PART NUMBER
312553001

VERSION NUMBER
5.0

EDITION NUMBER
1

ExPR

Expert Performance Reporter

MAINFRAME USER'S GUIDE

PRODUCT TYPE
SOFTWARE

StorageTek®

ExPR
Expert Performance Reporter

Mainframe User's Guide

Release 5.0

1st ed. 312553001

Information contained in this publication is subject to change without notice. Comments concerning the contents of this publication should be directed to:

Global Learning Solutions
Storage Technology Corporation
One StorageTek Drive
Louisville, CO 80028-3256
USA
URL: http://sts.stortek.com/sts/tis

Export Destination Control Statement

These commodities, technology or software were exported from the United States in accordance with the Export Administration Regulations. Diversion contrary to U.S. law is prohibited.

Restricted Rights

Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c) (1) and (2) of the Commercial Computer Software - Restricted Rights at FAR 52.227-19 (June 1987), as applicable.

Limitations on Warranties and Liability

Storage Technology Corporation cannot accept any responsibility for your use of the information in this document or for your use in any associated software program. You are responsible for backing up your data. You should be careful to ensure that your use of the information complies with all applicable laws, rules, and regulations of the jurisdictions in which it is used.

Warning: No part or portion of this document may be reproduced in any manner or in any form without the written permission of Storage Technology Corporation.

Proprietary Information Statement

The information in this document, including any associated software program, may not be reproduced, disclosed or distributed in any manner without the written consent of Storage Technology Corporation.

Should this publication be found, please return it to StorageTek, One StorageTek Drive, Louisville, CO 80028-5214, USA. Postage is guaranteed.

1st Edition (December 2003)

Document Effectivity

EC Number	Date	Doc Kit Number	Type	Effectivity
128806	December, 2003	---	First Edition	This document applies to ExPR Release 5.0

Contents

About This Book

Overview

This book describes procedures that are performed in the MVS environment to collect data, generate reports, and perform various other ExPR processes.

Audience

The audience for this book includes MVS system programmers, storage administrators, and MVS operators who will perform ExPR MVS host functions and analyze ExPR batch reports.

Organization

This book is organized as follows:

- Chapter 1, *Introduction*, provides an overview of ExPR MVS user functions and processes.
- Chapter 2, *ExPR Started Task Operator Commands*, provides information about the MVS commands used to start, stop, and otherwise manage the ExPR started task.
- Chapter 3, *ExPR Batch Database Update Processes*, describes various batch database processes and procedures required to update and maintain the ExPR database if the DirectSMF update function is not used.
- Chapter 4, *ExPR Allocation Recovery Processing*, describes ExPR SYSLOG processing that collects data for use in ExPR allocation recovery reports.
- Chapter 5, *ExPR Tape Catalog Processing*, describes how to update the ExPR database with tape catalog data for use in ExPR reports and perform other ExPR tape catalog processing functions.
- Chapter 6, *Printing Control Statement Information*, describes how to control what information is printed after ExPR configuration data is read during ExPR control statement processing.
- Chapter 7, *ExPR Run-Time Control Statements*, describes run-time control statements that are submitted to perform ExPR jobs.
- Chapter 8, *ExPR Batch Reports*, describes the mainframe reports that are produced in tabular format by ExPR during batch processing.

Conventions

The following conventions are used in this book:

- Statement keywords are shown in **boldface** type
- Variable information you enter is shown in *italics*
- A bar (|) separates mutually exclusive choices in command strings
- Brackets [ ] indicate optional items in command strings
- Parentheses ( ) and single quotation marks ‘ ’ must be entered as shown in command strings

Related Documentation

- *Introduction to ExPR*
- *ExPR Installation, Configuration, and Administration Guide (ICAG)*
- *ExPR PC 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: Introduction

Overview

This chapter provides an overview of ExPR MVS processes and the expected skills that an ExPR operator or system programmer should have.

ExPR MVS User Process Summary

ExPR processes described in this book include how to use MVS commands to manage the ExPR started task and the control cards you will modify and submit in the MVS jobstream to perform ExPR functions.

Skills Required

Users of this book should be familiar with JCL and MVS batch processes and Nearline and VSM/VTSS processes.

Chapter 2: Started Task Operator Commands

Overview

This chapter provides information about the MVS commands you can use to start, stop, and otherwise manage the ExPR started task.

Started Task Console Commands

The MVS START and STOP console commands are used to start and stop the ExPR started task:

Command	Description
S EXPRSTC	The MVS START console command starts the ExPR started task. **Note:** If you are using a shared PROCLIB library for your primary and secondary ExPR systems, the supplied EXPR proc takes a SYSID parameter so that the same proc can be used for multiple systems. In this case, you should specify the primary system name for variable *sysn*, and STCPARMP for *parmmem*. Then, when starting the started task on a secondary system, specify: S EXPR,SYSID=*sysn*,MEMBER=STCPARMS
P EXPRSTC	The MVS STOP console command terminates the ExPR started task in an orderly controlled manner. Internal tasks are allowed to complete outstanding work.

User Commands

The following commands can be entered at an MVS console using the MVS MODIFY command (for example, F EXPRSTC,CMF STATUS) as part of the day-to-day management of ExPR.

Command	Description
CMF STATUS	The CMF STATUS command causes an "on-demand" refresh of the Console Monitoring Function (CMF) messages pertaining to LSM free cell and free scratch thresholds, drives-in-use thresholds, and outstanding mount requests. These messages are issued every quarter hour.
HOSTS	The HOSTS command is for use on the primary ExPR started task. It will display the status of all known secondary systems, including information about logon date/time, last contact date/time, and the last inbound/outbound commands.
KILL	The KILL command terminates the ExPR started task immediately without waiting for the internal tasks to complete their outstanding work queue. This command should only be used if the MVS STOP command does not terminate the started task. Use of this command will not cause any damage to the ExPR database; however, outstanding host batch report requests will not be processed and the current hour's data will be lost by the DirectSMF update function.
REORG DATABASE/PGMIDATA /EXPRORF	The REORG command invokes an "on demand" reorganization and optional auto-deleting of the ExPR VSAM KSDS file. This causes the selected VSAM file to be dynamically copied to a new KSDS cluster, thereby eliminating CA/CI splits and secondary allocations. The REORG request will only be accepted if the reorganization parameters have been correctly specified via the PC Host Configurator application. (The Host Configurator is also where you specify the optional auto-delete aging criteria.) If you use an automated operations package, the REORG command can be triggered on a regular basis to clean up the VSAM file structures. **Note:** Each REORG command only supports one file per command.
SMF EXIT	The SMF EXIT command displays the status of the ExPR-supplied SMF IEFU83 exit used by the DirectSMF update function of the started task. Message XPR0746I is issued and can show the exit status as: INACT – the exit has never been activated ERROR – the exit previously initiated but subsequently has deactivated itself due to errors ACTIV – the exit is initialized and collecting SMF/RMF data The SMF EXIT command also lists various counters maintained by the exit, including SMF record types and storage utilization statistics.

Command	Description
SMF RESUME	The SMF RESUME command resumes the DirectSMF updating function after any batch updating of the ExPR database has completed.
SMF SUSPEND	The SMF SUSPEND command is used in conjunction with the DirectSMF update feature. Enter this command when you want to update the ExPR database in batch without stopping the ExPR started task. The DirectSMF update process is suspended while other batch updates are performed (i.e., SYSLOG-UPDATE, SMF-UPDATE from other MVS systems or the TAPECAT UPDATE process). When the batch updates are complete, enter the SMF RESUME command. WARNING: Simultaneous updates to the database from the started task and batch processes will result in database corruption, data loss, or other unpredictable results.
SOCKETS	The SOCKETS command produces a display of the status of the TCP/IP links to the started task. Message XPR0762I describes the response to this command.
TCP START	The TCP START command starts or restarts the ExPR client/server interface. The normal use would be to restart the TCP/IP interface after the TCP/IP address space has been restarted following a crash or maintenance.
TCP STOP	The TCP STOP command terminates the ExPR connection with the local MVS TCP/IP stack address-space. All open sockets and in-flight activity will be terminated. Use TCP START to restart the TCP/IP link.
TGUI REFRESH	The TGUI REFRESH command permits an “on demand” refresh of the TAPECAT extraction processes for the PC TAPECAT GUI inquiry function. When TGUI REFRESH is invoked, the TMS catalog and the HMS CDS are read and volume/dataset information is extracted. If you use an automated operations package, this command could be issued one or more times per day when batch job processing cycles have completed. **Note:** If the started task START TASKS statement did not specify TAPECAT-GUI, then this request is ignored.
TGUI RESTART	The TGUI RESTART command allows the TAPECAT GUI function to be started during the lifetime of the started task. However, this will only execute the index building process - the tape catalog extract will not occur. The previously extracted TMCHIST file contents will be used from the previous extraction run.
TGUI START	The TGUI START command allows the TAPECAT GUI function to be started during the lifetime of the started task. It will cause the tape catalog extract and index build processes to commence. This has the same effect as specifying START TASKS(TAPECAT-GUI) in the started task control statements. It is not necessary to shutdown and restart the started task to add the TAPECAT GUI functions.

Debugging Commands

The following commands should only be used when requested by a StorageTek customer support representative.

Command	Description
STORAGE	The STORAGE command displays details of the internal storage subpools within the ExPR started task.
TRACEON	The TRACEON command activates the basic tracing facilities of ExPR.
TRACEOFF	The TRACEOFF command reverses the effects of TRACEON and immediately stops all ExPR tracing.
TRACEOPTS	The TRACEOPTS command allows specification of any valid tracing control options (i.e., options that could have been coded on the EXEC PARM=*value*). For example, the size of the trace output can be significantly reduced by only tracing from the required point and not tracing the entire started task initialization process.
TRACERESET	The TRACERESET command resets all individual module/component traces that were previously specified on the EXEC PARM=value or via the TRACEOPTS command.
TRACEMSG	The TRACEMSG command allows a free-form textual entry to be placed in the ExPR TRACE dataset.

Chapter 3: ExPR Batch Database Update Processing

Overview

This chapter describes various batch database processes and procedures required to update and maintain the ExPR database if the DirectSMF update function is not used.

Database Update Processes

Database updates can be done either in batch processing or through the DirectSMF update feature.

- If DirectSMF update is used, these processes are performed automatically using parameters that are set in the ExPR started task. Refer to the *ExPR Installation, Configuration, and Administration Guide* for details.
- If batch SMF update processing is used, the database should be updated as part of the same housekeeping procedure as SMF, RMF, and HSC SMF processing.

The batch database update process can be selective with ExPR parameters providing controls for the record types to be input. Update (new date ranges) and replace (overwrite existing records) processing are supported. Each of the ExPR runtime control statements that relate to database processing are described below.

ExPR Data Collection Sources

ExPR collects data from the following sources:

- MVS SMF record type 21 (tape error statistics)
- MVS RMF record type 73 and 74 (channel and CU statistics including SSCH counts)
- HSC SMF records (HSC subtypes 4 and 7 for Nearline activity and VTCS subtypes 10, 11, 13-19, 21, 26, and 27 for VSM/VTSS activity)
- MVS system log (console output messages for allocation recovery analysis)
- HSC PGMI and HSC CDS (scratch and free cell statistics)
- Manual mount activity (collected by started task online monitor)
- Tape catalog data (optional process to produce tape usage statistics)

Refer to the *ExPR Installation, Configuration, and Administration Guide* in chapter 3, *Installation Planning for New ExPR Sites* for additional details about ExPR data collection.

ExPR Batch Data Collection Control Statements

The control statements listed below are used for the batch database update processes.

SELECT

SELECT defines filtering criteria for the SMF record types to be extracted from the general SMF housekeeping file maintained by the installation. SELECT subparameters include HSC, SMF21, RMF, PGMI, and VTSS. This parameter should be used when not all SMF type records handled by ExPR are required.

PERIOD

The UPRIN control statement PERIOD parameters FROM/TO can be used to limit the range of SMF/RMF data used to update the ExPR database.

If you are processing data that is more than 30 days old, you must include a PERIOD FROM/TO range. The default is from 30 days previous to the current date if a PERIOD statement is not specified, or the number of days specified in the host configuration as a site default.

PERFORM SMF-UPDATE

Extracts (subject to any SELECT filtering criteria) the required ExPR SMF record types (including PGMI data), writes them to a sequential file for input to the called SORT utility, and then updates the ExPR database with the sorted output.

An Important Consideration for SMF Update Processes

When running the SMF update processes, either in batch or real-time DirectSMF, it is important to ensure that the SMF data for all MVS hosts is included in a single update pass. The running of individual updates on a system by system or piecemeal basis will prevent ExPR from collecting and analyzing relevant data in the context of all other parallel activity. This is particularly important when you define ExPR consolidated views. All data must be handled in a single process to ensure that the global view of activity is correctly calculated.

Under real-time DirectSMF, this means that all secondary started tasks must be active and connected to the primary system. For the batch SMF-UPDATE function, you must input all SMF archive data, for a given date range, into a single batch execution. The various SMF files can be concatenated together and you can use the ExPR INPUT statement. The date/time/system order of the SMF input does not matter, as ExPR will sort the data. Also, in batch, you should always input whole days of SMF archive data, not partial days.

PERFORM SYSLOG-UPDATE

Update the ExPR database with console message records from the MVS SYSLOG. Selective message numbers are scanned and the date and timestamp associated with each

message is used to build a record containing the number of allocation recovery events and the duration of each event. Refer to chapter 4, *ExPR SYSLOG Allocation Recovery Processing* for more information.

PERFORM TAPECAT

Performs tape catalog processing and updates the ExPR database with information extracted from the tape catalog and CDS. This information relates to tape ages and utilization within the ACS or VTSS. Refer to chapter 5, *ExPR Tape Catalog Processing* for more information.

PERFORM REORGANIZATION

Invokes the automatic file reorganization feature to copy and rebuild the ExPR VSAM KSDS files (DATABASE, PGMIDATA and EXPRORF).

Reorganization normally occurs automatically at a specified time as part of the DirectSMF function within the ExPR started task, based on a frequency in number of days for each VSAM file that is defined and activated via the PC-based Host Configurator application.

Batch reorganization will always be run upon request, even if the feature has not been activated via the PC Host Configurator. However, the reorganization work DSN must be defined in the Host Configurator; an error message will be issued if it is not.

When run as a batch process, the reorganization function will always reorganize all files regardless of the frequency setting. It will also reset the next reorganization date to be used by the started task function. Batch reorganization requires exclusive use of the VSAM files: the started task must be stopped and restarted.

Batch reorganization is intended primarily for batch SMF-UPDATE users, but can be used by DirectSMF users also. As part of the reorganization function, the Auto-Delete process will also be performed (if activated via the Host Configurator application).

NOTE HERE

Chapter 4: ExPR Allocation Recovery Processing

Overview

This chapter describes ExPR processing that collects data for use in ExPR allocation recovery reports.

Define Allocation Recovery Setup

SYSLOG processing is used by ExPR to produce allocation recovery reports that indicate how much throughput delay is attributable to allocation recovery events in the MVS systems.

Allocation recovery is a single-thread function of MVS. It is therefore important to understand how much throughput delay is attributable to it. ExPR determines that an allocation recovery has occurred by searching for the following SYSLOG messages:

Allocation Recovery SYSLOG Messages

SYSLOG Message	Description
IEF290	….. Needs 1 Unit
IEF877	….. Needs 1 Unit (MVS V5+)
IEF238	Reply Device Name, Wait or Cancel
IEF233	General MVS Mount Message
IEF878	End of Message (MVS V5+)
IAT5210	For JES3 Only
IAT5918	For JES3 Only
MIM2120	….. Unable to Allocate
MIM2060	Reply Device Name, Wait or Cancel
MIM2046	….. Has Replied “___” to the Above Message

The SYSLOG-UPDATE process writes hourly summary records to the database for each LSM/VTSS/GROUP and additionally for all non-tape activity (i.e., other device types that invoked MVS allocation recovery).

Important Note: The SYSLOG-UPDATE function is designed to process the standard JES2/JES3 SYSLOG file, as produced by the IBM External Writer utility IASXWR00, or SMR / $AVRS. Installations that use other products or user-written utilities may have to modify the file before passing it to ExPR. Problems are particularly caused by the addition of separation banners, leading control pages, and page headings. These would need to be removed from the file. Similarly, changes to the column layout and spacing will cause ExPR to fail to extract the required messages.

ACTION:

- Process your installation's SYSLOG file(s) using *usrprfx*.CNTL member SYSLOG and the instructions that follow in this chapter.
- Be sure to include the CAPS ON command when tailoring *usrprfx*.CNTL members.

SYSLOG-UPDATE Support for JES2

The PERFORM SYSLOG-UPDATE control statement below is for a JES2 system. JES3 users should refer to the JES3 example that follows.

```
//SYSLOG DD DISP=SHR,DSN=usrprfx.syslog
//UPRIN DD *
  PERFORM SYSLOG-UPDATE ;
/*
```

***usrprfx*.CNTL Member: SYSLOG**

PERFORM SYSLOG-UPDATE selects SYSLOG data and updates the database. The SYSLOG input is located by DDNAME SYSLOG. This is a fixed value and should not be changed. Also, there is no PERIOD card required with this function; the full XWTR dataset will be processed by ExPR.

A separate SYSLOG-UPDATE run is necessary for each JES2 system; it is not possible to concatenate the SYSLOG files from multiple JES2 systems into a single run.

All JES2 or JES3 systems to be processed by the SYSLOG-UPDATE function must be defined by a HOST statement and must have at least one LSM/VTSS or GROUP defined.

SYSLOG-UPDATE Support for JES3

JES3 users should specify the following control statement.

```
//SYSLOG DD DISP=SHR,DSN=usrprfx.syslog
//UPRIN DD *
   PERFORM SYSLOG-UPDATE JES3(yyyy xxxxx yyyy xxxxx …) ;
/*
```

***usrprfx*.CNTL Member: SYSLOG**

The additional parameter JES3 lists the system-ids to be extracted from the GLOBAL JES3 console file. In the above example, for each system, *xxxxx* represents the message origin prefix in the JES3 complex and *yyyy* represents the MVS/JES3 system ID associated with each system (normally the MAIN statement processor name as defined in the HSC LIBGEN).

For example, if "SYS1 R=" is the message prefix for "SY1X" and "SYS2 R=" is the message prefix for "SY2X", you would code:

```
JES3(SY1X 'SYS1 R=' SY2X 'SYS2 R=')
```

The JES3 parameters must be specified in pairs; the system ID followed by the message prefix as it appears in the JES3 SYSLOG file. If the message prefix contains blanks, it must be enclosed in single quotation marks. The value and format of the message prefix are controlled by the JES3 MAINPROC statement parameters ID=, RID=, and SID=.

When multiple JES3 systems are specified, a separate allocation recovery report is generated for each system. The JES3 console file is read via the DDname SYSLOG, the same as for JES2. It is not possible to mix JES2 and JES3 SYSLOG-UPDATE functions in a single execution of ExPR.

In addition to MVS allocation/recovery, ExPR will also report on JES3 mount setup processing as recorded by messages IAT5210 and IAT5918.

Note: JES3 sites should also review the *ExPR Installation, Configuration, and Administration Guide* under appendix C, *Special Considerations for JES3 Installations*.

RECFM Support

Although the SYSLOG-UPDATE function was designed to read the output file from the IBM external writer, it is recognized that many installations use other utilities or packages to manage SYSLOG output. These utilities may not produce a VBA/VBM file like the external writer.

If your SYSLOG file is not VBA/VBM, you can specify the RECFM parameter on the SYSLOG-UPDATE statement, as shown below. Valid RECFMs are VBA, VBM, FBA, FBM, FB, and VB. The usual external writer record format for JES2 is VBA; for JES3 it is VB. Regardless of the RECFM, ExPR expects the SYSLOG file to be in the standard JES2/JES3 layout.

```
//SYSLOG DD DISP=SHR,DSN=usrprfx.syslog
//UPRIN DD *
   PERFORM SYSLOG-UPDATE JES3(yyyy xxxxx) RECFM(valid recfm) ;
/*
```

usrprfx.CNTL Member: SYSLOG

SMR Support

If you use the CA-SMR SYSLOG archive product, the file can be read by ExPR. This is achieved by specifying

```
RECFM(SMR xxx)
```

where *xxx* represents the valid record format of the SMR file.

MIM Support

If the MIM software product is active, messages IEF238, IEF290, and IEE600 may be replaced by MIM2060, MIM2120, and MIM2046 respectively. ExPR automatically detects these messages during SYSLOG processing. Due to the nature of MIM's interception of allocation/recovery (i.e., repeated sequences of message MIM2120 and MIM2046), the update report will show many mounts of a short duration. Additionally, when processing a MIM controlled allocation/recovery, the VOLSER column will always show as UA (unavailable) and the DDname may sometimes show as UA.

$AVRS Support

If you archive your SYSLOG using the $AVRS product, the file can be read by ExPR without any special parameters or considerations (subject to specifying the correct RECFM).

HCFORMAT Option

Since MVS/ESA v5 and OS390 v1r1, the JES2/JES3 SYSLOG files have the option of a two-digit year or a four-digit year, including the century (e.g., yyddd or yyyyddd). This format is selected in the MVS SYS1.PARMLIB system initialization members. Similarly ExPR SYSLOG-UPDATE processing needs to know what option was chosen. This is achieved by the HCFORMAT parameter. Specify HCFORMAT(YEAR) for two-digit yyddd format dates and HCFORMAT(CENT) for four-digit yyyyddd format dates. The default is HCFORMAT(YEAR).

Chapter 5: ExPR Tape Catalog Processing

Overview

This chapter describes how to update the ExPR database with tape catalog data for use in ExPR reports and perform other ExPR tape catalog processing functions.

Note: ExPR tape catalog processing is activated and controlled by parameters in the ExPR configuration on the host system.

Running the TAPECAT Functions

Tape catalog processing is controlled and initiated by batch tasks that scan the CDS and tape catalog, calculate age and utilization statistics, update the database file, create the history file, generate basic age and usage summary reports, and produce optional reports. Sample UPRIN decks are provided below.

Use the UPRIN control statement TAPECAT OPTION(UPDATE) to update the database with tape catalog information after the tape catalog processing feature has been implemented for your site with the ExPR Host Configurator application.

UPDATE scans the CDS and tape catalog, calculates age and utilization statistics, updates the database file, creates the tape catalog history file, and generates basic age and usage summary reports. Examples of the control card to run this task are in *usrprfx.*CNTL member TAPECATU.

ACTION:

- Review *usrprfx.*CNTL members TAPECATU, TAPECATR, and TAPECATH for examples of TAPECAT, UPDATE, REPORT, SUMMARY, and HISTORY.
- **ASG-zara Users:** Tailor *usrprfx.*CNTL member ZARAEXTR and run.
- Run TAPECATU to update the database and create a TMCHIST file.
- Be sure to include the CAPS ON command when tailoring *usrprfx.*CNTL members.

Due to the potential overhead caused by reading both the CDS and tape catalog, it is recommended that this task only be run once per day. This level of recording should be adequate for the reports generated from this source. However, the ExPR data key structure would permit the recording of tape catalog information on a more frequent basis

if required. Additionally, this task should be run at the same time each day to avoid data being distorted by any workload variations, such as enter/eject activity.

Note: If you use ASG-Zara as your tape management system, refer to *ASG-Zara Considerations* at the end of this chapter.

Example 1: Process Tape Catalog and Update Database and History Files

This example will read the CDS and tape catalog, calculate tape utilization estimations, and calculate age statistics based on last-reference date and data profile, such as stacked and multi-volume statistics. The database file is updated and the history file is created in this example, and two basic age and usage summary reports are generated listing each LSM/VTSS or dataset group that was processed (ExPR messages XPR0091I and XPR0092I).

```
//UPRIN          DD *
  TAPECAT OPTION(UPDATE) SYSID(mvshost) ;
```

***usrprfx*.CNTL Member: TAPECATU**

Do not forget to use TAPECATU for the TAPECAT UPDATE function.

Note: The SYSID parameter is required; an error message will be issued if it is omitted. In a multi-MVS shared tape catalog/CDS environment, specify the system ID of the main system. The TAPECAT database records are written to the database with the SYSID value in the record key.

Example 2: Process Tape Catalog Without Updating Database and History Files

This example will perform all of the calculations and generate the two summary reports as in the previous example, but will not update the database file and will not create the history file. This example is useful for generating snapshot statistics for subsets of the tape catalog when the CONFIG statement TAPEDEF EXCLUDE is specified.

```
//UPRIN          DD *
  TAPECAT OPTION(UPDATE NOHIST NODBUP) SYSID(mvshost) ;
```

***usrprfx*.CNTL Member: TAPECATU**

When using option NOHIST, you should comment out the TMCHIST DD in TAPECATU. Failure to do so will create an empty generation of the TMCHIST file.

Example 3: Process Tape Catalog Including All Volumes

By default, ExPR processes just those volumes in the tape catalog that are listed in the HSC CDS. However, the UPRIN control statement TAPECAT OPTION includes a subparameter option, FULLCAT, which includes all volumes in the tape management catalog for ExPR tape catalog processing. Use of this subparameter does not affect the calculation of age and utilization data for the ACSs, LSMs, and dataset workload groups. However, it will cause additional records to be written to the history file for subsequent comparison, sorting, and reporting (unless NOHIST is also specified).

```
//UPRIN          DD *
  TAPECAT OPTION(UPDATE FULLCAT) SYSID(mvshost) ;
```

***usrprfx*.CNTL Member: TAPECATU**

Do not forget to use TAPECATU for the TAPECAT UPDATE function.

If the FULLCAT option is replaced by the NONSILO option, the TAPECAT UPDATE function will only process non-ACS volumes (i.e., volumes in the tape catalog but not in the HSC CDS). The history file will then only contain details of the non-ACS volumes. NONSILO forces the NODBUP option, so the actual updating of the ExPR database will be suppressed.

Example 4: Process Tape Catalog and All Virtual-Tape-Volumes

This example extends example 3 above to include all volumes in the CDS and tape catalog and all VTVs and MVCs within the VSM system. It excludes all round/reel-to-reel tapes that may be in the tape catalog (i.e., the NOREEL option).

```
//UPRIN          DD *
  TAPECAT OPTION(UPDATE FULLCAT VIRTUAL NOREEL) SYSID(mvshost) ;
```

***usrprfx*.CNTL Member: TAPECATU**

Do not forget to use TAPECATU for the TAPECAT UPDATE function.

The VIRTUAL option causes TAPECAT UPDATE to include details of VTVs and MVCs within the VSM system. This information is extracted from the VTV/MVC report flat files, as documented in this chapter under *Extracting Details of VTV and MVC Volumes*.

Handling of VTSS VTV and MVC Volumes

The ExPR TAPECAT facility supports the Virtual Storage Manager (VSM) and its associated Virtual Tape Subsystems (VTSSs) by allowing you to include Virtual Tape Volumes (VTVs) and Multiple Volume Cartridges (MVCs) for analysis and reporting along with the non-VSM volumes within your installation.

The UPDATE facility can optionally include the virtual volumes, and the REPORT option can include them or report on them separately. Additionally, there are REPORT options specifically for virtual volumes.

It is important here to emphasize the special way that the ExPR TAPECAT function handles VSM VTVs and MVCs. A non-VSM volume has a record generated in the history file for each file/dataset cataloged on that volume. These real volumes have media types 0 through 4, depending on the device-type/density/compression option when they were created.

However, due to the nature of the VSM/VTSS system, several different types of records are written for each VTV or MVC. These different record types and the VSM/VTSS-specific TAPECAT REPORT options allow full cross-referencing of MVCs and VTVs, allowing you to determine:

- The application details of a VTV, same as for a real cartridge
- The location and size of all occurrences of a VTV within a VTSS and any archived copies on MVCs
- A summary of each MVC and any onboard archived copies of VTVs

This cross-referencing is made possible by creating history records with special dataset names, as shown below:

For each MVC and on-board VTV:

```
$$MVC.VOLSER.MVC001
$$MVC.VOLSER.MVC001.CONTAINS.VTV.VTV123
$$MVC.VOLSER.MVC001.CONTAINS.VTV.VTV124
$$MVC.VOLSER.MVC001.CONTAINS.VTV.VTV125
```

For each VTV:

```
$$VTV.VOLSER.VTV123.MIGRATED.TO.MVC001
$$VTV.VOLSER.VTV123.MIGRATED.TO.MVC006
$$VTV.VOLSER.VTV123.RESIDENT.IN.VTSS001
```

Extracting Details of VTV and MVC Volumes

The inclusion of VSM VTV and MVC volumes requires an extra input file in addition to the HSC CDS and your site's tape catalog. The required extract is the VTCS/VSM utility program (SWSADMIN) MVCRPT and VTVRPT reports. This extraction is invoked automatically by the TAPECAT UPDATE process if VSM is present in your system.

ExPR Internal Device/Media Types

The following table lists the device-type/media codes used internally by the ExPR TAPECAT facility and the ID used in the Volume Details report. These are written to the history file in the field THF_DEN.

TAPECAT Device-Type /Media Codes

THF_DEN Value	Volume Details Report	Maximum Capacity (including compression)	Device-Type/Media Description
0	ROUND	140 Mb	All 1600/6250 bpi reel-to-reel/round tapes
1	80	200 Mb	3480/18-track cartridges uncompressed (550 ft. cart)
2	80I	800 Mb	3480/18-track cartridges compressed (IDRC/ICRC) (550 ft. cart)
3	90	400 Mb 800 Mb	3490/36-track cartridges uncompressed (550 ft. cart) 3490/36-track cartridges uncompressed (1100 ft. cart)
4	90I	1600 Mb 3200 Mb	3490/36-track cartridges compressed (IDRC/ICRC) (550 ft. cart) 3490/36-track cartridges compressed (IDRC/ICRC) (1100 ft. cart)
5	VTV-VOL	400 Mb	3490E 400Mb VTV within the VSM system
M	MVC-BASE	N/A	An MVC-base record for each MVC within the VSM/VTSS system
N	MVC-VTV	N/A	An MVC-onboard-VTV record for each VTV copy on an MVC
V	VTV-COPY	N/A	A VTV-index record for each copy of a VTV on an MVC or within a VTSS
A	REDWD-10	40 Gb	An STK RedWood 10 Gb native cartridge
B	REDWD-25	100 Gb	An STK RedWood 25 Gb native cartridge
C	REDWD-50	200 Gb	An STK RedWood 50 Gb native cartridge
E	9490E	3200Mb	An STK 9490E 1100ft. E cartridge
J	MSTAR-10	70 Gb	An IBM 3590 MagStar 10 Gb native cartridge
R	9840	140 Gb	An STK 9840 native cartridge
P	9940	420Gb	An STK 9940 native cartridge
Z	9490EE	6.5 Gb	An STK 9490EE 2200 ft. EE cartridge

Note: The application dataset name and data attributes for a VTV are to be found in the type 5 record, in the same manner as non-VSM cartridges are found in types 1-4. Type M, N, and V are specific to VSM/VTSS and its internal management of VTVs and MVCs. These record types allow cross-referencing of copies of VTVs within a VTSS or MVCs and collation of the contents of a given MVC.

Special Considerations for the TMCHIST File

During configuration of ExPR, a generation data group was created for the TAPECAT TMCHIST file. This file holds a record per volume in the CDS (and optionally the tape catalog) and is a snapshot of the tape library at the time the TAPECAT UPDATE function is run.

The TMCHIST DD statement in *usrprfx.*CNTL member TAPECATU is set to create generation (+1) when running the TAPECAT UPDATE function. When using the UPDATE NOHIST option, the DD statement should be commented out; otherwise you will create empty generations of TMCHIST whenever you run TAPECATU.

If the TAPECAT reporting options REPORT or SUMMARY are requested in the same run as UPDATE (using TAPECATU), they will read the newly created (+1) generation. However, when running TAPECAT REPORT or SUMMARY standalone, *usrprfx.*CNTL member TAPECATR should be used.

The TAPECAT HISTORY function requires two generations of TMCHIST for comparison purposes. These are read via DD statements TMCHIST1 and TMCHIST2 and should always specify previous generations (0, -1, -2, etc.). These DD statements must be tailored in *usrprfx.*CNTL member TAPECATH before running the HISTORY function.

Note: If your installation wishes to read the TMCHIST file for your own processing requirements, *usrprfx.*CNTL member EXPRHIST contains an assembler record layout.

ASG-Zara Considerations

Installations that use the ASG-Zara tape management system must run an extra job before the ExPR TAPECAT UPDATE function. This job is a Zara utility LIST ACTIVE and LIST SCRATCH run, as documented in *usrprfx.*CNTL members ZARAEXTR and ZARAEXT2.

The ExPR/Zara interface module does not directly read the Zara tape catalog as with other TMS systems, but processes the extract file (as this is the published interface to ASG-Zara).

It is recommended that the Zara catalog extraction step be run immediately before the ExPR TAPECAT UPDATE function. This will ensure that the tape catalog and CDS are in synchronization. Ideally, the ZARAEXTR member should be copied to the front of the TAPECATU JCL.

If you intend to use the ExPR started task TAPECAT GUI facility, then you must schedule the ZARAEXT2 job before starting the started task.

When requesting a dynamic refresh of the extraction process, you will also have to schedule the ZARAEXT2 job to ensure that the latest information is available to the extraction processes. This job can execute while the ExPR started task continues to run. When job ZARAEXT2 completes, you can then request the extraction refresh from the PC or via the TGUI REFRESH operator command. The ZARAEXT2 job and the TGUI REFRESH command could be scheduled by an automated operations package.

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.

Chapter 6: Printing Control Statement Information

Overview

This chapter describes how to control what information is printed after ExPR configuration data is read during ExPR control statement processing.

Printing Control Statement Information

Whenever ExPR is executed, the configuration and control statements are printed to the UPRPRINT DD, whereas the user requested batch reports are produced via the UPRREPTS DD.

The listings include the generated statements (CDSCONF), the configuration statements (CONFIG), and run-time control statements (*usrprfx*.CNTL).

These listings can be quite lengthy, especially in large sites. You may wish to suppress printing all or parts of these listings with the PARM statement as shown below. However, it is strongly recommended that the default options remain in effect as the full configuration listing would be required for any problem diagnosis by StorageTek Software Support.

Control statements are listed in three sections: Generated Configuration, User Configuration, and UPRIN requests. These listings can be controlled with the OPTIONS control parameter. OPTIONS has the following syntax:

+	Prefix to include an output type
-	Prefix to exclude an output type
S	Runtime statements (UPRIN from *usrprfx*.CNTL)
C	Configuration statements (from CONFIG member)
G	Generated statements (from CDSCONF DD)
A	Analysis report (debugging use only)

The default setting is to include Configuration (CONFIG), Generated configuration (CDSCONF), and Runtime (UPRIN) but exclude the Analysis listing. If this is acceptable, it is not necessary to code the PARM statement.

For example, the default lists all input statements but not the Analysis listing:

```
//STEPn EXEC PGM=UPREXPR,PARM='OPTIONS(+GCS-A)'
```

The coded statement below would print just the run-time statements:

```
//STEPn EXEC PGM=UPREXPR,PARM='OPTIONS(+S-GCA)'
```

The coded statement below would print the Generated configuration and Sysin statements but not the Analysis listing and not the Configuration statements:

```
//STEPn EXEC PGM=UPREXPR,PARM='OPTIONS(+SG-CA)'
```

Chapter 7: ExPR Batch Run-Time Control Statements

Overview

This chapter describes run-time control statements that are submitted to perform ExPR jobs. Control statements are listed alphabetically.

Started Task Control Statement Note

MVS commands you can use to start, stop, and otherwise manage the ExPR started task are described in chapter 2, *Started Task Operator Commands* in this book.

Syntax descriptions for each of the started task parameter control statements in *usrprfx*.CNTL members STCPARMP and STCPARMS are in the *ExPR Installation, Configuration, and Administration Guide* under appendix A, *ExPR Started Task Control Statements*.

Control Statement Format Conventions

The following conventions are used in the tables below:

- Statement keywords are shown in **boldface** type
- Variable information you enter is shown in *italics*
- A bar (|) separates mutually exclusive choices in command strings
- Brackets [ ] indicate optional items in command strings
- Parentheses ( ) and single quotation marks ‘ ’ must be entered as shown in command strings

A semicolon (;) delimiter is required at the end of each statement. For example:

```
PERIOD FROM(1994340) TO(1994392) ;
REPORT NAME(MOUNTS) ;
```

Note: ACS and LSM Identifiers are decimal numbers, not hexadecimal. Various ExPR run-time control statements have an ACS and/or LSM parameter in the format ACS(*aaa*) and LSM(*aaa ll*), where *aaa* and *ll* numbering starts at 000 and 00 respectively. Please note that these are decimal identifier numbers, not hexadecimal. For example, the second LSM attached to the third ACS is identified as LSM(002 01).

SAMPLIB NOTE HERE

INPUT

This control statement allows SMF/RMF/PGMI data input from multiple DD names.

Note: To include data collected by the ExPR started task PGMI and Real-Time Monitor (RTM) functions, include a DDname of PGMIDATA in this statement.

Control Statement	Description
INPUT	The keyword.
DDNAME(PGMIDATA *dd1 dd2 ...*) ;	DDNAME identifies the DD names to accept input from.

Example:

- To request data input from PGMIDATA, INDATA1 and INDATA2:

  INPUT DDNAME(PGMIDATA INDATA1 INDATA2) ;

PERFORM

This control statement selects an action to be performed (one action request per statement).

Examples:
PERFORM INITIALIZE ;
PERFORM SMF-REPORT ;
PERFORM SMF-UPDATE ;
PERFORM SYSLOG-UPDATE ;
PERFORM REORGANIZATION ;

Control Statement	Description
PERFORM	The keyword.
INITIALIZE ;	PERFORM INITIALIZE initializes a newly defined database.

Control Statement	Description
REORGANIZATION	PERFORM REORGANIZATION invokes (1) the automatic file reorganization feature to copy and rebuild the ExPR VSAM KSDS files and (2) optionally the Auto-Delete function to remove unwanted records. Both features require definition via the PC-based Host Configurator application. Auto-Delete also requires activation to be invoked. Also, the reorganization work DSN must be defined in the Host Configurator; an error message will be issued if it is not.
REPORT ;	PERFORM REPORT is now just REPORT. See REPORT.
SMF-REPORT ;	PERFORM SMF-REPORT selects SMF records from a sorted input dataset and produces an Exception Event report, the same as SMF-UPDATE, but does not create database records.
SMF-UPDATE [DUPKEY(*option*)] [NOEXCPT] ;	PERFORM SMF-UPDATE selects PERFORM SMF/RMF/PGMI records from the input datasets, sorts them, creates database records, and produces an Exception Event report. DUPKEY *option* is REPLACE, IGNORE, or CANCEL. The default is REPLACE. NOEXCPT suppresses the exception report generated by SMF-UPDATE processing. Refer also to chapter 3, *ExPR Batch Database Update Processes*.
SYSLOG-UPDATE [JES3(*yyyy xxxx…*)] [RECFM(*valid_recfm*)] [HCFORMAT(CENT|YEAR)] ;	PERFORM SYSLOG-UPDATE requests allocation/recovery analysis of the JES console log. JES3 defines those systems in a JES3 complex that are to be extracted. Do not specify the JES3 parameter if you are processing JES2 console logs. For each JES3 system, *xxxxx* represents the message origin prefix and *yyyy* represents the associated MVS system ID (normally the SMFid). The message prefix has a maximum length of 11 and must be enclosed in single quotation marks if it has embedded blanks. The system ID can be up to four characters in length. RECFM – this optional parameter is valid for JES2 or JES3 installations. The IBM external writer produces a VBA file of JES2 SYSLOG messages and VB for JES3 messages. However, many sites use other utilities to manage their SYSLOG, and these utilities may not produce their files in VBA format. The valid RECFMs are VBA, VBM, FBA, FBM, FB, and VB. The default is VBA/VBM. Users of CA-SMR can specify

Control Statement	Description
	RECFM(SMR *xxx*), where *xxx* represents the valid format of the SMR file. HCFORMAT – this parameter allows the processing of JES2 or JES3 SYSLOG files with four-digit years within the date field, as introduced by MVS 5.2 and OS/390 R1. (CENT) process four-digit years and (YEAR) – the default – processes two-digit years. Refer also to chapter 4, *ExPR SYSLOG Allocation Processing*.
TAPECAT ;	PERFORM TAPECAT is now just TAPECAT. See TAPECAT below and refer also to chapter 5, *ExPR Tape Catalog Processing*.
VTSS-SMF-AUDIT ;	PERFORM VTSS-SMF-AUDIT can be used in place of SMF-REPORT or SMF-UPDATE. It produces an audit trail of virtual tape activity, including VTV mounts/dismounts, MVC mounts/dismounts, and VTV recalls, reclaims, and migrates. The database is not updated by this function. When performing VTSS-SMF-AUDIT, you should specify SELECT TYPE(VTSS) also.

An Important Consideration for SMF Update Processes:

When running the SMF update processes, either in batch or real-time DirectSMF, it is important to ensure that the SMF data for all MVS hosts is included in a single update pass. The running of individual updates on a system by system or piecemeal basis will prevent ExPR from collecting and analyzing relevant data in the context of all other parallel activity. This is particularly important when you define ExPR consolidated views. All data must be handled in a single process to ensure that the global view of activity is correctly calculated.

Under real-time DirectSMF, this means that all secondary started tasks must be active and connected to the primary system. For the batch SMF-UPDATE function, you must input all SMF archive data, for a given date range, into a single batch execution. The various SMF files can be concatenated together and you can use the ExPR INPUT statement. The date/time/system order of the SMF input does not matter, as ExPR will sort the data. Also, in batch, you should always input whole days of SMF archive data, not partial days.

PERIOD

This control statement selects an inclusive date range to process. The default if this control statement is not specified is 30 days previous to the current date.

Note: A default other than –30 days can be set for your site with the PC-based ExPR Host Configurator application. Separate defaults can be set for reporting periods and for batch database update periods.

Control Statement	Description
PERIOD	The keyword.
FROM(*yyyyddd* [*hh*]) TO(*yyyyddd* [*hh*]) ;	FROM and TO define the range, in the format "yearday" (where January 1, 2000 is 2000001). *yyyyddd* must be in the range 1980001 through 2079365. *hh* indicates the optional hour parameter (00-23). The default hours if not specified are 00 and 23. The FROM/TO values are used for two purposes in ExPR: (1) To control the range of data extracted from the ExPR database by various reports (2) To control the range of data that is input to the SMF-UPDATE batch database update process. **Note:** The report extraction process uses the date and optionally the hour, while the database update process uses only the date.

Examples:

- To select a week's worth of data:

  PERIOD FROM(2000184) TO(2000190) ;

- To select a night-shift for reporting (8:00 p.m. to 6:00 a.m.):

  PERIOD FROM(2000203 20) TO(2000204 06) ;

- To select the second half of a day (12:00 noon to midnight):

  PERIOD FROM(2000213 12) TO(2000213) ;

REPORT

This control statement generates ExPR Batch reports. Only one report can be generated per control statement.

Refer to chapter 8, *ExPR Batch Reports* for details of these reports.

Note: Reporting is performed through the ExPR Application Programming Interface (API). Your technical staff can use this API to develop customized batch tabular reporting applications.

Control Statement	Description
REPORT	The keyword.
NAME (*predefreport*|*extrnlmod*)	NAME identifies the report source, either predefined or from an external user-written module. *extrnlmod* represents a user-written load module to which ExPR links, and that module obtains data and writes the report by calling back through the API. *predefreport* represents one of the following values: ALLOC-REC – produce the Allocation Recovery report CONTENTS – produce the Contents report CU-BUSY – produce the Control Unit Busy report DB-CONTENTS – produce the Database Contents report DEMAND-ENTERS – produce the Demand Enters report DEVICE-GROUP-MOUNTS – produce the Mounts report for device groups DEVICE-GROUP-UTILIZATION – produce the Utilization report for device groups MANUAL-MOUNTS – same as DEVICE-GROUP-MOUNTS (for compatibility with prior release) MANUAL-UTILIZATION – same as DEVICE-GROUP-UTILIZATION (for compatibility with prior release) MOUNTS – produce the LSM-level Mounts report MOUNTS-ACS – produce the ACS-level Mounts report MOUNTS-DETAIL – produce the Mounts Detail report MOUNTS-LSMS-USED – produce Mounts LSMs Used report ORF-INDEX – produce the Online Report File Contents report PATH-BUSY – produce the Channel Path Group Utilization report SCRATCH-POOL – produce the Scratch Subpools report SYSTEM-MOUNTS – produce the System Mounts report TAPE-ERRORS – produce the Tape Errors reports THRESHOLDS – produce the Thresholds Exceptions report

Control Statement	Description
	UTILIZATION – produce the Utilization report VTSS-INTERFACE-PERFORMANCE – produce VTSS front-end interface statistics report VTSS-INTERNAL-PERFORMANCE – produce VTSS back-end internal statistics report VTSS-MOUNTS – produce the VTSS Mounts report for VTSSs VTSS-RESIDENCY – produce the VTSS Residency report VTSS-THRESHOLDS – produce the VTSS Thresholds Exceptions report VTSS-UTILIZATION – produce the VTSS Utilization report
{SINGLE|MULTIPLE} ; **Note:** The previous GROUP and NOGROUP parameters are still accepted. GROUP has been replaced by SINGLE and NOGROUP by MULTIPLE.	SINGLE indicates that the requested user-written report (written with the ExPR API) is "per LSM/VTSS/device group" and only records for a single entity should be passed during each link. This option is not used for the predefined reports. MULTIPLE indicates that the requested user-written report (written with the ExPR API) is "per ACS/all VTSSs/all device groups" and all records will be passed in a single invocation of the report module. This option is not used for the predefined reports. The default is MULTIPLE.

Examples:

- To request a Channel Path Busy report:

  REPORT NAME(PATH-BUSY) ;

- To request a per-LSM report you have designed through the ExPR API:

  REPORT NAME(*yourmodulename*) SINGLE ;

REPORT-OPTIONS

This control statement specifies:

- The level of detail reporting generated by certain batch reports. By default, device type and workload details are excluded from reports. With this control statement, you can elect to include device type and/or workload level detail in those reports where such information is normally summarized.
- The destination for report output. By default, report output is sent to the default UPRPRINT DD. With this control statement, you can route the output from any ExPR report or update process to the Online Report File (ORF) for subsequent display at an ExPR PC.

Control Statement	Description
REPORT-OPTIONS	The keyword.
DEVICE-TYPES ;	DEVICE-TYPES requests that in addition to the general ALL DEVICES summary line, a summary is also printed for each device-type within an LSM. This setting applies to requests for MOUNTS, MOUNTS-ACS, or MOUNTS-DETAIL reports in the current batch job.
WORKLOADS ;	WORKLOADS requests a summary line for each user-defined workload group for reports in the current batch job.
ONLINE ;	ONLINE causes all ExPR printed report output from the current batch job to be placed in the Online Report File (ORF) for subsequent retrieval by the ExPR PC Host Reports application.
NO-DETAIL ;	NO-DETAIL suppresses drive concurrency information (i.e., the second part of the report) on Utilization, VTSS Utilization, and Device Group Utilization reports.
MANAGEMENT-CLASSES ;	MANAGEMENT-CLASSES apply only to the VTSS Residency report. If specified, residency statistics will be printed for the defined VSM management classes.

Examples:

- To request device type detail in reports:

  REPORT-OPTIONS(DEVICE-TYPES) ;

- To request workload group detail in reports:

  REPORT-OPTIONS(WORKLOADS) ;

SELECT

This control statement specifies:

- Selective processing of data from only certain ACSs, LSMs, or VTSSs for inclusion in report requests in the current batch job. The default if this option is not specified is to include all ACSs, LSMs, and VTSSs.
- Selective processing of a subset of SMF input data by database update processes in the current batch job. The default if this option is not specified is to include all SMF input types that are processed by ExPR.
- Selective processing for a specific SYSID only for inclusion in the current batch job. The default if this option is not specified is to include all SYSIDs.

Control Statement	Description
SELECT	The keyword.
ACS(*aaa*)	ACS selects just the LSMs in the specified ACS for report requests.
LSM(*aaa ll*)	LSM selects just the specified LSM for report requests.
VTSSID(*vtss-id*)	VTSSID selects just the specified VTSS for report requests.
GROUP (*group-id*)	GROUP selects just a specific device group for device group reports. This includes the automatically generated RTD device groups (RTD-G*nnn*) and per-ACS device groups (ACS-*nnn*).
TYPE(HSC PGMI SMF21 VTSS RMF) ;	TYPE selects a subset of the SMF input for processing by the SMF-SELECT, SMF-UPDATE, or SMF-REPORT functions. HSC – HSC subtypes 4 and 7 for LSM activity SMF21 – MVS dismount records RMF – RMF types 73 and 74 VTSS – HSC subtypes 9 through 26 for VSM activity PGMI – ExPR pseudo-SMF records for the PGMI data collector
SYSID(*mvshost*) ;	SYSID selects a specific MVS host system for either report generation or SMF input filtering. Only one SYSID can be selected. If this option is not specified, all SYSIDs are selected.

Examples:

- To select a specific LSM for report requests:

  SELECT LSM(001 01) ;

- To request specific SMF input types for the batch database update process:

  SELECT TYPE(HSC SMF21) ;

- To select a specific SYSID for report requests or batch database update processes:

  SELECT SYSID(MVS1) ;

- To request both an LSM and SYSID:

  SELECT LSM(000 01) SYSID(MVS1) ;

- To request both a TYPE and a SYSID:

  SELECT TYPE(HSC SMF21) SYSID(MVS1) ;

- To select a device group:

  SELECT GROUP(*nnn*) ;

- To select an RTD device group:

  SELECT GROUP(RTD-G*nnn*) ;

- To select an ACS device group:

  SELECT GROUP(ACS-*nnn*) ;

RTD-G*nnn* Note: The RTD-G*nnn* device groups are generated automatically during the auto-configuration process, one per VTSS. When selecting an RTD device group, you need to ascertain the group identifier (RTD-G*nnn*) that relates to the VTSS you wish to report on. This can be determined from the UPRPRINT configuration listing. Each RTD DEVICE-GROUP statement has a textual description parameter DESC('RTDs for vtssname').

ACS-*nnn* Note: The ACS-*nnn* device groups are generated automatically, one for each ACS, where *nnn* is the ACSid.

Order of SELECT Statement Processing

Reports are generated in the same order as the REPORT statements, but will be produced subject to the final status of the SELECT SYSID criteria.

The following example would result in three reports for system CPUA, which is not the intended result.

```
  SELECT SYSID(MVSA) ;
  REPORT NAME(MOUNTS) ;
  REPORT NAME(CU-BUSY) ;
  SELECT SYSID(CPUA) ;
  REPORT NAME(ALLOC-REC) ;
/*
```

Therefore, the report requests in this example should be submitted as two separate batch jobs, one for each SYSID.

```
  SELECT SYSID(MVSA) ;
  REPORT NAME(MOUNTS) ;
  REPORT NAME(CU-BUSY) ;
 /*

  SELECT SYSID(CPUA) ;
  REPORT NAME(ALLOC-REC) ;
/*
```

Selection by ACS/LSM/VTSS-ids/Group-ids is cumulative. All requested reports will process all specified ids regardless of the order of the SELECT and REPORT statements.

Therefore, the following example would produce three reports with each using data from *both* of the selected LSMs.

```
  SELECT LSM(000 01) ;
  REPORT NAME(MOUNTS) ;
  REPORT NAME(CU-BUSY) ;
  SELECT LSM(000 02) ;
  REPORT NAME(ALLOC-REC) ;
/*
```

If this was not your intended result, you should submit the report requests as two separate batch jobs, one for each selected LSM.

TAPECAT

This control statement specifies tape catalog processing options.

Refer to chapter 5, *ExPR Tape Catalog Processing* for examples.

Control Statement	Description
TAPECAT	The keyword.
OPTION(*subparameter*) OPTION(*subparameter*) strings are listed below:	OPTION(*subparameter*) identifies the TAPECAT function to perform, either UPDATE, REPORT, SUMMARY, or HISTORY. Only one of these four options may be specified in each TAPECAT control statement. OPTION must be immediately followed by one of its subparameters set in parentheses. These are UPDATE, REPORT, SUMMARY, HISTORY, and TAPE-SIZING.
TAPECAT OPTION(UPDATE [NOHIST FULLCAT NODBUP NONSILO NOWARN NOCDS NOREEL VIRTUAL]) SYSID(*mvshost*) ; For example: TAPECAT OPTION(UPDATE NOHIST) SYSID(MVS1) ;	OPTION(UPDATE) reads the HSC CDS and tape catalog. All volumes in the tape catalog that are also in the HSC CDS are processed. The database file is updated and the history file is created. Summary aging and utilization reports are produced. NOHIST – This UPDATE option performs tape catalog processing but does not create the history file. NODBUP – This UPDATE option performs tape catalog processing but does not update the database. FULLCAT – This UPDATE option processes all volumes in the tape catalog in addition to volumes found in the HSC CDS (i.e., non-ACS volumes are included). Specifying FULLCAT will reset any previous specification of NONSILO. NONSILO – This UPDATE option processes only non-ACS volumes (i.e., those in the tape catalog but not in the HSC CDS). NONSILO forces the NODBUP option. Specifying NONSILO will reset any previous specification of FULLCAT. NOWARN – This UPDATE option suppresses warning messages in the range XPR0080W to XPR0087W during UPDATE processing. NOCDS – This UPDATE option tells the TAPECAT process that the installation does not have an HSC CDS, or that you do not wish to include volumes from the CDS. **NOCDS Note:** If your installation does not have an HSC CDS, you must comment out DDnames CDSPRIM and CDSCOPY. To process your complete tape catalog contents without a CDS, specify FULLCAT and NOCDS together.

Control Statement	Description
	VIRTUAL – This UPDATE option causes the inclusion of virtual tape volumes (VTVs) and multiple virtual cartridges (MVCs) associated with the VSM/VTSS support. Details of MVCs and VTVs are obtained from the VSM VTCS extract file. During update processing, various entries are created in the history file to allow cross-referencing of MVCs and VTVs. NOREEL – This UPDATE option causes the UPDATE process to ignore records in the tape catalog that have a device-type media flag indicating reel-to-reel round tape. Without the NOREEL option, the FULLCAT option may include many historical/static reel-to-reel volumes in the TMCHIST file. SYSID identifies the MVS host system associated with the tape catalog. This parameter is required for UPDATE processing. In a multi-MVS/shared system, the main system ID should be specified.
TAPECAT OPTION(REPORT [ALLDSNS FULLCAT NONSILO NOREEL VIRTUAL VIRTUAL-ONLY] By*xxxx…*) COUNT(*nnnnnn*) SKIP(*nnnnnn*) ; For example: TAPECAT OPTION(REPORT ALLDSNS BYDSN) COUNT(1000) SKIP(500) ;	OPTION(REPORT) produces the Nearline Volume Details report from the history file created by UPDATE processing. The required By*xxxx* parameter specifies the sorting sequence. A summary line is printed for each primary dataset that was written from the HSC CDS and tape catalog, sorted into the appropriate sequence. ALLDSNS – This REPORT option prints a summary line for all primary and secondary datasets. The default is primary only. FULLCAT – This REPORT option prints a summary line for all non-ACS volumes (but only if FULLCAT was also specified as an UPDATE option at the time the history file was created). Specifying FULLCAT will reset any previous specification of NONSILO. NONSILO – This REPORT option restricts the Volume Details report to non-ACS volumes only (i.e., those in the tape catalog but not in the HSC CDS). The history file must have been created with option NONSILO or FULLCAT to produce a NONSILO report. Specifying NONSILO will reset any previous specification of FULLCAT. NOREEL – This REPORT option suppresses the printing of reel-to-reel round tape volumes if the FULLCAT or NONSILO options are specified. There may be many historical/static reel-to-reel volumes that do not require printing. VIRTUAL – This REPORT option requests that the VTV and MVC entries be printed from the history file along with the other volumes. VIRTUAL must have been specified during the update process for VTV/MVC entries to exist in the history file. VIRTUAL-ONLY – This REPORT option requests that only the

Control Statement	Description
	VTV and MVC entries are printed from the history file. VIRTUAL must have been specified during the update process for VTV/MVC entries to exist in the history file. By*xxxx* – This required REPORT parameter specifies the sorting sequence(s) for the report. Multiple By*xxxx* options can be specified on a single statement to generate multiple reports. Also, the COUNT and SKIP options can be used to moderate the number of volumes to include in the report (COUNT and SKIP are described after the By*xxxx* options below). By*xxxx* options include: BYVOL – sorts by volser, file sequence BY VOLSET – sorts by the base volume volser and volume sequence number within a volume set (multi-volume stack) BYDSN – sorts by dataset name, volume sequence BYREF – sorts by reference date, dataset name BYUTIL – sorts by percentage/Mb, dataset name BYUSES – sorts by use count, reference date BYMEGS – sorts by megabytes, dataset name BYACS – sorts by ACS/LSM, volser/file sequence BYMEDIA – sorts by media type, volser/file sequence BYBLKSZ – sorts by dataset block size, dataset name BYBLKCT – sorts by dataset block count, dataset name BYLRECL – sorts by dataset logical record length, dataset name BYDSNS – sorts by number of datasets on a volume, volume serial, file sequence BYRECFM – sorts by dataset record format, dataset name BYSCR – sorts by volume scratch status, ACS/LSM BYCREATE – sorts by creation date, dataset name BYAGE – sorts by age in days, dataset name BYMVCS – sorts MVC-base and MVC-onboard-VTV records only into MVC and onboard-VTV volser sequence BYMAVAIL – sorts MVC-base records only into MVC free space percentage, MVC volser sequence

Control Statement	Description
	BYMUSED – sorts MVC-base records only into MVC used space percentage, MVC volser sequence BYMFRAG – sorts MVC-base records only into fragmented space percentage, MVC volser sequence BYMMOUNTS – sorts MVC-base records only into number of times used(mounted), percentage used, megabytes, scratch status sequence BYVTVSIZE – sorts VTV-index records only into megabytes/volser sequence BYVTSS – sorts VTV and VTV-index records only into VTSS-id/volser sequence COUNT(*nnnnnn*) controls the number of volumes listed by each BY… request, effectively producing smaller reports. SKIP(*nnnnnn*) causes each BY… request to skip printing a number of volumes at the beginning of each report.
TAPECAT OPTION(SUMMARY) ;	OPTION(SUMMARY) produces the Nearline Volume Summary report from the history file created by TAPECAT UPDATE processing. Volume statistics and utilization estimates are summarized for each ACS, LSM, VTSS, dataset workload group, and media type (device type and cart length). Statistics are also summarized separately for non-ACS volumes if FULLCAT or NONSILO was specified during the UPDATE processing that created the history file.
TAPECAT OPTION(HISTORY) ;	HISTORY produces comparison reports for two history files, listing volumes that have changed status and a summary of activity within the Nearline library and tape catalog.
TAPECAT OPTION(TAPE-SIZING) ;	The TAPE-SIZING function is for installations wishing to determine the total quantity of data stored within the complete tape library. A TMCHIST file is read and calculations are performed based on the number of gigabytes of data stored on tape. This function also reads the database type 3 records to determine the peak eight-hour period for tape data activity based on the quantity of data transferred to and from the host.

Chapter 8: ExPR Batch Reports

Overview

This chapter describes the mainframe batch reports that are produced in tabular format by ExPR.

What are Batch Reports

The ExPR batch reports are produced by reading database records for a given period and producing summaries of the statistics collected. The reports are formatted as tabular hardcopy output in a traditional MVS reporting format.

- If more sophisticated reporting is required, use the ExPR PC graphical reports (described in the *ExPR PC User's Guide*).
- If more flexible batch reports are required, your technical staff can develop customized reports using the ExPR API (described in the *ExPR Installation, Configuration, and Administration Guide*).

How the Reports are Run

Some reports are generated automatically by other processes, such as by database update functions or by ExPR tape catalog processing.

Most of the batch reports are generated by running report requests and selection parameters against the ExPR database as a batch task. Run-time control statements in *usrprfx*.CNTL are submitted that (1) select the report criteria and (2) run the batch task to build the report. For example:

```
SELECT SYSID(MVSA) ;
PERIOD FROM(1999340) TO(1999355) ;
REPORT NAME(MOUNTS) ;
```

In this example, the SELECT statement identifies the MVS system to report on, the PERIOD statement identifies the date range for the report, and the REPORT statement identifies the report and runs it. Refer to chapter 7, *ExPR Run-Time Control Statements* for additional information about these control statements.

Displaying Batch Reports at the PC

You can also display many of the batch reports in the same tabular format on the PC with the ExPR PC's Host Reports function. When you initiate a host tabular report at the PC, it sends a request to the host to generate the report and then notifies you at the PC when the report has been produced. Reports you request from the PC are stored in the Online Report File (ORF) on the host system for subsequent display and printing at the PC.

Additionally, reports can be generated by MVS batch processing and written to the ORF for subsequent retrieval at the PC. This is done with the run-time control statement REPORT-OPTIONS(ONLINE). When specified in an ExPR batch report job, this statement causes all REPORT requests to be written to the ORF instead of being printed on the UPRREPTS DD. The output from any ExPR update, report, or TAPECAT function can be routed to the ORF with this control statement.

Refer to the *ExPR PC User's Guide* for more information about generating reports into the Online Report File for display on the PC. Refer also to the Online Report File Index report in this chapter for information about displaying the contents of the ORF.

List of Batch Reports

The tables below list the various batch reports you can generate. Following the tables, individual reports are listed alphabetically with JCL instructions, a report sample, and field descriptions.

System-Wide Reports

Report Name	Description
Channel Path Group Busy	The Channel Path Group Busy report produces information about user-defined channel group utilization.
Control Units Busy	The Control Units Busy report produces control unit information, including the number of drives with a disconnect time exceeding the user-defined threshold.
MVS Allocation Recovery	The MVS Allocation Recovery report provides hourly summary information about allocation recovery tasks on JES2 or JES3 systems, including the number of events and the delay times.
MVS Allocation Recovery Update Report	The MVS Allocation Recovery Update report is generated automatically during ExPR database update processing. This report is similar to the MVS Allocation Recovery report except that it details each individual event instead of an hourly summary.
SMF Exception Events	The SMF Exception Events report compares the various user-defined thresholds for mount response time and other metrics against each individual LSM, VTSS, or device group event. Events that exceed a threshold will be individually listed, with date/time, system, drive, LSM/VTSS/device group, and a textual description of the breached threshold and the threshold's value versus the observed value.

Report Name	Description
System Mounts	The System Mounts report is a summary of the overall mount activity within an MVS host, listing mounts by ACS/LSM, VTSSs, device group, RTDs, and a total of all mounts and data transferred.

Nearline Reports

Report Name	Description
Contents	The Contents report lists, per LSM, cartridge movements (enter/eject count and number of passthroughs) and contents information (scratch count, free cells, total cells).
Mounts ACS	The Mounts ACS 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	The Mounts Detail report provides, per LSM, a breakdown of the mount response time components for both scratch and non-scratch mounts.
Mounts LSM	The Mounts LSM report lists, per LSM, 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 LSMs Used	The Mounts LSMs Used report provides, per LSM, details of the number of LSMs used to service mount requests (i.e., the length of passthroughs).
Scratch Subpool	The Scratch Subpools report lists, for each LSM, the low, high, and average hourly scratch cartridge counts for each HSC subpool that has been identified to ExPR with the Host Configurator application on the PC.
Tape Errors	The Tape Errors report provides listings of the number of temporary and permanent read/write errors that occurred. The report also provides an audit trail of which drive and volume the media errors occurred on.
Thresholds Exceptions	The Thresholds Exceptions report compares the Nearline performance thresholds you have defined against the database records over a selected period of time and highlights those fields that exceed a threshold.
Utilization	The Utilization report lists, per LSM, the percentage of time the robotics system was in use and the percentage of time that drives were concurrently in use.

VTSS Reports

Report Name	Description
SMF Exception Events	The SMF Exception Events report compares the various user-defined thresholds for mount response time and other metrics against each individual LSM, VTSS, or device group event. Events that exceed a user-defined threshold will be individually listed, giving full details of date/time, system, drive, LSM/VTSS/device group. A textual description of which

Report Name	Description
	threshold has been breached and the threshold's value versus the observed value are also included.
VTSS Interface Performance	The VTSS Interface Performance report summarizes, per VTSS, the hourly interface host activity within a VTSS, including the interface busy percentage, interface total I/O, and interface busy seconds. Separate tallies are reported for host links and RTD links.
VTSS Internal Performance	**T**he VTSS Internal Performance report summarizes, per VTSS, the hourly internal activity within a VTSS, including maximum disk buffer utilization and internal throughput read/write/total percentages.
VTSS Mounts	The VTSS Mounts report lists, per VTSS, the number of virtual tape mounts, average mount time, maximum mount time, and data transferred. Separate tallies are reported for scratch and non-scratch volumes.
VTSS Residency	The VTSS Residency report provides, per VTSS, the percentage and number of VTVs cycled in the buffer, the percentage and number of VTVs that missed the residency target, and the average residency time.
VTSS SMF Audit	The VTSS SMF Audit report gives a full audit trail of VSM/VTSS activity, showing MVC mounts, VTV mounts, VTV migrates, VTV recalls, VTV reclaims, and indicating when a user-defined threshold has been exceeded.
VTSS Thresholds	The VTSS Thresholds report specifically compares the thresholds defined for Virtual Tape Subsystems. It is similar to the Thresholds report for Nearline.
VTSS Utilization	The VTSS Utilization report lists, per VTSS, the percentage of time the VTSS system was in use and the percentage of time that virtual tape drives were concurrently in use.

Additionally, several of the reports described previously also provide VTSS-related information:

- The Control Units Busy report produces control unit information, including the number of drives with a disconnect time exceeding the user-defined threshold. VTSS virtual control units are listed in the report with the real control units.
- The Channel Paths Busy report produces information about user-defined channel group utilization. VTSS channel groups are listed in the report.
- The Tape Errors report provides listings of the number of temporary and permanent read/write errors that occurred. The report also provides an audit trail of which drive and volume the media errors occurred on. VTSS VTVs are listed in the report along with real volumes for Nearline and device groups.
- The Allocation Recovery report provides information about allocation recovery tasks on JES2 or JES3 systems, including the number of events and the delay times. This report includes allocation recovery events against VTDs.

- The Demand Enters report provides information about demand enters that occurred during the reporting period for MVC volumes.

Device Group Reports

Report Name	Description
Device Group Mounts ("Manual Mounts" report in pre-4.0 versions)	The Device Group Mounts report lists, for each device group, the number of mounts, average mount time, maximum mount time, and data transferred. Separate tallies are reported for scratch and non-scratch volumes.
Device Group Utilization ("Manual Utilization" report in pre-4.0 versions)	The Device Group Utilization report lists, for each device group, the percentage of time that drives were concurrently in use.

Additionally, several of the ExPR reports that were described previously provide manual drive-related information:

- The Control Units Busy report produces control unit information, including the number of drives with a disconnect time exceeding the user-defined threshold. Manual control units are listed in the report with the real control units.
- The Channel Path Busy report produces information about user-defined channel group utilization. Manual channel groups are listed in the report.
- The Tape Errors report provides listings of the number of temporary and permanent read/write errors that occurred. The report also provides an audit trail of which drive and volume the media errors occurred on. Manual drives are listed in the report along with Nearline and VTSS VTDs.
- The MVS Allocation Recovery report provides information about allocation recovery tasks on JES2 or JES3 systems, including the number of events and the delay times. This report will include allocation recovery events against manual tape drives.

Tape Catalog Reports

Report Name	Description
Aging and Utilization	The tape processing update Aging report lists, for each LSM/VTSS and for each user-defined dataset workload group, the number of cartridges within user-specified age bands and their average ages, the number of cartridges containing multi-volume datasets, and the number of cartridges containing multiple datasets. The tape processing update Utilization report lists, for each LSM/VTSS and for each user-defined dataset workload group, the number of cartridges within each tape utilization percentage band.
Library Sizing	The Library Sizing report reads a TMCHIST file and totals all the data stored within the tape library, including automated LSMs, VTSSs, and manually racked volumes. A comparison is then made against all known cartridge media types. A

Report Name	Description
	peak window for tape data transferred is also identified from the database type 03 records.
Volume Details	The Volume Details report lists, for each volume, the primary dataset name (or optionally all dataset names), volume sequence, number of megabytes, ACS/LSM/VTSS location, number of datasets, estimated utilization percentage, last-reference date, number of accesses, device type and cartridge length, scratch status, and the name, file sequence, block count, block size, record size, and record format of each dataset.
Volume History	The Tape Catalog History report provides comparative activity analysis between two tape catalog images by listing volumes that have changed status.
Volume Summary	The Volume Summary report provides tape catalog volume contents information summarized for each ACS, each LSM, each VTSS, each dataset workload group, each device type, each media type, and each defined tape length.

VSM Note: All tape catalog reports will also provide a breakdown of VSM VTVs and MVCs.

Miscellaneous Reports

Report Name	Description
Database File Contents	The Database File Contents report provides a summary overview of the ExPR database file contents. This report can be used to identify gaps within the database where input data might be missing.
Online Report File Index	The Online Report File Index report lists the reports that have been output to the Online Report File (ORF) for display at the ExPR PC.

Channel Path Group Busy Report

```
TUE, 11 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                PAGE   22
16:51:59    1999.223                                                                                          JOB:B30T005R    XPRREP019
-------------------------------------------------------------------------------------------------------------------------------------------
                                                 CHANNEL PATH GROUP BUSY REPORT FOR SYSTEM IPO1   DATE RANGE: 1999181 TO 1999181


-------------------------------------------------------------------------------------------------------------------------------------------
         CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG CPG
          30  31  32  50  51  52  53  54  55  56  57 255
DATE HOUR  %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %   %

1999181 00 NO DATA
        01    ..
        02    ..
        03    ..
        04    ..
        05    ..
        06  6   2   4   1   1   1   1   1   1   1   1   1
        07  6   2   5   0   0   0   0   0   0   0   0   0
        08  6   2   5   0   0   0   0   0   0   0   0   0
        09  6   2   5   0   0   0   0   0   0   0   0   0
        10  6   2   5   0   0   0   0   0   0   0   0   0
        11  6   2   5   0   0   0   0   0   0   0   0   0
        12  6   2   5   0   0   0   0   0   0   0   0   0
        13  6   2   4   0   0   0   0   0   0   0   0   0
        14  6   2   4   0   0   0   0   0   0   0   0   0
        15  6   2   4   0   0   0   0   0   0   0   0   0
        16  6   2   4   0   0   0   0   0   0   0   0   0
        17  6   2   4   0   0   0   0   0   0   0   0   0
        18  6   2   4   0   0   0   0   0   0   0   0   0
        19  6   2   4   0   0   0   0   0   0   0   0   0
        20  6   2   4   0   0   0   0   0   0   0   0   0
        21  6   2   4   0   0   0   0   0   0   0   0   0
        22  6   2   4   0   0   0   0   0   0   0   0   0
        23  6   2   4   0   0   0   0   0   0   0   0   0
END OF REPORT FOR THIS SYSTEM.  RECORDS READ: 01332   TYPE 9: 00216
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(PATH-BUSY) ;
```

The report produces information about user-defined channel group utilization. The report is generated as one page per day for each system defined. Up to 30 user-defined channel path groups are listed across the page. The user-defined group numbers (0-255) are inserted in the column headings.

The percentage busy time is printed under each defined group. This percentage is derived by totaling all RMF samples for all channels in a specific group and all RMF busy samples within the group.

VTSS and Manual Drive Note: Channel groups connected to Virtual Tape Subsystems (VTSSs) and manual tape device groups are reported on along with all other channel groups in the report.

Note for MSP Users: This report will not produce any data on MSP systems. This is because MSP does not generate the required RMF data.

Contents Report

```
TUE, 11 AUG 1999      S T O R A G E T E K   E X P R  5 . 0         XYZ COMPANY                                          PAGE   15
16:51:59    1999.223                                                                                          JOB:B30T005R    XPRREP024
-------------------------------------------------------------------------------------------------------------------------------------
                                            CONTENTS REPORT FOR SYSTEM IPO1              DATE RANGE: 1999181 TO 1999181
                                            ACS: 000 NEARLINE ACS 000
                                            LSM:  00 NEARLINE LSM 000 00
-------------------------------------------------------------------------------------------------------------------------------------
---PERIOD---            -------CARTRIDGE MOVEMENTS-------          -----------------LIBRARY CONTENTS----------------
                                            DEMAND
DATE    HOUR            PASSTHRUS  EJECTS  ENTERS  ENTERS          SCRATCH COUNTS    --FREE CELLS---     TOTAL CELLS
                                                                    MIN  AVG  MAX     MIN  AVG  MAX

1999181  00   PARTIAL          0       0       0      0
         01      ..            0       0       0      0
         02      ..            0       0       0      0
         03      ..            0       0       0      0
         04      ..            0       0       0      0
         05      ..            0       0       0      0
         06      ..            1      41       0      0
         07      ..            1       0       0      0
         08      ..            0       0       0      0
         09      ..            0       0       0      0
         10      ..            4       0       0      0
         11      ..           10       0       0      0
         12      ..            3       0       0      0
         13      ..            0       0       2      0
         14      ..            0       0      21      0
         15      ..            1       0      11      0
         16      ..            1       0       0      0
         17      ..            5       0       0      0
         18      ..            7       0       0      0
         19      ..            1       0       0      0
         20      ..            1       0       0      0
         21      ..           14       0       0      0
         22      ..            3       0       0      0
         23      ..            3       0       0      0
END OF REPORT FOR THIS SILO. RECORDS READ: 00560   TYPE 0: 00024   TYPE 8: 00000
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(CONTENTS) ;
```

The report is generated per-LSM and shows one day of data per page. The report title section shows the ACS/LSM reported on and the user-selected date range.

The report provides the following types of information:

- Cartridge Movements: Statistics on the movement of cartridges in, out, and around LSMs, including enters, ejects, and pass-throughs.
- Library Contents: LSM cell information, including scratch count, free cells, and total cells.

Control Units Busy Report

```
 TUE, 11 AUG 1999       S T O R A G E T E K   E X P R  5 . 0         XYZ COMPANY                                          PAGE   19
 16:51:59    1999.223                                                                                          JOB:B30T005R    XPRREP018
 ------------------------------------------------------------------------------------------------------------------------------------
                                                   CONTROL UNIT BUSY REPORT FOR SYSTEM IPO1       DATE RANGE: 1999181 TO 1999181
                                                   CONTROL UNIT: 0C00 (LCU#  54) LSM ATTACHED CU
                                                   DEVICES: 0C00 THRU 0C0F SYSTEM: IPO1
 ------------------------------------------------------------------------------------------------------------------------------------
 ACS+LSM ====>                                                                                                  THRESHOLD
 DEV-TYPE====>                                                                                                  CULOAD(00)
 DEV-ADDR====>-CU- 0C00  0C01  0C02  0C03  0C04  0C05  0C06  0C07  0C08  0C09  0C0A  0C0B  0C0C  0C0D  0C0E  0C0F
 DATE/ TOTAL <-------------------- CONTROL UNIT AND INDIVIDUAL DEVICE PERCENTAGE DISCONNECTED ---------------->< BYTES
TRANSFERRED>
 HOUR SSCHS AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI AV HI READ WRTTN
TOTAL

 1999181
 00 NO DATA
 01    ..
 02    ..
 03    ..
 04    ..
 05    ..
 06 295508 43 94 60 74 30 39 49 61 47 73  0  0  0  0  0  0  0  0 87 94 24 31 35 44 44 49  0  0  0  0  0  0  0 0 4375M 9692M   14G
 07 394380 44 85 68 77 46 51 81 85 47 85  0  0  0  0  0  0  0  0 41 50 37 49 39 47 57 59  0  0  0  0  0  0  0 0 2314M   18G   20G
 08 223900 35 81 54 62 45 48 27 81 27 81  0  0  0  0  0  0  0  0 28 62 21 33 34 35 30 47  0  0  0  0  0  0  0 0 1816M   10G   12G
 09 138741 18 67 12 60 52 55  1  1  1  1  0  0  0  0  0  0  0  0 39 61  6 58  4 55 39 67  0  0  0  0  0  0  0 0 2614M   12M 2626M
 10 186768 33 67  7 26 61 66 48 67 48 67  0  0  0  0  0  0  0  0 51 60 21 35 31 62 24 63  0  0  0  0  0  0  0 0 3543M 1682M 5225M
 11 219755 26 66 22 56 58 59 25 66 25 66  0  0  0  0  0  0  0  0  9 40  0  0 28 40 29 37  0  0  0  0  0  0  0 0 6674M  274M 6948M
 12 302194 14 79 19 79 44 58  1  3  1  3  0  0  0  0  0  0  0  0  8 26 59 59 16 20 21 34  0  0  0  0  0  0  0 0   11G  610M   12G
 13  55157 17 95 26 92 60 62  6 69  6 69  0  0  0  0  0  0  0  0 35 49 30 95  5 58 57 63  0  0  0  0  0  0  0 0 2579M    0K 2579M
 14  31351 19 66 23 66 15 54 28 60 28 60  0  0  0  0  0  0  0  0  4 58 57 62  3 57 29 59  0  0  0  0  0  0  0 0 1454M   21M 1475M
 15  51265 24 70  4 36  3 11 51 58 51 58  0  0  0  0  0  0  0  0 41 55 52 57 14 70 23 63  0  0  0  0  0  0  0 0  897M 1068M 1966M
 16  24142 40 77 51 77  0  0 54 61 54 61  0  0  0  0  0  0  0  0  0  0 34 62 63 64 20 58  0  0  0  0  0  0  0 0 1440M  196M 1636M
 17  27082 23 85 40 85  0  0  5 12  5 12  0  0  0  0  0  0  0  0  0  0 15 57 10 54  9 58  0  0  0  0  0  0  0 0 1863M   54M 1917M
 18 110018 22 85 75 85  0  0 57 64  0  0  0  0  0  0  0  0  0  0  0  0  8 79 28 53 12 20  0  0  0  0  0  0  0 0 4593M  543M 5136M
 19 151389 51 91 76 85  0  0 86 91 30 40  0  0  0  0  0  0  0  0 86 86 41 57 30 86 50 67  0  0  0  0  0  0  0 0 2079M   10G   12G
 20 309177 51 85 72 84 48 56 60 85 29 38  0  0  0  0  0  0  0  0 48 56  0  0  0  0 61 74  0  0  0  0  0  0  0 0 4229M   10G   14G
 21 170785 54 92 71 75 39 56 76 92 57 88  0  0  0  0  0  0  0  0 39 56  0  0 48 66 70 78  0  0  0  0  0  0  0 0 2778M 5287M 8065M
 22 186034 43 91 58 71 23 31 83 91 73 78  0  0  0  0  0  0  0  0 23 31  0  0 48 74 60 75  0  0  0  0  0  0  0 0 4486M 4293M 8779M
 23 153333 20 44  0  0  0  0 33 44 26 33  0  0  0  0  0  0  0  0  0  0  0  0 10 23  8 11  0  0  0  0  0  0  0 0 1678M 4587M 6264M
    3030979 DAILY TOTALS                                                                                          59G   76G  135G
 END OF REPORT FOR THIS CU.  RECORDS READ: 01332   TYPE 1: 00018
```

This report is produced by the following run-time control statement (*usrprfx.*CNTL member REPORTS):

```
REPORT NAME(CU-BUSY) ;
```

The report is generated for each tape control unit defined in the ExPR configuration. The headings identify the address of each control unit and its logical control unit number (LCU) from the system IOCP/IOCDS.

The report provides the following types of information:

- Total SSCHs: The total start subchannel commands (physical SIOs) to devices attached to this control unit.
- CU Average: The average percentage of disconnected time for this control unit.
- CU Highest: The highest percentage of disconnected time of any device attached to this control unit.

- Device Average: The average percentage of disconnected time for each device attached (0-F).
- Device Highest: The highest percentage of disconnected time for each device attached (0-F).
- CULOAD Threshold: The user-defined control unit loading threshold. An asterisk is printed between the HI and BYTES READ columns to indicate that this value has been surpassed. (Excessive control unit busy is also listed as an exception in the SMF Exception Events report.) VTSS virtual control units will automatically be checked against the VTSS-THRESHOLDS CU-LOAD.

The percentage disconnect time is collected by RMF on a per-device basis. Disconnected time is defined as the time spent by the device waiting to transfer data across the already busy control unit interface.

VTSS Note: Data pertaining to virtual tape control units (VTDs) within a VTSS is listed along with data for real tape control units. VTSS virtual control units have "VIRTUAL VTSS CU" appended to the report heading. Manual tape drive control units are also listed, with "MANUAL DRIVE CU" appended to the report heading.

9490/SD-3 Device Type Note: When the devices are 9490 or SD-3 (Timberline or Redwood), each device actually has its own integrated control unit. In this case, you should treat each pair of AV/HI device columns within the report as an individual control unit. The SSCH count will be for all devices/control units. When you review the data on the PC, you should also select the "device-specific" option.

Note for MSP Users: This report will not produce any data on MSP systems. This is because MSP does not generate the required RMF data.

Database File Contents Report

```
 Tue, 09 Sep 2003       S t o r a g e T e k   E x P R  5 . 0 . 0      XYZ Company                                                    Page    1

23:08:14    2003.252                                                                                                  Job:PRODREPS    XPRREP007
-------------------------------------------------------------------------------------------------------------------------------------------
                                                DB Contents Report For System IRI1                 Date range: 2003220 to 2003365
-------------------------------------------------------------------------------------------------------------------------------------------
                <------------------------------------ Database Record Types ------------------------------------>
  Date    Level   All   00   01   02   03   04   05   06   07   08   09   10   11   12   13   14   15   16   17   18   19
 -------  ------ ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----

 2003221 Hourly   420  240   85    5    5                             5                        25   25   10         20
 2003222 Hourly  1183  672  238   14   14                            14          7             70   70   28         56
 2003223 Hourly   845  480  170   10   10                            10          5             50   50   20         40
 2003225 Hourly  1342  768  272   16   16                            16          6             80   80   28         60
 2003227 Hourly   464  384   24    4    4                             4                        20   20    4
 2003228 Hourly  1398 1152   72   12   12                            12          6             60   60   12
 2003229 Hourly   589  336  119    7    7                             7          1             35   35   14         28
 2003230 Hourly   761  432  153    9    9                             9          5             45   45   18         36
 2003232 Hourly  1350  768  272   16   16                            16          6             80   80   32         64
 2003234 Hourly   252  144   51    3    3                             3                        15   15    6         12
 2003221 Daily     80   48   17    1    1                             1                         5    5    2
 2003222 Daily     89   48   17    1    1                             1          9              5    5    2
 2003223 Daily     85   48   17    1    1                             1          5              5    5    2
 2003225 Daily     86   48   17    1    1                             1          6              5    5    2
 2003227 Daily    116   96    6    1    1                             1                         5    5    1
 2003228 Daily    122   96    6    1    1                             1          6              5    5    1
 2003229 Daily     81   48   17    1    1                             1          1              5    5    2
 2003230 Daily     85   48   17    1    1                             1          5              5    5    2
 2003232 Daily     87   48   17    1    1                             1          7              5    5    2
 2003234 Daily     80   48   17    1    1                             1                         5    5    2
 2003223 Weekly   146   96   17    1    1                             1         18              5    5    2
 2003230 Weekly    99   48   17    1    1                             1         19              5    5    2
 2003237 Weekly   122   72   17    1    1                             1         18              5    5    2
 2003244 Weekly   104   54   17    1    1                             1         18              5    5    2
 2003220 Monthly  168   93   17    1    1                             1         18              5    5    2
 2003250 Monthly  147   84   17    1    1                             1         18              5    5    2
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(DB-CONTENTS) ;
```

The report provides a summary overview of the ExPR database file contents by counting the various types of ExPR database records at the three levels of granularity (hourly, daily, weekly) collected by ExPR. These are identified as levels 00, 01, and 02 respectively.

This report can be used to identify gaps within the database where input data might be missing. The report prints a line per day per level. The range of data listed in the report is controlled by the run-time control statement PERIOD.

Demand Enters Report

```
FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                    PAGE    1
16:35:23    1999.226                                                                                  JOB:B30T005R  XPRREP027
                                 GLOBAL DETAILS OF DEMAND ENTERS FOR SYSTEM CPUA            DATE RANGE: 1999175 TO 1999175
                                 ------------------------------------------------
                               UNIT VOLUME
--DATE--  HOUR SYSTEM ACS LSM ADDR SERIAL JOBNAME

1999.175 11.00  CPUA  000  00 0380 PR3000 MAINT13U
1999.175 12.00  CPUA  000  00 0384 PR3000 MAINT13U
1999.175 15.00  CPUA  000  01 0444 003412 ACC002XX
1999.175 17.00  CPUA  000  02 0431 PTFTAP SMPAPPLY
1999.175 19.00  CPUA  000  00 0384 002967 INV128A3
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(DEMAND-ENTERS) ;
```

The report lists any demand enters that occurred during the reporting period.

The report provides the following types of information:

- The date and hour in which the demand enter occurred
- The MVS system, ACS, LSM, and drive involved in the demand enter
- The volser and jobname that requested the mount

Demand enters should ideally be rare events and are therefore also listed as exceptions in the SMF Exception Events report. The same mount may also be listed as a mount-time threshold exception due to the manual intervention required.

Device Group Mounts Report

```
Wed, 28 Aug 2002      S t o r a g e T e k   E x P R  5 . 0         XYZ Company                                                    Page    1
19:22:10    2002.240                                                                                                  Job:V790611R    XPRREP040
-------------------------------------------------------------------------------------------------------------------------------------------
                                      Device Group Mounts Report For System ALL              Date range: 2002042 to 2002042
                                              Groupid:ALL           ALL TAPE DRIVES                                    (253 37)

-------------------------------------------------------------------------------------------------------------------------------------------
---Period---             <------------------------Stats for this Group------------------------>    <---Bytes transferred-->
 Date  Hour Device type      No-mounts                 Total-time   Average-time  Maximum-time
            or workload    Scrtch Nonscr              Scrtch Nonscr Scrtch Nonscr Scrtch Nonscr       Read Written   Total

2002042 00                    20     16                302    364     15     22     75     45        36K     11G     11G
        01                    55    101                313   2141    5.7     21     36     87      7008M   9342M     16G
        02                   129    102               2760   5344     21     52     98    183        37G     80G    117G
        03                    80    128               1560   5145     19     40     87    247        60G     65G    125G
        04                    22    193                 72   9785    3.3     50     31    175        56G     25G     81G
        05                    36    185                158   7640    4.4     41     82    344        71G     25G     97G
        06                    22     77                  0   3749      0     48    0.1    165        50G   2144M     52G
        07                    18    159                  0   5437      0     34      0    164        59G   4804M     63G
        08                    17    104                 57   2818    3.4     27     30    192        39G   3442M     43G
        09                    21     92                  0   1913      0     20    0.6    154      8281M   2515M     11G
        10                    35    156                  0   4196      0     26    0.1    166        26G   9725M     36G
        11                    31     99                 34   2376    1.1     24     23    122        33G   6610M     40G
        12                    38    106                  0   2544      0     24    0.4     87        18G     11G     29G
        13                    44    114                  0   7809      0     68    0.2   1060        24G     26G     50G
        14                    39    106                  0   2660      0     25    1.1    134        23G   9219M     32G
        15                   106    198                 10   5702    0.1     28     13    165        10G   9491M     19G
        16                    57    123                 17   2706    0.3     22     19    164        18G   2972M     21G
        17                    67    102                 46   2937    0.7     28     27    181        19G  10029M     28G
        18                    33     84                 23   2864    0.7     34     22    156        52G     10G     62G
        19                    70     95                 14   2783    0.2     29     12    147        21G   8871M     30G
        20                    40     86                108   2709    2.7     31     29    362        23G     16G     39G
        21                    29     84                  0   2704      0     32    0.1    138      7229M   8347M     15G
        22                    71    119                 56   3391    0.8     28     16    152      9687M     12G     21G
        23                    94    138                 75   4333    0.8     31     26    464        21G     17G     38G
Daily total                 1174   2767               5610  94060    4.7     33     98   1060       694G    384G   1077G
Period                      1174   2767               5610  94060    4.7     33     98   1060       694G    384G   1077G
End of report for this group. Records read: 00511   Type 00/14/16: 00024
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(DEVICE-GROUP-MOUNTS) ;
```

The report is generated per-device group and shows one day of data per page. The report title section shows the group being reported on and the user-selected date range.

The report provides mount event statistics within the manual tape environment, including the number of MVS mounts, the average and total mount times (in seconds), and the highest recorded time to mount a volume over the interval. Each report is further categorized by scratch and non-scratch volumes. Data transferred to and from the host is scaled according to the quantity (i.e., Kb, Mb, Gb, or Tb).

The report prints hourly, daily, and period totals per group. It can also produce additional hourly summary lines and daily/period totals for user-defined workload groups when the UPRIN control statement REPORT-OPTIONS is used.

ACS Note: In addition to reporting on your own installation-defined device groups, you can display statistics about the automatically generated ACS device groups. These have names of ACS-*nnn*, are generated on a one-per-ACS basis, and include all devices

attached to all LSMs for each ACS. ACS-*nnn* device groups that appear in the report are automatically generated “per-ACS” device groups, where *nnn* is the ACSid.

To select a specific ACS device group, specify:

SELECT GROUP(ACS-*nnn*) ;

where *nnn* is the ACSid.

VSM Note: In addition to reporting on your own installation-defined device groups, you can use this report to display statistics about the automatically generated RTD device groups. These have names of RTD-G*nnn*, are generated on a one-per-VTSS basis, and include all RTDs attached to a specific VTSS. When selecting an RTD device group, you need to ascertain the group identifier (RTD-G*nnn*) that relates to the VTSS you wish to report on. This can be determined from the UPRPRINT configuration listing. Each RTD DEVICE-GROUP statement has a textual description parameter DESC('RTDs for *vtssname*').

To select a specific RTD device group, specify:

SELECT GROUP(RTD-G*nnn*) ;

When reporting on an "RTD-Gnnn" device group, you should be aware that the scratch mount count and associated timings will always be zero. All HSC mounts for MVCs upon RTD drives are processed as non-scratch/specific volume mounts. This is because VTCS selects which MVC is required before requesting the mount from HSC. Additionally, the bytes transferred values will always be zero as MVS does not generate an SMF 21 record for MVCs.

Note for MSP Users: This report will not produce any data transferred values on MSP systems. This is because MSP does not generate the required data in the SMF 21 record.

Device Group Utilization Report

```
Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
19:25:02    2002.240                                                                                                  Job:V790611R    XPRREP045
-------------------------------------------------------------------------------------------------------------------------------------------
                                                Device Group Utilization Report for System ALL    Date range: 2002042 to 2002042
                                                Group: ALL            ALL TAPE DRIVES                                      (253 37)
-------------------------------------------------------------------------------------------------------------------------------------------
                        Drive Drive            ------------- Percentage of time drives were in use ---------------
           Device type   util% util%        No  (---------------------- No of in use drives -----------------------)
Date  Hour or workload  scrtch non-scr     devs ( 0   1  14  27  40  53  66  79  92 105 118 131 144 157 170 183 196)
                                                    13  26  39  52  65  78  91 104 117 130 143 156 169 182 195 208)
2002042 00                 0     1        208    0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        01                 0     2        208    0  81  19   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        02                 3     6        208    0   0  73  27   0   0   0   0   0   0   0   0   0   0   0   0   0
        03                 2     5        208    0   1  82  17   0   0   0   0   0   0   0   0   0   0   0   0   0
        04                 0     6        208    0  10  90   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        05                 1     5        208    0  20  77   3   0   0   0   0   0   0   0   0   0   0   0   0   0
        06                 0     4        208    0  59  41   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        07                 0     4        208    0  53  47   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        08                 0     4        208    0  11  89   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        09                 0     5        208    0  12  88   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        10                 0     5        208    0  20  80   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        11                 0     5        208    0  17  83   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        12                 0     5        208    0  32  68   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        13                 0     5        208    0  36  63   1   0   0   0   0   0   0   0   0   0   0   0   0   0
        14                 0     5        208    0   7  93   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        15                 0     5        208    0   6  94   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        16                 0     4        208    0   0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        17                 0     3        208    0   0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        18                 0     5        208    0   0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        19                 0     5        208    0   0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        20                 1     4        208    0  13  87   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        21                 0     4        208    0  71  29   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        22                 0     4        208    0  43  57   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        23                 1     4        208    0   0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0

Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    2
19:25:02    2002.240                                                                                                  Job:V790611R    XPRREP045
-------------------------------------------------------------------------------------------------------------------------------------------
                                                Device Group Utilization Report for System ALL    Date range: 2002042 to 2002042
                                                Group: ALL            ALL TAPE DRIVES                                      (253 37)
-------------------------------------------------------------------------------------------------------------------------------------------
                          ------------------------------- Percentage of time drives were in use -------------------------------
 Date  Hour  No of        0         10        20        30        40        50        60        70        80        90        100
             devices

2002042 00    002          ---------------------------->
              003          ------------------>
              004          >
              005          ----------->
              006          ---------------->
              007          -->
              008          ------------------>

Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    3
19:25:02    2002.240                                                                                                  Job:V790611R    XPRREP045
-------------------------------------------------------------------------------------------------------------------------------------------
                                                Device Group Utilization Report for System ALL    Date range: 2002042 to 2002042
                                                Group: ALL            ALL TAPE DRIVES                                      (253 37)
-------------------------------------------------------------------------------------------------------------------------------------------
                          ------------------------------- Percentage of time drives were in use -------------------------------
 Date  Hour  No of        0         10        20        30        40        50        60        70        80        90        100
             devices

2002042 01    002          ------------------------------->
              003          ---->
              004          ------------------>
              005          >
              006          >
              007          ->
              008          ----->
              009          ------->
              010          ->
              015          ->
              016          >
              017          >
              018          >
              024          >
              025          ---->
              026          >
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(DEVICE-GROUP-UTILIZATION) ;
```

The report is generated for each device group. The report title provides the name of the device group being reported on and the user-selected date range.

There are two reports:

- A Drive Utilization report showing one day of data per page.
- A Drive Concurrency report providing details of drive concurrency on an hourly basis.

Drive Utilization report

This report provides the following information for each hour within the associated day:

- Drive Util%: The percentage utilization of the defined drives for the device group on the basis of scratch and non-scratch volumes mounted on the associated drives.
- No Devs: The number of transports associated with the device group.
- Drives in Use: Presents, as a percentage of the hour, the number of drives that were concurrently in use. This information is gathered and presented using a banded approach (i.e., 01-04, 05-08,09-12, etc.).

Drive Concurrency report

This report provides the following information on an hourly basis:

- No of Drives: For each interval during the hour where a number of drives were in use concurrently, the number of drives.
- Percentage: The number of drives expressed as a percentage of the hour by means of a horizontal bar chart.

The report is printed twice, the first sorted chronologically by hour and the second sorted on the basis of highest to lowest percentages.

Note: The Drive Concurrency report can be suppressed by specifying REPORT-OPTIONS(NO-DETAIL) in the UPRIN control statements.

ACS Note: In addition to reporting on your own installation-defined device groups, you can display statistics about the automatically generated ACS device groups. These have names of ACS-*nnn*, are generated on a one-per-ACS basis, and include all devices attached to all LSMs for each ACS. ACS-*nnn* device groups that appear in the report are automatically generated “per-ACS” device groups, where *nnn* is the ACSid.

To select a specific ACS device group, specify:

```
SELECT GROUP(ACS-nnn) ;
```

where *nnn* is the ACSid.

VSM Note: In addition to reporting on your own installation-defined device groups, you can use this report to display statistics about the automatically generated RTD device groups. These have names of RTD-G*nnn*, are generated on a one-per-VTSS basis, and include all RTDs attached to a specific VTSS. When selecting an RTD device group, you need to ascertain the group identifier (RTD-G*nnn*) that relates to the VTSS you wish to report on. This can be determined from the UPRPRINT configuration listing. Each RTD DEVICE-GROUP statement has a textual description parameter DESC('RTDs for *vtssname*').

To select a specific RTD device group, specify:

```
SELECT GROUP(RTD-Gnnn) ;
```

When reporting on an "RTD-Gnnn" device group, you should be aware that the drive utilization percentage for scratch mounts will always be zero. All HSC mounts for MVCs on RTD drives are processed as non-scratch/specific volume mounts. This is because VTCS selects which MVC is required before requesting the mount from HSC.

Mounts ACS Report

```
TUE, 11 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                          PAGE   11
16:51:59    1999.223                                                                                          JOB:B30T005R    XPRREP021
-------------------------------------------------------------------------------------------------------------------------------------
                                              MOUNTS-ACS  REPORT FOR SYSTEM IPO1            DATE RANGE: 1999181 TO 1999181
                                              ACS: 000 NEARLINE ACS 000
                                              LSM:     ALL LSM'S IN THIS ACS
-------------------------------------------------------------------------------------------------------------------------------------
---PERIOD---            <-------------------------STATS FOR THIS ACS--------------------------> <---BYTES TRANSFERRED-->
 DATE  HOUR DEVICE-TYPE   LSM-MOUNTS                 TOTAL-TIME   AVERAGE-TIME  MAXIMUM-TIME
            OR WORKLOAD  SCRTCH NONSCR              SCRTCH NONSCR SCRTCH NONSCR SCRTCH NONSCR    READ WRITTEN   TOTAL

1999181 00         ALL        0      0                   0      0      0      0      0      0      0K      0K      0K
        01         ALL        0      0                   0      0      0      0      0      0      0K      0K      0K
        02         ALL        0      0                   0      0      0      0      0      0      0K      0K      0K
        03         ALL        0      0                   0      0      0      0      0      0      0K      0K      0K
        04         ALL        0      0                   0      0      0      0      0      0      0K      0K      0K
        05         ALL        0      0                   0      0      0      0      0      0      0K      0K      0K
        06         ALL       40     22                 810    416     20     18     91     60   6746M     16G     22G
        07         ALL       38     20                 802    388     21     19     78     72     10G     29G     39G
        08         ALL       23     31                 463    313     20     10     80     54   5442M     33G     39G
        09         ALL       17     76                 369    898     21     11     61     72   7754M   6587M     14G
        10         ALL       17    108                 304   1468     17     13     48    126     12G   7304M     19G
        11         ALL       16    103                 457   2360     28     22    112    111     12G   5193M     17G
        12         ALL       13     75                 348   1515     26     20     41    102     23G   6125M     29G
        13         ALL       11     71                 352   1159     32     16     63     76     11G   5648M     16G
        14         ALL       10     66                 155   1008     15     15     46     80   2942M   1721M   4663M
        15         ALL       10     91                 204   1063     20     11     38     59   1351M   2440M   3791M
        16         ALL        8     85                 156   1073     19     12     36     72   3988M   1788M   5776M
        17         ALL        7     68                 143   1002     20     14     43     86   5977M   2067M   8044M
        18         ALL        8     46                 234    710     29     15     75     83  10063M   2244M     12G
        19         ALL       75      5                1348     83     17     16     81     37   3468M     18G     22G
        20         ALL       50     16                1089    336     21     21    101     91   5466M     22G     27G
        21         ALL       35     36                 933    792     26     22    106    115   7237M     14G     21G
        22         ALL       42     18                 890    365     21     20     70    108   6775M     15G     22G
        23         ALL       35     16                 657    276     18     17     42     68   5245M     16G     21G
DAILY TOTAL        ALL      455    953                9714  15225     21     15    112    126    138G    203G    341G
PERIOD             ALL      455    953                9714  15225     21     15    112    126    138G    203G    341G
END OF REPORT FOR THIS ACS  . RECORDS READ: 00996   TYPE 00/14/16: 00084
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(MOUNTS-ACS) ;
```

The report is identical in layout to the previously described Mounts report. However, statistics on this report summarize all LSMs within a particular ACS complex. This is the sum total of all activity within an ACS on an hourly, daily, and period basis.

As with the Mounts report, additional lines can be generated for individual device types and user-defined jobname workload groups when the run-time control statement REPORT-OPTIONS is used.

Note for MSP Users: This report will not produce any data transferred values on MSP systems. This is because MSP does not generate the required data in the SMF 21 record.

Mounts Detail Report

```
Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
19:16:36    2002.240                                                                                                    Job:V790611R    XPRREP022
-------------------------------------------------------------------------------------------------------------------------------------------------
                                                Mounts Detail Report For System ALL              Date range: 2002042 to 2002042
                                                ACS: 000 NEARLINE ACS 000
                                                LSM:  00 NEARLINE LSM 000 00
-------------------------------------------------------------------------------------------------------------------------------------------------
                    <---------- Scratch mount breakdown details ---------><-------- Non-scratch mount breakdown details -------->
            Dev-type/   No   Avg Totl HSC Drive Dest Dest Othr Othr Pthr Pthr  No   Avg Totl HSC Drive Dest Dest Othr Othr Pthr Pthr
 Date  Hour   Workload Mnts Time Time  Q   Wait Rob  Robq Rob  Robq Rob  Robq Mnts Time Time  Q   Wait Rob  Robq Rob  Robq Rob  Robq

2002042 00               11   27  302  302    0    0    0    0    0    0    0    8   19  159    0  144   94   22   24    0   15    0
        01                6   17  106  106    0    0    0    0    0    0    0   20   27  548  173  179  125   28   26    6   11    0
        02               48   27 1300 1300    0    0    0    0    0    0    0   14   32  450    0  473  335  123   43    2   21    0
        03               30   30  918  918    0    0    0    0    0    0    0   26   39 1024   45  435  289  132   81    6   36    0
        04                3   24   73   73    0    0    0    0    0    0    0   39   33 1306  518  294  195   49  121   41   70   18
        05                3   41  123  123    0    0    0    0    0    0    0   30   46 1398  686  220  162  155   73   40   49   13
        06                0    0    0    0    0    0    0    0    0    0    0   14   36  509  244   98   77   22   41    6   21    0
        07                0    0    0    0    0    0    0    0    0    0    0   30   34 1023  493  255  130   26   75    5   39    0
        08                0    0    0    0    0    0    0    0    0    0    0   11   32  357  169   71   50   14   23   15   15    0
        09                0    0    0    0    0    0    0    0    0    0    0   16   21  339  141  107   65    0   17    0    9    0
        10                0    0    0    0    0    0    0    0    0    0    0   24   45 1087  613  161  107   49   60   51   35   11
        11                2   17   34   34    0    0    0    0    0    0    0   13   34  453  135  102   60   60   40   26   17   13
        12                0    0    0    0    0    0    0    0    0    0    0   29   31  922  534  188  129   20   30    0   21    0
        13                0    0    0    0    0    0    0    0    0    0    0   28  142 3981 3580  192  119   48   22    4   11    5
        14                0    0    0    0    0    0    0    0    0    0    0   29   23  693  274  202  136   24   40    0   17    0
        15                0    0    0    0    0    0    0    0    0    0    0   38   45 1717  888  262  190  170   98   51   45   13
        16                1   19   19   19    0    0    0    0    0    0    0   25   44 1110  728  183  102   12   44    8   31    2
        17                2   24   49   49    0    0    0    0    0    0    0   27   34  931  472  202  130   23   56   11   35    2
        18                1   22   22   22    0    0    0    0    0    0    0   21   39  837  516  146   94    4   46    0   30    1
        19                1   12   12   12    0    0    0    0    0    0    0   16   38  620  351  141   68    3   36    0   21    0
        20                6   18  109  109    0    0    0    0    0    0    0   18   37  682  326  172  113    9   32    9   21    0
        21                0    0    0    0    0    0    0    0    0    0    0   21   37  795  480  138   87   11   43    9   27    0
        22                3   12   38   38    0    0    0    0    0    0    0   27   35  953  437  232  130   17   72   20   41    4
        23                2   23   47   47    0    0    0    0    0    0    0   17   69 1186  875  137   80   34   37    2   21    0
End of report for this silo. Records read: 00559   Type 0: 00024
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(MOUNTS-DETAIL) ;
```

The report provides, a breakdown of the statistics produced in the Mounts report, particularly the components that make up the total response time of a Nearline mount request. This information is generated per LSM.

The report is in two sections, scratch and non-scratch. For each section, the report provides the following types of information on an hourly basis:

- The number of mounts requested.
- The average time in seconds to service a mount.
- The total time in seconds spent servicing mounts.
- HSC queue time: The time spent waiting while HSC processed other events.
- Drive Wait: The duration of tape drive threading/loading.
- Dest Robotics: The time the robotics arm was busy/moving.
- Dest Robotics Queue: The time awaiting the robotics arm to become free.
- Other Robotics: The time robotics arm in the adjacent LSM was busy.
- Other Robotics Queue: The time awaiting the robotics arm in the adjacent LSM.

- Passthru Robotics: The time cartridges were traveling between LSMs.
- Passthru Robotics Queue: The time awaiting the passthrough port to become free.

Note: "Destination Robotics" refers to the robotics arm of the LSM that is attached to the allocated drive. "Other Robotics" refers to the robotics activities of all other LSMs involved in moving the cartridge from its cell to the destination LSM.

The report can produce additional summary lines for individual device-types. This facility is controlled by the run-time control statement REPORT-OPTIONS.

Mounts LSM Report

```
Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
19:18:15    2002.240                                                                                                    Job:V790611R    XPRREP020
-------------------------------------------------------------------------------------------------------------------------------------------------
                                              M o u n t s Report For System ALL              Date range: 2002042 to 2002042
                                              ACS: 000 NEARLINE ACS 000
                                              LSM:  00 NEARLINE LSM 000 00
-------------------------------------------------------------------------------------------------------------------------------------------------
---Period---              <------------------------Stats for this LSM-------------------------->    <---Bytes transferred-->
 Date  Hour Device type     LSM-mounts                 Total-time   Average-time  Maximum-time
            or workload    Scrtch Nonscr              Scrtch Nonscr Scrtch Nonscr Scrtch Nonscr       Read Written   Total

2002042 00                    11      8                 302    159     27     19     75     35         0K     11G     11G
        01                     6     20                 106    548     17     27     25     61      1369M   2301M   3670M
        02                    48     14                1300    450     27     32     98     63       578M     33G     33G
        03                    30     26                 918   1024     30     39     87     76         0K     30G     30G
        04                     3     39                  73   1306     24     33     31     49         0K     11G     11G
        05                     3     30                 123   1398     41     46     82    110         0K   2133M   2133M
        06                     0     14                   0    509      0     36      0     67         0K      0K      0K
        07                     0     30                   0   1023      0     34      0     56         0K      0K      0K
        08                     0     11                   0    357      0     32      0     55         0K      0K      0K
        09                     0     16                   0    339      0     21      0     50       124K      0K    124K
        10                     0     24                   0   1087      0     45      0     91       168K      0K    168K
        11                     2     13                  34    453     17     34     23     68         0K   3736M   3736M
        12                     0     29                   0    922      0     31      0     69       616M   3472M   4088M
        13                     0     28                   0   3981      0    142      0   1060      1535M   4099M   5634M
        14                     0     29                   0    693      0     23      0     67         0K   1418M   1418M
        15                     0     38                   0   1717      0     45      0     90         0K   2385M   2385M
        16                     1     25                  19   1110     19     44     19     79         0K      0K      0K
        17                     2     27                  49    931     24     34     27     65      1213M    834M   2047M
        18                     1     21                  22    837     22     39     22     68         0K    789M    789M
        19                     1     16                  12    620     12     38     12     66         0K   1035M   1035M
        20                     6     18                 109    682     18     37     29     85         0K   4777M   4777M
        21                     0     21                   0    795      0     37      0     68         0K      0K      0K
        22                     3     27                  38    953     12     35     16     67       114M   1183M   1297M
        23                     2     17                  47   1186     23     69     26    405      1365M   4027M   5392M
Daily total                  119    541                3160  23089     26     42     98   1060      6790M    115G    122G
Period                       119    541                3160  23089     26     42     98   1060      6790M    115G    122G
End of report for this LSM.   Records read: 00559   Type 00/14/16: 00024
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(MOUNTS) ;
```

The report is generated per-LSM and shows one day of data per page. The report title section shows the ACS/LSM being reported on and the user-selected date range.

The report provides mount event statistics within the Nearline environment, including the number of MVS mounts, the average and total mount times (in seconds), and the highest recorded time to mount a volume over the interval. Each report is further categorized by scratch and non-scratch volumes. Data transferred to and from the host is scaled according to the quantity (i.e., Kb, Mb, Gb, or Tb). Mounts that exceeded the user-defined thresholds are listed individually on the SMF Exception Events report.

The report prints hourly, daily, and period totals per LSM. It can also produce additional hourly summary lines and daily/period totals for individual device-types and user-defined workload groups when the run-time control statement REPORT-OPTIONS is used.

Note for MSP Users: This report will not produce any data transferred values on MSP systems. This is because MSP does not generate the required data in the SMF 21 record.

Mounts LSMs Used Report

```
Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
19:13:16    2002.240                                                                                                    Job:V790611R    XPRREP023
-------------------------------------------------------------------------------------------------------------------------------------------------
                                                Mounts LSMS Used Report For System IRI6         Date range: 2002042 to 2002042
                                                ACS: 000 NEARLINE ACS 000
                                                LSM:  00 NEARLINE LSM 000 00
-------------------------------------------------------------------------------------------------------------------------------------------------
  Date  Hour                --Mounts-- <------------------------- No of LSMS used for mount ------------------------>
                             SCR NSCR    1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16

2002042                        0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         01                    0    4    3    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         02                    0    4    2    2    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         03                    0    3    1    2    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         04                    0    2    1    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         05                    0    7    4    3    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         06                    0    1    0    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         07                    0    4    3    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         08                    0    2    1    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         09                    0    2    1    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         10                    0    3    2    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         11                    0    3    0    3    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         12                    0    2    2    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         13                    0    9    9    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         14                    0    5    3    2    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         15                    0    4    3    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         16                    0    2    1    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         17                    0    6    4    2    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         18                    0    2    1    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         19                    0    1    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         20                    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         21                    0    5    2    3    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         22                    0    4    1    3    0    0    0    0    0    0    0    0    0    0    0    0    0    0
         23   No matching data found
End of report for this silo. Records read: 00576   Type 0: 00024
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(MOUNTS-LSMS-USED) ;
```

The report is generated per-LSM and shows one day of data per page. The report title section shows the ACS/LSM being reported on and the user-selected date range.

The report provides the following types of information:

- The number of scratch and non-scratch mounts.
- The number of mounts in each of the 16 LSM usage bands 1-16. Mounts in columns 2-16 indicate the length of a passthrough from cell to drive.

MVS Allocation Recovery Report

```
FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                          PAGE 1
16:23:51    1999.226                                                                                          JOB:B30T005S   XPRREP016
                                  MVS ALLOCATION/RECOVERY SUMMARY FOR SYSTEM CPUA                      DATE RANGE: 1999340 TO 1999352
                                  ----------------------------------------------

                        <---------- LSM/VTSS/GROUP SPECIFIC -----> <----------- OVERALL/COMPLETE SYSTEM ------------>
                    VTSS/    NO OF    TOTAL    LONGEST  NO OF   LONGEST  NO OF   NO OF  HIGHEST TIME ANY TIME ANY   TOTAL  THRESHOLD
                    GROUP/ OPERATOR  OPERATOR  OPERATOR WAITS    WAIT   CANCEL   WAIT  NO WAITS WAIT WAS REPLY WAS  LOST MAXALLOCREC
--DATE--  HOUR SYST ACS-LSM REPLIES REPLY TIME  REPLY SERVICED SERVICED REPLIES REPLIES PENDING PENDING  PENDING    TIME    (00300)

1999.346 15.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.10.44 00.10.44
1999.346 16.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.21.38 00.21.38
1999.346       CPUA *TOTALS*     0   00.00.00  00.00.00                                                  00.32.22 00.32.22 *TOTALS*
1999.347 08.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.02.05 00.02.05
1999.347 09.00 CPUA 000  00      1   00.01.19  00.01.19                                                  00.01.15 00.01.15
1999.347 12.00 CPUA 000  00      1   00.02.18  00.02.18                    3                             00.05.04 00.05.04
1999.347 13.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.59.35 00.59.35
1999.347 14.00 CPUA 000  00      2   00.02.10  00.01.20                    1                             00.30.34 00.30.34
1999.347 15.00 CPUA 000  00      0   00.00.00  00.00.00                    2                             00.01.00 00.01.00
1999.347 16.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.01.29 00.01.29
1999.347       CPUA *TOTALS*     4   00.05.47  00.02.18                    6                             01.41.02 01.41.02 *TOTALS*
1999.348 10.00 CPUA 000  00      0   00.00.00  00.00.00                    1                             00.02.42 00.02.42
1999.348 11.00 CPUA 000  00      1   00.02.49  00.02.49                                1      1   00.00.21 00.09.17 00.09.38
1999.348 12.00 CPUA 000  00      1   00.01.59  00.01.59      1  00.02.08                1      1   00.01.47 00.05.38 00.07.25
1999.348 14.00 CPUA 000  00      0   00.00.00  00.00.00                    1                             00.19.18 00.19.18
1999.348 16.00 CPUA 000  00      0   00.00.00  00.00.00      1  00.00.11             1      1   00.00.11 00.04.33 00.04.44
1999.348 17.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.06.12 00.06.12
1999.348 18.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.37.07 00.37.07
1999.348       CPUA *TOTALS*     2   00.04.48  00.02.49      2  00.02.08      2      2      1   00.02.19 01.24.47 01.27.06 *TOTALS*
1999.349 09.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.01.57 00.01.57
1999.349 11.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.13.45 00.13.45
1999.349 12.00 CPUA 000  00      0   00.00.00  00.00.00                    1                             00.02.45 00.02.45
1999.349 13.00 CPUA 000  00      1   00.00.52  00.00.52                                                  00.01.14 00.01.14
1999.349 14.00 CPUA 000  00      0   00.00.00  00.00.00                                                  00.04.38 00.04.38
1999.349 16.00 CPUA 000  00      0   00.00.00  00.00.00                    1                             00.05.27 00.05.27
1999.349       CPUA *TOTALS*     1   00.00.52  00.00.52                    2                             00.29.46 00.29.46 *TOTALS*
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(ALLOC-REC) ;
```

The report is a per-system per-LSM/VTSS/device group report of data collected from the SYSLOG-UPDATE function. The report only prints those hours with non-zero data recorded.

Information is also produced for undefined devices that involved allocation recovery. These devices are listed with a blank ACS/LSMid and are titled "UNDEFINED DEVICES" – this will include all non-tape-related allocation recovery events.

The report contains two sections. The first relates to the specific LSM/VTSS/device group and the second is for the whole MVS system and contains system-wide information.

The first part of the report provides the following types of information:

- The date, hour, system ID, and ACS/LSMid/VTSSid or device group name
- Operator reply measurements, including the number of replies that allocated devices on this subsystem, the total time spent awaiting a reply, and the longest operator reply

- System throughput measurements, including the number of outstanding WAITs serviced and the longest WAIT serviced by devices attached to each LSM/VTSS or manual group.

These reply and wait times are recorded in the hour in which the event completed. They can therefore exceed one hour and may have been outstanding for many hours previously.

The second part of each line relates to system-wide measurements, including:

- The number of CANCEL replies given by the operator
- The number of WAIT replies given by the operator
- The highest number of WAITs outstanding at any time (i.e. between the operator replying WAIT and the system allocating a drive and issuing a mount message)
- The time any WAIT or any REPLY was outstanding
- The total lost time (i.e., lost batch throughput)

Outstanding events that span several hours will have the time spread across those hours. These fields can be plotted graphically with the ExPR PC component as a measure of operator and system performance.

The Total Lost Time field may show more than 60 minutes of lost batch throughput per hour when multiple jobs have been simultaneously WAITed for drives to become available.

When an operator replies WAIT or CANCEL to an allocation recovery, there is no associated LSM. Therefore, the operator reply times for WAIT and CANCEL are recorded in the system-wide section of the report.

Whenever an operator reply or a WAITed mount exceeded the user-defined MAX-ALLOC-REC threshold, this is noted in the rightmost column of the report by the *EXCEEDED* message.

TOTALS: A daily totals line is generated at the end of each day.

VTSS Note: Allocation recovery events against virtual tape drives (VTDs) within a VTSS or manual tape drives will be logged along with all other events. The ACS/LSM columns will contain the VTSSid or manual device group name.

Note: A second report, the MVS Allocation Recovery Update report, is generated automatically during ExPR database update processing. That report details each individual event instead of an hourly summary.

MVS Allocation Recovery Update Report

```
FRI, 14 AUG 1999      S T O R A G E T E K   E X P R  5 . 0         XYZ COMPANY                                          PAGE    1
16:07:21    1999.226                                                                                    JOB:B30T005S    XPRREP015
                MVS ALLOCATION/RECOVERY UPDATE/REPORT FOR SYSTEM CPUA (1998.341 00:00:04 THRU 1998.352 09:50:00)
                ------------------------------------------------------------------------------------------------
                                                                                                                      MAXALLOCREC
JESJOBNO  JOBNAME STEPNAME  DDNAME  VOLSER --DATE-- STRTTIME END-TIME DURATION UNIT TYPE ACS LSM  ------- COMMENTS -------   (00300)

JOB00956 M42CAT   D1       TAPEUNIT SCRTCH 1998.347 16.56.49 16.57.09 00.00.20 0385
JOB00958 HCP001   D1       TAPEUNIT SCRTCH 1998.347 16.57.11 16.57.48 00.00.37 0386
JOB00287 GMS01C   S1       SYSUT2   PRIVAT 1998.348 10.17.03 10.19.46 00.02.43                    OPERATOR REPLIED CANCEL
JOB01474 SMFSAVT  INIT     TAPEUNIT SCRTCH 1998.348 11.16.06 11.18.55 00.02.49 0394      000  00
JOB02425 B30T005P EXPR     INDATA1  OTS038 1998.348 11.52.28 11.55.22 00.02.54 0393      000  02
JOB02422 B30T004C UNLDJCL  SYSUT1   NES355 1998.348 11.56.23 11.59.39 00.03.16                    OPERATOR REPLIED WAIT
JOB02422 B30T004C UNLDJCL  SYSUT1   NES355 1998.348 11.59.39 12.01.47 00.02.08 0390      000  00  MOUNT SERVICED AFTER WAIT
JOB04705 B30T005S EXPR     INDATA1  OTS403 1998.348 11.59.40 12.01.59 00.02.19 0392      000  02
JOB03794 CPF002   DFDSS    TAPE     PRIVAT 1998.348 12.02.02 12.02.11 00.00.09 0393      000  02
JOB01851 CPF002   DFDSS    TAPE     PRIVAT 1998.348 12.14.50 12.16.13 00.01.23 0395      000  01
JOB01853 CPF001   DFDSS    TAPE     PRIVAT 1998.348 12.16.13 12.16.19 00.00.06 0396      000  02
JOB01855 CPFRS1   DFDSS    TAPE     PRIVAT 1998.348 12.16.20 12.16.25 00.00.05 0397      000  02
JOB01673 B30T003B S00F1    SYSUT2   PR100B 1998.348 12.41.24 12.43.23 00.01.59 0390      000  00
JOB04463 B30T005S EXPR     INDATA1  OTS403 1998.348 14.25.29 14.25.52 00.00.23                    OPERATOR REPLIED CANCEL
JOB04466 B30T005S EXPR     INDATA1  OTS403 1998.348 14.33.49 14.52.45 00.18.56 0392      000  02                              EXCEEDED
JOB02436 B30T004C UNLDJCL  SYSUT1   NES355 1998.348 16.44.44 16.49.17 00.04.33                    OPERATOR REPLIED WAIT
JOB02436 B30T004C UNLDJCL  SYSUT1   NES355 1998.348 16.49.17 16.49.28 00.00.11 0390      000  00  MOUNT SERVICED AFTER WAIT
JOB04476 B30T005S EXPR     INDATA1  OTS403 1998.348 17.39.12 17.45.25 00.06.13 0392      000  02                              EXCEEDED
JOB04480 B30T005S EXPR     INDATA1  OTS403 1998.348 18.13.38 18.50.46 00.37.08 0393      000  02                              EXCEEDED
JOB02830 GMS01C   S1       SYSUT1   BRMJCL 1998.349 09.06.53 09.08.51 00.01.58 0397      000  02
JOB04753 B30T005S EXPR     INDATA1  OTS403 1998.349 11.46.15 12.00.16 00.14.01 0392      000  02                              EXCEEDED
JOB02451 B30T005P SORT     SORTIN   BRM99A 1998.349 12.10.08 12.11.00 00.00.52 0393      000  02
JOB00560 M42CAT   DFDSS    M42CAT   M42CAT 1998.349 12.16.35 12.18.15 00.01.40                    OPERATOR REPLIED CANCEL
JOB01269 CPFRS1   DFDSS    TAPE     PRIVAT 1998.349 13.30.46 13.31.08 00.00.22 0397      000  02
JOB01124 N51T001B S1       SYSUT1   L02EXP 1998.349 13.49.00 13.49.52 00.00.52 0394      000  00
JOB01273 CPF001   DFDSS    TAPE     PRIVAT 1998.349 14.07.25 14.07.34 00.00.09 0396      000  02
JOB02840 B30REST  S010     INDD1    BRM001 1998.349 14.51.03 14.55.32 00.04.29 0396      000  02
JOB04770 B30T005S EXPR     INDATA1  OTS403 1998.349 16.06.26 16.11.04 00.04.38 0393      000  02
JOB02486 B30T005S EXPR     TMCORF   SCRTCH 1998.349 16.12.05 16.12.54 00.00.49                    OPERATOR REPLIED CANCEL
JOB00001 TEST0001 UNLDJCL  SYSUT1   NES001 1998.350 00.44.44 00.49.17 00.04.33                    OPERATOR REPLIED WAIT
JOB00002 TEST0002 UNLDJCL  SYSUT1   NES002 1998.350 01.44.44 01.49.17 00.04.33                    OPERATOR REPLIED WAIT
JOB00003 TEST0003 UNLDJCL  SYSUT1   NES003 1998.350 02.44.44 02.49.17 00.04.33                    OPERATOR REPLIED WAIT
JOB00004 TEST0004 UNLDJCL  SYSUT1   NES004 1998.350 03.44.44 03.49.17 00.04.33                    OPERATOR REPLIED CANCEL
JOB00005 TEST0005 UNLDJCL  SYSUT1   NES005 1998.350 04.44.44 04.49.17 00.04.33                    OPERATOR REPLIED WAIT
JOB00001 TEST0001 UNLDJCL  SYSUT1   NES001 1998.350 00.49.17 05.49.28 05.00.11 0390      000  00  MOUNT SERVICED AFTER WAIT EXCEEDED
JOB00002 TEST0002 UNLDJCL  SYSUT1   NES002 1998.350 01.49.17 06.39.28 04.50.11 0393      000  02  MOUNT SERVICED AFTER WAIT EXCEEDED
JOB00003 TEST0003 UNLDJCL  SYSUT1   NES003 1998.350 02.49.17 07.29.28 04.40.11 0396      000  02  MOUNT SERVICED AFTER WAIT EXCEEDED
JOB00006 TEST0006 UNLDJCL  SYSUT1   NES006 1998.351 08.44.44 08.49.17 00.04.33                    OPERATOR REPLIED WAIT
JOB00050 TEST0050 UNLDJCL  SYSUT1   NES050 1998.351 23.44.44 00.22.17 00.37.33                    OPERATOR REPLIED WAIT EXCEEDED

    9084 SYSLOG RECORDS READ -    9071 SELECTED FOR SYSID CPUA
SYSLOG-UPDATE MESSAGE COUNTS:
IEF290 START OF ALLOC/RECOVERY...............128
IEF238 REPLY DEVICE-NAME,WAIT OR CANCEL......171
IEF233 MOUNT VOLUME ON DRIVE.................379
IEF450 JOB ABENDED...........................804
```

This report is generated automatically during SYSLOG-UPDATE processing (*usrprfx*.CNTL member SYSLOG).

Online Report File Index

```
FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                    PAGE    1
16:54:37    1999.226                                                                    JOB:B30T005R              XPRREP009

-------------------------------------------------------------------------------------------------------------------------------

                                          ORF-INDEX REPORT OF ONLINE REPORT FILE
                                          --------------------------------------

  DATE     TIME    ID                              REPORT DESCRIPTION                          REQUESTORS DETAILS    LINES BYTES
 ------- -------- --- ------------------------------------------------------------------------ -------------------- -------------

 1999201-17591291-020 MOUNTS           LSM:  00 NEARLINE LSM 001 00                    CPUA  EXPR STC: B30T005Z      13  1418
 1999201-17591527-020 MOUNTS           LSM:  01 NEARLINE LSM 001 01                    CPUA  EXPR STC: B30T005Z      13  1418
 1999201-17592151-020 MOUNTS           LSM:  00 NEARLINE LSM 000 00                    CPUA  EXPR STC: B30T005Z      88  7244
 1999201-17592646-020 MOUNTS           LSM:  01 NEARLINE LSM 000 01                    CPUA  EXPR STC: B30T005Z      88  7244
 1999201-17593275-020 MOUNTS           LSM:  02 NEARLINE LSM 000 02                    CPUA  EXPR STC: B30T005Z      13  1418
 1999201-17593485-020 MOUNTS           LSM:  03 NEARLINE LSM 000 03                    CPUA  EXPR STC: B30T005Z      13  1418
 1999201-17595342-021 MOUNTS-ACS       ACS: 000 NEARLINE ACS 000                       CPUA  EXPR STC: B30T005Z      88  7246
 1999201-18000080-022 MOUNTS-DETAIL    LSM:  01 NEARLINE LSM 000 01                    CPUA  EXPR STC: B30T005Z      84  7208
 1999201-18000864-023 MOUNTS-LSMS-USED LSM:  01 NEARLINE LSM 000 01                    CPUA  EXPR STC: B30T005Z      83  6368
 1999201-18001545-024 CONTENTS         LSM:  01 NEARLINE LSM 000 01                    CPUA  EXPR STC: B30T005Z      85  4969
 1999201-18002801-025 UTILIZATION      LSM:  01 NEARLINE LSM 000 01                    CPUA  EXPR STC: B30T005Z      84  6660
 1999201-18003606-026 THRESHOLDS       LSM:  01 NEARLINE LSM 000 01                    CPUA  EXPR STC: B30T005Z      32  4159
 1999201-18004208-027 DEMAND-ENTERS    GLOBAL DETAILS OF DEMAND ENTERS FOR SYSTEM CPUA  CPUA  EXPR STC: B30T005Z       8   683
 1999201-18010258-030 VTSS-MOUNTS      VTSSID: PRODVTSS       PRODUCTION VTSS          CPUA  EXPR STC: B30T005Z      88  3652
 1999201-18011980-035 VTSS-UTILIZATION VTSSID: PTODVTSS       PRODUCTION VTSS          CPUA  EXPR STC: B30T005Z      84  3673
 1999201-18313050-010 SYSTEM-MOUNTS    SYSTEM-MOUNTS REPORT FOR SYSTEM CPUA             CPUA  EXPR STC: B30T005Z      87 11320
 1999201-18324266-019 PATH-BUSY        CHANNEL PATH GROUP BUSY REPORT FOR SYSTEM CPUA   CPUA  EXPR STC: B30T005Z      84  4719
 1999201-18331344-016 ALLOC-REC        MVS ALLOCATION/RECOVERY SUMMARY FOR SYSTEM CPUA  CPUA  EXPR STC: B30T005Z      28  3622
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(ORF-INDEX) ;
```

This report lists the contents of the Online Report File (ORF). The ORF contains reports that were initiated by the ExPR PC's Host Reports function or by the run-time control statement REPORT-OPTIONS(ONLINE).

Reports in the ORF can be displayed and printed at the ExPR PC. Refer to the *ExPR PC User's Guide* for more information about this function.

Scratch Subpool Report

```
Mon, 24 Jul 2000       S t o r a g e T e k   E x P R  5 . 0          XYZ COMPANY                                                    Page    5
13:25:44    2000.206                                                                                                    Job:EXPR0J46    XPRREP029
-------------------------------------------------------------------------------------------------------------------------------------------
                                              SCRATCH POOL REPORT FOR SYSTEM SYS1              DATE RANGE:2000176 TO 2000206
                                              ACS: 000 NEARLINE ACS 000
                                              LSM: 00  NEARLINE LSM 000 00
-------------------------------------------------------------------------------------------------------------------------------------------
              <-- SUBPOOL NAME -->  <-- SUBPOOL NAME -->  <-- SUBPOOL NAME -->  <-- SUBPOOL NAME -->  <-- SUBPOOL NAME -->
---PERIOD---  <-- POOL0        -->  <-- POOL1        -->  <-- POOL2        -->  <-- POOL3        -->  <-- POOL4        -->

DATE    HOUR   LOW   AVRGE   HIGH    LOW   AVRGE   HIGH    LOW   AVRGE   HIGH    LOW   AVRGE   HIGH     LOW   AVRGE   HIGH

2000176   0      25     35     45      20     30     40      50     60     70      25     35     45       20     35     45
          1      23     34     44      21     32     41      52     61     71      23     34     44       21     34     44
          2      21     33     43      22     34     42      54     62     73      21     33     43       22     33     43
          3      19     32     42      23     36     43      56     63     75      19     32     42       23     32     42
          4      17     31     41      24     38     44      58     64     77      17     31     41       24     31     41
          5      15     30     42      25     40     45      60     65     79      15     30     42       25     30     42
          6      13     29     43      26     38     46      62     66     77      13     29     43       26     29     43
          7      11     28     44      27     36     47      64     67     75      11     28     44       27     28     44
          8      13     29     45      28     34     48      66     68     73      13     29     45       28     29     45
          9      15     30     46      29     32     49      68     69     71      15     30     46       29     30     46
         10      17     31     47      28     30     50      67     70     73      17     31     47       28     31     47
         11      19     32     48      27     32     49      66     71     75      19     32     48       27     32     48
         12      21     33     49      26     34     48      65     72     77      21     33     49       26     33     49
         13      23     34     48      25     36     47      64     71     79      23     34     48       25     34     48
         14      25     35     47      24     38     46      63     70     77      25     35     47       24     35     47
         15      23     34     46      23     40     45      62     69     75      23     34     46       23     34     46
         16      21     33     45      22     38     44      61     68     73      21     33     45       22     33     45
         17      19     32     44      21     36     43      60     67     71      19     32     44       21     32     44
         18      17     31     43      22     34     42      59     66     73      17     31     43       22     31     43
         19      15     29     42      23     32     41      58     65     75      15     29     42       23     29     42
         20      13     28     41      24     34     40      57     64     77      13     28     41       24     28     41
         21      11     29     42      25     36     41      56     63     79      11     29     42       25     29     42
         22      13     30     43      26     38     42      55     62     77      13     30     43       26     30     43
         23      15     31     44      27     40     43      54     61     75      15     31     44       27     31     44
END OF REPORT FOR THIS LSM. RECORDS READ ,  255, TYPE 17:   112
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(SCRATCH-POOL) ;
```

This report lists, for each LSM, the low, high, and average hourly scratch cartridge counts for each HSC subpool that has been identified to ExPR with the Host Configurator application on the PC.

SMF Exception Events Report

```
WED, 12 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                PAGE   23
12:20:41    1999.224                                                                                          JOB:B30T0051    XPRREP012
                  SMF UPDATE - SMF EXCEPTION EVENTS
                  ---------------------------------

  DATE     TIME   SYS  DRIVE TYPE ACS LSM  EVENT            OBSERVATION   THRESHOLD   VARIATION
-------- -------- ---- ----- ---- --- ---  ---------------  -----------   ---------   ---------
1999.181 21:56:46 CPUA  0C0A      000  00  NONSCR PASSTHRU 000-01     2           1     200% ---------->
1999.181 21:56:46 CPUA  0C0A      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 21:57:48 CPUA  0C29      000  01  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 21:58:51 CPUA  0C0A      000  00  NONSCR PASSTHRU 000-01     2           1     200% ---------->
1999.181 21:58:51 CPUA  44C5      PRODVTSS VTSS SCRATCH MOUNT        7           2     350% ---------------->
1999.181 21:59:21 CPUA  44D8      PRODVTSS VTSS NON-SCR MOUNT        5           2     250% ---------->
1999.181 21:59:59 CPUA            000  01  LOW AVAIL-SCRATCHES      175         200
1999.181 22:00:01 CPUA  0C02      000  01  HIGH CU DISCONNECT        82%         80%    + 2%
1999.181 22:02:27 CPUA  0C01      000  01  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:03:10 CPUA  0C0A      000  00  NONSCR PASSTHRU 000-01     2           1     200% ---------->
1999.181 22:03:10 CPUA  0C0A      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:04:50 CPUA  0C02      000  01  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:05:58 CPUA  0C00      000  01  SCRATCH MOUNT             62          50     124% ------>
1999.181 22:05:58 CPUA  0C00      000  01  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:07:19 CPUA  0C20      000  00  NONSCR PASSTHRU 000-02     2           1     200% ---------->
1999.181 22:07:19 CPUA  0C20      000  00  NON-SCRATCH MOUNT         82          60     136% ------>
1999.181 22:07:19 CPUA  0C20      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:18:04 CPUA  0C08      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:18:42 CPUA  0C00      000  01  NONSCR PASSTHRU 000-00     2           1     200% ---------->
1999.181 22:21:17 CPUA  0C28      000  01  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:22:38 CPUA  0C28      000  01  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:26:37 CPUA  0C01      000  01  NON-SCRATCH MOUNT        108          60     180% --------->
1999.181 22:28:16 CPUA  0C24      000  02  SCRATCH MOUNT             70          50     140% ------->
1999.181 22:30:01 CPUA  0C02      000  01  HIGH CU DISCONNECT        91%         80%    +11%
1999.181 22:31:24 CPUA  0C27      000  02  PERM I/O ERROR VOLSER=013539
1999.181 22:32:29 CPUA  0C00      000  01  SCRTCH PASSTHRU 000-02     2           1     200% ---------->
1999.181 22:32:29 CPUA  0C00      000  01  SCRATCH MOUNT             62          50     124% ------>
1999.181 22:33:40 CPUA  0C20      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:34:00 CPUA  0C27      000  02  SCRATCH MOUNT             65          50     130% ------>
1999.181 22:34:08 CPUA  0C08      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:34:25 CPUA  0C20      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:34:34 CPUA  0C00      000  01  PERM I/O ERROR VOLSER=013539
1999.181 22:35:45 CPUA  0C02      000  01  NONSCR PASSTHRU 000-02     2           1     200% ---------->
1999.181 22:35:45 CPUA  0C02      000  01  NON-SCRATCH MOUNT         69          60     115% ----->
1999.181 22:36:54 CPUA  0C0B      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:38:24 CPUA  0C0B      000  00  NONSCR PASSTHRU 000-02     2           1     200% ---------->
1999.181 22:38:24 CPUA  0C0B      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:40:59 CPUA  0C0B      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:42:20 CPUA  0C22      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 22:43:46 CPUA  0C0B      000  00  DRIVES-IN-USE EXCEEDED     7           6     116% ----->
1999.181 21:59:59 CPUA            000  01  LOW AVAIL-SCRATCHES      163         200
SMF INPUT ANALYSIS:
 LOWEST DATE IN INPUT.....................1999152
 HIGHEST DATE IN INPUT....................1999181
 LOWEST DATE SELECTED.....................1999001
 HIGHEST DATE SELECTED....................1999365
 ALL SYSTEMS:
 SMF RECORDS READ.........................202917
 RECORDS REJECTED/IGNORED.....................634
 SMF TYPE 21 - VOLUME STATISTICS.............2440
 RMF TYPE 73 - CHANNEL ACTIVITY..............117
 RMF TYPE 74 - CU/DEVICE ACTIVITY............117
 HSC SUBTYPE 004 - ROBOTICS..................175
 HSC SUBTYPE 007 - MOUNTS....................2213
            (OF WHICH DEMAND ENTERS WERE).......0
 HSC SUBTYPE 007 - DISMOUNTS.................2221
 HSC SUBTYPE 007 - EJECTS....................216
 HSC SUBTYPE 007 - ENTERS.....................95
 SYSTEM IPO1:
 SMF RECORDS READ.........................195378
 RECORDS REJECTED/IGNORED.....................634
 SMF TYPE 21 - VOLUME STATISTICS.............55
 RMF TYPE 73 - CHANNEL ACTIVITY..............0
 RMF TYPE 74 - CU/DEVICE ACTIVITY............0
 HSC SUBTYPE 004 - ROBOTICS..................0
 HSC SUBTYPE 007 - MOUNTS....................0
            (OF WHICH DEMAND ENTERS WERE).......0
 HSC SUBTYPE 007 - DISMOUNTS.................0
 HSC SUBTYPE 007 - EJECTS....................0
 HSC SUBTYPE 007 - ENTERS....................0
 EXPRSTC S/T 007 - EXPR MANUAL MOUNTS.........63
 EXPRSTC S/T 007 - EXPR MANUAL DISMOUNTS.....61
 SYSTEM CPUA:
 SMF RECORDS READ.........................7539
 RECORDS REJECTED/IGNORED....................0
 SMF TYPE 21 - VOLUME STATISTICS.............2385
 RMF TYPE 73 - CHANNEL ACTIVITY..............117
 RMF TYPE 74 - CU/DEVICE ACTIVITY............117
SMF EXCEPTION EVENTS REPORT COMPLETED
```

This report is generated by the batch database update process (*usrprfx*.CNTL member SMFUPDAT):

PERFORM SMF-UPDATE – updates the database and generates the report

PERFORM SMF-REPORT – generates the report only

The report compares the thresholds defined for mount response time and all other thresholds with the mount events and other HSC/VTSS activities as they were recorded. No summarization of this data has taken place, so reporting is at the lowest possible single event level.

The report provides the following information:

- DATE/TIME: The date and time the event (mount, eject, etc.) completed – determined from SMF date/timestamp (i.e., 1994.341 14:52:45).
- SYS: The MVS host system where the event occurred.
- DRIVE/TYPE: The device number/channel-unit address and the model of the device.
- ACS/LSM: The library ID or the VTSS/device group name.
- EVENT: The reason for the exception as detailed in the following two tables.
- OBSERVATION: The current events count or measurement within this hour (for example, the 69th observed non-scratch mount).
- THRESHOLD: The user-defined threshold value to be compared against the observation above (for example, 60 non-scratch mounts per hour).
- VARIATION: A percentage variation above the set threshold with a visible scale of the variation (for example, 69 mounts over a 60 threshold is 115%).

An unexpected dismount can occur at the start of the SMF data if the corresponding mount preceded the start of the SMF file.

A returned RC=4 from the report indicates a possible break in SMF recording, resulting in a mount-mount sequence with no intervening dismount, or a dismount with no preceding mount. If this occurs, check that SMF input data is complete and continuous.

An Important Consideration for SMF Update Processes

When running the SMF update processes, either in batch or real-time DirectSMF, it is important to ensure that the SMF data for all MVS hosts is included in a single update pass. The running of individual updates on a system by system or piecemeal basis will prevent ExPR from collecting and analyzing relevant data in the context of all other parallel activity. This is particularly important when you define ExPR consolidated views. All data must be handled in a single process to ensure that the global view of activity is correctly calculated.

Under real-time DirectSMF, this means that all secondary started tasks must be active and connected to the primary system. For the batch SMF-UPDATE function, you must input all SMF archive data, for a given date range, into a single batch execution. The various SMF files can be concatenated together and you can use the ExPR INPUT statement. The date/time/system order of the SMF input does not matter, as ExPR will sort the data. Also, in batch, you should always input whole days of SMF archive data, not partial days.

SMF Exception Events

Possible exceptions from Nearline and VTSS SMF data are listed below. Exception thresholds are defined for your site with the PC-based ExPR Host Configurator application, except for those marked with an asterisk, which are always reported by ExPR and are not user-controlled.

Nearline Exceptions

Nearline Exception	Description
SCRATCH MOUNT	Scratch mount time exceeded the threshold.
NON-SCRATCH MOUNT	Non-scratch mount time exceeded the threshold.
EXCESSIVE SCRATCH MNTS	The scratch mount count threshold has been exceeded for this LSM/hour.
EXCESSIVE NON-SCR MNTS	The non-scratch mount count threshold has been exceeded for this LSM/hour.
* UNEXPECTED MOUNT	A mount occurred for an already mounted drive.
* UNEXPECTED DISMOUNT	A dismount occurred for an already free drive.
DRIVES-IN-USE EXCEEDED	The number of active drives was exceeded for this LSM.
HIGH CU DISCONNECT	The tape control disconnect time exceeded the threshold.
* PERM I/O ERROR VOL=*xxxxxx*	The identified volume had a permanent read or write error.
* TEMP I/O ERROR VOL=*xxxxxx*	The identified volume had a temporary read or write error.
* DEMAND ENTER VOL=*xxxxxx* JOB=*xxxxxx*	A mount was issued against a Nearline drive for a volume that was not in the library. The operator had to load the cartridge into a CAP to satisfy the mount.
* HSC COUNTER OVERFLOW	An HSC LMU statistics counter has overflowed and been reset to zero by ExPR. This prevents distortion of mount-time breakdown values.
SCRATCH PASSTHRU *aaa-ll*	A scratch volume mount involved more LSMs than the MAX-LSM-USED threshold permitted; *aaa-ll* identifies the originating LSM.

Nearline Exception	Description
NON-SCR PASSTHRU *aaa-ll*	A non-scratch volume mount involved more LSMs than the MAX-LSMS-USED threshold permitted; *aaa-ll* identifies the originating LSM.
EXCESSIVE PASSTHRUS	The number of mounts involving a passthrough into this LSM has exceeded the user threshold during the past hour.
EXCESSIVE ENTERS	The number of cartridge enters via a CAP has exceeded the user threshold during the past hour.
EXCESSIVE EJECTS	The number of cartridge ejects via a CAP has exceeded the user threshold during the past hour.
LOW AVAIL-CELLS	The number of free/available cells within a particular LSM has fallen below the AVAIL-CELLS threshold within the past hour.
LOW AVAIL-SCRATCHES	The number of available scratch cartridges within a particular LSM has fallen below the AVAIL-SCRATCH threshold within the past hour.

VTSS Exceptions

VTSS Exception	Description
EXCESSIVE MVC MOUNTS	The number of MVC mounts for the VTSS has exceeded the threshold during the last hour.
EXCESSIVE VTV RECALLS	The number of VTV recalls from MVCs has exceeded the threshold during the last hour.
EXCESSIVE VTV RECLAIMS	The number of VTVs being moved during reclaim operations has exceeded the threshold during the last hour.
EXCESSIVE VTV MIGRATES	The number of VTVs being migrated has exceeded the threshold during the last hour.
EXCESS VTSS-SCRATCH MNT	The VTV scratch mount count threshold has been exceeded for this VTSS/hour.
EXCESS VTSS-NON-SCR MNT	The VTV non-scratch mount count threshold has been exceeded for this VTSS/hour.
VTSS SCRATCH MOUNT	The virtual scratch mount time has exceeded the threshold.
VTSS NON-SCR MOUNT	The virtual non-scratch mount time has exceeded the threshold.
HI VTSS CHNL-INT-BUSY	The internal VTSS host or RTD channel interface busy time has exceeded the percentage threshold
HIGH DISK BUFFER UTIL	The amount of used RAID within the VTSS has exceeded the user-defined percentage threshold
HIGH VTSS CU DISCONNECT	The channel disconnect percentage for the virtual VTSS control unit has exceeded the CU-LOAD threshold.
MAX VTDS EXCEEDED	The number of currently active/mounted virtual tape drives has exceeded the threshold.
MAX RTDS EXCEEDED	The number of currently active/mounted real tape drives has exceeded the user-defined threshold.
VTV RESIDENCY	Virtual tape volume residency time in the VTSS disk buffer.
* OFFLINE CACHE KBYTES	The internal VTSS cache has some of its memory in an offline status. This may be a hardware failure and may cause degraded VTSS performance.
* PINNED CACHE KBYTES	The internal VTSS cache has some of its memory in a pinned status. This may be a hardware failure and may cause degraded VTSS performance.

System Mounts Report

```
Tue, 27 Aug 2002      S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
22:29:38    2002.239                                                                                                  Job:V790611R    XPRREP010
-------------------------------------------------------------------------------------------------------------------------------------------
                                          System Mounts Report For System IRI6              Date range: 2002042 to 2002042

-------------------------------------------------------------------------------------------------------------------------------------------
---Period---  <-------------------------------------Mount counts-------------------------------------> <----Bytes transferred---->
 Date  Hour     LSM-Mounts  VTD-Mounts  <-------- RTD mounts by reason --------->  Manual-Mnts  ALL-Mount
                 SCR  NSCR   SCR  NSCR Migrt Recll Reclm Drain Audit Consl Exprt   SCR  NSCR   SCR  NSCR     Read  Written    Total

2002042 00         0     0     0     0     0     0     0     0     0     0     0     0     0     0     0       0K       0K       0K
        01         0     4    15    20     3     0     0     0     0     0     0     0     0    15    24     1143M    1179M    2322M
        02         0     9     7    12     4     4     0     0     0     0     0     0     0     7    21     2347M     437M    2784M
        03         0    14     5    16     1     5     0     0     0     0     0     0     0     5    30       36G     222M      36G
        04         0     9     4     4     5     1     0     0     0     0     0     0     0     4    13     7695M     279M    7974M
        05         0    14     7    22     5     7     0     0     0     0     0     0     0     7    36       33G    1128M      35G
        06         0     1     3    10     1     0     0     0     0     0     0     0     0     3    11     6220M      18M    6238M
        07         0    14     5    20     6     6     0     0     0     0     0     0     0     5    34     8696M     480M    9176M
        08         0     8     7    15     7     1     0     0     0     0     0     0     0     7    23      530M    1224M    1754M
        09         0     7     7     4     5     1     0     0     0     0     0     0     0     7    11      478M    1868M    2346M
        10         0    13     9    26     2     2     0     0     0     0     0     0     0     9    39     5145M     928M    6073M
        11         0    10     4    15     1     5     0     0     0     0     0     0     0     4    25     4289M    1574M    5863M
        12         0     4     5     8     2     2     0     0     0     0     0     0     0     5    12     4238M     335M    4573M
        13         0    22     9    10     5     0     0     0     0     0     0     0     0     9    32     4668M    7533M      12G
        14         0    14     8    10     5     4     0     0     0     0     0     0     0     8    24     3336M    1215M    4551M
        15         0     5    21    24     2     3     0     0     0     0     0     0     0    21    29      949M     655M    1604M
        16         0     3     4    10     2     1     0     0     0     0     0     0     0     4    13     2980M    8280K    2988M
        17         0    10    13    11     5     2     0     0     0     0     0     0     0    13    21     4471M    1303M    5774M
        18         0     7     7     8     5     2     0     0     0     0     0     0     0     7    15     2936M    1384M    4320M
        19         0     3     1    14     3     0     0     0     0     0     0     0     0     1    17      464M      14M     478M
        20         0     3     2    19     2     1     0     0     0     0     0     0     0     2    22     4012M    1199M    5211M
        21         0    11     5    15     6     5     0     0     0     0     0     0     0     5    26     2622M    1268M    3890M
        22         0    10     2    25     9     0     0     0     0     0     0     0     0     2    35     1693M       0K    1693M
        23         1     7    18    28     7     0     0     0     0     0     0     0     0    19    35     4651M    4782M    9433M
Daily total        1   202   168   346    93    52     0     0     0     0     0     0     0   169   548      141G      28G     169G
Period             1   202   168   346    93    52     0     0     0     0     0     0     0   169   548      141G      28G     169G
End of report for this system.  Records read: 0000955   Type 3: 00024
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(SYSTEM-MOUNTS) ;
```

The report is generated for each defined MVS system and shows one day of activity per page. Each hour is listed along with a daily total and a period total at the end of each system's report.

The report is divided into two sections, Mount Counts and Bytes Transferred:

The Mount Counts section is divided into six categories of mount activity: LSM mounts (automated libraries), VTD mounts (virtual tapes within VSM), RTD mounts (real tapes within VSM), manual cartridge mounts, manual reel-to-reel mounts, and total of all mounts. The six categories are further broken into scratch and non-scratch values.

The Bytes Transferred section summarizes the total amount of data moved between the host MVS system and all attached tape subsystems (automated, virtual, and manual drive device groups). This is presented as three values – data read, data written, and total data transferred. The quantity of data is scaled according to its size (i.e., Kb, Mb, Gb, or Tb).

Note for MSP Users: This report will not produce any data transferred values on MSP systems. This is because MSP does not generate the required data in the SMF 21 record.

Tape Errors Report

```
FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                          PAGE    1
16:30:45    1999.226                                                                                          JOB:B30T005R  XPRREP017
                                 OVERALL SUMMARY OF TAPE ERRORS FOR SYSTEM CPUA                 DATE RANGE: 1998001 TO 1998365
                                 ----------------------------------------------

                      <---TOTALS FOR DEFINED VOLS AND DRIVES--> <--TOTALS FOR UNDEFINED VOLS AND DRIVES->
                      <PERM ERRORS> <TEMP ERRORS>  <NO OF VOLS> <PERM ERRORS> <TEMP ERRORS>  <NO OF VOLS>
--DATE--  HOUR SYSTEM    READ  WRITE   READ  WRITE   PERM   TEMP   READ  WRITE   READ  WRITE   PERM   TEMP

1998.181 22.00  CPUA        0      2      0      0      2      0      0      0      0      0      0      0
1998.182 00.00  CPUA        0      1      0      0      1      0      0      0      0      0      0      0

FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                          PAGE    2
16:30:45    1999.226                                                                                          JOB:B30T005R  XPRREP017
                         OVERALL DETAILS OF TAPE ERRORS FOR SYSTEM CPUA (DATE/TIME ORDER)       DATE RANGE: 1998001 TO 1998365
                         ---------------------------------------------------------------
                      ACS LSM  UNIT VOLUME < PERM ERRORS > < TEMP ERRORS >   NO OF <DATA TRANSFERRED>
--DATE--  HOUR SYSTEM /VTSSID  ADDR SERIAL   READ   WRITE    READ   WRITE   SSCH'S    READ  WRITTEN

1998.181 22.00  CPUA  000  02  0C27 013539       0       1       0       0    1207      12K     965M
1998 181 22.00  CPUA  000  01  0C00 013539       0       1       0       0     191       4K      28M
1998.182 00.00  CPUA  000  01  0C02 017003       0       1       0       0     275     268K      35M

FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANEY                                         PAGE    3
16:30:45    1999.226                                                                                          JOB:B30T005R  XPRREP017
                         OVERALL DETAILS OF TAPE ERRORS FOR SYSTEM CPUA (VOLSER ORDER)          DATE RANGE: 1998001 TO 1998365
                         ---------------------------------------------------------------
                      ACS LSM  UNIT VOLUME < PERM ERRORS > < TEMP ERRORS >   NO OF <DATA TRANSFERRED>
--DATE--  HOUR SYSTEM /VTSSID  ADDR SERIAL   READ   WRITE    READ   WRITE   SSCH'S    READ  WRITTEN

1998.181 22.00  CPUA  000  02  0C27 013539       0       1       0       0    1207      12K     965M
1998.181 22.00  CPUA  000  01  0C00 013539       0       1       0       0     191       4K      28M
1998.182 00.00  CPUA  000  01  0C02 017003       0       1       0       0     275     268K      35M

FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANEY                                         PAGE    4
16:30:45    1999.226                                                                                          JOB:B30T005R  XPRREP017
                         OVERALL DETAILS OF TAPE ERRORS FOR SYSTEM CPUA (DRIVE ADDR ORDER)      DATE RANGE: 1998001 TO 1998365
                         ---------------------------------------------------------------
                      ACS LSM  UNIT VOLUME < PERM ERRORS > < TEMP ERRORS >   NO OF <DATA TRANSFERRED>
--DATE--  HOUR SYSTEM /VTSSID  ADDR SERIAL   READ   WRITE    READ   WRITE   SSCH'S    READ  WRITTEN

1998.181 22.00  CPUA  000  01  0C00 013539       0       1       0       0     191       4K      28M
1998.182 00.00  CPUA  000  01  0C02 017003       0       1       0       0     275     268K      35M
1998.181 22.00  CPUA  000  02  0C27 013539       0       1       0       0    1207      12K     965M
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(TAPE-ERRORS) ;
```

The report is divided into two sections, Overall Summary and Overall Detail. Both sections list the number of temporary and permanent read/write errors that occur; the detail report also provides an audit trail of which tape drive and cartridge volume the media errors occurred on.

The Overall Summary has two sections, one for defined volumes and devices and another for undefined volumes and devices. The following information is listed for each section:

- The number of permanent read errors recorded
- The number of permanent write errors recorded

- The number of temporary read errors recorded
- The number of temporary write errors recorded
- The number of volumes that had permanent errors
- The number of volumes that had temporary errors

The Overall Details lists one record per drive/volume that had I/O errors associated with it. For each drive/volume, the following information is printed:

- The ACS/LSM, VTSS, or manual group that owned the drive (these are blank for undefined devices)
- The device address of the unit involved
- The volser of the cartridge
- Counts of permanent/temporary read and write errors
- The SSCH count (number of physical I/Os to the volume)
- The quantity of data read and written to the volume

The SSCH count taken with the data transferred can give a ratio of errors to I/O activity. For example, one temporary error on a volume of 800Mb with 20,000 physical I/Os is not as important as a permanent error while writing tape labels.

To facilitate identification of faulty drives or volumes, the Overall Details report is printed three times: in date/time order, in erroneous volser order, and in failing drive address order.

Note: Tape errors are also listed as exceptions in the SMF Exception Events report.

VTSS and Manual Device Group Note: Tape error events relating to VTSS virtual volumes (VTVs) or manual device groups are listed along with all other tape errors.

Note for MSP Users: This report will not produce any data transferred values on MSP systems. This is because MSP does not generate the required data in the SMF 21 record.

TAPECAT Aging and Utilization Summary

```
TUE, 30 JUN 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANEY                                                    PAGE    9
17:26:42    1999.181                                                                                                 JOB:B30T005T    XPRREP050
                                  TAPE CATALOG UPDATE PROCESSING FOR SYSTEM IPO1
                                  ----------------------------------------------
99.181 17.26.46 XPR0709I HSC / SLSXCAL level is 2.0.0
99.181 17.32.33 XPR0100W DSN count mis-match: volser 021663 says 00000001 DSNs - 00000010 DSNs found
99.181 17.32.37 XPR0107I XPRCA1X run stats - 00024271 VOLs, 00050486 DSNBs, 00001044 DA reads
99.181 17.33.29 XPR0080W Volser VTV001 not in Tape Catalog
99.181 17.33.29 XPR0080W Volser VTV002 not in Tape Catalog
99.181 17.33.29 XPR0080W Volser VTV003 not in Tape Catalog
99.181 17.33.29 XPR0081W Volser 000004: CDS says Scratch, Catalog says not
99.181 17.33.29 XPR0087W Volser 000005 DSN=HSM.COPY.BACKTAPE.DATASET                    selected in dataset-group  1028 and  1029
99.181 17.33.29 XPR0087W Volser 000006 DSN=PROD.HK.BACKUP.TMS.AUDIT.G3523V00           selected in dataset-group     1 and 31000
99.181 17.33.29 XPR0087W Volser 000010 DSN=PROD.IB.IBCA.REPT.VSAM.BKUP.G0203V00       selected in dataset-group     1 and 31000
99.181 17.33.29 XPR0087W Volser 000011 DSN=IDMS.IDMSF.PR.DAILY.TCDB.BACKUP.G0092V00   selected in dataset-group     1 and  1026
99.181 17.33.29 XPR0087W Volser 000014 DSN=HSM.COPY.HMIGTAPE.DATASET                   selected in dataset-group  1028 and  1029

                                  (    -     DAYS)(   1-   3 DAYS)(   4-   7 DAYS)(   8-  14 DAYS)(  15-9999 DAYS)VTSS-AGEBANDS
XPR0092I-      OLDEST  # MULTI # MULTI (   1-   7 DAYS)(   8-  30 DAYS)(  31-  91 DAYS)(  92- 183 DAYS)( 184-9999 DAYS)AGEBANDS
 ACS LSM       IN DAYS VOLUMES  FILES  (# VOLS/AVG AGE)(# VOLS/AVG AGE)(# VOLS/AVG AGE)(# VOLS/AVG AGE)(# VOLS/AVG AGE)
-------- ----- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
 000  00           175    1565     902    4616       4     442      13     215      62      45     137       0       0
 000  01           169    1528     866    4696       4     361      14     233      60      16     137       0       0
 000  02           900     864     511    3634       3     311      12     122      58      38     135       1     900
PRODVTSS            28     421      54       0       0    3453       2    2145       6    1765      12     132      20
                                  (    -     DAYS)(   1-   3 DAYS)(   4-   7 DAYS)(   8-  14 DAYS)(  15-9999 DAYS)VTSS-AGEBANDS
XPR0092I-DATA- OLDEST  # MULTI # MULTI (   1-   7 DAYS)(   8-  30 DAYS)(  31-  91 DAYS)(  92- 183 DAYS)( 184-9999 DAYS)AGEBANDS
 ACS LSM GROUP IN DAYS VOLUMES  FILES  (# VOLS/AVG AGE)(# VOLS/AVG AGE)(# VOLS/AVG AGE)(# VOLS/AVG AGE)(# VOLS/AVG AGE)
-------- ----- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
 000 ALL     1    1628    3898    2060    6603    1313     478    1450     411    1543       2    1622       0       0
 000  01     2    1351      29      14      47    1314       0       0       0       0       0       0       0       0
 ALL ALL  1026    3820    3249     273    1713    1312     152    1452     259    1550     557    1637    1192    2246
 000  02  1027    1301      12       9      12    1298       0       0       0       0       0       0       0       0
 000 ALL  1028    1328       0       0      71    1296       0       0       0       0       0       0       0       0
 000 ALL  1029    1328       0       0      71    1296       0       0       0       0       0       0       0       0
 ALL ALL  1234       0       0       0       0       0       0       0       0       0       0       0       0       0
ALL VTSS 12345       0       0       0       0       0       0       0       0       0       0       0       0       0
MANUALS  30000    2248       0       0    1845    1313     174    1435      41    1517     163    1614       6    1977
ALL-VOLS 31000    3897    4522    2223    5224    1317     707    1448     675    1550     858    1634    2551    2123
XPR0091I-       TOTAL UTILIZED AVERAGE  - - - - - - - -  PERCENTAGE UTILIZED BANDS (NO OF VOLUMES)  - - - - - - - - -
 ACS LSM       VOLUMES VOLUMES  % UTIL  00-10%  11-20%  21-30%  31-40%  41-50%  51-60%  61-70%  71-80%  81-90% 91-100%
-------- ----- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
 000  00          5690    4390      43    1429     324     206     618     316      80      58      40      25    1294
 000  01          5649    3815      47    1175     297     189     402     251      88      59      48      28    1278
 000  02          4654    2400      42     835     210     116     273     169      51      25      27      13     681
PRODVTSS          7495    7450      64     167     234     254     369     500     793    4341     396     209     187
XPR0091I-DATA-  TOTAL UTILIZED AVERAGE  - - - - - - - -  PERCENTAGE UTILIZED BANDS (NO OF VOLUMES)  - - - - - - - - -
 ACS LSM GROUP VOLUMES VOLUMES  % UTIL  00-10%  11-20%  21-30%  31-40%  41-50%  51-60%  61-70%  71-80%  81-90% 91-100%
-------- ----- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- ------- -------
 000 ALL     1    7494    7494      48    2758     610     333     342     132      79      82      38      14    3106
 000  01     2      47      47      55      12       5       3       2       0       1       0       3       0      21
 ALL ALL  1026    3873    3873      80     428      93      77     203      70      30      28      32       8    2904
 000  02  1027      12      12      54       3       1       2       0       0       0       0       0       0       6
 000 ALL  1028      71      71      35      15       2       3      19      24       4       0       2       0       2
 000 ALL  1029      71      71      35      15       2       3      19      24       4       0       2       0       2
 ALL ALL  1234       0       0       0       0       0       0       0       0       0       0       0       0       0
ALL VTSS 12345       0       0       0       0       0       0       0       0       0       0       0       0       0
MANUALS  30000    2229    2229      45      73      79      95     861     568     147     106      87      89     124
ALL-VOLS 31000   10015   10015      43    4292     872     514     271     138      96     112      38      27    3655
99.181 17.35.54 XPR0093W At least one LSM/VTSS or dataset-group has no volumes
99.181 17.35.54 XPR0094I    4691 CDS volumes not in tape catalog
99.181 17.35.54 XPR0095I       2 volumes have a conflicting scratch status
99.181 17.35.54 XPR0097W    2830 volumes have had their mega-bytes capacity capped
DATABASE OUTPUT ANALYSIS:
RECORDS ADDED.............................28

BREAKDOWN OF ADDED/REPLACED RECORDS:.....28
TYPE 04 - TAPECAT LSM/VTSS VOLUME AGING........4
TYPE 05 - TAPECAT DATASET-GRP UTIL INFO.......10
TYPE 06 - TAPECAT DATASET-GRP AGING INFO......10
TYPE 07 - TAPECAT LSM/VTSS VOLUME UTIL.........4
```

These reports are produced automatically by the ExPR tape catalog processing update function (run-time control statement TAPECAT OPTION(UPDATE)).

Note: Be sure to use the TAPECATU JCL for the TAPECAT UPDATE function. Do not forget to comment out the TMCHIST DD if you specify the NOHIST option.

Fields in the reports are as follows:

- ACS/LSM: The Nearline library ID or the VTSSid.
- DSGRP: The user-defined dataset workload group (if any).
- OLDEST IN DAYS: The highest number of days since the last-reference date, i.e., the oldest tape within the LSM/VTSS or dataset workload group.
- # MULTI VOLUMES: The number of volumes that are part of a multi-volume stack containing one or more datasets held within the LSM/VTSS or dataset workload group.
- # MULTI FILES: The number of multi-file cartridges (more than one file per cartridge) held within the LSM/VTSS or dataset workload group.
- # VOLS/AVG AGE (1st occurrence): The number of non-scratch cartridges (#VOLS) that are older than the highest ageband and the average number of days since their last-reference date (AVG AGE) within the LSM/VTSS or dataset workload group. The ageband range (in days) is printed above the occurrence.
- # VOLS/AVG AGE (2nd through 5th occurrences): For each ageband, the number of non-scratch cartridges (# VOLS) that are within the specified ageband and the average number of days since their last reference (AVG AGE). The ageband range (in days) is printed above each occurrence.
- UTILIZED VOLUMES: The total number of entries for which utilization calculations have been performed. For LSMs/VTSSs, this is the number of non-scratch cartridges matched in the tape catalog and HSC CDS. For dataset workload groups, this is the number of cartridges in the group.
- AVERAGE % UTIL: The LSM/VTSS or group average of how much of the cartridges were utilized, expressed as a percentage of the length.
- *xx-xx*%: A series of percentage utilization bands showing the number of cartridges in each band.

Processing anomalies between the tape catalog and CDS are also printed as XPR warning messages in the reports. Warnings can be suppressed with the NOWARN option.

- The Aging summary report (XPR0092I) lists, for each LSM/VTSS and again for each user-defined dataset workload group, the number of non-scratch cartridges within user-specified agebands and their average ages, the number of cartridges containing multi-volume datasets, and the number of cartridges containing multiple datasets.
- The Utilization summary report (XPR0091I) lists, for each LSM/VTSS and again for each user-defined dataset workload group, the number of non-scratch cartridges within each tape utilization percentage band.

TAPECAT Tape-Sizing Library Contents Report

```
FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                PAGE    1
15:59:23    1999.226                                                                                                  JOB:B30T005T    XPRREP053
                                    TAPE-SIZING - LIBRARY CONTENTS REPORT                                  (AS AT 1999.181 17:26:42 BY 3.0.0)
                                    -------------------------------------

MEGABYTES  TOTAL  IN-USE  SCRA- UTILIZD NOT IN EXTNLY --CANDIDATE-VOLS--   STD-CARTS     E-CARTS  EMAX-CARTS    MAGSTARS    REDWOODS
  BAND   VOLUMES VOLUMES  TCHES VOLUMES CATALG MANAGD  VOLS  AVGMB TOTGB   OPT  CURR   OPT  CURR   OPT  CURR   OPT  CURR   OPT  CURR
-------- ------- ------- ------ ------- ------ ------ ------ ----- -----  ---  ---   ---  ---   ---  ---   ---  ---   ---  ---

=    0      4897    4181    716     214   4683      0    214     0     0     0   93     0   116     0    5     0    0     0    0
<   10      3524    3100    424    3524      0     29   3495     2     9     6 1564     4  1841     1   90     0    0     0    0
<   25      1226    1116    110    1226      0     27   1199    18    21    12  530     8   631     1   38     0    0     0    0
<   50      1051     979     72    1051      0     28   1023    37    37    19  405    14   587     1   31     0    0     0    0
<  100      1868    1752    116    1868      0     78   1790    65   115    58  725    43  1018     2   47     0    0     0    0
<  200      1993    1788    205    1993      0    111   1882   153   283   149  732   102  1088     5   62     0    0     0    0
<  400      6037    5469    568    6037      0    850   5187   238  1206   726 2716   388  2341    17  130     0    0     0    0
<  600      3538    3349    189    3538      0   2655    883   498   430     0    0   261   837    12   46     0    0     0    0
<  800       753     692     61     753      0    223    530   711   368     0    0   226   508     8   22     0    0     0    0
< 1000      1245    1167     78    1245      0    191   1054   922   949     0    0   584  1014    19   40     0    0     0    0
< 1600      2345    2205    140    2345      0    585   1760  1237  2127     0    0  1290  1669    58   91     0    0     0    0
< 2000       216     178     38     216      0    190     26  1781    45     0    0     0     0    24   26     0    0     0    0
> 2000         0       0      0       0      0      0      0             0     0    0     0     0     0    0     0    0     0    0
ALL BANDS  28695   25978   2717   24012   4683   4969  19043   300  5590   967 6765  2916 11650   143  628     0    0     0    0
SAVINGS    15017                                                        5798       8734          485            0           0
USING STD-CARTS  ONLY, WOULD REQUIRE   10834 CARTRIDGES FOR THE WHOLE LIBRARY, SAVING  17861 CARTS
USING E-CARTS    ONLY, WOULD REQUIRE    5417 CARTRIDGES FOR THE WHOLE LIBRARY, SAVING  23278 CARTS
USING EMAX-CARTS ONLY, WOULD REQUIRE    4334 CARTRIDGES FOR THE WHOLE LIBRARY, SAVING  24361 CARTS
USING MAGSTARS   ONLY, WOULD REQUIRE     867 CARTRIDGES FOR THE WHOLE LIBRARY, SAVING  27828 CARTS
USING REDWOODS   ONLY, WOULD REQUIRE     174 CARTRIDGES FOR THE WHOLE LIBRARY, SAVING  28521 CARTS
USING STD-CARTS  ONLY, WOULD REQUIRE    7156 CARTRIDGES FOR THE CANDIDATES   , SAVING  11887 CARTS
USING E-CARTS    ONLY, WOULD REQUIRE    3578 CARTRIDGES FOR THE CANDIDATES   , SAVING  15465 CARTS
USING EMAX-CARTS ONLY, WOULD REQUIRE    2863 CARTRIDGES FOR THE CANDIDATES   , SAVING  16180 CARTS
USING MAGSTARS   ONLY, WOULD REQUIRE     573 CARTRIDGES FOR THE CANDIDATES   , SAVING  18470 CARTS
USING REDWOODS   ONLY, WOULD REQUIRE     115 CARTRIDGES FOR THE CANDIDATES   , SAVING  18928 CARTS

FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                PAGE    2
15:59:23    1999.226                                                                                                  JOB:B30T005T    XPRREP011
-------------------------------------------------------------------------------------------------------------------------------------------
                                    TAPE-SIZING - SYSTEM THRUPUT REPORT FOR SYSTEM CPUA                 DATE RANGE: 1999180 TO 1999182

-------------------------------------------------------------------------------------------------------------------------------------------
---PERIOD---       <-----------------------------MOUNT COUNTS-----------------------------> <----BYTES TRANSFERRED---->
 DATE  HOUR           LSM-MNTS    VTD-MNTS    RTD-MNTS    MAN-CART    MAN-REEL    ALL-MNTS
                      SCR  NSCR   SCR  NSCR  MIGR  RCLL   SCR  NSCR   SCR  NSCR   SCR  NSCR     READ  WRITTEN    TOTAL

1999181 00 NO DATA
        01    ..
        02    ..
        03    ..
        04    ..
        05    ..
        06             40    22     0     0     0     0     5     1     0     0    45    23     8044M      17G      25G
        07             38    20     0     0     0     0     4     2     0     0    42    22       10G      29G      39G
        08             23    31     0     0     0     0     0     2     0     0    23    33     6270M      33G      39G
        09             17    76     0     0     0     0     3     0     0     0    20    76     6926M    6587M      13G
        10             17   108     0     0     0     0    15     1     0     0    32   109       12G    7304M      19G
        11             16    68     0     0     0     0     2     1     0     0    18    69       12G    5193M      17G
        12             13    69     0     0     0     0     2     1     0     0    15    70       23G    6125M      29G
        13             11    70     0     0     0     0     2     2     0     0    13    72       11G    5648M      16G
        14             10    65     0     0     0     0     4     1     0     0    14    66     2944M    1721M    4665M
        15             10    91     0     0     0     0    12     6     0     0    22    97     1349M    2440M    3789M
        16              8    85     0     0     0     0     4     4     0     0    12    89     3988M    1788M    5776M
        17              7    68     0     0     0     0    25     7     0     0    32    75     5977M    2463M    8440M
        18              8    46     0     0     0     0    18     0     0     0    26    46       11G    1848M      12G
        19             75     5     0     0     0     0     1     0     0     0    76     5     2639M      18G      21G
        20             50    16     0     0     0     0     4     1     0     0    54    17     5466M      22G      27G
        21             35    36     0     0     0     0     8     7     0     0    43    43     7237M      14G      21G
        22             42    18     0     0     0     0     0     0     0     0    42    18     6775M      15G      22G
        23             35    16     0     0     0     0     2     9     0     0    37    25     5245M      16G      21G
DAILY TOTAL           455   910     0     0     0     0   111    45     0     0   566   955      140G     204G     344G

THE PEAK HOURLY DATA TRANSFERRED (READ ) WAS       23G ON DAY 1998181 HOUR 12:00
THE PEAK HOURLY DATA TRANSFERRED (WRITN) WAS       33G ON DAY 1998181 HOUR 08:00
THE PEAK HOURLY DATA TRANSFERRED (TOTAL) WAS       39G ON DAY 1998181 HOUR 08:00
------- PEAK 8 HOUR WINDOW STATS -------
  DATE  HOUR  BYTES-RD BYTES-WR    TOTAL
------- ----- -------- -------- --------
1999181 06:00    8044M      17G      25G
1999181 07:00      10G      29G      39G
1999181 08:00    6270M      33G      39G
1999181 09:00    6926M    6587M      13G
1999181 10:00      12G    7304M      19G
1999181 11:00      12G    5193M      17G
1999181 12:00      23G    6125M      29G
1999181 13:00      11G    5648M      16G
------- ----- -------- -------- --------
TOTALS             88G     109G     198G
```

Important Note: The output from the Tape-Sizing report should only be used as a rough estimate of the flow and quantity of data within your total tape environments. The report is intended as a *starting point* for tape sizing analysis projects such as media efficiency analysis, the implementation of stacking software, and the evaluation of new hardware technologies. It is not possible for this report to take into account all of the exceptions and special cases which might require inclusion or exclusion in your analysis, so you should use the report as a measurement that requires technical familiarity with your total tape operations when interpreting its results.

This report is produced by the following run-time control statement (*usrprfx*.CNTL member TAPECATS):

```
TAPECAT OPTION(TAPE-SIZING) ;
```

The first part of the report analyzes the contents of your installation's complete tape library, based on the information stored in a TMCHIST file. The tapes are broken down into ranges based on the calculated number of megabytes per volume, and further broken down into different media types within each megabytes band. The default megabyte bands can be changed with the PC-based ExPR Host Configurator application.

The second part of the report is a modified System Mounts report with the busiest eight-hour window of tape data transfer highlighted.

Fields in this report are as follows:

- MEGABYTES BAND: The size (in Mb) of volumes selected in this line of the report.
- TOTAL VOLUMES: The number of volumes falling into this size band.
- IN-USE VOLUMES: The number of volumes that were not in scratch status.
- SCRATCHES: The number of volumes that were in scratch status.
- UTILIZED VOLUMES: The number of volumes that have utilization information in the TMCHIST file (i.e., dataset information from the tape catalog).
- NOT IN CATALOG: The number of volumes that were in the CDS or VTCS file but not in the tape catalog.
- EXTERNALLY MANAGED: The number of volumes that are controlled by an external management utility, usually HSM or a database manager.
- CANDIDATE VOLUMES: The number of volumes that can be considered for the sizing calculations (i.e., utilized volumes less externally managed volumes).
- CANDIDATE AVGMB: The average size in Mb of the candidate volumes.
- CANDIDATE TOTGB: The total size in gigabytes (Gb) of the candidate volumes.

The next five pairs of columns cover the major types of tape cartridge in use:

- STD-CARTS – Standard length 3480/3490 cartridges
- ECARTS – 1100-ft. 3490 thin film e-carts
- EMAX-CARTS – 1400-ft. 3490 extended e-carts
- MAGSTARS – IBM Magstar cartridges
- REDWOODS – StorageTek high-capacity Redwood cartridges

Under each category of media there are two columns, CURR and OPT:

- CURR is the current count of this type of cartridge that was found among the candidate volumes.
- OPT is the optimal number of this type of cartridge required if the candidate volumes were stacked by means of a stacking utility.

After all megabyte bands have been listed, there is an ALL BANDS summary line and a SAVED line to indicate how many cartridge volumes would be saved through volume stacking.

Finally, some calculations are produced to show the savings of stacking using each single category of media type.

Throughout the tape sizing process, the following media type capacities are used:

- STD-CARTS = 800 Mb
- E-CARTS = 1600 Mb
- EMAX-CARTS = 2000 Mb
- MAGSTARS = 10000 Mb
- REDWOODS = 50000 Mb

The second part of the Tape Sizing report is identical to the System Mounts report with the addition of identifying the peak eight-hour period for tape activity, based on the quality of data read and written by the host. This is based on all tape activity, including LSMs, VTSSs, and manual device groups.

TAPECAT Nearline Volume Details Report

```
FRI, 14 AUG 1999      S T O R A G E T E K   E X P R  5 . 0         XYZ COMPANEY                                          PAGE    9
 15:33:44    1999.226                                                                                  JOB:B30T005T    XPRREP060
                                                     NEARLINE VOLUME DETAILS REPORT                 (AS AT 1999.181 17:26:42 BY 3.0.0)
                                                     ------------------------------
                                              SORTED BY - VOLUME SERIAL NO
  FULLCAT VIRTUAL                             ------------------------------------------

                                                    <---------------- VOLUME STATISTICS ----------------><-- DATASET STATISTICS -->
 VOLUME                                             VOL DS PER MEGA CREATION LASTREF/ ACS  USAGE DEV-TYPE  FIL BLKCNT BLKSZ LRECL REC
 SERIAL --------------- DATASET NAME ---------------SEQ NS CNT BYTE   DATE   USED DATE   LSM CNT /MEDIA SCR SEQ M-USD M-AVL M-FRG  FM

        $$VTV.VOLSER.VTV001.RESIDENT.IN.PRODVTSS                200 95338    95338               PRODVTSS                         VTV
        $$VTV.VOLSER.VTV002.MIGRATED.TO.MVC003                  300 95338    97015               VTV-COPY                         VTV
        $$VTV.VOLSER.VTV002.MIGRATED.TO.MVC006                  300 95338    97015               VTV-COPY                         VTV
        $$VTV.VOLSER.VTV002.RESIDENT.IN.PRODVTSS                300 95338    97015               PRODVTSS                         VTV
        $$VTV.VOLSER.VTV003.RESIDENT.IN.PRODVTSS                100 95338    96177               PRODVTSS Y                       VTV
        $$VTV.VOLSER.VTV004.RESIDENT.IN.PRODVTSS                200 93050    96037               PRODVTSS Y                       VTV
        $$VTV.VOLSER.000001.MIGRATED.TO.MVC006                   25 91171    95338               VTV-COPY                         VTV
        $$VTV.VOLSER.000001.RESIDENT.IN.PRODVTSS                 25 91171    95338               PRODVTSS                         VTV
        $$VTV.VOLSER.000002.MIGRATED.TO.MVC006                   25 95008    95338               VTV-COPY                         VTV
        $$VTV.VOLSER.000002.RESIDENT.IN.PRODVTSS                 25 95008    95338               PRODVTSS                         VTV
        $$VTV.VOLSER.000003.MIGRATED.TO.MVC006                   25 95135    95338               VTV-COPY                         VTV
        $$VTV.VOLSER.000003.MIGRATED.TO.MVC007                   25 95135    95338               VTV-COPY                         VTV
        $$VTV.VOLSER.000003.RESIDENT.IN.PRODVTSS                 25 95135    95338               PRODVTSS                         VTV
        $$VTV.VOLSER.000004.MIGRATED.TO.MVC006                   25 95349    95349               VTV-COPY Y                       VTV
        $$VTV.VOLSER.000004.MIGRATED.TO.MVC008                   25 95349    95349               VTV-COPY Y                       VTV
        $$VTV.VOLSER.000004.RESIDENT.IN.PRODVTSS                 25 95349    95349               PRODVTSS Y                       VTV
        $$VTV.VOLSER.000007.MIGRATED.TO.MVC006                   25 95338    95338               VTV-COPY                         VTV
        $$VTV.VOLSER.000007.MIGRATED.TO.MVC009                   25 95338    95338               VTV-COPY                         VTV
        $$VTV.VOLSER.000007.RESIDENT.IN.PRODVTSS                 25 95338    95338               PRODVTSS                         VTV
 ABCDEF $$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG             0  0   ?    ? ?        94315    000 01  15 80  0550    0      0     0     0   ?
 MVC001 $$MVC.VOLSER.MVC001                                     800 96012    96012    000 02  24 MVC-BASE          80    10    10 MVC
 MVC001 $$MVC.VOLSER.MVC001.CONTAINS.VTV.VTV005                 150 94093    97091               MVC-VTV                          VTV
 MVC001 $$MVC.VOLSER.MVC001.CONTAINS.VTV.VTV006                 250 93254    94334               MVC-VTV                          VTV
 MVC002 $$MVC.VOLSER.MVC002                                     800 97167    97167    000 01  24 MVC-BASE          80    15     5 MVC
 MVC002 $$MVC.VOLSER.MVC002.CONTAINS.VTV.VTV006                 250 93254    94334               MVC-VTV                          VTV
 MVC003 $$MVC.VOLSER.MVC003                                     800 94131    94131            24 MVC-BASE          64    16    20 MVC
 MVC003 $$MVC.VOLSER.MVC003.CONTAINS.VTV.VTV002                 300 95338    97015               MVC-VTV                          VTV
 MVC004 $$MVC.VOLSER.MVC004                                   10000 93089    93089            24 MVC-BASE          80    20     0 MVC
 MVC005 $$MVC.VOLSER.MVC005                                   10000 96266    96266            24 MVC-BASE          48    48     4 MVC
 MVC006 $$MVC.VOLSER.MVC006                                   10000 92251    92251            24 MVC-BASE          16    16    68 MVC
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.VTV002                 300 95338    97015               MVC-VTV                          VTV
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.VTV007                  50 96152    96152               MVC-VTV                          VTV
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.VTV008                  25 96068    96068               MVC-VTV                          VTV
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.000001                  25 91171    95338               MVC-VTV                          VTV
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.000002                  25 95008    95338               MVC-VTV                          VTV
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.000003                  25 95135    95338               MVC-VTV                          VTV
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.000004                  25 95349    95349               MVC-VTV                          VTV
 MVC006 $$MVC.VOLSER.MVC006.CONTAINS.VTV.000007                  25 95338    95338               MVC-VTV                          VTV
 MVC007 $$MVC.VOLSER.MVC007                                   50000 97193    97193            24 MVC-BASE          36    32    32 MVC
 MVC007 $$MVC.VOLSER.MVC007.CONTAINS.VTV.000003                  25 95135    95338               MVC-VTV                          VTV
 MVC008 $$MVC.VOLSER.MVC008                                   50000 96366    96366            24 MVC-BASE         100     0     0 MVC
 MVC008 $$MVC.VOLSER.MVC008.CONTAINS.VTV.000004                  25 95349    95349               MVC-VTV                          VTV
 MVC009 $$MVC.VOLSER.MVC009                                     800 97053    97053            24 MVC-BASE           0    50    50 MVC
 MVC009 $$MVC.VOLSER.MVC009.CONTAINS.VTV.000007                  25 95338    95338               MVC-VTV                          VTV
 MVC010 $$MVC.VOLSER.MVC010                                     800 97053    97053            24 MVC-BASE           0   100     0 MVC
 VTV001 $$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG             0  0   ?    ? ?        95338             0 PRODVTSS    0      0     0     0   ?
 VTV002 $$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG             0  0   ?    ? ?        97015             0 PRODVTSS    0      0     0     0   ?
 VTV003 $$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG             0  0   ?    ? ?        96177             0 PRODVTSS Y  0      0     0     0   ?
 VTV004 $$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG             0  0   ?    ? ?        96037             0 PRODVTSS Y  0      0     0     0   ?
 000001 TEST.CA.CAB.DCABA047.SA131.COPY.G0012V00      1 53 100  440 94345    94345           306 PRODVTSS    1      4 28672  4096 FB
 000002 HSM.MCDS.BACKUP.V0002941                      1  1=100  640 94346    94346            76 PRODVTSS    1      0 32760 32760 VBS
 000003 HSM.DMP.#DB2A.VDB2A11.D94344.T512922          1  1 100 1040 94344    94344           369 PRODVTSS    1  16634 65536 65536 UN
 000004 HSM.COPY.BACKTAPE.DATASET                     1  1  67  540 94333    94333           103 PRODVTSS ?  1  34570 16384 16384 F
 000005 HSM.COPY.BACKTAPE.DATASET                     1  1  39  436 94347    94347    000 00 410 90I 1100    1  27893 16384 16384 F
 000006 PROD.HK.BACKUP.TMS.AUDIT.G3523V00             1  1   1    9 94342    94342    000 02 377 90I 1100    1   1042  8880   370 FB
 000007 HSM.COPY.HMIGTAPE.DATASET                     1  1  57  463 94038    94038           166 PRODVTSS    1  29641 16384 16384 F
 000008 PROD.HK.PDBSMF.MTHLY.G0089V00                 4  1  33   73 94015    94020           192 80  0550    1   2337 32760     0 UN
 000009 HSM.COPY.HMIGTAPE.DATASET                     1  1  37  417 94333    94333           268 90I 1100    1  26704 16384 16384 F
 000010 PROD.IB.IBCA.REPT.VSAM.BKUP.G0203V00          1  1   2   39 94347    94347    000 00 173 90I 1100    1   1249 32760 32756 VB
 000011 IDMS.IDMSF.PR.DAILY.TCDB.BACKUP.G0092V00      1  1  36  513 94285    94285    000 01  25 90I 1100    1  16432 32760     0 UN
 000012 TEST.FREE.GLOBIHIH.D301194                    3  1 100  199 94341    94341           174 80  0550    1   6392 32600   163 FB
 000013 TEST.FREE.GLOBIHIH.D301194                    2  1 100  198 94341    94341           209 80  0550    1   6355 32600   163 FB
 000014 HSM.COPY.HMIGTAPE.DATASET                     1  1   2   27 94333    94333    000 02 233 90I 1100    1   1734 16384 16384 F
 000015 PROD.PD.PD017C.G1599V00                       1  1   0   <1 94017    94017           128 80  0550    1      6 32736    48 FB
 000016 HSM.DMP.#SYST.VSYS016.D94340.T012105          1  1  48  775 94340    94340           344 90I 1100    1  12406 65536 65536 UN
 000017 TEST.OLAS.IBCATZ.DTH3DDA.IMCOP.G0002V00       3  1 100  116 94176    94176           319 80  0550    1   6470 32760 28014 VB
 000018 PROD.IB.IBCA.CA1.CAIBCADB.G0462V00            1  1   1   26 94341    94341    000 02 241 90I 1100    1    831 32760 32760 VBS
 000019 TEST.OLAS.IBCATJ.DTH3DDA.IMCOP.G0013V00      12  5 100  206+94345    94345           375 80  0550    1  27921 32760 28014 VB
 000020 HSM.BACKTAPE.DATASET                          1  1  46  517 94343    94343    000 00 221 90I 1100    1  33056 16384 16384 F
 000021 IDMS.IDMSA.PR.DAILY.FILE.BKUPCOPY.G1294V00    2  1 100  709 94347    94347           248 90I 1100    1  45415     0     0 UN
 000022 TEST.FREE.GLOBACOM.D301194                    4  1 100  199 94341    94341           270 80  0550    1   6407 32623   323 FB
 000023 HSM.DMP.MC2.VMC2002.D94345.T120209            1  1  21  339 94345    94345    000 00 249 90I 1100    1   5429 65536 65536 UN
 000024 PROD.OB.OB545.G0017V00                        1  1  62   22 91231    94067           195 80  0550    1  45135   500   500 F
 000029 PROD.OB.TRANS.ACTION.REGISTER.D2810930        2  1  42   94 93302    93309           298 80  0550    1   3099 32760  2124 VB
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member TAPECATR):

```
TAPECAT OPTION(REPORT BYxxxx) ;
```

The various BY*xxxx* options allow the report to be sorted in order of any of the columns listed below.

Fields in this report are as follows:

- VOLUME SERIAL: The volser of the volume cartridge. A percent symbol (%) is inserted between VOLUME SERIAL and DATASET NAME if the volume is full due to being a part of a multi-volume stack.
- DATASET NAME: The primary dataset name on the volume (and optionally all secondary datasets).
- VOL SEQ: The volume sequence within a multi-volume stack.
- DSNS: The number of datasets on the volume.
- PER CNT: The approximate percentage used of the volume. This is a percentage of the length of the cartridge that has been covered with data blocks and inter-block gaps.
- An equal symbol (=) is inserted between DSNS and PER CNT if the DSN-PROFILE AVG-USE parameter was used for this volume.
- MEGA-BYTE: The approximate amount of data written to the volume. For an MVC, this is the media size of the MVC. A plus symbol (+) beside this value indicates that the capacity has been capped. A less-than symbol (<) indicates that the volume has less than one megabyte but more than zero bytes of data.
- CREATION DATE: The date the volume was last written. When the BYAGE option is specified, the CREATION DATE field will contain "AGE *nnnn*" – where *nnnn* is the number of days since the volume was last used.
- LAST REF/USED DATE: The date the volume was last accessed.
- ACS LSM: The location of the volume within the Nearline library or the VTSSid for virtual volumes; blank for volumes outside the Nearline/VTSS environment.
- USAGE CNT: The number of times the volume has been accessed/mounted.
- DEV-TYPE/MEDIA: The creating device type and cartridge length (see table below).
- SCR: The volume's scratch status. Blank means the cartridge is not in scratch status. Y means the cartridge is a scratch. ? means the message XPR0081W or XPR0082W was issued for this cartridge, indicating that the status in the CDS is different from that in the tape catalog.
- FIL SEQ: The file sequence on a multi-file cartridge.

- BLKCNT M-USD: The block count of the dataset or, for an MVC, its percentage space used.
- BLKSZ M-AVL: The block size of the dataset or, for an MVC, its percentage space available. For a non-MVC volume, an asterisk (*) will be printed between BLKCNT and BLKSZ if the DSN-PROFILE BLKSZ or LRECL parameters were used for this file.
- LRECL M-FRG: The record size of the dataset or, for an MVC, its percentage space fragmented.
- RECFM: The record format of the dataset.

Note: Within the field descriptions above, there are five possible special status characters described (%, =, <, +, and *). These symbols are not used anywhere else within the layout of the TAPECAT Volume Details report. It is therefore possible to scan the reports using your online SYSOUT viewer (SDSF, etc.) to find volumes and files with these flags set.

The following table lists the device-type/media codes used internally by the ExPR TAPECAT facility and the ID used in the Volume Details report. These are written to the history file in the field THF_DEN.

TAPECAT Device-Type /Media Codes

THF_DEN Value	Volume Details Report	Maximum Capacity (including compression)	Device-Type/Media Description
0	ROUND	140 Mb	All 1600/6250 bpi reel-to-reel/round tapes
1	80	200 Mb	3480/18-track cartridges uncompressed (550 ft. cart)
2	80I	800 Mb	3480/18-track cartridges compressed (IDRC/ICRC) (550 ft. cart)
3	90	400 Mb 800 Mb	3490/36-track cartridges uncompressed (550 ft. cart) 3490/36-track cartridges uncompressed (1100 ft. cart)
4	90I	1600 Mb 3200 Mb	3490/36-track cartridges compressed (IDRC/ICRC) (550 ft. cart) 3490/36-track cartridges compressed (IDRC/ICRC) (1100 ft. cart)
5	VTV-VOL	400/800Mb	3490E 400/800Mb VTV within the VSM system
M	MVC-BASE	N/A	An MVC-base record for each MVC within the VSM/VTSS system
N	MVC-VTV	N/A	An MVC-onboard-VTV record for each VTV copy on an MVC
V	VTV-COPY	N/A	A VTV-index record for each copy of a VTV on an MVC or within a VTSS
A	REDWD-10	40 Gb	A StorageTek Redwood 10 Gb native cartridge
B	REDWD-25	100 Gb	A StorageTek Redwood 25 Gb native cartridge

C	REDWD-50	200 Gb	A StorageTek Redwood 50 Gb native cartridge
J	MSTAR-10	70 Gb	An IBM 3590 MagStar 10 Gb native cartridge
R	9840	280 Gb	A StorageTek 9840 native cartridge
P	9940	420 Gb	A StorageTek 9940 native cartridge
Z	9490EE	6.5 Gb	A StorageTek 9490EE 2200 ft. EE cartridge

Note: The application dataset name and data attributes for a VTV are to be found in the type 5 record in the same manner as non-VSM cartridges are found in types 1-4. Type M, N, and V are specific to VSM/VTSS and its internal management of VTVs and MVCs. These record types allow cross-referencing of copies of VTVs within a VTSS or MVCs and collation of the contents of a given MVC.

TAPECAT Nearline Volume History Report

```
AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                PAGE    1
15:47:31    1999.226                                                                                JOB:B30T005T    XPRREP052
                                          NEARLINE VOLUME HISTORY REPORT
                                          ------------------------------
(1ST FILE CREATED: 1999.175 AT 15:33:16 BY 3.0.0   2ND FILE CREATED: 1999.180 AT 15:05:45 BY 3.0.0)

VOLUME   CDS/ACS   TMC  CHANGED BECOME BECOME  VOLUME   VTSS      MVC
SERIAL   STATUS  STATUS DENSITY SCRTCH NONSCR RE-USED  STATUS   STATUS
------   ------- ------ ------- ------ ------ ------- -------- --------

000047                  YES     YES    YES    YES
000048                  YES     YES    YES    YES
000049   EJECTED                YES    YES    YES
000050   ENTERED ADDED
000051   ENTERED ADDED
000052           ADDED
000053                  YES     YES    YES    YES
000054   EJECTED                YES    YES    YES
000055           ADDED
000056           ADDED
000057   ENTERED ADDED
000058   ENTERED ADDED
000059   EJECTED         YES     YES    YES    YES
000060           ADDED
000061   ENTERED ADDED
000062   ENTERED ADDED
000063           ADDED
000064                  YES     YES    YES    YES
000065   EJECTED                YES    YES    YES
000066           ADDED
000067           ADDED
000068                  YES     YES    YES    YES
000069   EJECTED                YES    YES    YES
000070   EJECTED                YES    YES    YES
000071                  YES     YES    YES    YES
000072   EJECTED         YES     YES    YES    YES
000073           ADDED
000074   ENTERED ADDED
000075           ADDED
000076           ADDED
000077   EJECTED         YES     YES    YES    YES
000078   EJECTED                YES    YES    YES
000079   ENTERED ADDED
000080   ENTERED ADDED
000081   ENTERED ADDED
000082           ADDED
000083   EJECTED         YES     YES    YES    YES
000084           ADDED
000085   EJECTED                YES    YES    YES

HISTORY FILE COMPARISION STATISTICS :
VOLUMES ENTERED.........................13059
VOLUMES EJECTED.........................18056
VOLUMES MOVED BETWEEN ACS/LSM'S.........2319
VOLUMES ADDED TO THE TAPE CATALOG.......22387
VOLUMES DELETED FROM THE TAPE CATALOG.....2926
VOLUMES WITH CHANGED DENSITY/MODE.......3862
VOLUMES THAT HAVE BECOME SCRATCH........5253
VOLUMES THAT HAVE BECOME NON-SCRATCH.....5971
VOLUMES THAT HAVE BEEN RE-USED..........4638

VOLUMES THAT HAVE BEEN READ AS INPUT.......0
TOTAL NO OF INPUT OPENS....................0

 [Continued on next page]
```

```
  [continued from previous page]

TMCHIST1:VOLUMES READ.....................22177
         VOLUMES IN TAPE CATALOG...........2925
         SCRATCHES IN TAPE CATALOG..........723
         VOLUMES IN ACS LIBRARY...........20989
         SCRATCHES IN ACS LIBRARY..........3925
         VTV'S IN VSM/VTSS.................34239
         SCRATCH VTV'S IN VSM/VTSS.........4902
         MVC'S IN VSM/VTSS.................132
TMCHIST2:VOLUMES READ.....................28972
         VOLUMES IN TAPE CATALOG..........24276
         SCRATCHES IN TAPE CATALOG.........2334
         VOLUMES IN ACS LIBRARY...........15993
         SCRATCHES IN ACS LIBRARY..........1263
         VTV'S IN VSM/VTSS.................39489
         SCRATCH VTV'S IN VSM/VTSS.........2395
         MVC'S IN VSM/VTSS.................156

         VTV'S CREATED IN VTSS'S..........13245
         VTV'S DELETED FROM VTSS'S.........4520
         VTV'S RECALLED TO VTSS'S...........320
         VTV'S MIGRATED TO MVC'S...........4109
         VTV'S DELETED FROM MVC'S...........834
         VTV'S RECLAIMED BETWEEN MVC'S.....378
         VTV'S DELETED FROM VSM SYSTEM.....593
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member TAPECATH):

```
TAPECAT OPTION(HISTORY) ;
```

The report provides comparative activity analysis between two tape catalog images by listing volumes that have changed status and summarizing activity with the library and tape catalog.

The history report reads two generations of the TMCHIST GDG, as shown below.

```
//STEPABC  EXEC  EXPRP300
//EXPR.TMCHIST1  DD  DSN=user.name.SPRnnn.TMCHIST(-1),
//                   DISP=SHR,DCB=(BUFNO=20)
//EXPR.TMCHIST2  DD  DSN=user.name.SPRnnn.TMCHIST(0),
//                   DISP=SHR,DCB=(BUFNO=20)
//EXPR.UPRIN     DD  *
  PERFORM   TAPECAT  OPTION(HISTORY)  ;
```

***usrprfx*.CNTL Member: TAPECATH**

Note: Always ensure TMCHIST1 points at the older dataset.

The history report lists those volumes that have changed status between the two runs of TAPECAT UPDATE that generated the TMCHIST files. These changes can be:

- A volume being added to the TMC or deleted from the TMC
- A volume being entered into the Nearline library or ejected from the Nearline library
- A volume becoming a scratch or non-scratch
- A volume recording mode/density changing (18/36 track)

Additionally, history file comparison statistics are listed at the end of the report.

Note: When running the HISTORY report, ensure that the TMCHIST files were created with the same UPDATE options. History files with different options will give incorrect messages. For example, one history file with FULLCAT and another without FULLCAT will give many false TMCSTATUS messages of ADDED/DELETED.

Fields in this report are as follows:

- VOLUME SERIAL: The volser of the volume cartridge.
- CDS/ACS STATUS: Indicates if the cartridge was entered or ejected from the Nearline system.
- TMC STATUS: Indicates if the cartridge was added to or deleted from the tape management system.
- CHANGED DENSITY: Indicates if the cartridge's recording mode/density changed (18/36 track).
- BECOME SCRATCH: Indicates if the cartridge became a scratch.
- BECOME NONSCR: Indicates if the cartridge became a non-scratch.
- VOLUME RE-USED: Indicates if the cartridge was scratched and re-used or used and re-scratched between two TAPECAT update runs.

TAPECAT Nearline Volume Summary Report

```
AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                    PAGE   22
15:33:44    1999.226                                                                                          JOB:B30T005T    XPRREP051
                                        NEARLINE VOLUME SUMMARY REPORT                          (AS AT 1999.181 17:26:42 BY 3.0.0)
                                        ------------------------------
                                       PART 1 - VOLUME AGING AND TOTALS
                                       --------------------------------

        DATA-  DEVICE-    TOTAL   IN-USE   SCRA- UTILIZED NOT IN   MULTI   MULTI OLDEST  AVG  AVG  HIGH  CAPPED  TOTAL  MAX
 ACS LSM GROUP TYPE/MEDIA VOLUMES VOLUMES   TCHES VOLUMES CATALOG VOLUMES   FILES  DAYS  DAYS  MEGS  MEGS VOLUMES  DSNS DSNS

 000 00        ALL MEDIA     2468    2096     372    1168    1036      10      68  1633 1335   525  2165    48   1500    2
 000 00        3480          1036     928     108       0    1036       0       0  1624 1337     0     0     0      0    0
 000 00        3480  0550    1036     928     108       0    1036       0       0  1624 1337     0     0     0      0    0
 000 00        3490            71      68       3      68       0       0      68  1322 1306    77   141     0    139    2
 000 00        3490  1100      67      64       3      64       0       0      64  1322 1306    76   141     0    131    2
 000 00        3490  1475       4       4       0       4       0       0       4  1318 1308    87   141     0      8    2
 000 00        3490IDRC      1361    1100     261    1100       0      10       0  1633 1335   548  2165    48   1361    1
 000 00        3490I 1100    1284    1035     249    1035       0       8       0  1633 1335   543  1614    47   1284    1
 000 00        3490I 1475      77      65      12      65       0       2       0  1447 1326   631  2165     1     77    1
 000 00      1 ALL MEDIA     3051    3051       0    3051       0    1538     834  1628 1335   503  1876   199  14896  116
 000 00      1 3480            19      19       0      19       0      18       0  1628 1434    97   219     1     19    1
 000 00      1 3480  0550       5       5       0       5       0       5       0  1569 1494   116   219     1      5    1
 000 00      1 3480  1100      14      14       0      14       0      13       0  1628 1413    90   212     0     14    1
 000 00      1 3490IDRC      3032    3032       0    3032       0    1520     834  1616 1334   506  1876   198  14877  116
 000 00      1 3490I 1100    2858    2858       0    2858       0    1419     779  1616 1333   499  1523   191  13844  116
 000 00      1 3490I 1475     174     174       0     174       0     101      55  1578 1344   615  1876     7   1033  116
 000 00   1028 ALL MEDIA       13      13       0      13       0       0       0  1328 1299   452   806     0     13    1
 000 00   1028 3490IDRC        13      13       0      13       0       0       0  1328 1299   452   806     0     13    1
 000 00   1028 3490I 1100      12      12       0      12       0       0       0  1328 1300   454   806     0     12    1
 000 00   1028 3490I 1475       1       1       0       1       0       0       0  1295 1295   429   429     0      1    1
 000 00  31000 ALL MEDIA      158     158       0     158       0      17       0  1584 1416   211   996     0    158    1
 000 00  31000 3490IDRC       158     158       0     158       0      17       0  1584 1416   211   996     0    158    1
 000 00  31000 3490I 1100     151     151       0     151       0      17       0  1584 1415   213   996     0    151    1
 000 00  31000 3490I 1475       7       7       0       7       0       0       0  1574 1434   175   227     0      7    1
 000 00    ALL ALL MEDIA     5690    5318     372    4390    1036    1565     902  1633 1337   500  2165   247  16567  116
 000 00    ALL 3480          1055     947     108      19    1036      18       0  1628 1339    97   219     1     19    1
 000 00    ALL 3480  0550    1041     933     108       5    1036       5       0  1624 1338   116   219     1      5    1
 000 00    ALL 3480  1100      14      14       0      14       0      13       0  1628 1413    90   212     0     14    1
 000 00    ALL 3490            71      68       3      68       0       0      68  1322 1306    77   141     0    139    2
 000 00    ALL 3490  1100      67      64       3      64       0       0      64  1322 1306    76   141     0    131    2
 000 00    ALL 3490  1475       4       4       0       4       0       0       4  1318 1308    87   141     0      8    2
 000 00    ALL 3490IDRC      4564    4303     261    4303       0    1547     834  1633 1337   508  2165   246  16409  116
 000 00    ALL 3490I 1100    4305    4056     249    4056       0    1444     779  1633 1337   502  1614   238  15291  116
 000 00    ALL 3490I 1475     259     247      12     247       0     103      55  1578 1342   607  2165     8   1118  116

 FRI, 14 AUG 1999       S T O R A G E T E K   E X P R  5 . 0 . 0      XYZ COMPANY                                          PAGE   29
15:33:44    1999.226                                                                                          JOB:B30T005T    XPRREP051
                                        NEARLINE VOLUME SUMMARY REPORT                          (AS AT 1999.181 17:26:42 BY 3.0.0)
                                        ------------------------------
                                       PART 2 - VOLUME UTILIZATION
                                       --------------------------------

        DATA-  DEVICE-    TOTAL UTILIZED AVG%
 ACS LSM GROUP TYPE/MEDIA VOLUMES VOLUMES UTIL    00% 00-10% 11-20% 21-30% 31-40% 41-50% 51-60% 61-70% 71-80% 81-90% 91-99%   100%

 000 00        ALL MEDIA     2468    1168  41      0     84     47     58    459    262    139     28     26     19      6     40
 000 00        3480          1036       0   0      0      0      0      0      0      0      0      0      0      0      0      0
 000 00        3480  0550    1036       0   0      0      0      0      0      0      0      0      0      0      0      0      0
 000 00        3490            71      68   9      0     57     11      0      0      0      0      0      0      0      0      0
 000 00        3490  1100      67      64   9      0     54     10      0      0      0      0      0      0      0      0      0
 000 00        3490  1475       4       4   7      0      3      1      0      0      0      0      0      0      0      0      0
 000 00        3490IDRC      1361    1100  43      0     27     36     58    459    262    139     28     26     19      6     40
 000 00        3490I 1100    1284    1035  44      0     24     31     40    437    259    130     27     24     19      6     38
 000 00        3490I 1475      77      65  36      0      3      5     18     22      3      9      1      2      0      0      2
 000 00      1 ALL MEDIA     3051    3051  47    223    937    244    140    149     47     23     30     13      6      1   1238
 000 00      1 3480            19      19  80      0      0      1      2      2      0      0      0      0      0      0     14
 000 00      1 3480  0550       5       5  71      0      0      0      2      0      0      0      0      0      0      0      3
 000 00      1 3480  1100      14      14  84      0      0      1      0      2      0      0      0      0      0      0     11
 000 00      1 3490IDRC      3032    3032  47    223    937    243    138    147     47     23     30     13      6      1   1224
 000 00      1 3490I 1100    2858    2858  47    218    886    223    132    145     41     23     30     13      6      0   1141
 000 00      1 3490I 1475     174     174  53      5     51     20      6      2      6      0      0      0      0      1     83
 000 00   1028 ALL MEDIA       13      13  39      1      0      0      2      5      3      1      0      1      0      0      0
 000 00   1028 3490IDRC        13      13  39      1      0      0      2      5      3      1      0      1      0      0      0
 000 00   1028 3490I 1100      12      12  40      1      0      0      1      5      3      1      0      1      0      0      0
 000 00   1028 3490I 1475       1       1  28      0      0      0      1      0      0      0      0      0      0      0      0
 000 00  31000 ALL MEDIA      158     158  17     23     73     33      6      5      4      3      0      0      0      0     11
 000 00  31000 3490IDRC       158     158  17     23     73     33      6      5      4      3      0      0      0      0     11
 000 00  31000 3490I 1100     151     151  17     23     69     30      6      5      4      3      0      0      0      0     11
 000 00  31000 3490I 1475       7       7   9      0      4      3      0      0      0      0      0      0      0      0      0
 000 00    ALL ALL MEDIA     5690    4390  45    247   1094    324    206    618    316    166     58     40     25      7   1289
 000 00    ALL 3480          1055      19  80      0      0      1      2      2      0      0      0      0      0      0     14
 000 00    ALL 3480  0550    1041       5  71      0      0      0      2      0      0      0      0      0      0      0      3
 000 00    ALL 3480  1100      14      14  84      0      0      1      0      2      0      0      0      0      0      0     11
 000 00    ALL 3490            71      68   9      0     57     11      0      0      0      0      0      0      0      0      0
 000 00    ALL 3490  1100      67      64   9      0     54     10      0      0      0      0      0      0      0      0      0
 000 00    ALL 3490  1475       4       4   7      0      3      1      0      0      0      0      0      0      0      0      0
 000 00    ALL 3490IDRC      4564    4303  45    247   1037    312    204    616    316    166     58     40     25      7   1275
 000 00    ALL 3490I 1100    4305    4056  45    242    979    284    179    592    307    157     57     38     25      6   1190
 000 00    ALL 3490I 1475     259     247  47      5     58     28     25     24      9      9      1      2      0      1     85
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member TAPECATR):

```
TAPECAT OPTION(SUMMARY) ;
```

The report provides tape catalog volume contents information summarized for each ACS, each LSM, each dataset workload group, each device type, each media type, and each defined tape length.

The report is presented in two parts (due to page width constraints): Volume Aging and Volume Utilization.

Fields in this report are as follows:

- ACS LSM: The ACS/LSM or VTSS being reported.
- DATA-GROUP: The first matched dataset workload group (if any).
- DEVICE-TYPE/MEDIA: The device type and cartridge length.
- TOTAL VOLUMES: The total of all volumes resident within this LSM or VTSS.
- IN-USE VOLUMES: The volumes not in scratch status.
- SCRATCHES: The volumes available as scratches
- UTILIZED VOLUMES: The volumes a utilization calculation was performed for.
- NOT IN CATALOG: The number of volumes that were not in the tape catalog.
- MULTI-VOLUMES: The volumes that are part of a multi-volume stack.
- MULTI-FILES: The volumes with more than one dataset.
- OLDEST DAYS: The number of days since the oldest volume was last referenced.
- AVG DAYS: The average number of days since these volumes were last referenced.
- AVG MEGS: The average megabytes of data on these volumes.
- HIGH MEGS: The highest number of megabytes on any volume.
- CAPPED VOLUMES: The number of volumes message XPR0097W applied to.
- TOTAL DSNS: The total of all primary and secondary datasets.
- MAX DSNS: The maximum number of datasets on any volume.
- AVG % UTIL: The average percentage utilization for UTILIZED VOLUMES.
- 00-10 / 91-99%: The ten percentage bands showing the spread of cartridge utilization excluding empty (0%) and full (100%) volumes.
- 0%: The number of volumes with no data on them.
- 100%: The number of volumes which are completely full.

Thresholds Exceptions Report

```
TUE, 11 AUG 1999      S T O R A G E T E K   E X P R  5 . 0 . 0      XYZ COMPANEY                                                PAGE   17
16:51:59    1999.223                                                                                          JOB:B30T005R    XPRREP026
-------------------------------------------------------------------------------------------------------------------------------------
                                            THRESHOLD EXCEPTIONS REPORT FOR SYSTEM IPO1    DATE RANGE: 1999181 TO 1999181
                                            ACS: 000 NEARLINE ACS 000
                                            LSM:  00 NEARLINE LSM 000 00
-------------------------------------------------------------------------------------------------------------------------------------
               MNT CNT  MNT CNT  MNT TIME MNT TIME                                  MAX USED  AVAIL   AVAIL   MAX ALLOC MAX LSMS
  THRESHOLD    SCRATCH  NON-SCR  SCRATCH  NON-SCR  ENTERS   EJECTS  PASSTHRUS DRIVES  SCRATCHES CELLS   RECOVERY   USED
   VALUES ===> (  45)   (  55)   (  50)   (  60)   (  25)   (  30)   (  35)   (   1)   (   0)   (   0)   ( 300)    (   0)
  DATE  HOUR
1999181   6        20       11   =>  91<=     60        0   =>  41<=      1   =>   8<=                                  1
          8         4       17   =>  51<=     54        0        0        0   =>   5<=                                  0
         10         8       53       48   => 126<=      0        0        4   =>   8<=                                  1
         12         0       40        0   => 102<=      0        0        3   =>   8<=                                  1
         14         0       30        0       52       21        0        0   =>   5<=                                  0
         16         0       43        0   =>  72<=      0        0        1   =>   6<=                                  1
         18         3       35       36   =>  64<=      0        0        7   =>   5<=                                  1
         20         8        8   => 101<= =>  91<=      0        0        1   =>   7<=                                  1
         22        16        4       45   =>  82<=      0        0        3   =>   7<=                                  1
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(THRESHOLDS) ;
```

The report, which is run against the ExPR database, compares the Nearline thresholds you have specified (with the PC-based ExPR Host Configurator application) against the database records over a selected period of time. The report highlights those fields that exceed the threshold, providing you with information to use as a starting point when performing detailed analysis on any problem areas.

Reports are generated per-LSM and show only hours where at least one field has exceeded its threshold. If a threshold is exceeded, all the other fields for that hour are displayed even if they are within threshold. This enables a basic analysis of related data to be completed. If data is not present, the field is filled with blanks.

Where exceptions are present, they are highlighted with "=>" and "<=" characters on either side of the field. The exception threshold is displayed in parentheses below each exception field heading.

Exception thresholds relating to VTSSs are not listed in the report. The VTSS Thresholds report must be run for VTSS activity.

Note: Individual exception descriptions were listed previously with the SMF Exception Events report.

Utilization Report

```
Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
22:58:23    2002.240                                                                                                      Job:V790611R    XPRREP025
-------------------------------------------------------------------------------------------------------------------------------------------------
                                                Utilization Report For System ALL                Date range: 2002042 to 2002042
                                                ACS: 000 NEARLINE ACS 000
                                                LSM:  00 NEARLINE LSM 000 00
-------------------------------------------------------------------------------------------------------------------------------------------------
                          Drive Drive        -------------- Percentage of time drives were in use ---------------    THRESHOLD
               Device-     util% util%    No  (---------------------- No of in use drives ----------------------) DRIVESINUSE(00)
Date    Hour     type    scratch non-scr devs ( 0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16)


2002042 00                   5    14     14    0  28   5  41  15  11   0   0   0   0   0   0   0   0   0   0   0
        01                   4    19     14    0  44   3  19  15   4   7   0   0   0   4   4   0   0   0   0   0
        02                  31    34     14    0   0   0   0   0   0   1   5  11  31  51   1   0   0   0   0   0
        03                  27    29     14    0   0   0   0   1  12   7   9  20  30  21   0   0   0   0   0   0
        04                   4    33     14    0   0   0   2  15  61   4  15   3   0   0   0   0   0   0   0   0
        05                   0    26     14    0   1   7  27  35  29   1   0   0   0   0   0   0   0   0   0   0
        06                   0    23     14    5   5  11  23  38  18   0   0   0   0   0   0   0   0   0   0   0
        07                   0    26     14    0  12   6   8  33  41   0   0   0   0   0   0   0   0   0   0   0
        08                   0    27     14    0   0   0  26  59  15   0   0   0   0   0   0   0   0   0   0   0
        09                   0    25     14    0   6  15  13  48  18   0   0   0   0   0   0   0   0   0   0   0
        10                   0    27     14    0   0   2  40  33  25   0   0   0   0   0   0   0   0   0   0   0
        11                   0    30     14    0   0   0  20  38  30   3   9   0   0   0   0   0   0   0   0   0
        12                   0    36     14    0   0   0   9  31  25  16  18   1   0   0   0   0   0   0   0   0
        13                   0    26     14    0   8  16  38  20   3   2   7   5   1   0   0   0   0   0   0   0
        14                   0    37     14    0   0   8   3   6  48  14  21   0   0   0   0   0   0   0   0   0
        15                   0    32     14    0   0   0   9  46  35   5   5   0   0   0   0   0   0   0   0   0
        16                   7    23     14    0   0   0  15  57   9  19   0   0   0   0   0   0   0   0   0   0
        17                   6    28     14    0   0   0   1  14  72  13   0   0   0   0   0   0   0   0   0   0
        18                   7    26     14    0   0   0   2  32  56  10   0   0   0   0   0   0   0   0   0   0
        19                   7    28     14    0   0   0   6  21  43  30   0   0   0   0   0   0   0   0   0   0
        20                  11    28     14    0   0   0   2  22  25  28  23   0   0   0   0   0   0   0   0   0
        21                   0    25     14    0   0   8  32  47  13   0   0   0   0   0   0   0   0   0   0   0
        22                   2    27     14    0   0   2  17  37  42   2   0   0   0   0   0   0   0   0   0   0
        23                  15    31     14    0   0   0   0   0  20  27  36  15   2   0   0   0   0   0   0   0
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(UTILIZATION) ;
```

The report is generated per-LSM. The report title provides the name of ACS/LSM being reported on and the user-selected date range.

There are two reports:

- A Drive Utilization report showing one day of data per page.
- A Drive Concurrency report providing details of drive concurrency on an hourly basis.

Drive Utilization Report

This report provides the following information for each hour within the associated day:

- Drive Util%: The percentage utilization of the ACS/LSM transports on the basis of scratch and non-scratch volumes mounted on the associated transports.
- Robotics: The time the robotic arm was busy performing move operations (expressed as a percentage).
- No Devs: The number of transports supported by the associated ACS/LSM.

- Drives in Use: Presents, as a percentage of the hour, the number of drives that were concurrently in use. This information is gathered and presented using a banded approach (i.e., 01-04, 05-08,09-12, etc.).
- Drives In Use Threshold: If the DRIVE-IN-USE threshold is specified, this report will print the message **EXCEEDED** when the threshold has been exceeded.

Drive Concurrency report

This report provides the following information on an hourly basis:

- No of Drives: For each interval during the hour where a number of drives were in use concurrently, the number of drives will be presented.
- Percentage: The number of drives expressed as a percentage of the hour by means of a horizontal bar chart.

The report is printed twice, the first sorted chronologically by hour and the second sorted on the basis of highest to lowest percentages.

Note: The Drive Concurrency report can be suppressed by specifying REPORT-OPTIONS(NO-DETAIL) in the UPRIN control statements.

VTSS Interface Performance Report

```
Tue, 09 Sep 2003      S t o r a g e T e k   E x P R  5 . 0 . 0      XYZ Company                                                    Page  856
 23:37:27    2003.252                                                                                                    Job:PRODREPS    XPRREP037
 ------------------------------------------------------------------------------------------------------------------------------------------
                                            VTSS Interface Performance Report for System ALL      Date range:2002001 to 2002006
                                            VTSSid: VTSS1                                                                  (254 32)
 ------------------------------------------------------------------------------------------------------------------------------------------
              <-Disk Buffer Utilization->   <-------Host links------->          <-------RTD links-------->
              Max DBU     LAMT %   HAMT %    Intrface Intrface Intrface          Intrface Intrface Intrface
 ---Period---  % used                         busy % total IO busy sec            busy % total IO busy sec
 Date    Hour
 2002001   0       73        70        80           2    13029       55              16   592832      571
           1       73        70        80           0    13646        5               9   316697      325
           2       74        70        80           1     5242       20               8   289208      283
           3       72        70        80           0     6285        2              15   558263      548
           4       72        70        80           0     4033        1              12   423659      426
           5       72        70        80           4    50096      137               6   249243      230
           6       75        70        80           0     5861        1              15   540217      524
           7       73        70        80           0     2497        1               7   251049      245
           8       74        70        80           0     4575        1              10   365892      354
           9       74        70        80           0     5827        1              15   575256      554
          10       73        70        80           0     1932        0               5   162786      171
          11       73        70        80           0    16698        9              13   431688      452
          12       75        70        80           0     7165        2              13   465829      458
          13       72        70        80           0     3710        3               4   138108      139
          14       72        70        80           0     2339        5               1     4531       19
          15       72        70        80           1    19009       23               0     4214        7
          16       72        70        80           3    40502       96               1    23194       28
          17       72        70        80           0     2422        2               1     1101       24
          18       72        70        80           0       95        0               0        0        0
          19       72        70        80           0     3830       17               1    14123       52
          20       73        70        80           1    93141       50               1    16002       24
          21       73        70        80           3    86099      101               2    43599       64
          22       74        70        80           0     2291        1               0      476       11
          23       74        70        80           1    56303       37               1    35904       51
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(VTSS-INTERFACE-PERFORMANCE) ;
```

The report is generated per-VTSS per-hour and shows one day of data per page. The report title section shows the VTSS being reported on and the user-selected date range.

The report provides the following VTSS interface activity information:

- Disk Buffer Utilization (i.e., the percentage of occupied/used disk within the VTSS)
- Details of host and RTD channel interface activity – percentage busy, number of I/Os, and busy time

VTSS Internal Performance Report

```
Tue, 27 Aug 2002      S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
22:38:33    2002.239                                                                                                    Job:V790611R    XPRREP039
-------------------------------------------------------------------------------------------------------------------------------------------
                                          VTSS Internal Performance Report for System IRI6      Date range:2002042 to 2002042
                                          VTSSid: VTSS1                                                                  (254 32)
-------------------------------------------------------------------------------------------------------------------------------------------
               Maximum   Scratch <--------------------Data transfer-------------------->    <--------------Throughput-------------->
              disk buff  comprsn   Total  <---------Application-------->   <--System-->    <----Stage---->  <---Destage--->   Total
---Period---  utilizn %  rate %     (Mb)  Read % Write % Recall % Migr %   FSC % Recl %    Data(Mb) Rate %  Data(Mb) Rate %  Rate %
Date    Hour
2002042   0          56     N/A      956       0       0        0      0     100      0         478      1        478      1        2
          1          62       0     2607      31      27        0      5      36      0        1181      2       1426      2        4
          2          71      81     4360      30       2       17      2      49      0        1886      4       2474      4        8
          3          72     N/A    26050      84       0        1      1      14      0        2026      4      24024     35       39
          4          78      72     8634      26       3        0      2      70      0        3267      7       5367      8       15
          5          79      66    20874      89       3        1      2       5      0        1458      3      19416     28       31
          6          80     N/A     9862       2       0        0      0      98      0        4828     10       5034      7       17
          7          78      70     2819      34      14       13     26      13      0         947      2       1872      3        5
          8          72      62    11821       4       4        1      2      89      0        5818     12       6003      9       21
          9          69      79    13187       0      14        0      6      79      0        7096     15       6091      9       24
         10          68      69     5051      39       1        0      1      59      0        1564      3       3487      5        8
         11          70      85     5336      26      20        3     10      40      0        2340      5       2996      4        9
         12          72      74     2373       6       0        0      0      94      0        1117      2       1256      2        4
         13          74     N/A     8965       3      69        0     25       2      0        6328     13       2637      4       17
         14          77      72     4577       4      18        0      8      70      0        2437      5       2140      3        8
         15          80      86     5563       2       2        0      1      95      0        2761      6       2802      4       10
         16          75      87     6269      41       0        0      0      59      0        1861      4       4408      6       10
         17          76      74     6157      54       5        3      6      32      0        1458      3       4699      7       10
         18          78      84     6753      28       5        2     10      56      0        2294      5       4459      7       12
         19          79     N/A     7792       1       0        0      0      99      0        3840      8       3952      6       14
         20          69      80     7143      33       0        1      0      66      0        2400      5       4743      7       12
         21          72     N/A     3463      18       0       18      0      63      0        1730      4       1733      3        7
         22          78      89     6149      22       0       20     10      48      0        2689      6       3460      5       11
         23          79      36    18440      15      16        1     23      45      0        7277     15      11163     16       31
End of report for this VTSS. Records read:   551, Type 15:    24
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(VTSS-INTERNAL-PERFORMANCE) ;
```

The report is generated per-VTSS per-hour and shows one day of data per page. The report title section shows the VTSS being reported on and the user-selected date range.

The report provides the following VTSS internal activity information:

- Disk Buffer Utilization (i.e., the percentage of occupied/used disk within the VTSS)
- Scratch Compression Rate Percentage –
- Internal Throughput – read, write, and total percentages

VTSS Mounts Report

```
Tue, 09 Sep 2003       S t o r a g e T e k   E x P R  5 . 0 . 0      XYZ Company                                                    Page  531
23:37:27    2003.252                                                                                                  Job:PRODREPS    XPRREP030
-------------------------------------------------------------------------------------------------------------------------------------------
                                            VTSS Mounts Report For System ALL                Date range: 2002001 to 2002006
                                            VTSSid: VTSS1                                                              (254 32)

-------------------------------------------------------------------------------------------------------------------------------------------
---Period---            <----------------------Stats for this VTSS------------------------->    <---Bytes transferred-->
 Date  Hour Device type     VTD-mounts    Cache  RTD    Total-time   Average-time  Maximum-time
            or workload    Scrtch Nonscr  hit %  mounts Scrtch Nonscr Scrtch Nonscr Scrtch Nonscr       Read Written   Total

2002001 00  All Devs            9      4     50      8      0     71      0     17      0     40        80M    588M    668M
        01  All Devs            0      4    100      4      0    1.6      0    0.4      0    1.6       540M     33M    572M
        02  All Devs            2      1    100      5      0      0      0      0      0      0        12K   1559M   1559M
        03  All Devs            1      0      0      2      0      0      0      0      0      0         4K     24M     24M
        04  All Devs            0      0      0      2      0      0      0      0      0      0         0K      0K      0K
        05  All Devs            7     19    100      5      0     47      0    2.5    0.1     47      8119M   3420M     12G
        06  All Devs            0      0      0      0      0      0      0      0      0      0         0K      0K      0K
        07  All Devs            0      0      0      3      0      0      0      0      0      0         0K      0K      0K
        08  All Devs            0      0      0      0      0      0      0      0      0      0         0K      0K      0K
        09  All Devs            0      0      0      2      0      0      0      0      0      0         0K      0K      0K
        10  All Devs            0      0      0      2      0      0      0      0      0      0         0K      0K      0K
        11  All Devs            5      3    100      7    1.0     27    0.2    9.0    1.4     27        66M    298M    364M
        12  All Devs            1      3     67      6      0     50      0     16      0     25       126M    104M    230M
        13  All Devs            1      3    100      2      0     18      0    6.2      0     18        68M     23M     91M
        14  All Devs            2      2    100      4      0     64      0     32      0     36       399M    399M    797M
        15  All Devs            0     13    100      0      0      0      0      0      0      0      1406M      0K   1406M
        16  All Devs            2      2    100      4      0      0      0      0      0      0      5238M    878M   6116M
        17  All Devs            4      2    100      6      0      0      0      0      0      0        16M     34M     50M
        18  All Devs            1      0      0      2      0      0      0      0      0      0         4K   3776K   3780K
        19  All Devs           12      2    100      9      0      0      0      0    0.1      0        27M   1708M   1736M
        20  All Devs            6      6     83      7      0    116      0     19      0     61      1525M   2165M   3690M
        21  All Devs           10     13     92     10      0     44      0    3.4      0     44      4503M   1803M   6305M
        22  All Devs            1      1    100      1      0      0      0      0      0      0      9539K   9535K     19M
        23  All Devs            5      8     75      8      0    129      0     16    0.1    115      1068M   1974M   3042M
Daily total All Devs           69     86     91     99    1.0    570      0    6.6    1.4    115        23G     15G     38G

Tue, 09 Sep 2003       S t o r a g e T e k   E x P R  5 . 0 . 0      XYZ Company                                                    Page  532
23:37:27    2003.252                                                                                                  Job:PRODREPS    XPRREP030
-------------------------------------------------------------------------------------------------------------------------------------------
                                            VTSS Mounts Report For System ALL                Date range: 2002001 to 2002006
                                            VTSSid: VTSS1                                                              (254 32)

-------------------------------------------------------------------------------------------------------------------------------------------
---Period---            <---------RTD mounts breakdown by reason-------->
 Date  Hour Device type    Migrat Recall Reclam  Drain  Audit Consol Export

2002001 00  All Devs            5      2      1      0      0      0      0
        01  All Devs            2      0      2      0      0      0      0
        02  All Devs            3      0      2      0      0      0      0
        03  All Devs            2      0      0      0      0      0      0
        04  All Devs            0      0      2      0      0      0      0
        05  All Devs            2      0      3      0      0      0      0
        06  All Devs            0      0      0      0      0      0      0
        07  All Devs            0      0      3      0      0      0      0
        08  All Devs            0      0      0      0      0      0      0
        09  All Devs            0      0      2      0      0      0      0
        10  All Devs            0      0      2      0      0      0      0
        11  All Devs            6      0      1      0      0      0      0
        12  All Devs            2      1      3      0      0      0      0
        13  All Devs            2      0      0      0      0      0      0
        14  All Devs            4      0      0      0      0      0      0
        15  All Devs            0      0      0      0      0      0      0
        16  All Devs            4      0      0      0      0      0      0
        17  All Devs            6      0      0      0      0      0      0
        18  All Devs            2      0      0      0      0      0      0
        19  All Devs            9      0      0      0      0      0      0
        20  All Devs            6      1      0      0      0      0      0
        21  All Devs            9      1      0      0      0      0      0
        22  All Devs            1      0      0      0      0      0      0
        23  All Devs            7      1      0      0      0      0      0
Daily total All Devs           72      6     21      0      0      0      0
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(VTSS-MOUNTS) ;
```

The report is generated per-VTSS and shows one day of data per page. The report title section shows the VTSS being reported on and the user-selected date range.

The report provides mount event statistics within the virtual tape environment, including the number of mounts, cache-hit ratio, the average and total mount times (in seconds), the highest recorded time to mount a volume over the interval, and number of RTD mounts for migrate and recall. Each event field is further categorized by scratch and non-scratch volumes.

Note: Cache-hit ratio is calculated based on the number of successful read requests from the buffer. This statistic is only available for sites using NCS 4.0 or higher. For pre-NCS 4.0 sites, cache-hit ratio is displayed as zero.

Data transferred to and from the host is scaled according to the quantity (i.e., Kb, Mb, Gb, or Tb). Mounts that exceeded the user-defined thresholds are listed individually in the SMF Exception Events report generated by SMF-UPDATE.

The report prints hourly, daily, and period totals per VTSS. It can also produce additional hourly summary lines and daily/period totals for user-defined workload groups when the run-time control statement REPORT-OPTIONS is used.

For RTD mounts, hourly statistics are provided that break down mounts by reason.

Note for MSP Users: This report will not produce any data transferred values on MSP systems. This is because MSP does not generate the required data in the SMF 21 record.

VTSS Residency Report

```
Thu, 18 Jul 2002       S t o r a g e T e k   E x P R  5 . 0          Customer Company Name                                  Page   31
17:55:53    2002.199                                                                                                Job:T610151R    XPRREP038
-------------------------------------------------------------------------------------------------------------------------------------
                                                VTSS Residency Report For System ALL          Date range:2002150 to 2002150
                                                VTSSID: VTSS1
-------------------------------------------------------------------------------------------------------------------------------------
                 Total no    No VTVs    % of VTVs   Total no    No of     Avg idle time   Avg res time    No of migr    % of migr
                  of VTVs   cycled in     cycled     of VTVs   migr VTVs  migrated VTVs  migrated VTVs  VTVs missing  VTVs missing
---Period---      scratched   buffer     in buffer   deleted    deleted    (DD.HH:MM)     (DD.HH:MM)     res target    res target
Date    Hour
2002150   0           93         0          0         733        731       0.14:51        61.15:03          8             1
          1            0         0          0         893        891       0.02:34        81.04:03         11             1
          2           84         0          0         617        604       0.09:07       101.03:28         59            10
          3            0         0          0         695        691       0.02:24       101.14:47         23             3
          4            0         0          0         739        734       0.02:59       112.04:22         36             5
          5           93         0          0         731        730       0.18:47        63.01:07         24             3
          6            0         0          0         578        576       0.02:47        60.02:03          6             1
          7          168         0          0         430        414       0.11:30       179.09:28         56            14
          8            0         0          0        1036       1029       0.02:16        88.09:51         44             4
          9            0         0          0         762        759       0.02:39        73.22:30         35             5
         10           93         0          0         765        764       0.13:38        56.06:54          9             1
         11            0         0          0         715        710       0.02:52        95.10:58          9             1
         12            0         0          0         479        475       0.10:27       141.15:59         39             8
         13           84         0          0         924        912       0.02:31        94.23:50         46             5
         14            0         0          0         669        668       0.03:11        39.07:20         32             5
         15           93         0          0         727        725       0.14:21        54.08:21          9             1
         16            0         0          0         563        562       0.00:56        77.07:45          2             0
         17            0         0          0         143        142       0.00:08        71.17:21          0             0
         18            0         0          0         136        136       0.00:01        65.15:34          0             0
         19            0         0          0          52         52       0.00:03       165.05:36          2             4
         20            0         0          0         165        164       0.00:11        67.16:25          0             0
         21           93         0          0          71         71       1.16:46         3.00:54          4             6
         22            0         0          0         230        230       1.08:27        26.10:30          3             1
         23            0         0          0         112        112       0.00:09       136.16:44          0             0
Daily Summary        801         0          0       12965      12882       0.07:00        82.20:21        457             4
Target Residency    0.00:00, from config VTSS-THRESHOLDS VTSS-RESIDENCY(    0)

Thu, 18 Jul 2002       S t o r a g e T e k   E x P R  5 . 0          Customer Company Name                                  Page   32
17:55:53    2002.199                                                                                                Job:T610151R    XPRREP038
-------------------------------------------------------------------------------------------------------------------------------------
                                                VTSS Residency Report For System ALL          Date range:2002150 to 2002150
                                                VTSSID: VTSS1
-------------------------------------------------------------------------------------------------------------------------------------
                 Management class: --None--  Residency target:    0.00:00  Management class: MIGRIMD   Residency target:    1.00:00
                 ========================================================  ========================================================
                   No of     Avg idle    Avg res   No of migr   % of migr     No of     Avg idle    Avg res   No of migr   % of migr
                 migr VTVs  migr VTVs  migr VTVs  VTVs missed  VTVs missed  migr VTVs  migr VTVs  migr VTVs  VTVs missed  VTVs missed
---Period---      deleted   (DD.HH:MM) (DD.HH:MM)   res tgt      res tgt     deleted   (DD.HH:MM) (DD.HH:MM)   res tgt      res tgt
Date    Hour
2002150   0           0     0.00:00    0.00:00         0            0          6     0.04:37   183.01:59          1           17
          1           0     0.00:00    0.00:00         0            0         12     0.10:04   319.09:30          2           17
          2          24     0.00:07  616.13:26         0            0         25     0.05:07   152.20:06         13           52
          3           0     0.00:00    0.00:00         0            0         18     0.04:02   270.11:10          7           39
          4          23     0.00:07  624.06:11         0            0          8     0.00:38   117.07:55          4           50
          5           1     0.00:08  439.12:07         0            0          5     0.01:32   170.20:29          2           40
          6           0     0.00:00    0.00:00         0            0         10     0.11:35   343.11:27          1           10
          7          24     0.00:07  616.13:26         0            0         12     0.05:45   176.18:10          7           58
          8           0     0.00:00    0.00:00         0            0         39     0.02:01   133.05:32         20           51
          9           0     0.00:00    0.00:00         0            0         11     0.00:21    55.09:19          8           73
         10           0     0.00:00    0.00:00         0            0          5     0.00:07   110.08:43          3           60
         11           0     0.00:00    0.00:00         0            0         20     0.09:16   387.08:26          1            5
         12          24     0.00:07  616.13:26         0            0          6     0.02:00   197.23:48          3           50
         13           0     0.00:00    0.00:00         0            0         33     0.03:11   166.15:07         17           52
         14           0     0.00:00    0.00:00         0            0          6     0.00:17    17.17:21          2           33
         15           0     0.00:00    0.00:00         0            0          5     0.00:07   110.08:43          3           60
         16           0     0.00:00    0.00:00         0            0          5     0.05:43   206.20:28          1           20
         17           0     0.00:00    0.00:00         0            0          0     0.00:00     0.00:00          0            0
         18           0     0.00:00    0.00:00         0            0          0     0.00:00     0.00:00          0            0
         19           0     0.00:00    0.00:00         0            0          3     0.00:06   162.12:17          2           67
         20           0     0.00:00    0.00:00         0            0          0     0.00:00     0.00:00          0            0
         21           0     0.00:00    0.00:00         0            0          1     0.00:12     0.00:12          1          100
         22           0     0.00:00    0.00:00         0            0          1     0.00:03    64.06:32          0            0
         23           0     0.00:00    0.00:00         0            0          0     0.00:00     0.00:00          0            0
Daily Summary        96     0.00:07  616.13:26         0            0        231     0.04:10   190.11:53         98           42
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(VTSS-RESIDENCY) ;
```

The report shows overall VTSS residency and is generated per-VTSS with one day of data per page. The report title section shows the VTSS being reported on and the user-selected date range.

The report provides the following types of VTSS internal activity information:

- The number of VTVs scratched
- The number and percentage of VTVs cycled in the buffer
- The number of VTVs and migrated VTVs deleted
- The average idle time and residency of migrated VTVs
- The number and percentage of VTVs that missed the residency target

Cycled in Buffer Notes:

1. Draining MVCs may cause the cycled in buffer statistics to show a higher rate than is really the case because DRAINing MVCs causes the VTCS to treat any VTV recalled from the drained MVC as if it had not been migrated. For example, if a VTV is migrated to an MVC, recalled when the MVC is drained, and then deleted before being migrated again, the VTV will appear as if it had been cycled in buffer.
2. Cycled in buffer statistics are provided for sites using NCS 4.0 or higher. NCS 4.0 requires PTF L1H109P and NCS 4.1 requires PTF L1H109Z to be applied. For pre-NCS 4.0 sites, cycled in buffer statistics will appear as zero.

VTV Residency Time/Idle in Buffer Time Notes:

1. Residency Time is the time from a VTV's creation to when VTSS determines whether it should be migrated (based on management class residency time).
2. Idle in Buffer Time is the time a VTV remains in the buffer from last access to deletion.
3. NCS 2.1 or higher is required for Residency Time and Idle in Buffer time statistics to be recorded.
4. ExPR 5.0 (and ExPR 4.1 via PTF) have been improved to eliminate the residency time distortion caused by older VTVs being recalled to the buffer and then deleted. This has previously caused residency time to show as hundreds or thousands of hours. To ensure that these distortions are eliminated you must have the following HSC/VTCS PTFs applied:

HSC 4.0	FMID SOS4000	PTF L1H11DQ
VTCS 4.0	FMID SWS4000	PTF L1H11DR
HSC 4.1	FMID SOS4100	PTF L1H11DS
VTCS 4.1	FMID SWS4100	PTF L1H11DT
HSC 5.0	FMID SOS5000	PTF L1H11DV
VTCS 5.0	FMID SWS5000	PTF L1H11DW
HSC 5.1	FMID SOS5100	PTF L1H11DY
VTCS 5.1	FMID SWS5100	PTF L1H11DZ

Management Classes Notes:

1. If you have defined VTCS management classes to ExPR via the PC Host Configurator application and you specify REPORT-OPTIONS(MANAGEMENT-CLASSES), this report will produce additional output. For each defined management class, there will be an additional page per VTSS/class/day that provides residency information for VTVs within those management classes.
2. Management classes are supported for sites using NCS 4.0 or higher.

VTSS SMF Audit Events Report

```
THU, 13 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                PAGE   30
15:35:46    1999.225                                                                                        JOB:B30T005X    XPRREP033
                  SMF REPORT - VTSS-SMF-AUDIT EVENTS
                  ----------------------------------

  DATE     TIME   SYS  DRIVE TYPE ACS LSM  EVENT            OBSERVATION   THRESHOLD   VARIATION
-------- -------- ---- ----- ---- --- ---  ---------------  -----------   ---------   ---------
1999.181 12:21:54 CPUA  44C3 VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100036
1999.181 12:21:59 CPUA  44CA VTD  PRODVTSS VTSS SCRATCH MOUNT         7         200     VTV:100037
1999.181 12:22:10 CPUA  44CF VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100032
1999.181 12:22:13 CPUA  44CA VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100037
1999.181 12:22:15 CPUA  44BF VTD  PRODVTSS VTSS SCRATCH MOUNT         7         200     VTV:100038
1999.181 12:22:19 CPUA  44CB VTD  PRODVTSS VTSS SCRATCH MOUNT         8         200     VTV:100039
1999.181 12:22:34 CPUA  44CB VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100039
1999.181 12:22:42 CPUA  44BF VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100038
1999.181 12:22:45 CPUA  44C3 VTD  PRODVTSS VTSS SCRATCH MOUNT         5         200     VTV:100040
1999.181 12:23:12 CPUA  44C3 VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100040
1999.181 12:23:18 CPUA  44AE VTD  PRODVTSS VTSS SCRATCH MOUNT         8         200     VTV:100041
1999.181 12:23:38 CPUA  44AE VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100041
1999.181 12:23:43 CPUA  44CC VTD  PRODVTSS VTSS SCRATCH MOUNT         9         200     VTV:100042
1999.181 12:24:04 CPUA  44CC VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100042
1999.181 12:25:11 CPUA  44C5 VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100014
1999.181 12:26:03 CPUA  44D8 VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100012
1999.181 12:26:44 CPUA  44CD VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100029
1999.181 12:28:07 CPUA  44AB VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100015
1999.181 12:28:30 CPUA  44C7 VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100016
1999.181 12:28:45 CPUA  44C6 VTD  PRODVTSS VTSS SCRATCH DIS-MOUNT                        VTV:100013
1999.181 12:59:59 CPUA       RTDS PRODVTSS HI VTSS CHNL-INT-BUSY     51          20     +31%
1999.181 13:18:08 CPUA  0002 RTD  PRODVTSS MVC WAS DIS-MOUNTED
1999.181 13:18:24 CPUA  0002 RTD  PRODVTSS MVC WAS MOUNTED                              MVC:S00000
1999.181 13:18:41 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100001  FROM:VTSS    TO:S00000
1999.181 13:19:37 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100002  FROM:VTSS    TO:S00000
1999.181 13:21:03 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100003  FROM:VTSS    TO:S00000
1999.181 13:21:32 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100004  FROM:VTSS    TO:S00000
1999.181 13:22:17 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100005  FROM:VTSS    TO:S00000
1999.181 13:23:18 CPUA  0002 RTD  PRODVTSS MVC WAS DIS-MOUNTED
1999.181 13:23:35 CPUA  0002 RTD  PRODVTSS MVC WAS MOUNTED                              MVC:S00001
1999.181 13:24:34 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100006  FROM:VTSS    TO:S00001
1999.181 13:24:43 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100007  FROM:VTSS    TO:S00001
1999.181 13:24:43 CPUA  0002 RTD  PRODVTSS EXCESSIVE VTV MIGRATES     7           6     VTV:100007  FROM:VTSS    TO:S00001
1999.181 13:24:52 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100008  FROM:VTSS    TO:S00001
1999.181 13:24:52 CPUA  0002 RTD  PRODVTSS EXCESSIVE VTV MIGRATES     8           6     VTV:100008  FROM:VTSS    TO:S00001
1999.181 13:25:01 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100009  FROM:VTSS    TO:S00001
1999.181 13:25:01 CPUA  0002 RTD  PRODVTSS EXCESSIVE VTV MIGRATES     9           6     VTV:100009  FROM:VTSS    TO:S00001
1999.181 13:26:07 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100010  FROM:VTSS    TO:S00001
1999.181 13:26:07 CPUA  0002 RTD  PRODVTSS EXCESSIVE VTV MIGRATES    10           6     VTV:100010  FROM:VTSS    TO:S00001
1999.181 13:29:48 CPUA  0002 RTD  PRODVTSS VTV WAS MIGRATED                           VTV:100011  FROM:VTSS    TO:S00001
1999.181 13:29:48 CPUA  0002 RTD  PRODVTSS EXCESSIVE VTV MIGRATES    11           6     VTV:100011  FROM:VTSS    TO:S00001
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member SMFUPDAT):

```
PERFORM VTSS-SMF-AUDIT ;
```

The output for this report is similar to the Exception Events report but it only includes VSM virtual tape activity and it prints all events (not just exception events), including the following non-exceptions:

- MVC WAS MOUNTED: the identified MVC cartridge has been mounted on an RTD for a reclaim, recall, or migrate function.
- MVC WAS DISMOUNTED: an MVC has been dismounted from an RTD.
- VTV WAS RECALLED: the identified VTV was recalled by the VSM/VTSS.

- VTV WAS RECLAIMED: the identified VTV was reclaimed by the VSM/VTSS.
- VTV WAS MIGRATED: the identified VTV was migrated by the VSM/VTSS.
- VTSS SCRATCH DISMOUNT: the identified scratch VTV was dismounted from a VTD.
- VTSS NON-SCR DISMOUNT: the identified non-scratch VTV was dismounted from a VTD.

This report allows you to see a complete audit trail of virtual tape activity and to potentially track the progress of individual virtual volumes as they are created, migrated, recalled, reclaimed, read, and scratched.

Note: The VTSS-SMF-AUDIT function does not read or update the ExPR database, but collects its information directly from the SMF/RMF input files.

VTSS Thresholds Exceptions Report

```
THU, 13 AUG 1999       S T O R A G E T E K   E X P R  5 . 0          XYZ COMPANY                                                    PAGE   14
16:29:16    1999.225                                                                                                    JOB:B30T005R    XPRREP036
-------------------------------------------------------------------------------------------------------------------------------------------
                                          VTSS-THRESHOLD EXCEPTIONS REPORT FOR SYSTEM IPO1    DATE RANGE: 1998001 TO 1998365
                                              VTSSID: PRODVTSS       PRODUCTION VTSS                                    (254 32)
-------------------------------------------------------------------------------------------------------------------------------------------
    VTSS-        VTD MNTS VTD MNTS MNT TIME MNT TIME DISKBUFF CHNL-INT  VTV-     VTV-     VTV-     MVC-
  THRESHOLD      SCRATCH  NON-SCR  SCRATCH  NON-SCR  UTILIZTN  -BUSY   RECALLS MIGRATES RECLAIMS  MOUNTS  MAX-RTDS MAX-VTDS
   VALUES ===>   (  10)   (  10)   ( 200)   ( 200)   (  70)   (  20)   (   5)   (   6)   (   7)   (  10)   (   2)   (  16)
  DATE  HOUR
1998180   9    =>  12<=       0       42        0       30        9        0        4        0        0        0        6
         11    =>  24<=       0       65        0       32        9        0    =>  16<=      0        4        0       10
         12    =>  16<=       0       23        0       35        0        0        0        0        0        0        6
         17    =>  28<=       0       16        0       39        0        0        0        0        0        0        7
         18    =>  13<=       0       11        0       43        0        0        0        0        0        0        3
1998181  11          0        0        0        0       50    =>  87<=      0    => 104<=      0    =>  34<=      0        0
         12          0        0        0        0       44        6        0    =>  12<=      0        6        0        0
         14          7    =>  12<=      12      125       25        2        1        0        0        1        0        6
         15          0    =>  21<=       0        8       28        2        0        0        0        0        0        4
         16          0    =>  21<=       0        7       28        0        0        0        0        0        0        4
         17          0    =>  20<=       0        8       28        0        0        0        0        0        0        4
         18          0    =>  20<=       0        7       28        0        0        0        0        0        0        4
         19          0    =>  20<=       0       11       28        0        0        0        0        0        0        4
         20          0    =>  21<=       0       10       28        0        0        0        0        0        0        4
         21          0    =>  20<=       0        8       28        0        0        0        0        0        0        3
         22          0    =>  20<=       0        7       28        0        0        0        0        0        0        3
         23          0    =>  21<=       0        7       28        0        0        0        0        0        0        3
1998182   0          0    =>  20<=       0       11       28        0        0        0        0        0        0        3
          1          0    =>  20<=       0        8       28        0        0        0        0        0        0        3
          2          0    =>  13<=       0        6       28        0        0        0        0        0        0        2
          3          0    =>  13<=       0        5       28        0        0        0        0        0        0        2
          4          0    =>  13<=       0        5       28        0        0        0        0        0        0        2
         16    =>  11<=       4      155        8       29        0        0        0        0        0        0        8
         17    =>  11<= =>  19<=      53       28       31        0        0        0        0        0        0        7
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(VTSS-THRESHOLDS) ;
```

The report, which is run against the ExPR database, compares the VTSS thresholds you have specified (using the PC-based ExPR Host Configurator application) against the database records over a selected period of time. The report highlights those fields that exceed the threshold, providing you with information to use as a starting point when performing detailed analysis on any problem areas.

Reports are generated per-VTSS and show only hours where at least one field has exceeded its threshold. If a threshold is exceeded, all the other fields for that hour are displayed even if they are within threshold. This enables a basic analysis of related data to be completed. If data is not present, the field is filled with blanks. Where exceptions are present, they are highlighted with => and <= characters on either side of the field. The exception threshold is displayed in parentheses below each exception field heading.

The column heading values in MAX-VTDs and MAX-RTDs are dependent on the VSM family model, either VSM 1-3 or VSM 4, depending on the VSM being reported on.

Note: Individual exception descriptions were listed previously with the SMF Exception Events report.

VTSS Utilization Report

```
Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    1
00:03:20    2002.240                                                                                                  Job:V790611R    XPRREP035
-------------------------------------------------------------------------------------------------------------------------------------------
                                              VTSS Utilization Report For System IBM            Date range: 2002042 to 2002042
                                              VTSSid: VTSS1                                                              (254 32)
-------------------------------------------------------------------------------------------------------------------------------------------
                         Drive Drive           ------------- Percentage of time drives were in use ---------------  VTSS-THRESHOLD
          Device type   util% util%       No  (----------------------- No of in use VTDs ------------------------)   MAX-VTDS(00)
Date  Hour or workload  scrtch non-scr    devs ( 0   1   5   9  13  17  21  25  29  33  37  41  45  49  53  57  61)
                                               4   8  12  16  20  24  28  32  36  40  44  48  52  56  60  64)
2002042 00                0     0         64  100   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        01                0     0         64   79  20   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        02                0     1         64   35  65   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        03                0     3         64    0  99   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        04                0     1         64   30  70   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        05                0     2         64   32  64   4   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        06                0     1         64    0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        07                0     0         64   11  89   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        08                0     2         64    6  94   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        09                0     1         64    5  95   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        10                0     1         64    3  97   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        11                0     2         64   24  76   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        12                0     0         64   79  21   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        13                0     0         64   78  22   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        14                0     1         64   23  77   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        15                0     1         64    0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        16                0     1         64   28  72   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        17                0     2         64    0  96   4   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        18                1     2         64    0 100   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        19                0     1         64   33  67   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        20                0     1         64   31  67   2   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        21                0     0         64   75  25   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        22                0     0         64   78  22   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
        23                0     2         64   22  74   4   0   0   0   0   0   0   0   0   0   0   0   0   0   0

Wed, 28 Aug 2002       S t o r a g e T e k   E x P R  5 . 0          XYZ Company                                                    Page    2
00:03:20    2002.240                                                                                                  Job:V790611R    XPRREP035
-------------------------------------------------------------------------------------------------------------------------------------------
                                              VTSS Utilization Report For System IBM            Date range: 2002042 to 2002042
                                              VTSSid: VTSS1                                                              (254 32)
-------------------------------------------------------------------------------------------------------------------------------------------
                          ------------------------------ Percentage of time drives were in use ------------------------------
 Date  Hour  No of        0         10        20        30        40        50        60        70        80        90        100
             devices

2002042 01    000         ------------------------------------------------------------------------------>
              001         -->
              002         --->
              003         ------->
              004         -->
              005         >
```

This report is produced by the following run-time control statement (*usrprfx*.CNTL member REPORTS):

```
REPORT NAME(VTSS-UTILIZATION) ;
```

The report is generated per-VTSS. The report title provides the name of VTSS being reported on and the user-selected date range.

There are two reports:

- A Drive Utilization report showing one day of data per page.
- A Drive Concurrency report providing details of drive concurrency on an hourly basis.

Drive Utilization report

This report provides the following information for each hour within the associated day:

- Drive Util%: The percentage utilization of the VTSS Virtual Tape Drives on the basis of scratch and non-scratch volumes mounted on the Virtual Tape Drives.
- No Devs: The number of virtual tape drives supported by the associated VTSS subsystem.
- Drives in Use: Presents, as a percentage of the hour, the number of drives that were concurrently in use. This information is gathered and presented using a banded approach (i.e., 01-04, 05-08,09-12, etc.).
- VTSS Threshold: If the MAX-VTDS threshold is specified, this report will print the message **EXCEEDED** when the threshold has been exceeded.

Drive Concurrency report

This report provides the following information on an hourly basis:

- No of Drives: For each interval during the hour where a number of drives were in use concurrently, the number of drives.
- Percentage: Number of drives expressed as a percentage of the hour by means of a horizontal bar chart.

The report is printed twice, the first sorted chronologically by hour and the second sorted on the basis of highest to lowest percentages.

Note: The Drive Concurrency report can be suppressed by specifying REPORT-OPTIONS(NO-DETAIL) in the UPRIN control statements.

Index

L

M

N

O

P

R

S

T

U

V

NEED MORE INFORMATION?

www.storagetek.com

ABOUT STORAGETEK®

StorageTek® (NYSE:STK), a $2 billion worldwide company with headquarters in Louisville, Colo., delivers a broad range of storage solutions for digitized data. StorageTek solutions are easy to manage and allow universal access to data across servers, media types and storage networks. StorageTek is the innovator and global leader in virtual storage solutions for tape automation, disk storage systems and storage networking. Because of StorageTek, customers can manage and leverage their digital assets as their businesses grow, and can maximize IT productivity to ensure enterprise-class business continuity.

WORLD HEADQUARTERS
Storage Technology Corporation
One StorageTek Drive
Louisville, Colorado 80028 USA
Phone: **1.800.525.0369**

StorageTek®