

# StorageTek Expert Performance Reporter

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ExPR Mainframe User's Guide

Version 6.1

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StorageTek Expert Performance Reporter, ExPR Mainframe User's Guide

Part Number 312632101

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## Revision History

EC Number	Date	Revision	Description
132453	May, 2006	A	This document applies to ExPR Release 6.1.
	June 2010	AB	Rebranding.
	August 2011	AC	Updated support URLs and added a notification that the ExPR PC Component is now in sustain support only and will not have further engineering changes. The ExPR PC Component was effectively replaced by the ExPR Web-based GUI in ExPR Release 6.1.



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# Preface

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This book describes Oracle's StorageTek Expert Performance Reporter's Mainframe component, specifically the procedures that are performed in the MVS environment to collect data, generate reports and perform various other ExPR processes. 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.

## Related Documentation

The following list contains the names and order numbers of publications that provide additional information about ExPR.

Function	Title	Part Number
	Introduction to ExPR	312631901
Administrator	ExPR Installation, Configuration and Administration Guide	312632001
User	ExPR Client User's Guide	312632201
Administrator	ExPR Messages Guide	312632301
Administrator	ExPR MONTAPE/MONREPT Guide	312632401

The ExPR documentation is available online at:

<http://docs.sun.com/app/docs/prod/stortek.expr>

## Documentation, Support and Training

Function	URL
Web Site	<a href="http://www.oracle.com/index.html">http://www.oracle.com/index.html</a>
Documentation	<a href="http://www.oracle.com/technetwork/indexes/documentation">http://www.oracle.com/technetwork/indexes/documentation</a>
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Support	<a href="http://www.oracle.com/us/sun/index.htm">http://www.oracle.com/us/sun/index.htm</a>
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# Chapter 1: Introduction

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## 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.

**Note:** Unless specifically stated, references to MVS apply equally to MSP.

**Note:** The ExPR PC Component is now in sustain support only and will not have further engineering changes. The ExPR PC Component was effectively replaced by the ExPR Web-based GUI in ExPR Release 6.1.

## Skills Required

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

**Note:** Unless specifically stated, references to MVS apply equally to MSP.

**Note:** The ExPR PC Component is now in sustain support only and will not have further engineering changes. The ExPR PC Component was effectively replaced by the ExPR Web-based GUI in ExPR Release 6.1.



## Chapter 2: Started Task Operator Commands

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### 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 EXPR	<p>The MVS START console command starts the ExPR started task.</p> <p><b>Note:</b> 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 <i>sysn</i>, and STCPARMP for <i>parmmem</i>. Then, when starting the started task on a secondary system, specify:</p> <p>S EXPR,SYSID=<i>sysn</i>,MEMBER=STCPARMS</p>
P EXPR	<p>The MVS STOP console command terminates the ExPR started task in an orderly controlled manner. Internal tasks are allowed to complete outstanding work.</p>

**Note:**

- MVS secondary hosts running HSC/VTCS should use proc EXPR and MEMBER=STCPARMS.
- CSC MVS secondary hosts should use proc EXPRCSC and MEMBER=STCPARMC
- SMC MVS secondary hosts should use proc EXPRSMC and MEMBER=STCPARMM

## User Commands

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

Command	Description
CMF STATUS	<p>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 normally issued every quarter hour.</p>
DELETE LSM( <i>nnn-<u>nnn</u></i> )   VTSS( <i>nnn</i> )   DEVICE-GROUP( <i>nnn</i> )	<p>The DELETE command allows you to permanently remove the definition of LSMs, VTSSs and DEVICE-GROUPs that have ever been defined in the ExPR configuration. Once the historical data for any deleted entity has been removed from the ExPR database by the auto-delete process, there is no need for ExPR to remember the configuration details about these entities.</p> <p>Only previously deleted definitions can be permanently removed (i.e., those with a description of <b>** Deleted **</b> when displayed within a Web application).</p> <p>For LSM, the value is seven characters in length and consists of a three-character ACS number, a hyphen, and a three-character LSM number.</p> <p>For VTSS, the value can be up to eight characters in length and is the name of the VTSS as defined to VTCS.</p> <p>For DEVICE-GROUP, the value can be up to eight characters in length and is the name of the device group when it was first defined.</p> <p>When permanently deleting old hardware definitions, you should be certain that you no longer wish to access historical data in the ExPR database for those hardware subsystems. ExPR remembers deleted subsystems to enable you to continue historical reporting on them. Once you have permanently deleted these entries, historical reporting will no longer be possible. Once deleted, the internal dummy ACS/LSM number previously assigned to an old VTSS or device group may be reused by ExPR for a new VTSS or device group.</p>
HOSTS	<p>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.</p>

Command	Description
ITCU REFRESH HISTORY or TGUI REFRESH HISTORY	<p>The REFRESH command permits an “on demand” refresh of the TAPECAT extraction processes for the Integrated Tape Catalog Update (ITCU) and TAPECAT GUI functions. When REFRESH is invoked, the TMS catalog and the HMS CDS are read and volume/dataset information is extracted.</p> <p>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. The optional HISTORY keyword causes ITCU to create a new HISTORY dataset upon completion of the extraction process. This would be in addition to any scheduled extractions via the ITCU Host Configurator settings.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• If the started task START TASKS statement did not specify TAPECAT-GUI or if you have not activated ITCU, then this request is ignored.</li> <li>• The ITCU extraction functions will not run if an SMF SUSPEND command is in effect and the ITCU run requires update access to the ExPR database. ITCU writes records to the database if option NODBUP was not specified. ITCU does not update the database for the index building only function. Any ITCU request that requires update access to the database will be deferred until an SMF RESUME command is entered. This applies to scheduled and manually requested ITCU extractions.</li> </ul>
ITCU RESTART or TGUI RESTART	<p>The RESTART command allows the Integrated Tape Catalog Update (ITCU) and TAPECAT GUI functions 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; you should be aware that this file may be out of step with the CDS and TMS catalog.</p> <p><b>Note:</b> The ITCU extraction functions will not run if an SMF SUSPEND command is in effect and the ITCU run requires update access to the ExPR database. ITCU writes records to the database if option NODBUP was not specified. ITCU does not update the database for the index building only function. Any ITCU request that requires update access to the database will be deferred until an SMF RESUME command is entered. This applies to scheduled and manually requested ITCU extractions.</p>

Command	Description
ITCU START or TGUI START	<p>The START command allows the Integrated Tape Catalog Update (ITCU) and TAPECAT GUI functions to be started during the lifetime of the started task. It will cause the tape catalog/CDS extract and index build processes to commence. This has the same effect as specifying START TASKS(TAPECAT-GUI) in the started task control statements or activating ITCU with the ExPR Host Configurator application. It is not necessary to shutdown and restart the started task to add the TAPECAT GUI/ITCU functions.</p> <p><b>Note:</b> The ITCU extraction functions will not run if an SMF SUSPEND command is in effect and the ITCU run requires update access to the ExPR database. ITCU writes records to the database if option NODBUP was not specified. ITCU does not update the database for the index building only function. Any ITCU request that requires update access to the database will be deferred until an SMF RESUME command is entered. This applies to scheduled and manually requested ITCU extractions.</p>
KILL	<p>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. The current hour's data will not be written to the database by the DirectSMF update function until ExPR is restarted.</p>
REORG DATABASE/PGMIDATA /EXPRORF/RESET	<p>The REORG command invokes an "on demand" reorganization and optional auto-deleting of the ExPR VSAM KSDS files. This causes the selected VSAM file to be dynamically copied to a new KSDS cluster, thereby eliminating CA/CI splits and secondary allocations. Optionally, the database backup will also be performed. The REORG request will only be accepted if the reorganization parameters have been correctly specified via the ExPR 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.</p> <p>The RESET option will clear any failure indicators that were set during a failure of a previous reorg process, either manual or automatic. If a failure occurred and these indicators were not reset once the error that caused the failure had been corrected, no further reorgs, either manual or automatic, will be allowed to proceed.</p> <p><b>Note:</b> Each REORG command only supports one file per command.</p>



Command	Description
SEN RESET	<p>The SEN RESET command is to be used with great caution. It is intended to clear the ExPR HSC SEN listener exit anchor point when ExPR's view of the SEN listener has become out-of-synch with the real status. This could occur if the ExPR started task had previously abended and its ESTAE routines had failed to cleanup the SEN environment.</p> <p>Message XPR0248W indicates that the SEN listener cannot be started. This message should have been seen before considering use of the SEN RESET command.</p> <p>If message XPR0248W has been previously issued when there is only a single ExPR started task, this indicates that the started task may be out-of-synch. Ensure that you are not inadvertently running multiple ExPR started tasks on the same MVS system.</p> <p>If you are sure that the started task is out-of-synch, you can issue the SEN RESET command. This will cause message XPR0249W to be issued to warn you of the dangers of this command. After message XPR0249W has been issued, repeat the SEN RESET command. Repeating the command will cause the SEN listener anchor point to be reset and will then permit the SEN START command to be issued.</p> <p>If you have to use the SEN RESET command, you should report the incident to StorageTek Software Support. It will be necessary to supply the output of the current and previous ExPR started tasks.</p>
SEN START	<p>When running with HSC/VTCS 6.1 or later and wishing to utilize ExPR support for Near Continuous Operation (NCO), you must activate the ExPR-supplied HSC SEN "listener" exit. This would normally occur during initialization of the ExPR primary started task and its associated SMF exits unless option NOSEN was specified on the START TASKS control statement. If the SEN exit is inactive, it can be dynamically started with the SEN START command without restarting ExPR. SEN START is only valid on the primary started task.</p>
SEN STOP	<p>The SEN STOP command can be used to deactivate the ExPR-supplied HSC SEN "listener" exit, thereby deactivating ExPR support for NCO configuration changes. You may choose to activate/reactivate the SEN "listener" using SEN START and SEN STOP. This may be necessary if HSC is shut down and restarted. SEN STOP is only valid on the primary started task.</p>

Command	Description
SMF EXIT	<p>The SMF EXIT command displays the status of the ExPR-supplied SMF IEFU83 exit used by the DirectSMF update function of the started task.</p> <p>Message XPR0746I is issued and can show the exit status as:</p> <p>INACT – the exit has never been activated</p> <p>ERROR – the exit previously initiated but subsequently has deactivated itself due to errors</p> <p>ACTIV – the exit is initialized and collecting SMF/RMF data</p> <p>The SMF EXIT command also lists various counters maintained by the exit, including SMF record types and storage utilization statistics.</p>
SMF RESUME	<p>The SMF RESUME command resumes the DirectSMF updating function after any batch updating of the ExPR database has completed. SMF RESUME is only effective on the primary started task.</p>
SMF SUSPEND	<p>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.</p> <p><b>WARNING:</b> Simultaneous updates to the database from the started task and batch processes will result in database corruption, data loss, or other unpredictable results. SMF SUSPEND is only effective on the primary started task.</p> <p><b>Note:</b> The ITCU extraction functions will not run if an SMF SUSPEND command is in effect and the ITCU run requires update access to the ExPR database. ITCU writes records to the database if option NODBUP was not specified. ITCU does not update the database for the index building only function. Any ITCU request that requires update access to the database will be deferred until an SMF RESUME command is entered. This applies to scheduled and manually requested ITCU extractions.</p>
SOCKETS	<p>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.</p>
TCP START	<p>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.</p>
TCP STOP	<p>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.</p>

## Debugging Commands

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

Command	Description
DUMP FULL	The DUMP command produces a summary of all ExPR internal control block structure addresses. The optional keyword FULL causes all control blocks to be fully dumped instead of merely being summarized by address. Output from DUMP is directed to the TRACE DD.
PRINT DBCR	The PRINT DBCR command will cause a formatted version of the ExPR primary database control record to be written to the UPRPRINT file.
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 PARM='-T/...', thereby immediately ceasing ExPR tracing, except traces controlled by the TRACE( <i>xxx,xxx</i> ) operand.
TRACEOPTS	The TRACEOPTS command allows specification of any valid tracing control options (i.e., options that could have been coded on the EXEC PARM= <i>value</i> ). 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.  <b>Note:</b> The TRACE( <i>xxx,xxx</i> ) operand is ignored by TRACEOPTS.
TRACERESET	The TRACERESET command resets all individual module/component traces that were previously specified on the EXEC PARM= <i>value</i> or via the TRACEOPTS command, except those set by TRACE( <i>xxx,xxx</i> ).
TRACEMSG	The TRACEMSG command allows a free-form textual entry to be placed in the ExPR TRACE dataset. This allows marking of a particular moment in time and facilitates easier browsing of the trace file.



# Chapter 3: ExPR Batch Database Update Processing

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## 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 and volume dismount)
- 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, 27, and 28 for VSM/VTSS activity)
- MVS JES2/JES3 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 VTCS. This parameter should not normally be used for record type filtering unless directed by StorageTek support personnel.

### **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 (including CSC/SMC client systems) 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.

Additionally, for batch updates, the inputting of duplicate SMF records from multiple SMF archives is not a problem. Internally, ExPR sorts all SMF records into date/time/system sequence. Duplicate SMF records are detected and eliminated.

**PERFORM SYSLOG-UPDATE**

Updates 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.

**Note:** It is strongly recommended that you use the new Integrated Tape Catalog Update (ITCU) feature of the ExPR started task instead of the older batch processes.

**PERFORM REORGANIZATION**

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

VSAM file reorganization normally occurs automatically at a specified time as part of the DirectSMF function within the ExPR started task. This is based on a frequency in number of days for each VSAM file that is defined and activated via the Host Configurator application. However, sites that use batch SMF updates will not benefit from automatic reorganizations. It may also be desirable for users of DirectSMF to reorganize their files “on demand” – particularly if a reorganization failure has occurred. The batch reorganization function exists for these reasons.

Batch reorganization does not need to be activated via the Host Configurator (as with the started task reorganization), but the reorganization work DSN must be defined in the Host Configurator; an error message will be issued if it is not. However, it is important to note that batch reorganization will only normally run if the reorganization failure flag has not been set, as indicated by messages XPR0798E and XPR0799E. If reorganization has previously failed and you are running batch reorganization as part of your manual recovery procedures, then you must specify PERFORM REORGANIZATION RESET. This bypasses the testing of the failure error flag and therefore should only be used after you have determined the cause of the original failure and corrected the error.

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 optional database backup and Auto-Delete processes will also be performed (if activated via the Host Configurator application).





# 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/device 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 device 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:

```
PERFORM SYSLOG-UPDATE 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.

```
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

```
PERFORM SYSLOG-UPDATE ..... 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).

```
PERFORM SYSLOG-UPDATE ..... HCFORMAT(CENT) ;
```

# 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.

## Utilizing the Integrated Tape Catalog Update (ITCU) Feature

Previously, TAPECAT database update was solely a batch function. However, it is now possible to run this within the ExPR started task using the Integrated Tape Catalog Update (ITCU) feature. ITCU offers the ability to update the ExPR database and create a TMCHIST history file without scheduling a batch job and without the conflict of shared database updating.

The ITCU feature allows scheduling of up to four tape catalog extractions per day. Alternatively, your automated operations software can issue the started task ITCU commands to schedule the extraction. These commands are described in chapter 2, *Started Task Operator Commands*.

History files created by ITCU are identical to those from the batch TAPECAT UPDATE function. They are created within the same GDG family of datasets.

The batch TAPECAT reports can be run against any TMCHIST file, although these batch reports are not available through ITCU within the started task. However, the TAPECAT GUI facility can be used to select entries and data columns from the latest extraction history file.

ITCU and TAPECAT GUI operate together and are controlled by the ITCU options of the ExPR Host Configurator application. You can still utilize the TAPECAT GUI feature alone, without ITCU, by using the TGUI keywords of the started task START TASKS control statement. Refer to the *ExPR Installation, Configuration, and Administration Guide* in appendix A, *ExPR Started Task Control Statements*.

When utilizing the ITCU feature of ExPR, you should read the following sections in this chapter, which contain background information regarding the general operation of TAPECAT. However, the batch jobs and control statements are replaced by the ITCU options of the ExPR Host Configurator application.

The various update options described below are replicated within the ITCU feature. However, the batch report options are batch only; the TAPECAT GUI offers interactive reporting facilities.

## Running the TAPECAT Functions in Batch

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, TAPECATH and TAPECATS for examples of the TAPECAT UPDATE, REPORT, HISTORY/SUMMARY, and TAPE-SIZING functions respectively.
- **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 or primary started task. The TAPECAT database summary 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 also present 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 CATONLY option, the TAPECAT UPDATE function will only process non-HSC/VTCS managed volumes (i.e., volumes in the tape catalog but not in the HSC CDS). The history file will then only contain details of these volumes. CATONLY 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 a single media type, 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, 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 the VIRTUAL keyword is specified.

## 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 800 Mb	3490E 400 Mb VTV within the VSM system 3490E 800 Mb 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

<b>THF_DEN Value</b>	<b>Volume Details Report</b>	<b>Maximum Capacity (including compression)</b>	<b>Device-Type/Media Description</b>
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	3200 Mb	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
S	TS-120GB	840 Gb	An STK Titanium/T10000 120 Gb cartridge
T	T1-500GB	3,500 Gb	An STK Titanium/T10000 500 Gb cartridge
P	9940	420Gb	An STK 9940 native cartridge
Z	9490EE	6.5 Gb	An STK 9490EE 2200 ft. EE cartridge
X	LTO	Various capacities	General LTO-type media cartridges
Y	SDLT	Various capacities	General SDLT-type media cartridges

**Note:** The application dataset name and data attributes for a VTV are 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 for each volume and each dataset in the CDS or 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*.SUPRSAMP 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 PGUI or via the TGUI REFRESH operator command. The ZARAEXT2 job and the TGUI REFRESH command could be scheduled by an automated operations package.

The above restriction applies equally when using the ExPR Integrated Tape Catalog Update (ITCU) option with an ASG-Zara installation.

## 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 (UPRIN/*usrprfx*.CNTL).

**Important:** These listings can be quite lengthy, especially in large sites. You could 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	Run-time statements (UPRIN from <i>usrprfx</i> .CNTL)
C	Configuration statements (from CONFIG DD)
G	Generated statements (from CDSCONF DD)
A	Analysis report (debugging use only)

The default setting is to include Configuration (CONFIG), Generated configuration (CDSCONF), and Run-time (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 (UPRIN) statements:

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

The coded statement below would print the Generated configuration and UPRIN 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

The MVS commands that 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/ STCPARMS/STCPARMC/STCPARMM are in the *ExPR Installation, Configuration, and Administration Guide* in 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(2004340) TO(2004392) ;
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).

## 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 <i>dd1 dd2 ...</i> ) ;	DDNAME identifies the DD names to accept input from.

### Example:

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

```
INPUT DDNAME(PGMIDATA INDATA1 INDATA2) ;
```

INDATA1 and INDATA2 would be user-specified DDs assigned to SMF archive input files, as created by the IFASMFDP utility.

## 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 ;
PERFORM REORGANIZATION RESET ;
```



Control Statement	Description
<b>PERFORM</b>	The keyword.
INITIALIZE ;	PERFORM INITIALIZE initializes a newly defined database.
REORGANIZATION [RESET]	<p>PERFORM REORGANIZATION invokes:</p> <ol style="list-style-type: none"> <li>1. The optional database backup copy</li> <li>2. The automatic file reorganization feature to copy and rebuild the ExPR VSAM KSDS files</li> <li>3. Optionally, the Auto-Delete function to remove unwanted records.</li> </ol> <p>All features require definition via the 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.</p> <p>RESET is required if a previous reorganization has failed and investigation is required. No further started task or batch reorganizations will run until the problem is resolved and the error flag is cleared via the PERFORM REORGANIZATION RESET statement or the the started task command REORG RESET.</p>
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( <i>option</i> )] [NOEXCPT] ;	<p>PERFORM SMF-UPDATE selects SMF records from the input datasets, sorts them, creates database records, and produces an Exception Event report.</p> <p>DUPKEY <i>option</i> is REPLACE, IGNORE, or CANCEL. The default is REPLACE.</p> <p>NOEXCPT suppresses the exception report generated by SMF-UPDATE processing.</p> <p>Refer also to chapter 3, <i>ExPR Batch Database Update Processes</i>.</p>
SYSLOG-UPDATE [JES3( <i>yyyy xxx...</i> )] [RECFM( <i>valid_recfm</i> )] [HCFORMAT(CENT YEAR)] ;	PERFORM SYSLOG-UPDATE requests allocation/recovery analysis of the JES console log.

Control Statement	Description
	<p>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.</p> <p>For each JES3 system, <i>xxxx</i> represents the message origin prefix and <i>yyyy</i> represents the associated MVS system ID (normally the SMFid).</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Users of CA-SMR can specify RECFM(SMR <i>xxx</i>), where <i>xxx</i> represents the valid format of the SMR file.</p> <p>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.</p> <p>Refer also to chapter 4, <i>ExPR SYSLOG Allocation Processing</i>.</p>
TAPECAT ;	<p>PERFORM TAPECAT is now just TAPECAT. See TAPECAT below and refer also to chapter 5, <i>ExPR Tape Catalog Processing</i>.</p>
VTSS-SMF-AUDIT ;	<p>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.</p>

**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 (including CSC/SMC client systems) 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.

Additionally, for batch updates, the inputting of duplicate SMF records from multiple SMF archives is not a problem. Internally, ExPR sorts all SMF records into date/time/system sequence. Duplicate SMF records are detected and eliminated.

## 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 ExPR Host Configurator application. Separate defaults can be set for reporting periods and for batch database update periods.

Control Statement	Description
<p><b>PERIOD</b></p> <hr/> <p>FROM(yyyyddd [hh]) TO(yyyyddd [hh]) ;</p>	<p>The keyword.</p> <hr/> <p>FROM and TO define the range, in the Julian “yyyyddd” format (where January 1, 2006 is 2006001).</p> <p>yyyyddd must be in the range 1980001 through 2079365.</p> <p>hh indicates the optional hour parameter (00-23).</p> <p>The default hours if not specified are 00 and 23.</p> <p>The FROM/TO values are used for two purposes in ExPR:</p> <ol style="list-style-type: none"> <li>1. To control the range of data extracted from the ExPR database by various batch reports.</li> <li>2. To control the range of data that is input to the SMF-UPDATE batch database update process.</li> </ol> <p><b>Note:</b> The report extraction process uses the date and optionally the hour, while the database update process uses only the date.</p>

### 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. See the *ExPR Installation, Configuration, and Administration Guide* in chapter 9, *ExPR User Interfacing Facilities* for details.

Control Statement	Description
<b>REPORT</b>	The keyword.
NAME  <i>(predefreport/extrnlmod)</i>	NAME identifies the report source, either predefined or from an external user-written module.  <i>extrnlmod</i> represents a user-written load module to which ExPR links. That module obtains data and writes the report by calling back through the API.  <i>predefreport</i> 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

Control Statement	Description
<p>{SINGLE MULTIPLE} ;</p> <p><b>Note:</b> The previous GROUP and NOGROUP parameters are still accepted. GROUP has been replaced by SINGLE and NOGROUP by MULTIPLE.</p>	<p>MOUNTS-DETAIL – produce the Mounts Detail report</p> <p>MOUNTS-LSMS-USED – produce Mounts LSMs Used report</p> <p>ORF-INDEX – produce the Online Report File Contents report</p> <p>PATH-BUSY – produce the Channel Path Group Utilization report</p> <p>SCRATCH-POOL – produce the Scratch Subpools report</p> <p>SYSTEM-MOUNTS – produce the System Mounts report</p> <p>TAPE-ERRORS – produce the Tape Errors reports</p> <p>THRESHOLDS – produce the Thresholds Exceptions report</p> <p>UTILIZATION – produce the Utilization report</p> <p>VTSS-INTERFACE-PERFORMANCE – produce VTSS front-end interface statistics report</p> <p>VTSS-INTERNAL-PERFORMANCE – produce VTSS back-end internal statistics report</p> <p>VTSS-MOUNTS – produce the VTSS Mounts report for VTSSs</p> <p>VTSS-RESIDENCY – produce the VTSS Residency report</p> <p>VTSS-THRESHOLDS – produce the VTSS Thresholds Exceptions report</p> <p>VTSS-UTILIZATION – produce the VTSS Utilization report</p> <p>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.</p> <p>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.</p> <p>The default is MULTIPLE.</p>

**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.

Control Statement	Description
<b>REPORT-OPTIONS</b>	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).
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 <u>only</u> 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, VTSSs or device groups for inclusion in report requests in the current batch job. The default if this option is not specified is to include all ACSs, LSMs, VTSSs and device groups.
- 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
<b>SELECT</b>	The keyword.
ACS( <i>aaa</i> )	ACS selects just the LSMs in the specified ACS for report requests.
LSM( <i>aaa ll</i> )	LSM selects just the specified LSM for report requests.
VTSSID( <i>vtss-id</i> )	VTSSID selects just the specified VTSS for report requests.
GROUP ( <i>group-id</i> )	GROUP selects just a specific device group for device group reports. This includes the automatically generated RTD device groups (RTD- <i>Gnnn</i> ) and per-ACS device groups (ACS- <i>nnn</i> ).
TYPE(HSC PGMI SMF21 VTSS RMF) ;	<p>TYPE selects a subset of the SMF input for processing by the SMF-UPDATE or SMF-REPORT functions.</p> <p>HSC – HSC subtypes 4 and 7 for LSM activity</p> <p>SMF21 – MVS dismount records</p> <p>RMF – RMF types 73 and 74</p> <p>VTSS – VTCS subtypes for VSM activity</p> <p>PGMI – ExPR pseudo-SMF records for the PGMI data collector</p>
SYSID( <i>mvshost</i> ) ;	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-*Gnnn*) ;
- To select an ACS device group:  
SELECT GROUP(ACS-*nnn*) ;

**RTD-*Gnnn* Note:** The RTD-*Gnnn* 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-*Gnnn*) 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( <i>subparameter</i> )	OPTION( <i>subparameter</i> ) identifies the TAPECAT function to perform, either UPDATE, REPORT, SUMMARY, or HISTORY.

Control Statement	Description
<p>OPTION(<i>subparameter</i>) strings are listed below:</p>	<p>Only one of these four options may be specified in each TAPECAT control statement.</p> <p>OPTION must be immediately followed by one of its subparameters set in parentheses. These are UPDATE, REPORT, SUMMARY, HISTORY, and TAPE-SIZING.</p>
<p>TAPECAT OPTION(UPDATE [NOHIST FULLCAT NODBUP CATONLY NOWARN NOCDS NOREEL VIRTUAL]) SYSID(<i>mvshost</i>) ;</p> <p>For example:</p> <p>TAPECAT OPTION(UPDATE NOHIST SYSID(MVS1) ;</p>	<p>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.</p> <p>NOHIST – This UPDATE option performs tape catalog processing but does not create the history file.</p> <p>NODBUP – This UPDATE option performs tape catalog processing but does not update the database.</p> <p>FULLCAT – This UPDATE option processes all volumes in the tape catalog in addition to volumes found in the HSC CDS (i.e., non-StorageTek managed volumes are included). Specifying FULLCAT will reset any previous specification of CATONLY.</p> <p>CATONLY – This UPDATE option processes only non-StorageTek managed volumes (i.e., those in the tape catalog but not in the HSC CDS). CATONLY forces the NODBUP option. Specifying CATONLY will reset any previous specification of FULLCAT.</p> <p><b>Note:</b> Previously CATONLY could be specified as NONSILO. For compatibility purposes, this keyword is still accepted and causes the same processing as CATONLY.</p> <p>NOWARN – This UPDATE option suppresses warning messages in the range XPR0080W to XPR0087W during UPDATE processing.</p> <p>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.</p> <p><b>NOCDS Note:</b> If your installation does not have an HSC CDS, you must comment out DDnames CDS PRIM and CDSCOPY. To process your complete tape catalog contents without a CDS, specify FULLCAT and NOCDS together.</p> <p>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.</p> <p>NOREEL – This UPDATE option causes the UPDATE process to</p>

Control Statement	Description
	<p>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.</p> <p>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.</p>
<pre>TAPECAT OPTION(REPORT [ALLDSNS FULLCAT CATONLY NOREEL VIRTUAL VIRTUAL-ONLY] Byxxxx...) COUNT(nnnnnn) SKIP(nnnnnn) ;  For example:  TAPECAT OPTION(REPORT ALLDSNS BYDSN) COUNT(1000) SKIP(500) ;</pre>	<p>OPTION(REPORT) produces the Nearline Volume Details report from the history file created by UPDATE processing. The required Byxxxx parameter specifies the sorting sequence.</p> <p>A summary line is printed for each primary dataset that was extracted from the HSC CDS and tape catalog, sorted into the appropriate sequence.</p> <p>ALLDSNS – This REPORT option prints a summary line for all primary and secondary datasets. The default is primary only.</p> <p>FULLCAT – This REPORT option prints a summary line for all non-StorageTek managed 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 CATONLY.</p> <p>CATONLY – This REPORT option restricts the Volume Details report to non-StorageTek managed volumes only (i.e., those in the tape catalog but not in the HSC CDS). The history file must have been created with option CATONLY or FULLCAT to produce a CATONLY report. Specifying CATONLY will reset any previous specification of FULLCAT.</p> <p><b>Note:</b> Previously CATONLY could be specified as NONSILO. For compatibility purposes, this keyword is still accepted and causes the same processing as CATONLY.</p> <p>NOREEL – This REPORT option suppresses the printing of reel-to-reel round tape volumes if the FULLCAT or CATONLY options are specified. There may be many historical/static reel-to-reel volumes that do not require printing.</p> <p>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.</p> <p>VIRTUAL-ONLY – This REPORT option requests that only the 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.</p> <p>Byxxxx – This required REPORT parameter specifies the sorting</p>

Control Statement	Description
	<p>sequence(s) for the report. Multiple Byxxxx 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 Byxxxx options below).</p> <p>Byxxxx options include:</p> <p>BYVOL – sorts by volser, file sequence</p> <p>BY VOLSET – sorts by the base volume volser and volume sequence number within a volume set (multi-volume stack)</p> <p>BYDSN – sorts by dataset name, volume sequence</p> <p>BYREF – sorts by reference date, dataset name</p> <p>BYUTIL – sorts by percentage/Mb, dataset name</p> <p>BYUSES – sorts by use count, reference date</p> <p>BYMEGS – sorts by megabytes, dataset name</p> <p>BYACS – sorts by ACS/LSM/VTSS, volser/file sequence</p> <p>BYMEDIA – sorts by media type, volser/file sequence</p> <p>BYBLKSZ – sorts by dataset block size, dataset name</p> <p>BYBLKCT – sorts by dataset block count, dataset name</p> <p>BYLRECL – sorts by dataset logical record length, dataset name</p> <p>BYDSNS – sorts by number of datasets on a volume, volume serial, file sequence</p> <p>BYRECFM – sorts by dataset record format, dataset name</p> <p>BYSCR – sorts by volume scratch status, ACS/LSM/VTSS</p> <p>BYCREATE – sorts by creation date, dataset name</p> <p>BYAGE – sorts by age in days, dataset name</p> <p>BYMVCS – sorts MVC-base and MVC-onboard-VTV records only into MVC and onboard-VTV volser sequence</p> <p>BYMAVAIL – sorts MVC-base records only into MVC free space percentage, MVC volser sequence</p> <p>BYMUSED – sorts MVC-base records only into MVC used space percentage, MVC volser sequence</p> <p>BYMFRAG – sorts MVC-base records only into fragmented space</p>

Control Statement	Description
	<p>percentage, MVC volser sequence</p> <p>BYMMOUNTS – sorts MVC-base records only into number of times used(mounted), percentage used, megabytes, scratch status sequence</p> <p>BYVTVSIZE – sorts VTV-index records only into megabytes/volser sequence</p> <p>BYVTSS – sorts VTV and VTV-index records only into VTSS-id/volser sequence</p> <p>COUNT(<i>nnnnnn</i>) controls the number of volumes listed by each BY... request, effectively producing smaller reports.</p> <p>SKIP(<i>nnnnnn</i>) causes each BY... request to skip printing a number of volumes at the beginning of each report.</p> <p><b>Important Note:</b> If you specified FULLCAT and/or VIRTUAL during the TAPECAT UPDATE process, then you must specify the same on the REPORT control statement. If you omit these parameters from the REPORT statement, then you will not generate a full listing of the TMCHIST file contents. However, you may deliberately choose to use the various REPORT keywords to generate a subset report.</p>
TAPECAT OPTION(SUMMARY) ;	<p>OPTION(SUMMARY) produces the Nearline Volume Summary report from the history file created by TAPECAT UPDATE processing.</p> <p>Volume statistics and utilization estimates are summarized for each ACS, LSM, VTSS, dataset workload group, and media type (device type and cart length).</p> <p>Statistics are also summarized separately for non-StorageTek managed volumes if FULLCAT or CATONLY was specified during the UPDATE processing that created the history file.</p>
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

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### 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 GUI web-based reports (described in the *ExPR Client 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 (ICAG)* in chapter 9, *ExPR User Interfacing Facilities*).

### 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(2004340) TO(2004355) ;
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.

Generally the batch reports are run using the *usrprfx.CNTL* member REPORTS, except for TAPECAT reports, which use the various TAPECATx members. The description of each report later in this chapter will detail which JCL member to use.

It is important to use the correct member as the JCL varies to meet the specific requirements of reporting. This is particularly relevant to using the correct datasets and avoiding dataset sharing enqueues.

## 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***

<b>Report Name</b>	<b>Description</b>
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 the SYSLOG-UPDATE database update process. This report is similar to the MVS Allocation Recovery report except that it details each individual event instead of an hourly summary.



<b>Report Name</b>	<b>Description</b>
SMF Exception Events	<p>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.</p> <p>This is generated by the SMF-UPDATE or SMF-REPORT functions.</p>
System Mounts	<p>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.</p>

### ***Nearline Reports***

<b>Report Name</b>	<b>Description</b>
Contents	<p>The Contents report lists, per LSM, cartridge movements (enter/eject count and number of passthroughs) and contents information (scratch count, free cells, total cells).</p>
Mounts ACS	<p>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.</p>
Mounts Detail	<p>The Mounts Detail report provides, per LSM, a breakdown of the mount response time components for both scratch and non-scratch mounts.</p>
Mounts LSM	<p>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.</p>
Mounts LSMs Used	<p>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).</p>
Scratch Subpool	<p>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.</p>

<b>Report Name</b>	<b>Description</b>
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***

<b>Report Name</b>	<b>Description</b>
SMF Exception Events	<p>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 threshold has been breached and the threshold's value versus the observed value are also included.</p> <p>This is generated by the SMF-UPDATE or SMF-REPORT functions.</p>
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, RTD links, and clustering links.
VTSS Internal Performance	The 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.

Report Name	Description
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, VTV replicating/clustering events, 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	<p>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.</p> <p>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.</p>

<b>Report Name</b>	<b>Description</b>
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 peak window for tape data transferred is also identified from the database type 03 records.
Tape Catalog History	The Tape Catalog History report provides comparative activity analysis between two tape catalog images by listing volumes that have changed status.
Tape Catalog Summary	The Tape Catalog 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.
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.

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

### ***Miscellaneous Reports***

<b>Report Name</b>	<b>Description</b>
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.

# Channel Path Group Busy Report

TUE, 11 AUG 1999		S T O R A G E T E K E X P R										XYZ COMPANY										PAGE 22																																																																																																																																																																																																		
16:51:59		1999.223										JOB:B30T005R										XPRREP019																																																																																																																																																																																																		
DATE HOUR		30	31	32	50	51	52	53	54	55	56	57	255	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG	CPG																																																																																																																																																																																						
CHANNEL PATH GROUP BUSY REPORT FOR SYSTEM IPO1 DATE RANGE: 1999181 TO 1999181																																																																																																																																																																																																																								
1999181 00 NO DATA																																																																																																																																																																																																																								
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06	6	2	4	1	1	1	1	1	1	1	1	1	6	2	5	0	0	0	0	0	0	0	0	0	6	2	5	0	0	0	0	0	0	0	0	0	6	2	5	0	0	0	0	0	0	0	0	0	6	2	5	0	0	0	0	0	0	0	0	0	6	2	5	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	6	2	4	0	0	0	0	0	0	0	0	0	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

---PERIOD---		-----CARTRIDGE MOVEMENTS-----				-----LIBRARY CONTENTS-----						
DATE	HR	PASSTHRU	EJECTS	ENTERS	DEMAND 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.





- **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 GUI, 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, 14 Feb 2006		StorageTek ExPR 6.1.0										XYZ Company		Page 37								
23:54:07		2006.045												Job:T610REPS		XPRREP007						
DB Contents Report For System ALL										Date range: 2005183 to 2006100												
Date	Level	All	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
2006030	Hourly	1804	384	848	24	24					48						96	96	96			188
2006031	Hourly	1634	384	675	24	24					48						96	96	96			191
2006032	Hourly	1657	384	696	24	24					48		1				96	96	96			192
2006033	Hourly	1723	384	791	24	24					25						96	96	96			187
2006034	Hourly	1793	384	836	24	24					48						96	96	96			189
2006035	Hourly	1800	384	840	24	24					48						96	96	96			192
2006036	Hourly	1146	256	512	16	16					32						64	64	64			122
2006037	Hourly	1658	384	701	24	24					48						96	96	96			189
2006038	Hourly	1680	384	720	24	24					48						96	96	96			192
2006039	Hourly	1690	384	731	24	24					48						96	96	96			191
2006040	Hourly	1701	384	744	24	24					48						96	96	96			189
2006030	Daily	69	16	37	1	1					2						4	4	4			
2006031	Daily	61	16	29	1	1					2						4	4	4			
2006032	Daily	62	16	29	1	1					2		1				4	4	4			
2006033	Daily	66	16	34	1	1					2						4	4	4			
2006034	Daily	67	16	35	1	1					2						4	4	4			
2006035	Daily	67	16	35	1	1					2						4	4	4			
2006036	Daily	67	16	35	1	1					2						4	4	4			
2006037	Daily	62	16	30	1	1					2						4	4	4			
2006038	Daily	62	16	30	1	1					2						4	4	4			
2006039	Daily	63	16	31	1	1					2						4	4	4			
2006040	Daily	63	16	31	1	1					2						4	4	4			
2006029	Weekly	74	16	41	1	1					2		1				4	4	4			
2006036	Weekly	71	16	39	1	1					2						4	4	4			
2006031	Monthly	74	16	39	1	1					2			3			4	4	4			

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		XYZ COMPANY		PAGE 1	
16:35:23		1999.226						JOB:B30T005R XPRREP027	
GLOBAL DETAILS OF DEMAND ENTERS FOR SYSTEM CPUTA						DATE RANGE: 1999175 TO 1999175			
-----									
UNIT VOLUME									
--DATE--	HR	SYSTEM	ACS	LSM	ADDR	SERIAL	JOBNAME		
1999.175	11.00	CPUTA	000	00	0380	PR3000	MAINT13U		
1999.175	12.00	CPUTA	000	00	0384	PR3000	MAINT13U		
1999.175	15.00	CPUTA	000	01	0444	003412	ACC002XX		
1999.175	17.00	CPUTA	000	02	0431	PTFTAP	SMPAPPLY		
1999.175	19.00	CPUTA	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

---Period---		<-----Stats for this Group----->										<---Bytes transferred-->		
Date	Hour	Device type or workload	No-mounts		Total-time		Average-time		Maximum-time		Read	Written	Total	
			Scratch	Nonscr	Scratch	Nonscr	Scratch	Nonscr	Scratch	Nonscr				
2006040	00	All Devs	37	56	1128	1512	30	27	92	277	11G	109G	120G	
	01	All Devs	17	47	401	822	23	17	36	38	7930M	28G	36G	
	02	All Devs	15	54	408	950	27	17	77	28	17G	26G	44G	
	03	All Devs	39	31	1271	558	32	18	155	33	0K	44G	44G	
	04	All Devs	22	159	657	3625	29	22	74	92	47G	34G	81G	
	05	All Devs	28	184	823	5170	29	28	80	111	124G	69G	193G	
	06	All Devs	14	65	389	1287	27	19	80	86	22G	58G	80G	
	07	All Devs	43	40	1130	656	26	16	74	37	0K	105G	105G	
	08	All Devs	41	64	1299	1894	31	29	92	277	17G	118G	134G	
	09	All Devs	19	53	450	927	23	17	32	38	7930M	49G	57G	
	10	All Devs	14	50	385	855	27	17	77	28	13G	23G	37G	
	11	All Devs	34	26	1098	457	32	17	155	28	4206M	47G	51G	
	12	All Devs	23	111	641	2597	27	23	82	92	32G	28G	60G	
	13	All Devs	34	219	1064	5891	31	26	80	111	122G	69G	192G	
	14	All Devs	16	77	438	1617	27	21	80	86	39G	59G	98G	
	15	All Devs	22	44	556	673	25	15	73	23	0K	70G	70G	
	16	All Devs	53	55	1632	1793	30	32	92	277	17G	136G	152G	
	17	All Devs	30	48	759	806	25	16	32	38	188K	80G	80G	
	18	All Devs	9	56	198	1002	22	17	36	31	21G	13G	34G	
	19	All Devs	31	40	846	676	27	16	77	28	4206M	45G	49G	
	20	All Devs	30	51	1023	1178	34	23	155	92	25G	38G	63G	
	21	All Devs	31	236	939	6041	30	25	74	111	87G	54G	140G	
	22	All Devs	17	114	479	2804	28	24	80	86	81G	63G	143G	
	23	All Devs	17	44	442	668	26	15	80	23	0K	65G	65G	
Daily total		All Devs	636	1924	18463	44465	29	23	155	277	699G	1429G	2128G	
Period		All Devs	636	1924	18463	44465	29	23	155	277	699G	1429G	2128G	

End of report for this group. Records read: 00840 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-*Gnnn*, 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-*Gnnn*) 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 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.

**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

Date		Hour	Device type	Drive utilization(%)	No of drives	Percentage of time drives were in use																				
Date		Hour	Device type	Drive utilization(%)	No of drives	Percentage of time drives were in use																				
Date		Hour	Device type	Drive utilization(%)	No of drives	Percentage of time drives were in use																				
Date		Hour	Device type	Drive utilization(%)	No of drives	Percentage of time drives were in use																				
Date		Hour	Device type	Drive utilization(%)	No of drives	Percentage of time drives were in use																				
Tue, 14 Feb 2006 23:09:48 2006.045 StorageTek EXP R 6 . 1 . 0 XYZ Company Job:T610REPS Page 2 XPRREP045																										
Device Group Utilization Report for System ALL Date range: 2006040 to 2006040 Group: ACS-000 All ACS 000 drives (253 77)																										
2006040	00	All Devs	12 17	25	0	0	0	0	1	32	39	14	15	0	0	0	0	0	0	0	0	0	0	0	0	0
01	All Devs	2	20	25	0	3	24	12	28	20	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02	All Devs	3	20	25	0	0	6	34	34	13	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03	All Devs	7	14	25	0	0	0	19	38	31	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04	All Devs	3	34	25	0	0	0	5	26	16	20	23	10	0	0	0	0	0	0	0	0	0	0	0	0	0
05	All Devs	7	39	25	0	0	0	0	7	26	15	20	21	3	6	3	0	0	0	0	0	0	0	0	0	0
06	All Devs	3	19	25	0	0	8	40	28	17	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07	All Devs	9	15	25	0	0	1	22	29	17	10	19	2	0	0	0	0	0	0	0	0	0	0	0	0	0
08	All Devs	11	20	25	0	0	0	1	30	39	12	16	2	0	0	0	0	0	0	0	0	0	0	0	0	0
09	All Devs	4	22	25	0	3	11	2	30	27	19	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	All Devs	3	18	25	0	0	16	31	18	14	19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	All Devs	7	13	25	0	0	1	21	45	26	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	All Devs	4	29	25	0	0	0	18	33	15	16	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	All Devs	7	43	25	0	0	0	0	7	13	12	29	26	3	6	3	0	0	0	0	0	0	0	0	0	0
14	All Devs	3	23	25	0	0	5	28	27	26	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	All Devs	5	17	25	0	0	4	35	36	20	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	All Devs	13	24	25	0	0	0	1	21	34	17	25	2	0	0	0	0	0	0	0	0	0	0	0	0	0
17	All Devs	8	20	25	0	3	11	2	29	28	13	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	All Devs	1	22	25	0	0	16	30	22	13	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	All Devs	6	13	25	0	3	16	33	31	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	All Devs	6	19	25	0	0	4	24	49	11	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	All Devs	6	46	25	0	0	0	1	10	16	34	27	3	6	3	0	0	0	0	0	0	0	0	0	0	0
22	All Devs	4	30	25	0	0	0	13	24	33	19	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0
23	All Devs	4	14	25	0	0	9	44	31	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

  

Date		Hour	No of devices	Percentage of time drives were in use															
Date		Hour	No of devices	Percentage of time drives were in use															
Date		Hour	No of devices	Percentage of time drives were in use															
Date		Hour	No of devices	Percentage of time drives were in use															
Date		Hour	No of devices	Percentage of time drives were in use															
Tue, 14 Feb 2006 23:09:48 2006.045 StorageTek EXP R 6 . 1 . 0 XYZ Company Job:T610REPS Page 3 XPRREP045																			
Device Group Utilization Report for System ALL Date range: 2006040 to 2006040 Group: ACS-000 All ACS 000 drives (253 77)																			
2006040	00	006	>																
		007	----->																
		008	----->																
		009	----->																
		010	----->																
		011	----->																
		012	----->																
		013	----->																
		014	----->																

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 drive concurrency details 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-*Gnnn*, 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-*Gnnn*) 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

---Period---		LSM-mounts		-----Stats for this ACS-----						<---Bytes transferred-->			
Date	Hour	Device type or workload	Scrth	Nonscr	Total-time		Average-time		Maximum-time		Read	Written	Total
					Scrth	Nonscr	Scrth	Nonscr	Scrth	Nonscr			
2006040	00	All Devs	37	56	1128	1512	30	27	92	277	11G	109G	120G
	01	All Devs	17	47	401	822	23	17	36	38	7930M	28G	36G
	02	All Devs	15	54	408	950	27	17	77	28	17G	26G	44G
	03	All Devs	39	31	1271	558	32	18	155	33	0K	44G	44G
	04	All Devs	22	159	657	3625	29	22	74	92	47G	34G	81G
	05	All Devs	28	184	823	5170	29	28	80	111	124G	69G	193G
	06	All Devs	14	65	389	1287	27	19	80	86	22G	58G	80G
	07	All Devs	43	40	1130	656	26	16	74	37	0K	105G	105G
	08	All Devs	41	64	1299	1894	31	29	92	277	17G	118G	134G
	09	All Devs	19	53	450	927	23	17	32	38	7930M	49G	57G
	10	All Devs	14	50	385	855	27	17	77	28	13G	23G	37G
	11	All Devs	34	26	1098	457	32	17	155	28	4206M	47G	51G
	12	All Devs	23	111	641	2597	27	23	82	92	32G	28G	60G
	13	All Devs	34	219	1064	5891	31	26	80	111	122G	69G	192G
	14	All Devs	16	77	438	1617	27	21	80	86	39G	59G	98G
	15	All Devs	22	44	556	673	25	15	73	23	0K	70G	70G
	16	All Devs	53	55	1632	1793	30	32	92	277	17G	136G	152G
	17	All Devs	30	48	759	806	25	16	32	38	188K	80G	80G
	18	All Devs	9	56	198	1002	22	17	36	31	21G	13G	34G
	19	All Devs	31	40	846	676	27	16	77	28	4206M	45G	49G
	20	All Devs	30	51	1023	1178	34	23	155	92	25G	38G	63G
	21	All Devs	31	236	939	6041	30	25	74	111	87G	54G	140G
	22	All Devs	17	114	479	2804	28	24	80	86	81G	63G	143G
	23	All Devs	17	44	442	668	26	15	80	23	0K	65G	65G
Daily total		All Devs	636	1924	18463	44465	29	23	155	277	699G	1429G	2128G
Period		All Devs	636	1924	18463	44465	29	23	155	277	699G	1429G	2128G

End of report for this ACS. Records read: 01032 Type 00/14/16: 00024

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

Date		Hour	Workload	Dev-type/	No	Avg	Totl	HSC	Drive	Dest	Dest	Othr	Othr	Pthr	Pthr	No	Avg	Totl	HSC	Drive	Dest	Dest	Othr	Othr	Pthr	Pthr
			Mnts			Time	Time	Q	Wait	Rob	Robq	Rob	Robq	Rob	Robq	Mnts	Time	Time	Q	Wait	Rob	Robq	Rob	Robq	Rob	Robq
2006040	00	All	Devs	37	30	1128	614	294	186	34	0	0	0	0	56	27	1512	744	502	258	8	0	0	0	0	
	01	All	Devs	17	23	401	188	131	80	2	0	0	0	0	47	17	822	178	404	220	20	0	0	0	0	
	02	All	Devs	15	27	408	207	115	86	0	0	0	0	0	54	17	950	147	478	277	48	0	0	0	0	
	03	All	Devs	39	32	1271	716	311	207	37	0	0	0	0	31	18	558	73	285	151	49	0	0	0	0	
	04	All	Devs	22	29	657	334	170	117	36	0	0	0	0	159	22	3625	1152	1373	764	336	0	0	0	0	
	05	All	Devs	28	29	823	410	229	140	44	0	0	0	0	184	28	5170	2114	1663	892	501	0	0	0	0	
	06	All	Devs	14	27	389	218	106	65	0	0	0	0	0	65	19	1287	337	578	322	50	0	0	0	0	
	07	All	Devs	43	26	1130	530	335	226	39	0	0	0	0	40	16	656	61	375	186	34	0	0	0	0	
	08	All	Devs	41	31	1299	683	319	225	72	0	0	0	0	64	29	1894	1007	569	301	17	0	0	0	0	
	09	All	Devs	19	23	450	205	156	89	0	0	0	0	0	53	17	927	199	461	247	20	0	0	0	0	
	10	All	Devs	14	27	385	205	108	70	2	0	0	0	0	50	17	855	114	451	248	42	0	0	0	0	
	11	All	Devs	34	32	1098	614	265	182	37	0	0	0	0	26	17	457	74	229	128	26	0	0	0	0	
	12	All	Devs	23	27	641	311	184	132	14	0	0	0	0	111	23	2597	857	968	532	240	0	0	0	0	
	13	All	Devs	34	31	1064	556	275	171	62	0	0	0	0	219	26	5891	2264	1957	1070	600	0	0	0	0	
	14	All	Devs	16	27	438	240	122	73	3	0	0	0	0	77	21	1617	495	684	379	59	0	0	0	0	
	15	All	Devs	22	25	556	236	175	118	27	0	0	0	0	44	15	673	39	392	207	35	0	0	0	0	
	16	All	Devs	53	30	1632	869	408	288	67	0	0	0	0	55	32	1793	1004	504	257	28	0	0	0	0	
	17	All	Devs	30	25	759	356	243	144	16	0	0	0	0	48	16	806	140	428	214	24	0	0	0	0	
	18	All	Devs	9	22	198	80	70	46	2	0	0	0	0	56	17	1002	206	482	282	32	0	0	0	0	
	19	All	Devs	31	27	846	416	241	163	26	0	0	0	0	40	16	676	77	365	198	36	0	0	0	0	
	20	All	Devs	30	34	1023	607	238	168	10	0	0	0	0	51	23	1178	425	445	244	64	0	0	0	0	
	21	All	Devs	31	30	939	464	252	155	68	0	0	0	0	236	25	6041	2185	2092	1141	623	0	0	0	0	
	22	All	Devs	17	28	479	256	132	80	11	0	0	0	0	114	24	2804	1029	1011	561	203	0	0	0	0	
	23	All	Devs	17	26	442	222	131	88	1	0	0	0	0	44	15	668	23	400	213	32	0	0	0	0	

End of report for this silo. Records read: 01032 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

---Period---		LSM-mounts		-----Stats for this LSM-----						<---Bytes transferred-->			
Date	Hour	Device type or workload	Scratch	Nonscr	Total-time		Average-time		Maximum-time		Read	Written	Total
					Scratch	Nonscr	Scratch	Nonscr	Scratch	Nonscr			
2006040	00	All Devs	37	56	1128	1512	30	27	92	277	11G	109G	120G
	01	All Devs	17	47	401	822	23	17	36	38	7930M	28G	36G
	02	All Devs	15	54	408	950	27	17	77	28	17G	26G	44G
	03	All Devs	39	31	1271	558	32	18	155	33	0K	44G	44G
	04	All Devs	22	159	657	3625	29	22	74	92	47G	34G	81G
	05	All Devs	28	184	823	5170	29	28	80	111	124G	69G	193G
	06	All Devs	14	65	389	1287	27	19	80	86	22G	58G	80G
	07	All Devs	43	40	1130	656	26	16	74	37	0K	105G	105G
	08	All Devs	41	64	1299	1894	31	29	92	277	17G	118G	134G
	09	All Devs	19	53	450	927	23	17	32	38	7930M	49G	57G
	10	All Devs	14	50	385	855	27	17	77	28	13G	23G	37G
	11	All Devs	34	26	1098	457	32	17	155	28	4206M	47G	51G
	12	All Devs	23	111	641	2597	27	23	82	92	32G	28G	60G
	13	All Devs	34	219	1064	5891	31	26	80	111	122G	69G	192G
	14	All Devs	16	77	438	1617	27	21	80	86	39G	59G	98G
	15	All Devs	22	44	556	673	25	15	73	23	0K	70G	70G
	16	All Devs	53	55	1632	1793	30	32	92	277	17G	136G	152G
	17	All Devs	30	48	759	806	25	16	32	38	188K	80G	80G
	18	All Devs	9	56	198	1002	22	17	36	31	21G	13G	34G
	19	All Devs	31	40	846	676	27	16	77	28	4206M	45G	49G
	20	All Devs	30	51	1023	1178	34	23	155	92	25G	38G	63G
	21	All Devs	31	236	939	6041	30	25	74	111	87G	54G	140G
	22	All Devs	17	114	479	2804	28	24	80	86	81G	63G	143G
	23	All Devs	17	44	442	668	26	15	80	23	0K	65G	65G
Daily total		All Devs	636	1924	18463	44465	29	23	155	277	699G	1429G	2128G
Period		All Devs	636	1924	18463	44465	29	23	155	277	699G	1429G	2128G

End of report for this LSM. Records read: 01032 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

```

Tue, 14 Feb 2006      StorageTek  ExPR 6.1.0      XYZ Company      Page 55
23:09:48      2006.045                                     Job:T610REPS      XPRREP023
-----
                          Mounts LSMS Used Report For System ALL      Date range: 2006040 to 2006040
                          ACS: 000 NEARLINE ACS 000
                          LSM: 00 LSM 000 00 HSCid=x'000'
-----
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+
2006040
01             37  56  93  0  0  0  0  0  0  0  0  0  0  0  0  0  0
02             17  47  64  0  0  0  0  0  0  0  0  0  0  0  0  0  0
03             15  54  69  0  0  0  0  0  0  0  0  0  0  0  0  0  0
04             39  31  70  0  0  0  0  0  0  0  0  0  0  0  0  0  0
05             22 159 181  0  0  0  0  0  0  0  0  0  0  0  0  0  0
06             28 184 212  0  0  0  0  0  0  0  0  0  0  0  0  0  0
07             14  65  79  0  0  0  0  0  0  0  0  0  0  0  0  0  0
08             43  40  83  0  0  0  0  0  0  0  0  0  0  0  0  0  0
09             41  64 105  0  0  0  0  0  0  0  0  0  0  0  0  0  0
10             19  53  72  0  0  0  0  0  0  0  0  0  0  0  0  0  0
11             14  50  64  0  0  0  0  0  0  0  0  0  0  0  0  0  0
12             34  26  60  0  0  0  0  0  0  0  0  0  0  0  0  0  0
13             23 111 134  0  0  0  0  0  0  0  0  0  0  0  0  0  0
14             34 219 253  0  0  0  0  0  0  0  0  0  0  0  0  0  0
15             16  77  93  0  0  0  0  0  0  0  0  0  0  0  0  0  0
16             22  44  66  0  0  0  0  0  0  0  0  0  0  0  0  0  0
17             53  55 108  0  0  0  0  0  0  0  0  0  0  0  0  0  0
18             30  48  78  0  0  0  0  0  0  0  0  0  0  0  0  0  0
19              9  56  65  0  0  0  0  0  0  0  0  0  0  0  0  0  0
20             31  40  71  0  0  0  0  0  0  0  0  0  0  0  0  0  0
21             30  51  81  0  0  0  0  0  0  0  0  0  0  0  0  0  0
22             31 236 267  0  0  0  0  0  0  0  0  0  0  0  0  0  0
23             17 114 131  0  0  0  0  0  0  0  0  0  0  0  0  0  0
23      No data
End of report for this silo. Records read: 01032      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		XYZ COMPANY		PAGE 1								
16:23:51 1999.226						JOB:B30T005S XPRREP016								
MVS ALLOCATION/RECOVERY SUMMARY FOR SYSTEM CPUTA				DATE RANGE: 1999340 TO 1999352										
<----- LSM/VTSS/GROUP SPECIFIC ----->				<----- OVERALL/COMPLETE SYSTEM ----->										
VTSS/ GROUP/	NO OF OPERATOR	TOTAL OPERATOR	LONGEST OPERATOR	NO OF WAITS	LONGEST WAIT	NO OF CANCEL	NO OF WAIT	HIGHEST NO WAITS	TIME WAIT WAS	ANY REPLY WAS	TIME PENDING	ANY PENDING	TOTAL TIME	THRESHOLD MAXALLOCREC (00300)
--DATE--	HR	SYST	ACS-LSM	REPLIES	REPLY TIME	REPLY SERVICED	SERVICED	REPLIES	REPLIES	PENDING	PENDING	PENDING	TIME	
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							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							00.02.42	00.02.42
1999.348	11.00	CPUA	000 00	1	00.02.49	00.02.49					1		00.09.17	00.09.17
1999.348	12.00	CPUA	000 00	1	00.01.59	00.01.59		1	00.02.08		1		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		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	1	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							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 GUI 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				XYZ COMPANY				PAGE 1						
16:07:21		1999.226		MVS ALLOCATION/RECOVERY UPDATE/REPORT FOR SYSTEM CPUA (1998.341 00:00:04 THRU 1998.352 09:50:00)				JOB:B30T005S		XPRREP015						
JESJOBNO	JOBNAME	STEPNAME	DDNAME	VOLSER	--DATE--	STRTIME	END-TIME	DURATION	UNIT	TYPE	ACS	LSM	-----	COMMENTS	-----	MAXALLOCREC
																(00300)
JOB00956	M42CAT	D1	TAPEUNIT	SCRTRCH	1998.347	16.56.49	16.57.09	00.00.20	0385							
JOB00958	HCP001	D1	TAPEUNIT	SCRTRCH	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	SCRTRCH	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								
JOB02422	B30T004C	UNLDJCL	SYSUT1	NES355	1998.348	11.59.39	12.01.47	00.02.08	0390		000	00		OPERATOR REPLIED WAIT		
JOB04705	B30T005S	EXPR	INDATA1	OTS403	1998.348	11.59.40	12.01.59	00.02.19	0392		000	02		MOUNT SERVICED AFTER WAIT		
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	SCRTRCH	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).

# Scratch Subpool Report

Mon, 24 Jul 2000		StorageTek ExPR		XYZ COMPANY		Page 5										
13:25:44 2000.206						Job:EXPROJ46 XPRREP029										
SCRATCH POOL REPORT FOR SYSTEM SYS1										DATE RANGE:2000176 TO 2000206						
ACS: 000 NEARLINE ACS 000																
LSM: 00 NEARLINE LSM 000 00																
---PERIOD---		<-- SUBPOOL NAME -->			<-- SUBPOOL NAME -->			<-- SUBPOOL NAME -->			<-- SUBPOOL NAME -->			<-- SUBPOOL NAME -->		
		<-- 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.



## SMF Exception Events Report

WED, 12 AUG 1999		S T O R A G E T E K		E X P R		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	SCRATCH 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% ----->
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*):

<p>PERFORM SMF-UPDATE – updates the database and generates the report</p> <p>PERFORM SMF-REPORT – generates the report only</p>
---

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 69<sup>th</sup> 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 (including CSC/SMC client systems) 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.

Additionally, for batch updates, the inputting of duplicate SMF records from multiple SMF archives is not a problem. Internally, ExPR sorts all SMF records into date/time/system sequence. Duplicate SMF records are detected and eliminated.

### ***SMF Exception Events***

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

### ***Nearline Exceptions***

<b>Nearline Exception</b>	<b>Description</b>
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.

Nearline Exception	Description
* 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 <i>aaa-ll</i>	A scratch volume mount involved more LSMs than the MAX-LSM-USED threshold permitted; <i>aaa-ll</i> identifies the originating LSM.
NON-SCR PASSTHRU <i>aaa-ll</i>	A non-scratch volume mount involved more LSMs than the MAX-LSMS-USED threshold permitted; <i>aaa-ll</i> 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.

<b>Nearline Exception</b>	<b>Description</b>
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***

<b>VTSS Exception</b>	<b>Description</b>
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.

VTSS Exception	Description
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.
VTV COPIED TO <i>vtssname</i>	The VTV has been replicated between a pair of clustered VTSSs. Details of the replication queuing and transmission times are given, along with the size of the VTV and the transmissions rate per second.
* 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

--Period--		--Mount counts--												--Bytes transferred--					
Date	Hour	LSM-Mounts		VTD-Mounts		RTD mounts by reason						Manual-Mnts		ALL-Mount		Read	Written	Total	
		SCR	NSCR	SCR	NSCR	Migrt	Recll	Reclm	Drain	Audit	Consl	Exprt	SCR	NSCR	SCR	NSCR			
2006040	00	37	110	165	27	43	0	53	0	0	0	0	0	0	202	137	69G	170G	239G
	01	20	90	216	11	50	0	32	0	0	0	0	0	0	236	101	29G	135G	164G
	02	16	108	123	54	49	2	47	0	0	0	0	0	0	139	162	58G	75G	133G
	03	81	69	801	127	49	10	0	0	0	0	0	0	0	882	196	85G	280G	365G
	04	30	230	495	229	51	0	47	0	0	0	0	0	0	525	459	297G	347G	644G
	05	28	243	201	106	42	0	49	0	0	0	0	0	0	229	349	267G	280G	547G
	06	14	112	72	38	28	0	66	0	0	0	0	0	0	86	150	88G	90G	178G
	07	43	87	400	39	38	6	44	0	0	0	0	0	0	443	126	88G	327G	414G
	08	41	113	130	27	40	0	54	0	0	0	0	0	0	171	140	75G	199G	274G
	09	22	106	301	20	63	0	36	0	0	0	0	0	0	323	126	48G	189G	237G
	10	14	103	110	39	40	1	54	0	0	0	0	0	0	124	142	24G	49G	73G
	11	67	63	721	107	44	11	2	0	0	0	0	0	0	788	170	92G	243G	335G
	12	40	165	510	197	58	0	32	0	0	0	0	0	0	550	362	228G	322G	551G
	13	35	295	245	143	46	0	46	0	0	0	0	0	0	280	438	302G	323G	625G
	14	16	116	71	60	21	0	65	0	0	0	0	0	0	87	176	131G	131G	262G
	15	22	97	229	40	35	6	56	0	0	0	0	0	0	251	137	90G	183G	273G
	16	53	93	270	27	31	0	44	0	0	0	0	0	0	323	120	75G	309G	384G
	17	33	103	303	27	64	0	37	0	0	0	0	0	0	336	130	55G	204G	259G
	18	9	101	124	21	43	1	43	0	0	0	0	0	0	133	122	24G	55G	79G
	19	54	102	633	117	56	11	29	0	0	0	0	0	0	687	219	93G	222G	315G
	20	57	80	368	152	32	0	18	0	0	0	0	0	0	425	232	180G	296G	476G
	21	32	327	476	170	72	0	47	0	0	0	0	0	0	508	497	286G	327G	613G
	22	17	157	117	78	20	0	67	0	0	0	0	0	0	134	235	189G	187G	377G
	23	17	89	91	37	29	3	57	0	0	0	0	0	0	108	126	77G	155G	232G
Daily total		798	3159	7172	1893	1044	51	1025	0	0	0	0	0	0	7970	5052	2948G	5100G	8048G
Period		798	3159	7172	1893	1044	51	1025	0	0	0	0	0	0	7970	5052	2948G	5100G	8048G

End of report for this system. Records read: 0001701 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										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>													
--DATE--	HR	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																											
--DATE--	HR	SYSTEM	ACS	LSM	UNIT	VOLUME	< PERM ERRORS >	< TEMP ERRORS >	NO OF	<DATA TRANSFERRED>																															
			/VTSSID	ADDR	SERIAL		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 COMPANY		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																											
--DATE--	HR	SYSTEM	ACS	LSM	UNIT	VOLUME	< PERM ERRORS >	< TEMP ERRORS >	NO OF	<DATA TRANSFERRED>																															
			/VTSSID	ADDR	SERIAL		READ	WRITE	SSCH'S	READ	WRITTEN																														
1998.181	22.00	CPUA	000	02	0C27	013539	0	1	0	0	1207	12K	965M																												
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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 COMPANY		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																											
--DATE--	HR	SYSTEM	ACS	LSM	UNIT	VOLUME	< PERM ERRORS >	< TEMP ERRORS >	NO OF	<DATA TRANSFERRED>																															
			/VTSSID	ADDR	SERIAL		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		XYZ COMPANY		PAGE 9																																																																																																																																																																																																																																																																																																																																																																																	
17:26:42 1999.181		TAPE CATALOG UPDATE PROCESSING FOR SYSTEM IPO1				JOB:B30T005T XPRREP050																																																																																																																																																																																																																																																																																																																																																																																	
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<table border="1"> <thead> <tr> <th>ACCS LSM</th> <th>OLDEST</th> <th># MULTI</th> <th># MULTI</th> <th>( 1- 7 DAYS)</th> <th>( 8- 30 DAYS)</th> <th>( 31- 91 DAYS)</th> <th>( 92- 183 DAYS)</th> <th>( 184-9999 DAYS)</th> <th>VTSS-AGEBANDS</th> </tr> <tr> <th>IN DAYS</th> <th>VOLUMES</th> <th>FILES</th> <th>(# VOLS/AVG AGE)</th> <th>(# VOLS/AVG AGE)</th> <th>(# VOLS/AVG AGE)</th> <th>(# VOLS/AVG AGE)</th> <th>(# VOLS/AVG AGE)</th> <th>(# VOLS/AVG AGE)</th> <th>AGEBANDS</th> </tr> </thead> <tbody> <tr> <td>000 00</td> <td>175</td> <td>1565</td> <td>902</td> <td>4616</td> <td>4</td> <td>442</td> <td>13</td> <td>215</td> <td>62 45 137 0 0</td> </tr> <tr> <td>000 01</td> <td>169</td> <td>1528</td> <td>866</td> <td>4696</td> <td>4</td> <td>361</td> <td>14</td> <td>233</td> <td>60 16 137 0 0</td> </tr> <tr> <td>000 02</td> <td>900</td> <td>864</td> <td>511</td> <td>3634</td> <td>3</td> <td>311</td> <td>12</td> <td>122</td> <td>58 38 135 1 900</td> </tr> <tr> <td>PRODVTS</td> <td>28</td> <td>421</td> <td>54</td> <td>0</td> <td>0</td> <td>3453</td> <td>2</td> <td>2145</td> <td>6 1765 12 132 20</td> </tr> </tbody> </table>								ACCS LSM	OLDEST	# MULTI	# MULTI	( 1- 7 DAYS)	( 8- 30 DAYS)	( 31- 91 DAYS)	( 92- 183 DAYS)	( 184-9999 DAYS)	VTSS-AGEBANDS	IN DAYS	VOLUMES	FILES	(# VOLS/AVG AGE)	(# VOLS/AVG AGE)	(# VOLS/AVG AGE)	(# VOLS/AVG AGE)	(# VOLS/AVG AGE)	(# VOLS/AVG AGE)	AGEBANDS	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	PRODVTS	28	421	54	0	0	3453	2	2145	6 1765 12 132 20																																																																																																																																																																																																																																																																																																																				
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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				XYZ COMPANY				PAGE 1					
15:59:23		1999.226		TAPE-SIZING - LIBRARY CONTENTS REPORT												JOB:B30T005T		XPRREP053	
														(AS AT 1999.181 17:26:42 BY 3.0.0)					
MEGABYTES	TOTAL	IN-USE	SCRA-	UTILIZED	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	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
<	25	1226	1116	110	1226	0	27	1199	18	21	12	530	8	631	1	38	0	0	0
<	50	1051	979	72	1051	0	28	1023	37	37	19	405	14	587	1	31	0	0	0
<	100	1868	1752	116	1868	0	78	1790	65	115	58	725	43	1018	2	47	0	0	0
<	200	1993	1788	205	1993	0	111	1882	153	283	149	732	102	1088	5	62	0	0	0
<	400	6037	5469	568	6037	0	850	5187	238	1206	726	2716	388	2341	17	130	0	0	0
<	600	3538	3349	189	3538	0	2655	883	498	430	0	261	837	12	46	0	0	0	0
<	800	753	692	61	753	0	223	530	711	368	0	226	508	8	22	0	0	0	0
<	1000	1245	1167	78	1245	0	191	1054	922	949	0	584	1014	19	40	0	0	0	0
<	1600	2345	2205	140	2345	0	585	1760	1237	2127	0	1290	1669	58	91	0	0	0	0
<	2000	216	178	38	216	0	190	26	1781	45	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
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		TAPE-SIZING - SYSTEM THRUPUT REPORT FOR SYSTEM CPUA												DATE RANGE: 1999180 TO 1999182			
--PERIOD--		--MOUNT COUNTS--										--BYTES TRANSFERRED--							
DATE	HR	LSM-MNTS		VTD-MNTS		RTD-MNTS		MAN-CART		MAN-REEL		ALL-MNTS		READ	WRITTEN	TOTAL			
1999181	00	NO	DATA	SCR	NSCR	SCR	NSCR	MIGR	RCLL	SCR	NSCR	SCR	NSCR	SCR	NSCR				
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	HR	BYTES-RD	BYTES-WR														TOTAL		
1999181	06:00	8044M	17G														25G		
1999181	07:00	10G	29G														39G		
1999181	08:00	6270M	33G														39G		

**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 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 quantity 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		XYZ COMPANY		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)		
-----								
FULLCAT VIRTUAL				SORTED BY - VOLUME SERIAL NO				
-----								
		<----- VOLUME STATISTICS ----->				DATASET STATISTICS		
VOLUME		VOL DS	PER MEGA	CREATION	LASTREF/ ACS	USAGE	DEV-TYPE	
SERIAL	DATASET NAME	SEQ NS	CNT BYTE	DATE	USED DATE	LSM CNT	FIL BLKCNT BLKSZ LRECL REC	
							M-MEDIA SCR SEQ M-USD M-AVL M-FRG FM	
	\$\$\$VTV.VOLSER.VTV001.RESIDENT.IN.PRODVTSS		200	95338	95338		PRODVTSS	VTW
	\$\$\$VTV.VOLSER.VTV002.MIGRATED.TO.MVC003		300	95338	97015		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.VTV002.MIGRATED.TO.MVC006		300	95338	97015		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.VTV002.RESIDENT.IN.PRODVTSS		300	95338	97015		PRODVTSS	VTW
	\$\$\$VTV.VOLSER.VTV003.RESIDENT.IN.PRODVTSS		100	95338	96177		PRODVTSS Y	VTW
	\$\$\$VTV.VOLSER.VTV004.RESIDENT.IN.PRODVTSS		200	93050	96037		PRODVTSS Y	VTW
	\$\$\$VTV.VOLSER.000001.MIGRATED.TO.MVC006		25	91171	95338		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.000001.RESIDENT.IN.PRODVTSS		25	91171	95338		PRODVTSS	VTW
	\$\$\$VTV.VOLSER.000002.MIGRATED.TO.MVC006		25	95008	95338		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.000002.RESIDENT.IN.PRODVTSS		25	95008	95338		PRODVTSS	VTW
	\$\$\$VTV.VOLSER.000003.MIGRATED.TO.MVC006		25	95135	95338		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.000003.MIGRATED.TO.MVC007		25	95135	95338		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.000003.RESIDENT.IN.PRODVTSS		25	95135	95338		PRODVTSS	VTW
	\$\$\$VTV.VOLSER.000004.MIGRATED.TO.MVC006		25	95349	95349		VTW-COPY Y	VTW
	\$\$\$VTV.VOLSER.000004.MIGRATED.TO.MVC008		25	95349	95349		VTW-COPY Y	VTW
	\$\$\$VTV.VOLSER.000004.RESIDENT.IN.PRODVTSS		25	95349	95349		PRODVTSS Y	VTW
	\$\$\$VTV.VOLSER.000007.MIGRATED.TO.MVC006		25	95338	95338		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.000007.MIGRATED.TO.MVC009		25	95338	95338		VTW-COPY	VTW
	\$\$\$VTV.VOLSER.000007.RESIDENT.IN.PRODVTSS		25	95338	95338		PRODVTSS	VTW
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	VTW
MVC001	\$\$\$MVC.VOLSER.MVC001.CONTAINS.VTV.VTV006		250	93254	94334		MVC-VTV	VTW
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	VTW
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	VTW
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	VTW
MVC006	\$\$\$MVC.VOLSER.MVC006.CONTAINS.VTV.VTV007		50	96152	96152		MVC-VTV	VTW
MVC006	\$\$\$MVC.VOLSER.MVC006.CONTAINS.VTV.VTV008		25	96068	96068		MVC-VTV	VTW
MVC006	\$\$\$MVC.VOLSER.MVC006.CONTAINS.VTV.000001		25	91171	95338		MVC-VTV	VTW
MVC006	\$\$\$MVC.VOLSER.MVC006.CONTAINS.VTV.000002		25	95008	95338		MVC-VTV	VTW
MVC006	\$\$\$MVC.VOLSER.MVC006.CONTAINS.VTV.000003		25	95135	95338		MVC-VTV	VTW
MVC006	\$\$\$MVC.VOLSER.MVC006.CONTAINS.VTV.000004		25	95349	95349		MVC-VTV	VTW
MVC006	\$\$\$MVC.VOLSER.MVC006.CONTAINS.VTV.000007		25	95338	95338		MVC-VTV	VTW
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	VTW
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	VTW
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	VTW
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	0 0 0 0 ?
VTV002	\$\$\$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG	0	0	?	?	97015	0	0 0 0 0 ?
VTV003	\$\$\$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG	0	0	?	?	96177	0	0 0 0 0 ?
VTV004	\$\$\$DSN.UNAVAIL.TAPE.NOT.IN.CATALOG	0	0	?	?	96037	0	0 0 0 0 ?
000001	TEST.CA.CAB.DCABA047.SA131.COPY.G0012V00	1	53	100	440	94345	306	PRODVTSS 1 4 28672 4096 FB
000002	HSM.MCDS.BACKUP.V0002941	1	1	100	640	94346	76	PRODVTSS 1 0 32760 32760 VBS
000003	HSM.DMP.#DB2A.VDB2A11.D94344.T512922	1	1	100	1040	94344	369	PRODVTSS 1 16634 65536 65536 UN
000004	HSM.COPY.BACKTAPE.DATASET	1	1	67	540	94333	103	PRODVTSS ? 1 34570 16384 16384 F
000005	HSM.COPY.BACKTAPE.DATASET	1	1	39	436	94347	000 00 410	90I 1100 1 27893 16384 16384 F
000006	PROD.HK.BACKUP.TMS.AUDIT.G3523V00	1	1	1	9	94342	000 02 377	90I 1100 1 1042 8880 370 FB
000007	HSM.COPY.HMIGTAPE.DATASET	1	1	57	463	94038	166	PRODVTSS 1 29641 16384 16384 F
000008	PROD.HK.PDBSMF.MTHLY.G0089V00	4	1	33	73	94015	192	80 0550 1 2337 32760 0 UN
000009	HSM.COPY.HMIGTAPE.DATASET	1	1	37	417	94333	268	90I 1100 1 26704 16384 16384 F
000010	PROD.IB.IBCA.REPT.VSAM.BKUP.G0203V00	1	1	2	39	94347	000 00 173	90I 1100 1 1249 32760 32756 VB
000011	IDMS.IDMSF.PR.DAILY.TCDB.BACKUP.G0092V00	1	1	36	513	94285	000 01 25	90I 1100 1 16432 32760 0 UN
000012	TEST.FREE.GLOBIH.H.D301194	3	1	100	199	94341	174	80 0550 1 6392 32600 163 FB
000013	TEST.FREE.GLOBIH.H.D301194	2	1	100	198	94341	209	80 0550 1 6355 32600 163 FB
000014	HSM.COPY.HMIGTAPE.DATASET	1	1	2	27	94333	000 02 233	90I 1100 1 1734 16384 16384 F
000015	PROD.PD.PD017C.G1599V00	1	1	1	<1	94017	128	80 0550 1 6 32736 48 FB
000016	HSM.DMP.#SYST.VSYS016.D94340.T012105	1	1	48	775	94340	344	90I 1100 1 12406 65536 65536 UN
000017	TEST.OLAS.IBCATZ.DTH3DDA.IMCOP.G0002V00	3	1	100	116	94176	319	80 0550 1 6470 32760 28014 VB
000018	PROD.IB.IBCA.CA1.CA1BCADB.G0462V00	1	1	1	26	94341	000 02 241	90I 1100 1 831 32760 32760 VBS
000019	TEST.OLAS.IBCATZ.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	000 00 221	90I 1100 1 33056 16384 16384 F
000021	IDMS.IDMSA.PR.DAILY.FILE.BKUPCOPY.G1294V00	2	1	100	709	94347	248	90I 1100 1 45415 0 0 UN
000022	TEST.FREE.GLOBACOM.D301194	4	1	100	199	94341	270	80 0550 1 6407 32623 323 FB
000023	HSM.DMP.MC2.VMC2002.D94345.T120209	1	1	21	339	94345	000 00 249	90I 1100 1 5429 65536 65536 UN
000024	PROD.OB.OB545.G0017V00	1	1	62	22	91231	195	80 0550 1 45135 500 500 F
000029	PROD.OB.TRANS.ACTION.REGISTER.D2810930	2	1	42	94	93302	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 BYxxxx 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 six 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 Mb 800 Mb	3490E 400 Mb VTV within the VSM system 3490E 800 Mb 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

THF_DEN Value	Volume Details Report	Maximum Capacity (including compression)	Device-Type/Media Description
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	3200 Mb	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
S	TS-120GB	840 Gb	An STK Titanium/T10000 120 Gb cartridge
T	T1-500GB	3,500 Gb	An STK Titanium/T10000 500 Gb cartridge
P	9940	420Gb	An STK 9940 native cartridge
Z	9490EE	6.5 Gb	An STK 9490EE 2200 ft. EE cartridge
X	LTO	Various capacities	General LTO-type media cartridges
Y	SDLT	Various capacities	General SDLT-type media cartridges

**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		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)									
SERIAL	CDS/ACS	TMC	CHANGED	BECOME	BECOME	VOLUME	VTSS	MVC	
STATUS	STATUS	DENSITY	SCRATCH	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									
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 EXPR300
//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 15:33:44		STORAGETEK EXPR 1999.226			XYZ COMPANY					PAGE 22 XPRREP051		JOB:B30T005T (AS AT 1999.181 17:26:42 BY 3.0.0)						
NEARLINE VOLUME SUMMARY REPORT																		
PART 1 - VOLUME AGING AND TOTALS																		
ACS	LSM	DATA-GROUP	DEVICE-TYPE/MEDIA	TOTAL VOLUMES	IN-USE VOLUMES	SCRA-TCHES	UTILIZED VOLUMES	NOT IN CATALOG	MULTI VOLUMES	MULTI FILES	OLDEST DAYS	AVG DAYS	AVG MEGS	HIGH MEGS	CAPPED VOLUMES	TOTAL DSNS	MAX 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 15:33:44		STORAGETEK EXPR 1999.226			XYZ COMPANY					PAGE 29 XPRREP051		JOB:B30T005T (AS AT 1999.181 17:26:42 BY 3.0.0)						
NEARLINE VOLUME SUMMARY REPORT																		
PART 2 - VOLUME UTILIZATION																		
ACS	LSM	DATA-GROUP	DEVICE-TYPE/MEDIA	TOTAL VOLUMES	UTILIZED VOLUMES	AVG% 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

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, 14 Feb 2006   StorageTek ExPR 6.1.0   XYZ Company   Page 1
23:43:46   2006.045   Job:T610REPS   XPREP026
-----
Threshold Exceptions Report For System ALL   Date range: 2006040 to 2006040
ACS: 000 NEARLINE ACS 000
LSM: 00 LSM 000 00 HSCid=x'000'
-----

```

Date	Hour	Mnt cnt		Mnt time		Enters	Ejects	Passthru	Max used drives	Avail scratches	Avail cells	Max alloc recovery	Max LSMS used
		scratch (100)	non-scr (100)	scratch (20)	non-scr (30)								
2006040	0	37	56	=> 92<=	=> 277<=	2	0	0	7	1208	2		0
	2	15	54	=> 77<=	28	0	0	0	7	1208	2		0
	4	22	=> 159<=	=> 74<=	=> 92<=	42	0	0	8	1208	2		0
	6	14	65	=> 80<=	=> 86<=	0	0	0	6	1208	2		0
	8	41	64	=> 92<=	=> 277<=	3	28	0	8	1208	2		0
	10	14	50	=> 77<=	28	0	0	0	7	1208	2		0
	12	23	=> 111<=	=> 82<=	=> 92<=	42	0	0	7	1208	2		0
	14	16	77	=> 80<=	=> 86<=	0	0	0	6	1208	2		0
	16	53	55	=> 92<=	=> 277<=	3	28	0	8	1208	2		0
	18	9	56	=> 36<=	=> 31<=	0	0	0	6	1208	2		0
	20	30	51	=> 155<=	=> 92<=	42	0	0	7	1208	2		0
	22	17	=> 114<=	=> 80<=	=> 86<=	0	0	0	8	1208	2		0

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 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

Date		Hour	Device type	Drive utilization(%)		No	Percentage of time drives were in use																																THRESHOLD							
			scratch	non-scr	devs	No of in use drives																																DRIVESINUSE(00)								
						0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32								
2006040	00	All	Devs	16	21	25	0	0	0	0	1	32	39	14	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	01	All	Devs	6	21	25	0	3	24	12	28	20	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	02	All	Devs	8	21	25	0	0	6	34	34	13	13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	03	All	Devs	11	21	25	0	0	0	19	38	31	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	04	All	Devs	3	37	25	0	0	0	5	26	16	20	23	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	05	All	Devs	9	43	25	0	0	0	0	7	26	15	20	21	3	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	06	All	Devs	7	20	25	0	0	8	40	28	17	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	07	All	Devs	13	21	25	0	0	1	22	29	17	10	19	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	08	All	Devs	16	22	25	0	0	0	1	30	39	12	16	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	09	All	Devs	9	25	25	0	3	11	2	30	27	19	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10	All	Devs	7	21	25	0	0	16	31	18	14	19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	11	All	Devs	11	19	25	0	0	1	21	45	26	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12	All	Devs	4	31	25	0	0	0	18	33	15	16	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	13	All	Devs	8	47	25	0	0	0	0	7	13	12	29	26	3	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	14	All	Devs	7	23	25	0	0	5	28	27	26	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	15	All	Devs	10	18	25	0	0	4	35	36	20	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	16	All	Devs	17	24	25	0	0	0	1	21	34	17	25	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	17	All	Devs	12	22	25	0	3	11	2	29	28	13	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	18	All	Devs	5	23	25	0	0	16	30	22	13	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	19	All	Devs	6	19	25	0	3	16	33	31	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	20	All	Devs	6	24	25	0	0	4	24	49	11	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	21	All	Devs	6	48	25	0	0	0	0	1	10	16	34	27	3	6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	22	All	Devs	7	30	25	0	0	0	13	24	33	19	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	23	All	Devs	8	17	25	0	0	9	44	31	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	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

---Period---		<-Disk Buffer Utilization->			<-----Host Links----->			<-----RTD Links----->			<----Clustering Links---->		
Date	Hour	Max DBU % Used	LAMT %	HAMT %	Intrface Busy %	Intrface Total IO	Intrface Busy Sec	Intrface Busy %	Intrface Total IO	Intrface Busy Sec	Intrface Busy %	Intrface Total IO	Intrface Busy Sec
2006040	0	73	70	80	15	212221	523	13	314445	467	17	593448	627
	1	78	70	80	18	285763	632	8	188183	302	29	953276	1050
	2	80	70	80	29	1338085	1029	24	585038	852	8	264011	277
	3	58	70	80	42	1855556	1496	6	109026	216	30	917051	1090
	4	60	70	80	69	4607119	2499	18	447923	637	15	392995	537
	5	61	70	80	27	2078220	957	14	300286	487	0	15420	16
	6	62	70	80	4	426553	152	15	327975	539	1	21068	22
	7	68	70	80	51	639173	1828	32	1566433	1156	0	0	0
	8	71	70	80	19	302182	670	11	261743	388	23	663140	837
	9	77	70	80	21	339242	756	21	1316794	769	0	0	0
	10	79	70	80	14	522976	493	20	464638	704	8	272148	284
	11	80	70	80	50	2316495	1789	21	1193324	766	0	0	0
	12	60	70	80	56	3548114	2027	8	204728	304	19	516889	667
	13	61	70	80	39	2959834	1414	16	383042	581	3	99753	105
	14	62	70	80	10	796386	352	15	315552	532	0	7825	8
	15	65	80	90	35	425638	1252	23	487062	819	18	508840	665
	16	71	80	90	32	590550	1148	14	360974	507	43	1097425	1538
	17	75	80	90	17	252484	601	17	1010662	595	0	0	0
	18	79	80	90	12	239697	434	15	353733	548	19	650067	689
	19	80	70	80	26	1216437	944	16	395293	567	6	221270	232
	20	59	70	80	45	2832671	1633	4	94075	145	18	495730	651
	21	61	70	80	51	3557451	1843	18	426555	645	6	208696	223
	22	61	70	80	15	1194214	539	17	387569	622	0	14510	15
	23	64	70	80	25	396249	916	14	674801	503	0	0	0

End of report for this VTSS. Records read: 864, Type 15: 24

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, RTD, and clustering channel interface activity – percentage busy, number of I/Os, and busy time

**Note:** Please be aware that clustering interface activity will be reported for all hosts, including hosts that do not partake in the initiating/control of VTV replication events. This is due to clustering interface activity being derived from a single data source, not individual MVS systems. CLINKs do not belong to any specific MVS VTCS host.

# VTSS Internal Performance Report

---Period---		Max DBU %	Scr comp %	Total (Mb)	Data Actually Transferred								Throughput and Potential			Total Rate%	
Date	Hour				Application				System				Destage	Stage			
					MVS Read%	MVS Write%	VTVs Recall%	VTVs Migr%	VTVs Reclm%	VTVs Inbnd%	VTVs Outbnd%	FSC%	Data (Mb)	Rate%	Data (Mb)	Rate%	
2006111	0	72	76	97748	4	39	2	20	14	0	20	1	46550	61	51198	39	100
	1	74	71	43038	0	38	0	20	20	0	21	1	20434	43	22604	33	76
	2	78	42	86345	0	46	0	23	8	0	23	1	42707	63	43638	37	100
	3	81	73	29496	7	19	1	10	49	0	11	2	12321	26	17175	25	51
	4	83	72	81753	28	23	5	13	9	0	15	7	26437	38	55316	62	100
	5	75	67	84807	51	19	0	9	8	0	11	2	19873	24	64934	76	100
	6	76	67	54830	74	1	0	0	22	0	1	1	6692	14	48138	70	84
	7	79	73	20849	49	1	0	0	48	0	1	1	5186	11	15663	23	34
	8	80	84	55713	7	28	4	14	29	0	17	1	25425	54	30288	44	98
	9	73	66	78628	0	44	0	22	10	0	23	1	38405	61	40223	39	100
	10	75	44	69411	0	46	0	23	8	0	22	1	34784	61	34627	39	100
	11	79	43	44232	2	33	1	18	26	0	18	1	20872	44	23360	34	78
	12	80	75	82323	23	21	5	12	15	0	13	11	25911	37	56412	63	100
	13	74	65	70722	45	21	0	11	4	0	11	6	16685	28	54037	72	100
	14	70	69	76302	65	9	0	4	16	0	5	2	12665	17	63637	83	100
	15	71	76	30882	56	2	0	1	40	0	1	1	6766	14	24116	35	49
	16	74	84	36487	1	36	1	17	25	0	19	2	17530	37	18957	28	65
	17	77	71	93490	4	40	2	20	11	0	22	1	44090	60	49400	40	100
	18	80	49	41029	0	36	0	17	27	0	19	0	20159	42	20870	31	73
	19	82	40	70448	0	44	1	20	10	0	24	1	34604	60	35844	40	100
	20	73	80	55184	15	17	1	8	30	0	11	18	17225	36	37959	55	91
	21	75	64	89754	33	27	4	15	0	0	16	6	27341	34	62413	66	100
	22	77	68	90000	67	7	0	4	17	0	3	2	14201	15	75799	85	100
	23	79	76	31094	62	2	0	1	34	0	1	1	5681	12	25413	37	49

End of report for this VTSS. Records read: 864, 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
- Application Data/Activity - represents compressed data moved through the VTSS as a direct result of mainframe host mounts, including data read/written by MVS jobs and the corresponding migrates and recalls triggered by those MVS mounts.
- System Data/Activity - represents compressed data moved through the VTSS as part of VSM's internal data management, including VTV reclaims (as part of MVC housekeeping) and VTSS clustering activity.

- Staged data describes data that is read from the VTSS disk buffer array into its semiconductor memory. Staged data includes data that is read by an MVS host and VTVs that are migrated to MVCs.
- Destaged data describes data that is written to the VTSS disk array from its semiconductor memory. Destaged data includes data that is written by MVS and VTVs that are recalled from MVCs.

# VTSS Mounts Report

---Period---		<-----Stats for this VTSS----->										<---Bytes transferred-->			
Date	Hour	Device type or workload	VTD-mounts		Cache	RTD	Total-time		Average-time		Maximum-time		Read	Written	Total
			Scratch	Nonscr	hit %	mounts	Scratch	Nonscr	Scratch	Nonscr	Scratch	Nonscr			
2006040	00	All Devs	77	0	0	11	0	0	0	0	0.1	0	311K	28G	28G
	01	All Devs	109	0	0	7	10	0	0.1	0	2.4	0	446K	53G	53G
	02	All Devs	88	52	96	19	8.8	208	0.1	4.0	1.8	99	41G	44G	85G
	03	All Devs	297	109	89	10	29	1515	0.1	13	7.7	156	56G	70G	126G
	04	All Devs	112	201	100	12	0	0	0	0	1.1	1.2	210G	21G	231G
	05	All Devs	12	75	100	14	0	0	0	0	0.1	1.7	85G	3055M	88G
	06	All Devs	38	7	100	18	0	0	0	0	0.1	0.1	6112M	1995M	8108M
	07	All Devs	202	12	50	17	20	553	0.1	46	3.2	99	29G	157G	187G
	08	All Devs	65	0	0	11	0	0	0	0	0.1	0	294K	51G	51G
	09	All Devs	151	0	0	9	0	0	0	0	2.4	0	614K	69G	69G
	10	All Devs	76	37	97	20	7.6	111	0.1	3.0	1.8	99	11G	21G	32G
	11	All Devs	266	103	87	11	26	1380	0.1	13	7.7	156	83G	67G	150G
	12	All Devs	156	161	100	8	15	241	0.1	1.5	1.1	135	144G	47G	191G
	13	All Devs	12	116	100	12	0	0	0	0	0.1	1.7	128G	3275M	132G
	14	All Devs	7	27	100	18	0	0	0	0	0	0.1	31G	786M	32G
	15	All Devs	135	12	50	22	0	553	0	46	0.4	99	29G	106G	135G
	16	All Devs	129	0	0	9	12	0	0.1	0	3.2	0	585K	93G	93G
	17	All Devs	151	0	0	9	0	0	0	0	2.4	0	610K	62G	62G
	18	All Devs	74	19	95	10	7.4	98	0.1	5.2	1.8	99	2367M	21G	24G
	19	All Devs	236	117	89	24	0	1380	0	11	1.4	156	88G	72G	160G
	20	All Devs	110	125	100	4	33	250	0.3	2.0	7.7	135	107G	41G	148G
	21	All Devs	124	138	100	12	0	0	0	0	1.1	1.7	153G	22G	175G
	22	All Devs	6	44	100	20	0	0	0	0	0	0.1	47G	782M	48G
	23	All Devs	81	9	78	18	0	189	0	21	0.3	94	17G	88G	105G
Daily total		All Devs	2714	1364	95	325	172	6480	0	4.7	7.7	156	1268G	1142G	2410G
Period		All Devs	2714	1364	95	325	172	6480	0	4.7	7.7	156	1268G	1142G	2410G

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 17:55:53		StorageTek EXP R			Customer Company Name				Page 31		
2002.199									Job:T610151R XPRREP038		
-----											
VTSS Residency Report For System ALL											
VTSSID: VTSS1											
Date range:2002150 to 2002150											
-----											
---Period---		Total no	No VTVs	% of VTVs	Total no	No of	Avg idle time	Avg res time	No of migr	% of migr	
Date	Hour	of VTVs	cycled in	cycled	of VTVs	migr VTVs	(DD.HH:MM)	(DD.HH:MM)	VTVs missing	VTVs missing	
		scratched	buffer	in buffer	deleted	deleted			res target	res target	
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 17:55:53		StorageTek EXP R 5.0			Customer Company Name				Page 32		
2002.199									Job:T610151R XPRREP038		
-----											
VTSS Residency Report For System ALL											
VTSSID: VTSS1											
Date range:2002150 to 2002150											
-----											
Management class: --None--		Residency target: 0.00:00				Management class: MIGRIND		Residency target: 1.00:00			
-----		-----				-----		-----			
---Period---		No of	Avg idle	Avg res	No of migr	% of migr	No of	Avg idle	Avg res	No of migr	% of migr
Date	Hour	migr VTVs	migr VTVs	migr VTVs	VTVs missed	VTVs missed	migr VTVs	migr VTVs	migr VTVs	VTVs missed	VTVs missed
		deleted	(DD.HH:MM)	(DD.HH:MM)	res tgt	res tgt	deleted	(DD.HH:MM)	(DD.HH:MM)	res tgt	res tgt

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 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				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 SMF 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.
- **VTV COPIED:** the VTV was replicated between two clustered VTSS boxes. RT/QT/TT are respectively Replication Time (the total of QT+TT), Queuing Time (time from VTV dismount to start of transmission), Transmission Time (time to transmit the VTV on a CLINK). These are all in seconds. The size of the VTV is given in Kb or Mb and the transmission rate is stated as Kb per second.

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, and read.

**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.

For each entry, the following additional information is provided:

- **OBSERVATION:** The current events count or measurement within this hour (for example, the 69<sup>th</sup> 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%).

## VTSS Thresholds Exceptions Report

Tue, 14 Feb 2006		StorageTek		EXPR 6.1.0		XYZ Company		Page 2				
23:43:46		2006.045						Job:T610REPS				
								XPRREP036				
-----												
VTSS Threshold Exceptions Report for System ALL								Date range: 2006040 to 2006040				
VTSSid: VTSS01												
-----												
VTSS- THRESHOLD values ==>	VTD mnts scratch	VTD mnts non-scr	Mnt time scratch	Mnt time non-scr	Diskbufr utiliztn	Chnl-int -busy	VTV- recalls	VTV- migrates	VTV- reclaims	MVC- mounts	Max-RTDs	Max-VTDs
	( 100)	( 100)	( 5)	( 60)	( 78)	( 0)	( 50)	( 50)	( 50)	( 40)	( 6)	( 50)
Date Hour												
2006040 1	=> 109<=	0	2.4	0	78	18	0	0	30	7	2	5
2	88	52	1.8	=> 99<=	=> 80<=	29	2	0	=> 64<=	19	3	13
3	=> 297<=	=> 109<=	=> 7.7<=	=> 156<=	58	42	12	0	0	10	2	27
4	=> 112<=	=> 201<=	1.1	1.2	60	69	0	0	30	12	2	29
7	=> 202<=	12	3.2	=> 99<=	68	51	6	0	=> 57<=	17	3	19
9	=> 151<=	0	2.4	0	77	21	0	0	27	9	2	5
10	76	37	1.8	=> 99<=	=> 79<=	14	1	0	=> 68<=	20	3	13
11	=> 266<=	=> 103<=	=> 7.7<=	=> 156<=	=> 80<=	50	13	0	13	11	3	20
12	=> 156<=	=> 161<=	1.1	=> 135<=	60	56	0	0	10	8	2	29
13	12	=> 116<=	0.1	1.7	61	39	0	0	45	12	2	12
15	=> 135<=	12	0.4	=> 99<=	65	35	6	0	=> 80<=	22	3	19
16	=> 129<=	0	3.2	0	71	32	0	0	16	9	2	15
17	=> 151<=	0	2.4	0	75	17	0	0	31	9	2	5
18	74	19	1.8	=> 99<=	=> 79<=	12	1	19	43	10	3	7
19	=> 236<=	=> 117<=	1.4	=> 156<=	=> 80<=	26	13	0	40	24	3	20
20	=> 110<=	=> 125<=	=> 7.7<=	=> 135<=	59	45	0	0	5	4	2	27
21	=> 124<=	=> 138<=	1.1	1.7	61	51	0	0	37	12	2	29
23	81	9	0.3	=> 94<=	64	25	2	0	=> 72<=	18	3	14

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 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

Date		Hour	Device type	Drive utilization(%)		No	Percentage of time drives were in use																VTSS-THRESHOLD		
Date		Hour	or workload	scratch	non-scr	devs	No of in use VTDs																MAX-VTDS ( 0)		
Date		Hour					0	1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61		
-----																									
VTSS Utilization Report For System ALL																									
VTSSid: VTSS01																									
Date range: 2006040 to 2006040 (254 74)																									
-----																									
2006040	00		All Devs	2	0	64	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	01		All Devs	3	0	64	0	98	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	02		All Devs	7	0	64	0	39	55	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	03		All Devs	5	4	64	8	33	24	20	10	5	0	0	0	0	0	0	0	0	0	0	0	0	
	04		All Devs	2	16	64	0	0	13	69	9	5	2	3	0	0	0	0	0	0	0	0	0	0	
	05		All Devs	0	3	64	3	86	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	06		All Devs	0	0	64	80	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	07		All Devs	7	0	64	16	37	17	23	7	0	0	0	0	0	0	0	0	0	0	0	0	0	
	08		All Devs	3	0	64	7	82	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	09		All Devs	3	0	64	0	98	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10		All Devs	5	0	64	0	68	31	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	11		All Devs	6	4	64	5	25	40	25	2	3	0	0	0	0	0	0	0	0	0	0	0	0	
	12		All Devs	3	12	64	3	15	7	54	9	7	2	3	0	0	0	0	0	0	0	0	0	0	
	13		All Devs	0	6	64	0	61	19	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	14		All Devs	0	0	64	61	39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	15		All Devs	3	0	64	35	44	7	8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	
	16		All Devs	6	0	64	7	58	19	11	5	0	0	0	0	0	0	0	0	0	0	0	0	0	
	17		All Devs	3	0	64	0	98	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	18		All Devs	3	0	64	0	94	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	19		All Devs	6	3	64	0	29	48	19	2	3	0	0	0	0	0	0	0	0	0	0	0	0	
	20		All Devs	1	8	64	8	28	10	49	2	2	0	0	0	0	0	0	0	0	0	0	0	0	
	21		All Devs	2	10	64	0	40	19	25	7	5	2	3	0	0	0	0	0	0	0	0	0	0	
	22		All Devs	0	1	64	37	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	23		All Devs	2	0	64	60	25	7	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
-----																									
VTSS Utilization Report For System ALL																									
VTSSid: VTSS01																									
Date range: 2006040 to 2006040 (254 74)																									
-----																									
Date	Hour	No of devices	Percentage of time drives were in use																						
			0	10	20	30	40	50	60	70	80	90	100												
2006040	00	001	----->																						
		002	----->																						
		003	---->																						

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 in the report using a banded approach, where the first column represents the percent of time that one to four drives were in use and the next column represents the percent of time that five to eight drives were in use, and so on.
- **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.





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