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<td>Limitations</td>
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<tr>
<td>Format</td>
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<tr>
<td>Limitations</td>
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<tr>
<td>Format</td>
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<tr>
<td>Parameters</td>
</tr>
<tr>
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As part of an effort to improve its product lines, EMC periodically releases revisions of its software and hardware. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Contact your EMC technical support professional if a product does not function properly or does not function as described in this document.

Note: This document was accurate at publication time. New versions of this document might be released in EMC Online Support. Check EMC Online Support to ensure that you are using the latest version of this document.

Purpose

This document shows how to install, configure, and use ResourcePak for z/TPF.

Audience

This guide is for system programmers and operators who install and use ResourcePak for z/TPF.

Related documentation

The following EMC publications provide additional information:

- *EMC Product Suite for z/TPF Release Notes*
- *EMC SRDF Controls for z/TPF Product Guide*
- *EMC TimeFinder Controls for z/TPF Product Guide*
- *EMC VMAX3 Family with HYPERMAX OS Product Guide*

Conventions used in this document

EMC uses the following conventions for special notices:

Note: A note presents information that is important, but not hazard-related.

IMPORTANT

An important notice contains information essential to software or hardware operation.
Preface

Typographical conventions

EMC uses the following type style conventions in this document:

**Normal** Used in running (nonprocedural) text for:
- Names of interface elements, such as names of windows, dialog boxes, buttons, fields, and menus
- Names of resources, attributes, pools, Boolean expressions, buttons, DQL statements, keywords, clauses, environment variables, functions, and utilities
- URLs, pathnames, filenames, directory names, computer names, links, groups, service keys, file systems, and notifications

**Bold** Used in procedures for:
- Names of interface elements, such as names of windows, dialog boxes, buttons, fields, and menus
- What the user specifically selects, clicks, presses, or types

**Italic** Used in all text (including procedures) for:
- Full titles of publications referenced in text
- Emphasis, for example, a new term
- Variables

**Courier** Used for:
- System output, such as an error message or script
- URLs, complete paths, filenames, prompts, and syntax when shown outside of running text

**Courier bold** Used for specific user input, such as commands

**Courier italic** Used in procedures for:
- Variables on the command line
- User input variables

<> Angle brackets enclose parameter or variable values supplied by the user

[] Square brackets enclose optional values

| Vertical bar indicates alternate selections — the bar means “or”

{} Braces enclose content that the user must specify, such as x or y or z

... Ellipses indicate nonessential information omitted from the example

In addition to the command example conventions described above, the following rules apply to the command syntax descriptions:

- **Capitalization** indicates the portions of keywords that must be typed (for example, **ALL** or **GROup**). They must be spelled exactly as shown.

**Variables** appear in lowercase and italics (for example, **ccccccccc**). They represent user-supplied names or values in the syntax.
Where to get help

EMC support, product, and licensing information can be obtained through EMC Online Support as described next.

**Note:** To open a service request through EMC Online Support, you must have a valid support agreement. Contact your EMC sales representative for details about obtaining a valid support agreement or to answer any questions about your account.

**Product information**

For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to EMC Online Support (registration required) at:

https://support.EMC.com

**Technical support**

EMC offers a variety of support options.

**Support by Product** — EMC offers consolidated, product-specific information on the Web at:

https://support.EMC.com/products

The Support by Product web pages offer quick links to Documentation, White Papers, Advisories (such as frequently used Knowledgebase articles), and Downloads, as well as more dynamic content, such as presentations, discussions, relevant Customer Support Forum entries, and a link to EMC Live Chat.

**EMC Live Chat** — Open a Chat or instant message session with an EMC Support Engineer.

**Your comments**

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to:

techpubcomments@emc.com
Preface
CHAPTER 1
Product Overview

This chapter provides an introduction to ResourcePak for z/TPF.

◆ Introduction ........................................................................................................ 16
◆ The EMC Product Suite for z/TPF ................................................................. 16
◆ ResourcePak for z/TPF and z/VM ................................................................. 16
Introduction

EMC® ResourcePak® for z/TPF (Transaction Processing Facility) is a collection of EMC utility programs that provide feature functionality, configuration and statistical reporting, and extended features for SRDF Controls for z/TPF and TimeFinder Controls for z/TPF.

The EMC Product Suite for z/TPF

ResourcePak for z/TPF is one component of the EMC Product Suite for z/TPF. In addition to ResourcePak, the suite consists of:

- TimeFinder Controls for z/TPF
- SRDF Controls for z/TPF

ResourcePak for z/TPF and z/VM

When running z/TPF under z/VM on a storage system, ResourcePak for z/TPF requires that volumes through which SymmAPI macros are to be issued, be defined as unsupported devices. At Enginuity levels 5874 and later, the ResourcePak for z/TPF requirement for unsupported devices under z/VM no longer applies.

**Note:** Contact your EMC representative for more information about running EMC software products under z/VM.
CHAPTER 2
Installation

This chapter shows how to install ResourcePak for z/TPF:

- Preparation ................................................................. 19
- Download the ResourcePak for z/TPF distribution kit .................. 21
- Customize the z/TPF source ................................................. 22
- Install ResourcePak for z/TPF ............................................... 23
**Overview**

Installing ResourcePak for z/TPF has the following stages:

1. Preparation.
2. Download the distribution kit.
3. Customize the z/TPF source.
4. Install ResourcePak for z/TPF.

This chapter shows how to complete each stage.

**Conventions**

This chapter uses these conventions:

- *prod* represents a product name.
- *vrm* represents the version, release, and modification level of a software product.
Preparation

Before installing ResourcePak for z/TPF:

- Ensure that your storage systems meet the hardware and software requirements.
- Check the EMC Online Support website for any product updates or current release notes.

Hardware and software requirements

Storage systems

ResourcePak for z/TPF requires the hardware and software shown in Table 1. Make sure your storage systems meet these requirements.

Table 1 Storage system requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>All currently-supported DMX, VMAX, and VMAX 3 storage systems.</td>
</tr>
<tr>
<td>Enginuity™ release</td>
<td>5773 and higher and HYPERMAX OS 5977 and higher, a b c</td>
</tr>
</tbody>
</table>

a. Chapter 4 defines the minimum requirements for each utility.
b. The minimum supported release level was accurate at the time of the publication of this document, but is subject to change. Please check the Release and End of Life Service Dates on EMC Online Support.com for the most current information.
c. 5876 and higher is required for Offline Module Access support.

z/TPF mainframe

Table 2 shows the mainframe hardware and software requirements for ResourcePak for z/TPF. Make sure your mainframe system meets these requirements:

Table 2 Mainframe hardware and software requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Configuration</td>
<td>Any system that supports current IBM mainframe operating systems.</td>
</tr>
<tr>
<td>Software</td>
<td>z/TPF 1.1 or higher.</td>
</tr>
</tbody>
</table>

Version compatibility

If you install any combination of TimeFinder Controls for z/TPF, SRDF Controls for z/TPF, and ResourcePak for z/TPF on to the z/TPF complex, they must all have the same version number. For example, ResourcePak for z/TPF V8.0.0 and SRDF Controls for z/TPF V8.0.0.
Download maintenance updates

**Note:** If there is no current maintenance update, keep these instructions for future use when you do need to download maintenance updates.

You can download the latest maintenance updates and current release or service notes (identical to release notes) from the EMC Online Support website:

https://support.EMC.com

Register as a valid EMC customer so you can access EMC Online Support. Make sure, as well, that your license for this software is registered. If it is not, you cannot access the download section of the website.

On the page for your product, there are files for different product versions. For your version, you may see the following types of files:

- **ReadMe_vrm_Fixes.txt** - contains information about the release.
- **Service_Notes_prodvrm.pdf** - contains information discovered after initial release of the product.
- **prodvrm_fixes.zip** - contains the previous two documents as well as a software patch file and instructions on how to apply this maintenance.

To download these files:

1. Log in to:
   
   https://support.EMC.com

2. Choose **Support > Downloads > ResourcePak for z/TPF** to display a table of .zip files and document files.

3. Do one of the following:

   - To download a copy of a document, click either **ReadMe_prodvrm_Fixes.txt** or **Service_Notes_prodvrm.pdf**.
   - To download the zip file, click **prodvrm_fixes.zip**. Download the zip file to your home system, unpack the zip file, and follow the instructions it contains.

**IMPORTANT**

Do not apply any maintenance update until after ResourcePak for z/TPF is accepted.
Download the ResourcePak for z/TPF distribution kit

The ResourcePak for z/TPF distribution kit consists of a tar file for LINUX file systems. This tar file may be packaged on a CD or as an electronic download from EMC Online Support.

To extract the ResourcePak tar file to your LINUX file system:

1. Do one of the following:
   - Installing from a CD:
     a. Mount the CD on an open system host.
     b. Copy the contents of the CD to a working directory.
   - Installing from an EMC Online Support download:
     a. Log into a privileged account on an open systems host (root on UNIX or administrator on Windows).
     b. Allocate a working directory on the open system for the installation.
     c. Log onto the Online Support website.
     d. Choose Support > Downloads > ResourcePak for z/TPF from the Online Support home page and select your product.

       Note: If you are not able to access this location, you may not have registered your software or you may have registered it incorrectly. Follow the prompts to register your software, correct your registration, or contact EMC if there is a problem.

       The page for the selected product appears.
     e. Select the product version you want to download. The product version consists of a tar file and the installation instructions.
     f. Download the installation kit into the working directory on the open system.

2. If your host is a Windows system, copy the tar file in the working directory and use FTP to transfer the tar file to LINUX.

   ftp hostname
   (username and password prompts)
   cd..
   25....is working directory name prefix binary 200 Representation type is image

   put ZTRPvrm.tar ZTRPvrm.tar

3. From LINUX:
   a. List the contents of the tar file:

      tar -tvf ZTRPvrm.tar

   b. Extract the contents of the tar file:

      tar -xvf ZTRPvrm.tar
This produces the following files:

<table>
<thead>
<tr>
<th>File name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPReadMe</td>
<td>A ReadMe file</td>
</tr>
<tr>
<td>RPRelNotes</td>
<td>Release Notes for ResourcePak for z/TPF 8.0.0</td>
</tr>
<tr>
<td>/TRPvrm_OBJ</td>
<td>ResourcePak for z/TPF shared object</td>
</tr>
<tr>
<td>/TRPvrm_SRC</td>
<td>ResourcePak for z/TPF source and macros</td>
</tr>
<tr>
<td>/TRPvrm_SAM</td>
<td>ResourcePak for z/TPF sample source and macros</td>
</tr>
</tbody>
</table>

### Customize the z/TPF source

Table 3 describes z/TPF source customization required for ResourcePak. Sample code for z/TPF is included in the TRPvrm_SAM distribution file.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>umet.asm</td>
<td>Add ZUDCP, ZUDVQ, ZUECS, ZUEDS, ZUERM, ZUFRT, ZUGRP, ZULOC, and ZUVTP as BSS only functional entries. Add ZUCPY and ZUOMA as subsystem-unique entries.</td>
</tr>
<tr>
<td>usr.cntl</td>
<td>Add entries for E1Sx and E1Ax program segments. For z/TPF, run the appropriate off-line jobs to generate the allocator source (TABLEXX) and PAT source (IPATxx). EMC recommends that all E1Ax and E1Sx segments be allocated for the BSS to reserve program names for any future expansion of EMC ResourcePak for z/TPF.</td>
</tr>
<tr>
<td>ucnfeq.maca</td>
<td>Define MDBF subsystem-unique user CINFC, tag UMMEOMA.</td>
</tr>
</tbody>
</table>
| emcueq.macb | Set the global variable &OMA to 1 if Offline Module Access is installed. Otherwise set the variable to 0. (The default setting is 1.)  
  • Set the global variable &QOS to 1 if Quality Of Service controls is installed or to 0 if Quality of Service Controls is not installed. (The default setting is 1.)  
  • Set the global variable &SES to 1 if Session controls is installed or to 0 if Session Controls is not installed. (The default setting is 1.)  
  • Set the global variable &TF to 1 if TimeFinder Controls is installed or to 0 if TimeFinder Controls is not installed. (The default setting is 1.)  
  • Set the global &RDF to 1 if SRDF Controls is installed or to 0 if SRDF Controls is not installed. (The default setting is 1.) |

a. Required for ZUCPY and ZUOMA utilities. TimeFinder Controls for z/TPF is required.
b. Required for Offline Module Access, Session Controls and QOS for z/TPF integration.
Install ResourcePak for z/TPF

To install ResourcePak for z/TPF:

1. Unload ResourcePak for z/TPF into the appropriate source, object, listing, and macro libraries.

2. Review the EMC Online Support website for up-to-date information on SymmAPI and ResourcePak for z/TPF. Download any segments specified as superseding those shipped with your copy of ResourcePak for z/TPF.

   **Note:** “Download maintenance updates” on page 20 provides information about accessing Online Support.

3. Update the appropriate general Functional Message Table for:
   
   - Display Cache Statistics
   - Display Device Configuration
   - Display Device/DA Statistics
   - Display MPLF connection, lock, and attention message information
   - TimeFinder Session Controls
   - Virtual Tape Support Commands
   - Display EMC License Management
   - Display Feature Registration Table
   - Dynamic Cache Partitioning Controls
   - Dynamic RDF Group Controls
   - Offline Module Access
   - Display Point-In-Time Copy

   **Note:** The sample Functional Message Editor Table entries in `umet.asm` contain more information about updating the Functional Message Table.

4. Assemble the general Functional Message Table.

5. Update `emcueq.mac` to indicate whether Offline Module Access, QOS Controls, Session Controls, SRDF Controls, and TimeFinder Controls are installed.

6. Define MDBF subsystem user CINFC tag UMMEOMA. Refer to sample `ucnfseq.mac` statements.

7. Update the BasicSubsystem Allocators with the program input cards for ResourcePak and SymmAPI for z/TPF.

   The sample program allocation input deck in `usr.cntl` provides a model for updating the Allocators.

   **Note:** If TimeFinder Controls for z/TPF or SRDF Controls for z/TPF is installed, some of the OCO program segments are already allocated.

8. Generate the BasicSubsystem SAL table (`TABLExx`) and program allocation table (`IPATxx`).
9. Assemble the Basic Subsystem IPAT.xx.

10. Using the program directory as a reference, determine which segments should be loaded to the BSS.

**Note:** If either TimeFinder Controls for z/TPF or SRDF Controls for z/TPF is installed, ensure that the compatible version of ResourcePak for z/TPF is loaded.
# CHAPTER 3

## ResourcePak Operation

This chapter describes the ResourcePak utilities.

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- **MPLF connection, lock, and attention message information display** .......... 28
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- **Session Controls for z/TPF** .................................... 30
- **Dynamic Cache Partitioning (DCP)** .......................... 31
- **Dynamic RDFGroup Controls** ................................. 32
- **Display Electronic License Management Entitlements** ....... 32
- **Display Feature Registration Table** .......................... 32
- **Storage Resource Pool Management** .......................... 32
- **EMC Virtual Tape Controls** ..................................... 32
- **Offline module access for z/TPF** .............................. 33
Introduction

ResourcePak for z/TPF is a collection of EMC utility programs that provide feature functionality, configuration and statistical reporting, and extended features for SRDF Controls for z/TPF and TimeFinder Controls for z/TPF.

ResourcePak for z/TPF consists of the utilities shown in Table 4.

Table 4 ResourcePak for z/TPF utilities

<table>
<thead>
<tr>
<th>Utility</th>
<th>Function</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZUCPY</td>
<td>Displays Point-in-Time Copy and provides access to data from a point-in-time copy created by TimeFinder for z/TPF using clone target devices.</td>
<td>44</td>
</tr>
<tr>
<td>ZUDCP</td>
<td>Create, modify, and display EMC Dynamic Cache Partitions on a storage system.</td>
<td>46</td>
</tr>
<tr>
<td>ZUDVQ</td>
<td>Display Device Configuration and provide configuration information about logical devices in a storage system.</td>
<td>57</td>
</tr>
<tr>
<td>ZUECS</td>
<td>Display Cache Statistics and provide statistical information about the channel adapters in a storage system.</td>
<td>62</td>
</tr>
<tr>
<td>ZUEDS</td>
<td>Display device Statistics and statistical information about the disk adapters in a storage system.</td>
<td>65</td>
</tr>
<tr>
<td>ZUELM</td>
<td>Display EMC License Management entitlements.</td>
<td>68</td>
</tr>
<tr>
<td>ZUFRT</td>
<td>Display the EMC Feature Registration Table of a storage system.</td>
<td>70</td>
</tr>
<tr>
<td>ZUGRP</td>
<td>Add, delete and display information for one or more RDFGroups in a storage system identified by an SDA and a multi-hop list.</td>
<td>73</td>
</tr>
<tr>
<td>ZULOC</td>
<td>Display MPLF connection and lock or active attention messages for a SSID or active attention messages for a SSID for the issuing z/TPF host.</td>
<td>79</td>
</tr>
<tr>
<td>ZUOMA</td>
<td>Displays an in-core table containing control data and a target status table derived from the TimeFinder for z/TPF data structures.</td>
<td>82</td>
</tr>
<tr>
<td>ZUSRP</td>
<td>Display information on Storage Resource Pools (SRP) and update the Reserved Capacity Limit of a SRP on VMAX 3.</td>
<td>86</td>
</tr>
<tr>
<td>ZUVTP</td>
<td>Load and display requests on supported virtual tape controllers. describes ZUVTP.</td>
<td>93</td>
</tr>
</tbody>
</table>

ResourcePak for z/TPF also contains software extensions for both:
- TimeFinder Controls for z/TPF
- SRDF Controls for z/TPF

Quality of Service (QOS) Controls for z/TPF is an extension for both TimeFinder and SRDF Controls for z/TPF. Use QOS Controls for z/TPF to display and define the Quality of Service values for a group. The QOS values can be displayed and set when user exits are activated in the TimeFinder and SRDF Scheduler and Monitor.
Session Controls for z/TPF is an extension for TimeFinder Controls for z/TPF. Use Session Controls for z/TPF to display and terminate TimeFinder/Clone sessions and snapshots associated with the source or target of a TimeFinder device pair. Session Controls allows termination of TimeFinder sessions or snapshots for device pairs in other TimeFinder groups. Use this facility with care.

Offline Module Access for z/TPF is an extension for TimeFinder Controls for z/TPF that maintains and displays memory resident tables. You can use Offline Module Access for z/TPF to run the Find Data Recovery Software Copy (FDRSC) macro. Use the ZUOMA functional entry to control Offline Module Access for z/TPF.

Display Device Configuration

Display Device Configuration (see page 57) is a utility that displays the relationship of the internal logical devices to physical devices within a storage system.

Display Cache Statistics

Display Cache Statistics (see page 62) is a utility that displays cache statistics for all channel directors of the storage system designated by the input z/TPF SDA.

Display Cache Statistics updates the statistics in global memory as a low priority task. Cache statistics may be updated as infrequently as every 4 seconds.

Statistics are calculated on a short and long timer interval.

Enginuity or HYPERMAX OS provides the long-term statistics. To maintain consistency in the returned display, the API internally issues an EVNTW for a minimum of five seconds and calculates the short-term statistics for you.

Note: This action adds a delay to the response from ZUECS.

The long timer interval is the time since the last IML of the storage system or the last time global statistics were cleared through a service processor inline command.

EMC Device/DA Performance Statistics display

Display Device/DA Statistics (see page 65) is a utility that displays Disk Adaptor statistics for all DAs of the storage system designated by the input z/TPF SDA. For Enginuity 5876 and earlier, you can also use the utility to display backend statistics for a range of device numbers specified in the input message.

DA Statistics are calculated on a short and long timer interval.

For the DA and Device option, the API internally issues an EVNTW for a minimum of five seconds and calculates the statistics during that term. The DA display long timer interval is the time since the last IML of the storage system or the last time global statistics were cleared through a service processor inline command.
MPLF connection, lock, and attention message information display

The MPLF utility (see page 79) displays:

- Multi-Path Lock Facility (MPLF) connection information
- Active MPLF locks
- Active MPLF attention messages for the z/TPF host issuing the message and the SSID designated by the input SDA

The information provided is for the SSID that the supplied SDA identifies.

MPLF processing takes approximately eight seconds. The MPLF structures for the connected z/TPF hosts and the SSID designated by the SDA are displayed followed by the active locks for the processor where the functional input was made and the SSID that the SDA identifies. The display contains only those locks that are active throughout the processing of the message.

For Attention messages, processing takes approximately five seconds. The display contains all active attention messages queued on the connect device associated with the SSID that the supplied SDA identifies.

Quality of Service Controls for z/TPF

Quality of Service (QOS) Controls for z/TPF utility allows you to define the Quality of Service value for an SRDF group or a TimeFinder group. The QOS value for an SRDF group determines the priority given to SRDF copy tasks: full or partial volume synchronization in both synchronization directions, R1 to R2 and R2 to R1.

The QOS value for a TimeFinder group determines the priority given to the following TimeFinder copy tasks:

- Establish
- Re-Establish
- Restore
- Incremental Restore

These capabilities are available on Enginuity 5773 to 5876.

Setting the QOS value for all TimeFinder or RDF pairs in a group is an automated process. Setting the QOS value is initiated in user exits provided for TimeFinder and SRDF Controls for z/TPF. You only need to define the QOS value as a general property of the TimeFinder or SRDF Group. Enable QOS Controls for z/TPF to initiate the process of setting the QOS value for the TimeFinder or SRDF Group.

Defining the QOS value for a TimeFinder or SRDF Group sets an indicator in the group control record. The QOS Controls utility sets QOS values for the TimeFinder or SRDF Group based on the value of the indicator for the Group. The QOS Controls utility clears this indicator if the defined QOS value is set in one or more sets in the TimeFinder or SRDF Group.

The QOS Controls utility also displays QOS values by group and set for TimeFinder Controls for z/TPF and SRDF Controls for z/TPF.
Enabling QOS Controls for z/TPF

**IMPORTANT**
The procedure to enable QOS Controls for z/TPF assumes that ResourcePak for z/TPF version 8.0.0 has been pre-loaded along with either or both of SRDF Controls for z/TPF version 8.0.0 and TimeFinder Controls for z/TPF version 8.0.0.

To enable QOS Controls for z/TPF for SRDF Controls for z/TPF and TimeFinder Controls for z/TPF:

1. Set the &QOS global variable defined in the EMC User Equate Macro, emcueq.mac:
   
   ![Code snippet](&QOS SETB 1 QOS installed)

   **Note:** emcueq.mac is distributed with SRDF Controls for z/TPF and TimeFinder Controls for z/TPF.

2. Assemble the EMC User Exit e1a0.asm with emcueq.mac to enable QOS Controls for z/TPF.

   **Note:** e1a0.asm is distributed with SRDF Controls for z/TPF and TimeFinder Controls for z/TPF.

3. Load E1A0.so to the z/TPF system.

**SRDF Controls for z/TPF**

The Monitor uses the QOS Controls utility to set the QOS value for all RDF pairs in an SRDF Group when both of the following conditions apply:

- An SRDF Group is being synchronized
- The Monitor is active when you define the QOS value for that SRDF group

Otherwise, the Scheduler uses the QOS Controls utility to set the QOS value for all RDF pairs in the SRDF group the next time you issue an SRDF operation describing the source (R1) devices to the SRDF sets.

The operations you can issue to source (R1) devices include:

- Admax
- Suspend
- Resume
- Rdy
- Nrdy
- Invalidate
- Validate
- Refresh
- Rfr-resume
- Mode
- Write-enable
Dynamic RDF commands Crtpair, Delpair, and Swapair also run the QOS Controls utility. However, this happens only if the SRDF orientation indicates that the local storage system contains the source (R1) devices. A change of direction in synchronization runs the QOS Controls utility. However, this happens only if the SRDF orientation indicates that the sets contain the source (R1) devices.

**TimeFinder Controls for z/TPF**

If a TimeFinder Group is being synchronized and the Monitor is active at the time you define the QOS value for that TimeFinder Group, the Monitor runs QOS Controls and sets the QOS values for all TimeFinder pairs in the TimeFinder group when both of the following conditions apply:
- A TimeFinder Group is being synchronized
- The Monitor is active at the time you define the QOS value for that TimeFinder Group

Otherwise, the Scheduler runs QOS Controls and sets the QOS value for all TimeFinder pairs in the TimeFinder Group the next time you start one of these TimeFinder operations:
- Establish
- Re-establish
- Split
- Clip
- Restore
- Incremental Restore

**Session Controls for z/TPF**

Session Controls for z/TPF is a feature extension for TimeFinder Controls for z/TPF. With Session Controls for z/TPF, you can:
- Display and Terminate TimeFinder/Clone sessions and snapshots associated with:
  - The source of a TimeFinder device pair
  - The target of a TimeFinder device pair
  - Both the source and target of a TimeFinder device pair
You can terminate TimeFinder sessions and snapshots for device pairs in other TimeFinder groups. Use Session Controls for z/TPF with caution.
- Display all TimeFinder sessions and snapshots associated with the source or target devices in a TimeFinder Group. This includes TimeFinder sessions and snapshots on the source or target devices associated with a device not in the TimeFinder group.
- Delete a specified TimeFinder session or snapshot on:
  - The source device in a TimeFinder Group
  - The target device in a TimeFinder Group
  - Both the source and target devices in a TimeFinder Group
- Delete TimeFinder Clone session identifiers by specifying the four-character TimeFinder session ID.
- Delete TimeFinder SnapVX snapshots by specifying the eight character TimeFinder snapshot identifier.
Enabling Session Controls for z/TPF

**IMPORTANT**
The procedure to enable Session Controls for z/TPF assumes that ResourcePak for z/TPF version 8.0.0 has been pre-loaded along with TimeFinder Controls for z/TPF version 8.0.0.

To enable Session Controls for z/TPF for TimeFinder Controls for z/TPF:

1. Set the &SES global variable defined in the EMC User Equate Macro, emcueq.mac:
   
   ```
   &SES SETB 1 Session Controls installed
   ```

   **Note:** emcueq.mac is distributed with SRDF Controls for z/TPF and TimeFinder Controls for z/TPF.

2. Assemble the EMC User Exit e1a0.asm with emcueq.mac to enable Session Controls for z/TPF.

   **Note:** e1a0.asm is distributed with SRDF Controls for z/TPF and TimeFinder Controls for z/TPF.

3. Load E1A0.so on to the z/TPF system.

Session Controls and ZUTIM DISplay and ZUTIM TERminate

Session Controls for z/TPF enables extended functionality for the ZUTIM DISplay entry and the ZUTIM TERminate entry. The EMC TimeFinder Controls for z/TPF Product Guide contains the syntax and examples of these commands.

Dynamic Cache Partitioning (DCP)

Dynamic Cache Partitioning (DCP) (see page 46) is a licensed feature available as an option in Enginuity 5773 and later. Use DCP to define up to eight cache partitions and associate devices as members of those partitions. The partitions are not static and you can specify minimum and maximum sizes.

To allow dynamic management of each partition, you specify periods at which partitions can donate to one another. This allows busy partitions to receive cache donations from less busy partitions, up to their specified maximum. The minimum values prevent a partition from being starved for cache resources. As with current cache thresholds, write pending limits and destage priority can be set for each partition.

When used in conjunction with SRDF/A, all the devices in the RDFGroup must be in the same cache partition. If not, the request to activate SRDF/A fails.
Dynamic RDFGroup Controls

Use Dynamic RDFGroup Controls (see page 73) to display information for one or more RDFGroups in a storage system that a supplied SDA and multi-hop list identify. With Dynamic RDFGroup Controls you can create RDFGroups between SRDF partner storage systems attached with Fibre Channel or GigE.

ZUGRP is valid only for SRDF partner storage systems that are:

◆ Running Enginuity Microcode 5773 to 5876
◆ Configured with one or more static RDFGroups in a switched SRDF environment

The ZUGRP DISPLAY command shows RDFGroup information for a specified storage system and any or all of its SRDF partner storage systems. You can use the information to determine the correct parameter values to add RDFGroups between SRDF partner storage systems.

For systems running HYPERMAX OS 5977 and later, use the ZURDF GRP commands to create RGFGroups. The SRDF Controls for z/TPF Product Guide shows how to use those commands.

Display Electronic License Management Entitlements

Display Electronic License Management Entitlements is a utility (see page 68) that displays the features or bundles of features that a specified storage system is licensed for and the method that enables those entitlements. For further information regarding Electronic License Entitlements see your EMC Sales Representative.

Display Feature Registration Table

The Feature Registration Table utility (see page 70) registers the usage of the different features for specified storage system. For further information on Feature Registrations see your EMC Sales Representative.

Storage Resource Pool Management

Use Storage Resource Pool (SRP) Management (see page 86) to display and modify the properties of Storage Resource Pools. The utility is available on systems running HYPERMAX OS 5977 and later.

EMC Virtual Tape Controls

Using the EMC Disk Library for mainframe family of solutions users of IBM System z mainframe can replace physical tape systems with a dynamic, virtual tape solution. Physical tape systems include traditional, virtual tape servers such as the IBM VTS and Oracle/STK VSM.

EMC Virtual Tape Controls is a utility (see page 93) that supports EMC Dlm. With the utility you can load, unload, and query virtual tape drives. There is also a fill option that causes scratch tapes to be loaded automatically whenever one is unloaded. This provides capabilities similar to an Automatic Cartridge Loader.
Offline module access for z/TPF

Offline Module Access for z/TPF provides the ability to read local z/TPF point-in-time copy data from clone targets via the SymmAPI macro FDRSC.

The clone targets must be accessible from the channel and defined in keypoint 0. TimeFinder for z/TPF provides a configuration option to define SDAs for Clone targets intended to be accessed via Offline Module Access for z/TPF.

Access to the point-in-time copy data via Offline Module Access for z/TPF requires that the clone targets be detached from their device pair source via split, and made "User Ready". Access to point-in-time copy data is only permitted if the most recent operation was a Split, Clip or Terminate.

⚠️ CAUTION
Be aware that clone targets that are host accessible and user ready may create duplicate VSN situations during z/TPF roll call.

Offline Module Access for z/TPF maintains and displays memory resident control information and tables. It allows for operation of the EMC SymmAPI for z/TPF macro FDRSC. Offline Module Access for z/TPF is an extension of TimeFinder for z/TPF. This section describes the OMA control data structure.

IMPORTANT
Offline Module Access for z/TPF is supported only on storage systems running Enginuity 5876 or HYPERMAX OS.

Offline Module Access control data block (OCD)

The Offline Module Access control data block (OCD) is an MDBF subsystem-unique heap storage block addressed by the user CINFC tag UMMEOMA. A sample ucnfseq.mac containing the UMMEOMA equate is included on the installation tape.

The OCD consists of two components:
- OCD General Information
- Clone Target Status Table (TST)

Note: Chapter 4 describes the OMA functional entries used to maintain and display the OCD.

OCD general information

OCD general information contains:
- Software version
- Timestamp set at the time the OCD is initialized
- Indicators reflecting status of TimeFinder data structures
- A count and list of DASD subsystem IDs that do not provide the minimum support for OMA
- Miscellaneous TimeFinder information
Target Status Table

The Target Status Table (TST) contains data describing the online data base point-in-time copies at the time of the last TimeFinder operation for each TimeFinder group.

You can calculate the number of 4 K frames of heap storage used for each MDBF subsystem unique OMA Control Data Block as follows:

- The OCD general information is one (1) 4 K frame.
- The TST is ((# SON FSTB slots * 112 + 4096) / 4096) 4 K frames.

Offline Module Access Control Data Refresh

Offline Module Access Control Data Refresh initializes the OCD general information and Target Status Table with information derived from the TimeFinder Control Records allocated on the Basic Subsystem of the z/TPF complex.

Following the completion of every TimeFinder for z/TPF operation or when using the ZUOMA REFRESH entry, TimeFinder for z/TPF automatically refreshes the OCD. Failure to properly refresh the OCD data structures prior to using any dependent utilities, such as ZUCPY, can cause unexpected results.

Segment logic flow

E-type segment E1SE.so controls Offline Module Access Control Data Refresh. The logic flow of this segment is:

1. Calculate # of 4K frames required for the OCD.
2. If the OCD does not exist or the existing OCD is not large enough, return any existing frames and get the correct number of frames for the OCD.
3. Clear the OCD.
4. For each online symbolic module and general file on this MDBF subsystem:
   - Check whether the minimum requirements for OMA (minimum hardware is a VMAX system running Enginuity 5876 and higher or HYPERMAX OS) are met.
   - If not, store the unsupported SSID in the OCD.
5. Store TimeFinder Group count in the OCD.
6. Store the software version in the OCD.
7. Establish the Target Status Table (TST) base address and store it in the OCD.
8. If the TimeFinder Control Records are not allocated on the Basic Subsystem, or they are not initialized, issue an error message and abandon the refresh.
9. For every Point-In-Time Copy Group (TimeFinder Group) defined to TimeFinder for z/TPF, create a target item for every online module in this MDBF subsystem.
10. Store a Refresh Timestamp in the OCD.

1. TimeFinder for z/TPF version 8.0.0 and higher automatically issues the ZUOMA REFRESH entry at the completion of active commands if the TimeFinder program segment e1t3.asm was assembled with the &OMA global variable in macro emcueq.mac set to 1.
Offline Module Access Control Data Display

The Offline Module Access Control Data Display utility shows OCD general information values and Target Status Table contents. The display is MDBF subsystem dependent. The OCD data display contains information such as:

◆ The time of the last OCD table refresh
◆ The OMA software version
◆ The TST core address
◆ List of the local TimeFinder Groups
◆ Count of online unsupported SSIDs

The Target Status Table display shows the detailed information for each z/TPF module displayed. The display includes:

◆ The SDAs of the requested TimeFinder Group’s source and target devices associated with this z/TPF online module at the time of the last OCD refresh
◆ The storage system device number for the source and target devices in this pair for the requested TimeFinder group
◆ The last TimeFinder operation on this pair

Note: “ZUOMA: Control data controls” on page 82 describes the OMA functional entry ZUOMA DISPLAY.

Segment logic flow

E-type segment E1SF.so controls Offline Module Access Control Data Display utility. The logic flow of this segment is as follows:

1. If the OCD does not exist, issue an error message and exit.
2. If Display OCD general information was chosen, collect and display general information.
3. If Display TST was chosen, do one of the following:
   • If the specified TimeFinder Group is invalid, issue an error message and exit.
   • If the TimeFinder Control Records do not exist or were not initialized at the time of the Refresh, issue an error message and exit.
   • If the specified symbolic module is illegal, issue an error message and exit.
   • Determine TimeFinder group and target status item (TSI) base.
   • For the specified count, display the TSI information.
Display Point-in-Time Copy

The Display Point-in-Time Copy utility displays a record from a specified point-in-time copy (TimeFinder Group). The functional entry ZUCPY initiates the display.

To operate this utility:

1. Load the Offline Module Access for z/TPF.

2. Initialize the OMA Control Data Block (OCD) on the MDBF subsystem on which the Display Point-in-Time Copy utility is to execute.

Refresh the OCD following the completion of every TimeFinder for z/TPF operation and before using any dependent utilities. Failure to refresh the OCD may cause unexpected results when using ZUCPY.

Note: “ZUCPY: Display point-in-time copy” on page 44 and “ZUOMA: Control data controls” on page 82 provide more information.

Segment logic flow

E-type segment e1si.asm is the Display Point-In-Time Copy utility. The logic flow of this segment follows:

1. Get 4K data block as the input work block to FDRSC macro.

2. Parse the input message to:
   - Determine whether MCHR or FARF was input and store in FARW of data level 1 as input to FDRSC macro.
   - Validate and store relative the start address and count.
   - Store the TF Group in EBW000 as input to FDRSC macro.

3. Load R2 with the work block address.

4. Issue FDRSC:

   FDRSC D1,GROUP=EBW000, WRKBLK=(R2), ERROR=E1SCERR3

   If you receive an error, check for non-zero return code. Non-zero return codes from the FDRSC macro are reported with the message:

   UCPY0001E Error on FDRSC call - .........
   See EMC product guide for z/TPF Return Codes

5. Validate the input Relative Start Address against the returned block size.

6. Setup ENTRC CVBN to display the returned record.
FDRSC macro: Find Data Recovery Software Copy

The EMC SymmAPI for z/TPF macro FDRSC returns a single record of a specified point-in-time copy (TimeFinder Group). FDRSC macro execution requires that:

- TimeFinder for z/TPF V8.0.0 or higher is loaded and TimeFinder Data Structures are initialized.
- Offline Module Access for z/TPF is loaded.
- The OMA Control Data Structure is initialized.

The clone targets must be accessible to z/TPF for I/O on a channel to z/TPF and defined in keypoint 0.

Refresh the OCD before using any dependent utilities. Failure to refresh the OCD may cause unexpected results when you use dependent utilities such as ZUCPY. After you have done the initial refresh, maintenance of the OCD is initiated by any TimeFinder operation.

FDRSC macro logic flow

The logic flow of the FDRSC macro call is:

1. If FARF or MCHR is invalid or missing, return the appropriate non-zero return code.
2. If FARF is specified, use SONIC to decode FARF and determine the size of requested record.
3. If MCHR is specified, read the record from the specified module to determine the size of requested record.
4. If the specified record size could not be determined, return the appropriate non-zero return code.
5. If OCD does not exist, return the appropriate non-zero return code.
6. If the input TimeFinder Group is invalid, return the appropriate non-zero return code.
7. If the TimeFinder Control Records do not exist or are not initialized, return the appropriate non-zero return code.
8. Find head of TSI items for the symbolic module derived from input FARF or MCHR.
9. Lock head of the TSI items to serialize copies from this target in a tightly coupled environment.
10. Find the TSI item for input TimeFinder Group.
11. If last TimeFinder operation for the TSI item is not Split, Clip, or Terminate return the appropriate non-zero return code.
12. Determine the SDA from the symbolic module number and TSI information. If the SDA is not currently online, locate the next available online SDA in the same SSID.
13. If the minimum hardware requirement is not met by this SSID, return the appropriate non-zero return code.
   “Hardware and software requirements” on page 19 lists the minimum hardware requirements.
14. If the SSID is unsupported, return the appropriate non-zero return code.
15. Determine the SDA of the destination storage system device as defined during TimeFinder configuration of the TimeFinder Group.

16. Mount the target SDA if not already mounted.

17. Read the specified record from the target device via FDCTC.

18. Dismount target SDA unless mounted prior to initiation.

19. Unlock the head of the TSI item.

20. Return to the calling segment with the returned core block address on the input data level or in the input DECB.

**FDRSC: Usage**

The Find Data Recovery Software Copy (FDRSC) macro provides access to data on TimeFinder Clone Target Volumes, which must be accessible on the channel. The Target SDAs must be defined during TimeFinder Group configuration.

**Format**

```
FDRSC Dx|DECB=(Rx)|label, GROUP=(Rx)|label, WRKBLK=(Rx), ERROR=label
```

**Parameters**

- **Dx**: The data level on which the requested record is to be returned. Data level DE or DF may not be specified. One of the following ECB fields must be initialized with an address identifying the record to be returned:
  - CE1FMx — 8 hex digit FARF
  - CE1FXx — 14 hex digit MCHR

  Specify this parameter or the DECB parameter. Do not specify both.

- **DECB=(Rx)|label**: This parameter specifies a register Rx containing the address of a DECB in which the requested record is to be returned, or a data field containing the 4 byte address of the DECB. One of the following DECB fields must be initialized with an address identifying the record to be returned:
  - IDECFA — 8 hex digit FARF
  - IDECLFX0 - 14 hex digit MCHR

  Specify this parameter or the Dx parameter. Do not specify both.

- **GROUP=(Rx)|label**: This parameter specifies a register Rx containing the address of the 8-character TimeFinder Group name, or a data field containing an 8-character TimeFinder Group name. The TimeFinder Group name identifies the point-in-time copy from which the record is to be retrieved.

- **WRKBLK=(Rx)**: Register Rx must contain the address of a 4K work block to be used as a communications interface between the application and E-type macro. The block must be initialized with zeroes. The block may not be on data level DE or DF. The default register is R14.

- **ERROR=label**: Label indicates where to branch to if a non-zero return code is encountered.
Input requirements

The macro requires that:

- You specify either the Dx or the DECB parameter. Specify only one of these parameters. Do not specify data levels DE or DF.
- The register specified in the WRKBLK parameter contains the address of a 4K block. If the WRKBLK parameter is not included, the macro assumes that R14 contains the 4K block address. The block may not be on data level DE or DF.
- The GROUP value, DECB address, and WRKBLK address are greater than zero.

Limitations

- The FDRSC SymmAPI macro call can be used on a VMAX system running Enginuity 5876, a VMAX3 system running HYPERMAX OS, or a VMAX All Flash system running HYPERMAX OS.
- TimeFinder for z/TPF V8.0.0 must be loaded on the BSS of the z/TPF complex and z/TPF TimeFinder data structures must be configured.
- Offline Module Access for z/TPF V8.0.0 must be loaded on the MDBF SS of the z/TPF complex on which the utility is intended to run and OMA data structures must have been refreshed since the last TimeFinder operation.
- Registers 1 through 7 are saved across the macro call. Registers 14 and 15 are considered work registers and are not saved nor restored. Register 0 contains the return code upon return.
- Data levels DE and DF must be available for macro use.

Return conditions

The requested record is returned on the data level or DECB specified on input.

A return code is placed in register zero. A non-zero return code indicates an error condition. If an error occurs during macro execution and the ERROR parameter was coded, a branch will be taken to the label specified in the calling segment.

Appendix B contains a list of EMC SymmAPI return codes.

Programming considerations

The FDRSC macro can be used on any MDBF Subsystem on which Offline Module Access for z/TPF has been loaded. OMA data structures must have been refreshed since the last TimeFinder operation. Prior to using an application that uses the FDRSC macro, ensure that OMA data structures have been refreshed and the TimeFinder Group to be accessed is not attached.

It is the responsibility of the application program to release the FDRSC work block and the data block containing the requested record on return from the macro call.

The FDRSC macro call expands to up to x'5A' bytes dependent on the parameters used. The macro can be executed on any I-Stream.
Assembly error messages

WRKBLK REGISTER VALUE IS NOT VALID
Severity: 8
Explanation: The register value specified for the WRKBLK parameter is invalid.
User Response: Code a valid register value for the WRKBLK parameter.

GROUP MUST BE SPECIFIED
Severity: 8
Explanation: The GROUP parameter was not specified.
User Response: Specify a register value or label for the GROUP parameter.

GROUP REGISTER VALUE IS NOT VALID
Severity: 8
Explanation: The register value specified for the GROUP parameter is invalid.
User Response: Code a valid register value for the GROUP parameter.

DATA LEVEL SPECIFIED IS NOT VALID
Severity: 8
Explanation: The data level specified is not one of D0 through DD.
User Response: Code a valid data level between D0 and DD.

EITHER LEVEL OR DECB MUST BE SPECIFIED
Severity: 8
Explanation: Neither Dx nor the DECB parameter was specified.
User Response: Code either a valid data level between D0 and DD or the DECB parameter.

EITHER LEVEL OR DECB MUST BE SPECIFIED, BUT NOT BOTH
Severity: 8
Explanation: Both Dx and DECB parameters were specified.
User Response: Code either a valid data level between D0 and DD or the DECB parameter. Do not code both.

DECB REGISTER VALUE IS NOT VALID
Severity: 8
Explanation: The register value specified for the DECB parameter is invalid.
User Response: Code a valid register value for the DECB parameter.
Example

**Sample Source:** e1si.asm

**Input DSECT**
esavid.mac

**Input Data**
D1 Data level
CE1FM1(4) 8 hex digit FARF
EBW000(8) 8 character TF group name

**Return Data**
CE1CR1(4) Core Block on Data Level D1

**Macro Syntax**

FDRSC D1, Return record on data level D1
GROUP=EBW000, TimeFinder Group
WRKBLK=(R2), ESAVID base register
ERROR=E1SCERR3 Branch to E1SCERR3 on error
CHAPTER 4
ResourcePak Commands

This chapter defines the ResourcePak commands:

- ZUCPY: Display point-in-time copy................................................................. 44
- ZUDCP: EMC Dynamic Cache Partitioning Controls ....................................... 46
- ZUDVQ: Display device configuration.............................................................. 57
- ZUECS: Cache statistics display........................................................................ 62
- ZUEDS: Device/DA Performance Statistics display ........................................... 65
- ZUELM: Display Electronic License Management Entitlements ......................... 68
- ZUFRT: Display Feature Registration Table....................................................... 70
- ZUGRP: Dynamic RDFGroup Controls............................................................. 73
- ZULOC: MPLF connection, lock, and attention message information display...... 79
- ZUOMA: Control data controls .......................................................................... 82
- ZUSR: Storage Resource Pool Management ..................................................... 86
- ZUVTP: Virtual tape controls .......................................................................... 93
ZUCPY: Display point-in-time copy

Requirements and limitations

- You can use ZUCPY on a VMAX system running Enginuity 5876, a VMAX3 system running HYPERMAX OS 5977, or a VMAX All Flash system running HYPERMAX OS 5977.
- Load TimeFinder for z/TPF V8.0.0 or higher on the BSS of the z/TPF complex and initialize the TimeFinder Controls for z/TPF data structures.
- Load Offline Module Access for z/TPF V8.0.0 or higher on each MDBF SS of the z/TPF complex on which the utility is intended to run.
- Ensure you have refreshed the OMA data structures since the last TimeFinder operation.

Format

```
ZUCPY hhhh rsa cnt GROup-cccccccc
```

Parameters

- `hhhh`: The 8-digit hexadecimal FARF or a 14-digit MCHR.
- `rsa`: Offset into the record (in hexadecimal).
- `cnt`: The number (in hexadecimal) of bytes to display.
- `cccccccc`: The 1- to 8-character name of a TimeFinder group.

Additional information

- ZUCPY makes an external call to CVBN to display the data as specified and assumes the standard interface to CVBN.
- You can display a point-in-time copy record on a z/TPF duplicate symbolic module by specifying the duplicate symbolic module in the MCHR.
- For help information on ZUCPY, type:
  ```
  ZUCPY Help
  ```

Examples

Example 1

```
Action    Display the first 32 bytes of the point-in-time copy from TimeFinder Group1 of the record with FARF 54000001.
User      ZUCPY 54000001 GRO-GROUP1
System

CSMP0097I 03.16.33 CPU-A SS-BSS SSU-SSU0 IS-01
DFIL0010I 03.16.33 BEGIN DISPLAY
00000000- C5C30000 E4E4C1C4 FFFFFFFF 00000000 EC.UUAD ........
00000010- FFFFFFFF 00000000 00000000 00000000 ........ ........
END OF DISPLAY - ZEROED LINES NOT DISPLAYED
```
Example 2

**Action**
Display the entire point-in-time copy from TimeFinder Group Group1 of the record with FARF 54000001 prior to refreshing the OMA Control Data.

**User**
ZUCPY 54000001 0.FFF GRO-GROUP1

**System**
CSMP0097I 03.16.33 CPU-A SS-BSS SSU-SSU0 IS-01
Error on FDRSC call - 00000250
See EMC product guide for TPF Return Codes

Example 3

**Action**
Display entry without specifying the GROUP parameter.

**User**
ZUCPY 54000001 0.FFF

**System**
CSMP0097I 03.16.33 CPU-A SS-BSS SSU-SSU0 IS-01
BPKD0059E 03.16.33 ZUCPY, GROUP PARAMETER IS REQUIRED

Example 4

**Action**
Display the entire point-in-time copy from TimeFinder Group Group2 of the record with FARF 54000001 prior to having operated on TimeFinder Group Group2.

**User**
ZUCPY 54000001 0.FFF GRO-GROUP2

**System**
CSMP0097I 03.16.33 CPU-A SS-BSS SSU-SSU0 IS-01
Error on FDRSC call - 00000318
See EMC product guide for TPF Return Codes

Example 5

**Action**
Display the duplicate point-in-time copy from TimeFinder Group Group2 of the record with FARF 54000001.

**User**
ZMCHR 54000001

**System**
CSMP0097I 03.16.36 CPU-A SS-BSS SSU-SSU0 IS-01
MCHR0001I 03.16.36 0101011C000A01 DUPE SMALL

**User**
ZUCPY 0103011C000A01 GRO-GROUP2

**System**
UCPY0010I 03.16.36 BEGIN DISPLAY
00000000- C5C30000 E4E4C1C4 EEEEEEEE EEEEEEEE EC..UUAD ........
00000010- EEEEEEEE 00000000 00000000 00000000 ........ ........
END OF DISPLAY - ZEROED LINES NOT DISPLAYED
ZUDCP: EMC Dynamic Cache Partitioning Controls

ResourcePak for z/TPF includes commands to manage and display partitions of cache memory on specified storage systems:

- **ZUDCP CREATE**
- **ZUDCP DELETE**
- **ZUDCP DISPLAY**
- **ZUDCP HELP**
- **ZUDCP MODIFY**
- **ZUDCP MOVE**
- **ZUDCP SETSTATE**

These commands are available on systems running Enginuity 5773 and later or HYPERMAX OS.

**ZUDCP CREATE**

The create command adds a new partition. You can optionally add devices to a partition with the create command. If no devices are added, the group is empty.

**Types of partition** — There are two types of partition flexible or static:

- A flexible partition set a target size but defines minimum and maximum cache allocations for the partition.
- A static partition has a fixed size with the same allocation defined for the minimum and maximum values.

The system definitions begin with a predefined default partition that contains 100% of cache. All devices are in the default partition, initially.

The target allocations across all defined partitions must add up to 100%. When you define a new partition, the default partition's target allocation automatically changes, keeping the total at 100% and any associated devices move from the default partition to the new partition.

**Write pending limit** — Each cache partition group has its own definable write pending (WP) limit of between 40 percent to 80 percent. As the partition group’s write pending count approaches this limit, the storage system’s front-end adapters introduce “WP fairness” delays to throttle write activity from the host. If write activity continues and the write pending limit is reached, the storage system carries out priority destage operations. If the purpose of cache partitioning is to contain an application that produces many writes, set the write pending limit to a premeditated low value. To operate in a way consistent with the system write pending limit, leave the value of the write pending limit at 80 percent.

**Head devices** — Storage systems include special types of device made up of multiple device numbers that appear to the host as a single volume called the head device. In mainframe environments, these include RAID-10 devices, also known as Striped CKD, or SCKD. In open systems environments these devices are known as FBA META devices.
When defining cache partitions, all device numbers associated with these special types must be in the same partition. The TYPE-SCKD or TYPE-META identifies the host addressable head device and the storage system identifies and includes all associated member devices on both the CREATE and MOVE commands.

Limitations

- The maximum number of partitions is eight.
- The name of each partition contains 8 to 31 alphanumeric characters.
- If you provide the GID, specify a unique hexadecimal value between 01 and FE, inclusive.
- The MAX, MIN, and TAR parameters are required and must be consistent with each other.

Format

```
ZUDCP Create ccuu NAME-cccccccc MAX-dd MIN-dd TAR-dd
[ GID-xx AGE-dddddddd WP-dd ]
[ TYPE-DEVS | META | SCKD SDN-xxxxxxxxx CNT-dd ]
[ TYPE-RDFG GRO-dd]
```

Parameters

- **ccuu**: An SDA mounted on the z/TPF system, that identifies the storage system.
- **NAME**: The 8- to 31-character, alphanumeric name of the new partition. Partition names are unique.
- **MAX**: The maximum percentage of the total cache that the partition can use. The value cannot be less than the target or minimum cache allocations.
- **MIN**: The minimum percentage of the total cache that the partition can use. The value cannot be greater than the target cache allocation.
- **TAR**: The target (or desired) percentage of the total cache that the partition can use. The value can be between 10% and 90%.
- **GID**: The partition identifier or Group ID. Supply a hexadecimal value between 01 and FE, inclusive. If not supplied, the system generates the Group ID.
- **AGE**: The minimum number of seconds before cache can be donated to another partition. The maximum value is 268435455 and the default value is 300 seconds.
- **WP**: The write pending limit for the partition expressed as a percentage of the partition size. The value can be between 40% and 80%.
### ResourcePak Commands

**TYPE**

The type of devices to be moved into the new partition. If the range of devices you are moving contains SRDF/A, META, or SCKD devices, include the TYPE parameter.

- **META** — Moves all members in a meta definition. Specify the meta head device. Use CNT-1 for adding a meta device.
- **RDFG** — Moves all the devices in the specified RDF group. You cannot move SRDF/A devices individually but must move them as a group.
- **SCKD** — Use this option for striped CKD (Raid-10) devices. Specify a head device on the SDN parameter. Use CNT-1 to add all members of one SCKD device. You can use the MOVE command to add move devices.
- **DEVS** — This is the default and specifies a range of devices beginning with the device that the SDN parameter identifies and the value of the CNT parameter defining the number of devices in the group.

**SDN**

The number of starting device in the range. Used with all device types except TYPE-RDFG.

**CNT**

The number of devices in the range to move to the partition starting at the device identified by SDN. Used with all device types except TYPE-RDFG.

**GRO**

A decimal number that identifies the RDF group to move into the partition when the device type is TYPE-RDFG.

### Additional Information

Best practices recommend creating empty partitions and then moving devices into the partition using the MOVE command. This is because the CREATE command allows devices to be taken from pre-existing partitions other than those in the default partition.

### Examples

**Example 1**

**Action**

Create a new partition for the CU identified by SDA 5180.

**User**

ZUDCP CREATE 5180 NAME-TEST0001 MAX-100 MIN-0 TAR-20

**System**

CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0011I DCP Create Complete
Example 2

Action Display partitions for the CU identified by SDA 5180
User ZUDCP DISP 5180
System

CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0002I EMC Dynamic Cache Partitioning for 5180 CU 000000000840
  GroupID: 0000 Name: DEFAULT_PARTITION
  Device Count: 2240 State: ENBL
  Target Allocation 80 Minimum Allocation 0
  Maximum Allocation 100 Write Pending Limit 80
  Destage Priority 1 Donation Time 300

GroupID: 0001 Name: TEST0001
  Device Count: 0 State: ENBL
  Target Allocation 20 Minimum Allocation 0
  Maximum Allocation 100 Write Pending Limit 80
  Destage Priority 1 Donation Time 300

End of Display

ZUDCP DELETE

Delete the partition that the Group ID identifies. Any devices in the deleted partition return to the default partition.

Limitations

◆ Group ID must exist.
◆ You cannot delete the default partition.

Format

ZUDCP DELETE ccuu GID-xx

Parameters

ccuu An SDA mounted on the z/TPF system identifying the storage system.
GID The partition identifier of the group to be deleted.

Example

Action Delete a partition on the CU identified by SDA 5180.
User ZUDCP DELETE 5180 GID-01
System

CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0012I DCP Delete Complete
**ZUDCP DISPLAY**

Display attributes, device ranges, or statistics, when statistics collection has been run, of a cache partition.

**Limitations**

If you supply the DEVS parameter, also supply the GID parameter.

*Note:* There is an overhead associated with enabling statistics. So enable statistics only in non-production environments or at the request of EMC.

**Format**

```
ZUDCP DISPLAY ccuu [GID-hh]
(DEVS GID-hh)
```

**Parameters**

- **GID**
  
  The partition identifier or Group ID. Supply a hexadecimal value between 01 and FE, inclusive. Omit this parameter to display all defined partitions. GID is required when you use the DEVS parameter.

- **DEVS**
  
  Displays the device ranges for the specified partition. The GID parameter is required.

**Examples**

**Example1**

**Action**

Display partitions for the CU designated by SDA 5180.

**User**

`ZUDCP DISP 5180`

**System**

```
CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0002I EMC Dynamic Cache Partitioning for 5180 CU 00000000000000840
GroupID: 0000 Name: DEFAULT_PARTITION
  Device Count: 2227 State: ENBL
  Target Allocation 70 Minimum Allocation 0
  Maximum Allocation 100 Write Pending Limit 80
  Destage Priority 1 Donation Time 300
GroupID: 0001 Name: TEST0002
  Device Count: 13 State: ENBL
  Target Allocation 30 Minimum Allocation 0
  Maximum Allocation 100 Write Pending Limit 80
  Destage Priority 1 Donation Time 300
End of Display
```
Example 2

**Action**
Display the devices in the partition identified by GID-01.

**User**
ZUDCP DISP 5180 DEVS GID-01

**System**
CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0002I EMC Dynamic Cache Partitioning for 5180 CU 000000000840
GroupID: 0001 Name: TEST0001
Device Count: 13 State: ENBL
Device Range: 03D8 - 03E4
End of Display

**ZUDCP HELP**

Display help information for Dynamic Cache Partitioning.

**Format**

ZUDCP Help

**Example**

**Action**
Display the command help.

**User**
ZUDCP HELP

**System**
CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0000I ZUDCP Help
ZUDCP DISPLAY ccuu [DEVS] [GID-xxx]
SETstate ccuu ENABLE | DISABLE | ANALysis | INIT
DELETE ccuu GID-xx
MOVE ccuu GID-xx (TYPE-DEVS | META | SCKD SDN-xxxx CNT-dddd)
| (TYPE-RDFG GRO-dd)
Create | MODIFY ccuu MIN-dd MAX-dd TAR-dd
Name-cccccccc [GID-hh AGE-xxxxxxxx WP-xx
TYPE-DEVS | META | SCKD SDN-xxxx CNT-dddd
TYPE-RDFG GRO-dd]
ZUDCP MODIFY

Modify the attributes of the cache partition identified by the Group ID.

Limitations

- The GID must exist.
- For the default partition, you can change the AGE attribute only.

Format

ZUDCP MODify ccuu GID-xx
Name-cccccccc MAX-dd Min-dd TAR-dd
AGE-dddddddd WP-dd

Parameters

- **ccuu**: A SDA mounted on the z/TPF system, that identifies the storage system.
- **GID**: The partition identifier or Group ID. Supply a hexadecimal value between 01 and FE, inclusive. This is a required parameter and identifies the group to modify.
- **NAME**: The 8- to 31-character, alphanumeric name of the partition to modify. Partition names are unique.
- **MAX**: The maximum percentage of the total cache that the partition can use. The value cannot be less than the target or minimum cache allocation.
- **MIN**: The minimum percentage of the total cache that the partition can use. The value cannot be greater than the target cache allocation.
- **TAR**: The target (or desired) percentage of the total cache that the partition can use. The value can be between 10% and 90%.
- **AGE**: The minimum number of seconds before cache can be donated to another partition. The maximum value is 268435455 and the default value is 300 seconds.
- **WP**: The write pending limit for the partition expressed as a percentage of the partition size. The value can be between 40% and 80%. “ZUDCP CREATE” on page 46 contains more information about the write pending limit and its uses.
Examples

Example 1

Action Modify the partition identified by GID-01 for the CU identified by SDA 5180:

- Set the target cache allocation to 30%.
- Rename the partition to TEST0002.

User ZUDCP MODIFY 5180 GID-01 NAME-TEST0002 TAR-30

System

CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0011I DCP Modify Complete

Example 2

Action Display the partitions for the CU identified by SDA 5180.

User ZUDCP DISP 5180

System

CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0002I EMC Dynamic Cache Partitioning for 5180 CU 000000000840
  GroupID: 0000   Name: DEFAULT_PARTITION
  Device Count: 2240   State: ENBL
  Target Allocation 70   Minimum Allocation 0
  Maximum Allocation 100   Write Pending Limit 80
  Destage Priority 1   Donation Time 300
  GroupID: 0001   Name: TEST0002
  Device Count: 0   State: ENBL
  Target Allocation 30   Minimum Allocation 0
  Maximum Allocation 100   Write Pending Limit 80
  Destage Priority 1   Donation Time 300
End of Display
ResourcePak Commands

ZUDCP SETSTATE

Initialize, enable, or disable Dynamic Cache Partitioning.

Format

ZUDCP SETstate ccuu ENABLE | DISABLE | INIT | ANALYSIS

Parameters

ccuu An SDA mounted on the z/TPF system that identifies the storage system.

ENABLE Enable cache partitioning.

DISABLE Disable cache partitioning.

INIT Initialize the data structures for cache partitioning and remove all defined partitions. All devices return to the default partition.

ANALYSIS Allow for the allocation of partitions and movement of devices to partitions. DCP is not fully enabled in this mode. Analysis mode can be enabled only if all cache partitions are flexible. That is, MIN = 0 MAX = 100 AGE= 0. Modify Partition 0 to AGE-0.

Additional Information

In analysis mode, various counters and usage values are maintained without the full effect of DCP being enabled. When you complete the analysis, disable cache partitioning and modify or delete the cache partitions to reflect the values calculated during the analysis. Always disable cache partitioning and redefine your partitions after using analysis mode.

Examples

Example 1

Action Disable Cache Partitioning for the CU designated by SDA 38A2.

User ZUDCP SETSTATE 38A2 DISABLE

System

ZUDCP SETSTATE 38A2 DISABLE
CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0010I DCP SetState Complete

Example 2

Action Enable Cache Partitioning for the CU designated by SDA 38A2.

User ZUDCP SETSTATE 38A2 ENABLE

System

ZUDCP SETSTATE 38A2 ENABLE
CSMP0097I 20.32.17 CPU-G SS-BSS SSU-SSU0 IS-01
UDCP0010I DCP SetState Complete
ZUDCP MOVE

Move devices from between groups.

Format

ZUDCP MOVE ccuu GID-xx (TYPE-DEVS | META | SCKD SDN-xxxxxxxx CNT-dddd)
| (TYPE-RDFG GRO-dd)

Parameters

ccuu  An SDA mounted on the z/TPF system that identifies the storage system.

GID  The identifier of the partition that the group moves to.

TYPE  The type of devices to be moved. If the range of devices you are moving contains SRDF/A, META, or SCKD devices, include the TYPE parameter.
   ◆ META — Moves all members in a meta definition. Specify the meta head device.
   ◆ RDFG — Moves all the devices in the specified RDF group. You cannot move SRDF/A devices individually but must move them as a group.
   ◆ SCKD — Use this option for striped CKD (Raid-10) devices. The count parameter (CNT) defines the number of head devices in a range and is a number from 1 to 32, inclusive.
   ◆ DEVS — This is the default and specifies a range of devices beginning with the device that the SDN parameter identifies and the value of the CNT parameter defining the number of devices in the group.

SDN  The number of the starting device in the range. Used with all device types except TYPE-RDFG.

CNT  The number of devices in the range to move to the partition starting at the device identified by SDN. Used with all device types except TYPE-RDFG.

GRO  DA decimal number that identifies the RDF group to move into the partition when the device type is TYPE-RDFG.
Examples

Example 1

Action Move 13 devices from the default group, starting at device number 3D8, to the partition named GID-01.

User ZUDCP MOVE 5180 SDN-3D8 CNT-13 GID-01

System

Example 2

Action Display the devices in the partition named GID-01.

User ZUDCP DISP 5180 DEVS GID-01

System

Example 2

Action Display the devices in the partition named GID-01.

User ZUDCP DISP 5180 DEVS GID-01

System
ZUDVQ: Display device configuration

Display the relationship between the internal logical devices and physical devices in a storage system.

Limitations

- ZUDVQ is available on systems running Enginuity 5773 and later or HYPERMAX OS.
- The z/TPF SDA must be locally attached and mounted on the z/TPF system.

Format

```
ZUDVQ ccud [INFO|SUMM] [ssss cccc] [MHL1-dd.dd MHL2-dd.dd]
```

Parameters

- `ccud`: An SDA mounted on the z/TPF system that identifies the storage system.
- `INFO`: Device information for input SDA. Valid only for a local storage system.
- `SUMM`: Summary of device types in ranges.
- `ssss`: Optional: The hexadecimal number of the starting device in the range to display.
  Default: Zero.
- `cccc`: Optional: The number of devices in the range to display, in decimal. This parameter is ignored for the SUMM display.
  Default: ALL
- `MHL1-dd.dd`: Optional: Hops one and two of the multi-hop list that identifies the RDFGroup path to the remote storage system.
- `MHL2-dd.dd`: Optional: Hops three and four of the multi-hop list that identifies the RDFGroup path to the remote storage system.

Additional information

- The default number of lines to display is the total number of logical devices less the starting device number. As the number of devices can be large, the Display entry displays one page at a time. To display the next page type:
  `ZPAGE`.
- For help information on ZUDVQ type:
  `ZUDVQ Help`
ResourcePak Commands

Examples

The examples in this section display the following information:

<table>
<thead>
<tr>
<th>Dev#</th>
<th>Hexadecimal, logical device number.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Type of logical volume.</td>
</tr>
<tr>
<td></td>
<td>Values can be:</td>
</tr>
<tr>
<td>R1</td>
<td>Source (R1) volume</td>
</tr>
<tr>
<td>R2</td>
<td>Target (R2) volume</td>
</tr>
<tr>
<td>ML</td>
<td>Local mirror device</td>
</tr>
<tr>
<td>L1</td>
<td>Source (R1) volume that is also locally mirrored</td>
</tr>
<tr>
<td>L2</td>
<td>Target (R2) volume that is also locally mirrored</td>
</tr>
<tr>
<td>ADL</td>
<td>Dynamic SRDF, SRDF/A, locally protected</td>
</tr>
<tr>
<td>DR</td>
<td>Dynamic Reallocation Volume (used by Symmetrix Optimizer)</td>
</tr>
<tr>
<td>DRX</td>
<td>Dynamic RDF device, to be used as either source (R1) or target (R2)</td>
</tr>
<tr>
<td>DR1</td>
<td>Dynamic RDF source (R1)</td>
</tr>
<tr>
<td>DR2</td>
<td>Dynamic RDF target (R2)</td>
</tr>
<tr>
<td>DLX</td>
<td>Dynamic locally mirrored RDF device</td>
</tr>
<tr>
<td>DL1</td>
<td>Dynamic locally mirrored RDF source (R1)</td>
</tr>
<tr>
<td>DL2</td>
<td>Dynamic locally mirrored RDF target (R2)</td>
</tr>
<tr>
<td>D21</td>
<td>Cascaded SRDF device</td>
</tr>
<tr>
<td>A21</td>
<td>Cascaded SRDF device in SRDF/A mode</td>
</tr>
<tr>
<td>UP</td>
<td>Unprotected device</td>
</tr>
</tbody>
</table>

| STATE | Current state for this logical device |
|       | Values can be:                       |
| R/W   | Read / write mode                    |
| R/O   | Read only mode                       |
| N/R   | Not ready mode                       |

<table>
<thead>
<tr>
<th>Mirror 1 – Mirror 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA-IF</td>
</tr>
</tbody>
</table>

For RDF devices, this field may contain SRC or TGT indicating that the mirror position represents the RDF partner device on the remote storage system.

| BCV   | designates this mirror position is used for an attached BCV. |
|       | N/A denotes a mirror position not in use. |
| ITRK  | Indicates the invalid track count for this mirror position. |
Example 1

**Action**  
Display the six logical volumes in the storage system 3 hops along RDFGroups 6, 1, and 2 from the storage system identified by the z/TPF SDA 56C0 starting with logical volume 22.

**User**  
ZUDVQ 56C0 22 6 MHL1-6.1 MHL2-2

**System**

CSMP0097I 11.04.41 CPU-A SS-BSS SSU-SSU0 IS-01  
UDVQ0001I EMC Device Configuration SDA 56C0 Total Lines 0006

<table>
<thead>
<tr>
<th>EMC</th>
<th>Symm</th>
<th>Typ</th>
<th>State</th>
<th>Mirror1</th>
<th>Mirror2</th>
<th>Mirror3</th>
<th>Mirror4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device #</td>
<td></td>
<td></td>
<td></td>
<td>DA-IF</td>
<td>Itrk</td>
<td>DA-IF</td>
<td>Itrk</td>
</tr>
<tr>
<td>00000022</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>00000023</td>
<td>DL2 R/O</td>
<td><em>TGT</em></td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td><em>SRC</em></td>
<td>0</td>
</tr>
<tr>
<td>00000024</td>
<td>DL2 R/O</td>
<td><em>TGT</em></td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td><em>SRC</em></td>
<td>0</td>
</tr>
<tr>
<td>00000025</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>00000026</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>00000027</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
</tbody>
</table>

End of EMC Device Configuration Display

**Note:** The device number in column 1 represents the logical volume and has no relation to z/TPF volumes or SDAs.

Example 2

**Action**  
Display twelve devices beginning at device number 00B4 on the control unit identified by z/TPF SDA 5C60.

**User**  
ZUDVQ 5C60 B4 12

**System**

CSMP0097I 11.04.41 CPU-A SS-BSS SSU-SSU0 IS-01  
UDVQ0001I EMC Device Configuration SDA 56C0 Total Lines 0012

<table>
<thead>
<tr>
<th>EMC</th>
<th>Symm</th>
<th>Typ</th>
<th>State</th>
<th>Mirror1</th>
<th>Mirror2</th>
<th>Mirror3</th>
<th>Mirror4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device #</td>
<td></td>
<td></td>
<td></td>
<td>DA-IF</td>
<td>Itrk</td>
<td>DA-IF</td>
<td>Itrk</td>
</tr>
<tr>
<td>000000B4</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>000000B5</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>000000B6</td>
<td>DLX R/O</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>000000B7</td>
<td>DLX R/O</td>
<td><em>TGT</em></td>
<td>50103</td>
<td>N/A</td>
<td>0</td>
<td><em>SRC</em></td>
<td>0</td>
</tr>
<tr>
<td>000000B8</td>
<td>DLX R/O</td>
<td><em>TGT</em></td>
<td>50085</td>
<td>N/A</td>
<td>0</td>
<td><em>SRC</em></td>
<td>0</td>
</tr>
<tr>
<td>000000B9</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>000000BA</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>000000BB</td>
<td>DLX R/W</td>
<td>THIN</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>000000BC</td>
<td>DLX R/W</td>
<td><em>SRC</em></td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td><em>TGT</em></td>
<td>0</td>
</tr>
<tr>
<td>000000BD</td>
<td>DLX R/W</td>
<td><em>SRC</em></td>
<td>0</td>
<td>N/A</td>
<td>0</td>
<td><em>TGT</em></td>
<td>0</td>
</tr>
</tbody>
</table>
ResourcePak Commands

<table>
<thead>
<tr>
<th>Address</th>
<th>Type</th>
<th>SRP</th>
<th>Number</th>
<th>SSID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000000BE</td>
<td>DLX</td>
<td>000000BE</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>0000000BF</td>
<td>DLX</td>
<td>000000BF</td>
<td>1089</td>
<td>N/A</td>
</tr>
<tr>
<td>000000C0</td>
<td>DLX</td>
<td>000000C0</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>000000C1</td>
<td>DLX</td>
<td>000000C1</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>000000C2</td>
<td>DLX</td>
<td>000000C2</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>000000C3</td>
<td>DLX</td>
<td>000000C3</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>000000C4</td>
<td>DLX</td>
<td>000000C4</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>000000C5</td>
<td>DLX</td>
<td>000000C5</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Example 3

**Action**
Display device information associated with input SDA of 3542.

**User**
ZUDVQ 3542 I

**System**
CSMP0097I 23.32.18 CPU-A SS-BSS SSU-SSU0 IS-01
SDA 3542 is Symmetrix device 000000DA in CU serial number 400000000435

Example 4

**Action**
Display summarized device type information in ranges for the entire unit represented by z/TPF SDA 56C0.

**User**
ZUDVQ 56C0 SUMM

**System**
SDA 56C0 Local CU 000196701175 - 5977

<table>
<thead>
<tr>
<th>DEV#</th>
<th>TYP</th>
<th>RANGE</th>
<th>SRP</th>
<th>NUMBER</th>
<th>SSID</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000001</td>
<td>DLX</td>
<td>1</td>
<td>00000001</td>
<td>3</td>
<td>0000</td>
</tr>
<tr>
<td>00000002</td>
<td>DLX</td>
<td>2</td>
<td>00000001</td>
<td>6452</td>
<td>0000</td>
</tr>
<tr>
<td>00000004</td>
<td>DLX</td>
<td>2</td>
<td>00000001</td>
<td>40329</td>
<td>0000</td>
</tr>
<tr>
<td>00000006</td>
<td>DLX</td>
<td>1</td>
<td>00000001</td>
<td>134432</td>
<td>0000</td>
</tr>
<tr>
<td>00000007</td>
<td>DLX</td>
<td>12</td>
<td>00000001</td>
<td>3</td>
<td>0000</td>
</tr>
<tr>
<td>00000013</td>
<td>DLX</td>
<td>13</td>
<td>00000001</td>
<td>1113</td>
<td>0000</td>
</tr>
<tr>
<td>00000020</td>
<td>DLX</td>
<td>3</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000023</td>
<td>DLX</td>
<td>2</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000025</td>
<td>DLX</td>
<td>11</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000030</td>
<td>DLX</td>
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<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000034</td>
<td>DLX</td>
<td>12</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000040</td>
<td>DLX</td>
<td>1</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000041</td>
<td>DLX</td>
<td>25</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>0000005A</td>
<td>DLX</td>
<td>6</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000060</td>
<td>DLX</td>
<td>16</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000070</td>
<td>DLX</td>
<td>8</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000078</td>
<td>DLX</td>
<td>152</td>
<td>00000001</td>
<td>1113</td>
<td>6400</td>
</tr>
<tr>
<td>00000110</td>
<td>DLX</td>
<td>16</td>
<td>00000001</td>
<td>1113</td>
<td>0000</td>
</tr>
</tbody>
</table>

MORE DATA AVAILABLE, ENTER ZPAGE TO CONTINUE

ZPAGE

<table>
<thead>
<tr>
<th>Address</th>
<th>Type</th>
<th>SRP</th>
<th>Number</th>
<th>SSID</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000120</td>
<td>DLX</td>
<td>94</td>
<td>00000001</td>
<td>1113</td>
</tr>
<tr>
<td>0000017E</td>
<td>DLX</td>
<td>10</td>
<td>00000001</td>
<td>1113</td>
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<td>00000188</td>
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<td>1113</td>
</tr>
<tr>
<td>0000018A</td>
<td>DLX</td>
<td>550</td>
<td>00000001</td>
<td>1113</td>
</tr>
<tr>
<td>000003B0</td>
<td>DLX</td>
<td>6</td>
<td>00000001</td>
<td>1113</td>
</tr>
</tbody>
</table>
Example 5

**Action**  Display summarized device type information for Enginuity 5773 to 5876 in ranges beginning with logical device 230 in the storage system represented by z/TPF SDA 3B80.

**User**  

ZUDVQ 3B80 230 SUMM

**System**  

CSMP0097I 00.06.16 CPU-G SS-BSS SSU-SSU0 IS-01  

UDVQ0006I EMC Device Configuration Display  

SDA 3B80 Local CU 000000000063 - 5771  

<table>
<thead>
<tr>
<th>DEV#</th>
<th>DEV#</th>
<th>TYP</th>
<th>RANGE</th>
<th>RAID</th>
<th>NUMBER</th>
<th>SSID</th>
<th>COUNT</th>
<th>PROT</th>
<th>of CYLs</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>00000230</td>
<td>0000025B</td>
<td>DLX</td>
<td>44</td>
<td>R5</td>
<td>3339</td>
<td>0141</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000025C</td>
<td>0000027D</td>
<td>DLX</td>
<td>34</td>
<td>2M</td>
<td>3339</td>
<td>0241</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000027E</td>
<td>00000293</td>
<td>DLX</td>
<td>22</td>
<td>R5</td>
<td>10017</td>
<td>0A4B</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of EMC Device Configuration Display
ZUECS: Cache statistics display

Display cache statistics for all channel directors of the storage system identified by a z/TPF SDA. You can limit the display to FICON or ESCON. Optionally, you can display SRDF Link statistics.

Limitations

ZUECS is available on systems running Enginuity 5773 and later or HYPERMAX OS.

Format

ZUECS ccud [FIcon | LInk]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ccud</td>
<td>An SDA mounted on the z/TPF system. that identifies the storage system.</td>
</tr>
<tr>
<td>FIcon</td>
<td>Limit the display to active FICON directors.</td>
</tr>
<tr>
<td>LInk</td>
<td>Display SRDF director statistics.</td>
</tr>
</tbody>
</table>

Additional information

- The LInk parameter is only valid on systems running Enginuity Microcode 5773 and later or HYPERMAX OS. A zero value may indicate the corresponding statistic is not available for the requested configuration.
- There is a delay of approximately 10 seconds when requesting ESCON or FICON statistics as the data must be collected over a short interval.
- For help information on ZUECS type:

  ZUECS Help
Examples

This example displays the following information:

- **Dir**: Hexadecimal channel director number
- **Cache Hits**: Number of times records were read from cache
- **Writes**: Total number of writes
- **Requests**: Total number of reads or writes (cache hits or misses)
- **I/O**: Number of chained I/Os
- **Rate**: Average number of I/Os per second from the channel director to cache
- **Hit pct**: The percentage of read/write hits for all I/O requests
- **Write pct**: The percentage of writes for all I/O requests
- **Short Timer**: Amount of time in minutes and seconds since the beginning of the last statistical collection period within the storage system
- **Long Timer**: The amount of time since the last clearing of long term statistical counters in the storage system in the format of days:hours:minutes:seconds
- **Read hit pct**: The percentage of reads satisfied from cache

ZUECS displays only active directors, where total requests are greater than zero.

### Example 1

**Action**: Display cache statistics for the storage system identified by the z/TPF SDA 50C0.

**User**: ZUECS 50C0

**System**

CSMP0097I 01.51.37 CPU-H SS-BSS SSU-SSU0 IS-01
UECS0001I EMC Cache Statistics for CU designated by SDA 50C0

<table>
<thead>
<tr>
<th>Dir</th>
<th>Cache Hits</th>
<th>Writes</th>
<th>Requests</th>
<th>I/O</th>
<th>Short Timer</th>
<th>Long Timer</th>
<th>Read hit pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>0B</td>
<td>89 980 220</td>
<td>19 697 478</td>
<td>91 352 761</td>
<td>92 514 222</td>
<td>00:10</td>
<td>125:06:25:15</td>
<td>99</td>
</tr>
<tr>
<td>0E</td>
<td>94 174 920</td>
<td>19 987 609</td>
<td>95 587 556</td>
<td>96 810 276</td>
<td>00:10</td>
<td>125:06:25:15</td>
<td>99</td>
</tr>
<tr>
<td>33</td>
<td>1 054 737 285</td>
<td>604 688 163</td>
<td>1 056 956 788</td>
<td>1 074 992 904</td>
<td>00:10</td>
<td>125:06:25:15</td>
<td>99</td>
</tr>
<tr>
<td>36</td>
<td>1 056 266 076</td>
<td>585 580 950</td>
<td>1 058 547 129</td>
<td>1 077 383 497</td>
<td>00:10</td>
<td>125:06:25:15</td>
<td>99</td>
</tr>
</tbody>
</table>

End of Display
### Example 2

**Action**  
Display cache statistics for the SRDF links associated with storage system identified by the z/TPF SDA 3BA2.

**User**  
ZUECS 3BA2 LINK

**System**  
ZUECS 3BA2 LINK  
CSMP0097I 19.32.13 CPU-A SS-BSS SSU-SSU0 IS-01  
UECS0001I EMC Cache Statistics for CU designated by SDA 3BA2  
Dir: 30  
I/O: 7 354 524 KB Received: 00000004 497C3CE0  
Writes: 3 052 938 KB Sent: 00000004 4B206E90  
Requests: 0 Util Cnt: 0  
T1 Util Cnt: 0 T2 Util Cnt: 0  
--------------------------------------------------------------------  
Dir: 40  
I/O: 38 282 KB Received: 00000000 0A0E4FA8  
Writes: 438 KB Sent: 00000000 03FA80C0  
Requests: 0 Util Cnt: 0  
T1 Util Cnt: 0 T2 Util Cnt: 0  
--------------------------------------------------------------------

End of Display
ZUEDS: Device/DA Performance Statistics display

Display disk adapter statistics for all adapters of the storage system identified by a z/TPF SDA. ZUEDS DEV displays backend statistics for each logical device in the storage system.

Limitations

ZUEDS is available on systems running Enginuity 5773 or later or HYPERMAX OS.

Format

ZUEDS DA|DEV SDA-ccud [SDN-hhhh] [CNT-dddd]

Parameters

DA
Display disk adapter statistics for all adapters in the storage system identified by SDA.

DEV
Display backend statistics for each logical device in the storage system identified by SDA. This parameter is not available on HYPERMAX OS 5977 and later.

SDA-ccud
An SDA mounted on the z/TPF system that identifies a storage system.

SDN-hhhh
The number of the starting device in the range, in hexadecimal.

CNT-dddd
The of devices to display, starting with the SDN, in decimal.

Additional information

- A zero value may indicate the corresponding statistic is not available for the requested configuration.
- There is a delay of approximately 10 seconds when requesting statistics as the data must be collected over a short interval.
- For help information for ZUEDS type:
  
  ZUEDS Help

Examples

Example 1

This example displays the following information:

Dir Hexadecimal channel director number.
Cache Hits Number of times records were read from cache.
Reads Total number of reads.
Writes Total number of writes.
Requests Total number of reads or writes.
I/O Number of chained I/Os.
Rate Average number of I/Os per second from the channel director to cache.
Hit pct The percentage of read/write hits for all I/O requests.
Write pct The percentage of writes for all I/O requests.
Short Timer  Amount of time in minutes and seconds used for the displayed statistical collection period within the storage system.

Long Timer  The amount of time since the last clearing of long term statistical counters in the storage system in the format of days:hours:minutes:seconds.

I/O Rate  The average I/Os per second for the statistical period.

Write PCT  The write percentage of I/Os for the statistical period.

Action  Displays DA statistics for the storage system identified by SDA 3260.

User  ZUEDS DA SDA-3260

System  

CSMP0097I 18.34.05 CPU-G SS-BSS SSU-SSU0 IS-01
UEDS0001I  EMC Disk Adaptor Statistics for CU designated by SDA 3260

Dir: 01
Reads: 55 298 018  Write: 815 441 269
Requests: 870 739 287  I/O: 5 386 511 446
Short Timer: 00:17 I/O Rate: 89 Write pct: 98
Long Timer : 128:18:25:41 I/O Rate: 322 Write pct: 93

Dir: 02
Reads: 57 405 397  Write: 949 314 475
Requests: 1 006 719 872  I/O: 4 024 913 248
Short Timer: 00:17 I/O Rate: 84 Write pct: 96

Dir: 0F
Reads: 47 971 307  Write: 536 869 434
Requests: 584 840 741  I/O: 2 332 719 936
Short Timer: 00:17 I/O Rate: 91 Write pct: 97

Dir: 10
Reads: 55 202 030  Write: 802 407 097
Requests: 857 609 127  I/O: 3 485 783 449
Short Timer: 00:17 I/O Rate: 84 Write pct: 98
Long Timer : 128:18:25:41 I/O Rate: 313 Write pct: 93

Dir: 11
Reads: 55 419 628  Write: 801 665 661
Requests: 857 085 289  I/O: 3 510 767 196
Short Timer: 00:17 I/O Rate: 85 Write pct: 99
Long Timer : 128:18:25:41 I/O Rate: 315 Write pct: 93

Dir: 12
Reads: 58 070 867  Write: 957 522 422
Requests: 1 015 593 289  I/O: 4 068 711 941
Short Timer: 00:17 I/O Rate: 89 Write pct: 98

Dir: 1F
Reads: 48 183 127  Write: 539 802 415
Requests: 587 985 542  I/O: 2 333 545 398
Short Timer: 00:17 I/O Rate: 88 Write pct: 99

Dir: 20
Reads: 57 253 063  Write: 930 549 440
Requests: 987 802 503  I/O: 4 060 936 056
Short Timer: 00:17 I/O Rate: 88 Write pct: 98

End of Display
### Example 2

This example displays the following information:

- **SDN**: The device number.
- **Reads**: Total number of reads.
- **Blks**: Total blocks read.
- **Writes**: Total number of writes.
- **Blks**: Total blocks written.
- **Write PCT**: The write percentage of I/Os for the statistical period.
- **PFtch**: Total number of prefetch operations.
- **Tot I/Os**: Total number of chained I/Os.
- **Tot Blks**: Total blocks.

**Action**: Display device statistics for device number 64 for a count of 8 devices in the storage system identified by SDA 5040.

**User**: ZUEDS DEV SDA-5040 SDN-64 CNT-8

**System**

```
CSMP0097I 18.50.08 CPU-G SS-BSS SSU-SSU0 IS-01
UEDS0002I EMC Device Configuration Statistics Display
SDA 5040 Time Elapsed 00:10 Total Lines 8
SDN  Reads  Blks  Writes  Blks  Wpct  PFtch  Tot I/Os  Tot Blks
0064  14  543  6  90  30  0  20  633
0065  14  518  5  74  26  0  19  592
0066  17  625  5  66  22  0  22  691
0067  15  689  7  105  31  0  22  794
0068  14  634  6  94  30  0  20  728
0069  13  507  5  77  27  0  18  584
006A  13  508  6  99  31  0  19  607
006B  14  561  6  94  30  0  20  655
ENS_0002501_08:50:09 End of Display
```
**ZUELM: Display Electronic License Management Entitlements**

Display the Electronic License Entitlements for a specified storage system.

**Limitations**

ZUELM is available on systems running Enginuity 5875 and later or HYPERMAX OS.

**Format**

```
ZUELM DISPLAY ccuu [MHL1-dd.dd] [MHL2-dd.dd]
```

**Parameters**

- **ccuu**
  - An SDA mounted on the z/TPF system that identifies the storage system.

- **MHL1-dd.dd**
  - Hops one and two of the multi-hop list that identifies the RDFGroup path to the remote storage system.

- **MHL2-dd.dd**
  - Hops three and four of the multi-hop list that identifies the RDFGroup path to the remote storage system.

**Additional Information**

For help information on ZUELM, type:

```
ZUELM Help
```

**Examples**

**Example 1**

This example displays the following items:

- **ccu**
  - The SDA mounted on the z/TPF system.

- **Feature Name**
  - A the name of the system entitlement.

- **Act**
  - Activation type for entitlement
    
    - **E-IND** means Evaluation Individual.
    - **P-IND** means Permanent Individual.
    - **P-ENT** means Permanent Enterprise Agreement.
    - **MAN** means Manual Override.

- **Licensed Capacity**
  - **Type/Units**
    
    - **Type Reg** means registered capacity.
    - **R-TB-Non-SATA** means raw non-SATA capacity.
    - **R-TB-SATA** means raw SATA capacity.

- **Usage Counts**
  - Number of times the feature was used.

- **Action Display table on a supported CU.**
UELM0005I EMC License Information for 4CC0
Symmetrix ID : 000192604124

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Act</th>
<th>Type</th>
<th>Units</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYMM_VMAX_ENGINIITY</td>
<td>P-IND</td>
<td>R-TB-Non-SATA</td>
<td>100</td>
<td>0000000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-TB-SATA</td>
<td>50</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_TF_CLONE</td>
<td>E-IND</td>
<td>REG-TB</td>
<td>15</td>
<td>000000016</td>
</tr>
<tr>
<td>SYMM_VMAX_TF_SNAP</td>
<td>P-IND</td>
<td>REG-TB</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_SRDF_S</td>
<td>P-IND</td>
<td>REG-TB</td>
<td>15</td>
<td>0000051A</td>
</tr>
<tr>
<td>SYMM_VMAX_SRDF_A</td>
<td>P-ENT</td>
<td>REG-TB</td>
<td>15</td>
<td>00000505</td>
</tr>
<tr>
<td>SYMM_VMAX_SRDF_STAR</td>
<td>P-IND</td>
<td>REG-TB</td>
<td>15</td>
<td>00000011</td>
</tr>
<tr>
<td>SYMM_VMAX_DCP</td>
<td>P-IND</td>
<td>R-TB-Non-SATA</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-TB-SATA</td>
<td>10</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_SPC</td>
<td>P-IND</td>
<td>R-TB-Non-SATA</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-TB-SATA</td>
<td>10</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_OPTIMIZER</td>
<td>P-IND</td>
<td>R-TB-Non-SATA</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-TB-SATA</td>
<td>10</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_FAST</td>
<td>P-IND</td>
<td>REG-TB</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_FAST_VP</td>
<td>P-IND</td>
<td>REG-TB</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_SRDF</td>
<td>P-IND</td>
<td>REG-TB</td>
<td>30</td>
<td>00000F10</td>
</tr>
<tr>
<td>SYMM_VMAX_OR_DM</td>
<td>P-IND</td>
<td>R-TB-Non-SATA</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-TB-SATA</td>
<td>10</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_SMC</td>
<td>P-IND</td>
<td>R-TB-Non-SATA</td>
<td>15</td>
<td>00000005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-TB-SATA</td>
<td>10</td>
<td>0000000000</td>
</tr>
<tr>
<td>SYMM_VMAX_PROSPHERE</td>
<td>P-IND</td>
<td>R-TB-Non-SATA</td>
<td>15</td>
<td>0000000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-TB-SATA</td>
<td>10</td>
<td>0000000000</td>
</tr>
</tbody>
</table>

Legend for Act(ivation Type):
E-IND = Evaluation Individual
P-IND = Permanent Individual
P-ENT = Permanent Enterprise Agreement
MAN = Manual Override

End of Display

Example 2

Action        Display table on an unsupported storage system.
User          ZUELM DISP 64A1
System
CSMP0097I 13.57.08 CPU-A SS-BSS SSU-SSU0 IS-01
UELM0003E SDA 64A1 designates an unsupported CU
ZUFRT: Display Feature Registration Table

ZUFRT displays the Feature Registration Table for the storage system that the supplied SDA identifies.

Limitations

You can use ZUFRT on systems running Enginuity 5874 to 5876.

Format

ZUFRT DISplay ccuu [FID-hhhh]

Parameters

ccuu An SDA mounted on the z/TPF system that identifies the storage system.
FID-hhhh Hexadecimal feature ID.

Additional Information

For help information on ZUFRT, type:

ZUFRT Help

Examples

Example 1

This example displays the following information:

<table>
<thead>
<tr>
<th>FID</th>
<th>Description</th>
<th>EN</th>
<th>BK</th>
<th>Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>Max Number of ORS Sessions</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0004</td>
<td>Relax disk spare rules for hard</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0005</td>
<td>Relax disk spare rules for flash</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0006</td>
<td>Host access to unprotected std v</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0007</td>
<td>Disable Permanent Member Sparing</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0100</td>
<td>Enginuity</td>
<td>Y</td>
<td>N</td>
<td>00000009</td>
</tr>
<tr>
<td>0102</td>
<td>Open Replicator</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0103</td>
<td>TimeFinder/Mirror</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0104</td>
<td>TimeFinder/Clone</td>
<td>Y</td>
<td>N</td>
<td>00000012</td>
</tr>
<tr>
<td>0105</td>
<td>TimeFinder/Extent Snap</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0106</td>
<td>TimeFinder/Snap</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0107</td>
<td>Native FlashCopy</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
</tr>
<tr>
<td>0108</td>
<td>SRDF/Synchronous</td>
<td>Y</td>
<td>N</td>
<td>00000057</td>
</tr>
<tr>
<td>0109</td>
<td>SRDF/Asynchronous</td>
<td>Y</td>
<td>N</td>
<td>0000000F</td>
</tr>
</tbody>
</table>

System

CSMP0097I 13.58.39 CPU-A SS-BSS SSU-SSU0 IS-01
UFRT0002I EMC Feature Registration Display for 3880

Action Display table on a supported storage system.
User ZUFRT DISP 3880
<table>
<thead>
<tr>
<th>FID</th>
<th>Description</th>
<th>EN</th>
<th>BK</th>
<th>Counts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>010A</td>
<td>XRC</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
<td></td>
</tr>
<tr>
<td>010B</td>
<td>PPRC</td>
<td>N</td>
<td>N</td>
<td>00000000</td>
<td></td>
</tr>
<tr>
<td>010C</td>
<td>Cascaded SRDF</td>
<td>Y</td>
<td>N</td>
<td>00000000</td>
<td></td>
</tr>
<tr>
<td>010D</td>
<td>Concurrent SRDF</td>
<td>Y</td>
<td>N</td>
<td>00000000</td>
<td></td>
</tr>
</tbody>
</table>

MORE DATA AVAILABLE, ENTER ZPAGE TO CONTINUE

ZPAGE

CSMP0097I 13.58.47 CPU-A SS-BSS SSU-SSU0 IS-01

010E Diskless Cascaded SRDF     N  N  00000000
010F SRDF/STAR                N  N  00000000
0110 SRDF/A DSE Pools         Y  N  00000000
0111 SRDF/A Transmit Idle     Y  N  00000000
0112 DPAV                    N  N  00000000
0113 HYPERPAV                N  N  00000000
0114 Masking                Y  N  00000000
0115 Config Change Management Y  N  00000001
0116 Cfg Chg - Device Attributes Y N  00000001
0117 Cfg Chg - Device Create  Y  N  00000001
0118 Cfg Chg - Meta Form/Dissolve Y N  00000000
0119 Cfg Chg - Meta Reconfig  Y  N  00000000
011A Cfg Chg - Mapping       Y  N  00000000
011B Cfg Chg - Port Flags    Y  N  00000000
011C Cfg Chg - Symmetrix attributes Y N  00000000
011D Virtual Provisioning    N  N  00000000
011E DeltaMark               Y  N  00000000
011F Double CheckSum (DCS)   N  N  00000000

MORE DATA AVAILABLE, ENTER ZPAGE TO CONTINUE

ZPAGE

CSMP0097I 13.58.52 CPU-A SS-BSS SSU-SSU0 IS-01

0120 Generic SafeWrite        Y  N  00000000
0121 Quality of Service - Pace Y  N  00000000
0122 Quality of Service - Cache Partition Y N  00000000
0123 Quality of Service - Priority Y  N  00000000
0124 Optimizer               Y  N  00000000
0125 Virtual LUNs            N  N  00000000
0126 Single disk erasure     N  N  00000000
0127 Device Geometry         Y  N  00000000
0128 Enginuity Upgrade Preparation Y N  00000000
0129 SymFAST - Thick         Y  N  00000000
012A Virtual Provisioning - Zero Space Y N  00000000
012B Virtual Provisioning - Pool Rebalance Y N  00000000
012C SRDF/A Write Pacing     Y  N  00000000
012D SRDF Software Compression Y  N  00000000
012E TimeFinder/Clone - Thick to thin Y  N  00000000

End of Display

Example 2

Action Display a specific feature.
User ZUFRT DISP 3880 FID-104
System

CSMP0097I 13.59.48 CPU-A SS-BSS SSU-SSU0 IS-01
UFRT0002I EMC Feature Registration Display for 3880
FID Description EN BK Counts
0104 TimeFinder/Clone Y N 000000012

End of Display
## Example 3

<table>
<thead>
<tr>
<th>Action</th>
<th>Display table on an unsupported storage system.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>ZUFRT DISP 64A1</td>
</tr>
<tr>
<td>System</td>
<td>CSMP0097I 13.57.08 CPU-A SS-BSS SSU-SSU0 IS-01</td>
</tr>
<tr>
<td></td>
<td>UFRT0003E SDA 64A1 designates an unsupported CU</td>
</tr>
</tbody>
</table>

UFRT0003E SDA 64A1 designates an unsupported CU
ZUGRP: Dynamic RDFGroup Controls

Display information for one or more RDFGroups in a specified storage system. In addition, you can create RDFGroups between SRDF partner storage systems attached through Fibre Channel or GigE.

Limitations

- You can use ZUGRP to display RDFGroup information for SRDF partner storage systems running Enginuity 5773 and higher.
- To add RDFGroups to storage system running Enginuity 5874 and earlier, the storage system must be configured with one or more RDFGroups in a switched SRDF environment.
- For information on dynamic RDFGroup controls for HYPERMAX OS 5977 and later, see the SRDF Controls for z/TPF Product Guide.

Format

ZUGRP DISPLAY SDA-ccud [PRG-ddd] [MHL1-dd.dd MHL2-dd.dd]

ZUGRP ADD|DELETE SDA-ccud PRG-ddd SRG-ddd SCU-cccccccccccc PD1-dddd.ddd [PD2-ddd.ddd PD3-ddd.ddd PD4-ddd.ddd] SD1-dddd.ddd [SD2-dddd.ddd SD3-dddd.ddd SD4-dddd.ddd] [LABel-cccccccccc] [MHL1-dddd.ddd MHL2-dddd.ddd] [NOVERIFY] [FIBRe|GIGE]

Parameters

ADD
Add the specified RDFGroup to the specified primary and secondary RDF directors and the specified RDFGroup label.

DELETE
Delete the specified RDFGroup from the specified primary and secondary RDF directors and the specified label.

ccud
A z/TPF SDA that identifies the storage system.

PRG
Primary RDFGroup. 1-3 decimal digits.
Values: 0 to 250 (inclusive).

SRG
Secondary RDFGroup. 1-3 decimal digits.
Values: 0 to 250 (inclusive). If not specified, the default value is the value of the PRG parameter.

SCU
The serial number of the secondary storage system.

PD1-PD4
Primary RDF directors. Up to 8 directors, 1 to 3 decimal digits.
Values:
- 1-64 for Enginuity 5773
- 1 to 128 for Enginuity 5874 and higher.

A value of zero for PD1 on the delete command deletes the RDFGroup from all RDF directors on both the primary and secondary storage systems.
ResourcePak Commands

SD1–SD4  Secondary RDF directors. Up to 8 directors, 1 to 3 decimal digits. Values:
◆ 1 to 64 for Enginuity 5773
◆ 1 to 128 for Enginuity 5874 and higher.

LABel1  The label for the RDFGroup consisting of the characters 0 to 9, A to Z, and ":". If RDFGroup label is not specified, the default is "most_significant_digits_of_primary_serial_number:hexadecimal_PrimaryRDFGroup:most_significant_digits_of_secondary_serial_number".

MHL1–MHL2  RDFGroups specifying the path to the primary storage system. Specify up to 4 hops, each of 1 to 3 decimal digits.

NOVErify  Run the command without verifying the existence of RDFGroups between the partner storage systems.

FIBRe|GIGE  The type of RDF link.

Additional information

◆ For the ADD command, the RDF director numbers specified by parameters PD1-PD4 and SD1-SD4 identify the RDF director where the RDFGroup specified is added. To add an existing dynamic RDFGroup to one or more directors on the primary side only (PD1-PD4), specify any RDF director already configured with the RDFGroup on the secondary side (SD1-SD4). To add an existing dynamic RDFGroup to one or more directors on the secondary side only (SD1-SD4), specify any RDF director already configured with the RDFGroup on the primary side (PD1-PD4).

◆ For the DEL command, the RDF director numbers specified by parameters PD1-PD4 and SD1-SD4 identify the RDF director from which the RDFGroup specified is deleted. To keep the RDFGroup on all RDF directors already configured with the RDFGroup on the primary side, do not specify PD1-PD4. To keep the RDFGroup on all RDF directors already configured with the RDFGroup on the secondary side, do not specify SD1-SD4. To delete the RDFGroup from all RDF directors on both the primary and secondary storage systems, specify a value of 0 for PD1.

◆ Deleting an RDFGroup from a specified director removes all paths for that RDFGroup from that specified director to all directors in its partner director.

◆ For help information on ZUGRP type:

   ZUGRP Help

Examples

The examples display the following information:

DIR  Decimal director number on the Primary storage system
GRP  Decimal RDFGroup on the Primary storage system
Partner S/N  The serial number of the Secondary storage system
ODR  Director number on the Secondary storage system (in decimal)
OGP  RDFGroup on the Secondary secondary storage system (in decimal)
**Example 1**

**Action**
Display RDFGroup information for all RDFGroups in the storage system identified by SDA 64C0

**User System**
ZUGRP DIS SDA-64C0

<table>
<thead>
<tr>
<th>DIR</th>
<th>GRP</th>
<th>Partner S/N</th>
<th>ODR</th>
<th>OGP</th>
<th>RCS</th>
<th>GRP Label</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>6</td>
<td>001903000063</td>
<td>64</td>
<td>6</td>
<td>FYY</td>
<td>063:06:936 Dynamic</td>
<td>Dynamic</td>
</tr>
<tr>
<td>29</td>
<td>6</td>
<td>001903000063</td>
<td>64</td>
<td>6</td>
<td>FYY</td>
<td>063:06:936 Dynamic</td>
<td>Dynamic</td>
</tr>
<tr>
<td>20</td>
<td>63</td>
<td>001903000063</td>
<td>48</td>
<td>6</td>
<td>FYY</td>
<td>063:06:936 Dynamic</td>
<td>Dynamic</td>
</tr>
<tr>
<td>29</td>
<td>63</td>
<td>001903000063</td>
<td>48</td>
<td>6</td>
<td>FYY</td>
<td>063:06:936 Dynamic</td>
<td>Dynamic</td>
</tr>
<tr>
<td>36</td>
<td>29</td>
<td>00190100840</td>
<td>56</td>
<td>63</td>
<td>FYY</td>
<td>3F-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>45</td>
<td>29</td>
<td>00190100840</td>
<td>56</td>
<td>63</td>
<td>FYY</td>
<td>3F-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>36</td>
<td>28</td>
<td>00190100840</td>
<td>56</td>
<td>62</td>
<td>FYY</td>
<td>3E-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>45</td>
<td>28</td>
<td>00190100840</td>
<td>56</td>
<td>62</td>
<td>FYY</td>
<td>3E-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>36</td>
<td>27</td>
<td>00190100840</td>
<td>41</td>
<td>61</td>
<td>FYY</td>
<td>3D-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>45</td>
<td>27</td>
<td>00190100840</td>
<td>41</td>
<td>61</td>
<td>FYY</td>
<td>3D-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>36</td>
<td>27</td>
<td>00190100840</td>
<td>40</td>
<td>61</td>
<td>FYY</td>
<td>3D-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>45</td>
<td>27</td>
<td>00190100840</td>
<td>40</td>
<td>61</td>
<td>FYY</td>
<td>3D-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>20</td>
<td>12</td>
<td>00190100840</td>
<td>41</td>
<td>60</td>
<td>FYY</td>
<td>3C-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>29</td>
<td>12</td>
<td>00190100840</td>
<td>41</td>
<td>60</td>
<td>FYY</td>
<td>3C-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>29</td>
<td>12</td>
<td>00190100840</td>
<td>40</td>
<td>60</td>
<td>FYY</td>
<td>3C-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>00190100840</td>
<td>41</td>
<td>3</td>
<td>FYY</td>
<td>03-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>00190100840</td>
<td>40</td>
<td>3</td>
<td>FYY</td>
<td>03-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>13</td>
<td>11</td>
<td>00190100840</td>
<td>41</td>
<td>3</td>
<td>FYY</td>
<td>03-840-936 Static</td>
<td>Static</td>
</tr>
<tr>
<td>13</td>
<td>11</td>
<td>00190100840</td>
<td>40</td>
<td>3</td>
<td>FYY</td>
<td>03-840-936 Static</td>
<td>Static</td>
</tr>
</tbody>
</table>

End of Display
Example 2

**Action**

Display RDFGroup information for all RDFGroups in the secondary storage system on RDFGroup 10 from the primary storage system identified by the SDA 64C0.

**User**

ZUGRP DIS SDA-64C0 MHL1-10

**System**

<table>
<thead>
<tr>
<th>DIR</th>
<th>GRP</th>
<th>Partner S/N</th>
<th>ODR</th>
<th>OGP</th>
<th>RCS</th>
<th>GRP Label Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>63</td>
<td>000187430936</td>
<td>36</td>
<td>29</td>
<td>FYY</td>
<td>3F-840-936</td>
</tr>
<tr>
<td>56</td>
<td>63</td>
<td>000187430936</td>
<td>45</td>
<td>29</td>
<td>FYY</td>
<td>3F-840-936</td>
</tr>
<tr>
<td>56</td>
<td>62</td>
<td>000187430936</td>
<td>36</td>
<td>28</td>
<td>FYY</td>
<td>3E-840-936</td>
</tr>
<tr>
<td>40</td>
<td>61</td>
<td>000187430936</td>
<td>36</td>
<td>27</td>
<td>FYY</td>
<td>3D-840-936</td>
</tr>
<tr>
<td>40</td>
<td>61</td>
<td>000187430936</td>
<td>45</td>
<td>27</td>
<td>FYY</td>
<td>3D-840-936</td>
</tr>
<tr>
<td>41</td>
<td>61</td>
<td>000187430936</td>
<td>36</td>
<td>27</td>
<td>FYY</td>
<td>3D-840-936</td>
</tr>
<tr>
<td>41</td>
<td>61</td>
<td>000187430936</td>
<td>45</td>
<td>27</td>
<td>FYY</td>
<td>3D-840-936</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
<td>000187430936</td>
<td>29</td>
<td>12</td>
<td>FYY</td>
<td>3C-840-936</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
<td>000187430936</td>
<td>20</td>
<td>12</td>
<td>FYY</td>
<td>3C-840-936</td>
</tr>
<tr>
<td>41</td>
<td>60</td>
<td>000187430936</td>
<td>29</td>
<td>12</td>
<td>FYY</td>
<td>3C-840-936</td>
</tr>
<tr>
<td>41</td>
<td>60</td>
<td>000187430936</td>
<td>20</td>
<td>12</td>
<td>FYY</td>
<td>3C-840-936</td>
</tr>
<tr>
<td>40</td>
<td>3</td>
<td>000187430936</td>
<td>13</td>
<td>11</td>
<td>FYY</td>
<td>03-840-936</td>
</tr>
<tr>
<td>40</td>
<td>3</td>
<td>000187430936</td>
<td>4</td>
<td>11</td>
<td>FYY</td>
<td>03-840-936</td>
</tr>
<tr>
<td>41</td>
<td>3</td>
<td>000187430936</td>
<td>4</td>
<td>11</td>
<td>FYY</td>
<td>03-840-936</td>
</tr>
<tr>
<td>41</td>
<td>3</td>
<td>000187430936</td>
<td>13</td>
<td>11</td>
<td>FYY</td>
<td>03-840-936</td>
</tr>
<tr>
<td>56</td>
<td>0</td>
<td>000187430936</td>
<td>4</td>
<td>10</td>
<td>FYY</td>
<td>00-840-936</td>
</tr>
<tr>
<td>56</td>
<td>0</td>
<td>000187430936</td>
<td>13</td>
<td>10</td>
<td>FYY</td>
<td>00-840-936</td>
</tr>
</tbody>
</table>

End of Display

Example 3

**Action**

Add RDFGroup 31 to the primary storage system identified by the SDA 64C0 and the secondary storage system that has a Serial Number of 000190100840. The RDFGroup is added on primary directors 20 and 29 and secondary directors 40 and 41.

**User**

ZUGRP ADD SDA-64C0 PRG-31 SRG-31 SCU-000190100840 PD1-20.29 SD1-40.41

**System**

<table>
<thead>
<tr>
<th>DIR</th>
<th>GRP</th>
<th>Partner S/N</th>
<th>ODR</th>
<th>OGP</th>
<th>RCS</th>
<th>GRP Label Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>87</td>
<td>222</td>
<td>000190300346</td>
<td>49</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
<tr>
<td>87</td>
<td>222</td>
<td>000190300346</td>
<td>64</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
<tr>
<td>88</td>
<td>222</td>
<td>000190300346</td>
<td>64</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
<tr>
<td>88</td>
<td>222</td>
<td>000190300346</td>
<td>49</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
</tbody>
</table>

Example 4

**Action**

Display RDFGroup information for RDFGroup 222 in the primary storage system designated by SDA 3840.

**User**

ZUGRP DIS SDA-3840 PRG-222

**System**

<table>
<thead>
<tr>
<th>DIR</th>
<th>GRP</th>
<th>Partner S/N</th>
<th>ODR</th>
<th>OGP</th>
<th>RCS</th>
<th>GRP Label Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>87</td>
<td>222</td>
<td>000190300346</td>
<td>49</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
<tr>
<td>87</td>
<td>222</td>
<td>000190300346</td>
<td>64</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
<tr>
<td>88</td>
<td>222</td>
<td>000190300346</td>
<td>64</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
<tr>
<td>88</td>
<td>222</td>
<td>000190300346</td>
<td>49</td>
<td>222</td>
<td>FYY</td>
<td>069:DE:346 Dynamic</td>
</tr>
</tbody>
</table>

End of Display
Action: Delete RDFGroup 222 from RDF director 88 in the primary storage system identified by the SDA 3840. The RDFGroup label is the default label.

User: ZUGRP DEL SDA-3840 PRG-222 SCU-000190300346 PD1-88

System:
CSMP0097I 03.02.34 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup Controls operation complete

Action: Display RDFGroup information for RDFGroup 222 in the primary storage system identified by the SDA 3840.

User: ZUGRP DIS SDA-3840 PRG-222

System:
CSMP0097I 03.04.59 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup display for CU 000192600069 Microcode 5874
DIR  GRP   Partner S/N  ODR  OGP  RCS   GRP Label Type
87  222  000190300346   49  222  FYY  069:DE:346 Dynamic
87  222  000190300346   64  222  FYY  069:DE:346 Dynamic
End of Display

Example 5

Action: Delete RDFGroup 222 from RDF director 49 in the secondary storage system identified by the SDA 3840. The RDFGroup label is the default label.

User: ZUGRP DEL SDA-3840 PRG-222 SCU-000190300346 SD1-49

System:
CSMP0097I 03.06.39 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup Controls operation complete

Action: Display RDFGroup information for RDFGroup 222 in the primary storage system identified by the SDA 3840.

User: ZUGRP DIS SDA-3840 PRG-222

System:
CSMP0097I 03.06.58 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup display for CU 000192600069 Microcode 5874
DIR  GRP   Partner S/N  ODR  OGP  RCS   GRP Label Type
87  222  000190300346   64  222  FYY  069:DE:346 Dynamic
End of Display
Example 6

**Action**
Add RDFGroup 222 to RDF director 87 in the primary storage system identified by the SDA 3840 and RDF director 49 in the secondary storage system. The RDFGroup label is the default label.

**User**
```
ZUGRP ADD SDA-3840 PRG-222 SCU-000190300346 PD1-88 SD1-49
```

**System**
```
CSMP0097I  03.10.24 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup Controls operation complete
```

**Action**
Display RDFGroup information for RDFGroup 222 in the primary storage system identified by SDA 3840.

**User**
```
ZUGRP DIS SDA-3840 PRG-222
```

**System**
```
CSMP0097I  03.12.19 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup display for CU 000192600069 Microcode 5874
  DIR  GRP  Partner S/N  ODR  OGP  RCS  GRP Label Type
  87  222  000190300346  49  222  FYY  069:DE:346 Dynamic
  87  222  000190300346  64  222  FYY  069:DE:346 Dynamic
  88  222  000190300346  64  222  FYY  069:DE:346 Dynamic
  88  222  000190300346  49  222  FYY  069:DE:346 Dynamic
End of Display
```

Example 7

**Action**
Delete RDFGroup 222 from RDF directors 87 and 88 in the primary storage system identified by the SDA 3840 and RDF directors 49 and 64 in the secondary storage system. This is all RDF directors configured with RDFGroup 222. The RDFGroup label is the default label.

**User**
```
ZUGRP DEL SDA-3840 PRG-222 SCU-000190300346 PD1-0
```

**System**
```
CSMP0097I  03.15.43 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup Controls operation complete
```

**Action**
Display RDFGroup information for RDFGroup 222 in the primary storage system identified by the SDA 3840.

**User**
```
ZUGRP DIS SDA-3840 PRG-222
```

**System**
```
CSMP0097I  03.15.59 CPU-B SS-BSS SSU-SSU0 IS-01
UGRP0001I Dynamic RDFGroup display for CU 000192600069 Microcode 5874
  DIR  GRP  Partner S/N  ODR  OGP  RCS  GRP Label Type
End of Display
```
ZULOC: MPLF connection, lock, and attention message information display

Display Multi-Path Lock Facility (MPLF) connection and lock allocation information and active MPLF locks. ZULOC ATTN displays active MPLF attention messages for the z/TPF host issuing the message and the SSID designated by the SDA.

Limitations

You can use ZULOC on the systems running Enginuity 5773 and later with MPLF enabled.

Format

ZULOC MPLF | ATTN SDA-ccud

Parameters

MPLF | Display Multi-Path Lock Facility (MPLF) connection and lock allocation information and MPLF locks active for the duration of entry (more than 6 sec) for the SSID designated by the input SDA.

ATTN | Display MPLF attention messages active for the duration of the entry (more than 6 sec) for the MPLF connect device of the z/TPF host issuing the message, and the SSID designated by the SDA.

SDA-ccud | An SDA mounted on the z/TPF system that identifies the storage system.

Additional information

- The information relates to the SSID that the SDA identifies.
- When specifying MPLF, the processing takes approximately eight seconds. The MPLF structures for the connected z/TPF hosts and the SSID identified by the SDA are displayed, followed by:
  - The active locks for the processor where you issued the ZULOC command
  - The SSID identified by the SDA

**Note:** ZULOC MPLF only displays the locks active throughout the processing of this command. The lock display indicates the minimum time that the locks have been active.

- When specifying Attention messages, the processing takes approximately five seconds. The display lists all active attention messages queued on the z/TPF host’s connect device associated with the SSID identified by the SDA.
- For help information on ZUEDS, type:

  ZULOC Help
Examples

Example 1

This example displays the following information:

**AVAILABLE LOCKS**
Hexadecimal and decimal number of MPLF locks allocated.

**USED LOCKS**
Hexadecimal and decimal number of MPLF locks in use.

**CPU**
CPU ID of the z/TPF host.

**DIR**
Channel director for the MPLF Connect Path on the storage system.

**SDA**
Symbolic device address of the MPLF Connect Device.

**Token**
Multi-Path Lock user token.

**GIDN**
Group ID number.

**Group-ID**
Path group ID.

**CH/CU/IMG/LNK**
Internal Enginuity data structures.

**Lock Name**
Name assigned to the active lock.

**Time Stamp**
The time that the lock was created.

**Holders**
The CPU ID of the z/TPF host holding the lock.

**Waiters**
The CPU ID(s) of the z/TPF host(s) waiting on the lock.

**Action**
Display the MPLF Connect information for the SSID and storage system identified by the SDA-3848. The MPLF connect information is followed by any locks that were active for the specified SSID during the information gathering.

**User**
ZULOC MPLF SDA-3848

**System**
CSMP0097I 10.52.49 CPU-A SS-BSS SSU-SSU0 IS-01
ULOCC0001I EMC MPLF Information designated by SDA 3848 for SSID 3841

<table>
<thead>
<tr>
<th>AVAILABLE LOCKS</th>
<th>X'000007FB' (2043)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USED LOCKS</td>
<td>X'00000020' (32)</td>
</tr>
<tr>
<td>CPU</td>
<td>8g/67</td>
</tr>
<tr>
<td>DIR</td>
<td>3857</td>
</tr>
<tr>
<td>SDA</td>
<td>017201</td>
</tr>
<tr>
<td>TOKEN</td>
<td>4000</td>
</tr>
<tr>
<td>GIDN</td>
<td>000880A500050A2900008910</td>
</tr>
<tr>
<td>GROUP-ID</td>
<td>17/01/07/000C</td>
</tr>
<tr>
<td>CH/CU/IMG/LNK</td>
<td></td>
</tr>
</tbody>
</table>

MPLF locks active for more than 5 seconds

<table>
<thead>
<tr>
<th>LOCK NAME</th>
<th>TIME STAMP</th>
<th>HOLDER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>00C5010B</td>
<td>MAR/06/12 11:40:11</td>
<td>A</td>
</tr>
<tr>
<td>0580030A</td>
<td>MAR/06/12 11:40:46</td>
<td>A</td>
</tr>
</tbody>
</table>

User ZULOC MPLF SDA-3848

System
Example 2

This example displays the following information:

- **DR**: Hexadecimal channel director number.
- **Time Stamp**: The time the attention message was created.
- **State**: The time the attention message state was changed.
- **CH/CU/IMG/LNK**: Internal Ingenuity data structures.
- **ST**: Attention message state. Values:
  - 01 = Suspended
  - 02 = Message held
  - 08 = Unassigned
  - 09 = Assigned
  - 19 = Previous message read
- **GIDN**: Group ID number.
- **SDA**: Symbolic device address of the MPLF Connect Device.
- **LN**: Attention message type. Values:
  - 1 = In-Line Response
  - 2 = Contention response
  - 3 = Lock granted
  - 4 = Resources Available
- **Lock Name**: Name assigned to the active lock.

**Action**: Display attention messages for the SSID identified by the SDA and the MPLF connect device of the z/TPF host where the ZULOC ATTN was entered. The z/TPF host designated by GIDN 4002 shares the MPLF connect device, SDA 3613, with the z/TPF host designated by GIDN 4001.

**User**

ZULOC ATTN SDA–3600

**System**

CSMP0097I 18.38.00 CPU-A SS–BSS SSU–SSU0 IS–01
ULOC0002I EMC Attention Messages on device 3613

<table>
<thead>
<tr>
<th>DR</th>
<th>TIME STAMP</th>
<th>STATE</th>
<th>CH/CU/IMG/LNK</th>
<th>ST</th>
<th>GIDN</th>
<th>SDA</th>
<th>LN</th>
<th>LOCK-NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/03/00A3</td>
<td>19</td>
<td>4002</td>
<td>3613</td>
<td>2</td>
<td>0C980504</td>
<td>42000000</td>
</tr>
<tr>
<td>05 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/02/009E</td>
<td>19</td>
<td>4001</td>
<td>3613</td>
<td>2</td>
<td>0C980504</td>
<td>43000000</td>
</tr>
<tr>
<td>25 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/03/00A3</td>
<td>19</td>
<td>4002</td>
<td>3613</td>
<td>3</td>
<td>0C980504</td>
<td>44000000</td>
</tr>
<tr>
<td>05 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/02/009E</td>
<td>19</td>
<td>4001</td>
<td>3613</td>
<td>3</td>
<td>0C980504</td>
<td>42000000</td>
</tr>
<tr>
<td>05 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/02/009E</td>
<td>19</td>
<td>4001</td>
<td>3613</td>
<td>2</td>
<td>0C980504</td>
<td>42000000</td>
</tr>
<tr>
<td>25 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/03/00A3</td>
<td>19</td>
<td>4002</td>
<td>3613</td>
<td>3</td>
<td>0C980504</td>
<td>46000000</td>
</tr>
<tr>
<td>25 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/03/00A3</td>
<td>19</td>
<td>4002</td>
<td>3613</td>
<td>2</td>
<td>0C980504</td>
<td>46000000</td>
</tr>
<tr>
<td>16 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/01/0099</td>
<td>08</td>
<td>4000</td>
<td>3613</td>
<td>3</td>
<td>0B09030A</td>
<td>43000000</td>
</tr>
<tr>
<td>05 SEP/10/08 13:22:24</td>
<td>13:22:24</td>
<td>00/01/02/009E</td>
<td>19</td>
<td>4001</td>
<td>3613</td>
<td>2</td>
<td>0B09030A</td>
<td>47000000</td>
</tr>
</tbody>
</table>

End of display
ZUOMA: Control data controls

ResourcePak for z/TPF includes commands to display and refresh control data and a target status table (TST) derived from the TimeFinder for z/TPF data structures:

- ZUOMA DISplay
- ZUOMA REFresh

ZUOMA DISplay

Use the ZUOMA DISplay command to show the content of a in-memory table that contains control data and the TST derived from TimeFinder for z/TPF data structures.

Requirements and Limitations

- You can use ZUOMA DISplay on a VMAX system running Enginuity 5876, a VMAX3 system running HYPERMAX OS 5977, or a VMAX All Flash system running HYPERMAX OS.
- Load TimeFinder for z/TPF V8.0.0 or higher on the BSS of the z/TPF complex and initialize the TimeFinder Controls for z/TPF data structures.
- Load Offline Module Access for z/TPF V8.0.0 or higher on each MDBF SS of the z/TPF complex on which the utility is intended to run.
- Initialize the Control Data structures of the Offline Module Access facility before using any ZUOMA command.

Format

```
ZUOMA DISplay OCD | (TST mod cnt GROup-cccccccc)
```

Parameters

- **OCD**
  Display the general OMA Control Data.
- **TST**
  Display the Target Status Table.
- **mod**
  The number (in hexadecimal) of the symbolic module.
- **cnt**
  The number (in decimal) of modules to display.
- **GROup-cccccccc**
  The 1- to 8-character name of a BCV group.

Additional information

For help information on ZUOMA DISplay, type:

```
ZUOMA Help
```
Examples

Example 1

This example displays the following information:

**MOD**  The symbolic module number of the device.

**SSDA**  The symbolic address of the source device at the time the specified TimeFinder operation was issued.

**SRC#**  The storage device number of the source device.

**TGT#**  The storage device number of the target device.

**TSDA**  The symbolic address of the target device as defined during configuration of the TimeFinder group.

**TF operation**  The last TimeFinder operation recorded in the TimeFinder Device pair Information Record.

**Action**  Display four items from the TST for TimeFinder Group Group2 starting with symbolic module 100.

**User**  ZUOMA DIS TST 100 4 GRO- GROUP2

**System**

CSMP0097I  00.07.27  CPU-A SS-BSS SSU-SSU0 IS-01
UOMA1003I  00.07.27  Offline Module Access Display
TimeFinder Group GROUP2 Status Table Display

<table>
<thead>
<tr>
<th>MOD</th>
<th>SSDA</th>
<th>SRC#</th>
<th>TGT#</th>
<th>TSDA</th>
<th>TF Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0100</td>
<td>3600</td>
<td>00000007</td>
<td>0000014B</td>
<td>3640</td>
<td>Split</td>
</tr>
<tr>
<td>0101</td>
<td>3601</td>
<td>00000008</td>
<td>0000014C</td>
<td>3641</td>
<td>Split</td>
</tr>
<tr>
<td>0102</td>
<td>33C0</td>
<td>000000B4</td>
<td>000000FC</td>
<td>3380</td>
<td>Split</td>
</tr>
<tr>
<td>0103</td>
<td>33C1</td>
<td>000000B5</td>
<td>000000FD</td>
<td>3380</td>
<td>Split</td>
</tr>
</tbody>
</table>

End of Display
Example 2

This example displays the following information:

- **OMA Software Version**: The version number of the Offline Module Access facility and SymmAPI loaded.
- **Refreshed at HH/mm.ss on mm/dd/yy**: The time and date that the ZUOMA REFresh command was issued.
- **TF Data Structures Initialized**: An indication of whether the TimeFinder Control Records were initialized during the previous ZUOMA REFresh command.
- **Target Status Table Core Address**: The memory address of the TST.
- **Unsupported SSIDs**: The DASD Subsystem identifiers that the Data Recover Utilities cannot operate on. For example, ZUCPY.

**Action**

Display Offline Module Access control data.

**User**

ZUOMA DIS OCD

**System**

CSMP0097I 00.11.02 CPU-A SS-BSS SSU-SSU0 IS-01
OMA1004I 00.11.02 Offline Module Access Display
OMA Software Version: 0007 Modification: 0001 Revision: 0000
Refreshed at 00.07.13 on 01/08/14
TF Data Structures Initialized: Yes
Target Status Table Core Address: 08001000
Local BCV Groups: 0004
GROUP1 GROUP2 GROUP3 GROUP4
Unsupported SSIDs: 0000
End of Display

**ZUOMA REFresh**

Use the ZUOMA REFresh command to initialize the Control Data structures for the EMC Offline Module Access facility.

**Requirements and limitations**

- You can use ZUOMA REFresh on a VMAX system running Enginuity 5876, a VMAX3 system running HYPERMAX OS 5977, or a VMAX All Flash system running HYPERMAX OS.
- Load TimeFinder for z/TPF V8.0.0 or higher on the BSS of the z/TPF complex and initialize the TimeFinder Controls for z/TPF data structures.
- Load Offline Module Access for z/TPF V8.0.0 or higher on each MDBF SS of the z/TPF complex on which the utility is intended to run.
- Initialize the Control Data structures of the Offline Module Access facility before using any ZUOMA command.
- If you load multiple EMC products for z/TPF on a z/TPF complex, they must be at the same version levels to ensure compatibility.
Format

ZUOMA REFresh

Additional information

For help information on ZUOMA REFresh, type:

ZUOMA Help

Example

<table>
<thead>
<tr>
<th>Action</th>
<th>User</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initialize Offline Module Access control data.</td>
<td>ZUOMA REFRESH</td>
<td></td>
</tr>
<tr>
<td>CSMP0097I 03.16.01 CPU-A SS-BSS SSU-SSU0 IS-01</td>
<td>UOMA1000I 03.16.01 OMA Refresh Started</td>
<td></td>
</tr>
<tr>
<td>CSMP0097I 03.16.01 CPU-A SS-BSS SSU-SSU0 IS-01</td>
<td>UOMA1001I 03.16.01 OMA Refresh Complete</td>
<td></td>
</tr>
</tbody>
</table>
ZUSRP: Storage Resource Pool Management

Display and manage the components of Storage Resource Pools (SRP).

Limitations

- ZUSRP is available on system running HYPERMAX OS 5977 and later.
- The z/TPF SDA that you provide must be locally attached and mounted on the z/TPF system.

ZUSRP DISPLAY

Display information about a Storage Resource Pool and its components.

Format

ZUSRP DISPLAY SDA-ccuu poolreq-typereq [MHL1-dd.dd MHL2-dd.dd]

Parameters

- **SDA-ccuu**
  - An SDA mounted in the z/TPF system that identifies the storage system.

- **poolreq**
  - The pool request. One of:
    - SRP – Storage Resource Pool information request.
    - DGP – Disk Group information request.
    - SGP – Storage Group information request.
    - SLO – Service Level Objective information request.

- **typereq**
  - The type of display requested. One of:
    - ALL – display all Pools and Groups.
    - LIST – display a list of Pools and Groups.
    - (id) – display the Pool or Group that has the specified identifier.
    - (name) – display the Pool or Group with the specified name.

- **MHL1-dd.dd**
  - Optional: Hops one and two of the multi-hop list that identifies the RDF group path to the remote storage system.

- **MHL2-dd.dd**
  - Optional: Hops three and four of the multi-hop list that identifies the RDF group path to the remote storage system.

Examples

**SRP Examples**

The examples in this section display the following information:

- **SRP Name**
  - The name of the SRP.
- **Description**
  - The description of the SRP.
- **ID**
  - The identifier of the SRP.
- **CKD Default**
  - A flag indicating whether this is the default SRP for CKD volumes.
### ResourcePak Commands

**FBA Default**
A flag indicating whether this is the default SRP for FBA volumes.

**Resv Cap**
The maximum percentage of the SRP capacity that can be allocated for SnapVX protection tracks.

**DSE Max Cap**
The maximum amount of an SRP (in GB) than can be allocated for SRDF/A spillover.

**Capacity**
The maximum capacity in CKD and FBA tracks.

**Free**
The amount of unallocated tracks in the SRP expressed as a number and as a percentage of the SRP capacity.

**Allocated**
The amount of allocated tracks in the SRP expressed as a number and as a percentage of the SRP capacity.

**Snap**
The amount of tracks in the SRP, expressed as a number and as a percentage of SRP capacity, that can be allocated for SnapVX protection.

**DSE**
The amount of tracks in the SRP, expressed as a number and as a percentage of SRP capacity, allocated for SRDF/A spillover.

**Subscribed**
The amount of logical tracks, expressed as a number and as a percentage of SRP capacity, bound to the SRP.

#### Example 1

**Action**
Display all SRPs allocated in the storage system identified by the SDA 46E0.

**User**
ZUSRP DIS SDA-46E0 SRP-ALL

**System**

| CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01 |
| USRP0010I SRP ALL Display for Local CU 000196701170 |

---

**SRP Name:** SRP_1  
**Description:** (None)  
**ID:** 0001  
**CKD Default:** Y  
**FBA Default:** Y  
**Resv Cap:** 10 pct  
**DSE Max Cap:** 0(GB)

<table>
<thead>
<tr>
<th>CKD</th>
<th>PCT</th>
<th>FBA</th>
<th>PCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 297 600</td>
<td></td>
<td>67 032 000</td>
<td></td>
</tr>
<tr>
<td>44 131 685</td>
<td>58</td>
<td>63 611 567</td>
<td>94</td>
</tr>
<tr>
<td>31 165 915</td>
<td>41</td>
<td>3 420 433</td>
<td>5</td>
</tr>
<tr>
<td>1 342</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>117 889 380</td>
<td>156</td>
<td>4 570 095</td>
<td>6</td>
</tr>
</tbody>
</table>

---

**SRP Name:** SRP_0x102  
**Description:** (None)  
**ID:** 0102  
**CKD Default:** N  
**FBA Default:** N  
**Resv Cap:** 11 pct  
**DSE Max Cap:** 0(GB)

<table>
<thead>
<tr>
<th>CKD</th>
<th>PCT</th>
<th>FBA</th>
<th>PCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

---

End of Display
Example 2

**Action**
List the SRPs allocated in the storage system identified by the SDA 46E0.

**User**
ZUSR P DIS SDA-46E0 SRP-LIST

**System**

CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USRP0011I SRP LIST Display for Local CU 000196701170

<table>
<thead>
<tr>
<th>ID</th>
<th>SRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>SRP_1</td>
</tr>
<tr>
<td>0102</td>
<td>SRP_0x102</td>
</tr>
</tbody>
</table>

End of Display

Example 3

**Action**
Display the SRP with the identifier 0001 allocated in the storage system identified by the SDA 46E0.

**User**
ZUSR P DIS SDA-46E0 SRP-1

**System**

CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USRP0012I SRP ID Display for Local CU 000196701170

SRP Name: SRP_1
Description: (None)
ID: 0001  CKD Default: Y  FBA Default: Y  Resv Cap:  10 pct
DSE Max Cap: 0(GB)

<table>
<thead>
<tr>
<th>CKD</th>
<th>PCT</th>
<th>FBA</th>
<th>PCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>75 297 600</td>
<td>67 032 000</td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>44 131 685</td>
<td>63 611 567</td>
<td>94</td>
</tr>
<tr>
<td>Allocated</td>
<td>31 165 915</td>
<td>3 420 433</td>
<td>5</td>
</tr>
<tr>
<td>Snap</td>
<td>1 342</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DSE</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Subscribed</td>
<td>117 889 380</td>
<td>4 570 095</td>
<td>6</td>
</tr>
</tbody>
</table>

End of Display

DGP Example

The examples in this section display the following information:

- **Disk Group**: The name of a Disk Group.
- **SRP**: The name of the SRP that the Disk Group is part of.
- **ID**: The identifier of the Disk Group.
- **Class**: The class of the Disk group.
- **Speed**: The physical speed of the disks in the Disk Group.
- **Prot**: The protection or raid type of the disks in the Disk Group.
- **Unformatted Capacity**: The total capacity (in GB) of the Disk group.
- **Capacity**: The maximum capacity expressed in CKD and FBA tracks.
- **Free**: The amount of unallocated tracks, expressed as a number and as a percentage of SRP capacity, in the Disk Group.
Allocated  The amount of allocated tracks, expressed as a number and as a percentage of SRP capacity, in the Disk Group.

Snap  The amount of tracks, expressed as a number and as a percentage of SRP capacity, allocated for SnapVX protection.

DSE  The amount of tracks, expressed as a number and as a percentage of SRP capacity, allocated for SRDF/A spillover.

Action  Display all Device Groups allocated in the storage system identified by the SDA 46E0.

User  ZUSR P DIS SDA-46E0 DGP-ALL

System

CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USRSP0020I DGP ALL Display for Local CU 000196701170

Disk Group: GRP_1_1200_10K_R1
SRP: SRP_1
ID: 0001  Class: SAS  Speed: 10K  Prot: RAID-1
Unformatted Capacity: 1200(GB)

<table>
<thead>
<tr>
<th>CKD</th>
<th>PCT</th>
<th>FBA</th>
<th>PCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>0</td>
<td>45 057 600</td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>0</td>
<td>43 341 364</td>
<td>96</td>
</tr>
<tr>
<td>Allocated</td>
<td>0</td>
<td>1 716 236</td>
<td>3</td>
</tr>
<tr>
<td>Snap</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DSE</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Disk Group: GRP_2_600_10K_R1
SRP: SRP_1
ID: 0002  Class: SAS  Speed: 10K  Prot: RAID-1
Unformatted Capacity: 600(GB)

<table>
<thead>
<tr>
<th>CKD</th>
<th>PCT</th>
<th>FBA</th>
<th>PCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>75 297 600</td>
<td>21 974 400</td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>44 131 685</td>
<td>20 270 203</td>
<td>92</td>
</tr>
<tr>
<td>Allocated</td>
<td>31 165 915</td>
<td>1 704 197</td>
<td>7</td>
</tr>
<tr>
<td>Snap</td>
<td>1 342</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DSE</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

End of Display

SGP Example

The examples in this section display the following information:

SGP  The name of a Storage Group.
SRP  The name of the SRP that a Storage Group is part of.
ID  The identifier of a Storage Group.
SLO  The name of the Service Level Objective allocated to a Storage Group.
SLO ID  The identifier of the Service Level Objective allocated to a Storage Group.
Device Count  The number of devices in a Storage Group.
FAST  A flag indicating whether FAST manages the Storage Group.
ResourcePak Commands

RDFC  A flag indicating whether the Storage Group is enabled for SRDF coordination.

WORDLOAD The name of the workload allocated to the SLO ID.

Devs One or more ranges of devices that are in a Storage group. Each range consists of two device numbers indicating the start and end devices in the range.

---

**Action**
Display the Storage Group with an identifier of 0001 allocated in the storage system identified by the SDA 46E0.

**User**
ZUSR P DIS SDA-46E0 SGP-1

**System**

CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USRP0032I SGP ID Display for Local CU 000196701170

SGP: GUEST_INTERNAL_SG
ID: 0001 Device Count: 17
SRP: SRP_1 FAST: N RDFC: Y
SLO: Optimized WORKLOAD: (None)
SLO ID: 0001

Devs: START END START END START END
-----------------------------
00000002 00000012 |
-----------------------------
End of Display

---

**SLO Example**

The examples in this section display the following information:

**SLO** The name of a Service Level Objective.

**ID** The identifier of a Service Level Objective.

**Description** The description of a Service Level Objective.

**WORDLOAD** The name of the workload allocated to the Service level Objective.

**Approx Average Response Time (usec)** The response time of the Service Level Objective expressed in microseconds.

---

**Action**
Display the Service Level Objective with an identifier of 0004 allocated in the storage system identified by the SDA 46E0.

**User**
ZUSR P DIS SDA-46E0 SLO-4

**System**

CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USRP0042I SLO ID Display for Local CU 000196701170

SLO: Diamond WORKLOAD: DSS_REP
ID: 0004 Approx Average Response Time (usec): 3700
Description: Emulation

---

End of Display
ZUSRP CHANGE

Change the properties of a Storage Resource Pool.

Format

ZUSRP CHAnge SDA-ccuu SRP-hhh RCP-dd [MHL1-dd.dd MHL2-dd.dd]

Parameters

SDA-ccuu  An SDA mounted in the z/TPF system that identifies the storage system.
SRP      The identifier of a Storage Resource Pool, in hexadecimal.
RCP      The Reserved Capacity Limit Percentage of the Storage Resource Pool, in decimal.
          Value: 0 to 100 (inclusive)
MHL1-dd.dd Optional: Hops one and two of the multi-hop list that identifies the RDF group path to the remote storage system.
MHL2-dd.dd Optional: Hops three and four of the multi-hop list that identifies the RDF group path to the remote storage system.

Example

Action  Change the Reserve Capacity Percentage limit for the SRP with an identifier of 1 in the storage system identified by the SDA 46E0.
User    ZUSRP CHA SDA-46E0 SRP-1 RCP-11
System

ZUSRP DIS SDA-46E0 SRP-1
CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USR0012I SRP ID  Display for Local  CU 000000000000
------------------------------------------------------------------
SRP Name: SRP_1
      Description: (None)
      ID: 0001  CKD Default: Y  FBA Default: Y  Resv Cap:  10 pct
      DSE Max Cap: 0(GB)
------------------------------------------------------------------
          CKD    PCT    FBA    PCT
--- ------- ------- ------- -------
Capacity  75 297 600 67 032 000
Free      44 131 685 58 631 567 94
Allocated 31 165 915 41 3 420 433 5
Snap       1 342 0 0 0
DSE        0 0 0 0
Subscribed 117 889 380 156 4 570 095 6
------------------------------------------------------------------
End of Display

ZUSRP CHA SDA-46E0 SRP-1 RCP-11
CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USR0002I SRP Reserved Capacity Updated

ZUSRP DIS SDA-46E0 SRP-1
CSMP0097I 13.28.32 CPU-A SS-BSS SSU-SSU0 IS-01
USR0012I SRP ID  Display for Local  CU 000196701170
------------------------------------------------------------------
SRP Name: SRP_1
Description: (None)
ID: 0001  CKD Default: Y  FBA Default: Y  Resv Cap: 11 pct
DSE Max Cap: 0(GB)

<table>
<thead>
<tr>
<th></th>
<th>CKD</th>
<th>PCT</th>
<th>FBA</th>
<th>PCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>75 297 600</td>
<td>67 032 000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free</td>
<td>44 131 685</td>
<td>63 611 567</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Allocated</td>
<td>31 165 915</td>
<td>3 420 433</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Snap</td>
<td>1 342</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>DSE</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Subscribed</td>
<td>117 889 380</td>
<td>4 570 095</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

End of Display

**ZUSRP HELP**

For help information on ZUSRP, type:

```
ZUSRP Help
```
ZUVTP: Virtual tape controls

ResourcePak for z/TPF includes commands to control virtual tape:

- ZUVTP Fill
- ZUVTP Help
- ZUVTP Load
- ZUVTP Query
- ZUVTP Unload

ZUVTP Fill

This function manages a Fill feature which instructs the DLm to automatically load a scratch tape from the specified scratch synonym to the specified virtual tape drive every time a tape is unloaded. If the device does not have a tape loaded, this function loads a scratch tape from the specified scratch synonym. If a tape is loaded, when it unloads, an automatic load of a scratch tape from the specified scratch synonym occurs. When an invalid synonym is specified, the DLm returns a unit check-in sense data and a message suggesting a check of the source scratch synonym.

Limitations

This version only supports the EMC DLm. This command is restricted to BSS.

Format

ZUVTP FILL DEV-ccuu SYN-cccccccc

Parameters

DEV-ccuu Address designating the virtual tape device that is configured on the z/TPF host.

SYN-cccccccc The 8 character scratch synonym pool from which the virtual tape is to be loaded.

Additional information

The command confirms the VSN on the virtual tape that is loaded.

Example 1

**Action** Request that fill processing be activated for a valid scratch synonym.
**User** ZUVTP FILL DEV-8F5 SYN-SCRTCH
**System**

CSMP0097I 23.58.34 CPU-A SS-BSS SSU-SSU0 IS-01
UVTP0009I VSN BB0004 LOADED ON 08F5 FILL-AUTO SYN-SCRTCH

Example 2

**Action** Request that fill processing be activated for an invalid scratch synonym.
**User** ZUVTP FILL DEV-8F5 SYN-BAD
**ZUVTP Help**

Display help information for the ZUVTP commands.

**Format**

```
ZUVTP Help
```

**Examples**

**Action**

Display basic help.

**User**

```
ZUVTP HELP
```

**System**

CSMP0097I 23.58.00 CPU-A SS-BSS SSU-SSU0 IS-01
UVTP0000I VALID INPUT FORMAT :
  ZUVTP FILL DEV-ccuu,SYN-ssssssss
  ZUVTP QUERY DEV-ccuu
  ZUVTP LOAD DEV-ccuu VSN-volume
  ZUVTP LOAD DEV-ccuu SYN-ssssssss
  ZUVTP UNLOAD DEV-ccuu, NOALL|ALL

**ZUVTP Load**

Request the mount of a virtual tape on a virtual tape drive. This request can either mount a specific VSN or a scratch tape from a specified scratch synonym.

**Limitations**

ZUVTP is unsuccessful if there is a tape already loaded on this device. This version only supports EMC DLm. This command is restricted to BSS.

**Format**

```
ZUVTP LOAD DEV-ccuu SYN-cccccccc | VSN-vvssnn
```

**Parameters**

- **DEV-ccuu**  
  Address designating the virtual tape device that is configured on the z/TPF host.

- **SYN-cccccccc**  
  The 8 character scratch synonym pool from which virtual tape is to be loaded.

- **VSN-vvssnn**  
  The 6 character VSN associated with the virtual tape to be loaded.

**Additional information**

The command confirms the VSN on the virtual tape that is loaded.
Examples

Example 1

**Action**
Request a scratch tape load by specifying a scratch synonym.

**User**
ZUVTP LOAD DEV-8F2 SYN-SCRTCH

**System**
CSMP0097I 23.58.34 CPU-A SS-BSS SSU-SSU0 IS-01
UVTP000AE VSN BB0001 LOADED ON 08F2 FILL-NONE

Example 2

**Action**
Request a scratch tape load by specifying a VSN.

**User**
ZUVTP LOAD DEV-8F2 VSN-AA0099

**System**
CSMP0097I 23.58.34 CPU-A SS-BSS SSU-SSU0 IS-01
UVTP000AE VSN AA0099 LOADED ON 08F2 FILL-NONE

ZUVTP Query

Check the status of a virtual tape device.

Limitations

This version only supports the EMC DLm. This command is restricted to BSS.

Format

ZUVTP QUERY DEV-ccuu

Parameters

DEVCuu
Address designating the virtual tape device that is configured on the z/TPF host.

Additional information

The command confirms the VSN on the virtual tape that is loaded.

Example

The following information is displayed in this example:

Tape
Either the VSN of the loaded tape or "NO TAPE LOADED"

Device
Address of the virtual tape device from the ZUVTP QUERY

FILL
AUTO if Fill is active or NONE

SYN
If Fill is AUTO this is the scratch synonym for the active scratch pool.

ZUVTP QUERY DEV-8F5
CSMP0097I 23.58.34 CPU-A SS-BSS SSU-SSU0 IS-01
UVTP0009I VSN BB0004 LOADED ON 08F5 FILL-AUTO SYN-TEST
ZUVTP Unload

Request a rewind and unload of a virtual tape on a virtual tape drive.

Limitations

ZUVTP is unsuccessful if there is no tape loaded on this device. This version only supports the EMC DLm. This command is restricted to BSS.

Format

ZUVTP UNLoad DEV-ccuu [NOALL|ALL]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEV-ccuu</td>
<td>Address designating the virtual tape device that is configured on the z/TPF host.</td>
</tr>
<tr>
<td>NOALL</td>
<td>Instructs the DLm to unload the current tape from the specified device. If the Fill feature has been activated for this device, the DLm automatically loads another scratch tape from the scratch synonym specified for the Fill feature. NOALL is the default switch for this command.</td>
</tr>
<tr>
<td>ALL</td>
<td>Instructs the DLm to unload the current tape from the specified device and to discontinue the use of the Fill feature for this device. If there is currently an active tape mounted on this device, the tape remains active. When the active tape is unloaded during normal processing, the Fill feature does not load another tape from the scratch pool.</td>
</tr>
</tbody>
</table>

Additional information

The command confirms the VSN on the virtual tape that is unloaded.

Examples

Example1

<table>
<thead>
<tr>
<th>Action</th>
<th>Request a scratch tape load by specifying a VSN with Fill processing inactive.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>ZUVTP UNLOAD DEV-8F5 NOALL</td>
</tr>
<tr>
<td>System</td>
<td>CSMP0097I 23.58.34 CPU-A SS-BSS SSU-SSU0 IS-01</td>
</tr>
<tr>
<td></td>
<td>UVTP0008I NO TAPE LOADED ON 08F5 FILL-NONE</td>
</tr>
</tbody>
</table>

Example2

<table>
<thead>
<tr>
<th>Action</th>
<th>Request an unload of a tape on a device where fill is active with the NOALL option.</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>ZUVTP UNLOAD DEV-8F5 NOALL</td>
</tr>
<tr>
<td>System</td>
<td>CSMP0097I 23.58.34 CPU-A SS-BSS SSU-SSU0 IS-01</td>
</tr>
<tr>
<td></td>
<td>UVTP0009I VSN CC0003 LOADED ON 08F5 FILL-AUTO SYN-TEST</td>
</tr>
</tbody>
</table>
Example 3

**Action**  
Request an unload of a tape on a device where fill is active with the ALL option.

**User**  
ZUVTP UNLOAD DEV-8F5 ALL

**System**
CSMP0097I 23.58.34 CPU-A SS-BSS SSU-SSU0 IS-01
UVTP0008I NO TAPE LOADED ON 08F5 FILL-NONE
APPENDIX A
Messages

This appendix lists the messages reported by the ResourcePak for z/TPF, the reason for the message, and the recommended user action, if any.

- Message format .................................................................................................................. 100
- Message descriptions ......................................................................................................... 101
Message format

Messages have the following format:

```
ppppnnnx hh.mm.ss text
```

Where:

* `pppp`  
  Is the first 4 characters of the segment name or the secondary action code of the associated input message.

* `nnnn`  
  Is a unique message number.

* `x`  
  Is one of the following severity codes:
  
  - I: Information only. The message is a normal response.
  - A: Action required. Additional operator action is required.
  - W: Attention. An error that could require additional user action.
  - E: Error. An error without program shutdown.
  - T: Termination. An error with program shutdown.

* `hh.mm.ss`  
  Is the time of day that the message was reported.

* `text`  
  Is the text of the message.
Message descriptions

UCPY0000I

EMC Point In Time Copy Display

The format is:

\[ \text{ZUCPY } \text{hhhh } rsa.\text{cnt } \text{GROUP-} \text{cccccccc} \]

Where:

- **hhhh**: The eight-digit, hexadecimal FARF or 14-digit MCHR.
- **rsa**: The hexadecimal offset into the record.
- **cnt**: The number of bytes to display (in hexadecimal).
- **cccccccc**: The one- through eight character name for a TimeFinder group.

**Explanation**: This is the normal response to the ZUCPY Help command and to a ZUCPY command with invalid parameters.

**System Action**: None.

**User Response**: Reissue the ZUCPY command using the specified format.

UCPY0001E

Error on FDRSC call - .......
See EMXC Product Guide for FDSRC Return Codes

**Explanation**: A FDSRC call call could not return the requested Poiny-In-Time copy of the record.

**System Action**: None.

**User Response**: Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

UCPY0003E

Invalid relative start address specified

**Explanation**: The relative start address is invalid.

**System Action**: None.

**User Response**: Enter the ZUCPY functional entry specifying a valid relative start address.
**UDCP0001E**

Error on SymmAPI call - ........

See EMC Product Guide for SymmAPI Return Codes.

**Explanation:** An EMC SymmAPI call could not perform the requested action.

**System Action:** None.

**User Response:** Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID.

**UDCP0002E**

Heap storage not available. Try again later

**Explanation:** The operation could not acquire the heap storage necessary to issue the command.

**System Action:** None.

**User Response:** Try the operation when the system is less busy.

**UDCP0003E**

SDA ccuu designates an unsupported CU

**Explanation:** The specified SDA ccuu designates a storage system that does not support SymmAPI for z/TPF. The system is either another vendor’s hardware or one running a version of Enginuity that does not support the API.

**System Action:** None.

**User Response:** Determine which of the aforementioned explanations applies. If running z/TPF under z/VM on a storage system running Enginuity 5773, ensure the SDA is defined as an unsupported device to z/VM or is directly attached and not defined as a minidisk for VPARS.

**UDCP0004E**

SDA ccuu is an invalid device address

**Explanation:** The specified SDA is either invalid or not currently mounted on the z/TPF system.

**System Action:** None.

**User Response:** Mount the device to z/TPF or try the operation on another SDA residing on the same storage system.

**UDCP0005E**

Requested GID not found

**Explanation:** The cache partition Group ID for the requested partition does not exist on this storage system.

**System Action:** None.

**User Response:** Provide a valid partition Group ID using the ZUDCP DISPLAY command.
UDCP0006E

GID is required on DEVS display

Explanation: Since the DEVS display command is directed towards a specific partition, a partition Group ID is required.

System Action: None.

User Response: Reissue the command with the appropriate partition Group ID.

UDCP0007E

Requested GID already exists or is invalid

Explanation: The ZUDCP CREATE command requires a partition Group ID specified as a unique hexadecimal value between x'01' and x'FE'.

System Action: None.

User Response: Reissue the CREATE command with a valid, unique partition Group ID. Or let the system to select a Group ID.

UDCP0008E

Error - Max Partitions already exist

Explanation: You issued a ZUDCP CREATE command when the maximum number of partitions already exist.

System Action: None.

User Response: Partitions can be rearranged with the move and modify commands or delete a partition before creating another.

UDCP0009E

Delete error - cannot delete default group

Explanation: The group ID of zero is a reserved default group and cannot be deleted.

System Action: None.

User Response: Enter the ZUDCP DELETE command with corrected partition Group ID.

UDCP0010E

Set state error - DCP is not DISABLED

Explanation: The requested action cannot be performed with Dynamic Cache Partitioning enabled.

System Action: None.

User Response: Issue the ZUDCP DISABLE command and then reissue the request.
Messages

**UDCP0011E**

Error - Name must be at least 8 chars

**Explanation:** When executing aZUDCP CREATE or MODIFY, provide a partition name that has between 8 and 31 characters.

**System Action:** None.

**User Response:** Reissue the command with a correct partition name.

**UDCP0012E**

Error - Name already exists

**Explanation:** Partition names must be unique.

**System Action:** None.

**User Response:** Reissue the command with a unique name. You can use the ZUDCP DISPLAY command to show names of existing partitions.

**UDCP0013E**

Error - WP should be between 40 and 80

**Explanation:** Write pending values for a partition must be between 40% and 80%.

**System Action:** None.

**User Response:** Reissue the command with a valid WP value or, if unsure, allow it to default.

**UDCP0014E**

Error - Type must be DEVS, RDFG, META, or SCKD

**Explanation:** The type parameter must be a valid defined type.

**System Action:** None.

**User Response:** Reissue the command with a valid type.

**UDCP0015E**

Error - Specified SDN is out of range or not valid

**Explanation:** The device number (SDN) is not valid or does not exist on the targeted storage system.

**System Action:** None.

**User Response:** Validate the targeted device range. Reissue the command with a valid SDN.
**UDCP0016E**

Error - MIN MAX TAR values are not compatible

Min <= TAR <= MAX, 10 <= TAR <= 90, and MAX <=100

**Explanation:** The MIN, MAX, and TAR values, which represent the minimum, maximum, and target allocation percentages, are not compatible. Minimum value must be equal or less than the target value and the target value must be equal to or less than the maximum value. The maximum value cannot exceed 100%. A fully flexible configuration has the minimum equal to zero and maximum equal to 100%. The target value can be 10% to 90%. The sum of all partition target values must equal 100%.

**System Action:** None.

**User Response:** Validate the values for Min, Max, and Target allocations and reissue the command.

---

**UDCP0017E**

Error - Must specify SDN- and CNT- with TYPE'

**Explanation:** The TYPE parameter entered requires SDN and CNT be specified.

**System Action:** None.

**User Response:** Reissue the command with valid parameters.

---

**UDCP0018E**

Error - Must specify a valid GRO- with TYPE-RDFG

**Explanation:** With TYPE-RDFG the group parameter GRO- must be included and must be a valid RDF group that is not currently empty.

**System Action:** None.

**User Response:** Reissue the command with valid parameters.

---

**UDCP0019E**

Error - GRO- is not a valid RDF group

**Explanation:** The RDF group value specified with GRO- parameter was either invalid or empty.

**System Action:** None.

**User Response:** Reissue the command with valid parameters.

---

**UDCP0020E**

Error - target allocation of default group would be below min

**Explanation:** The default group requires a minimum allocation of 10% of cache. When defining or modifying groups, the target cache allocation specified is subtracted from the cache allocated to the default group. The command entered would force the default group to go below default minimum values and is disallowed.

**System Action:** None.

**User Response:** Reissue the command with valid parameters.
Messages

UDCP0021E
Error - cannot change attributes of default group
Explanation: The default group attributes cannot be changed. The only parameter that can be modified is AGE to allow AGE-0 for ANALYSIS mode.
System Action: None.
User Response: Reissue the command with valid parameters.

UDCP0022E
Error - specified SDN is not a head device
Explanation: When working with TYPE-SCKD or TYPE-META, the SDN must be directed to an appropriate head device.
System Action: None.
User Response: Reissue the command with valid parameters.

UDCP0023E
Error - Feature is not allowed or is restricted
Explanation: Feature Registration checks found the Cache Partitioning feature to be disallowed. Both ZUDCP ENABLE and CREATE commands are not permitted when Feature Registration is blocked.
System Action: None.
User Response: None. If condition persists, contact EMC Support.

UDCP0024E
Error - CNT is invalid
Explanation: The CNT for TYPE-SCKD must be between 1 and 32.
System Action: None.
User Response: Reissue the command with valid parameters.

UDCP0025E
Error - partition definitions not valid for ANALYSIS mode
Explanation: Analysis mode requires that all defined partitions have minimum allocation of 0%, donation age of zero, and maximum allocation of 100%.
System Action: None.
User Response: Use the ZUDCP MODIFY command to set MIN-0 MAX-100 AGE-0 for each partition. Only AGE can be modified for the default partition.
UDCP0026E

Error - Name is not valid

Explanation: A cache partition name must be alphanumeric, may contain an underscore, but cannot begin with an underscore.

System Action: None.

User Response: Reissue the command with a valid name parameter.

UDVQ0000I

EMC Device Configuration Display

The formats are:

ZUDVQ ccud [ssss cccc] [MHL1-dd.dd MHL2-dd.dd] [SUMM]
ZUDVQ ccud [INFO]

Where:

ccud One to four digit valid z/TPF SDA.
ssss One to four digit starting Symm device.
cccc One to four hex count of lines.
MHL1-2 RDF Groups specifying the path to the storage system.
SUMM Summary of device types in ranges.
INFO Device information for input SDA.

Explanation: This is the normal response to the ZUDVQ Help command and a ZUDVQ command with invalid parameters.

System Action: None.

User Response: Reissue the ZUDVQ command using the specified format.

UDVQ0001E

Error on SymmAPI call - ........
See EMC product guide for SymmAPI Return Codes

Explanation: A SymmAPI call could not perform the requested action.

System Action: None.

User Response: Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.
Messages

UDVQ0002E

SDA ccud designates an unsupported CU

Explanation: The specified SDA ccud designates a storage system that does not support SymmAPI for z/TPF. The system is either another vendor’s hardware or one running a version of Enginuity that does not support the API.

System Action: None.

User Response: Determine which of the previous explanations applies. If running z/TPF under z/VM on a storage system running Enginuity 5773, ensure the SDA is defined as an unsupported device to z/VM or is directly attached and not defined as a minidisk for VPARS.

UDVQ0003E

Invalid starting device number

Explanation: The starting device number specified is out of range.

System Action: None.

User Response: Reissue the ZUDVQ command specifying a valid device number.

UDVQ0004E

Invalid device count

Explanation: The device count specified is out of range.

System Action: None.

User Response: Reissue the ZUDVQ command specifying a valid device count.

UECS0000I

EMC Cache Statistics Display.
The format is:

ZUECS ccud
Where:
ccud 1 to 4 digit valid z/TPF SDA.

Explanation: This is the normal response to the ZUECS Help command and a ZUECS command with invalid parameters.

System Action: None.

User Response: Reissue the ZUECS command using the specified format.
UECS0001E

Error on SymmAPI call - .........
See EMC product guide for SymmAPI Return Codes

Explanation: A SymmAPI call could not perform the requested action. Appendix B lists the return codes.

System Action: None.

User Response: Determine the meaning of the return code. Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

UECS0002E

SDA ccud designates an unsupported CU

Explanation: The specified SDA ccud designates a storage system that does not support SymmAPI for z/TPF. The system is either another vendor’s hardware or one running a version of Enginuity that does not support the API.

System Action: None.

User Response: Determine which of the aforementioned explanations applies. If running z/TPF under z/VM on a storage system running Enginuity 5773, ensure the SDA is defined as an unsupported device to z/VM or is directly attached and not defined as a minidisk for VPARS.

UECS0003E

Unsupported option on SDA ccud

The option specified is not supported at the Enginuity level of the controller designated by SDA.

Explanation: The specified SDA ccud designates a storage system that does not support the specified option. An example is the Link option which requires Enginuity version 5771 and later.

System Action: None.

User Response: Select an SDA which represents a controller at the appropriate Enginuity level and reissue the command.
Messages

UEDS0000I

EMC Disk Adaptor/Device Statistics Display

Format is:

ZUEDS DA|DEV SDA-ccud [SDN-hhhh] [CNT-dddd]

Where:

ccud 1 to 4 digit valid z/TPF SDA.

hhhh A valid device number on the storage system.

dddd The count of devices to display.

Explanation: This is the normal response to the ZUEDS Help command and a ZUEDS command with invalid parameters.

System Action: None.

User Response: Reissue the ZUEDS command using the specified format.

UEDS0001E

Error on SymmAPI call - ........

See EMC product guide for SymmAPI Return Codes

Explanation: A SymmAPI call could not perform the requested action.

System Action: None.

User Response: Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

UEDS0002E

Heap storage not available. Try again later

Explanation: The operation could not acquire the heap storage necessary to complete the command.

System Action: None.

User Response: Try the operation when the system is less busy.

UEDS0003E

SDA ccud designates an unsupported CU

Explanation: The specified SDA ccud designates a storage system that does not support SymmAPI for z/TPF. The system is either another vendor’s hardware or one running a version of Enginuity that does not support the API

System Action: None.

User Response: Determine which of the aforementioned explanations applies. If running z/TPF under z/VM on a storage system running Enginuity, ensure the SDA is defined as an unsupported device to z/VM or is directly attached and not defined as a minidisk for VPARS.
UESD0004E

SDA ccud is an invalid device address
Explanation: The input SDA specified is invalid.
System Action: None.
User Response: Determine the reason for the failure and reissue the ZUESD command specifying a valid SDA.

UESD0005E

Invalid starting device number
Explanation: The starting device number specified is out of range.
System Action: None.
User Response: Reissue the ZUESD command specifying a valid device number.

UESD0006E

Invalid device count
Explanation: The device count specified is out of range.
System Action: None.
User Response: Reissue the ZUESD command specifying a valid device count.

UELM0000I

ZUELMDIS ccuu [MHL1-\dd.\dd MHL2-\dd.\dd]
Where:
- ccuu: One to four digit valid z/TPF SDA.
- MHL1-2: RDF Groups specifying the path to the storage system.

Explanation: This is the response to the ZUELMD Help command or to a ZUELMD commands with invalid parameters.
System Action: None.
User Response: Reissue the ZUELMD command using the specified format.
**ULEM0001E**

Error on SymmAPI call- ........

See EMC product guide for SymmAPI Return Codes

**Explanation:** A SymmAPI call could not perform the requested action.

**System Action:** None.

**User Response:** Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

**ULEM0002E**

Heap storage not available. Try again later.

**Explanation:** The operation could not acquire the heap storage necessary to complete the command.

**System Action:** None.

**User Response:** Try the operation when the system is less busy.

**ULEM0003E**

SDA .... designates an unsupported CU

**Explanation:** The specified SDA ccud designates a storage system that does not support SymmAPI for z/TPF. The system is either another vendor's hardware or one running a version of Enginuity that does not support the API.

**System Action:** None.

**User Response:** Determine which of the aforementioned explanations applies. If running z/TPF under z/VM on a storage system running Enginuity 5773, ensure the SDA is defined as an unsupported device to z/VM or is directly attached and not defined as a minidisk for VPARS.

**ULEM0004E**

SDA .... is an invalid device address

**Explanation:** The input SDA specified is invalid.

**System Action:** None.

**User Response:** Determine the reason for the failure and reissue the ZUELM command specifying a valid SDA.
UFRT0000I

**ZUFRT Help**

**ZUFRT DISplay ccuu [FID-xxx] [MHL1-dd.dd] [MHL2-dd.dd]**

**Where:**
- **ccuu** One to four digit valid z/TPF SDA.
- **FID-xxx** Hexadecimal feature ID.
- **MHL1-2** RDF Groups specifying the path to the storage system.

**Explanation:** This is the response to the ZUFRT Help command and a ZUFRT command with invalid parameters.

**System Action:** None.

**User Response:** Reissue the ZUFRT command using the specified format.

UFRT0001I

**Error on SymmAPI call- ........**

See EMC product guide for SymmAPI Return Codes

**Explanation:** A SymmAPI call could not perform the requested action.

**System Action:** None.

**User Response:** Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

UFRT0002E

**Heap storage not available. Try again later.**

**Explanation:** The operation could not acquire the heap storage necessary to complete the command.

**System Action:** None.

**User Response:** Try the operation when the system is less busy.

UFRT0003E

**SDA .... designates an unsupported CU**

**Explanation:** The specified SDA ccud designates a storage system that does not support SymmAPI for z/TPF. The system is either another vendor’s hardware or one running a version of Enginuity that does not support the API.

**System Action:** None.

**User Response:** Determine which of the aforementioned explanations applies. If running z/TPF under z/VM on a storage system running Enginuity 5773, ensure the SDA is defined as an unsupported device to z/VM or is directly attached and not defined as a minidisk for VPARS.
Messages

UFRT0004E

SDA .... is an invalid device address
Explanation: The input SDA specified is invalid.
System Action: None.
User Response: Determine the reason for the failure and reissue the ZUFRT command specifying a valid SDA.

UFRT0005E

Requested FID not found
Explanation: The input FID specified is invalid.
System Action: None.
User Response: Reissue the ZUFRT command specifying a valid FID.

UFRT0009I

ZUFRT ELM
To display ELM entitlements use
ZUELM DIS ccuu [MHL1-dd.dd] [MHL2-dd.dd]
Explanation: This is the normal response to the ZUFRT ELM command.
System Action: None.
User Response: Issue the ZUELM command using the specified format to display EMC License Management Entitlements.

UGRP0000I

EMC Dynamic RDFGroup Controls
ZUGRP DISplay SDA-ccud [PRG-ddd] [MHL1-dd.dd MHL2-dd.dd]
Where:
ccud - Valid z/TPF SDA
PRG - Primary RDFGroup
ZUGRP ADD3DELete SDA-ccud PRG-ddd SRG-ddd SCU-cccccccccmmm
PD1-ddd.ddd [PD2-ddd.ddd PD3-ddd.ddd PD4-ddd.ddd] SD1-ddd.ddd
[SD2-ddd.ddd SD3-ddd.ddd SD4-ddd.ddd] [LABel-cccccccccmmm]
[MHL1-dd.dd MHL2-dd.dd]
Where:
ccuud The identifier of a z/TPF SDA.
PRG-ddd The identifier of the Primary RDFGroup.
SRG-ddd The identifier of the Secondary RDFGroup.
SCU-cccccccc The one- through eight character name for a TimeFinder group.
PD1-4 The identifiers of the Primary RDF directors.
SD1-3 The identifiers of the Secondary RDF directors.
LABel-cccccccc The label of the RDFGroup.
MHL1-2 RDFGroups that define the path to the primary storage system.

**Explanation:** This is the normal response to the ZUGRP Help command and a ZUGRP command with invalid parameters.

**System Action:** None.

**User Response:** Reissue the ZUGRP command using the specified format.

**UGRP0001I**

Dynamic RDFGroup Controls operation complete

**Explanation:** The request to add or delete a dynamic RDFGroup completed successfully.

**System Action:** None.

**User Response:** None.

**UGRP0001E**

Error on SymmAPI call - ........

*See EMC product guide for SymmAPI Return Codes*

**Explanation:** A SymmAPI call could not perform the requested action.

**System Action:** None.

**User Response:** Determine the meaning of the return code (*Appendix B* lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

**UGRP0002E**

SDA ... designates an unsupported Control Unit

**Explanation:** The specified SDA *ccud* designates a storage system that does not support SymmAPI for z/TPF. The system is either another vendor’s hardware or one running a version of Enginuity that does not support the API.

**System Action:** None.

**User Response:** Determine which of the aforementioned explanations applies. If running z/TPF under z/VM on a storage system running Enginuity 5773, ensure the SDA is defined as an unsupported device to z/VM or is directly attached and not defined as a minidisk for VPARS.
Messages

UGRP0003E
Primary (PD1) and Secondary (SD1) directors must be specified
Explanation: The RDF directors on which the RDFGroup was intended to be added must be specified for the primary and the secondary storage systems.
System Action: None.
User Response: Issue the ZUGRP DIS command for both the primary and secondary systems to review the configured RDF directors. Then reissue the ZUGRP ADD command specifying the correct RDF director numbers.

UGRP0004E
Invalid RDF director
Explanation: An invalid director number was specified on the ZUGRP ADD|DEL functional entry.
System Action: None.
User Response: Issue the ZUGRP DIS command for both the primary and secondary storage systems to list the configured RDF directors. Valid RDF directors for Enginuity Microcode 5773 and earlier are 1 to 64. Valid RDF directors for Enginuity Microcode 5874 and later are 1 to 128.
Reissue the ZUGRP ADD|DEL command specifying the correct RDF director numbers.

UGRP0005E
Primary RDFGroup does not exist or defined to another secondary CU
Explanation: You specified an incorrect primary RDFGroup in the ZUGRP DEL command.
System Action: None.
User Response: Issue the ZUGRP DIS command for both the primary and secondary storage systems to list the configured RDFGroups. Then reissue the ZUGRP DEL command specifying the correct RDFGroup.

UGRP0006E
Primary RDFGroup (PRG) must be specified
Explanation: The primary RDFGroup was not specified in the ZUGRP ADD|DEL functional entry.
System Action: None.
User Response: Issue the ZUGRP DIS command for both the primary and secondary storage systems to list the configured RDFGroups. The reissue the ZUGRP ADD|DEL command specifying the correct RDFGroups.
UGRP0007E

Static RDFGroup does not exist to input secondary CU

Explanation: Dynamic RDFGroups can only be added for device pairs for which there is already a pre-configured static RDFGroup.

System action: None.

User Response: Issue the ZUGRP DIS command for both the primary and secondary storage systems to list the configured RDFGroups and directors. The reissue the ZUGRP ADD|DEL functional entry specifying the correct RDFGroups and RDF directors.

If you cannot determine the correct parameters or there is no static RDFGroup configured for the pair of systems, contact the EMC Customer Support Center for technical assistance.

UGRP0008E

No RDF Directors

Explanation: Dynamic RDFGroups can only be added for storage systems configured with either fibre channel or GigE RDF directors.

System action: None.

User Response: Contact the EMC Customer Support Center for technical assistance.

UGRP0009E

Secondary CU (SCU) must be specified

Explanation: The secondary storage system on which the RDFGroup was intended to be added or deleted must be specified.

System Action: None.

User Response: Issue the ZUGRP DIS command for both the primary and secondary systems to list the serial numbers. Then reissue the ZUGRP ADD|DEL command specifying the correct secondary storage system (SCU).

UGRP0010E

RDFGroup label must consist of 0-9,A-Z, or :

Explanation: The RDFGroup label specified in the ZUGRP ADD command may consist only of the characters 0-9, A-Z, or :

System Action: None.

User Response: Reissue the ZUGRP ADD command specifying a valid RDFGroup label.
Messages

**UGRP0011E**

Primary (PD1) or Secondary (SD1) directors must be specified

**Explanation:** You must specify RDF directors from which the RDFGroup is intended to be deleted for either the primary or secondary storage systems.

**System Action:** None.

**User Response:** Issue the ZUGRP DIS command for both the primary and secondary systems to list the configured RDF directors. Then, reissue the ZUGRP DEL command specifying the correct RDF director number(s).

**ULOC00001**

**EMC Disk MPLF/Attention Message Display**

The format is:

ZULOC MPLF|ATTN SDA-ccud

**Where:**

ccud 1 to 4 digit valid z/TPF SDA.

**Explanation:** This is the normal response to the ZULOC Help command and a ZULOC command with invalid parameters.

**System Action:** None.

**User Response:** Reissue the ZULOC functional entry using the specified format.

**ULOC0001E**

Error on SymmAPI call - ........

See EMC product guide for SymmAPI Return Codes

**Explanation:** A SymmAPI call could not perform the requested action.

**System Action:** None.

**User Response:** Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

**ULOC0002E**

Heap storage not available. Try again later

**Explanation:** The operation could not acquire the heap storage necessary to issue the command.

**System Action:** None.

**User Response:** Try the operation when the system is less busy.
**ULOC0003E**

SDA ccud designates an unsupported CU

**Explanation:** The specified SDA ccud designates a storage system that does not implement SymmAPI for z/TPF. The system is either another vendor’s hardware or one running a version of Enginuity that does not implement the API call being made. If running under VM, the system may implement SymmAPI for z/TPF, but be defined as DASD.

**System Action:** None.

**User Response:** Determine which of the aforementioned explanations applies. If you are running z/TPF under VM, ensure the SDA is defined as an unsupported device to VM or is directly attached and not defined.

**ULOC0004E**

SDA ccud is an invalid device address

**Explanation:** The starting device number specified is out of range.

**System Action:** None.

**User Response:** Reissue the ZULOC command specifying a valid device number.

**ULOC0005E**

SDA ccud designates a CU without MPLF

**Explanation:** The device designates a storage system that does not have z/TPF configured.

**System Action:** None.

**User Response:** Reissue the ZULOC command specifying a valid storage system.

**UOMA0000I**

Valid Offline Module Access Commands are:
REFresh, DISplay
For details enter ZUOMA Help Command.

**Explanation:** This is the normal response to a ZUOMA command with invalid parameters.

**System Action:** None.

**User Response:** Enter the ZUOMA functional entry using the specified format.

**UOMA0001I**

EMC Offline Module Access Control Data Refresh
Format: ZUOMA REFresh

**Explanation:** This is the normal response to the ZUOMA Help REFresh command.

**System Action:** None.

**User Response:** Enter the ZUOMA command using the specified format.
Messages

**UOMA0002I**

EMC Offline Module Access Control Data Display

Format is: ZUOMA DISplay OCD|(TST mod cnt
GROup-cccccccc)

Where:

- **OCD** Displays OMA Control data.
- **TST** Displays the Target Status Table.
- **mod** The symbolic number of the module (in hexadecimal).
- **cnt** The number of modules (in decimal).
- **cccccccc** The eight-character name of a TimeFinder Group.

**Explanation:** This is the normal response to the ZUOMA Help DISplay command.

**System Action:** None.

**User Response:** Enter the ZUOMA command using the specified format.

**UOMA0001E**

Error during copy extent validation
Record type #EMCSP4 not found

**Explanation:** OMA record type #EMCSP4 does not exist. This message may also appear for record types #EMCTF, #EMCSPL, and #EMCSPS.

**System Action:** None.

**User Response:** OMA requires that the record types #EMCSP4, #EMCSPL, and #EMCSPS be allocated in the FCTB. Code FCTB allocations for these record types accordingly. If you intend to use EMC Symmetrix Utility Display Point-In-Time Copy, allocate and initialize #EMCTF also.

**UOMA0002E**

Error during copy extent validation
Record equate #EMCSP4 not found

**Explanation:** The FCTB equate for OMA record type #EMCSP4 does not exist. This message may also appear for record types #EMCSPL and #EMCSPS.

**System Action:** None.

**User Response:** OMA requires that the record types #EMCSP4, #EMCSPL, and #EMCSPS be allocated in the FCTB. Code FCTB allocations for these record types accordingly.
UOMA0003E

Error during copy extent validation
RTCUC returned data block too small for record type #EMCSP4

Explanation: ZUOMA REFRESH issued an RTCUC macro call for record type #EMCSP4 but the returned data block was larger than that provided by the application. This message may also appear for record types #EMCSPL and #EMCSPS.

System Action: None.

User Response: OMA requires that the FCTB allocations for each of the record types #EMCSP4, #EMCSPL, and #EMCSPS be on contiguous tracks and not split. If this requirement is properly met, the RDB provided by the application for the RTCUC macro call is adequate. Code FCTB allocations for these record types accordingly.

UOMA0004E

Error during copy extent validation
Record type #EMCSP4 allocation is split across more than one extent

Explanation: ZUOMA REFRESH detected that the FCTB allocation for OMA record type #EMCSP4 is split and not on contiguous tracks. This message may also appear for record types #EMCSPL and #EMCSPS.

System Action: None.

User Response: OMA requires that the FCTB allocations for each of the record types #EMCSP4, #EMCSPL, and #EMCSPS be on contiguous tracks and not split. Code FCTB allocations for these record types accordingly.

UOMA0005E

Error during copy extent validation
Record type #EMCSP4 allocation must span at least one entire track

Explanation: ZUOMA REFRESH detected that the FCTB allocation for OMA record type #EMCSP4 does not span an entire track across all symbolic modules. This message may also appear for record types #EMCSPL and #EMCSPS.

System Action: None.

User Response: OMA requires that the FCTB allocations for each of the record types #EMCSP4, #EMCSPL, and #EMCSPS span an entire track across all symbolic modules. Code FCTB allocations for these record types accordingly.
Messages

UOMA0006E

Unable to allocate system heap for Offline Module Access control data refresh  

Explanation: ZUOMA REFRESH was unable to get system heap for the OMA Control Data block.  

System Action: None.  

User Response: Review system heap allocations for your z/TPF complex and adjust to accommodate the expected size of the OMA Control Data.

UOMA0007E

Unable to return system heap for Offline Module Access control data refresh  

Explanation: ZUOMA REFRESH was unable to return the system heap for the OMA Control Data block.  

System Action: None.  

User Response: Note all errors indicated by ZUOMA REFRESH. Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

UOMA0010W

OMA unsupported for SSID `hhhh`  

Explanation: ZUOMA REFRESH determined that the DASD subsystem with SSID `hhhh` does not meet minimum hardware and Enginuity or HYPERMAX OS requirements to support Offline Module Access.  

System Action: None.  

User Response: Note the unsupported SSID. You cannot use the OMA utilities on the reported SSID.

UOMA0011E

Error on SymmAPI call - ........   

See EMC product guide for SymmAPI Return Codes  

Explanation: A SymmAPI call could not perform the requested action.  

System Action: None.  

User Response: Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.
UOMA0014E
OMA disabled for Target access
Record type #EMCTF master control record FACS error
Explanation: ZUOMA REFRESH determined that there is a problem with the TimeFinder Master Control Records on the Basic Subsystem of the z/TPF Complex.
System Action: None.
User Response: Allocate the TimeFinder for z/TPF Data Structures to enable ZUOMA REFRESH to build the Target Status Table. You cannot use the EMC Symmetrix Utility, Display Point-In-Time Copy, unless the Target Status Table has been initialized. If you intend to use EMC Symmetrix Utility Display Point-In-Time Copy, allocate and initialize the #EMCTF records also.

UOMA0015E
OMA disabled for Target access
Record type #EMCTF master control record FIND error
Explanation: ZUOMA REFRESH determined that there is a problem with the TimeFinder Master Control Records on the Basic Subsystem of the z/TPF Complex.
System Action: None.
User Response: Allocate the TimeFinder for z/TPF Data Structures to enable ZUOMA REFRESH to build the Target Status Table. You cannot use the EMC Symmetrix Utility, Display Point-In-Time Copy, unless the Target Status Table has been initialized. If you intend to use EMC Symmetrix Utility Display Point-In-Time Copy, allocate and initialize the #EMCTF records also.

UOMA0016E
TimeFinder data structures not initialized
Explanation: ZUOMA REFRESH determined that the TimeFinder Control Records are allocated but not initialized on the basic subsystem of the z/TPF Complex.
System Action: None.
User Response: Follow TimeFinder for z/TPF procedures to initialize the TimeFinder for z/TPF data structures.

UOMA0017E
OMA Disabled for Target access
Record type #EMCTF CU control record FACS error
Explanation: ZUOMA REFRESH determined that there is a problem with the TimeFinder CU Control Records on the Basic Subsystem of the z/TPF Complex.
System Action: None.
User Response: Allocate TimeFinder for z/TPF Data Structures to enable ZUOMA REFRESH to build the Target Status Table. You cannot use the EMC Symmetrix Utility, Display Point-In-Time Copy, unless the Target Status Table has been initialized. If you intend to use EMC Symmetrix Utility Display Point-In-Time Copy, allocate and initialize #EMCTF records.
Messages

UOMA0018E

OMA disabled or Target access
Record type #EMCTF CU control record FIND error

Explanation: ZUOMA REFRESH determined that there is a problem with the TimeFinder CU Control Records on the Basic Subsystem of the z/TPF Complex.

System Action: None.

User Response: Allocate the TimeFinder for z/TPF Data Structures to enable ZUOMA REFRESH to build the Target Status Table. You cannot use the EMC Symmetrix Utility, Display Point-In-Time Copy unless the Target Status Table has been initialized. If you intend to use EMC Symmetrix Utility Display Point-In-Time Copy, allocate and initialize #EMCTF records.

UOMA0019E

OMA disabled for Target access
Record type #EMCTF Device control record FACS error

Explanation: ZUOMA REFRESH determined that there is a problem with the TimeFinder Device Control Records on the Basic Subsystem of the z/TPF Complex.

System Action: None.

User Response: Allocate TimeFinder for z/TPF Data Structures to enable ZUOMA REFRESH to build the Target Status Table. You cannot use the EMC Symmetrix Utility, Display Point-In-Time Copy, unless the Target Status Table has been initialized. If you intend to use EMC Symmetrix Utility Display Point-In-Time Copy, allocate and initialize #EMCTF records.

UOMA0020A

OMA disabled for Target access
Record type #EMCTF Device control record FIND error

Explanation: ZUOMA REFRESH determined that there is a problem with the TimeFinder Device Control Records on the Basic Subsystem of the z/TPF Complex.

System Action: None.

User Response: Allocate TimeFinder for z/TPF Data Structures to enable ZUOMA REFRESH to build the Target Status Table. You cannot use the EMC Symmetrix Utility, Display Point-In-Time Copy, unless the Target Status Table has been initialized. If you intend to use EMC Symmetrix Utility Display Point-In-Time Copy, allocate and initialize #EMCTF records.

UOMA0021E

Offline Module Access Control Data not initialized
Enter ZUOMA REFresh

Explanation: You ran the ZUOMA DISPLAY command without previously using the ZUOMA command to initialize the OMA Control Data.

System Action: None.

User Response: Use the ZUOMA REFRESH command to initialize OMA Control Data Structures and then use the ZUOMA DISPLAY command.
UOMA0022E

Specified TimeFinder Group name R2 is invalid
Explanation: The TimeFinder Group named in a ZUOMA DISPLAY TST command does not exist.
System Action: None.
User Response: Re-enter the command specifying the name of a group that exists.

UOMA0023E

TimeFinder data structures not initialized
Explanation: You used the ZUOMA DISPLAY command when the OMA Control Data indicates that TimeFinder Control Records are not initialized on the basic subsystem of the z/TPF Complex.
System Action: None.
User Response: Follow TimeFinder for z/TPF procedures to initialize the TimeFinder for z/TPF data structures. Initialize OMA Control Data using the ZUOMA REFRESH command.

UOMA0024E

The specified symbolic module number hhhh is Invalid
Explanation: The symbolic module number you supplied in a ZUOMA DISPLAY TST command lays outside the range of online symbolic module numbers for the MDBF subsystem.
System Action: None.
User Response: Re-enter the command supplying a valid symbolic module number.

UOMA0025E

UOMA0025E Offline Module Access not installed
Explanation: Offline Module Access is not installed.
System Action: None.
User Response: “Customize the z/TPF source” on page 22 and “Install ResourcePak for z/TPF” on page 23 show how to install Offline Module Access.

UOMA1000I

hh.mm.ss OMA Refresh Started
Explanation: ZUOMA REFRESH has started initializing OMA Control Data.
System Action: None.
User Response: None.
Messages

UOMA1001I

hh.mm.ss OMA Refresh Complete

Explanation: ZUOMA REFRESH has initialized the OMA Control Data.

System Action: None.

User Response: None.

UOMA1002I

hh.mm.ss OMA Refresh Aborted

Explanation: ZUOMA REFRESH did not complete successfully.

System Action: None.

User Response: Note the errors that ZUOMA REFRESH issued and contact your EMC Representative.

USRP0001I

Storage Resource Pool Management HELP message

The formats are:

ZUSRP DISplay SDA-ccuSRP|DGP|SGP|SLO-ALL|LIST|(id)|(name)
[MHL1-dd.dd MHL2-dd.dd]
ZUSRP CHange SDA-ccuu SRP-hhhh RCP-dd [MHL1-dd.dd MHL2-dd.dd]

Where:

SRP = Storage Resource Pool
DGP = Disk Group
SGP = Storage Group
SLO = Service Level Objective
ALL = Display all Pools or Groups
List = Display list of all Pools or groups
id = Display specified Pool or Group
name = Display specified Pool or Group
MHL1-2-RDFGroups specifying path to the storage system
SRP = Hexadecimal SRP ID
RCP = SRP Reserved Capacity Limit Percentage (0-100)
MHL1-2-RDFGroups specifying the path to the storage system

Explanation: This is the normal response to the ZUSRP Help command and a ZUSRP command with invalid parameters.

System Action: None.

User Response: Reissue the ZUSRP command using the specified format.
USRP0002I

SRP Reserved Capacity Updated

Explanation: The SRP Reserved Capacity Limit Percentage was successfully changed as requested for the specified SRP.

System Action: The new value comes into effect at the next activation of the SRP Monitor to ensure SnapVX tracks do not exceed the specified percentage of SRP capacity in accordance with defined iCDP properties.

User Response: None.

USRP9001E

SDA .... designates a CU that does not support Storage Resource Pools

Explanation: The specified SDA ccud designates a storage system that does not provide Storage Resource Pools.

System Action: None.

User Response: Correct the input SDA.

USRP9002E

Error on SymmAPI call - ........
See EMC product guide for SymmAPI Return Codes

Explanation: A SymmAPI call could not perform the requested action.

System Action: None.

User Response: Determine the meaning of the return code (Appendix B lists the return codes). Search the EMC Knowledgebase for applicable solutions relating to this message ID. If you cannot determine and correct the problem, contact the EMC Customer Support Center for technical assistance. Make sure you have all relevant job documentation available.

UVTP0000I

VALID INPUT FORMAT:

   ZUVTP FILL DEV-ccuu,SYN-ssssssss
   ZUVTP QUERY DEV-ccuu
   ZUVTP LOAD DEV-ccuu VSN-volume
   ZUVTP LOAD DEV-ccuu SYN-ssssssss
   ZUVTP UNLOAD DEV-ccuu, NOALL|ALL

Explanation: This is the normal response to the ZUVTP Help command.

System Action: None.

User Response: None.
UVTP0001E

LOAD FAILED
Explanation: The requested load failed.
System Action: None.
User Response: Investigate the virtual tape device.

UVTP0002I

DEVICE ccuu IN USE
Explanation: The device specified in the message is already in use.
System Action: None.
User Response: Display the tape status table and choose an available device.

UVTP0003E

DEVICE ccuu NOT CONFIGURED
Explanation: The specified virtual tape device is not configured to the system.
System Action: None.
User Response: Check the device address. If this is the desired device, vary it online to the system.

UVTP0004E

TAPE ALREADY LOADED ON DEVICE ccuu
Explanation: A mount was requested on a device that already has a tape loaded.
System Action: None.
User Response: Check the device address. If this is the desired device, issue ZUVTP UNLOAD to unload the tape and then request a load.

UVTP0005E

DEVICE ccuu UNSUPPORTED CU
Explanation: The specified device is not a tape device supported by this function.
System Action: None.
User Response: Check the device address.

UVTP0006E

DEVICE ccuu NOT ADDRESSABLE
Explanation: A tape CCW failed when issued to the specified device.
System Action: None.
User Response: Investigate condition of the specified tape device.
**UVTP0007I**

**Message:** NO TAPE LOADED ON ccuu FILL-AUTO SYN-ssssssss

**Explanation:** The status of this drive is no tape is loaded and Fill processing is active after the last ZUVTP command was issued. This is an unusual state because Fill processing should have loaded a scratch tape.

**System Action:** None.

**User Response:** Check the availability of scratch tapes in the scratch synonym specified.

---

**UVTP0008I**

**Message:** NO TAPE LOADED ON ccuu FILL-NONE

**Explanation:** The status of this drive is no tape is loaded and Fill processing is inactive after the last ZUVTP command was issued.

**System Action:** None.

**User Response:** None.

---

**UVTP0009I**

**Message:** VSN vvssnn LOADED ON ccuu FILL-AUTO SYN-ssssssss

**Explanation:** The status of this drive is the specified tape is loaded and Fill processing is active after the last ZUVTP command was issued.

**System Action:** None.

**User Response:** None.

---

**UVTP000AI**

**Message:** VSN vvssnn LOADED ON ccuu FILL-NONE

**Explanation:** The status of this drive is the specified tape is loaded and Fill processing is inactive after the last ZUVTP command was issued.

**System Action:** None.

**User Response:** None.

---

**UVTP000BE**

**Message:** FILL REQUEST FAILED CHECK SOURCE SYNonym

**Explanation:** A Fill request was issued with an invalid scratch synonym specified. This message is preceded by sense data indicating a unit check.

**System Action:** None.

**User Response:** Check the source synonym name and reenter the Fill request.
Messages
APPENDIX B
Return Codes

This appendix lists return codes for the ESAPI and FDRSC macros.

- SymmAPI return codes ......................................................................................... 132
- FDRSC macro return codes .................................................................................. 138
SymmAPI return codes

The return code from a SymmAPI call is a full word displayed in a message similar to the following:

Uxxxx0001E Error on SymmAPI call - ........

See EMC product guide for SymmAPI Return Codes

**Byte 0-1**

System Call Code

**Byte 2**

Reserved

**Byte 3**

Return code

**Byte 3 - General z/TPF Return Codes**

<table>
<thead>
<tr>
<th>RC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0xE0</td>
<td>FDCTC error - Check operations or gatekeeper SDA</td>
</tr>
<tr>
<td>0xE1</td>
<td>Invalid synchronization direction set for issued operation</td>
</tr>
<tr>
<td>0xE2</td>
<td>HW/SW incompatible with API</td>
</tr>
<tr>
<td>0xE3</td>
<td>Zero SPT field (SPT base/DBI/MOD/SDA)</td>
</tr>
<tr>
<td>0xE4</td>
<td>Unable to allocate ECB Heap Storage - MALOC error</td>
</tr>
<tr>
<td>0xE5</td>
<td>SDA offline</td>
</tr>
<tr>
<td>0xE6</td>
<td>SDA invalid</td>
</tr>
<tr>
<td>0xE7</td>
<td>Invalid RDF group</td>
</tr>
<tr>
<td>0xE8</td>
<td>SDN not found device table</td>
</tr>
<tr>
<td>0xE9</td>
<td>SRDF director or RDF group offline</td>
</tr>
<tr>
<td>0xEA</td>
<td>SRDF Monitor found invalid RDF flags</td>
</tr>
<tr>
<td>0xEB</td>
<td>Feature Registration Check Failed</td>
</tr>
</tbody>
</table>
# Byte3 - General SymmAPI return codes

<table>
<thead>
<tr>
<th>RC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x00</td>
<td>System call succeeded</td>
</tr>
<tr>
<td>0x80</td>
<td>System call is NOT defined</td>
</tr>
<tr>
<td>0x81</td>
<td>Executing director type does NOT support the system call</td>
</tr>
<tr>
<td>0x82</td>
<td>Wrong system call parameters</td>
</tr>
<tr>
<td>0x83</td>
<td>Data called NOT found</td>
</tr>
<tr>
<td>0x84</td>
<td>Data exceeds buffer size</td>
</tr>
<tr>
<td>0x85</td>
<td>(SA_ADAPTER - iii)</td>
</tr>
<tr>
<td>0x86</td>
<td>Remote request initiated by non RDF R1 device</td>
</tr>
<tr>
<td>0x87</td>
<td>Remote request with no link available</td>
</tr>
<tr>
<td>0x88</td>
<td>Illegal RSC - can not use socket device</td>
</tr>
<tr>
<td>0x89</td>
<td>Requested length is not on 8 bytes bound</td>
</tr>
<tr>
<td>0x8a</td>
<td>Passive system call extended parameters cause parameter buffer overflow</td>
</tr>
<tr>
<td>0x8b</td>
<td>RSC on R1 when R2 is not ready</td>
</tr>
<tr>
<td>0x8c</td>
<td>RSC failed</td>
</tr>
<tr>
<td>0x8d</td>
<td>Inline system call not supported from host</td>
</tr>
<tr>
<td>0x8e</td>
<td>Inline system call data timeout</td>
</tr>
<tr>
<td>0x8f</td>
<td>Inline system call request from incorrect utility</td>
</tr>
<tr>
<td>0x90</td>
<td>Attempt to write data beyond buffer end (internal logic error)</td>
</tr>
<tr>
<td>0x91</td>
<td>Sent parameter flag byte error</td>
</tr>
<tr>
<td>0x92</td>
<td>DA error (for disconnected system calls)</td>
</tr>
<tr>
<td>0x93</td>
<td>System Internal error (Data consistency problem encountered)</td>
</tr>
<tr>
<td>0x94</td>
<td>Extended remote request with invalid route</td>
</tr>
<tr>
<td>0x95</td>
<td>System call temporarily unavailable. Please retry</td>
</tr>
<tr>
<td>0x96</td>
<td>System call requires the use of a socket</td>
</tr>
<tr>
<td>0x97</td>
<td>System call not allow on dir/port by field in IMPL</td>
</tr>
<tr>
<td>0x98</td>
<td>Error sending system call to a remote director (same storage system)</td>
</tr>
<tr>
<td>0x99</td>
<td>Error executing system call on a remote director (same storage system)</td>
</tr>
<tr>
<td>0xa0</td>
<td>Requested system call format does not support more than 32 directors</td>
</tr>
<tr>
<td>0xa1</td>
<td>System call not supported for detected configuration (upgrade application)</td>
</tr>
<tr>
<td>0xa2</td>
<td>Multi-hop system call timed out somewhere along the line</td>
</tr>
<tr>
<td>0xa3</td>
<td>Multi-hop system call was sent, and it ran into an existing multi-hop system call</td>
</tr>
<tr>
<td>0xa4</td>
<td>Requested count is not enough for extended parameters</td>
</tr>
<tr>
<td>0xa5</td>
<td>System call result remained un-initialized</td>
</tr>
<tr>
<td>0xa6</td>
<td>POLL</td>
</tr>
<tr>
<td>0xa7</td>
<td>Requested system call format does not support Open RDF</td>
</tr>
<tr>
<td>0xa8</td>
<td>Requested system call format does not support RDF Multicast</td>
</tr>
<tr>
<td>0xa9</td>
<td>Requested system call format does not support Dynamic RDF</td>
</tr>
<tr>
<td>0xaa</td>
<td>System call cannot be run to this device</td>
</tr>
<tr>
<td>0xab</td>
<td>System call is disconnecting, you should not get this code</td>
</tr>
<tr>
<td>0xac</td>
<td>Format 6 input CRC does not match parameters</td>
</tr>
<tr>
<td>0xad</td>
<td>System call timed out during execution</td>
</tr>
<tr>
<td>0xae</td>
<td>Could not get access ID/tag from parameters</td>
</tr>
</tbody>
</table>
Return Codes

0xa9  The system call format is not supported
0xaa  The sub command is not valid
0xab  The sub format is not valid
0xac  Reserved parameters are not zero
0xad  Operation is not allowed on a meta member
0xae  Quick Config parameters indicate a status has changed
0xaf  User requested abort on polling syscall
0xb0  Director is in the middle of IML, please retry in 10 seconds
0xb1  SymmWin is in the middle of a NDU, please abort this IO
0xb2  Endian swap did not work

**Note:** Other possible non-zero return codes are dependent on the system call code.
<table>
<thead>
<tr>
<th>RC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x01</td>
<td>Illegal primary RDFGroup number</td>
</tr>
<tr>
<td>0x02</td>
<td>Illegal secondary RDFGroup number</td>
</tr>
<tr>
<td>0x03</td>
<td>storage system not switched dynamic SRDF</td>
</tr>
<tr>
<td>0x04</td>
<td>RDFGroup already defined as static</td>
</tr>
<tr>
<td>0x05</td>
<td>Supported RDF director include non dynamic RDF directors</td>
</tr>
<tr>
<td>0x06</td>
<td>RDFGroup label already in use</td>
</tr>
<tr>
<td>0x07</td>
<td>Mismatch in the serial number of the secondary storage system</td>
</tr>
<tr>
<td>0x08</td>
<td>RDFGroup default label not allowed</td>
</tr>
<tr>
<td>0x09</td>
<td>RDFGroup delete not supported on both sides</td>
</tr>
<tr>
<td>0x0A</td>
<td>Parameters don’t match existing RDFGroup parameters</td>
</tr>
<tr>
<td>0x0B</td>
<td>Primary and secondary RDFGroup parameters mismatch</td>
</tr>
<tr>
<td>0x0C</td>
<td>Configuration flags value illegal</td>
</tr>
<tr>
<td>0x0D</td>
<td>Primary mixed directors type support not allowed</td>
</tr>
<tr>
<td>0x0E</td>
<td>Primary and secondary RDFGroup configuration flags conflict</td>
</tr>
<tr>
<td>0x0F</td>
<td>Invalid other side GigE anchor director</td>
</tr>
<tr>
<td>0x10</td>
<td>Other side GigE anchor director must be part of secondary supported director mask</td>
</tr>
<tr>
<td>0x11</td>
<td>RDFGroup interface configuration flag conflict with directory type</td>
</tr>
<tr>
<td>0x12</td>
<td>Illegal local RDFGroup parameters</td>
</tr>
<tr>
<td>0x13</td>
<td>Illegal secondary RDFGroup parameters</td>
</tr>
<tr>
<td>0x14</td>
<td>Dynamic RDFGroup change not on affected director</td>
</tr>
<tr>
<td>0x15</td>
<td>RDFGroup is not empty</td>
</tr>
<tr>
<td>0x16</td>
<td>RDF directors offline</td>
</tr>
<tr>
<td>0x17</td>
<td>RDF directors not switched</td>
</tr>
<tr>
<td>0x18</td>
<td>Other side GigE directors do not have matching entry in GigE IP table</td>
</tr>
<tr>
<td>0x19</td>
<td>Other side anchor GigE director does not have a matching entry in GigE IP table</td>
</tr>
<tr>
<td>0x1A</td>
<td>Dynamic RDFGroup change already in progress</td>
</tr>
<tr>
<td>0x1B</td>
<td>Not allowed during director IML</td>
</tr>
<tr>
<td>0x1C</td>
<td>Secondary storage system not found</td>
</tr>
<tr>
<td>0x1D</td>
<td>Timeout on connection attempt</td>
</tr>
<tr>
<td>0x1E</td>
<td>Dynamic RDFGroup request cancelled due to director IML</td>
</tr>
<tr>
<td>0x1F</td>
<td>Dynamic RDFGroup tables in the primary storage system NVD and GM are corrupt</td>
</tr>
<tr>
<td>0x20</td>
<td>Other side rejected the connection attempt</td>
</tr>
<tr>
<td>0x21</td>
<td>Internal microcode error</td>
</tr>
<tr>
<td>0x22</td>
<td>All RDFGroups already in use</td>
</tr>
<tr>
<td>0x23</td>
<td>Illegal limbo time value</td>
</tr>
<tr>
<td>0x24</td>
<td>Operation on Star RDFGroup without an override</td>
</tr>
<tr>
<td>0x25</td>
<td>Dynamic RDFGroup request and secondary storage system GM serial number mismatch</td>
</tr>
<tr>
<td>0x26</td>
<td>Dynamic RDFGroup request and secondary storage system GM mismatch</td>
</tr>
</tbody>
</table>
### Byte 3 - Dynamic Cache Partitioning SymmAPI return codes

<table>
<thead>
<tr>
<th>RC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DCP Create errors</strong></td>
<td></td>
</tr>
<tr>
<td>0x01</td>
<td>Cannot create a default group (GID must be &gt; 0)</td>
</tr>
<tr>
<td>0x02</td>
<td>Requested allocation is more than maximum allowed</td>
</tr>
<tr>
<td>0x03</td>
<td>Requested allocation is less than minimum allowed</td>
</tr>
<tr>
<td>0x04</td>
<td>Group name already exists</td>
</tr>
<tr>
<td>0x05</td>
<td>Number of devices equals zero</td>
</tr>
<tr>
<td>0x07</td>
<td>Group already exists</td>
</tr>
<tr>
<td>0x08</td>
<td>Maximum number of groups already defined</td>
</tr>
<tr>
<td>0x09</td>
<td>Default group below minimum</td>
</tr>
<tr>
<td>0x0A</td>
<td>Illegal group ID</td>
</tr>
<tr>
<td>0x0B</td>
<td>WP allocation is more than maximum allowed</td>
</tr>
<tr>
<td>0x0C</td>
<td>WP allocation is less than minimum allowed</td>
</tr>
<tr>
<td>0x0D</td>
<td>Minimum allocation is more than target</td>
</tr>
<tr>
<td>0x0E</td>
<td>Maximum allocation id less than target</td>
</tr>
<tr>
<td>0x0F</td>
<td>Group ID is larger than max allowed</td>
</tr>
<tr>
<td><strong>DCP Device Range errors</strong></td>
<td></td>
</tr>
<tr>
<td>0x11</td>
<td>Power vault device in specified range</td>
</tr>
<tr>
<td>0x12</td>
<td>VCM device in specified range</td>
</tr>
<tr>
<td>0x13</td>
<td>FBA gatekeeper device is in the range</td>
</tr>
<tr>
<td>0x14</td>
<td>A META device is in the range</td>
</tr>
<tr>
<td>0x15</td>
<td>Device range goes beyond last device</td>
</tr>
<tr>
<td>0x16</td>
<td>RDF device is in the range</td>
</tr>
<tr>
<td>0x17</td>
<td>Striped CKD is in the range</td>
</tr>
<tr>
<td>0x18</td>
<td>RDF group specified does not exist</td>
</tr>
<tr>
<td>0x19</td>
<td>Number of devices must be zero when rdF group specified</td>
</tr>
<tr>
<td>0x1A</td>
<td>Illegal RDF group ID</td>
</tr>
<tr>
<td>0x1B</td>
<td>Start device not a META head</td>
</tr>
<tr>
<td>0x1C</td>
<td>Non-zero number of devices on META option</td>
</tr>
<tr>
<td>0x1D</td>
<td>Device not a striped CKD</td>
</tr>
<tr>
<td>0x1E</td>
<td>Non-zero number of devices</td>
</tr>
<tr>
<td>0x1F</td>
<td>RDF option empty group</td>
</tr>
<tr>
<td><strong>DCP Delete Group errors</strong></td>
<td></td>
</tr>
<tr>
<td>0x20</td>
<td>Trying to delete the default group</td>
</tr>
<tr>
<td>0x21</td>
<td>Group does not exist</td>
</tr>
<tr>
<td><strong>General DCP error occurred</strong></td>
<td></td>
</tr>
<tr>
<td>0x71</td>
<td>Director is either not available or busy with another task. Try message again. If failure persists, please check to see if directors are online and available.</td>
</tr>
<tr>
<td>0x74</td>
<td>Invalid Group ID</td>
</tr>
<tr>
<td>0x75</td>
<td>Group not defined</td>
</tr>
<tr>
<td>0x76</td>
<td>DCP not initialized</td>
</tr>
<tr>
<td>0x77</td>
<td>Invalid runtime parameters</td>
</tr>
<tr>
<td>0x78</td>
<td>Invalid runtime parameter value specified</td>
</tr>
</tbody>
</table>
Return Codes

0x79  Invalid minimum allocation for Analysis mode
0x7A  Invalid maximum allocation for Analysis mode
0x7B  Invalid donation age for Analysis mode
0x7C  Unknown runtime parameter
FDRSC macro return codes

The return code from a FDRSC macro call is a full word returned in Register 0.

Byte 0-1 - Supplementary information

The meaning of the supplementary information is dependent on the value of the modifier byte.

Byte 2 - Modifier

See the following section for values of this byte.

Byte 3 - Error code

The meaning of the error code byte is dependent on the value of the modifier byte.

<table>
<thead>
<tr>
<th>Modifier Value</th>
<th>Error Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x01</td>
<td>0x50</td>
<td>WRKBLK register zero</td>
</tr>
<tr>
<td></td>
<td>0x51</td>
<td>DECB register zero</td>
</tr>
<tr>
<td></td>
<td>0x52</td>
<td>DECB label zero</td>
</tr>
<tr>
<td></td>
<td>0x53</td>
<td>GROUP register zero</td>
</tr>
<tr>
<td></td>
<td>0x54</td>
<td>GROUP label zero</td>
</tr>
<tr>
<td></td>
<td>0x55</td>
<td>Missing FARF</td>
</tr>
<tr>
<td></td>
<td>0x56</td>
<td>MCHR conversion unsuccessful</td>
</tr>
<tr>
<td></td>
<td>0x57</td>
<td>Invalid FARF</td>
</tr>
<tr>
<td></td>
<td>0x58</td>
<td>MHCR -- FNSPC error -- unable to determine record size</td>
</tr>
<tr>
<td></td>
<td>0x59</td>
<td>MCHR -- module offline</td>
</tr>
<tr>
<td>0x02</td>
<td>0x50</td>
<td>OCD not allocated</td>
</tr>
<tr>
<td></td>
<td>0x51</td>
<td>Copy track extents not allocated</td>
</tr>
<tr>
<td></td>
<td>0x52</td>
<td>TimeFinder data not initialized</td>
</tr>
<tr>
<td></td>
<td>0x53</td>
<td>Invalid TimeFinder group</td>
</tr>
<tr>
<td>0x03</td>
<td>0x04</td>
<td>Last operation was Establish</td>
</tr>
<tr>
<td></td>
<td>0x08</td>
<td>Last operation was Re-establish</td>
</tr>
<tr>
<td></td>
<td>0x10</td>
<td>Last operation was Restore</td>
</tr>
<tr>
<td></td>
<td>0x14</td>
<td>Last operation was IncRestore</td>
</tr>
<tr>
<td></td>
<td>0x18</td>
<td>No operation since TimeFinder initialization</td>
</tr>
<tr>
<td></td>
<td>0xe0</td>
<td>FDCTC error</td>
</tr>
<tr>
<td></td>
<td>0xe4</td>
<td>Maloc error</td>
</tr>
<tr>
<td></td>
<td>0xe6</td>
<td>Invalid SDA</td>
</tr>
<tr>
<td></td>
<td>0x50</td>
<td>SDA in unsupported SSID</td>
</tr>
<tr>
<td>0x04</td>
<td>See “Byte3 - General SymmAPI return codes” on page 133</td>
<td></td>
</tr>
</tbody>
</table>