

# SafeDR Guide and Reference 1.1.0



## Copyright Notice

Every effort has been made to supply complete and accurate information. However, Safe Software assumes no responsibility for its use, nor for any infringement of the intellectual property rights of third parties which would result from such use.

First edition copyright © 2005 Safe Software, Inc.

Copyright © 2005 Safe Software, Inc., 550 Basin Drive, Kissimmee, FL 34744, USA. World rights reserved. No part of this publication may be stored in a retrieval system, transmitted, or reproduced in any way, including but not limited to photocopy, photograph, magnetic or other record, without the prior agreement and written permission of Safe Software, Inc.

Manufactured in the United States of America



## TABLE OF CONTENTS

COPYRIGHT NOTICE.....	III
<b>CHAPTER 1. SAFEDR INTRODUCTION AND OVERVIEW.....</b>	<b>9</b>
HOW TO CONTACT SAFE SOFTWARE, INC.....	9
REQUIREMENTS.....	10
SAFEDR FEATURES AND CAPABILITIES .....	11
Standalone Recovery .....	11
Backup and Restore .....	11
Tape Management.....	12
<b>CHAPTER 2. SAFEDR INSTALLATION .....</b>	<b>13</b>
LOAD THE SAFEDR PRODUCT CODE.....	13
INSTALL THE SAFEDR SERVER: .....	15
INSTALL THE SAFEDR USER INTERFACE: .....	16
CONFIGURE SAFEDR .....	17
SAFADMIN.....	17
TAPEOPER .....	17
SYSOPER.....	17
TAPEDEVS.....	17
REPORTID.....	17
SAFEPW.....	18
DIRLOC.....	18
CREATE THE SAFEDR STANDALONE RECOVERY SYSTEM (SSRS).....	19
VERIFY THE SAFEDR INSTALLATION:.....	20
<b>CHAPTER 3. PERFORMING SAFEDR BACKUPS .....</b>	<b>23</b>
USING SAFEDR FOR BACKUP/RESTORE AND DISASTER RECOVERY .....	23
DEFINING SAFEDR BACKUP JOBS.....	24
RUNNING SAFEDR BACKUP JOBS .....	25
SafeDR Streams.....	25
SafeDR Workers.....	25
<b>CHAPTER 4. PERFORMING SAFEDR RESTORES.....</b>	<b>27</b>
DEFINING SAFEDR RESTORE JOBS .....	27
RUNNING SAFEDR RESTORE JOBS.....	27
RUNNING SAFEDR STANDALONE RESTORE.....	28
TESTING THE SAFEDR STANDALONE RECOVERY SYSTEM.....	28
<b>CHAPTER 5. SAFEDR TAPE MANAGEMENT .....</b>	<b>29</b>
HOW SAFEDR USES TAPE VOLUMES .....	29
HOW SAFEDR USES TAPE DRIVES .....	30
<b>CHAPTER 6. SAFEDR BACKUP JOB REFERENCE.....</b>	<b>33</b>
COMMENT .....	35
COMPACT .....	37

CPSYS .....	39
EXCLUDE .....	41
EXPIRE .....	43
FULLPACK .....	45
INCLUDE .....	47
SAFEDR .....	49
STREAMS .....	51
<b>CHAPTER 7. SAFEDR RESTORE JOB REFERENCE .....</b>	<b>53</b>
CATRANGE .....	55
COMMENT .....	57
CPSYS .....	59
EXCLUDE .....	61
INCLUDE .....	63
LOOKBACK .....	65
STREAMS .....	67
<b>CHAPTER 8. SAFEDR COMMAND REFERENCE .....</b>	<b>69</b>
COMMAND RESPONSES AND RETURN CODES .....	71
CANCEL .....	73
CATALOG .....	75
CMS .....	79
CONTROL .....	81
EDIT / EDITR .....	83
END .....	85
QUERY / Q .....	87
REPLY .....	89
REVIEW / REVIEWR .....	91
START / STARTR .....	93
TAPE .....	95
VERSION .....	97
<b>CHAPTER 9. SAFEDR CONTROL REFERENCE .....</b>	<b>99</b>
CPSYS .....	101
DEBUG .....	103
DIRLOC .....	105
REPORTID .....	107
SAFADMIN .....	109
SAFEPW .....	111
SYSOPER .....	113
TAPEDEVS .....	115
TAPEOPER .....	117
WORKER .....	119
<b>CHAPTER 10. SAFEDR USER EXITS .....</b>	<b>121</b>
SAFEDR User Exits .....	123

Table Of Contents

QUIESCE USER EXIT .....125  
TAPEEXIT USER EXIT .....127  
**CHAPTER 11. SAFEDR MESSAGES & CODES.....129**  
SAFEDR MESSAGES.....129  
SAFEDR ABNORMAL TERMINATION CODES .....137



## Chapter 1. SafeDR Introduction and Overview

### *How to contact Safe Software, Inc.*

#### **Mailing Address:**

Safe Software, Inc.  
550 Basin Drive  
Kissimmee, FL 34744  
USA

#### **Voice - Technical Support, Sales, and Marketing:**

(877) 793-0777 or  
(407) 944-7233

#### **Fax:**

(407) 944-7234

#### **Hours of Operation:**

Business Hours: 9:00am - 6:00pm Eastern Standard Time, Business days  
Technical Support Hours: 9:00am - 6:00pm Eastern Standard Time, Business days  
Emergency Technical Support Hours: 24 hours every day. (See emergency contact procedure below.)

#### **Email:**

Email@SafeSoftware.Com

#### **Internet Website:**

WWW.SafeSoftware.Com

#### **Emergency Technical Support Contact Procedure:**

If you have an urgent need to contact technical support, please page a technician using the following procedure. Emergency technical support is available 24 hours a day, 7 days a week. Please leave a detailed message in the regular technical support voice mail before paging a technician.

Dial (800) 759-8888 or (601) 960-9548 if outside of the USA. Enter the PIN number 2201900 followed by the # key when prompted. Enter the telephone number you would like the technician to use when returning your call followed by the # key 2 times when prompted. If the primary technician does not return your call within 15 minutes please page the secondary technician. The secondary technician may be paged using the same procedure. Substitute the PIN number 1601147 in place of the PIN number above.

## **Requirements**

### **Software Requirements:**

z/VM - Any release currently supported by IBM as of the date of the release of this version of SafeDR.

### **Hardware Requirements:**

None, in addition to those of z/VM.

### **Other Requirements:**

- A Free 3390 DASD Volume. This will contain the SafeDR Standalone Recovery System (used during a standalone system recovery) and the SafeDR server.
- Access to the following free z/VM function packages:
  - REXX IUCV  
This package can be downloaded from:  
<http://www.vm.ibm.com/>  
Click on “Downloads”, then “Packages Page”, and look for REXXIUCV.

## **SafeDR Features and Capabilities**

SafeDR is an automated Backup, Restore, and Disaster Recovery solution for z/VM. It is a turnkey solution to both daily minidisk backup and system recovery problems. SafeDR provides you with the ability to backup and restore your entire system, or just a subset such as a volume or a minidisk. SafeDR manages its own tapes and tape drives and can be integrated with your existing tape management solution.

### **Standalone Recovery**

Implementing a disaster recovery and a backup and restore plan for z/VM is a daunting task, requiring extensive z/VM expertise. A single mistake in how you backup your system may leave you without the ability to recover part, or all, of your system in the event of a disaster.

SafeDR eliminates the need for extensive z/VM expertise by completely automating your standalone recovery needs. SafeDR backs up your system so that recovering any part of it: one or more minidisks, one or more DASD volumes, or the entire system can be accomplished by anyone. No z/VM expertise required.

SafeDR automatically creates a standalone recovery tape with every backup job. This includes a backup of SafeDR and its catalogs. (Of course, you can turn this off if you are running multiple backup jobs each day.)

Standalone recovery is a breeze with SafeDR. Each backup job contains our “Six simple steps to recovering your system” – a script that allows anyone to perform a standalone recovery of your system. You mount a single tape, follow the script, and respond to SafeDR prompts.

SafeDR restores DASD Volser and CP Allocation information during disaster recovery situations.

### **Backup and Restore**

SafeDR takes the point of view that Backup and Restore should be a subset of your disaster recovery plan and solution. SafeDR allows you to backup your entire system, or a subset, using simple INCLUDE and EXCLUDE entries in a job file. These allow you to quickly and easily build a backup job to backup your entire system, a set of minidisks, a server, or any combination that you might require. SafeDR gives you the ability to restore anything that has been backed up, a disk or several disks, an entire DASD volume, your entire system, etc. SafeDR performs physical, or image, backups of all disks backed up to tape.

When you create a backup job, you define what SafeDR will back up and how long SafeDR retains the backup. Once the retention period has passed, SafeDR automatically reuses the tapes from that job and deletes the backup.

SafeDR maintains a backup catalog for each successful backup that it ran. These catalogs, maintained on the SafeDR data base disk, contain all of the information about the completed

backup job. What was backed up? Where was it located? Which tapes contain the information? SafeDR uses this information during restores to determine what items to pull from which tapes.

SafeDR can write to multiple tape drives. If the job syntax allows for more than one tape drive, SafeDR will create multiple streams when the job runs. Each stream writes to a tape drive. For example, if you have five tape drives available, you can have SafeDR write to all five drives at once, getting close to a 5x improvement over writing to just one drive. SafeDR splits up the list of items to be backed up by DASD Volume, and each stream picks the “next” DASD volume to be backed up from a master list and backs that up. This eliminates I/O contention at the DASD level. SafeDR restores from multiple tape drives as well. SafeDR sorts the restore set by Tape Volume, so as to minimize tape volume contention (two streams requiring the same tape volume at the same time).

SafeDR provides a QUIESCE user exit that you use to terminate or suspend activity on servers while SafeDR backs them up. This exit provides you with ordering information, so that you can easily and programmatically determine when to terminate a server (just before the first disk for the server is backed up) and when to restart it (not until the last one is backed up).

## Tape Management

SafeDR manages tape volumes and tape drives. SafeDR automatically attaches available tape drives for backups and restores. SafeDR prevents errors by not allowing writing backups to active tape volumes. SafeDR automatically scratches tapes when they expire. You can integrate SafeDR with your existing tape management solution using the Tape user exit.

SafeDR handles tape mounts by issuing a message to the SafeDR Tape Operators, one or more VM userids that you designate. SafeDR will reissue mount requests at predetermined intervals, until the tape mount is satisfied. You can use the Tape user exit to interface SafeDR with your tape management solution, allowing it to satisfy tape mount requests.

## Chapter 2. SafeDR Installation

This section documents how to install SafeDR. It is a cookbook approach to installing SafeDR on your system. Perform this installation from MAINT or another system administrator userid. You will need the ability to update the z/VM user directory to add the SafeDR server and its worker userids. You will need to allocate space on a free 3390 DASD volume. SafeDR must be installed so that it has access to the DASD allocation information in CKD Cylinder 0.

### **Load the SafeDR Product code.**

This section describes how to load the SafeDR Product code to a work disk in preparation of installing SafeDR.

#### **Step 1: Review the README.TXT file on the SafeDR Product diskette or CD.**

Instructions contained in the readme file add to or supersede the instructions listed here.

#### **Step 2: Obtain a work minidisk of 1800 4K blocks or larger (Approximately 10 3390 cylinders)**

The minidisk may be a TDISK or SFS Directory if desired. Format the minidisk using the CMS FORMAT command.

#### **Step 3: Load the SafeDR Product Code from the SafeDR Product Diskette or CD:**

Use a PC file transfer program to transfer the SDR110.VMA file from the SafeDR diskette to the work minidisk as file SDR110 VMARC. Perform the transfer in “binary” mode.

*Note that as newer versions of SafeDR are released, the name of the files will change to incorporate the version. For example, SafeDR 1.1.0A will be named SDR110A.VMA and will load to SDR110A VMARC.*

#### **Step 4: Reformat the VMARC file by issuing the command:**

```
PIPE < SDR110 VMARC fm | FBLOCK 80 | > SDR110 VMARC fm
```

Where *fm* is the CMS filemode of the work minidisk

*Note that you may be using a different file name, determined by the release of SafeDR you are installing.*

*If you receive an error from the PIPE command, it is likely caused by corruption of the VMARC file when it was transferred to VM. Retry the transfer, taking care to preserve the file by performing a “binary” transfer and by not inserting or deleting any control characters or linend characters.*

#### **Step 5: Run VMARC to unpack all of the files in the archive to the work disk.**

Issue the command VMARC UNPK SDR110 VMARC *fm* = = *fm* to unpack the SafeDR product files to the work minidisk accessed as file mode *fm*. The command VMARC LIST SDR110 VMARC *fm* may be used to list the files in the archive.

**Note:** The VMARC utility is a publicly available program that may be downloaded from various sites on the internet. The VMARC utility may be downloaded from URL:

<http://www.marist.edu/~workshop/vmarc.html>.

The SafeDR product code has now been loaded. Continue the installation process by following the steps in the next section, “Install the SafeDR Server”.

## ***Install the SafeDR server:***

This section documents the creation of the SafeDR server userid and the installation of the SafeDR product server code.

### **Step 1: Create the CP directory entry for the SafeDR server and workers.**

Use the directory management program or procedure at your site to add the SafeDR server directory entries to your system. The SDRSRV DIRECT has the following sample items to help you:

- PROFILE SDRPROF – This directory profile makes defining the SafeDR server easier and is required for using the POOL statement to generate the workers
- USER SAFEDR entry – The SafeDR server
- USER SDR/POOL entry – These two records create the workers.

SafeDR must be installed with a server name of SAFEDR. Contact Safe Software technical support if you require an installation on a different userid.

### **Step 2: Configure and populate the SafeDR server using the SDRINST exec.**

Use the SDRINST exec to automatically FORMAT the SafeDR server disks and populate them with the SafeDR product code and default files. Run this exec from your system administration userid on which you have the “work” minidisk. You must be able to LINK to the SafeDR server disks from this userid.

Issue: SDRINST INSTALL *fm*

Where *fm* is the filemode of the work minidisk.

SDRINST will validate the contents of *fm*, link to SafeDR, format all server disks, and copy all SafeDR program materials to the server. Watch for error messages while SDRINST is running.

Examine any error messages carefully and attempt to resolve any problems. You can run “SDRINST INSTALL” multiple times; each time it will start from the beginning with a FORMAT of the SafeDR server disks.

If you are unable to resolve all errors, contact Safe Software technical support for assistance.

The SafeDR server code has now been installed. Continue the installation process by following the steps in the next section, “Install the User Interface”.

## ***Install the SafeDR User Interface:***

This section documents how to install the SafeDR User Interface. The User Interface consists of several programs you use to communicate with the SafeDR server. These programs are placed on a public minidisk, or a disk that you and all users (administrators and operators) have access to.

### **Step 1: Copy the SafeDR User Interface files to a public minidisk.**

Copy these files to your public or shared minidisk:

- SAFEDR EXEC
  - Note: You will find the SAFEDR EXEC on SAFEDR 192 (The SafeDR “code” minidisk).
- RXIUCVFN MODULE
  - Note: The RXIUCVFN MODULE can be obtained from the IBM VM Download site at <http://www.vm.ibm.com/download/>:
  - Go to [www.vm.ibm.com/download](http://www.vm.ibm.com/download)
  - Click on "Packages page" (<http://www.vm.ibm.com/download/packages/>)
  - Locate the REXXIUCV package - "IUCV interface for Rexx"
  - Download this VMARC package (You can place this on the SafeDR 191 if you wish)
  - Reformat the REXXIUCV.VMARC file for unpacking:  
PIPE < REXXIUCV VMARC *fm* | FBLOCK 80 | > REXXIUCV VMARC *fm*
  - Unpack the archive:  
VMARC UNPK REXXIUCV VMARC *fm* RXIUCVFN MODULE *fm*

The SafeDR User Interface has now been installed. Continue the installation process by following the steps in the next section, “Configure SafeDR”.

## **Configure SafeDR**

You use this section to configure the SafeDR server for your installations requirements. Before starting, you will need to determine the following things:

- Which userids will be given SAFAMDIN authorization
- Which userids will be designated as Tape Operators (TAPEOPER)
- Which userids will be designated as system operators (SYSOPER)
- Which tape drives SafeDR will use, or any available tape drive
- Which userids or email address should be sent job output reports
- Where will SafeDR find a copy of the USER DIRECT file.

You will perform these steps while logged onto the SafeDR server.

### **Step 1: Logon to the SafeDR server**

Answer No to the question “Do you wish to start the SafeDR server now?”

### **Step 2: Update the SAFEDR CONTROL file on the SAFEDR DBA minidisk.**

See chapter 7 “SafeDR Control Reference” for details about the control file records to be added or modified in this step. Use the XEDIT command: XEDIT SAFEDR CONTROL R

#### **SAFADMIN**

Add a SAFAMDIN record to the SAFEDR CONTROL file for each user that will have SAFAMDIN authorization. Users with SAFADMIN can also perform the actions of TAPEOPER and SYSOPER userids, but will not be sent the Tape or System related message that these users receive.

#### **TAPEOPER**

Add a TAPEOPER record to the SAFEDR CONTROL file for each user that is a SafeDR Tape Operator. These users can respond to tape related requests.

#### **SYSOPER**

Add a SYSOPER record to the SAFEDR CONTROL file for each user that is a SafeDR System Operator. These users can start and stop jobs and respond to SafeDR system related requests.

#### **TAPEDEVS**

SafeDR uses all available tape drives by default. If you need to limit the use of tape drives to particular drives or ranges of drives, add TAPEDEVS record to accomplish this now.

#### **REPORTID**

SafeDR sends job output reports to each VM userid or email address listed on REPORTID records. Using an email address on a different system and/or at a different location can be useful in ensuring that you always have access to the Backup Output Report that contains the “Six Simple Steps to Restoring Your System” and the Tape Volume name for your standalone recovery tape.

## SAFEPW

The contents of the SAFEPW record will be supplied for your site by Safe Software Technical Support. SafeDR will not initialize without a valid SAFEPW record.

## DIRLOC

SafeDR uses this record to determine where to link to get a copy of the current USER DIRECT file.

## **Create the SafeDR Standalone Recovery System (SSRS)**

Perform these steps while logged onto the SafeDR server with it not running. If the SafeDR server is running, end it's execution by issuing **SERVER STOP**.

### **Step 1: Logon to the SafeDR server**

Ensure that the server is not running. If you need to stop the SafeDR server, issue **SERVER STOP** to the SafeDR server console.

### **Step 2: Link the SafeDR recovery system disk, 123, R/W**

```
CP LINK * 123 123 MW
```

### **Step 3: Run the SafeDR Standalone Recovery System creation utility, SDRMINME.**

```
SDRMINME CREATE
```

This routine creates the SafeDR Standalone Recovery System from your existing system. Many informational messages are generated by the various utilities that SDRMINME uses. If SDRMINME ends with a non zero return code, examine the console for errors displayed. Attempt to correct these errors and rerun SDRMINME CREATE.

Contact Safe Software technical support if you cannot resolve errors or have any questions about the creation of the SafeDR Standalone Recovery System.

*Note: It is very important that the SafeDR Standalone Recovery System is a valid system. SafeDR uses this system (as a "single pack z/VM system") during standalone recovery situations. This one pack system is restored during the "Six Simple Steps To Recovering Your System" and is the system that runs to automate a system recovery.*

### **Step 4: Link the SafeDR recovery system disk back to R/O**

```
CP LINK * 123 123 RR
```

## **Verify the SafeDR Installation:**

### **Step 1: Verify that the SafeDR server will initialize**

- A. Logon to the SafeDR server
- B. Run the PROFILE EXEC by issuing PROFILE from the CMS prompt.
- C. Answer YES to start the server
- D. Watch for the SafeDR message "SDRDBI0005I SafeDR initialization complete."
- E. If you do not receive this message then initialization was not successful. Review the console for error messages, correct the error conditions, and try again.
- F. When the SafeDR server has initialized successfully, you can disconnect from the server by issuing CMS CP DISC

### **Step 2: Verify that you can communicate with SafeDR.**

- A. Logon to a userid that is a SAFADMIN and a TAPEOPER.
- B. Issue SAFEDR VERSION
- C. If you do not receive the SafeDR message "SDRVER0199I SafeDR Version: *version* Copyright *year* Safe Software, Inc." then you are unable to communicate with the SafeDR server. Review your console for error messages, correct these error conditions and try again.
- D. If this does not correct the problem, examine the SafeDR console by logging onto the SafeDR server. Review its console for error messages, correct these error messages and try again.
- E. Common Problems:
  - Not having access to SAFEDR EXEC or RXIUCVFN MODULE. These must be on an accessed minidisk in order to communicate to the SafeDR server.
  - SDRSDR0197E Unable to connect to server "SAFEDR"; RC: 15
    - Usually caused by a missing IUCV ALLOW in the SafeDR server directory entry

### **Step 3: Run a test backup and restore job.**

This will verify that you can backup and restore with SafeDR. This takes you through running a test backup and restore session.

1. Create a test backup job
  1. Determine a minidisk (userid/vdev) that you can backup and restore. This must be a disk that can be destroyed and its data lost. For example, create a new disk, format it, and place a few files on it. For this test's purpose, we'll assume it is *SAMPLE 191*. Replace *SAMPLE 191* wherever it appears in this script with the userid/vdev that you choose.
  2. SAFEDR EDIT TEST BACKUP
    1. Change the INCLUDE record to INCLUDE USER *SAMPLE 191*
    2. Change the CPSYS record to CPSYS NO
    3. Change the SAFEDR record to SAFEDR NO
    4. Issue the Xedit FILE command to save this job.
2. Run the backup job
  1. SAFEDR START TEST

2. Watch your console for progress messages and tape mount requests. When you are requested to mount a SCRATCH tape, do so. SafeDR will continue as soon as the tape is mounted.
  3. If you receive any error messages (*nnnnE*), review the documentation to attempt to resolve the error and retry.
  4. When the job completes, you will see "SDRJCT0199I SafeDR job TEST BACKUP Completed Successfully"
  5. Review the job output report for errors and to gain some familiarity with the product
3. Destroy the disk
    1. Link the disk R/W
    2. Carefully use the CMS format command to destroy the contents of the disk.
  4. Restore the disk
    1. Create a restore job
      1. SAFEDR EDIT TEST RESTORE
      2. Change/replace the INCLUDE record to INCLUDE USER SAMPLE 191
      3. FILE
    2. Run the restore job
      1. SAFEDR START TEST RESTORE
        - or: SAFEDR STARTR TEST
      2. Watch your console for progress messages and tape mount requests. When you are requested to mount the tape used by the backup job, do so. SafeDR will continue as soon as the tape is mounted.
      3. If you receive any error messages (*nnnnE*), review the documentation to attempt to resolve the error and retry.
      4. When the job completes, you will see "SDRJCT0199I SafeDR job TEST RESTORE Completed Successfully"
      5. Review the job output report for errors and to gain some familiarity with the product

#### **Step 4: Verify that the SafeDR Standalone Recovery System is useable**

This verifies that the SafeDR Standalone Recovery System created from your system will run on your hardware.

1. Logon to SafeDR server. You will use this virtual machine to perform this test.
2. SYSTEM RESET
3. TERM CONMODE 3270
4. IPL 123
5. At this point, the SafeDR Standalone Recovery System should be running.
6. Reply No to the prompt "Do you wish to recover your system?"
7. SHUTDOWN to terminate the SafeDR Standalone Recovery System.
8. Logoff



## Chapter 3. Performing SafeDR Backups

### *Using SafeDR for Backup/Restore and Disaster Recovery*

SafeDR provides you with both backup and restore capabilities and disaster recovery capabilities. You can restore any minidisk backed up at any time from any active (not yet deleted) backup catalog. SafeDR provides you with a great deal of flexibility in planning and implementing your backups for both backup/restore and disaster recovery.

The terms Backup and Restore and Disaster Recovery mean different things to different people. SafeDR defines them as:

- Backup and Restore refers to backups taken for recovering a single disk or set of disks as part of regular daily sort of work. The restores run while z/VM is running in normal production mode and disasters are limited in scope to not bringing down z/VM nor requiring a transition to different hardware.
- Disaster Recovery refers to any sort of system failure that requires you to perform a restore without z/VM running. It may or may not be on the same hardware.

SafeDR allows you to restore from any active backup catalog from either a regularly running z/VM system or in standalone mode.

You create one or more backup jobs to run on a frequency that you determine, based on your business requirements. You schedule these to be run by system operators at the designated times. You provide disaster recovery capability when you run a backup job that specifies “SAFEDR YES”. This is the switch that causes SafeDR to create a Standalone Recovery Tape. You will generally specify “CPSYS YES” when you specify “SAFEDR YES”, because “CPSYS YES” is the switch that causes SafeDR to backup all of your z/VM System Areas.

This Standalone Recovery tape, or SAR Tape, is what you use when you need to restore something (a minidisk, set of disks, a DASD Volume, a set of DASD volumes, or even your entire system) when z/VM is not running.

The simplest form of SafeDR backup/restore and disaster recovery is a single job that backs up every defined minidisk on every active DASD volume along with all CP system areas and creates a SAR tape. This job looks like:

```
INCLUDE USER *  
CPSYS YES  
SAFEDR YES
```

This backup job backs up every defined minidisk on all active volumes along with all defined CP Areas. The CP Areas are defined by SafeDR to be:

- Areas on CP OWNED volumes allocated as DRCT or SPOOL and the allocation area on each CP OWNED volume.
- The CHECKPOINT and WARMSTART area, as determined by examining Real System Storage.
  - Note: Backing up these areas allows you to recover all closed SPOOL files at the time of backup.
- MAINT CF1, CF2, CF3
  - Note: By convention, these disks represent your PARM disks.
- SafeDR records PAGE and T-DISK areas so that SafeDR can be format and allocate them appropriately during a disaster recovery restore. SafeDR does not, however, actually dump them to tape.
  - Note: You do not need to backup your PAGE or T-DISK areas.
- Any minidisk or volume defined on a CPSYS record in the SAFEDR CONTROL file.

If you were to run the backup job shown previously, SafeDR would backup all virtual minidisks defined in the source directory on all active DASD volumes and all CP Areas on active DASD volumes and if that completed successfully, SafeDR would then run a job (called the SAFEDR JOB) that creates the SAR tape.

The SAR tape contains everything required to perform a standalone recovery of your system, including a backup of the SafeDR server and its catalogs. This means that it is a good idea to run a job that contains “SAFEDR YES” as often as you run any backup job because the “SAFEDR YES” backup provides you with the ability to recover the SafeDR catalog, which contains the information about all active backup jobs.

If you run a single job each day, be sure to include “SAFEDR YES” in that job. If you run more than one backup job each day, be sure that the *last* job to run has “SAFEDR YES” or create a special job that only contains a “SAFEDR YES” record, and run that job last. This is how you ensure that you always have a backup of the most recent SafeDR catalog set.

### ***Defining SafeDR Backup Jobs***

You define SafeDR backup jobs with the SafeDR EDIT command. This places you into XEDIT on a job file. You add, delete, or change records until you have the job definition in place that you require. When you FILE out of the EDIT command, SafeDR validates the job file looking for syntax errors. If SafeDR finds an error, it will inform you of the error and ask you to either fix it or abandon your changes. When you answer “Yes” to this prompt, SafeDR will place you back into XEDIT on that job file, just as it was when you issued FILE. You can correct your errors and FILE again.

You can use the SafeDR REVIEW command to review a backup job. This causes SafeDR to perform the selection process, to determine what SafeDR would back up by the given job, allowing you to see what SafeDR would be back up according to your job specification, without actually having to run the job. You'll probably find that a creating a backup job consists of one or more iterations of:

1. SAFEDR EDIT *newjob*
2. SAFEDR REVIEW *newjob*

### **Running SafeDR Backup Jobs**

You start SafeDR backup jobs with the SafeDR START command. SafeDR runs one job at a time. SafeDR issues informational messages and prompts to your SYSOPER and TAPEOPER userids. When the job completes, a copy of the job report is sent to each user that is defined on a "REPORTID" record.

### **SafeDR Streams**

SafeDR takes advantage of CMS multitasking to speed processing and to be able to use more than one tape drive at a time. When SafeDR runs a backup job, it creates tasks, called streams, to handle the actual copying of data to tape. Each stream is given one tape drive. Therefore, if a backup job has four drives in use, it will have four active streams.

SafeDR sets the number of streams for job to be the smaller of:

- Number of STREAMS defined in the job file
- Number of SafeDR workers available
- Number of tape drives available

When you start a backup job, SafeDR compiles the job, creating a list of DASD areas to backup. SafeDR orders this list by DASD volume and creates a master list of DASD volumes. Each stream in the job pulls one DASD volume from the list at a time and works to dump it to tape. Working on one DASD at a time provides a good balance between keeping all streams active for as long as possible against I/O contention at the DASD level.

SafeDR orders Restore jobs differently, attempting to keep Tape volume contention to a minimum by ordering the restore by tape volume. Each restore stream selects a unique tape volume to restore from, and then restores all the items in the restore list from that tape. This minimizes how often two streams will require the same tape volume at the same time.

### **SafeDR Workers**

SafeDR uses worker virtual machines to allow multiple tape drives to be written to or read from at the same time. You define one or more workers during installation, and can modify this number over time. Workers are predefined in the VM directory using a POOL record. Workers do not require a private DASD space, which makes them easy to predefine. Safe Software recommends having at least as many workers defined as tape drives available. SafeDR brings workers online as needed, meaning extra workers defined, but not used, will not consume any system resources.

SafeDR manages all interaction with workers. You do not need to perform any management tasks on workers.

## Chapter 4. Performing SAFEDR Restores

Once you've mastered creating SafeDR backup jobs, you'll find that restores are very similar to the backup jobs you've been creating. You again simply specify what to restore, along with a few job options, and START the job. You'll find that even standalone recovery is easy, simply requiring you to perform a few simple steps to start the restore process.

### **Defining SafeDR Restore Jobs**

You define SafeDR restore jobs with the SafeDR EDITR command. This places you into XEDIT on a job file. You add, delete, or change records until you have the job definition in place that you require. When you FILE out of the EDIT command, SafeDR validates the job file looking for syntax errors. If SafeDR finds an error, it will inform you of the error and ask you to either fix it or abandon your changes. When you answer "Yes" to this prompt, SafeDR will place you back into XEDIT on that job file, just as it was when you issued FILE. You can correct your errors and FILE again.

You can use the SafeDR REVIEWR command to review a restore job. This causes SafeDR to perform the selection process, to determine what SafeDR would restore by the given job, allowing you to see what SafeDR would restore according to your job specification, without actually having to run the job. You'll probably find that creating a restore job consists of one or more iterations of:

1. SAFEDR EDITR *newjob*
2. SAFEDR REVIEWR *newjob*

*Note: SafeDR allows you to EDIT a restore job with the syntax SAFEDR EDIT newjob RESTORE or the via the EDITR command, which is simply a shortcut to avoid having to enter the RESTORE parameter. The same holds true for the REVIEW/REVIEWR commands.*

When you are running in disaster recovery mode, you can create jobs in exactly the same way. Note, however, that when you start up in disaster recovery mode, SafeDR will ask you if you'd like to restore the entire system. This makes it easy to recover your entire system, as SafeDR will run a predefined restore job that restores all minidisks and CP Areas.

*Note: SafeDR runs a restore job called "SARFULL RESTORE", which is placed on the SafeDR catalog disk during installation. You can modify SARFULL using the SafeDR EDIT or EDITR command.*

### **Running SafeDR Restore Jobs**

You start SafeDR restore jobs with the SafeDR STARTR command. SafeDR runs one job at a time. SafeDR issues informational messages and prompts to your SYSOPER and TAPEOPER userids. When the job completes, a copy of the job report is sent to each user that is defined on a "REPORTID" record.

*Note: SafeDR allows you to START a restore job with the syntax `SAFEDR START newjob RESTORE` or the via the `STARTR` command, which is simply a shortcut to avoid having to enter the `RESTORE` parameter.*

### **Running SafeDR Standalone Restore**

You perform a Standalone Restore by following the “Six Simple Steps to Recovering Your System” from a backup job. You can run in standalone mode on either real hardware or in a virtual machine (with appropriate resources, such as enough DASD to perform you restore and one or more tape drives).

*Note: The ability to run a Standalone Restore in a virtual machine is an excellent way to test and train on SafeDR’s standalone recovery capabilities.*

### **Testing the SafeDR Standalone Recovery System**

You should verify that the SafeDR Standalone Recovery System will work on your system by periodically running it. You can test the SafeDR Standalone Recovery System from the SafeDR server with the following steps:

1. Logon to SafeDR server
2. Terminate the server by issuing:
  - **SERVER STOP**
3. Temporarily reset your privilege class to “G”:
  - **CP SET PRIVCLASS \* =G**

*Note: This removes the special CP privileges that you give the SafeDR server. They are not required and are not recommended for a guest operating system.*
4. Start the SafeDR Standalone Recovery System:
  - **CP SYSTEM RESET**
  - **CP LINK \* 123 123 MW**
  - **CP TERM CONMODE 3270**
  - **CP IPL 123**
5. You should see a similar IPL sequence as compared to your base z/VM system.
6. You should see SAFEDR being autologged on the SafeDR Standalone Recovery System
7. You should see some informational messages about the SafeDR Standalone Recovery System
8. You should be prompted: “Do you wish to restore the entire system? (Yes/No)”
9. Respond No (and press enter)
10. Perform any additional verification
11. Shutdown the SafeDR Standalone Recovery System:
  - **CP SHUTDOWN**
12. Reset the SafeDR server privilege class:
  - **CP SET PRIVCLASS \* RESET**
13. Restart the SafeDR server:
  - **IPL CMS**

*Note: Alternatively, you could just LOGOFF and XAUTOLOG the SafeDR server to restart it.*

## Chapter 5. SafeDR Tape Management

SafeDR provides you with the capability to manage both Tape Volumes and Tape Drives. Tape Volume management refers to how tape volumes are used and reused by SafeDR. Tape Drive management is the other component of SafeDR Tape Management. You can use the SafeDR TAPEEXIT user exit to override or complement some or all of Tape Drive management functions in SafeDR as well as to get control to take other actions for certain Tape Volume management situations.

This section documents how SafeDR uses drives and volumes and how the TAPEEXIT affects SafeDR behavior.

### ***How SafeDR uses Tape Volumes***

SafeDR keeps a tape catalog. SafeDR adds tapes to this catalog when a Tape Operator mounts a new tape for a backup job or when a Tape Operator defines a new tape with the SafeDR TAPE ADD command. SafeDR keeps the following information for each tape volume:

Volser	The tape volume label.
Device type	The tape drive device type the last time this tape was used.
Expiration date	The expiration date of this tape.
Status	If a tape is not active in a job, then SafeDR keeps a status of SCRATCH or BADTAPE <ul style="list-style-type: none"><li>▪ SCRATCH: Tape is not in use and can be used to satisfy a SCRATCH mount request.</li><li>▪ BADTAPE: SafeDR encountered an I/O error writing to this tape. SafeDR will not allow this tape to satisfy a SCRATCH mount request. You must reset the status after replace the physical tape volume.</li></ul>

Backup Catalog If the tape is in an active catalog, SafeDR tracks the catalog that it is in.

SafeDR uses tapes for two purposes: Backup and Restore.

When SafeDR is running a backup job, it requests “SCRATCH” tapes. This request can be satisfied by either a tape that has a status of SCRATCH; a tape that has expired (but not yet scratch...SafeDR will scratch the tape and all other tapes associated with the expired catalog if an expired tape is mounted); or a tape that is not defined to SafeDR (this causes SafeDR to add the tape to its tape catalog)

When SafeDR is running a restore job, it requests tapes with a specific tape volser. You must mount the requested tape in order for the job to continue. SafeDR may request the same tape on two different drives at the same time if you have multiple streams defined for the restore job. If this happens, wait until the tape is unloaded from the first drive and then mount it on the second drive. SafeDR orders restore processing to attempt to minimize this behavior, but it can occur when a virtual minidisk spans from one tape to another.

You can use the TAPEEXIT user exit in the following ways that relate to SafeDR volumes:

- TAPEEXIT MOUNT: You can use the TAPEEXIT to replace the prompt for tape mounts. If you enable the exit for MOUNT requests, SafeDR will not prompt tape operators for any mounts. Your exit will be responsible for the mount.
- TAPEEXIT SCRATCH: When SafeDR scratches a tape, either from the TAPE SCRATCH command or by reusing a tape in a backup job, SafeDR will call the TAPEEXIT to allow you to perform additional processing as a result of the scratch, such as notifying your tape management solution that the given tape is now free for use.
- TAPEEXIT EOT: When SafeDR unloads a tape volume, it will call the TAPEEXIT to allow you to perform additional processing as a result of the unload, such as notifying your tape management solution that the tape has a particular retention period.
- TAPEEXIT PROMPT OVERRIDE: When SafeDR requests a SCRATCH tape and is given a tape volume that is not expired and is active in a backup catalog, SafeDR prompts the TAPE OPERATOR for an override. Asking if the tape should actually be used for a job (which would delete it from the other backup catalog, causing that catalog to be deleted and all of its tapes to be scratched). You can handle these requests with the TAPEEXIT, if you require.
  - *Note: One use for this feature is to **disable** the override capability.*
- TAPEEXIT PROMPT LABEL: When SafeDR requests a SCRATCH tape and is given a tape with no label on it, the TAPE OPERATORS are prompted to either reject the tape or to provide a label. You can use this to augment or preempt SafeDR processing of this request.

*Note: SafeDR also calls the TAPEEXIT user exit with START and EOJ parameters to indicated the start and end of a backup or restore job.*

### **How SafeDR uses Tape Drives**

When SafeDR starts a backup job, it allocates one tape drive per stream in the job. For example, if the job specifies three streams, SafeDR will attempt to allocate and attach three drives, one for each stream.

SafeDR selects a tape drive for a backup job by attempting to use a higher capacity drive over a lower capacity drive. SafeDR accomplishes this by sorting the available tape drives by descending (alphabetical) device type order.

*Currently this order is: 3590, 3490, 3480, 3422.*

SafeDR attaches the selected drive to the stream and that stream uses that drive until it completes.

SafeDR calls the TAPEEXIT user exit for the following actions related to tape drive allocation:

- TAPEEXIT ALLOC: A request to allocate a tape drive and attach it to a worker.
  - A backup is running and a stream is starting and requires a drive.

- A restore is running and a stream is starting and requires a drive or has encountered a different device type for a second or subsequent tape volume, and needs to allocate that drive type.
- A standalone backup is running (SAFEDR YES) and the stream that will handle that job is starting and requires a tape drive.
- TAPEEXIT DETACH: A request to remove a tape drive from a worker
  - A backup stream has completed.
  - A restore stream has completed.
  - A restore stream has encountered a different device type for a second or subsequent tape volume and is detaching the drive before attempting to allocate one of the different device type.

You can use the TAPEEXIT to augment or preempt existing SafeDR processing for a tape drive.

*Note: SafeDR also calls the TAPEEXIT user exit with START and EOJ parameters to indicated the start and end of a backup or restore job.*



## Chapter 6. SafeDR Backup Job Reference

Table 1 - Summary of SafeDR Backup Job Records	
Name	Description
COMMENT	A one line comment describing a job
COMPACT	Turn off/on DDR compression
CPSYS	Turn off/on inclusion of defined CP Areas
EXCLUDE	Exclude a minidisk, all disks for a user, or an entire DASD Volume for backup
EXPIRE	Set catalog and tape expiration date
FULLPACK	Include/Exclude minidisks with "END" operand
INCLUDE	Include a user's virtual minidisk, all disks for a user, or an entire DASD volume for backup
SAFEDR	Turn off/on automatic standalone recovery backup job
STREAMS	Set a limit on number of backup streams for this job



## **COMMENT**

<b>COMMENT</b>	<i>Comment</i>
----------------	----------------

### **Purpose**

Use the COMMENT record to provide a one-line description of the job. The contents of this record is displayed in the QUERY JOBS output and on job reports.

### **Usage Notes**

1. Specify no more than one COMMENT record.
2. COMMENT is not required.



## **COMPACT**

<b>COMPACT</b>	{ <u>ON</u> }
	{ OFF }

### **Purpose**

Use the COMPACT record to control the COMPACT operand on the DDR OUTPUT records.

### **Usage Notes**

1. Specify no more than one COMPACT record.
2. COMPACT is not required.
3. The CP Utility DDR makes the final determination of how to implement the COMPACT operand, depending on the tape device used. Generally, any tape device that has a built in compress should be written to with COMPACT OFF.



## CPSYS

<b>CPSYS</b>	{ <u>YES</u> } { NO }
--------------	--------------------------

### Purpose

Use the CPSYS record to enable or disable the automatic inclusion of SafeDR defined “CP Areas” and all minidisk areas from the CPSYS records in the SAFEDR CONTROL file.

### CP Areas

CP Areas are defined as:

- All CP areas returned by the CP QUERY ALLOC MAP command, except for TDISK and PAGE areas. (TDISK and PAGE areas are automatically CP Formatted during a system recovery)
- MAINT CF1 (usually 1<sup>st</sup> CP PARM disk)
- MAINT CF2 (usually 2<sup>nd</sup> CP PARM disk)
- MAINT CF3 (usually 3<sup>rd</sup> CP PARM disk, only on z/VM 4.4.0 and more recent)
- CP CHECKPOINT area, determined by examining CP storage
- CP WARMSTART area, determined by examining CP storage
- Allocation area on each CP OWNED volume that contains a CP Area
  - CKD DASD: Cylinder 0
  - FBA DASD: Blocks 0-31

### Usage Notes

1. Specify no more than one CPSYS record.
2. CPSYS is not required.
3. To add additional areas that should be included for CPSYS YES, use the SafeDR CPSYS record in the SAFEDR CONTROL file.



## EXCLUDE

<b>EXCLUDE</b>	<pre>{ USER    <i>userid</i> {  *  } }                     { <i>Vdev</i> } { VOLUME  <i>DasdVolser</i> }</pre>
----------------	--

### Purpose

Use the EXCLUDE record to remove a virtual minidisk, all the disks defined to a userid, or all disks defined on a DASD volume from a backup job. EXCLUDE areas override INCLUDE areas, but will not exclude areas defined as “CP AREAS” by SafeDR or the SafeDR SAFEDR CONTROL file CPSYS records.

SafeDR always excludes volumes that are OFFLINE (defined to be the DASD volsers returned by the “CP QUERY DASD ACTIVE” command)

There is not a default EXCLUDE setting.

### Usage Notes

1. Specify as many EXCLUDE records as needed.
2. EXCLUDE is not required
3. SafeDR always excludes virtual minidisks defined with T-DISK, V-DISK, or DEVNO.

### Examples

To include all disks for user PETER, *except*, the 191 disk, you could specify:

```
INCLUDE USER PETER *
EXCLUDE USER PETER 191
```

To backup all disks on the system, except the disks on DASD volume PDQ123, you could specify:

```
INCLUDE USER *
EXCLUDE VOLUME PDQ123
```



## ***EXPIRE***

<b>EXPIRE</b>	<i>days</i>
---------------	-------------

### **Purpose**

Use the EXPIRE record to set the retention period, in days, for the backup catalog and the tapes created. The value can be from 1 to 9999.

### **Usage Notes**

1. Specify one EXPIRE record in each backup job.
2. EXPIRE is required in each backup job.
3. The EXPIRE record only changes values for future backup jobs runs. SafeDR does not update existing catalogs if you update a backup job with a different EXPIRE value.



## **FULLPACK**

<b>FULLPACK</b>	{ <u>INCLUDE</u> }
	{ EXCLUDE }

### **Purpose**

Use the FULLPACK record to tell SafeDR to skip or include MDISK records from the source directory that have a size of “END” in the job compilation. Many z/VM systems have “fullpack minidisks” that cover each pack, and this record makes it easy to automatically not include those disks in a backup.

SafeDR filters out all MDISK records with a size value of “END” when FULLPACK EXCLUDE is specified. When SafeDR runs a job with FULLPACK INCLUDE, it converts all “END” values into an actual size calculation, at the point in time that the job is run (or REVIEWed).

### **Usage Notes**

1. Specify no more than one FULLPACK record
2. FULLPACK is not required.
3. SafeDR only examines the SIZE field for “END” and ignores the starting location on the MDISK record.



## **INCLUDE**

<b>INCLUDE</b>	<pre>{ USER    <i>userid</i> {  *  } }                         { <i>Vdev</i> } { VOLUME  <i>DasdVolser</i> }</pre>
----------------	--

### **Purpose**

Use the INCLUDE record to tell SafeDR to include a virtual minidisk, all the disks for a userid, or all the disks defined on a DASD volume in a backup job. EXCLUDE records override INCLUDE records.

The default for INCLUDE is “INCLUDE VOLUME \*”, which will backup all disks defined in the source directory.

### **Usage Notes**

1. Specify as many INCLUDE records as needed.
2. INCLUDE is not required
3. SafeDR always excludes virtual minidisks defined with T-DISK, V-DISK, or DEVNO.
4. SafeDR performs a physical backup of each minidisk selected.
5. INCLUDE VOLUME only backs up the areas on the matching volume defined by virtual minidisks or CP Areas
6. SafeDR automatically prevents “double dumping”, defined as having two or more minidisks defined in the same physical area. If this occurs, SafeDR automatically ensures that only one dump of the DASD area is performed, while retaining the ability to restore any of the minidisk definitions.

### **Examples**

To backup a single userid, you could specify:  
INCLUDE USER LINUX01

To backup all the virtual minidisks defined on a DASD volume named PDQ123, you could specify:  
INCLUDE VOLUME PDQ123



## SAFEDR

<b>SAFEDR</b>	{ <u>YES</u> }
	{ NO }

### Purpose

Use the SAFEDR record to enable or disable the automatic Standalone Recovery (SAR) backup. This causes SafeDR to run a special, second, backup job after the completion of the defined backup job that creates the Standalone Recovery Tape used in the event of a standalone recovery situation. The Standalone Recovery Tape is an “IPL’able” tape that is used to recover the SafeDR Standalone Recovery System (SSRS) that can be used to restore part or all of your system in the event of a disaster or other situation that requires a standalone recovery.

Use the SAFEDR YES option to generate your Standalone Recovery Tape *and* to obtain a backup of the SafeDR server and SafeDR catalogs.

SafeDR defaults to running this job (SAFEDR YES).

### Warning

*If you are using SafeDR to provide your Standalone Recovery Capability, be sure to run a job with “SAFEDR YES” as often as necessary to meet your installation’s recovery goals.*

### Usage Notes

1. Specify no more than one SAFEDR record
2. SAFEDR is not required.
3. The SAFEDR YES is the setting that causes a backup of the SafeDR server machine, including the catalog disk. It is very important to have this backup in case of an emergency as the only way SafeDR can recover it’s own catalog disk is from the SAR tape.
4. Use the SAFEDR NO specification when you wish to skip creating the SAR tape, for example, if you run three backups each day of different parts of the system, you may wish to have a separate job that specifies the “SAFEDR YES” setting.



## STREAMS

<b>STREAMS</b>	{ <u>      </u> *        } { <i>number</i> }
----------------	---

### Purpose

Use the STREAMS record to set an upper limit on the number of streams used in a backup job. The actual number used is the smaller of the STREAMS setting, the number of available tape drives, and the number of available workers.

### Usage Notes

1. Specify no more than one STREAMS record
2. STREAMS is not required.
3. Changing the STREAMS record only affects future runs of the job.



## Chapter 7. SafeDR Restore Job Reference

<b>Table 2 - Summary of SafeDR Backup Job Records</b>	
<b>Name</b>	<b>Description</b>
CATRANGE	Set dates to select catalogs to restore from
COMMENT	A one line comment describing a job
CPSYS	Turn off/on inclusion of defined CP Areas
EXCLUDE	Exclude a minidisk, all disks for a user, or an entire DASD Volume for restore
INCLUDE	Include a user's virtual minidisk, all disks for a user, or an entire DASD volume for restore
LOOKBACK	Determine number of days to look back in catalogs for an item.
STREAMS	Set a limit on number of backup streams for this job



## CATRANGE

<b>CATRANGE</b>	<pre>{ <i>month/day/year</i> } { <i>month1/day1/year1 month2/day2/year2</i> }</pre>
-----------------	---

### Purpose

Use the CATRANGE record to set the range of dates from which SafeDR will select catalogs to examine for restore selection. SafeDR uses the range given as the first filter against which catalogs to select to attempt to restore from. This provides you with the ability to “go back in time” to restore a previous version of a file from several backup runs ago.

When you supply a single date, SafeDR creates a range from that date to “today”. SafeDR uses LOOKBACK to generate a CATRANGE if you do not specify CATRANGE.

### Parameters

*Month/Day/Year* SafeDR will select catalogs from this date to “today”

*Month1/Day1/Year1 Month2/Day2/Year2* SafeDR will only examine catalogs created in this date range (inclusive of start and stop days)

*Note: Use one or two digits for Month and Day and four digits for year.*

### Usage Notes

1. Specify no more than one CATRANGE record
2. CATRANGE is not required; if not provided, the default CATRANGE is determined from LOOKBACK (which has a fixed default of 90 days if not specified).
3. Use the CATRANGE record to “go back in time” to a previous instance of a item.

### Examples

To only select an item if was backed up on or after November 30, 2002:

**CATRANGE 11/30/2002**

To only select an item if was backed up on or after November 30, 2002 but before or on December 15, 2002:

**CATRANGE 11/30/2002 12/15/2002**



## **COMMENT**

<b>COMMENT</b>	<i>Comment</i>
----------------	----------------

### **Purpose**

Use the COMMENT record to provide a one-line description of the job. The contents of this record is displayed in the QUERY JOBS output and on job reports.

### **Usage Notes**

1. Specify no more than one COMMENT record.
2. COMMENT is not required.



## CPSYS

<b>CPSYS</b>	{ <u>YES</u> } { NO }
--------------	--------------------------

### Purpose

Use the CPSYS record to enable the restore of “CP Areas” and all minidisk areas from the CPSYS records in the SAFEDR CONTROL file. This record only applies if SafeDR is running in Standalone Recovery Mode on the SSRS. If SafeDR is running in regular mode, this record is ignored (but allowed to be in the jobfile).

### CP Areas

CP Areas are defined as:

- All CP areas returned by the CP QUERY ALLOC MAP command, except for TDISK and PAGE areas. (TDISK and PAGE areas are automatically CP Formatted during a system recovery)
- MAINT CF1 (usually 1<sup>st</sup> CP PARM disk)
- MAINT CF2 (usually 2<sup>nd</sup> CP PARM disk)
- MAINT CF3 (usually 3<sup>rd</sup> CP PARM disk, only on z/VM 4.4.0 and more recent)
- CP CHECKPOINT area, determined by examining CP storage
- CP WARMSTART area, determined by examining CP storage
- Allocation area on each CP OWNED volume that contains a CP Area
  - CKD DASD: Cylinder 0
  - FBA DASD: Blocks 0-31

### Usage Notes

1. Specify no more than one CPSYS record.
2. CPSYS is not required.
3. To add additional areas that should be included for CPSYS YES, use the SafeDR CPSYS record in the SAFEDR CONTROL file.
4. SafeDR ignores “CPSYS YES” unless the restore is run on the SafeDR Standalone Recovery System.



## EXCLUDE

<b>EXCLUDE</b>	<pre>{ USER   <i>userid</i> {  *  } }                     { <i>Vdev</i> } { VOLUME <i>DasdVolser</i> }</pre>
----------------	--

### Purpose

Use the EXCLUDE record to remove a virtual minidisk, all the disks defined to a userid, or all disks defined on a DASD volume from a restore job. EXCLUDE areas override INCLUDE areas, but will not exclude areas defined as “CP AREAS” by SafeDR or the SafeDR SAFEDR CONTROL file CPSYS records.

SafeDR always excludes volumes that are OFFLINE (defined to be the DASD volsers not returned by the “CP QUERY DASD ACTIVE” command)

There is not a default EXCLUDE setting.

### Usage Notes

1. Multiple EXCLUDE records can be specified.

### Examples

To include all disks for user PETER, *except*, the 191 disk, you could specify:

```
INCLUDE USER PETER *
EXCLUDE USER PETER 191
```

To restore all disks on the system, except the disks on DASD volume PDQ123, you could specify:

```
INCLUDE USER *
EXCLUDE VOLUME PDQ123
```



## **INCLUDE**

<b>INCLUDE</b>	<pre>{ USER   <i>userid</i> {  *  }}                   { <i>Vdev</i> } { VOLUME <i>DasdVolser</i> }</pre>
----------------	---

### **Purpose**

Use the INCLUDE record to tell SafeDR to include a virtual minidisk, all the disks for a userid, or all the disks defined on a DASD volume in a restore job. EXCLUDE records override INCLUDE records.

The default for INCLUDE is “INCLUDE VOLUME \*”, which will restore all disks defined in the source directory.

### **Usage Notes**

1. Specify as many INCLUDE records as needed.
2. INCLUDE is not required
3. SafeDR always excludes virtual minidisks defined with T-DISK, V-DISK, or DEVNO.
4. SafeDR performs a physical restore of each minidisk selected.
5. INCLUDE VOLUME restores the areas on the matching volume defined by virtual minidisks or CP Areas
6. SafeDR never restores over the extents of its 123 minidisk. This protects SafeDR from accidentally restoring over itself while running. You must use the SafeDR Standalone Recovery System to restore the SafeDR server.

### **Examples**

To restore a single userid, you could specify:  
INCLUDE USER LINUX01

To restore all the virtual minidisks defined on a DASD volume named PDQ123, you could specify:  
INCLUDE VOLUME PDQ123



## LOOKBACK

LOOKBACK	{ <u>90</u> }
	{ <i>NumDays</i> }

### Purpose

Use the LOOKBACK record to control the range of dates of catalogs files SafeDR examines during the restore selection process. With a large, long-lasting, set of catalog files, this record improves restore job compilation time by limiting the number of catalogs that SafeDR has to open to look for backup instances for each item to be restored.

CATRANGE overrides LOOKBACK.

### Usage Notes

1. Specify no more than one LOOKBACK record.
2. LOOKBACK is not required.
3. Use of the CATRANGE record completely overrides LOOKBACK.
4. LOOKBACK effectively creates a CATRANGE from *NumDays* ago to today.



## STREAMS

<b>STREAMS</b>	{ <u>      </u> *        } { <i>number</i> }
----------------	---

### Purpose

Use the STREAMS record to set an upper limit on the number of streams used in a backup job. The actual number used is the smaller of the STREAMS setting, the number of available tape drives, and the number of available workers.

### Usage Notes

1. Specify no more than one STREAMS record
2. STREAMS is not required.
3. Changing the STREAMS record only affects future runs of the job.



## Chapter 8. SafeDR Command Reference

<b>Table 3 - Summary of SafeDR Commands</b>		
<b>Command Name</b>	<b>Description</b>	<b>Authorization</b>
CANCEL	Terminate a job, a job stream, or a pending mount request	SAFADMIN or SYSOPER/TAPEOPER
CATALOG	Manage SafeDR catalogs	SAFADMIN
CMS	Issue a CMS command on the SafeDR server console	SAFADMIN
CONTROL	Manage SafeDR configuration	SAFADMIN
EDIT EDITR	Manage SafeDR backup and restore jobs	SAFADMIN
END	Terminate SafeDR server	SAFADMIN
QUERY	Interrogate SafeDR job and configuration information	SAFADMIN
REPLY	Respond to SafeDR requests	SAFADMIN or Tape: TAPEOPER Disk/System: SYSOPER
REVIEW REVIEWR	Compile a backup or restore job to determine the minidisks and tapes affected	SAFADMIN
START STARTR	Start SafeDR backup and restore jobs	SAFADMIN or SYSOPER
TAPE	Manage SafeDR tapes	SAFADMIN or TAPEOPER
VERSION	Display SafeDR version	None



## **Command Responses and Return Codes**

The SafeDR command set produces a variety of messages. These messages are documented in “Chapter 11. SafeDR Messages & Codes”. In all cases, the return code generated is 0 for a successful request. If an error occurs, SafeDR sets the return code to the message number of the error detected.

### **Example**

```
safedr cancel job  
SDRCAN0116E Missing parameter.  
Ready(00116);
```



## CANCEL

<b>CANCEL</b>	<b>[JOB]</b> <i>JobName JobType</i> <b>MOUNT</b> <i>RDev</i> <b>STREAM</b> <i>RDev</i>
---------------	--

### Purpose

Use the CANCEL command to terminate active jobs, streams in active jobs, or pending tape mount requests.

### Authorization

<i>Command</i>	<i>Authorization</i>
CANCEL JOB	SYSOPER or SAFADMIN
CANCEL STREAM	SYSOPER or SAFADMIN
CANCEL MOUNT	TAPEOPER or SAFADMIN

### Subcommands

JOB	Terminate an active job
MOUNT	Terminate a SafeDR Tape Mount Request
STREAM	Terminate a stream in an active job

### Parameters

#### **JOB:**

*JobName* Name of job to terminate  
*JobType* Type (BACKUP | RESTORE) of job to terminate

#### **MOUNT:**

*RDev* Real Device number of pending tape mount

#### **STREAM:**

*RDev* Real Device number of tape drive associated with job stream

### Usage Notes

1. CANCEL STREAM against a one-stream job cancels the entire job.
2. SafeDR deletes any catalog created and any tapes used are set to SCRATCH status when a job is canceled.

3. Tapes that are scratched as part of a running job that is canceled remain in scratch status.

## CATALOG

<b>CATALOG</b>	<b>AUTOEXP</b> <b>LIST</b> [ <i>CatName</i> [ <i>CatType</i> ]] <b>DELeTe</b> <i>CatName CatType</i>
----------------	--

### Purpose

Use the CATALOG command to manage SafeDR catalogs:

- Automatically delete expired catalogs
- Display catalog information
- Delete specific catalogs.

When you delete a catalog, via either AUTOEXP or DELETE, SafeDR scratches all tapes associated with the catalog.

When you use the LIST subcommand without “*CatName*” or “*CatName CatType*”, SafeDR displays a summary list of catalog files. If you provide “*CatName*” or “*CatName CatType*”, SafeDR generates detailed information on each catalog file displayed.

### Authorization

SAFADMIN authorization.

### Subcommands

AUTOEXP	Run SafeDR automatic catalog deletion
LIST	Display summary information about all catalogs or detailed information on a subset or single catalog file
DELETE	Delete an individual catalog file, scratching all associated tapes

### Parameters

#### AUTOEXP:

<None>

#### LIST:

*CatName*           Catalog filename. Same as name of job that created catalog file.  
Leave blank to see summary list of all catalogs.  
Any value causes SafeDR to display detailed information about each catalog.  
Use any valid CMS LISTFILE syntax.

*CatType* Catalog filetype. Use this to differentiate between different instances of a job's catalog.  
Use any valid CMS LISTFILE syntax.

**DELETE:**

*CatName CatType* Catalog filename and filetype to be deleted.

**Usage Notes**

1. AUTOEXP has the synonym AUTOCAT.
2. Safe Software recommends scheduling running the AUTOEXP command on a regular (daily or weekly) basis.
3. To see a summary list of all active SafeDR catalogs, issue: SAFEDR CATALOG LIST
4. To see a detailed list of all active SafeDR catalogs, issue: SAFEDR CATALOG LIST \*
5. Detailed list extent information is cylinders for CKD and blocks for FBA.
6. AUTOEXP will not run while other jobs are active.

**Examples**

**Display Summary list:**

This command shows all active SafeDR catalogs. The results include the “CatName CatType” which can be used in detailed LIST or DELETE commands, the date the job ran that created the catalog, and the date that the catalog will expire and be eligible for automatic deletion (AUTOEXP). Note also that the CatName is the same as the job name that created the job (at the time the job ran).

```
safedr catalog list
CatName- CatType- ----- Run Date ---- --Expire--
BAK1      CAT00233 03/29/2005 11:23:33 04/05/2005
BAK1      CAT00232 03/23/2005 14:49:34 03/30/2005
BAK1      CAT00229 03/23/2005 14:46:22 03/30/2005
BAK1      CAT00228 03/23/2005 14:45:14 03/30/2005
Ready;
```

**Display Detail information for BAK1 CAT00233**

This command shows the detail information from “BAK1 CAT00233”, which ran on March 29, 2005. The results include the summary information plus:

- SafeDR YES|NO
- List of tapes associated with this catalog
- List of DASD volumes with Volser, Devtype, RDev, and extent information

- For each DASD Volume, list of minidisks or CP Areas backed up on the volume

```
safedr catalog list bak1 cat00233
CatName- CatType- ----- Run Date ---- --Expire--
BAK1      CAT00233 03/29/2005 11:23:33 04/05/2005
SAFEDR: NO
TAPES: JAH002
VOLUME: SSI001 3390 0433 Extent: 3285-3286
  USERID: HALLTST1 0200 Extent: 3285-3286
VOLUME: SSI004 3390 0435 Extent: 1-6
  USERID: HALLTST1 0100 Extent: 1-2
  USERID: HALLTST1 0101 Extent: 3-6
Ready;
```



## CMS

CMS	<i>cmscmd</i> CP <i>cpcmd</i>
-----	----------------------------------

### Purpose

Use the CMS command to issue CMS and CP commands to the SafeDR server console and return the command's output.

### Authorization

SAFADMIN authorization.

### Parameters

*cmscmd* The CMS command to be issued.

CP *cpcmd* The CP command to be issued prefixed by CP.

### Usage Notes

1. The CMS command should not be used to invoke full screen functions such as XEDIT. This will cause the SafeDR server to appear to hang.
2. The entire string is passed to the appropriate handler (CMS or CP), including options.
3. SafeDR uses the CMS Pipeline stage “CMS” to issue the command and capture the response, unless you use the CP parameter, in which case the CMS Pipeline stage “CP” is used to issue the command and capture the response.

## Examples

### SAFEDR CMS CP QUERY VIRTUAL DASD

This command causes the CP QUERY VIRTUAL DASD command to be issued on the SafeDR server, and the results are returned to the issuing user.

```
safedr cms cp query virtual dasd
DASD 0123 3390 SDRTS2 R/O          782 CYL ON DASD 043A SUBCHANNEL = 0000
DASD 0190 3390 440RES R/O          107 CYL ON DASD 043B SUBCHANNEL = 0012
DASD 0191 3390 SDRTS2 R/W           25 CYL ON DASD 043A SUBCHANNEL = 000A
DASD 0192 3390 SDRTS2 R/W           20 CYL ON DASD 043A SUBCHANNEL = 000B
DASD 0194 3390 SDRTS2 R/W           25 CYL ON DASD 043A SUBCHANNEL = 000C
DASD 019D 3390 440RES R/O          146 CYL ON DASD 043B SUBCHANNEL = 0014
DASD 019E 3390 440RES R/O          250 CYL ON DASD 043B SUBCHANNEL = 0013
DASD 0AF0 3390 SDRTS2 R/W            1 CYL ON DASD 043A SUBCHANNEL = 0001
DASD 0AF1 3390 SDRTS2 R/W           30 CYL ON DASD 043A SUBCHANNEL = 0002
DASD 0AF2 3390 SDRTS2 R/W            2 CYL ON DASD 043A SUBCHANNEL = 0003
DASD 0AF3 3390 SDRTS2 R/W            2 CYL ON DASD 043A SUBCHANNEL = 0004
DASD 0AF4 3390 SDRTS2 R/W            2 CYL ON DASD 043A SUBCHANNEL = 0005
DASD 0AF5 3390 SDRTS2 R/W          250 CYL ON DASD 043A SUBCHANNEL = 0006
DASD 0AF6 3390 SDRTS2 R/W            5 CYL ON DASD 043A SUBCHANNEL = 0007
DASD 0AF7 3390 SDRTS2 R/W          120 CYL ON DASD 043A SUBCHANNEL = 0008
DASD 0AF8 3390 SDRTS2 R/W          250 CYL ON DASD 043A SUBCHANNEL = 0009
DASD 0DBA 3390 SDRTS2 R/W            50 CYL ON DASD 043A SUBCHANNEL = 000D
Ready;
```

## CONTROL

CONTROL	ADD	CPSYS SAFADMIN REPORTID SAFEPW SYSOPER TAPEDEVS TAPEOPER
	DELeTe	CPSYS SAFADMIN REPORTID SAFEPW SYSOPER TAPEDEVS TAPEOPER
	MODify	DIRLOC WORKER
	Query	<i>recordtype</i> <u>ALL</u>

### Purpose

Use the CONTROL command to manage the SafeDR configuration information. All changes are effective immediately, except as noted in the Usage Notes. See Chapter 7 “Control Records” for details on the syntax for each record.

ADD and DELETE are used with records that can appear more than once (e.g. SAFADMIN) while MODIFY is used to update a record that can only appear once (e.g. DIRLOC).

### Authorization

SAFADMIN authorization

### Subcommands

ADD Add and activate a control file record  
DELETE Remove and deactivate a control file record  
MODIFY Change an existing control file record  
QUERY Display all matching control file records.

## **Usage Notes**

1. Changes to the WORKER record do not take affect until the SafeDR server is stopped and restarted.
2. Changes to records may or may not affect currently executing jobs.

## EDIT / EDITR

<b>EDIT</b>	<code>jobname [{BACKUP } pfname [pftype]] [(options) {RESTORE}]</code>
<b>EDITR</b>	<code>jobname [{RESTORE} pfname [pftype]] [(options) {BACKUP }]</code>
	-----
	<i>Options:</i> <b>DELETE</b> <b>ERASE</b>

### Purpose

Use the EDIT and EDITR commands to create, update, and delete BACKUP and RESTORE jobs. The EDIT/EDITR command places the issuer into an XEDIT session on the named job file. The prototype job operands (pfname/pftype) are used to create a new job using an existing job as a template.

Note that the EDITR is simply a shortcut for using a default filetype of “RESTORE”.

### Authorization

SAFADMIN authorization.

### Parameters

*jobname*            The job name to create or update  
*pfname pftype*      The job name to use as a template (only valid if job  
                          “*jobname* {BACKUP|RESTORE}” does not exist.

### Usage Notes

3. EDIT has a default filetype of BACKUP; EDITR has a default filetype of RESTORE. There is no other difference between the two commands.
4. Use the REVIEW or REVIEWR command to evaluate the selection criteria in your job.
5. You can use a BACKUP job as a prototype for a restore job, and vice-versa.



## **END**

<b>END</b>	[LOGOFF]
------------	----------

### **Purpose**

Use the END command to terminate the SafeDR server. It may also be used to log off the SafeDR server virtual machine.

### **Authorization**

SAFADMIN authorization.

### **Parameters**

LOGOFF      Cause SafeDR server to LOGOFF after it terminates.

### **Usage Notes**

1. SafeDR will terminate processing even if other commands or jobs are active.



## QUERY / Q

QUERY Q	JOBS	{BACKUP }
		{RESTORE}
		{ <u>ALL</u> }
	REQuests	
	TAPES	{SCRATCH }
		{BADTAPES}
		{Volser }

### Purpose

Use the QUERY command to display information about SafeDR:

- Defined Jobs
- Outstanding SafeDR prompts
- Tape information

### Authorization

SAFADMIN authorization

*-or-*

JOBS: SYSOPER

REQUESTS: SYSOPER or TAPEOPER

TAPES: TAPEOPER

### Subcommands

JOBS Display active jobs

REQUESTS Display outstanding SafeDR prompts

TAPES Display tape information

### Parameters

#### JOBS:

BACKUP Display all defined BACKUP jobs

RESTORE Display all defined RESTORE jobs

ALL Display all defined jobs

#### REQUESTS:

*None*

**TAPES:**

SCRATCH Display list of all scratch tapes

BADTAPES Display list of all tapes marked "BAD" due to I/O errors

*Volser* Display tape information for a individual tape

**Examples****QUERY JOBS:**

```
safedr q jobs
JobName JobType Comment
BAK      BACKUP  U+ SAFEDR 192 -CP -SDR
BAK1     BACKUP  u+HALLTST1 -c -s s1
BAK2     BACKUP  INCL USER *           +CP -SDR
BAK3     BACKUP  INCL USER HALL 191 -CP -SDR
BAK4     BACKUP  INCL USER HALLTST1 100 -CP +SDR
BAK5     BACKUP  U+ HALLTST1 -CP -SDR
BAK6     BACKUP  U+ HALLTST1 -CP +SDR
FULL     BACKUP  INCL VOLUME * CPSYS YES SAFEDR YES
Ready;
```

**QUERY REQUESTS:**

```
safedr q req
ReplyNum Request
      2 PLEASE MOUNT A SCRATCH TAPE ON TAPE DRIVE 0589
      1 PLEASE MOUNT A SCRATCH TAPE ON TAPE DRIVE 0588
Ready;
```

**QUERY TAPES:**

```
safedr q tape scratch
JAH003 JAH004 JAH005 JAH006 JAH007 JAH008 JAH009 JAH010 JAH011
JAH012
Ready;
```

```
safedr q tape badtapes
SDRQRY0147E No BADTAPE tapes in Tape Database.
Ready(00147);
```

```
safedr q tape jah001
Tape "JAH001" is used by catalog "BAK1 CAT00229" and has
expiration date: 20050330
Ready;
```

## **REPLY**

<b>REPLY</b>	<i>num response</i>
--------------	---------------------

### **Purpose**

Use the REPLY command to respond to SafeDR prompts.

### **Authorization**

SAFADMIN authorization

-or-

Tape Requests: TAPEOPER authorization

DASD Requests: SYSOPER authorization

### **Parameters**

*num* Request number from request

*response* Response to given request

### **Examples**

#### **Overriding Tape Expiration:**

```
safedr q req
```

```
ReplyNum Request
```

```
      7 Tape "JAH001" on 0588 is not expired and is active in  
job BAK1. Do youwish to overwrite?
```

```
Ready;
```

```
safedr reply 7 yes
```

```
Ready;
```



## REVIEW / REVIEWR

<b>REVIEW</b> <b>REVIEWR</b>	<i>jobname jobtype</i> ( [ { <b>TERM</b> } ] [ { <b>DISK</b> } ] [ { <b><u>EDIT</u></b> } ]
---------------------------------	---

### Purpose

Use the REVIEW and REVIEWR commands to compile a job to determine what will be backed up or restored as determined by the job definition and the contents of the current user directory.

### Authorization

SAFADMIN authorization

### Parameters

*jobname*      Name of job  
*jobtype*      Type of job (Defaults to BACKUP or RESTORE for REVIEW/REVIEWR)

### Usage Notes

1. The default *jobtype* for REVIEW is BACKUP and the default *jobtype* for REVIEWR is RESTORE.
2. Use the REVIEW/REVIEWR commands as you edit backup or restore jobs to determine how the INCLUDE/EXCLUDE records will affect the job.



## START / STARTR

<b>START</b>	<i>jobname</i> { <u>BACKUP</u> } [( <i>WORKERLOG</i> )] { <u>RESTORE</u> }
<b>STARTR</b>	<i>jobname</i> { <u>RESTORE</u> } [( <i>WORKERLOG</i> )] { <u>BACKUP</u> }

### Purpose

Use the START and STARTR commands run backup and restore jobs.

### Authorization

SAFADMIN authorization

-or-

SYSOPER authorization

### Parameters

*jobname* Name of job

*jobtype* Type of job (Defaults to BACKUP or RESTORE for START/STARTR)

### Options

**WORKERLOG** Includes the console log of each worker used in the output report

### Usage Notes

1. The default *jobtype* for START is BACKUP and the default *jobtype* for STARTR is RESTORE.



## TAPE

<b>TAPE</b>	<b>ADD</b> <i>volser</i> [ <i>devtype</i> ] <b>SCRATCH</b> <i>volser</i>
-------------	---

### Purpose

Use the TAPE command to scratch existing tapes or add new tapes to the SafeDR tape database.

### Authorization

SAFADMIN authorization

-or-

TAPEOPER authorization

### Parameters

*volser*        Tape volser to add or scratch

*devtype*      Optional device type to mark tape with during an ADD. If not given, the devtype is left undetermined and is set when the tape is mounted on a drive.

### Usage Notes

2. SCRATCH causes the tape given to be scratched, the catalog that the tape given is in to be deleted, and any other tapes in that catalog to be scratched.
3. Contact Safe Software technical support for assistance if you need to remove tapes from the tape database or change their devtype.



## **VERSION**

<b>VERSION</b>	
----------------	--

### **Purpose**

Use the VERSION command to display the SafeDR version.

### **Authorization**

No authorization required.

### **Parameters**

None



## Chapter 9. SafeDR Control Reference

<b>Table 4 - Summary of SafeDR Control Records</b>	
<b>Record Name</b>	<b>Description</b>
CPSYS	Define additional areas for a backup defined with “CPSYS YES”
DEBUG	Various diagnostic switches
DIRLOC	Define location of CP Source Directory (USER DIRECT) to use
REPORTID	Define userids/email addresses to receive SafeDR job reports
SAFADMIN	Define SafeDR administrators
SAFEPW	Password that authorizes SafeDR use
SYSOPER	Define SafeDR System Operators
TAPEDEVS	List of Tape Devices to be used by SafeDR
TAPEOPER	Define SafeDR Tape Operators
WORKER	Define SafeDR worker machines



## CPSYS

<b>CPSYS</b>	<pre>{USER  <i>userid</i> <i>vdev</i> } {VOLUME <i>volser</i>      }</pre> <hr/> <p><b><i>userid</i></b> - <i>userid</i> to include. <b><i>vdev</i></b>   - <i>vdev</i> on <i>userid</i> to include. <b><i>volser</i></b> - DASD Volume to include (entire device)</p>
--------------	--

### Purpose

Use the CPSYS record to include additional areas for a “CPSYS YES” backup. The listed areas are included in the SafeDR list of defined “CP Areas”.

### Usage Notes

1. You can specify as many CPSYS records as needed to describe your additional areas.
2. EXCLUDE backup job records do not apply to CPSYS areas.
3. SafeDR does not copy CPSYS Areas to the SafeDR Standalone Recovery System.



## **DEBUG**

<b>DEBUG</b>	<b>STARTUP <i>SDRRUN_Parms</i></b>
--------------	------------------------------------

### **Purpose**

Provides the ability to add various product configuration parameters before they are made a permanent part of SafeDR. DEBUG configurations records maybe renamed or removed from the product at any time.

### **Parameters**

STARTUP

Any valid SDRRUN startup parameters can be specified here and override the defaults. Manually issuing SDRRUN with parms overrides the DEBUG START parameters.

### **Usage Notes**

None



## **DIRLOC**

<b>DIRLOC</b>	<i>Userid vdev</i>
---------------	--------------------

### **Purpose**

Specifies the userid and virtual address of the CMS minidisk containing the USER DIRECT file.

### **Parameters**

Userid	Userid
Vdev	Virtual Device Address

### **Usage Notes**

1. SafeDR attempts to validate that the target disk contains a file named "USER DIRECT".
2. This record is required.
3. SafeDR links and accesses this disk each time it needs access to the source directory.



## REPORTID

REPORTID	{ <i>Userid</i> } { <i>Userid@Nodeid</i> } { <i>Emailaddr</i> ( SMTP )
----------	--

### Purpose

Defines the list of userids and/or email addresses that SafeDR sends job output reports to.

### Parameters

<i>Userid</i>	Userid on local system. SafeDR uses SENDFILE to send a copy of the output report to this userid.
<i>Userid@Nodeid</i>	Userid on <i>Nodeid</i> system. SafeDR uses SENDFILE to send a copy of the output report to this userid.
<i>Emailaddr</i>	Email address. SafeDR uses SENDFILE with the SMTP option to send a copy of the output report to this userid.

### Usage Notes

1. SafeDR does not validate any of the targets.
2. Other system products/services may be required to use the “@Nodeid” and/or “Emailaddr” forms, such as RSCS or TCP/IP.
3. This record is required.



## SAFADMIN

SAFADMIN	{ [ <u>Userid</u> ]}userid } { ACIGROUP groupid }
----------	--

### Purpose

Defines usersids that are authorized to administer SafeDR.

### Parameters

Userid	Userid on local system.
Groupid	ACIGROUP – all users in the ACIGROUP are given SAFADMIN authorization.

### Usage Notes

1. Multiple SAFADMIN records can be specified.
2. This record is required.



## **SAFEPW**

<b>SAFEPW</b>	<b>XXXXXXXX XXXXXXXX XXXXXXXX XXXXXXXX</b>
---------------	--

### **Purpose**

Provides authorization to run the SafeDR product.

### **Parameters**

xxxxx...                      A password consisting of four, 8 character, hexadecimal words.

### **Usage Notes**

1. SafeDR will not operate without a valid SAFEPW record.
2. Multiple SAFEPW records may be specified.
3. SafeDR will use the "best" SAFEPW record found if there are multiple SAFEPW records in the SAFEDR CONTROL file.







## TAPEDEVS

<b>TAPEDEVS</b>	<pre>{ <i>raddr</i>          } { <i>raddr1-raddr2</i> }</pre>
-----------------	---

### Purpose

Limits the tape devices that SafeDR will use. By default, SafeDR uses all available tape drives.

### Parameters

Raddr	A single tape device
Raddr1-Raddr2	A range of tape devices

### Usage Notes

1. Multiple TAPEDEVS records may be specified.
2. SafeDR does not validate the tape device until it is selected for use.







## **WORKER**

<b>WORKER</b>	<i>Prefix Num</i>
---------------	-------------------

### **Purpose**

Defines the name and number of SafeDR Workers.

### **Parameters**

Prefix	3 character prefix to use to create SafeDR workers.
Num	Number of workers to define

### **Usage Notes**

1. Only one WORKER record may be defined.
2. You must define the Workers in the USER DIRECT before they can be used.
3. Use the “SDRPROF PROFILE” and the USER/POOL records in the SDRSRV DIRECT sample file to define the SafeDR worker machines.



## Chapter 10. SafeDR User Exits

<b>Table 5 – SafeDR User Exits</b>	
<b>User Exit</b>	<b>Description</b>
QUIESCE	Provides QUIESCE support during backup jobs to ensure data integrity.
TAPEEXIT	Replaces some or all Tape Drive Control and Tape Volume Management



## **SafeDR User Exits**

### **Overview**

SafeDR user exits are provided as a means of customizing SafeDR operation. They are written in REXX and are executed by the SafeDR server on the SafeDR server userid. An executing user exit has full control of the server and access to all of the server's resources and privileges.

### **Environment**

The SafeDR application server is built on the CMS Reusable Server Kernel. When a SafeDR user exit is invoked, it is running on the thread of execution that is implementing the currently running task (e.g. a Stream thread). While the user exit is in control, the SafeDR server is unable to process any other work.



## QUIESCE User Exit

<b>Name</b>	<b>QUIESCE EXEC</b>
<b>Input</b>	<pre>{ QUIESCE } Order Userid VDev { RESUME  }</pre> <hr/> <p><i>Order</i>      Position of disk in set of disks owned by userid being backed up: <i>QUIESCE:</i>     FIRST - This is the first disk being backed up for this userid.     NOTFIRST - This is the second or subsequent disk to be backed up for this userid (this can be used to assume that the QUIESCE was performed on the "FIRST" call) <i>RESUME:</i>     NOTFIRST - This is not the last disk to be backed up for this user (this can be used to assume that it is not yet time to RESUME the application)     LAST - This is the last disk to be backed up for this userid (usually this is when you will perform a RESUME action)</p> <p><i>Userid</i>      Owner of the disk <i>VDev</i>        Virtual address of the disk</p>
<b>Output</b>	<p><b>The following return codes are valid</b></p> <ul style="list-style-type: none"><li><b>0</b> - Disk Quiesced or Resumed successfully</li><li><b>4</b> - Disk does not need to be Quiesced/Resumed</li><li><b>8</b> - Error on disk</li></ul>

### Purpose

Use the QUIESCE user exit to perform quiesce/resume operations on a disk or set of disks. You use the QUIESCE exit when an application or server must be terminated or suspended before it is backed up. For example, you must shutdown a Linux guest before backing up its disks.

SafeDR calls the QUIESCE exit during a backup for each disk, before the disk is backed up. If the exit responds with RC=0, then SafeDR marks the disk for "RESUME" and, after the disk is backed up, calls the QUIESCE exit to resume the disk.

You will find that you often have to Quiesce several disks as a set; if the disks are all owned by the same userid, you can use the FIRST/NOTFIRST/LAST order keywords to determine when to

actually QUIESCE the application (e.g. Order=FIRST) and when to RESUME the application (Order=LAST).

You enable the use of the QUIESCE User Exit by placing it on the server A-disk (only) with the name “QUIESCE EXEC”.

### **Usage Notes**

1. Refer to the sample Quiesce user exit “QUIESCE SAMPEXEC” for more details.
2. RC4 and RC8 only affect the contents of the output report in the Quiesce section; they do not cancel the job.
3. SafeDR only calls QUIESCE RESUME for disks that responded with RC=0 to the QUIESCE QUIESCE call.

## TAPEEXIT User Exit

Name	TAPEEXIT EXEC
Input	<p><i>Calltype Parameters</i></p> <p>-----</p> <p><b>CallTypes</b></p> <p>START - Job is starting</p> <p>ALLOC - Allocate and attach a tape drive</p> <p>DETACH - Detach a tape drive from a worker</p> <p>EOJ - End of job</p> <p>EOT - End of tape (tape is still mounted)</p> <p>MOUNT - Mount a scratch tape or specific tape</p> <p>PROMPT - Ask Tape operator for a label or to override a tape expiration date.</p> <p>SCRATCH- A tape volume is being scratched.</p> <p><b>Parameters</b></p> <p>START <i>JobType JobName #Streams #Workers</i></p> <p>ALLOC <i>JobType JobName workerid TapeVdev TapeDevType</i></p> <p>DETACH <i>JobType JobName WorkerID TapeVdev TapeDevType TapeRDev</i></p> <p>EOJ <i>JobType JobName jobstatus</i></p> <p>EOT <i>JobType JobName TapeVolser WorkerID TapeVdev TapeDevType TapeDevType JobRetentionPeriod</i></p> <p>MOUNT <i>JobType JobName TapeVolser WorkerID TapeVdev TapeDevType TapeRDev JobRetentionPeriod</i></p> <p>SCRATCH <i>TapeVolser</i></p> <p>PROMPT { OVERRIDE } <i>JobType JobName WorkerID TapeVdev TapeDevType TapeRDev TapeVolser {SAFEDR   NOTSAFEDR} TapeExpirationDate { LABEL } JobType JobName WorkerID TapeVdev TapeDevType TapeRDev</i></p>
Output	<p>The following return codes are valid</p> <p>0 - Worked</p> <p>4 - Defer to default SafeDR action</p> <p>8 - Reject request or Cancel job</p> <p>16 - Cancel Stream</p> <p>20 - Other error (Cancel Job)</p>

## Purpose

The TAPEEXIT user exit is used to replace some or all of the default SafeDR tape drive and tape volume management. Generally, this exit is used to interface with an existing tape management system, but can also be used to simply enhance the default SafeDR behavior.

You can use the TAPEEXIT user exit to modify or enhance SafeDR behavior for the following tape related actions:

- Tape Drive Allocation, Attach/Detach (of drive to worker)
- Tape Volume Mount, End of Tape Volume
- Job startup and end via Start of job and End of job calls

You enable the use of the TAPEEXIT User Exit by placing it on the server A-disk (only) with the name “TAPEEXIT EXEC”.

### CallTypes

The CallType determines the type of call to the user exit.

- START** Called by Job Control before any tape drives or tape volumes are used.
- ALLOC** Called by Stream to allocate and attach a tape drive to a worker machine. If Exit returns a valid condition, SafeDR assumes that a drive has been attached to the worker *and* that the exit has stacked the Tape Drive RDEV and the Tape Drive Device Type on the stack in form: “*TapeRDev TapeDevType*”
- DETACH** Called by Stream to detach a tape drive from a worker.
- EOJ** Called by Job Control just before the job terminates. The job is complete and, if successful, has created a catalog. All tapes, tape drives, and workers are cleaned up and not in use.
- EOT** Called by Stream when End Of Tape is reached. Tape is still positioned at end and is active.  
Note: *JobRetentionPeriod* is set to ‘\*’ for RESTORE jobs.
- MOUNT** Called by Stream when a tape is required (SCRATCH for backups and by *TapeVolser* for restores). Tape drive is attached to worker.
- SCRATCH** Called by Stream when a tape is reused (via override or due to expiration date being reached); by TAPE SCRATCH command; and by any other operation that scratches a tape. Tape drive and tape status are indeterminate.
- PROMPT** Called by Stream when a tape mounted for a scratch request is active, to determine if the expiration date should be overridden  
Called by Stream when a tape mounted for a scratch request has no label on it, to determine what the label should be for the tape.  
A return code of 0 from “PROMPT LABEL” requires that the new label be on the program stack.

### Usage Notes

1. Refer to the sample tape user exit “TAPEEXIT SAMPEXEC” for more details.

## Chapter 11. SafeDR Messages & Codes

### SafeDR Messages

- 0001I**    **SafeDR server initialization started.**  
Documents the start of the SafeDR server.
- 0002I**    **Userid Starting|Ending command.**  
The SafeDR server has started or finished processing the command *command* issued by user *userid*
- 0003I**    **Userid Command ended RC: *return\_code***  
The SafeDR server completed processing of a command for user *userid* with the given return code (*return\_code*). You can use the taskid in column three of the message string to determine which 002I message this message is associated with.
- 0004E**    **SafeDR initialization failed with RC: *return\_code*.**  
The SafeDR server failed to initialize, exiting with the return code given.  
**Action**    Examine the SafeDR server console for error messages documenting the problem, correct the situation, and retry initialization.
- 0005I**    **SafeDR initialization complete.**  
The SafeDR server successfully initialized.
- 0006R**    **Request *nnn*: *request\_message***  
The SafeDR server is requesting an action, "*request\_message*" from an operator. The operator uses the reply number, *nnn*, to tell SafeDR which request they are replying to on a REPLY command. SafeDR usually issues an associated 0007I message listing the applicable responses. Note that SafeDR may supply additional information about the request in subsequent 0199I messages.  
**Action**    Perform the action requested and use the information in the subsequent "0007I" message to reply to SafeDR with the status of the action.
- 0007I**    **Issue: SAFEDR REPLY *nnn* *reply\_options***  
This message documents how to respond to a SafeDR request.
- 0008W**    **Command ending with data on program stack.**  
This documents an internal error with SafeDR.  
**Action**    Obtain the SafeDR server console and document the command or commands issued that lead up to this message being issuing. Contact Safe Software technical support for assistance.
- 0100E**    **File *fileid* not found.**  
A user issued a command that affects a file, *fileid*, and that file did not exist or the SafeDR server required a file, *fileid*, that was not found.  
**Action**    Verify that *fileid* exists and retry command; Contact Safe Software technical support for assistance.
- 0108E**    **Not authorized for command**  
A user issued a command that they are not authorized to use. SafeDR rejects the use of the command and issues this error message.  
**Action**    Obtain or logon to a *userid* with appropriate SafeDR privilege, usually "SAFADMIN", and retry the command.
- 0113E**    **Invalid parameter "*parameter*".**  
*Parameter* is invalid.  
**Action**    Correct the invalid parameter and retry the command.

- 0114E Invalid option “*option*”.**  
*Option* is invalid.  
**Action** Correct the invalid option and retry the command.
- 0115E Extra operand “*operand*”**  
*Operand* is an extraneous parameter.  
**Action** Retry the command without the extra information.
- 0116E Missing parameter.**  
The command specified is missing a required parameter.  
**Action** Correct the command and retry.
- 0117E Missing option value for option “*option*”.**  
The command specified is missing the required value for an option.  
**Action** Correct the command and retry.
- 0118E Invalid option value “*option*”.**  
The option value specified is invalid.  
**Action** Correct the command and retry.
- 0119E EXCLUDE USER \*\* not valid.**  
**EXCLUDE VOLUME \* not valid**  
You cannot exclude all volumes or all users in a backup or restore job.  
**Action** Remove or correct the EXCLUDE record at issue.
- 0129E SafeDR server disk “*vdev*” not linked R/W.**  
The given SafeDR server disk must be linked R/W.
- 0130E Tape I/O Error {reading|writing} tape “*tape\_volser*” on device: “*RDEV*”.**  
SafeDR encountered an I/O error reading from or writing to the given tape on the designated drive.
- 0131E Unable to start job because SafeDR is running in RESTORE ONLY MODE**  
SafeDR did not find a valid (matching CPU Model and Serial number) SAFEPW at startup and can only run RESTORE jobs.
- 0132E Unable to start job due to another running job**  
SafeDR runs one job at a time (backup and/or restore). SafeDR also will not start a job if the CATALOG AUTOEXP command is running.
- 0133E No Active Jobs.**  
There are no active jobs.
- 0134W Recovery system warning: *warning\_message***  
An error was encountered creating or validating the SafeDR Standalone Recovery System.  
**Action** Review the warning to determine severity and correct as warranted.
- 0135E Tape “*tapevolser*” already in tape database Devtype: *devtype* Catalog: *CatFn CatFt***  
A user attempted to add a tape with volser “*tapevolser*” to the tape database. It is already defined in the tape database. SafeDR displays the tape device type, if known, and catalog file if the tape is active.  
**Action** Select a different tape volser and retry the request.
- 0136E Exit TAPEEXIT canceled job *jobname* with RC: *return\_code*.**  
**Exit TAPEEXIT canceled job stream *streamnum* with RC: *return\_code*.**  
The SafeDR user exit TAPEEXIT returned a return code, *return\_code*, that caused the job or stream to be terminated.

- Action** Correct the error condition that caused the termination and retry the job.
- 0137E No catalogs on data base disk**  
No catalogs exist on the SafeDR database disk.
- 0138E Unable to determine CP CHECKPOINT area: reason.**  
**Unable to determine CP WARMSTART area: reason.**  
SafeDR examined CP Real storage during a backup job that contains CPSYS YES to determine the CHECKPOINT and WARMSTART area and had an error, documented by *reason*, determining that area. This is a catastrophic error because you will lose all spool files if SafeDR is unable to backup these areas. Job compilation fails
- Action** Determine the cause of the error and correct it. Retry the job.
- 0139W CP Level *nn* not validated for determining CHECKPOINT and WARMSTART locations.**  
SafeDR uses the DMSQEFL CSL to determine the CP level and received a level of *nn* which has not been validated by Safe Software to work with this version of SafeDR. This could SafeDR to be unable to backup the WARMSTART or CHECKPOINT areas, which are required to be able to recover your spool in the even of a system failure. SafeDR will attempt to obtain and validate these areas using the most recent version of z/VM documented in your version of SafeDR.
- Action** Contact Safe Software immediately.
- 0140E Catalog "*catfn catft*" does not exist.**  
You issued a command against a named catalog and SafeDR determined that the catalog does not exist.
- Action** Correct the catalog and retry the command
- 0141E Job '*jobname jobtype*' is not active.**  
You attempted to cancel a job that is not active
- Action** Correct the *jobname* and/or *jobtype* and retry the command.
- 0142E Tape Drive "*rdev*" does not have a pending mount.**  
You attempted to cancel a tape mount for a tape drive that does not have an outstanding mount request.
- Action** Correct the *rdev* and retry the command.
- 0143E Tape Drive "*rdev*" is not in use.**  
You attempted to cancel a tape mount for a tape drive that is not currently active in a job.
- Action** Correct the *rdev* and retry the command.
- 0144R Do you wish to restore the entire system? (Yes/No)**  
SafeDR issues this prompt during a standalone recovery situation, shortly after the SafeDR Standalone Recovery System has completed initialization. A reply of Yes will run a restore job to restore the entire system, including all DASD labels and allocation information, CP Areas, and all defined minidisks.
- Action** Reply Yes to run the full restore or No to be returned to the CMS prompt on OPERATOR on the SafeDR Standalone Recovery System. You can then create, edit or run any SafeDR job that you require.
- 0145E Tape Database is empty.**  
The SafeDR tape database is empty and cannot be queried.
- 0146E Tape "*volser*" not found in Tape Database.**  
Tape *volser* is not in the tape database and cannot be queried.
- 0147E No SCRATCH tapes in Tape Database.**  
**No BADTAPES tapes in Tape Database.**  
No tapes of the status given are in the database.
- 0148E Tape "*label*" mounted on *rdev* is marked "BAD".**  
In response to a tape mount request, a tape was mounted that is marked in the SafeDR Tape Database as

- “BADTAPE”, indicating that SafeDR encountered an I/O error on a previous use of this tape.
- Action** Mount a different tape or replace the tape and use the TAPE SCRATCH command to mark the tape as scratch.
- 0149E Job "fileid" not found.**  
A backup or restore job named *fileid* is not found on the SafeDR data base disk.
- Action** Specify a valid job name; Use the SAFEDR QUERY JOBS command to see a list of all defined jobs.
- 0150I Minidisk "userid vdev" was moved from volser1 start1 end1 to volser2 start2 end2 and will be processed as a "moved disk" later in the job.**  
SafeDR backed up *userid vdev* from location *volser1 start1 end1* and determined, during a restore, that the disk moved to the new location listed. SafeDR restores this minidisk in a subsequent pass over the restore tape set.
- 0151E Unable to restore of "userid vdev"; reason.**  
SafeDR is unable to restore a minidisk due to the reason given and skips restore the disk.
- Action** Correct the error shown and retry the restore, perhaps in a new restore job for just the failed disk.
- 0152E Wrong tape mounted. Asked for "volser1" but tape mounted is "volser2".**  
SafeDR requested a tape be mounted for a restore but the wrong tape was mounted. SafeDR unloads the incorrect tape and reissues the mount request.
- 0153E Catalog Integrity Error: errorstring, in file: fileid.**  
SafeDR detected a severe error in a catalog file, *fileid*. Job processing terminates.
- Action** Do not manually change the SafeDR data base disk. Contact Safe Software Technical Support. You may be able to work around the problem with the use of CATRANGE.
- 0154E Tape "volser" mounted on RDEV is "in use" by active backup job "jobname". Tape Unloaded.**  
SafeDR requested a scratch tape and the tape mounted, *volser*, has already been used in this backup job. SafeDR unloads the tape and asks for another scratch tape.
- 0155E Error creating IPL DDR standalone recovery tape; reason**  
SafeDR encountered an error, *reason*, creating the standalone recovery tape (IPL DDR tape). This is a **critical** error, leaving you without a standalone recovery tape.
- Action** Attempt to resolve the problem described by *reason*; contact Safe Software support for assistance.
- 0156E Recovery System Error: errorstring**  
SafeDR encountered an error, *errorstring*, creating or updating the recovery system. The recovery system is in an indeterminate state and cannot be relied upon.
- Action** Attempt to resolve the problem described by *errorstring*; contact Safe Software support for assistance.
- 0157E SafeDR cannot allocate a unique catalog fileid for job "jobname".**  
SafeDR creates catalog fileids in the format "*jobname* CATnnnnn". If there are 100,000 catalog files for *jobname* on the catalog disk (CAT00000-CAT99999) then SafeDR is unable to create a new catalog for *jobname*.
- Action** Delete some catalog files for *jobname*. Verify that automatic catalog expiration is running successfully. Contact Safe Software technical support for assistance.
- 0158E Backup job ended with volume volume status: "status" .**  
A backup job ended with an invalid state. The job was not flagged as canceled or suspended, but DASD volume *volume* did not have a status of "BAK". The backup job is left in an indeterminate state and cannot be relied on. SafeDR does keep the backup catalog in place as all backed up volumes can be restored from.
- Action** Save all console logs, review for correctable errors, contact Safe Software.
- 0159E Backup job ended with stream streamnum status: "status"**  
A backup job ended with an invalid state. The job was not flagged as canceled or suspended, but stream

- number *streamnum* did not have a status of "DONE". The backup job is left in an indeterminate state and cannot be relied on.
- Action** Save all console logs, review for correctable errors, contact Safe Software.
- 0160E Invalid response: “response”.**  
An operator replied to a message with an invalid response.
- 0161E SAFEDR TAPEFILE contains duplicate records:**  
SafeDR detected duplicate records (two records with same volser) in the TAPEFILE. This indicates a processing error.
- Action** Save all console logs, review for correctable errors, contact Safe Software.
- 0162I Stream ending unexpectedly.**  
A backup or restore job stream is ending prematurely.
- Action** Look for a preceding error message and correct that problem. Retry the job
- 0165E Stream *n* (Job:jobname jobtype): SafeDR is unable to allocate a tape drive.**  
SafeDR did not find any FREE tape drives in its TAPEDEVS list. Stream *n* terminates. SafeDR terminates the job if this is the last, or only, stream in the job.
- 0166E The SafeDR tape control exit (TAPEEXIT EXEC) returned an invalid condition.**  
The Tape control exit was called and returned a bad condition. Look for a previous 0199I message with the complaint.
- Action** Correct the error in the tape control exit.
- 0167E Error *rc* allocating a worker.**  
SafeDR was unable to allocate a workerid. The *rc* is from the call to the RSK routine `ssWorkerAllocate()`. SafeDR also reports this error whenever the number of streams requested is greater than the total number of workers defined and one or more workers are in use on another job.
- 0168E No workers configured**  
SafeDR cannot run any jobs without workers.
- Action** Define one or more workers.
- 0169E Job "*fn ft*" does not exist.**
- 0170E No outstanding requests.**  
The response to QUERY REQUESTS when there are no outstanding requests for action to any SafeDR operators.
- 0171E Reply *nnn* is not outstanding.**  
The reply number given, *nnn*, is not an outstanding request.
- Action** Use the QUERY REQUESTS command to obtain the correct request number and retry the REPLY command.
- 0172E Mismatch in binding file: *varname* = *value*, expected: *expectedvalue***  
CMS provides Binding Files to associate REXX names with numeric values and CMS applications can utilize these Binding Files to ease coding to various CMS functions. SafeDR does not use the binding files as they are sizeable and have to be loaded each time a program runs. To improve performance, SafeDR has these associations hard coded and performs a test load during initialization to verify that the hard-coded values match those in the Binding Files. SafeDR issues this message if a value does not match.
- Action** Contact Safe Software, Inc Tech Support with the contents of the message and the version of CP and CMS that SafeDR is running on.
- 0173W Generic warning message**  
A warning about an unexpected condition.

- Action** Review warning and attempt to resolve, contact Safe Software technical support as needed.
- 0174W Unable to backup *userid vdev***  
SafeDR was unable to backup a disk.
- Action** Look for previous messages detailing the cause.
- 0175E Job file "*fileid*" contains invalid records.**  
SafeDR detected invalid records in a job file.
- Action** Correct the errors with the EDIT command and retry.
- 0176E Unable to link DIRLOC disk (*userid vaddr*), RC:rc.**  
SafeDR is unable to link DIRLOC disk, containing the source directory file (USER DIRECT).
- 0177E Missing USER DIRECT file on DIRLOC disk (*userid vaddr*).**  
The disk specified by DIRLOC does not contain a USER DIRECT file.
- Action** Determine where the current USER DIRECT (z/VM source directory) resides and update the DIRLOC CONTROL FILE record.
- 0178E Missing EXPIRE record.**  
SafeDR detected that a backup job is missing an EXPIRE record, which is required.
- 0179E Duplicate record.**  
SafeDR detected a duplicate record in a job file.
- Action** Edit the job file to remove the duplicate record.
- 0180R Do you wish to re-Edit the file to correct the errors? (Y/N)**  
SafeDR displays this message during an interactive EDIT command session when errors have been detected in a job file. This gives you the opportunity to continue the edit session to correct the error (Y) or cancel the changes (N).
- Action** Enter Y to continue editing or N to cancel changes.
- 0181E File "*fileid*" not retrieved, it already exists on your A-Disk.**  
SafeDR detected that a file that it is copying to your A-disk already exists, usually during an EDIT command. You cannot perform that request until the duplicate file is deleted, moved to a new location, or renamed.
- Action** Delete, move, or rename the file in question and retry your request.
- 0182E File "*fileid*" is locked by another user.**  
SafeDR detected that another user was updating or using the file *fileid*.
- Action** Wait until the file is free and retry your request.
- 0183E File "*fileid*" not found.**  
SafeDR could locate the file *fileid*.
- 0184W SafeDR running in \*\*RESTORE ONLY MODE\*\* due to SAFEPW model/serial mismatch.**  
SafeDR did not find a SAFEPW that matched the current CPU (model and serial number) and was not expired. SafeDR will only run RESTORE jobs until this is resolved.
- Action** Contact Safe Software technical support.
- 0185E Invalid SafeDR SAFEPW.**  
SafeDR detected an invalid SAFEPW record in the SAFEDR CONTROL file or on a CONTROL ADD command.
- Action** Correct the SAFEPW specification and retry the command; contact Safe Software technical support if the error persists.
- 0186E The SafeDR SAFEPW is not valid for this CPU**

This SAFE PW is not expired, but the CPU Model and/or Serial number do not match.

- 0187E The SafeDR SAFE PW will expire at the end of the month**  
SafeDR determined that you are in the last month of the SAFE PW date range.  
**Action** Contact Safe Software technical support.
- 0188E Item not in database**  
The record was not found in the SafeDR database.
- 0189E Unexpected error "rc" updating file "fileid".**  
SafeDR was unable to update a file. RC is from the CMS PIPE command.  
**Action** Contact Safe Software technical support.
- 0190I on record n in file "fileid"**  
SafeDR displays this message in association with an error (E level) message when it detects an error in a file.
- 0191E Item already in database.**  
This record is in the database, unable to add.
- 0192I SafeDR Worker Allocated to *tsk\_address***  
**SafeDR Worker Released from *tsk\_address***  
SafeDR displays this message as an indication that a SafeDR worker was allocated or released by a task.
- 0193E LOGIC ERROR: *error description***  
A validation check failed.  
**Action** Contact Safe Software technical support.
- 0194E Unexpected RC: *rc [reas]* from *cmd***  
SafeDR displays this message when it receives a return code or return code and reason code combination that it is not prepared to handle.  
**Action** Contact Safe Software technical support.
- 0195E Unexpected IUCV SEVER**  
The SafeDR client received an IUCV SEVER that it did not expect.  
**Action** Contact Safe Software technical support.
- 0196E Unexpected Type from IUCV(QUERY,NEXT): *type***  
The SafeDR client issued IUCV('QUERY','NEXT') and got a type response that it was not expecting.  
**Action** Contact Safe Software technical support.
- 0197E Unable to connect to server "*serverid*"; RC:*rc***  
The SafeDR client is unable to connect to the server via IUCV('CONNECT') function. RC is from RXIUCVFN.  
**Action** If the RC is 11, the likely cause is that the SafeDR server is not running. Otherwise, look up the return code in the "VM REXX IUCV Function Package manual" to determine the error indication and the action to take. Or contact Safe Software technical support.
- 0198I Diagnostic Related Informational Message**  
SafeDR uses this message to display diagnostic information when a trace has been enabled.
- 0199I Generic Informational Message**  
SafeDR uses this message to display a variety of information.
- 0199W Generic Warning Message**  
SafeDR uses this to display one of several warnings about situations that should be addressed, but are not

critical.

**0300E Unexpected return code *return code* from *command*.**

An unexpected return code was received while processing a command.

**Action** Contact Safe Software technical support.

**0520E CMSSTOR *type* fails with return code *return code*.**

An unexpected return code was received from CMSSTOR *type*.

**Action** Contact Safe Software technical support.

## SafeDR Abnormal Termination Codes

If any of the abends listed below occur, please retain the documentation listed below and then contact Safe Software Technical Support.

- The VMDUMP produced by the abend
- The SafeDR server and, if applicable, worker console log(s).

<b>Code</b>	<b>Description</b>
<b>DBA001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>DBA002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>DBA003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>DBA004</b>	<b>Error in storage management.</b> This abend indicates an internal storage problem.
<b>DBA005</b>	<b>Invalid ADMSECT</b> This abend indicates an internal storage problem.
<b>DBA006</b>	<b>Invalid OPSECT, TPSECT, RPSECT, or TVSECT</b> This abend indicates an internal storage problem. (R6 contains address of control block)
<b>DBA101</b>	<b>Unable to set REXX var MSG.</b> This abend indicates an unexpected return code from CMSCDR
<b>DBA102</b>	<b>Logic error: TYPE not ADD DEL QRY</b>
<b>DBA103</b>	<b>Logic error: NAMETYPE not USER ACIGROUP</b>
<b>DBA104</b>	<b>Unexpected error from SSIREXMS (RC:R15)</b> SSIREXMS returned an error from DMSCSR
<b>DBA200</b>	<b>Unimplemented function called.</b>
<b>DBB001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>DBB004</b>	<b>Error in storage management.</b> This abend indicates an internal storage problem.

<b>Code</b>	<b>Description</b>
<b>LOK001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>LOK100</b>	<b>Error obtaining GCB MUTEX handle</b>
<b>LOK101</b>	<b>Error acquiring GCB MUTEX</b>
<b>SDR001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>SDR002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>SDR003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>SDR100</b>	<b>Unable to allocate storage for TSKSECT</b> This abend indicates an internal storage problem or an out of storage condition.
<b>SDR101</b>	<b>Unable to locate TSK on GCBTSK list.</b> This abend indicates a logic error in chaining active tasks.
<b>DBA003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>SYM001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>SYM003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>CLI001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>CLI002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>CLI003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>CLI100</b>	<b>Unexpected error from SSICOMMS</b> This abend indicates a communication error.
<b>CLI102</b>	<b>Unexpected response during SSICLI COPYFROM</b> This abend indicates a logic error copying a file from a user's A-Disk.
<b>CLI104</b>	<b>Unexpected error from SSIREXMS (RC:R15)</b> SSIREXMS returned an error from DMSCSR
<b>CMT001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.

<b>Code</b>	<b>Description</b>
<b>CMT003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>CMT004</b>	<b>Error in storage management.</b> This abend indicates an internal storage problem.
<b>COM001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>COM002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>COM003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>COM004</b>	<b>Error in storage management.</b> This abend indicates an internal storage problem.
<b>COM101</b>	<b>SSICOMMS: Len(RC) &lt;&gt; 4</b> Logic error in communications
<b>COM102</b>	<b>SSICOMxx: QRB returned RC &lt;&gt;0</b> Logic error in communications
<b>COM103</b>	<b>SSICOMxx: ssCDP returned RC &lt;&gt;0</b> Logic error in communications
<b>COM104</b>	<b>SSICOMxx: ssCGP returned RC &lt;&gt;0</b> Logic error in communications
<b>COM105</b>	<b>SSICOMxx: QSEND returned RC &lt;&gt;0</b> Logic error in communications
<b>COM106</b>	<b>SSICOMxx: ssCDG had amt REMAINING &lt;&gt; 0</b> Logic error in communications
<b>COM107</b>	<b>SSICOMOR: Called w/o response buffer</b> Logic error in communications
<b>COM108</b>	<b>SSICOMxx: Called with bad ORDER</b> Logic error in communications
<b>CVT001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>DBW001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>DBW005</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>DBW006</b>	<b>Invalid SPWSECT</b> This abend indicates an internal storage problem.
<b>DIA001</b>	<b>Invalid GCBSECT</b>

<b>Code</b>	<b>Description</b>
	This abend indicates an internal storage problem.
<b>DIA003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>DIA100</b>	<b>Unexpected CC from Diag 210</b>
<b>DIA101</b>	<b>Unable to set REXX var</b> Non-zero rc (R15) from SSIREXST. This is RC from DMSCSR.
<b>DUM001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>SSI101</b>	<b>Unable to locate TSK on GCBTSK list.</b> This abend indicates a logic error in chaining active tasks.
<b>LOG002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>PRM001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>PRM002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>PRM003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>PRM004</b>	<b>Error in storage management.</b> This abend indicates an internal storage problem.
<b>PRM005</b>	<b>Invalid PRMSECT</b> This abend indicates an internal storage problem.
<b>PRM101</b>	<b>Unable to set REXX var MSG.</b> This abend indicates an unexpected return code from CMSCDR
<b>REX001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>REX101</b>	<b>CALL macro overran WORKAREA</b> This abend indicates an internal storage problem.
<b>SCA001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>SCA003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>SUB001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>SUB003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.

<b>Code</b>	<b>Description</b>
<b>SUB100</b>	<b>Invalid DSA in Thread User Data Word</b> This abend indicates an internal storage problem.
<b>SUB101</b>	<b>SUBCOM called with no data string</b> This abend indicates a logic error.
<b>SUB102</b>	<b>Unexpected RC (R15) from SSIREXGT</b> This abend indicates an unexpected condition
<b>TRD001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>TRD002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>TRD003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.
<b>TRD100</b>	<b>Unexpected SCAN failure</b> This abend indicates a logic error.
<b>UTL001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>WRK001</b>	<b>Invalid GCBSECT</b> This abend indicates an internal storage problem.
<b>WRK002</b>	<b>Invalid TSKSECT</b> This abend indicates an internal storage problem.
<b>WRK003</b>	<b>Invalid SCNSECT</b> This abend indicates an internal storage problem.