Nearline Control Solution

Concurrent Disaster Recovery Guide

Version 6.2

docs.sun update only

Preface

Oracle's StorageTek Virtual Tape Control System 6.2.0 (VTCS 6.2.0, hereafter referred to as "VTCS") is MVS host software, which together with the portions of NCS 6.2.0 that support VTCS and the Virtual Tape Storage Subsystem (VTSS), comprises Virtual Storage Manager (VSM).

Audience

This guide is for StorageTek or customer personnel who are responsible for installing, configuring, and administering VTCS and VSM.

Prerequisites

To perform the tasks described in this guide, you should already understand the following:

- MVS or OS/390 operating system
- JES2 or JES3
- System Management Facility (SMF)
- System Modification Program Extended (SMP/E)
- Nearline Control Solution (NCS)

What's New in This Guide?

Revision D

The VTCS 6.2, Revision D of this guide contains information about the VTCS 6.2 enhancements described in TABLE P-1.

TABLE P-1   VTCS 6.2 Updates to CDRT Guide, Revision D

This Enhancement...	...is described in...	...and requires the following PTFs...
Support for VLE 1.0	"Using the Concurrent Disaster Recovery Test Software" on page 1	■ L1A00R6 ■ L1A00RZ ■ L1A00SY ■ L1H158F ■ L1H158G ■ L1H158H ■ L1H155S ■ L1H155T ■ L1H15G9 ■ L1H15H0 ■ L1H15H7 ■ L1H15NA ■ L1H15QL

Revision C contains technical updates and corrections.

Revision B, which requires PTF L1H13ZB, removes the restriction against enters and ejects during a DR test.

Contents

Using the Concurrent Disaster Recovery Test Software

Customers that use or maintain a Disaster Recovery (DR) site as part of a business continuance plan may want to periodically validate their ability to continue normal production processing before an actual disaster occurs; other customers don't have a choice and must periodically demonstrate the readiness of their business continuance model to satisfy insurance requirements and/or their auditors.

Using the Concurrent Disaster Recovery Test (CDRT) facility, those businesses currently using StorageTek Streamline and/or Nearline (real hardware) tape libraries, VSM (virtual hardware), and associated software (HSC, VTCS) can validate their real and virtual tape business continuance capability without the need to purchase additional hardware and software.

CDRT supports a parallel test of production hosts and applications with simultaneous access to production data by both the production and the DR test systems.

Key CDRT concepts include the following:

- Using CDRT, a DR test can execute with real hardware, virtual hardware, or both.

- CDRT, HSC, and VTCS programmatically enforces certain functional restrictions during the CDS preparation and actual DR test in an attempt to ensure system integrity.

- CDRT logically separates a portion of existing production real and virtual hardware and tape volume pools for the period of the DR test. This allows testing of your DR configuration while concurrently running production work, ensures the integrity of the production data, and minimizes conflicts for tape volumes and hardware resources.

- CDRT creates a test copy of the production CDS. The production subsystem and the DR test subsystems therefore do not communicate with each other. Changes that occur in the DR test CDS are not reflected in the production CDS copy and vice versa. The DR test hosts exercise the logically separated hardware only. The production hosts continue to use all hardware with one exception: the DR hosts have exclusive use of any logically separated VTSSs during the DR test. Other resources, like RTDs, Multiple Virtual Cartridges (MVCs) and real scratch tapes, must be controlled by defining separate pools to each set of hosts.

- A DR test can be conducted using local resources only or with a combination of local and remote resources; configurations consisting of a remote site with real and virtual hardware only, or real and virtual hardware with a mainframe processor, are also supported.

- The DR test real hardware is a minimum of one ACS. One or more ACSs can be a dummy ACS in VSM environments running without RTDs attached to a VTSS. Optionally, one or more VTSSs can be employed as DR test virtual hardware.

- At the end of a DR test, the test copy of the CDS and all data created from the DR test are typically discarded and the logically separated hardware is redeployed back to the normal production environment.

Note –

- To satisfy the requirements of recovering from a true disaster, it is critical that jobs in a DR test jobstream **do not** update any volumes created in production, either through `DISP=MOD` or by overwriting these volumes. The use of such practices means that if a true disaster occurred, the state of these volumes would be unpredictable.

- For the DR test run, it is **strongly recommended** that production volumes that could be modified during the DR test are copied to new volumes at the beginning of the test, and that the **copied** volumes are updated by the DR test, not the original volumes. Also, JCL should be modified if possible so that the status of all tape volumes at the time of a disaster is known.

Metadata Considerations

Fundamental to the execution of a successful DR test using CDRT is a consistent copy of the state of all tape volumes managed by host software and the real and virtual hardware. The consistency in the state of tape volumes between the production hosts and the DR hosts at the start of the DR test is what allows the parallel processing of customer applications. Since the CDS reflects the state of all tape volumes and resources in the real and virtual hardware, CDRT partially meets this consistency requirement for you when it makes its test copy of the CDS.

In a tape volume environment, however, quite often some of this tape volume state data (metadata) is retained and managed outside of the HSC/VTCS subsystem and the real and virtual hardware. Typically, tape volume metadata (i.e. VOLSER, DSN, Expiration date, scratch status, real or virtual designation, etc.) is stored in one or more Tape Management Catalogs (TMCs), one or more z/OS catalogs and the CDS.

You must co-ordinate the creation of copies of metadata retained and managed outside of HSC/VTCS (and the real and virtual hardware) with the creation of the test copy of the CDS by CDRT.

How Do You Use CDRT?

You have a production CDS at your production site. You want to run a DR test at your DR site. The DR test will use hardware (VTSSs and ACSs) that exist at the DR site but are normally managed by the production site.During the DR test you will have two different CDSs each with access to the hardware at the DR site. Now, what are the steps?

At the production site:

■ Set up your POOLPARM/VOLPARM definitions on your primary CDS to define a set of MVC pools and scratch subpools for exclusive use by the DR test.

■ "Prime" the production CDS to define the resources that the DR test will use, by using the SLUADMIN utility command:

```
DRTEST PRIMEPRD
```

(and include the DR host, VTSS and ACS parameters). Your production CDS is now ready for the DR test.

At the DR test site:

Assuming that you have a copy of the production CDS at the DR site, you now use it as input to create the DR test CDS by using the SLUADMIN utility command:

```
DRTEST CREATE NOUPDPRD
```

(and include the same DR host, VTSS and ACS parameters you used above)

At the production site:

Run the SLUADMIN utility to start the DR test using the command:

```
DRTEST START
```

At the DR test site:

Bring up the DR test systems (HSC/SMC) using the DR test CDS. Run your batch tests at the DR site.

At the conclusion of your batch tests at the DR site, perform cleanup steps as described on "Cleaning Up After a DR Test" on page 24**.**

For more information on the DRTEST command, see *ELS Command, Control Statement, and Utility Reference*.

Concurrent DR Test Restrictions

Warning.

- Because two versions of the CDS exist during the DR test, you must explicitly follow the restrictions in this section. Even though the CDRT software programmatically automates the preparation of the test CDS and enforces certain functional restrictions during the CDS preparation and actual DR test to attempt to ensure system integrity, you still need to adhere to the following restrictions. Otherwise, unpredictable and undesirable results can occur, such as but not limited to corrupting your production CDS and losing data!

- VTVs to be accessed by the DR test must be resident in the DR test VTSS or on an MVC in the DR ACS. You should ensure that VTVs that will be accessed by the DR test are migrated to the DR ACS.

Restrictions that The CDRT Software Enforces

During a DR test, the CDRT software programmatically enforces the following restrictions **on the production hosts**:

- All CAPs in the DR test ACS are in manual mode.

  You must issue the HSC `CAPPREF` command to set the CAPs to manual prior to running the utility. The software insures that they remain in that state as long as the test is in effect.

- Any DR test VTSS(s) are offline. You must vary the DR VTSS(s) offline to the production system prior to starting the DR test. The software ensures that they remain offline as long as the DR test is in effect.

Note – If the VTSS is offline and not used by production, the VTSS defined must have `CONFIG VTD NOVERIFY` specified with the VTD addresses.

- `FLOAT(OFF)` and `EJCTAUTO(OFF)` are set and enforced in the DR test ACS by the software.

- No ejects, moves, HSC library audits, or scratch redistributions are allowed in the DR test ACS.

During a DR test, the CDRT software programmatically enforces the following restrictions **on the DR Test hosts**:

- The non-DR test ACS(s) remain disconnected.
- All CAPs in the DR test ACS are in manual mode.
- Any non-DR test VTSS(s) remain offline.
- `FLOAT(OFF)` and `EJCTAUTO(OFF)` are enforced everywhere.
- No moves, HSC library audits, or scratch redistributions are allowed anywhere.
- Scratch updates are allowed only when POOLPARM/VOLPARM is in use, and DRTEST scratch pools are defined.

Optimizing Access to Test and Production Resources

During a DR test, it is recommended that you enforce procedures to optimize access to resources in both test and production environments. Specifically:

- Before starting the DR test, define production management classes that specify immediate migration to both production and DR test ACSs so that VTVs will be available on MVCs accessible to the DR test system as well as the production system.

- Define DR test management classes that specify a single migration copy, since only one ACS is normally available to the DR test site.

- Use the POOLPARM/VOLPARM facility to segregate both scratch subpools and MVC pools between production and DR test.

- If possible, ensure that your DR test processing does not update any pre-existing VTVs (DISP=MOD or overwrite with DISP=OLD).

- Minimize contention between production jobs migrating to the DR test ACS and DR test jobs accessing VTVs on MVCs in the DR test ACS by running the ACTMVCGN utility to mark active MVCs as read-only in the production environment.

- Disable MVC space reclamation (via CONFIG HOST NORECLAM) on production MVCs during DR test, to preserve the MVC contents of volumes being used by the DR test system.

Installing the CDRT Utility

Before you install the software:

■ Ensure that you are at the latest service level for HSC and VTCS. For more information, see *NCS Installation Guide* and *Installing ELS*. The StorageTek Customer Resource Center (CRC) has the current PTFs for all StorageTek software and the most current publications for the software. Complete the pre-installation tasks described in the following sections:

   ■ Ensure that VTCS 6.2 and NCS 6.2 are installed.

Next, install the CDRT Utility as described in the following sections:

Note – The CDRT Utility is supported in VTCS/NCS 5.0.0 and above. CDRT, NCS, and VTCS must always be at the same release levels on the same system.Throughout the installation procedures, wherever you see the *release* variable, 6200 is Release 6.2.

Verifying Installation Materials

Before installing the CDRT Utility, make sure you have the CDRT Base Media (tape or CD-ROM).

The CDRT Utility Installation Media Contents

The CDRT Utility is delivered on the CDRT Utility Base Media (tape or CD-ROM). TABLE 1-1 lists the files included on the CDRT Utility product tape.

TABLE 1-1 CDRT Utility Base Tape Contents

File	Data Set Name	Description
1	SMPMCS	SMP/E control statements
2	SWU*release*.F1	**SWU***release* JCLIN and SMP/E install sample JCL jobs: **SWUDDDEF** - Sample job to allocate target and distribution libraries. **SWURECIV** - Sample job to receive the CDRT Utility FMID. **SWUAPPLY** - Sample job to apply check/apply the CDRT Utility FMID. **SWUACCPT** - Sample job to accept the CDRT Utility FMID.
3	SWU*release*.F2	**SWU***release* JCL installation samples (JCL installation samples are automatically installed in the SWU*release* SAMPLIB); for more information, see "CDRT Utility JCL installation samples" on page 8.
4	SWU*release*.F3	**SWU***release* object modules

TABLE 1-2 lists the files included on the CDRT Utility Base CD-ROM.

TABLE 1-2 CDRT Utility Base CD Contents

File	Data Set Name	Description
1	Documents	The installation documentation for installing CDRT from a CD
2	CDRT62.gimzip	Compressed file containing the complete CDRT product minus sample JCL.
3	CDRT62.pax	Compressed file containing the CDRT product including sample JCL.
4	Samples	Unix version of CDRT samples (without CR/LF)
5	Samples.win	Windows version of CDRT samples (with CR/LF)
6	Start Here.html	HTML starting point to the documents folder

The CDRT Utility FMIDs

The CDRT Utility software is packaged in standard SMP/E format. The CDRT Utility installation tape includes one FMID:

SWU*release*

> contains the CDRT Utility load modules, JCL, and installation samples.

Note – You **must** install this FMID in the same target and distribution zones as NCS and VTCS.

CDRT Utility JCL installation samples

The CDRT Utility installation automatically installs in the CDRT Utility SAMPLIB the members described in TABLE 1-3.For information about the DRTEST command and DRTEST utility, see ELS Command, Control Statement, and Utility Reference. For information about CDRT messages, see ELS Messages and Codes.

TABLE 1-3   CDRT Utility JCL installation samples

SWUADMIN	SWUADMIN sample job to prepare a DR test environment.

Installing the CDRT Base from Tape

▼ Unloading the CDRT Utility Install Jobs

SWU*release*.F1 contains sample install jobs for the CDRT Utility. FIGURE 1-1 shows JCL to unload these install jobs.

```
//            *****************************************************************
//            *           JOB:         jobname
//            *
//            *           PURPOSE:     LOAD THE SMP/E INSTALL SAMPLE JCL
//            *
//            *           CHANGES :    COMPLETE THE JOB STATEMENT,
//            *                        FILL IN THE DSN FOR SYSUT2.
//            *
//*          *****************************************************************
//jobname     JOB ......
//JCL         EXEC        PGM=IEBCOPY
//SYSPRINT    DD          SYSOUT=*
//SYSUT1      DD          DSN=SWUrelease.F1,DISP=OLD,
//            UNIT=tapeunit,VOL=SER=WUrelease,LABEL=(2,SL)
//SYSUT2      DD          DSN=your.dataset.name,
//                        DISP=(,CATLG,DELETE),
//                        UNIT=SYSALLDA,
//                        SPACE=(TRK,(5,1,5))
//SYSIN       DD          *
 C INDD=SYSUT1,OUTDD=SYSUT2
//*
```

FIGURE 1-1   JCL to Unload the CDRT Utility Installation Jobs

▼ Receiving the CDRT Utility FMID from Tape

Modify JCL installation sample `SWURECIV` per the comments in this sample, ensuring that:

- In the `SMPCSI DD` statement, you change the data set name of the global CSI to point to your HSC global CSI.
- In the `SET BDY` statement, you change the names of the Target and Distribution Zones to the names of the Target and Distribution Zones used by HSC.

Then run `SWURECIV` to receive the CDRT Utility FMID.

Go to .

Installing CDRT Base from CD-ROM

▼ Unloading the CDRT Base Installation CD

The following sections tell how to unload the CDRT base functions from the Base CD-ROM.

▼ FTPing CDRT62.pax to USS

The CDRT62.pax file contains the CDRT Base and sample JCL.

To FTP CDRT62.pax to USS:

1. **Create a USS directory to receive the CDRT62.pax file:**

   a. Establish network connectivity between your desktop PC and a MVS host and USS.

   b. Logon to USS by entering **OMVS** from the TSO READY prompt or enter **TSO OMVS** from an ISPF command line.

   c. Use the **mkdir** command to create a new directory. For example, the **mkdir SMPNTS** command creates a new directory named **SMPNTS**. Use the **pwd** command to show the complete USS path to **SMPNTS**.

      Note this path information, which you need in the SMP/E RECEIVE batch job NTSCDRT.

2. **Insert the CDRT 6.2 installation CD into the CD-ROM drive.**

3. **Open a DOS window and cd to your CD-ROM.**

4. **Transfer the CDRT62.pax file, in binary, from the CD to the USS directory using the following FTP commands:**

   ftp *mvshost*
   user
   password
   cd /uss/*userid/SMPNTS*
   binary
   put CDRT62.pax
   quit

5. **Watch for FTP messages to ensure the successful transfer of CDRT62.pax to the new directory.**

   You can also logon on to USS, change directory (**cd**) to the SMPNTS directory and then enter the **ls** command from within the SMPNTS directory. The CDRT62.pax file should be listed.

▼ Unpacking the CDRT62.pax File

This section tells how to unpack the CDRT62.pax file.

To unpack the CDRT62.pax file:

1. **Log on to USS by entering** TSO OMVS **from an ISPF command line or** OMVS **from the TSO READY prompt.**

   If you are still logged on to USS and within the SMPNTS directory, go to Step 3. Otherwise, continue with Step 2.

2. **Change directory** (cd) **to the SMPNTS directory.**

3. **To unpack the CDRT62.pax file:**

   pax -rv <CDRT62.pax

   This file will unpack in place and will create the files and directories shown in TABLE 1-4 and

TABLE 1-4   Contents of SMPNTS after unpacking the CDRT62.pax file

File	Data Set Name	Description
1	LOADSAMP.xmit	NCS Samples formatted for input into the TSO Receive
2	CDRT62.gimzip	Directory Input to the SMP/E Receive process
3	CDRT62.pax	Compressed file FTPed from the install CD
4	Samples	CD installation JCL

TABLE 1-5   Contents of the CDRT62.gimzip directory

File	Data Set Name	Description
1	GIMPAF.XML	Product attribute file
2	GIMPAF.XSL	Style sheet
3	SMPHOLD	Directory containing SMP/E HOLD data
4	SMPPTFIN	Directory containing SMP/E PTFIN file for each product
5	SMPRELF	Directory containing SMP/E REL files for each product

TABLE 1-5.

4. **If desired, you can now delete the CDRT62.pax file to reclaim space:**

   rm CDRT62.pax

▼ TSO RECEIVEing the LOADSAMP.xmit file

After you unpack the CDRT62.pax file, copy the LOADSAMP.xmit file to an MVS PDS data set using the following JCL:

```
//Your jobcard
//******************************************************************************
//* Turn caps off for this member. Enter CAPS OFF on the command line.     *
//*                                                                        *
//* Use this JCL member to unload CDRT sample JCL members from USS.        *
//*                                                                        *
//*** You must first FTP the CDRT62.pax file to USS and unpack the file  ****
//*                                                                        *
//******************************************************************************
//ALLOCJCL EXEC PGM=IEFBR14,REGION=4800K
//DD1   DD DSN=hlq.CDRT62.JCLSAMP,
//          DISP=(NEW,CATLG),UNIT=XXXX,VOL=SER=XXXXXX,
//          DCB=(LRECL=80,BLKSIZE=27920,RECFM=FB),
//          SPACE=(TRK,(9,4,10))
/*
//UNLOAD   EXEC PGM=IKJEFT01,COND=(0,NE)
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSTSIN  DD DATA
 ALLOCATE DD(LOADDD) PATHOPTS(ORDONLY) FILEDATA(BINARY) +
            PATH('/uss/userid/SMPNTS/LOADSAMP.xmit')

 RECEIVE INDD(LOADDD)
        DSNAME('hlq.CDRT62.JCLSAMP') SHR
```

FIGURE 1-1 JCL to Copy LOADSAMP.xmit to a PDS

▼ SMP/E Receiving the CDRT Functions from the CDRT Installation CD

Use the NTSCDRT sample member to SMP/E RECEIVE the CDRT functions from Unix Systems Services (USS).

Follow the instructions in the prologue of the NTSCDRT sample member and submit the batch job to receive the CDRT FMID.

The return code **must** be zero (0) for all steps executed in this job. If you receive a different return code, contact StorageTek Software Support.

Go to "Completing the Installation" on page 14.

Completing the Installation

▼ Allocating Target and Distribution Libraries

Make the required changes and site specific changes per the JCL comments in the SWUDDDEF member and run the job to allocate the target and distribution libraries and the UCLIN for the target and distribution zone DD names.

▼ Apply Checking the CDRT Utility FMID

Modify JCL installation sample `SWUAPPLY` per the comments in this sample, ensuring that:

- In the `SMPCSI DD` statement, you change the data set name of the global CSI to point to your HSC global CSI.
- In the `SET BDY` statement, you change the names of the Target and Distribution Zones to the names of the Target and Distribution Zones used by HSC.

Then run `SWUAPPLY` to apply check the CDRT Utility FMID.

▼ Applying the CDRT Utility FMID

Delete the `CHECK` statement from JCL installation sample `SWUAPPLY`, then run this member again to apply the CDRT Utility.

▼ Accept Checking the CDRT Utility FMID

Modify JCL installation sample `SWUACCPT` to accept check the CDRT Utility FMID.

▼ Accepting the CDRT Utility FMID

Delete the `CHECK` statement from JCL installation sample `SWUACCPT`, then run it to accept the CDRT Utility FMID. When the accept is successful, the SMP/E distribution libraries contain the data sets described in TABLE 1-6.

TABLE 1-6 SMP/E Distribution Library Contents

Data Set Name	Contents
yourhlq.SWU*release*.ASWULINK	Load modules required for CDRT Utility execution
yourhlq.SWU*release*.ASWUSAMP	Sample material for use with CDRT Utility.

▼ APF Authorizing the CDRT Utility Load Modules

You must APF authorize the CDRT Utility Load Modules (*yourhlq*.`SWU`*release*.`SWULINK`).

Defining MVC Pools for Concurrent DR Testing

As described in the operational scenarios in this guide, StorageTek **requires** that you define a separate MVC pool for the DR test to prevent the parallel systems from attempting to migrate VTVs to the same MVCs.There are several ways to configure and use MVC Pools, and this section describes a method that works for most customers.

The two systems that use the shared hardware environment must use different MVC Pools to enable them to have MVCs they can both read from and a pool that they can write to. FIGURE 1-2 shows a sample configuration of a range of 5,000 MVCs.
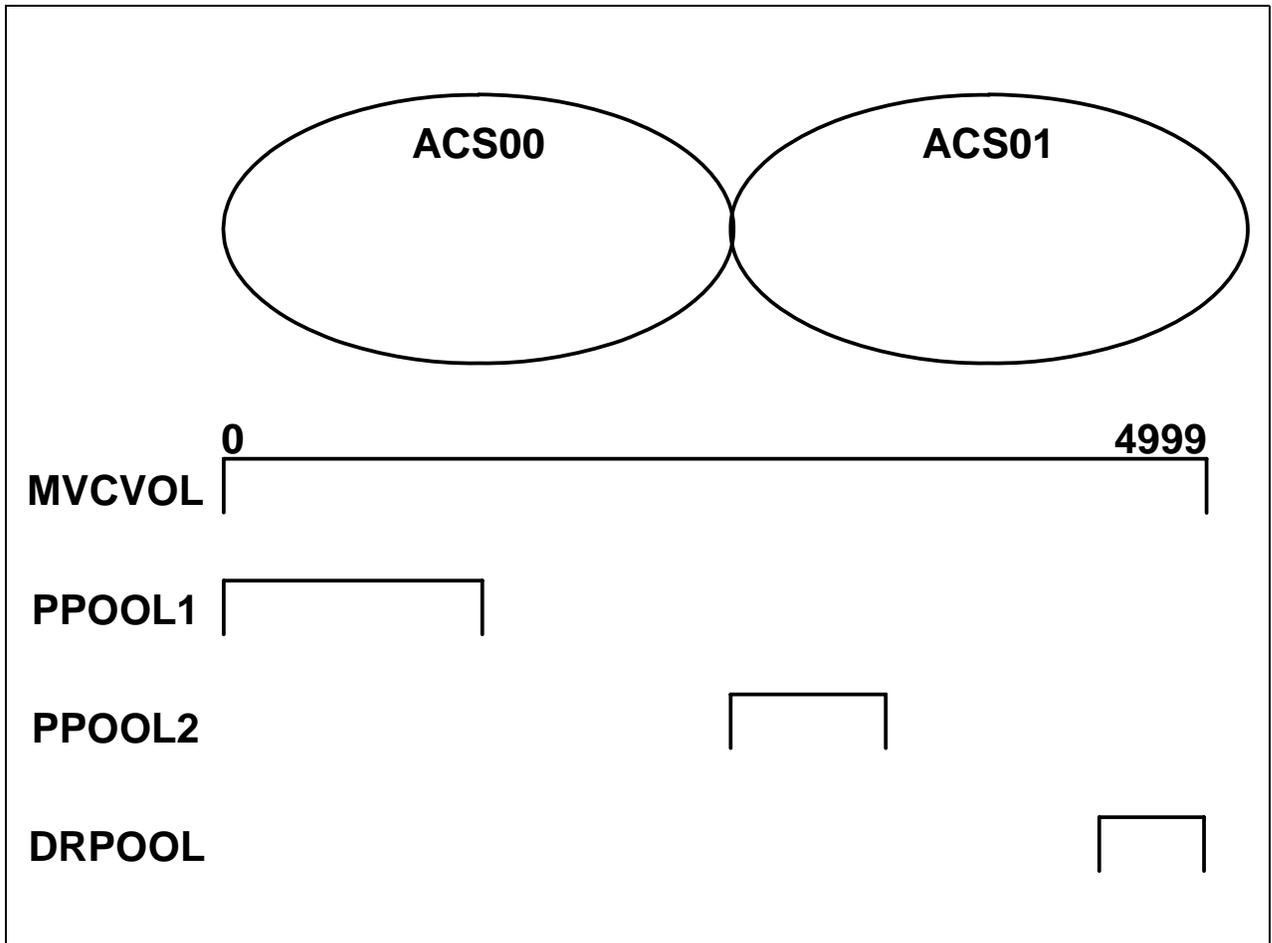
FIGURE 1-2   Sample MVCVOL and MVC Pool Configurations

In FIGURE 1-2 on page 16:

- The VTCS `CONFIG MVCVOL` statement defines the whole range from 0 – 4999.

- The production pool that resides in ACS 00 (the ACS local to the production system) has a pool that defines (via the HSC `MVCPOOL` statement) sufficient MVCs for short-term future use. These MVC, which all reside in ACS 00, are shown as `PPOOL1`. `PPOOL1` contains MVCs that are used by production at all times, **including** during DR testing. Production can both read and write to these MVCs at all times, including during DR testing. The DR test system, however, **never** has either read or write access to the MVCs.

- The production pool that resides in ACS 01 (the ACS remote to the production system, and local to the DR test system) also has pool that defines sufficient MVCs for short-term future use in that ACS (typically for duplexed DR VTVs). These MVCs, which all reside in ACS 01, are shown as `PPOOL2`. `PPOOL2` contains MVCs that are used by production at all times, **including** during DR testing. Production can both read and write to these MVCs at all times, including during the DR Test periods. The DR test system, however, **only** has read access to the MVCs. The data on these MVCs is frozen for DR Test use.

- The DR Test pool that resides in ACS 01 (the ACS remote to the production system, and local to the DR test system) has a pool that defines sufficient MVCs in that ACS used **only** for the DR Test. These MVCs, which all reside in ACS 01, are shown as `DRPOOL`. `DRPOOL` contains MVCs that are **only** used by DR Test during the test period. Outside of the test period, these MVCs **should not** be used at all. Production has no access to these MVCs.

Warning. To maintain the access conditions described above, you must ensure that you follow all restrictions described in "Optimizing Access to Test and Production Resources" on page 5**.**

FIGURE 1-3 on page 18 shows sample MVCVOL and MVCPOOL definitions for the configuration shown in FIGURE 1-2 on page 16.

INITIAL VTCS CONFIG DEFINITION

MVCVOL LOW=000000 HIGH=004999

POSSIBLE INDIVIDUAL SYSTEM DEFINITIONS

PROD	DR TEST
MVCPOOL V(000000-000999)	MVCPOOL V(004500-004999)
MVCPOOL V(002500-003499)	
OR a single statement	
MVCPOOL V(000000-003499)	

FIGURE 1-3 Sample MVCVOL and MVCPOOL Definitions

FIGURE 1-4 shows how the two different systems shown in FIGURE 1-3 on page 18 can read or write from each of the MVC Pools.
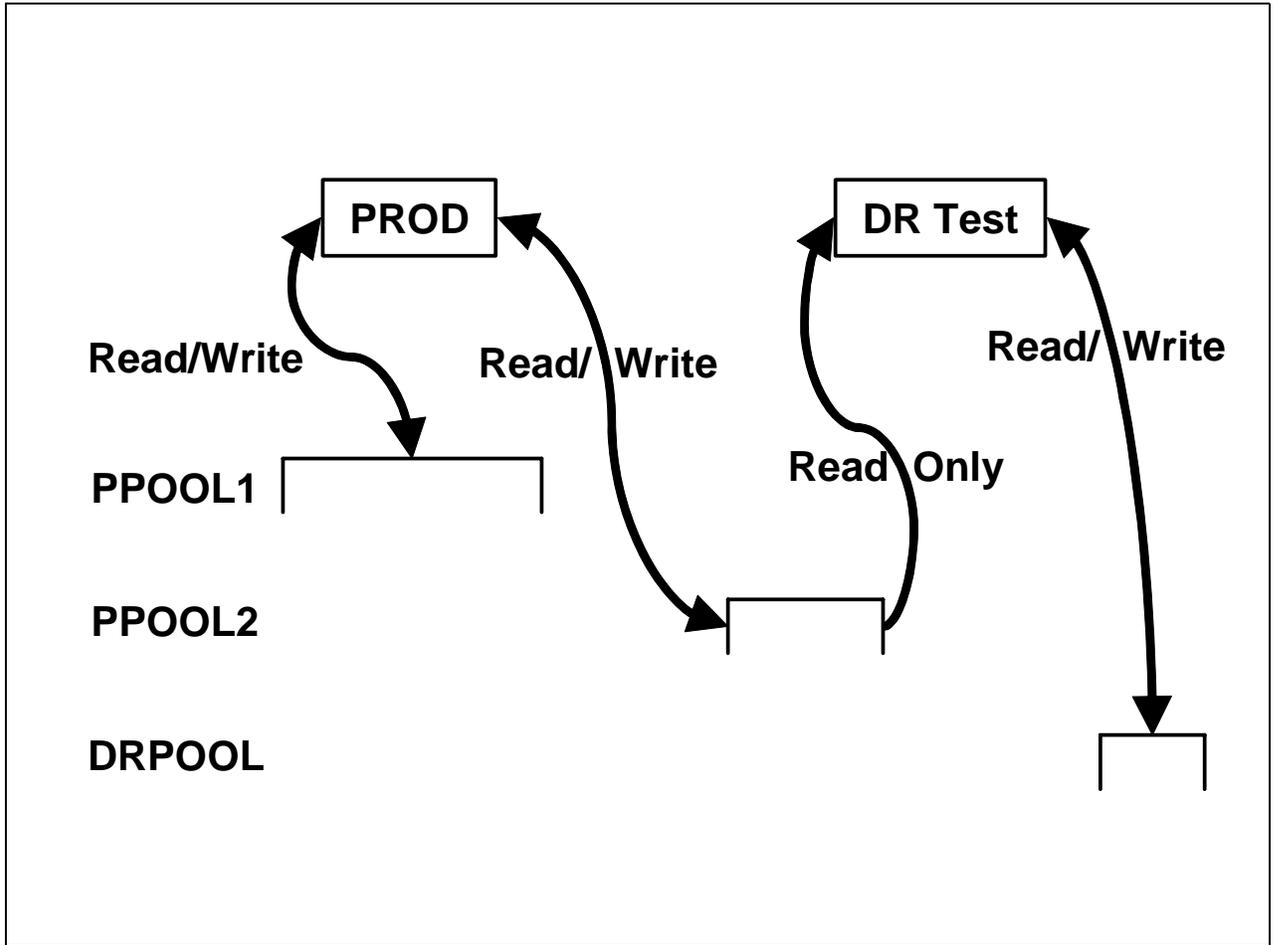
FIGURE 1-4 Production and Test System MVC Access

Running a DR Test

Note – For more information about the commands and utilities used in this procedure, see *ELS Command, Control Statement, and Utility Reference*.

▼ To run a DR test:

1. **Define volume pools as described in** "Defining MVC Pools for Concurrent DR Testing" on page 16.

2. **Create** `MGMTCLAS/STORCLAS` **statements for the DRTEST environment...**

   ...using the same Management Class names as your production environment. Any Management Classes used for the DR Test will simplex data for the DR test systems. We don't want to duplex while there's only ACS01 available, so the `MGMTclas` statement looks like FIGURE 1-5.

   ```
   MGMT NAME(CRITICAL)MIGPOL(LOCAL) IMMWAIT(0) DELSCR(YES)
   ```

   FIGURE 1-5   Create Management Class for DR Test

   The MIGPOL Management Class now specifies a LOCAL Storage Class. To complete simplexing of the MIGPOL Management Class, create any Storage Class referenced by MIGPOL in FIGURE 1-5 to point to ACS01and MVC Pool DRTEST...

   ...as shown in FIGURE 1-6:

   ```
   STOR NAME(LOCAL) ACS(01) MVCPOOL(MVCP1)
   ```

   FIGURE 1-6   Create Storage Class LOCAL to Point to ACS01

3. **Set FLOAT OFF to *all Production HSC hosts* at the Primary Site.**

   This freezes the environment at the Secondary Site. If you do not do so, the CDRT CDS can be out of synchronization with the production CDS at the Primary Site.

4. **Ensure the following:**
   - Don't scratch any volumes that will be required by the DRTEST.
   - Stop all CAP activity and scratch processing in the DR test ACS, and all production jobstreams using Nearline or VSM resources. This ensures that all VTVs are been migrated to MVCs and freezes the VTV states until the DR test CDS copy is created.

- It is also recommended that you freeze the MVC states and reduce contention for the MVC volumes by running the SLUADMIN `ACTMVCGN` utility to create read-only control statements for all active production MVCs in the DRTEST ACS as shown in FIGURE 1-7.

```
//ACTMVCGN JOB (ACCT),'ACTMVCGN',NOTIFY=&SYSUID
//ACTMVCG1 EXEC PGM=SLUADMIN,PARM='MIXED'
//STEPLIB  DD DSN=hlq.SEALINK,DISP=SHR
//SLSPRINT DD SYSOUT=*
//*   NOTE: MVCMAINT READONLY(ON) STATEMENTS
//SLUSMVON DD DSN=hlq.SLUSMVON,DISP=(NEW,CATLG,DELETE),
//         SPACE=(CYL,1)
//*   NOTE: MVCMAINT READONLY(OFF) STATEMENTS
//SLUSMVOF DD DSN=hlq.SLUSMVOF,DISP=(NEW,CATLG,DELETE),
//         SPACE=(CYL,1)
//*   NOTE: THE FOLLOWING STEP SELECTS ALL "ACTIVE" MVCS
//*  IN ACS 01.
//SLSIN    DD *
 ACTMVCGN ACS(01)
/*
//ACTMVCG2 EXEC PGM=SLUADMIN,PARM='MIXED'
//STEPLIB  DD DSN=hlq.SEALINK,DISP=SHR
//SLSPRINT DD SYSOUT=*
//* NOTE: EXEC MVCMAINT TO SET READONLY(ON)
//SLSIN    DD DSN=hlq.SLUSMVON,DISP=SHR
```

FIGURE 1-7 ACTMVCGN Example JCL

Note – While completely stopping all Nearline and VSM activity is the safest way to ensure that the DR test environment is set up correctly, some customers may be unable or unwilling to completely quiesce these operations. Because the DR Test CDS is a point-in-time copy of the production CDS, the DRTEST environment has access only to VTVs created before the creation of the DR Test CDS. If volumes used in the DRTEST may have changed (because of a DISP= MOD use, or a scratch and re-use), then the DR test will not produce the expected results.

---

5. **Copy the MVS Catalog for the DR test site if required.**

6. **Optionally, copy the TMS database (if a TMS is used) for the DR test site.**

7. **On the production system, use the HSC** `CAPPREF` **command to set all CAPs in the DR test ACS to manual mode.**

8. **At the Production Site, run the** `DRTEST` **utility (with the** `PRIMEprd` **keyword) to prepare the production CDS for the DR test.**

   For example:

   ```
   /PRIME EXEC PGM=SLUADMIN,PARM='MIXED'
   //STEPLIB DD DSN=hlq.SEALINK,DISP=SHR
   //SLSCNTL DD DSN=hlq.DBASEPRM,DISP=SHR
   //SLSCNTL2 DD DSN=hlq.DBASESEC,DISP=SHR
   //SLSSTBY DD DSN=hlq.DBASETBY,DISP=SHR
   //SLSPRINT DD SYSOUT=*
   //SLSIN DD *
   DRTEST PRIME -
   HOSTID(MVS1,MVS2) -
   DRVTSS(VTSS01,VTSS02) -
   SPARE -
   DRACS(01)
   ```

   You only need to run `PRIMEprd` **once** in your environment, no matter how many DRTEST iterations you run, **unless** your configuration changes. If your DR test configuration changes in any way, then you need to rerun `PRIMEprd`. Note also that if you run `DRTEST RESET` after each DR test, then you need to run `PRIMEprd` before each new DR test.

9. **At the DR Test Site, run the** `DRTEST` **utility (with the** `CREATE` **keyword) against the mirrored or backup copy of the production CDS to create the new DR Test CDS for the DR test.**

   For example:

   ```
   /CREATE EXEC PGM=SLUADMIN,PARM='MIXED'
   //STEPLIB DD DSN=hlq.SEALINK,DISP=SHR
   //SLSCNTL DD DSN=hlq.DBASEPRM,DISP=SHR
   //SLSNEW1 DD DSN=hlq.DBASNEW1,DISP=(NEW,CATLG,DELETE),
   //                 UNIT=SYSDA,SPACE=(CYL,(cdssize),,CONTIG)
   //SLSNEW2 DD DSN=hlq.DBASNEW2,DISP=(NEW,CATLG,DELETE),
   //                 UNIT=SYSDA,SPACE=(CYL,(cdssize),,CONTIG)
   //SLSNEW3 DD DSN=hlq.DBASNEW1,DISP=(NEW,CATLG,DELETE),
   //                 UNIT=SYSDA,SPACE=(CYL,(cdssize),,CONTIG)
   //SLSPRINT DD SYSOUT=*
   //SLSIN DD *
   DRTEST CREATE -
   HOSTID(MVS1,MVS2) -
   DRVTSS(VTSS01,VTSS02) -
   SPARE -
   DRACS(01) -
   NOUPD
   ```

   The CDSs and journals (if used) must be allocated via the DD statements on the utility. **Note that** when `NOUPD` is used, only the `SLSCNTL DD` statement is required, and it can be either the actual primary CDS, a backup, or a mirrored copy.

10. **Start the DR test at the production site, pointing to the DRTEST** `MGMTCLAS`/`STORCLAS` **definitions you created in** Step 2**.**

For example:

```
/PRIME EXEC PGM=SLUADMIN,PARM='MIXED'
//STEPLIB DD DSN=hlq.SEALINK,DISP=SHR
//SLSIN DD *
DRTEST START
```

Note – You can also start the test by entering a `DRTEST  START` command from the console.

11. **Start the SMC system on the DRTEST client host(s).**

12. **Start the SMC/HSC/VTCS system(s) (pointing to the CDS you created in** Step 9**) on the DR test systems.**

13. **Verify the VTDs for the test VTSS(s) and paths are online.**

14. **Vary online the DR VTSSs to the DR system.**

15. **Vary online the DR RTDs to the DR system.**

16. **Run the tests at the DR test site.**

During the DR test, the following conditions are programmatically enforced:

- The production site ACS(s) are disconnected from the DR test host(s).
- The production site VTSSs are offline to the DR test host(s).
- No floating dismounts, ejects, moves, scratch updates, audits, or scratch redistributions can occur at the DR test site.
- No floating dismounts, enters/ejects, moves, audits, or scratch redistributions on the DR test ACS can occur at the production site.
- All CAPs in the DR test ACS are in manual mode.

Note – You can enter volumes into the DR Test ACS, but after the test is complete, you must either eject the volumes or audit the cells to synchronize the production CDS with the actual library volumes.

Cleaning Up After a DR Test

As described on page 2, it is critical that jobs in a DR test jobstream **do not** update any volumes created in production. How you clean up after a DR test depends on whether you followed this recommendation:

- "Cleaning Up After a DR Test (Production Volumes Not Updated)" on page 24
- "Cleaning Up After a DR Test (Production Volumes Updated)" on page 25

Note – For information about the DRTEST command and DRTEST utility, see *ELS Command, Control Statement, and Utility Reference*. For information about CDRT messages, see *ELS Messages and Codes*.

▼ Cleaning Up After a DR Test (Production Volumes Not Updated)

1. **Run the SLUADMIN SCRAtch utility to scratch all possible VTVs in your DRTEST subpool(s).**

   Because you set `DELSCR(YES)` in your Management Class, the VTVs will be automatically deleted from the buffer when you scratch them at the conclusion of the test.

   Warning. **If you do not use SET VOLPARM and you do not set up separate scratch pools, you are risking data loss!**

---

2. **Stop VTCS/HSC/SMC on the** `DR TEST` **MVS system.**

3. **Run SLUADMIN utility with ACTMVCGN MVCMAINT READONLY(OFF) statements to reset active MVCs so that they can be used for migration as shown in** FIGURE 1-8**.**

```
//ACTMVCGN JOB (ACCT),'ACTMVCGN',NOTIFY=&SYSUID
//ACTMVCG1 EXEC PGM=SLUADMIN,PARM='MIXED'
//STEPLIB  DD DSN=hlq.SEALINK,DISP=SHR
//SLSPRINT DD SYSOUT=*
//* NOTE: EXEC MVCMAINT TO SET READONLY(OFF)
//SLSIN    DD DSN=hlq.SLUSMVOF,DISP=SHR
```

FIGURE 1-8 ACTMVCGN Example JCL (Test Cleanup)

▼ Cleaning Up After a DR Test (Production Volumes Updated)

1. **Run a VTV report.**

   Examine the report for any VTVs on `VTSS1` that were created or modified since you began the DR test.

2. **If your DRTEST has updated VTVs created by the production system, ensure that these VTVs are migrated and deleted from the buffer.**

3. **Demand migrate (and delete from the VTSS) the new VTVs you identified in Step 1:**

   `MIGRATE VTV (`*`volser1,volser2,...volsern`*`) DELETE(YES)`

4. **Optionally, migrate VTSS1 to zero to ensure that VTVs that were created and/or changed during the DR test are not reconciled to VTSS0.**

   Warning. **You must do this migrate to zero, otherwise production data in** `VTSS0` **could be replaced by the test VTVs in** `VTSS1`**, which causes loss of production data!**

---

5. **Stop VTCS/HSC/SMC on the** `DR TEST` **MVS system.**

6. **Run SLUADMIN utility with ACTMVCGN MVCMAINT READONLY(OFF) statements to reset active MVCs so that they can be used for migration as shown in FIGURE 1-8.**

```
//ACTMVCGN JOB (ACCT),'ACTMVCGN',NOTIFY=&SYSUID
//ACTMVCG1 EXEC PGM=SLUADMIN,PARM='MIXED'
//STEPLIB  DD DSN=hlq.SEALINK,DISP=SHR
//SLSPRINT DD SYSOUT=*
//* NOTE: EXEC MVCMAINT TO SET READONLY(OFF)
//SLSIN    DD DSN=hlq.SLUSMVOF,DISP=SHR
```

FIGURE 1-9   ACTMVCGN Example JCL (Test Cleanup)

▼ To resume normal operations:

1. Stop the DR test on the PRODUCTION **MVS system and reset all DR test settings in the production CDS..**

For example:

```
/STOP EXEC PGM=SLUADMIN,PARM='MIXED'
//STEPLIB DD DSN=hlq.SEALINK,DISP=SHR
//SLSPRINT DD SYSOUT=*
//SLSIN DD *
DRTEST STOP
DRTEST RESET
```

2. To resume normal production operations, do the following:

- If desired, place CAPs in the DR test ACS in automatic mode.
- Reset FLOAT, EJECT, etc, status to desired production state.

Operational Scenarios

This section tells how to use the DR Test software to set up the environment for, start, and stop DR testing. This section consists of the following information:

For information about the DRTEST command and DRTEST utility, see *ELS Command, Control Statement, and Utility Reference*. For information about CDRT messages, see *ELS Messages and Codes*.

Scenario 1: Production and Test Sites, ACS at Each Site, Spare VTSS at Test Site

In Scenario 1, there is a single ACS at both the production and test sites, and "spare" VTSS(s) at the test site used solely for testing (no requirements to migrate or restore "spare" VTSS contents). In normal operations, the production site writes and accesses VTVs on VTSSs at the production site, and output VTVs are always migrated immediately and duplexed to separate MVCs, one in each ACS. shows the system for Scenario 1 before running the `DRTEST` utility.
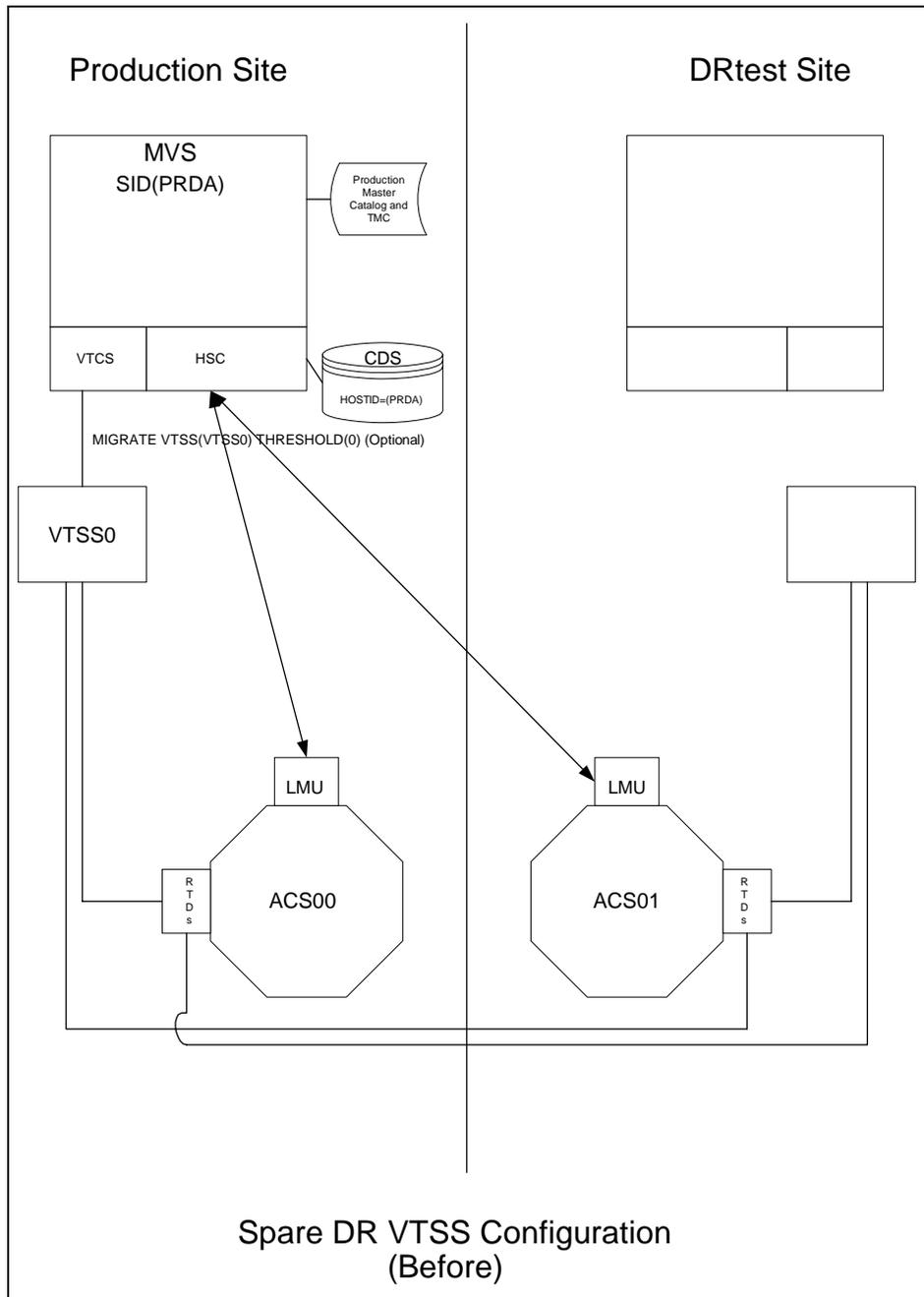
FIGURE 1-10 Spare VTSS Configuration - Before Running the DRTEST Utility

FIGURE 1-11 shows the system for Scenario 1 (spare VTSS at test site) after running the DRTEST utility.

Production Site

DRtest Site

MVS
SID(PRDA)

Production Master Catalog and TMC

copy

DRtest Master Catalog and TMC

MVS
SID(PRDA)

VTCS | HSC

CDS

HOSTID=(PRDA)

DRTEST

DRtest CDS

HOSTID=(null,PRDA)

HSC | VTCS

VTSS0

VTSS0

ACS00 DISCONNECTED

MNTD FLOAT OFF ACS01

MNTD FLOAT OFF

LMU

LMU

R T D s

ACS00

ACS01

R T D s

**Spare DR VTSS Configuration
(After)**
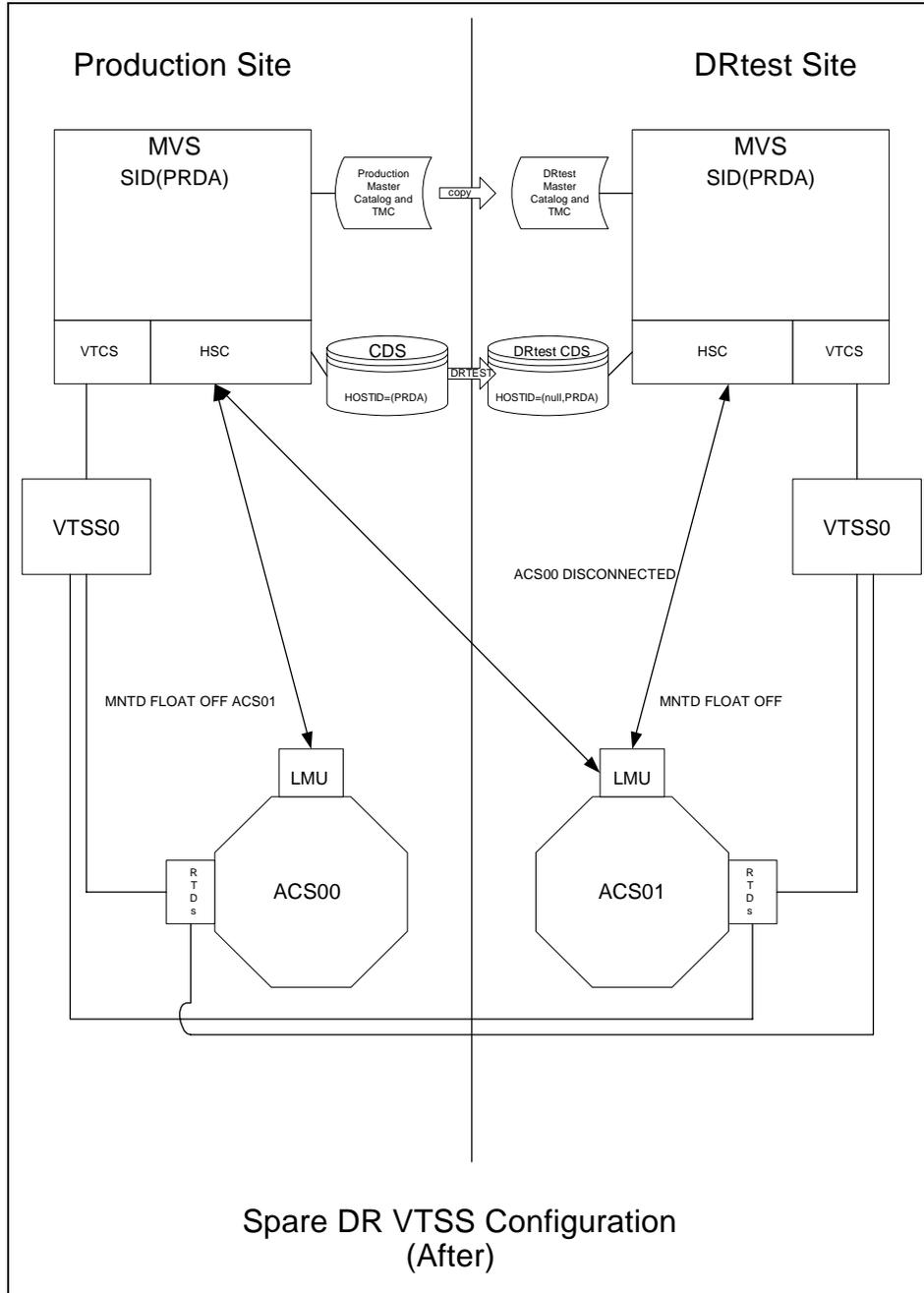
FIGURE 1-11 Spare VTSS Configuration - After Running the DRTEST Utility

Additional Operations for Scenario 1:

■ Before the test, optionally, migrate the spare VTSS(s) to zero or have your StorageTek CSE "clean" the VTSS.

Migrating to zero synchronizes the CDS with the "cleaned" state of the spare VTSS to suppress SLS6680E messages for VTV mounts. You can run VTCS `VTVRPT OPTION(UNAVAIL)` to ensure that all VTVs are migrated and are available to other VTSSs.

■ After the test, run the procedure in .

Scenario 2: Production and Test Sites, ACS at Each Site, VTSS Takeover at Test Site

In Scenario 2, there is a single ACS at both the production and test sites, but no "spare" VTSS(s) at the test site used for testing. In normal operations, the production site writes and accesses VTVs on VTSSs at both sites, and output VTVs are always migrated immediately and duplexed to separate MVCs, one in each ACS. In this configuration, you must demand migrate to zero one or more VTSSs at the test site and vary these VTSSs offline to the production system, so testing can take over the required VTSS resources. In addition, one or more LPARs at the test site function as displaced production systems, running in parallel with the actual production systems. Both ACSs are online to the production system.

FIGURE 1-12 on page 33 shows the system for Scenario 2 (VTSS takeover at test site) before running the `DRTEST` utility.
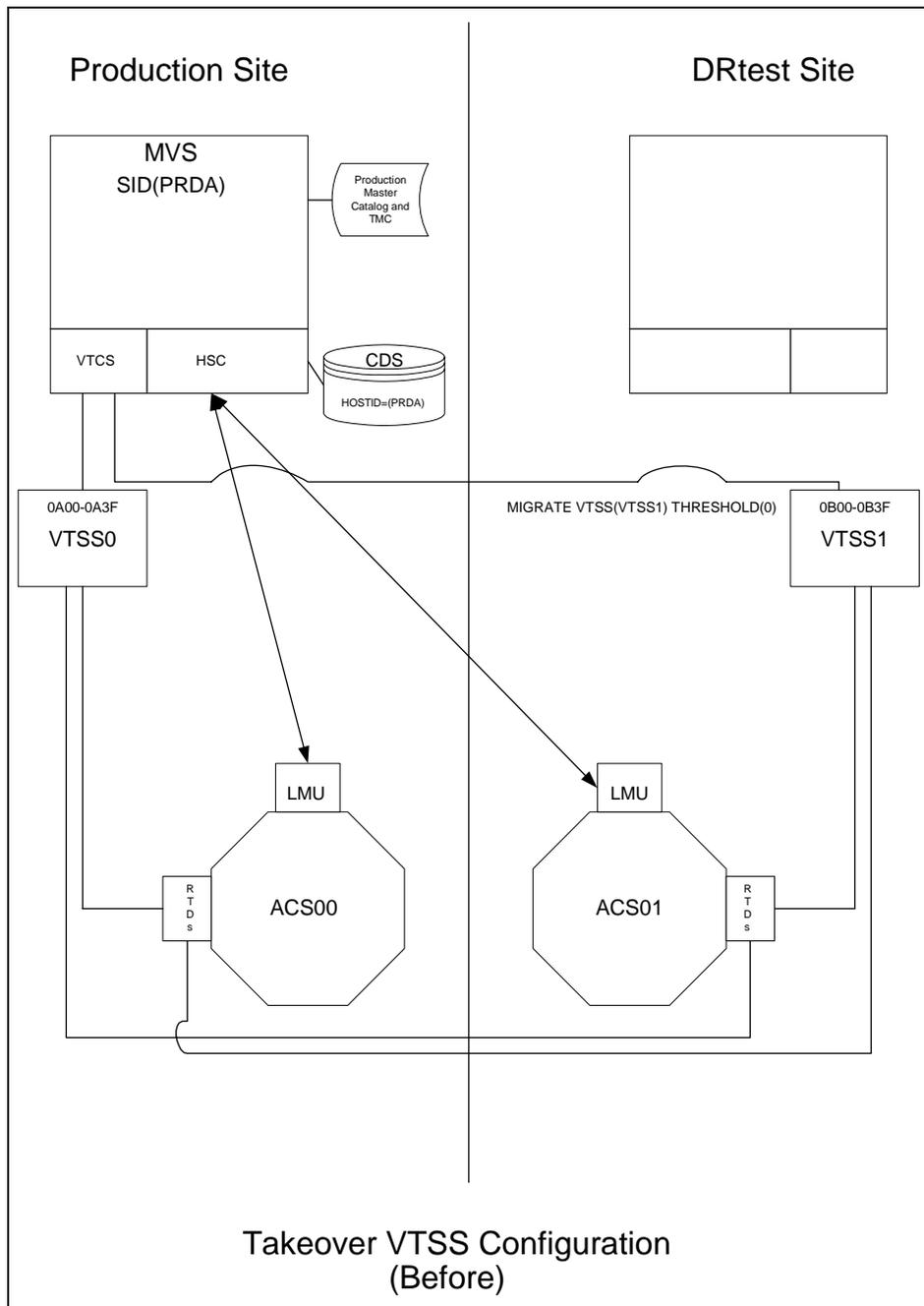
FIGURE 1-12 VTSS Takeover Configuration - Before Running the DRTEST Utility

FIGURE 1-13 shows the system for Scenario 2 (VTSS takeover at test site) after running the DRTEST utility.
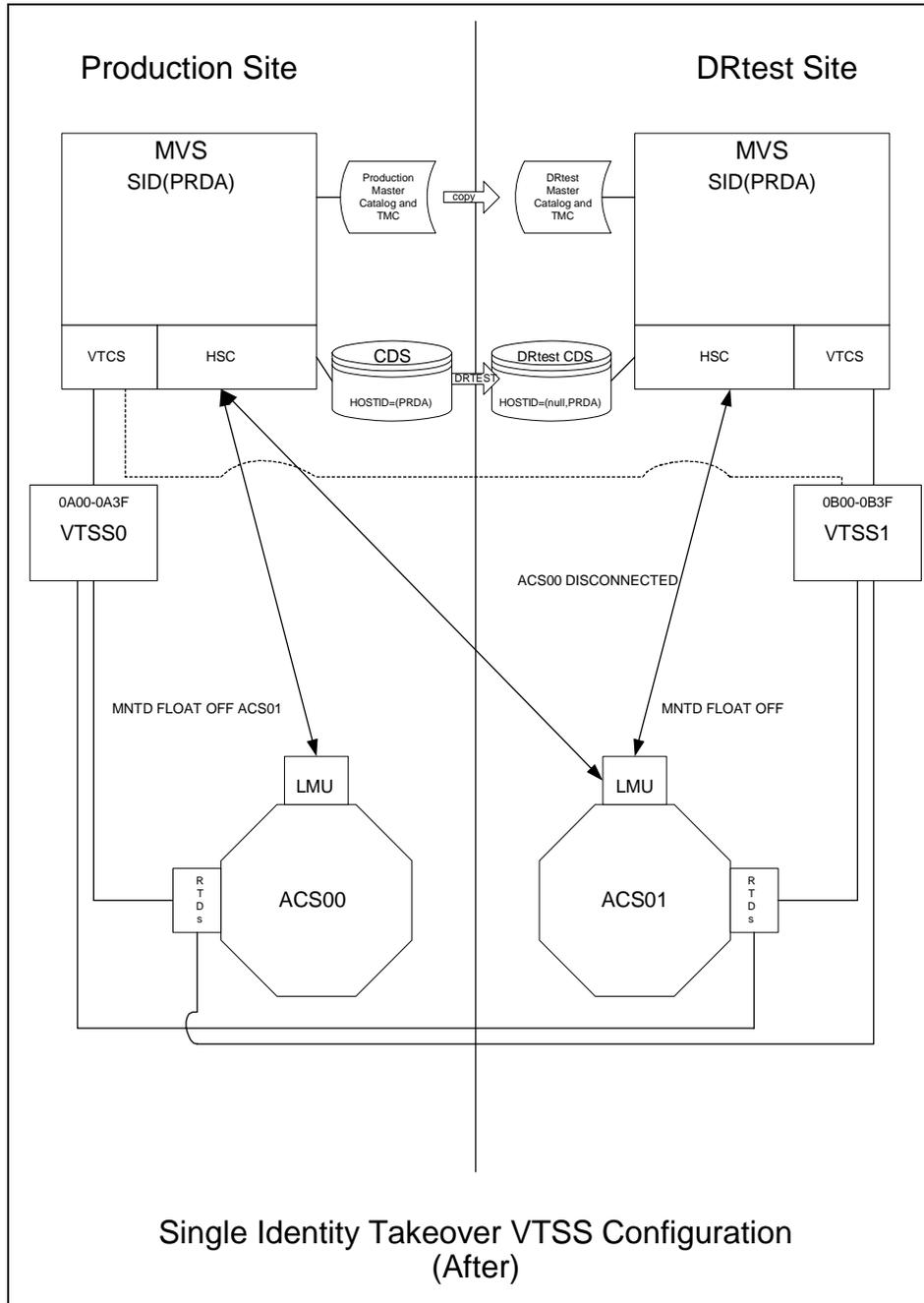
FIGURE 1-13 VTSS Takeover Configuration - After Running the DRTEST Utility

Additional Operations for Scenario 2:

■ Before the test, optionally, migrate the spare VTSS(s) to zero or have your StorageTek CSE "clean" the VTSS.

Migrating to zero synchronizes the CDS with the "cleaned" state of the spare VTSS to suppress SLS6680E messages for VTV mounts. You can run VTCS `VTVRPT OPTION(UNAVAIL)` to ensure that all VTVs are migrated and are available to other VTSSs.

■ After the test, run the procedure in .

Scenario 3: Production and Test Sites, ACS at Each Site, No VTSSs

In Scenario 3, there is a single ACS at both the production and test sites, but no VTSS(s) at the test site used for testing. In normal operations, the production site writes and accesses tape data sets at both sites. shows the system for Scenario 3 (real-only configuration) before running the `DRTEST` utility.
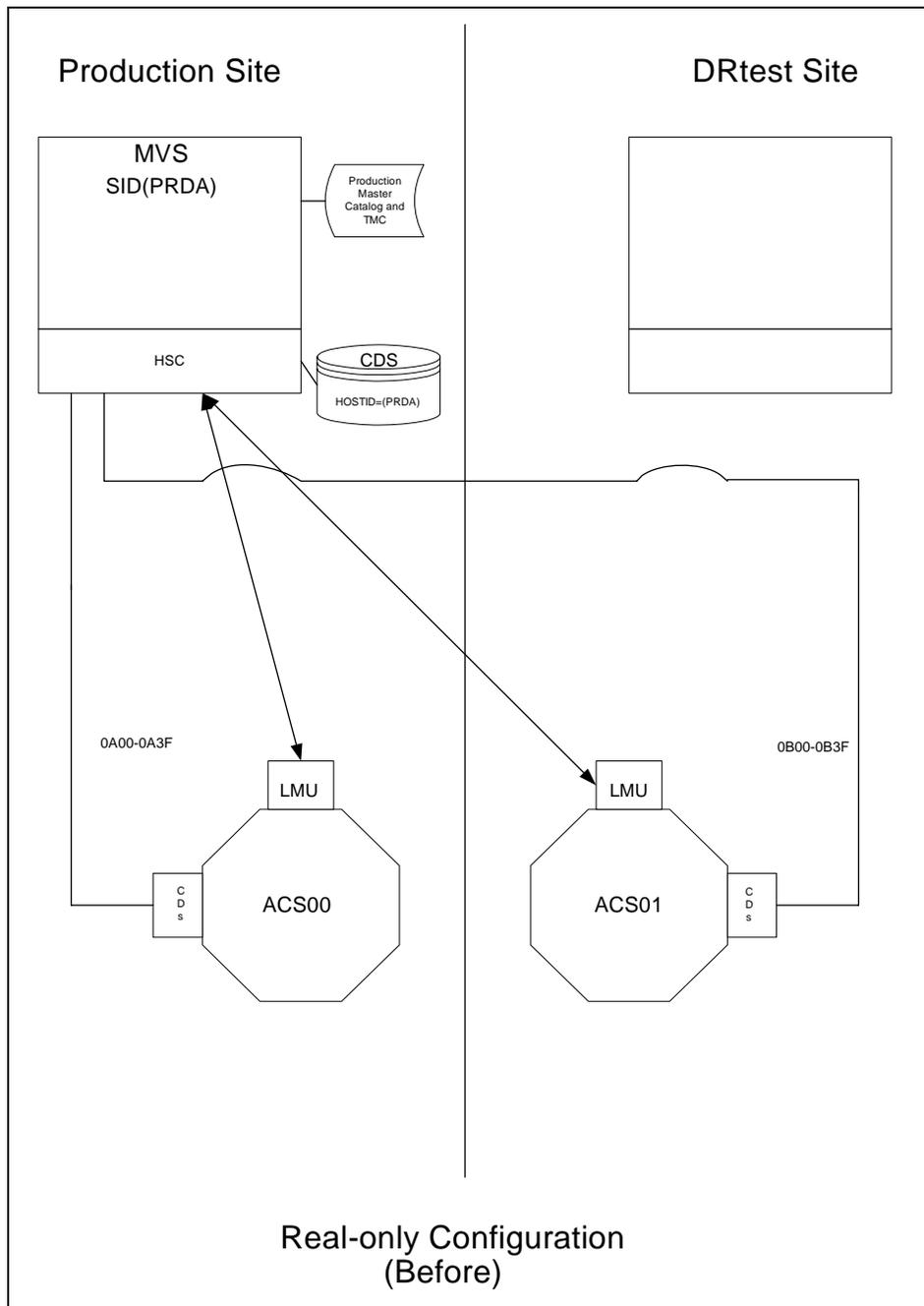
FIGURE 1-14 Real-Only Configuration - Before Running the DRTEST Utility

The figure shows two sites separated by a vertical line. On the left is the "Production Site" and on the right is the "DRtest Site."

Production Site contains:
- MVS SID(PRDA)
- Production Master Catalog and TMC
- HSC
- CDS HOSTID=(PRDA)
- 0A00-0A3F
- LMU / ACS00 with CDs
- 0B00-0B3F
- LMU / ACS01 with CDs

Real-only Configuration (Before)

FIGURE 1-15 shows the system for Scenario 3 shows the system for Scenario 3 (real-only configuration) after running the DRTEST utility.

Production Site

DRtest Site

MVS
SID(PRDA)

Production Master Catalog and TMC

copy

DRtest Master Catalog and TMC

MVS
SID(PRDA)

HSC

CDS

DRtest CDS

HSC

HOSTID=(PRDA)

DRTEST

HOSTID=(null,PRDA)

MNTD FLOAT OFF ACS01

ACS00 DISCONNECTED

MNTD FLOAT OFF

0A00-0A3F

LMU

LMU

0B00-0B3F

C D s

ACS00

ACS01

C D s

Real-only Configuration
(After)
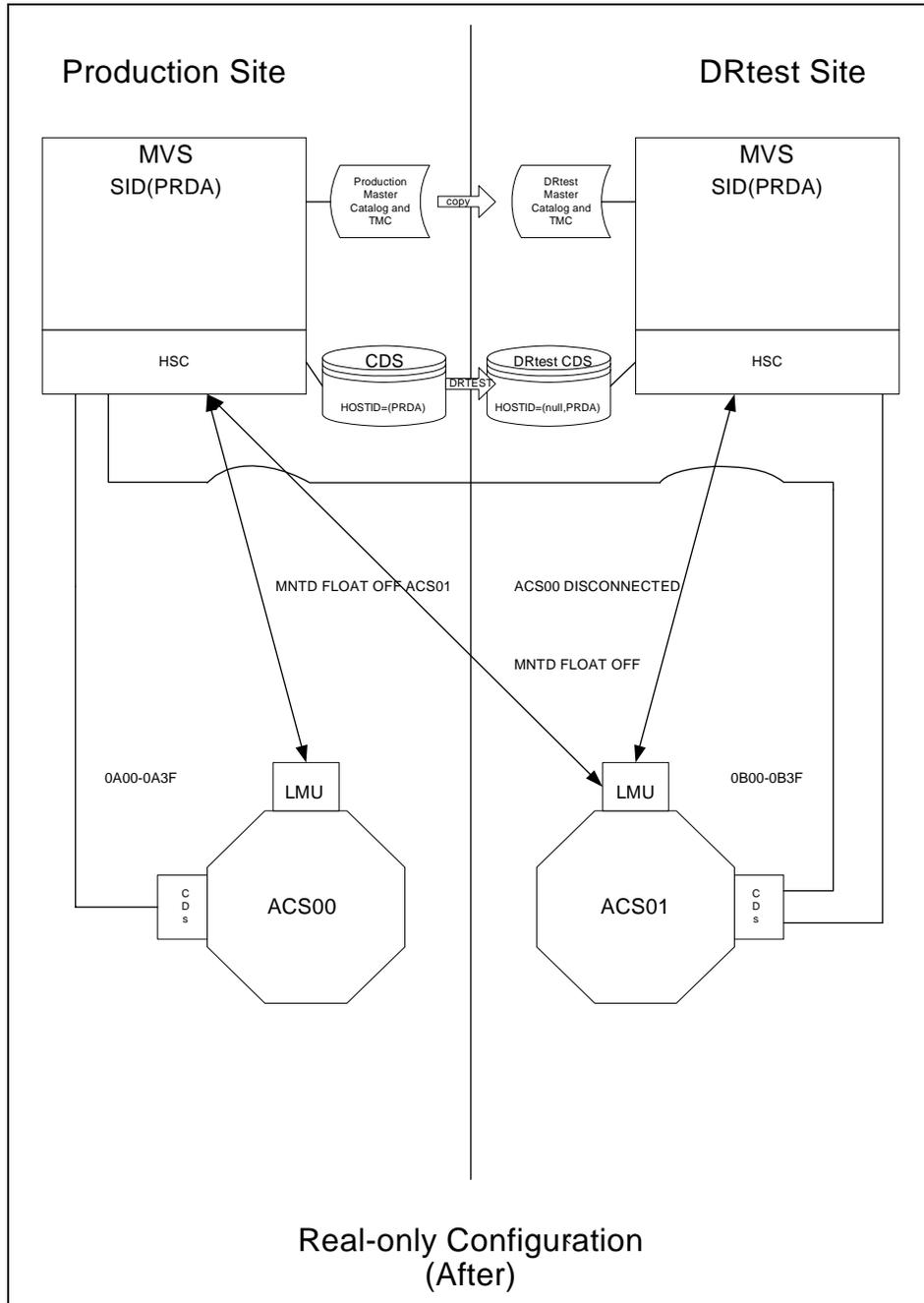
FIGURE 1-15 Real-Only Configuration - After Running the DRTEST Utility

Scenario 4: Clustered VTSSs with Production and DR Test Sites

As shown in , in normal operations, Scenario 4 is a Clustered VTSS configuration used for DR, with Production and DR Test sites cross-connected to the Production and DR Test ACSs. At the Production Site, `VTSS0` is the Primary, and `VTSS1` is the Secondary at the DR Test Site.

Using the secondary VTSS of a cluster as the DR test VTSS requires careful consideration in order to ensure that there are no unintended consequences during and after the DR test. Unintended consequences can include recall errors during the test and/or production data loss after the DR test is complete.

If the contents of VTSS1 change between the time that the DRTEST utility is executed to create the DRTEST CDS and the actual start of the test using the DRTEST CDS, error messages will be issued for VTVs that the DRTEST CDS indicates are resident in VTSS1 but no longer are resident. These messages are expected in this situation and do not indicate a failure. These messages can be prevented by migrating VTSS1 to zero before executing the DRTEST utility. This will synchronize the status of VTVs resident in VTSS1 with the CDS prior to the start of your DR test.

Preparing Your VTSS Cluster for a DR Test

In this section, you're making sure any in process replications from VTSS0 to VTSS1 are complete.

▼ To prepare your VTSS cluster for a DR test:

1. **Vary** VTSS1 **to quiesced state:**

   VARY VTSS1 QUIESCED

   The objective here is to (gracefully) shut down replication to VTSS1 so we can use it exclusively for the DR test.

2. **Monitor replication until it completes.**

   ...with Display REPLicat. Here, replication is still active:

   VTSS   HOST QDEPTH

   VTSS0 PRODUCTION   1

   You know replication is complete when you see this:

   VTSS   HOST QDEPTH

   VTSS0 PRODUCTION   0

3. **Cross check that replication is complete by checking the CLINK status...**

   ...with Display CLINK. Here, the CLINK is still active:

   VTSS CLINK STATUS USAGE   HOST

   VTSS0 7   ONLINE REPLICATING PRODUCTION

   VTSS0 8   ONLINE REPLICATING PRODUCTION

   You know the CLINK is no longer active when you see this:

   VTSS CLINK STATUS USAGE   HOST

   VTSS0 7   ONLINE FREE

   VTSS0 7   ONLINE FREE

4. **Vary** VTSS1 **offline:**

   VARY VTSS1 OFFLINE

FIGURE 1-16 Primary/Secondary Clustered VTSS Configuration - Normal Operations

.

What if you wanted to use the DR Test Site for testing? FIGURE 1-17 shows the system for Scenario 4 during the DR test.
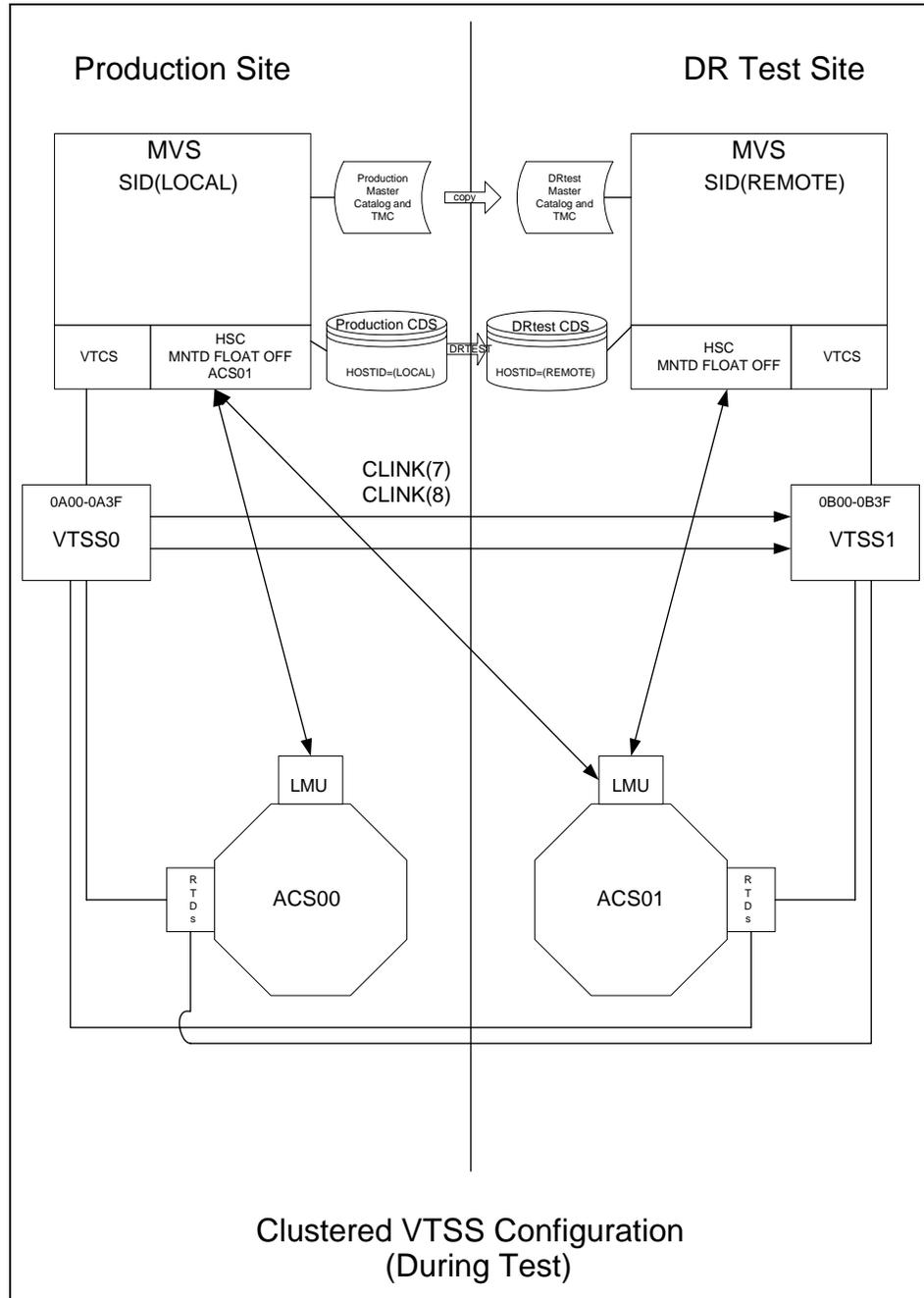
FIGURE 1-17 Primary/Secondary Clustered VTSS Configuration - During Test

Scenario 5: Production and Test Sites, ACS and VLE at Each Site

In Scenario 5, there is a single ACS at both the production and test sites, but no "spare" VTSS(s) at the test site used for testing. In normal operations, the production site writes and accesses VTVs on VTSSs at both sites, and output VTVs are always migrated immediately and duplexed, one copy to an MVC in the ACS, one copy to a VMVC in the VLE. In this configuration, you must demand migrate to zero one or more VTSSs at the test site and vary these VTSSs offline to the production system, so testing can take over the required VTSS resources. In addition, one or more LPARs at the test site function as displaced production systems, running in parallel with the actual production systems. **Both ACSs and VLEs are online to the production system.**

shows the system for Scenario 5 before running the `DRTEST` utility.
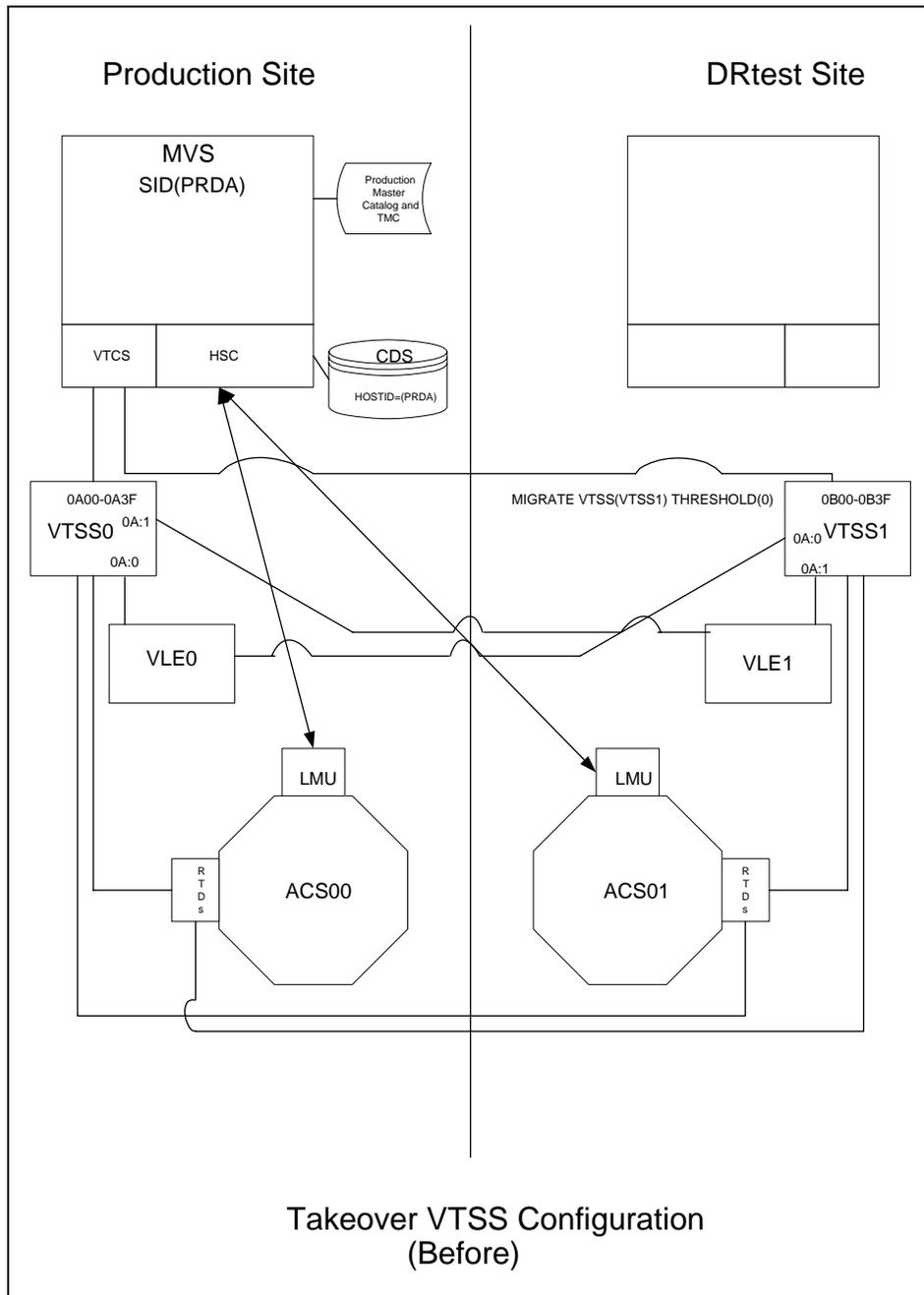
FIGURE 1-18 VLE and ACS Configuration - Before Running the DRTEST Utility

FIGURE 1-11 shows the system for Scenario 5 after running the DRTEST utility.

Production Site

DRtest Site

MVS
SID(PRDA)

Production Master Catalog and TMC

copy

DRtest Master Catalog and TMC

VTCS   HSC

CDS

DRtest CDS

HOSTID=(PRDA)

DRTEST

HOSTID=(null,PRDA)

0A00-0A3F

VTSS0
0A:1
0A:0

0B00-0B3F

VTSS1
0A:0
0A:1

VLE0 INACCESSIBLE

VLE0

VLE1

LMU

LMU

ACS00 DISCONNECTED
MNTD FLOAT OFF

MNTD FLOAT OFF ACS01

R T D s

ACS00

ACS01

R T D s

Single Identity Takeover VTSS Configuration
(After)

FIGURE 1-19 VLE and ACS Configuration - After Running the DRTEST Utility

Additional Operations for Scenario 5:

- Before the test, optionally, migrate the spare VTSS(s) to zero or have your StorageTek CSE "clean" the VTSS.

  Migrating to zero synchronizes the CDS with the "cleaned" state of the spare VTSS to suppress SLS6680E messages for VTV mounts. You can run VTCS `VTVRPT OPTION(UNAVAIL)` to ensure that all VTVs are migrated and are available to other VTSSs.

- You must add the `STORMNGR` parameter to the `DRTEST PRIME` and `DRTEST CREATE SLUADMIN` jobs in "Running a DR Test" on page 20. The VLE appliance that you specify on the `STORMNGR` parameter is the VLE at the DR site (VLE1, in this scenario).

- You do not need to do anything to the VLE; it and the ACS are shared with the production environment.

- After the test, run the procedure in "Cleaning Up After a DR Test" on page 24.

Scenario 6: Production and Test Sites, VLE Only at Each Site

In Scenario 6, there is a single VTSS with a VLE attached at each site. The VTSS at the test site is **not** a spare and is used by the production site during normal operations. The output VTVs are always migrated immediately and duplexed to separate VMVCs, one in each VLE.

In this configuration, you must demand migrate to zero one or more VTSSs at the test site and vary these VTSSs offline to the production system, so testing can take over the required VTSS resources. In addition, one or more LPARs at the test site function as displaced production systems, running in parallel with the actual production systems. Both VLEs are online to the production system.

shows the system for Scenario 6 before running the `DRTEST` utility.
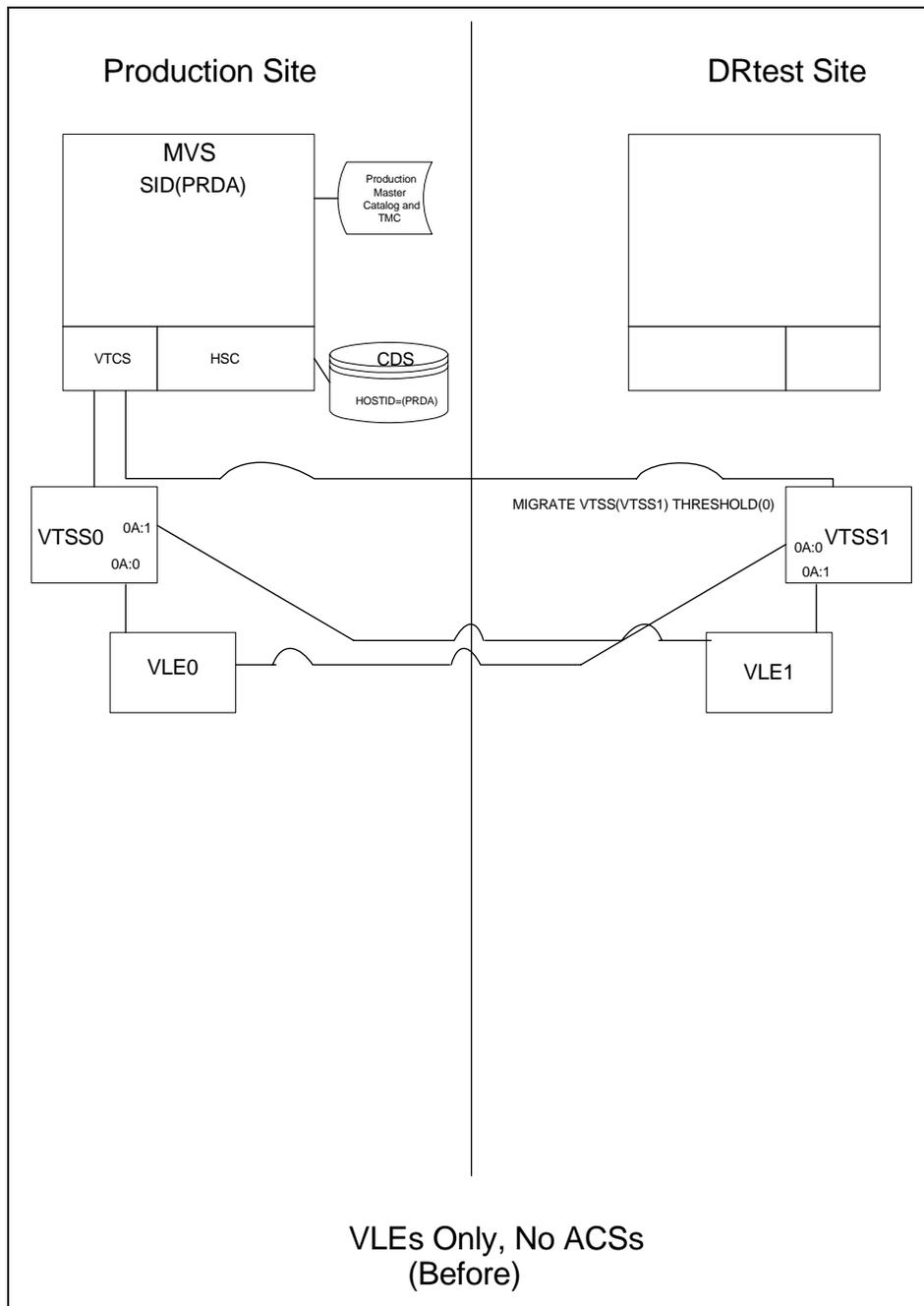
FIGURE 1-20 VLE Only Configuration - Before Running the DRTEST Utility

FIGURE 1-13 shows the system for Scenario 6 after running the DRTEST utility.

Production Site

MVS
SID(PRDA)

Production Master Catalog and TMC

COPY

DRtest Master Catalog and TMC

DRtest Site

VTCS   HSC

CDS

HOSTID=(PRDA)

DRTEST

DRtest CDS

HOSTID=(null,PRDA)

VTSS1 OFFLINE

VTSS0   0A:1

0A:0

0A:0   VTSS1

0A:1

VLE0

VLE0 INACCESSIBLE

VLE1

VLEs Only, No ACSs
(After)
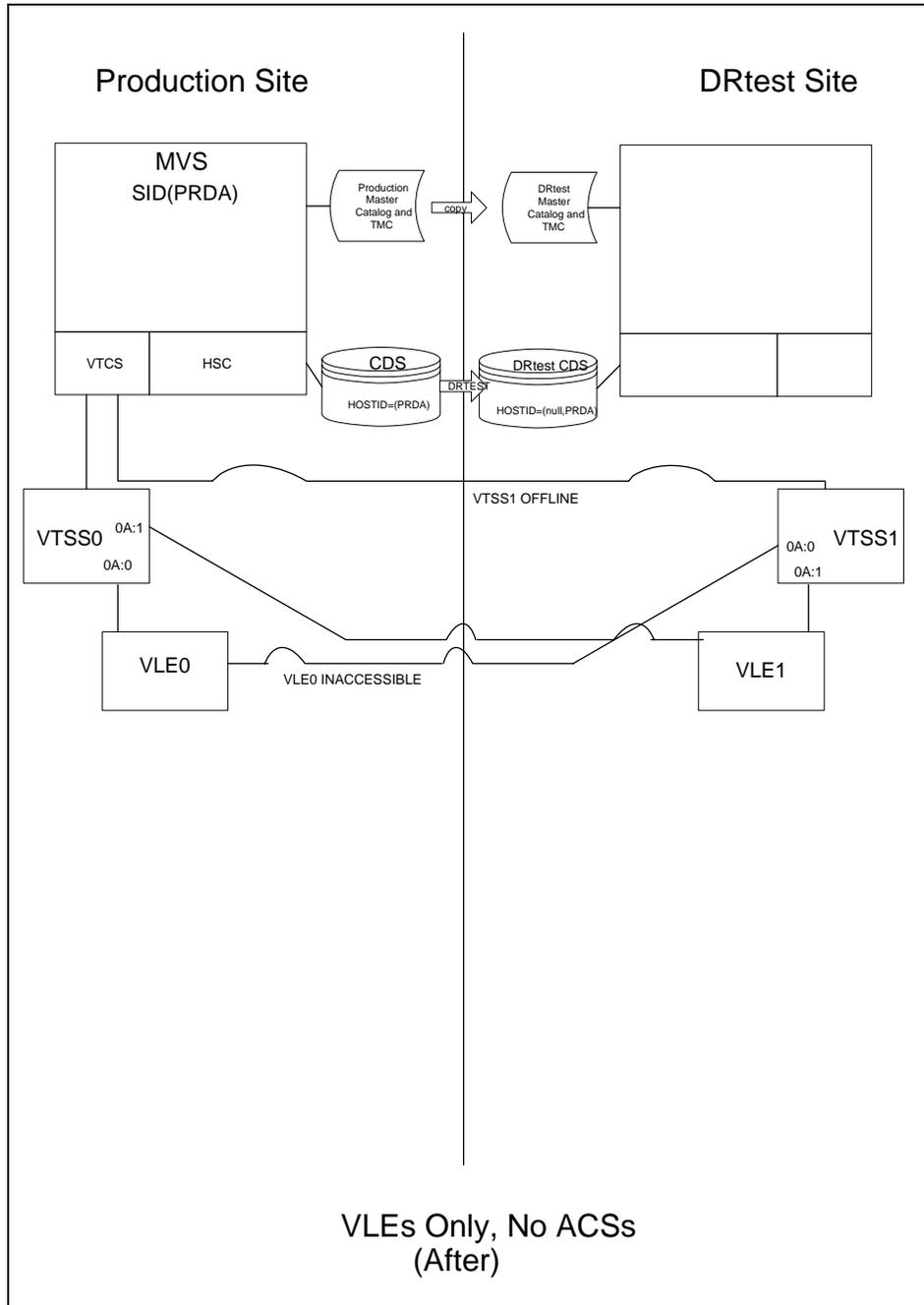
FIGURE 1-21 VLE Only Scenario- After Running the DRTEST Utility

Additional Operations for Scenario 6:

■ Before the test, optionally, migrate the spare VTSS(s) to zero or have your StorageTek CSE "clean" the VTSS.

Migrating to zero synchronizes the CDS with the "cleaned" state of the spare VTSS to suppress SLS6680E messages for VTV mounts. You can run VTCS `VTVRPT OPTION(UNAVAIL)` to ensure that all VTVs are migrated and are available to other VTSSs.

■ You must add the `STORMNGR` parameter to the `DRTEST PRIME` and `DRTEST CREATE SLUADMIN` jobs in "Running a DR Test" on page 20. The VLE appliance that you specify on the `STORMNGR` parameter is the VLE at the DR site (VLE1, in this scenario).

■ You do not need to do anything to the VLE; it is shared with the production environment.

■ After the test, run the procedure in "Cleaning Up After a DR Test" on page 24.

Scenario 7: Clustered VTSSs with Production and DR Test Sites

As shown in FIGURE 1-16 on page 41, in normal operations, Scenario 7 is a Clustered VTSS and VLE configuration used for DR, with Production and DR Test sites cross-connected to the Production and DR Test ACSs and VLEs. At the Production Site, `VTSS0` is the Primary, and `VTSS1` is the Secondary at the DR Test Site.

Using the secondary VTSS of a cluster as the DR test VTSS requires careful consideration in order to ensure that there are no unintended consequences during and after the DR test. Unintended consequences can include recall errors during the test and/or production data loss after the DR test is complete.

If the contents of VTSS1 change between the time that the DRTEST utility is executed to create the DRTEST CDS and the actual start of the test using the DRTEST CDS, error messages will be issued for VTVs that the DRTEST CDS indicates are resident in VTSS1 but no longer are resident. These messages are expected in this situation and do not indicate a failure. These messages can be prevented by migrating VTSS1 to zero before executing the DRTEST utility. This will synchronize the status of VTVs resident in VTSS1 with the CDS prior to the start of your DR test.

Preparing Your VTSS Cluster for a DR Test

In this section, you're making sure any in process replications from VTSS0 to VTSS1 are complete.

▼ To prepare your VTSS cluster for a DR test:

1. **Vary** `VTSS1` **to quiesced state:**

   `VARY VTSS1 QUIESCED`

   The objective here is to (gracefully) shut down replication to `VTSS1` so we can use it exclusively for the DR test.

2. **Monitor replication until it completes.**

   ...with `Display REPLicat`. Here, replication is still active:

   VTSS   HOST QDEPTH

   VTSS0 PRODUCTION   1

   You know replication is complete when you see this:

   VTSS   HOST QDEPTH

   VTSS0 PRODUCTION   0

3. **Cross check that replication is complete by checking the CLINK status...**

   ...with `Display CLINK`. Here, the CLINK is still active:

   VTSS CLINK STATUS USAGE   HOST

   VTSS0   7   ONLINE REPLICATING PRODUCTION

   VTSS0   8   ONLINE REPLICATING PRODUCTION

   You know the CLINK is no longer active when you see this:

   VTSS CLINK STATUS USAGE   HOST

   VTSS0   7   ONLINE FREE

   VTSS0   7   ONLINE FREE

4. **Vary** `VTSS1` **offline:**

   `VARY VTSS1 OFFLINE`

Production Site

MVS
SID(LOCAL)

Production
Master
Catalog and
TMC

DR Test Site

VTCS   HSC

CDS

HOSTID=(LOCAL,)

CLINK(7)
CLINK(8)

0A00-0A3F
Primary
VTSS0

0B00-0B3F
Secondary
VTSS1

VLE0

VLE1

LMU

LMU

R
T
D
s

ACS00

ACS01

R
T
D
s

Clustered VTSS and VLE Configuration
(Normal Operations)

FIGURE 1-22 Primary/Secondary Clustered VTSS and VLE Configuration - Normal Operations

.

What if you wanted to use the DR Test Site for testing? FIGURE 1-17 shows the system for Scenario 7 during the DR test.

Production Site

DR Test Site

MVS
SID(LOCAL)

Production Master Catalog and TMC

copy

DRtest Master Catalog and TMC

MVS
SID(REMOTE)

VTCS

HSC
MNTD FLOAT OFF
ACS01

Production CDS

HOSTID=(LOCAL)

DRTEST

DRtest CDS

HOSTID=(REMOTE)

HSC
MNTD FLOAT OFF

VTCS

CLINK(7)
CLINK(8)

0A00-0A3F

VTSS0

0B00-0B3F

VTSS1

VLE0

VLE1

LMU

LMU

R
T
D
s

ACS00

ACS01

R
T
D
s

Clustered VTSS and VLE Configuration
(During Test)

FIGURE 1-23 Primary/Secondary Clustered VTSS Configuration - During Test

DRTEST Utility

The DRTEST utility sets up the environment for DR testing and, optionally, starts and stops the test.

Syntax

```
►►──DRTEST───────────HOSTID(hostid1,hostid2,...hostidn)──────────────────────►

►──────────────────────────────────────────────────────────────────────────►
    └─DRVTSS(vtss1,vtss2,...vtssn)──────────────────────────────────►
                            └─SPARE(vtss1,vtss2,...vtssn)─┘

►──────────────────────────────────────────────────────────────────────────►
    ►───────────STORMNGR(plex1,plex2,...plexn)──────┘
►─DRACS(acsid1,acsid2...acsid16)────────────────────────────────────────────►

►──────────────────────────────────────────────────────────────────────────►◄
    └─START─┘      └─STOP─┘      └─RESET─┘
```
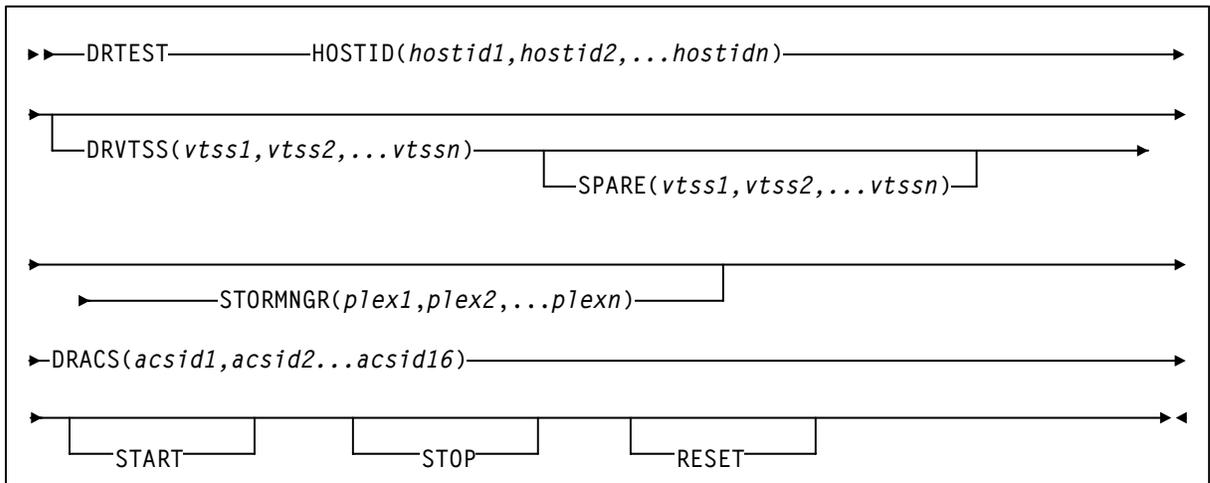
FIGURE 1-24 DRTEST utility syntax

Parameters

HOSTID (*hostid1,hostid2,...hostidn*)

Specifies the HOSTIDs replicated in the test CDS in available host-id positions. The combination of existing production HOSTIDs and those identified in this parameter for replication cannot exceed the 16 host limit. If an additional host-id (not used in production) needs to be added for DR test purposes alone, this additional host-id will use 2 of the 16 host-ids in the limit.

See for parameter use details.

DRVTSS (*vtss1,vtss2,...vtssn*)

Optionally, specifies the VTSS names available to the DR test site. Unless you specify these VTSSs as spares, the VTSSs are offline to the production site and online to the DR test site when the DR test starts.

SPARE(*vtss1,vtss2,...vtssn*)

Specifies that the DR test VTSS(s) are spares and that identically named VTSS(s) exist and are online at the production site when the DRTEST utility is run and during the DR test.

See for use details.

DRACS (*acsid1...acsid16*)

Specifies one or more ACSs available to the DR test site. Multiple ACS IDs must be specified as a list, and not as a range of ACS IDs. The ACSs are online to the DR test site but can remain connected (and usually are) to the production site when the DR test starts. CDRT Version 6.2 and above supports a maximum of 16 DR ACSs.

See for use details.

STORMNGR

Optionally, specifies the Subsystem Names of the ELS appliances attached to the DR test site TapePlex.

stormngr-list

the list of Subsystem names.

START

Starts the DR test on the production site.

Example Control Cards:

```
DRTEST START
```

START Requirements:

- HSC/VTCS must be active on the executing system.
- DR test should not be active. This refers to the production CDS status.
- SLSNEW DD statement(s) identifying the DRTEST CDS(s) are required.

START Options:

- SLSCNTL DD statement(s) identifying the production CDS are optional, but must match the active HSC/VTCS if used.

Note – START can be specified with other parameters (HOSTID, DRVTSS, DRACS, and SPARE) when creating the DR test CDS and starting the DR test at the same time.

STOP

Stops the DR test on the production site.

Example Control Cards:

`DRTEST STOP`

STOP Requirements:

- HSC/VTCS must be active on the executing system.
- SLSNEW DD statement(s) identifying the DRTEST CDS(s) are required.
- All test systems at the DR test site must be terminated.
- No other parameters are coded on the same control card with STOP.

STOP Options:

- SLSCNTL DD statement(s) identifying the production CDS are optional, but must match the active HSC/VTCS if used.

RESET

Removes all DR test settings in the production CDS.

Example Control Cards:

`DRTEST RESET`

RESET Requirements:

- HSC/VTCS can be either active on the executing system or not.
- DR test must not be active. This refers to the production CDS status.
- SLSNEW DD statement(s) identifying the DRTEST CDS(s) are optional.
- No other parameters are coded on the same control card with RESET.

RESET Options:

- SLSCNTL DD statement(s) identifying the production CDS are optional, but must match the active HSC/VTCS if used.

Usage

Use the `DRTEST` utility to set up the environment for DR testing and, optionally, to start and stop the test. You use the `SWUADMIN` program to run the `DRTEST` utility. You can also use the HSC `DRTEST` command to start or stop testing. For more information, see .

Starting the DR test sets a state in the production environment where certain HSC and VTCS system functions are inhibited. Before starting the test, you need to quiesce some ongoing HSC and/or VTCS processes. Starting systems with the DR test CDS also inhibits certain HSC and VTCS functions and assures the proper operating state for the DR test. For more information, see:

▼ Running DRTEST STOP and RESET in the Same Job

Example Control Cards:

```
DRTEST STOP
DRTEST RESET
```

DRTEST STOP and DRTEST RESET can be run in the same job with two control cards per the example above. Note that STOP must run before RESET. This combination requires:

- HSC/VTCS must be active.
- DR test should be active.
- SLSCNTL DD statement(s) identifying the production CDS are not allowed.
- SLSNEW DD statement(s) identifying the DRTEST CDS(s) are required.

▼ PRIMING the Production CDS

Example Control Cards:

```
DRTEST HOSTID(ZIPF,ZIPG) -
DRVTSS(VTSSW) -
DRACS(00)
```

The HOSTID, DRVTSS, DRACS and optionally the SPARE parameters are mutually inclusive. Running the DRTEST utility with a combination of these parameters is called PRIMING the production CDS. Until this PRIMING is done, DRTEST START cannot be run successfully. PRIMING requires:

- HSC/VTCS can be either active or not.
- DR test must not be active during PRIMING.
- SLSCNTL DD statement(s) identifying the production CDS are optional, but must match the active HSC/VTCS if used.
- SLSNEW DD statement(s) identifying the DRTEST CDS(s) are required.

▼ PRIMING the Production CDS and Running DRTEST START in the Same Job

Example Control Cards:

```
DRTEST HOSTID(ZIPF,ZIPG) -
DRVTSS(VTSSW) -
DRACS(00) START
```

The Production CDS can be primed and DR test started within the same job. This combination requires:

- HSC/VTCS must be active.
- DR test must not be active during priming.
- SLSCNTL DD statement(s) identifying the production CDS are not allowed.
- SLSNEW DD statement(s) identifying the DRTEST CDS(s) are required.

JCL Requirements

STEPLIB

  specifies the link library that contains the CDRT, HSC, and VTCS modules.

Note – The SWUADMIN program determines the HSC Primary CDS for both the production and test CDS as follows:

■ If your JCL **does not** specify the CDS and HSC is initialized, SWUADMIN queries HSC for the Primary CDS and SWUADMIN uses that CDS. The JCL examples in this chapter show this method.

■ If your JCL specifies all defined copies of the CDS, SWUADMIN queries these copies and uses the correct copy.

SLSCNTL

  specifies the current primary copy of the production HSC CDS.

SLSCNTL2

  specifies the current secondary copy of the production HSC CDS.

SLSSTBY

  specifies the current standby copy of the production HSC CDS.

SLSNEW1

  specifies the new primary copy of the test HSC CDS.

SLSNEW2

  specifies the new secondary copy of the test HSC CDS.

SLSNEW3

  specifies the new standby copy of the test HSC CDS.

SLSJRN00 – SLSJRN*nn*

  DDNAMEs for the DR test journal files, which are only valid if the current CDS defines journaling. There are two files per HOSTID: SLSJRN00 and SLSJRN01 for *hostid1*, SLSJRN02 and SLSJRN03 for *hostid2*, and so forth).

SLSSTATN

  DDNAME for LMU station address changes for HOSTIDs. This file is optional, and if not supplied the same station addresses are used in the DR test CDS for the HOSTIDs as in the existing CDS.

  Each entry follows the HSC SET SLISTATN utility format; for more information, see *HSC/MVS System Programmer's Guide*. FIGURE 1-25 shows an example of the SLSSTATN file.

```
SET SLISTATN(00E7,00E8),FORACS(01),FORHOST(PRIT)
SET SLISTATN(00E7,00E8),FORACS(01),FORHOST(PRI1)
SET SLISTATN(00E7,00E8),FORACS(01),FORHOST(PRI2)
SET SLISTATN(00E7,00E8),FORACS(01),FORHOST(PRIY)
```

FIGURE 1-25 SLSSTATN File Example

SLSVTSS

DDNAME for VSM changes on the DR test CDS. This file is optional and is only used if the
DR test configuration includes VSM elements. Typically, this file is used to change RTD
hardware connection definitions in the DR test CDS but may be used to modify any VSM
definitions on the DR test CDS because the file invokes the VTCS CONFIG RESET utility.
Note that improper use of CONFIG RESET against the DR test CDS may render the DR test
environment inoperable!

Each entry follows the format of the VTSS, VTD, RTD, and HOST statements of the VTCS
CONFIG utility; for more information, see *VTCS Installation, Configuration, and
Administration Guide*. FIGURE 1-26 shows an example of the SLSVTSS file.

```
CONFIG RESET

VTSS             NAME=VTSS01  LOW=70 HIGH=80
MAXMIG=1  MINMIG=1 RETAIN=10
                 RTD NAME=VTS18800 DEVNO=8800
CHANIF=0A
                 RTD NAME=VTS18801 DEVNO=8801
CHANIF=0I
                 RTD NAME=VTS18802 DEVNO=8802
CHANIF=1A
                 RTD NAME=VTS18803 DEVNO=8803
CHANIF=1I
                 HOST NAME=MVS1
                 VTD LOW=8900 HIGH=893F
 VTSS            NAME=VTSS02  LOW=70 HIGH=80
MAXMIG=8 MINMIG=8 RETAIN=10
                 RTD NAME=VTS28805 DEVNO=8805
CHANIF=0A
```

FIGURE 1-26 SLSVTSS File Example

SLSOUT

specifies the destination for the SWUADMIN processing messages.

SLSIN

specifies the input to the SWUADMIN program (DRTEST utility name and parameters).

JCL Example

FIGURE 1-27 shows example JCL to run the `DRTEST` utility to only set up the environment for DR testing. It assumes that HSC is up because no `SLSCNTL` DD statement is present.

```
//JOBNAME          job
//STEP1               EXEC PGM=SWUADMIN,PARM=
'MIXED'
STEPLIB            DD
hlq.SWUrelease.SWULINK,DISP=SHR
//                 DD
hlq.SWSrelease.SWSLINK,DISP=SHR
//                 DD
hlq.SOSrelease.SLSLINK,DISP=SHR
//SLSNEW1          DD DSN=
NEW.VSMLMULT.DBASEPRM,DISP=SHR
//SLSSTATN         DD DSN=
HSC.STATION.CHANGES,DISP=OLD
//SLSVTSS          DD DSN=
VTCS.VTSS.CHANGES,DISP=OLD
//SLSPRINT         DD SYSOUT=*
//SLSIN            DD *
  DRTEST         HOSTID(MVS1,MVS2) -
                 DRVTSS(VTSS01,VTSS02) -
                 SPARE -
                 DRACS(01)
```

FIGURE 1-27 `DRTEST` utility example: setting up the test environment

DRTEST Command

Use the HSC `DRTEST` command to start or stop DR testing.

Syntax

```
►►──────DRTEST──────────┬──START──┬──────────────────────────────────►◄
                        └──STOP───┘
```
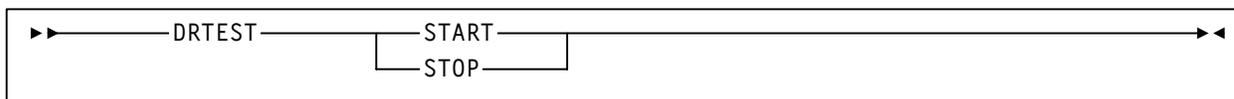
Parameters

`START`

Starts the DR test on the production site. `START` requires that an active HSC system is up on the executing system.

`STOP`

Stops the DR test on the production site. `STOP` requires:

- An active HSC system is up on the executing system.
- All test systems at the DR test site must be terminated.

Use the HSC `DRTEST` command to start or stop DR testing. The `DRTEST` command is valid only if you have already set up the DR test environment. For more information, see "DRTEST Utility" on page 55.

Note – `DRTEST` is an HSC command, which consists of the HSC command prefix character followed immediately by a command name and required or optional positional parameters and keyword parameters. For example, to stop DR testing, enter the following:

```
.DRTEST STOP
```

For more information about the rules governing commands, refer to Chapter 2, "Commands, Control Statements, and Utilities," in *HSC Operator's Guide for MVS*.

Example

To start DR testing, enter the following:

```
.DRTEST START
```

Messages

SLS6019E

HSC version incompatible with DR test

Explanation. An attempt to start the HSC failed because its version or release level conflicts with the DR test environment. The CDS indicates there is either an active DR test or the CDS is the DR test CDS.

System Action. HSC initialization terminates.

User Response. Only HSC 5.0 and above systems can participate in a DR test. Either terminate the DR test or start an HSC on this host at 5.0 or above.

SLS6020I

ASCOMM failure for DRTEST {START|STOP}, RC=$XXXXXXXX$

Explanation. A DRTEST request was sent to the HSC via the Address Space Communications Service (ASCOMM), but that component failed with a return code of $XXXXXXXX$.

System Action. The DRTEST request fails.

User Response. Look up the ASCOMM return code in the *HSC Messages and Codes* manual to try to determine the cause for the failure. If unable to remedy the error, contact StorageTek Software Support.

SLS6021I

DRTEST {START|STOP} error: $CCCC...CCCC$:

Explanation. A DRTEST request was sent to the HSC but an error condition was detected that prevented the request from being performed. $CCCC...CCCC$ details the reason for the error and is one of the following:

- Unrecognized DR test request
- DR test environment not established (execute SWUADMIN Utility)
- DR test request not permitted (or required) from DR test site
- DR test already active
- DR test not active
- DR test request requires VTCS to be active
- Non-spare DR test VTSS not offline
- CAP(s) in the DR test ACS found active
- CAP(s) in the DR test ACS in automatic mode
- Hosts found active at HSC release < 5.1
- Not all hosts adapted the DR test state

System Action. The DRTEST request fails.

User Response. The explanations above are fairly self-explanatory. You must run the SWUADMIN DRTEST function to prepare the production CDS before a DR test START or STOP request can be issued. All CAPs in the DR test ACS must be idle and in manual mode during a DR test. VTCS must be up and the DR test VTSS(s) varied offline to the production site.

The DR test facility is only available on HSC systems 5.0 and above. If the message indicates down-level hosts are active, they must be stopped before a DR test START request can be issued. If all active HSC systems are at 5.0 and above, but the message indicates there are still down-level hosts active, then it is likely that these systems were cancelled instead of stopped. Do an HSC DISPLAY CDS command and look for the active system(s) below 5.0. Then run the HSC SLUADMIN SET utility specifying HSCLEVEL(OFF) for any inactive down-level hosts and then reissue the DR test START request.

SLS6022I

DRTEST {START|STOP} successful. A DRTEST START or STOP request was sent to the HSC and completed successfully.

System Action. The HSC continues processing. If a DR test was started, some operational restrictions are now in effect such as: CAPs in the DR test ACS must remain in manual mode, certain Moves, Enters or Ejects, Audits, Scratch Updates or Redistributions, Varying ACSs or Stations Online, or setting FLOAT(ON) or EJCTAUTO(ON) may be rejected. If a DR test was stopped, normal production operation without the above operational restrictions continues.

User Response. None.

SLS6023I

Cannot set {FLOAT(ON)|EJCTAUTO(ON)} for ACS *XX*, DR test active

Explanation. A MNTD command or control statement specified setting FLOAT(ON) or EJCTAUTO(ON) but this could not be performed for ACS *XX* because it conflicts with an active DR test.

System Action. The HSC continues processing. The requested MNTD option cannot be set until the DR test is terminated.

User Response. Wait until the DR test is terminated before attempting to set the MNTD option on a production site HSC. The requested MNTD option can never be set from a DR test site HSC.

SLS6024I

{CAPPREF AUTO|ENTER|EJECT|MOVE|SCREDIST|VARY ONLINE} rejected for {CAP *XX*:*XX*:*XX*|ACS *XX*|STATION *XXXX*}, DR test active

Explanation. A CAPPREF, ENTER, EJECT, MOVE or VARY command, or a EJECT, MOVE, or SCREDIST utility function was requested but could not be performed because it conflicts with an active DR test. The CAP, ACS, or STATION where the function was not permitted is identified.

System Action. The HSC continues processing. The requested function cannot be performed until the DR test is terminated.

User Response. Wait until the DR test is terminated before attempting to perform the requested function on a production site HSC. The requested function can never be performed from a DR test site HSC.

SLS6025I

{AUDIT|EJECT|MOVE|SCRATCH UPDATE|SCRATCH REDISTRIBUTION} Utility not permitted, DR test active

Explanation. An HSC SLUADMIN Audit, Eject, Move, Scratch Update, or Scratch Redistribution utility function was requested but could not be performed because it conflicts with an active DR test.

System Action. The utility function terminates.

User Response. Wait until the DR test is terminated before attempting to execute the SLUADMIN utility function on a production site HSC. The utility function can never be performed from a DR test site HSC.

SLS6026I

DR test {started|not started|stopped|not stopped} {successfully| unsuccessfully} on {host *CCCCCCCC*|all hosts}

Explanation. A DRTEST request was sent to an active HSC system. This message tells of the success or failure to set the DR test state on a particular host (*CCCCCCCC*) or for all hosts (from the controlling HSC).

System Action. The HSC continues processing.

User Response. If the message indicates the DR test was started or stopped successfully on all hosts, then continue with the DR test as desired. If the DR test state is not started or stopped successfully on a particular host, then investigate the cause on that host, possibly recycle the HSC there. If you are unable to remedy the problem, contact StorageTek Software Support.

SLS6030E

Cannot create new {CDS|JOURNAL} DDNAME *CCCC...CCCC1*; *CCCCCCCC2*

Explanation. An attempt to create a DR test data set, *CCCC...CCCC1*, with the SWUADMIN utility has failed because the data set is either unknown or unsuitable for use as a CDS copy or journal data set. *CCCCCCCC2* is one of the following reasons:

- Invalid BLKSIZE (the BLKSIZE must be 4096)
- Invalid DSORG (the DSORG must be PS)
- More than one extent
- Invalid UCB type (the data set must reside on a DASD)
- Could not obtain VTOC info

System Action. The SWUADMIN utility terminates.

User Response. When attempting to create the DR test data set, make sure that the data set was specified correctly on the SWUNEWx or SLSJRNXX DD statement. If the reason was "Could not obtain VTOC info", then it is likely that the DSN= parameter (or VOL=SER= parameter for uncataloged data sets) was either missing or incorrectly specified. For all other reasons, if the DSN= parameter specified the correct data set, then the data set is unsuitable for use as a CDS copy or journal data set; reallocate a new data set with the proper attributes and re-execute the SWUADMIN utility.

SLS6031E

New CDS *CCCC...CCCC* is of insufficient size; capacity is *DDD1* blocks, required capacity is *DDD2* blocks

Explanation. An attempt to create a DR test CDS data set, *CCCC...CCCC*, with the SWUADMIN utility has failed because the data set is not big enough. It can contain only *DDD1* 4096-byte blocks but the DR test CDS requires at least *DDD2* blocks.

System Action. The SWUADMIN utility terminates.

User Response. Reallocate a larger new CDS data set and re-execute the SWUADMIN utility.

SLS6032E

BSAM Open failed for new CDS *CCCC...CCCC*

Explanation. An attempt to create a DR test CDS data set, *CCCC...CCCC*, with the SWUADMIN utility has failed during its initialization process. A BSAM Open operation failed.

System Action. The SWUADMIN utility terminates.

User Response. Look for other error messages from BSAM that might help isolate the error. If the error cannot be resolved, contact StorageTek Software Support.

`SLS6033E`

BSAM Write failed for new CDS *CCCC...CCCC*, block *DDDD*

Explanation. An attempt to create a DR test CDS data set, *CCCC...CCCC*, with the SWUADMIN utility has failed during its initialization process. A BSAM Write operation failed writing block number *DDDD*.

System Action. The SWUADMIN utility terminates.

User Response. Look for other error messages from BSAM that might help isolate the error. If it is a permanent I/O error, delete and reallocate a new CDS data set and re-execute the SWUADMIN utility. If the error cannot be resolved, contact StorageTek Software Support.

`SLS6034E`

Copy of CDS *CCCC...CCC1* to CDS *CCCC...CCC2* failed UBSMIO RC=*XXXX*

Explanation. An attempt to copy a DR test CDS data set, *CCCC...CCC1*, to a CDS copy, *CCCC...CCC2* by the SWUADMIN utility has failed in the UBSMIO subroutine with a return code *XXXX*.

System Action. The SWUADMIN utility terminates.

User Response. Look for other error messages from BSAM that might help isolate the error. If it is a permanent I/O error, delete and reallocate a CDS copy and re-execute the SWUADMIN utility. If the error cannot be resolved, contact StorageTek Software Support.

`SLS6035E`

Non zero return code from UDB macro; function is *CCCCCCCC*, RC=*XXXX*

Explanation. A UDB macro was issued for a CCCCCCCC function against the CDS and received a non zero return code XXXX. This indicates that the SWUADMIN utility has failed during it's initialization process.

System Action. The SWUADMIN utility terminates.

User Response. Message SLS6035E is preceded by message SLS2184I giving a more detailed explanation of the error condition. If the error cannot be resolved, contact StorageTek Software Support.

`SLS6036E`

RESET not allowed: *CCCC....CCCC*

Explanation. An attempt to `RESET` the CDRT flags in a CDS via the `SLUADMIN` utility was disallowed. *CCCC....CCCC* details the reason for the error and is one of the following:

■ Cannot reset DR test CDS
■ DR test is active

System Action. The SWUADMIN utility terminates.

User Response. RESET is used to remove all CDRT flags in a production CDS set by a previous execution of the SWUADMIN utility. It is not used against a DR test CDS. RESET cannot be performed if a DR test is active. Wait until the DR test is terminated before attempting to RESET the production CDS.

SLS6037I

Journal *CCCC...CCCC1* formatted

Explanation. The SWUADMIN utility has formatted a DR test Journal data set, *CCCC...CCCC1*.

System Action. The SWUADMIN utility continues.

User Response. None.

SLS6038E

Insufficient number of SLSJRNxx DD statements for number of DR Host IDs

Explanation. An attempt to create the required DR test Journal data sets with the SWUADMIN utility has failed because there were an insufficient number of SLSJRNxx DD statements for the SWUADMIN utility job.

System Action. The SWUADMIN utility terminates.

User Response. There needs to be two Journal data sets per DR host defined in the SWUADMIN jobstep. These should be SWUJRN00 and SWUJRN01 for the first host id, SWUJRN02 and SWUJRN03 for the second host id, etc. Allocate the proper number of Journal data sets, specify the correct SWUJRNxx DD statements, and re-execute the SWUADMIN utility.

SLS6039E

CAP *AA:LL:CC* not in MANUAL mode or not IDLE

Explanation. An attempt to create the DR test environment with the SWUADMIN utility has failed because of the CAP status in the production HSC environment.

System Action. The SWUADMIN utility terminates.

User Response. All CAPs in the DR test ACS must be in Manual mode and idle. Issue a DISPLAY CAP command from an active HSC system. If a CAP in the DR test ACS is active, stop the Enter or Eject operation from the controlling HSC. If a CAP in the DR test ACS is in Automatic mode, use the CAPPREF command to set the CAP to manual mode. Then re-execute the SWUADMIN utility.

SLS6041E

Addition of HOSTID will exceed Data Base maximum of 16

Explanation. An attempt to create the DR test environment with the SWUADMIN utility has failed because of the number of host ids specified on the HOSTID parameter of the DRTEST control statement.

System Action. The SWUADMIN utility terminates.

User Response. The number HOSTID host ids plus the current number of host ids in the production HSC environment cannot exceed 16. Consider reducing the number of HOSTID host ids specified for the DR test environment. If then number of hosts in the production HSC environment is already at the maximum (16), consider re-generating the CDS with fewer host ids. Then re-execute the SWUADMIN utility.

SLS6042E

{HOSTID *CCCCCCCC*|DRACS *AA*|DRVTSS *CCCCCCCC*}not found in Data Base

Explanation. An attempt to create the DR test environment with the SWUADMIN utility has failed because one of the following, specified on the DRTEST control statement did not exist in the current CDS:

- The host id, *CCCCCCCC*, specified on the HOSTID parameter
- The ACS id, *AA*, specified on the DRACS parameter
- The VTSS name, *CCCCCCCC*, specified on the DRVTSS parameter

System Action. The SWUADMIN utility terminates.

User Response. All HOSTID host ids must exist in the current production HSC/VTCS CDS. If the HOSTID host id was incorrectly specified, correct the specification and re-execute the SWUADMIN utility. If the HOSTID host id does not exist in the production CDS, add it with the HSC SLUADMIN SLUSET utility function. Similarly, the ACS ID and VTSS names must exist in the production
ACS. If either of these were incorrectly specified, correct the error. Then re-execute the SWUADMIN utility.

SLS6043I

Cannot create DRTEST CDS; DR test is active

Explanation. An attempt to create the DR test environment with the SWUADMIN utility has failed because the utility has detected an active DR test.

System Action. The SWUADMIN utility terminates.

User Response. Stop the current DR test; issue the DRTEST STOP command and re-execute the SWUADMIN utility.

SLS6044I

DRTEST START/STOP parameter requires HSC to be active on this system

Explanation. An attempt to start or stop the DR test with the SWUADMIN utility has failed because the HSC is currently not active on this system.

System Action. The SWUADMIN utility terminates without starting or stopping the DR test.

User Response. The HSC (and VTCS) must be active on the system where the DRTEST START or STOP is issued. When the HSC is active, consider using the HSC DRTEST command to start of stop the DR test. If you desire to create the DR test environment and start the DR test in one operation from the SWUADMIN utility, then assure that the HSC and VTCS are both fully initialized on the system and re-execute the SWUADMIN utility.

SLS6046I

SWUADMIN must run AUTHORIZED for DRTEST function

Explanation. An attempt execute the DRTEST function of the SWUADMIN utility has failed because its program libraries were not authorized.

System Action. The SWUADMIN utility terminates.

User Response. The SWUADMIN program libraries (JOBLIB or STEPLIB) must be authorized to run the DRTEST function. Authorize these libraries per your local practice and re-execute the SWUADMIN utility.

```
SLS6047I
```

SLSCNTL/SLSCNTL2/SLSSTBY DD statements cannot be supplied with the START/STOP request.

Explanation. An attempt to start or stop the DR test with the SWUADMIN utility has failed because one or more of the DD statements defining the current HSC CDS were supplied with the utility JCL.

System Action. The SWUADMIN utility terminates.

User Response. The HSC (and VTCS) must be active on the system where the DRTEST START or STOP is issued. The CDS identities, if required to create the DR test environment, are acquired from the active HSC. If you desire to create the DR test environment and start the DR test in one operation from the SWUADMIN utility, then assure that the HSC and VTCS are both fully initialized, remove the SLSCNTL/SLSCNTL2/SLSSTBY DD statements and re-execute the SWUADMIN utility. If you only desire to start or stop the DR test, then consider using the HSC DRTEST command, or just remove the SLSCNTL/SLSCNTL2/SLSSTBY DD statements and re-execute the SWUADMIN utility.

```
SLS6048I
```

Dataset not available for ddname {SLSCNTL|SLSCNTL2|SLSSTBY}

Explanation. During an execution of the SWUADMIN utility, an attempt to dynamically allocate one of the ddnames of the CDS with an active HSC failed. If the ddname is SLSCNTL2 or SLSSTBY, this is not an error if the HSC has only one or two copies of the CDS. SWUADMIN always attempts to allocate all three ddnames.

System Action. If the ddname is SLSCNTL, the SWUADMIN utility also issues message SLS6049I and terminates. For other ddnames SWUADMIN continues.

User Response. If the ddname refers to a legitimate CDS copy, this is an error. Some other system may have that CDS copy allocated for exclusive use. Determine that process, halt it and re-execute the SWUADMIN utility.

`SLS6049I`

SLSCNTLx specifications do not match SLSNEWx specifications

Explanation. An attempt to create the DR test environment with the SWUADMIN utility has failed because the current HSC CDS configuration does not match that for the supplied SLSNEWx DD statements.

System Action. The SWUADMIN utility terminates.

User Response. The number of CDS copies in the DR test CDS must be the same as the number of copies of the current HSC CDS. If the current HSC CDS has a shadow and standby copy, then SLSNEW1, SLSNEW2, and SLSNEW3 DD statements must be supplied in the SWUADMIN JCL. Determine the number of current CDS copies and supply the proper number of SLSNEWx DD statements and re-execute the SWUADMIN utility.

`SLS6088I`

Cartridge /volser/ entered into LSMid AA:LL on DRTEST host, Audit ACS or Eject cartridge after DRTEST.

Explanation. Volume serial number /volser/ is entered into the library. Its location is within the specified ACS and LSM.

System Action. The cartridge is entered into a Disaster Recovery (DR) ACS, its volume serial number optically verified,and it is moved to its new location.

User Response. After the completion of the Disaster Recovery test, either audit the DR ACS or eject the cartridge.

Additional Information

Oracle Corporation (Oracle) offers several methods for you to obtain additional information.

Oracle's External Web Site

Oracle's external Web site provides marketing, product, event, corporate, and service information. The external Web site is accessible to anyone with a Web browser and an Internet connection. The URL for the Oracle external Web site is: http://www.oracle.com/us/index.html

The URL for Oracle's StorageTek storage information is:

http://www.oracle.com/us/products/servers-storage/storage/index.html

Oracle's StorageTek Documentation

The URL for Oracle's StorageTek documentation is:

http://docs.sun.com/app/docs

Oracle Global Partners

The Oracle Global Partners site provides information about solutions available with Oracle's partners:

http://www.oracle.com/partners/index.html

Third-Party Web Sites

Oracle is not responsible for the availability of third-party web sites mentioned in this document. Oracle does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Oracle will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Oracle's Global Offices

You may contact any of Oracle's worldwide offices to discuss complete storage, service, and support solutions for your organization. You can find contact information at: http://www.oracle.com/corporate/contact/global.html

Customer Support

For more information about Oracle support (including for StorageTek branded products) see: http://www.oracle.com/us/support/index.html

Conventions for Reader Usability

Conventions are used to shorten and clarify explanations and examples within this book.

Typographic

The following typographical conventions are used in this book:

- **Bold** is used to introduce new or unfamiliar terminology.
- Letter Gothic is used to indicate command names, filenames, and literal output by the computer.
- Letter Gothic Bold is used to indicate literal input to the computer.
- *Letter Gothic Italic* is used to indicate that you must substitute the actual value for a command parameter. In the following example, you would substitute your name for the "username" parameter.
- Logon *username*
- A bar (|) is used to separate alternative parameter values. In the example shown below either username or systemname must be entered.
- Logon *username|systemname*
- Brackets [ ] are used to indicate that a command parameter is optional.
- Ellipses (...) are used to indicate that a command may be repeated multiple times.
- The use of mixed upper and lower case characters (for non–case sensitive commands) indicates that lower case letters may be omitted to form abbreviations. For example, you may simply enter **Q** when executing the **Quit** command.

Keys

Single keystrokes are represented by double brackets [[ ]] surrounding the key name. For example, press [[ESC]] indicates that you should press only the escape key.

Combined keystrokes use double brackets and the plus sign (+). The double brackets surround the key names and the plus sign is used to add the second keystroke. For example, press [[ALT]] + [[C]] indicates that you should press the alternate key and the C key simultaneously.

Enter Command

The instruction to "press the [[ENTER]] key" is omitted from most examples, definitions, and explanations in this book.

For example, if the instructions asked you to "enter" **Logon pat**, you would type in **Logon pat** *and* press [[ENTER]].

However, if the instructions asked you to "type" **Logon pat**, you would type in **Logon pat** and you would *not* press [[ENTER]].

Warnings, Cautions, and Notes - Software

The following are used in software documentation.

Caution – Information necessary to keep you from corrupting your data.

Tip – Information that can be used to shorten or simplify your task or they may simply be used as a reminder.

Note – Information that may be of special interest to you. Notes are also used to point out exceptions to rules or procedures.

Warnings, Cautions, and Notes - Hardware

The following are used in hardware documentation.

Note – A note provides additional information that is of special interest. A note might point out exceptions to rules or procedures. A note usually, but not always, follows the information to which it pertains.

Caution – A caution informs you of conditions that might result in damage to hardware, corruption of data, or corruption of application software. A caution always precedes the information to which it pertains.

Warning – Possible Physical Injury. A warning alerts you to conditions that might result in long-term health problems, injury, or death. A warning always precedes the information to which it pertains.

Syntax

Syntax flow diagram conventions include the following:

Flow Lines—Syntax diagrams consist of a horizontal baseline, horizontal and vertical branch lines and the command text. Diagrams are read left to right and top to bottom. Arrows show flow and direction.

```
►►─── COMMAND NAME ──┬── item 1 ──┬─────────────────────────────◄┤
                     ├── item 2 ──┤
                     └── item 3 ──┘
```
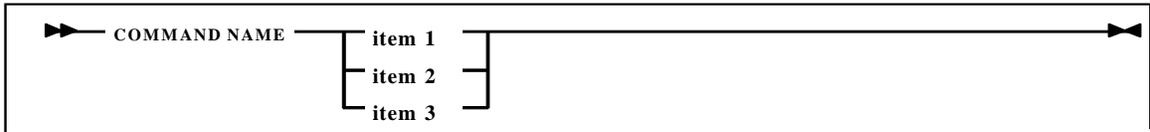
Single Required Choice—Branch lines (without repeat arrows) indicate that a single choice must be made. If one of the items to choose from is on the baseline of the diagram, one item must be selected.

```
►►──┬── item 1 ──┬──────────────────────────────────────────────◄┤
    ├── item 2 ──┤
    └── item 3 ──┘
```

Single Optional Choice—If the first item is on the line below the baseline, one item may optionally be selected.

```
►►──────────────────────────────────────────────────────────────◄┤
    ├── item 1 ──┤
    ├── item 2 ──┤
    └── item 3 ──┘
```
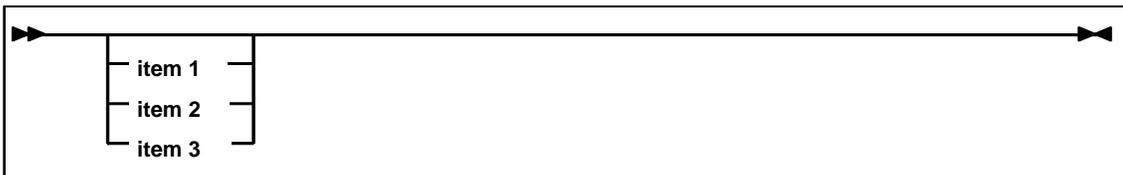
Defaults—Default values and parameters appear above the baseline.

```
        ┌── Default ──┐
►►──────┴─────────────┴──────────────────────────────────────────◄┤
```
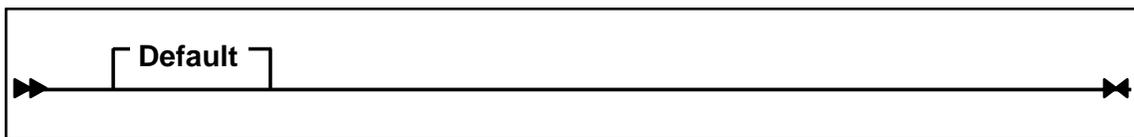
Repeat Symbol—A repeat symbol indicates that more than one choice can be made or that a single choice can be made more than once. The repeat symbol shown in the following example indicates that a comma is required as the repeat separator.

```
         ┌──────,──────┐
►►───────▼── variable ──┴─────────────────────────────────────────◄┤
```
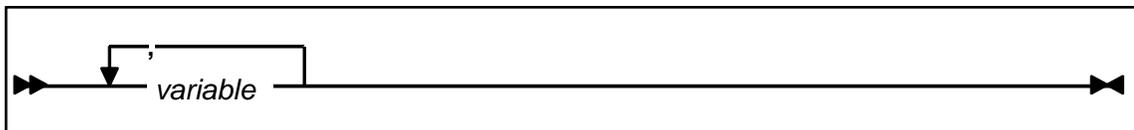
Keywords—All command keywords are shown in all upper case or in mixed case.   When commands are not case sensitive, mixed case implies that the lowercase letters may be omitted to form an abbreviation.

Variables—Italic type is used to indicate a variable.

Alternatives—A bar (|) is used to separate alternative parameter values.

Optional—Brackets [ ] are used to indicate that a command parameter is optional.

Delimiters—If a comma (,), a semicolon (;), or other delimiter is shown with an element of the syntax diagram, it must be entered as part of the statement or command.

Ranges—An inclusive range is indicated by a pair of elements of the same length and data type, joined by a dash. The first element must be strictly less than the second element.

```
►►──┬─ items 1-3 ─┬──────────────────────────────────────────────────────►◄
    ├─ items 4-6 ─┤
    └─ items 7-9 ─┘
```
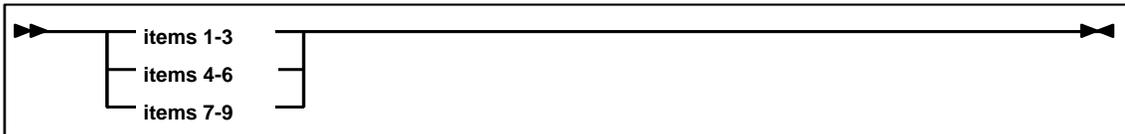
Lists—A list consists of one or more elements. If more than one element is specified, the elements must be separated by a comma or a blank and the entire line must be enclosed by parentheses.

```
►►──┬─ (items 1,2) ─┬─────────────────────────────────────────────────────►◄
    ├─ (items 4,5) ─┤
    └─ (items 6,7) ─┘
```