



StorageTek™ Nearline Control Solution Software

Concurrent Disaster Recovery Test Guide

CRC Update Only
Revision B
Version 6.2



NCS™

Concurrent Disaster Recovery Test Guide

CRC Update Only

Version 6.2

Sun Microsystems, Inc.
www.sun.com

CRC Update Only
November 2007

Submit comments about this document to: SLSFS@Sun.com

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Adobe PostScript

Revision History

EC	Date	Description
132819	November 2007	Revision B

Preface

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)

Organization of This Publication

This table provides a general overview of the sections in this publication.

[“Using the Concurrent
Disaster Recovery Test
Software” on page 1](#)

CDRT Usage and Reference Information

What’s New in This Guide?

Revision B, which requires PTF L1H13ZB, removes the restriction against enters and ejects during a DR test. For more information, see:

- [“Restrictions that The CDRT Software Enforces” on page 3.](#)
- [“Restrictions that You Must Enforce” on page 4](#)

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 [[AL]] + [[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

The following are used in this book.

Warning. Information necessary to keep you from damaging your hardware or software.

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

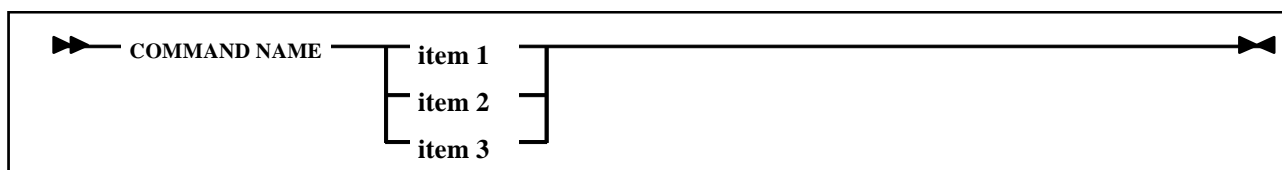
Tip – Information that can be used to shorten or simplify your task or they may simply be used as a reminder.

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

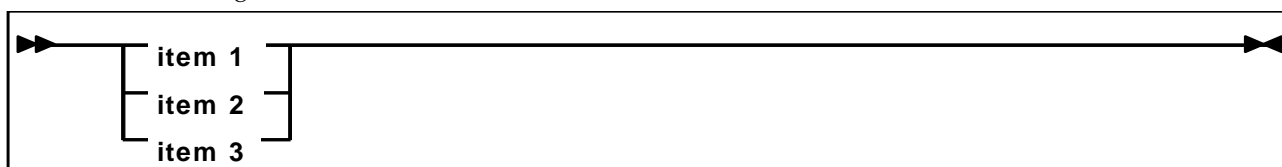
Syntax

Syntax flow diagram conventions include the following:

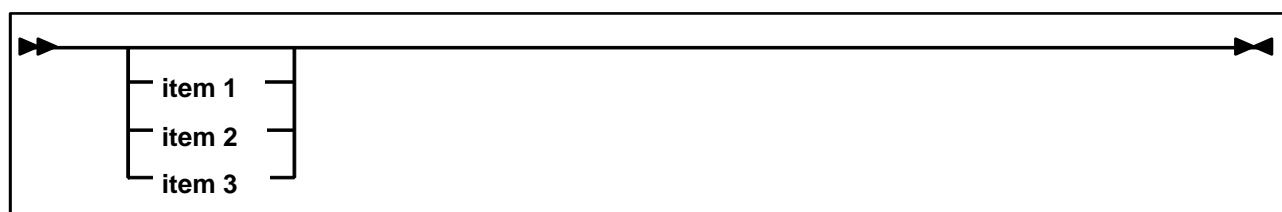
Flow Lines—Syntax diagrams consist of a horizontal baseline, horizontal and vertical branch lines and the command text. Diagrams are read left to right and top to bottom. Arrows show flow and direction.



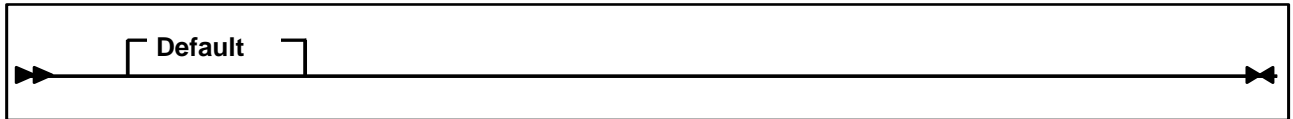
Single Required Choice—Branch lines (without repeat arrows) indicate that a single choice must be made. If one of the items to choose from is on the baseline of the diagram, one item must be selected.



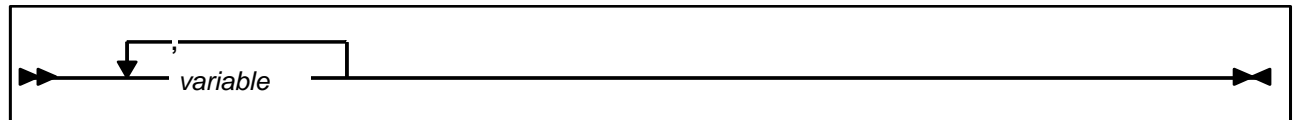
Single Optional Choice—If the first item is on the line below the baseline, one item may optionally be selected.



Defaults—Default values and parameters appear above the baseline.



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.



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.

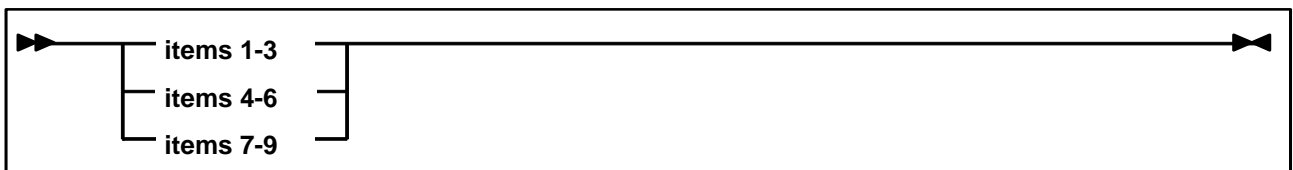
Variables—Italic type is used to indicate a variable.

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

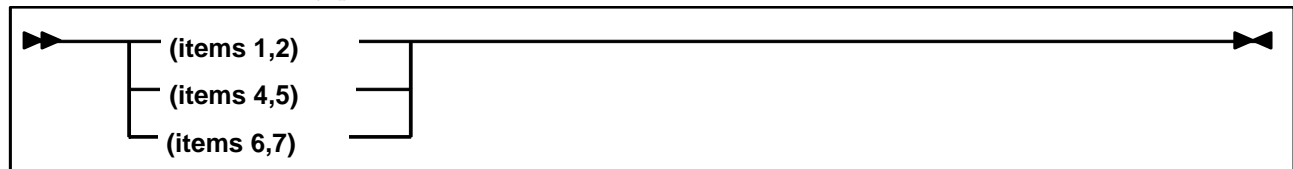
Optional—Brackets [] are used to indicate that a command parameter is optional.

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.



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.



Related Publications

The following publications provide additional information about VSM and StorageTek's Automated Cartridge System software and hardware.

NCS/VTCS

- *Introducing VSM*
- *NCS/VTCS XML Guide*
- *NCS Installation Guide*

VTCS and VSM

The VTCS and VSM documentation set consists of the following:

- *Installing and Configuring VTCS*
- *Managing VTCS*
- *Beyond the Basics: VTCS Leading Edge Techniques*
- *VTCS Command and Utility Reference*
- *VTCS Messages and Codes*
- *VTCS Quick Reference*
- *The VTCS Information CD-ROM, which contains PDF file formats of the preceding publications*

VTSS

- *Virtual Storage Manager Planning, Implementation, and Usage Guide*
- *Virtual Storage Manager Physical Planning Guide*
- *VTSS Installation Guide*

HSC

- *Configuration Guide*
- *Operator's Guide*
- *System Programmer's Guide*
- *Messages and Codes*
- *System Programmer's Reference Summary*
- *Operator's Reference Summary*

SMC

- *SMC Configuration and Administration Guide*

LibraryStation

- *Configuration Guide*
- *Operator and System Programmer's Guide*
- *Messages and Codes*

MVS/CSC

- *Configuration Guide*
- *Operator Guide*
- *System Programmer Guide*
- *Messages and Codes*

ExPR

- *Introduction to ExPR*
- *ExPR SMP/E Installation*
- *ExPR MVS Configuration*
- *ExPR MVS Reports*
- *ExPR MVS Reference*

ExLM

- *ExLM Installation and Maintenance Guide*
- *ExLM User's Guide*
- *ExLM Messages and Codes*
- *ExLM Quick Reference*

IBM Publications

- *IBM ESA/390 Common I/O-Device Commands and Self Description*
- *IBM 3490 Magnetic Tape Subsystem*
 - Models A01, A02, A10, A20, B02, B04, B20, and B40*
 - Introduction*
- *IBM 3490 Magnetic Tape Subsystem*
 - Models A01, A02, A10, A20, B02, B04, B20, and B40*
 - Hardware Reference*
(Referred to in this book as the *IBM 3490 Hardware Reference*)
- *IBM 3490 Command Reference*
- *IBM 3480 Magnetic Tape Subsystem Reference*

- *IBM 3480 Installation Guide and Reference*
- *OS/390 V2R4.0 MVS Planning: Global Resource Serialization*
- *MVS Authorized Assembler Services Guide*

Additional Information

Sun Microsystems, Inc. (Sun) offers several methods for you to obtain additional information.

Sun's External Web Site

Sun'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 Sun external Web site is: <http://www.sun.com>

The URL for Sun StorageTek™ brand-specific information is:
<http://www.storagetek.com>

Customer Resource Center

The Sun StorageTek product Customer Resource Center (CRC) is a Web site that enables members to resolve technical issues by searching code fixes and technical documentation for StorageTek brand products. CRC membership entitles you to other proactive services, such as HIPER subscriptions, technical tips, answers to frequently asked questions, addenda to product documentation books, and online product support contact information. Customers who have a current warranty or a current maintenance service agreement may apply for membership by clicking on the Request Password button on the CRC home page. Sun employees may enter the CRC through the SunWeb PowerPort.

The URL for the CRC is <http://www.support.storagetek.com>

Partners Site

The StorageTek Partners site is a Web site for partners with a StorageTek Partner Agreement. This site provides information about products, services, customer support, upcoming events, training programs, and sales tools to support StorageTek Partners. Access to this site, beyond the Partners Login page, is restricted. On the Partners Login page, Sun employees and current partners who do not have access can request a login ID and password and prospective partners can apply to become StorageTek resellers.

The URL for the StorageTek Partners site is:
<http://members.storagetek.com>

The URL for partners with a Sun Partner Agreement is:
<http://www.sun.com/partners/>

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Hardcopy Publications

Contact a Sun sales or marketing representative to order additional paper copies of this publication or to order other StorageTek brand product customer publications in paper format.

Customer Support

Customer support is available 24 hours a day, seven days a week, to customers with Sun or StorageTek maintenance contracts and to Sun employees. You can find additional information about customer support on the Customer Resource Center (CRC) Web site at:

<http://www.support.storagetek.com>

Customer-initiated Maintenance

Customer-initiated maintenance begins with a telephone call from you to Sun Microsystems StorageTek Support. You receive immediate attention from qualified personnel, who record problem information and respond with the appropriate level of support.

To contact Sun Microsystems StorageTek Support about a problem:

1. Use the telephone and call:

☎ **800.872.4786** (1.800.USA.4Sun)

☎ **800.722.4786** (Canada)

For international locations, go to

<http://www.sun.com/service/contacting/solution.html>

for the appropriate telephone number

2. Describe the problem to the call taker. The call taker will ask several questions and will either route your call to or dispatch a support representative.

If you have the following information when you place a service call, the process will be much easier:

Account name	_____
Site location number	_____
Contact name	_____
Telephone number	_____
Equipment model number	_____
Device address	_____
Device serial number (if known)	_____
Urgency of problem	_____
Fault Symptom Code (FSC)	_____
Problem description	_____

Sun's Worldwide Offices

You may contact any of Sun's worldwide offices to discuss complete storage, service, and support solutions for your organization. You can find address and telephone number information on 's external Web site at:

<http://www.sun.com/worldwide/>

Notices

Please read the following compliance and warning statements for this product.

Caution – Potential equipment damage: Cables that connect peripherals must be shielded and grounded; refer to descriptions in the cable instruction manuals. Operation of this equipment with cables that are not shielded and not correctly grounded might result in interference to radio and TV reception.

Changes or modifications to this equipment that are not expressly approved in advance by StorageTek will void the warranty. In addition, changes or modifications to this equipment might cause it to create harmful interference.

United States FCC Compliance Statement

The following compliance statement pertains to Federal Communications Commission Rules 47 CFR 15.105:

Note – This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

CISPR 22 and EN55022 Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japanese Compliance Statement

The following compliance statement in Japanese pertains to VCCI EMI regulations:

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation: This is a Class A product based on the Technical Requirement of the Voluntary Control Council for Interference by Information Technology (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take corrective actions.

Taiwan Warning Label Statement

The following warning label statement pertains to BSMI regulations in Taiwan, R.O.C.:

警告使用者：這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

English translation: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

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The following is the Internal Code License Agreement from StorageTek:

The following is the Internal Code License Agreement from StorageTek:

NOTICE

INTERNAL CODE LICENSE

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 - c. "Maintenance Code" is defined as Microcode and other software, including data files, which may reside or execute in or be used by or in connection with Equipment, and which detects, records, displays, and/or analyzes malfunctions in the Equipment.
 - d. "Microcode" is defined as a set of instructions (software) that is either imbedded into or is to be loaded into the Equipment and executes below the external user interface of such Equipment. Microcode includes both Internal Code and Maintenance Code, and may be in magnetic or other storage media, integrated circuitry, or other media.
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 - (iii) sublicense, assign, or lease the Internal Code or permit another person to use such Internal Code, or any copy of it.

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8. You acknowledge that copies of both Internal Code and Maintenance Code may be installed on the Equipment before shipment or included with the Equipment and other material shipped to you, all for the convenience of StorageTek's service personnel or service providers licensed by StorageTek, and that during the warranty period, if any, associated with the Equipment, and during periods in which the Equipment is covered under a maintenance contract with StorageTek or service providers licensed by StorageTek, both Internal Code and Maintenance Code may reside and be executed in or used in connection with such Equipment, and you agree that no rights to Maintenance Code are conferred upon you by such facts.
- StorageTek or the licensed service provider may keep Maintenance Code and service tools and manuals on your premises but they are to be used only by StorageTek's customer service personnel or those of service providers licensed by StorageTek. You further agree that upon
- (i) any termination of such warranty period or maintenance contract period; or
 - (ii) transfer of possession of the Equipment to another party, StorageTek and its authorized service providers shall have the right with respect to the affected Equipment to remove all service tools and manuals and to remove or disable all Maintenance Code and/or replace Microcode which includes both Internal Code and Maintenance Code with Microcode that consists only of Internal Code.

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Using the Concurrent Disaster Recovery Test Software

Customers who use a Disaster Recovery (DR) configuration may want to validate their ability to continue normal production processing before an actual disaster occurs. In fact, certain businesses are required by their auditors to prove the readiness of their business continuance model. Using the Concurrent Disaster Recovery Test software, you can do this validation without purchasing additional Nearline and/or VSM hardware. The DR Test software lets you test your DR environment while concurrently running production work. The software supports a complete parallel test of production systems and applications with simultaneous access to production data by both the production and DR test systems. The DRTEST utility creates a DR test version of the production CDS, which provides the DR test system its own view of the Nearline and/or VSM environment. Additionally, the DRTEST utility and changes to HSC and VTCS programmatically enforce certain functional restrictions during the CDS preparation and actual DR test to attempt to ensure system integrity.

The CDRT Utility provides a method of segregating a portion of the Nearline/VSM hardware to be used during a test run for displaced production processing at the recovery site. This DR test environment exercises the segregated hardware while normal production processing continues with the non-segregated hardware. The DR test hardware is a minimum of one ACS. Optionally, one or more VTSSs may be employed as DR test hardware. The ACS is shared between the production systems and the DR test systems, and the DR test systems have exclusive use of any DR test VTSS(s) during a DR test. At the end of a DR test, all data created from the test systems is discarded and the segregated hardware can be re-deployed to the normal production environment.

How Does the CDRT Utility Work?

Two HSC Control Data Sets (CDSs) segregate the Nearline/VSM hardware to allow concurrent DR testing with normal production processing. One set of hosts, the production hosts, use the normal CDS that continues to be used after a DR test, and contains the production Nearline and VSM metadata. A second CDS is used by the DR test hosts to create separate parallel metadata when exercising a DR test. After the DR test is complete, **the DR Test CDS is discarded.**

The HSC CDS provides the main serialization mechanism for most Nearline/VSM resources. Hosts contend for these resources by locking and updating CDS records. In a dual CDS environment, each set of hosts has its own view of the Nearline/VSM resources. Therefore, each set of hosts can create different versions of updates to the CDS and acquire the same resources independently. However, the DR test ACS is still connected to the production hosts during a 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.

To eliminate contention for the same VTSS(s), the segregated hardware is made unavailable to the other set of hosts.

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!

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.
- FLOAT(OFF) and EJCTAUTO(OFF) are set and enforced in the DR test ACS by the software.
- No 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.
This is ensured by the software.
- All CAPs in the DR test ACS are in manual mode.
This is ensured by the software.
- Any non-DR test VTSS(s) remain offline.
This is ensured by the software.
- FLOAT(OFF) and EJCTAUTO(OFF) are enforced everywhere.
This is ensured by the software.
- No enters, ejects, moves, HSC library audits, scratch updates, or scratch redistributions are allowed anywhere.

Restrictions that You Must Enforce

During a DR test, **you** must enforce the following restrictions:

- In a normal DR environment, VTVs are usually migrated immediately to two MVCs in separate ACSs. During a DR test, the DR test systems *only* migrate VTVs to single MVCs and *only* use an output MVC pool that is separate from that of the production hosts. To do this, you must **define** non-overlapping MVC pools for each set of hosts.
- During a DR test, the DR test hosts can recall and access a specific VTV from the MVC in the DR test ACS while the production systems can also recall and access the same VTV from the other MVC in a non-DR test ACS. To ensure that each set of hosts recalls the VTV from the preferred MVC, you **must** define Management Class and Storage Class statements for the production hosts that specify immediate migration to two MVCs, the first in a non-DR test ACS, the second in the DR test ACS. This ensures that the production hosts will try to recall a VTV from the non-DR test ACS, which prevents contention between the production and DR test hosts for the same MVC for a recall operation. For an example, see the definitions in [“Scenario 1: Production and Test Sites, ACS at Each Site, Spare VTSS at Test Site” on page 21](#).
- CDRT was designed to operate primarily in a VSM environment, but a DR test can also be executed in a real-only environment.
- If a DR test involves the direct use of real Nearline volumes for customer data, the production hosts and DR test hosts **must** also use separate real tape scratch pools. You do this by defining non-overlapping scratch pools for each set of hosts, and then some technique, such as TAPEREQs (preferred) or User Exits, to direct each set of hosts to the appropriate scratch subpool.
- Contention for existing specific real tape volumes cannot be controlled as well as contention for specific VTVs. During a DR test it is possible for a host using one version of the CDS to be using a real tape volume when a host in the other set also tries to access it. In this case, the secondary access will result in an errant volume condition and will cause a job to be delayed or cancelled. This presents no long-term problems as subsequent accesses will eventually “find” the real volume and clear the errant status.
- StorageTek **strongly recommends** that you **severely restrict** MVC space reclamation on any production MVCs during the DR test, because the production and test systems cannot know what has happened to MVCs used by both systems if a reclaim occurs. As shown in [FIGURE 1-2 on page 17](#), the production MVCs are in PP00L1 and PP00L2. To virtually ensure that space reclamation for this pool does not start, modify the production MVCPool statements as follows:

```
MVCPool V(000000-000999) NAME(PP00L1) MVCFREE(1) MAXMVC(98) THRESH(98) START(98)
MVCPool V(002500-003499) NAME(PP00L2) MVCFREE(1) MAXMVC(98) THRESH(98) START(98)
```

- PTF L1H13ZB removes the restriction against enters and ejects during a DR test. However, if you choose to perform enters and ejects during a DR test, you **must ensure** that the production CDS is synchronized with the status of the ACS on termination of the DR test **while adhering** to the current programmatic restriction against audits during a DR test. You can do this in one of the following ways:
 - Audit the cells used to contain volumes that were entered during the DR test. Do this audit **from a production host immediately** after stopping the DR test.
 - Eject the volumes entered **before** stopping the DR test.

Caution – Do **not** simultaneously enter volumes from both the production host side and the DR host side of the DR ACS, because this can cause “full cell” errors if previously entered cartridges from the other side of the DR ACS were not first ejected!

Using the DR Test Software

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:

- [“Installing the CDRT Utility” on page 7](#)
- [“Scenario 1: Production and Test Sites, ACS at Each Site, Spare VTSS at Test Site” on page 21](#)
- [“Scenario 2: Production and Test Sites, ACS at Each Site, VTSS Takeover at Test Site” on page 27](#)
- [“Scenario 3: Production and Test Sites, ACS at Each Site, No VTSSs” on page 33](#)
- [“Scenario 4: Clustered VTSSs with Local and Remote Sites” on page 38](#)
- [“DRTEST Utility” on page 47](#)
- [“DRTEST Command” on page 54](#)
- [“Messages” on page 55](#)

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 and Configuring VTCS*. 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:
 - [“Verifying Installation Materials” on page 8](#)
 - [“Unloading the CDRT Utility Install Jobs” on page 10](#)
 - Ensure that VTCS 6.2 and NCS 6.2 are installed.

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

- [“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.” on page 15](#)
- [“Apply Checking the CDRT Utility FMID” on page 15](#)
- [“Apply Checking the CDRT Utility FMID” on page 15](#)
- [“Applying the CDRT Utility FMID” on page 15](#)
- [“Accept Checking the CDRT Utility FMID” on page 16](#)
- [“APF Authorizing the CDRT Utility Load Modules” on page 16](#)

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	SWUrelease.F1	SWUrelease 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	SWUrelease.F2	SWUrelease JCL installation samples (JCL installation samples are automatically installed in the SWUrelease SAMPLIB); for more information, see “CDRT Utility JCL installation samples” on page 9 .
4	SWUrelease.F3	SWUrelease 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:

SWUrelease

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](#). You must APF authorize the CDRT Utility Load Modules (yourhlq.SWUrelease.SWULINK).

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

SWUrelease.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 [“Completing the Installation” on page 15](#).

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 1-5](#).

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

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=h1q.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('h1q.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 Sun StorageTek Software Support.

Go to [“Completing the Installation” on page 15.](#)

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 `SWUACCEPT` to accept check the CDRT Utility FMID.

▼ Accepting the CDRT Utility FMID

Delete the `CHECK` statement from JCL installation sample `SWUACCEPT`, 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
<i>yourhlq.SWUrelease.ASWULINK</i>	Load modules required for CDRT Utility execution
<i>yourhlq.SWUrelease.ASWUSAMP</i>	Sample material for use with CDRT Utility.

▼ APF Authorizing the CDRT Utility Load Modules

You must APF authorize the CDRT Utility Load Modules (*yourhlq.SWUrelease.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.

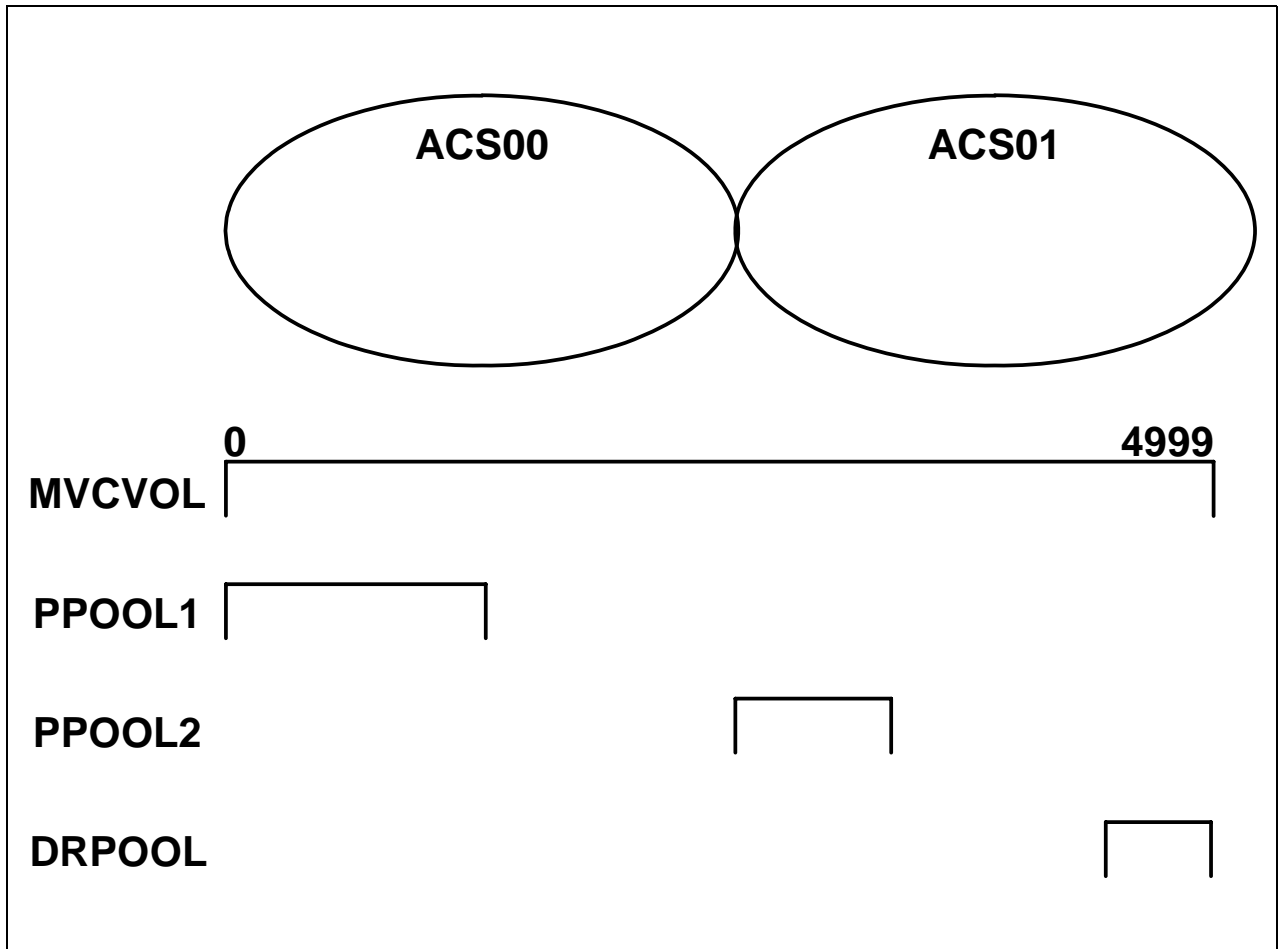


FIGURE 1-2 Sample MVCVOL and MVC Pool Configurations

In [FIGURE 1-2 on page 17](#):

- 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 MVCP00L statement) sufficient MVCs for short-term future use. These MVC, which all reside in ACS 00, are shown as PP00L1. PP00L1 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 PP00L2. PP00L2 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 DRP00L. DRP00L 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 [“Restrictions that You Must Enforce” on page 4](#).

[FIGURE 1-3 on page 19](#) shows sample MVCVOL and MVCP00L definitions for the configuration shown in [FIGURE 1-2 on page 17](#).

INITIAL VTCS CONFIG DEFINITION**MVCVOL LOW=000000 HIGH=004999****POSSIBLE INDIVIDUAL SYSTEM DEFINITIONS****PROD****MVCPOOL V(000000-000999)****MVCPOOL V(002500-003499)****OR a single statement****MVCPOOL V(000000-003499)****DR TEST****MVCPOOL V(004500-004999)****FIGURE 1-3** Sample MVCVOL and MVCPOOL Definitions

FIGURE 1-4 shows how the two different systems shown in FIGURE 1-3 on page 19 can read or write from each of the MVC Pools.

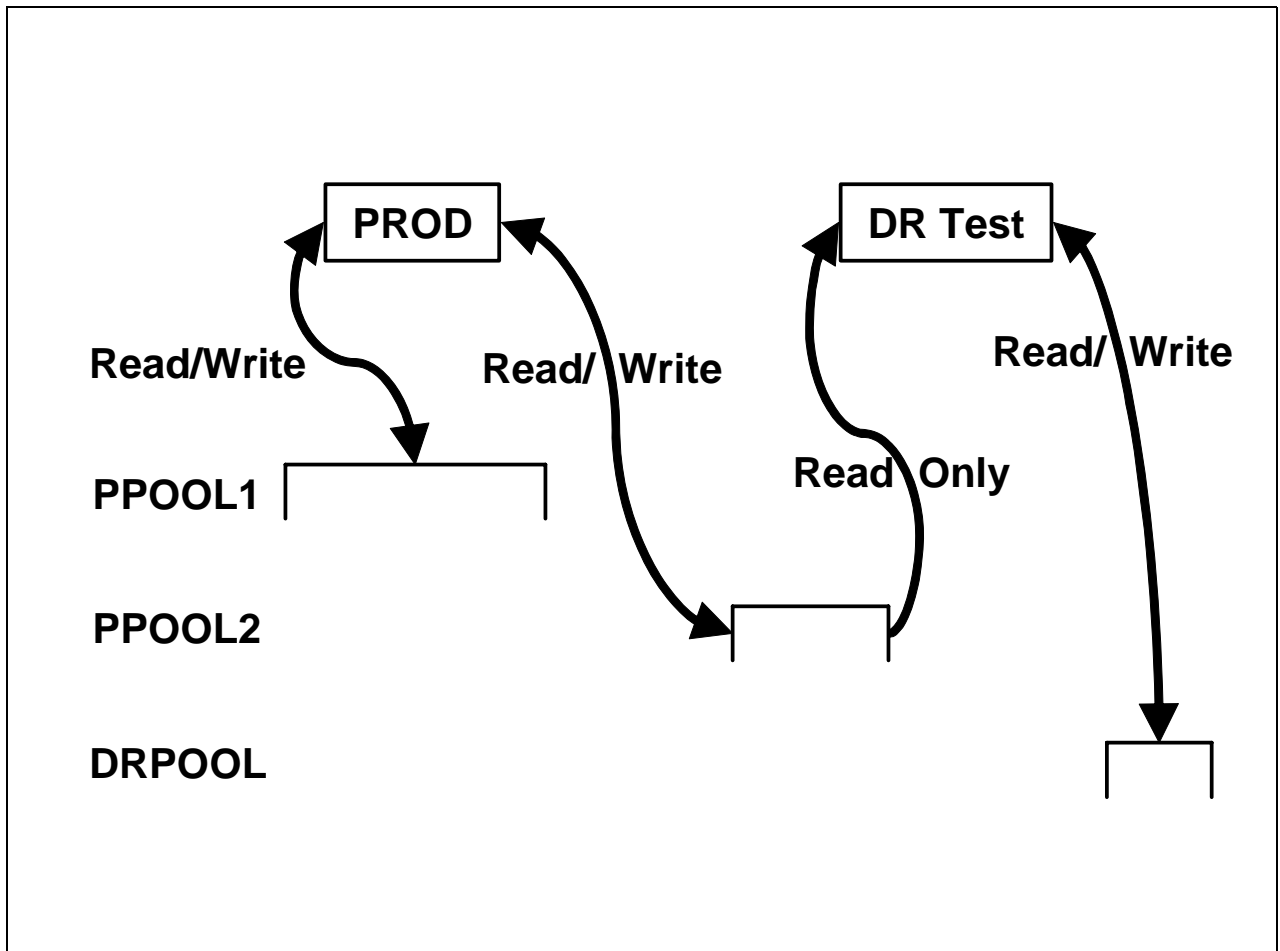


FIGURE 1-4 Production and Test System MVC Access

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. [FIGURE 1-5 on page 22](#) shows the system for Scenario 1 before running the DRTEST utility.

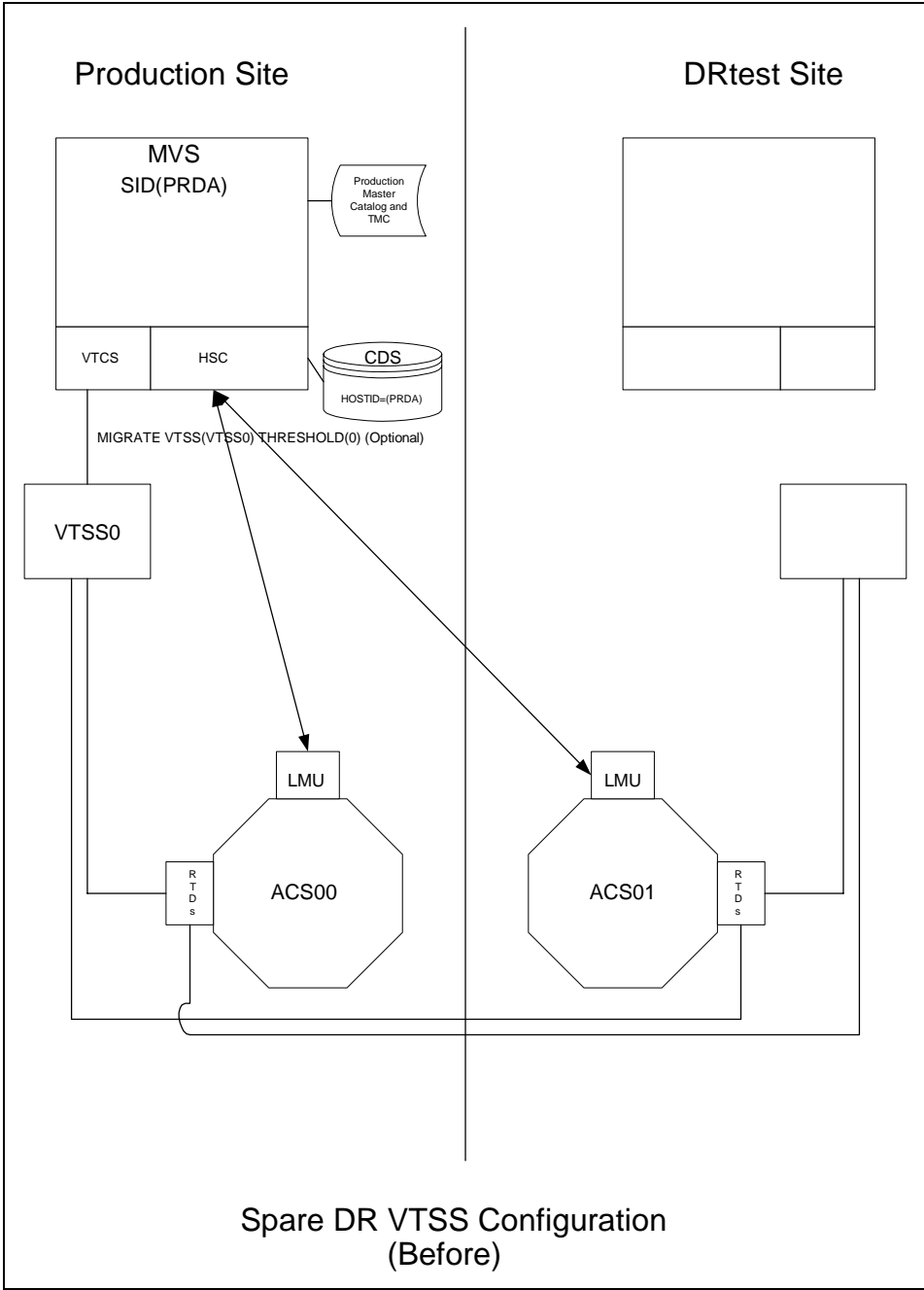


FIGURE 1-5 Spare VTSS Configuration - Before Running the DRTEST Utility

FIGURE 1-6 shows the system for Scenario 1 (spare VTSS at test site) after running the DRTEST utility.

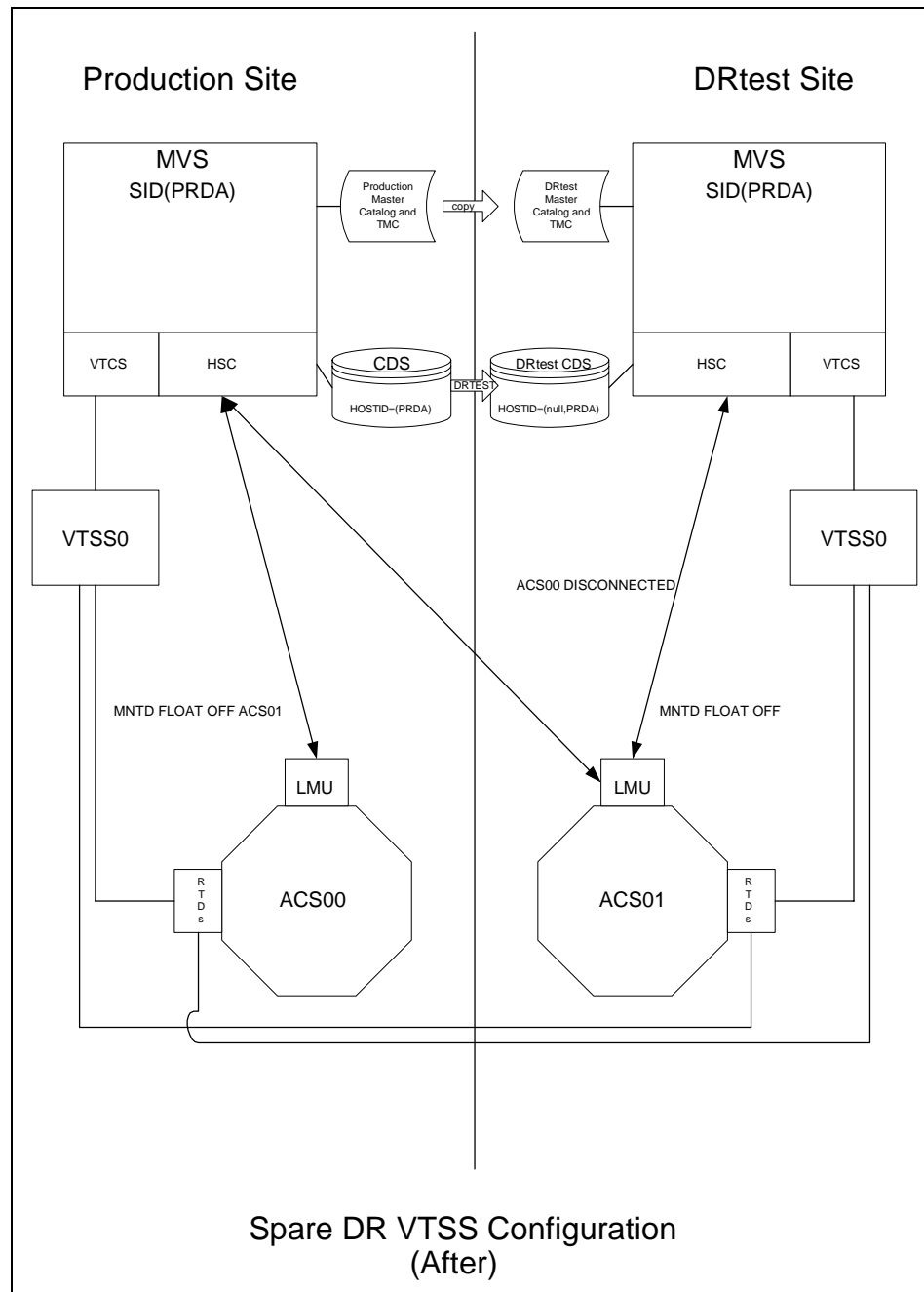


FIGURE 1-6 Spare VTSS Configuration - After Running the DRTEST Utility

▼ To run a DR test for Scenario 1:

1. Prepare parm members for the DR test system prior to beginning the test:

- MVCP00L - Define separate, non-overlapping MVC pools for the DR system.
- MGMTCLASS/STORCLAS - Update any DR Test Management Classes to simplex data for the DR test systems. We don't want to duplex while there's only ACS01 available, so the MGMTCLAS statement looks something like [FIGURE 1-7](#).

```
MGMT NAME (VSMDR) MIGPOL (LOCAL) IMMED (KEEP)
```

FIGURE 1-7 Management Class for Business Continuance

The MIGPOL Management Class now specifies a LOCAL Storage Class. To complete simplexing of the MIGPOL Management Class, change any Storage Class referenced by MIGPOL in [FIGURE 1-7](#) to point to ACS01 for the DR test systems...

...as shown in [FIGURE 1-8](#):

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

FIGURE 1-8 Update Storage Class LOCAL to Point to ACS01

Now, it is not necessary to change the TAPEREQ statement which still points to Management Class VSMDR.

2. Quiesce the production processing.

This includes stopping all CAP activity and scratch processing in the DR test ACS, and all production jobstreams using Nearline or VSM resources. Quiescing production activity ensures that all VTVs are been migrated to MVCs and freezes the VTV and MVC states until the DR test CDS copy is created.

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. Note that only the VTVs that exist when the DRTEST utility is executed are those VTVs that are available to the DR test site. If you know that the DR test will not access those VTVs that are created or modified after the DRTEST utility is executed, then it is possible to continue Nearline/VSM activities in the production environment. Any MVCs that may be used by the DR test systems should be dismounted when the DRTEST utility is executed.

3. 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 VTRPT OPTION(UNAVAIL) to ensure that all VTVs are migrated and are available to other VTSSs.

4. Ensure that there are sufficient MVCs available to both the production and DR test systems...

If there are sufficient MVCs to define two separate pools for the production and test systems, go to [Step 5](#). Otherwise, do one of the following:

- Run the VTCS MVCDRAIN utility to free up MVCs for DR test MVC pool use.
- Add more MVCs to the production MVC pool.

Warning. In either case, 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. For more information, see [“Defining MVC Pools for Concurrent DR Testing” on page 17](#).

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. Use the HSC CAPPREF command to set all CAPs in the DR test ACS to manual mode
8. Vary any RTDs that are shared between the production and test VTSSs offline. The production RTDs will only need to be offline for a short time while the utility executes.
9. Run the DRTEST utility to prepare the CDSs for the DR test. The CDSs and journals (if used) can be allocated via the DD statements on the utility.

For more information, see [“DRTEST Utility” on page 47](#).

10. Start the DR test at the production site:

DRTEST START

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

11. Load the new production MVC pool (if changed in [Step 4](#)) and optionally new scratch subpools and TAPEREQs (if doing real tape processing as well as virtual tape).
12. Vary the production RTDs online to the production VTSSs.
13. Start the HSC/VTCS system(s) on the DR test systems.
14. Vary online the DR VTSSs to the DR system
15. Vary on the DR RTDs online to the DR system
16. Resume production processing and run the parallel 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, enters/ejects, moves, scratch updates, audits, or scratch redistributions can occur at the DR test site.
- No floating dismounts, 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.
- HSC 4.0/4.1 systems cannot be active when starting the DR test, or running on the DR hosts.

17. After the DR test completes, do the following:

- Demand migrate to zero the DR test VTSS(s) on the DR test site or optionally have your CSE “clean” the VTSSs.
- Stop the HSC/VTCS system(s) at the DR test site.
- Stop the DR test at the production site.:

DRTEST STOP

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

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

- If desired, place CAPs in the DR test ACS in automatic mode.
- Load the production MVC pool, TAPEREQs, and so forth.
- Reset FLOAT, EJECT, etc, status to desired production state.

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 1-9 on page 28](#) shows the system for Scenario 2 (VTSS takeover at test site) before running the DRTEST utility.

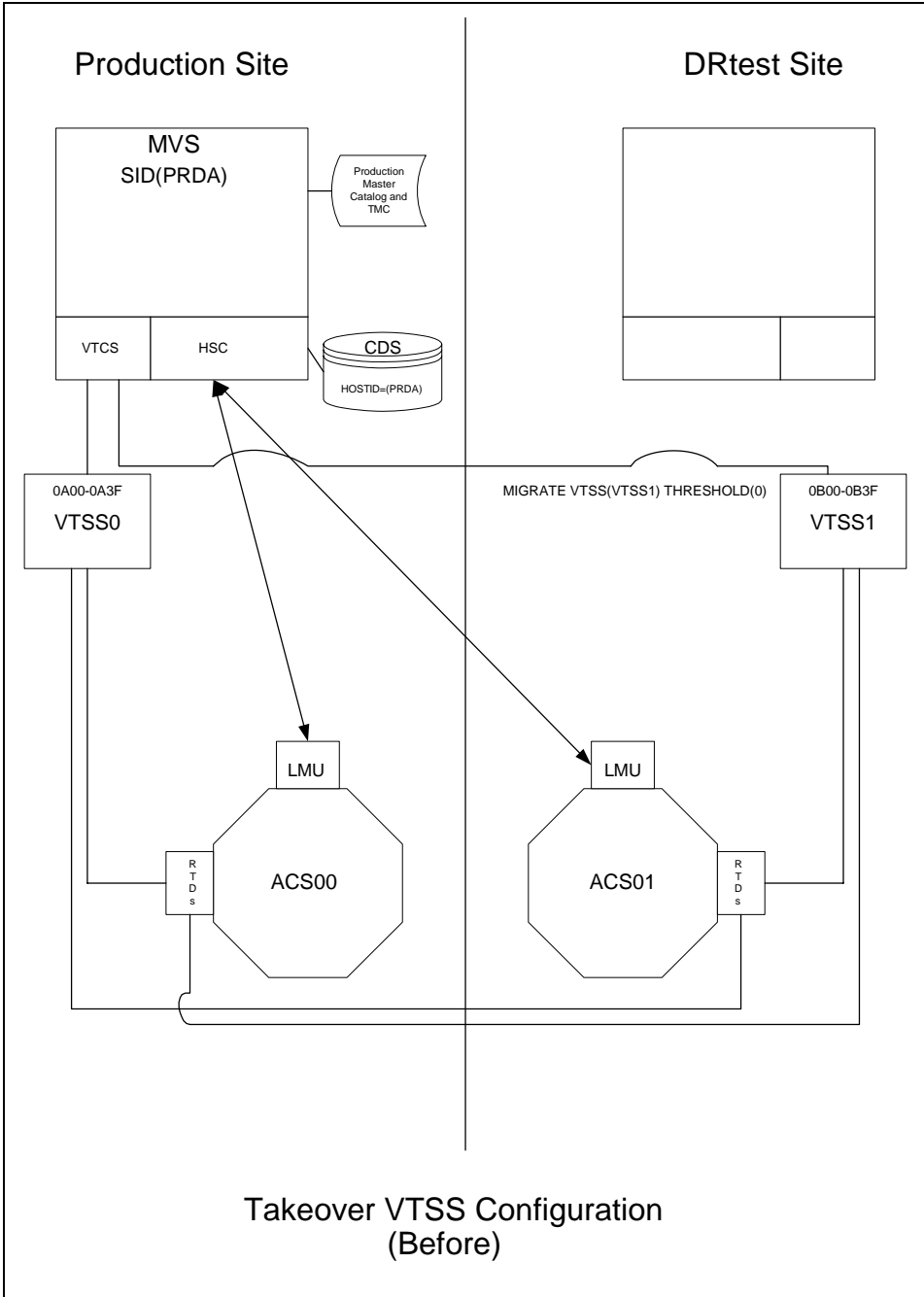


FIGURE 1-9 VTSS Takeover Configuration - Before Running the DRTEST Utility

FIGURE 1-10 shows the system for Scenario 2 (VTSS takeover at test site) after running the DRTEST utility.

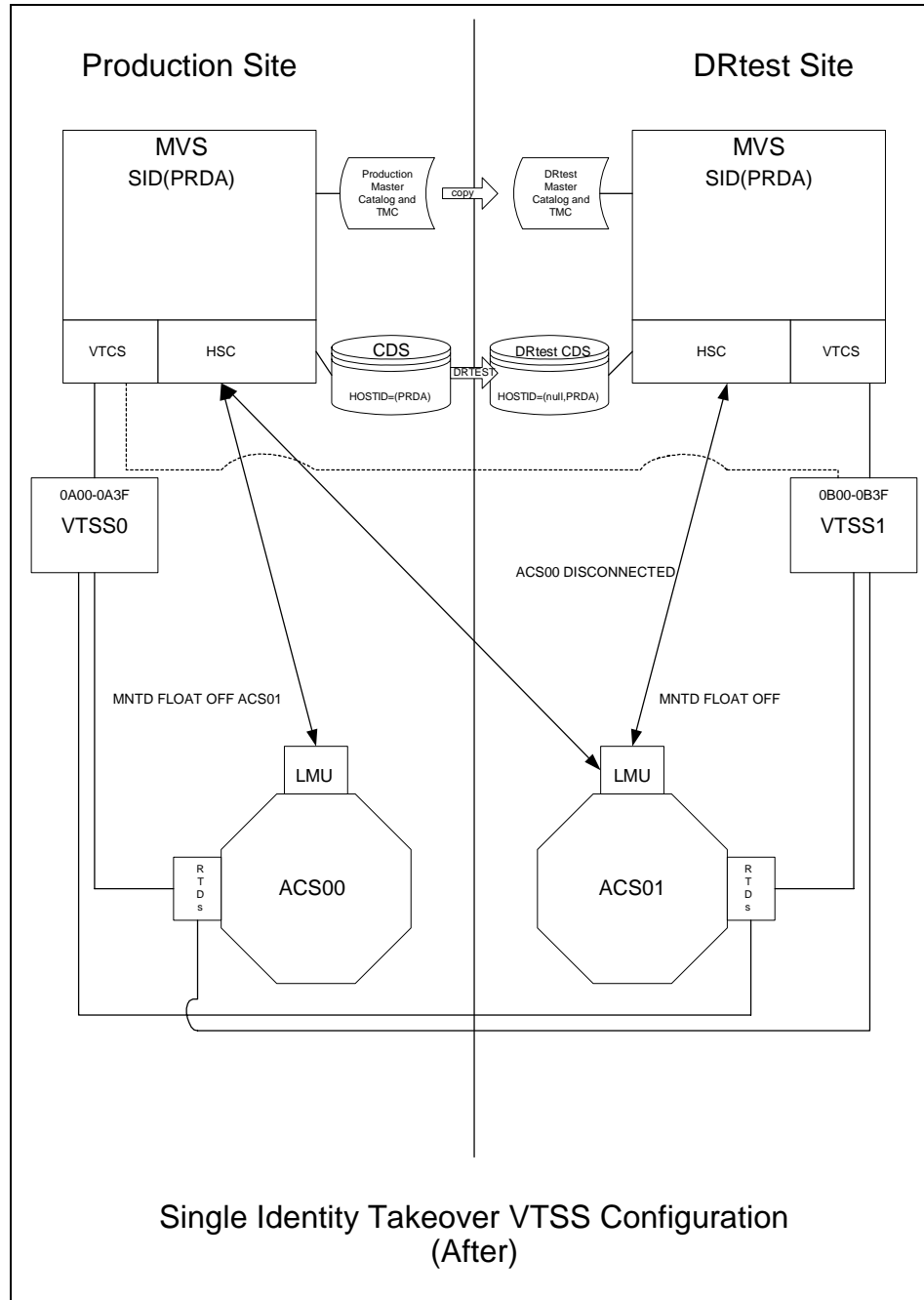


FIGURE 1-10 VTSS Takeover Configuration - After Running the DRTEST Utility

▼ To run a DR test for Scenario 2:

1. Prepare parm members for the DR test system prior to beginning the test:

- MVCP00L - Define separate, non-overlapping MVC pools for the DR system.
- MGMTCLASS/STORCLAS - Update any DR Test Management Classes to simplex data for the DR test systems. We don't want to duplex while there's only ACS01 available, so the MGMTclas statement looks something like [FIGURE 1-11](#).

```
MGMT NAME (VSMDR) MIGPOL (LOCAL) IMMED (KEEP)
```

FIGURE 1-11 Management Class for Business Continuance

The MIGPOL Management Class now specifies a LOCAL Storage Class. To complete simplexing of the MIGPOL Management Class, change any Storage Class referenced by MIGPOL in [FIGURE 1-7](#) to point to ACS01 for the DR test systems...

...as shown in [FIGURE 1-12](#):

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

FIGURE 1-12 Update Storage Class LOCAL to Point to ACS01

Now, it is not necessary to change the TAPEREQ statement which still points to Management Class VSMDR.

2. Quiesce the production processing.

This includes stopping all CAP activity and scratch processing in the DR test ACS, and all production jobstreams using Nearline or VSM resources. Quiescing production activity ensures that all VTVs are been migrated to MVCs and freezes the VTV and MVC states until the DR test CDS copy is created.

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. Note that only the VTVs that exist when the DRTEST utility is executed are those VTVs that are available to the DR test site. If you know that the DR test will not access those VTVs that are created or modified after the DRTEST utility is executed, then it is possible to continue Nearline/VSM activities in the production environment. Any MVCs that may be used by the DR test systems should be dismounted when the DRTEST utility is executed.

3. Optionally, migrate the spare VTSS(s) to zero 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.

4. Ensure that there are sufficient MVCs available to both the production and DR test systems...

If there are sufficient MVCs to define two separate pools for the production and test systems, go to [Step 5](#). Otherwise, do one of the following:

- Run the VTCS MVCDRAIN utility to free up MVCs for DR test MVC pool use.
- Add more MVCs to the production MVC pool.

Warning. In either case, 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. For more information, see .

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. Use the HSC CAPPREF command to set all CAPs in the DR test ACS to manual mode.

8. Vary any RTDs that are shared between the production and test VTSSs offline.

The production RTDs will only need to be offline for a short time while the utility executes.

9. Run the DRTEST utility to prepare the CDSs for the DR test.

The CDSs and journals (if used) can be allocated via the DD statements on the utility. For more information, see [“DRTEST Utility” on page 47](#).

10. Start the DR test at the production site.

DRTEST START

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

11. Load the new production MVC pool (if changed in [Step 4](#)) and optionally new scratch subpools and TAPEREQs (if doing real tape processing as well as virtual tape).

12. Vary the production RTDs online to the production VTSSs.

13. Start the HSC/VTCS system(s) on the DR test systems.

14. Vary online the DR VTSSs to the DR system

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

16. Resume production processing and run the parallel 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, moves, scratch updates, audits, or scratch redistributions can occur at the DR test site.
- No floating dismounts, 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.
- HSC 4.0/4.1 systems cannot be active when starting the DR test, or running on the DR hosts.

17. After the DR test completes, do the following:

- Demand migrate to zero the DR test VTSS(s) on the DR test site or optionally have your CSE “clean” the VTSSs.
- Stop the HSC/VTCS system(s) at the DR test site.
- Stop the DR test at the production site.

DRTEST STOP

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

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

- If desired, place CAPs in the DR test ACS in automatic mode.
- Load the production MVC pool, TAPEREQs, and so forth.
- Reset FLOAT, EJECT, etc, status to desired production state.

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. [FIGURE 1-13 on page 34](#) shows the system for Scenario 3 (real-only configuration) before running the DRTEST utility.

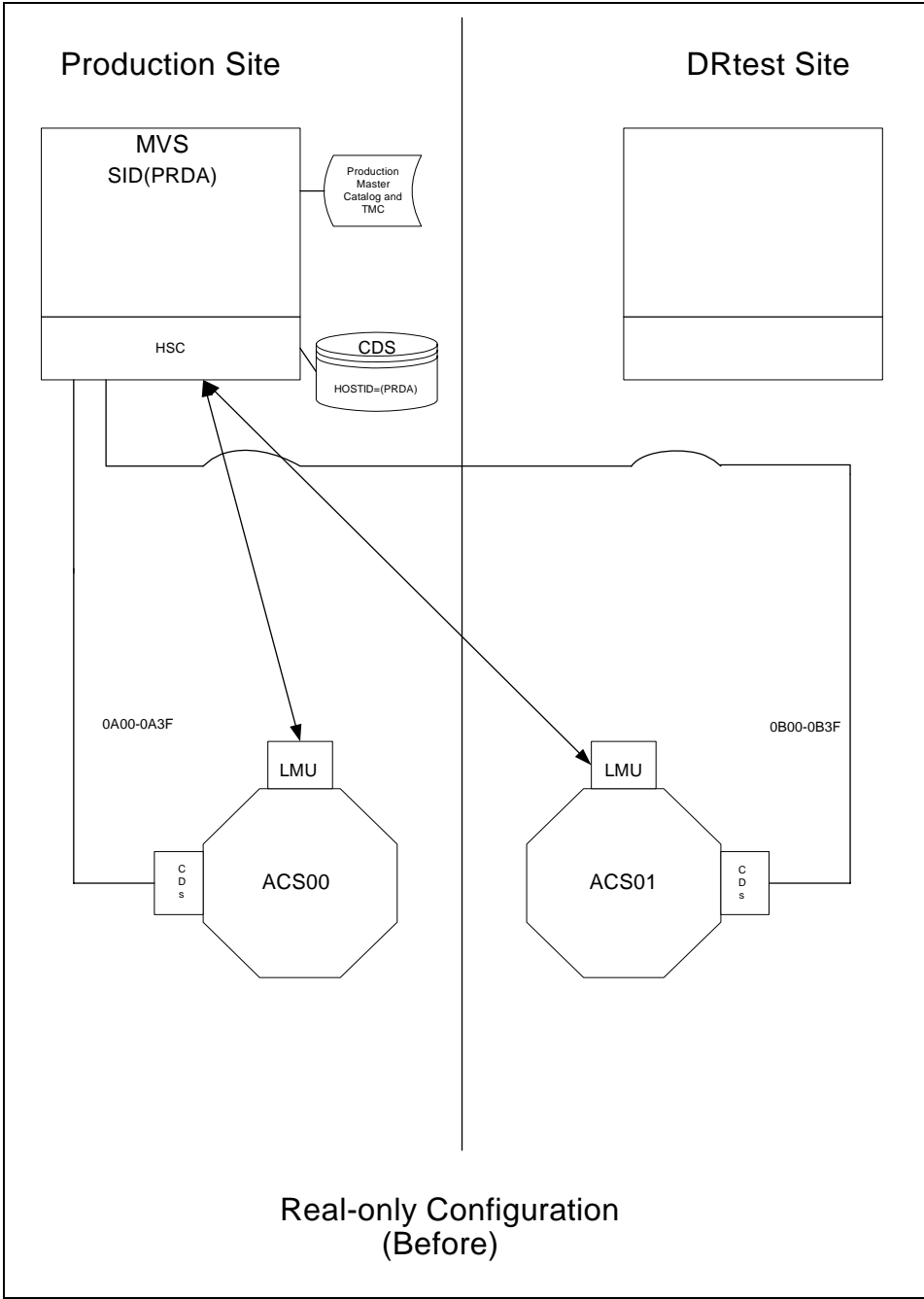


FIGURE 1-13 Real-Only Configuration - Before Running the DRTEST Utility

FIGURE 1-14 shows the system for Scenario 3 (real-only configuration) after running the DRTEST utility.

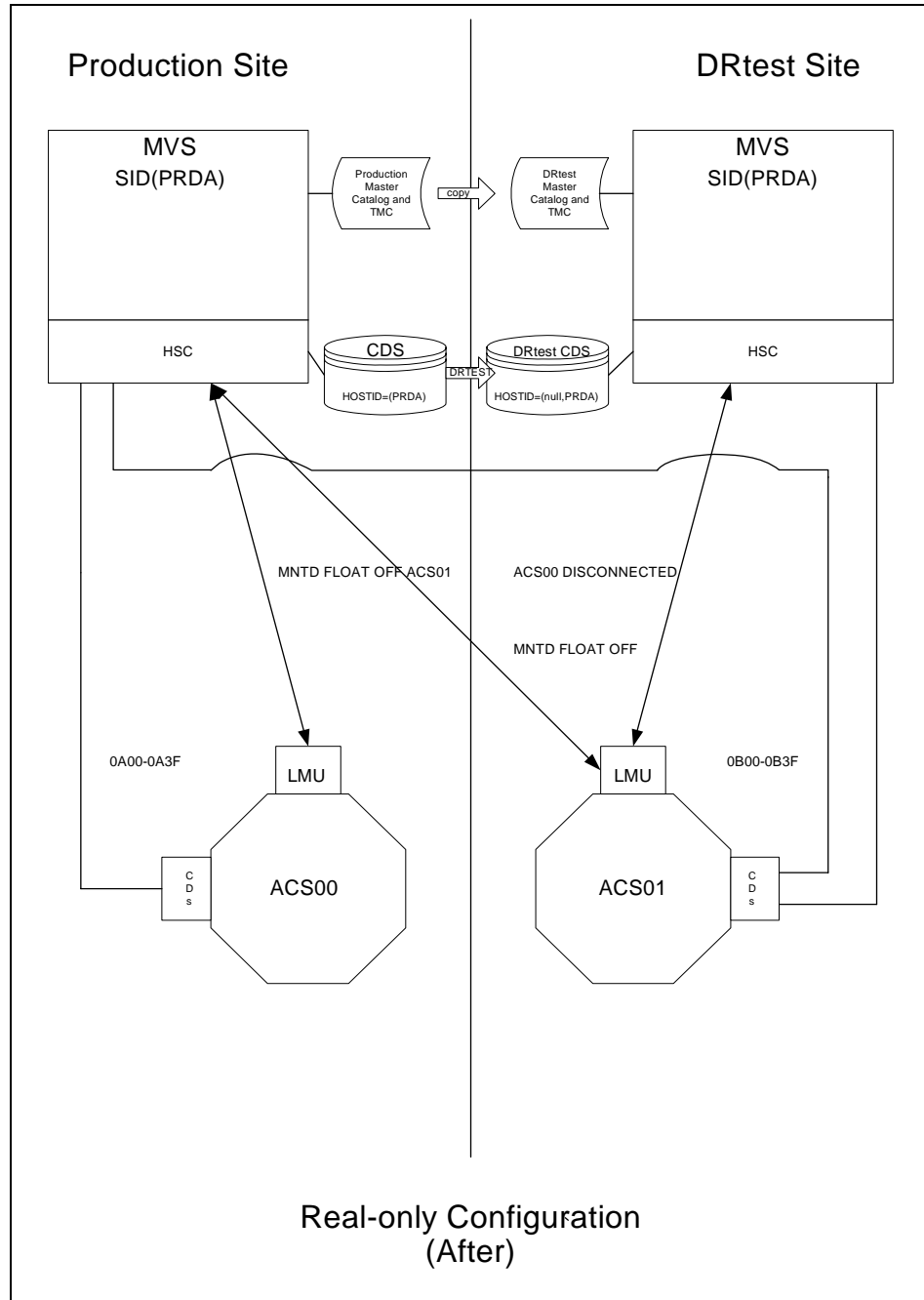


FIGURE 1-14 Real-Only Configuration - After Running the DRTEST Utility

▼ To run a DR test for Scenario 3:

1. Prepare parm members for the DR test system prior to beginning the test:

- SCRPOOL - Define separate, non-overlapping scratch pools for the DR system.
- TAPEREQ - Direct non-specific mount requests to the DR test scratch pool as shown in [FIGURE 1-15](#).

```
SCRPOOL NAME(DRPOOL) RANGE(DR0000-DR9999)
TAPEREQ SUBPOOL(DRPOOL)
```

FIGURE 1-15 Update parms to direct scratch mounts to DR test scratch pool

2. Quiesce the production processing.

This includes stopping all CAP activity and scratch processing in the DR test ACS, and all production processing using Nearline resources. Quiescing production activity ensures that all data sets needed by the DR test system are created and cataloged, and freezes the real volume states until the DR test CDS copy is created.

Note – While completely stopping all Nearline 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. Note that only the data sets that exist when the DRTEST utility is executed are those that are available to the DR test site. If you know that the DR test will not access those data sets that are created or modified after the DRTEST utility is executed, then it is possible to continue Nearline activities in the production environment. Any real volumes that may be used by the DR test systems should be dismounted when the DRTEST utility is executed.

3. Ensure that there are sufficient scratch volumes available to both the production and DR test systems...

If there are sufficient scratch volumes to define two separate pools for the production and test systems, go to [Step 5](#). Otherwise, do one of the following:

- Run the HSC SCRATCH utility to define more scratch volumes for DR test scratch volume pool use.
- Enter more scratch volumes with the SCRATCH option.

Warning. In either case, StorageTek requires that you define a separate scratch pool for the DR test to prevent the parallel systems from attempting to use the same scratch volumes.

4. Copy the MVS Catalog for the DR test site if required.

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

6. Use the HSC CAPPREF command to set all CAPs in the DR test ACS to manual mode.

7. Vary any cartridge drives (CDs) that are shared between the production and test DR system offline to one site or use tape sharing software.

8. Run the DRTEST utility to prepare the CDSs for the DR test.

The CDSs and journals (if used) can be allocated via the DD statements on the utility. For more information, see [“DRTEST Utility” on page 47](#).

9. Start the DR test at the production site.

DRTEST START

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

10. Load the new production scratch pool (if changed in [Step 3](#)) and TAPEREQ statements.**11. Start the HSC system(s) on the DR test systems.****12. Resume production processing and run the parallel 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).
- No floating dismounts, moves, scratch updates, audits, or scratch redistributions can occur at the DR test site.
- No floating dismounts, 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.

13. After the DR test completes, do the following:

- Stop the HSC system(s) at the DR test site.
- Stop the DR test at the production site.

DRTEST STOP

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

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

- If desired, place CAPs in the DR test ACS in automatic mode.
- Load the production scratch pools, TAPEREQs, and so forth.
- Reset FLOAT, EJECT, etc, status to desired production state.

Scenario 4: Clustered VTSSs with Local and Remote Sites

As shown in [FIGURE 1-16 on page 39](#), in normal operations, Scenario 4 is a Clustered VTSS configuration used for DR, with local and remote sites cross-connected to the local and remote ACSs. At the Local Site, VTSS0 is the Primary, and VTSS1 is the Secondary at the Remote 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. See [Step 4](#) and [Step 6 on page 44](#).

Caution – At the termination of the DR test when the connection between VTSS0 and VTSS1 is re-established, VTSS reconciliation will occur. Reconciliation means that VTCS will examine the VTVs in both the primary VTSS and secondary VTSS and update, based on timestamps, which VTVs are current. If, during the DR test, you had used the same VTV VOLSERs in your DR test that currently exist in your production environment and you do not migrate those changed VTVs after the test and before the cluster is re-established, VTCS will consider newer VTVs, in VTSS1, as production data when the cluster is re-established. This can result in a loss of production data! See [Step 1](#) and [Step 2 on page 46](#).

Note – If [Step 1](#) and [Step 2](#) are performed manually, the risk of production data loss is inherently greater compared to using separate VTV VOLSER ranges and/or draining VTSS1 completely before re-establishing the cluster. See [Step 3 on page 46](#).

Thus, before your disaster test begins, decide which clean-up procedure to use; either implement separate, non-overlapping ranges of VTV VOLSERs during testing and/or drain VTSS1 after the DR test or run a VTV report and migrate all VTVs that were changed in VTSS1 during the test.

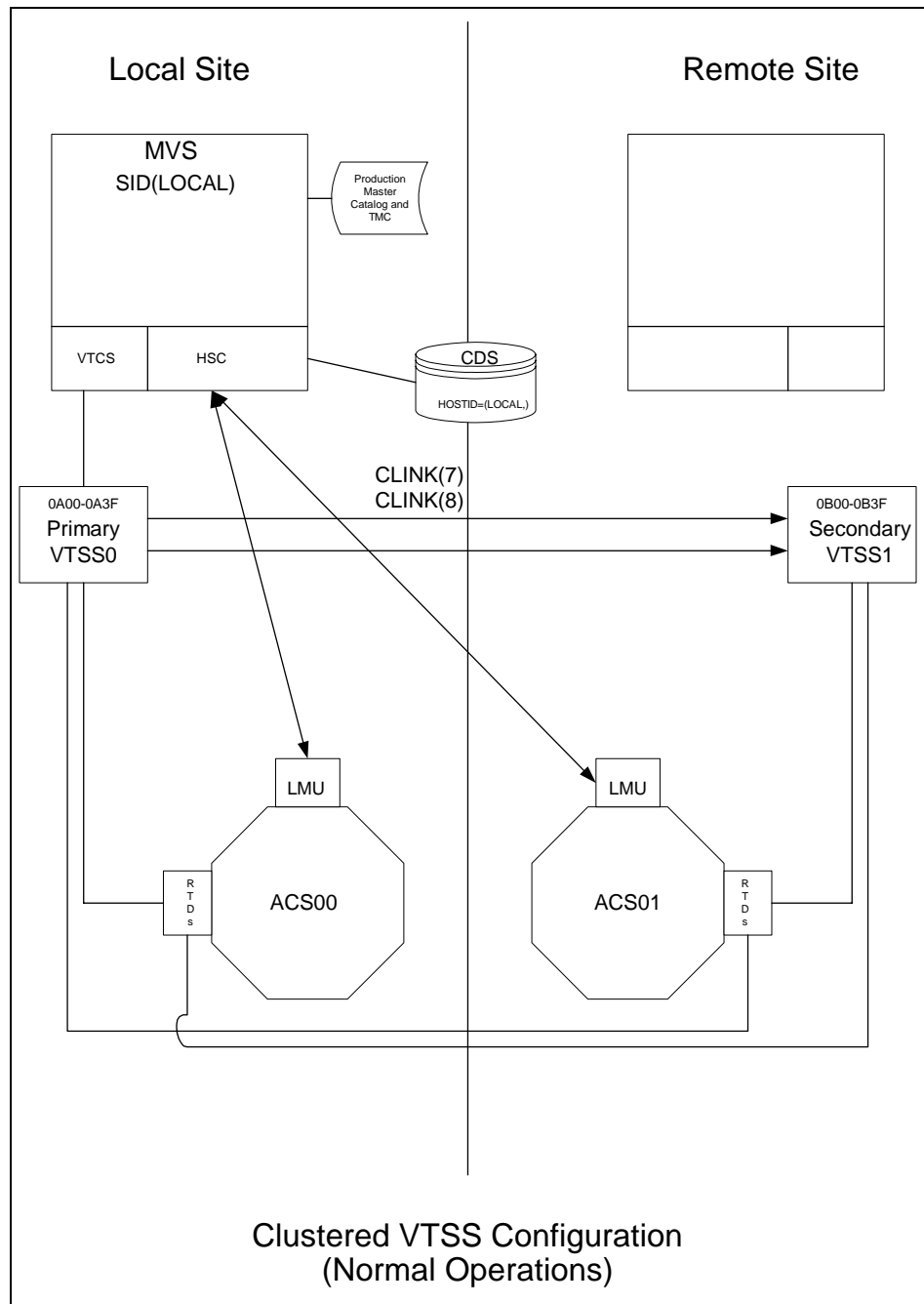


FIGURE 1-16 Primary/Secondary Clustered VTSS Configuration - Normal Operations

What if you wanted to use the Remote Site for DR testing? [FIGURE 1-17](#) shows the system for Scenario 4 during the DR test.

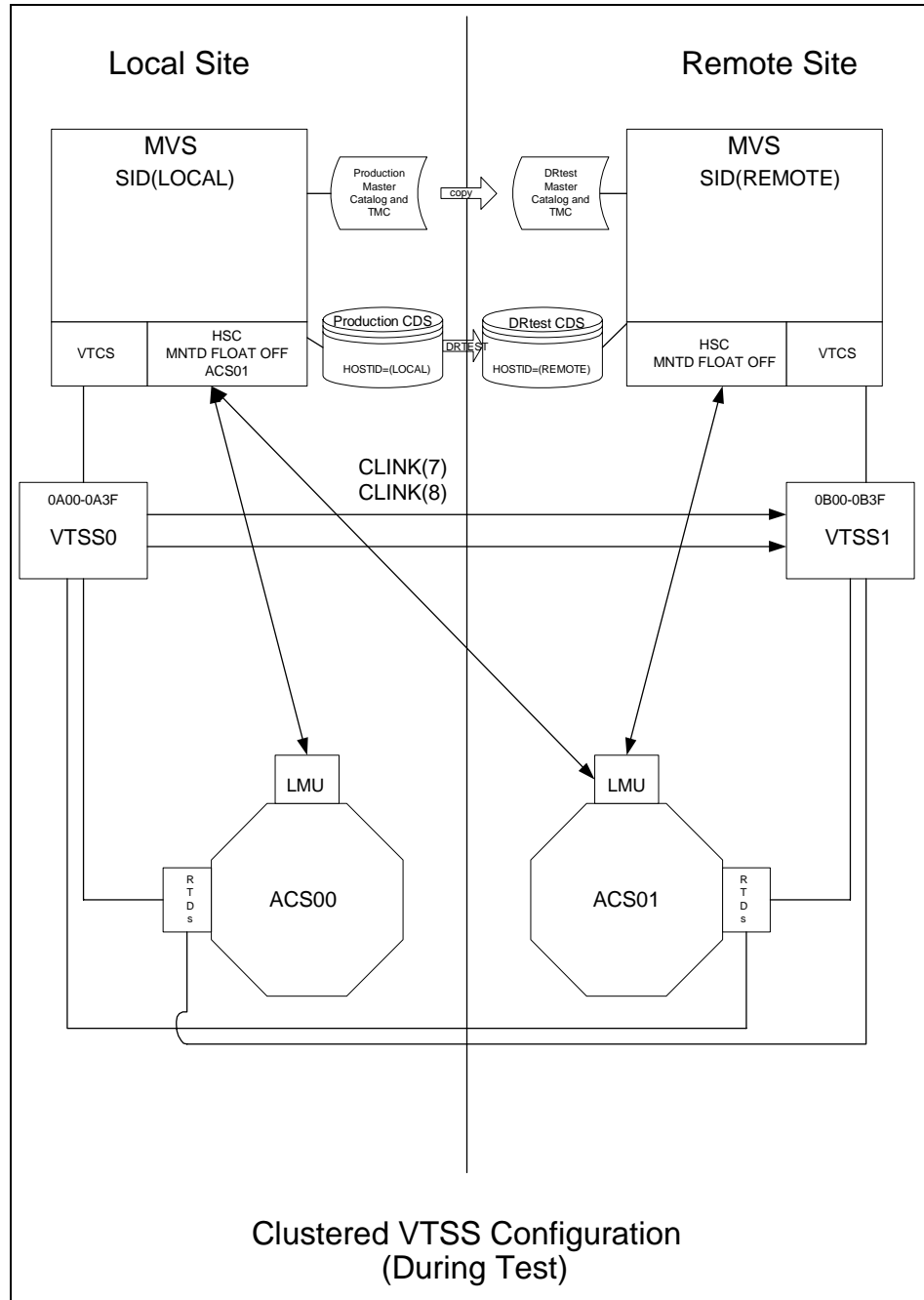


FIGURE 1-17 Primary/Secondary Clustered VTSS Configuration - During Test

Defining Resources for the Test

Note – A Best Practices suggestion is to put the statements in this procedure into a separate PARMLIB member so you can apply all statements before you start testing.

▼ Here's how it works:

1. Ensure that there are sufficient MVCs available to both the production and DR test systems...

If there are sufficient MVCs to define two separate pools for the production and test systems, go to [Step 3](#). Otherwise, first do one of the following:

- Run the VTCS MVCDRAIN utility to free up MVCs for DR test MVC pool use.
- Add more MVCs to the production MVC pool.

2. Optionally, ensure that there are sufficient VTVs available to both the production and DR test systems to define a separate non-overlapping range of VTV VOLSERs.

If there are sufficient VTVs to define two separate, non-overlapping VTV ranges, one for the production and another for the test systems, go to [Step 3](#). Otherwise, first do the following two steps:

- Run the VTCS DECOM utility to examine your current VTCS configuration and to determine which VTV VOLSER range to add.
- Add a non-overlapping range of VTVs to be used by the hosts at the disaster site by executing the VTCS CONFIG utility with DECOM output plus an additional VTVVOL statement that defines the new VTV VOLSER range.

3. Write an MVCPOOL statement that defines MVCs for the test.

As described in [“Defining MVC Pools for Concurrent DR Testing” on page 17](#), you must have already defined the MVCs to VTCS via the CONFIG MVCVOL statement, and these MVCs must reside in ACS01.

For example, the following MVCPOOL statement defines volsers 004500 - 004999 as MVCs in Named Pool TESTPOOL.

```
MVCP V(004500 - 004999) NAME (TESTPOOL) MVCFREE(1) MAXMVC(98) THRESH(98)
START(98)
```

Warning.

- As described in this step, 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.
 - This MVCPOOL statement restricts reclamation as described in [“Restrictions that You Must Enforce” on page 4](#).
-

4. Load the TESTPOOL definition into the LOCAL MVS system.

For example:

```
VT MVCDEF DSN(VSM.MVCPPOOL.LOCAL)
```

You do this to prevent the production jobs from stepping on MVCs in TESTPOOL.

5. Define a Test Storage Class and associate it with TESTPOOL.

For example, the following STORclas statement:

- Defines Storage Class STORTEST
- Associates STORTEST with Named MVC Pool TESTPOOL

```
STOR NAME (STORTEST) MVCPOOL (TESTPOOL)
```

6. Take the Production Management Class(es) that would be referenced during the test and rewrite the MGMTclas statements to point it to STORTEST.

For example:

```
MGMT NAME (PAYROLL) MIGPOL (STORTEST)
```

7. Create a separate PARMLIB member that loads the statements from [Step 3](#), [Step 5](#), and [Step 6](#) on the REMOTE MVS system.

For example:

```
VT MVCDEF DSN (VSM.DRTEST.REMOTE)  
MGMTDEF DSN (VSM.DRTEST.REMOTE)
```

Caution – The “and don’t forget” part of this step is **don’t** alter TAPEREQ/MGMTCLAS statements on the LOCAL system, because, once again, you do not want production work interfering with your test resources during the test.

Quiescing the Test VTSS

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

▼ To quiesce the test VTSS:

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 REPLCAT. Here, replication is still active:

```
VTSS  HOST QDEPTH
```

```
VTSS0 LOCAL  1
```

You know replication is complete when you see this:

```
VTSS  HOST QDEPTH
```

```
VTSS0 LOCAL  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 LOCAL
```

```
VTSS0  8  ONLINE REPLICATING LOCAL
```

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
```

...and continue with ["Setting Up the Test Environment" on page 44](#)

Setting Up the Test Environment

Finally, you set up the Remote Site (test) environment.

▼ To set up the test environment:

1. **Copy the MVS Catalog to the DR test site if required.**
2. **Optionally, copy the TMS database (if a TMS is used) to the DR test site.**
3. **Use the HSC CAPPREF command to set all CAPs in the DR test ACS to manual mode.**
4. **Optionally, migrate VTSS1 to zero in order to synchronize VTSS1 with the CDS.**
5. **Vary any RTDs that are shared between the production and test VTSSs offline.**

These RTDs will only need to be offline for a short time while the utility executes.

6. **Run the DRTEST utility to copy the CDSs for the DR test.**

The CDSs and journals (if used) can be allocated via the DD statements on the utility. For more information, see [“DRTEST Utility” on page 47](#).

...and turn to [“Running the Test” on page 45](#)

Running the Test

▼ Setup is complete, so start the test:

1. **Start the DR test on the LOCAL MVS system.**

`DRTEST START`

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

2. **Start VTCS/HSC/SMC on the REMOTE MVS system...**

...which loads the statements created in [Step 7 on page 42](#).

3. **Vary VTSS1 online on the REMOTE MVS system:**

`VARY VTSS1 ONLINE`

4. **Run the tests at the Remote 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, moves, scratch updates, audits, or scratch redistributions can occur at the DR test site.
- No floating dismounts, 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.
- HSC 4.0/4.1 systems cannot be active when starting the DR test, or running on the DR hosts.
- And when you're done testing...

...finish with [“Cleaning up and Resuming Normal Processing” on page 46](#).

Cleaning up and Resuming Normal Processing

The test is complete, so now it's time to clean up and return to normal processing.

▼ To clean up and return to normal processing:

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. Demand migrate (and delete from the VTSS) the new/modified VTVs you identified in [Step 1](#):

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

3. 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 or the demand migrate in [Step 2](#), otherwise production data in VTSS0 could be replaced by the test VTVs in VTSS1, which causes loss of production data!

4. Stop VTCS/HSC/SMC on the REMOTE MVS system.

5. Stop the DR test on the LOCAL MVS system.

```
DRTEST STOP
```

For more information, see [“DRTEST Utility” on page 47](#) and [“DRTEST Command” on page 54](#).

6. 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.

7. Vary VTSS1 back online on the LOCAL MVS system.

```
VARY VTSS1 ON
```

...which completes the test, test cleanup, and resumption of normal processing.

DRTEST Utility

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

Syntax

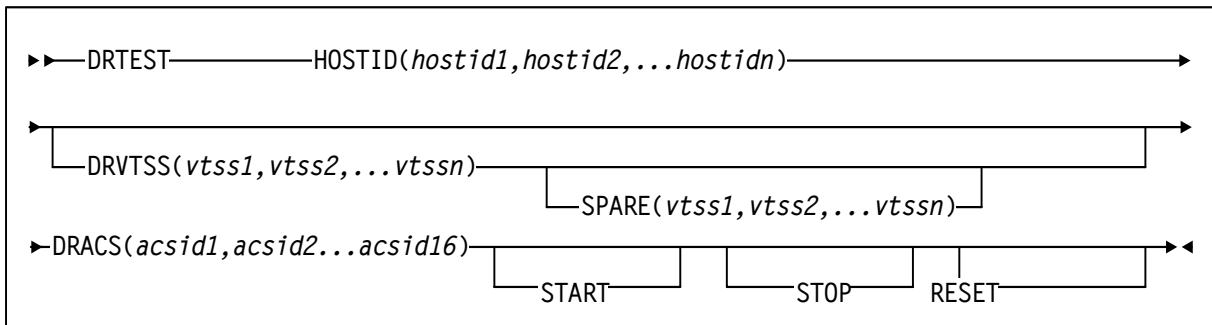


FIGURE 1-18 DRTEST utility syntax

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 [“PRIMING the Production CDS” on page 49](#) 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 [“PRIMING the Production CDS” on page 49](#) 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 [“PRIMING the Production CDS” on page 49](#) for use details.

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 [“DRTEST Command” on page 54](#).

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:

- [“Scenario 1: Production and Test Sites, ACS at Each Site, Spare VTSS at Test Site” on page 21](#)
- [“Scenario 2: Production and Test Sites, ACS at Each Site, VTSS Takeover at Test Site” on page 27](#)
- [“Scenario 3: Production and Test Sites, ACS at Each Site, No VTSSs” on page 33](#)
- [“Scenario 4: Clustered VTSSs with Local and Remote Sites” on page 38](#)

▼ 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 – SLSJRNNn

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 1-19](#) 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 1-19 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 1-20](#) 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 1-20 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 1-21 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 1-21 DRTEST utility example: setting up the test environment

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

Timing diagram for DRTEST signal. The signal is high from the start of the test until the STOP signal is asserted, then it becomes low. The START signal is asserted at the beginning of the test, and the STOP signal is asserted at the end of the test.

Parameters

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

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

- 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 47](#).

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*.

To start DR testing, enter the following:

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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=XXXXXXX

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 SLSJRNX 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 its 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 or 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.

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