Sun StorEdge™ Data Management Center 2.0 Software Installation Guide

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Contents

Preface

The *Sun StorEdge™ Data Management Center 2.0 Installation Guide* describes how to install and configure the Data Management Center (DMC) system.

How This Book Is Organized

Chapter 1 “Introduction” provides general information about the DMC software.

Chapter 2 “Installing Fast Write Cache 2.0 for DMC” provides pre-installation and installation information for FWC.

Chapter 3 “Installing StorEdge Target Emulation 1.2 for DMC” provides pre-installation and installation information for STE.

Chapter 4 “Installing Instant Image 2.0 for DMC” provides pre-installation and installation information for II.

Chapter 5 “Installing Component Manager 2.1 for DMC” provides pre-installation and installation information for CM.

Appendix A “Using STE” provides detailed information on using STE.

Appendix B “Installing StorEdge Network Data Replicator 2.0 for DMC” provides pre-installation and installation information for SNDR.

Appendix C “Installing DMC 2.0 Using Solaris 2.6” provides installation information for FWC, II and CM using Solaris 2.6.

Appendix D “Installing DMC 2.0 Using Solaris 7” provides installation information for FWC, II and CM using Solaris 7.

Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

Typographic Conventions

Typeface	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the *User's Guide.* These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type `rm` *filename.*

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Documentation

Product	Application	Title	Part Number
FWC	Installation	*Sun StorEdge™ Fast Write Cache 2.0 Installation Guide*	806-4405
	Release	*Sun StorEdge™ Fast Write Cache 2.0 Release Notes*	806-3165
	System Adminstration	*Sun StorEdge™ Fast Write Cache 2.0 System Administrator's Guide*	806-2064
STE	Release	*Sun StorEdge™ Target Emulation 1.2 Release Notes*	806-5527
II	Release	*Sun StorEdge™ Instant Image 2.0 Release Notes*	806-0231
	Installation	*Sun StorEdge™ Instant Image 2.0 Installation Guide*	806-4004
	System Adminstration	*Sun StorEdge™ Instant Image 2.0 System Administrator's Guide*	806-0230

Product	Application	Title	Part Number
CM	Installation	*Sun StorEdge™ Component Manager 2.1 Installation Guide: For the Solaris Operating Environment*	806-4811
	User	*Sun StorEdge™ Component Manager 2.1 User's Guide*	806-4813
	Release	*Sun StorEdge™ Component Manager 2.1 Release Notes*	806-4814
SNDR	Release	*Sun StorEdge™ Network Data Replicator 2.0 Release Notes*	806-4404
	Installation	*Sun StorEdge™ Network Data Replicator 2.0 Installation Guide*	806-4403
	System Adminstration	*Sun StorEdge™ Network Data Replicator 2.0 System Administrator's Guide*	806-4402

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CHAPTER 1

Introduction

This chapter describes the Data Management Center system. This chapter contains the following topics:

Note – The purpose of this document is to enable you to install and configure your DMC using the typical examples provided. For more detailed information about each software element, refer to the documents listed in that product's chapter.

DMC Overview

The DMC system is a collection of the following software components that provide a storage system solution.

TABLE 1-1 DMC Components

Software Component	Version
Sun StorEdge™ Target Emulation (STE)	1.2
Sun StorEdge™ Fast Write Cache (FWC)	2.0
Sun StorEdge™ Instant Image (II)	2.0
Sun StorEdge™ Component Manager (CM)	2.1
Sun StorEdge™ Management Console (SMC)	1.2
Sun StorEdge™ Network Data Replicator (SNDR) *Optional*	2.0

Key Functions of DMC

The following are some key functions of DMC.

TABLE 1-2 DMC Key Functions

Components	Component Functions
STE	Allows multiple heterogeneous hosts to access the attached storage as if they were one or more SCSI target devices.
FWC	Enhances performance by writing data to NVRAM cards.
II	Provides point-in-time snapshots of data without affecting online data access.
CM	Provides configuration, control, monitoring, and diagnosis of A5x00 and T3 storage enclosures.
SMC	A centralized GUI for storage administration. Supplies common services to management plug-ins such as log and alarm management and remote notification.
SNDR	Provides transparent replication of volumes between primary and secondary sites over TCP/IP compatible links.

Note – For more detailed information about each of these components, refer to applicable manuals listed in that product's chapter.

Optional Software

This software product may supplement your DMC system.

- Sun StorEdge™ Network Data Replicator (SNDR)

Key Functions of Optional Software

Each product offers unique functionality as shown in TABLE 1-3.

TABLE 1-3 Optional Software Key Functions

Software Product	Function
SNDR	Allows for the replication of data between physically separated servers in real time and from any distance.

Note – For more detailed information about each of these products, refer to applicable manuals.

Caution – The DMC uses STE vdisks to provide storage to directly attached fiber channel hosts. When data services software (II, FWC, CM and SNDR) is on an application server, data volumes are in the SV (storage volume) layer. DMC does not use the SV layer instead it uses the STE layer. Other documents direct you to place II, FWC, CM and SNDR under SV using `/etc/opt/SUNWspsv/sv.cf`. When loading DMC, you must place these items under STE using `/etc/opt/SUNWte/ste.cf`. DMC loaded on a server is a storage server, not an application server.

Supported Operating Systems and Patches

The following operating systems are supported as shown in TABLE 1-4.

TABLE 1-4 Supported Operating Systems

Server	Supported Operating Systems
DMC	Solaris 2.6, 7, 8

Caution – If you are installing DMC software on a Solaris 2.6 system, ensure you add this line to the `/etc/system` file.

```
set kobj_map_space_len=0x200000
```

Caution – Before loading DMC software, ensure that all required patches are loaded.

The following tables describe the minimum patch revisions. If newer revisions are available, use them. Patches are available on `http://sunsolve.sun.com`.

Caution – We recommend that all patches (OS and DMC) are loaded in single user mode.

Note – You must be logged in as root to install and administer DMC software.

TABLE 1-5 Solaris 2.6 Patches

Patch Number	Patch Description
not applicable	Solaris 2.6 Recommended Patch Cluster
108091-03	5.6 ssJDK1.2.1_03
105375-22	5.6 `sf` & `socal` driver

TABLE 1-6 Solaris 7 Patches

Patch Number	Patch Description
not applicable	Solaris 7 Recommended Patch Cluster
106924-06	5.7 isp driver patch (SBus systems only)
106980-11	5.7 `libthread`
107081-19	5.7 Motif 1.2.7 and 2.1.1: Runtime library
107469-07	5.7 sf & socal drivers

TABLE 1-7 Solaris 8 Patches

Patch Number	Patch Description
not applicable	Solaris 8 Recommended Patch Cluster
109460-02	5.8 `sf` & `socal` drivers

TABLE 1-8 DMC Product Patches

Patch Number	Patch Description
109624-01	FWC patch to work with CM 2.1
109628-01	II patch to work with CM 2.1

Caution – Ensure you load the applicable patches in TABLE 1-8 *after* installing FWC and II.

TABLE 1-9 Open Boot PROM Patches (OBP)

Patch Number	Patch Description
103346-26	Hardware / PROM: Ultra Enterprise™ 3x00 / 4x00 / 5x00 / 6x00 flashprom update

Supported Hardware Platforms

- The DMC supports the server hardware platforms shown in TABLE 1-10.

TABLE 1-10 Supported Sun Servers

Model	Usage
Sun Enterprise 10000	High-End server
Sun Enterprise 3x00-6x00	Midrange servers
NOTE: Minimum server configuration is 4 CPUs and 2.0 Gbytes RAM	

- The DMC supports the Interfaces shown in TABLE 1-11.

TABLE 1-11 Interfaces Supported

Interface Type	Interface Part Number
SBus Fibre Channel Host Bus Adapter (FC-AL HBA)	501-3060

- The DMC supports the any Sun supported storage hardware platforms.

Disk Space Requirements

Ensure you have the required disk space allocated for the software you plan to install.

TABLE 1-12 Approximate Disk Space Needs

Software Item	Approximate Disk Space
CM/SMC	/etc= 2MBytes minimum /var= 50MBytes minimum /usr/opt= 35MBytes
FWC	40MBytes root=50KBytes /usr=40MBytes /var=136KBytes SUNWmscmu and SUNWmscmu=283KBytes
STE	5MBytes
II	2MBytes 70MBytes for supporting packages
SNDR	306KBytes 3374KBytes for supporting packages

CHAPTER 2

Installing Fast Write Cache 2.0 for DMC

This chapter describes a typical example of installing and configuring FWC 2.0 on a Solaris 8 E4500 server. This chapter contains the following topics:

Pre-Installation

We recommend you familiarize yourself with the following items prior to installing the FWC software.

Note – Ensure you have installed the NVRAM cards prior to loading the FWC software. The NVRAM cards are not currently shipped with the FWC software. The part number is: SG-XFWC-SBUS-256MB.

TABLE 2-1 Required Materials

Item Name	Item Part Number
Sun StorEdge™ Fast Write Cache 2.0 CD	704-7138-10
Sun StorEdge™ Fast Write Cache 2.0 Installation Guide	806-4405
Sun StorEdge™ Fast Write Cache 2.0 Release Notes	806-3165
Sun StorEdge™ Fast Write Cache 2.0 System Administrator's Guide	806-2064

Note – If you are running a previous revision of FWC, remove the old FWC packages before installing FWC 2.0. Please refer to the *Sun StorEdge™ Fast Write Cache System Administration Guide* for information on removing the old FWC packages.

Installation

The following typical example assumes you are running Solaris 8 Operating System on an E4500 server with the required patches indicated in Chapter One.

▼ FWC Installation Procedure

1. **Verify the presence of the cards by running** `prtdiag`**. The following is an excerpt from** `prtdiag` **output.**

```
# /usr/platform/sun4u/sbin/prtdiag

(additional output deleted)
========================= IO Cards =========================

     Bus   Freq
Brd  Type  MHz   Slot Name                      Model
---  ----  ----  ---- ----------------------- ------------------
 1   SBus   25     0   SUNW,socal/sf (scsi-3) 501-3060
 1   SBus   25     2   NW,nvmem                MMI,MM-1370C/255M
 1   SBus   25     3   SUNW,hme
 1   SBus   25     3   SUNW,fas/sd (block)
 1   SBus   25     13  SUNW,socal/sf (scsi-3) 501-3060
 5   SBus   25     0   SUNW,socal/sf (scsi-3) 501-3060
 5   SBus   25     1   SUNW,socal/sf (scsi-3) 501-3060
 5   SBus   25     2   SUNW,nvmem              MMI,MM-1370C/255M
 5   SBus   25     3   SUNW,hme
 5   SBus   25     3   SUNW,fas/sd (block)
 5   SBus   25     13  SUNW,socal/sf (scsi-3) 501-3060
 7   SBus   25     0   SUNW,socal/sf (scsi-3) 501-3060
 7   SBus   25     2   SUNW,ba                 SUNW,SAHI-3
 7   SBus   25     3   SUNW,hme
 7   SBus   25     3   SUNW,sas/sd (block)
 7   SBus   25     13  SUNW,socal/sf (scsi-3) 501-3060
```

Note – This example assumes that the Solaris volume manager is controlling the cd. If it is not, refer to the *Guidelines for Using CDs and Diskettes* in the Solaris AnswerBook.

Note – The installation of FWC differs somewhat when using Solairs 2.6 and 7 than Solaris 8. Refer to either Appendix C for Solaris 2.6 or Appendix D for Solaris 7 to supplement this installation.

2. **Insert the FWC cd and verify that the cd is mounted. Install FWC.**

```
# mount | grep cdrom
/cdrom/sun_storedge_fast_write_cache_20 on /vol/dev/dsk/c1t6d0/
sun_storedge_fast_write_cache_20 read only/setuid/maplcase/
noglobal/rr/traildot/dev=16c0002 on Mon Jul 10 13:32:49 2000
# cd /cdrom/sun_storedge_fast_write_cache_20
# ls
Copyright       Docs           Fast_Write_Cache  FR_Copyright
install_fwc       README
# ./install_fwc

                        Sun StorEdge Fast Write Cache

This product provides a graphical interface to the monitoring and
configuring of Fast Write Cache.  It is assumed that you agree to
legal terms explained in
        http://www.sun.com/share/text/SMICopyright.html


                Answer "y" if you accept the terms of the SMI Copyright.

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR
SYSTEM
[y/n] (y)? y

By default Fast Write Cache and Sun StorEdge platform are installed
in /usr/opt
An install log can be found at /var/tmp/fwc_install.log.10Jul2000-
13:33:43

(additional output has been deleted)

Installation of Sun StorEdge Fast Write Cache was successful.

An un-install script has been generated to aid in the removal of
this software.
The location of the un-install script is:
        /var/tmp/uninstall_fwc
#
```

Caution – Make sure you preserve `/var/tmp/uninstall_fwc`. If you need to uninstall FWC in the future, you will need the `uninstall_fwc` script to do so.

3. **Eject the cdrom**

```
# cd /
# eject cdrom
```

Caution – You must install the applicable patches listed in TABLE 1-8 after installing FWC.

4. **Reboot the system with** `/etc/shutdown`.

```
# /etc/shutdown -y -i 6 -g 0
```

Note – Do not reboot a DMC using `init 6` or `reboot`.

After the system has rebooted, you can check the status of the FWC boards with `fwcadm nvram -s`**.**

```
# /usr/opt/SUNWesm/sbin/fwcadm  nvram -s
Device Size Inst   Parent Status  Dirty  Battery  UCE CE   Mirror
#_____________________________________________________________________
nvram0  254 MB #0  sbus #0  Active     1    Good    0  0   nvram1
nvram1  254 MB #1  sbus #2  Active     1    Good    0  0   nvram0
```

Technical Resources

For more detailed information on FWC, refer to the documents listed in TABLE 2-1. Refer to Appendix A for STE details.

Caution – The DMC uses STE vdisks to provide storage to directly attached fiber channel hosts. When data services software (II, FWC, CM and SNDR) is onan application server, data volumes are in the SV (storage volume) layer. DMC does not use the SV layer instead it uses the STE layer. Other documents direct you to place II, FWC, CM and SNDR under SV using `/etc/opt/SUNWspsv/sv.cf`. When loading DMC, you MUST place these items under STE using `/etc/opt/SUNWte/ste.cf`. DMC loaded on a server is a storage server, not an application server.

CHAPTER 3

Installing StorEdge Target Emulation 1.2 for DMC

This chapter describes a typical example of installing and configuring STE 1.2 on a Solaris 8 E4500 DMC, connected via fibre channel to a Solaris 8 initiator host. This chapter contains the following topics:

Pre-Installation

We recommend you familiarize yourself with the following items prior to installing the STE software.:

TABLE 3-1 Required Materials

Item Name	Item Part Number
Sun StorEdge™ Target Emulation 1.2 CD	704-7250-10
Sun StorEdge™ Target Emulation 1.2 Release Notes	806-5527-10

The following items are needed for the installation. For more detailed information on STE, refer to Appendix A.

Note – If you are running a previous revision of STE, stop STE, and remove the STE packages.

```
# steadm -d
# pkgrm SUNWsftm SUNWte
```

Installation

The following typical example assumes that you are running the Solaris 8 Operating System on an E4500 server with the required patches indicated in Chapter One. DMC is connected via fibre channel to a Solaris 8 initiator host.

▼ STE Installation Procedure

Note – This example assumes that the Solaris volume manager is controlling the cd. If it is not, refer to the *Guidelines for Using CDs and Diskettes* in the Solaris AnswerBook.

Caution – Install the supporting Data Services software packages in this order from the II CD.

1. **Insert the II cd and verify that the cd is mounted. Install II.**

```
# mount | grep cdrom

/cdrom/instant_image_l10n on /vol/dev/dsk/c0t6d0/instant_image_l10n read
only/set
uid/maplcase/noglobal/rr/traildot/dev=16c0002 on Wed Aug  9 13:54:11 2000

# cd /cdrom/instant_image_l10n/Instant_Image/
# ls
Docs/           Solaris_2.6/    Solaris_7/      Solaris_7-899/  Solaris_8/

# cd Solaris_8/Packages/
# ls
SUNWcdae/   SUNWcj2rt/  SUNWesmrt/  SUNWfrdae/  SUNWii/     SUNWj2rt/
SUNWjeesm/  SUNWmjhlp/  SUNWspcsl/  SUNWsvmsr/
SUNWcesm/   SUNWdaert/  SUNWesmru/  SUNWfresm/  SUNWiimsr/  SUNWjadae/
SUNWjj2rt/  SUNWmjmai/  SUNWspsv/   SUNWsvmsu/
SUNWcii/    SUNWesm/    SUNWfj2rt/  SUNWfrii/   SUNWiimsu/  SUNWjaii/
SUNWmjacf/

# pkgadd -d . SUNWspuni SUNWscm

(additional output deleted)
```

2. **Eject the cd.**

```
# cd /
# eject cdrom
```

3. **Insert the STE cd and verify that the cd is mounted. Install STE.**

```
# mount | grep cdrom
/cdrom/ste_1_2 on /vol/dev/dsk/c1t6d0/ste_1_2 read only/setuid/
   maplcase/logglobal/rr/traildot/dev=16c0001 on Mon Jul 10 13:31:18 2000
# cd /cdrom/ste_1_2/STE_1.2
# ls
Solaris_2.6    Solaris_7      Solaris_7-899  Solaris_8
# cd Solaris_8
# ls
SUNWifptm  SUNWscm    SUNWsftm   SUNWspuni  SUNWte
# pkgadd -d . SUNWte SUNWsftm

(additional output deleted)
```

4. **Eject the cd.**

```
# cd /
# eject cdrom
```

STE Configuration Example

In this example, three Veritas volumes are used to create STE vdisks. The three volumes: /dev/vx/rdsk/testdg/lun0,/dev/vx/rdsk/testdg/lun1,/dev/vx/rdsk/testdg/lun2 will be made into STE vdisks /dev/vx/rdsk/testdg/headsandtails0 will be used to contain the STE phantom headers and phantom tails.

▼ STE Configuration Procedure

1. **Run** `steconf` **to interrogate the DMCs fibre channel interfaces.**

```
# /usr/opt/SUNWesm/sbin/steconf
Brd  Slot Driver Device Name
---  ----  ----  ------------------------------------------
 1   0     sftm  /devices/sbus@3,0/SUNW,socal@0,0:0 (Offline)
 1   13    sftm  /devices/sbus@2,0/SUNW,socal@d,10000:0 (Offline)
           sftm  /devices/sbus@2,0/SUNW,socal@d,10000:1 (Initiator)
 5   0     sftm  /devices/sbus@b,0/SUNW,socal@0,0:0 (Offline)
           sftm  /devices/sbus@b,0/SUNW,socal@0,0:1 (Offline)
 5   1     sftm  /devices/sbus@a,0/SUNW,socal@1,0:0 (Offline)
           sftm  /devices/sbus@a,0/SUNW,socal@1,0:1 (Offline)
 5   13    sftm  /devices/sbus@a,0/SUNW,socal@d,10000:0 (Offline)
           sftm  /devices/sbus@a,0/SUNW,socal@d,10000:1 (Offline)
 7   0     sftm  /devices/sbus@f,0/SUNW,socal@d,0:0 (Offline)
           sftm  /devices/sbus@f,0/SUNW,socal@0,0:0 (Offline)
 7   13    sftm  /devices/sbus@e,0/SUNW,socal@d,10000:0 (Offline)
           sftm  /devices/sbus@e,0/SUNW,socal@0,10000:0 (Offline)
```

In this example we will use Port 1 of the SOC+ host bus adapter in board 5, slot 0.

2. **Edit the** `/etc/opt/SUNWte/ste.cf` **file.**

Note – The format of the `ste.cf` file is explained in Appendix A.

---

3. **This is a the** */etc/opt/SUNWte/ste.cf* **file for this configuration:**

```
 Copyright (c) 1999, by Sun Microsystems, Inc.
# All Rights Reserved.
#
#pragma ident"@(#)ste.cf1.799/05/17 SMI"
#
# SCSI Target Emulation Configuration File - ste.cf
#
Port
Name Driver Device Name                                  Loop Id
---  ------ ------------------------------------------------
 tm4  sftm  sftm  /devices/sbus@b,0/SUNW,socal@0,0:1   4


#Vdisk                              Port   SCSI
#Name   Partition Name               Name  LUN   State   Options
#------ ------------------------- ---- ----- ------ ---------------
vdisk0  /dev/vx/rdsk/testdg/lun0    tm4    0     online  ph=dev0 pt=dev1
vdisk1  /dev/vx/rdsk/testdg/lun1    tm4    1     online  ph=dev2 pt=dev3
vdisk2  /dev/vx/rdsk/testdg/lun2    tm4    2     online  ph=dev4 pt=dev5

#device
#keyword  Partition Name                     Start Block  Size
#-------  ------------------------------- ----------- --------

dev0     /dev/vx/rdsk/testdg/headsandtails0  0            2268
dev1     /dev/vx/rdsk/testdg/headsandtails0  2268         4536
dev2     /dev/vx/rdsk/testdg/headsandtails0  6804         2268
dev3     /dev/vx/rdsk/testdg/headsandtails0  9072         4536
dev4     /dev/vx/rdsk/testdg/headsandtails0  13608        2268
dev5     /dev/vx/rdsk/testdg/headsandtails0  15876        4536
```

Note – Use phantom headers and tails. For more details, refer to Appendix A.

4. **Run** `stesocal.ksh` **to create** `/kernel/drv/socal.conf`**.**

```
# /usr/opt/SUNWesm/SUNWte/tools/stesocal.ksh
Parsing STE configuration file '/etc/opt/SUNWte/ste.cf'.
Parsing done.

SOCAL configuration file needs to be changed.
Write the SOCAL configuration file '/kernel/drv/socal.conf'? (y/n)y
Wrote SOCAL configuration file '/kernel/drv/socal.conf'.

Must reboot for changes to take effect!
#
```

This is the `socal.conf` file generated by `stesocal.ksh`.

```
name="SUNW,socal" parent = "sbus@b,0"
      reg=0x0, 0x0, 0x10000, 0x0, 0x10000, 0x10000, 0x0, 0x20000, 0x18
        port1-loop-id=4;
```

5. **Reboot the DMC with** `/etc/shutdown`**.**

Note – Do not reboot a DMC using *`init 6`* or *`reboot`*.

```
# /etc/shutdown -y -i 6 -g 0
```

6. **After the DMC has rebooted, the vdisks can be labeled by the initiator hosts.**

This is an example of a `prtvtoc`(1M) of the STE vdisk as seen from the initiator host. Use `format`(1M) from the initiator host to label the STE vdisk.

```
# prtvtoc /dev/rdsk/c3t4d2s2
* /dev/rdsk/c3t4d2s2 partition map
*
* Dimensions:
*     512 bytes/sector
*     108 sectors/track
*      21 tracks/cylinder
*    2268 sectors/cylinder
*     184 cylinders
*     182 accessible cylinders
*
* Flags:
*   1: unmountable
*  10: read-only
*
*
*                           First    Sector    Last
*   Partition  Tag  Flags   Sector    Count    Sector MountDirect
    0          2     01     0       2268      2267
    1          3     00     2268    410508    412775
    2          5     01     0       412776    412775
```

Technical Resources

For more detailed information regarding STE, refer to Appendix A.

Caution – The DMC uses STE vdisks to provide storage to directly attached fiber channel hosts. When data services software (II, FWC, CM and SNDR) is used on an application server, data volumes are in the SV (storage volume) layer. DMC does not use the SV layer. Instead; it uses the STE layer. Other documents direct you to place II, FWC, CM and SNDR under SV using */etc/opt/SUNWspsv/sv.cf*. When loading DMC, you MUST place these items under STE using */etc/opt/SUNWte/ste.cf*. DMC loaded on a server is a storage server, not an application server.

CHAPTER 4

Installing Instant Image 2.0 for DMC

This chapter describes a typical example of installing and configuring II 2.0 on a Solaris 8 E4500 server. This chapter contains the following topics:

Pre-Installation

We recommend you familiarize yourself with the following items prior to installing the II software.

TABLE 4-1 Required Materials

Item Name	Item Part Number
Sun StorEdge™ Instant Image 2.0 CD	704-6939-10
Sun StorEdge™ Instant Image 2.0 Release Notes	806-0231
Sun StorEdge™ Instant Image 2.0 Installation Guide	806-4004
Sun StorEdge™ Instant Image 2.0 System Administrator's Guide	806-0230

Note – If you are running a previous revision of II, remove the old II packages before installing II 2.0. Please refer to the *Sun StorEdge™ Instant Image 2.0 Installation Guide* for information on removing the old II packages.

Installation

The following typical example assumes you are running Solaris 8 Operating System on an E4500 server with the required patches indicated in Chapter One.

▼ II Installation Procedure

Note – This example assumes that the Solaris vloume manager is controlling the cd. If it is not, refer to the *Guidelines for Using CDs and Diskettes* in the Solaris AnswerBook.

Note – The installation of II differs somewhat when using Solairs 2.6 and 7 than Solaris 8. Refer to either Appendix C for Solaris 2.6 or Appendix D for Solaris 7 to supplement this installation.

1. **Insert the II cd and verify that the cd is mounted. Install II.**

```
# mount | grep cdrom
/cdrom/instant_image_l10n on /vol/dev/dsk/c1t6d0/
instant_image_l10n read only/setuid/maplcase/noglobal/rr/
traildot/dev=16c0001 on Thu Jul 20 08:56:24 2000
# cd /cdrom/instant_image_l10n
# ls
Copyright     FR_Copyright   install_ii     Instant_Image  README
# ./install_ii

Product language versions available are
        1. English
        2. French
        3. Japanese
        4. Simplified Chinese
What language version do you want to install [1-4]?:1

                      Sun StorEdge Instant Image

This product provides a graphical interface to the monitoring and
configuring of Instant Image.  It is assumed that you agree to
legal terms
explained in
        http://www.sun.com/share/text/SMICopyright.html



              Answer "y" if you accept the terms of the SMI Copyright.

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR
SYSTEM
[y/n] (y)? y

(additional output deleted)
```

Note – Ensure you enter *y* to load loader II core packages. The software does not load otherwise.

```
(screen continued from above)

Starting installation of Instant Image Core packages
An earlier version of SUNWspuni exists on the system
The installed version is: 1.0.10,REV=5.7.1.2000.04.24
and the version to be installed is: 1.0.8,REV=02.01.2000

Should version 1.0.10,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Installation of SUNWspuni was successful.
An earlier version of SUNWscm exists on the system
The installed version is: 1.1.19,REV=5.7.1.2000.04.24
and the version to be installed is: 1.1.16,REV=02.01.2000

Should version 1.1.19,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Aug  4 17:48:01 turing126 unix: pseudo-device: rammc0
Aug  4 17:48:01 turing126 unix: rammc0 is /pseudo/rammc@0
Installation of SUNWscm was successful.
An earlier version of SUNWspsv exists on the system
The installed version is: 1.0.31,REV=5.7.1.2000.04.24
and the version to be installed is: 1.0.30,REV=02.01.2000

Should version 1.0.31,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Aug  4 17:48:22 turing126 unix: pseudo-device: sv0
Aug  4 17:48:22 turing126 unix: sv0 is /pseudo/sv@0
Aug  4 17:48:42 turing126 unix: pseudo-device: sv0
Aug  4 17:48:42 turing126 unix: sv0 is /pseudo/sv@0
Installation of SUNWspsv was successful.
An earlier version of SUNWspcsl exists on the system
The installed version is: 1.0.33,REV=5.7.1.2000.04.24
and the version to be installed is: 1.0.31,REV=02.01.2000
```

```
(screen continued from above)

Should version 1.0.33,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Installation of SUNWspcsl was successful.
Aug  4 17:49:15 turing126 unix: pseudo-device: ii0
Aug  4 17:49:15 turing126 unix: ii0 is /pseudo/ii@0
Installation of SUNWii was successful.


Starting installation of Instant Image packages
Installation of SUNWsvmsr was successful.
Installation of SUNWsvmsu was successful.
Installation of SUNWiimsr was successful.
Installation of SUNWiimsu was successful.

Installation of Sun StorEdge Instant Image was successful.

Before you can enable and use the Sun StorEdge Instant Image
software with your volumes, you need to add the volumes to the
storage volume layer. See the Sun StorEdge Instant Image
documentation for procedures on how to add the volumes.

An un-install script has been generated to aid in the removal of
this
software.
The location of the un-install script is:
        /var/tmp/uninstall_ii
#
```

Caution – Make sure you preserve `/var/tmp/uninstall_ii`. If you need to uninstall II in the future, you will need the `uninstall_` script to do so.

2. **Eject the cdrom.**

```
# cd /
# eject cdrom
```

Caution – You must install the applicable patches listed in TABLE 1-8 after installing II.

3. **Reboot the system with** `/etc/shutdown`**.**

Note – Do not reboot a DMC using `init 6` or `reboot`.

```
# /etc/shutdown -y -i 6 -g 0
```

II Configuration Example

After the system has rebooted you can configure volumes for II. In this example, two STE vdisks, `/dev/vx/rdsk/testdg/master0` and `/dev/vx/rdsk/testdg/shadow0` will be the *master* and *shadow* volumes in an II pair.

The master and shadow volumes are under STE control. The following `/etc/opt/SUNWte/ste.cf` file indicates the DMCs STE configuration. (There are several STE vdisks that are configured, but are not part of the II configuration). Ensure that the vdisks have been labeled appropriately by their respective initiators.

This is an example of the `/etc/opt/SUNWte/ste.cf` file.

```
# SCSI Target Emulation Configuration File - ste.cf
#
Port
Name Driver Device Name                                    Loop Id
---  ------ ------------------------------------------------------
tm3  sftm  /devices/sbus@b,0/SUNW,socal@0,0:0          3
tm4  sftm  /devices/sbus@b,0/SUNW,socal@0,0:1          4


#Vdisk                                Port   SCSI
#Name   Partition Name                Name  LUN   State   Options
#------ --------------------------- ---- ------ ------ ----------------
vdisk0  /dev/vx/rdsk/testdg/lun0     tm4    0    online   ph=dev0 pt=dev1
vdisk1  /dev/vx/rdsk/testdg/lun1     tm4    1    online   ph=dev2 pt=dev3
vdisk2  /dev/vx/rdsk/testdg/lun2     tm4    2    online   ph=dev4 pt=dev5
vdisk3  /dev/vx/rdsk/testdg/master0  tm4    3    online   ph=dev6 pt=dev7
vdisk4  /dev/vx/rdsk/testdg/shadow0  tm3    0    online   ph=dev8 pt=dev9


#device
#keyword  Partition Name                      Start Block  Size
#-------  ---------------------------------- ----------- -------

dev0     /dev/vx/rdsk/testdg/headsandtails0  0            2268
dev1     /dev/vx/rdsk/testdg/headsandtails0  2268         4536
dev2     /dev/vx/rdsk/testdg/headsandtails0  6804         2268
dev3     /dev/vx/rdsk/testdg/headsandtails0  9072         4536
dev4     /dev/vx/rdsk/testdg/headsandtails0  13608        2268
dev5     /dev/vx/rdsk/testdg/headsandtails0  15876        4536
dev6     /dev/vx/rdsk/testdg/headsandtails0  20412        2268
dev7     /dev/vx/rdsk/testdg/headsandtails0  22680        4536
dev8     /dev/vx/rdsk/testdg/headsandtails0  27216        2268
dev9     /dev/vx/rdsk/testdg/headsandtails0  29484        4536
```

Note – The master0 and shadow0 volumes along with their phantom headers and tails are denoted in gray.

▼ II Configuration Procedure

1. **Using the `iiadm`, put the master0 and shadow0 volumes into a independent II pair.**

   ```
   # /usr/opt/SUNWesm/sbin/iiadm -e ind /dev/rdsk/c0t1d0s3 /dev/rdsk/
   c0t1d0s4 /dev/rdsk/c0t1d0s5
   ```

2. **Check the status of the pair.**

```
# /usr/opt/SUNWesm/sbin/iiadm -i all
/dev/rdsk/c0t1d0s3: (master volume)
/dev/rdsk/c0t1d0s4: (shadow volume)
/dev/rdsk/c0t1d0s5: (bitmap volume)
Independent copy, copy in progress, copying master to shadow
Percent of bitmap set: 90
```

Technical Resources

For more detailed information on II, refer to the documents listed in TABLE 4-1 and refer to Appendix A for STE details.

Caution – The DMC uses STE vdisks to provide storage to directly-attached fiber channel hosts. When data services software (II, FWC, CM and SNDR) is used on an application server, data volumes are in the SV (storage volume) layer. DMC does not use the SV layer. Instead; it uses the STE layer. Other documents direct you to place II, FWC, CM and SNDR under SV using `/etc/opt/SUNWspsv/sv.cf`. When loading DMC, you must place these items under STE using `/etc/opt/SUNWte/ste.cf`. DMC loaded on a server is a storage server, not an application server.

CHAPTER 5

Installing Component Manager 2.1 for DMC

This chapter describes a typical example of installing and configuring CM 2.1 on a Solaris 8 E4500 server. This chapter contains the following topics:

Pre-Installation

We recommend you familiarize yourself with the following items prior to installing the CM software.

TABLE 5-1 Required Materials

Item Name	Item Part Number
Sun StorEdge™ Component Manager 2.1 CD	704-7285-10
Sun StorEdge™ Component Manager 2.1 Installation Guide: For the Solaris Operating Environment	806-4811
Sun StorEdge™ Component Manager 2.1 User's Guide	806-4813
Sun StorEdge™ Component Manager 2.1 Release Notes	806-4814

Note – If you are running a previous revision of CM, remove the old CM packages before installing CM 2.1. Please refer to the *Sun StorEdge™ Component Manager Installation Guide* for information on removing the old CM packages.

Note – When running Solaris 2.6 OS ensure `SUNWses` package is installed prior to installing CM.

Note – When using Sun StorEdge™ A5x00 with CM ensure patch 107473-04 or higher is installed. When using Sun StorEdge™ T3 with CM ensure patch 109115-02 or higher is installed.

Note – When using CM with SunStorEdge™ A5x00 or T3 ensure you use the latest required firmware as noted on: `http://sunsolve.sun.com.`

Installation

The following typical example assumes you are running Solaris 8 Operating System on an E4500 server with the required patches indicated in Chapter One.

▼ CM Installation Procedure

Note – This example assumes that the Solaris volume manager is controlling the cd. If it is not, refer to the *Guidelines for Using CDs and Diskettes* in the Solaris AnswerBook.

Note – The installation of CM differs somewhat when using Solairs 2.6 and 7 than Solaris 8. Refer to either Appendix C for Solaris 2.6 or Appendix D for Solaris 7 to supplement this installation.

---

1. **Insert the CM cd and verify that the cd is mounted. Install CM.**

```
# mount | grep cdrom
/cdrom/cm2.1 on /vol/dev/dsk/c1t6d0/cm2.1 read only/setuid/maplcase/
   noglobal/rr/traildot/dev=16c0002 on Thu Jul 20 09:00:17 2000
# cd /cdrom/cm2.1/
# ls
Component_Mgr  Copyright      FR_Copyright   install_cm
# ./install_cm

Sun StorEdge Component Manager
This product provides a graphical interface to the monitoring and
configuration of Component Manager. It is assumed that you agree to
the legal terms explained in
http://www.sun.com/share/text/SMICopyright.html


                Answer "y" if you accept the terms of the SMI Copyright.

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR SYSTEM
[y/n](y)?y

(additional output has been deleted)

An install log can be found at /var/tmp/cm_install.log.31May2000-14:37:55

(additional output has been deleted)

The location of the un-install script is:
/var/tmp/uninstall_cm
#
```

Caution – Make sure you preserve `/var/tmp/uninstall_cm`. If you need to uninstall CM in the future, you will need the `uninstall_cm` script to do so.

2. **Eject the cdrom.**

```
# cd/
# eject cdrom
```

Note – When StorEdge T3 are used with CM you MUST configure the *hosts* file so they can communicate together. You must add the IP address and the component names of the T3 subsystems to the `/etc/opt/SUNWesm/mo/hosts` file as shown.

a. Use an editor to make the entry.

```
ada45# vi /ect/opt/SUNWesm/mo/hosts
```

The entry format is shown:

```
# Component Manager 2.1 - Component table
#
# Each component entry is specified by its IP address and name,
#    IP address Name
#    129.150.151.69 cafejapan
#
123.456.78.90 ada49
```

3. **Reboot the system with** `/etc/shutdown`**.**

```
# /ect/shutdown -y -i 6 -g 0
```

Note – Do not reboot a DMC using `init 6` or `reboot`.

Technical Resources

For more detailed information on CM, refer to the documents listed in TABLE 5-1. Refer to Appendix A for details on STE.

APPENDIX **A**

Using STE

This appendix describes STE. This appendix contains the following topics:

What is STE?

STE is SCSI target emulation software (the STE driver plus one or more target mode drivers) over a Fibre Channel.

STE functionality:

- Enables an initiator host to connect to a target server and access the attached storage as if it were one or more SCSI target devices.
- Enables directly attached hosts to access Sun StorEdge Data Services, including II, SNDR, and FWC.
- Provides caching and read-ahead functionality for fast read/write access.
- Provides a variable logical disk partition size.
- Allows multiple LUNs to be configured on a Fibre Channel port.

STE Components

The STE product includes several utilities for managing the STE software and its attached target devices.

Utility	Function
`steadm`	Provides a command line interface for enabling, monitoring, and disabling STE.
`steconf`	Prints configuration information about Fibre Channel devices on the system.
`stesocal.ksh`	Generates the `socal.conf` file.
`stezap.ksh`	Erases the VTOC from the specified phantom header.

Product Considerations

- Do not use the SOC+ Fibre Channel Host Adapter in dual mode. You cannot configure one port for STE and the other port for a storage array.
- The Solaris operating environment reserves space for header information at the beginning of each disk. You may not write to this space. Use a phantom header as described in the “Phantom Header Section of `ste.cf` file “.

- VERITAS Dynamic Multipathing (DMP) and Alternate Pathing (AP) are not supported.
- STE 1.2 is not supported in a clustered environment.
- If you perform any reconfiguration, reconfigure the `ste.cf` file.
- STE and SV cannot share the same volume.

To Disable, Reconfigure, and Enable STE

STE initializes at system startup. To stop STE or change its configuration, you may do so manually with the `steadm(1M)` utility. Refer to the `steadm man` page for more information.

▼ To Disable STE

1. **To disable STE (all targets and vdisks), issue the following command**:

   ```
   # steadm -d
   ```

2. **To disable only a specific Target Mode Fibre Channel Port or Virtual Disk, specify the Port Name or Vdisk Name as an argument. For example:**

   ```
   # steadm -d vdisk6
   # steadm -d tm0
   ```

Note – Each port must have a LUN 0; therefore, you cannot disable a virtual disk that is being exported on LUN 0. If the virtual disk on LUN 0 is the only virtual disk on the port, use `steadm -d portname` to disable it.

▼ To Reconfigure STE

Note – To reconfigure an existing Target Mode Fibre Channel Port or Virtual Disk, you must disable, then reenable it.

---

1. **Disable any existing Target Mode Fibre Channel Port(s) and/or Virtual Disk(s) that you want to reconfigure.**

2. **Using a text editor, modify the STE configuration file** `/etc/opt/SUNWte/ste.cf` **as desired.**

3. **Enable the new or modified Target Mode Fibre Channel Port(s) and/or Virtual Disk(s).**

▼ To Enable STE

1. **To enable STE, use the following command:**

```
# steadm -e
```

2. **To enable a disabled Target Mode Fibre Channel Port or Virtual Disk, specify the Port Name or Vdisk Name as an argument. For example:**

```
# steadm -e vdisk6
# steadm -e tm0
```

To Remove STE

To remove STE from your target system, use the `pkgrm`(1M) utility.

1. **Become superuser (root).**

2. **Remove the STE and related packages.**

Note – If you are running other Sun StorEdge Data Services, do not remove SUNWscm and SUNWspuni. Other Sun Data Services include Sun StorEdge Instant Image, Sun StorEdge Fast Write Cache and Sun StorEdge Network Data Replicator.

```
# pkgrm SUNWsftm SUNWte SUNWscm SUNWspuni
```

3. **If you will not be upgrading or reinstalling STE, clean up residual files.**

`pkgrm`(1M) does *not* remove the STE configuration file or trace files generated by STE. If you will not be upgrading or reinstalling STE, you may want to manually remove the `/etc/opt/SUNWte` and `/var/opt/SUNWte` directories. If you were using SOC+ cards in Target Mode, you may also want to manually remove the Target Mode entries from the `/kernel/drv/socal.conf` file.

To Upgrade or Reinstall STE

1. **Remove the existing version of STE from your target system, as described in Removing STE.**

   Multiple instances of the STE packages cannot coexist on a target system.

2. **Follow the procedures in Installing STE.**

3. **If you are upgrading from a previous version of STE, merge configuration file changes into your existing STE configuration file.**

   `pkgadd`(1M) does *not* overwrite an existing `/etc/opt/SUNWte/ste.cf` file; therefore, examine the new sample configuration file installed as part of the upgrade (`/usr/opt/SUNWesm/SUNWte/etc/ste.cf.sample`) and merge any changes into your existing STE configuration file.

To Upgrade the Operating System

If you upgrade your operating system, you must follow these steps.

1. **Save the `/etc/opt/SUNWte/ste.cf` and the `/kernel/drv/socal.conf` files for use when reconfiguring STE.**

2. **Uninstall STE 1.2 software and drivers.**

3. **Upgrade your operating system.**

4. **Reinstall STE 1.2 software and drivers specific to your operating system. Refer to 'To Install STE'.**

STE Configuration Files

About the socal.conf File

The entries in the server's /kernel/drv/socal.conf file (created by executing the /usr/opt/SUNWesm/SUNWte/tools/stesocal.ksh script) correspond to the entries in the server's ste.cf file as shown below. The socal.conf file is required to put the appropriate ports into target mode for use by STE.

Note – Any change to the socal.conf file requires a reboot of the target server.

The following is a sample socal.conf file.

```
name="SUNW,socal" parent = "/sbus@2,0"
reg=0x0, 0x0, 0x10000, 0x0, 0x10000, 0x10000, 0x0, 0x20000, 0x18
port0-loop-id=7 port1-loop-id=7;
name="SUNW,socal" parent = "/sbus@a,0"
reg=0x0, 0x0, 0x10000, 0x0, 0x10000, 0x10000, 0x0, 0x20000, 0x18
port0-loop-id=7 port1-loop-id=7;
```

In the example above, ports 0 and 1 of the SOC+ HBA at sbus@2,0/SUNW,socal@0,0 (board 1, slot 0), and ports 0 and 1 of the SOC+ device at sbus@a,0/SUNW,socal@0,0 (board 5, slot 0) are reserved for target mode.

There is one entry in the `/kernel/drv/socal.conf` file for each SOC+ adapter. The entries in the `socal.conf` file conform to the standard `driver.conf`(4) and `sbus`(4) configuration file formats as shown below:

TABLE A-1 The `socal.conf` File Properties

Property	Description
`name`	The name of the SOC+ HBA. It should be set to `name="SUNW,socal"`.
`parent`	The full path name of the parent bus. It should be set to `/sbus@`*X*`,0` where *X* matches the SBus name for the SOC+ adapter as displayed by `steconf`.
`reg`	An arbitrary length array in which each element consists of a 3-tuple of integers describing the mappable resources on the SBus. It should be set to `0x`*Z*`, 0x0, 0x10000, 0x`*Z*`, 0x10000, 0x10000, 0x`*Z*`, 0x20000, 0x18`, where *Z* matches the slot number for the SOC+ adapter as displayed by `steconf`.
`port0-loop-id`	The Loop_ID to be used by port 0 in target mode. It should be set to match the Loop ID value in the `ste.cf` file. Note that once you set this property, you can only use the port in target mode (in other words, you cannot use that port as a SCSI initiator). Loop IDs can range from 0 to 15.
`port1-loop-id`	The Loop_ID to be used by port 1 in target mode as described above.

About the `ste.cf` File.

An `ste.cf` file includes three sections:

1. The first section identifies the target mode Fibre Channel ports.
2. The second section identifies the virtual disks used to link target mode ports with a disk.
3. The third section identifies phantom headers and phantom tails.

Target Mode Fibre Channel Port Section of ste.cf File

The Target Mode Fibre Channel Port section of the `ste.cf` file contains one line per Target Mode Fibre Channel Port. For example:

Sample ste.cf File (Target Port Section)

```
# StorEdge Target Emulation Configuration File - ste.cf
# Target Mode Fibre Channel Port section

#Port
#Name   Driver  Device Name                                  Loop Id
#-----  ------  ------------------------------------------  -------
tm0     sftm    /devices/sbus@2,0/SUNW,socal@0,0:0           7
tm1     sftm    /devices/sbus@2,0/SUNW,socal@0,0:1           7
tm2     sftm    /devices/sbus@a,0/SUNW,socal@0,0:0           7
tm3     sftm    /devices/sbus@a,0/SUNW,socal@0,0:1           7
```

The four entries in the example above define the four ports in the sample `socal.conf` file and give them the names `tm0`, `tm1`, `tm2`, and `tm3`. You can use the `steconf` utility to determine the driver, device name, and physical location.

Each line of the Target Mode Fibre Channel Port section consists of these four parameters:

TABLE A-2 Properties of the Target Mode Fibre Channel Port section of the `ste.conf` File

Parameter	Description
`Port Name`	The keyword “tm” followed by a unique integer to define the port that is being configured.
`Driver`	The name of the target mode driver used to control the Fibre Channel hardware. The value is `sftm` for Sbus system.
`Device Name`	The path to the Target Mode Fibre Channel Port.
`Loop ID`	Determines the ID that the Target Mode Fibre Channel Port will present on the Fibre Channel loop. Loop IDs can range from 0 to 15.

Virtual Disk Section of the `ste.cf` File

The virtual disk section contains one line per virtual disk. For example:

Sample `ste.cf` File (Virtual Disk Section)

```
# StorEdge Target Emulation Configuration File - ste.cf
# Virtual Disk section

#Virtual disks
#Name    Partition Name          Port LUN  State    Options
#------- ----------------------  ---- --- -------  ---------
vdisk0 /dev/vx/rdsk/datadg/Vol01 tm0 0  online  ph=dev0 pt=dev1
vdisk1 /dev/vx/rdsk/datadg/Vol02 tm0 1  online  ph=dev2 pt=dev3
vdisk2 /dev/vx/rdsk/datadg/Vol03 tm0 2  online  ph=dev4 pt=dev5
vdisk3 /dev/vx/rdsk/datadg/Vol04 tm1 0  online  ph=dev6 pt=dev7
vdisk4 /dev/vx/rdsk/datadg/Vol05 tm1 1  online  ph=dev8 pt=dev9
vdisk5 /dev/vx/rdsk/datadg/Vol06 tm1 2  online  ph=dev10 pt=dev11
```

Each line of the Virtual Disk section consists of the following six parameters:

TABLE A-3 Properties of the Virtual Disk section of the `ste.conf` File

Parameter	Description
`Name`	The keyword “vdisk” followed by a unique integer to define the vdisk that is being configured.
`Partition Name`	The path to the logical volume that will be presented on the Target Mode Fibre Channel Port.
`Port`	The Target Mode Fibre Channel Port for this virtual disk. The port name must match one of the entries in the Port Configuration section.

Parameter	Description
LUN	The logical unit number to be presented on the Target Mode Fibre Channel Port. LUN0 must exist for each target mode port specified.
State	Enables the user to specify “online” or “offline” for Virtual Disks. If a Virtual Disk’s state is set to “offline”, it will be offline when STE software starts and will only be enabled when the user issues an `steadm -e` command referencing that specific Virtual Disk as an argument. The recommended practice is to set “online” as the state.
Options	Enables the user to specify additional configuration options for the Virtual Disk. Available options are: ph=*phantomheader* and / or pt=*phantom tail* Phantom headers and tails are used to protect disk-related data from being over written. See “Protecting Disk-Related Data” for additional information. The *phantomdevice* variables must match one of the Device Name entries in the Phantom Partition Configuration section. ro= *read only* For example, if two hosts are sharing a disk you should specify that one is read only. Although the initiator cannot write to the data on the virtual disk, the VTOC can be overwritten.

Phantom Devices Section of `ste.cf` File

The Phantom Devices section of the STE configuration file contains one line per Phantom Device. Phantom headers and tails are used to protect disk-related data from being over-written. See “Protecting Disk-Related Data” for additional information on phantom headers and tails. See “Configuration Considerations” for additional guidelines.

For example:

Sample `ste.cf` File (Phantom Header Section)

```
# StorEdge Target Emulation Configuration File - ste.cf
# Phantom Header section

#device
#keyword  Partition Name                        Start Block  Size
#-------  ------------------------------------ -----------  ----
dev0     /dev/vx/rdsk/datadg/headsandtails     0            2268
dev1     /dev/vx/rdsk/datadg/headsandtails     2268         4536
dev2     /dev/vx/rdsk/datadg/headsandtails     6804         2268
dev3     /dev/vx/rdsk/datadg/headsandtails     9072         4536
dev4     /dev/vx/rdsk/datadg/headsandtails     13608        2268
dev5     /dev/vx/rdsk/datadg/headsandtails     15876        4536
```

Each line of the Phantom Header section consists of these four parameters:

TABLE A-4 Properties of the Phantom Header section of the `ste.conf` File

Parameter	Description
Device Keyword	The keyword “dev” followed by a unique integer to define which phantom device is being configured.
Partition Name	The partition on which the phantom devices reside.
Start Block	The starting block of the phantom device on the partition.
Size	The size (in blocks) of the phantom device.

Certain initiators set aside space at the beginning and / or end of each disk for metadata; the required size and location (at the beginning or end of the disk) are system-specific. However, we recommend a size of 2268 blocks (1 cylinder) for the phantom header and 4536 blocks(2 cylinders) for the phantom tail. Additional blocks may be required to be added to the phantom tail per the guidelines presented in the “Configuration Considerations” section of this manual.

The phantom devices physically reside on a separate phantom partition, but appear to the initiator to be part of the shared virtual disk. To protect against data loss, the phantom partition should be a mirrored or RAID 5 partition.

Length of Phantom Headers and Tails

In this example, the phantom header size of 2268 is a result of the STE disk geometry for the LUNs that it exports:

- 512 bytes / sector

- 108 sectors / track
- 21 tracks / cylinder
- *n* cylinders

where *n* is adjusted so that total capacity matches the size of the logical volume being exported. Using this geometry, one cylinder is 108*21=2268 sectors (blocks). Therefore, the header = 2268 blocks and the tail = 4536 blocks.

To Protect Disk-Related Data

Certain applications store their private disk-related metadata at the beginning and end of disks. For example, the Solaris operating environment stores the disk label which contains partition information in the first 16 blocks of the disk.

When the initiator first detects a new LUN, it must be labeled. The `format` utility writes the label in the first 16 blocks of the LUN presented to it.

Volume Table of Contents (VTOC)

In a standard STE configuration, there is potential for the initiator to overwrite the original Volume Table of Contents (VTOC). The VTOC is written into the first 16 blocks of cylinder 0. When the target exports the device, a phantom header and tail must be configured. When the initiator formats the exported device, it will then write its VTOC into the first 16 blocks of cylinder 0, in the space allocated, to the phantom header. This preserves the original VTOC.

Caution – The original VTOC can be destroyed if the initiator writes data starting at block 0. To avoid corrupting the VTOC, run the format command to properly configure the exported device. The initiator formats the LUN such that slice 0 is the first cylinder and the remainder of the drive is in slice 1.

▼ To configure a device to be exported to an initiator:

1. **On the target, create a phantom header. This will be used by the initiator for VTOC information.**
2. **Export the new vdisk that contains the data partition, and the phantom devices.**
3. **On the initiator, make cylinder 0 slice 0. This cylinder receives the VTOC from the initiator. The data will start on slice 1, which begins on cylinder 1.**

4. **Make the rest of the volume slice 1. Slice 1 contains all data.**

The following figure depicts the use of phantom devices.

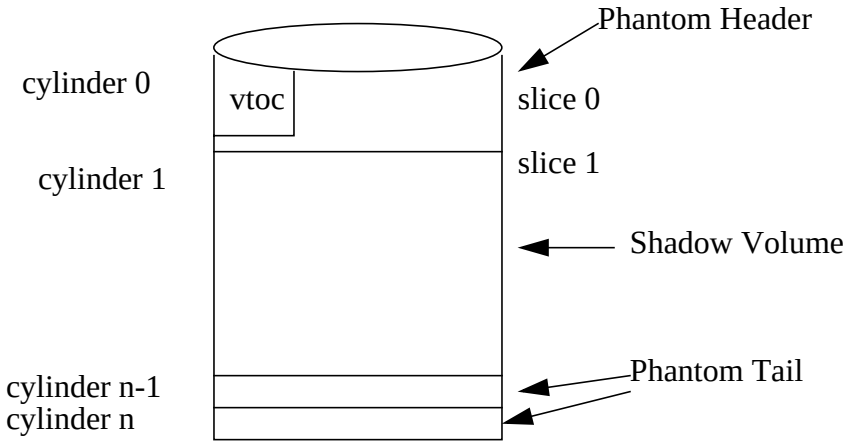

FIGURE A- 1 Vdisk Representation

The Use of Phantom Devices

Certain initiators set aside space at the beginning and end of each disk for header and other system information. The required size and location are system-specific. To prevent these initiators from writing their header information over the contents of the shared device, you must prepend a phantom header and append a phantom tail. The phantom headers and tails physically reside on separate partitions. These phantom headers and tails appear to the initiator as part of the shared virtual disk.

Initiators write header and system information to the first cylinder of the exported device. If a phantom header doesn't exist, the system will write to cylinder 0 block 0 of the device. This will result in data loss from the volume you are exporting as a shadow.

The format utility allocates the last 2 cylinders as *alternate* cylinders. These cylinders are allocated at the end of the device. When the initiator does a `format` (1M), it will take the last two cylinders of the data space and allocate them as alternates. With the inclusion of a phantom tail, the initiator will use the phantom tail for its alternate cylinders.

See “Configuration Considerations” section of the *Sun StorEdge™ Instant Image 2.0.1 Installation Guide* for additional guidelines on setting up phantom devices.

Changing the Volume Size for a STE LUN

Execute the `/usr/opt/SUNWesm/SUNWte/tools/stezap.ksh` script to erase the VTOC from the specified phantom header.

This may be necessary when a volume is resized, but the initiator fails to recognize the new size. In order for the initiator to see the new size, the phantom header must be wiped clean.

The usage for this command is:

```
# stezap.ksh [ -f ste.cf_file ] dev# [dev# ...]
```

where `ste.cf`_file is the location of the `ste.cf` file.

If no file is specified, the default location (`/etc/opt/SUNWte/ste.cf`) is used.

To wipe the phantom headers, specify the dev numbers (from the `ste.cf` file) that correspond to the phantom headers.

For instance, if “dev0” in the ste.cf file is a phantom header for a volume, and it needs to be wiped, type the following:

```
# stezap.ksh dev0
```

This will automatically read the `ste.cf` file and determine the appropriate device, offset and block count to wipe. After this is done, the initiator is ready to re-label the drive.

Troubleshooting

The following section presents possible problems, their causes and the corrective actions to resolve the issues.

Error: Cannot load module ‘sftm’.

STE 1.2 is installed and configured. The system is rebooted and a message similar to the following is displayed.

```
NOTICE: STE: Polling has been started
May 11 10:33:08 ns-east-32 unix: /usr/kernel/drv//sparcv9/sftm:
undefined
symbol ’socal_sftm_attach’
May 11 10:33:08 ns-east-32 root: Error executing
/usr/opt/SUNWesm/SUNWte/sbin/steadm start. Abandoned
May 11 10:33:08 ns-east-32 unix: /usr/kernel/drv//sparcv9/sftm:
undefined
symbol ’socal_sftm_detach’
May 11 10:33:08 ns-east-32 unix: WARNING: mod_load: cannot load
module ’sftm’
May 11 10:33:08 ns-east-32 root: Error executing
/usr/opt/SUNWesm/SUNWte/sbin/steadm start. Abandoned
```

Cause: SOCAL driver patch not loaded.

Corrective Action: Add the proper SOCAL patch as defined below.

Patch Number	Description
105375-22	Solaris 2.6 SOCAL driver patch
107469-07	Solaris 7 SOCAL driver patch
109460-02	Solaris 8 SOCAL driver patch

Error: Error executing steadm start

STE 1.2 is installed and configured. The system is rebooted and a message similar to the following is displayed.

```
NOTICE: STE: Polling has been started
May 11 12:30:13 ns-east-32 root: Error executing
/usr/opt/SUNWesm/SUNWte/sbin/steadm start. Abandoned
May 11 12:30:13 ns-east-32 root: Error executing
/usr/opt/SUNWesm/SUNWte/sbin/steadm start. Abandoned
```

Cause: Either the socal.conf file does not exist or a driver entry is incorrect in the ste.cf file.

Corrective Action: Correct the driver entry in the ste.cf file and run the `/usr/opt/SUNWesm/SUNWte/tools/stesocal.ksh` and reboot DMC.

Error: Unable to detect exported volumes

You are unable to detect the exported volumes while running `format` (1M) on the initiator.

Possible Causes: Hosts not connected by Fibre Channel Cables. LUNs not exported.

Corrective Action 1: Verify the Fibre Channel cable is connected to the correct port on the target.

Corrective Action 2: On the target, run `/usr/opt/SUNWesm/sbin/steadm -c` to confirm the LUNs are being exported.

Corrective Action 3: On the initiator, run `drvconfig, disks` and `format`.

Error: Drive Not Available

The STE volumes are labeled using the `format` (1M) command. At a later time, you run the `format` (1M) command and a message similar to the following is displayed:

```
c3t7d2 <drive not available:  formatting>
          /sbus@1f,0/SUNW, socal@2,0/sf@1,0/
```

Cause: Connection lost with target.

Corrective Action: Check the Fibre Channel connection.

Error: Modified volume size not recognized on the initiator

Cause: A valid disk label already exists.

Corrective Action: Execute the `/usr/opt/SUNWesm/SUNWte/tools/stezap.ksh` script to erase the VTOC from the specified phantom header.

This may be necessary when a volume is resized, but the initiator fails to recognize the new size. In order for the initiator to see the new size, the phantom header must be wiped clean.

The usage for this command is

```
# stezap.ksh [ -f ste.cf_file ] dev# [dev# ...]
```

where `ste.cf_file` is the location of the `ste.cf` file.

If no file is specified, the default location (`/etc/opt/SUNWte/ste.cf`) is used.

To wipe the phantom headers, specify the dev numbers (from the `ste.cf` file) that correspond to the phantom headers.

For instance, if “dev0” in the ste.cf file is a phantom header for a volume, and it needs to be wiped, type the following

```
# stezap.ksh dev0
```

This will automatically read the `ste.cf` file and determine the appropriate device, offset and block count to wipe. After this is done, the initiator is ready to re-label the drive.

APPENDIX **B**

Installing StorEdge Network Data Replicator 2.0 for DMC

This appendix describes a typical example of installing and configuring SNDR 2.0. SNDR is configured on a pair of hosts: *primary* and *secondary*, unlike other DMC software. In this example, the DMC, a Solaris 8 E4500, is the *primary* host; the *secondary* DMC is a Solaris 7 E5000. This appendix contains the following topics:

Pre-Installation

We recommend you familiarize yourself with the following items prior to installing the SNDR software.

TABLE B-1 Required Materials

Item Name	Item Part Number
Sun StorEdge™ Network Data Replicator 2.0 CD	704-7215-10
Sun StorEdge™ Network Data Replicator 2.0 Release Notes	806-4404
Sun StorEdge™ Network Data Replicator 2.0 Installation Guide	806-4403
Sun StorEdge™ Network Data Replicator 2.0 System Administrator's Guide	806-4402

Note – If you are running a previous revision of SNDR, remove the old SNDR packages before installing SNDR 2.0. Please refer to the *Sun StorEdge™ Network Data Replicator 2.0 Installation Guide* for information on removing the old SNDR packages.

Installation

The following typical example assumes your primary is a Solaris 8 E4500 and your secondary is a Solaris 7 8/99 E5000 with the required patches indicated in Chapter One.

▼ SNDR Installation Procedure

1. **Insert the SNDR cd and verify that the cd is mounted. Install SNDR on the primary server.**

```
# mount | grep cdrom
/cdrom/network_data_replicator_20 on /vol/dev/dsk/c1t6d0/
network_data_replicator_20 read only/setuid/maplcase/noglobal/rr/
traildot/dev=16c0003 on Thu Jul 20 09:01:53 2000
# cd /cdrom/network_data_replicator_20/Network_Data_Replicator
# ls
Solaris_2.6    Solaris_7      Solaris_7-899  Solaris_8
# cd Solaris_8
# ls
SUNWrdcr   SUNWrdcu   SUNWscm    SUNWspsv   SUNWspuni
#pkgadd -d . SUNWrdcr SUNWrdcu
```

Note – It is assumed that the supporting Data Services software packages (`SUNWspuni, SUNWscm, SUNWspsv`) have been loaded previously. In the unlikely chance that these packages are absent, install the packages in this order:

---

a. If needed, install these packages in this order.

```
# pkgadd -d . SUNWspuni SUNWscm SUNWspsv SUNWrdcr SUNWrdcu
```

b. Eject the cd.

```
# cd /
# eject cdrom
```

2. **Insert the SNDR cd and verify the cd is mounted. Install the SNDR on the secondary server.**

```
# mount | grep cdrom
/cdrom/network_data_replicator_20 on /vol/dev/dsk/c1t6d0/
network_data_replicator_20 read only/setuid/maplcase/noglobal/rr/
traildot/dev=16c0003 on Thu Jul 20 09:01:53 2000
# cd /cdrom/network_data_replicator_20/Network_Data_Replicator
# ls
Solaris_2.6    Solaris_7      Solaris_7-899  Solaris_8
# cd Solaris_7-899
# ls
SUNWrdcr   SUNWrdcu   SUNWscm    SUNWspsv   SUNWspuni
#pkgadd -d . SUNWrdcr SUNWrdcu
```

Note – It is assumed that the supporting Data Services software packages (SUNWspuni, SUNWscm, SUNWspsv) have been loaded previously. In the unlikely chance that these packages are absent, install the packages in this order:

a. If needed, install these packages in this order.

```
# pkgadd -d . SUNWspuni SUNWscm SUNWspsv SUNWrdcr SUNWrdcu
```

b. Eject the cd

```
# cd /
# eject cdrom
```

3. **Change the system id on** *ONE* **system.**

   On one system (primary or secondary), update the /usr/kernel/drv/mc_rms.conf file. Change the systemid from 2 to 3. (systemid=2 to systemid=3).

Note – You must change the systemid. It may be either the primary or secondary host.

4. **Modify** /etc/opt/SUNWscm/sd.cf **file on** *BOTH* **systems. Increase the** *threads* **from 128 to 256 (threads=128 to threads=256).**

5. **Reboot both the primary and the secondary servers with** /etc/shutdown.

```
# /etc/shutdown -y -i 6 -g 0
```

Note – Do not reboot a DMC using init 6 or reboot.

SNDR Configuration Example

After the systems have rebooted, you can configure the SNDR volumes to be used to replicate between the primary and the secondary servers.

In this example, Sun ATM 4.01 is used as the network link between the DMC, (a Solaris 8 E4500), and another DMC host, (Solaris 7 8/99, E5000). The host name for DMCs ATM interface is *atmblue* and its IP address is 10.9.0.32. The host name for the second DMCs ATM interface is *atmred* and its IP address is 10.9.0.94.

Note – ATM is not required for SNDR. Refer to the *Sun StoreEdge™ Network Data Replicator 2.0 System Administrator's Guide* for more information regarding SNDR's data link requirements.

The two volumes (*primary0* and *primary1*) that SNDR will use to replicate (from the *primary site* to the *secondary site*) are under STE control. This is the `ste.cf` file for this configuration.

Note – For more detailed information regarding configuring the STE vdisks, refer to Appendix A.

This is an example of the */etc/opt/SUNWte/ste.cf* file.

```
# SCSI Target Emulation Configuration File - ste.cf
#
Port
Name Driver Device Name                                    Loop Id
---  ------ ------------------------------------------------
tm3  sftm  /devices/sbus@b,0/SUNW,socal@0,0:0          3
tm4  sftm  /devices/sbus@b,0/SUNW,socal@0,0:1          4


#Vdisk                                Port   SCSI
#Name   Partition Name                Name  LUN  State   Options
#------ --------------------------- ---- ------ ----- -----------------
vdisk0  /dev/vx/rdsk/testdg/lun0      tm4    0   online   ph=dev0 pt=dev1
vdisk1  /dev/vx/rdsk/testdg/lun1      tm4    1   online   ph=dev2 pt=dev3
vdisk2  /dev/vx/rdsk/testdg/lun2      tm4    2   online   ph=dev4 pt=dev5
vdisk3  /dev/vx/rdsk/testdg/master0   tm4    3   online   ph=dev6 pt=dev7
vdisk4  /dev/vx/rdsk/testdg/shadow0   tm3    0   online   ph=dev8 pt=dev9
vdisk5  /dev/vx/rdsk/testdg/primary0  tm3    1   online   ph=dev10 pt=dev11
vdisk6  /dev/vx/rdsk/testdg/primary1  tm4    4   online   ph=dev12 pt=dev13


#device
#keyword  Partition Name                     Start Block  Size
#-------  ------------------------------- ----------- -------

dev0      /dev/vx/rdsk/testdg/headsandtails0  0            2268
dev1      /dev/vx/rdsk/testdg/headsandtails0  2268         4536
dev2      /dev/vx/rdsk/testdg/headsandtails0  6804         2268
dev3      /dev/vx/rdsk/testdg/headsandtails0  9072         4536
dev4      /dev/vx/rdsk/testdg/headsandtails0  13608        2268
dev5      /dev/vx/rdsk/testdg/headsandtails0  15876        4536
dev6      /dev/vx/rdsk/testdg/headsandtails0  20412        2268
dev7      /dev/vx/rdsk/testdg/headsandtails0  22680        4536
dev8      /dev/vx/rdsk/testdg/headsandtails0  27216        2268
dev9      /dev/vx/rdsk/testdg/headsandtails0  29484        4536
dev10     /dev/vx/rdsk/testdg/headsandtails0  34020        2268
dev11     /dev/vx/rdsk/testdg/headsandtails0  36288        4536
dev12     /dev/vx/rdsk/testdg/headsandtails0  40824        2268
dev13     /dev/vx/rdsk/testdg/headsandtails0  43092        4536
```

1. **Update** `rdc.cf`**.**

This is the */etc/opt/SUNWrdc/rdc.cf* file for both hosts in this example:

```
# Primary Primary Primary      Secondary Secondary Secondary  Protocol Mode
# Host    Device  Bitmap         Host      Device    Bitmap
#=======================================================================
atmblue /dev/vx/rdsk/testdg/primary0 /dev/vx/rdsk/testdg/primary1
    atmred /dev/vx/rdsk/testdg/secondary0 /dev/vx/rdsk/testdg/secondary1
    ip sync
```

2. **Enable RDC.**

```
# rdcadm -e
```

3. **To demonstrate SNDR, we will update the secondary from the primary.**

```
# rdcadm -m
RDC: auto sync is now OFF
Overwrite secondary with primary? (Y/N) [N]: Y
#
```

4. **To observe the update, run** `scmadm -S -M`**.**

```
# /usr/opt/SUNWesm/sbin/scmadm -S -M
```

```
SAMPLE 42         ****** Dual Copy Statistics ******           09:22:17

primary               link status   secondary         dual copy status

.east-32:...stdg/primary0 *=*    atm20:...dg/secondary0 REPLICATING


partition       recovery needed                 recovery completed
```

5. **To exit** `scmadm`**, type "^c" (Control-c).**

Technical Resources

For more detailed information on SNDR, refer to the documents listed in TABLE B-1.

Caution – The DMC uses STE vdisks to provide storage to directly attached fiber channel hosts. When data services software (II, FWC, CM and SNDR) is on an application server, data volumes are in the SV (storage volume) layer. DMC does not use the SV layer instead it uses the STE layer. Other documents direct you to place II, FWC, CM and SNDR under SV using `/etc/opt/SUNWspsv/sv.cf`. When loading DMC, you must place these items under STE using `/etc/opt/SUNWte/ste.cf`. DMC loaded on a server is a storage server, not an application server.

APPENDIX **C**

Installing DMC 2.0 Using Solaris 2.6

The other chapters of this manual describe the installation procedures applicable to DMC 2.0 when using the Solaris 8 Operating System. Depending on the operating system you are using the installation procedures differ somewhat. This appendix describes *only* those installation procedures that are unique to Solaris 2.6 Operating System when loading DMC 2.0. This appendix contains the following topic:

Note – Only refer to this appendix when you are installing DMC 2.0 using Solaris 2.6 Operating System. When using Solaris 7 refer to Appendix D.

This appendix should be used to supplement the individual DMC 2.0 component installation chapters when you are using Solaris 2.6.

Installation

The installation steps outline in the rest of the manual still apply. Only certain steps noted here are different. Only FWC, II and CM are different. Thus, STE and SNDR are not impacted.

▼ FWC Installation Procedure

1. Insert the FWC cd and verify that the cd is mounted. Install FWC.

```
# mount | grep cdrom
/cdrom/sun_storedge_fast_write_cache_20 on /vol/dev/dsk/c1t6d0/
sun_storedge_fast_write_cache_20 read only/setuid/maplcase/
noglobal/rr/traildot/dev=16c0002 on Mon Jul 10 13:32:49 2000
# cd /cdrom/sun_storedge_fast_write_cache_20
# ls
Copyright       Docs           Fast_Write_Cache  FR_Copyright
install_fwc       README
# ./install_fwc

                      Sun StorEdge Fast Write Cache

This product provides a graphical interface to the monitoring and
configuring of Fast Write Cache.  It is assumed that you agree to
legal terms explained in
        http://www.sun.com/share/text/SMICopyright.html


              Answer "y" if you accept the terms of the SMI Copyright.

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR
SYSTEM
[y/n] (y)? y
Checking for required patch 105181-15
Checking for required patch 105490-07
Checking for required patch 105210-22
Checking for required patch 105568-13
Checking for required patch 105633-22
Checking for required patch 105669-08
Checking for required patch 106040-13
Checking for required patch 108091-01

This product requires patch 108091-01 or later

Patch: 108091-01
Synopsis: ssJDK1.2.1_03 fails with fatal error on SPARC 2.6
ISO8859-01 European

Should patch 108091-01 be added [y/n] (y)? y
Installation of patch 108091-01 was successful.
```

```
(screen continued from above)

By default Fast Write Cache and Sun StorEdge platform are installed
in /usr/opt
An install log can be found at /var/tmp/fwc_install.log.10Jul2000-
13:33:43

(additional output has been deleted)

Starting installation of Sun StorEdge Platform packages.
Installation of SUNWesm was successful.
Installation of SUNWdaert was successful.
Installation of SUNWesmrt was successful.
Installation of SUNWmjacf was successful.
Installation of SUNWmjmai was successful.
Installation of SUNWmjhlp was successful.
Installation of SUNWesmru was successful.
Installation of SUNWmscmu was successful.
Installation of SUNWmscmr was successful.

Installation of Sun StorEdge Fast Write Cache was successful.

An un-install script has been generated to aid in the removal of
this software.
The location of the un-install script is:
        /var/tmp/uninstall_fwc
#
```

▼ II Installation Procedure

1. **Insert the II cd and verify that the cd is mounted. Install II.**

```
# mount | grep cdrom
/cdrom/instant_image_l10n on /vol/dev/dsk/c1t6d0/
instant_image_l10n read only/setuid/maplcase/noglobal/rr/
traildot/dev=16c0001 on Thu Jul 20 08:56:24 2000
# cd /cdrom/instant_image_l10n
# ls
Copyright     FR_Copyright   install_ii     Instant_Image  README
# ./install_ii

Product language versions available are
        1. English
        2. French
        3. Japanese
        4. Simplified Chinese
What language version do you want to install [1-4]?:1

                      Sun StorEdge Instant Image

This product provides a graphical interface to the monitoring and
configuring of Instant Image.  It is assumed that you agree to
legal terms
explained in
        http://www.sun.com/share/text/SMICopyright.html



              Answer "y" if you accept the terms of the SMI Copyright.

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR
SYSTEM
[y/n] (y)? y
```

Note – Ensure you enter *n* for patch 105490-07 because patch 107633 was already loaded as listed in the Solaris 2.6 OS table earlier and 107633 supersedes 105490-07.

```
(screen continued from above)

Checking for required patch 105181-15
Checking for required patch 105490-07

This product requires patch 105490-07 or later

Patch: 105490-07
Synopsis: SunOS 5.6: linker patch

Should patch 105490-07 be added [y/n] (y)? n
Patch 105490-07 will not be installed.
Note problems may be encountered during subsequent package
additions.
For future reference, this patch may be found in: ./Instant_Image/
Solaris_2.6/Patches/105490-07
Checking for required patch 105210-22
Checking for required patch 105568-13
Checking for required patch 105633-22
Checking for required patch 105669-08
Checking for required patch 106040-13
Checking for required patch 108091-01

By default Instant Image and Sun StorEdge platform are installed
in /usr/opt
An install log can be found at /var/tmp/ii_install.log.01Aug2000-
18:12:18
```

Note – Ensure you enter *y* to load older II core packages. The software does not load otherwise.

```
(screen continued from above)

Starting installation of Instant Image Core packages
An earlier version of SUNWspuni exists on the system
The installed version is: 1.0.10,REV=5.6.0.2000.04.24
and the version to be installed is: 1.0.8,REV=02.01.2000

Should version 1.0.10,REV=5.6.0.2000.04.24 be removed [y/n] (y)? y
Installation of SUNWspuni was successful.
An earlier version of SUNWscm exists on the system
The installed version is: 1.1.19,REV=5.6.0.2000.04.24
and the version to be installed is: 1.1.16,REV=02.01.2000

Should version 1.1.19,REV=5.6.0.2000.04.24 be removed [y/n] (y)? y
pseudo-device: rammc0
rammc0 is /pseudo/rammc@0
Installation of SUNWscm was successful.
An earlier version of SUNWspsv exists on the system
The installed version is: 1.0.31,REV=5.6.0.2000.04.24
and the version to be installed is: 1.0.30,REV=02.01.2000

Should version 1.0.31,REV=5.6.0.2000.04.24 be removed [y/n] (y)? y
Installation of SUNWspsv was successful.
An earlier version of SUNWspcsl exists on the system
The installed version is: 1.0.33,REV=5.6.0.2000.04.24
and the version to be installed is: 1.0.31,REV=02.01.2000

Should version 1.0.33,REV=5.6.0.2000.04.24 be removed [y/n] (y)? y
Installation of SUNWspcsl was successful.
pseudo-device: ii0
ii0 is /pseudo/ii@0
Installation of SUNWii was successful.
```

```
(screen continued from above)

Starting installation of Instant Image packages
Installation of SUNWsvmsr was successful.
Installation of SUNWsvmsu was successful.
Installation of SUNWiimsr was successful.
Installation of SUNWiimsu was successful.

Installation of Sun StorEdge Instant Image was successful.

Before you can enable and use the Sun StorEdge Instant Image
software with your volumes, you need to add the volumes to the
storage volume layer. See the Sun StorEdge Instant Image
documentation for procedures on how to add the volumes.

An un-install script has been generated to aid in the removal of
this software.
The location of the un-install script is:
        /var/tmp/uninstall_ii

(additional output has been deleted)

#
```

▼ CM Installation Procedure

1. Insert the CM cd and verify that the cd is mounted. Install CM.

```
# mount | grep cdrom
/cdrom/cm2.1 on /vol/dev/dsk/c1t6d0/cm2.1 read only/setuid/maplcase/
   noglobal/rr/traildot/dev=16c0002 on Thu Jul 20 09:00:17 2000
# cd /cdrom/cm2.1/
# ls
Component_Mgr  Copyright      FR_Copyright   install_cm
# ./install_cm

Sun StorEdge Component Manager
This product provides a graphical interface to the monitoring and
configuration of Component Manager. It is assumed that you agree to
the legal terms explained in
http://www.sun.com/share/text/SMICopyright.html
```

Answer "y" if you accept the terms of the SMI Copyright.

```
DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR SYSTEM
[y/n](y)?y
Checking for required patch 105357-04
Checking for required patch 105181-19
Checking for required patch 105490-07
Checking for required patch 105210-27
Checking for required patch 105568-16
Checking for required patch 105633-36
Checking for required patch 105669-10
Checking for required patch 106040-13
Checking for required patch 108091-03
```

```
(screen continued from above)

This product requires patch 108091-03 or later

Patch: 108091-03
Synopsis: SunOS 5.6: ssJDK1.2.1_03 fails with fatal error in
ISO8859-01 Locales

Should patch 108091-03 be added [y/n] (y)? y
Installation of patch 108091-03 was successful.
Checking for required patch 105284-31

By default Component Manager and Sun StorEdge platform are
installed in /usr/opt
An install log can be found at /var/tmp/cm_install.log.02Aug2000-
09:19:57

Starting installation of Java  packages.
An earlier version of SUNWj2rt exists on the system
The installed version is: 1.2.1,REV=1999.12.03.16.34
and the version to be installed is: 1.2.2,REV=2000.03.17.13.20

Should version 1.2.1,REV=1999.12.03.16.34 be removed [y/n] (y)? y
Installation of SUNWj2rt was successful.


Starting installation of Sun StorEdge Platform packages.
An earlier version of SUNWesm exists on the system
The installed version is: 1.1.0,REV=07.24.2000
and the version to be installed is: 1.2.0,REV=05.30.2000

Should version 1.1.0,REV=07.24.2000 be removed [y/n] (y)? y
Installation of SUNWesm was successful.
An earlier version of SUNWdaert exists on the system
The installed version is: 1.3.1,REV=12.06.1999
and the version to be installed is: 1.3.3,REV=05.26.2000

Should version 1.3.1,REV=12.06.1999 be removed [y/n] (y)? y
Installation of SUNWdaert was successful.
An earlier version of SUNWesmrt exists on the system
The installed version is: 1.1.0,REV=07.24.2000
and the version to be installed is: 1.2.0,REV=05.30.2000
```

```
(screen continued from above)

Should version 1.1.0,REV=07.24.2000 be removed [y/n] (y)? y
Installation of SUNWesmrt was successful.
A current or later version of SUNWmjacf exists on the system
Version: 1.0,REV=03.31.1999 of SUNWmjacf has been installed
Installation of SUNWmjacf was skipped: newer version installed
A current or later version of SUNWmjmai exists on the system
Version: 1.1,REV=03.31.1999 of SUNWmjmai has been installed
Installation of SUNWmjmai was skipped: newer version installed
A current or later version of SUNWmjhlp exists on the system
Version: 1.0,REV=01.26.2000 of SUNWmjhlp has been installed
Installation of SUNWmjhlp was skipped: newer version installed
An earlier version of SUNWesmru exists on the system
The installed version is: 1.1.0,REV=07.24.2000
and the version to be installed is: 1.2.0,REV=05.30.2000

Should version 1.1.0,REV=07.24.2000 be removed [y/n] (y)? y
Installation of SUNWesmru was successful.


Starting installation of Component Manager Core packages
Installation of SUNWencl was successful.


Starting installation of Component Manager packages
Installation of SUNWencm was successful.
Installation of SUNWencc was successful.
Installation of SUNWencu was successful.
Installation of SUNWencmr was successful.
Installation of SUNWenccr was successful.

Installation of Sun StorEdge Component Manager was successful.


An un-install script has been generated to aid in the removal of
this
software.
The location of the un-install script is:
        /var/tmp/uninstall_cm
#
```

APPENDIX **D**

Installing DMC 2.0 Using Solaris 7

The other chapters of this manual describe the installation procedures applicable to DMC 2.0 when using the Solaris 8 Operating System. Depending on the operating system you are using the installation procedures differ somewhat. This appendix describes *only* those installation procedures that are unique to Solaris 7 Operating System when loading DMC 2.0. This appendix contains the following topic:

Note – Only refer to this appendix when you are installing DMC 2.0 using Solaris 7 operating system. When using Solaris 2.6 refer to Appendix C.

This appendix should be used to supplement the individual DMC 2.0 component installation chapters when you are using Solaris 7.

Installation

The installation steps outline in the rest of the manual still apply. Only certain steps noted here are different. Only FWC, II and CM are different. Thus, STE and SNDR are not impacted.

▼ FWC Installation Procedure

1. **Insert the FWC cd and verify that the cd is mounted. Install FWC.**

```
# mount | grep cdrom
/cdrom/sun_storedge_fast_write_cache_20 on /vol/dev/dsk/c1t6d0/
sun_storedge_fast_write_cache_20 read only/setuid/maplcase/
noglobal/rr/traildot/dev=16c0002 on Mon Jul 10 13:32:49 2000
# cd /cdrom/sun_storedge_fast_write_cache_20
# ls
Copyright       Docs           Fast_Write_Cache  FR_Copyright
install_fwc       README
# ./install_fwc

                      Sun StorEdge Fast Write Cache

This product provides a graphical interface to the monitoring and
configuring of Fast Write Cache.  It is assumed that you agree to
legal terms explained in
        http://www.sun.com/share/text/SMICopyright.html


              Answer "y" if you accept the terms of the SMI Copyright.

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR
SYSTEM
[y/n] (y)? y
Checking for required patch 106980-05
Checking for required patch 107078-18
Checking for required patch 107636-01
Aug  4 15:04:39 turing126 login: ROOT LOGIN /dev/pts/0 FROM
reysoftco.Central.Sun.COM

By default Fast Write Cache and Sun StorEdge platform are installed
in /usr/opt
An install log can be found at /var/tmp/fwc_install.log.04Aug2000-
15:04:12

Starting installation of Java  packages.
An earlier version of SUNWj2rt exists on the system
The installed version is: 1.2.1,REV=1999.07.25.00.00
and the version to be installed is: 1.2.1,REV=1999.12.03.16.34

Should version 1.2.1,REV=1999.07.25.00.00 be removed [y/n] (y)? y
Installation of SUNWj2rt was successful.
```

```
(screen continued from above)

Starting installation of Sun StorEdge Platform packages.
Installation of SUNWesm was successful.
Installation of SUNWdaert was successful.
Installation of SUNWesmrt was successful.
Installation of SUNWmjacf was successful.
Installation of SUNWmjmai was successful.
Installation of SUNWmjhlp was successful.
Installation of SUNWesmru was successful.

(additional output has been deleted)

Installation of SUNWspuni was successful.
Installation of SUNWscm was successful.
Installation of SUNWspsv was successful.
Installation of SUNWnvm was successful.
Installation of SUNWspcsl was successful.

Starting installation of Fast Write Cache packages
Installation of SUNWmscmu was successful.
Installation of SUNWmscmr was successful.

Installation of Sun StorEdge Fast Write Cache was successful.

An un-install script has been generated to aid in the removal of
this
software.
The location of the un-install script is:
        /var/tmp/uninstall_fwc
#
```

▼ II Installation Procedure

1. **Insert the II cd and verify that the cd is mounted. Install II.**

```
# mount | grep cdrom
/cdrom/instant_image_l10n on /vol/dev/dsk/c1t6d0/
instant_image_l10n read only/setuid/maplcase/noglobal/rr/
traildot/dev=16c0001 on Thu Jul 20 08:56:24 2000
# cd /cdrom/instant_image_l10n
# ls
Copyright     FR_Copyright   install_ii     Instant_Image  README
# ./install_ii

Product language versions available are
        1. English
        2. French
        3. Japanese
        4. Simplified Chinese
What language version do you want to install [1-4]?:1

                      Sun StorEdge Instant Image

This product provides a graphical interface to the monitoring and
configuring of Instant Image.  It is assumed that you agree to
legal terms
explained in
        http://www.sun.com/share/text/SMICopyright.html



              Answer "y" if you accept the terms of the SMI Copyright.

DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR
SYSTEM
[y/n] (y)? y
```

Note – Ensure you enter *y* to load older II core packages. The software does not load otherwise.

```
(screen continued from above)

Checking for required patch 106980-05
Checking for required patch 107078-18
Checking for required patch 107636-01

By default Instant Image and Sun StorEdge platform are installed
in /usr/opt
An install log can be found at /var/tmp/ii_install.log.04Aug2000-
16:25:43

(additional output has been deleted)
Starting installation of Instant Image Core packages
An earlier version of SUNWspuni exists on the system
The installed version is: 1.0.10,REV=5.7.1.2000.04.24
and the version to be installed is: 1.0.8,REV=02.01.2000

Should version 1.0.10,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Installation of SUNWspuni was successful.
An earlier version of SUNWscm exists on the system
The installed version is: 1.1.19,REV=5.7.1.2000.04.24
and the version to be installed is: 1.1.16,REV=02.01.2000

Should version 1.1.19,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Aug  4 17:48:01 turing126 unix: pseudo-device: rammc0
Aug  4 17:48:01 turing126 unix: rammc0 is /pseudo/rammc@0
Installation of SUNWscm was successful.
An earlier version of SUNWspsv exists on the system
The installed version is: 1.0.31,REV=5.7.1.2000.04.24
and the version to be installed is: 1.0.30,REV=02.01.2000

Should version 1.0.31,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Aug  4 17:48:22 turing126 unix: pseudo-device: sv0
Aug  4 17:48:22 turing126 unix: sv0 is /pseudo/sv@0
Aug  4 17:48:42 turing126 unix: pseudo-device: sv0
Aug  4 17:48:42 turing126 unix: sv0 is /pseudo/sv@0
Installation of SUNWspsv was successful.
An earlier version of SUNWspcsl exists on the system
The installed version is: 1.0.33,REV=5.7.1.2000.04.24
and the version to be installed is: 1.0.31,REV=02.01.2000
```

Note – Ensure you enter *y* to load older II core packages. The software does not load otherwise.

```
(screen continued from above)

Should version 1.0.33,REV=5.7.1.2000.04.24 be removed [y/n] (y)? y
Installation of SUNWspcsl was successful.
Aug  4 17:49:15 turing126 unix: pseudo-device: ii0
Aug  4 17:49:15 turing126 unix: ii0 is /pseudo/ii@0
Installation of SUNWii was successful.


Starting installation of Instant Image packages
Installation of SUNWsvmsr was successful.
Installation of SUNWsvmsu was successful.
Installation of SUNWiimsr was successful.
Installation of SUNWiimsu was successful.

Installation of Sun StorEdge Instant Image was successful.

Before you can enable and use the Sun StorEdge Instant Image
software with your volumes, you need to add the volumes to the
storage volume layer. See the Sun StorEdge Instant Image
documentation for procedures on how to add the volumes.

An un-install script has been generated to aid in the removal of
this
software.
The location of the un-install script is:
        /var/tmp/uninstall_ii
#
```

▼ CM Installation Procedure

1. Insert the CM cd and verify that the cd is mounted. Install CM.

```
# mount | grep cdrom
/cdrom/cm2.1 on /vol/dev/dsk/c1t6d0/cm2.1 read only/setuid/maplcase/
   noglobal/rr/traildot/dev=16c0002 on Thu Jul 20 09:00:17 2000
# cd /cdrom/cm2.1/
# ls
Component_Mgr  Copyright      FR_Copyright   install_cm
# ./install_cm

Sun StorEdge Component Manager
This product provides a graphical interface to the monitoring and
configuration of Component Manager. It is assumed that you agree to
the legal terms explained in
http://www.sun.com/share/text/SMICopyright.html
```

Answer "y" if you accept the terms of the SMI Copyright.

```
DO YOU AGREE TO THE ABOVE TERMS AND WISH TO INSTALL THIS ON TO YOUR SYSTEM
[y/n](y)?y
Checking for required patch 106541-10
Checking for required patch 106980-10

This product requires patch 106980-10 or later

Patch: 106980-10
Synopsis: SunOS 5.7: libthread patch

Should patch 106980-10 be added [y/n] (y)? y
Installation of patch 106980-10 was successful.
Checking for required patch 107636-03
Checking for required patch 107081-11

This product requires patch 107081-11 or later

Patch: 107081-11
Synopsis: Motif 1.2.7 and 2.1.1: Runtime library patch for Solaris 7

Should patch 107081-11 be added [y/n] (y)? y
Installation of patch 107081-11 was successful.
Checking for required patch 108376-03
```

```
(screen continued from above)

By default Component Manager and Sun StorEdge platform are
installed in /usr/opt
An install log can be found at /var/tmp/cm_install.log.04Aug2000-
17:56:16


Starting installation of Java  packages.
An earlier version of SUNWj2rt exists on the system
The installed version is: 1.2.1,REV=1999.12.03.16.34
and the version to be installed is: 1.2.2,REV=2000.03.17.13.20

Should version 1.2.1,REV=1999.12.03.16.34 be removed [y/n] (y)? y


Starting installation of Component Manager Core packages
Installation of SUNWencl was successful.


Starting installation of Component Manager packages
Installation of SUNWencm was successful.
Installation of SUNWencc was successful.
Installation of SUNWencu was successful.
Installation of SUNWencmr was successful.
Installation of SUNWenccr was successful.

Installation of Sun StorEdge Component Manager was successful.


An un-install script has been generated to aid in the removal of
this
software.
The location of the un-install script is:
        /var/tmp/uninstall_cm
#
```

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