LARGE SYSTEMS

Fibre And ESCON Migration

Reference Manual

Operating System

GCOS 8

REFERENCE

67 A2 RG94 REV10

LARGE SYSTEMS

Fibre And ESCON Migration

Reference Manual

Subject: Guidelines and configuration examples for migrating to Fibre and ESCON® (Enterprise System Connection) controller channel architecture in a GCOS 8 host system environment.

Special instructions: RG94-10 supercedes all other versions of this manual. Change bars indicate significant technical changes from RG94-09A.

Software supported: GCOS 8 System Release 6.1
GCOS 8 System Release 6.0
GCOS 8 System Release 5.2
GCOS 8 System Release 5.1 for Fibre
GCOS 8 System Release 5.0 for ESCON

Software

April 2007

BULL CEDOC
357 AVENUE PATTON
B.P.20845
49008 ANGERS CEDEX 01
FRANCE

67 A2 RG94 REV10

Suggestions and criticisms concerning the form, content, and presentation of this book are invited. Documentation comments or changes can be reported using Software Technical Action Requests (STARs) via local account procedures.

Trademarks and Acknowledgements

67 A2 RG94 REV10

Preface

This manual provides guidelines for a site that intends to use Fibre or ESCON subsystems on DPS 9000/TA, DPS 9000/TA200, DPS 9000/TA300, or NovaScale 9000 Series host systems. A subsystem is any tape or disk subsystem connected to the host system via either a PCI-ESCON channel or a Fibre Channel.

NOTES:

1. FIBER is a thin, flexible medium capable of conducting modulated light transmission (also called optical fiber).
2. FIBRE is the name of a technology that operates on optical fibers as well as on copper cables.
3. Throughout this manual, Fiber is used as a generic term for either the PCI-ESCON channel or the Fibre channel. Both channels use Fiber cable for connection to their peripherals.

The following sections are included in this document.

Section 1	IOSP Overview
Section 2	Hardware Considerations
Section 3	Software Considerations
Section 4	Configuration Examples
Section 5	Block Diagram and Marketing Identifiers
Section 6	Limitations and Constraints

GCOS 8 Documentation

GCOS 8 documentation is distributed on the Bull CD-ROM product, CD-DOC II. Any documents that are updated after a CD-DOC version is distributed are available in Portable Document Format (PDF) from the Bull Internet CD-DOC site at:

http://www.enterprise.bull.com/cd_doc/

Reporting Documentation Discrepancies

Report documentation discrepancies via the site's normal problem-reporting process.

Document Corrections

Document corrections made after a CD-DOC version is distributed can be accessed via a link on the Bull Internet CD-DOC site.

No new document corrections are included in this revision.

Bull Hardware Platforms

This document may have generic references to a DPS 9000 hardware platform and/or a Bull NovaScale 9000 hardware platform. If so, such references are applicable to all models of the specified hardware platform as follows:

Hardware Model - DPS 9000 Series	**Corresponding Software**
• DPS 9000/TA Series (DPS9000H)	GCOS 8 SR5.0, SR5.1, SR5.2, SR6.0, or SR6.1
• DPS 9000/TA200 Series (DPS9000I)	GCOS 8 SR5.1**,** SR5.2, SR6.0, or SR6.1
• DPS 9000/TA300 Series (DPS9000J)	GCOS 8 SR5.2, SR6.0, or SR6.1
Hardware Model - Bull NovaScale 9000 Series	**Corresponding Software**
• Bull NovaScale 9000 Series 1 and Series 1.1 (9000V)	GCOS 8 SR5.2, SR6.0, or SR6.1
• Bull NovaScale 9000 Series 2 (NS9000B)	GCOS 8 SR6.0 or SR6.1
• Bull NovaScale 9000 Series 3 (NS9000C)	GCOS 8 SR6.1

NOTE: The names in parentheses — e.g., DPS9000J, NS9000B — are used in the GCOS 8 software and in problem reporting as internal equivalents of the external model names — e.g., DPS 9000/TA300, NovaScale 9000 Series 2.

If information applies to a specific model only (for example, the DPS 9000/TA300 model of the DPS 9000 Series), the documentation so indicates.

Contact your Marketing representative for more information about Bull DPS 9000 Series large-system computers and Bull NovaScale 9000 Series Servers.

Table of Contents

Figures

Table

1. Overview

The Input/Output Server Processor (IOSP) is a high performance input/output processor for DPS 9000/TA, DPS 9000/TA200, and DPS 9000/TA300 systems. The IOSP contains various highly reliable hardware components including up to 11 PCI-ESCON boards and up to four fibre channel boards.

The IOSP is an input/output architecture that supports connection of peripheral subsystems to the GCOS 8 host system through either the ESCON channel architecture or the fibre channel protocol. (Note that ESCON is a registered trademark of the IBM Corporation.)

The NovaScale 9000 Series IOC supports the fibre channel connections.

Both ESCON and fibre are based on fiber optic technology, which (1) permits configuration of more complex peripheral networks than previously allowed, (2) supports new disk and tape device types, and (3) facilitates future additions of new peripheral devices.

The fiber optic cable for ESCON consists of two interconnected fibers that have Retractable Shroud Duplex (RSD) connectors on each end of the cable. The fiber optic cable for fibre channels consists of two interconnected fibers that have SC or LC on each end of the cable.

The CDA5200/5300/5400/5600/5800 disk subsystems and the ESCON Director Model 4 (ESCD) are supported in an ESCON environment. The ESCON Director is an active fiber optic switch that provides configuration flexibility within the ESCON architecture.

The CDA8400/8700 disk subsystems and the Brocade switches are supported in a fibre channel environment. The Brocade switch is a fiber optic switch that provides configuration flexibility with the fibre Channel architecture.

The FDA 2100/2100S/2400/2500/2800/2900 disk subsystems are supported in a fibre channel environment.

The Sun Microsystems/STK TimberLine and the 9840-A cartridge tape subsystems (CTCC003 and CTCC005, respectively) are supported in an ESCON environment. The 9840A, 9840B, 9840C, and 9940B cartridge tape subsystems are supported in a fibre channel environment.

For additional information about these devices refer to the following documents:

CDA5300/5400/5600/5800 Cache Disk Array Mass Storage Subsystem Configuration, Performance, and Migration Guide LY24
ESCON Cartridge Tape Subsystem Configuration, Performance, and Migration Guide LY25
CDA8400/8700 Cache Disk Array Mass Storage Subsystem Configuration, Performance, and Migration Guide LY26
FIBRE Cartridge Tape Subsystem Configuration, Performance, and Migration Guide..... LY27
FDA2100/2300 Cache Disk Array Mass Storage Subsystem Configuration, Performance, and Migration Guide LY28
FDA2500 Cache Disk Array Mass Storage Subsystem LY54
FDA2300 Disk Subsystems Installation Instructions.....58105521
Fibre Channel Connection Component Charts 58105522
Galileo 2FC Controller Installation Supplement.....58105538
Media Server Subsystem Installation Instruction 58105483
NEC S2300 Disk Array Unit Maintenance Guide 855-900327
NEC S2300 Disk Array Unit User's Guide 856-850305
SUN/STK 9840 Subsystem Installation Supplement 58105465
SUN/STK 9940B Cartridge Subsystem Installation Supplement 58105514
FDA2400/2800 Disk Subsystem Installation Instructions *58105547*
FDA2500 Disk Subsystem Installation Instructions *58105572*

1.1 Fibre And ESCON Products Supported On SR6.1

Table 1-1 on the next page identifies the Fibre and ESCON products that are supported on each platform when running SR6.1. The following legend applies to the table.

Legend			
S	Fully Supported	**R**	Support Only with Reconnect
SE	Fully Supported via Emulation	**RC**	Support with reconnect via Callisto
LS	Limited to Local On-site Support	**N/A**	**N**ot **A**vailable on the specified platform or not supported with SR6.1
SFR	Supported only with approved **S**pecial **F**unctionality **R**equest		
SFR/S	SFR Support on NovaScale 9080 and Standard Support on NovaScale 9160 & 9320		

Table 1-1. Fibre And ESCON Products Supported On SR6.1 By Platform (1 of 2)

PRODUCTS	DPS 9000 /TA	DPS 9000 /TA200	DPS 9000 /TA300	NovaScale 9080/9160/9320	NovaScale 9162/9322	NovaScale 9163/9323
CHANNELS:						
ESCON HPIA	N/A	N/A	N/A	N/A	N/A	N/A
CALLISTO ESCON/LCB1	S	R	N/A	N/A	N/A	N/A
CALLISTO "A2" FIBRE/LCB1	S	R	N/A	N/A	N/A	N/A
CALLISTO "A3" FIBRE/LCB2	N/A	N/A	S	N/A	N/A	N/A
CALLISTO "S" FIBRE/LCB1	S	N/A	N/A	N/A	N/A	N/A
CALLISTO "B2" FIBRE/LCB2	N/A	S	S	SE	SE	SE
NCC CONSOLE	N/A	S	S	S	S	S
DISKS:						
ESCON: EMC 5100/5200	LS	LS	N/A	N/A	N/A	N/A
EMC 5300/5400	LS	LS	N/A	N/A	N/A	N/A
EMC 5600/5800	LS	LS	N/A	N/A	N/A	N/A
EMC 8400/8700	LS	LS	N/A	N/A	N/A	N/A
EMC 8500/8800	LS	LS	N/A	N/A	N/A	N/A
FIBRE: EMC 8400/8700	S	R	R	R	R	R
EMC 8500/8800	S	S	S	S	S	S
DMX 800	S	S	S	S	S	S
DMX 1000/2000/3000	SFR	SFR	SFR	SFR	SFR	SFR
FDA 2100/2100S/2300	S	S	S	S	R	SFR
FDA 2400/2800	SFR	S	S	SFR/S	S	SFR
FDA 2500/2900	N/A	N/A	S	N/A	S	S
TAPES:						
PSI: MTU0640 9 trk	S	N/A	N/A	N/A	N/A	N/A
FIPS: MTU8200 9 trk	S	N/A	N/A	N/A	N/A	N/A
MTU8500 18 trk	S	N/A	N/A	N/A	N/A	N/A
MTU4780 18 trk	S	N/A	N/A	N/A	N/A	N/A
MTU4490 36 trk	S	R	N/A	N/A	N/A	N/A
MTU4890 36 trk	S	R	N/A	N/A	N/A	N/A
ESCON: MTU9490 36 trk	S	RC	RC	N/A	N/A	N/A
MTU9840 288 trk	S	RC	RC	N/A	N/A	N/A
FIBRE: MTU9840 288 trk	S	S	S	S	S	S
MTU9940 576 trk	S	S	S	S	S	S

Table 1-1. Fibre And ESCON Products Supported On SR6.1 By Platform (2 of 2)

PRODUCTS	DPS 9000 /TA	DPS 9000 /TA200	DPS 9000 /TA300	NovaScale 9080/9160/9320	NovaScale 9162/9322	NovaScale 9163/9323
LIBRARIES:						
FIPS: CTL9310 w/MTU4780/4490	S	N/A	N/A	N/A	N/A	N/A
CTL9710 w/ MTU4890	S	R	N/A	N/A	N/A	N/A
ESCON: CTL9310 w/ MTU9490/9840	S	RC	RC	N/A	N/A	N/A
CTL9740 w/ MTU9490/9840	S	RC	RC	N/A	N/A	N/A
FIBRE: CTL180 w/ MTU9840/9940	S	S	S	S	S	S
CTL700/700E w/ MTU9840/9940	S	S	S	S	S	S
CTL9310 w/ MTU9840/9940	S	S	S	S	S	S
CTL9740 w/ MTU9840	R	R	R	R	R	R
CTL8500 w/ MTU9840/9940	S	S	S	S	S	S
MEDIA SERVER:						
FIPS: Media Server 8 v2	LS	LS	N/A	N/A	N/A	N/A
FIBRE: Media Server 8 v3	SFR	SFR	SFR	SFR	SFR	SFR
Media Server Virtuo v4	R	R	R	R	R	R
Media Server Virtuo v4.5 / v4.6	R	R	R	R	R	R
StoreWay Virtuo 5.1	S	S	S	S	S	S

1.2 System Prerequisites

The following software and hardware components must be installed to support the fiber environment.

- DPS 9000/TA, DPS 9000/TA200, DPS 9000/TA300, or NovaScale 9000 Series system
- GCOS 8 Software Set 6.0 or later
- GCOS 8 Configuration Manager (G8CM)

1.3 Fibre Benefits

Migration to a fiber environment provides the following benefits.

1. Supports larger subsystem configurations.
2. Enhances performance.
3. Simplifies cabling.
4. Improves configuration flexibility.
5. Simplifies configuration management through G8CM.
6. Provides single-channel support of multiple subsystems via the ESCON Director or the fibre switch.

1.3.1 Supports Larger Subsystem Configurations

The fibre channel and the ESCON PCI (Peripheral Controller Interface) channel supports 255 GCOS-addressable disk devices (units), while the FIPS (Federal Information Processing Standard) channel supports only 64 such devices. The CDA5200-9 and CDA5400-9 subsystems can connect 96 physical disk drives. In a RAID-S configuration this equates to 216 GCOS-addressable units (72 physical drives each mapping to three GCOS-addressable units). The CDA5300/5600 subsystems can have 32 physical drives.

Maximum disk subsystem capacity is the maximum number of units that can be addressed in a subsystem multiplied by the largest GCOS 8 configurable unit size (3GB). The ESCON and fibre limit is (255 * 3GB = 765GB), which significantly exceeds the FIPS limit of (64 * 3GB = 192GB).

The number of addressable fibre tape devices is 31 per subsystem (i.e., 32 control units with one reserved for the ESCON director).

1.3.2 Enhances Performance

Fiber optic cabling results in overall system performance enhancements.

- The fibre channel overhead is less than the overhead of older channel types and, therefore, yields better input/output response time.
- The fibre channel is capable of greater data throughput than either the FIPS or the HPIA ESCON channel for a connection of the same distance.
- The fibre channel connect rate is faster than older channel types.

1.3.3 Simplifies Cabling

Fiber optic cabling is simpler, more cost-effective, and more reliable.

- The fiber optic cable requires only two optical connections. Multi-conductor copper cables require many mechanical pin connections.
- The hot-pluggable characteristics of fiber optic cables allow installation or removal of the cables without disrupting the disk controller or the Input/Output cabinet.
- One fiber optic cable is less expensive than one equivalent FIPS cable; two FIPS cables are replaced with one fiber optic cable to the tape or disk controller.
- The smaller fiber optic cable size reduces the overall weight and bulkiness of the cables, which allows easier installation with less-congested under-floor cabling.
- The outside diameter of fiber optic cable is approximately 3.0MM by 6.1MM (.118-inch by .242-inch oval or .188-inch round), and the weight of the cable is only .012 pounds per foot. As a result, the weight on computer room floors is significantly reduced.

1.3.4 Improves Configuration Flexibility

The distance between the GCOS 8 host system and the peripheral subsystem can extend to a maximum of 9KM by using two ESCON Directors, or operate to a maximum of 3KM without using ESCON Directors. Increased distance also adds a new level of configuration flexibility. For example, devices can be configured in a remote, secure environment. Also, separating the host and peripheral subsystems in this manner helps in consolidating a site's data centers.

For fibre channel connections, the distance can be 500 meters for multimode fibers, or 10KM for standard single-mode fibers. Fibre switches are available to manage and extend connections.

Connecting the GCOS 8 host mainframe and peripheral subsystems with fiber optic cable allows the mainframe and the subsystems to be located on different floors - or even in different buildings.

1.3.5 Simplifies Configuration Management Through G8CM

The ESCON and fibre hardware is configured into a GCOS 8 System via the GCOS 8 Configuration Manager. G8CM provides a central repository of GCOS 8 system configuration information and is used to generate configuration files for GCOS 8 System Startup. This simplifies the task of managing large configurations.

The G8CM application provides a dialog-based interface that allows site personnel to view and modify all aspects of a GCOS 8 System configuration.

Site personnel can use G8CM to import an existing GCOS 8 System Startup configuration file ($CONFIG Section) and then can use the G8CM dialog interface to add fiber components to the configuration. Once modification is complete, Reliability/Availability/Serviceability (RAS) tables are generated and used by GCOS 8 System Startup.

G8CM assists site personnel in creating new configurations by restricting the configuration choices to those selections that are acceptable to GCOS 8 System software. These choices may include device names, devices supported by specific hardware platforms and software releases, and an overall configuration hierarchy.

For additional information, refer to the *G8CM User's Guide*, (Order No. RJ51).

1.3.6 Provides Single-Channel Support of Multiple Subsystems via Fibre Switch or ESCON DIrector

The Fibre Switch/ESCON Director performs a number of functions.

- As a peripheral switch, it allows multiple host computer systems to have access to the same peripheral subsystem. This is useful for implementing failure backup connections or for sharing certain peripherals such as tape units.

- Sharing is also allowed in the sense that one host channel can connect to more than one peripheral subsystem (but not simultaneously). This may be useful in an environment in which system configurations are changed frequently for test, development, or operational purposes.

2. Hardware Considerations

This section describes considerations and requirements for the following sysems and subsystems:

- DPS 9000/TA, DPS 9000/TA200 and DPS 9000/TA300 systems
- NovaScale 9000 Series systems
- CDA5200/5300/5400/5600/5800/8400/8700 subsystems
- CTCC003 9490 cartridge tape subsystem
- CTCC005-006 9840A cartridge tape subsystem
- CTCC008 9840B cartridge tape subsystem
- CTUC013-016 9840C cartridge tape subsystem
- CTUC019-012 9940B cartridge tape subsystem

2.1 General Considerations For DPS 9000/TA, DPS 9000/TA200 And DPS 9000/TA300

The following actions must be performed as soon as possible to pre-stage customers who want to install a fiber technology subsystem.

Fiber Pre-Installation Requirements

The following are fiber pre-installation requirements.

- Install GCOS 8 Configuration Manager (G8CM).
- Start using G8CM to configure the current non-fiber peripheral complement.
- It is important to become familiar with G8CM operations before attempting to configure fiber components.
- Purchase fiber-related hardware: IOSP, PCI-ESCON channels, fibre channels, fibre switches, ESCON Directors, fiber optic cables, and ESCON Channel Adapters for the CDA subsystem. Separate fibre-only models of the STK Eagle device are needed to connect to fibre Channels

Installation Requirements

The following are installation requirements.

1. Install the appropriate GCOS 8 software set.
2. Install fiber-related hardware: IOSP, PCI-ESCON channels, fibre channels, ESCON Directors, fibre switches, ESCON or fibre Channel Adapters for the CDA subsystem, and fiber optic cables.
3. For DPS9000/700-2, DPS 9000/TA and DPS 9000/TA200, configure the channels via the service processor's Build Configuration (BCF) program.
4. Configure the peripheral devices and channels using G8CM.
5. Check that the latest revision of channel firmware is loaded into the channels.
6. Update the CDA configuration file (BIN file), execute the IMPL command on the service processor to load the new configuration file to the channel adapters, and load the microcode. (This is a Customer Service Organization (CSO) function.)
7. Start testing.

2.2 Subsystem Requirements

Disk and tape subsystem requirements are discussed below. (Reference Table 1-1 "Fibre And ESCON Products Supported On SR6.1 By Platform" for a list of the channels and peripherals supported.

2.2.1 CDA5200 Subsystem Requirements

The CDA5200 subsystems used with ESCON connections require ESCON channel adapters and microcode revision level 5061 or later.

NOTES:

1. If the CDA5200 subsystem is at microcode revision level 5056, take the controller off-line and upgrade to revision level 5059.

2. Using revision level 5059, run the controller for at least eight hours before upgrading to revision level 5061.

3. In addition, each FIPS channel adapter (sometimes referred to as channel director) must be at the minimum revision level before migrating to microcode revision level 5059. The following are the minimum revision levels for the channel adapters.

FIPS Channel Adapter	Minimum Revision Level
200-813-906	C11
200-818-902	A11
200-818-906	A11
200-810-902	D19

2.2.2 CDA5300/5400/5600/5800/8400/8700 Subsystems

The following CDA5300/5400/5600/5800/8400/8700 devices are mapped into 512-word physical sectors by the controller or channel firmware. However, system software subdivides the 512-word physical sector into eight uniquely addressable 64-word sectors.

CDA5200-4/MSK2C	CDA5300-18/MSK3C	CDA5xxx/MALFC
CDA5100-4/MSK2C	CDA5400-18/MSK3C	CDA5xxx/MALVC
CDA5100-9/MSK3C	CDA5600-18/MSK3C	CDA8400-36/MSK3C
CDA4800-3/MSK3C	CDA5800-18/MSK3C	CDA8700-36/MSK3C
CDA5200-3/MSK3C	CDA5600-36/MSK3C	CDA8xxx/MALFC
CDA5400-9/MSK3C	CDA5800-36/MSK3C	CDA8xxx/MALVC

Blocks that begin and end on a sector boundary are written directly to the disk by the firmware.

CDA device characteristics may vary from one device type to another. Refer to "Appendix D" of the *Operating Techniques* manual (Order No. RG29) for information about disk subsystem configuration and capacity.

Refer to the *CDA5300/CDA5400/CDA5600/CDA5800 Cache Disk Array Configuration Guide* (Order No. LY24) or the *CDA8400/8700 Cache Disk Array Configuration Guide* (Order No. LY26) for more subsystem information.

2.2.3 CTCC003 Cartridge Tape Subsystem Requirements

The CTCC003 is the STK 9490 TimberLine cartridge tape subsystem. When used with ESCON connections, it requires ESCON channel adapters and devices as well as 9490 microcode that support ESCON connections. The CTCC003 subsystems include the following.

CTCC003-Q200 StorageTek 9490-M32 (TimberLine) ESCON Cartridge Tape Subsystem. Single cabinet with two ESCON cartridge tape subsystems and the supporting electronics.

CTCC003-Q400 StorageTek 9490-M34 (TimberLine) ESCON Cartridge Tape Subsystem. Single cabinet with four ESCON cartridge tape subsystems and the supporting electronics.

2.2.4 CTCC005 Cartridge Tape Subsystem Requirements

The CTCC005 is the STK 9840A cartridge tape subsystem. When used with ESCON connections, it requires ESCON channel adapters and devices as well as 9840 microcode that support ESCON connections. The CTCC005 subsystems include the following.

CTCC005-Q000	StorageTek 9840-L02 (Eagle) ESCON Cartridge Tape Subsystem, library mountable. Includes drive and power supply.
CTCC005-Q100	StorageTek 9840-R02 (Eagle) ESCON Cartridge Tape Subsystem, rack mountable. Includes drive and power supply.
CTCC005-Q200	StorageTek 9840-S02 (Eagle) ESCON Cartridge Tape Subsystem with stacker/loader. Includes drive and power supply.

2.2.5 Cartridge Tape Subsystem Requirements

The CTCC005 is the SUN/STK 9840A ESCON cartridge tape subsystem. This connection requires an HPIA or a PCI-ESCON card in the IOSP.

The CTCC006 is the SUN/STK 9840A Fibre channel cartridge tape subsystem. This connection requires a fibre channel Host Bus Adapter (HBA) in the IOSP or the NovaScale 9000 Series IOP. The fibre channel enabler key must also be purchased for the IOSP. Othe fibre channel cartridge tape subsystems are:

CTUC008	**9840B**
CTUC013-016	**9840C**
CTUC009-012	**9940B**

The NovaScale 9000 system does not support ESCON connections.

2.3 DPS 9000/TA Requirements And Limitations

- Revision D100 (HR0100) or later is required for a DPS9000/TA system configuration.
- The PCI-ESCON configuration is limited to 16 channels per physical channel for DPS 9000/TA systems.
- The fibre configuration is limited to 32 logical channels per physical channel.

2.4 DPS 9000/TA200 Requirements And Limitations

- Service Processor version HR0200 or later is required for a DPS9000/TA200 system configuration.
- The PCI-ESCON configuration is limited to 16 channels per physical channel for DPS 9000/TA200 systems.
- The fibre configuration is limited to 32 logical channels per physical channel.
- System configuration is supported by GCOS 8 Configuration Manager (G8CM) Release V5.5 (8NN5.5) or later.

2.5 DPS 9000/TA300 Requirements And Limitations

- Service Processor version HR0200 or later is required for a DPS9000/TA200 system configuration.
- The PCI-ESCON configuration is limited to 16 channels per physical channel for DPS 9000/TA200 systems.
- The fibre configuration is limited to 32 logical channels per physical channel.
- System configuration is supported by GCOS 8 Configuration Manager (G8CM) Release V5.7 (8NN5.7) or later.
- The Virtual Machine Facility (VMF) is supported via release 8VM5.6 U1 or later.
- The DPS 9000/TA300 is supported by the GCOS 8 Network Server Processor (GNSP B2) communications processor only.

2.6 NovaScale 9000 Series Requirements And Limitations

- GCOS 8 SR5.2, SR6.0, SR6.1 (or later) is required.
- System configuration is supported by GCOS 8 Configuration Manager (G8CM) V6.0 (or later).
- ESCON devices are not supported.
- The Virtual Machine Facility (VMF) is not supported.
- The fibre configuration is limited to 32 logical channels per physical channel.

Notes

3. Software Considerations

GCOS 8 System Release 5.0 (or later) is required to support the Input/Output Server Processor (IOSP) and the associated PCI-ESCON channels. GCOS 8 System release 5.1 (or later) is required to support fibre channels.

GCOS 8 System Release 6.0 (or later) is required to support the NovaScale 9000 Series platforms.

Although G8CM is required for configuring fiber subsystems, it can be used for non-fiber configurations as well. (In fact, it is recommended that a site become familiar with this process by using G8CM to configure its system prior to adding fiber devices.) Once the system has been configured, the site then can add fiber devices as desired. A detailed example of G8CM output is presented in Section 4 of this document. (Refer to the *GCOS 8 Configuration Manager (G8CM) User's Guide* (Order No. RJ51) for more detailed information.

3.1 Installation Method

Refer to the *GCOS 8 Software Release Bulletin For SR6.1* (Order No. SK60-02) and to the *GCOS 8 Software Installation Bulletin For SR6.1* (Order No. SK61-02) for information about installing the GCOS 8 system software.

3.2 Preparing To Build Boot Tape For Fiber Configuration

The following is a recommended procedure for preparing to build a boot tape that includes fiber devices in the system configuration.

Use of a Virtual Machine Facility (VMF) environment is recommended when configuring devices. (Note that the VMF is not available on the NovaScale 9000 Series platform.) This approach accelerates the procedure because files can be transferred to/from the Host Operating System (HOS) or a Guest Operating System (GOS) without interrupting normal operations on the production system.
(If VMF is not used, system software must be terminated and rebooted before and after file-transfer operations.)

1. Transfer the ASCII configuration file from the $CONFIG Section of the GCOS 8 System Startup job stream into the GCOS 8 Configuration Manager. Use of the G8CM File/Transfer dialog is recommended. However, other file transfer facilities can be used (e.g., the FTP 8 file transfer program).

   Note that the name of the transferred configuration file must be in the format xxxxxx.cfg (where xxxxxx = an alphanumeric prefix).

2. Use the G8CM File/Import function to import the configuration file into the G8CM central repository. (Respond YES to the message that asks whether the new configuration data base is to be opened.)

3. Use the G8CM dialog interface to add all required components to the configuration data base.

4. Use the G8CM File/Gen RAS (Reliability, Availability, and Serviceability) function to generate RAS files.

5. Review the .rfg file to verify the correctness of the configuration. The .rfg file is an ASCII representation of the RAS file (refer to 4.2, "Disk Subsystem Configuration Example").

   - If an error is discovered at this point in the procedure, return to step 3 and make the required correction. Repeat steps 3-5 until the configuration is satisfactory.

6. Use the G8CM File/Transfer dialog interface to transfer the RAS tables to the GCOS 8 System.

    - If an error is discovered after the RAS tables have been transferred to the GCOS 8 host system, then correct the problem and re-transfer the file. If the problem cannot be fixed at this point, then return to step 2 and start again

7. Transfer the IOSPCDS.rhd file to the system Service Processor. The IOSPCDS.rhd file is a copy of the RAS .rhd file and is used by the SP during SYC initialization to load the configuration into the fibre channel.

G8CM operations - including procedures for importing a GCOS 8 configuration file, adding devices to a system configuration, generating RAS tables, and transferring files to the GCOS 8 host system - are described in the *GCOS 8 Configuration Manager (G8CM) User's Guide* (Order No. RJ51). Information on building boot tapes and the Write System Boot Tape (WSBT) program are contained in the *GCOS 8 Software Installation Bulletin For SR6.1* (Order No. SK61-02) and the *Service Routines* manual (Order No. RG36), respectively. VMF operation is discussed in the *Virtual Machine Facility (VMF) Reference Manual* (Order No. RG39).

3.3 Software Migration Issues

The following migration issues are associated with Software Release 6.0 and later. Refer to the *System Release 6.1 Evolution* manual (Order No. RJ61-01), and the *GCOS 8 Software Release Bulletin For SR6.1* (Order No. SK60-02), for additional information.

3.3.1 Configuration Manager (G8CM) Required

3.3.1.1 G8CM Release 8NN7.1

G8CM Release 8NN7.1 is used to configure GCOS 8 systems that operate on Bull NovaScale 9000 Series 3 hardware. G8CM Release 8NN7.1, also called G8CM V7.1, is delivered preinstalled on an Intel-compatible PC, equipped with the Windows 2000 operating system, which acts as the NovaScale 9000 Service Processor (SP).

IMPORTANT

NovaScale 9000 Series 3 systems are supported only by GCOS 8 System Release 6.1 (SR6.1).

G8CM V7.1 is required to configure NovaScale 9000 Series 3 systems; these models cannot be configured directly in GCOS 8 Startup.

Earlier versions of G8CM do not support the NovaScale 9000 Series 3 systems. Earlier versions of NovaScale 9000 systems, i.e., 1.0, 1.1, and 2.0, are not supported by G8CM V7.1.

Version 7.1 can configure only NovaScale 9000 Series 3 systems.

Refer to the following document for additional information.

G8CM V7.1 Reference Manual..... RK08
G8CM V7.1 User's Guide RK09
GCOS 8 Configuration Manager (G8CM) V7.1 SRB.....SK53

3.3.1.2 G8CM Release 8NN7.0

G8CM Release 8NN7.01 is used to configure GCOS 8 systems that operate on Bull NovaScale 9000 Series 2 hardware. G8CM Release 8NN7.0, also called G8CM V7.0, is delivered preinstalled on an Intel-compatible PC, equipped with the Windows 2000 operating system, which acts as the NovaScale 9000 Service Processor (SP).

NOTE: G8CM V7.0 is required to configure NovaScale 9000 Series 2 systems; these models cannot be configured directly in GCOS 8 Startup. Earlier versions of G8CM do not support the NovaScale 9000 Series 2. G8CM V7.0 can be used only to configure NovaScale 9000 Series 2 systems.

Refer to the following documents for additional information.

GCOS 8 Configuration Manager (G8CM) V7.0 User's Guide..... RK01
GCOS 8 Configuration Manager (G8CM) V7.0 Reference Manual..... RK02
GCOS 8 Configuration Manager (G8CM) V7.0 SRB.....SK43

3.3.1.3 G8CM Release 8NN6.0

G8CM Release 8NN6.0 is used to configure GCOS 8 systems that operate on Bull NovaScale 9000 Series 1.1 hardware. G8CM Release 8NN6.0, also called G8CM V6.0, is delivered preinstalled on an Intel®-compatible PC, equipped with the Windows® 2000 operating system, which acts as the NovaScale 9000 Series 1.1 Service Processor (SP).

NOTE: G8CM V6.0 is required to configure NovaScale 9000 Series 1.1 systems; these models cannot be configured directly in GCOS 8 Startup. Earlier versions of G8CM do not support the NovaScale 9000 Series 1.1. G8CM V6.0 cannot be used to configure DPS 9000 systems.

Refer to the following documents for additional information.

GCOS 8 Configuration Manager (G8CM) V6.0 User's Guide..... RJ93
GCOS 8 Configuration Manager (G8CM) V6.0 SRB.....SK37

3.3.1.4 G8CM Release 8NN5.7

G8CM Release 8NN5.7 is required for configuring ESCON subsystems on DPS 9000 hardware, GNSP devices in GCOS 8 configurations, GCOS 8 SAN, and DMX800, DMX1000, and FDA2300 subsystems. Though not mandatory, G8CM is recommended for configuring ASD subsystem environments. G8CM V5.7 cannot be used to configure NovaScale 9000 Series systems.

Refer to the following documents for additional information.

GCOS 8 Configuration Manager (G8CM) V5.7 User's Guide..... RJ51-06
GCOS 8 Configuration Manager (G8CM) V5.7 SRB..... SK04-06

3.3.2 AUTOLOAD Device

The AUTOLOAD file can be configured on a device connected through an IOSS/IOCU HPIA (ESCON) channel, a PCI-ESCON channel, or a fibre channel.

The mirroring of AUTOLOAD devices is not supported on fibre or ESCON channels. Mirroring is supported only on FIPS channels.

Refer to the *System Startup* manual (Order No. RG28) for additional information.

3.3.3 Read-Alter-Rewrite Operations In Fibre Environment

When GCOS 8 System startup occurs, all disk devices connected through a fiber path have read-alter-rewrite buffering provided by the operating system. Additional memory is required for the directories and buffers. The Rapid Access Data System (RADS) capability is now incorporated in layered IOS.

When the software disk cache control program (TDCC) is started, RADS can be configured as desired regarding memory size, write-through, disks cached, and other options. Turning off cache for disk devices connected through a fiber path still allows for directory and buffer space so that the read-alter-rewrite capability remains enabled.

Refer to the *Rapid Access Data System (RADS) Reference Manual* (Order No. RG37) for additional information.

3.3.4 PCI-ESCON or Fibre Channel Access In VMF Configuration

Any tape or disk subsystem connected to the GCOS 8 System via a Fibre Channel or PCI-ESCON channel is considered an "ESCON subsystem". An ESCON subsystem can contain devices for multiple Guest Operating Systems (GOSs) and the Host Operating System (HOS), but each GOS and/or HOS must have dedicated logical channels. Each channel, all the Fibre and PCI-ESCON channels, and all logical channels associated with those Fibre and PCI-ESCON channels must be dedicated to a single copy of the GCOS 8 System (HOS or GOS).

Refer to the *Virtual Machine Facility Reference Manual* (Order No. RG39) for additional information.

3.3.5 Hardware Debugging Information

The hardware configuration portion of the dump epilog configuration section comprises a pseudo-directive list of configured hardware components. Additionally, a listing of the hardware configuration (as defined in the AUTOLOAD file) is generated when the LAUTO console verb is executed in a fiber environment.

The following example illustrates a configuration file generated by G8CM. The actual configuration data is in the form of RAS tables on the boot tape. Hardware records in this example are shown as comments (starting with **CM). (RAS tables are defined in the *System Tables* manual (Order No. RG32).)

Note that the Configuration Component Identifier (CCI) for a specific component displays in parentheses at the end of comment (**CM) lines. (The CCI of logical device 0 equates to the logical device number for all logical devices for that unit (i.e., device ddddd).)

Refer to the *System Startup* manual (Order No. RG28) and to the *GCOS 8 Configuration Manager (G8CM) User's Guide* (Order No. RJ51) for additional information.

Configuration file generated by G8CM

```
1      8        16
-------------------------------------------------
$      SYID     HST,SYS_5.1,5,5.1
.
.
.
**CM   PLA      PPRO-0/LPRO-0,PPRO-1/LPRO-1,PPRO-2/LPRO-2,
**CM   ETC      PPRO-3/LPRO-3,PPRO-4/LPRO-4,PPRO-5/LPRO-5,
**CM   ETC      PPRO-6/LPRO-6,PPRO-7/LPRO-7,ICU-0,ICU-1,
**CM   ETC      ICU-2,ICU-3,ICU-4,ICU-5,ICU-6,ICU-7
**CM   HPIA-19 NORMAL,ICU-6,CH-24-25
**CM   HPIA-16 NORMAL,ICU-6,CH-248-255
**CM   FIBRE-02 NORMAL,ICU-6,CH-208-239
**CM   FIBRE-03 NORMAL,ICU-7,CH-42-73
**CM   HPIA-01 NORMAL,ICU-0,CH-210-217
**CM   FIBRE-11 NORMAL,ICU-6,CH-136-167
**CM   HPIA-04 NORMAL,ICU-5,CH-248-255
**CM   HPIA-05 NORMAL,ICU-1,CH-100-107
**CM   HPIA-07 NORMAL,ICU-2,CH-220-227
**CM   HPIA-08 NORMAL,ICU-2,CH-230-237
**CM   HPIA-09 NORMAL,ICU-2,CH-240-247
**CM   HPIA-10 NORMAL,ICU-4,CH-220-227
**CM   HPIA-25 NORMAL,ICU-2,CH-210-217
**CM   HPIA-06 NORMAL,ICU-4,CH-200-207
**CM   FIBRE-12 NORMAL,ICU-7,CH-74-105
**CM   ESCD     9032,ESCD1,
**CM   ETC      PORT-136,224,254,
**CM   ETC      PORT-146,224,254,
**CM   ETC      PORT-147,224,254,
**CM   ETC      PORT-150,224,254,
**CM   ETC      PORT-151,224,254,
**CM   ETC      PORT-153,224,254,
**CM   ETC      PORT-154,224,254,
**CM   ETC      PORT-155,224,254,
**CM   ETC      PORT-158,224,254,
**CM   ETC      PORT-159,224,254,
**CM   ETC      PORT-170,224,254,
**CM   ETC      PORT-174,224,254,
**CM   ETC      PORT-224,ICU-6,CH-
248,136,146,147,150,151,153,154,155,
**CM   ETC      158,159,170,174,254,
**CM   ETC      PORT-
254,136,146,147,150,151,153,154,155,158,159,170,
**CM   ETC      174,224
**CM   ESCD     9033,ESCD0,
**CM   ETC      PORT-136,193,254,
**CM   ETC      PORT-150,193,254,
**CM   ETC      PORT-151,193,254,
**CM   ETC      PORT-155,193,254,
**CM   ETC      PORT-158,193,254,
**CM   ETC      PORT-159,193,254,
**CM   ETC      PORT-170,193,254,
```

```
**CM   ETC     PORT-174,193,254,
**CM   ETC     PORT-193,ICU-4,CH-
200,136,150,151,155,158,159,170,174,
**CM   ETC     254,
**CM   ETC     PORT-254,136,150,151,155,158,159,170,174,193
**CM   ICU-0   CH-20,TAPE*FIPS*9,DE,UNITS-8,NONSEQ,
**CM   ETC     UNIT-0,1F0,RLSE,DE, (2)
**CM   ETC     UNIT-1,1F1,RLSE,DE, (3)
**CM   ETC     UNIT-2,1F2,RLSE,DE, (4)
**CM   ETC     UNIT-3,1F3,RLSE,DE, (5)
.
.
.
**CM   ICU-6   CH-208,HPIA,UNITS-584,NONSEQ,
**CM   ETC     UNIT-0.0,MALFC,AU-8,REMOVED, (338)
**CM   ETC     UNIT-1.0,MALFC,AU-8,REMOVED, (339)
**CM   ETC     UNIT-2.0,MALFC,AU-8,REMOVED, (340)
```

3.3.6 Fiber Device Address Format (Disk)

In a configuration that includes disk devices that are connected through a fiber (fiber-optic) path, the device address format is modified

from: i-ccc-dd.s

to: **i-ccc-dddddа**

In a non-fiber environment, dd.s represents a device number (dd) ranging from 0-63 and a subunit number (.s) ranging from 0-9.

In a fiber environment, dddddа represents a logical device volume number (LDVN). LDVNs are used externally in console messages (e.g., by PSTATS and by Test and Diagnostics (T&D) functions such as ELAN and MEWS).

The LDVN includes the five-digit Configuration Component Identifier (CCI) number of the lowest-numbered subunit when the physical device is initially configured and assembled by the G8CM product. CCI numbers are used internally by Layered IOS (LIOS) software and by channels to establish addressing.

The following defines the address components of a fiber-connected device.

ddddd	A unique five-digit LDVN, which is assigned by G8CM. Once assigned, this number remains the same as long as the device is configured.
a	An alphabetic character assigned, as required, by G8CM to associate a logical device (subunit) with an LDVN. For example: A is the equivalent to subunit 0 B is the equivalent to subunit 1 C is the equivalent to subunit 2 . . . Through J which is equivalent to subunit 9

For example, the dddddа field might contain the following to identify four logical devices associated with the same physical device:

```
00530A
00530B
00530C
00530D
```

The following is an example of comment statements (**CM) within a configuration file generated by G8CM. Actual configuration data is in the form of RAS tables on the Boot tape. Note that the CCI for a specific peripheral unit displays in parentheses near the end of each comment line.

```
          -------Unit Identifier-------        CCI  LDVN

**CM ETC  UNIT-24.0,MG0,MSK2C,DEDICATED,NOFMS,(646) 646A
**CM ETC  UNIT-24.1,MG1,MSK2C,DEDICATED,NOFMS,(647) 646B
**CM ETC  UNIT-24.2,MG2,MSK2C,DEDICATED,NOFMS,(648) 646C
**CM ETC  UNIT-24.3,MG3,MSK2C,DEDICATED,NOFMS,(649) 646D
```

Refer to the *System Startup* manual (Order No. RG28) and to the *GCOS 8 Configuration Manager (G8CM) User's Guide* (Order No. RJ51) for additional information.

3.3.7 Device Address Format (Magnetic Tape)

In a configuration that includes magnetic tape devices that are connected through a fiber path, the device address format is modified

from: i-ccc-dd

to: i-ccc-ddddd

or i-ccc-dd

The LDVN designator is not used for addressing if magnetic tape devices are connected through a fiber path.

- During system startup, the device format is i-ccc-ddddd (where ddddd is the configuration component identifier (CCI) or the device number.

- During system operation, the address format is i-ccc-dd (where dd is the generated device number). The generated device number, along with the device name and system name, are displayed on the tape device's message display to associate dd with a specific device.

The following is an example of comment statements (**CM) within a configuration file generated by G8CM. Actual configuration data is in the form of RAS tables on the Boot tape. Note that the CCI for a specific peripheral unit displays in parentheses near the end of each comment line.

```
**CM   ICU-1   CH-32,HPIA,UNITS-1,NONSEQ,ESCD,ESCD0-136
**CM   ETC     UNIT-0,TB4,CTAPE*9490,DEDICATED,RLSE,
**CM   ETC     COMP36,NOLOAD,DISPLAY                    (450)
**CM   ICU-1   CH-32,HPIA,UNITS-1,NONSEQ,ESCD,ESCD0-150
**CM   ETC     UNIT-0,TB5,CTAPE*9490,DEDICATED,RLSE,
**CM   ETC     COMP36,NOLOAD,DISPLAY                    (357)
```

3.3.8 System Booting via PCI-ESCON Channels

System booting from tape and disk devices connected through PCI-ESCON channels is supported in GCOS 8 SR5.0 and later releases. System booting through HPIA channels is not supported.

The ESCON Boot process is described in detail in the *Administrative Guide For Booting GCOS 8* (Order No. RJ55).

3.3.9 System Booting via Fibre Channels

System booting from tape and disk devices connected through fibre channels is supported in GCOS 8 SR5.1 and later releases.

The Fibre Channel Boot process is described in detail in the *Administrative Guide For Booting GCOS 8* (Order No. RJ55).

4. Configuration Examples

This section includes illustrations of disk and tape subsystems and supporting configuration statements and directives as follows.

- Disk subsystem configuration.
- Tape subsystem configuration.
- DPS 9000/TA Fibre Channel and PCI-ESCON configuration.
- DPS 9000/TA200 and DPS 9000/TA300 Fibre Channel and PCI-ESCON configuration.

4.1 ESCON Disk Subsystem Configuration

Figure 4-1 illustrates a GCOS 8 disk subsystem. The basic subsystem (IOP-0) includes two 9-MB PSI channels, two ESCON HPIA channels, two ESCON channel adapters, four disk adapters, and from 16 to 96 disk drives (48 drives shown in Figure 4-1). In the configuration shown in Figure 4-1, the DPS 9000 GCOS 8 RAID-S subsystem has 36 user disk drives and 72 user units. The cache size for this configuration is 1280 MBs.

For some applications, additional performance may be achieved with additional simultaneous channel paths (i.e., by adding two 9-MB PSI channels, two ESCON HPIA channels, and two ESCON channel adapters). Additional connectivity may be achieved by adding channel paths (9-MB PSI channels and ESCON HPIA channels) to port B on the ESCON channel adapters.

Note that the letter “V” in Figure 4-1 identifies user data units. The letter “P” identifies parity units.

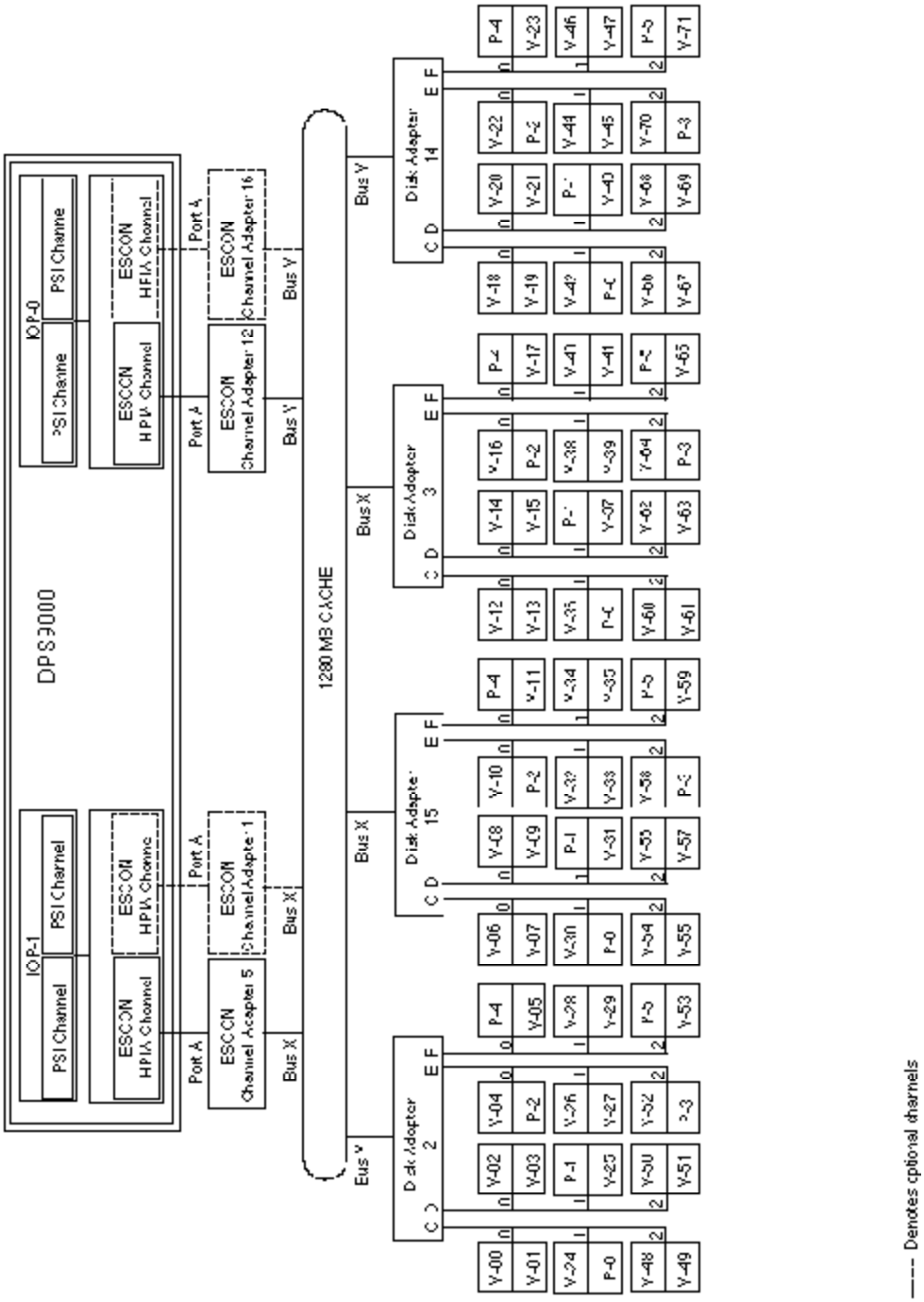

Figure 4-1. CDA5236-4S ESCON Cache Disk Array Subsystem

For additional information about CDA characteristics and configurations refer to the following documents.

4.1.1 ESCON Disk Subsystem Configuration Example

The following example of G8CM output reflects some of the directives that define the configuration illustrated in Figure 4-1.

The hardware configuration portion of the dump epilog configuration comprises a pseudo-directive list of configured hardware components. Additionally, a listing of the hardware configuration (as defined in the AUTOLOAD file) is generated when the LAUTO console verb is executed in an ESCON environment.

The following is an example of comment statements (**CM) within a configuration file generated by G8CM. Actual configuration data is in the form of RAS tables on the boot tape. Note that the Configuration Component Identifier (CCI) for a specific component (peripheral unit) displays in parentheses at the end of the comment (**CM) lines.

The CCI of the lowest numbered subunit configured when the physical device is first configured in G8CM becomes the Logical Device Unit Number (LDVN, the ddddd part of the device address) for all logical devices (i.e., subunits) on the physical device unit.

```
**CM   ICU-0   CH-224,HPIA,UNITS-48,NONSEQ,
**CM   ETC     UNIT-24.0,MG0,MSK2C,DEDICATED,NOFMS, (646)
**CM   ETC     UNIT-24.1,MG1,MSK2C,DEDICATED,NOFMS, (647)
**CM   ETC     UNIT-24.2,MG2,MSK2C,DEDICATED,NOFMS, (648)
**CM   ETC     UNIT-24.3,MG3,MSK2C,DEDICATED,NOFMS, (649)
**CM   ETC     UNIT-25.0,NG0,MSK2C,DEDICATED,NOFMS, (650)
**CM   ETC     UNIT-25.1,NG1,MSK2C,DEDICATED,NOFMS, (651)
**CM   ETC     UNIT-25.2,NG2,MSK2C,DEDICATED,NOFMS, (652)
**CM   ETC     UNIT-25.3,NG3,MSK2C,DEDICATED,NOFMS, (653)
**CM   ETC     UNIT-26.0,OG0,MSK2C,DEDICATED,NOFMS, (654)
**CM   ETC     UNIT-26.1,OG1,MSK2C,DEDICATED,NOFMS, (655)
**CM   ETC     UNIT-26.2,OG2,MSK2C,DEDICATED,NOFMS, (656)
**CM   ETC     UNIT-26.3,OG3,MSK2C,DEDICATED,NOFMS, (657)
**CM   ETC     UNIT-27.0,PG0,MSK2C,DEDICATED,NOFMS, (658)
**CM   ETC     UNIT-27.1,PG1,MSK2C,DEDICATED,NOFMS, (659)
**CM   ETC     UNIT-27.2,PG2,MSK2C,DEDICATED,NOFMS, (660)
**CM   ETC     UNIT-27.3,PG3,MSK2C,DEDICATED,NOFMS, (661)
**CM   ETC     UNIT-28.0,QG0,MSK2C,DEDICATED,NOFMS, (662)
**CM   ETC     UNIT-28.1,QG1,MSK2C,DEDICATED,NOFMS, (663)
**CM   ETC     UNIT-28.2,QG2,MSK2C,DEDICATED,NOFMS, (664)
**CM   ETC     UNIT-28.3,QG3,MSK2C,DEDICATED,NOFMS, (665)
```

```
**CM   ETC     UNIT-29.0,RG0,MSK2C,DEDICATED,NOFMS, (666)
**CM   ETC     UNIT-29.1,RG1,MSK2C,DEDICATED,NOFMS, (667)
**CM   ETC     UNIT-29.2,RG2,MSK2C,DEDICATED,NOFMS, (668)
**CM   ETC     UNIT-29.3,RG3,MSK2C,DEDICATED,NOFMS, (669)
**CM   ETC     UNIT-66.0,SG0,MSK2C,DEDICATED,NOFMS, (670)
**CM   ETC     UNIT-66.1,SG1,MSK2C,DEDICATED,NOFMS, (671)
**CM   ETC     UNIT-66.2,SG2,MSK2C,DEDICATED,NOFMS, (672)
**CM   ETC     UNIT-66.3,SG3,MSK2C,DEDICATED,NOFMS, (673)
**CM   ETC     UNIT-67.0,TG0,MSK2C,DEDICATED,NOFMS, (674)
**CM   ETC     UNIT-67.1,TG1,MSK2C,DEDICATED,NOFMS, (675)
**CM   ETC     UNIT-67.2,TG2,MSK2C,DEDICATED,NOFMS, (676)
**CM   ETC     UNIT-67.3,TG3,MSK2C,DEDICATED,NOFMS, (677)
**CM   ETC     UNIT-68.0,UG0,MSK2C,DEDICATED,NOFMS, (678)
**CM   ETC     UNIT-68.1,UG1,MSK2C,DEDICATED,NOFMS, (679)
**CM   ETC     UNIT-68.2,UG2,MSK2C,DEDICATED,NOFMS, (680)
**CM   ETC     UNIT-68.3,UG3,MSK2C,DEDICATED,NOFMS, (681)
**CM   ETC     UNIT-69.0,VG0,MSK2C,DEDICATED,NOFMS, (682)
**CM   ETC     UNIT-69.1,VG1,MSK2C,DEDICATED,NOFMS, (683)
**CM   ETC     UNIT-69.2,VG2,MSK2C,DEDICATED,NOFMS, (684)
**CM   ETC     UNIT-69.3,VG3,MSK2C,DEDICATED,NOFMS, (685)
**CM   ETC     UNIT-70.0,WG0,MSK2C,DEDICATED,NOFMS, (686)
**CM   ETC     UNIT-70.1,WG1,MSK2C,DEDICATED,NOFMS, (687)
**CM   ETC     UNIT-70.2,WG2,MSK2C,DEDICATED,NOFMS, (688)
**CM   ETC     UNIT-70.3,WG3,MSK2C,DEDICATED,NOFMS, (689)
**CM   ETC     UNIT-71.0,XG0,MSK2C,DEDICATED,NOFMS, (690)
**CM   ETC     UNIT-71.1,XG1,MSK2C,DEDICATED,NOFMS, (691)
**CM   ETC     UNIT-71.2,XG2,MSK2C,DEDICATED,NOFMS, (692)
**CM   ETC     UNIT-71.3,XG3,MSK2C,DEDICATED,NOFMS (693)
**CM   XBAR    ICU-0,CH-224,CH-120,CH-225,CH-121,
**CM   ETC     CH-226,CH-122,CH-227,
**CM   ETC     CH-123,CH-228,CH-124,
**CM   ETC     CH-229,CH-125,CH-230,CH-126,
**CM   ETC     CH-231,CH-127,CH-232,CH-128,
**CM   ETC     CH-233,CH-129,CH-234,
**CM   ETC     CH-130, CH-235,CH-131,
**CM   ETC     CH-236,CH-132,CH-237,CH-133,
**CM   ETC     CH-238,CH-134,CH-239,CH-135
**CM   GROUP ICU-0,CH-224-239,
**CM   ETC      ICU-0,CH-120-135
```

4.2 Fibre Disk Subsystem Configuration

Figure 4-2 illustrates a GCOS 8 Fibre disk subsystem. The basic CDA subsystem includes two PCI Fibre channels, two 2-port Fibre channel adapters, four disk adapters, and 16 disk drives. In the configuration shown in Figure 4-2, the CDA8400 disk subsystem has the maximum 96 disk drives and 192 mirrored ASD user units. The cache size for this configuration is 4096 MBs. All Fibre disk subsystems must be configured as ASD units with G8CM V4.1.03 or later.

For some applications, additional performance can be achieved with additional simultaneous channel paths by adding two PCI Fibre channels and connecting them to the B Processor ports of the Fibre channel adapters in the CDA unit. Additional performance/connectivity also can be achieved by adding up to four 2-port fibre channel adapters in the CDA unit and PCI fibre channels in the IOSP.

Note that the letter “M1” in Figure 4-2 identifies user data units. The letter “M2” identifies mirror two units.

For additional information about CDA8400 characteristics and configurations refer to the *CDA8400/8700 Cache Disk Array Configuration Guide* (Order No. LY26).

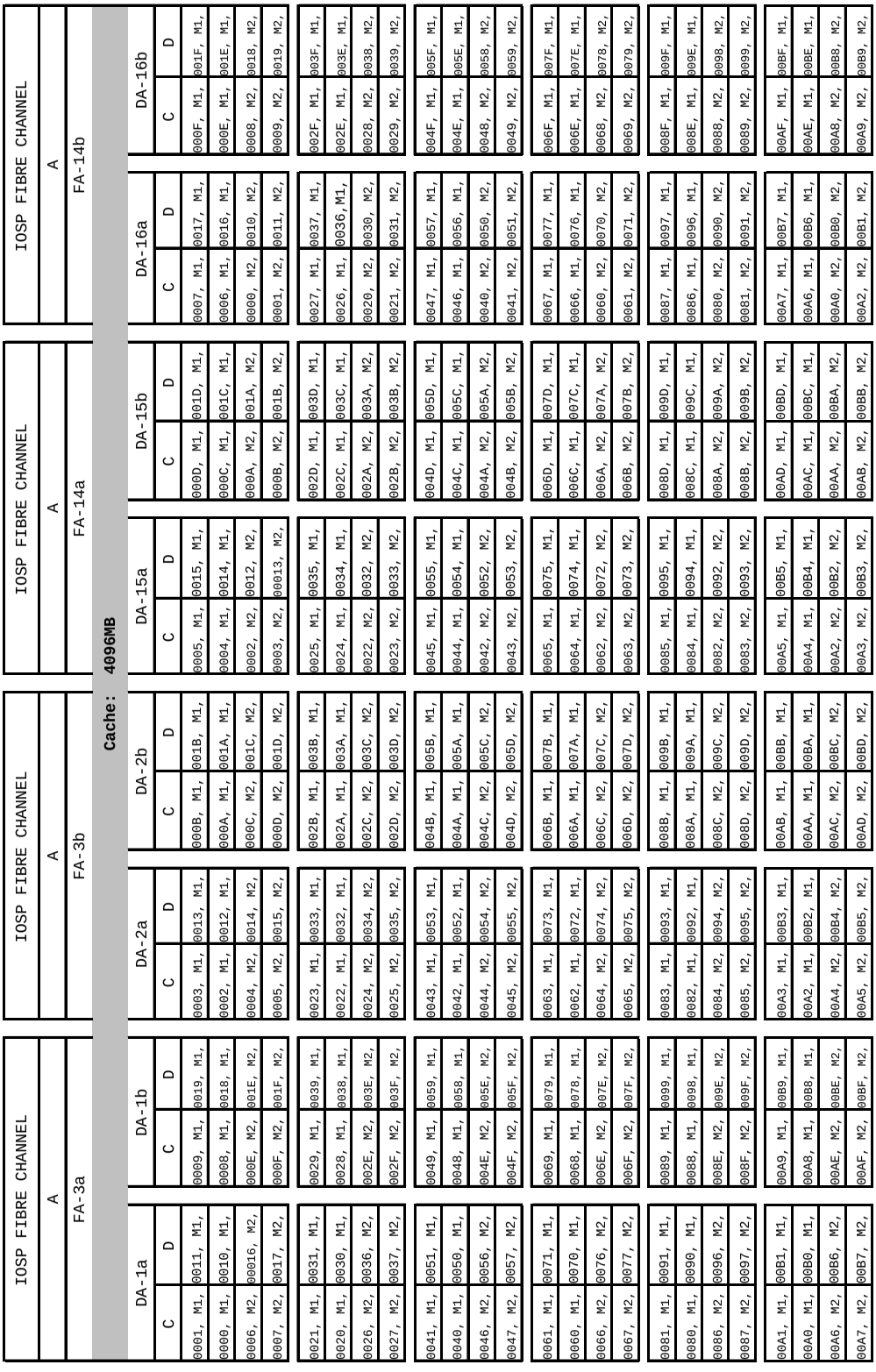

Figure 4-2. FCDA84192-36M(A4) Fibre Cache Disk Array Subsystem

4.2.1 Fibre Disk Subsystem Configuration Example

The following example of a G8CM .RFG file represents a Fibre disk subsystem for an ASD FCDA84192-36M(A4) configuration as illustrated in Figure 4-2.

A listing of the total system hardware configuration (as defined in the AUTOLOAD file) is generated when the LAUTO console verb is executed at the GCOS console.

The following is an example of comment statements (**CM) within the .RFG configuration file generated by G8CM. Actual configuration data is in the form of RAS tables on the boot tape. Note that the Configuration Component Identifier (CCI) for a specific component (peripheral unit) displays in parentheses at the end of the comment (**CM) lines.

The LDVN includes the five-digit CCI number of the lowest-numbered subunit when the physical device is initially configured and assembled by the G8CM product. CCI numbers are used internally by Layered IOS (LIOS) software and by Fibre channels to establish addressing.

```
**CM   HPIA-29 NORMAL,ICU-7,CH-240-247
**CM   FIBRE-03 NORMAL,ICU-7,CH-42-73
**CM   HPIA-01 NORMAL,ICU-0,CH-210-217
**CM   FIBRE-11 NORMAL,ICU-6,CH-136-167
**CM   HPIA-04 NORMAL,ICU-5,CH-248-255
*                 *
*                 *
*                 *
**CM   ICU-6   CH-136,HPIA,UNITS-1920,NONSEQ,
**CM   ETC     UNIT-00.0,VA0,MALFC,NOFMS,AU-8, (1691)
**CM   ETC     UNIT-00.1,VA1,MALFC,NOFMS,AU-8, (1699)
**CM   ETC     UNIT-00.2,VA2,MALFC,NOFMS,AU-8, (1707)
**CM   ETC     UNIT-00.3,VA3,MALFC,NOFMS,AU-8, (1715)
**CM   ETC     UNIT-00.4,VA4,MALFC,NOFMS,AU-8, (1723)
**CM   ETC     UNIT-00.5,VA5,MALFC,NOFMS,AU-8, (1731)
**CM   ETC     UNIT-00.6,VA6,MALFC,NOFMS,AU-8, (1739)
**CM   ETC     UNIT-00.7,VA7,MALFC,NOFMS,AU-8, (1747)
**CM   ETC     UNIT-00.8,VA8,MALFC,NOFMS,AU-8, (1763)
**CM   ETC     UNIT-00.9,VA9,MALVC,RMVBL,AU-16,SIZE-7370, (1755)
*                 *
**CM   ETC     UNIT-23.0,VC0,MALVC,RMVBL,AU-24,SIZE-12374, (1829)
*                 *
*                 *
**CM   ETC     UNIT-191.0,ZZ0,MALFC,NOFMS,AU-8, (2488)
**CM   ETC     UNIT-191.1,ZY1,MALFC,NOFMS,AU-8, (2536)
**CM   ETC     UNIT-191.2,ZY2,MALFC,NOFMS,AU-8, (2585)
**CM   ETC     UNIT-191.3,ZY3,MALFC,NOFMS,AU-8, (2632)
**CM   ETC     UNIT-191.4,ZY4,MALFC,NOFMS,AU-8, (2680)
**CM   ETC     UNIT-191.5,ZY5,MALFC,NOFMS,AU-8, (2728)
**CM   ETC     UNIT-191.6,ZY6,MALFC,NOFMS,AU-8, (2776)
**CM   ETC     UNIT-191.7,ZY7,MALFC,NOFMS,AU-8, (2824)
**CM   ETC     UNIT-191.8,ZY8,MALFC,NOFMS,AU-8 (2920)
**CM   ETC     UNIT-191.9,ZY9,MALVC,RMVBL,AU-16,SIZE-7370, (2872)
**CM   XBAR    ICU-6,CH-136,ICU-7,CH-170,CH-171,CH-90,CH-91,
**CM   ETC     CH-186,CH-187,ICU-6,CH-154,CH-155,CH-65,ICU-7,CH-140,
**CM   ETC     CH-141,CH-172,CH-173,CH-92,CH-93,CH-188,CH-189,
**CM   ETC     ICU-6,CH-156,CH-157,CH-66,ICU-7,CH-142,CH-143,
**CM   ETC     CH-174,CH-175,CH-94,CH-95,CH-190,CH-191,ICU-6,CH-158,
```

```
**CM   ETC     CH-159,CH-67,ICU-7,CH-144,CH-145,CH-176,CH-177,
**CM   ETC     CH-96,CH-97,CH-192,CH-193,ICU-6,CH-160,CH-161,
**CM   ETC     CH-68,ICU-7,CH-146,CH-147,CH-178,CH-179,CH-98,
**CM   ETC     CH-99,CH-194,CH-195,ICU-6,CH-162,CH-163,CH-69,
**CM   ETC     ICU-7,CH-148,CH-149,CH-180,CH-181,CH-100,CH-101,
**CM   ETC     CH-196,CH-197,ICU-6,CH-164,CH-165,CH-70,ICU-7,CH-150,
**CM   ETC     CH-151,CH-182,CH-183,CH-102,CH-103,CH-198,CH-199,
**CM   ETC     ICU-6,CH-166,CH-167,CH-71,ICU-7,CH-152,CH-153,
**CM   ETC     CH-184,CH-185,CH-104,CH-105,CH-200,CH-201,ICU-6,CH-137,
**CM   ETC     CH-56,ICU-7,CH-74,CH-75,CH-122,CH-123,CH-154,
**CM   ETC     CH-155,CH-202,CH-203,ICU-6,CH-138,CH-139,CH-57,
**CM   ETC     ICU-7,CH-124,CH-125,CH-156,CH-157,CH-76,CH-77,
**CM   ETC     CH-204,CH-205,ICU-6,CH-140,CH-141,CH-58,ICU-7,CH-126,
**CM   ETC     CH-127,CH-158,CH-159,CH-78,CH-79,CH-206,CH-207,
**CM   ETC     ICU-6,CH-142,CH-143,CH-59,ICU-7,CH-128,CH-129,
**CM   ETC     CH-160,CH-161,CH-80,CH-81,CH-208,CH-209,ICU-6,CH-144,
**CM   ETC     CH-145,CH-60,ICU-7,CH-130,CH-131,CH-162,CH-163,
**CM   ETC     CH-82,CH-83,CH-210,CH-211,ICU-6,CH-146,CH-147,
**CM   ETC     CH-61,ICU-7,CH-132,CH-133,CH-164,CH-165,CH-84,
**CM   ETC     CH-85,CH-212,CH-213,ICU-6,CH-148,CH-149,CH-62,
**CM   ETC     ICU-7,CH-134,CH-135,CH-166,CH-167,CH-86,CH-87,
**CM   ETC     CH-214,CH-215,ICU-6,CH-150,CH-151,CH-63,ICU-7,CH-136,
**CM   ETC     CH-137,CH-168,CH-169,CH-88,CH-89,CH-216,CH-217,
**CM   ETC     ICU-6,CH-152,CH-153,CH-64,ICU-7,CH-138,CH-139
**CM   GROUP   ICU-6,CH-136-167,
**CM   ETC     ICU-7,CH-74-105,
**CM   ETC     ICU-6,CH-56-71,
**CM   ETC     ICU-7,CH-122-153,
**CM   ETC     ICU-7,CH-154-185,
**CM   ETC     ICU-7,CH-186-217
```

4.2.2 Fibre Disk Subsystem Connected Through A Fibre Switch Configuration Example

The following example of a G8CM RGF file represents a Fibre disk subsystem for an ASD FCDA84192-36M(A4) configuration (Figure 4-2) connected through a Brocade Silkworm 2800 Fibre Switch. The example shows the ports of the Brocade switch and its connections. Channel ICU-6,CH-208 connects to port 0 of the Brocade switch and exits through port 2; channel ICU-7,CH-42 connects to port 1 of the Brocade and exits through port 3 to the CDA8400 subsystem.

In addition to the differences shown in this example, the “Point To Point” parameter for the CDA8400 Fibre channel adapter ports must be enabled in the CDA configuration Bin file.

```
**CM   HPIA-20 NORMAL,ICU-6,CH-200-207
**CM   HPIA-21 NORMAL,ICU-7,CH-16-23
**CM   FIBRE-02 NORMAL,ICU-6,CH-208-239
**CM   FIBRE-35 NORMAL,ICU-6,CH-72-87
**CM   HPIA-22 NORMAL,ICU-7,CH-248-255
**CM   ESCD    FIBRE_SWITCH,BROC1,
**CM   ETC     PORT-0,ICU-6,CH-208,2,
**CM   ETC     PORT-1,ICU-7,CH-42,3,
**CM   ETC     PORT-2,0,
**CM   ETC     PORT-3,1,
```

```
**CM   ETC     PORT-4,ICU-6,CH-72,5,6,7,8,9,10,
**CM   ETC     PORT-5,4,
**CM   ETC     PORT-6,4,
**CM   ETC     PORT-7,4,
**CM   ETC     PORT-8,4,
**CM   ETC     PORT-9,4,
**CM   ETC     PORT-10,4
*                 *
*                 *
*                 *
**CM   ICU-6   CH-208,HPIA,UNITS-1920,NONSEQ,ESCD-broc1-2,
**CM   ETC     UNIT-00.0,RB0,MALFC,NOFMS,AU-8, (912)
**CM   ETC     UNIT-00.1,RA1,MALFC,NOFMS,AU-8, (1002)
**CM   ETC     UNIT-00.2,RA2,MALFC,NOFMS,AU-8, (1058)
**CM   ETC     UNIT-00.3,RA3,MALFC,NOFMS,AU-8, (1114)
**CM   ETC     UNIT-00.4,RA4,MALFC,NOFMS,AU-8, (1170)
**CM   ETC     UNIT-00.5,RA5,MALFC,NOFMS,AU-8, (1226)
**CM   ETC     UNIT-00.6,RA6,MALFC,NOFMS,AU-8, (362)
**CM   ETC     UNIT-00.7,RA7,MALFC,NOFMS,AU-8, (418)
**CM   ETC     UNIT-00.8,RA8,MALFC,NOFMS,AU-8, (871)
**CM   ETC     UNIT-00.9,RA9,MALVC,RMVBL,AU-24,SIZE-7370, (527)
*                 *
**CM   ETC     UNIT-33.0,RF0,MALVC,RMVBL,AU-24,SIZE-12374, (1939)
*                 *
*                 *
**CM   ETC     UNIT-191.0,SPARE,MALFC,AU-8, (1001)
**CM   ETC     UNIT-191.1,SPARE,MALFC,AU-8, (1057)
**CM   ETC     UNIT-191.2,SPARE,MALFC,AU-8, (1113)
**CM   ETC     UNIT-191.3,SPARE,MALFC,AU-8, (1169)
**CM   ETC     UNIT-191.4,SPARE,MALFC,AU-8, (1225)
**CM   ETC     UNIT-191.5,SPARE,MALFC,AU-8, (1281)
**CM   ETC     UNIT-191.6,SPARE,MALFC,AU-8, (417)
**CM   ETC     UNIT-191.7,SPARE,MALFC,AU-8, (526)
**CM   ETC     UNIT-191.8,SPARE,MALFC,AU-8 (1298)
**CM   ETC     UNIT-191.9,SPARE,MALVC,AU-16,SIZE-7370, (870)
**CM   XBAR    ICU-6,CH-208,ICU-7,CH-42,CH-43,ICU-6,CH-209,CH-210,
**CM   ETC     ICU-7,CH-44,CH-45,ICU-6,CH-211,CH-212,ICU-7,CH-46,
**CM   ETC     CH-47,ICU-6,CH-213,CH-214,ICU-7,CH-48,CH-49,ICU-6,CH-215,
**CM   ETC     CH-216,ICU-7,CH-50,CH-51,ICU-6,CH-217,CH-218,
**CM   ETC     ICU-7,CH-52,CH-53,ICU-6,CH-219,CH-220,ICU-7,CH-54,
**CM   ETC     CH-55,ICU-6,CH-221,CH-222,ICU-7,CH-56,CH-57,ICU-6,CH-223,
**CM   ETC     CH-224,ICU-7,CH-58,CH-59,ICU-6,CH-225,CH-226,
**CM   ETC     ICU-7,CH-60,CH-61,ICU-6,CH-227,CH-228,ICU-7,CH-62,
**CM   ETC     CH-63,ICU-6,CH-229,CH-230,ICU-7,CH-64,CH-65,ICU-6,CH-231,
**CM   ETC     CH-232,ICU-7,CH-66,CH-67,ICU-6,CH-233,CH-234,
**CM   ETC     ICU-7,CH-68,CH-69,ICU-6,CH-235,CH-236,ICU-7,CH-70,
**CM   ETC     CH-71,ICU-6,CH-237,CH-238,ICU-7,CH-72,CH-73,ICU-6,CH-239
**CM   GROUP   ESCD-broc1-2,
**CM   ETC     ESCD-broc1-3
```

4.3 ESCON Tape Subsystem Configurations

Figures 4-3 through 4-5 illustrate sample configurations as follows.

Figure 4-3 shows a PCI-ESCON connection to an STK 9840 tape subsystem with one PCI-ESCON channel adapter.

Figure 4-4 shows ESCON director (ESCD) connections to an STK 9840 tape subsystem with one PCI-ESCON channel adapter.

Figure 4-5 shows two ESCDs with a channel path to two STK 9840 tape control units.

4.3.1 $CONFIG File Changes for Controllers on ESCON Channels.

If the configuration contains controllers on PCI-ESCON channels, then the $CONFIG file record format for those controllers is modified slightly. (Note that the true configuration is contained in the RAS tables, and the text representation in the $CONFIG file is for reference only.) If a subsystem is defined on a channel that contains a PCI-ESCON channel, the subsystem "default" type field on the IOP record will be "HPIA". In addition, the GROUP record can indicate that the CU port is attached to an ESCD (Enterprise System Connection Director).

4.3.2 Basic ESCON Connection

The following is an example of comment statements (**CM) within a G8CM file that shows a basic ESCON connection to an STK 9840 Eagle tape subsystem with one ESCON channel adapter (port). These comments define the CU-0 subsystem in Figure 4-3.

```
**CM   HPIA-0  NORMAL,ICU-6,CH-8-11
**CM   ICU-6   CH-8,HPIA,UNITS-1,NONSEQ,
**CM   ETC     UNIT-0,TB0,CTAPE*9490,DEDICATED,RLSE,COMP36,NOLOAD,
**CM   ETC     DISPLAY (149)
**CM   XBAR    ICU-6,CH-8,CH-9,CH-10,CH-11
```

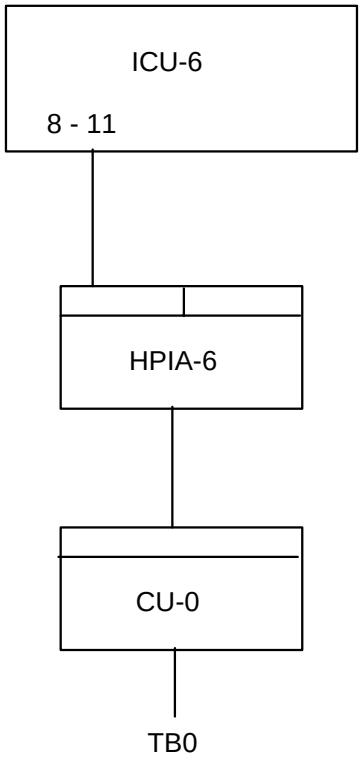

Figure 4-3. Basic PCI-ESCON Connection to an STK 9840 Tape subsystem

4.3.3 Basic ESCON Connected Through an ESCD

The following is an example of comment statements within a G8CM file. The example shows a basic ESCON connection through an ESCON Director to an STK 9840 Eagle tape subsystem with one PCI-ESCON Channel Adapter (port). These comments define the CU-0 subsystem shown in Figure 4-4.

```
**CM   HPIA-0  NORMAL,ICU-6,CH-8-11
**CM   ESCD    9032,ESCD0
**CM   ETC     PORT-145,146,254
**CM   ICU-6   CH-8,HPIA,UNITS-1,NONSEQ,ESCD-ESCD0-146
**CM   ETC     UNIT-0,TB0,CTAPE*9490,DEDICATED,RLSE,COMP36,NOLOAD,
               DISPLAY (149)
**CM   XBAR    ICU-6,CH-8,CH-9,CH-10,CH-11
**CM   GROUP   ESCD-ESCD0-146,
```

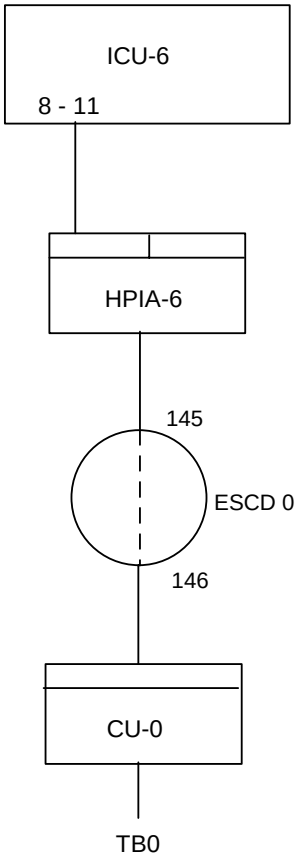

Figure 4-4. PCI-ESCON Connections to an STK 9840 Tape Subsystem Through an ESCD

CD9000 ESCON Director

SPR ST300 supplies the CD9000 ESCON Director from Inrange Corporation. The CD9000 emulates the IBM 9032-4 Director with 128 ports and additional port capability. The following shows the CD9000 addressing scheme. Select the 9032 option in G8CM.

CD9000 Model	Port Address Range
128 port	80 to FF (emulates the 9032-4)
256 port	00 to FF (enhanced addressing)

NOTE: Ports 00, FE, and FF are not available for use per ESCON specification (IBM document SA22-7202).

4.3.4 G8CM and Multiple ESCD Units Example

The ESCD configuration and G8CM file must both be configured to create a dedicated path through the first ESCD (Passthru Switch) to connect to the ESCD devices through the second ESCD (Destination Switch). The following example of the G8CM output reflects some of the directives that define the configuration shown in Figure 4-5. This path is called a CH (channel) Chain.

The path from the "in" director port EA (234) to the "out" port EB (235) must be configured in the ESCD as a static connection. This acts as if a hardwire connection is being made.

The G8CM configuration connects port EA to port EB in the Passthru switch as dedicated. In the Destination switch, port 94 (148) is configured as connected to port 86 (134) for device ES0 and to port 87 (135) for device ES1. Port FE (254) is inserted automatically into the configuration because it is the port used by the ESCD for control purposes. This port is not available for hardware connections and is designated as the Control Unit Port (CUP).

```
**CM    HPIA-01  NORMAL, ICU-6,CH-116-117
**CM    ESCD     9032,ESCD1,
**CM    ETC      PORT-234,ICU-6,CH-116,DED,235,
**CM    ETC      PORT-235,ESCD-escd2-148,DED,234,
**CM    ETC      PORT-254
**CM    ESCD     9032,ESCD2,
**CM    ETC      PORT-134,148,254,
**CM    ETC      PORT-135,148,254,
**CM    ETC      PORT-148,ESCD-escd1-235,134,135,254,
**CM    ETC      PORT 254,134,135,148
*
**CM    ICU-6    CH-116,HPIA,UNITS-1,NONSEQ,ESCD-escd1-235,ESCD-
                 escd2-134,
**CM    ETC      UNIT-0,ESO,CTAPE*9490,RLSE,COMP36(679)
**CM    XBAR     ICU-6,CH-116,CH-117
**CM    GROUP    ESCD-escd2-134
*
**CM    ICU-6    CH-116,HPIA,ESCD-escd1-235,ESCD-escd2-135,
**CM    ETC      UNIT-0,ES1,CTAPE*9490,RLSE,COMP36 (683)
**CM    XBAR     ICU-6,CH-116,CH-117
**CM    GROUP    ESCD-escd2-135
```

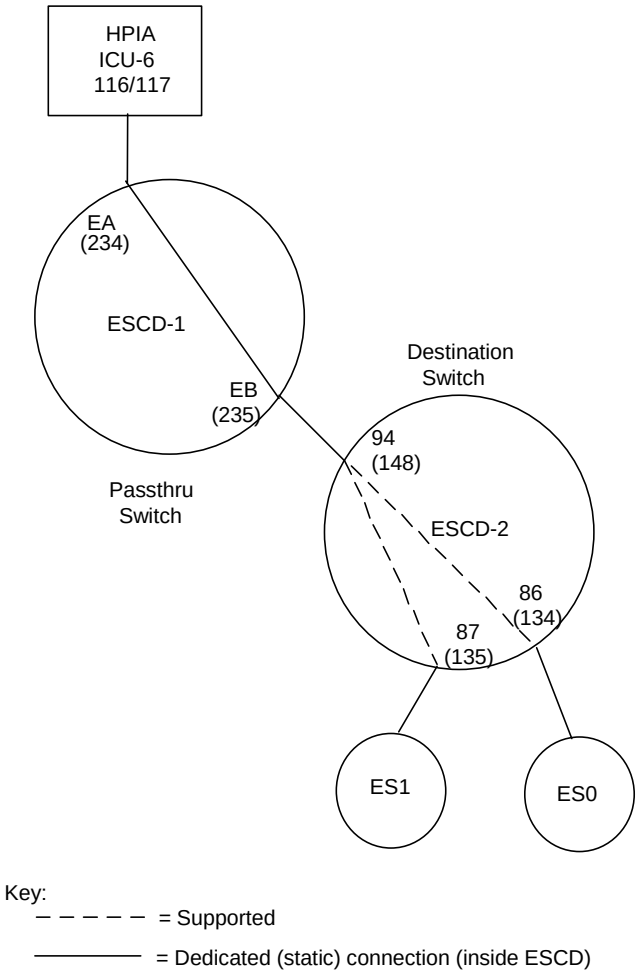

Figure 4-5. CH Chained Path

4.4 Fibre Channel Tape Subsystem Configurations

Figures 4-6 and 4-7 illustrate sample fibre channel tape subsystem configurations.

Figure 4-6 shows a fibre channel adapter connection to an STK 9840 tape subsystem with one fibre channel adapter.

Figure 4-7 shows a fibre switch connection to an STK 9840 tape subsystem with one fibre channel adapter.

4.4.1 $CONFIG File Changes For Controllers on Fibre Channels

If the configuration contains controllers on fibre channels, then the $CONFIG file record format for those controllers is modified slightly. (Note that the true configuration is contained in the RAS tables, and the text representation in the $CONFIG file is for reference only.) If a subsystem is defined on a channel that contains a fibre channel, the subsystem default type field on the ICU record is FIBRE. In addition, the GROUP record can indicate that the CU port is attached to a fibre switch.

4.4.2 Basic Fibre Channel Connection

The following is an example of comment statements within a G8CM file that shows a basic fibre channel connection to an STK 9840 Eagle tape subsystem with one fibre channel adapter. These comments define the CU-0 subsystem in Figure 4-6.

```
**CM    FIBRE-0    NORMAL,ICU-6,CH-8-11
**CM    ICU-6     CH-8,FIBRE,UNITS-1,NONSEQ,
**CM    ETC       UNIT-0,TB0,CTAPE*9490,DEDICATED,RLSE,COMP36,NOLOAD,
**CM    ETC       DISPLAY (149)
**CM    XBAR      ICU-6,CH-8,CH-9,CH-10,CH-11
```

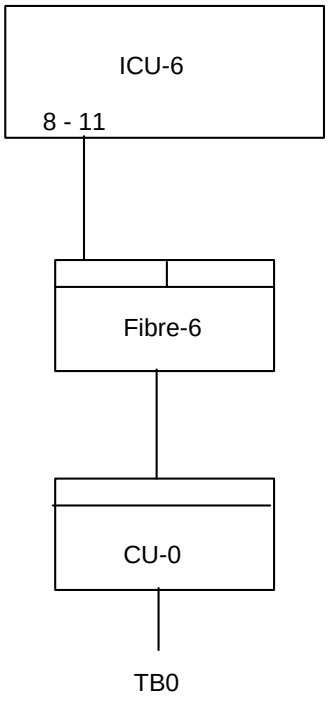

Figure 4-6. Basic Fibre Channel Tape Connection

4.4.3 Basic Fibre Channel Connected Through a Fibre Switch

The following is an example of comment statements within a G8CM file that shows basic fibre channel connections through a fibre channel switch to multiple STK 9840 Eagle tape subsystems with one fibre channel adapter. These comments define the CU-0 subsystem in figure 4-7.

```
**CM     ESCD  FIBRE_SWITCH,BROC1,
**CM     ETC   PORT-4,ICU-6,CH-72,5,
**CM     ETC   PORT-5,4
**CM     ETC   PORT-6,4
**CM     ICU-6 CH-72,HPIA,UNITS-1,NOSNSEQ,ESCD-broc1-5,
**CM     ETC   UNIT-0,FT0,CTAPE*9840,RLSE,COMP36(3580)
**CM     ETC   UNIT-0,FT1,CTAPE*9840,RLSE,COMP36(3581)
**CM     XBAR  ICU-6,CH-72,CH-73
**CM     GROUP       ESCD-broc1-5
```

The selected switches are the Brocade Silkworm 2800 or 3800 (standard Bull products). Switch connectors are industry-standard GBICs (Gigabit Interface Converter) for the 2800 and SFPs (Small Form Factor Plugins) for the 3800. Short wave, or long-wavelength fibre cabling may be mixed on the same switch in any combination. A long-wave laser connection provides a 10km connection capability.

Cascaded switches are not supported until the following requirements are met:

- G8CM Version 5.6.04 or later is used to build a configuration
- IOSP Software revision D6 is installed. D6 is contained in the following releases:

  Jupiter 2 – L8C300 patch 6

  Olympus – HR0100 update 18

  Olympus 2 – HR0200 update 5

The implementation of cascaded switches requires the use of World Wide Port Names (WWPN) to configure the devices with G8CM.

Configuring a fibre channel subsystem connection through a switch is similar to what is currently done for an ESCON subsystem connection through an ESCON director. The output port number of the switch (0-15) defines the subsystem's physical address. The IOSP receives this output port number in the switch-port-address field of the IOSPCDS file. This information is used by the IOSP to identify the subsystem when building the Device Configuration Table for each adapter.

If tape and disk connections are made through the same physical switch, each type of subsystem must be set up in a zone. Refer to the switch documentation for instructions on creating zones.

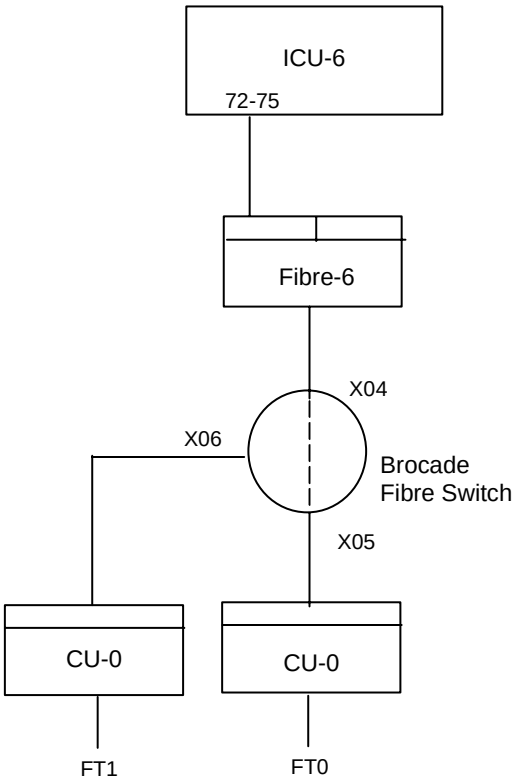

Figure 4-7. Tape Subsystem Connection Through a Fibre Switch

4.5 Sample DPS 9000/TA, DPS 9000/TA200 Or DPS 9000/TA300 Configurations

Figure 4-8 illustrates a DPS 9000/TA, DPS 9000/TA200 or DPS 9000/TA300 configuration for fibre channel or PCI-ESCON devices.

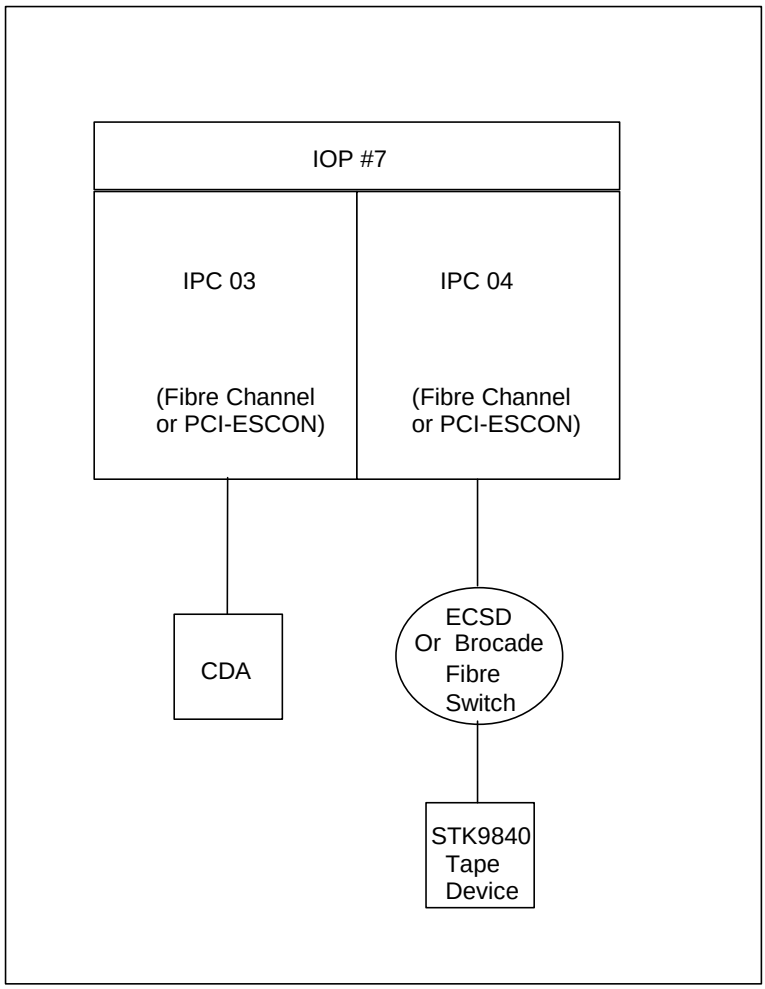

Figure 4-8. DPS 9000/TA, DPS 9000/TA200 or DPS 9000/TA300 PCI-ESCON or Fibre Channel Configuration

Following are sample DPS 9000/TA Service Processor Build Configuration (BCF) definitions for the IOP illustrated in Figure 4-8.

```
BCFO2   14:46:20  BCF506    ----------------------------------------
BCF02   14:46:20  BCF101    NAM    Unit Name                  IPC23
BCF02   14:46:20  BCF102    PAR    Parent IOP Name            IOP7
BCFO2   14:46:20  BCF103    STA    Current State              ASSIGNED
BCFO2   14:46:20  BCF105    RUR    Reason Unit Released       REQUEST
BCFO2   14:46:20  BCF121    CHT    Channel Type               HPIA
BCFO2   14:46:20  BCF126    PCH    Primary Channel            8
BCFO2   14:46:20  BCF124    NLC    No. Of Logical Channels    16
BCFO2   14:46:20  BCF122    FID    Firmware ID                HPIA
BCFO2   14:46:20  BCF134    FRV    Firmware Revision          A0
BCFO2   14:46:20  BCF123    HID    Hardware ID                HPIA
BCFO2   14:46:20  BCF127    RSO    Reset Out Required         NO
BCFO2   14:46:20  BCF125    ODC    OS Device Code(s)          65
BCFO2   14:46:20  BCF130    HRI    Hardware Index             0
BCFO2   14:46:20  BCF210    THS    Error Threshold Exceeded   NO
```

5. Block Diagrams and Marketing Identifiers

5.1 Block Diagrams

Figures 5-1, 5-2 and 5-3 illustrate DPS 9000/TA, DPS 9000/TA200 and DPS 9000/TA300 block diagrams.

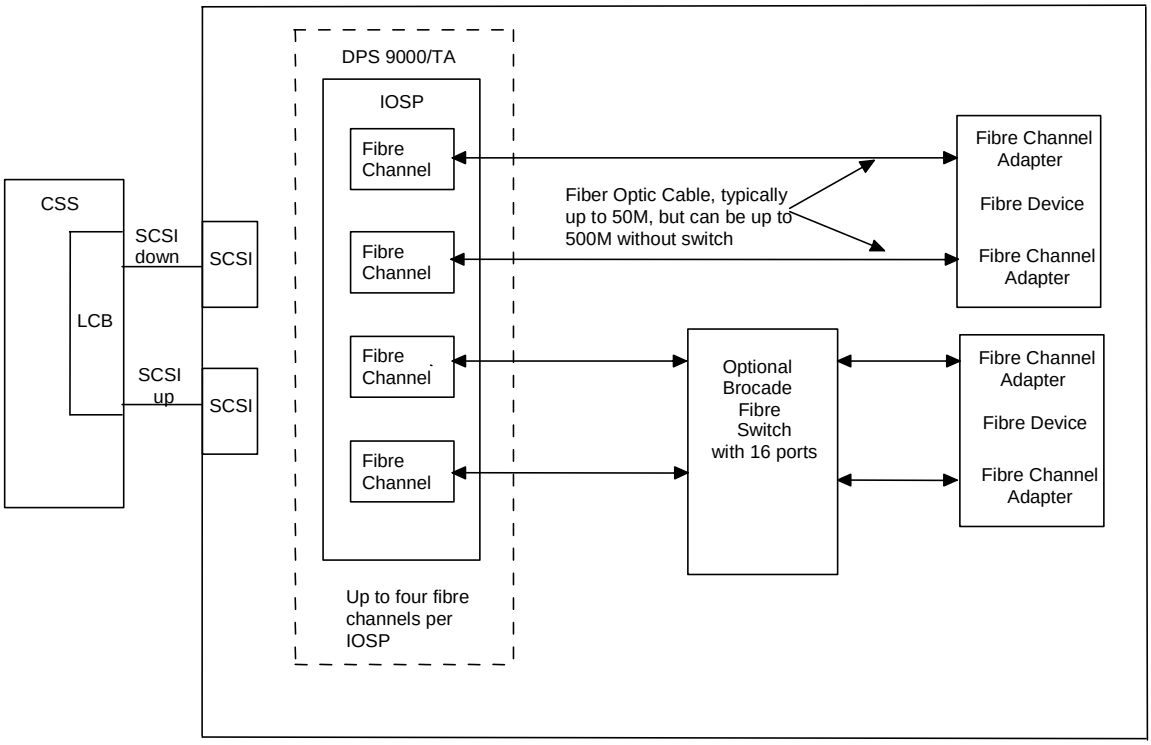

Figure 5-1. DPS 9000/TA Fibre Channel Block Diagram

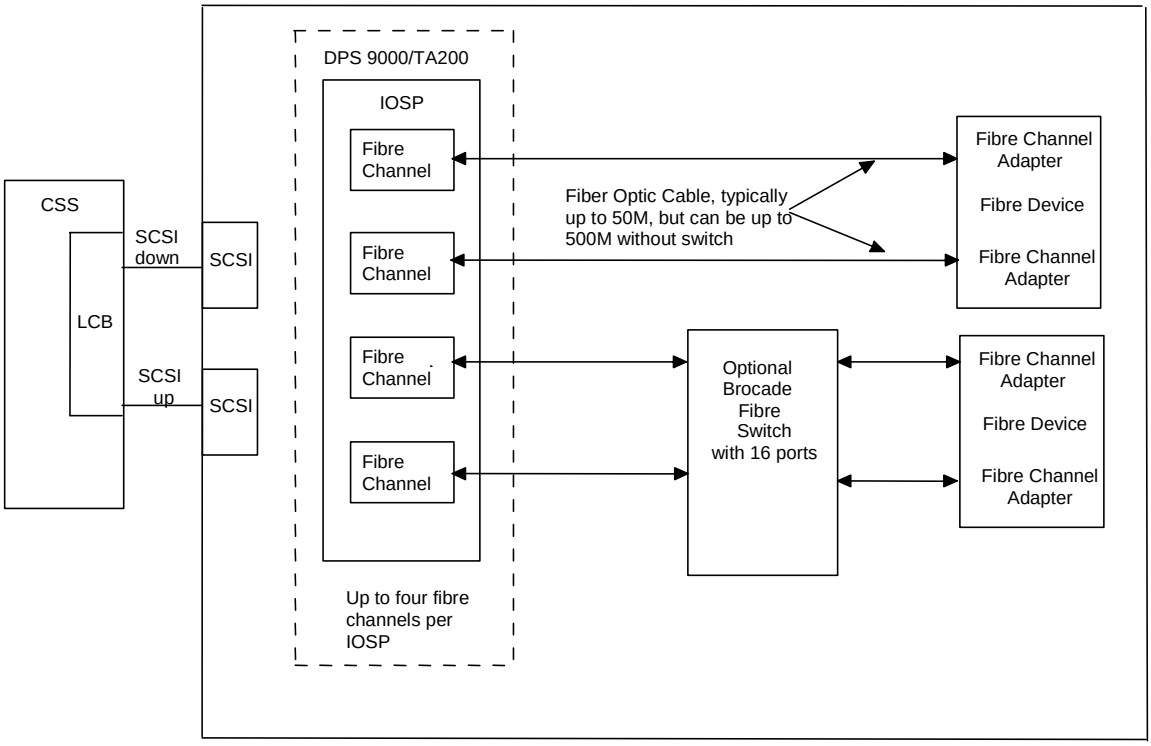

Figure 5-2. DPS 9000/TA200 Fibre Channel Block Diagram

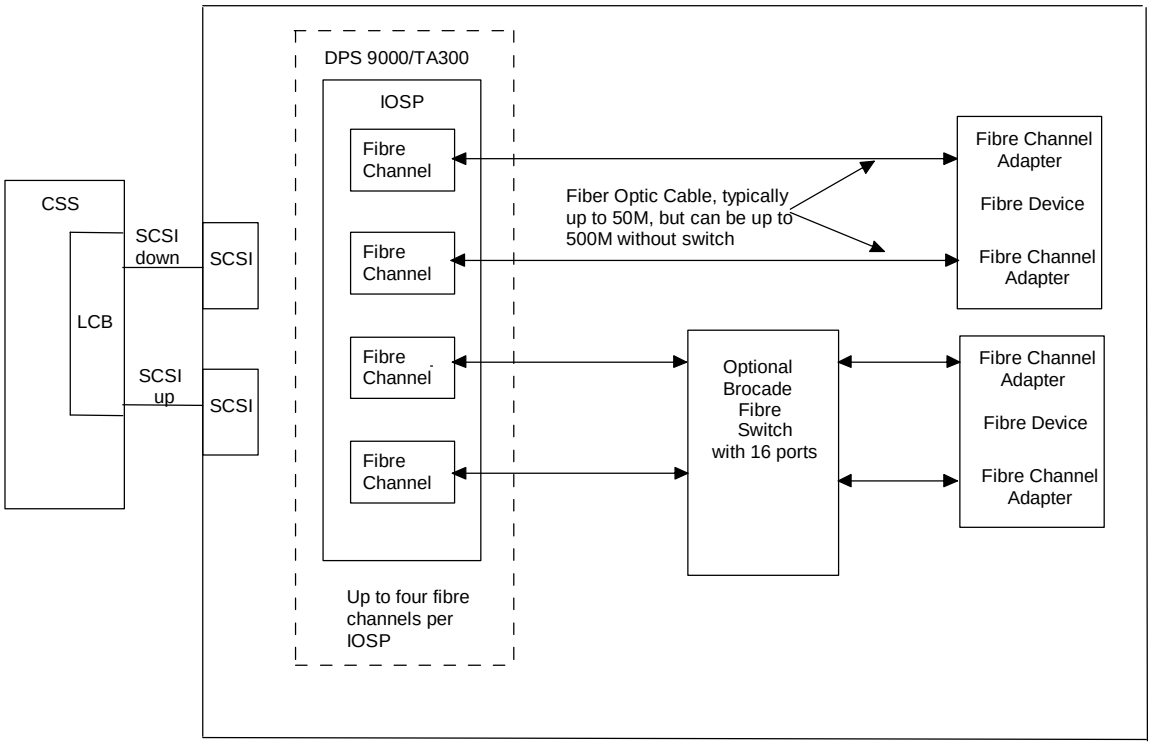

Figure 5-3. DPS 9000/TA300 Fibre Channel Block Diagram

5.2 Marketing Identifiers

The marketing identifiers for the I/O Server Processor (IOSP) with PCI-ESCON and Fibre channels consist of a combination of hardware components and firmware that provide I/O connection from a DPS 9000/TA, DPS 9000/TA200 or DPS 9000/TA300 central system to an ESCON- or fibre-based disk or tape subsystem.

Contact your Bull Marketing Representative for a complete list of these marketing identifiers.

6. Limitations And Constraints

The following are rules and restrictions for connecting via an IOSP Fibre or PCI-ESCON channel on GCOS 8 Software Set 6.0 and later.

- A specific physical device must be assigned to one (and only one) GCOS 8 System. In addition, the same physical device cannot be shared on other subsystems within the GCOS 8 system.
- When multiple peripheral subsystems are connected to a specific channel, the subsystems must be all disk or all tape.
- A maximum of 255 physical disk devices can be configured on a specific channel or channel pair. This is a channel limit.
- A maximum of 32 control units can be configured.
- For DSP 9000/TA, DSP 9000/TA200 and DSP 9000/TA300 systems, 16 logical channels are allowed for ESCON and 32 logical channels for Fibre.
- Offline Monitor T & Ds are available for the DSP 9000/TA, DSP 9000/TA200 and DSP 9000/TA300 systems. TST376 (Disk Comprehensive Test) can only be run if the CCACDS file has previously been loaded into the channel.
- Port 0 of a switch must not be connected to a control unit (connect only to a host adapter). All host adapters must have the topology set to **pt2pt**.

Dynamic Switching

GCOS 8 System software does not support internal dynamic switch features on the ESCD or Fibre switch. Dynamic switching consists of multiple paths to the same controller/device as shown in Figure 6-1.

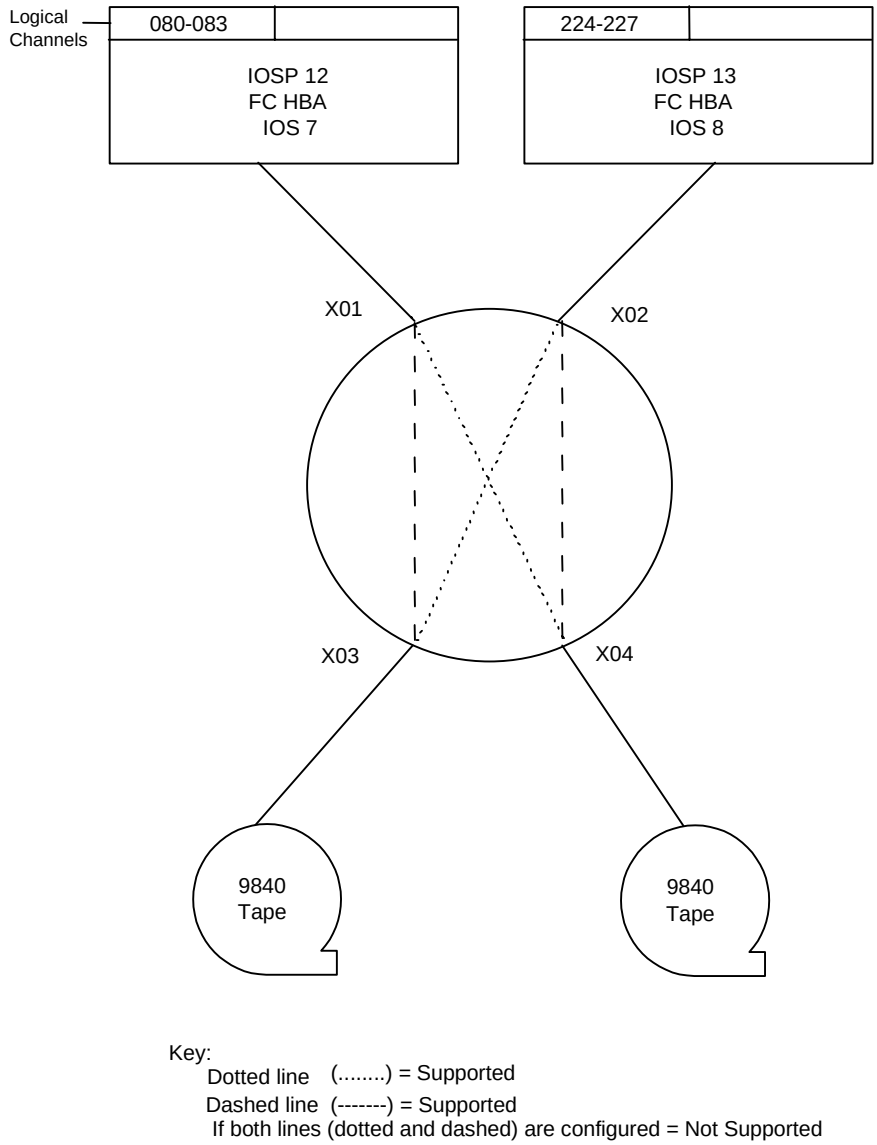

Figure 6-1. Internal Dynamic Switch Features

Glossary

BCF

Build Configuration program. A utility program that executes in the DPS 9000/700-2 and the DPS 9000/TA Service Processor (SP) to load, display, create, modify, or delete system configuration records.

CCACDS

Combined Channel Adapter Configuration Data Set. This is a file image created by G8CM that describes the I/O configuration for the channel. It is made up of a Bull header and an IOCDS image.

CCI

Configuration Component Identifier. Equates to the logical device number for all logical devices on that unit (i.e., device ddddd).

CDA

Cache Disk Array. A specialized disk subsystem that uses cache RAM to decrease the amount of time the CPU must wait for an input/output request to be served.

Channel Adapter

Sometimes referred to as Channel Director. The component in the cache disk array subsystem that allows the CDA to transfer data between the host channels and disk devices.

COB

COncentrator Board. Contained in the CSS cabinet.

Configuration Manager

See GCOS 8 Configuration Manager (G8CM)

CSS

Central SubSystem

DSC

Dual Shroud Connector

Emulation Mode

The CDA emulation of MSU8395/MSK3C devices

ESCD

Enterprise System Connection Director. An active fiber optic switch that provides configuration flexibility within the ESCON architecture.

ESCON

Enterprise System Connection. An input/output architecture that supports connection of peripheral subsystems to the GCOS 8 host system through the ESCON architecture. ESCON is a registered trademark of the IBM Corporation.

Fiber

Thin, flexible medium capable of conducting modulated light transmissions. Sometimes called optical fiber.

Fibre Channel

Channel supporting connection of subsystems to the GCOS 8 host system through the Fibre channels Protocol.

Fibre Switch

A Brocade 16-port switch that provides configuration flexibility within the Fibre architecture.

FIPS

Federal Information Processing Standards. A set of standards used in U.S. government procurement.

GCOS 8 Configuration Manager (G8CM)

Provides a central repository of GCOS 8 system configuration information and is used to generate configuration files for GCOS 8 System Startup.

GOS

Guest Operating System. In a GCOS 8 system running under the Virtual Machine Facility (VMF) software, the GOS is the copy of GCOS 8 that controls some set of applications, but does not control the hardware shared by all Guest Operating Systems.

GUI

Graphical User Interface. The term applied to a human-computer interface that is based on the use of windows, icons, and a mouse or similar pointing device.

HOS

Host Operating System. In a GCOS 8 system running under the Virtual Machine Facility (VMF) software, the HOS is the copy of GCOS 8 that controls the hardware.

HPIA

High Performance Interface Adapter. An I/O channel that allows a DPS 9000/700-2 or a DPS 9000/TA system to connect to a peripheral subsystem that utilizes a fiber optic interface.

IMCV

Input Media Conversion.

IOCDS

Input/Output Configuration Data Set. Part of a file image (i.e., CCACDS) that describes the relationship of channel to the subsystem devices accessed.

IOSC

Input/Output Server Cabinet containing one or two IOSPs

IOSP

Input/Output Server Processor. A reliable, high performance input/output processor for the DPS 9000/700-2 and DPS 9000/TA. The IOSP contains the PCI-ESCON and Fibre channel boards.

ISM

Integrated System Management. A Bull offering that provides system administrators with a variety of management tools.

LCB

Link Control Board. Located in the CSS cabinet and transfers data between system memory and the IOSP.

LLink

Little Link (320-word allocation unit).

LDVN

Logical Device Unit Number

Logical Device

Subdivision of the addressable unit. Software addressed entity defined as unit on the logical Startup configuration statement.

Logical Subsystem

Software logical definition of a set of resources that are accessible from a set of channels. Defined by the $ IOP, $ GROUP, and $ XBAR Startup logical configuration statement.

Mirroring

The CDA maintains two identical copies of a designated unit on separate disks. Each unit automatically updates during a write operation. If one disk device fails, CDA automatically uses the other disk device.

Mirrored Pair

A logical unit with all data recorded twice (i.e., once on each of the two different physical devices).

PCI

Peripheral Controller Interface for IOSP channels.

PSI

Peripheral Subsystem Interface. A Bull I/O channel that allows a DPS 9000 system to connect to a peripheral subsystem that utilizes a Bull proprietary interface.

RAID

Random Array of Independent Disks. Cluster of disks in which data is copied to multiple drives.

RAID-S

Random Array of Independent Disks-S. EMC Corporation nomenclature for a RAID Level 5 disk subsystem.

RADS

Rapid Access Data System

RAS

Reliability, Availability, and Serviceability. A collection of GCOS 8 system software responsible for these aspects of a system.

RAS Tables

A set of binary files that represent a GCOS 8 configuration. Configurations containing ESCON hardware can be fully represented only in RAS tables.

RSD

Retractable Shroud Duplex

TimberLine

Storage Technology Corporation (STK) ESCON Cartridge Tape subsystem (STK9490)

VMF

GCOS 8 Virtual Machine Facility. A set of software programs and files that enables a site to execute multiple copies of the GCOS 8 System on a single, DPS 9000/700-2 or DPS 9000/TA large-computer hardware platform.

Index

E

F

G

H

I

M

O

P

R

S

T

V

BULL CEDOC
357 AVENUE PATTON
B.P.20845
49008 ANGERS CEDEX 01
France

67 A2 RG94 REV10 Printed in U.S.A.