Bull ESCALA EPC Series

EPC Connecting Guide

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EPC Connecting Guide

Hardware

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BULL ELECTRONICS ANGERS
CEDOC
34 Rue du Nid de Pie – BP 428
49004 ANGERS CEDEX 01
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Year 2000

The product documented in this manual is Year 2000 Ready.

About This Book

Typical Powercluster configurations are illustrated, together with the associated sub-systems. Cabling details for each configuration are tabulated, showing cross-references to the Marketing Identifiers (MI) and the Catalogue.

Reference numbers associated with the configuration figure titles correspond to those in the Catalogue.

This document is complementary to, and should be read in conjunction with, these cabling guides:

- *Cabling Guide for Multiple Bus Systems* (UNIX, ISA – PCI Based Systems)
- *Cabling Guide for MCA Systems* (UNIX, MCA Based Systems).

Audience

This document addresses an audience of Site Installation System engineers.

User Profile

Those responsible for installing, maintaining and upgrading Powercluster systems.

Document Revision Level

This document is at Revision 02 level.

Document Overview

This manual is structured as follows:

Chapter 1 **Introducing the Escala Powercluster Series**
Introduces the Powercluster family of Escala racks.

Chapter 2 **EPC400**
Describes the Escala RT Series rack with an Escala RT drawer.

Chapter 3 **EPC800**
Describes the Escala RM Series rack with a CPU rack drawer.

Chapter 4 **EPC1200**
Describes the Escala RL470 Basic System which consists of two racks (a computing rack with a CPU drawer and an expansion rack with an I/O drawer.

Chapter 5 **Multiple Node Configurations**
Describes the additional node types offered.

Chapter 6 **Subsystems**
Introduces the types of subsystems.

Chapter 7 **Console Cabling Requirements**
Describes cabling requirements for control consoles.

Chapter 8 **Fast Ethernet Interconnect Requirements**
Describes particular cabling for Fast Ethernet applications.

Chapter 9 **FDDI Interconnect Requirements**
Describes particular cabling for FDDI applications.

Chapter 10 **Disk Subsystems Cabling Requirements**
Describes particular cabling for Disk Drive applications.

Chapter 11 **Tape Subsystems Cabling Requirements**
Summarizes tape drive applications.

Chapter 12 **Remote Maintenance**
Describes remote maintenance solutions.

Appendix A **Marketing Identifier Cross-References**
Provides a way to trace the use, in this document, of Marketing Identifiers associated with EPC cabling.

Appendix B **Support Bulletins**
Where to find Technical Support Bulletins: linking M.I.s to spare parts; where are M.I.s used; history of Part Nos.

Appendix C **PCI/ISA Adapter List**
Lists of adapters (controllers) and their identification labels.

Appendix D **Cable and Connector Identification Codes**
Explains cable identification rules and markings, and connector identification codes.

Glossary Alphabetical list of terms and abbreviations used in this manual.

Index General index.

Terminology

The term “machine” is used to indicate the proprietary hardware, in this case the Escala family of multi–processors.

The term “Operating System” is used to indicate the proprietary operating system software, in this case AIX.

Related Publications

Escala Powercluster Series

- *EPC Connecting Guide* (this present document)
  Reference: 86 A1 65JX

- *Site Preparation for Rack Systems*
  Reference: 86 A1 30PX

- *EPC and HA Solutions – Setup Guide*
  Reference: 86 A2 79HX

- *PowerConsole and ClusterAssistant – Setup Guide*
  Reference: 86 A2 81HX

- *Powercluster & HA Solutions: Using the Sample HA Scripts*
  Reference: 86 A7 82HX

- *Powercluster Cluster Management Tools: ClusterWatch*
  Reference: 86 A2 80HX

Other Publications

- *Cabling Guide for Multiple Bus Systems*
  Reference: 86 A1 70JX.

- *Cabling Guide for MCA Systems*
  Reference: 86 A1 87AQ.

- *Escala 7133 SSA Disk Subsystems – Service Guide*
  Reference: 86 A1 94GX.

- *Escala AMDAS JBOD Storage System – Setup & Operator Guide*
  Reference: 86 A1 79GX.

- *Escala AMDAS JBOD Storage Subsystem – User’s Guide*
  Reference: 86 A1 79GX.

- *General Guide to Data Processing Site Preparation*
  Reference: URL http://bbs.bull.net/aise

- *Escala RT Series Setting Up the System*
  Reference: 86 A1 18PX

- *Escala RT Series Rack Service Guide*
  Reference: 86 A1 20PX

- *Escala S Series System Service Guide*
  Reference: 86 A1 91JX

- *Escala Mxxx Installation & Service Guide*
  Reference: 86 A1 25PN

- *Escala Rxxx Installation & Service Guide*
  Reference: 86 A1 29PN

- *Escala RL470 Installation Procedures for Drawers*
  Reference: 86 A1 29PX

- *DLT4000/4500/dlt4700 Catridge Tape Subsystem Product Manual*
  Reference: Quantum 81-108336-02 (Jan 96).

- *Disk & Tape Devices Configuration Information*
  Reference: 86 A1 88GX.

- *Peripherals AMDAS Storage Subsystem Installation Guide*, Product Manua
  Reference: 00 A1 52VG.

- *Peripherals JDA/SDA7 Storage SubSystem* Product Manual
  Reference: 00 A7 S1VG.

- *FDDI Adapter – Installation and Configuration Guide*
  Reference: 86 A1 53GX 01.

- *Superstack II Hub 10 Management User Guide*
  Reference: Vendor publication.

- *Oncore Integrated System Hub Installation and Operation Guide*
  Reference: 3M Vendor publication.

- *Oncore Distributed Management Module User Guide*
  Reference: 3M Vendor publication.

- *Oncore SwitchModules User Guide*
  Reference: 3M Vendor publication.

- *FCS 266 MCA Adapter – Installer's / User's Manual*
  Reference: Vendor publication No. PUB 009.

- *FCS 266/1062 Fibre Switch–16 – Installer's / User's Manual*
  Reference: Vendor publication No. PUB 021.

- *CS/2500 Series Communications Server Installation Guide*
  Reference: 3Com® 09-0263-001

- *Installing Your Explora Family System*
  Reference: Vendor publication. P/N: 9300385.

- *17" Professional Color Monitor User's Guide*
  Reference: Vendor publication

- *Workstations BQX 4.0*
  Reference: 76665004–002

Table of Contents

Chapter 1. Introducing the Escala Powercluster Series

Introducing the Powercluster family of Escala racks.

Introducing Powercluster Servers (Cluster Nodes)

The Powercluster offer is made up of Escala rack-mountable servers. Three uni-node server models are available:

- EPC400, an Escala RT Series rack with an Escala RT drawer, see page 2-1.
- EPC800, an Escala RM Series rack with a CPU rack drawer, see page 3-1.
- EPC1200, an RL470 Basic System which consists of two racks (a computing rack with a CPU drawer and an expansion rack with an I/O drawer), see page 4-1.

Multiple Node Configurations

In addition, multiple node configurations can be defined from these models by adding more nodes. For this purpose, three additional node types are offered:

- EPC400-N: an Escala RT drawer in an Escala RT rack (RT node)
- EPC800-N: an Escala RM drawer in an Escala RM rack (RM node)
- EPC1200-N: an RL470 Basic System which consists of two racks (a computing rack with a CPU drawer and an expansion rack with an I/O drawer) (RL node).

These additional nodes are introduced on page 0.

Note: The RT nodes and RL nodes are often called PCI nodes. RM nodes are called MCA nodes.

Mixed Configurations

Mixed configurations can be constructed. The permitted combinations are RM*RT, RM*RL, and RT*RL. An original configuration with the three node types is not allowed. However any node type can be added to an existing EPC.

EPC1200 Minimum Configuration

The EPC1200 model is available in any configuration (uni-node and above).

Additional Nodes/Racks

According to the configuration rules, an additional node comes with the associated rack(s), if needed. If the configuration already contains a rack corresponding to the type of the additional node, and if there is enough room left to insert that node into the rack, the order of the additional node consists of the sole node drawer (Provided that the configuration rules permit it). Otherwise a rack (RM rack, RT rack or RL bi–rack) of a type corresponding to the node type (RM node, RT node or RL node) is also supplied.

Powercluster Models/Nodes/Racks

	EPC400	EPC800	EPC1200
Nb of Racks	1 – 7	1 – 7	2 – 14
Nb of Nodes	1 – 8	1 – 8	2 – 8

Figure 1. Powercluster Models

Chapter 2. EPC400 Series

Describing the Escala RT Series rack with an Escala RT drawer.

EPC400 Series – Profile

These models, contained in a 19” RACK (36U), are RT Nodes, including:

Configuration	**EPC400** CPXG210–0000	**EPC430** CPXG225–0000	**EPC440** CPXG226–0000
Power Supply	Redundant	Redundant	Hot Swapping
Slots for CPU board	4	4	2 (up to 8GB)
Ultra SCSI Bus for Medias	1	1	1
Ultra SCSI Bus for Disks	1	1 (ultra–2/LVD)	1
Floppy Disk 1.44MB 3” 1/2	1	1	1
Keyboard and Mouse Port	Y	Y	Y
SVGA Adapter	1	1	1
Video Memory RAM	1 MB	2MB	1 MB
Ethernet Port (10/100 Mbps)	1	1	1
Async. Lines	3	3	3
Centronics Port	1	1	1
Disk Hot Swapping	Y	Y	Y
I/O Slots	5 PCI + 2 PCI/ISA + 1 ISA	5 PCI + 2 PCI/ISA + 1 ISA	8 PCI
Open Bay for Medias	2	2	2
	2 Slots for Cages of 3 Disks(1”) or 2 Disks (1,6”)	2 Slots for Cages of 3 Disks(1”) or 2 Disks (1,6”)	12 Open Bays for HOT–swappable disks 1” or 6 Open Bays for HOT–swappable disks 1.6”
Rack Mount Option	Type 1	Type 1	for drawer 8EIA

Standard Adapters/Cables

One CBLG105–1800 serial cable is automatically generated for every drawer.

Two CBL1912 adapter cables (9 pin, 25 pin) are systematically provided with any base EPC model.

An 8–port asynchronous board is per default generated for every CPU drawer:

M.I. (DCCG087–0000)

PCI 8–Port Async RS232 Adapter with connector box.

This board can be removed in order to save a slot. But remember that this board is often necessary for establishing the RS232 serial network (heart beat messages) between the nodes. Native serial ports (COM3 and COM2) must be used for setting the heart beat network.

The 8–port Async board is also mandatory on a node which a modem is connected to, when the Remote Maintenance Option is used, see page 12-1.

List of Drawers for EPC400 Series Rack

The drawers, with their rack-mount kits, that can be mounted into the EPC400 rack are as follows.

Legend

The following conventions are used:

– not applicable.

Yes fitted at manufacture.

Customer Fitted at customer's site by Customer services.

No Equipment is not fitted in this rack.

Yes | No A mounting kit is offered in option. If ordered, the corresponding drawer is mounted into the rack by manufacturing and transported. Otherwise the equipement is not put into the rack.

Customer | No Though there is a mounting kit, the equipment cannot be transported inside the rack. If the mounting kit is ordered, the kit (slides, ...) is fixed such that the corresponding drawer can be mounted into the rack by the Customer Services at the customer's site. Otherwise the equipment is not put into the rack.

Options	EPC400	Rack mount kits
PDU or PDB	yes	included in RCKG002
Additional PDU	yes	included in PSSG020
CPU drawer	yes (RT drawer)	CKTG079
PCI Expansion drawer	yes	CKTG079
PCI I/O Drawer	–	–
DAS1300	yes	CKTG082
DAS2900	yes	CKTG082
DAS3200	yes	CKTG083
DAS3500	yes	CKTG083
FC-AL Hub (Single Hub Double Hub)	yes	 RCKQ003 RCKQ004
DLT Tape Drive (on shelf) (One per drawer)	yes	CKTG087
VDAT Mammoth (One per drawer)	yes	CKTG093
Console Concentrator	yes|no	CKTG097
Admin Ethernet Hub	yes|no	CKTG098
FDDI Dual Hub	no	–
Fast Ethernet Switch	yes|no	CKTG098
Overland LBX 4000	Customer	included in CTLF026
Overland LBX 7000	Customer	included in CTLF028

Figure 2. Drawers and Rack-mount Kits for EPC400 Rack (Table).

Chapter 3. EPC800

Describing the Escala RM Series rack with a CPU rack drawer.

EPC800 – Profile

M.I. (CPXG211–0000)

This model, contained in a 19” RACK (36U), is one RM Node, including:

- 1 dual CPU module Power PC 604e @200Mhz – 2MB L2 cache / CPU
- 3 slots for additional dual CPU modules
- 4 memory slots
- Expandable Memory up to 4GB
- 1 floppy disk 1.44MB 3”1/2
- 1 LSA board: SCSI2 F/W SE port + 1 Ethernet port
- 3 Async. lines – 1 centronics port
- 1 MCA Bus with 6 free MCA slots (8 total)
- 2 open bays for disks (1”)
- 1 open bay for media (CD–ROM)
- 1 open bay for additional disk or media (1”6)
- 1 power supply
- 1 redundant power supply.

Notes:

1. There are 8 slots in the basic option.
2. A second MCA bus, with 8 slots is possible (giving a total of 16 slots).
3. No graphics display is available with this model.

Compatibility with Earlier EPC Models

For compatibility with previous EPC models, an existing configuration can be extended with an Escala T Series CPU cabinet and 8 additional slots.

Standard Adapters/Cables

One CBLG105–1800 serial cable is automatically generated for every drawer.

Two CBL1912 adapter cables (9 pin, 25 pin) are systematically provided with any base EPC model.

An 8–port asynchronous board is per default generated for every CPU drawer:

M.I. (DCCG067–0000)

8–Port Async RS232 Adapter with connector box.

This board can be removed in order to save a slot. But remember that this board is often necessary for establishing the RS232 serial network (heart beat messages) between the nodes.

The 8–port Async board is also mandatory on a node which a modem is connected to, when the Remote Maintenance Option is used, see page 12-1.

List of Drawers for EPC800 Rack

The drawers, with their rack-mount kits, that can be mounted into the EPC 400 rack are as follows.

Legend

The following conventions are used:

– not applicable.

Yes fitted at manufacture.

Customer Fitted at customer's site by Customer services.

No Equipment is not fitted in this rack.

Yes | No A mounting kit is offered in option. If ordered, the corresponding drawer is mounted into the rack by manufacturing and transported. Otherwise the equipement is not put into the rack.

Customer | No Though there is a mounting kit, the equipment cannot be transported inside the rack. If the mounting kit is ordered, the kit (slides, ...) is fixed such that the corresponding drawer can be mounted into the rack by the Customer Services at the customer's site. Otherwise the equipment is not put into the rack.

Options	EPC800	Rack mount kits
PDU or PDB	yes	included
Additional PDU	yes	included
CPU drawer	yes (RM drawer)	included
PCI Expansion drawer	–	–
PCI I/O Drawer	–	–
DAS1300	yes	CKTG089
DAS2900	yes	CKTG089
DAS3200	yes	CKTG090
DAS3500	–	–
FC-AL Hub (Single Hub or Double Hub)	–	–
DLT Tape Drive (on shelf) (One per drawer)	yes	CKTG066
VDAT Mammoth (One per drawer)	yes	CKTG095 (HH external device)
Cosole Concentrator	yes|no	CKTU105
Admin Ethernet Hub	yes|no	CKTU107 or 105
FDDI Dual Hub	Customer|no	CKTU106
Fast Ethernet Switch	no	–
Overland LBX 4000	Customer	included in CTLF026
Overland LBX 7000	Customer	included in CFTLF028

Figure 3. Drawers and Rack-mount Kits for EPC800 Rack (Table).

Chapter 4. EPC1200/1200A and 2400

Describing the Escala EPC1200/1200A and 2400 Systems which consist of two racks (a computing rack with a CPU drawer and an expansion rack with an I/O drawer).

EPC1200 – Profile

These models, contained in a two 19” racks (36U), are two RL Nodes, including:

Computing Unit (CEC–Rack):

- 1 Base CPU Board with 4 RS64A@125 Mhz and 4MB cache per CPU
- 3 slots for 4–CPU boards
- 16 slots for memory boards (512, 1024, 2048, 4096MB)
- Remote I/O Board supporting 4 I/O connectors (each at 500 MBps)
- 512 MB Base River Memory (4 boards of 128MB)

Expansion Unit (I/O–Rack):

- 1 I/O drawer with 12 Disks bays, 4 Media bays and 14 slots for PCI adapters
- 2x6 bays (1”) for disks with
  - 11 disks bays (1”) free for add–ons
- 1x4 bays for media with
  - 1 Floppy Disk 1.44MB 3” 1/2 (1 media bay used)
  - 1 12–20X CD–ROM drive (1 media bay used)
  - 2 additional media bays free for add–ons
  - 2 additional media bays free for add–ons
- 14 slots for PCI adapters [5x64–bit slots (all free), 9x32–bit slots (6 free)]
  - 1 SCSI Adapter for driving devices/media bays
  - 1 SCSI Adapter for driving devices/disk bays
  - 1 Service Processor PCI board (1 dedicated PCI slot used)
    - Keyboard and Mouse Port
    - 2 Serial ports and 1 Parallel port
- cables: 2x6 m for Remote I/O loops, 2x6 m SPCN & 1x6 m JTAG
- 1 Power Distribution Unit Specify (Single Phase)
- 4.5 GB Base Ultra–SCSI 16–bit Hot Swap Disk Drive (1”)

Note: Up to 4 I/O drawers can be accommodated with an additional Expansion unit.

Standard Adapters/Cables

One CBLG105–1800 serial cable is automatically generated for every drawer.

Two CBL1912 adapter cables (9 pin, 25 pin) are systematically provided and mounted with any CPU drawer.

An 8–port asynchronous board is per default generated for every CPU drawer:

M.I. (DCCG130–0000)

8–Port Async RS232/422 PCI Adapter with fan-out box.

This multi–port board is mandatory as the S1 and S2 native serial ports are reserved for other use.

The 8–port Async board is also mandatory on a node which a modem is connected to, when the Remote Maintenance Option is used, see page 12-1.

List of Drawers for EPC1200 Rack

The drawers, with their rack-mount kits, that can be mounted into the EPC1200 rack are as follows.

Legend

The following conventions are used:

– not applicable.

Yes fitted at manufacture.

Customer Fitted at customer's site by Customer services.

No Equipment is not fitted in this rack.

Yes | No A mounting kit is offered in option. If ordered, the corresponding drawer is mounted into the rack by manufacturing and transported. Otherwise the equipement is not put into the rack.

Customer | No Though there is a mounting kit, the equipment cannot be transported inside the rack. If the mounting kit is ordered, the kit (slides, ...) is fixed such that the corresponding drawer can be mounted into the rack by the Customer Services at the customer's site. Otherwise the equipment is not put into the rack.

Options	EPC1200	Rack mount kits
PDU or PDB		–
Additional PDU		–
CPU drawer	yes (RL drawer)	integrated
PCI Expansion drawer	–	–
PCI I/O Drawer	yes	integrated
DAS1300	–	–
DAS2900	yes	CKTG100
DAS3200	yes	CKTG101
DAS3500	yes	CKTG101
FC-AL Hub (Single or Double)	yes	–
DLT Tape Drive (on shelf) (One per drawer)	no	–
VDAT Mammoth (One per drawer)	–	–
Cosole Concentrator	no	–
Admin Ethernet Hub	no	–
FDDI Dual Hub	no	–
Fast Ethernet Switch	no	–
Overland LBX 4000	Customer	included in CTLF026
Overland LBX 7000	Customer	included in CTLF028

Figure 4. Drawers and Rack-mount Kits for EPC1200 Rack (Table).

Chapter 5. Subsystems

Introduces the different types of subsystems.

Subsystems – Summary

There are several types of subsystems:

- User consoles, on page 5-2.
- Serial Networks, on page 5-4.
- Interconnect, on page 5-5.
- HA Library, on page 5-6.
- DAS SCSI, see page 5-7.
- DAS FC-AL, see page 5-8.

User Consoles

There are 4 terminal types, see page 6-1.

- System Console, an ASCII terminal (BQ306)
- Graphics Display (on all models except on the EPC800 model) that substitutes to an ASCII system console with graphical capabilities
- Cluster Console, a self–bootable X Terminal
- PowerConsole, an Escala S Series.

For administration purpose, there are two private networks:

- A serial network for configuration with more than 2 nodes. In that case all the nodes are linked to a console concentrator (3COMs CS2600 terminal server) enabling from a single terminal attached to it, to have the system console function for every node.
- A dedicated–administration ethernet network enabling to operate the cluster with graphical tools. The dedicated–administration network is made up with a Superstack II Ethernet Hub. The dedicated administration network is mandatory if a cluster console is ordered for a two–node powercluster. In other cases, it is optional.

For a uni–node Powercluster, a System Console or a Graphics Display can be used. There is no Graphics Display for the EPC800 model.

For a Two–node Powercluster, the possible configurations in terms of consoles are:

- a System Console attached to every node,
- or a System Console attached to a first node, a Graphics Display attached to the second node, plus a crossed Ethernet cable for linking the two nodes,
- or a System Console that may be attached to a node, a Cluster Console attached to the other node along with a dedicated administration network,
- or a PowerConsole that comes with a Console Concentrator to link the PowerConsole to all the nodes.

For any configuration with more than 2 nodes, there can be:

- a PowerConsole
- or a Cluster Console.

In both cases, there is a console concentrator and the dedicated–administration network is optional.

Number of nodes	Administration Hub	Console Concentrator	Console Type	Dedicated Admin. Network	Figure	Cross Reference Page
1	0	0	System Console, Graphics Display	N/A	PWCCF07	on page 6-5
2	0	0	System Console, Graphics Display	N/A	PWCCF08	on page 6-6
2	0	0	System Console	N/A	PWCCF01	on page 6-6 & on page 6-9
2	1	0	ClusterConsole	Yes	PWCCF02	on page 6-29
3 or more	1	1	ClusterConsole	Yes	PWCCF03	on page 6-31
3 or more	0	1	ClusterConsole	No	PWCCF05	on page 6-32
2 or more	1	1	PowerConsole	Yes	PWCCF04	on page 6-42
2 or more	0	1	PowerConsole	No	PWCCF06	on page 6-43

Serial Networks

There are two type of serial networks:

A first one is used by HACMP to monitor the nodes. Nodes periodically exchange keep alive messages (heart beat) in particular through this network.

A second one is used to wire the nodes on a console concentrator, if any. It enables a single terminal connected to the console concentrator to be the system console of every node.

A node provides 2 or 3 native serial ports:

S1 (or COM1) port is used to connect a system console.

S2 (or COM2) is dedicated to remote maintenance (EPC440, 800, 1200 and 2400).

S3 (or COM3) is a third serial port available on EPC400, 430 and EPC800 models.

When more serial ports are necessary, one can use a multi–port Asynchronous board. EPC models are provided per default with an 8–port async card. For remote maintenance purposes, in the case of a configuration with a cluster console, an 8–port async card is necessary on the node to which the modem is connected.

Heart Beat Network

A serial ring is established between all the nodes.

For a 2–node configuration, there is a serial cable between node #1 and node #2. The cable is connected to a serial port on each node. Either S3 port or a port on the multi–port async board is used. (In the case of RL470, EPC440, 1200, 2400, it is the 8–port board since there is no S3 port).

For disaster recovery configuration the serial line can be extended by using a micro-modem at each line end. No lines, nor micro-modems can be ordered and thereby are not provided by the manufacturing.

For configuration with N nodes (N>2) , there is a serial cable between:

node #1 and node #2

node #2 and node #3

...

node #N and node #1.

Two serial ports are used on each node. They are either two ports of the multiple–port async board (mandatory on EPC1200 systems), or the native serial ports S2 (COM2) and S3 (COM3).

Notes:

1. Using S2 port may be in conflict with remote maintenance access needs (EPC800).
2. On EPC1200 and EPC2400 systems, the multi–port async card should be put into slot 5 or slot 7.
3. On EPC400 and EPC430 nodes, COM2 and COM3 serial ports must be used. You must not use COM1 port of multiple–port async board.
4. On EPC440, COM2 can be used.

Console Network

When there is a console concentrator, each node is linked to the console concentrator with a serial cable. The cable is connected to the S1 (COM1) serial port of the node.

Interconnect

There are two interconnect types:

- FDDI interconnect, on page 7-2
- Fast Ethernet interconnect, on page 9-2.

For 2–node configuration of same node type, there is a Fast Ethernet Full Kit (2 Fast Ethernet adapters plus a crossed Ethernet cable), as well a FDDI Full Kit (2 FDDI adapters and two FDDI cables). A Fast Ethernet Full Kit and a FDDI Full Kit are defined for each node type.

For configuration of more than 2 nodes, according to the interconnect type, a Fast Ethernet Base Kit or a FDDI Base Kit corresponding to the node type is used for each node. There is also a Fast Ethernet Switch Kit or a FDDI Hub Kit. A Base Kit includes a LAN adapter and the appropriate cables.

For mixed configuration of two nodes, the Base Kit is used on each node. The Base Kit to be used for a node depends on the node type (EPC400, EPC800, or EPC1200) and on the selected interconnect type (FDDI or Fast Ethernet). In the case of Ethernet interconnect, a crossed ethernet cable is automatically generated. In the case of a FDDI interconnect between an EPC1200 node and an EPC400 node, a pair of SC–SC Fiber Optic cables are used.

There is no interconnect in a configuration for disaster recovery.

Type	Number of Attached Nodes	Figure	Cross Reference Page
Single Fast Ethernet	2	INTCF09	on page 7-5
Ethernet Single Switch	[3 – 8]	INTCF10	on page 7-7
Gigabit Ethernet	2	INTCF10	on page 7-7
FDDI	2	INTCF05	on page 9-4 & on page 9-5
FDDI w/ Hub	[3 – 8]	INTCF06	on page 9-6

HA Library

For details, see page 10-69.

Number of Nodes	Number of Drives	Number of Adapters / Nodes	SSA Picture	Cross Reference Page
2	1	1	LIBCF01	on page 10-73
2	2	1	LIBCF02	on page 10-73
2	2	2	LIBCF03	on page 10-74

DAS SCSI

For details, see page 10-23.

Configuration Type	Number of Attached Nodes	Daisy Chained Y/N	Number of Node-DAS Cables	Figure	Cross Reference Page
Single SP / Single SCSI	1	N	1	DASCF01	on page 10-27
Single SP / Single SCSI	1	Y	1	DASCF02	on page 10-28
Dual SP / Dual SCSI	1	N	2	DASCF03	on page 10-28
Dual SP / Dual SCSI	1	Y	2	DASCF04	on page 10-29
Single SP / Single SCSI	[2 – 4]	N	1	DASCF05	on page 10-29
Single SP / Single SCSI	[2 – 4]	N	2	DASCF06	on page 10-30
Single SP / Single SCSI	[2 – 4]	Y	1	DASCF07	on page 10-30
Single SP / Single SCSI	[2 – 4]	Y	2	DASCF08	on page 10-31
Dual SP / Dual SCSI	[2 – 4]	N	2	DASCF09	on page 10-31
Dual SP / Dual SCSI	[2 – 4]	N	4	DASCF10	on page 10-32
Dual SP / Dual SCSI	[2 – 4]	Y	2	DASCF11	on page 10-32
Dual SP / Dual SCSI	[2 – 4]	Y	4	DASCF12	on page 10-33

DAS FC-AL

Not on EPC800.

For details, see page 10-36.

Configuration Type	Number of Attached Nodes	Number of Adapters Per Node	FC-AL Hub	Number of DAS	Figure	Cross Reference Page
Single SP / Single Loop	1	1	0	1	SLOOP01	on page 10-45
Single SP / Single Loop	2	1	0	1	SLOOP02	on page 10-46
Single SP / Single Loop	N > 1	1	1	D > 1	SLOOP03	on page 10-46
Dual SP / Dual Loop	1	2	0	1	DLOOP01	on page 10-48
Dual SP / Dual Loop	2	2	0	1	DLOOP02	on page 10-49
Dual SP / Dual Loop	N	2	2	D	DLOOP03	on page 10-50
Dual SP / Dual Loop	2	1	0	1	DLOOP04	on page 10-48
Single or Dual SP Loop	1	1 or 2	0	1	XLOOP01	on page 10-51
Dual SP / Dual Loop	2	2	2	2	XLOOP02	on page 10-51
Dual SP / Dual Loop	2	2	4	2	XLOOP02	on page 10-52

Note: XLOOP0x are configurations for Disaster Recovery.

Chapter 6. Console Cabling Requirements

Describes cabling requirements for control consoles.

Console Cabling Requirements – Overview

More details in:

System Console and Graphics Display

Details in:

List of MIs

IDENTIFICATOR	DESCRIPTION	
GRAPHICS ADAPTERS		
GTFG039–0100	PCI MATROX 4MB Video RAM Adapter	EPC400
GTFG045–0100	4MB Extension Memory	EPC400
GTFG046–0000	SVGA 2D Graphics PCI Adapter	EPC1200
GRAPHICS DISPLAYS		
DMUG012–0000	15” Color Display w/ cables (Wyse)	
DMUG013–0000	17” Color Display w/ cables (Wyse)	
DMUG010–0P00	17” Multiscan Color Display (Sony)	
DMUG016–0P00	19” Multiscan Color Display (Sony)	
KEYBOARD/MOUSE		
PDUG008–0000	3–Button Mouse (logitec)	
KBUG003–000F	Keyboard Option France 102 Keys (Cherry)	
KBUG003–000E	Keyboard Option US 101 Keys (Cherry)	
KBUG003–000H	Keyboard Option UK 102 Keys (Cherry)	
KBUG003–000T	Keyboard Option Italy 102 Keys (Cherry)	
KBUG003–000G	Keyboard Option Germany 102 Keys (Cherry)	
KBUG003–000S	Keyboard Option Spain 102 Keys (Cherry)	
KBUG003–000K	Keyboard Option Danish 102 Keys (Cherry)	
KBUG003–000B	Keyboard Option Finnish/Swedish 102 Keys (Cherry)	
KBUG003–000N	Keyboard Option Norwegian 102 Keys (Cherry)	
KBUG003–000P	Keyboard Option Portuguese 102 Keys (Cherry)	
KBUG003–000U	Keyboard Option Belgian 102 Keys (Cherry)	
CKTG094–0000	Kit Extender Cables for Graphics	
SYSTEM CONSOLES		
CSKU101–1000	SYSTEM CONSOLE (FRANCE),AZERTY	
CSKU101–2000	SYSTEM CONSOLE (EUROPE),QWERTY	
CSKU101–P000	SYSTEM CONSOLE (UK),QWERTY	
CSKU101–U000	SYSTEM CONSOLE (US),QWERTY	
CSKU101–000G	SYSTEM CONSOLE (GERMANY),QWERTY	

Hardware Components

System Console (France)

CSKU101–1000 (AZERTY)

Identificator	Description	Length	Quantity
DTUK016–01F0	BQ306 Screen and logic – Europe Power cord		1
KBU3033	BQ306 AZERTY French Keyboard		1
CBLG104–2000	Cable, local RS232 (25F/25M)	15m	1
CBLG106–2000	Cable, remote RS232 (25M/25F)	15m	1
MB323	Interposer (25M/25M) – BE		1

System Console (Europe)

CSKU101–2000 (QWERTY)

Identificator	Description	Length	Quantity
DTUK016–01F0	BQ306 Screen and logic – Europe Power cord		1
KBU3031	BQ306 QWERTY US Keyboard		1
CBLG104–2000	Cable, local RS232 (25F/25M)	15m	1
CBLG106–2000	Cable, remote RS232 (25M/25F)	15m	1
MB323	Interposer (25M/25M) – BE		1

System Console (UK)

CSKU101–P000 (QWERTY)

Identificator	Description	Length	Quantity
DTUK016–01E0	BQ306 Screen and logic – UK Power cord		1
KBU3032	BQ306 QWERTY UK Keyboard		1
CBLG104–2000	Cable, local RS232 (25F/25M)	15m	1
CBLG106–2000	Cable, remote RS232 (25M/25F)	15m	1
MB323	Interposer (25M/25M) – BE		1
GPOWSFBUK1	UK power cord – [90399222–001]		1

System Console (US)

CSKU101–U000 (QWERTY)

Identificator	Description	Length	Quantity
DTUK016–01F0	BQ306 Screen and logic – Europe Power cord		1
KBU3031	BQ306 QWERTY US Keyboard		1
CBLG104–2000	Cable, local RS232 (25F/25M)	15m	1
CBLG106–2000	Cable, remote RS232 (25M/25F)	15m	1
MB323	Interposer (25M/25M) – BE		1
GPOWSFBUS1	US power cord – [90399322–001]		1

System Console (Germany)

CSKU101–000G (QWERTY)

Identificator	Description	Length	Quantity
DTUK016–01F0	BQ306 Screen and logic – Europe Power cord		1
KBU3034	BQ306 QWERTY German Keyboard		1
CBLG104–2000	Cable, local RS232 (25F/25M)	15m	1
CBLG106–2000	Cable, remote RS232 (25M/25F)	15m	1
MB323	Interposer (25M/25M) – BE		1

Examples of Use

System Console

The System Console (ASCII terminal) is offered in the following cluster configurations:

- Uni-node Escala EPC: the system console is attached through serial port S1 of the node.
- Two–node Escala EPC: the System Console can be used alone. In this case the System Console is connected to a node's S1 port, as shown on Figure 10. There can be two System Consoles, one per node, each one connected to a node's S1 port.
- Escala EPC configuration with Console Concentrator: the System Console can be used with a Cluster Console or a PowerConsole. In that case, the System Console is connected to a serial port on the Console Concentrator, as shown on Figure 11.

Note: A 9M/25M RS232 cable (CBL1912) shipped with any Escala CPU drawer (EPC800 node, EPC400 node, EPC1200/EPC1200A node), is connected to the node's S1 serial port (9F).

Graphics Display

The Graphics Display is offered in the following cluster configurations:

- In a uni-node Escala EPC, the Graphics Display can be ordered in lieu of a System Console (an ASCII terminal)
- For a two–node Escala EPC, there can be a System Console attached to a first node and a Graphics Display attached to the second node, or conversely.
- The latter applies to any two-node Escala EPC used in disaster recovery architecture.
- EPC800 node: there is no Graphics display.
- MATROX board can run on EPC400 configuration with a PCI expansion drawer.
- **The Fibre DAS management requires a graphical terminal.**

Note: An Ethernet cross–over cable (CBLG161–1900) is provided with the Graphics Display. It can interconnect the two nodes by using the integrated Ethernet boards. This Ethernet link allows to access the second node from the graphical terminal of the first one.

General Cabling Diagrams

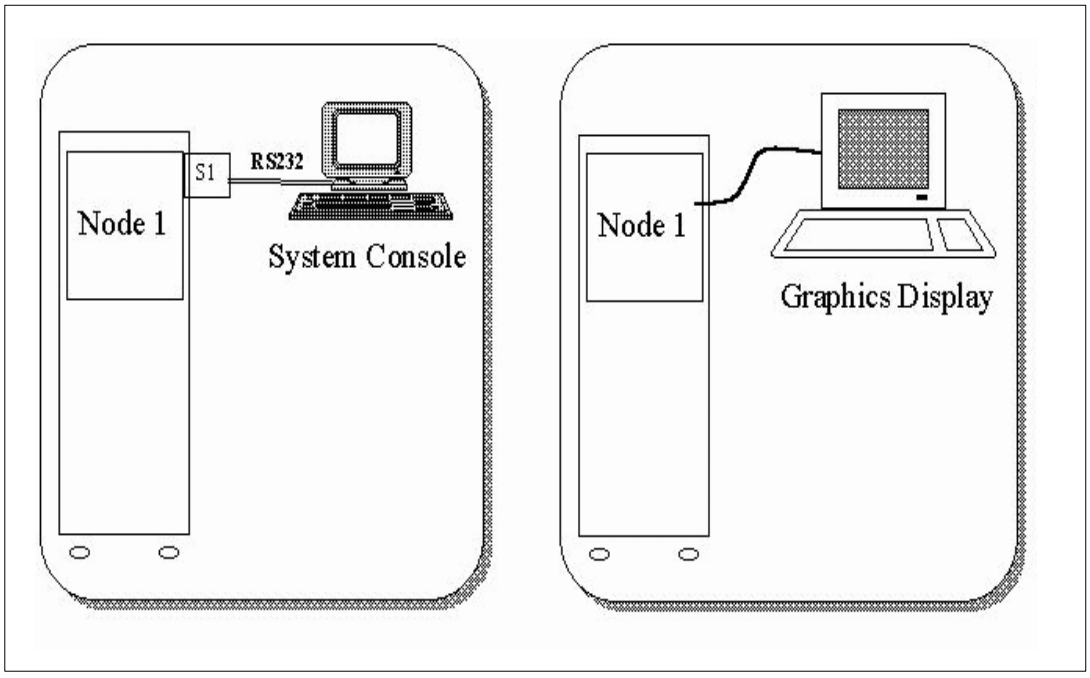


Figure 5. PWCCF07: Uni-node Escala EPC

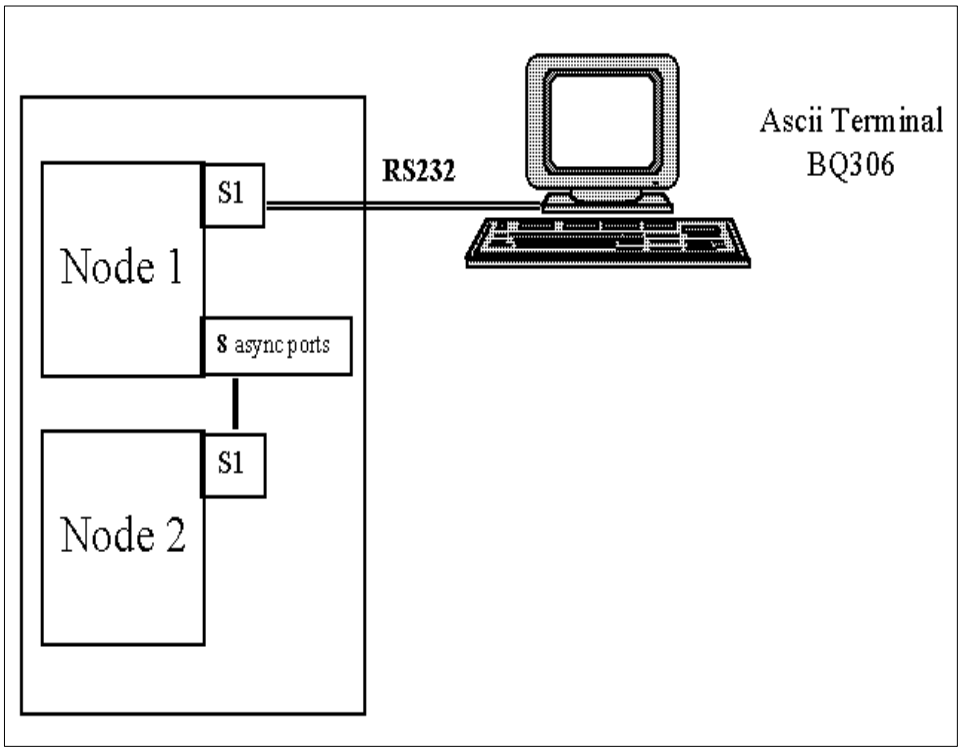


Figure 6. PWCCF01: 2–node Escala EPC – (one System Console).

Note: The 8 async ports board is not mandatory. In this case, use S2 or S3 port to link the two nodes.

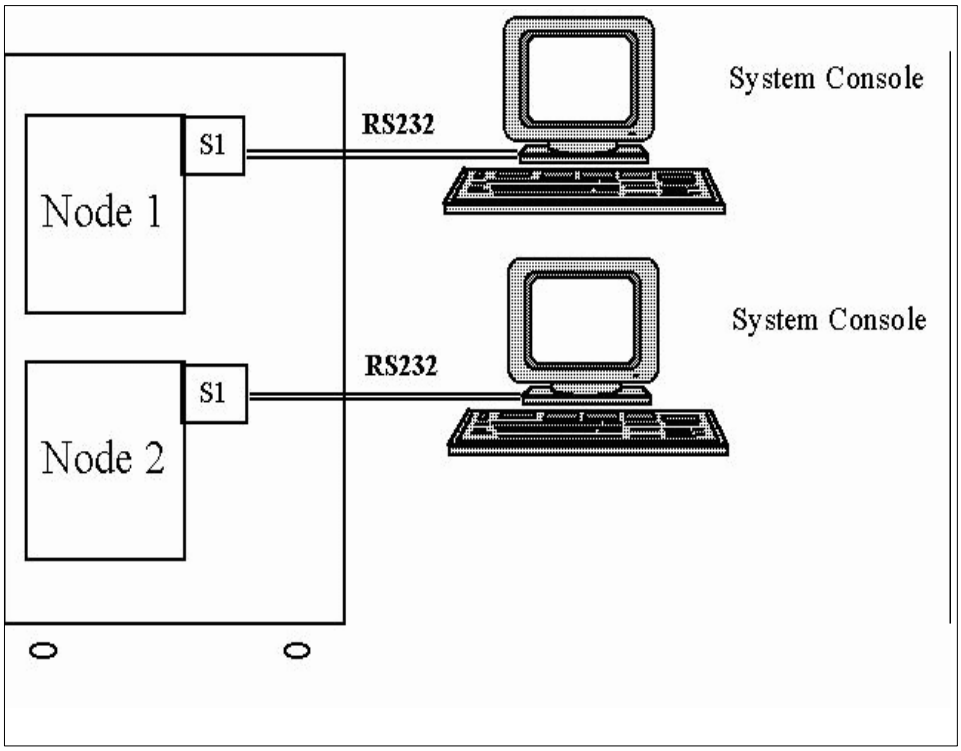


Figure 7. PWCCF08: 2–node Escala EPC – (two System Consoles).

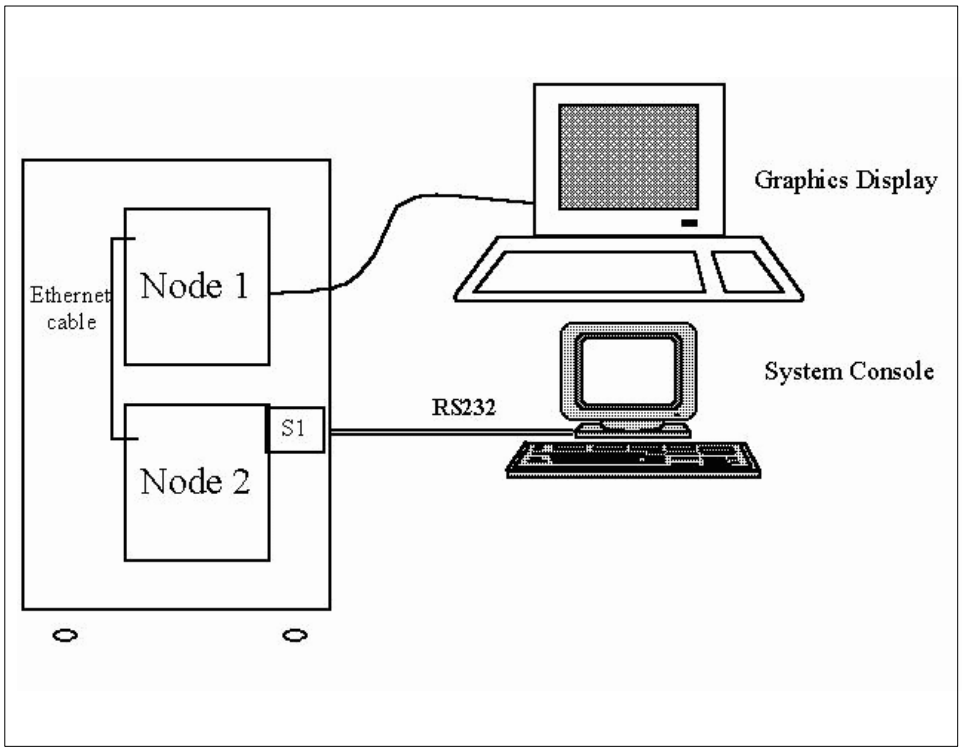


Figure 8. PWCCF08: 2–node EPC – (1 System Console, 1 Graphic Display).

Note: The Ethernet cable is not mandatory. The LAN network can be used to reach Node 2 from Graphics Displays

Cabling Legend

Item	M.I.	Designation	Length	FRU
[1]	CBL1912	Cable, Adapter RS232 (9M/25M)	0.3m	76958073-002
[2]	CBLG104-2000	Cable, local RS232 (25F/25M)	15m	90232001-001
[3]	CBLG105-1800	Cable, local RS232 (25F/25F)	7.5m	90233002-001
[4]	CBLG197-2000	Cable, remote RS232 (25M/25F)	15m	91287001-001
[6]	CBLG161-1900	Cable, Ethernet crossed cable RJ45/RJ45	10m	91093001–001
[7]	CBLG179-1900	Cable, Ethernet RJ45/RJ45 cat 5	10m	91094001–001
[8]	VCW3630	Cable, Ethernet to Transceiver	5m	76958087-001

Cabling Diagrams

Typical cabling arrangements are shown in the Figures below.

Cabling of the Graphics Display to a node

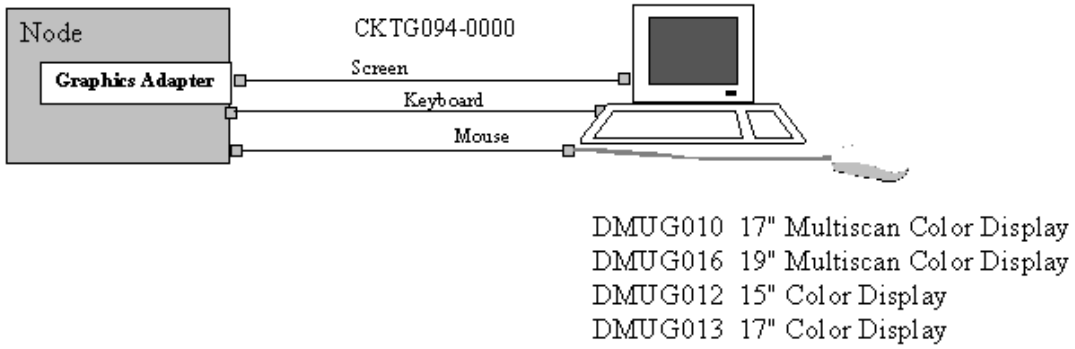


Figure 9. Cabling of the Graphics Display to a Node.

Cabling of the System Console to a node's S1 plug

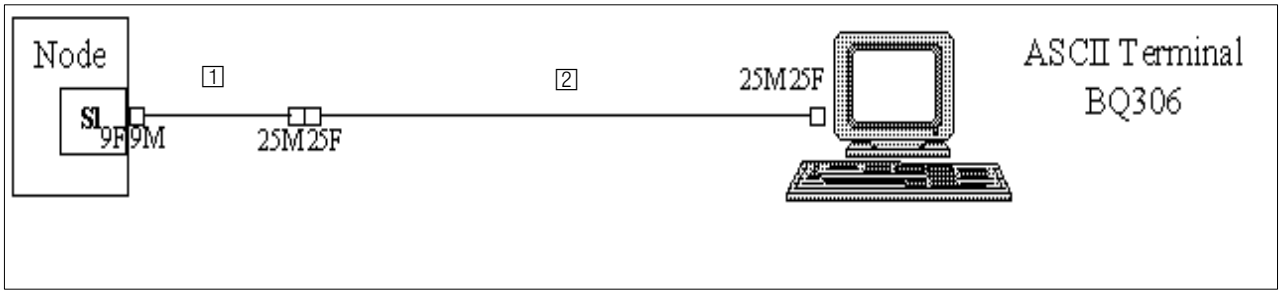


Figure 10. Cabling of the System Console to a Node's S1 Plug

Cabling of the System Console to the Console Concentrator

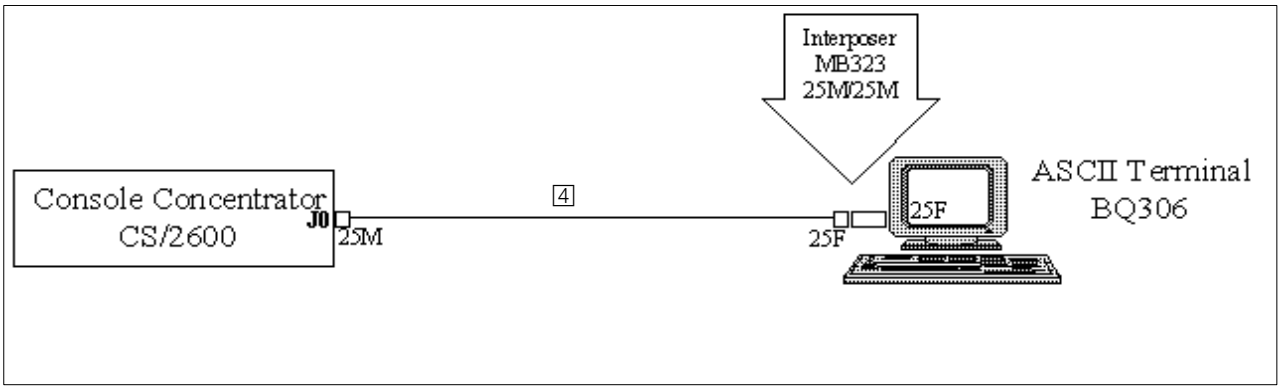


Figure 11. Cabling of the System Console to the Console Concentrator

The graphics display is connected to the node of the ordered ESCALA EPC model (EPC400/430/440 or EPC1200 / EPC1200A, EPC2400). There is no graphics for an ESCALA EPC800 model.

Cabling of the System Console with a serial link (2-node EPC)

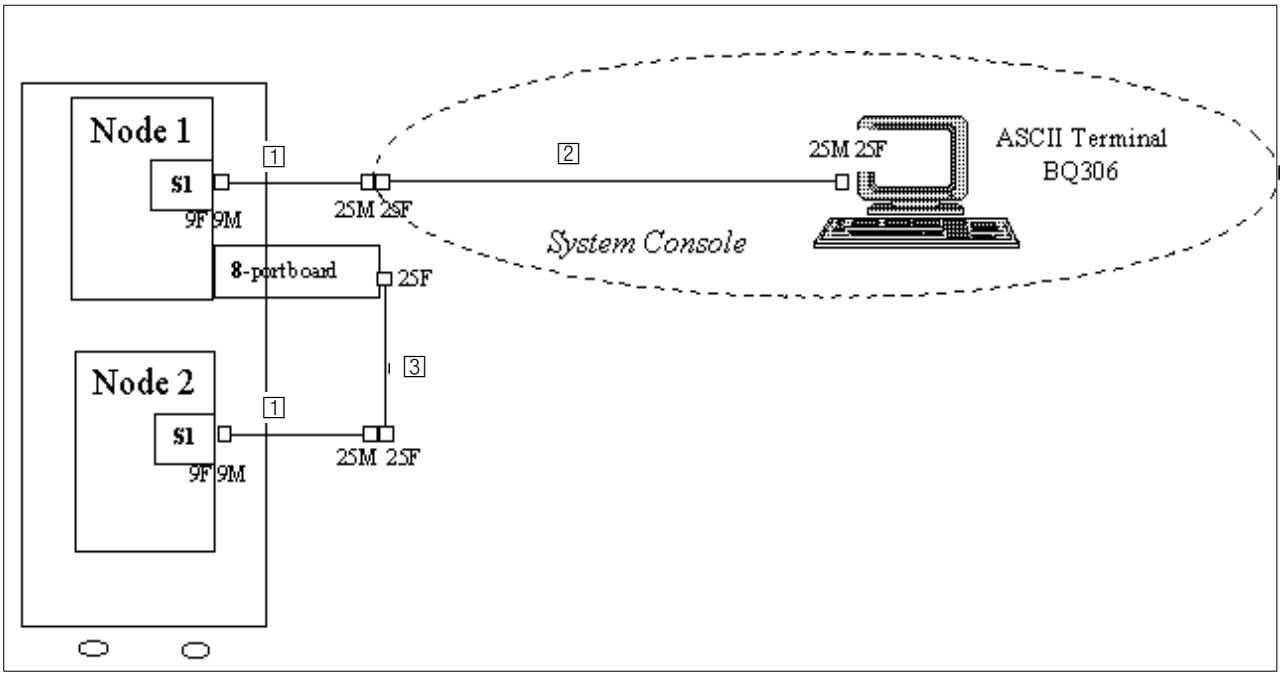


Figure 12. PWCCF01: Cabling Schema for a 2–node Powercluster

Notes:

1. Cable 3 (CBLG105–1800) will be generated automatically and systematically in the order.
2. Cable adapter 1 (CBL 1912) is provided for each native serial port of any CPU drawer.
3. On EPC400, instead of using a 8-port board, you can use the S3 port on node #1 and a serial adapter cable (CBL1912). This may conflict with use of S3 for DAS management.

Configuration Procedure for a 2-Node EPC with 1 System Console

The procedure is performed from the ASCII terminal connected to S1 plug of node#1 and allows to switch from node #1 system console to node #2 system console, when a multi–port async board is present and the two nodes are linked with a serial cable as depicted in the previous figure.

Configuration

1. Log in as root user.
2. Create the ttyx device using smit tty menus relative to the link established between the 8–port board and the S1 plug of node #2.
3. Setup this device with the following characteristics:

```
baud rate = 9600
bits      = 8
bit stop  = 1
parity    = non
DTR       = ignored
Duplex    = Full
Echo      = OFF
```

4. Update the file */etc/uucp/Devices* by adding the following line after the commented lines as below:

```
Direct ttyx –9600 direct
```

where ttyx is the device created with smit in the above step.

Connection

There are two possibilities to connect as a system console to node #2:

```
cu –l ttyx
pwcons –c ttyx
```

The `pwcons` utility comes with the Bull Cluster software package. This is a shell script build above the `cu` command which is installed in the /usr/sbin directory.

For more details, refer to the *EPC & HA Solutions – Setup Guide.*

At this point the AIX login banner of node #2 is displayed on the screen and it is possible to log in as usual.

Disconnection

Logout from node #2.

Close the connection by keying (Tilde and period):

```
~.
```

Cluster Administration Hub

Details in:

Hardware Components

Cluster Administration Hub (UK)

DCKU116–P000

Identificator	Description	Length	Quantity
3C16670A–UK	BASE UNIT for SUPERSTACK II HUB 10 (12–Port RJ45, 1 AUI)		1
3C16630A	SUPERSTACK II HUB 10 Management Module		1
CBLG179–1900	Cable, RJ45	10m	10
GCORSECA01	Power Cord, Internal to PDB - 90228002-001		1

Cluster Administration Hub (Europe)

DCKU116–2000

Identificator	Description	Length	Quantity
3C16670A–ME	BASE UNIT for SUPERSTACK II HUB 10 12–Port RJ45		1
3C16630A	SUPERSTACK II HUB 10 Management Module		1
CBLG179–1900	Cable, RJ45	10m	10
GCORSECA01	Power Cord, Internal to PDB - 90228002-001		1

Cluster Administration Hub (US)

DCKU116–U000

Identificator	Description	Length	Quantity
3C16670A–ME	BASE UNIT for SUPERSTACK II HUB 10 12–Port RJ45		1
3C16630A	SUPERSTACK II HUB 10 Management Module		1
CBLG179–1900	Cable, RJ45	10m	10
GPOWSFBUS1	Power Cord, US - 90399322-001		1
GCORSECA01	Power Cord, Internal to PDB - 90228002-001		1

Examples of Use

The Cluster Administration Hub is used to set up a dedicated administration network (10Base-T Ethernet network). The Cluster Administration Hub is used for Escala EPC configurations with a Cluster Console, or a Cluster PowerConsole. The administration network utilizes the LSA adapter of an EPC800 node, an ethernet board on an EPC1200/EPC1200A node, the integrated ethernet card on an EPC400 node or on the Powerconsole.

A Cluster Administration Hub has 12 ports. For large configuration, it may be necessary to make more ports available. In that case, two hubs need to be connected in order to make a bigger hub. Use a cross-over Ethernet cable (CBLG161-1900) to interconnect the two hubs.

CAUTION:
The Cluster Hub is mandatory for using the distributed version of Navisphere, the DAS management application.

Management Module

Installation

The use of a Superstack II Hub 10 for the administration network does not require the configuration of a Superstack II Hub 10 management module because as there is no hub chaining, the administration network is private and its load is low.

Refer to the Superstack II Hub 10 Management User Guide and follow the instructions in the user guide precisely otherwise hub damage may occur.

Configuration

For the configuration, you must use a BQ306 ASCII console and a CBLG105-1800 RS232 cable [3]. Refer to the Superstack II Hub 10 Management User Guide.

Cabling Legend

Item	M.I.	Designation	Length	FRU
[6]	CBLG161-1900	Cable, Ethernet crossed cable RJ45/RJ45	10m	

Cabling Diagrams

Connect:

every node of the Escala EPC,

the Cluster console (X terminal Explora console) or the Powerconsole (Escala S100 workstation or Estrella workstation)

the console concentrator (CS/2600), if used,

to the Superstack II Hub10 by means of Ethernet cables (RJ45/RJ45) and TPC 10 boxes (if needed).

Use an Ethernet board on each node (LSA board on a EPC800 CPU drawer, integrated card on EPC400 CPU drawer) and the integrated Ethernet plug of the Powerconsole.

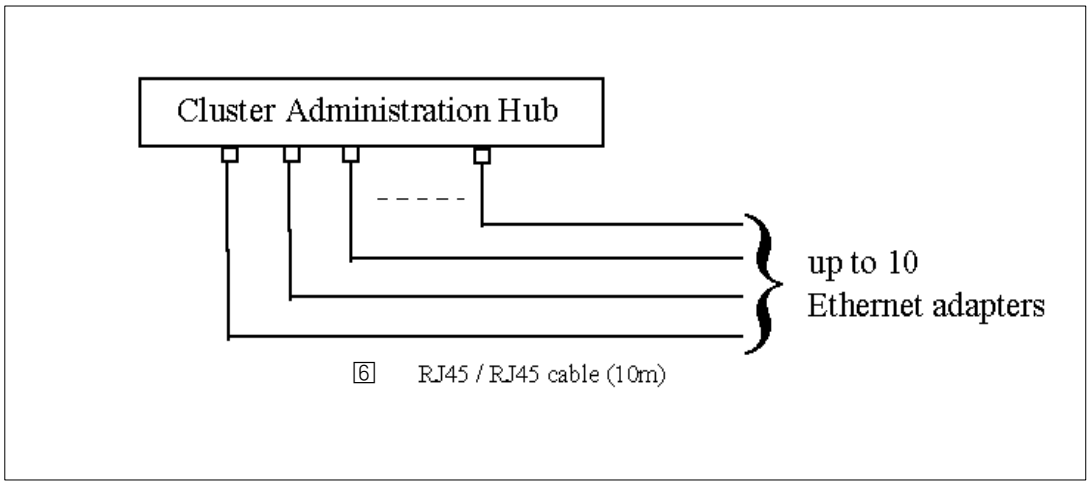


Figure 13. Cluster Administration Hub Ethernet Connections

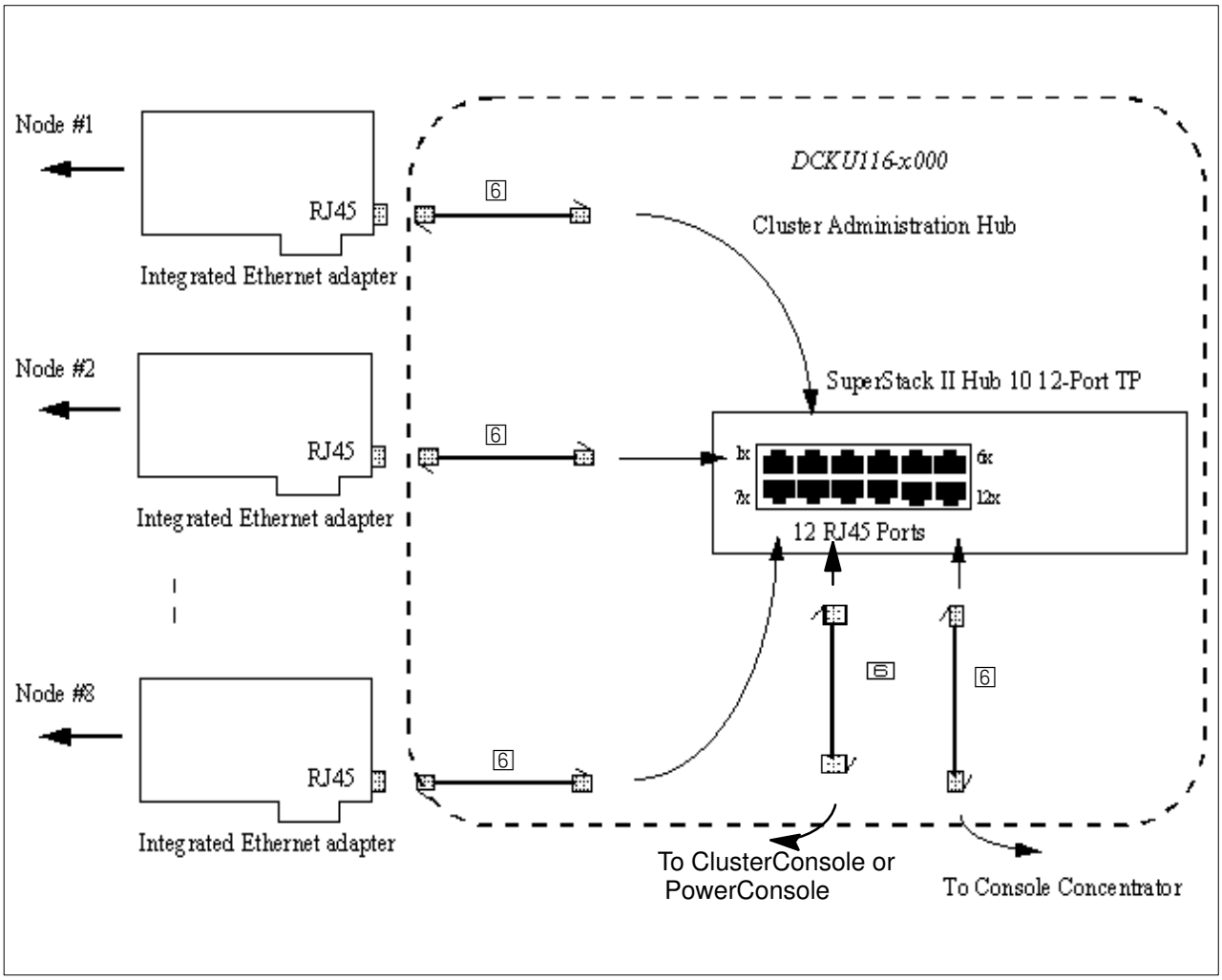


Figure 14. Cluster Administration Hub Connections to Nodes and Console

Console Concentrator

Details in:

Hardware Components

Console Concentrator

DCKU115–2000

Identificator	Description	Length	Quantity
3C5411–ME	Base Unit – CS/2600 (10 ports, disk–based)		1
3C5440E	Protocol Packs TCP/OSI/TN3270 Version 6.2.1		1
3C759ME	Rack Mount Kit for the CS/2x00		1
CBLG106–2000	Cable, Remote RS232 (25F/25M)	15m	10
MB323	INTERPOSER (25M/25M) – BE		2
3C1681–0	ISOLAN TPC10 transceiver for HUB connection		1
CBLG179-1900	Cable, RJ45/RJ45 cat 5 - GCBLRJ4501	10m	1
GCORSECA01	Power Cord, internal, to PDB - 90228002-001		1
GPOWSFBUK1	Power Cord, UK - 90399222-001		1
CBL1912	Cable, Adapter RS232 (9M/25M)		2

Console Concentrator

DCKU119–2000

Identificator	Description	Length	Quantity
3C5411–ME	Base Unit – CS/2600 (10 ports, disk–based)		1
3C5440E	Protocol Packs TCP/OSI/TN3270 Version 6.2.1		1
3C759ME	Rack Mount Kit for the CS/2x00		1
MB323	INTERPOSER (25M/25M) – BE		2
3C1681–0	ISOLAN TPC10 transceiver for HUB connection		1
GCORSECA01	Power Cord, internal, to PDB - 90228002-001		1
GCBLRJ4501	Cable, RJ45/RJ45 cat 5	10m	1

Usage cases DCKU115–2000

The Console Concentrator is used with:

- a Powerconsole whatever is the number of nodes in the Escala EPC configuration. See Figure .
- a Cluster Console if the number of nodes is more than two nodes. See Figure 17.

If there is a cluster Hub (case of dedicated administration network), the Console Concentrator is connected to it. Otherwise, the Console Concentrator is connected to the Customer's Ethernet Network. In that case, if the customer's network is COAXIAL THICK or COAXIAL THIN then the Customer is in charge of connecting the Console Concentrator to his network with his own cable (As usual for all the Escala platforms).

The nodes (S1 port) are connected via serial cables to the Console Concentrator. For an EPC400 node or an EPC800 node you must use a CBLG106 cable and a CBL1912 adapter. In the case of an EPC1200/EPC1200A node, in order to stop the RI signal to which the node is sensitive, you must use a CBL2101 cable in addition to the CBLG106 cable and the CBL1912 adapter.

A CBL2101 cable is generated automatically for each EPC1200 and EPC1200A node of a configuration containing a console concentrator.

One Console Concentrator is needed for configurations up to 8 nodes. Once the nodes (S1 port) are connected to the Console Concentrator, the console ports of the two FDDI LinkBuilder hubs can be connected onto the Console Concentrator, if there are two serial ports left on the Console Concentrator. To do this, the two small RS232 adapter cables provided are used to plug the serial link on the FDDI equipment. This also applies to the Fast Ethernet Switch and the Gigabit Ethernet Switch (only one serial port on the console concentrator is required to connect a switch).

Several Console Concentrators are necessary for large configurations.

Cascading Console Concentrators through a serial line is not operational. Therefore, the Console Concentrators must be connected to the Cluster Hub or the customer's LAN.

Cabling Diagrams DCKU115–2000

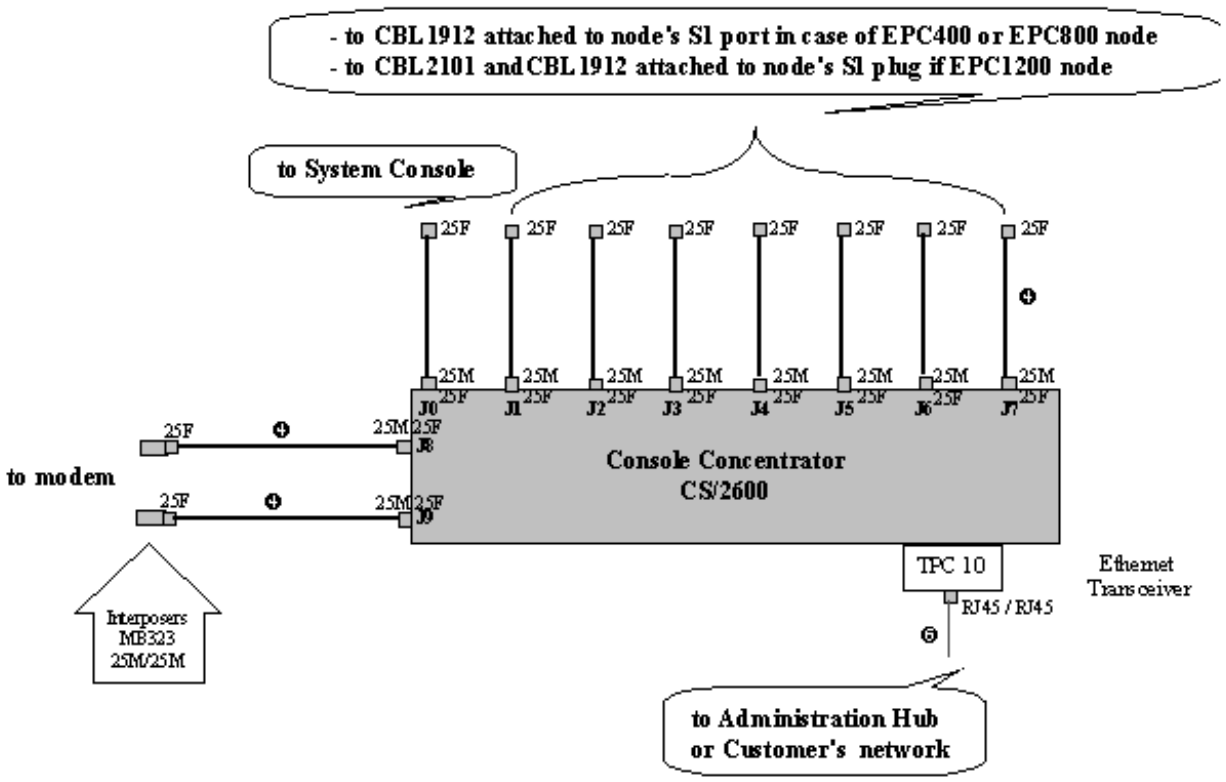


Figure 15. Console Concentrator Cabling DCKU115–2000

Cabling Legend

Item	M.I.	Designation	Length	FRU
1	CBL1912	Cable, Adapter RS232 (9M/25M)	0.3m	76958073-002
2	CBLG104-2000	Cable, local RS232 (25F/25M)	15m	90232001-001
3	CBLG105-1800	Cable, local RS232 (25F/25F)	7.5m	90233002-001
4	CBLG106-2000	Cable, remote RS232 (25M/25F)	15m	90234001-001
	CBL2101	V24/V28 conn. cable (25M/25F)	3.6m	90479001-001
5	CBLG161-1900	Cable, Ethernet crossed RJ45/RJ45	10m	91093001-001
6	CBLG179-1900	Cable, Ethernet RJ45/RJ45 cat 5	10m	91094001-001
8	VCW3630	Cable, Ethernet to transceiver	5m	76958087-001

Cabling Instructions

No special instructions.

Usage cases DCKU119–2000

The Console Concentrator is used with:

- a Powerconsole whatever is the number of nodes in the Escala EPC configuration. See Figure .
- a Cluster Console if the number of nodes is more than two nodes. See Figure 17.

If there is a cluster Hub (case of dedicated administration network), the Console Concentrator is connected to it. Otherwise, the Console Concentrator is connected to the Customer's Ethernet Network. In that case, if the customer's network is COAXIAL THICK or COAXIAL THIN then the Customer is in charge of connecting the Console Concentrator to his network with his own cable (As usual for all the Escala platforms).

The nodes (S1 port) are connected via serial cables to the Console Concentrator. A cable CBLG197-2000 (Cable Remote RS232 (25M-25F) is provided depending on the number of nodes ordered.

For EPC400/430 a CBL1912 is connected to the CBLG197-2000.

For EPC440/1200/1200A/2400 the cable P/N40H6328 delivered with the node is connected to the CBLG197-2000.

The cable CBLG197-2000 is connected to the Console Concentrator.

One Console Concentrator is needed for configurations up to 8 nodes. Once the nodes (S1 port) are connected to the Console Concentrator, the console ports of the two FDDI LinkBuilder hubs can be connected onto the Console Concentrator, if there are two serial ports left on the Console Concentrator. To do this, the two small RS232 adapter cables provided are used to plug the serial link on the FDDI equipment. This also applies to the Fast Ethernet Switch and the Gigabit Ethernet Switch (only one serial port on the console concentrator is required to connect a switch).

Several Console Concentrators are necessary for large configurations.

Cascading Console Concentrators through a serial line is not operational. Therefore, the Console Concentrators must be connected to the Cluster Hub or the customer's LAN.

Cabling Diagrams DCKU119–2000

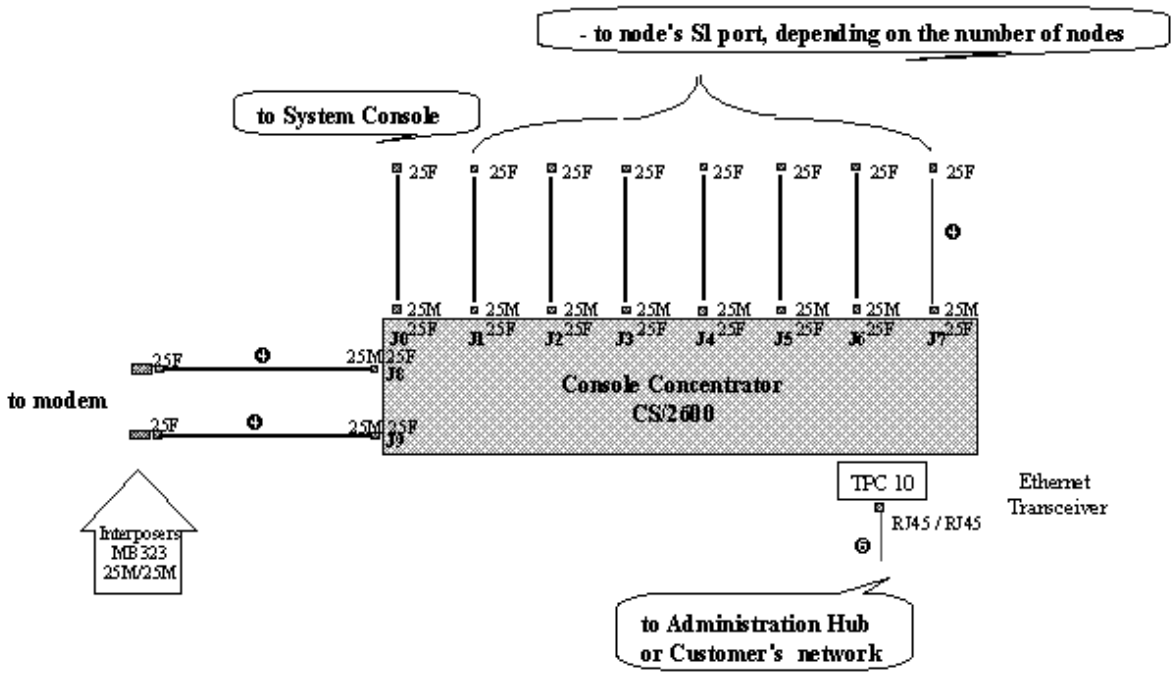


Figure 16. Console Concentrator Cabling DCKU119–2000

Cabling Legend

Item	M.I.	Designation	Length	FRU
1	CBL1912	Cable, Adapter RS232 (9M/25M)	0.3m	76958073-002
2	CBLG104-2000	Cable, local RS232 (25F/25M)	15m	90232001-001
3	CBLG105-1800	Cable, local RS232 (25F/25F)	7.5m	90233002-001
4	CBLG197-2000	Cable, remote RS232 (25M/25F)	15m	90234001-001
5	CBLG161-1900	Cable, Ethernet crossed RJ45/RJ45	10m	91093001-001
6	CBLG179-1900	Cable, Ethernet RJ45/RJ45 cat 5	10m	91094001-001
8	VCW3630	Cable, Ethernet to transceiver	5m	76958087-001

Console Concentrator Configuration

The configuration of the console concentrator is undertaken by Customer Services. This configuration procedure is provided as a reference only.

Initial Conditions

The configuration of the console concentrator (CS/2600) is done through the ASCII console (BQ306). The ASCII console must be connected to the J0 port of the CS/2600 server, to setup the console baud rate to 9600.

CS/2600 configuration can also be done through the Cluster PowerConsole (workstation), provided that it is connected to the J0 port instead of the ASCII console.

Provide a floppy diskette to copy the original 3Com diskette to it. This 3”1/2 floppy diskette must be double-faced and double density. Clearly identify this diskette.

Then, define a Console Telnet addressing scheme in conjunction with a dedicated–administration network addressing diagram and write it down on the label on the diskette.

Addressing Schema Example

For a configuration of n nodes, where the nodes (S1) are connected to the console concentrator using the ports J1 to Jn,

assign the telnet IP address

1.0.0.11 to the port J1

1.0.0.12 to the port J2

.....

1.0.0.1n to the port Jn

Regarding the elements of the dedicated–administration network, give the IP address,

1.0.0.1 to the node #1 (integrated ethernet adapter)

1.0.0.2 to the node #2

.....

1.0.0.n to the node #n

1.0.0.10 to the Console Concentrator itself

1.0.0.20 to the Powerconsole (or Cluster Console)

Example 1 of Label Format

Admin Network	Example of Value	Example of Label	Your Own Value	Your Own Label
Network Mask	255.0.0.0	N/A		
Powerconsole IP@	1.0.0.20	PWC		
Console Concentrator IP@	1.0.0.10	CS/2600		
IP@ of Node #1 CS/2600 Port #1 (J1)	1.0.0.1 1.0.0.11	Node1_admin Node1_cons		
IP@ of Node #2 CS/2600 Port #2 (J2)	1.0.0.2 1.0.0.12	Node1_admin Node1_cons		
IP@ of Node #3 CS/2600 Port #3 (J3)	1.0.0.3 1.0.0.13	Node1_admin Node1_cons		
IP@ of Node #4 CS/2600 Port #4 (J4)	1.0.0.4 1.0.0.14	Node1_admin Node1_cons		
IP@ of Node #5 CS/2600 Port #5 (J5)	1.0.0.5 1.0.0.15	Node1_admin Node1_cons		
IP@ of Node #6 CS/2600 Port #6 (J6)	1.0.0.6 1.0.0.16	Node1_admin Node1_cons		
IP@ of Node #7 CS/2600 Port #7 (J7)	1.0.0.7 1.0.0.17	Node1_admin Node1_cons		
IP@ of Node #8 CS/2600 Port #8 (J8)	1.0.0.8 1.0.0.18	Node1_admin Node1_cons		

Example 2 of Label Format

Here is a simpler example of label format.

Port #	Telnet IP address
J1	1.0.0.11
J2	1.0.0.12
J3	1.0.0.13
J4	1.0.0.14
J5	1.0.0.15
J6	1.0.0.16
J7	1.0.0.17
J8	1.0.0.18

Console Concentrator Configuration Procedure

Before you start, note that:

- The Console Concentrator (CS/2600) is configured through the ASCII console (BQ306). The ASCII console has to be connected to the J0 port of the CS/2600 server, to set the console baud rate to 9600. However, the Console Concentrator (CS/2600) can also be configured through the PowerConsole provided that it is connected to the J0 port instead of the ASCII console.
- You need a floppy diskette (double face and double intensity 3”1/2) to copy the original 3Com diskette.

The configuration of CS/2600 described here is done using the ASCII console. When using the PowerConsole instead of the ASCII console, the configuration is made using an AIX window (dtterm or aixterm, or xterm).

1. Serial Link Console – CS2600 Configuration:

   a. Only if Powerconsole is used

   – Boot the PowerConsole workstation in normal mode.
   – Create the ttyx device using smit tty menus (log in as root user), relative to the link established between the PowerConsole (the RS232 adapter name and the port used in the PowerConsole side), and the CS2600 server port J0.

   b. Setup this device with the following characteristics:

```
baud rate = 9600
bits      = 8
bit stop  = 1
parity    = non
```

According to the terminal type, the following need also to be set (Not the case for a BQ306)

```
DTR       = ignored
Duplex    = Full
Echo      = OFF
```

Only if a Powerconsole is used:

Update the file /etc/uucp/Devices by adding the following line after the commented lines as below:

```
Direct ttyx -9600 direct
```

where `ttyx` is the device created with smit in the above step.

To make a serial RS232 connection between the PowerConsole and the J0 port of the CS2600 server, key in the command:

```
cu -l ttyx
```

where ttyx is the device created with smit in the above step.

2. CS/2600 booting:

   a. Insert the floppy diskette referenced as:
   83–0377–004 (CS/2600 SW/2500–TO–3270–LOCAL)

   in the floppy driver of the CS/2600 terminal server.

   b. Power–on the CS/2600 terminal server

   c. Wait until the end of auto–self testing phase (yellow led called as self test turns off)

   d. Wait a few more seconds until the floppy led is switch off

3. Only if Powerconsole is used

   Establish the connection between the workstation and CS/2600 on the serial port J0

   – using the `cu` command on the PowerConsole side (see step 1).

4. Switch the CS/2600 to monitor mode:

   – make a hardware reset (button on the left side of the CS/2600) as described in the CS/2600 Installation Guide.

5. Wait few seconds, then press <Enter> two–three times during regular interval of 1 second, the following prompt must be displayed:

```
3Com Corporation CS/2600 Series Monitor
        >
```

6. Make a copy of the original floppy diskette to a new diskette

   – as described in the CS/2600 Installation Guide. (for this, use the command "`co`")

7. Take away the original diskette and use the new one.

8. Key in the command (after >):

```
> fc <Enter>
```

   The following menu will be displayed:

```
Firmware Configuration Utility Commands:
C       - Change parameters
D       - Display parameters
Esc     - Exit to monitor
```

9. Choose the menu Change parameters, by keying:

```
C <Enter>
```

10. Modify the following parameters as:

```
5.      Monitor              Disabled
6.      Initial Boot source  Local Floppy
A.      Boot protocol        TFTP Boot
B.      IP/TFTP parameters
```

    Refer to the CS/2600 Installation Guide to see how to modify these values.

11. IP/TFTP parameters Configuration
    Select the menu B that appears once TFTP Boot protocol has been selected for menu A:

    – setup the "Adr discover protocol" with Local Information
    – setup the "Client Ip address" with the Ethernet address chosen for the CS2600 server (@IPCS/2600): for example `120.184.33.10`
    – setup the "Gateway address" with for example `120.184.33.10`, if necessary (customer's LAN)
    – setup the "Subnet mask value" with the subnet mask of the client LAN network, for example: `255.255.255.0`

12. Exit from all the menus with <`Esc`> till the prompt >

13. Reset the CS/2600 server softly.

    – (Push the reset switch in the front panel).

14. At the end of self testing phase

    (Self test and boot state leds go off),

    – Wait at least 2 minutes (the led of the floppy driver turns off),

– and key in <Enter> few times to obtain the following prompt:

```
Welcome to the 3Com Communication
[1] CS>
```

15. Add the necessary privileges for network management

– with the command (after the CS>):

```
[1] CS> set pri = nm <Enter>
```

– The CS/2600 server asks for a password, key in <Enter> as initially no password is set.
– The CS/2600 server displays the prompt:

```
[2] cs#
```

16. For any additional configurations such as:

Setting up the date and the time, the system name, the password, etc.

Refer to the CS/2600 Operation Guide.

17. Update the list of allowed services

– by keying the command (after the cs#):

```
[2] cs# set cs = all <Enter>
```

– the CS/2600 server displays the prompt:

```
[3] cs#
```

18. Declare the IP address of the CS/2600:

`cs# setd –ip net = @IPCS/2600 (for example  140.184.33.10).`
See step 11.

19. Serial Ports J1,J2 (etc.) configuration for hosts:

By default, all the ports are configured as terminal connected ports with autobaud value for baud rate parameter.

– In order to change the configuration of ports J1, J2 (etc) to be as host connected port (S1 plug of a node), strike the commands (after the cs#):

```
[3] cs# setd !1 –term dv = host <Enter>
[4] cs# setd !1 –term baud = 9600 <Enter>
```

where

`!1` is the port J1, !2 port J2, etc.

– Assign an IP address to each port connected to a host with the command (after cs#):

```
[5] cs# setd !1 –tcpappl porm = @IP1 <ENTER>
```

where

`@IP1` is the Ethernet address chosen for the Node #1 connected on the port J1,

`@IP2` is the Ethernet address chosen for the Node #2 connected on the port J2, etc.

For example 1: @IP1 = 120.184.33.11 , @IP2 = 120.184.33.12, etc.

20. Check the configuration of the IP addresses of ports J1, J2, etc.
within the commands (after cs#):

```
[8] cs# sh –tcpappl porm <ENTER>
```

21. Check the configuration of Host ports J1, J2, etc.
with the command (after cs#):

– for port J1:

```
[9] cs# sh !1 dp <ENTER>
```

– for port J2:

```
[10] cs# sh !2 dp <ENTER>
```

– etc.

22. Check the CS/2600 network connection:
    – Make for example a ping to the PowerConsole station, using the command `ping` (after cs#):

```
[10] cs# ping @IP_PWC <ENTER>
```

    – The ping command must respond with the message:
    – `pinging ... @IP_PWC is alive`

23. Check that the different ports are in ”LISTEN” state.

    Enter the commands (after the cs#):

```
[6] cs# sh -term all <ENTER>
```

    the Port 0 is in ”command” state

PowerConsole Configuration Procedure

Update the file /etc/hosts with the different addresses configured on the CS/2600 server:

```
@IP0 (CS/2600 server address), @IP1 (J1/Node1 S1 address),
@IP2 (J1/Node2 S1 address), etc.
```

For example:

```
120.184.33.10  CS-2600     # @IP0
120.184.33.11  Node1_cons  # @IP1
120.184.33.12  Node2_cons  # @IP2
```

Examples of Use

1. From the PowerConsole, open an AIX window (dtterm, xterm, aixterm) one for each node connected to the CS/2600 terminal server:
   - Establish the connection to S1 node by striking the telnet command with the associated address @IP1, @IP2, etc.:

     ```
     # telnet @IP1          for Node #1 in first window
     # telnet @IP2          for Node #2 in second window
     etc.
     ```

2. To disconnect a session from a PowerConsole window to a node connected with CS/2600 server port,
   a. strike Control and ”]”:

      ```
      <CTRL>+]
      ```

   b. The session is disconnected and one returns to the telnet program. At this point, key in ”q” or quit to exit the telnet (after telnet>):

      ```
      telnet> q  <ENTER>
      ```

3. To disconnect a monitoring CS/2600 session established on the PowerConsole within the cu command,

   key in the two characters ”tilde” and ”period”:

   ```
   ~.
   ```

CAUTION:
In the monitoring CS/2600 session on the J0 port, do not exit this session with the commands logout or listen. Otherwise, the J0 is no longer available for monitoring. In this case, a hardware reset of CS/2600 has to be made to re-enable this port (J0), and consequently the other ports are disabled.

Cluster Console

Details in:

Hardware Components

Cluster Console (Europe)

CSKU102–2100

Identificator	Description	Length	Quantity
XSTK412–04HE	X CONSOLE, 17” TP COU		1
KBU3400	Keyboard, 101K QWERTY INT’L		1
CBL1912	Cable, RS232 (9M /25M)		1
CBLG105–1800	Cable, local RS232 (25F / 25F)	7.5m	1
CBLG106–2000	Cable, Remote RS232 (25M /25F)	15m	1
XSMK004–0000	Memory, EXT. 8MO 32 Bits		1
CBLG179–1900	Cable, RJ45/RJ45 cat 5	10m	1

Cluster Console (France)

CSKU102–1100

Identificator	Description	Length	Quantity
XSTK412–04HE	X CONSOLE, 17” TP COU		1
KBU3405	Keyboard, 102K AZERTY FRANCE		1
CBL1912	Cable, RS232 (9M /25M)		1
CBLG105–1800	Cable, local RS232 (25F/25F)	7.5m	1
CBLG106–2000	Cable, Remote RS232 (25M / 25F)	15m	1
XSMK004–0000	Memory, EXT. 8MO 32 Bits		1
CBLG179–1900	Cable, RJ45/RJ45 cat 5	10m	1

Examples of Use

The Cluster Console is an NCD Explora 400 console. It needs:

- a Cluster Administration Hub for 2–node configuration.
- a Console Concentrator for larger configuration (up to 8 nodes).

There is also a Cluster Administration Hub with the option of dedicated administration network.

If there is no Cluster Administration Hub, that is to say no dedicated administration network, the Console Concentrator and the Cluster Console will be connected to the customer's LAN network (an Ethernet network) in the customer's premises.

In the case that the customer's network is COAXIAL THICK or COAXIAL THIN then the Customer is in charge of connecting the Console Concentrator and the Cluster Console to his network with his own cables (As usual for all the Escala platforms).

A second Cluster Console can also be ordered to act just as an X terminal on the customer's Ethernet LAN, and thus to provide a second point for remote management.

Cabling Diagrams

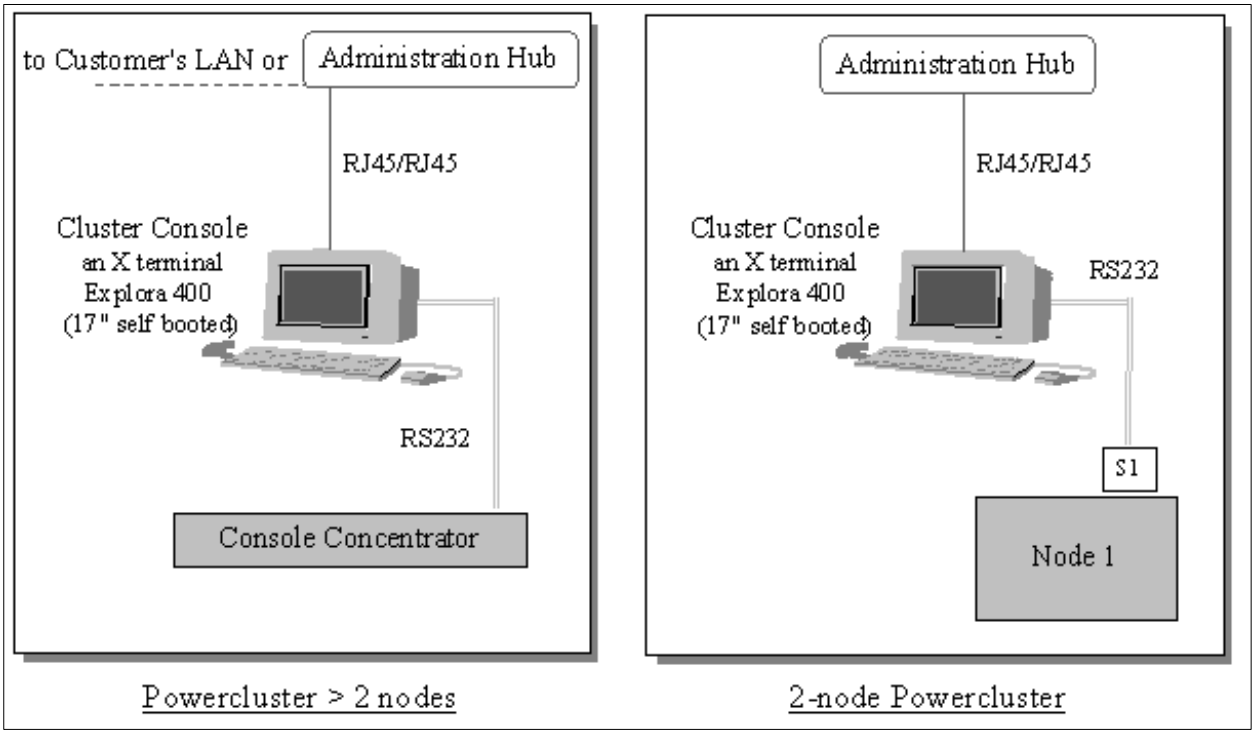


Figure 17. Cluster Console with Powercluster 2 Nodes and >2 Nodes

Cabling Legend

Item	M.I.	Designation	Length	FRU
1	CBL1912	Cable, Adapter RS232 (9M/25M)	0.3m	76958073-002
2	CBLG104-2000	Cable, local RS232 (25F/25M)	15m	90232001-001
3	CBLG105-1800	Cable, local RS232 (25F/25F)	7.5m	90233002-001
4	CBLG106-2000	Cable, remote RS232 (25M/25F)	15m	90234001-001
	CBL2101	V24/V28 conn. cable (25M/25F)	3.6m	90479001-001
5	CBLG161-1900	Cable, Ethernet crossed RJ45/RJ45	10m	91093001-001
6	CBLG179-1900	Cable, Ethernet RJ45/RJ45 cat 5	10m	91094001-001
8	VCW3630	Cable, Ethernet to transceiver	5m	76958087-001

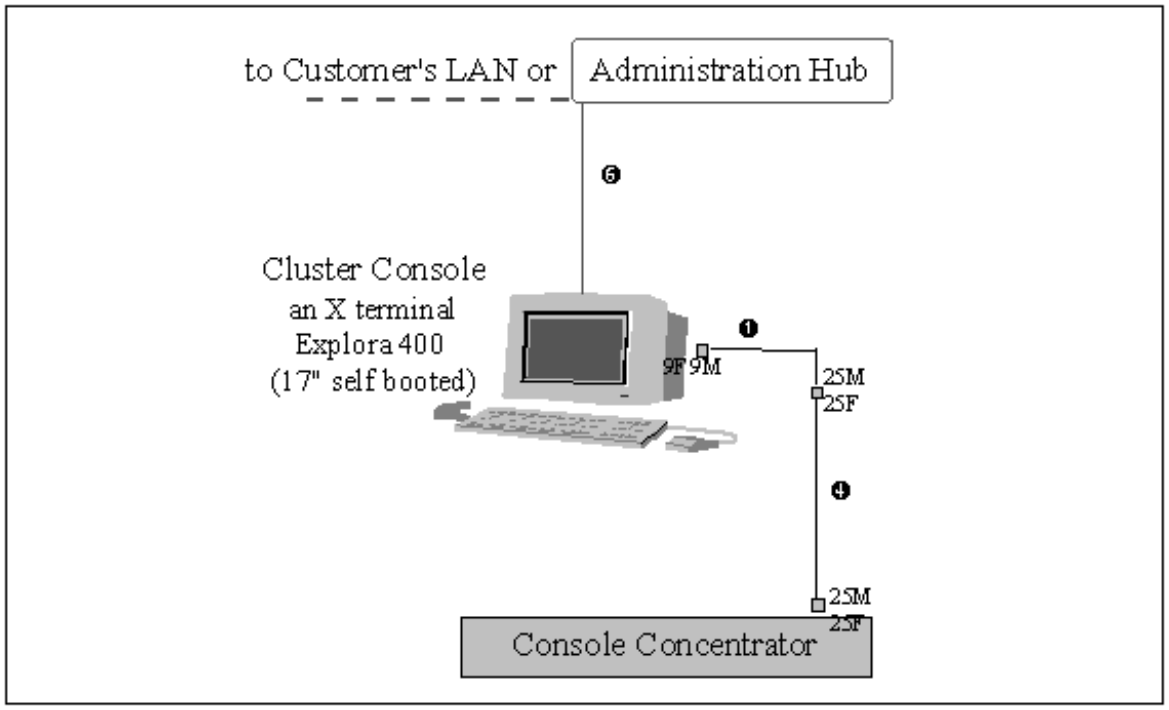


Figure 18. Cluster Console with Console Concentrator

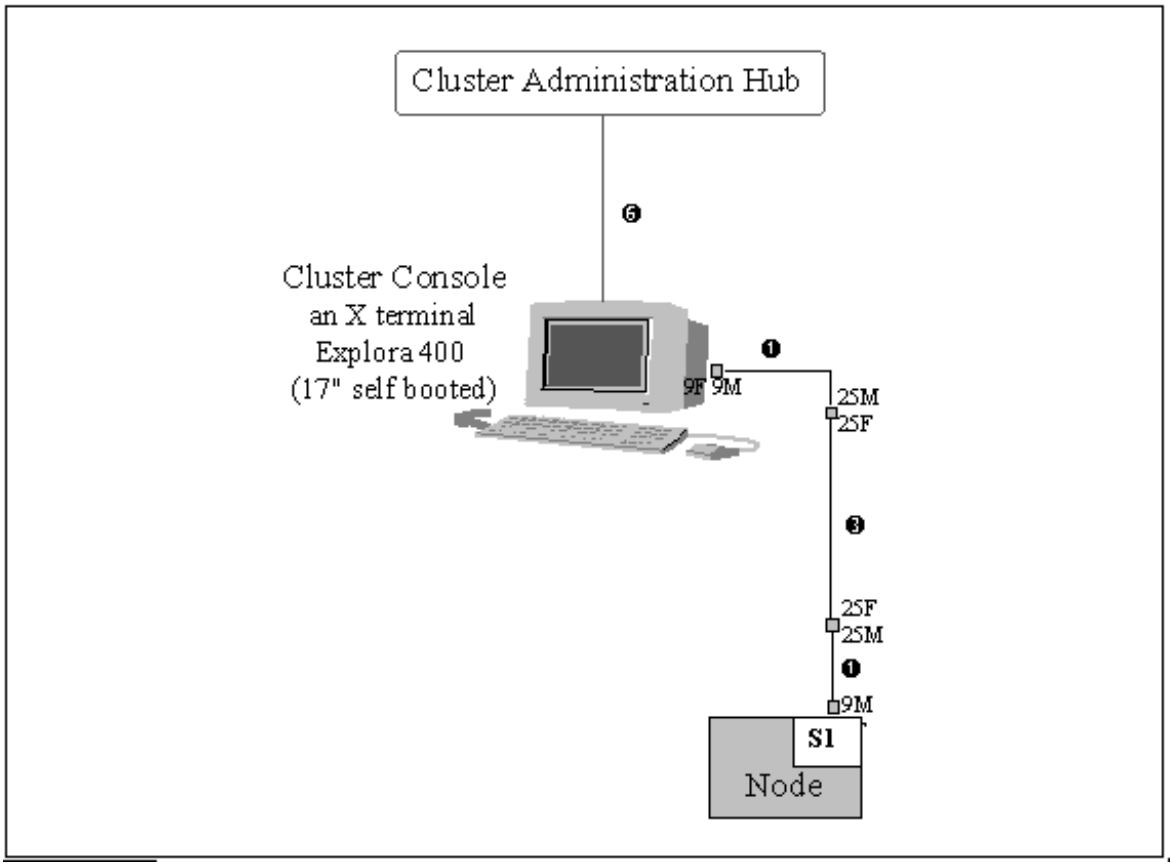


Figure 19. Cluster Console with Connection to Node's S1 Plug

Cabling Diagrams for a 2–node Configuration

There are two CBLG105–1800 cables [3]. A first one is generated automatically and systematically in any Escala EPC order. The second one is included in the Cluster Console component.

For connecting the nodes to the cluster hub, please use the native integrated Ethernet board.

Temporary Replacement of a Cluster Console with a System Console

The Cluster Console acts both as system console and administration graphical console. The delivered System Console is not wired. It is used as spare console. If the Cluster Console is out of order, the System Console (a BQ306 ASCII terminal) can be connected to the S1 port on node #1.

Note: If the node is an EPC1200 or an EPC1200A, it may be necessary to add a CBL2101 cable to the CBLG105-1800 cable [3] when connecting the X terminal to the node's S1 serial port. This is the case when the X terminal has not been initialized before the connection.

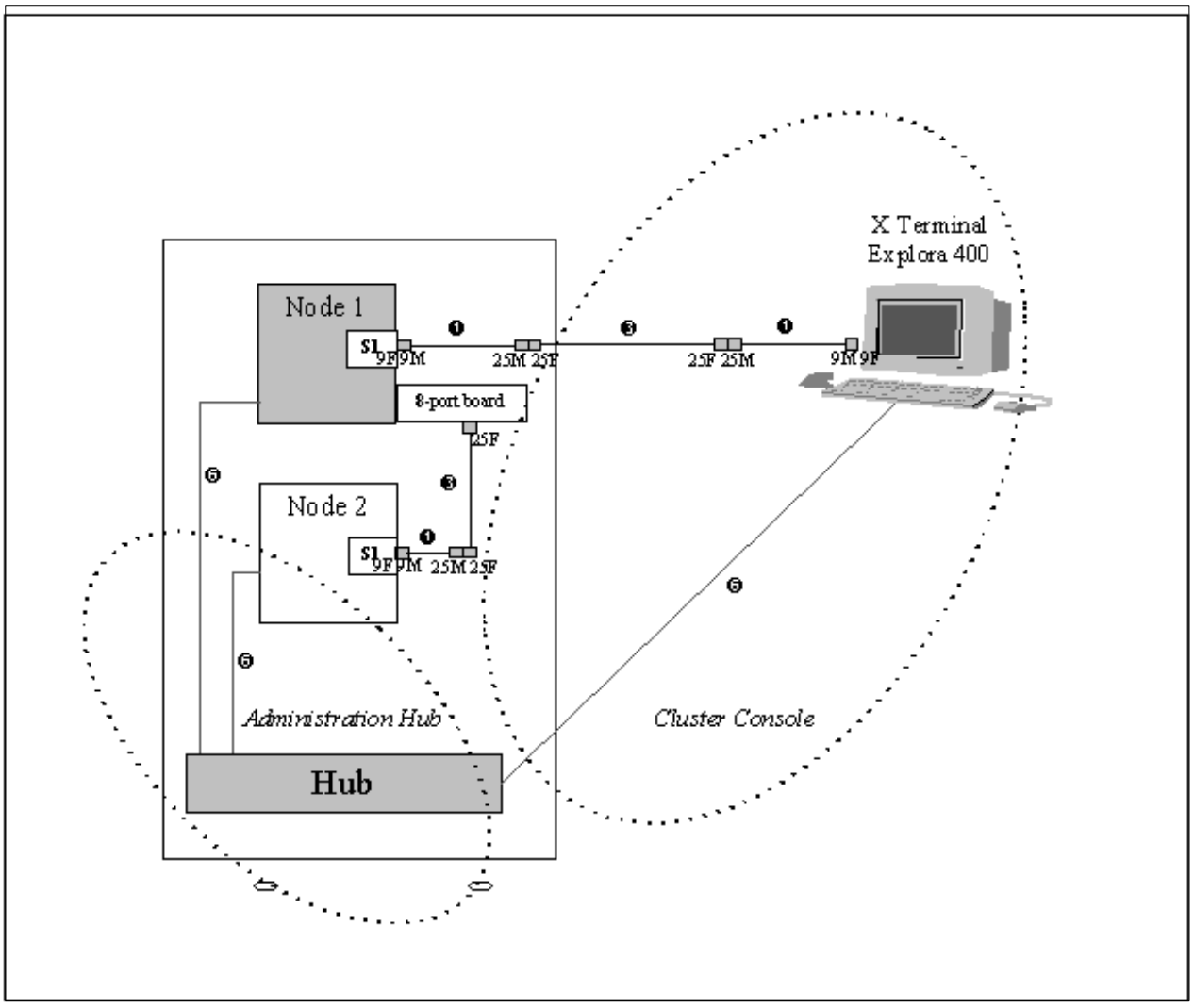


Figure 20. PWCCF02: Temporary Replacement of Cluster Console with System Console

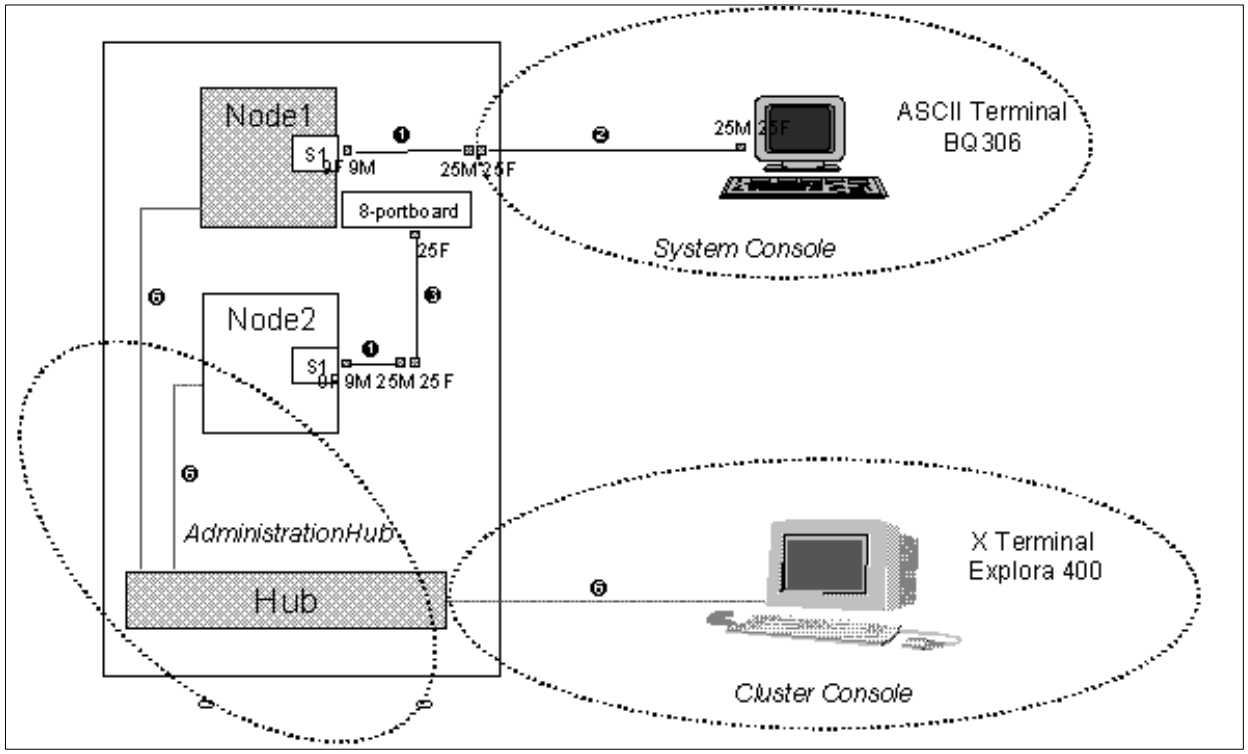


Figure 21. Alternative Cabling of Cluster Console and System Console – Common administration graphical interface

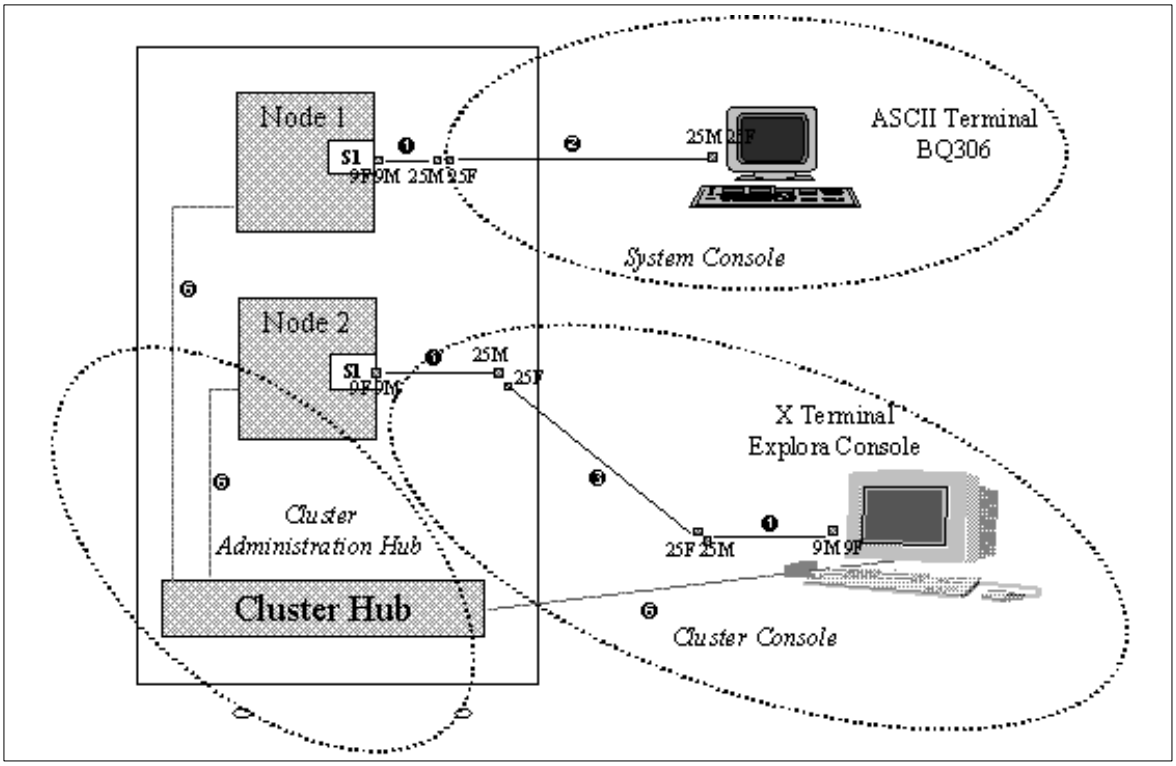


Figure 22. Alternative Cabling of Cluster Console and System Console – Both node console and common administration graphical terminal

Cabling Diagrams For Configuration With More Than 2 Nodes

With a dedicated–administration network, use the integrated Ethernet board for connecting the nodes to the cluster administration hub.

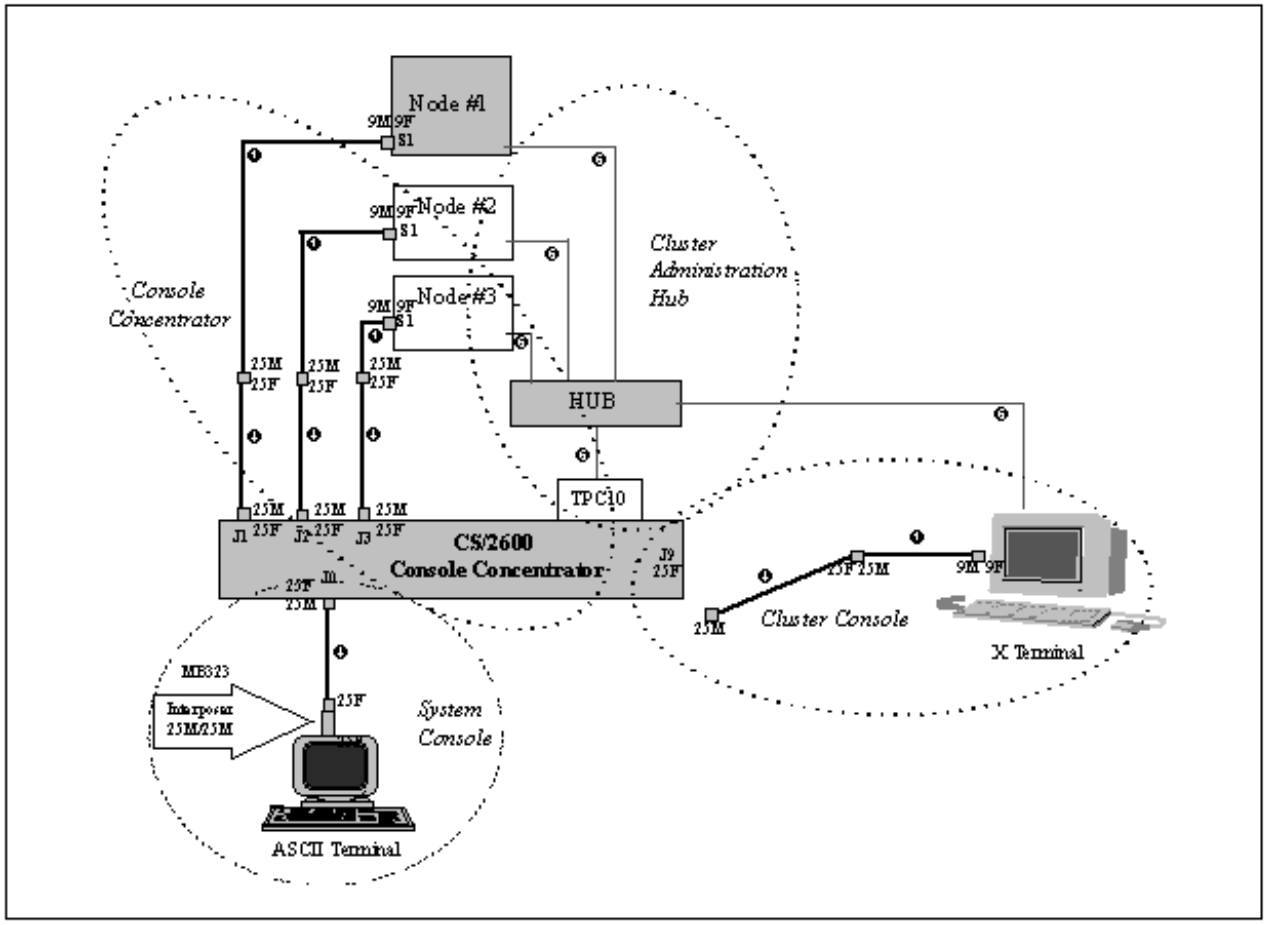


Figure 23. PWCCF03: Cluster Console with a Cluster Administration Hub

With no dedicated–administration network, the Console Concentrator and the Cluster Console (X Terminal) must be connected to the customer's Ethernet–based public network (a single Ethernet LAN @10Mbps).

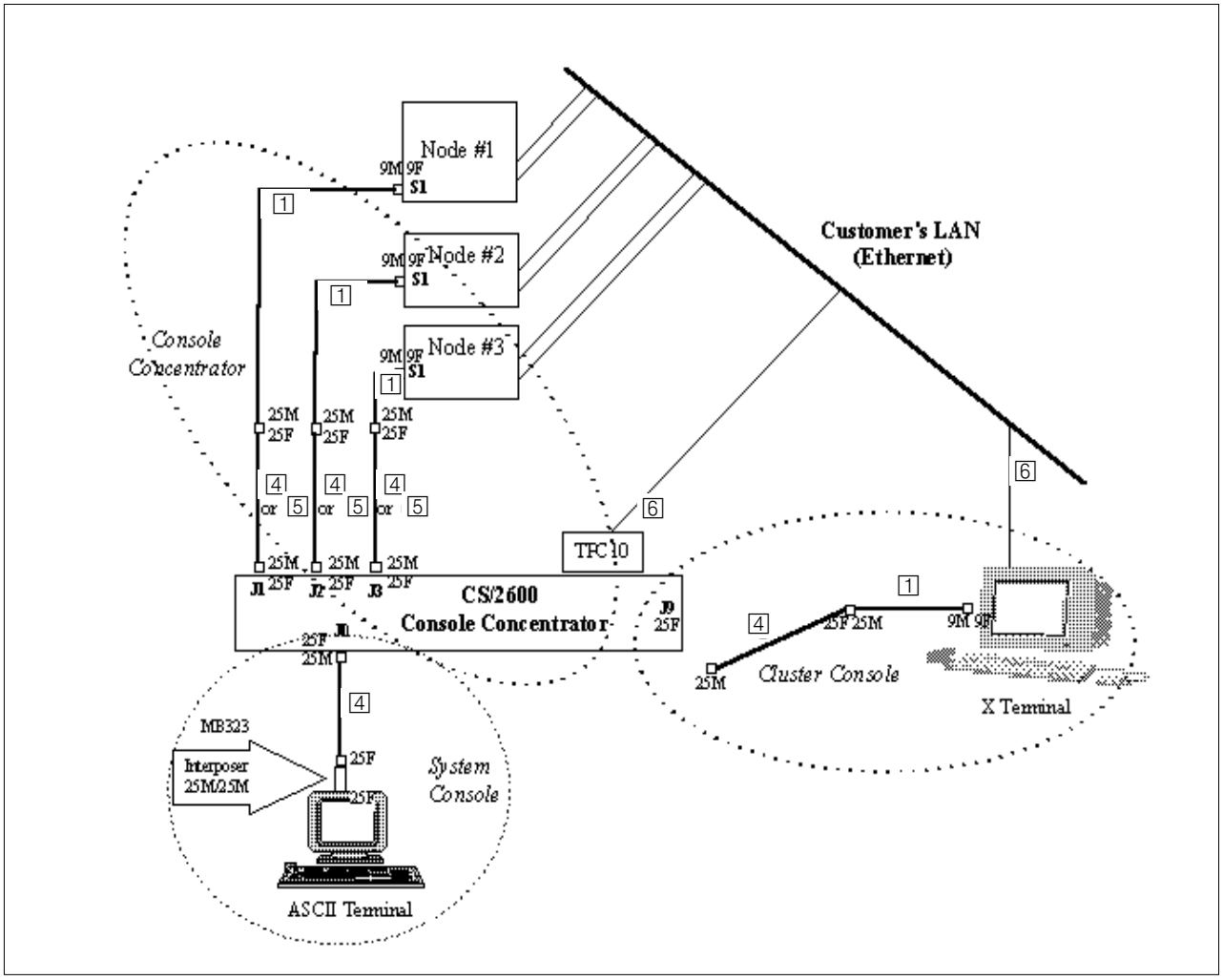


Figure 24. PWCCF05: Cluster Console without Cluster Administration Hub

Cabling Instructions

Documentation References

Installing Your Explora Family System

17" Professional Color Monitor – User's Guide

Workstations BQX 4.0.

Installation

Warning: Do not plug the power cords on the X Terminal box and on the monitor front side before being asked to do so:

1. Install the memory extension and the PCMCIA board which has been previously write-enabled.
   See section §5 of *Installing Your Explora Familly System* documentation.
2. Connect the video cable between the X Terminal box and the monitor.
3. Connect the X Terminal to the Superstack II Hub 10 using a RJ45/RJ45 cable.
4. Connect the X Terminal box:

   to the console concentrator using RS232 cables (CBL1912, CBLG106–2000),

   elsewise to the S1 port of an EPC node using RS232 cables (CBL1912. CBLG105–1800)

5. Connect the keyboard and the mouse on the X terminal box.
6. Plug the power cord on the X Terminal box and on the monitor.
7. Power ON the X Terminal box.
8. Power ON the monitor (Green LED is switched on).
   Refer to the *17" Professional Color Monitor User's Guide* for further information on LEDs and command switches.
9. You can stop the automatic starting of the X Terminal by typing the ESC key after Power–up tests have completed.
10. Once the prompt > has come, type the command **se** and press ENTER to get the main menu.
11. Select **keyboard** in order to set the type of keyboard (IBM PS/2 or N101).
12. Select **Monitor** to set the resolution frequency of the monitor.

Warning: Selecting a wrong screen resolution can damage your monitor. Make sure your selection is supported by your monitor. See the *17" Professional Color Monitor User's Guide.*

13. Select **Network** then set the following parameters:

Get IP Address from:	NVRAM
Terminal IP Address:	@IP of XT
Subnet Mask:	Subnet Mask

14. Select **Boot** then set the following characteristics as follows:

TFTP Boot Directory:	/local/
TFTP Order:	Disabled
NFS Order:	Disabled
MOP Order	Disabled
Local Order	1

15. Select **Done** then **Reboot**.

16. Once the prompt> is displayed, if the Boot is not automatic, then:

    type **>BL**

    and press **ENTER**

17. Two or three windows appear after the starting has completed:

    a window of Setup and Configuration (upper left),

    a telnet window,

    a system console window corresponding to the serial line RS232 (S1 plug of a EPC node) provided that the X terminal is directly wired to a node's S1 port.

18. Inside the Setup and Configuration window:

    select **Window Manager**

    and click on the icon to run **NCD Window Manager**.

19. In the telnet window, or after opening **New Telnet** in **TERMINAL** of the Setup window: type in the Service field, the IP address of another node

    and hit **OK** to establish the telnet session.

    Open as many New Telnet windows as there are nodes left; go to the Setup & Configuration window,

    select **Terminal**

    then **New Telnet**

    then type the node IP address in the service field.

20. In order to have a full automatic boot when powered up,
    select the **SETUP** menu in the **Setup and Configuration** window, then:

    select **Change Setup Parameters**

    then **Booting**

    validate **Boot automatically at power–up**

    Save the configuration by choosing **Apply.**

21. In order to have an automatic establishment of additional telnet session to other nodes, select in the Setup window

    SETUP

    Change Setup Parameter

    – Commands and Startup

    then for each node add the IP address within the command line

    term –ctype telnet <@IP> –geometry ...–title <node name>...–n<node abbr>...

    and save the configuration by hitting **Apply**

22. At the next power–up put back the PCMCIA board to write unable.

Cluster PowerConsole

Cluster PowerConsole is provided by an AIX workstation from the following:

- Escala S Series

Details in:

Hardware Components (Escala S Series)

Cluster PowerConsole Extensions are listed on page 6-37.

Cluster PowerConsole (Escala S Series) (France)

CSKU105–1000

Identificator	Description	Length	Quantity
CPXG222–0000	Escala S100 – 233		1
MANG057–SP0Z	Basic HW Doc for Escala–S		1
CMMG112–0000	64 MB EDO DRAM DIMM Memory		1
GTFG042–0000	GXT225P Graphics Adapter (PCI)		1
DMUG013–0000	17” Color Display		1
PDUG008–0000	3–Button Mouse		1
KBUG003–000F	Keyboard for FRANCE		1
CBL1912	RS232 CABLE 9M/25M Pins	0.5 m	1
CBLG106–2000	Cable Remote RS232 (25M/25F)	15 m	1
CBLG179–1900	cable RJ45 Category 5	10 m	1
VCW3630	Ethernet ”Thin” Cable (15M/15F) to Transceiver	5 m	1

Cluster PowerConsole (Escala S Series) (Europe)

CSKU105–2000

Identificator	Description	Length	Quantity
CPXG222–0000	Escala S100 – 233		1
MANG057–SP0Z	Basic HW Doc for Escala–S		1
CMMG112–0000	64 MB EDO DRAM DIMM Memory		1
GTFG042–0000	GXT225P Graphics Adapter (PCI)		1
DMUG013–0000	17” Color Display		1
PDUG008–0000	3–Button Mouse		1
KBUG003–000E	Keyboard for US		1
CBL1912	RS232 CABLE 9M/25M Pins	0.5 m	1
CBLG106–2000	Cable Remote RS232 (25M/25F)	15 m	1
CBLG179–1900	Cable RJ45 Category 5	10 m	1
VCW3630	Ethernet ”Thin” Cable (15M/15F) to Transceiver	5 m	1

Cluster PowerConsole (Escala S Series) (UK)

CSKU105–P000

Identificator	Description	Length	Quantity
CPXG222–0000	Escala S100 – 233		1
MANG057–SP0Z	Basic HW Doc for Escala–S		1
CMMG112–0000	64 MB EDO DRAM DIMM Memory		1
GTFG042–0000	GXT225P Graphics Adapter (PCI)		1
DMUG013–0000	17” Color Display		1
PDUG008–0000	3–Button Mouse		1
KBUG003–000H	Keyboard for UK		1

CBL1912	RS232 CABLE 9M/25M Pins	0.5 m	1
CBLG106–2000	Cable Remote RS232 (25M/25F)	15 m	1
CBLG179–1900	Cable RJ45 Category 5	10 m	1
VCW3630	Ethernet ”Thin” Cable (15M/15F) to Transceiver	5 m	1

Cluster PowerConsole (Escala S Series) (US)

CSKU105–U000

Identificator	Description	Length	Quantity
CPXG222–0000	Escala S100 – 233		1
MANG057–SP0Z	Basic HW Doc for Escala–S		1
CMMG112–0000	64 MB EDO DRAM DIMM Memory		1
GTFG042–0000	GXT225P Graphics Adapter (PCI)		1
DMUG013–0000	17” Color Display		1
PDUG008–0000	3–Button Mouse		1
KBUG003–000E	Keyboard for UK		1
CBL1912	RS232 CABLE 9M/25M Pins	0.5 m	1
CBLG106–2000	Cable Remote RS232 (25M/25F)	15 m	1
CBLG179–1900	Cable RJ45 Category 5	10 m	1
VCW3630	Ethernet ”Thin” Cable (15M/15F) to Transceiver	5 m	1

Cluster PowerConsole Extensions (Escala S Series)

CMMG111-0000, CMMG112-0000, CMMG113-0000, MTUG029–0P00, MTUG028–0P00, MTUG032–0P00, DCCG135–0000, DCCG085–0000, DCCG102–0000, MSUG103–0000, MSUG099–0000, DCCG086–0000, DCUG001–000F, DCUG001–000H, DCUG001–000U, DCUG001–000D, DCUG001–000T, DCUG001–000E, DCUG001–000G.

Identificator	Description
CMMG111-0000	32MB EDO DRAM DIMM Memory Module
CMMG112-0000	64MB EDO DRAM DIMM Memory Module
CMMG113-0000	128MB EDO DRAM DIMM Memory Module
MTUG029–0P00	7/14 GB 8mm VDAT Internal Tape Drive
MTUG028–0P00	12/24 GB 4mm DAT Internal Tape Drive
MTUG032–0P00	16/32 GB Internal QIC Tape Drive
DCCG135–0000	PCI Token–Ring Network Adapter
DCCG085–0000	PCI Ethernet Adapter 10/100 Mbps
DCCG102–0000	PCI FDDI Fiber Single Ring Adapter
MSUG103–0000	4.3GB SCSI–2 F/W Internal Disk Drive 1”
MSUG099–0000	9.1GB SCSI–2 F/W Internal Disk Drive 1”
DCCG086–0000	ELECT. MODEM BOARD w/cable (ISA)
DCUG001–000F	MODEM OPTION FRANCE
DCUG001–000H	MODEM OPTION UK
DCUG001–000U	MODEM OPTION BELGIAN
DCUG001–000D	MODEM OPTION DUTCH
DCUG001–000T	MODEM OPTION ITALY

CBLG179–1900	Cable, RJ45 Ethernet for HUB connection	10m	1
VCW3630	Cable, Ethernet ”Thin” (15M, 15F) to Transceiver	5m	1

Examples of Use

The PowerConsole with the Cluster Assistant GUI is a cluster administration graphics workstation which is available to setup, install, manage, and service the EPC nodes and the EPC cluster.

The PowerConsole hardware is an S100 workstation running AIX 4.3.2. Escala S100 running AIX 4.3.1 was the previous AIX stations used as PowerConsole hardware.

CAUTION:
The AIX release of the PowerConsole must be higher or identical to the AIX release of any Escala EPC node.

The PowerConsole needs a Cluster Administration Hub (10 mbps)for setting up a dedicated–administration network. A Console Concentrator is used by default in any configuration. RS232 cables can also be used on the one hand to connect a modem for remote maintenance purpose, and on the other hand to establish a remote asynchronous connection via RTC.

Cabling to Console Concentrator and Cluster Administration Hub will be set in manufacturing. An Ethernet board (LSA board on an EPC800 node, integrated card on an EPC400 node) is used to connect a node to the Cluster hub. It is mandatory to connect the integrated Ethernet 10M/Bsec port of an EPC400 CPU drawer to the Cluster Hub (do not connect a PCI Ethernet adapter 10/100 mbps to the hub). This is required for enabling network boot of an EPC400 node from the PowerConsole (NIM tool).

There is an optional extra communication board (FDDI, Ethernet or Token-ring adapter) that can be ordered to allow the PowerConsole to be connected to the customer’s LAN network. **This option is mandatory with NetBackup software,** if there is a dedicated administration network. With that option, an X–Terminal attached to the customer’s network can remotely access to the PowerConsole, provided that it is configured to run with the CDE windows manager of the PowerConsole.

If there is no Cluster Administration Hub, that is to say no dedicated administration network, the Console Concentrator and the PowerConsole will be connected to the customer’s LAN network (it must be an Ethernet network @ 10Mbps) in customer’s premises. An Ethernet cable (VCW3630) is provided for doing this.

If the customer’s network is COAXIAL THICK or COAXIAL THIN then the Customer is in charge of connecting the Console Concentrator and the PowerConsole to his network with his own cables (As usual for all the Escala platforms).

As an alternative, the PowerConsole can be connected to the Console Concentrator. To do this, you must order an additional CBLG161-1900 (Ethernet cross-over cable RJ45/RJ45) and use the TCP10 transceiver on the Console Concentrator end. In that case, the PowerConsole must also be connected to the customer’s network which requires an appropriate extra communication board in the PowerConsole configuration. A shortcoming of such a configuration is that the distributed version of Navisphere (full version with a key) for managing the DAS full fibre disk subsystem cannot operate from the PowerConsole.

Figures 25 & 26 illustrate the two possible implementations – with or without Cluster administration hub. In the former case, the nodes, the PowerConsole and the Console concentrator are linked to the Cluster Administration Hub to make an independent Ethernet network, said the dedicated–administration network. In the second case, the PowerConsole and the Console Concentrator are directly connected to the customer’s Ethernet network. Remind that in both case, the Escala EPC nodes are connected to the customer’s LAN network.

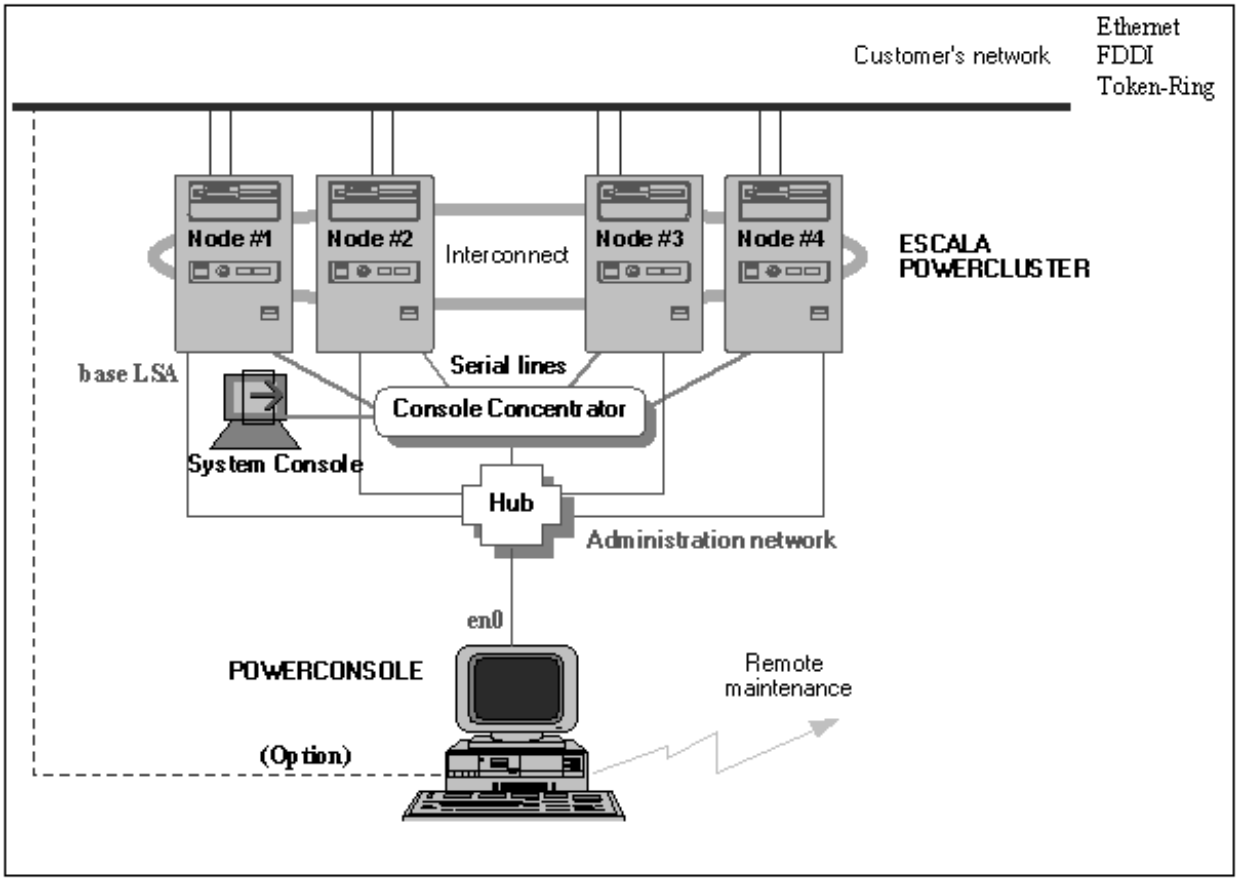


Figure 25. PowerConsole With a Dedicated Administration Network

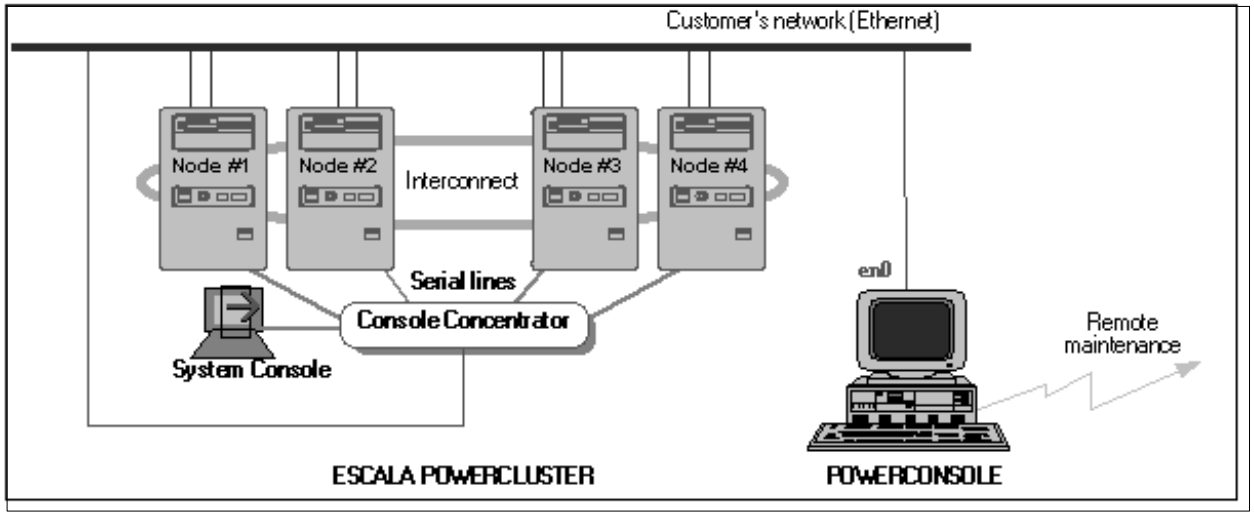


Figure 26. PowerConsole Without Dedicated Administration Network

Within an Escala EPC, a node pertains to an HACMP cluster or it is a standalone node (without HACMP). There can be zero, one or more HACMP clusters, as there can be zero, one or more standalone nodes. For implementing IP address takeover, the nodes of an HACMP cluster need to be connected to the same LAN (subnet).

For full operation of the Escala EPC from the PowerConsole, it is advised that all the nodes and the PowerConsole be connected to the customer's network.

Cabling Legend

Item	M.I.	Designation	Length	FRU
1	CBL1912	Cable, Adapter RS232 (9M/25M)	0.3m	76958073-002
2	CBLG104-2000	Cable, local RS232 (25F/25M)	15m	90232001-001
3	CBLG105-1800	Cable, local RS232 (25F/25F)	7.5m	90233002-001
4	CBLG197-2000	Cable, remote RS232 (25M/25F)	15m	91287001-001
5	CBLG161–1900	Cable, Ethernet RJ45/RJ45	10m	91093001-001
6	CBLG179-1900	Cable, Ethernet RJ45/RJ45 cat 5	10m	90094001-001
8	VCW3630	Cable, Ethernet to transceiver	5m	76958087-001

Cabling Diagrams

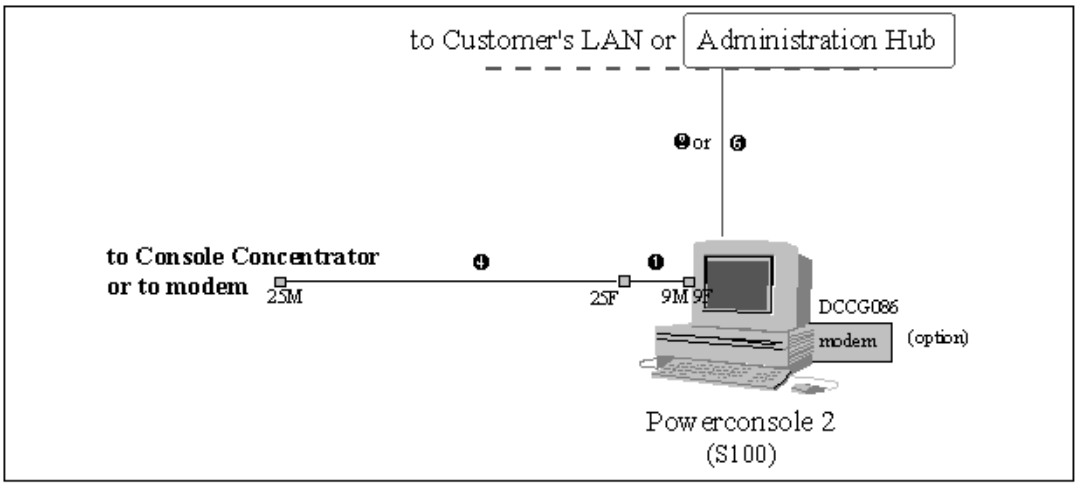


Figure 27. Escala S Series based PowerConsole Connections

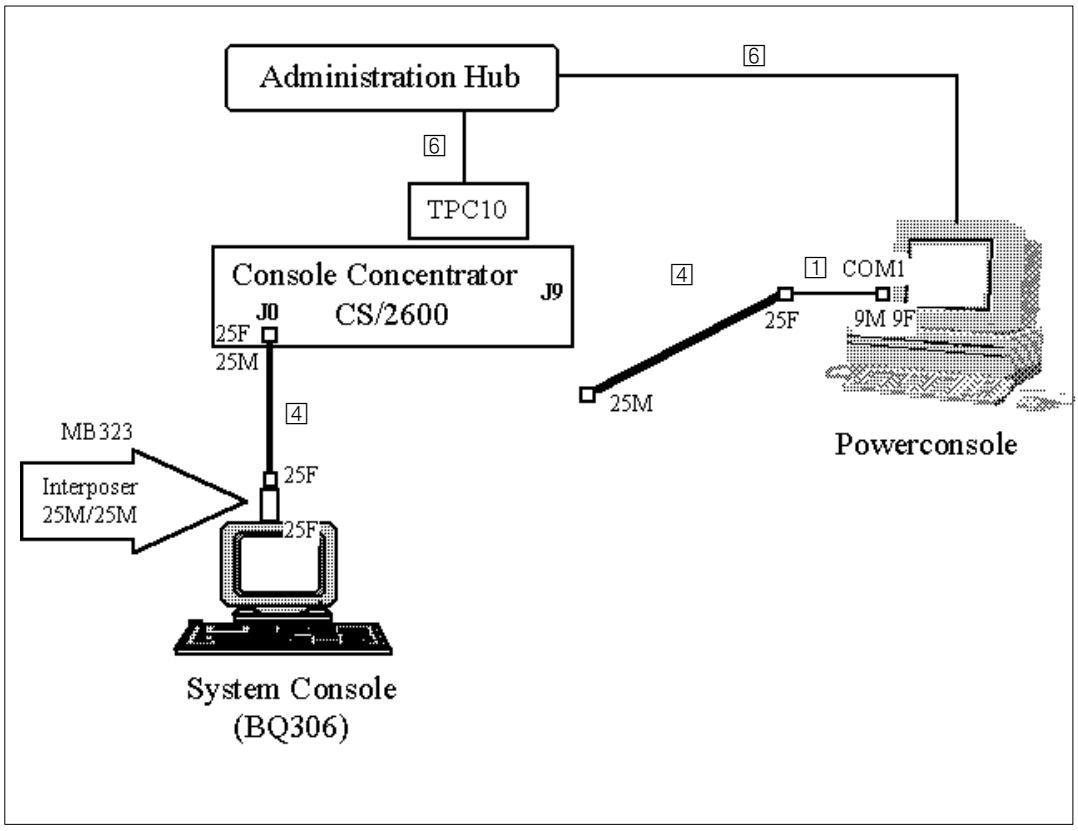


Figure 28. PowerConsole to Console Concentrator and Administration Hub

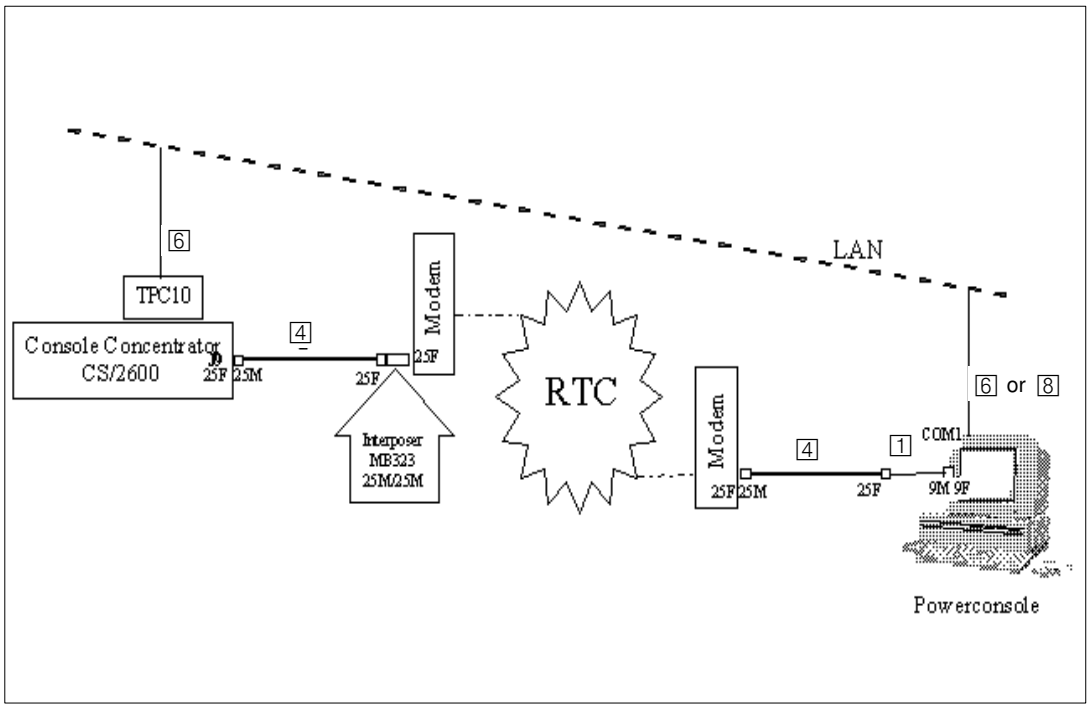


Figure 29. PowerConsole with Remote Access (LAN or Modem)

Cabling Pattern (without Modems)

Cabling to be used if there is a dedicated–administration network.

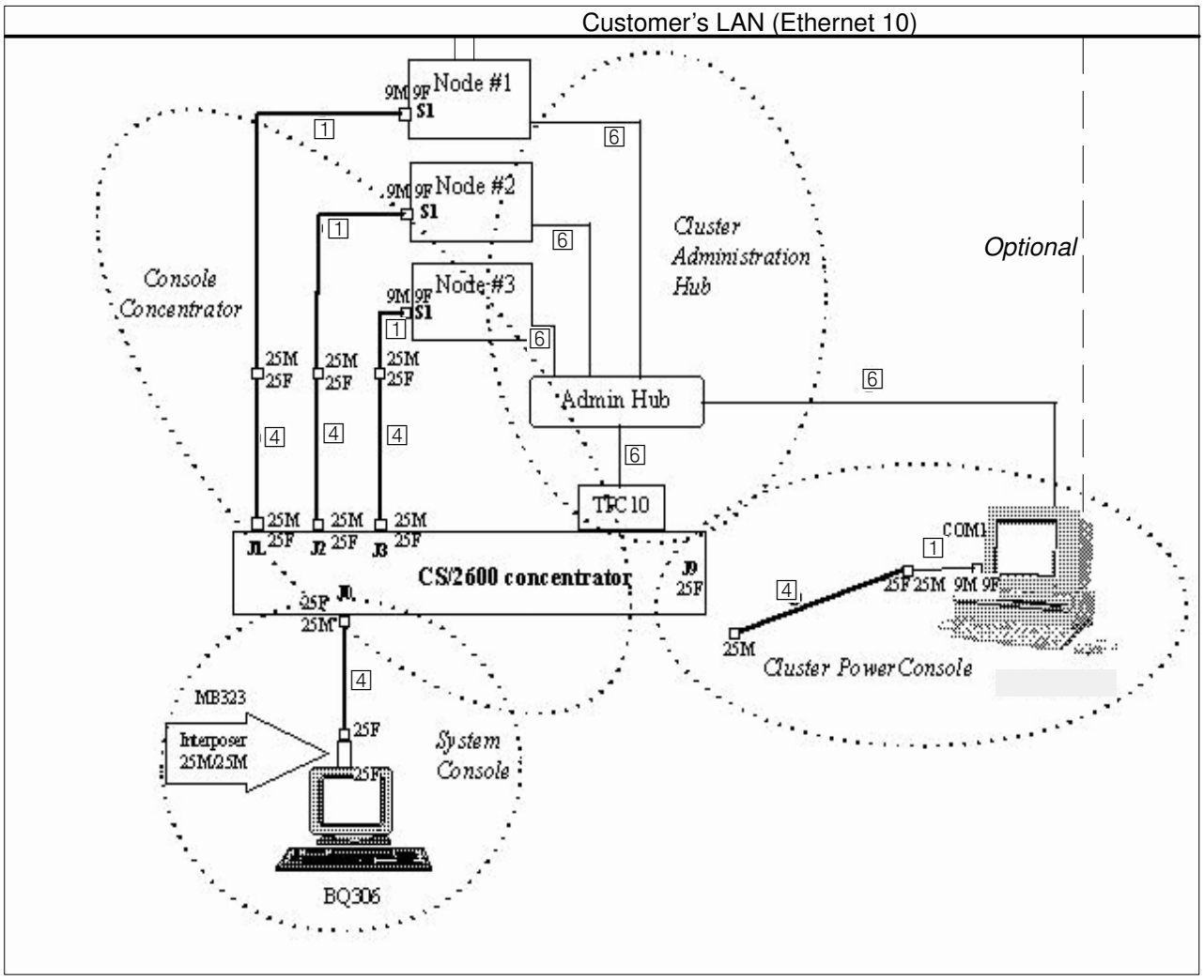


Figure 30. PWCCF04: PowerConsole with Administration Hub

Cabling to be used when there is no dedicated–administration network.

The Console Concentrator and the PowerConsole will be connected to the customer's LAN network (an ethernet network).

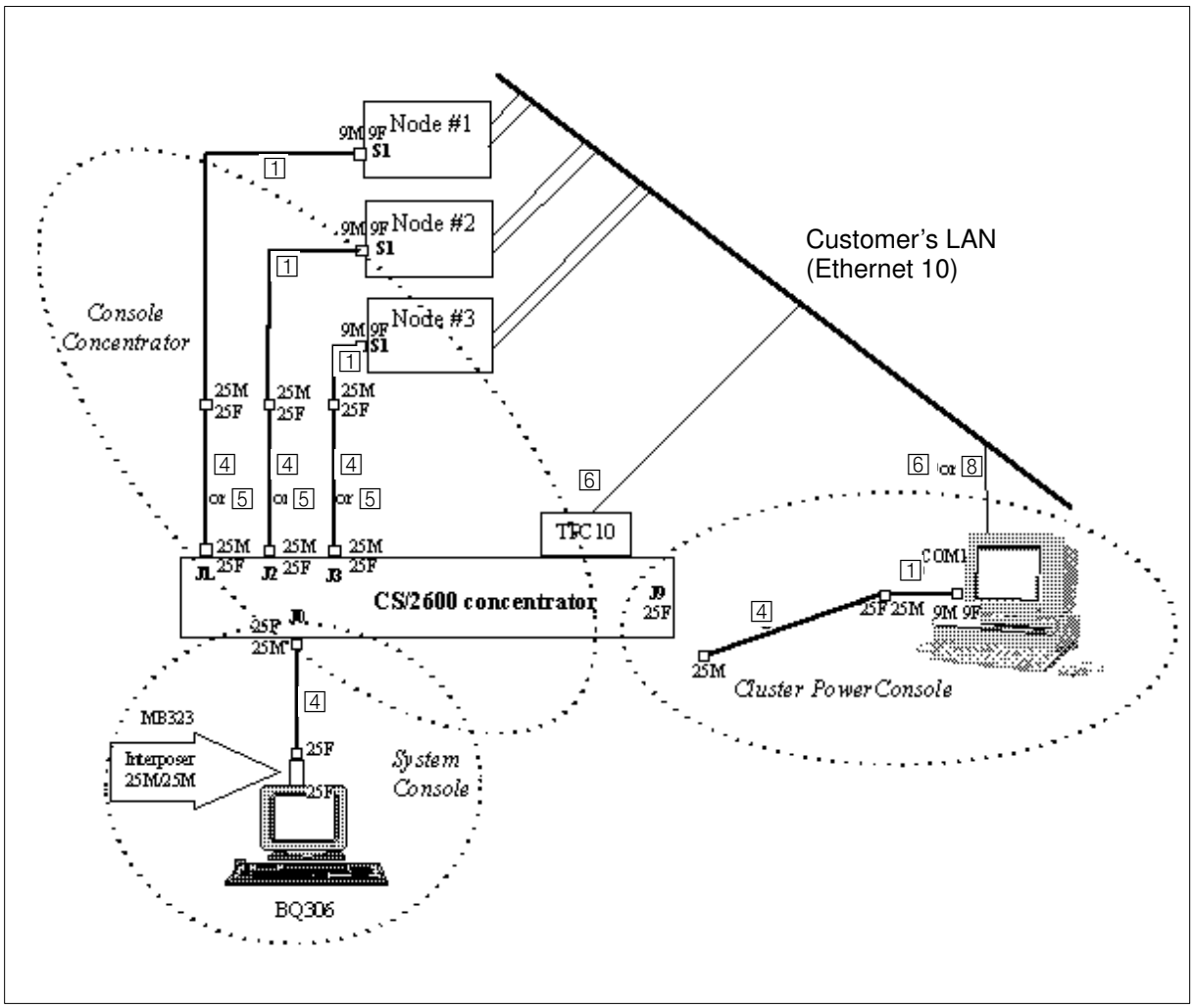


Figure 31. PWCCF06: PowerConsole without Administration Hub

Example of Cable Usage (for a 2–node Powercluster)

Type	Function	Cabling From – To	Description	QTY
CBLG 106–2000	Link CS2600/J1 to Node 1 Link CS2600/J2 to Node 2 Link CS2600/J0 to ASCII console	CS2600/J1–>CBL1912 CS2600/J2–>CBL1912 CS2600/J0–>Interposer	RS232 Direct 25M/25F M/M	3
CBL 1912	Link CS2600/J1 to Node 1 Link CS2600/J2 to Node 2	CBLG106–>S1 Node 1 CBLG106–>S1 Node 2	RS232 Direct 25M/9F	2
Interposer Modem / MB 323 concentrator to ASCII console (BQ300)	Link CS2600/J0	CBLG106–>ASCII console	Interposer 25M/25M Direct	1
TPC10 box 3C1681–0	Link CS2600 AUI to 802.3 LAN	CS2600 AUI–>RJ45 Ethernet cable	AUI/RJ45 3C1681–0	1
Ethernet Cable CBLG179–1900 (10M)	Link CS2600 AUI to Ethernet LAN Link PowerConsole AUI to to Ethernet LAN	TCP10–>HUB PowerConsole RJ45–>HUB	RJ45/RJ45	2

Figure 32. PowerConsole Cable Usage Example – Table

Legend – M: stands for Male Connector, F: for Female Connector.

Cabling Instructions

No special instructions.

Remote Maintenance Connections

Modem connections for remote maintenance purposes, are described in Remote Maintenance, on page 12-1.

Configuration Rules for PowerConsole 2 Extensions

Additional internal disk drives and media drives must be placed in this PowerConsole according to the following rules:

Five bays are available in Escala S100:

- three of them are already used by: floppy, one CD–ROM 20X and one system disk of 4.5GB.
- Two bays are free (one 1” and one 1.6”). They can be used for two disk drives or for one media and one disk drive.

The disk drives are 1” high, 7200tpm, with a capacity of 4.3GB and 9.1GB.

The VDAT fits only in the bay #2 (normally the bay of the CD–ROM) of the S100 and therefore they must be swapped with the CD–ROM.

Figure 33. Escala S100 Peripherals Placement Information

Figure 34 sums up the possible configurations.

Peripheral	Bay 1	Bay 2	Bay 3	Bay 4	Bay 5
4.3GB Disk	Floppy	CD-ROM	Y	Basic Disk	Y
9.1GB Disk	Floppy	CD-ROM	Y	Basic Disk	Y
12/24GB 4mm DAT	Floppy	CD-ROM	Y	Basic Disk	N
16/32GB QIC	Floppy	CD-ROM	Y	Basic Disk	N
8mm VDAT	Floppy	Y	CD-ROM	Basic Disk	N

Figure 34. Escala S100 Peripherals Adding.

Chapter 7. Fast Ethernet Interconnect Requirements

Describing particular cabling for Fast Ethernet applications.

Fast Ethernet Interconnect Requirements – Overview

Details in:

Hardware Components

Fast Ethernet Interconnect Full Kit (2 EPC400-N)

DCKG009–0000

DCKG009–0000 component is only used to link two EPC400 nodes with a single Ethernet link without switch.

Identificator	Description	Quantity
DCCG085–0000	PCI Ethernet 10&100 Mb/s Adapter (2986)	2
CBLG161–1900	10m Ethernet Cross Cable – RJ45 / RJ45	1

Fast Ethernet Interconnect Base Kit (EPC400-N)

DCKG010–0000

Identificator	Description	Quantity
DCCG085–0000	PCI Ethernet 10&100 Mb/s Adapter (2986)	1
CBLG179–1900	10m Ethernet Cable – RJ45 / RJ45 – Category 5	1

Fast Ethernet Interconnect Full Kit (2 EPC800-N)

DCKU101–0100

DCKU101–0100 component is only used to link two EPC800 nodes with a single Ethernet link without switch.

Identificator	Description	Quantity
DCCG094–0000	MCA Ethernet 10&100 Mb/s Adapter	2
CBLG161–1900	10m Ethernet Cross Cable – RJ45 / RJ45	1

Fast Ethernet Interconnect Base Kit (EPC800-N)

DCKU102–0100

Identificator	Description	Quantity
DCCG094–0000	MCA Ethernet 10&100 Mb/s Adapter	1
CBLG179–1900	10m Ethernet Cable – RJ45 / RJ45 – category 5	1

Fast Ethernet Interconnect Full Kit (2 EPC1200-N)

DCKG011–0000

DCKG011–0000 component is used to link:

two EPC1200 nodes

or

two EPC1200A nodes

or

an EPC1200 node and an EPC1200A nodes

with a single Ethernet link without switch.

Identificator	Description	Quantity
DCCG137–0000	PCI Ethernet 10&100 Mb/s Adapter (2986)	2
CBLG161–1900	10m Ethernet Cross Cable – RJ45 / RJ45	1

Fast Ethernet Interconnect Base Kit (EPC1200-N)

DCKG012–0000

Identificator	Description	Quantity
DCCG137–0000	PCI Ethernet 10&100 Mb/s Adapter (2986)	1
CBLG179–1900	10m Ethernet Cable – RJ45 / RJ45 – category 5	1

Ethernet Single Switch Kit (Models of 3 to 8 Nodes)

DCKU117–0000

Identificator	Description	Quantity
3C16981–ME	SuperStack II Switch 3300 10/100 12–Port	1
GCORSECA01	Internal Power Cord (to PDB) – [90228002–001]	1
GPOWSFBUK1	UK Power Cord – [90399222–001]	1
GPOWSFBUS1	US Power Cord – [90399322–001]	1

Examples of Use

Interconnect of Two Mixed Nodes

For each node, the Fast Ethernet Interconnect Base Kit corresponding to the node type is used. A Fast Ethernet crossed cable (CBLG161–1900) is automatically generated for linking the two nodes. It means that the two Fast Ethernet cables (CBLG179–1900) included the Fast Ethernet Interconnect Base Kits are not used in this case.

Interconnect of 3 up to 8 Nodes

The Fast Ethernet Interconnect Base Kit components and DCKU117–0000 are used together to set up an Ethernet–based interconnect between more than two nodes:

- There are as many Fast Ethernet Interconnect Base Kit components as nodes to be interconnected,
- For each node, the selected Fast Ethernet Interconnect Base Kit corresponds to the node type,
- and there is a Fast Ethernet Switch (DCKU117–0000) for a 100Mbps Ethernet interconnect.

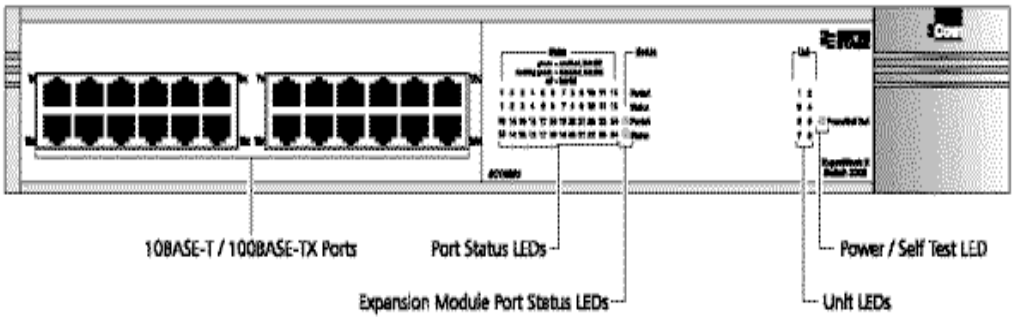
Fast Ethernet Switch 3300 overview:

The SuperStack II Fast Ethernet Switch 3300 10/100 12–port provides Ethernet and Fast Ethernet Switching in one switch.

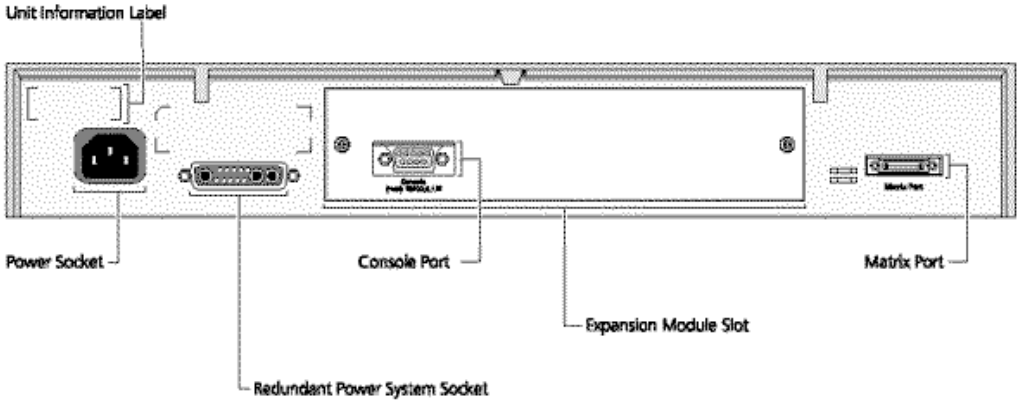
It has 12 copper autosensing 10BASE–T / 100BASE–TX RJ45 ports. It supports both full & half duplex on all ports which is able to provide 200 Mbps of bandwidth to the connected device, with auto–negotiation. These ports can be set to 10BASE–T, 100BASE–TX or they can automatically detect the speed of a link. It allows connection to Ethernet or Fast Ethernet devices over a maximum length of 100m using data grade category 5 twisted pair cable.

Local management can be performed via an RS–232 (DB–9 port) line. In–band Web management of the Switch 3300 model is available from any node connected to the fast ethernet switch, through a Web browser.

Switch 3300 – Front View



Switch 3300 – Rear view



Advanced switch usage

When two fast ethernet interconnects are ordered between the same group of nodes, two cross–over Ethernet RJ45/RJ45 cables (CBLG161–1900), if provided, can be used to establish a resilient link pair between the two switches, and to set up in that way a redundant interconnect. Refer to SuperStack II Fast Ethernet Switch User Guide to configure them. The use of such a redundant interconnect is not supported by the Oracle Parallel Server, and it is restricted to Client / Server applications which are aware of HACMP behaviour.

n HACMP environment, PCI and MCA 10/100 Mb/s adapters must NOT be left with standard setup ”Auto Detection”. This may cause AIX system to be very slow when adapter is not connected to network equipment and will cause ”network_down” or ”swap_adapter” HACMP events. So you have to configure them to the exact speed 10BaseT or 100BaseTX.

By setting a link (a cross–over Ethernet cable CBLG161–1900) between the Cluster administration Hub and the fast ethernet switch, in–band (Web) management of the switch can also be performed from the Powerconsole GUI.

If the fast ethernet interconnect links all the Escala EPC nodes (single–adapter per node case only), it can act as the administration network. It is no longer necessary to get a Cluster administration Hub.

Cabling Diagrams

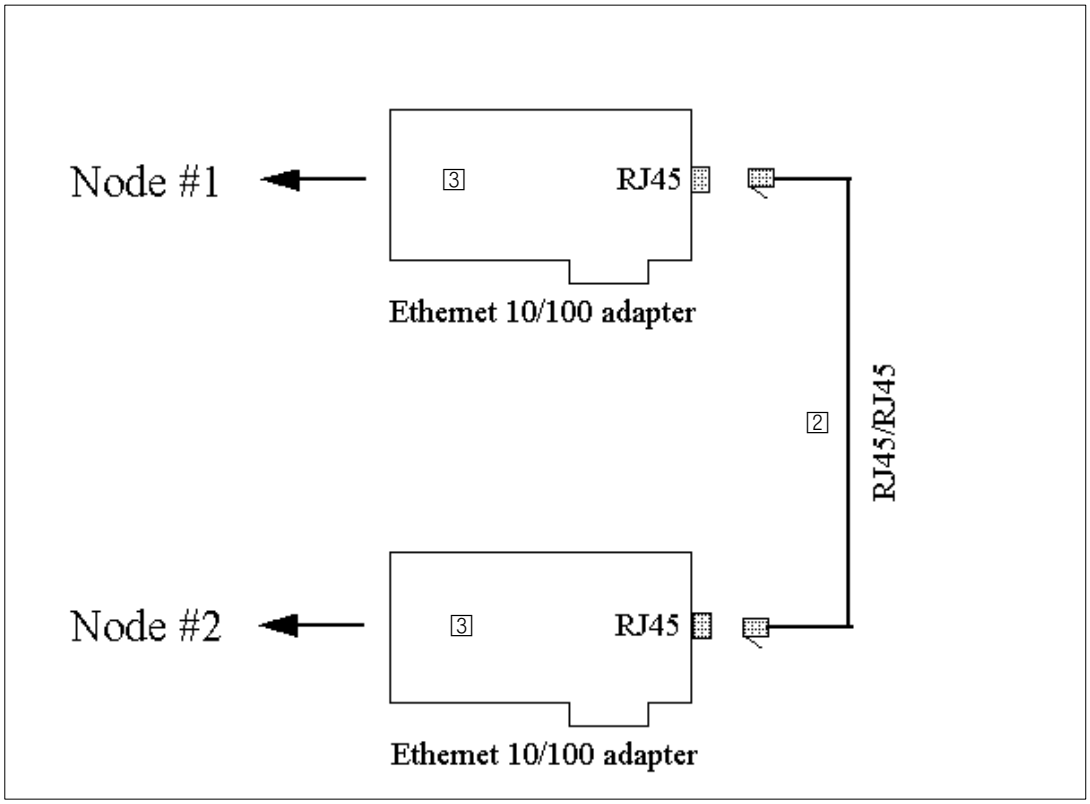


Figure 35. INTCF01/INTCF09: Ethernet Single Interconnect for 2 Nodes

Ethernet 10/100 adapters must be configured at 100 Mbps Full duplex using smit chgenet.

Regarding Half or Full Duplex consideration:

- Half Duplex must be used for connections including hubs (not switches) and more than two hosts on the network

- Full Duplex must be used only for connections thru a SWITCH or POINT to POINT connections. In particular you can use Full Duplex for 2 nodes interconnect using crossed cable RJ45/RJ45 MI CBLG161.

When using Full Duplex, collision detection is disabled.

Switch ports should be configured with Auto–negotiation Enabled, except if you have HACMP problems like ”network_down” or ”swap_adapter” where Auto–negotiation must be Disabled Auto–negotiation introduces several seconds delays in case of connection or IP address takeover which can perturbate HACMP heartbeats mechanism.

To configure Ethernet adapter speed:

23. Use

```
# smit chgenet
```

24. Select an adapter and change the parameter.
25. Adapter CONNECTOR [Auto Detection]

    ...

26. Apply change to DATABASE only [yes]
27. Reboot the system.

Cabling Legend

Item	M.I.	Node Type	Designation	Length	FRU
1	CBLG179-1900		Ethernet cable RJ45/RJ45 - 100 Mhz	10m	91094001–001
2	CBLG161-1900		Ethernet cross cable RJ45/RJ45	10m	91093001–001
3	DCCG094-0000	EPC800	Ethernet 10/100 MCA adapter	-	
	DCCG085-0000	EPC400	PCI Ethernet 10/100 adapter (SMC)	-	
	DCCG137-0000	EPC1200	Ethernet 10/100 PCI adapter (IBM)	-	FC–S70–2968
4	DCCG076-0000	EPC800	FDDI Fibre Dual Ring MCA Adapter	-	76729471-001
	DCCG103-0000	EPC400	PCI FDDI Fibre Dual Ring adapter	-	
	DCCG124-0000	EPC1200	FDDI Fibre Dual Ring PCI Adapter	-	FC–S70–2742
5	CBLG160-1800		FDDI Fibre MIC-MIC cable	6m	90022006–001
6	CBLG171-1800		FDDI Fibre SC-MIC cable	6m	90022306-001
7	CBLU170-1800		FDDI Fibre SC-SC cable	6m	90666206-001
8	CBL1912		Adapter RS232 cable (9M/25M)	0.3m	76958073-002
9	CBLG106-2000		Remote cable RS232 (25F/25M)	15m	90234001-001

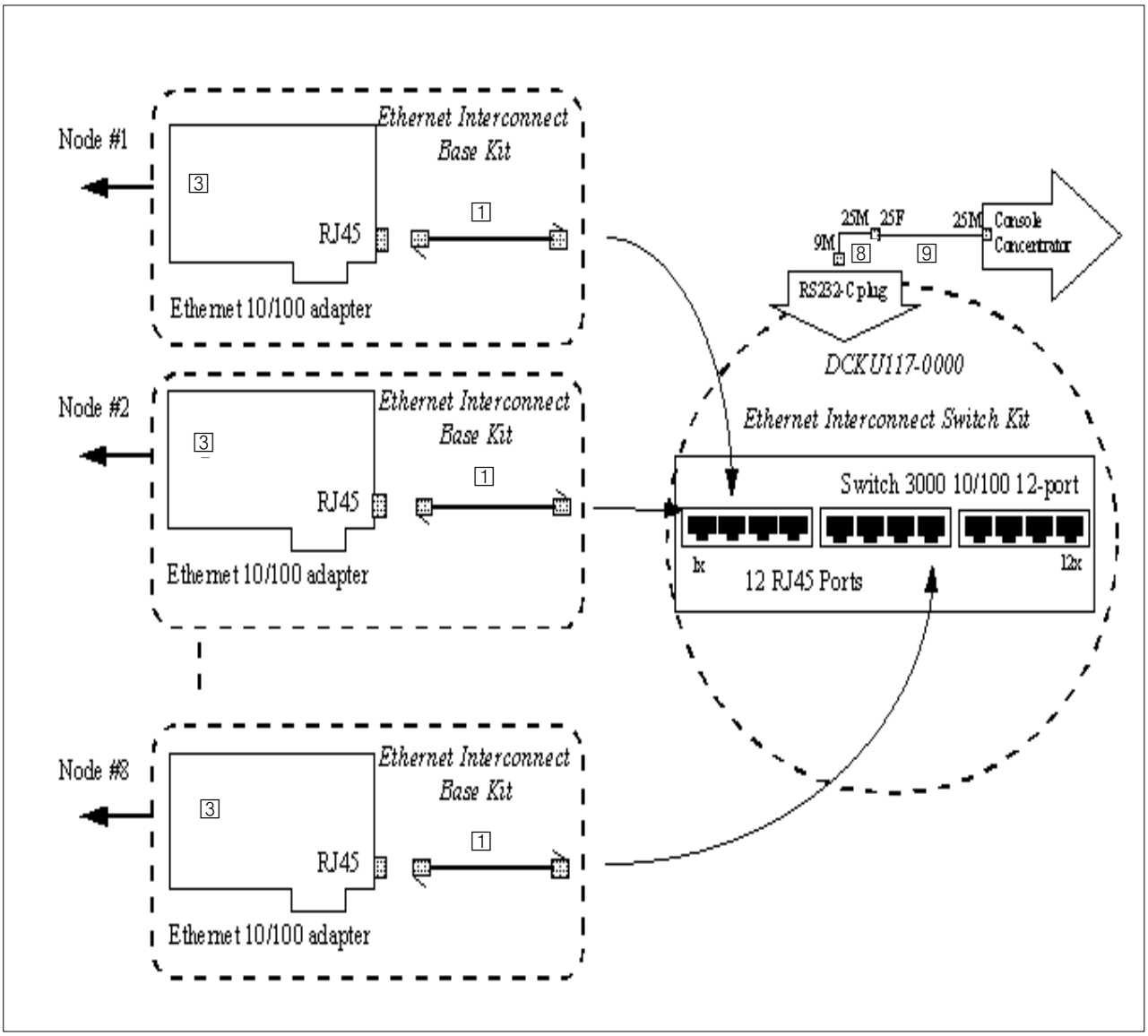


Figure 36. INTCF10: Ethernet Switch Single Interconnect for 3 to 8 Nodes with Single Adapter Per Node

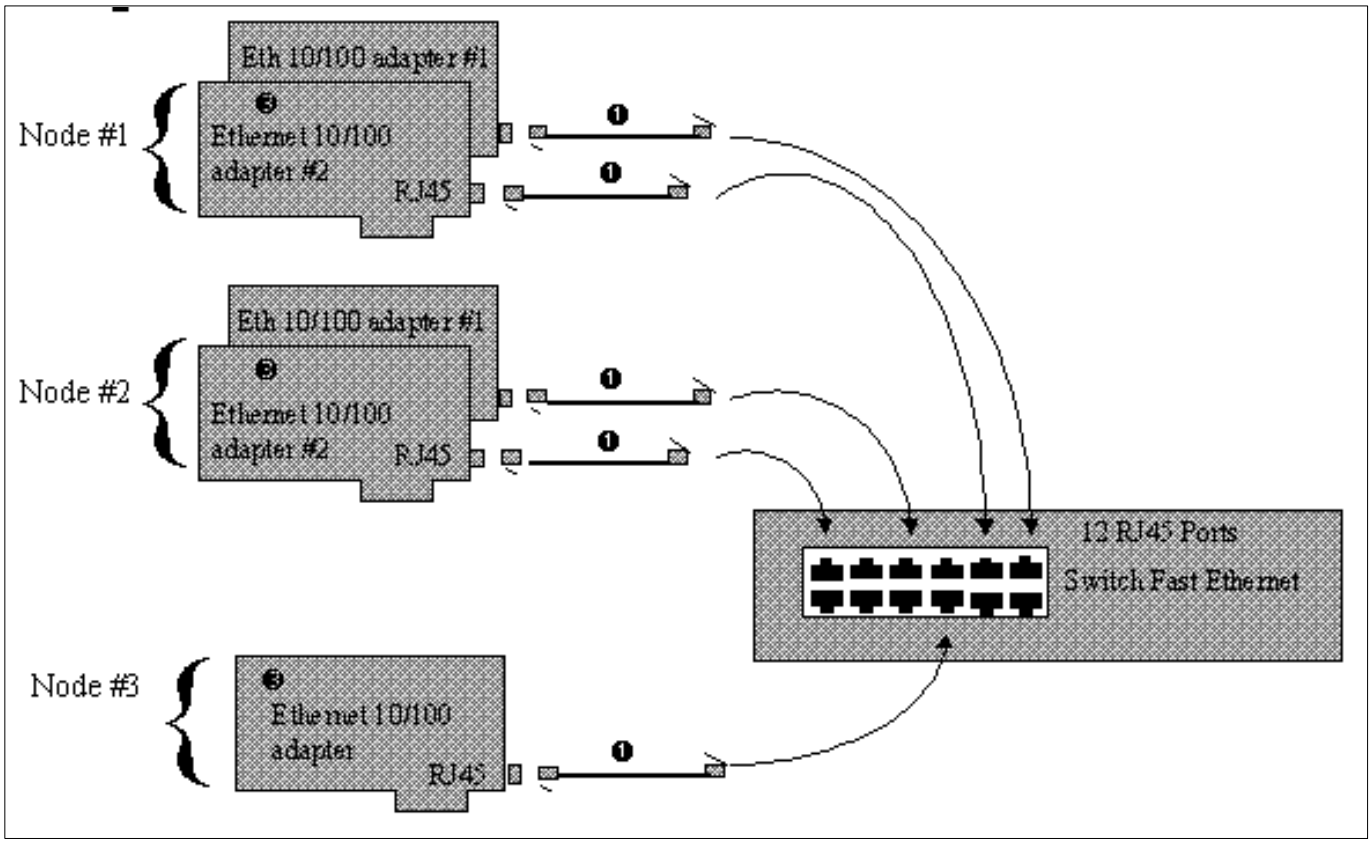


Figure 37. INTCF10: Ethernet Switch Single Interconnect for 3 to 8 Nodes with Dual Adapters Per Node

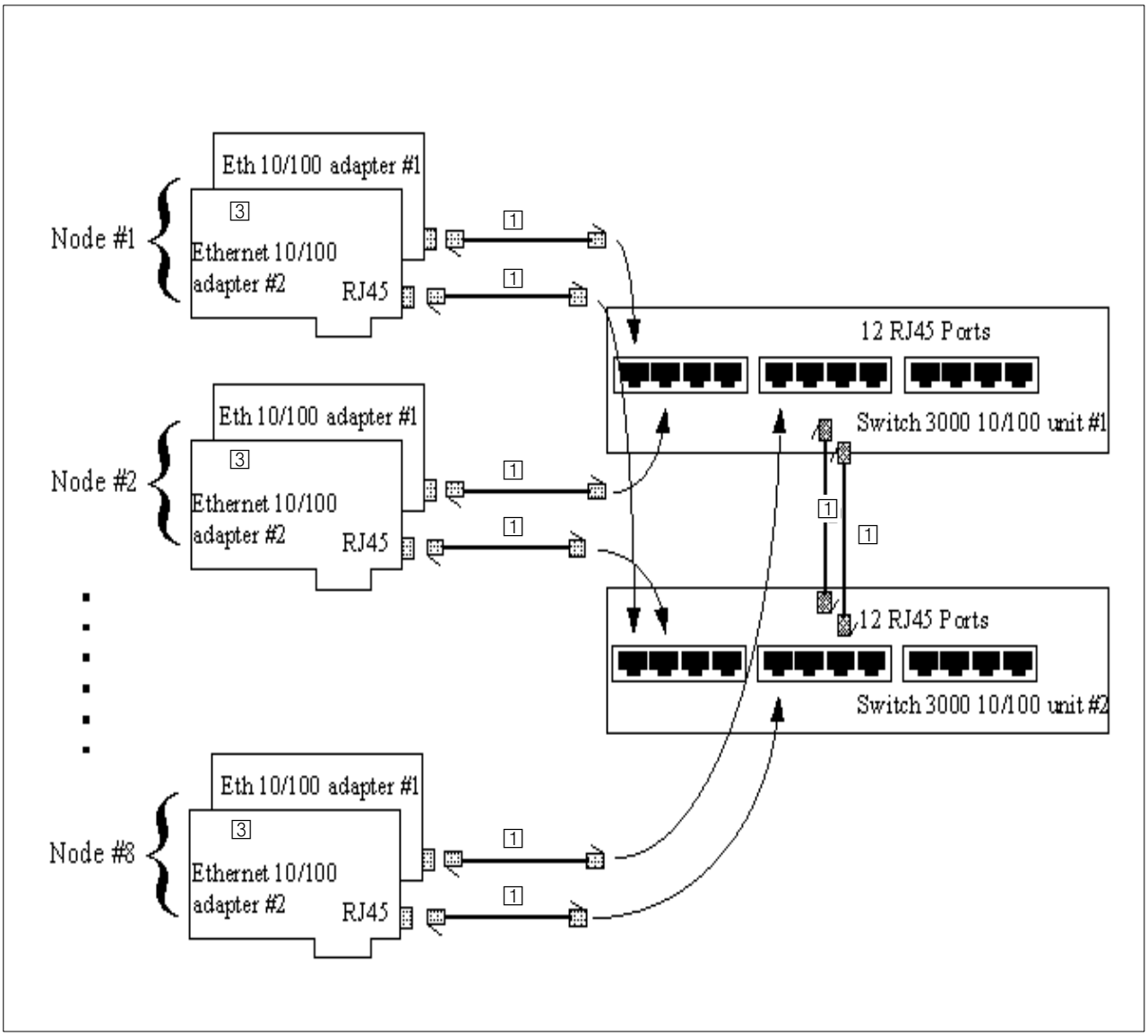


Figure 38. Redundant Fast Ethernet Interconnect for 3 to 8 Nodes

Cabling Instructions

Between 2 Nodes (node #1 and node #2)

Connect one end of the cross–over cable (CBLG161–1900) to the RJ45 port on the Ethernet 10/100 adapter on node #1, and the other end to the RJ45 port on the Ethernet 10/100 adapter on node #2.

With a Hub

First of all, a SuperStack II Hub 10 Management Module (3C16630A) has to be fitted to each Hub 10 12 Port TP unit (3C16670A) to provide SNMP management.

Refer to the vendor publication *Superstack II Hub 10 Management User Guide.*

Warning: Carefully follow the User Guide instructions when connecting. Otherwise damage to the hub module could result.

For each node, connect one end of the cable (CBLG179–1900) to a RJ45 port on the Hub unit and the other end to the RJ45 port on the Ethernet 10/100 MCA adapter of the node.

Connect node #1 to port 1x of the hub,
node #2 to port 2x
node #3 to port 3x
and so on.

With a Switch

For each node, connect one end of the cable (CBLG179–1900) to a RJ45 port on the Switch unit and the other end to the RJ45 port on the Ethernet 10/100 MCA adapter of the node.

Connect node #1 to port 1x of the switch,
node #2 to port 2x
node #3 to port 3x
and so on.

If there is a serial port left on the Console Concentrator, an RS–232 cable (CBLG106–2000) with a 9–pin RS–232C adapter (CBL1912) can be wired between the Console Concentrator (CS/2600) of the Powercluster and the RS–232 console serial port on the hub (Management Module) or on the rear of the switch. This pair of cables comes with the Console Concentrator.

Switch Configuration: to be set to auto–baud, 8 data bits, no parity and 1 stop bit.

General Configuration Procedure

The following steps describe the network configuration phase of an interconnect.

Note: This procedure is the same whatever the interconnect type (Ethernet switch, or FDDI hub).

Configure IP addresses
Ping and Rlogin between nodes.

Configuring Network Interfaces

Configuring the network interfaces (en1, en0 or fi1, fi0) regarding the interconnect on each node:

For node #1 go to the following smit menu:

#smit mktcpip
according to the adapter type (Ethernet adapter, FDDI adapter)
select **en0** or **fi0**

```
Minimum Configuration & Setup
To delete existing configuration data, please use Further
Configuration menus.

Type or select values in entry fields
Press Enter AFTER making all desired changes.
                                        [Entry Fields]

*HOSTNAME                               [node1_X]
*Internet ADDRESS (dotted decimal)      [100.100.100.1]
Network MASK (dotted decimal)           [255.255.255.0]
*Network INTERFACE                      en0 (or fi0)

Your CABLE Type                         dix (or tp) +
START Now                               yes         +
```

For node #2 go to the smit menu:

#smit mktcpip
according to the adapter type (Ethernet 10/100 adapter, or FDDI adapter)
select **en0** or **fi0**

```
Minimum Configuration & Setup
To delete existing configuration data, please use Further
Configuration menus.

Type or select values in entry fields
Press Enter AFTER making all desired changes.
                                        [Entry Fields]

*HOSTNAME                               [node2_X]
*Internet ADDRESS (dotted decimal)      [100.100.100.2]
Network MASK (dotted decimal)           [255.255.255.0]
*Network INTERFACE                      en0 (or fi0 or sf0)

Your CABLE Type                         dix (or tp)+
START Now                               yes        +
```

And proceed the same for the other nodes, if any, without forgetting incrementing IP address.

There may be several interconnects in an Escala Powercluster configuration.

In order to configure the other adapters on a node, please use the **SMIT Further Configuration** menus. Otherwise the HOSTNAME would be changed.

For that type **`#smit tcpip`**

Then through the sequence of displayed menus

select

Further Configuration
Netwok Interface
Network Interface Selection
Change/Show Characteristics of Network Interface

and choose the network interface (**en1**, **fi0**) to be configured

```
*Network Interface Name                  [fi0]
*Internet ADDRESS (dotted decimal)       [111.111.111.x]
 Network MASK (dotted decimal)           [255.255.255.0]
*Current State                           [up]
 Use ARP                                 [yes]
 Broadcast Address
```

Note: The interconnects of an Escala Powercluster define separate IP networks. The IP addresses used on two interconnects pertain to two different networks.

Updating the Name Directories

The following applies to an interconnect. Do it as many times as there are interconnects.

On node #1 append the node name and IP address to the /**etc**/**hosts** file
100.100.100.1 node1_X

create /.rhosts file with node #1, node #2 and other nodes, if any
 # vi/.rhosts
insert
node1_X
node2_X
...

On node #2 append the node name and IP address to the /**etc**/**hosts** file
100.100.100.2 node2_X

create /.rhosts file with node #1, node #2 and other nodes
 # vi/.rhosts
insert
node1_X
node2_X
...

And so on for the other nodes.

Checking the Interconnection of the Nodes

On node #1 ping every node and check reachability with every node
 # ping node2_X
 # rsh node2_X uname –a
which returns **AIX node2_X**

 # ping node3_X
 # rsh node3_X uname –a
which returns **AIX node3_X**
and so on.

On node #2 ping every node and check reachability with every node

 # ping node1_X
 # rsh node1_X uname –a
which returns **AIX node1_X**

 # ping node3_X
 # rsh node3_X uname –a
which returns **AIX node3_X**

and so on.

and proceed the same with all the other nodes.

Setting Network Parameters for Testing

Ethernet

TCP/IP Configuration

Default values:

thewall = 16384	psebufcalls = 20	tcp_keepintvl = 150
sb_max = 65536	strturncnt = 15	tcp_keepidle = 14400
somaxconn = 1024	pseintrstack = 12288	bcastping = 0
clean_partial_conns = 0	lowthresh = 90	udpcksum = 1
net_malloc_police = 0	medthresh = 95	tcp_mssdflt = 512
rto_low = 1	psecache = 1	icmpaddressmask = 0
rto_high = 64	subnetsarelocal =	tcp_keepinit = 150
rto_limit = 7	maxttl = 255	ie5_old_multicast_mapping = 0
rto_length = 13	ipfragttl = 60	rfc1323 = 0
arptab_bsiz = 7	ipsendredirects = 1	pmtu_default_age = 10
arptab_nb = 25	ipforwarding = 0	pmtu_rediscover_interval = 30
tcp_ndebug = 100	udp_ttl = 30	udp_pmtu_discover = 0
ifsize = 8	tcp_ttl = 60	tcp_pmtu_discover = 0
arpqsize = 1	arpt_killc = 20	ipqmaxlen = 100
route_expire = 0	tcp_sendspace = 4096	directed_broadcast = 1
strmsgsz = 0	tcp_recvspace = 4096	ipignoreredirects = 0
strctlsz = 1024	udp_sendspace = 9216	ipsrcroutesend = 1
nstrpush = 8	udp_recvspace = 41600	ipsrcrouterecv = 0
strthresh = 85	rfc1122addrchk = 0	ipsrcrouteforward = 1
psetimers = 20	nonlocsrcroute = 0	

Figure 39. TCP/IP Configuration Default Values

Adapter Configuration

Default values:

Transmit queue size = 64 Receive buffer pool size = 32

Configuring PCI Fast Ethernet Adapter

For the media speed parameter of any PCI adapter, it is recommended:

- not to let the auto-negotiating default behavior, but to set the speed 10Mbps or 100Mbps of the adapter according to the LAN speed
- to choose half duplex mode when using a Fast Ethernet switch
- to choose full duplex mode when there is no Fast Ethernet switch.

Chapter 8. Gigabit Ethernet Interconnect Requirements

Describing particular cabling for Gigabit Ethernet applications.

Gigabit Ethernet Interconnect Requirements – Overview

Details in:

Hardware Components

Gigabit Ethernet Interconnect Full Kit (2 EPC400-N)

DCKG029–0000

DCKG029–0000 component is only used to link two EPC400 nodes with a single Ethernet link without switch.

Identificator	Description	Quantity
DCCG144–0000	Gigabit Ethernet SX-PCI Adapter (2969)	2
CBLU170–1800	6m SC-SC Optical Fibre Cable	1

Gigabit Ethernet Interconnect Base Kit

DCKG010–0000

Identificator	Description	Quantity
DCCG144–0000	Gigabit Ethernet SX-PCI Adapter (2969)	2
CBLG170–1800	**6m SC-SC Optical Fibre CAble**	1

Gigabit Ethernet Switch Kit (Models of 3 to 8 Nodes)

DCUG003–0000

Identificator	Description	Quantity
3C93012–ME	SuperStack II Gigabit Eth. Switch 9300 12–Port SX	1
GCORSECA01	Internal Power Cord (to PDB) – [90228002–001]	1

Examples of Use

Interconnect Between Two Nodes

A Gigabit Ethernet Interconnect Full Kit component is only used to link two PCI nodes with a single Gigabit Ethernet link without switch.

Interconnect of Three Up to Eight Nodes

The Gigabit Ethernet Interconnect Base Kit components and Gigabit Ethernet Switch component are used together to set up a Gigabit Ethernet–based interconnect between more than two PCI nodes:

- There are as many Gigabit Ethernet Interconnect Base Kit components as nodes to be interconnected, and there is a Gigabit Ethernet Switch (DCUG003) for a 1Gbps Ethernet interconnect.
- For each node, the Gigabit Ethernet Interconnect Base Kit corresponding to the node type is used.
- A Gigabit Ethernet crossed cable (CBLG161–1900) is automatically generated for linking the two nodes. This means that the two Gigabit Ethernet cables (CBLG179–1900) included the Gigabit Ethernet Interconnect Base Kits are not used in this case.

Gigabit–Ethernet Switch Overview

The SuperStack II Switch 9300 (MI 3C93012–ME) delivers full line rate, nonblocking switching among all 12 Gigabit Ethernet 1000BASE– SX ports with SC connectors for using multimode (MMF) Fibre.

The Switch 9300 supports full–duplex mode on all Gigabit Ethernet ports and up to 16,000 MAC addresses.

Local management can be performed via an RS–232 (DB–9 port) line, as well as out–of–band management via an RJ45 port.

For the latter, the Gigabit Ethernet switch 9300 can be connected to the Cluster Administration Hub, if any; take a cable CBL179 provided with the Cluster Hub, or to the customer's 10Base–T Ethernet LAN.

Switch 9300 Physical Characteristics

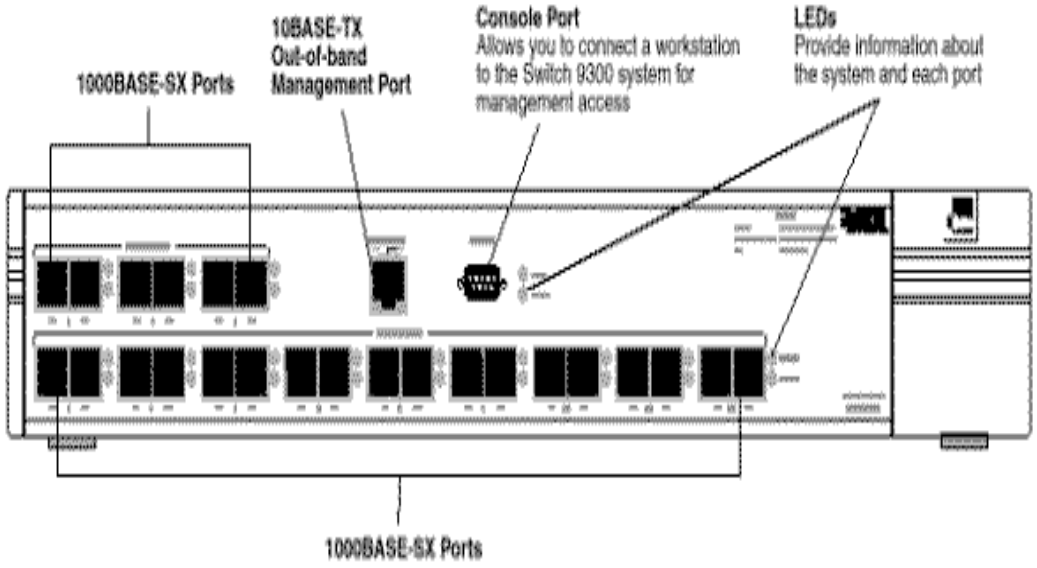


Figure 40. Switch 9300 – Front View

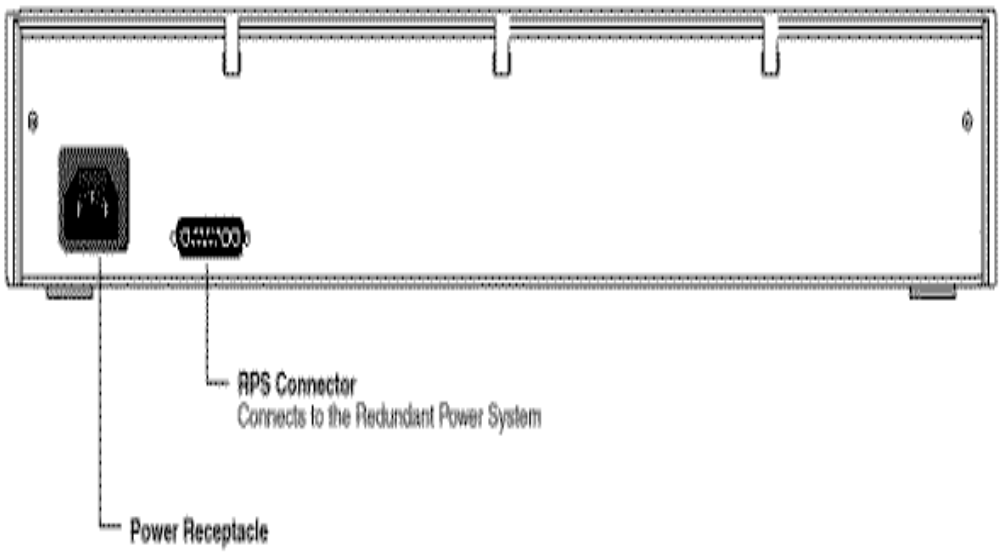


Figure 41. Switch 9300 – Rear View

Cabling Diagrams

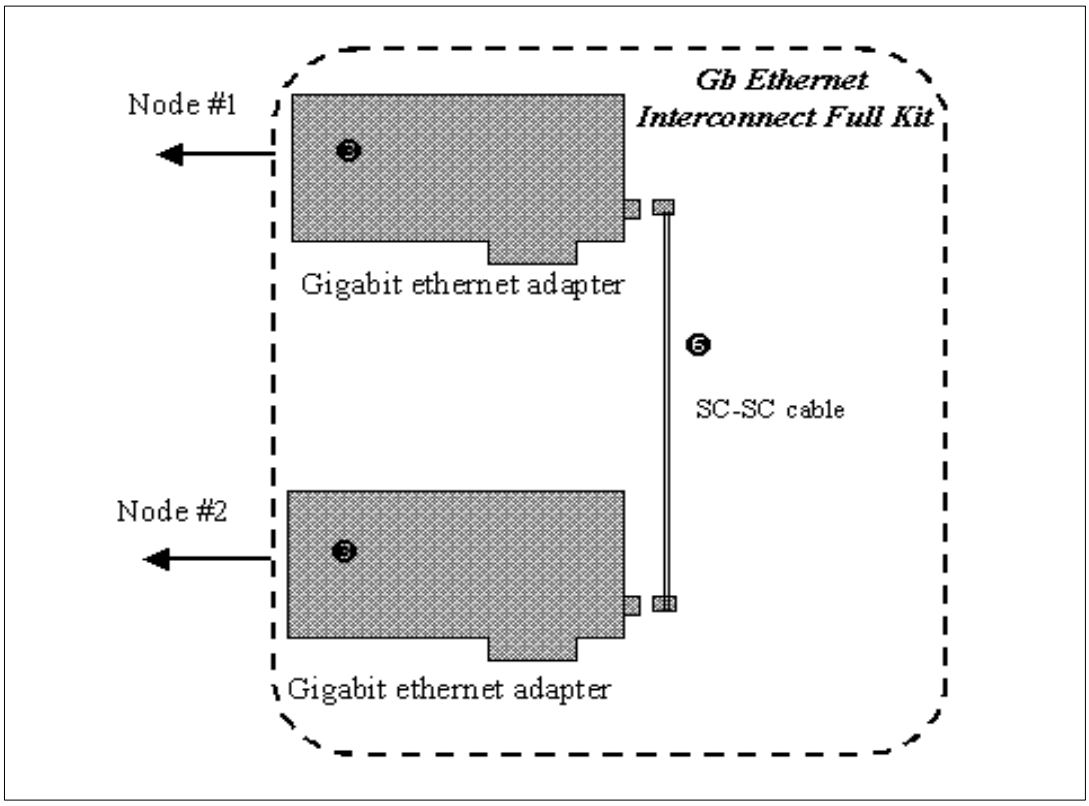


Figure 42. Gigabit Ethernet Interconnect for 2 Nodes

Figure 43 depicts an interconnect where each node has a single attachment.

For nodes having dual gigabit ethernet adapters for HACMP purpose, there are two SC–SC links between a node and the switch.

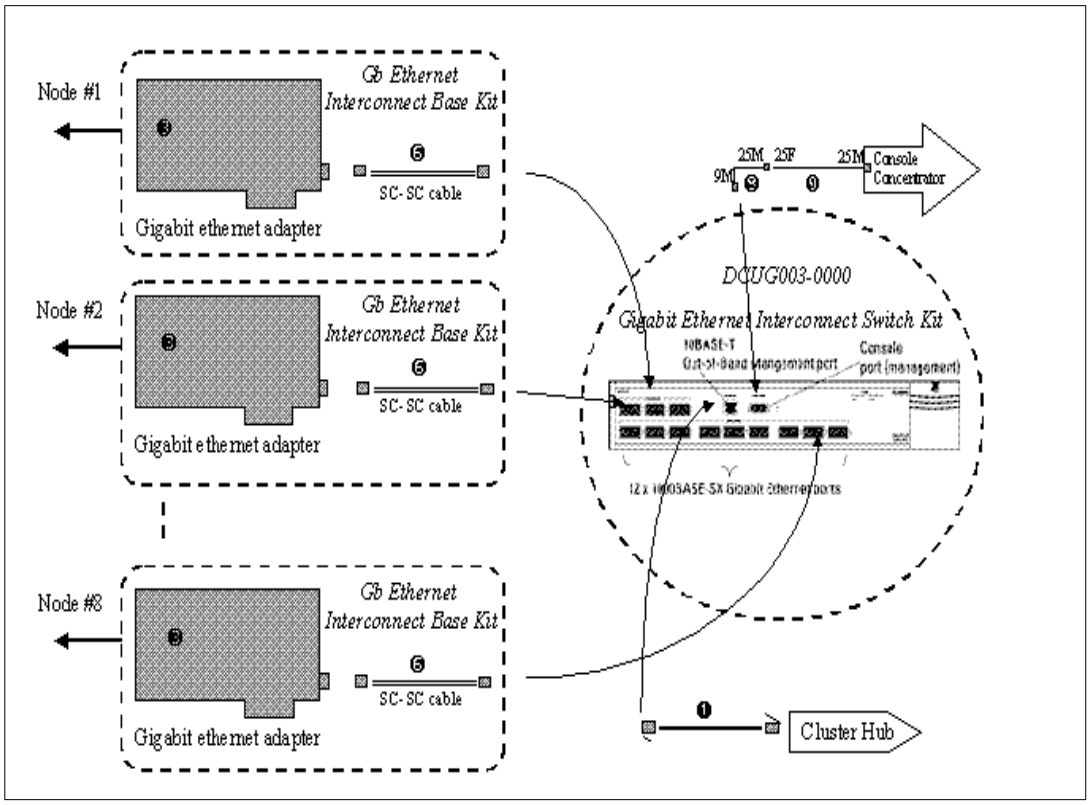


Figure 43. Gigabit Ethernet Interconnect for >2 Nodes

Quick Installation Guide

Audience: The following provides quick procedures for installing the SuperStack¿ 9300. It is intended for trained technical personnel only who has experience installing communications equipment.

To install the SuperStack¿
information on each setup task, see the related sections in this guide or complete details in the indicated documents.

Determine Site Requirements:

Install the SuperStack II Switch 9300 system in an area that meets the requirements in Figure 44.

Figure 44. System Site Requirements

Location	· Ambient (room) temperature – 0 to 50 ¿ ¿ · Relative humidity – 10% to 90%, noncondensing · A level surface for system installation
Power	· Power supply – 175 Watts · Power source location –¿ meters · Input voltage options – 100 to 120 VAC or 200 to 240 VAC · Current rating – 100 VAC at 1.9 amperes (maximum) or 200 VAC at 0.79 amperes (maximum)

Warning: For your safety and to ensure adequate cooling airflow, keep blank faceplates over all empty slots.

If you need more information on site requirements, see Appendix B: Site Requirements and Safety Codes in the Getting Started Guide for your system

Unpack the system

Check the packing slip to ensure that you have all of the components that you ordered.

The system is shipped with one power supply installed. If you have ordered a redundant power supply or uninterruptible power supply for the system, be sure to have it available for installation.

Install the system

Before you install the system:

- Move the system close to where you plan to install it.
- Have a Number 1 Phillips screwdriver available.
- Have the hardware kit available. See below

Figure 45. System Hardware Mounting Kit

Item	Qty	Use in
Rubber feet (self–adhesive)	4	Installing the system on a table top
Mounting bracket	2	Installing the system in the distribution rack
M4 x 10 Phillips pan–head screws	6	Installing the system in the distribution rack

Determine whether you are installing the system on a tabletop or in a distribution rack.

For complete installation instructions, see Chapter 2: Installing the System in the Getting Started Guide for your system.

Warning: Hazardous energy exists within the SuperStack II Switch 9300 system. Always be careful to avoid electric shock or equipment damage. Many installation and troubleshooting procedures should be performed only by trained technical personnel.

Install optional power supply

The system operates using a single power supply assembly and is shipped with one power supply installed.

You can add an uninterruptible power supply (UPS) to the system. The additional power supply is orderable and shipped separately. Contact your sales representative.

You can add a redundant power supply (RPS) to the system. The additional power supply is orderable and shipped separately.

For instructions on how to install the RPS, see the Advanced RPS Power Module Type 2 User Guide.

Attach the cables

Cable your system for connecting these elements to your network:

- 1000BASE–SX/LX connectors
- 10BASE–T out–of–band port connector
- Console port

For information on cabling ports, see Chapter 3: Cabling in the Getting Started Guide for your system.

Power On the system

Place the system near an easily accessible power outlet. You can only power down the system by removing the power cord from the power source. To get your system powered up and ready to operate:

- Verify that each unused slot in the system is covered with a blank faceplate.
- To view possible error messages in the Administration Console while the system is running power–up diagnostics, connect a terminal, workstation, or PC with terminal emulation software to the system's terminal serial port.
- On the back panel, plug the power cord into the power receptacle.
- CAUTION: To prevent a possible fire hazard, be sure to fully insert the power cord.
- Plug the other end of the power cord into a power outlet.

LEDs and Power–up Diagnostics

Your system runs diagnostic software at power up. This software verifies that every component in the system is operating correctly. If any component fails during power–up diagnostics, the system either fails to power up or it prevents faulty modules from coming online.

For diagnostic messages, view the system configuration display in the administration console (if you have connected the system to a workstation).

The system and port LEDs are described in Figure 46.

Figure 46. System and Port LEDs

LED	Name	Type	Color Indications	Description
Power	–	System Power	Green No light	The system is powered on The system is powered off
Fault	–	System Fault	Yellow No light	The system has failed diagnostics or other operational error has occurred The system is operational
Pckt	Packet	Port Activity	Yellow Blinking Yellow No light	Data is passing through the port Data is passing through the port Data is not passing through the port
Stat	Status	Port Link	Green Blinking Green No light	The port is online The port is online but disabled The port is off–line

Configure system for management

Your system is shipped from the factory with IEEE 802.1 bridging set to off. To configure your system for your particular networking environment (including customized filtering, SNMP setup, and routing), you must first establish management access.

You can manage your system locally through a terminal connection or remotely using an IP or modem connection. Figure 47 describes the access mechanisms.

For more information on access mechanisms, see Chapter 6: Quick Setup for Management Access in the Getting Started Guide for your system.

Figure 47. Management Access Mechanisms

Access Mechanism	Access Description	Interface
Terminal	Connect directly to the Administration Console and stay attached during system reboots	Console port
Modem	Access the Administration Console from remote sites	Console port
IP	Access the Administration Console using the rlogin or telnet commands.	Ethernet port assigned to an IP interface

Out–of–band Management:

Uses the dedicated administration network for management data. You configure a system management interface for the Ethernet 10BASE–T out–of–band port

To manage your network out of band:

- From the top level of the Administration Console, enter: **management ip interface define**
- Enter the IP address for the out–of–band port.
- Enter the subnet mask of the subnetwork to which you want to connect the interface. Press Return or Enter to accept the default subnet mask.
- Enter **system** as the interface type.

Administer and Operate the system

See the Administration Guide for information for solving any problems

See also Appendix D: Technical Support in the Getting Started Guide for your system.

For information on how to administer and operate the SuperStack II Switch 9300, see the Administration Guide on the Documentation CD and the Software Installation and Release Notes.

Chapter 9. FDDI Interconnect Requirements

Describes particular cabling for FDDI applications.

FDDI Interconnect Requirements – Overview

Details in:

Hardware Components

FDDI Interconnect Full Kit (2 EPC400-N)

DCKG013–0000

DCKG013–0000 component is only used to link two EPC400 nodes with a double FDDI link without hub.

Identificator	Description	Quantity
DCCG103–0000	PCI FDDI Fibre Dual Ring Adapter (SysK)	2
CBLU170–1800	FDDI Fibre SC–SC cable (6m)	2

FDDI Interconnect Base Kit (EPC400-N)

DCKG014–0000

Identificator	Description	Quantity
DCCG103–0000	PCI FDDI Fibre Dual Ring Adapter (SysK)	1
CBLG171–1800	FDDI Fibre SC–MIC cable (6m)	2

FDDI Interconnect Full Kit (2 EPC800-N)

DCKU107–0100

DCKU107–0100 component is only used to link two EPC800 nodes with a double FDDI link without hub.

Identificator	Description	Quantity
DCCG076–0000	MCA FDDI Fibre Dual Ring Adapter	2
CBLG160–1800	FDDI Fibre MIC-MIC Cable (6m)	2

FDDI Interconnect Base Kit (EPC800-N)

DCKU108–0100

Identificator	Description	Quantity
DCCG076–0000	MCA FDDI Fibre Dual Ring Adapter	1
CBLG160–1800	FDDI Fibre MIC-MIC Cable (6m)	2

FDDI Interconnect Full Kit (2 EPC1200-N)

DCKG015–0000

DCKG015–0000 component is used to link:

two EPC1200 nodes

or

two EPC1200A nodes

or

an EPC1200 node and an EPC1200A nodes

with a double FDDI link without hub.

Identificator	Description	Quantity
DCCG124–0000	PCI FDDI Fibre Dual Ring Adapter (2742)	2
CBLU170–1800	FDDI Fibre SC–SC cable (6m)	2

FDDI Interconnect Base Kit (EPC1200-N)

DCKG016–0000

Identificator	Description	Quantity
DCCG124–0000	PCI FDDI Fibre Dual Ring Adapter (2742)	1
CBLG171–1800	FDDI Fibre SC–MIC cable (6m)	2

FDDI Hub Kit (models of 3 to 6 nodes)

DCKU109–0000

Identificator	Description	Quantity
CBLG160–1800	FDDI Fibre MIC-MIC Cable (6m)	2
3C781	LinkBuilder FDDI Management Module	2
3C782	LinkBuilder FDDI Fibre-Optic Module (4 ports, MIC)	4
3C780–ME	LinkBuilder FDDI Base Unit	2
GCORSECA01	Internal Power Cord (to PDB) – [90228002–001]	2
GPOWSFBUK1	UK Power Cord – [90399222–001]	2

FDDI Hub Extension Kit (models of 7 or 8 nodes)

DCKU110–0000

The DCKU110–0000 component is necessary in addition to DCKU109–0000 for models of 7 or 8 nodes.

Identificator	Description	Quantity
3C782	LinkBuilder FDDI Fibre-Optic Module (4 ports, MIC)	1

Interconnect Between 2 Mixed Nodes

For each node, the FDDI Interconnect Base Kit corresponding to the node type is used. Two FDDI Fibre cables are used for linking the two nodes:

- In [EPC1200 node * EPC400 node] case or [EPC1200A node * EPC400 node] case, two FDDI SC–SC cables (CBLU170–1800) are generated with the order and used. It means that the pairs of FDDI fibre SC–MIC cables of the FDDI base kits are not used.
- In [EPC800 node * EPC1200 node] or [EPC800 node * EPC400 node] or [EPC800 node * EPC1200A node] cases, the two FDDI SC–MIC cables are used. The two FDDI MIC–MIC cables of the EPC800's FDDI base kit are not used.

Interconnect of More Than 2 Nodes

The FDDI Interconnect Base Kits and DCKU109–0000 are used together to interconnect more than two nodes with FDDI Hub technology.

There are as many FDDI Interconnect Base Kits as nodes to be interconnected, and there is a pair of FDDI Hubs (one DCKU109–0000).

For each node, the selected FDDI Interconnect Base Kit corresponds to the node type. In case of EPC400 node, EPC1200 node or EPC1200A node, the SC–SC cable of the FDDI Base Kit is not used.

The DCKU110–0000 component is necessary in addition to DCKU109–0000 for configurations of 7 or 8 nodes.

Cabling Diagrams

INTCF05 FDDI Interconnect for 2 Nodes

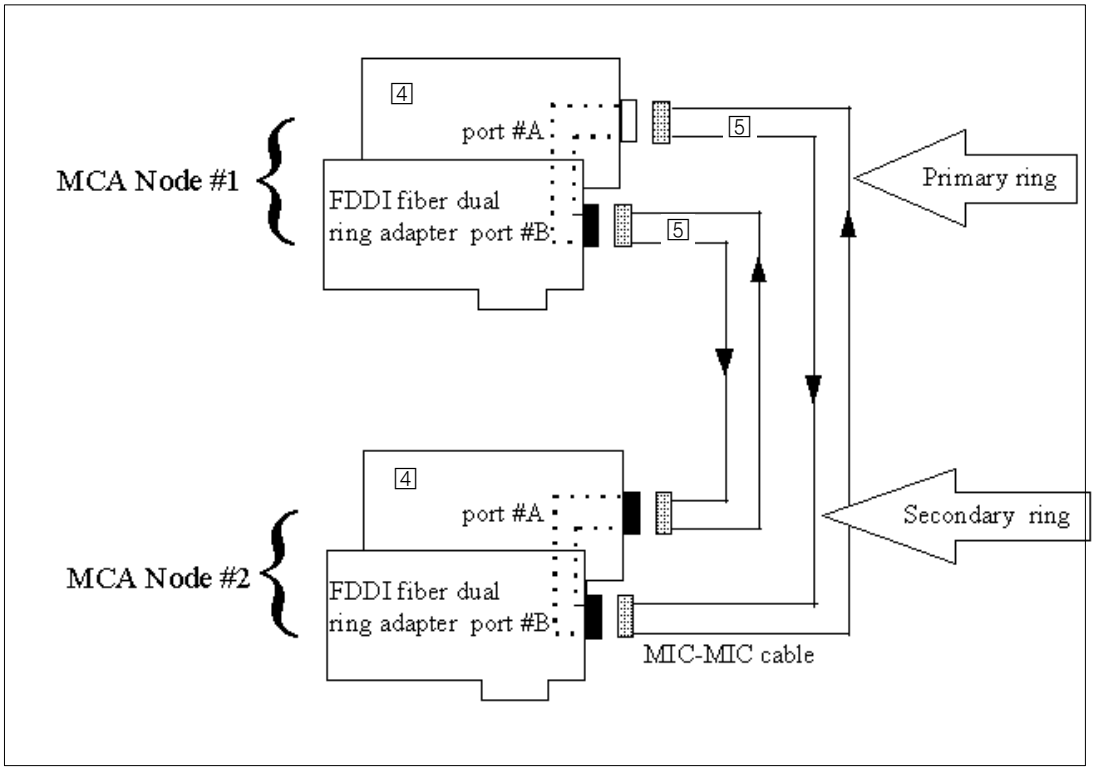


Figure 48. INTCF05: FDDI Interconnect for 2 Nodes. Case: EPC800 Nodes.

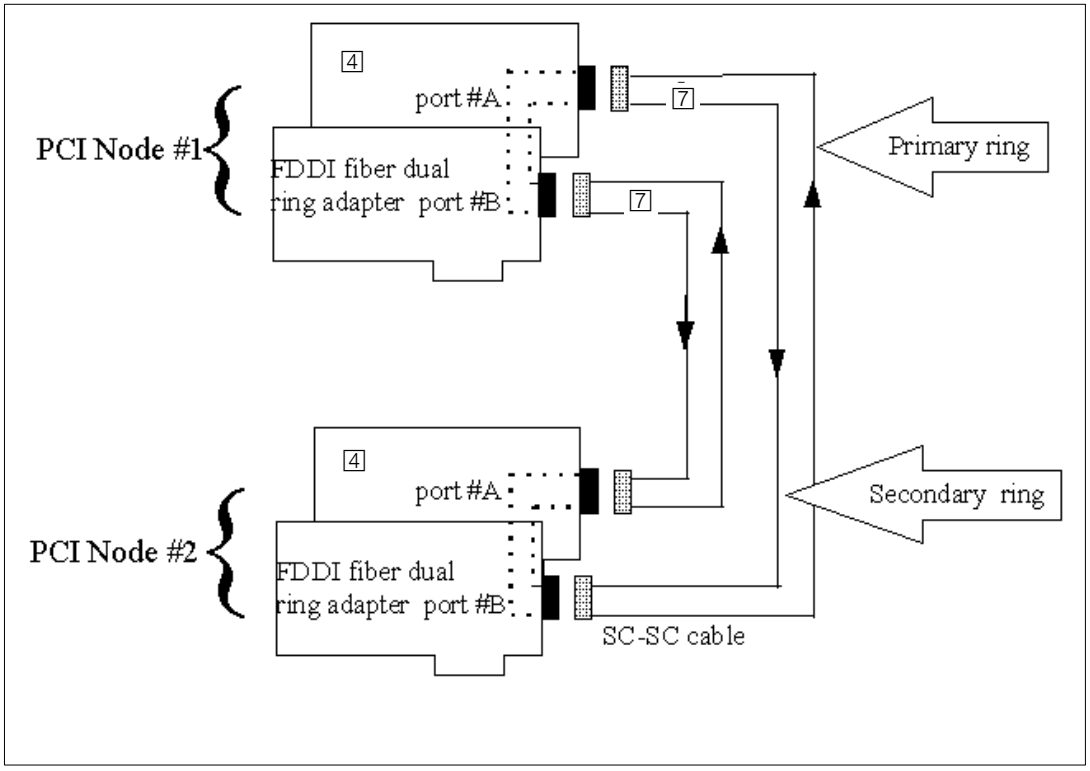


Figure 49. INTCF05: FDDI Interconnect for 2 Nodes. Case: EPC1200, EPC1200A and/or EPC400 Nodes.

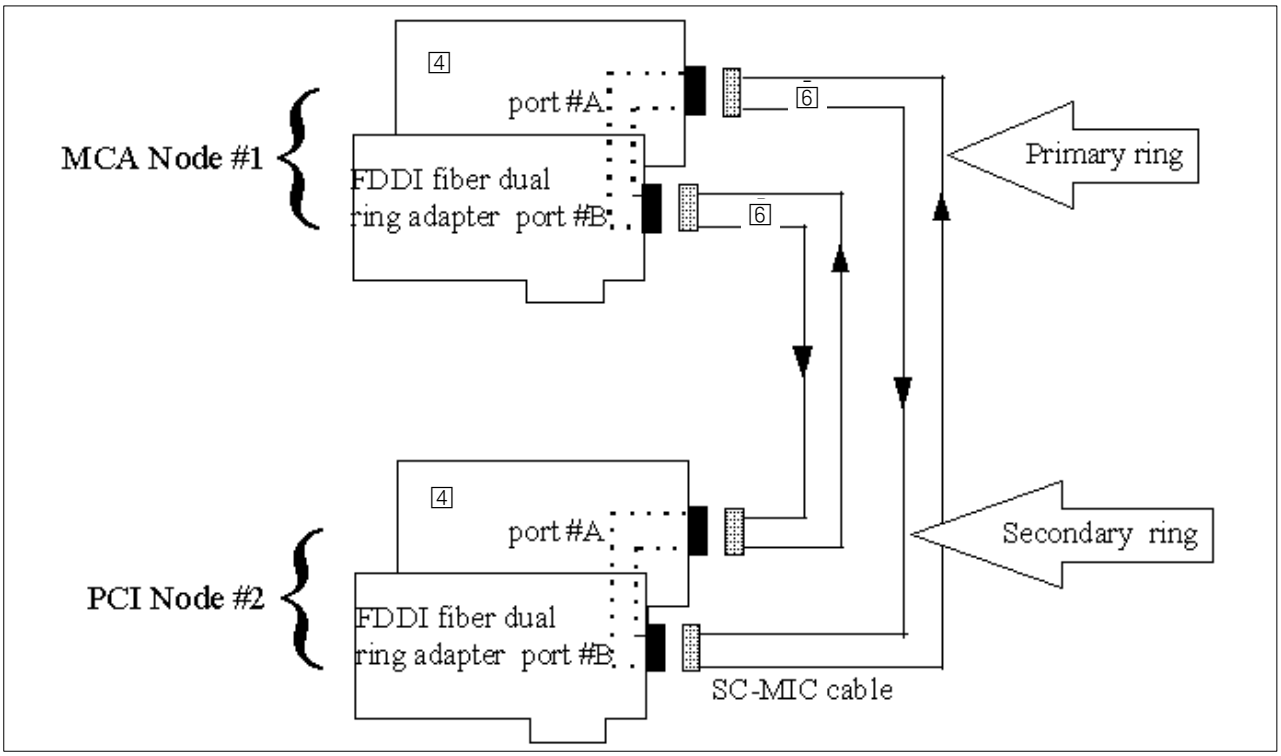


Figure 50. INTCF05: FDDI Interconnect for 2 Nodes. Mixed Case: (MCA * PCI nodes) with an EPC800 node.

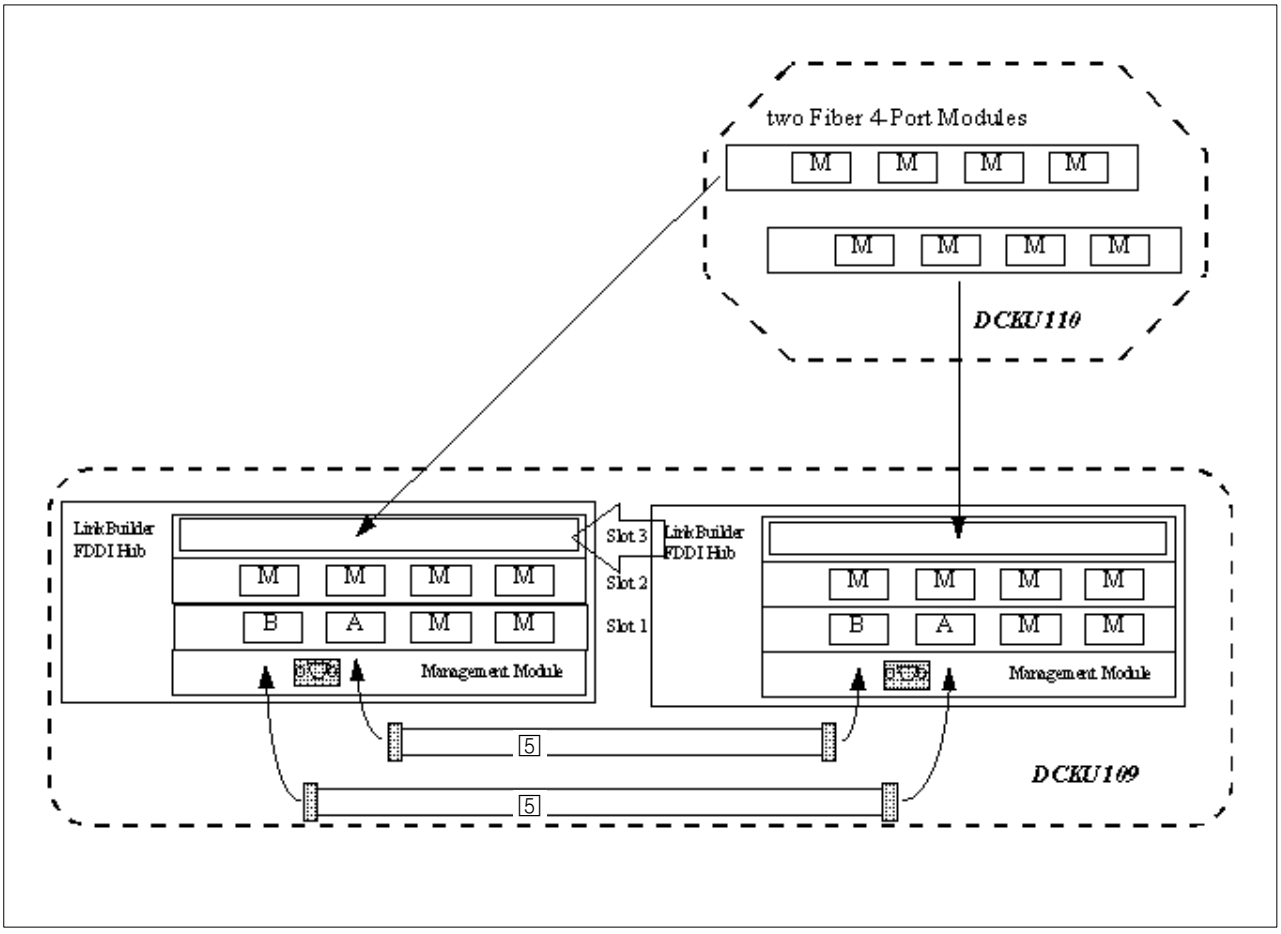


Figure 51. Components of FDDI Interconnect with Hub (Dual Homing)

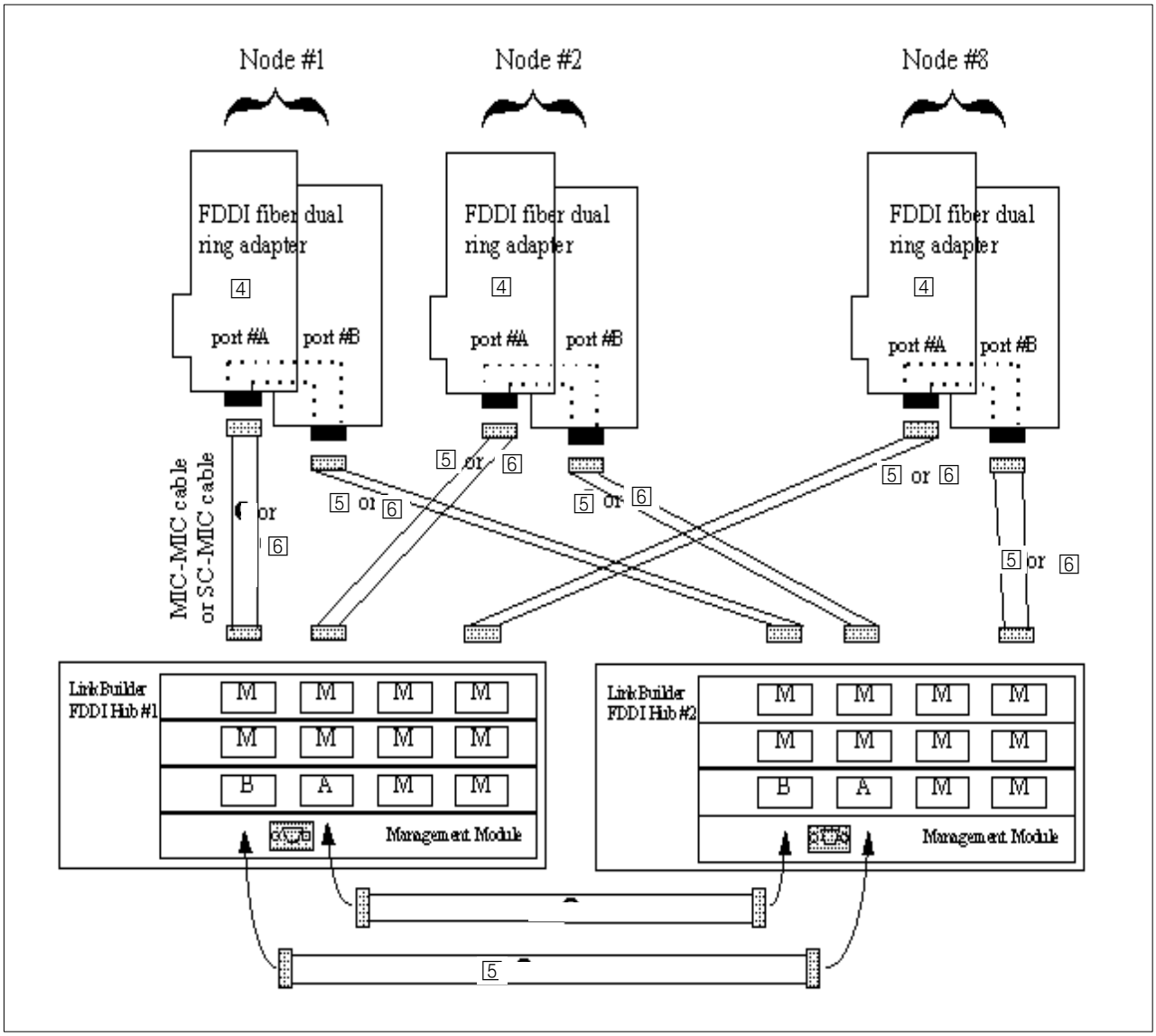


Figure 52. INTCF06: FDDI Interconnect with Hub (Dual Homing)

Cabling Legend

Item	M.I.	Node Type	Designation	Length	FRU
1	CBLG179–1900		Ethernet cable RJ45/RJ45 - 100 Mhz	10m	91094001–001
2	CBLG161–1900		Ethernet cross cable RJ45/RJ45	10m	91093001–001
3	DCCG094–0000	EPC800	Ethernet 10/100 MCA adapter	-	
	DCCG085–0000	EPC400	PCI Ethernet 10/100 adapter (SMC)	-	
	DCCG137–0000	EPC1200	Ethernet 10/100 PCI adapter (IBM)	-	FC–S70–2968
4	DCCG076–0000	EPC800	FDDI Fibre Dual Ring MCA adapter	-	76729471-001
	DCCG103–0000	EPC400	PCI FDDI Fibre Dual Ring adapter	-	
	DCCG124–0000	EPC1200	FDDI Fibre Dual Ring PCI adapter	-	FC–S70–2742
5	CBLG160–1800		FDDI Fibre MIC-MIC cable	6m	90022006–001
6	CBLG171–1800		FDDI Fibre SC-MIC cable	6m	90022306-001
7	CBLU170–1800		FDDI Fibre SC-SC cable	6m	90666206-001
8	CBL1912		Adapter RS232 cable (9M/25M)	0.3m	76958073-002
9	CBLG106–2000		Remote cable RS232 (25F/25M)	15m	90234001-001

Cabling Instructions

Dual homing configuration provides two attachments to FDDI network. One of them functions as a backup link if the primary link fails. This type of attachment is especially useful for connecting to mission–critical devices.

The hub chassis provides slots for one management module (required) and three media modules.

The LinkBuilder FDDI Management Module must be inserted in slot 0. This module provides management and configuration functions through a console interface. Access to this interface is eitheir by a 9–pin RS–232C console serial port for a terminal or modem connection or via TCP telnet protocol connection over the network.

If there are two serial ports left on the Console Concentrator, you can wire an RS–232 cable (CBLG106–2000) with a 9–pin RS–232C adapter (CBL1912) between the Console Concentrator (CS/2600) of the Powercluster and the RS–232 console serial port on each FDDI hub. These cables come with the Console Concentrator.

Three media modules are currently available. Each module can be placed in any slot, but the modules must be installed from the bottom up, beginning with slot 1.

Note: Do not leave empty slots between modules.

The two leftmost ports of modules installed in slot 1 can be configured; these two ports are designated as attachment ports.

The attachment ports can be configured as B and A, S and M, or M and M. The remaining two ports are M ports by default. If some modules are in slot 2 or 3, all ports are automatically configured as M ports:

- B/A configuration corresponds to dual attachment or to dual homing attachment.
- S/M configuration corresponds to single attachment,
- M/M configuration corresponds to null attachment.

The cabling diagrams shows the Link Builder FDDI hub with the management module and three Fibre media port module. These figures shows also the configuration ports for dual homing (ports configuration is written inside each port).

Between the Two Hubs

Connect the port B from the first hub to the port A from the second hub
Connect the port A from the first hub to the port B from the second hub.

Between the Nodes and Hubs

Each node is configured with dual ring adapter, therefore the cable coming from the ”A” card must be connected to one hub and the cable coming from the ”B” card must be connected to the other hub. Each cable coming from a node is plugged in a M port.

Regarding FDDI adapter installation, please refer to the Bull documentation:
FDDI Adapter – Installation and Configuration Guide. Cedoc reference 86 A1 53GX.

General Configuration Procedure

The network configuration phase of an interconnect are standard.

Note: This procedure is the same whatever the interconnect type (Ethernet hub single or double, Ethernet switch single or double, FDDI hub, FDDI switch, or FCS). See **General Configuration Procedure**, on page 7-11. The network configuration phase differs, and is given below.

Network Configuration

1. Set the attachment port configuration:

   type: `set attach`

   A selection prompt appears, select the B/A attachment port configuration

2. Set the IP address:

   type: `set ip xxx.xxx.xxx.xxx  yyy.yyy.yyy.yyy  zzz.zzz.zzz.zzz`

   where

   xxx.xxx.xxx.xxx is the Hub's IP address (e.g. 190.183.7.10)

   `yyy.yyy.yyy.yyy` is the netmask (e.g. 255.255.255.0)

   `zzz.zzz.zzz.zzz` is the broadcast IP address

3. To verify your IP address, type: `show ip`

4. Type: `connect`

   This command has the hub connected to the FDDI ring.

5. Try to ping the hubs from one of the nodes.

   Try to ping one node from another one.

To configure the IP address the conventional rules must be applied. With this LinkBuilder FDDI the dual ring between the two hubs could be on another subnetwork, to obtain the high availability some routes must be added for each hub.

Chapter 10. Disk Subsystems Cabling Requirements

Describing particular cabling for Disk Drive applications.

Disk Subsystems Cabling Requirements – Overview

More details in:

SSA Disk Subsystem

You will find:

MI List

Identificator	Description	FRU
SSAG007–0000	SSA DISK SUBSYSTEM RACK w/ four 4.5 GB Disk Drives	
SSAG009–0000	SSA DISK SUBSYSTEM RACK w/ four 9.1 GB Disk Drives	
SSAG004–0000	SSA DISK SUBSYSTEM RACK	
MSUG068–0000	4,5GB SSA DISK DRIVE MODULE	
MSUG082–0000	9,1GB SSA DISK DRIVE MODULE	
CKTG069–0000	SSA OPTIC FIBRE EXTENDER	
CBLG162–1400	SSA SUBSYSTEM CABLE (2,5M)	
CBLG162–1700	SSA SUBSYSTEM CABLE (5M)	
CBLG162–1900	SSA SUBSYSTEM CABLE (10M)	
CBLG163–1100	SSA LOOP TO LOOP CABLE (1M)	
MSCU101–0000	6216 – SSA ENHANCED 4–PORT ADAPTER (TYPE 4–G)	
MSCG021–0000	6214 – SSA 4–PORT ADAPTER (TYPE 4–D)	
MSCG029–0000	6217 – SSA RAID ADAPTER (TYPE 4–I)	
MSCG038–0000	6219 – MCA SSA 2-w JBOD & 1-w RAID ADAPTER (TYPE 4–M)	
MSCG024–0000	6218 – PCI SSA 1-w JBOD & RAID ADAPTER (TYPE 4–J)	
MSCG039-0000	6215 – SSA 4-PORT PCI Multi-Initiator/RAID EL ADAPTER (TYPE 4–N)	
MSCG036-0000	ditto but for EPC1200, EPC1200A	
CMMG110-0000	6222 – SSA Fast/Write 4MB Cache Option Card	

General Information

These components are used with the SSA model 020.

Use of internal bypass is allowed.

The cabling diagrams only deal with a single loop. For double loop, the physical connections must be doubled. The second loop can be set up on the same adapter or on a second one, in which case two adapters give a higher availability.

Disk mirroring can be implemented across two loops, through the standard features of the AIX system. (Disks on a loop are mirrored to disks on the other loop).

Standard cable length is 10m (MI CBLG162-1900). When several cable types are part of the configuration, start to use the larger cables and end with the shorter ones.

Put the disks in the increasing order of their bar–code number, starting by the front (slot on the left hand) and continuing by the rear (slot on the left hand). The loop includes an adapter on each node.

Additional diagrams illustrate the possible use of Optic Fibre Extender for implementing Powercluster with 500m distance between peer nodes and peer SSA disk subsystems as an answer to disaster recovery.

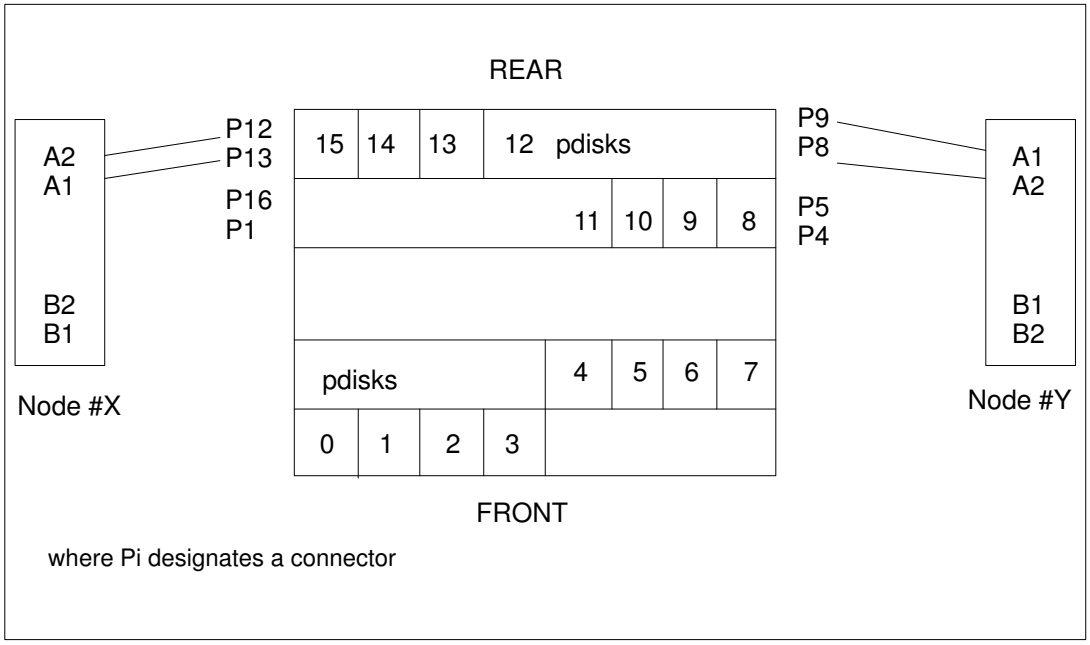


Figure 53. Example of 1 SSA cabinet and 1 adapter per node (one loop).

More information can be found in *Bull DPX/20 Escala 7133 SSA Disk Subsystems – Service Guide.*

Mixed Configurations

The following table shows the possible mixing of SSA adapters and number of initiators in an SSA loop, according to the SSA adapter type.

				MCA				PCI	
	MI	**Type**	**FC**	**6214**	**6216**	**6217**	**6219**	**6218**	**6215**
MCA	MSCG021	4-D	6214	2	1+1	–	–	–	–
	MSCU101	4-G	6216	1+1	8	–	–	–	–
	MSCU029	4-I	6217	–	–	1	–	–	–
EPC800	MSCG038	4-M	6219	–	–	–	8	–	8
PCI	MSCG024	4-J	6218	–	–	–	–	1	–
EPC400	MSCG039	4-N	6215	–	–	–	8	–	8
EPC1200/A	MSCG036			–	–	–	8	–	8

Legend: ”FC” = Feature code, ”–” = mix not possible.

Non–array disk drives and not configured for fast–write operations are assumed for sharing SSA disk subsystems.

Notes:

1. Only MCA adapters (6216) available on EPC800 nodes allows the sharing of SSA disk subsystems between 2 or more nodes (up to 8 adapters on a loop).

2. For PCI nodes (EPC400 and EPC1200) and for mixed configurations, sharing of a SSA loop is limited to 2 nodes with PCI adapters (6215) and MCA adapters (6219).

Cabling Diagrams

SSACF01: Cabling For 1 to 4 Nodes, With 1 SSA Cabinet and 1 to 4 Segments

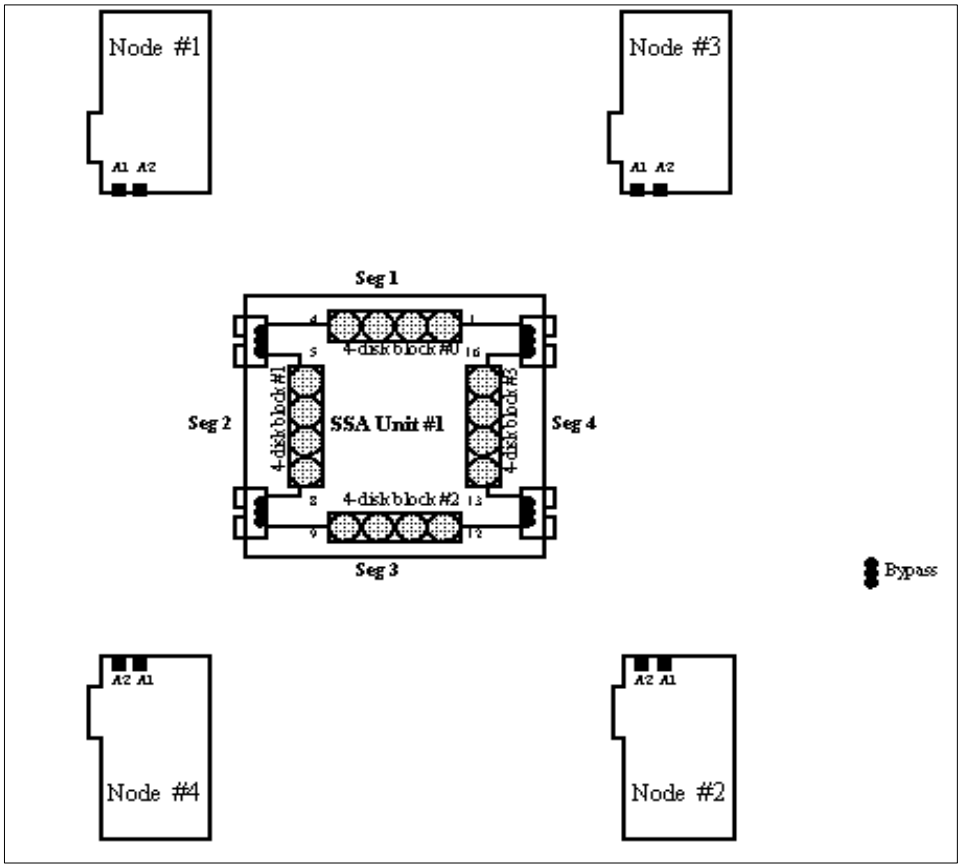


Figure 54. SSACF01: Base mounting diagram (1 to 4 nodes, 1 SSA cabinet, 1 to 4 segments).

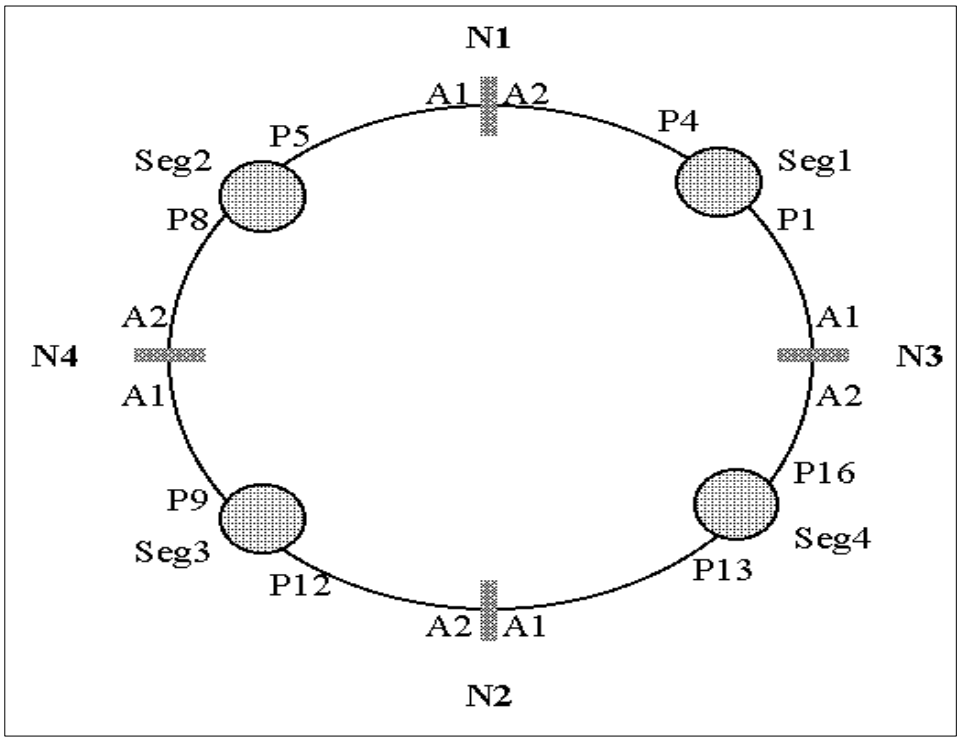


Figure 55. SSACF01: Loop diagram: 1 to 4 nodes, 1 SSA cabinet, 1 to 4 segments.

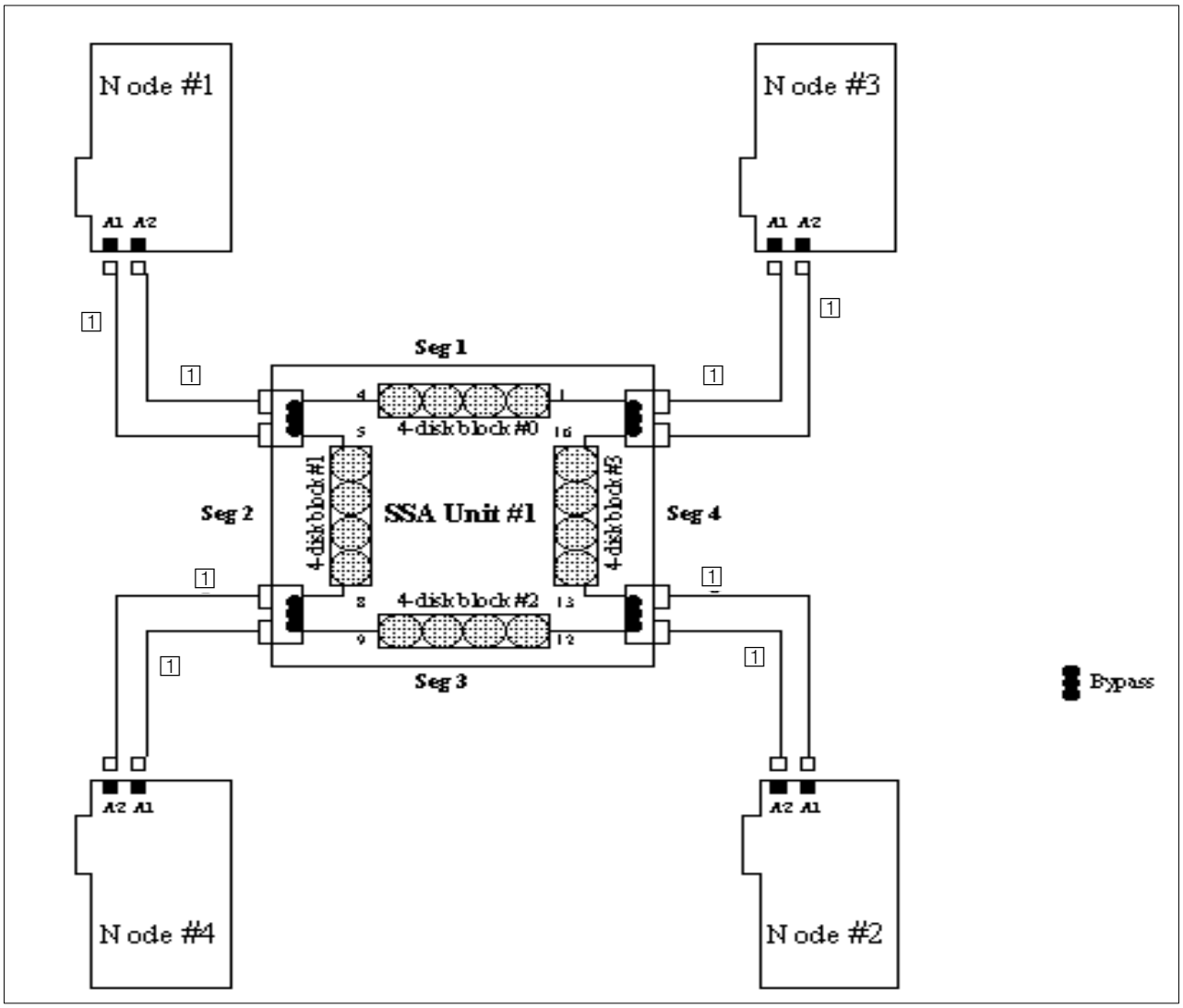


Figure 56. SSACF01: Cabling example for 4 nodes, 1 SSA cabinet and 16 disks.

Parts List

Cabling example for 4 nodes, 1 SSA cabinet and 16 disks.

Item	M.I.	Designation	Length	FRU
1	CBLG162-1900	SSA Subsystem cable	10m	IBM32H1466
2	CBLG162-2100	SSA Subsystem cable	25m	IBM88G6406
3	CBLG162-1700	SSA Subsystem cable	5m	IBM88G6404
4	CBLG162-1400	SSA Subsystem cable	2,5m	IBM32H1465
5	CBLG163-1100	SSA Loop to Loop cable	1m	IBM07H8985

SSACF02: Cabling For 1 to 6 Nodes, With 2 SSA Cabinets

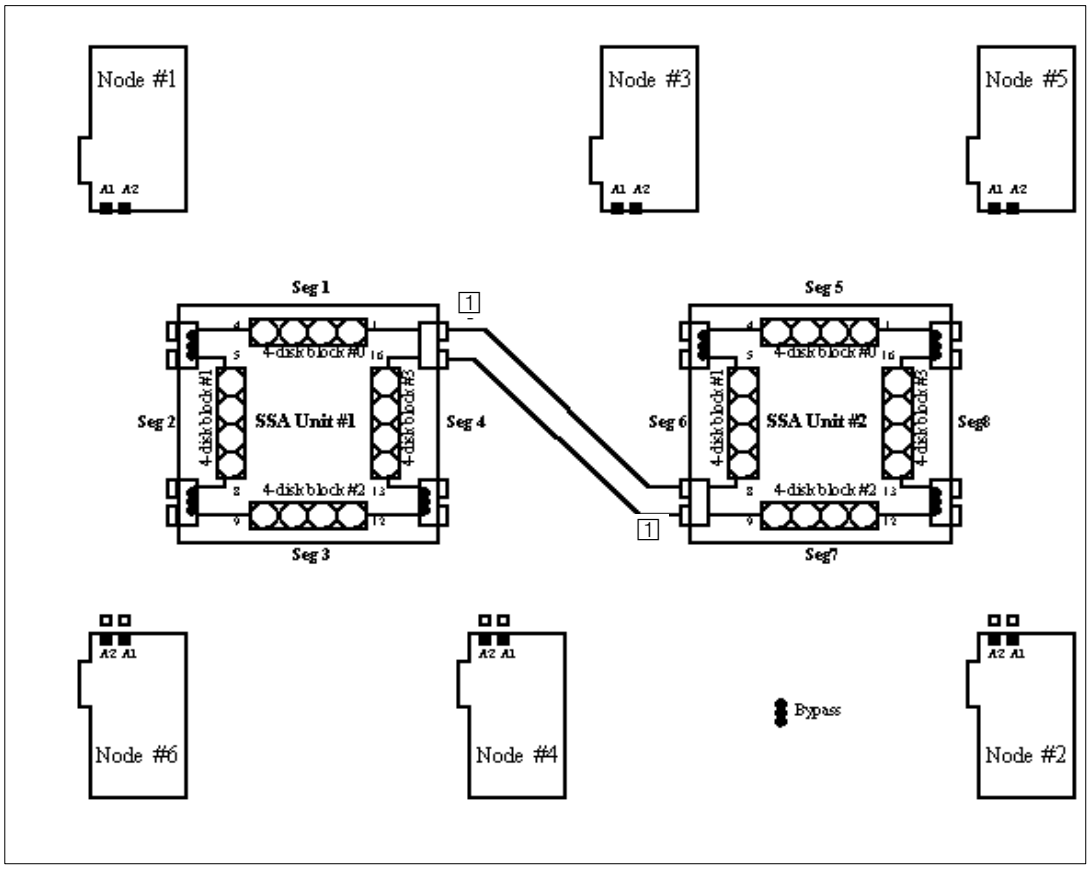


Figure 57. SSACF02: Base mounting diagram (1 to 6 nodes, two SSA cabinets, 1 to 8 segments).

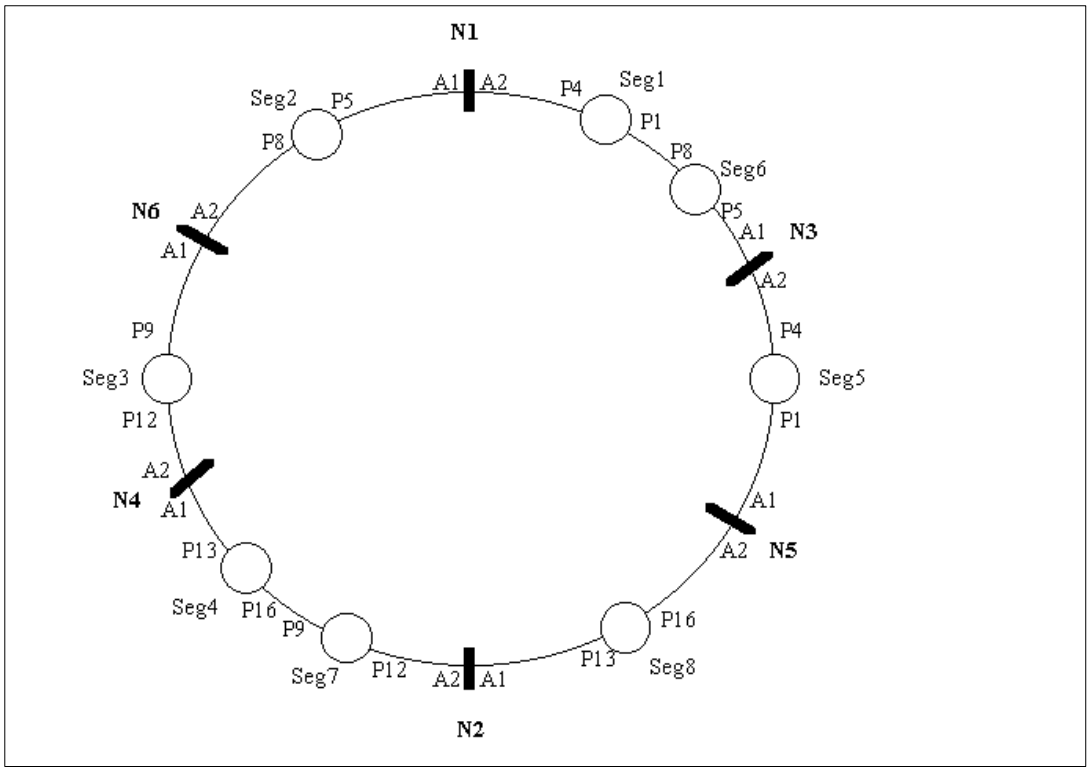


Figure 58. SSACF02: Loop diagram: 1 to 6 nodes, 2 SSA cabinets, 5 to 8 segments.

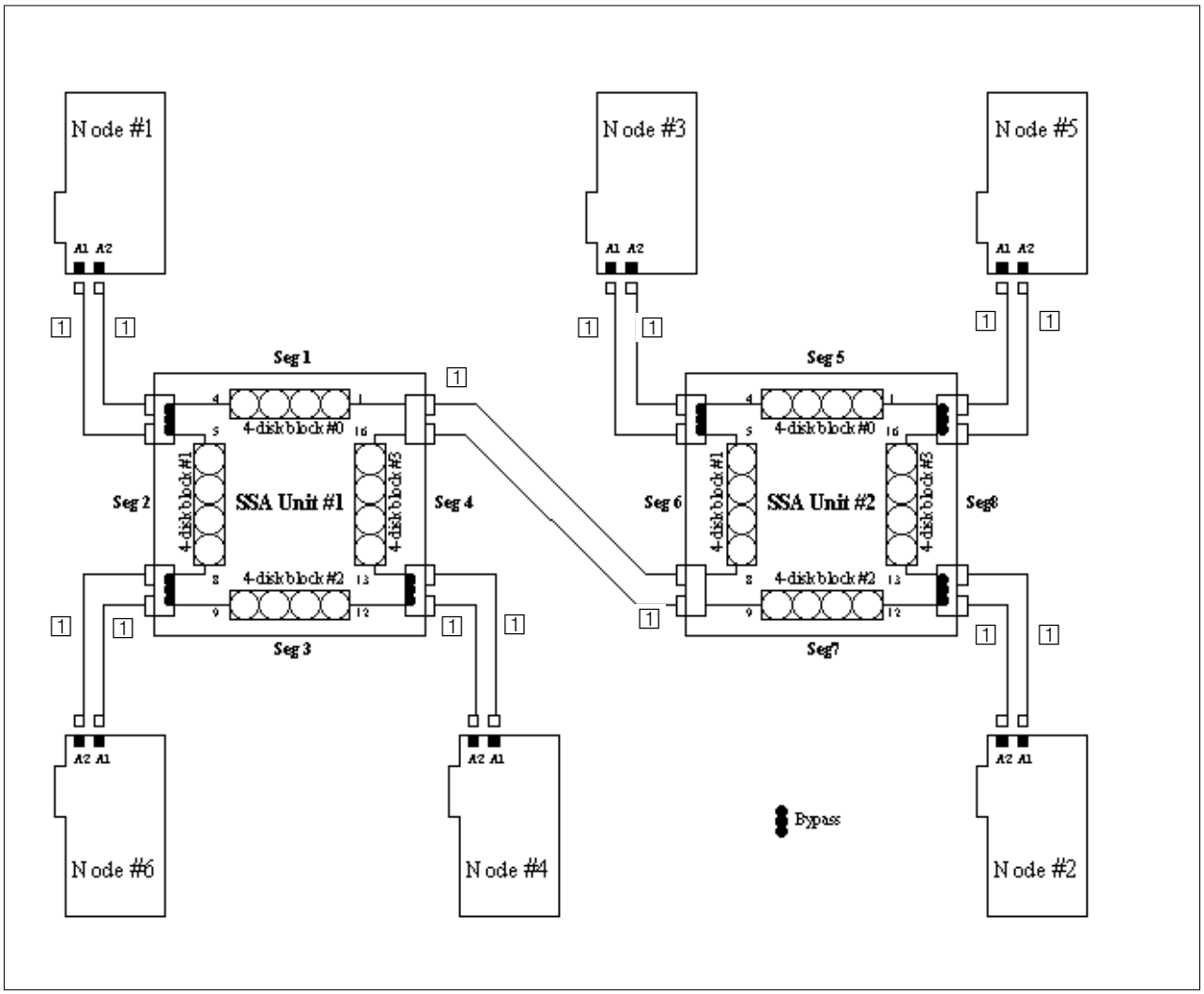


Figure 59. SSACF02: Cabling example for 6 nodes, 2 SSA cabinets and 32 disks.

At least 8 disk drives are mandatory.

Parts List

Cabling example for 6 nodes, 2 SSA cabinets and 32 disks.

Item	M.I.	Designation	Length	FRU
1	CBLG162-1900	SSA Subsystem cable	10m	IBM32H1466
2	CBLG162-2100	SSA Subsystem cable	25m	IBM88G6406
3	CBLG162-1700	SSA Subsystem cable	5m	IBM88G6404
4	CBLG162-1400	SSA Subsystem cable	2,5m	IBM32H1465
5	CBLG163-1100	SSA Loop to Loop cable	1m	IBM07H8985

SSACF03: Cabling For 5 to 8 Nodes with 1 SSA Cabinet

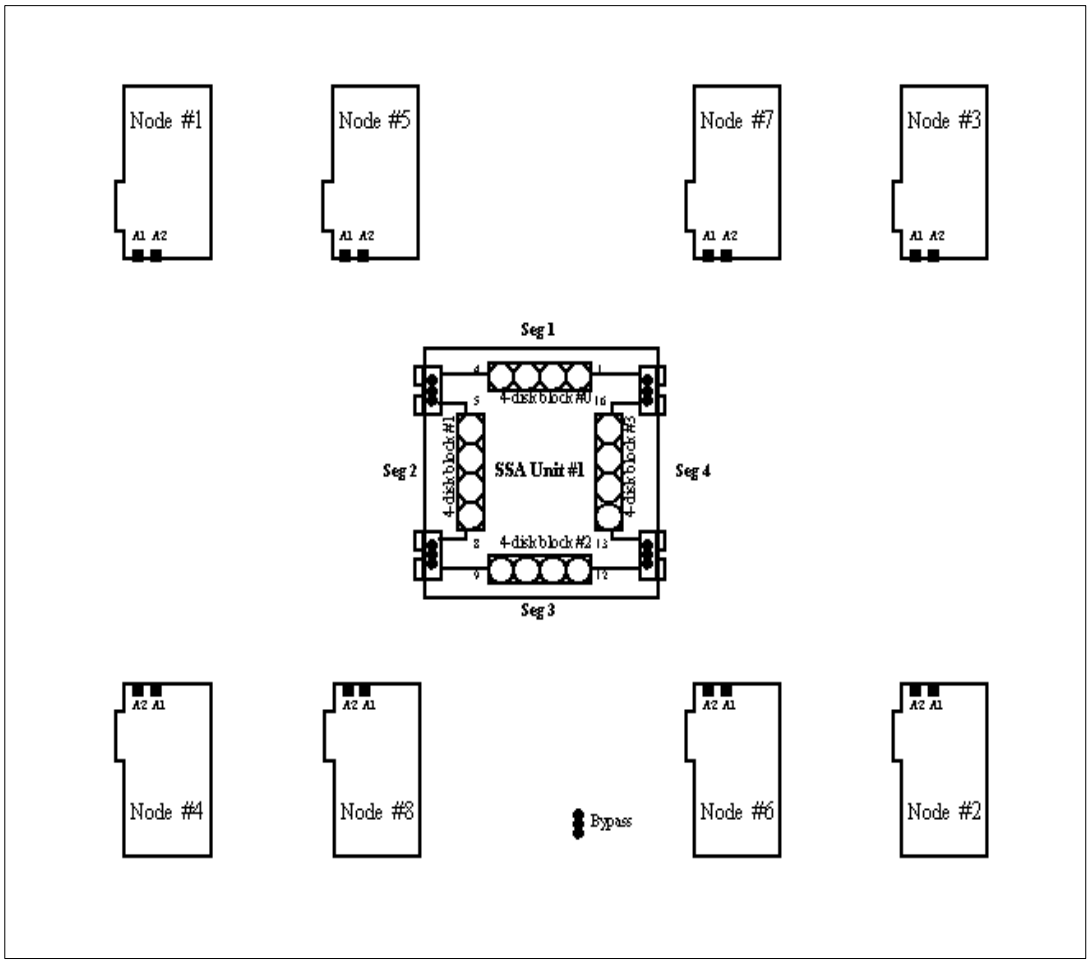


Figure 60. SSACF03: Base mounting diagram (5 to 8 nodes, 1 SSA cabinet, 1 to 4 segments).

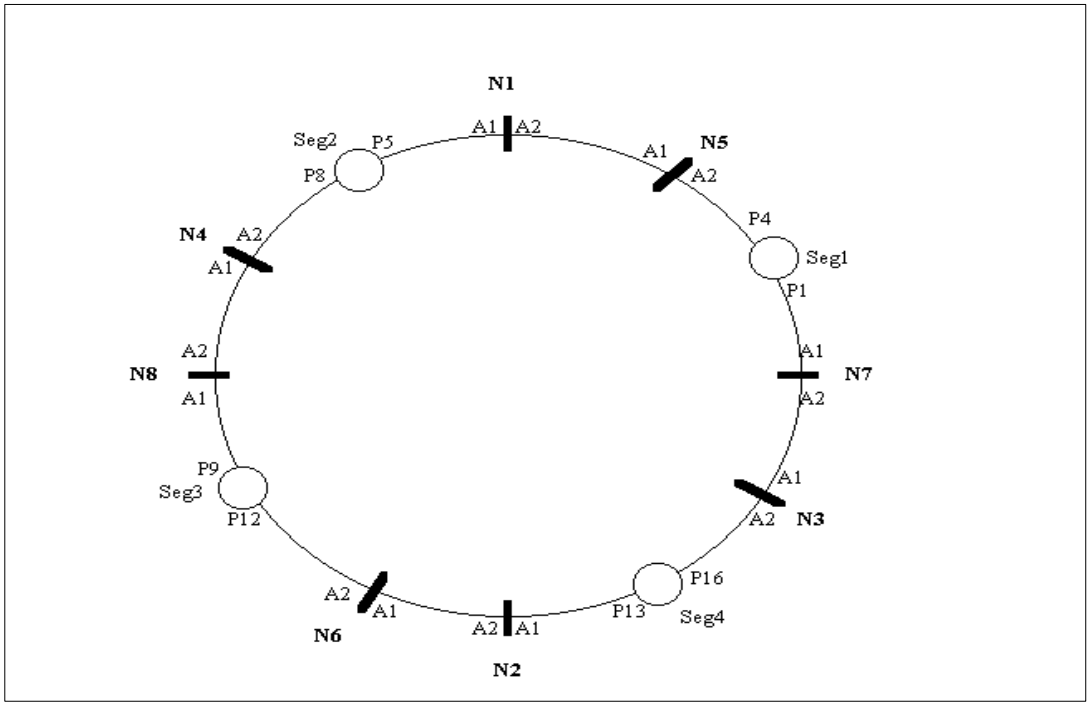


Figure 61. SSACF03: Loop diagram: 5 to 8 nodes, 1 SSA cabinet, 1 to 4 segments.

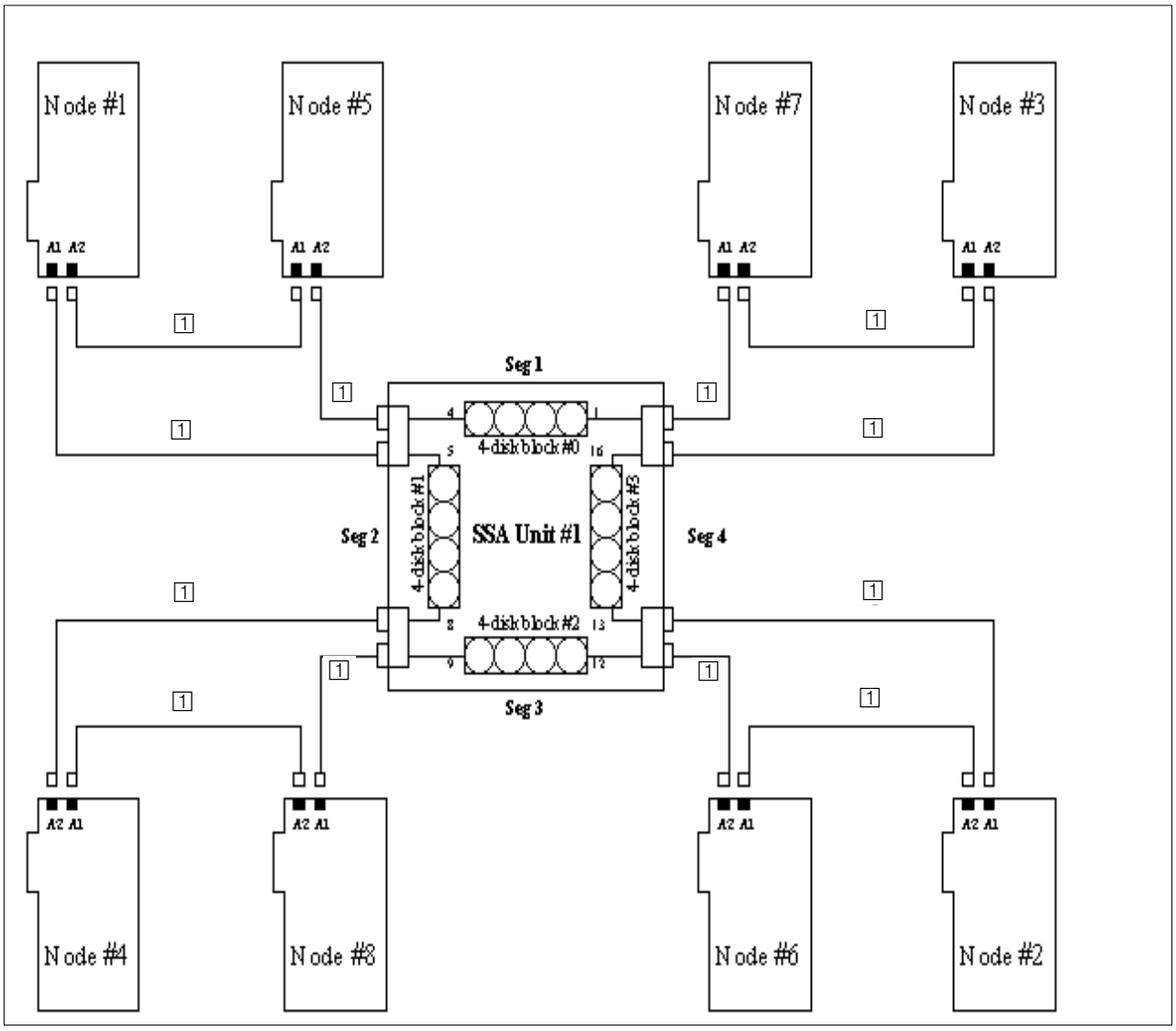


Figure 62. SSACF03: Cabling example for 8 nodes, 1 SSA cabinet and 16 disks.

Parts List

Cabling example for 8 nodes, 1 SSA cabinet and 16 disks.

Item	M.I.	Designation	Length	FRU
1	CBLG162-1900	SSA Subsystem cable	10m	IBM32H1466
2	CBLG162-2100	SSA Subsystem cable	25m	IBM88G6406
3	CBLG162-1700	SSA Subsystem cable	5m	IBM88G6404
4	CBLG162-1400	SSA Subsystem cable	2,5m	IBM32H1465
5	CBLG163-1100	SSA Loop to Loop cable	1m	IBM07H8985

As soon as there is more than one node connected to a single port on the SSA cabinet, the internal bypass must be suppressed. The operation to manipulate the switch by–pass is manual. Do not forget to plug out the cabinet before intervening.

For an 8–node configuration there is no by–pass at all.

For a 7–node configuration there is one by–pass (between port 8 and port 9).

For a 6–node configuration there are two by–passes – one between port 8 and port 9, the other one between port 1 and port 16.

For a 5–node configuration there are three by–passes – one between port 8 and port 9, a second one between port 1 and port 16, a third one between port 12 and port 13.

SSACF04: Cabling For 7 to 8 Nodes With 2 SSA Cabinets

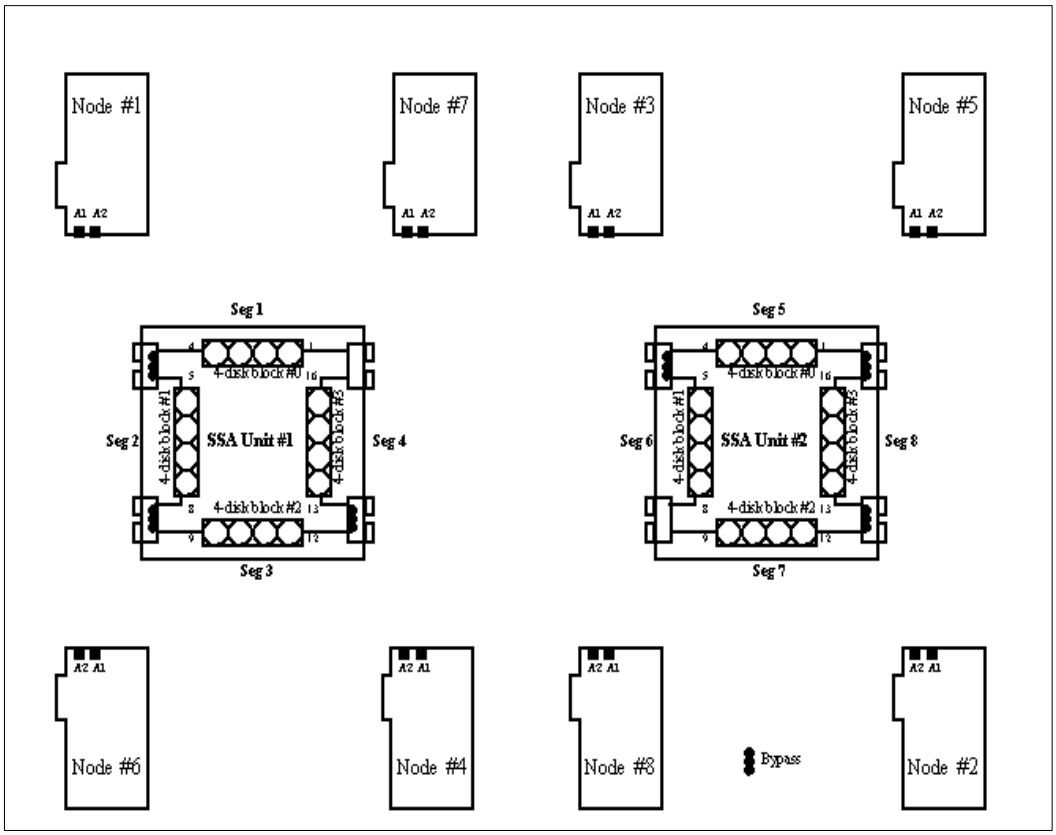


Figure 63. SSACF04: Base mounting diagram (7 to 8 nodes, 2 SSA cabinets, up to 8 segments).

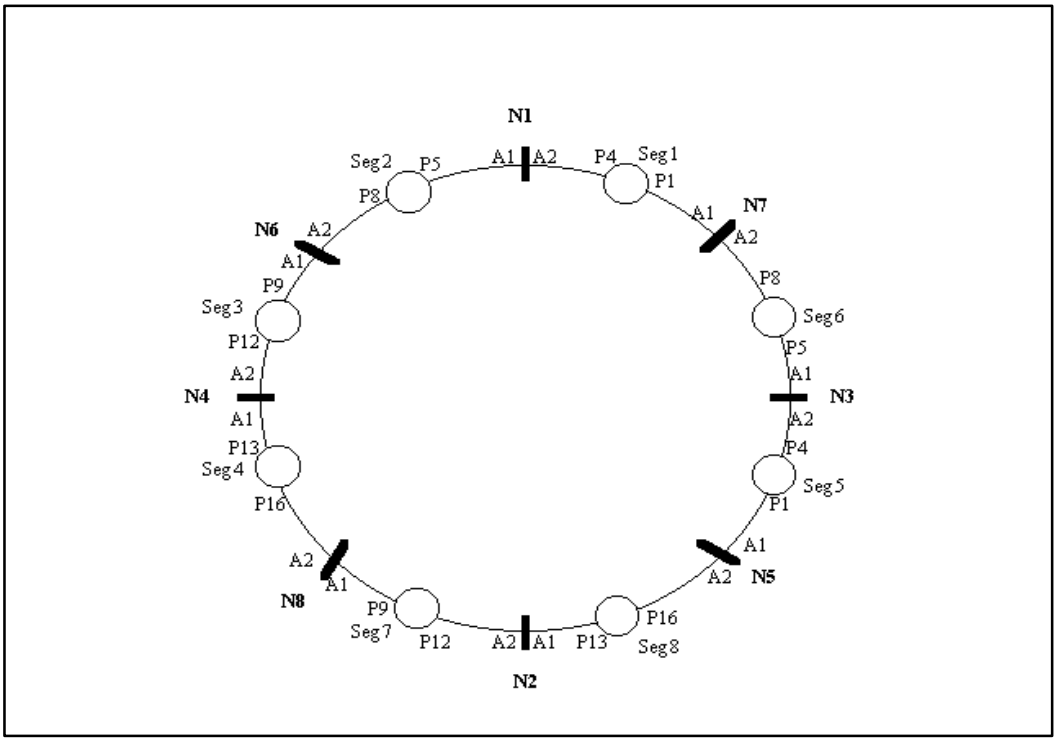


Figure 64. SSACF04: Loop diagram: (7 to 8 nodes, 5 to 8 segments).

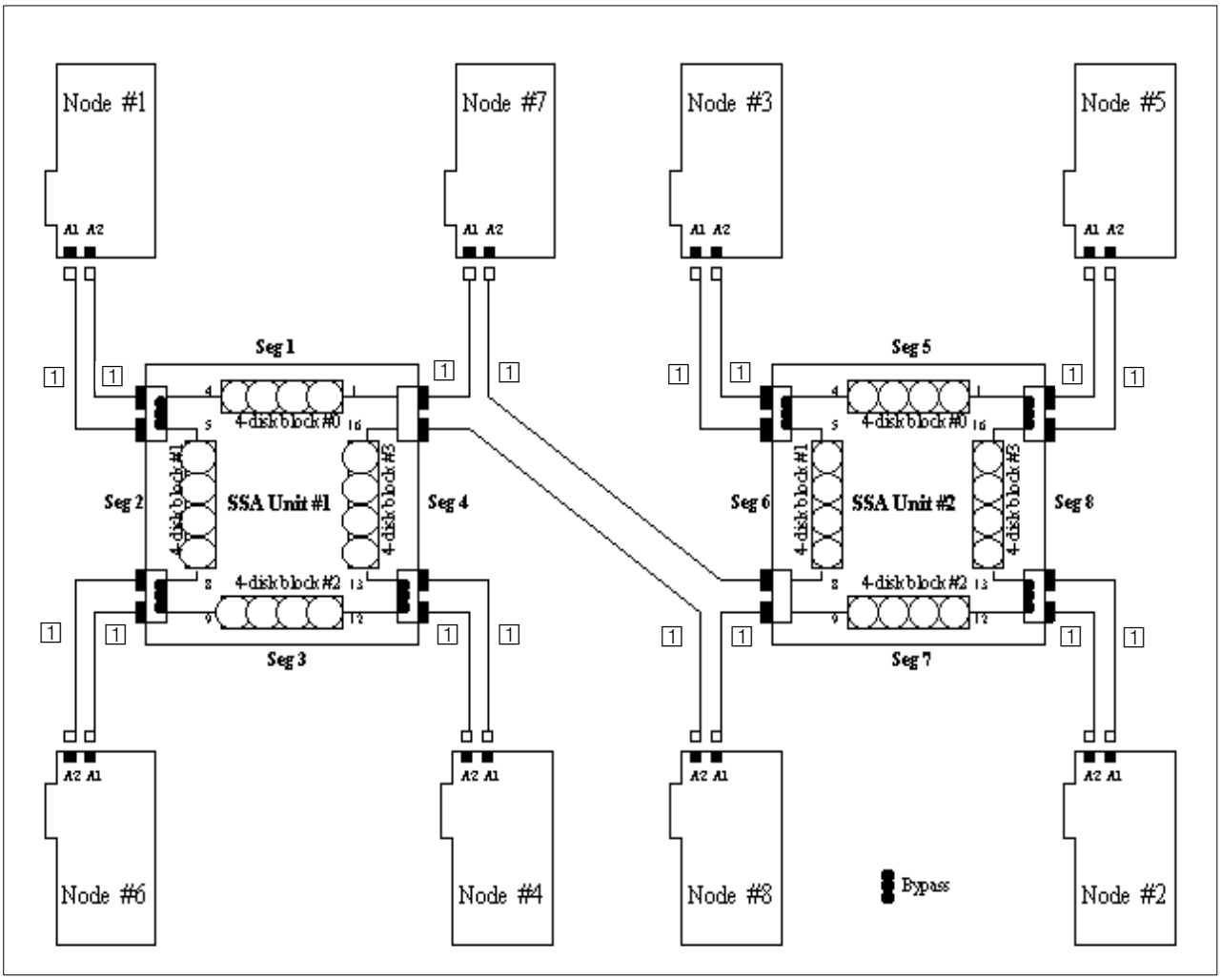


Figure 65. SSACF04: Cabling example for 8 nodes, 2 SSA cabinets and 32 disks.

Parts List

Cabling example for 8 nodes, 2 SSA cabinets and 32 disks.

Item	M.I.	Designation	Length	FRU
[1]	CBLG162-1900	SSA Subsystem cable	10m	IBM32H1466
[2]	CBLG162-2100	SSA Subsystem cable	25m	IBM88G6406
[3]	CBLG162-1700	SSA Subsystem cable	5m	IBM88G6404
[4]	CBLG162-1400	SSA Subsystem cable	2,5m	IBM32H1465
[5]	CBLG163-1100	SSA Loop to Loop cable	1m	IBM07H8985

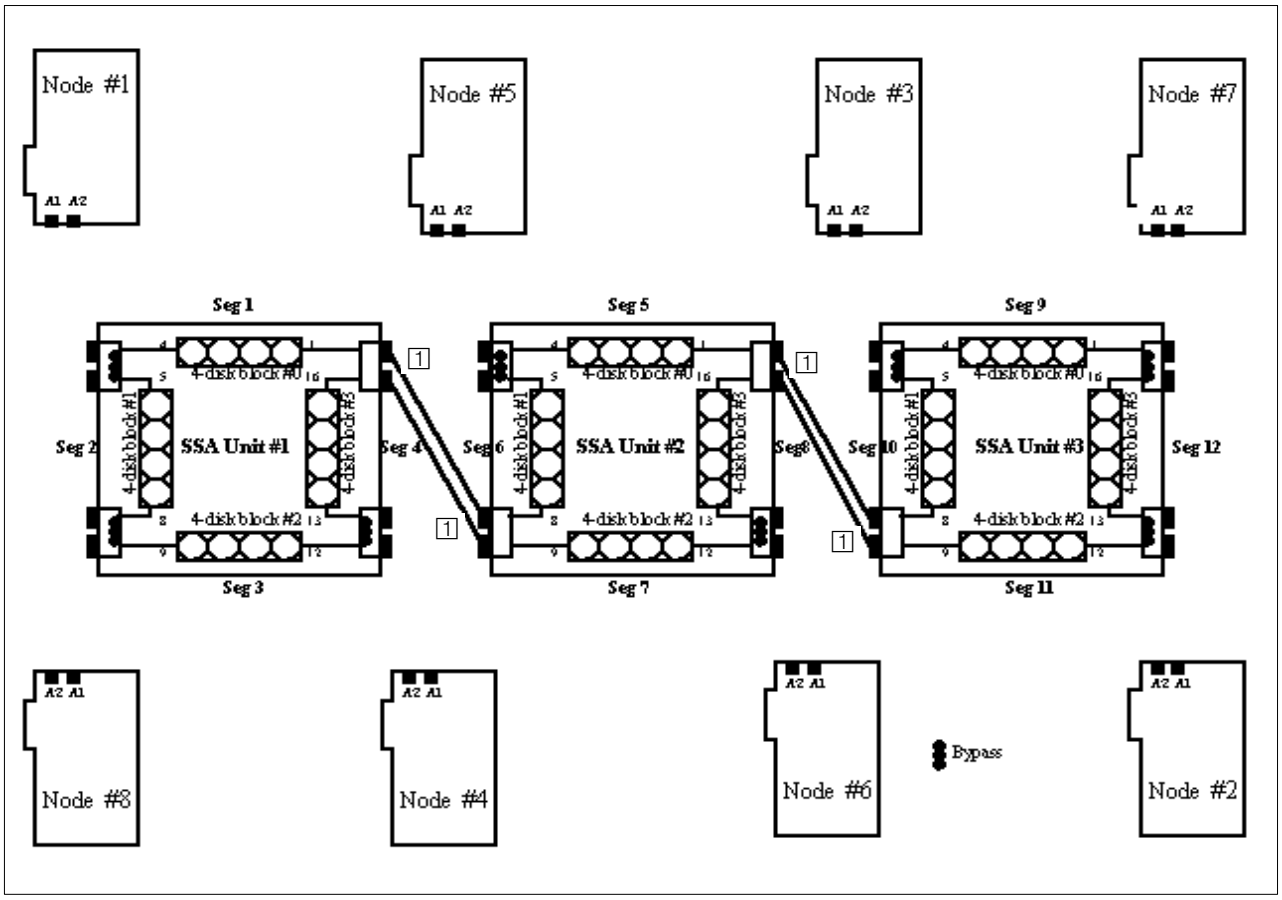


Figure 66. SSACF05: Base mounting diagram (1 to 8 nodes, 3 SSA cabinets, up to 12 segments).

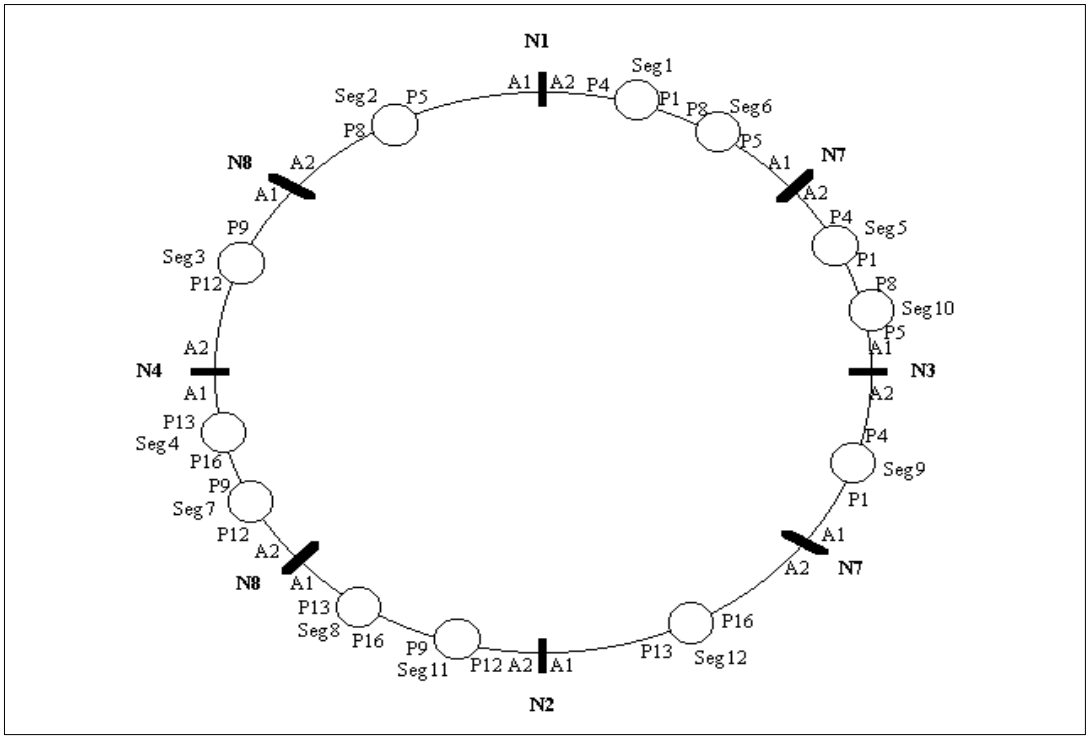


Figure 67. SSACF05: Loop diagram: (1 to 8 nodes, 9 to 12 segments).

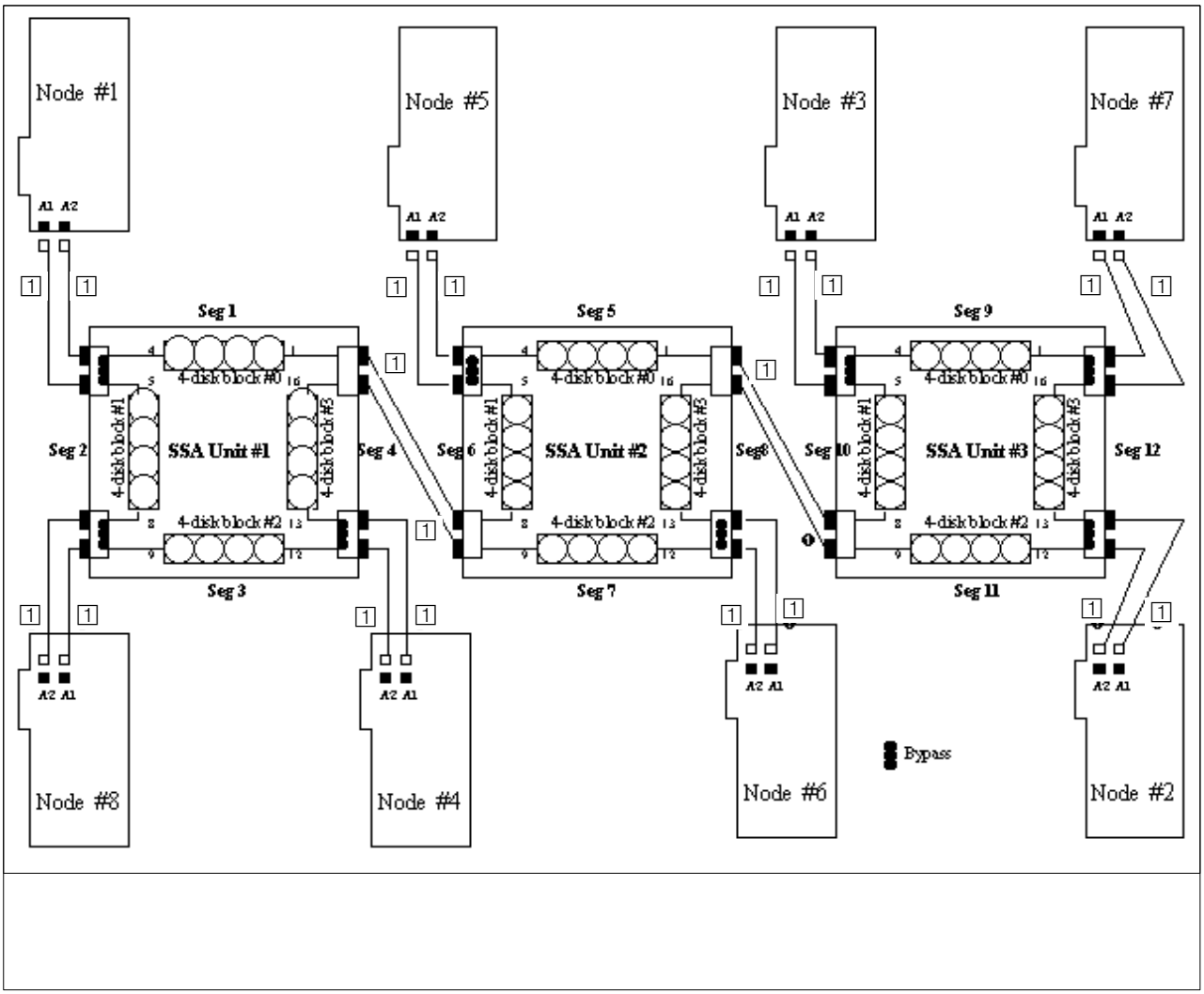


Figure 68. SSACF05: Cabling example for 8 nodes, 3 SSA cabinets and 48 disks.

At least 12 disk drives are required.

Parts List

Cabling example for 8 nodes, 3 SSA cabinets and 48 disks.

Item	M.I.	Designation	Length	FRU
1	CBLG162-1900	SSA Subsystem cable	10m	IBM32H1466
2	CBLG162-2100	SSA Subsystem cable	25m	IBM88G6406
3	CBLG162-1700	SSA Subsystem cable	5m	IBM88G6404
4	CBLG162-1400	SSA Subsystem cable	2,5m	IBM32H1465
5	CBLG163-1100	SSA Loop to Loop cable	1m	IBM07H8985

Cabling Instructions

The cabling instruction lines are generated by the ordering document.

- The nodes are named by N1, N2, .. N8.
- U1, U2, U3 designate the SSA units.
- P1, P4, P5, P8, P9, P12, P13, P16 and so on designate the ports on an SSA cabinet.
- An instruction line specifies (NiAj) on which adapter of which node a cable end has to be plugged, and (UkPl) on which port of which SSA unit the other cable end must be plugged.

The instruction lines allowing to cable the example of diagram SSACF01 are generated by the ordering document as follows :

N1A1 – U1P5
U1P8 – N4A2
N4A1 – U1P9
U1P12 – N2A2
N2A1 – U1P13
U1P16 – N3A2
N3A1 – U1P1
U1P4 – N1A2

The line N2A1 – U1P13 means to plug a cable end on adapter A1 of node #2 and the other cable end on port 13 of SSA cabinet (U1 as unit #1).

Optic Fibre Extender

Usage Cases

CAUTION:
The solutions suggested here are not offered in standard.

With the introduction of Optic Fibre Extender, an SSA loop can be extended enabling to construct an architecture for disaster recovery where the Powercluster configuration is spread over two buildings within a campus. The maximum length of a fibre link between two optic fibre extenders is 600 meters. It is assumed that there is a customer's public network, and also a customer's private network for implementing a HA solution in mode 3, which link all the nodes. The public network and the private network must be separate subnets, and at least one of them must provide an ethernet LAN segment in order to connect the Powerconsole or Cluster Console and associated equipments.

The Escala Powercluster offer only contains the optic fibre extender. The cabling (in double optic fibre) between separate buildings or inside a building is out of scope of the Escala EPC product and must be performed by ad–hoc professional services. It applies also for the RS232 lines used between the nodes for exchanging "keep–alive" messages and the RS232 line used between two possible Console Concentrators. Since some nodes can be 600m far from other nodes, it is necessary to provide a means to extend an RS232 line to such a length capability. For this, it is suggested to use a pair of micro modems for each RS232 link to be extended.

The micro modem referenced ME 762A–F is an example of what can be purchased to extend RS232 lines. Refer to *EPC Series Site Preparation Guide* for more information.

CAUTION:
Both 25M (male) and 25 F (female) micro-modems are available.
– a 25F micro-modem fits the Hub
– a 25M micro-modem fits the console concentrator (CS/2600) .

Figures 69 and 70 illustrate disaster recovery solutions which differ in terms of number of nodes and shared SSA cabinets. They are extensions of configurations SSACF01 and SSACF02. In these extended configurations two physical loops are implemented.

Figure 69 shows an implementation with one SSA cabinet per loop, Figure 70 with two cabinets per loop. In the first case, there is an extended optic fibre link between each node and the distant cabinet. In the second case, there is an extended optic fibre link between the two distant cabinets of each loop.

For a system administration standpoint, the Powerconsole and a Console Concentrator can be connected to the public network or the private network. The network type must be Ethernet. The nodes are linked via serial lines to the console concentrator. For the nodes which are distant, the serial lines need to be extended with the use of micro modems. If the number of distant nodes is more than 2, a second console concentrator near to those nodes can be used. In that case the distant nodes are wired to the second concentrator which in turn is connected to the first one via an extended serial line.

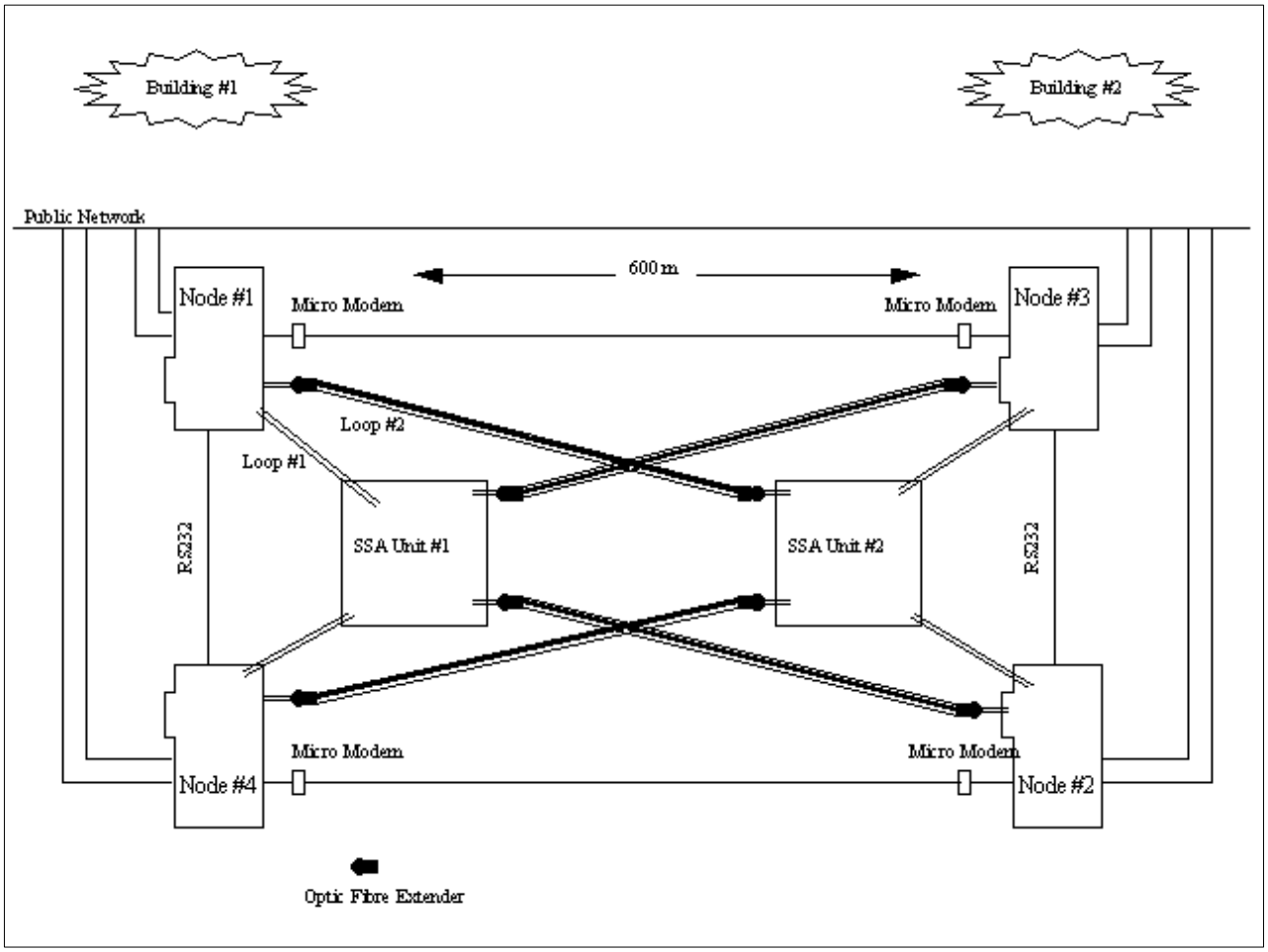


Figure 69. Optic Fibre Extender: Global diagram (1 pair of 2 nodes, 1 cabinet).

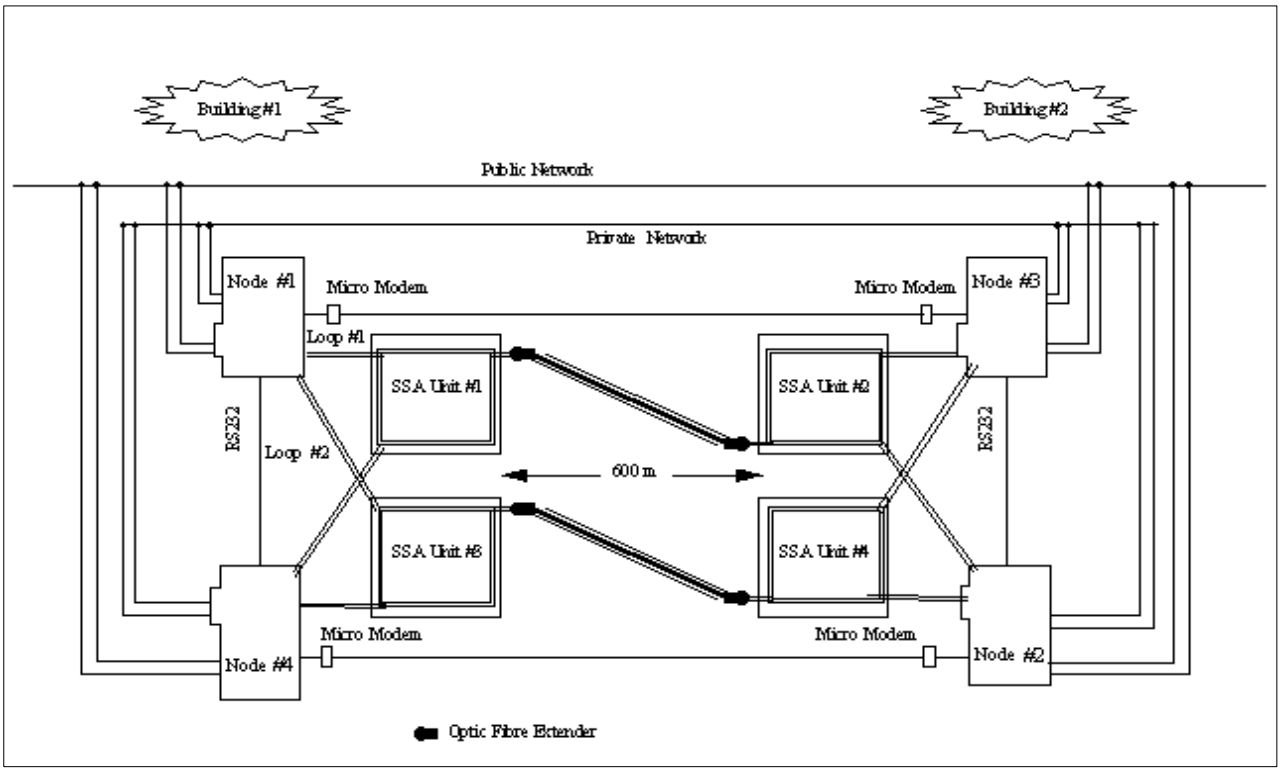


Figure 70. Optic Fibre Extender: Global diagram (1 pair of 2 nodes, 2 cabinets).

Cabling Diagram With 1 or 2 Nodes, 1 SSA Cabinet on Each Side

Figures 71 and 72 show configurations with two loops and one adapter per node. For higher availability it is better to have two adapters, one per loop.

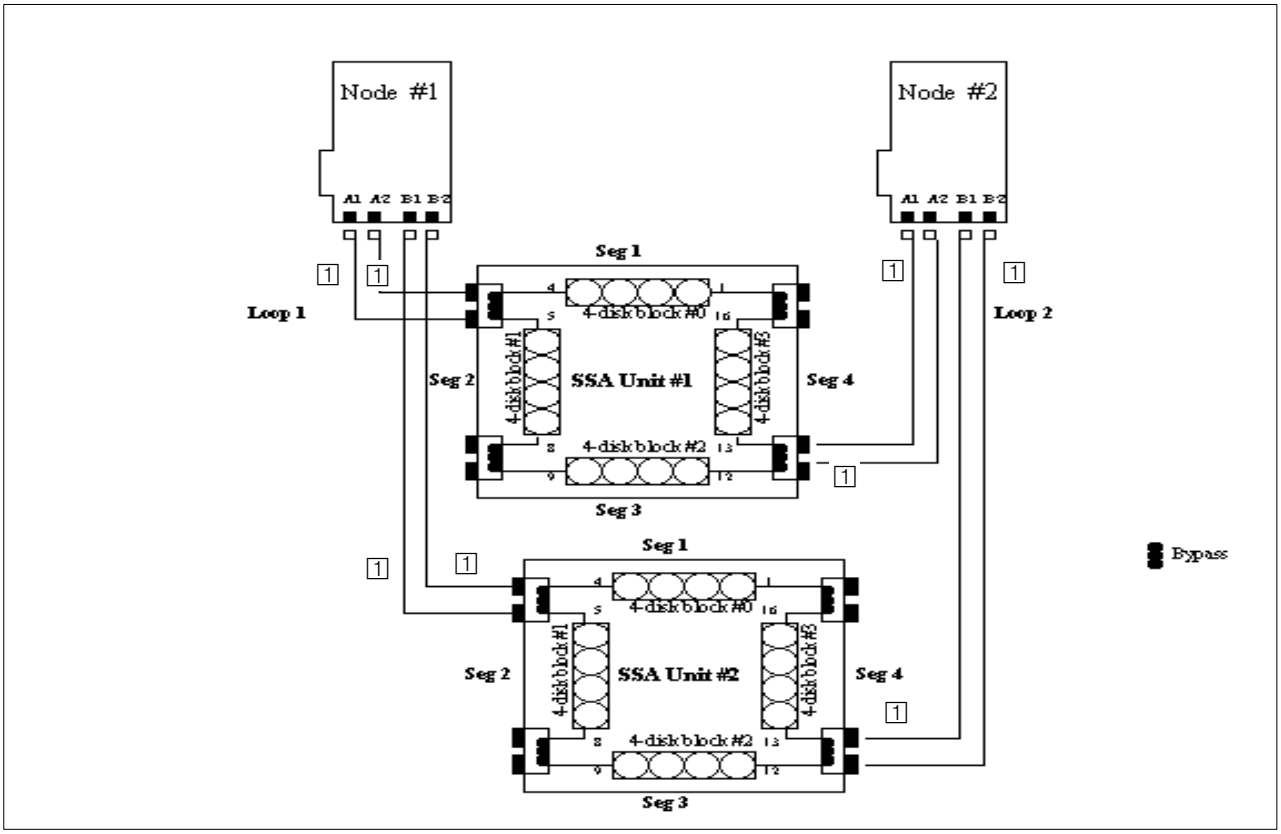


Figure 71. SSACF01 Configuration with two loops (1 or 2 nodes, 1 SSA cabinet on each side).

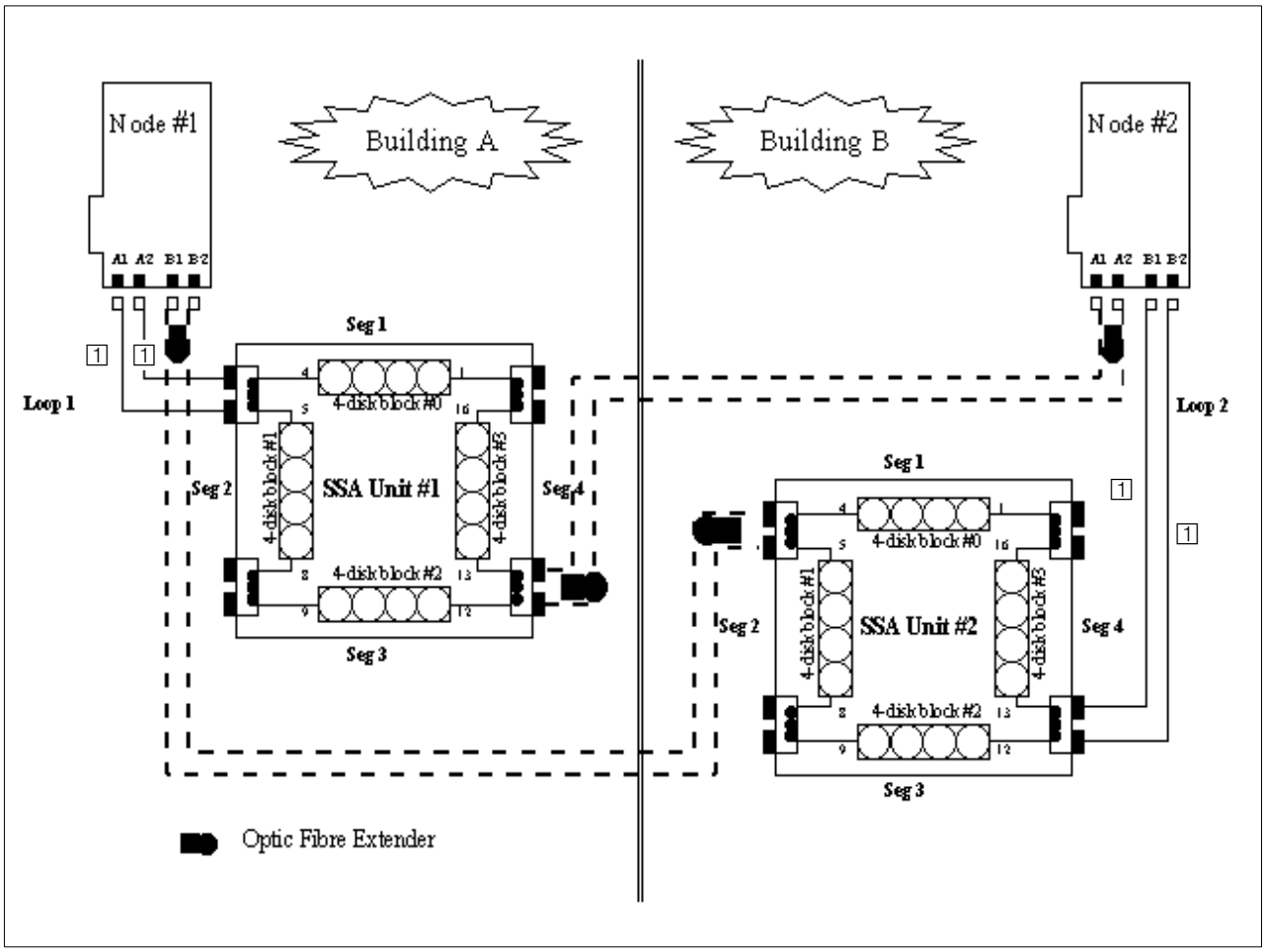


Figure 72. Cabling schema with FIbre Optical Extenders (1 or 2 nodes, 1 SSA cabinet on each side).

Cabling Diagram With 1, 2 or 3 Nodes, 2 SSA Cabinets on Each Side

Figures 73 and 74 show configurations with two loops and one adapter per node. For higher availability it is better to have two adapters, one per loop.

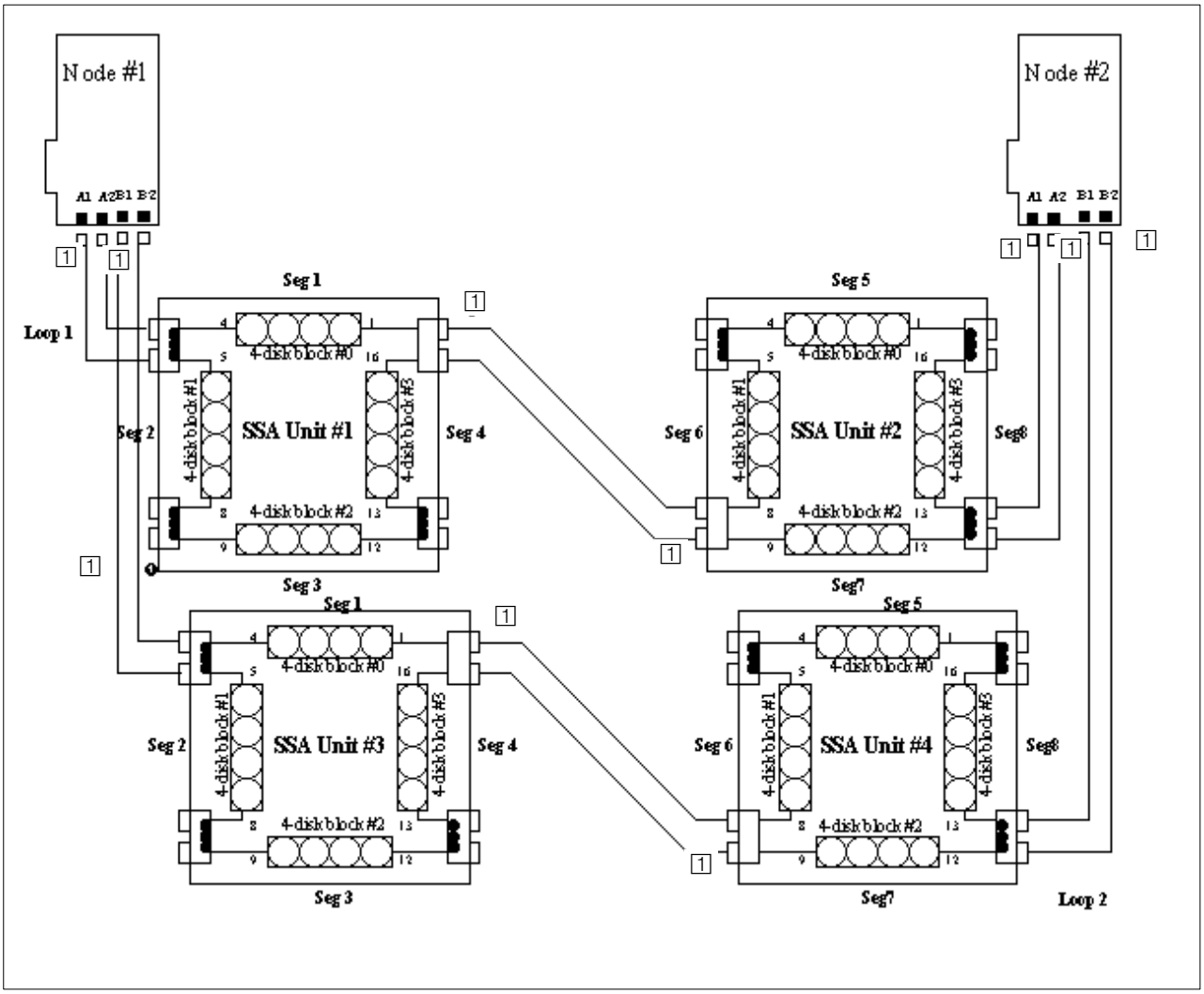


Figure 73. SSACF02 Configuration with two loops (1, 2 or 3 nodes, 2 SSA cabinets on each side).

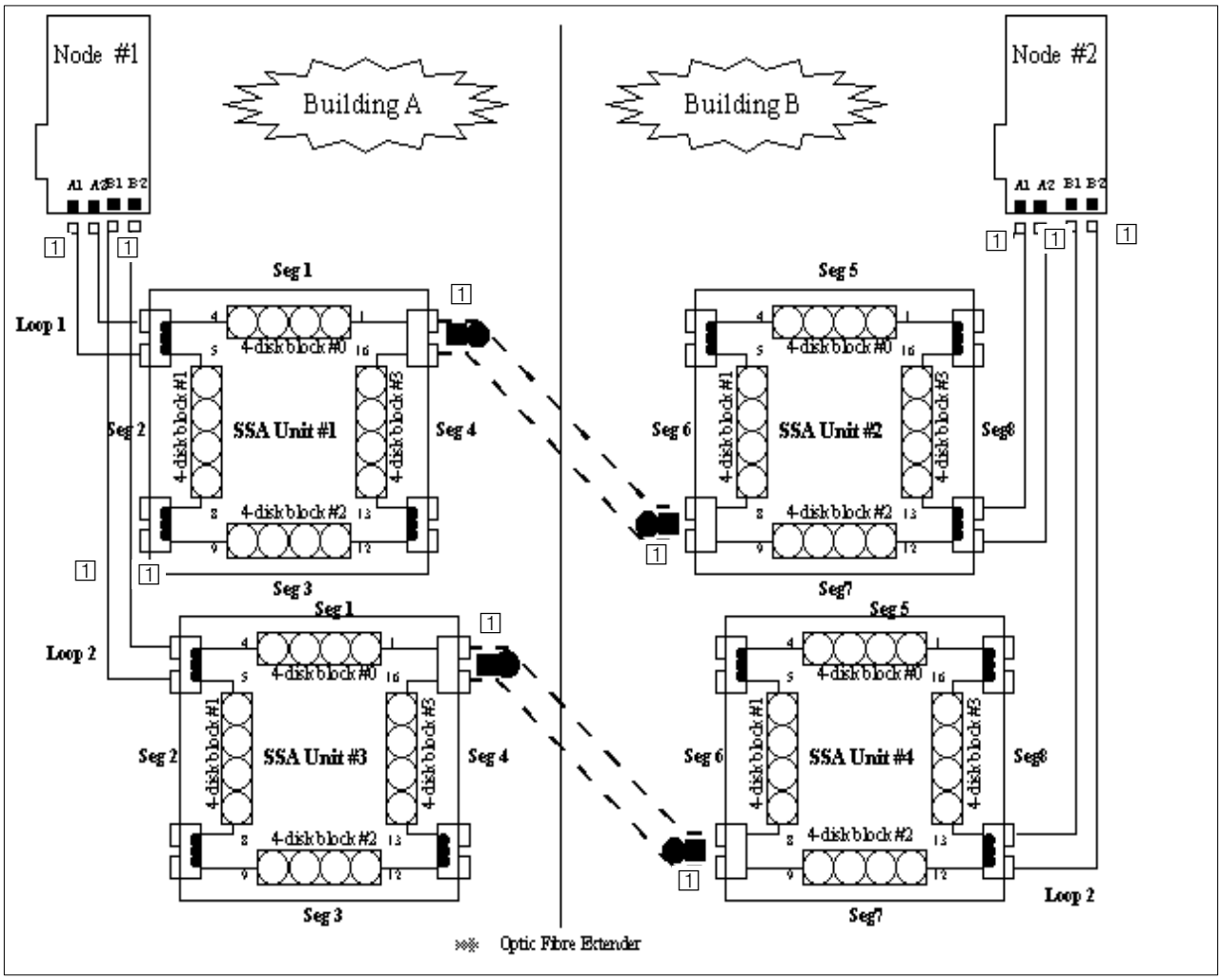


Figure 74. Cabling diagram with FIbre Optical Extenders (1, 2 or 3 nodes, 2 SSA cabinets on each side).

Disk Array Subsystems (DAS)

You will find:

MI List

IDENTIFICATOR	DESCRIPTION
DASG016–0100	DAS 1300 RAID Subsystem – 10 Drive Rack Chassis
DASG026–0000	DAS 2900 RAID Subsystem – 20 Drive Rack Chassis
DASG028–0000	DAS 3200 RAID Subsystem – 30 Drive Rack Chassis
DASG034–0000	DAS 3500 RAID Subsystem – 30 Drive Rack Chassis
DASG035–0000	DAS 3500 RAID Subsystem – 30 Drive Desk Side
DASG044–0000	DAS 57xx RAID Subsystem – Rack 10 Slots (1SP/1LCC)
DASG045–0000	DAS 57xx RAID Subsystem – Desk 20 Slots (1SP/1LCC)
DASG046–0000	DAS 5720 RAID Subsystem – Rack 20 Slots (2SP/2LCC)
DASG047–0000	DAS 5720 RAID Subsystem – Desk 20 Slots (2SP/2LCC)
DASG048–0000	DAS 5300 RAID Subsystem – Rack 10 Slots (1SP/1LCC)
DASG049–0000	DAS 5300 RAID Subsystem – Desk 10 Slots (1SP/1LCC)
DASG050–0000	DAS 5300 RAID Subsystem – Desk 30 Slots (1SP/1LCC)
DRWG010–0000	DAE 5000 Rack 10 Slots (1LCC)
DRWG011–0000	DAE 5000 Rack 10 Slots (2LCC)
CABG023–0000	DAE 5000 Desk 10 Slots (1LCC)
CABG024–0000	DAE 5000 Desk 10 Slots (2LCC)
CABG025–0000	DAE 5000 Desk 30 Slots (1LCC)
CABG026–0000	DAE 5000 Desk 30 Slots (2LCC)
MSPG008–0000	Add'nal Storage Processor Fibre (DAS 57xx)
MSPG009–0000	Add'nal Storage Processor Fibre (DAS 5300)
PSSG021–0000	Redundant Power Supply (DAS 57xx)
PSSG022–0000	Redundant Power Supply (DAE 5000)
PSSG022–0100	Redundant Power Supply (DAS5300/DAE)

IDENTIFICATOR	DESCRIPTION
CKTG0105–0000	Add'nal Link Control Card (DAE 5000)
CKTG0106–0000	Add'nal Link Control Card (DAS 57xx)
PSSG023–0000	Base Battery Backup Rack (DAS 57xx)
PSSG024–0000	Add'nal Battery Backup Rack (DAS 57xx)
PSSG025–0000	Battery Backup Desk (DAS 57xx)
PSSG026–0000	Dual Battery Backup Rack (DAS 57xx)
PSSG027–0000	Dual Battery Backup Desk (DAS 57xx)
PSSG028–0000	Add'nal PDU – Single Phase (for EPC1200/1200A)
PSSG029–0000	Add'nal PDU Desk (DAS 57xx/DAE 5000)
PSSG032–0000	Standby Power Supply Rack (DAS 5300)
PSSG033–0000	Add'nal Standby Power Supply Desk (DAS 5300)
PSSG034–0000	Standby Power Supply Desk (DAS 5300)
PSSG035–0000	Dual Standby Power Supply Rack (DAS 5300)
PSSG036–0000	Dual Standby Power Supply Desk (DAS 5300)
CBLG194–1400	Power Cord (Right Angled) for DAS/DAE
CBLG195–1400	Power Cord (Straight) for Rack
MSUG108–0F00	8.8GB RAID Fibre Disk for (10 000rpm) DAS
MSUG109–0F00	17.8GB RAID Fibre Disk for (10 000rpm) DAS
MSUG110–0F00	8.8GB RAID Fibre Disk for (10 000rpm) DAE
MSUG111–0F00	17.8GB RAID Fibre Disk for (10 000rpm) DAE
CMMG114–0000	64MB Cache Memory (DAS 57xx)
CMMG115–0000	128MB Cache Memory (DAS 57xx)
CMMG116–0000	256MB Cache Memory (DAS 57xx)
CMMG117–0000	512MB Cache Memory (DAS 57xx)
CMMG152–0000	64MB Cache Memory (DAS 5300)
CMMG153–0000	128MB Cache Memory (DAS 5300)
MSUG096–0D00	4.2GB HI Speed SCSI-2 Disk for DAS
MSUG074–0D00	4.2GB HI Speed SCSI-2 Disk for DAS (OVER 10*4.2GB)
MSUG075–0D00	4.2GB HI Speed SCSI-2 Disk for DAS (OVER 20*4.2GB)
MSUG073–0D00	8,8GB HI Speed SCSI-2 Disk for DAS
MSUG084–0D00	8.8GB HI Speed SCSI-2 Disk for DAS (OVER 10*8.8GB)
MSUG085–0D00	8.8GB HI Speed SCSI-2 Disk for DAS (OVER 20*8.8GB)

IDENTIFICATOR	DESCRIPTION
MSUG100–0D00	17.8GB HI Speed SCSI-2 Disk for DAS
MSUG101–0D00	17.8GB HI Speed SCSI-2 Disk for DAS (OVER 10*8.8GB)
MSUG102–0D00	17.8GB HI Speed SCSI-2 Disk for DAS (OVER 20*8.8GB)
MSPG003–0100	Add'nal Wide Storage Processor (DAS 1300)
MSPG005–0000	Add'nal Wide Storage Processor (DAS 2900)
MSPG006–0000	Add'nal Wide Storage Processor (DAS 3200)
MSPG007–0000	Add'nal Storage Processor Fibre (DAS 3500)
MSKG006–0000	Upgrade Kit DAS3200 to DAS 3500
PSSG002–0100	Redundant Power Supply (DAS 2x00)
PSSG005–0000	Redundant Power Supply (DAS 1x00)
PSSG004–0000	Battery Backup For Cache Memory (DAS2x0)
PSSG006–0000	Battery Backup For Cache Memory (DAS1300)
CMMG024–0000	32MB Mirrored Cache Memory
CMOG043–0000	8 to 32MB Cache Memory Option
CMMG047–0000	32MB Non Mirrored Cache Memory
CKTG049–0000	0.8M Y SCSI Cable
CKTG070–0000	1M Y SCSI Cable (68MD/68MD)
CBLG137–1200	3M SCSI-2 F/W Adapter to DASXX00 Cable
CBLG137–1800	M SCSI-2 F/W SE/D Adapter to DAS XX00 Cable
CBLG097–1000	5M Wide Storage Processor Chaining Cable For DAS
CBLG099–1800	6M SCSI-2/Wide DAS to DAS Cable
CBLG060–1800	6M RS232 Cable with F/F & 9F/25F Adapters
CBLG061–1400	Power Cords for DAS – EUROPE
CBLG062–1400	Power Cords for DAS – US
CBLG065–1400	Power Cords for DAS – UK
CBLG111–1000	0.6M DE F/W System to System Cable
CBLG112–1400	5M DE F/W System to System Cable
MSCG023–0000	PCI ULTRA SCSI DE Adapter Symbios / for EPC400/430
MSCG012–0000	SCSI-2 F/W DE EXT Disk Adapter for EPC800
MSCG020–0000	SCSI-2 F/W DE Enhanced Disk Adapter (WSA) for EPC800
MSCG030–0000	ULTRA SCSI Differential PCI Adapter for EPC1200/A/440/2400
MSCG032–0000	SCSI-2 F/W Differential PCI Adapter for EPC1200/A/440/2400

IDENTIFICATOR	DESCRIPTION
DCCG140–0000	PCI Enhanced Fibre Channel Adapter
DCCG147–0000	PCI 64–bit Copper Fibre Channel Adapter
DCCG148–0000	PCI 64–bit Optical Fibre Channel Adapter

Copper and Fiber cables, MIA, Hub and Extender Links for Fiber Channel Attachments

IDENTIFICATOR	DESCRIPTION
DCOQ001-0000	FC MIA 1/M5/DCS
LNCQ001-0000	FC-AL Hub 1GB 9-Ports
RCKQ003-0000	Rack Kit/1 LNCQ001
RCKQ004–0000	Rack Kit/2 LNCQ001
FCCQ001-1800	Cord 2FO/M5/DSC 5M
FCCQ001-2100	Cord 2FO/M5/DSC 15M
FCDF001-0000	FC Link Extender CU/SM
FCCQ002-1000	Cord 2CU/DB9 0.5M
FCCQ002-1500	Cord 2CU/DB9 3M
FCCQ002-2000	Cord 2CU/DB9 10M
FCCQ002-3500	Cord 2CU/DB9 30M

Examples of Use for SCSI Technology

The length of the cables [2] used between nodes and DAS is per default of 6m. Such a 6m cable allows to dispatch the CPU drawers (Nodes) and the DAS drawers in separate racks. The 3m cable is used between a node and a DAS drawer located within a same rack. The ordering document mentions the position of the CPU drawers and the DAS drawers in the racks. This comment applies to examples shown in Figure 75 to Figure 78.

Regarding cables [4] used between nodes, the 2.5 m long cable is used between nodes in different racks whereas the cable of 0.6m length is used between nodes in a same rack. **In any case the total length of all the used cables must not exceed 18m**.

There are two types of Y cables. CKTG070 cables are used with PCI adapters (EPC1200/A/2400/440 and EPC400/430 nodes) whereas CKTG049 cables are for MCA adapters (EPC800 nodes).

CAUTION:
Remove any SCSI terminators on the SCSI adapter. External terminators must be used in a HACMP cluster. If you terminate the shared SCSI bus on the adapter, you lose termination when the cluster node that contains the adapter fails.

So, for instance, before connecting the Y cable on an EPC1200/A/2400/400 node, you must remove the terminator (P/N 42G3326) of the PCI Differential Ultra SCSI adapter (type 4-L FC 6207).

Cabling Diagrams for SCSI Technology

Parts List

Item	M.I.	Designation	Length	FRU
1	CKTG070–0000	Y SCSI cable (68MD/68MD)	1m	909920001–001
1	CKTG049–0000	16 Bit Y-cable	–	IBM52G4234
2	CBLG137–1200	SCSI-2 F/W adapter to DAS – 3	3m	DGC005–041274–00
2	CBLG137–1800	SCSI-2 F/W adapter to DAS – 6	6m	DGC005–041275–00
3	CBLG097–1000	Wide SP cable DAS to DAS	0.5m	DGC005–040705
4	CBLG111–1000	DE F/W Node to Node cable	0.6m	IBM52G4291
4	CBLG112–1400	DE F/W Node to Node cable	2.5m	IBM52G4233
5	–	Terminator	–	90054001–001

DASCF01: Cabling for: Single SP / Single SCSI with 1 node – 1 DAS

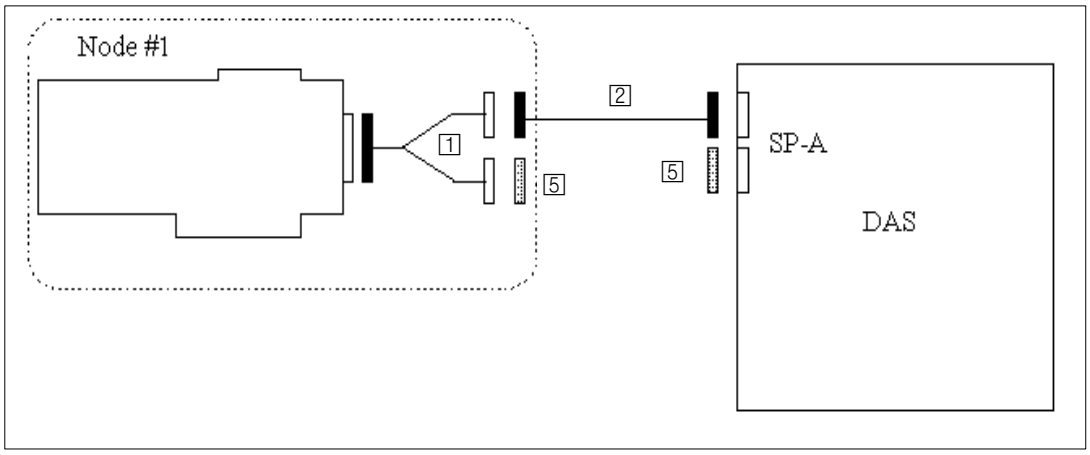


Figure 75. DASCF01: Single SP / Single SCSI with 1 node – 1 DAS.

DASCF02: Cabling for: Single SP / Single SCSI with 1 node – Daisy chained DAS

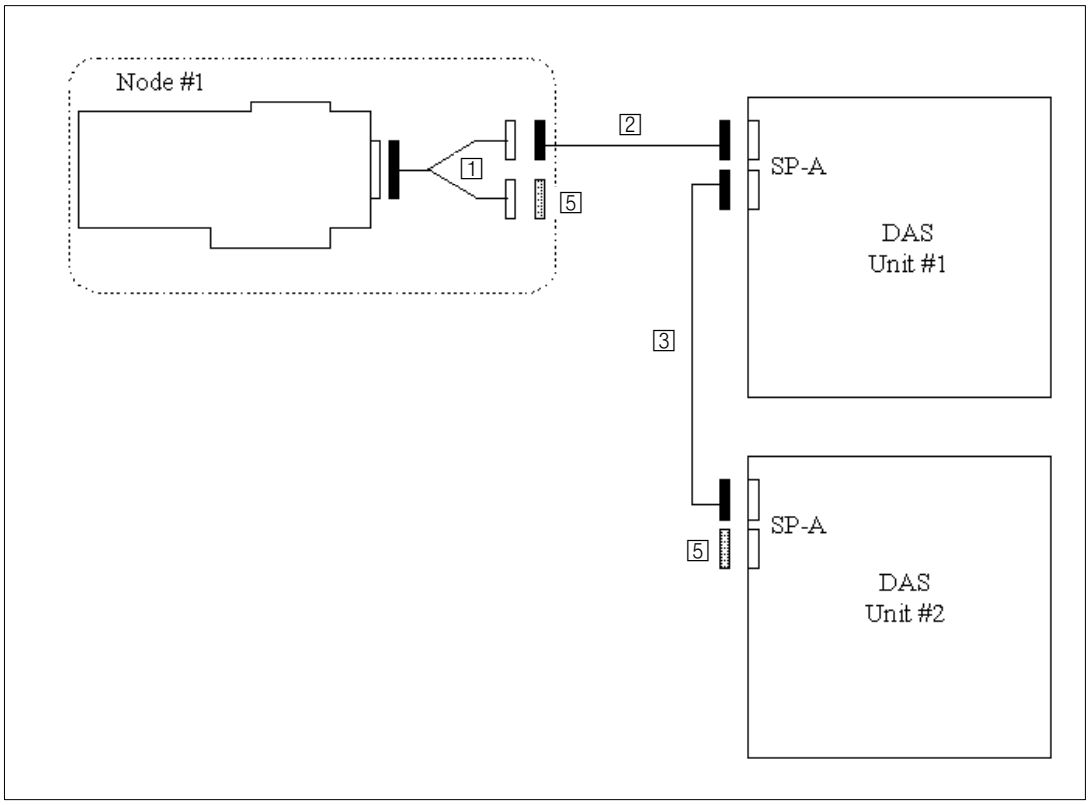


Figure 76. DASCF02: Single SP / Single SCSI with 1 node – Daisy chained DAS.

DASCF03: Cabling for: Dual SP / Dual SCSI with 1 node – 1 DAS

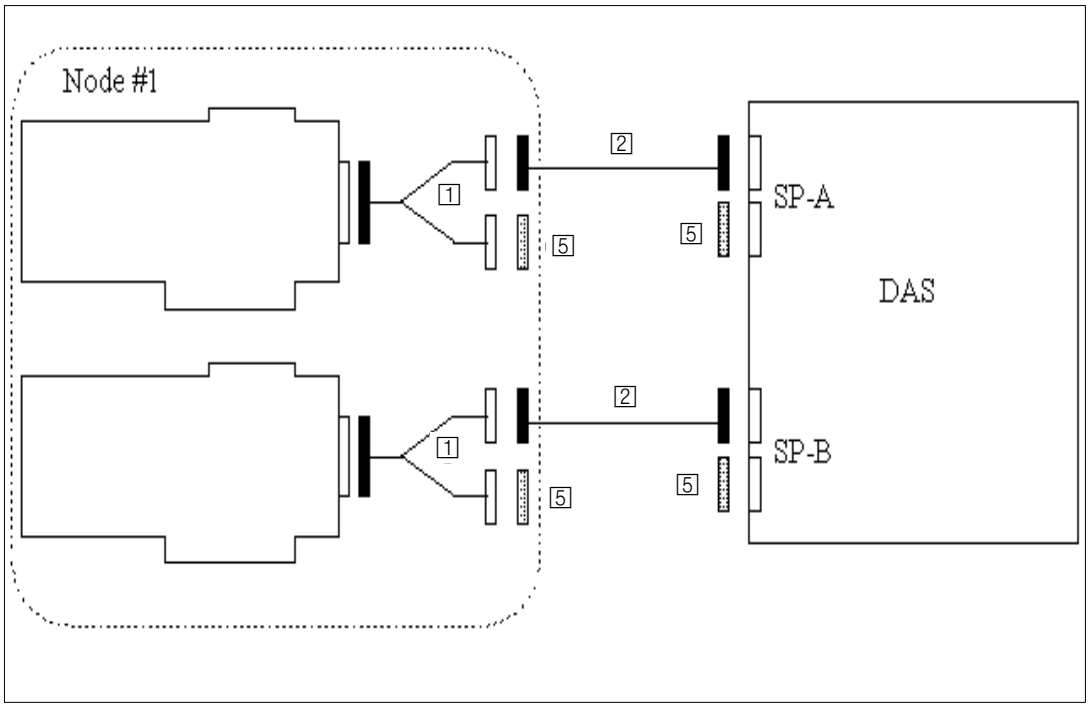


Figure 77. DASCF03: Dual SP / Dual SCSI with 1 node – 1 DAS.

DASCF04: Cabling for: Dual SP / Dual SCSI with 1 node – Daisy chained DAS

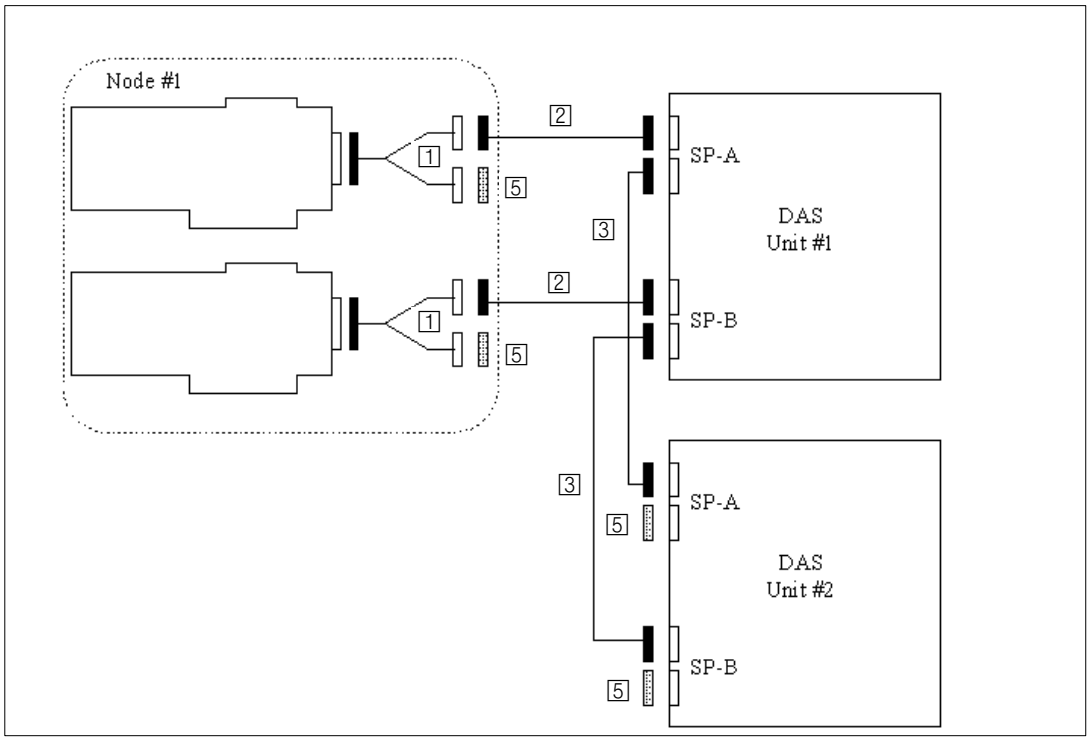


Figure 78. DASCF04: Dual SP / Dual SCSI with 1 node – Daisy chained DAS.

DASCF05: Cabling for: Single SP / Single SCSI with up to 4 nodes – one DAS (1)

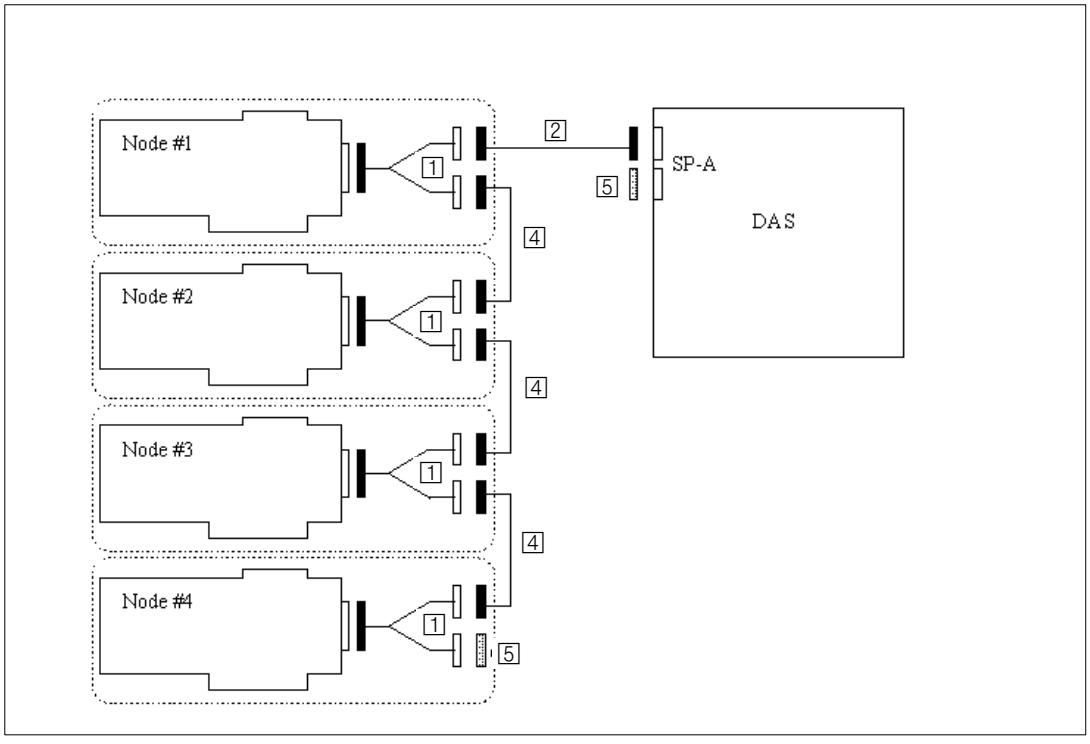


Figure 79. DASCF05: Single SP / Single SCSI with up to 4 nodes – one DAS (1). See also Figure 80.

DASCF06: Example of Single SP / Single SCSI with up to 4 nodes – one DAS (2)

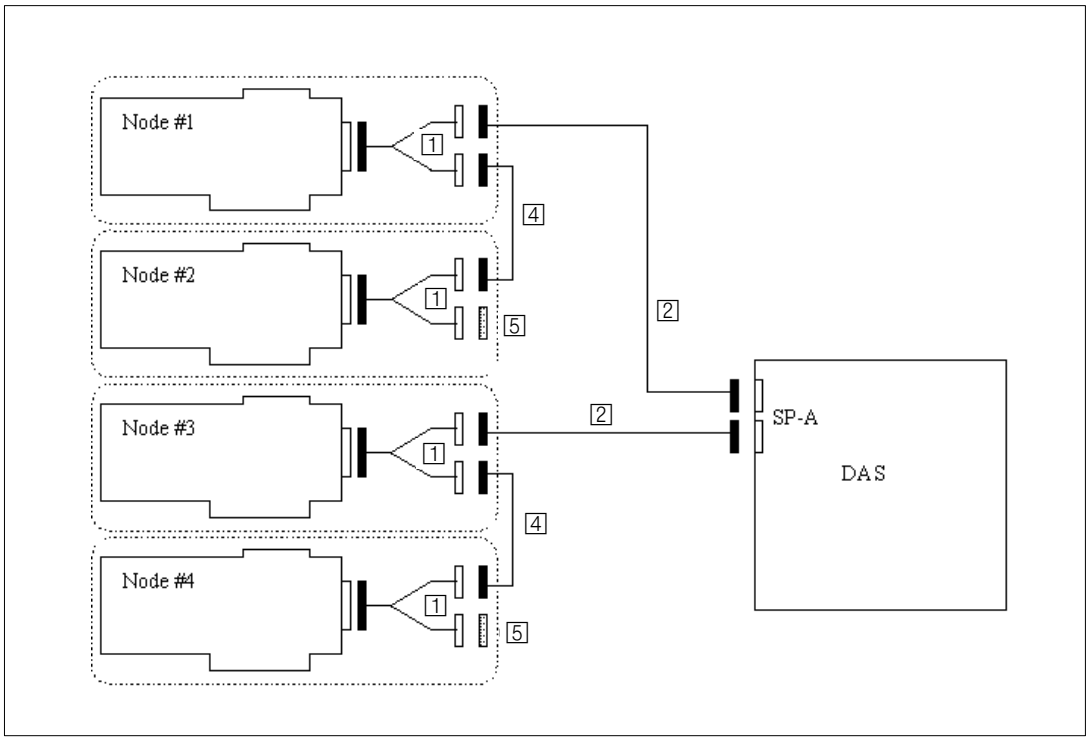


Figure 80. DASCF06: Example of Single SP / Single SCSI with up to 4 nodes – one DAS (2). See also Figure 79.

DASCF07: Cabling for: Single SP / Single SCSI with up to 4 nodes – Daisy chained DAS (1)

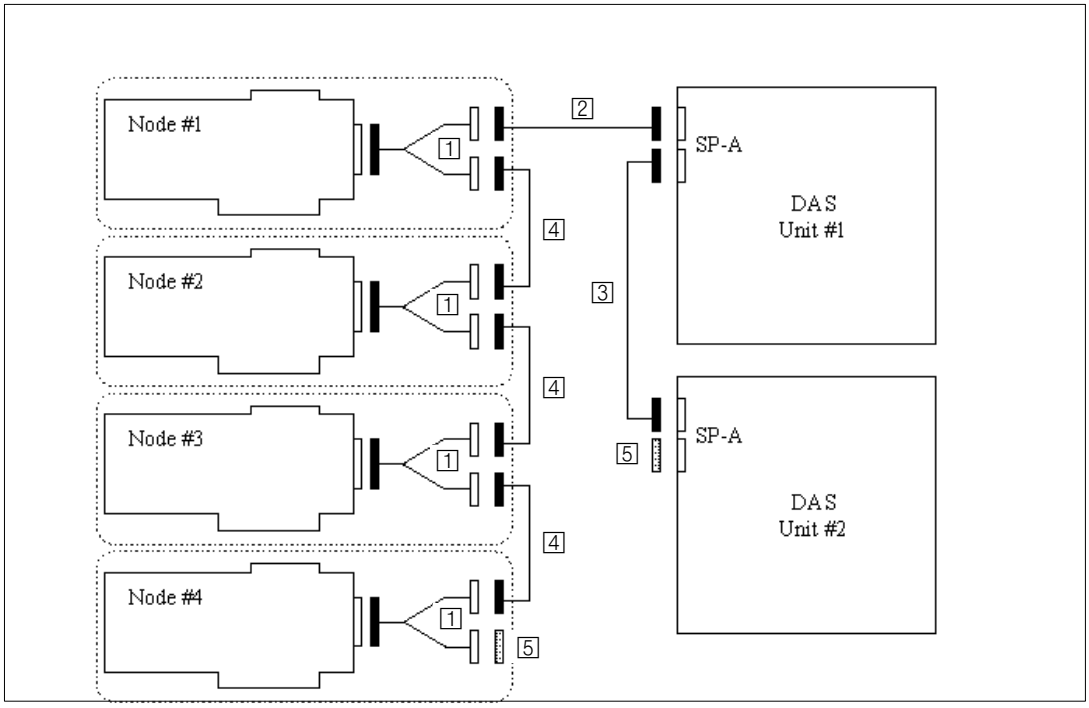


Figure 81. DASCF07: Single SP / Single SCSI with up to 4 nodes – Daisy chained DAS (1).

DASCF08: Cabling for: Single SP / Single SCSI with up to 4 nodes – Daisy chained DAS (2)

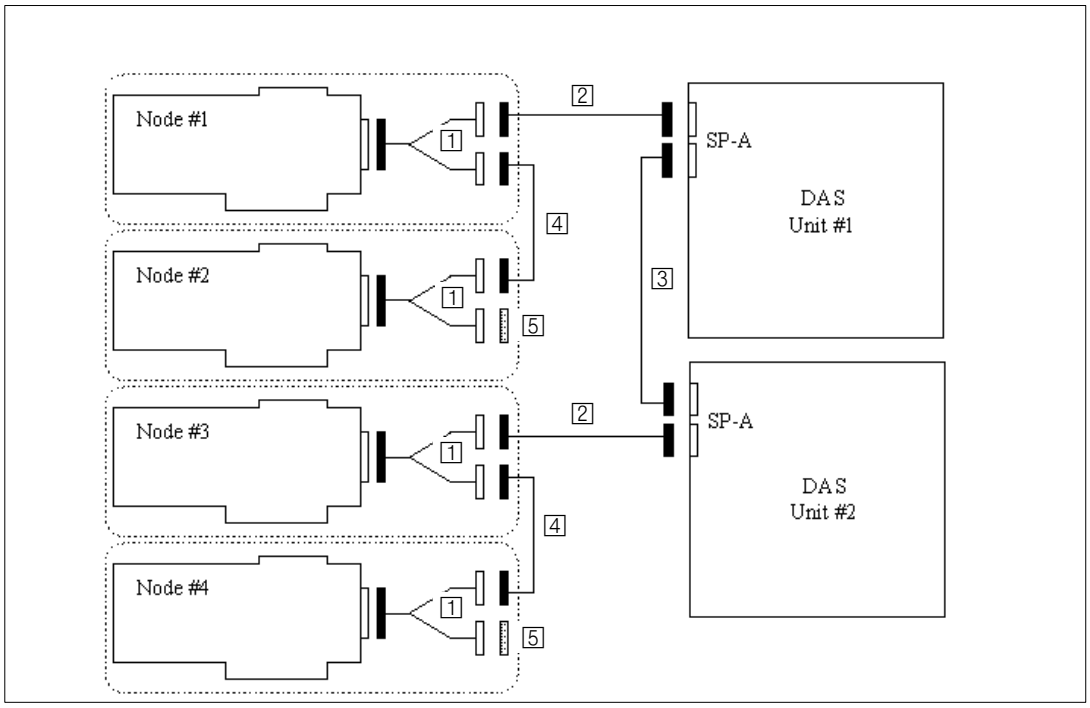


Figure 82. DASCF08: Single SP / Single SCSI with up to 4 nodes – Daisy chained DAS (2).

DASCF9: Cabling for: Dual SP / Dual SCSI with up to 4 nodes – 1 DAS (1)

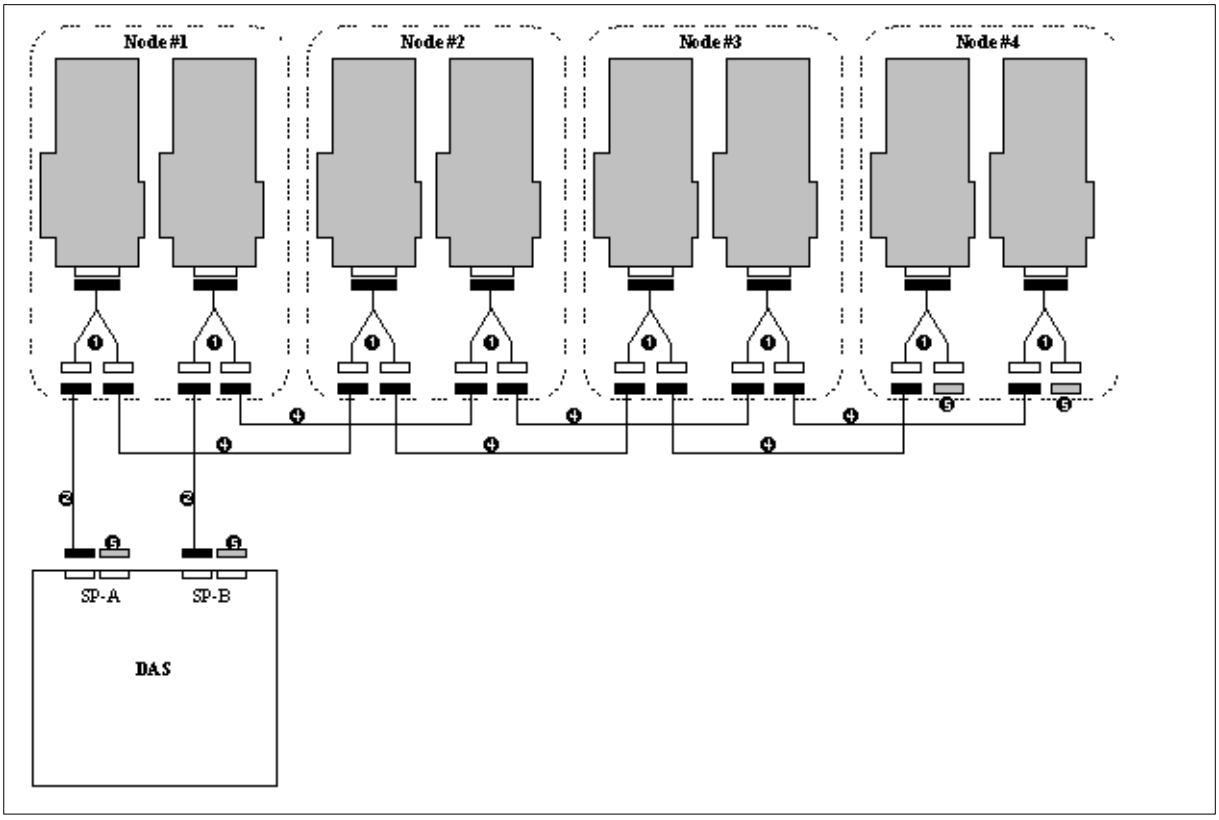


Figure 83. DASCF09: Dual SP / Dual SCSI with up to 4 nodes – 1 DAS (1).

DASCF10: Cabling for Dual SP / Dual SCSI with up to 4 nodes – 1 DAS (2)

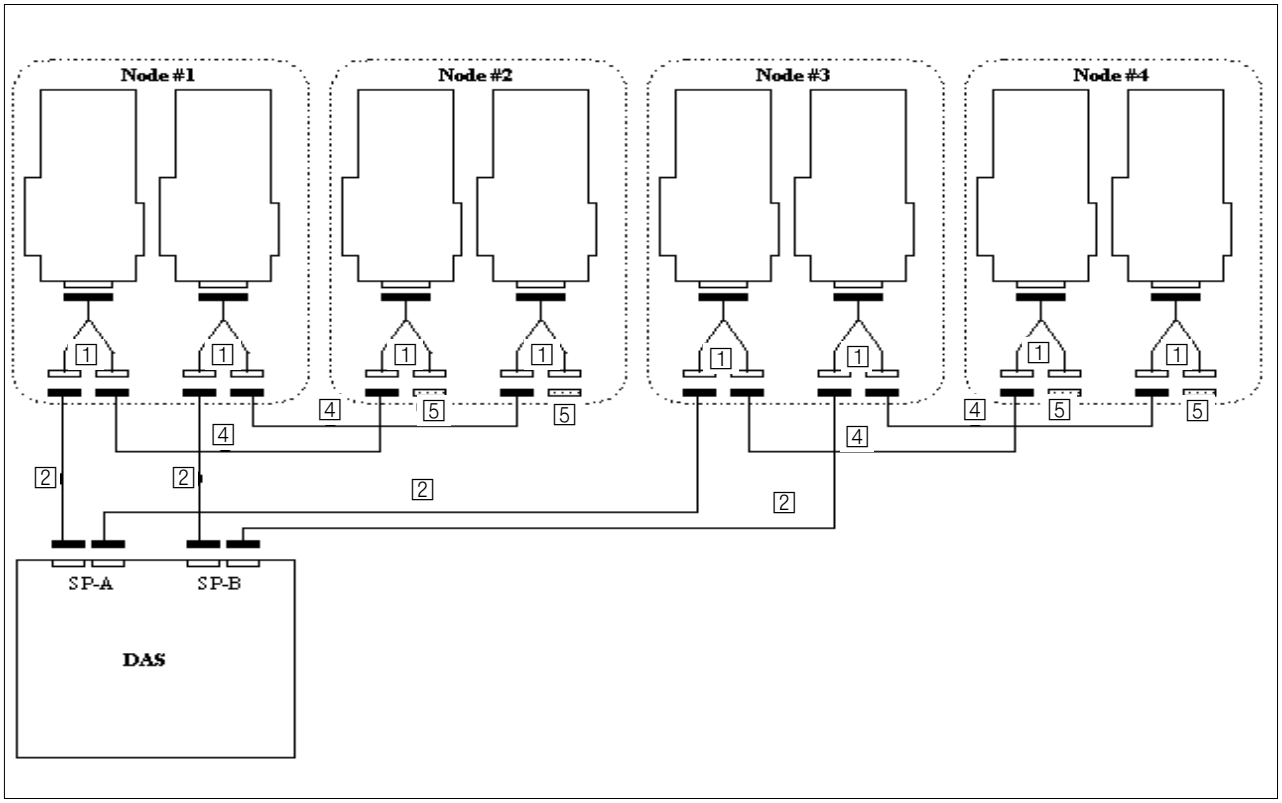


Figure 84. DASCF10: Dual SP / Dual SCSI with up to 4 nodes – 1 DAS (2).

DASCF11: Cabling Dual SP / Dual SCSI with up to 4 nodes – Daisy chained DAS (1)

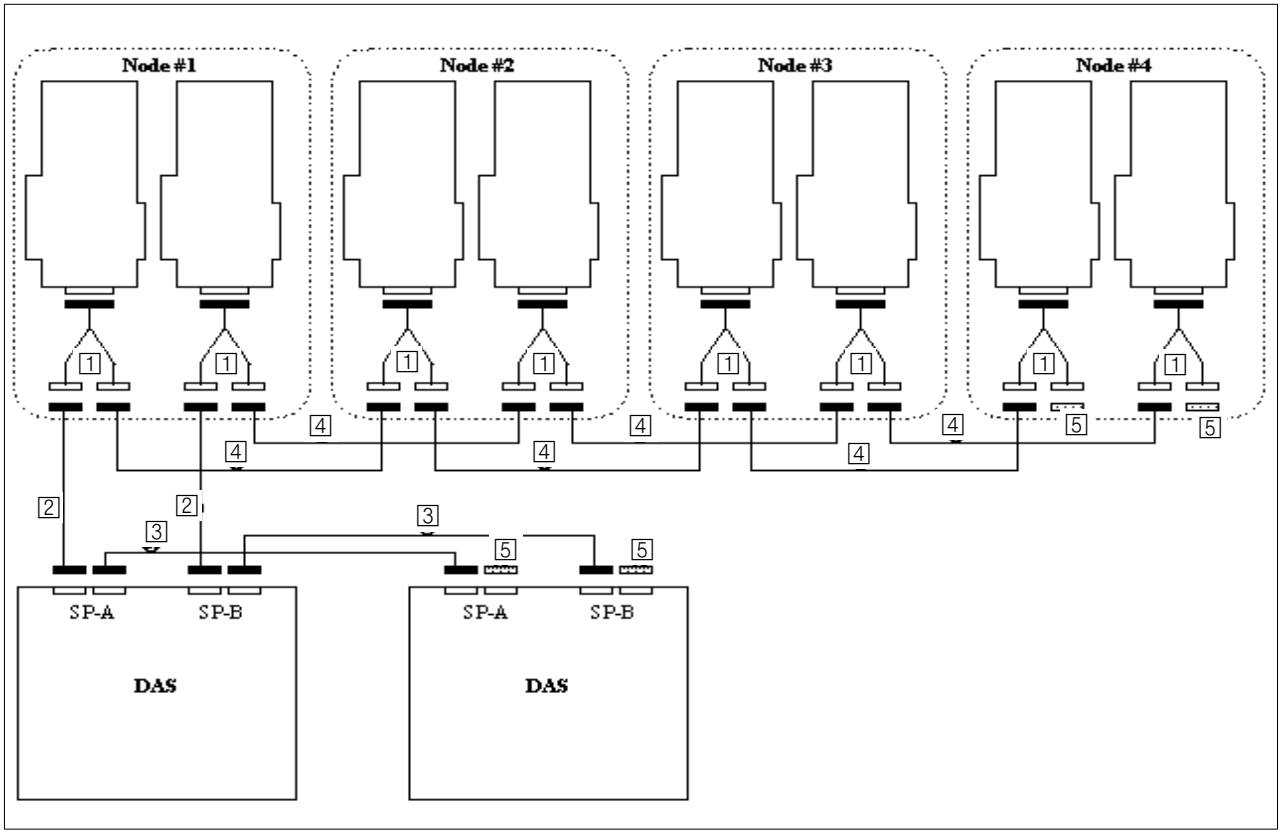


Figure 85. DASCF11: Dual SP / Dual SCSI with up to 4 nodes – Daisy chained DAS (1).

DASCF12: Cabling Dual SP / Dual SCSI with up to 4 nodes – Daisy chained DAS (2)

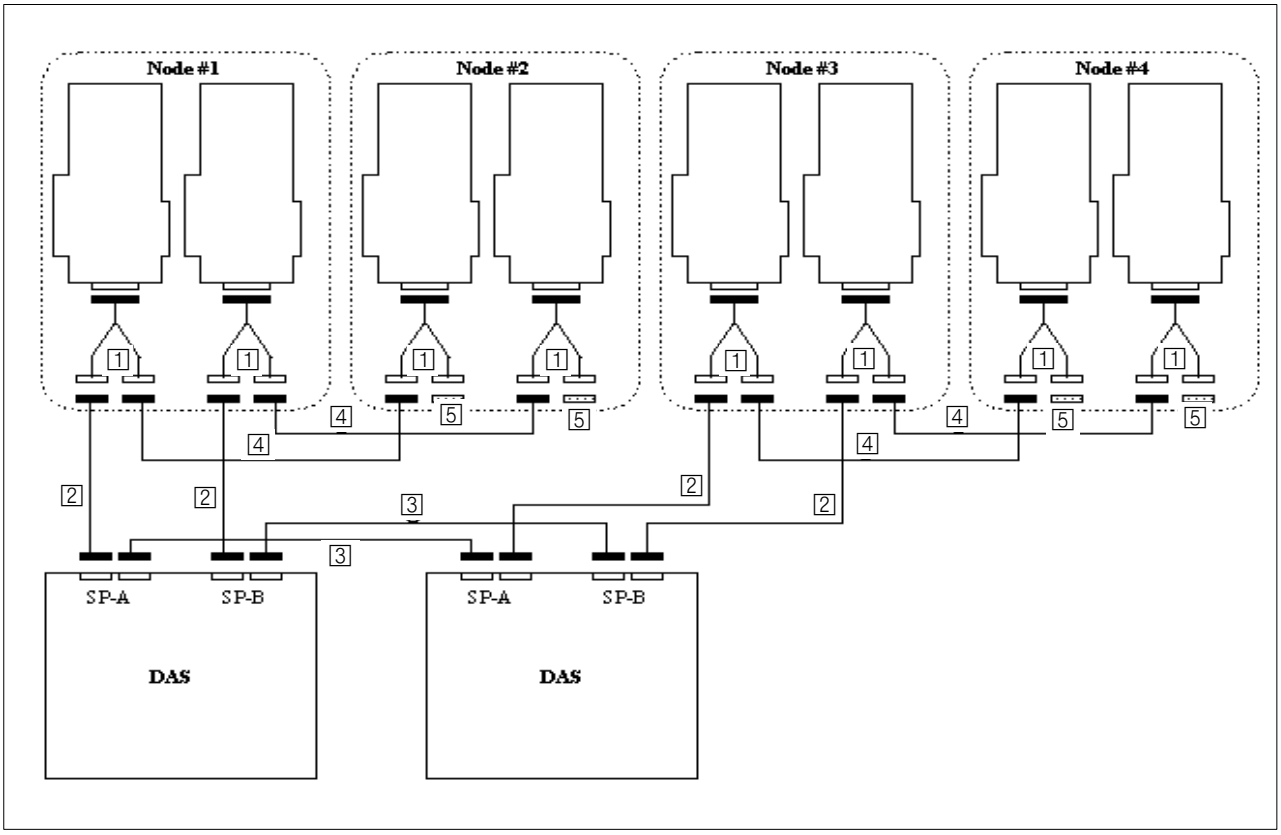


Figure 86. DASCF12: Dual SP / Dual SCSI with up to 4 nodes – Daisy chained DAS (2).

Cabling for Configuration & Management

EPC800, EPC1200 EPC1200A, EPC2400, EOC430 and EPC440 Nodes

The following cabling configuration requires a serial multi-port asynchronous card.

Connect the RS232 cable to a port left on the multiple ways asynchronous boards of a node that shares the DAS.

For a single DAS with one SP, connect the DAS to the first node, as shown.

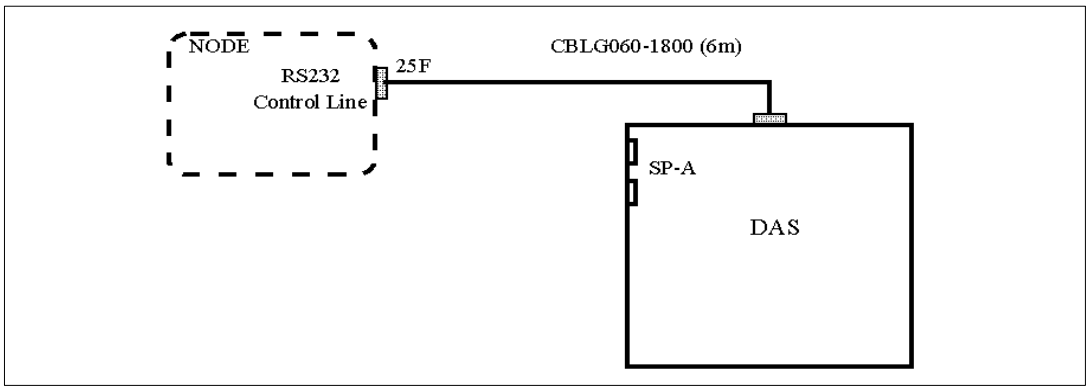


Figure 87. Cabling for Configuration & Management, 1 DAS, 1 SP.

For a single DAS with two SP, connect a first serial cable from the console plug of SP–A to a node, then connect a second cable from the console plug of SP–B to another node.

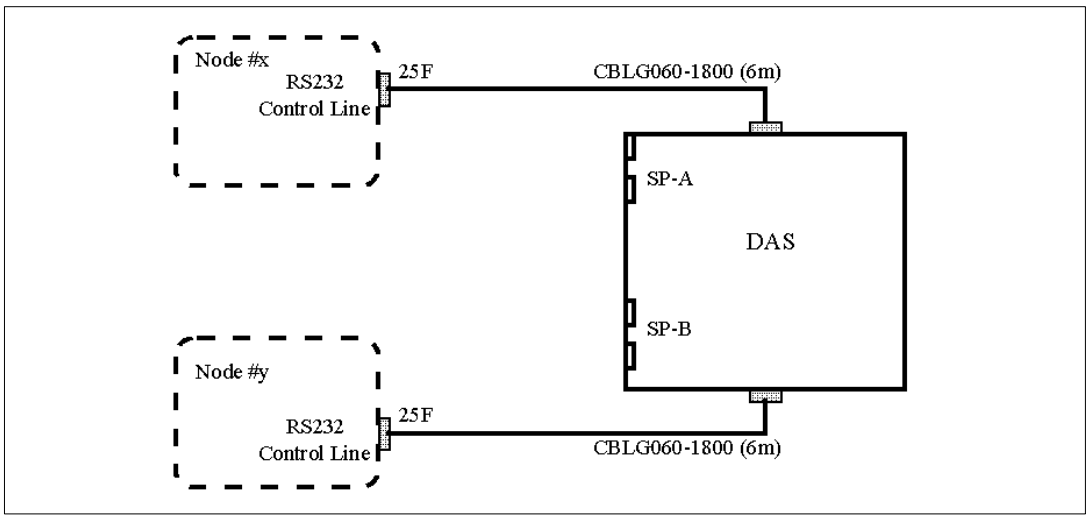


Figure 88. Cabling for Configuration & Management, 1 DAS, 2 SP.

With 2 DAS cabinets, distribute fairly the cabling between the nodes sharing the DAS.

EPC400 Node

A multi–port asynchronous board is not appropriate. A serial port is suitable for the DAS management through a serial line.

DAS Management Through SCSI Links

In any case, DAS management can be performed thru SCSI links from nodes the DAS subsystem is attached to, by using the Navisphere application from a graphical terminal. The remote maintenance option consumes the S2 serial port on a node when an external modem is connected to that node. A serial line is mandatory to manage the DAS the first time (to bind the first LUN). So this may enter in conflict with the need of serial ports for heartbeat line establishment, for system console and for remote maintenance. Therefore a graphical terminal (a graphics display, an X terminal or a PowerConsole) is recommended for the management of the DAS.

Examples of Use for Fibre Channel

The following only applies to PCI nodes (EPC400/430/440, EPC1200, EPC1200A and EPC2400) with the Clariion DAS fibre models. This includes DAS 3500, DAS 57xx. DAS5300 (DPE) and its associated DAE.

Thre are four types of Clariion storage systems available in a rackmount version.

- DAS5700: 10 to 120 disks RAID subsystems. A DAS5700 includes one DPE and additional DAEs. Disk-Array Processor Enclosure (DPE) based storage systems – storage processor building blocks for high availability and performance expansion – 13,200 I/Os per second and 167MB per second. A DPE is a 10-slot enclosure with RAID functionality provided by one or two storage processors (SPs). In addition to its own disks, a DPE can support additional disks in chained 10-slot Disk-Array Enclosures (DAEs).

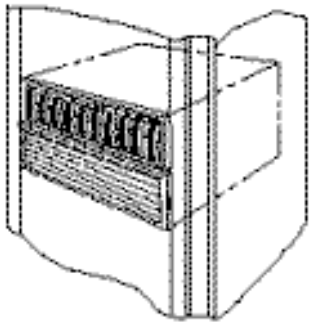


Figure 89.Disk Array Processor Enclosure – DPE

- DAS5300: low end 10 to 30 disks RAID subsystems. A DAS5300 includes one DPE and up two additional DAEs.
- DAS 3500 is a 30-slot SCSI disk storage system. Like the DPE, these offer RAID functionality provided by one or two SPs. However, they use SCSI, not Fibre Channel, disk. Each has space for 30 modules.

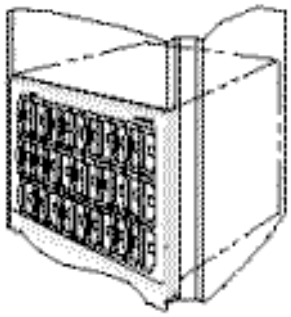


Figure 90.DAS 3500 30-slot SCSI disk storage system

- DAS 3500 and DPE have complete RAID level support – RAID 1/0, 1, 3 and 5.
- Disk-Array Enclosure (DAE-only) storage systems. A DAE is a 10-slot enclosure without SPs (otherwise known as Just a Bunch Of Disks – JBOD). A DAE-only system does not inherently include RAID but can operate as a RAID device using software running on the server system.

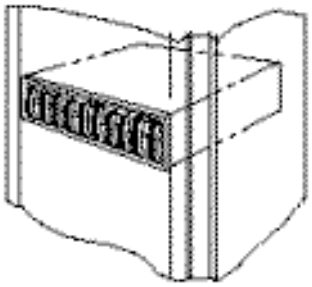


Figure 91.Disk Array Enclosure – DAE

DAS management software is the Navisphere application.

The communication bridge between the Navisphere application and the DPE array is the Navisphere agent. The Navisphere agent resides on every DPE array's node and communicates directly with the storage system firmware. It requires a graphical interface for setting up configuration parameters.

In an EPC configuration with a PowerConsole, the Navisphere application is integrated in the ClusterAssistant launch board.

Cabling: up to 30m is supported with copper using twinax cable assemblies. Medium to long distances of 10m to 10km is supported using the appropriate Media Interface Adapters (MIA) that converts the electrical signal to fibre-optics.

Connection of nodes to DAS drawers is direct or made via Fibre Channel hubs. The length of the copper cables used is 3m by default. A 10m cable is used to connect components in distinct racks.

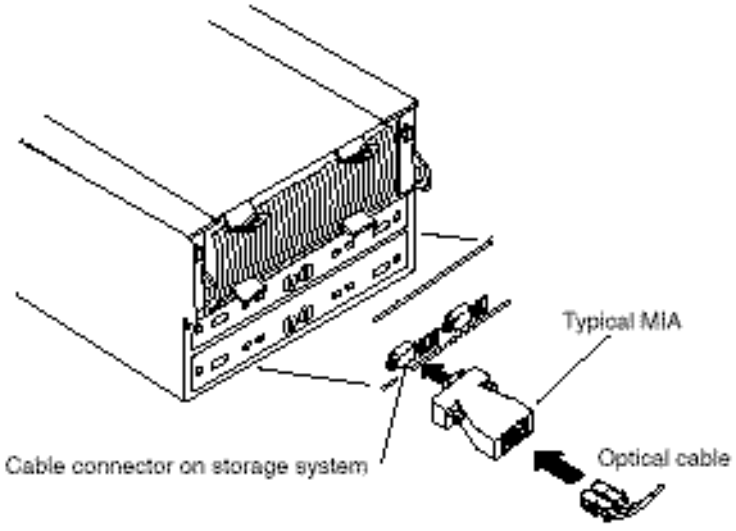


Figure 92.MIA (Media Interface Adapter) seen from the back of the storage system

The following table describes the intended uses of the different configurations.

Diagram number	Nb of loops	Nb of nodes	Nb of adapters per node	HACMP on each node	ATF on each node	Nb of DAS	Nb of SPs per DAS	Nb of hubs	Notes
SLOOP00	1	1	1 or 2	No	No	1 or 2	0	0	4.
SLOOP01	1	1	1	No	No	1	1 or 2 linked	0 or 1	3.
SLOOP02	1	2	1	No	No	1	1	0	–
SLOOP03	1	N>1	1	No	No	D>1	1 or 2 linked	1	1.
SLOOP04	2	2	2	Yes	No	2	0	2	4.
DLOOP01	2	1	2	No	Yes	1	2 (1/loop)	0	–
DLOOP02	2	2	2	Yes	Yes	1	2 (1/loop)	0	–
DLOOP03	2	N	2	Yes	Yes	D	2 (1/loop)	2	1.
DLOOP04	2	2	1	Yes(split) or No	No	1	2 (1/loop)	0	–
XLOOP01	1	1	1 or 2	No	No Yes	1	1 or 2 (1/loop)	0	2.
XLOOP02	2	2	2	Yes	Yes	2	2 (1/loop)	2	2.
XLOOP02	2	2	2	Yes	Yes	2	2	4	2.
DSWITCH 01	2	2	2	Yes	Yes	2	2	2Switchs	2.

Figure 93.DAS Fibre Channel – Table of Examples of Use.

In every case, there must be at most 6 DAS (SP) and 4 Nodes (adapter) on a same FC–AL loop.

Notes:

1. 1 < N + D < 10
2. deport of DAS (mirror) for disaster recovery.
3. A hub is necessary for a dual-SP DAS 57xx (linked SPs)
4. Use of the DAE JBOD

ATF is supported for configurations with Dual-SP DAS and dual attachment (dual loop) per node.

DAS Full Fibre Channel Models

The DAS 57xx model family comprises:

1. DAS 5700 model with a RAID subsystem, including:

- Either a single-SP DPE or a dual-SP DPE disk drawer
- One or more chained DAE disk drawers (1 up to 5 in an EPC1200 or EPC1200A or EPC2400 I/O rack and up to 6 in an EPC400/430 rack or in a rack containing EPC440 drawer)
- One power supply per SP and as many additional power supplies as chained DAE drawers

2. DAS 5300 model with a RAID subsystem, including:

- Either a single–SP DPE or a dual–SP including a DAE disk drawer
- One or two chained DAE disk drawers inside an EPC1200/A/2400/400/430 I/O rack, or in a rack containing an EPC440 drawer)
- One power supply per SP and as many additional power supplies as chained DAE drawers

3. DAS 5720 model with a RAID subsystem, including:

- Two 10-slot disk drawers (1 dual-SP + 1 DAE)
- Dual power supplies
- One battery backup

There is one Standby Power Supply (SPS) for a dual-SP DPE. For higher availability purposes, a second Standby Power Supply, can be used on the second Storage Processor in order to enable write caching even if a SPS is faulty or not fully charged.

Furthermore, a redundant AC power can be supplied: a dual-AC source allows to plug the DAS 57xx to two separate AC sources.

A CBLG194-1400 (right angle) power cord is used to connect the power supply of the DPE (without SPS) and to connect the power supply of every DAE to the PDU inside the rack.

A CBLG195-1400 (straight) power cord is used to connect a SPS to the PDU.

A SPS is rack-mounted. A rack kit is available for each SPS.

The following tables give the minimum number of disk drives per disk drawer type.

Nb of Disk Drives	Minimum in DPE	Min. in a Chained DAE
Single-SP DPE	5	2
Dual-SP DPE	10	4

Figure 94.DAS5700 – Table of Minimums of Disk Drives per Drawer Type

Nb of Disk Drives	Minimum in DPE	Min. in a Chained DAE
Single-SP DPE	3	2
Dual-SP DPE	5	4

Figure 95.DAS5300 – Table of Minimums of Disk Drives per Drawer Type

A DPE as well as a DAE drawer have the capacity of supporting 10 disk drives.

External Fibre Channel Disk (DAE)

One or two DAE Fibre Channel disk subsystems can optionally be ordered as external rack-mounted devices to EPC400/430/440, EPC1200, EPC1200A and EPC2400.

Each DAE contains up to 10 disk drives.

Disk Drive Capacity	1 LCC	2 LCC	Maximum
8.8 GB 10 000rpm	2	4	10
17.8 GB 10 000rpm	2	4	10

Figure 96.DAS Fibre Channel – Table of Number of Disk Drives per External Fibre Channel Disk Subsystem (DAE)

The following are automatically supplied with a DAE:

- CBLG194-0000 – Power Cord
- DRWG010-0000 – DAE 5000 Rack 10 slots (1 LCC)

Rack 400:	CKTG109-0000 – Rackmount option (DAE 5000)
Rack 1200:	CKTG110-0000 – Rackmount option (DAE 5000)
Disk Drives:	MSUG110-0F00 – 8.8GB Fibre DAE Disk (10 000rpm)
	MSUG111-0F00 – 17.8GB Fibre DAE Disk (10 000rpm)
Attachment:	1 x DCCG141-0000 – PCI Fibre Channel Adapter
	1 x DCCG147-0000 – PCI Fibre Channel Adapter
	1 x DCCG148-0000 – PCI Fibre Channel Adapter
	1 x FCCQ002-2000 – Cord 2CU/DB9 10M

Fibre Channel Hub

The FC–AL hub of Escala offer is the Gadzoox's FCL1063TW hub. The FCL1063TW is an active hub for Fibre Channel Arbitrated Loop storage clusters. It has intelligent, per–port data detection check capabilities for automatic port bypass control. The FCL1063TW is configured to have 9 default copper ports each of which are supplied with power to support the Fibre Channel media Interface Adaptors (MIA) for electrical to optical conversion. The FCL1063TW operates without any user intervention. It continuously monitors the serial data and automatically configures an FC–AL network based on its intelligent bypass control logic. To operate, one adds valid FC–AL nodes with ANSI compliant cables – plug and play operation.

Regarding Dual Loop Configuration, two hubs are recommended. The FCL1063TW is designed as a precise half rack chassis so that full redundancy can be achieved with a single, 1U height rack space. Two hubs used together for dual loop applications provide dual power supplies and independent loop ports, and allow for field repairability without system down time.

The FCL1063TW can be mounted into a rack. There is a double rack mount kit designed for mounting two hubs, side by side into a rack.

There is no power switch on the Fibre Channel Hub. The hub should be the first operating component, before powering up the nodes with FC–AL adapters and the DAS fibre (DAS3500, DAS57xx or DAS5300).

The removal of an SP on a DAS57xx and DAS5300 breaks (no by-pass) the FC-AL loop. Therefore, the two SPs of a DAS 57xx and DAS5300 cannot be linked between themselves. The use of a Fibre Channel Hub is thus recommended for Dual-SP DAS 57xx and DAS5300 as pictured in SLOOP01/03.

Configuration for High-Availability and Disaster Recovery

HACMP in conjunction with the support of Fibre connection in DAS subsystems can be used for data mirroring between systems placed in separate locations for extended high availability and disaster recovery (see XLOOP02 figures). The base configuration is made of two PCI nodes (EPC400/440, EPC1200, EPC1200A or EOC2400 nodes) which are located in two floors of the same building, or in two separate buildings within a campus. The two nodes are equipped each with a system console or a graphic display. It is assumed that there is a customer's public network (LAN) to which the nodes are connected. There is no interconnect. A DAS fibre disk subsystem is attached to a node and its data are mirrored on the remote DAS fibre disk subsystem attached to the second node. There are two hubs on each side. A FC-AL hub is used to establish a path from a node to the local disk unit. Two paths exist between a node and a disk unit.

Distances Up to 500 meters

Case 1 – IP takeover on node failure:

For implementing a HACMP cluster, the two nodes must be connected to a same subnet of the customer's public network. The heartbeat serial line between the two nodes is extended by means of micro-modems on each side.

The micro-modem referenced ME62AF (said mini-driver) in Blackbox catalogues is an example of what you can purchase to extend RS232 lines.

The physical characteristics are:

- Protocol asynchronous
- Speed 9.6 kbps
- Transmission Line 2 twisted pair (Wire gauge: 24-AWG, i.e. 0.5mm)
- Operation Full duplex, 4-wire
- Connectors DTE/DCE DB-25 female
- Size 1.3cm x 5.3cm x 10.9cm
- Weight 0.1kg

The maximum length of a fibre link between two MIA is 500 meters. A pair of FC-AL hubs is interconnected with a fiber cable (50µ) and an MIA device on each FC-AL hub when the distance between the two nodes does not exceed 500 meters.

The Escala EPC offer only contains the MIAs which are used to interconnect the FC-AL hubs. The cabling between separate buildings or inside a building is out of scope of the Escala product and must be performed by ad-hoc professional services. This also applies for the extended RS232 lines used for the heartbeat mechanism of HACMP.

When a node fails, the service is recovered on the remote node, and the recovery is transparent to the client in as much as the appropriate failover script exists at application level.

However, on a site disaster, the client may have to reconnect to the node that has automatically recovered the activity of the node of the destroyed site. This can be the case when the router to the public network enabling the client to access the cluster was in the destroyed site.

Case 2 – No IP Takeover

In that case the two distant nodes may not be on the same IP subnet. The heartbeat serial line should be double if the two nodes are not connected to the same TCP-IP network. When a node fails or a disaster happens on a site, the client has to connect to the peer node where the service has been recovered. There is no transparent recovery.

Large Distances (under 10 km)

CAUTION:
The section only presents technologies that can allow theoretically to go beyond 500m. In any case, ad-hoc professional customer services are recommended for constructing such solution.

The two Fibre Channel hubs are interconnect with fiber cable (9µ) and Finisar device on each hub when the distance exceeds 500m. IP takeover is only possible if there is LAN (the two nodes must pertain to same subnet) that permits such distance between the nodes. FDDI is an example of appropriate LAN technology in that case.

For a large distance, the micro-modem referenced ME657A-F (said pseudo-modem) can be used for setting the heartbeat line.

The physical characteristics are:

- Protocol asynchronous
- Speed 9.6 kbps for distances up to 9.5km
- Transmission Line 2 twisted pair (Wire gauge: 24-AWG, i.e. 0.5mm)
- Operation Full duplex, 4-wire
- Connectors DTE/DCE DB-25 female

- Size 1.3cm x 5.3cm x 10.9cm
- Weight <0.1kg

Installation of micro-modem

Even if the micro-modem are not delivered with EPC product, the following indicates the simple steps to install a micro-modem model ”Mini Driver ME762A-F”.

1. Connect the 4-wire telephone line to the unit’s 5-screw terminal block.
2. Set the DCE/DTE switch to the DCE position, since you are connecting the micro-modem to node (a DTE).
3. Cabling: XMT + on RCV +, XMT – on RCV –
   a. Connect the transmit pair to ’XMT” and the receive pair to ”RCV”. To maintain polarity, make sure that the +XMT pair on the local driver is connected to the +RCV pair on the remote driver. The +XMT pair on the local driver must be connected to the –RCV pair on the remote driver.
   b. A ground is provided to connect the cable shield.
4. You will be able to use straight-pinned DB25 cable. Connect the driver directly to the 25-pin connector of a serial port on the multi-way asynch board (case of EPC1200 or EPC1200A node), or use a 9M/25M serial cable adapter (CBL1912) to connect it the 9-pin connector of the S3 serial port on the node (case of EPC400 case).

The following instructions for cabling and configuring apply to the micro-modem Multi-Function Line Drivers ME657A-F or ME657A-M.

Note: This micro-modem can only work in DCE mode.

Cabling:

XMT on RCV and RCV on XMT (no polarity)

Configuration:

Switch	Function	Setting	
SW1-1	data rate	on	9 600bps
SW1-2	data rate	off	
SW1-3	data rate	off	
SW1-4	data rate	on	
SW1-5	clock source	on	Internal
SW1-6	clock source	on	
SW1-7	protocol	on	Asynchronous
SW1-8	carrier control	off	
SW2-1	word length	off	10bits
SW2-2	word length	off	
SW2-3	sig-rate range	off	
SW2-4	RTS/CTS delay	on	
SW2-5	RTS/CTS delay	on	
SW2-6	2Wire/4Wire	on	4-wire full-duplex
SW2-7	2Wire/4Wire	off	
SW2-8	test mode	off	

Figure 97.DAS Fibre Channel – Configuration for Micro-modem Multi-Function Line Drivers

For setting an extended serail line between a Console Concentrator and the S1 port of a distant node, you can use a pair of micro-modems. A micro-modem ME762A-M or ME657A-M on the Console Concentrator side and a micro-modem ME762A-F or ME657A-F on the node side.

Case of the ME762A (Mini-Driver)

The DCE/DTE switch of the micro-modem attached to the Console Concentrator must be set to the DTE position whereas the switch of the micro-modem attached to the node must be set to the DCE position.

Case of the ME657A (Multi-Function Line Driver)

An interposer DCE/DTE reference IBM58F2861 must be used to plug the micro-modem on the Console Concentrator.

Cabling Diagrams for Fibre Channel

Parts List

Item	M.I.	Designation	Length	FRU
1	FCCQ002–1000	Cord 2CU/DB9	0,5m	91060001-001
2	FCCQ002–1500	Cord 2CU/DB9	3m	91060002-001
2	FCCQ002–2000	Cord 2CU/DB9	10m	91060010-001
3	FCCQ001–1800	Cord 2FO/M5/DSC	5m	91061005-001
4	FCCQ001–2100	Cord 2FO/M5/DSC	15m	91061015-001
5	DCOQ001–0000	FC MIA 1/M5/DSC	–	91071001-001
6	DCCG147–0000	PCI 64-bit Copper Fibre Channel Adapter	–	LP8000e
6	DCCG148–0000	PCI 64-bit Optical Fibre Channel Adapter	–	LP8000e

Chaining DPE and DAE

To connect a DPE and DAEs, you must use copper cables whose maximum length is 10 meters. As a result, the distance between a DPE and A DAE cannot exceed 10 meters.

Cabling a DAE as an External Device

In standard configurations, only one DAE can be attached to a node's FC adapter. Up to two DAE,s, hence with two FC adapters can be ordered per node. The following figure shows a chained DAE with one Link Control Card. This is not a standard offer.

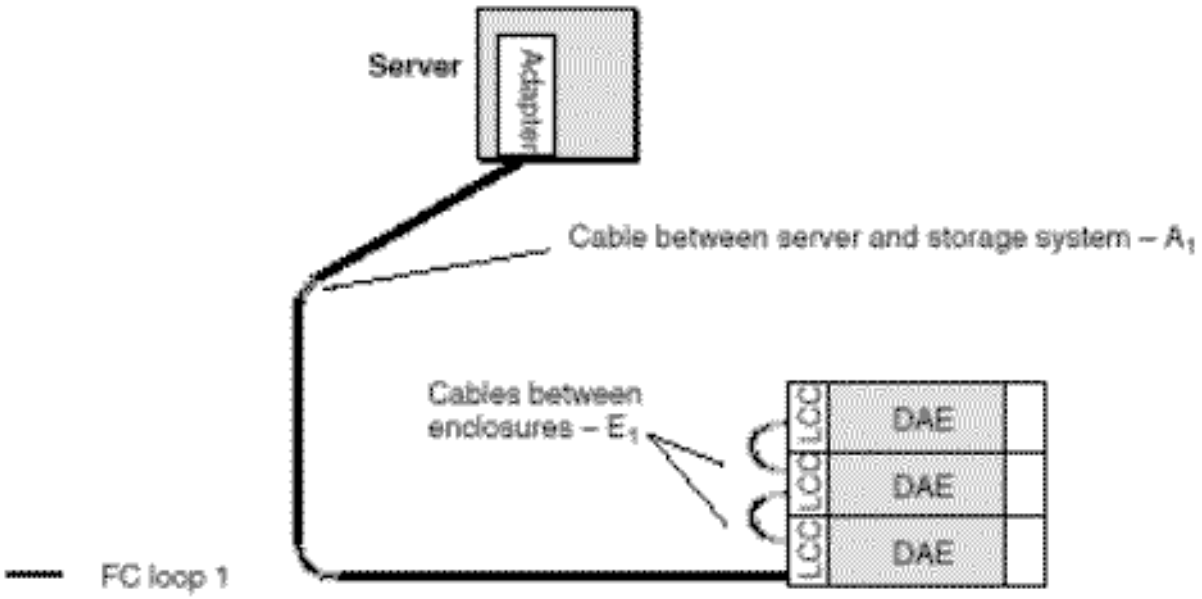


Figure 98.A chained DAE with one Link Control Card

SLOOP00: Single Loop, 1 Node, 1 or 2 DAE

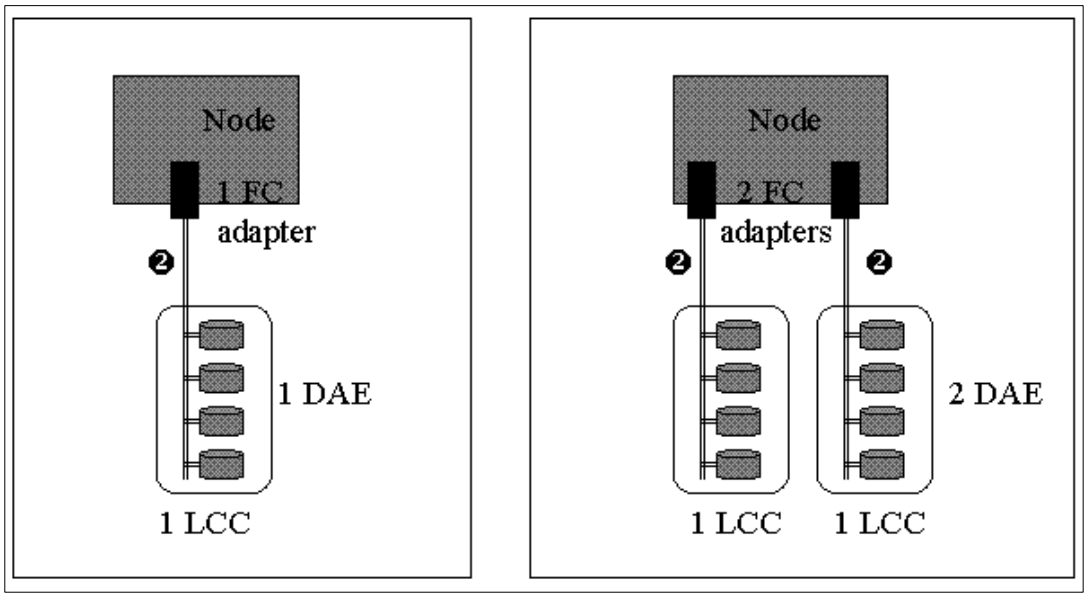


Figure 99.SLOOP00: Single Loop, 1 Node, 1 or 2 DAE.

SLOOP01: Single Loop, 1 Node, 1 DAS with 1 SP)

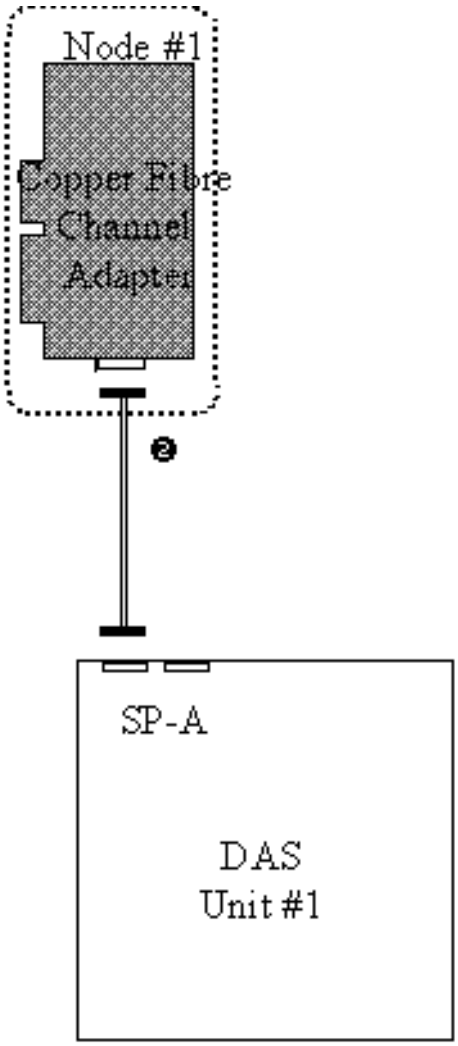


Figure 100.SLOOP01: Single Loop, 1 Node, 1 DAS with 1 SP).

SLOOP02: Single Loop, 2 Nodes, 1 DAS (1 SP)

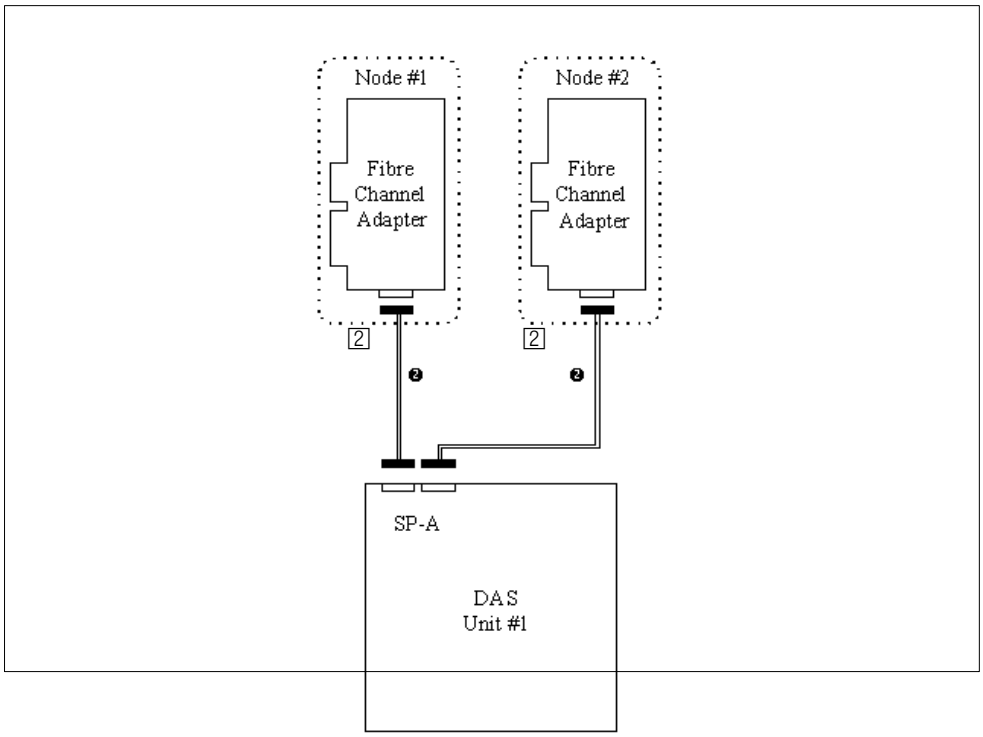


Figure 101.SLOOP02: Single Loop, 2 Nodes, 1 DAS (1 SP).

SLOOP03: Single Loop, 1 Hub, N Nodes, D DAS with 1 SP

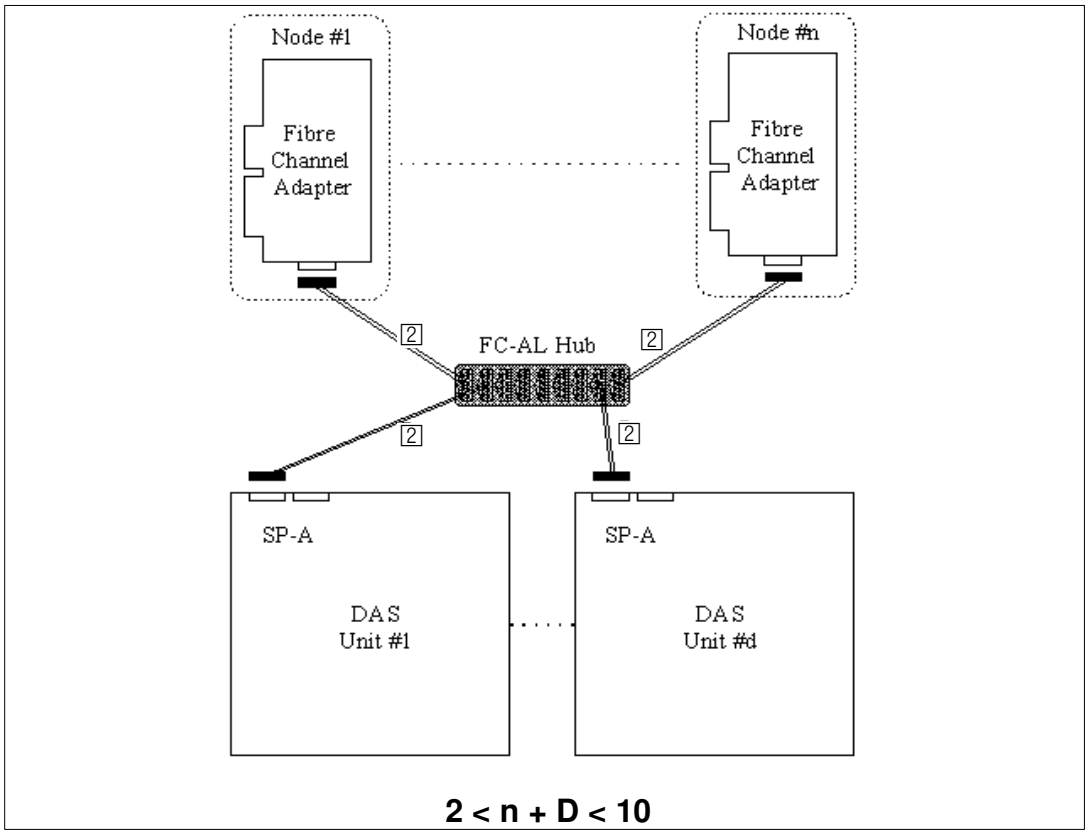


Figure 102.SLOOP03: Single Loop, 1 Hub, N Nodes, D DAS (1 SP).

SLOOP04: Two Loops, 2 Nodes, 2 DAEs (1 LCC)

The following applies to EPC400/430/440 and EPC1200A/2400 HA packages. It is to be used with HACMP/ES 4.3 cluster software.

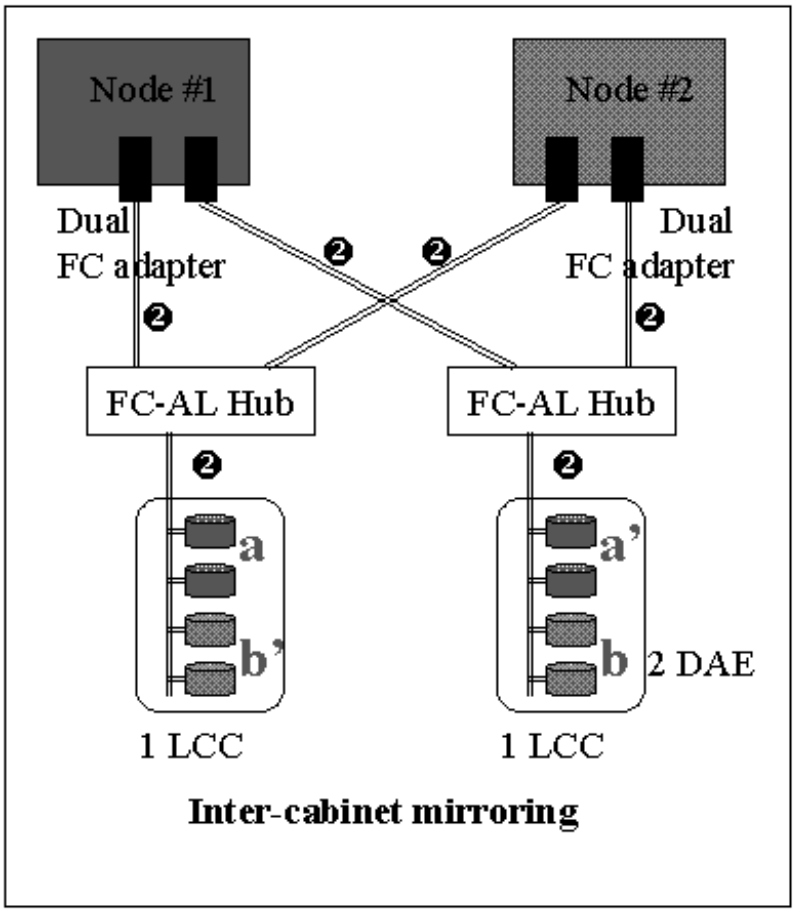


Figure 103.SLOOP04: Two Loops, 2 Nodes, 2 DAEs (1 LCC).

DLOOP01: Dual Loop, 1 Node with 2 Adapters, 1 DAS with 2 SPs

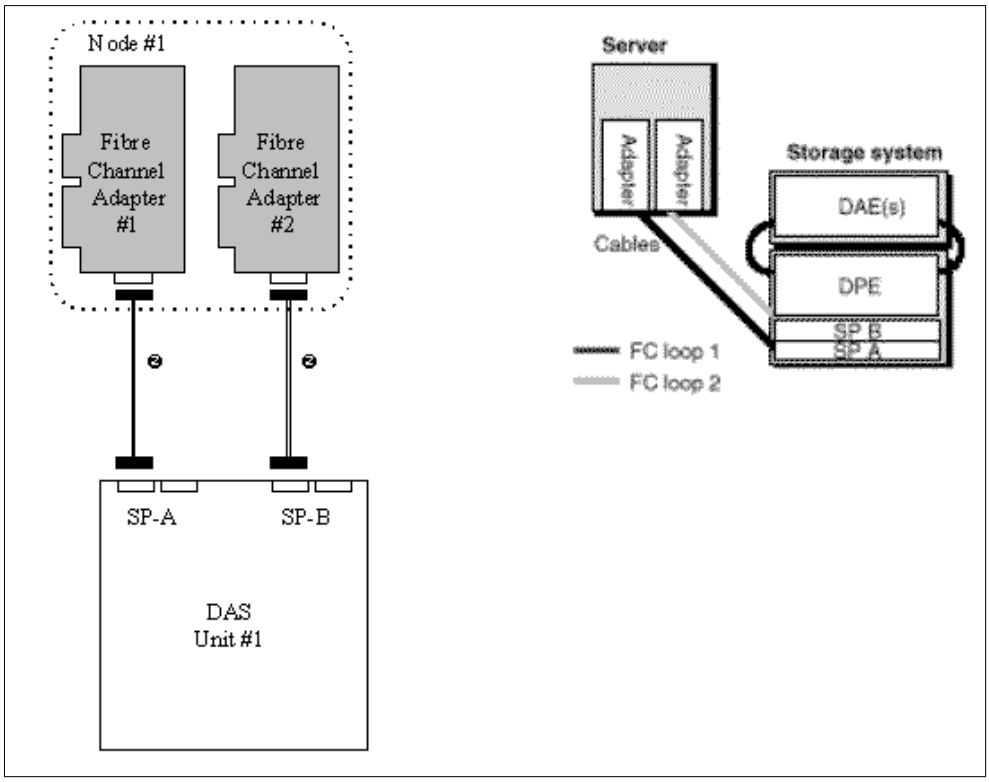


Figure 104.DLOOP01: Dual Loop, 1 Node with 2 Adapters, 1 DAS with 2 SPs.

DLOOP04: Two Loops, 2 Nodes, 1 DAS with 2 SPs

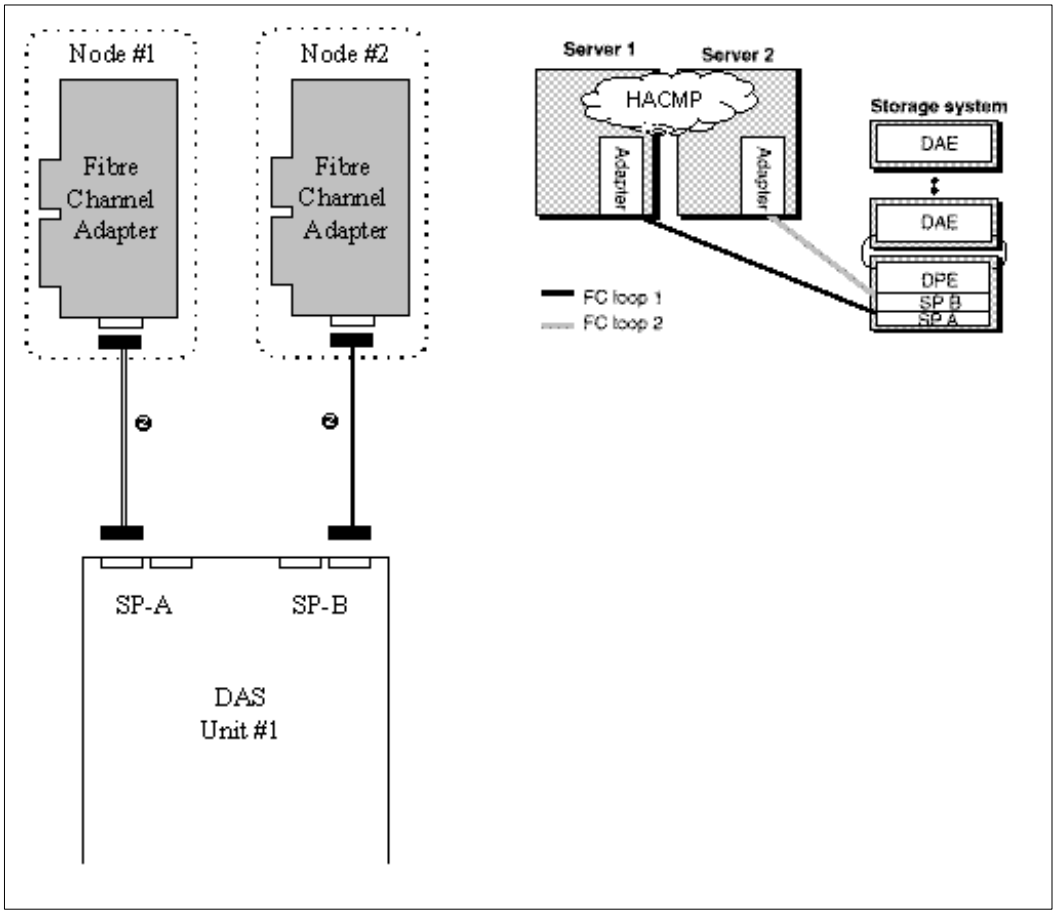


Figure 105.DLOOP04: Two Loops, 2 Nodes, 1 DAS with 2 SPs.

DLOOP02: Dual Loop, 2 Nodes, 1 DAS with 2 SPs

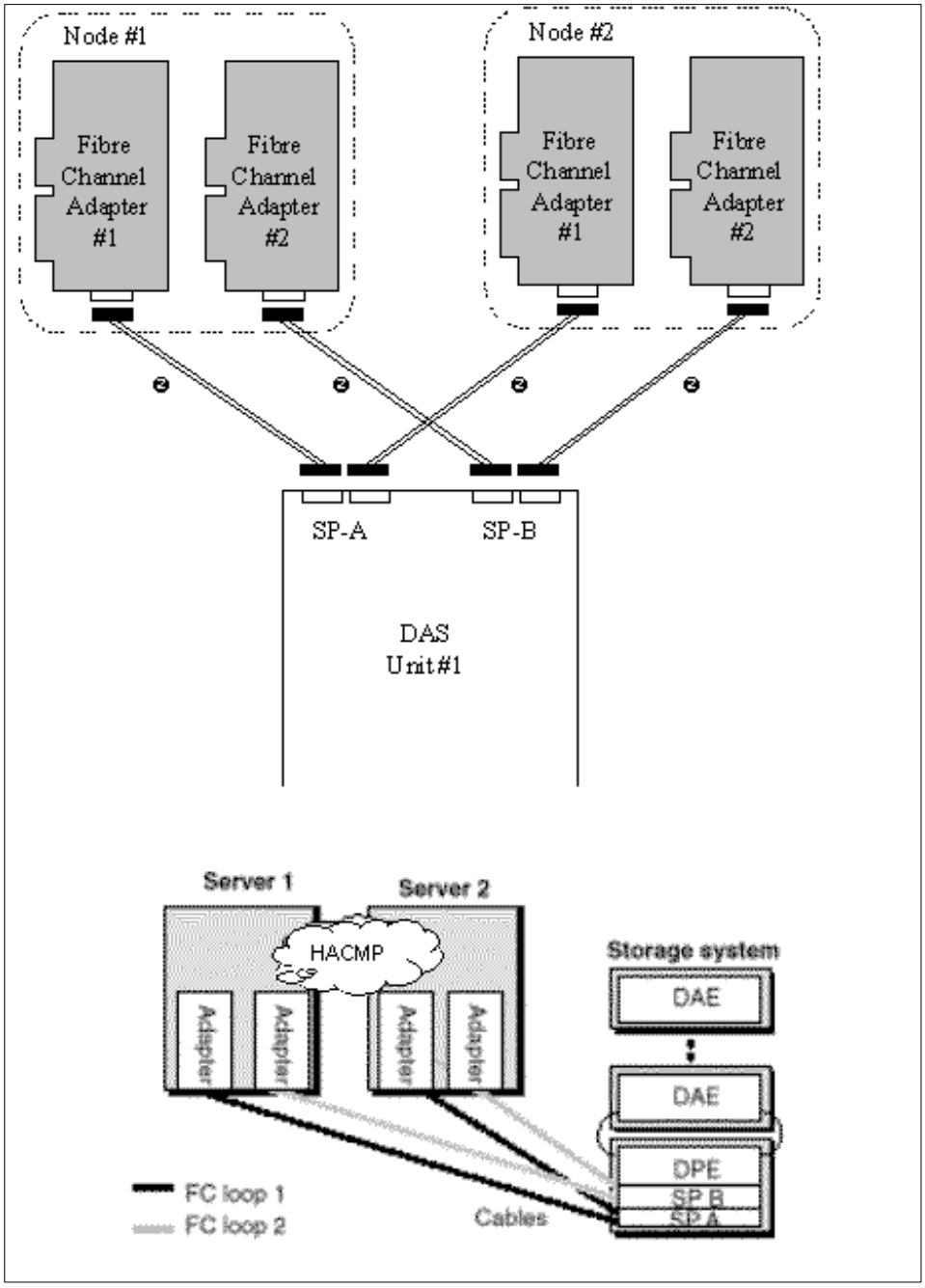


Figure 106.DLOOP02: Dual Loop, 2 Nodes, 1 DAS with 2 SPs.

DLOOP03: Dual Loop, Two Hubs, N Nodes, D DAS with 2 SPs

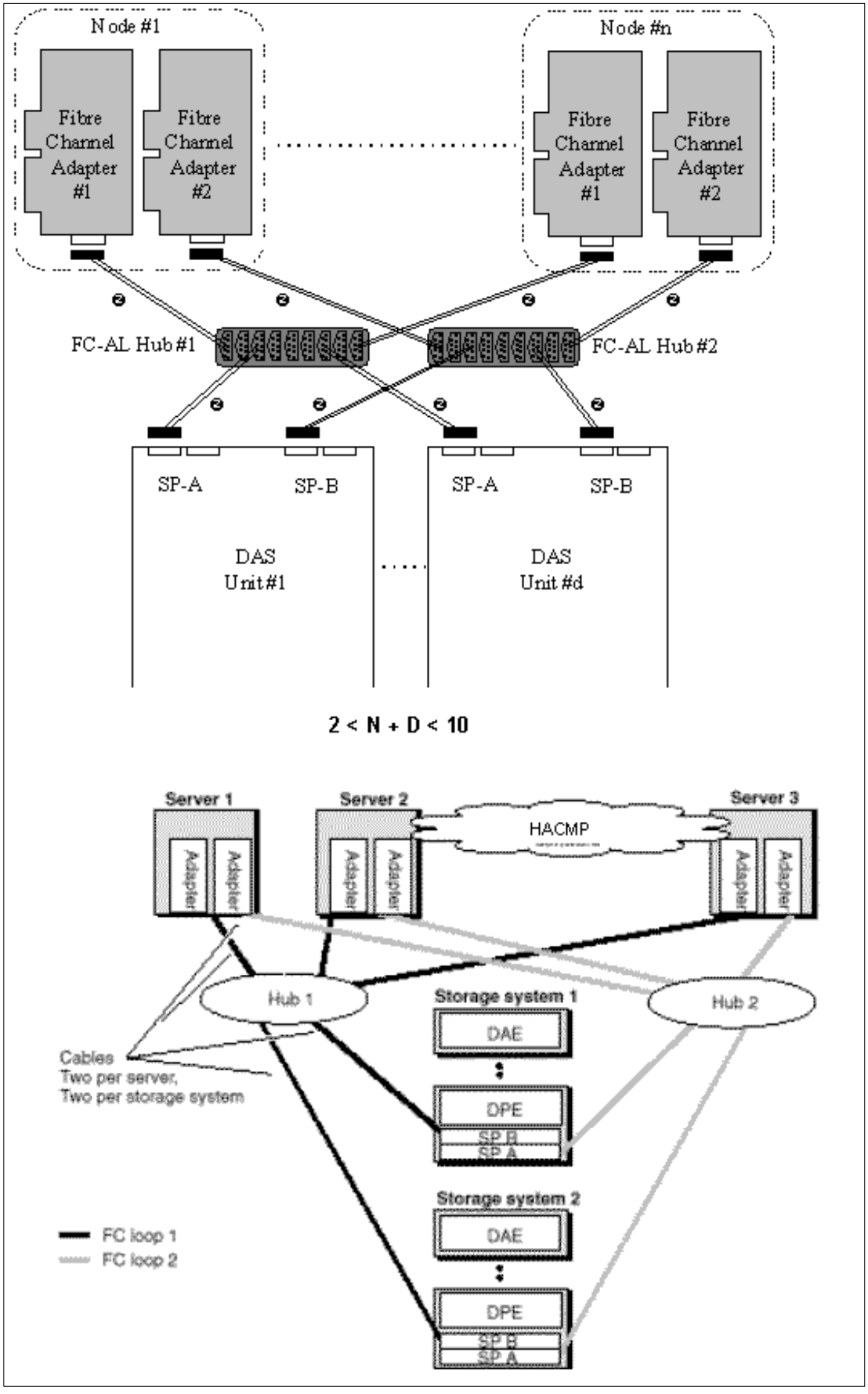


Figure 107.DLOOP03: Dual Loop, Two Hubs, N Nodes, D DAS with 2 SPs.

XLOOP01: 1 Node, Single or Dual Loop, 1 Deported DAS

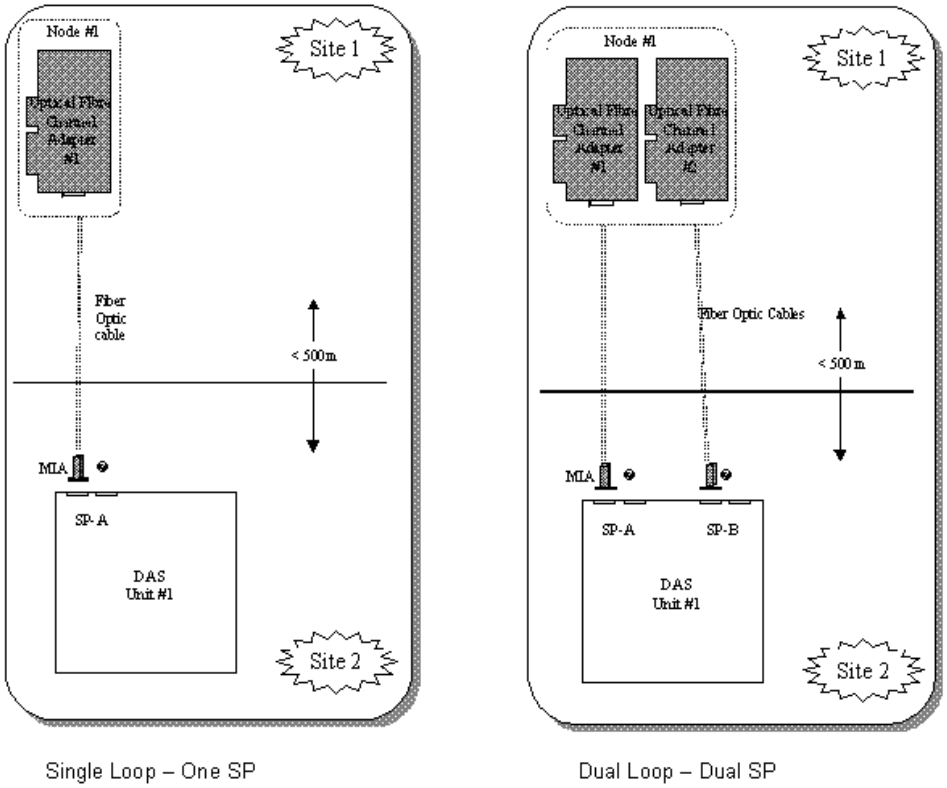


Figure 108.XLOOP01: 1 Node, Single or Dual Loop, 1 Deported DAS.

XLOOP02: 2 Nodes, Dual Loop, 2 Hubs, 2 DAS (one Deported)

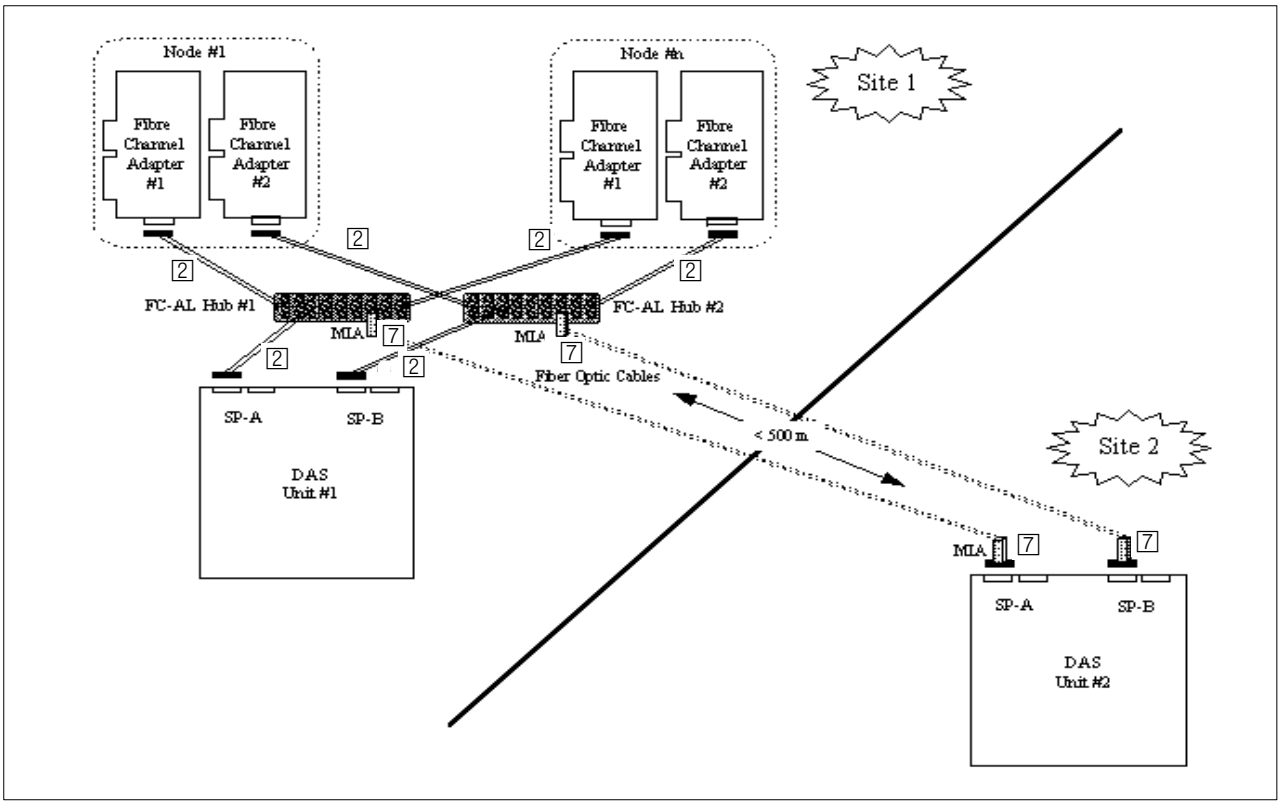


Figure 109.XLOOP02: 2 Nodes, Dual Loop, 2 Hubs, 2 DAS (one Deported).

XLOOP02: 2 Nodes, Dual Loop, 4 Hubs, 2 DAS

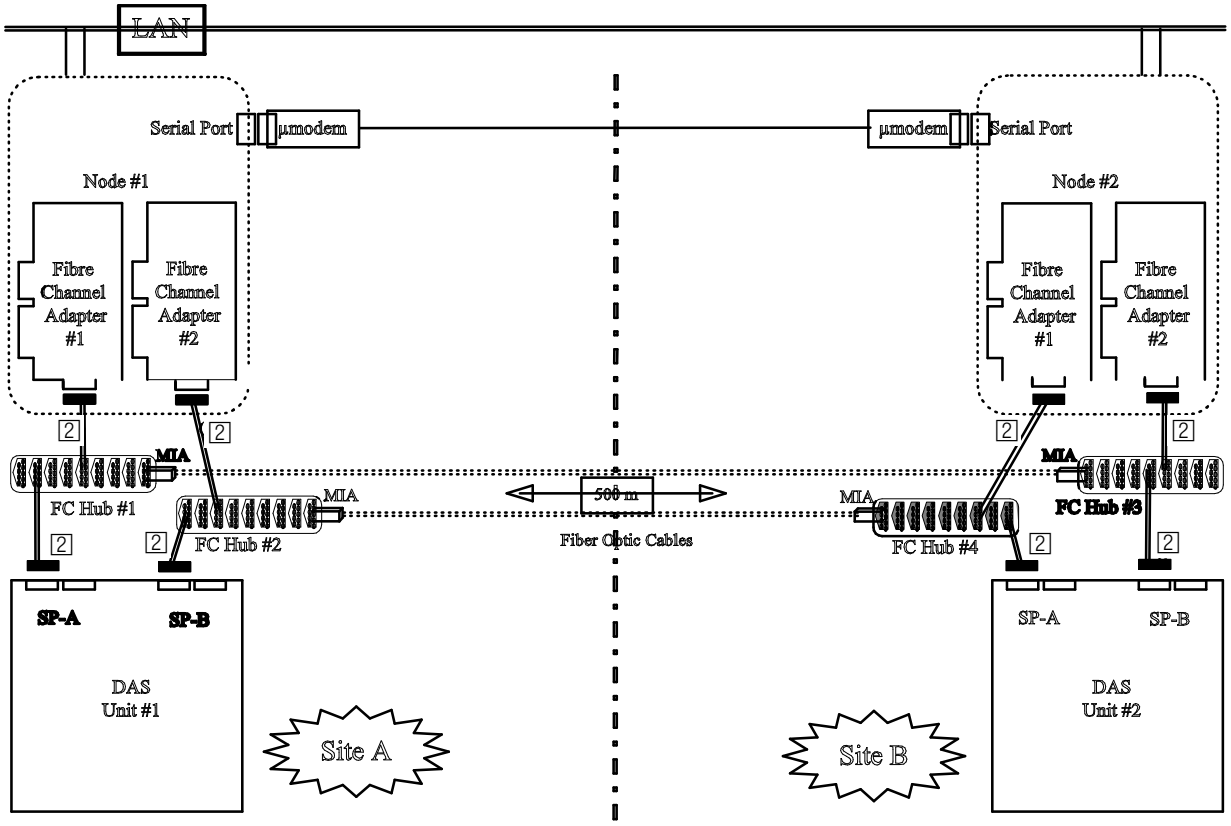
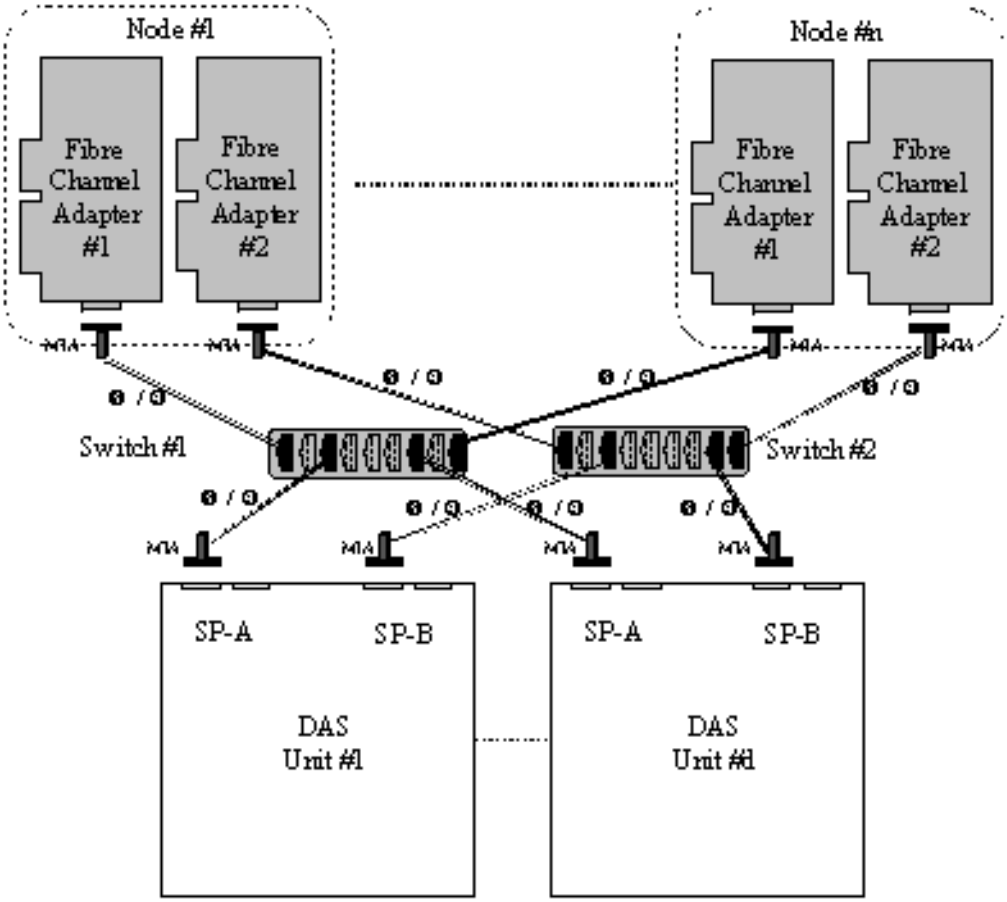


Figure 110.XLOOP02: 2 Nodes, Dual Loop, 4 Hubs, 2 DAS.

DSWITCH01: Dual Switch, N Nodes, D DAS with 2 SPs



0 < N + D ≤ 16

The connectors of the switch that are black on the figure are equipped with GBICs.

Figure 111.DSWITCH01: Dual Switch, N Nodes, D DAS with 2 SPs.

JDA Subsystems

AMDAS JDA disk subsystems (End Of Life) are only available on EPC800 nodes.

You will find:

MI List

M.I.	Designation	Length	FRU
DRWF006–0000	Just a Bunch of Disks Array Drawer		
MSUF070–0J00	4.2GB Hi Speed Disk Drive (JDA)		
MSUF073–0J00	9.1GB Hi Speed Disk Drive (JDA)		
MSKF005–0000	Disk Tray Assembly		
PSSF007–0000	JDA Redundant Power Supply		
CBLF177–1300	Cable, SCSI–2 RS232	2m	
CBLF177–1700	Cable, SCSI–2 RS232	6m	
CBLF177–2100	Cable, SCSI–2 RS232	20m	
CBLG157–1100	Cable, SCSI–2 (68MD/68MD)	1m	90676006-002
CBLG157–1300	Cable, SCSI–2 (68MD/68MD)	2m	90676002-002
CBLG157–1700	Cable, SCSI–2 (68MD/68MD)	6m	90676003-002
CBLG157–1900	Cable, SCSI–2 (68MD/68MD)	12m	90676004-002
CBLG157–2100	Cable, SCSI–2 (68MD/68MD)	20m	90676005-002
CBLG102–1700	Cable, SCSI to BHS	6m	

Examples of Use

These components are used in the following cases:

Number of Control-lers	Number of Attached Nodes	Number of SCSI Chains	Number of Disks	Number of Plates	JDA Con-figuration Figure
1	1	1	[1 – 6] [7 – 12]	1 2	JDACF01 JDACF02
1	2	2	[2 – 12] [13 – 24]	2 4	JDACF03 JDACF04
2	1	2	[2 – 12] [13 – 24]	2 4	JDACF05 JDACF06
1	2	1	[1 – 6] [7 – 12]	1 2	JDACF07 JDACF08
2	2	2	[2 – 12] [13 – 24]	2 4	JDACF09 JDACF10

The JDA cabinet is attached to a single node or it is common to two nodes.

When it is common to two nodes the disk cabinet can be used as system disk extension or shared disk subsystem.

In the former case the disks are not shared. Each node possesses its own SCSI bus.

In the latter the configuration allows to support a node failure. There are two SCSI adapters per node, where each adapter is connected to a distinct SP. The first adapter of a node allows to access the disks on plates (e.g. A and/or B) allocated to the node, whereas the second adapter allows to access to the disks on plates (e.g. D and/or E) of the other node. If a node fails, the other node can recover the activities and access the disks of the failed node through the second adapter.

However, the mirroring of data implemented through standard mirroring function of AIX system cannot be done across the two SCSI chains. It means that the failure of a main adapter is not supported, for the reason that no engineering tests have been so far performed on that case.

Cabling Diagrams

JDACF01 1 node + 1 controller, 1 SCSI bus, 1 plate

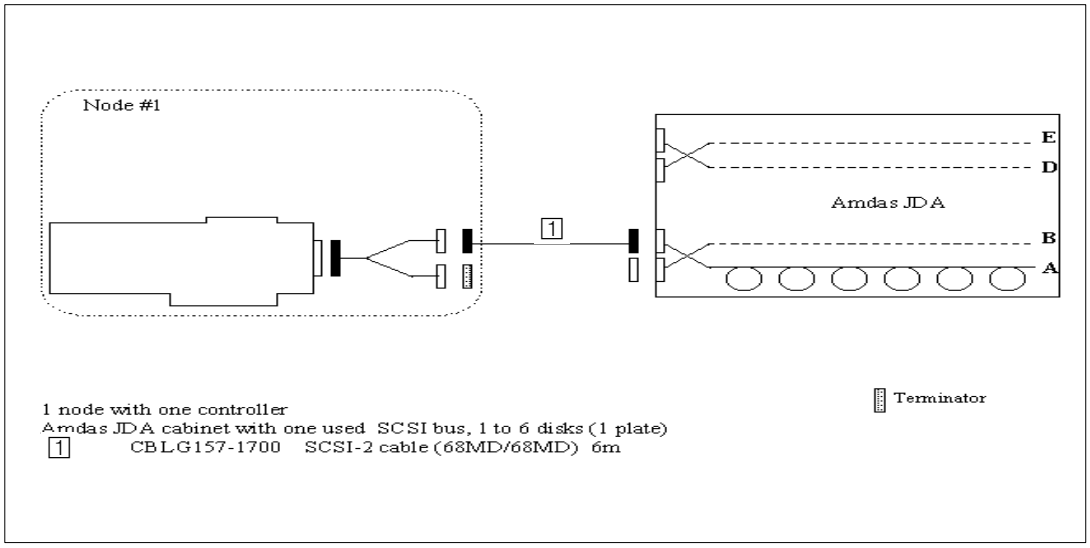


Figure 112.
JDACF01: 1 node + 1 controller, 1 SCSI bus, 1 plate.

JDACF02 1 node + 1 controller, 1 SCSI bus, 2 plates

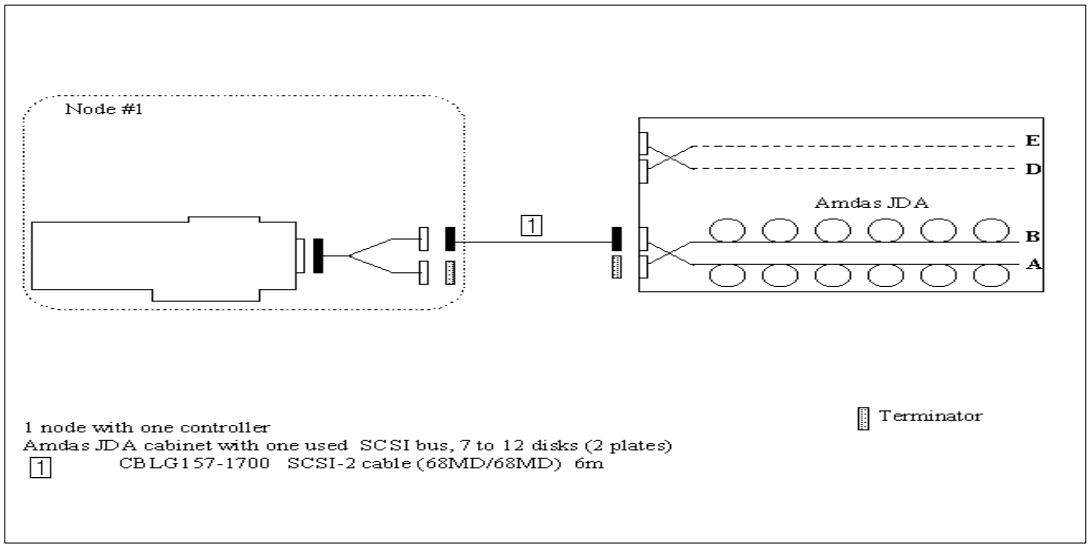


Figure 113. JDACF02: 1 node + 1 controller, 1 SCSI bus, 2 plates.

JDACF03 2 nodes + 2 controllers (1 per node), 2 SCSI buses, 2 plates

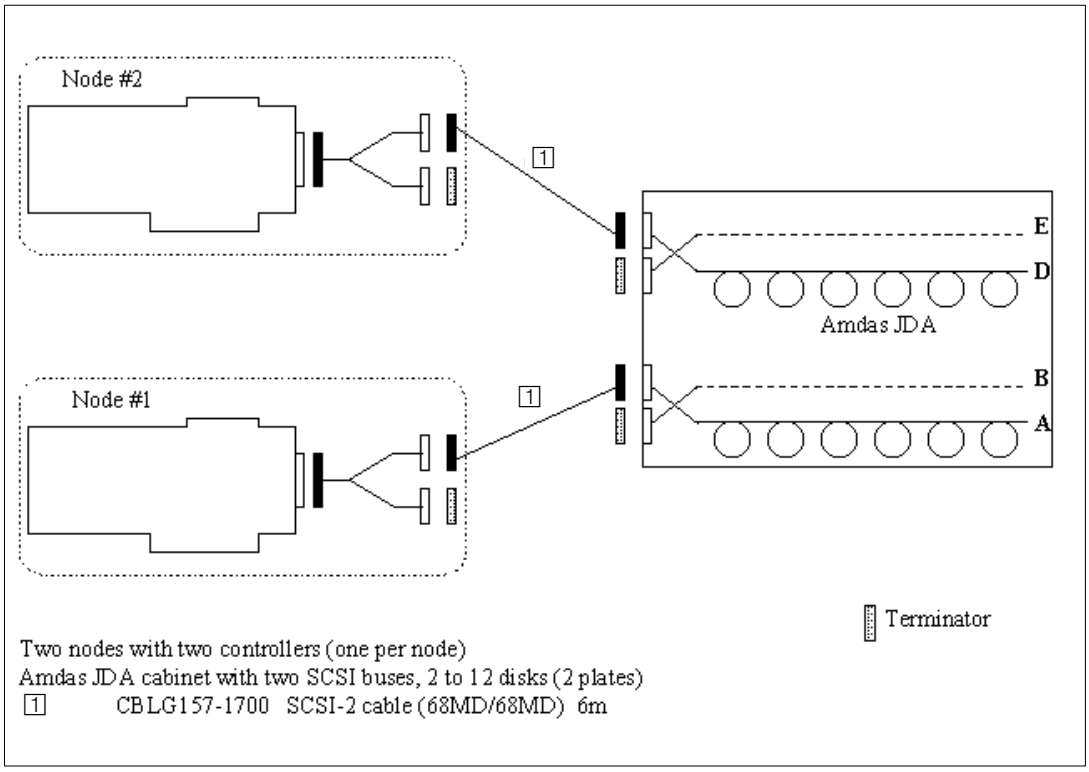


Figure 114. JDACF03: 2 nodes + 2 controllers (1 per node), 2 SCSI buses, 2 plates.

JDACF04 2 nodes + 2 controllers (1 per node), 2 SCSI buses, 4 plates

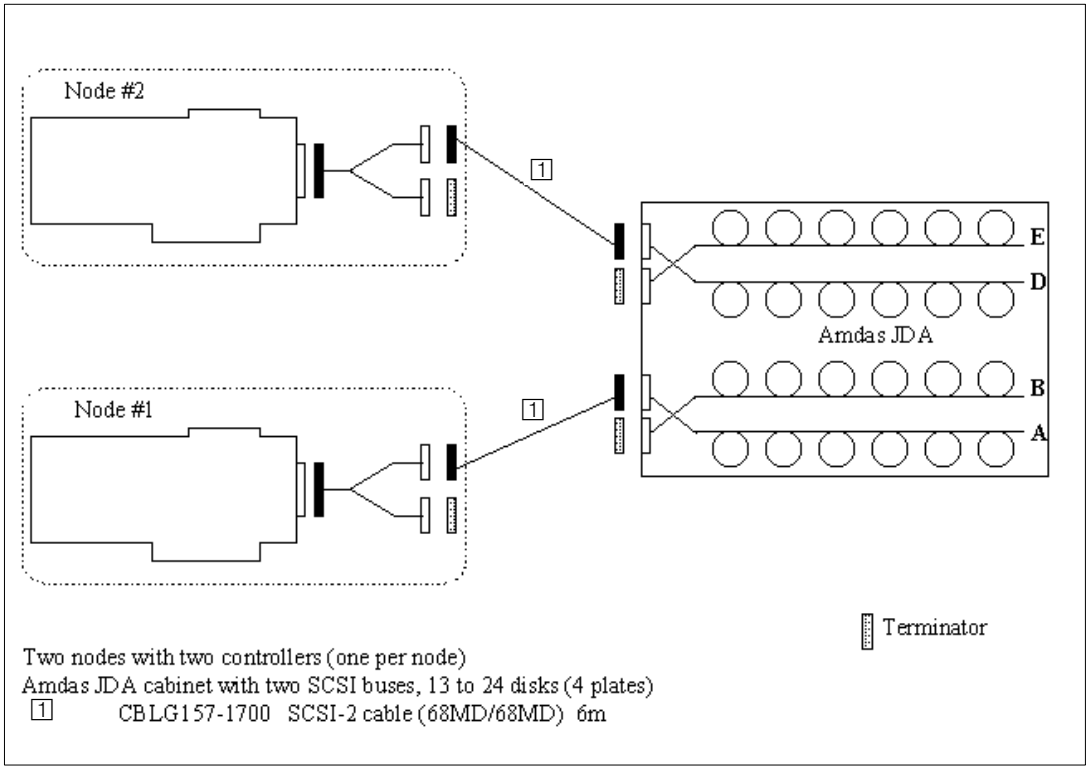


Figure 115. JDACF04: 2 nodes + 2 controllers (1 per node), 2 SCSI buses, 4 plates.

JDACF05 1 node + 2 controllers, 2 SCSI buses, 2 plates

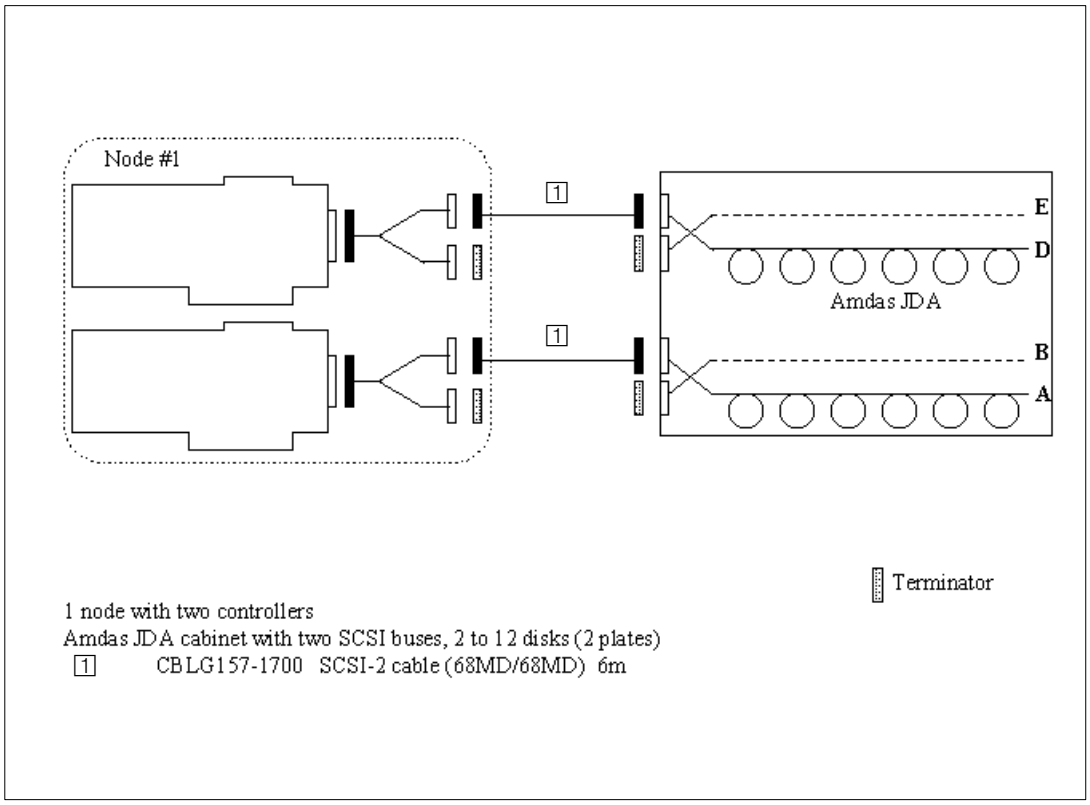


Figure 116. JDACF05: 1 node + 2 controllers, 2 SCSI buses, 2 plates.

JDACF06 1 node + 2 controllers, 2 SCSI buses, 4 plates

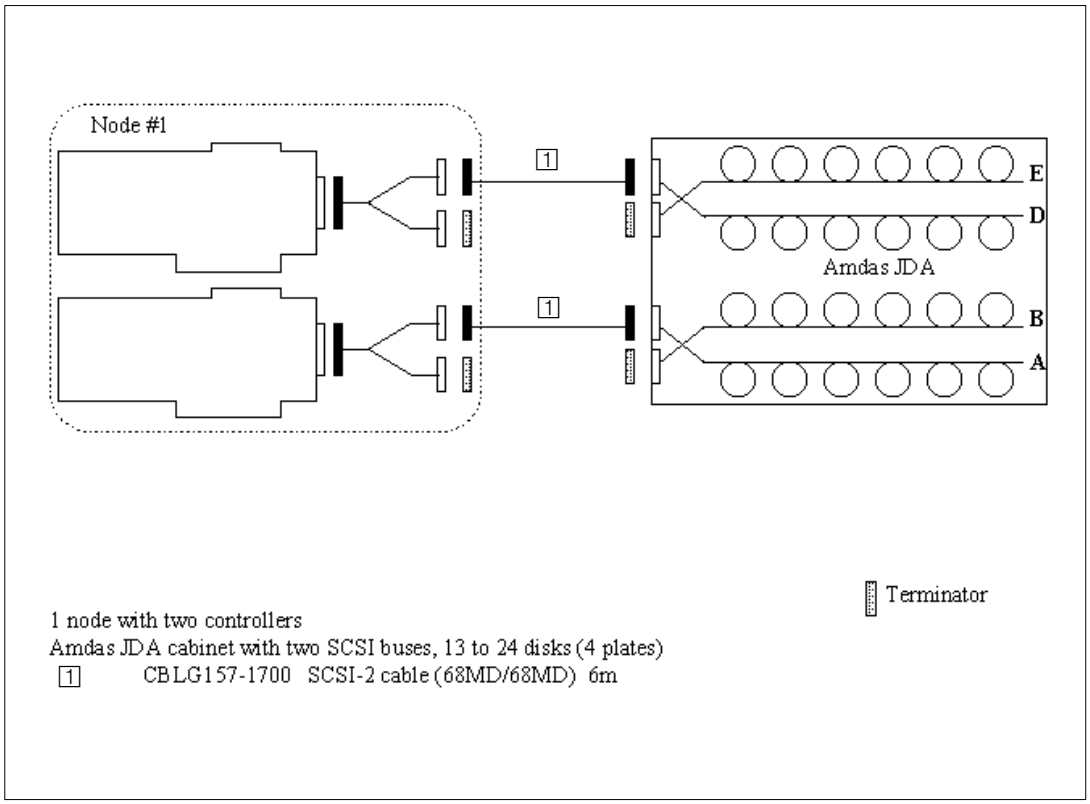


Figure 117. JDACF06: 1 node + 2 controllers, 2 SCSI buses, 4 plates.

JDACF07 2 nodes + 1 controller per node – HA mode , 1 shared SCSI bus, 1 plate

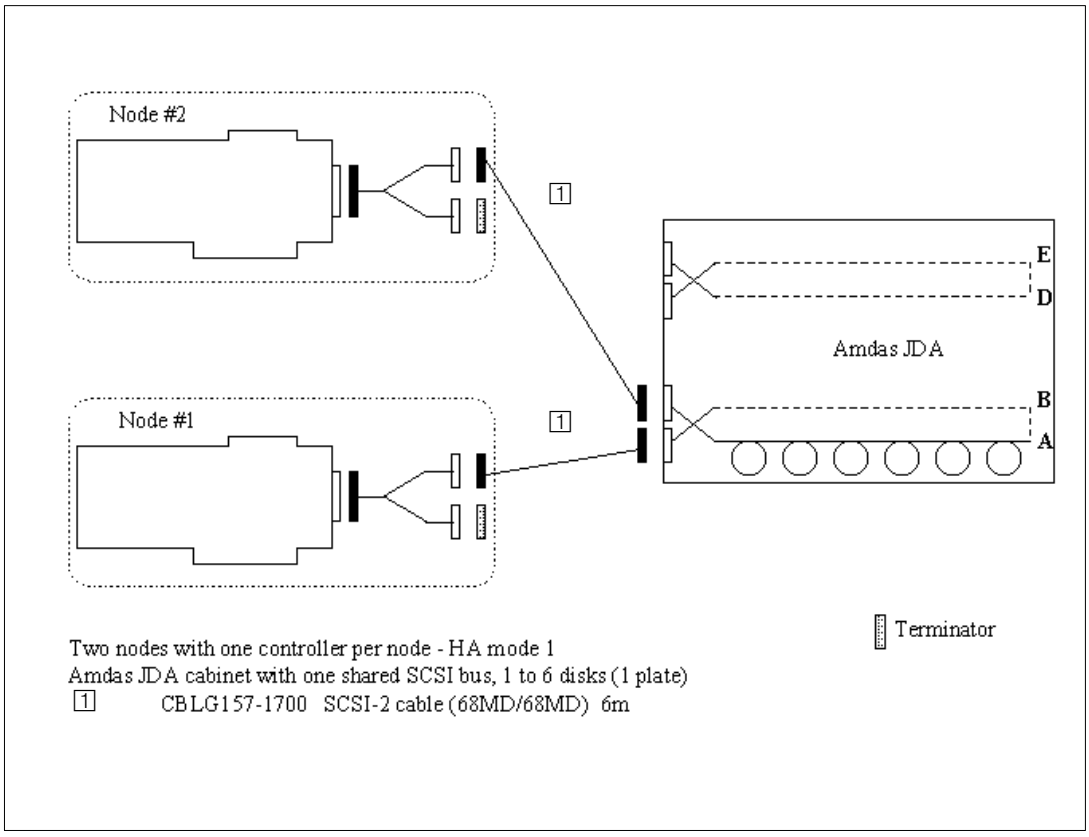


Figure 118. JDACF07: 2 nodes + 1 controller per node – HA mode , 1 shared SCSI bus, 1 plate.

JDACF08 2 nodes + 1 controller per node – HA mode , 1 shared SCSI bus, 2 plates

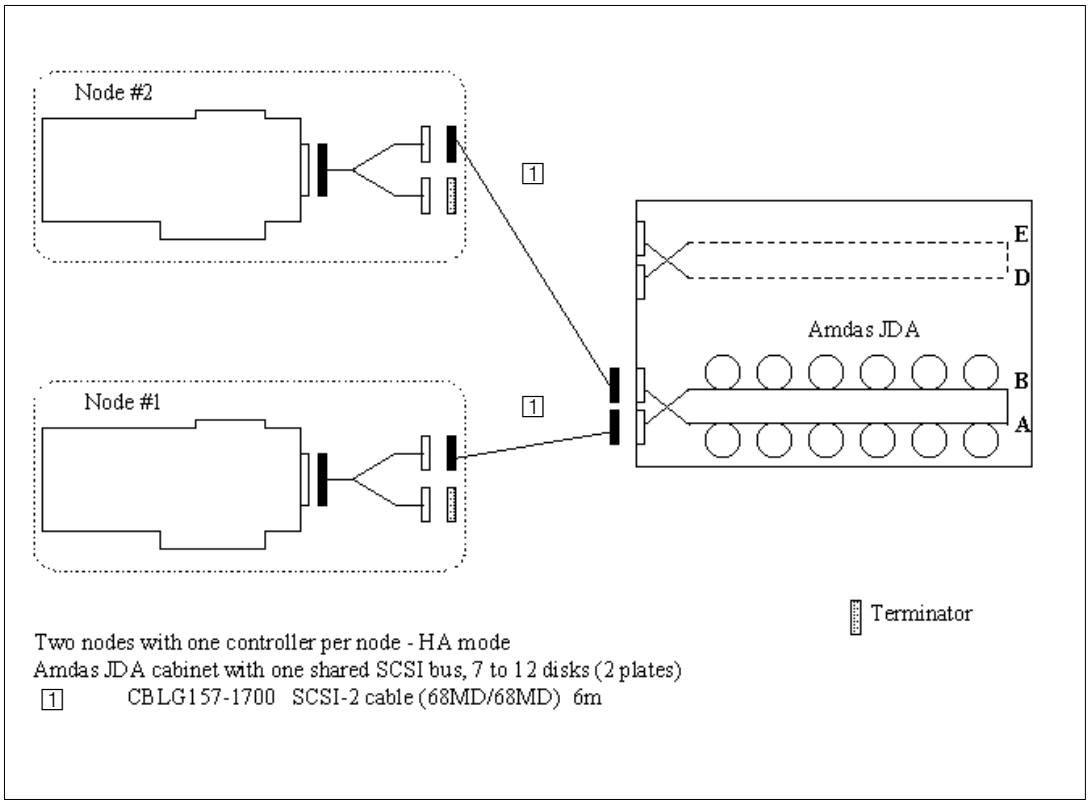


Figure 119. JDACF08: 2 nodes + 1 controller per node – HA mode , 1 shared SCSI bus, 2 plates.

JDACF09 2 nodes + 2 controllers per node – HA mode, 2 shared SCSI buses, 2 plates

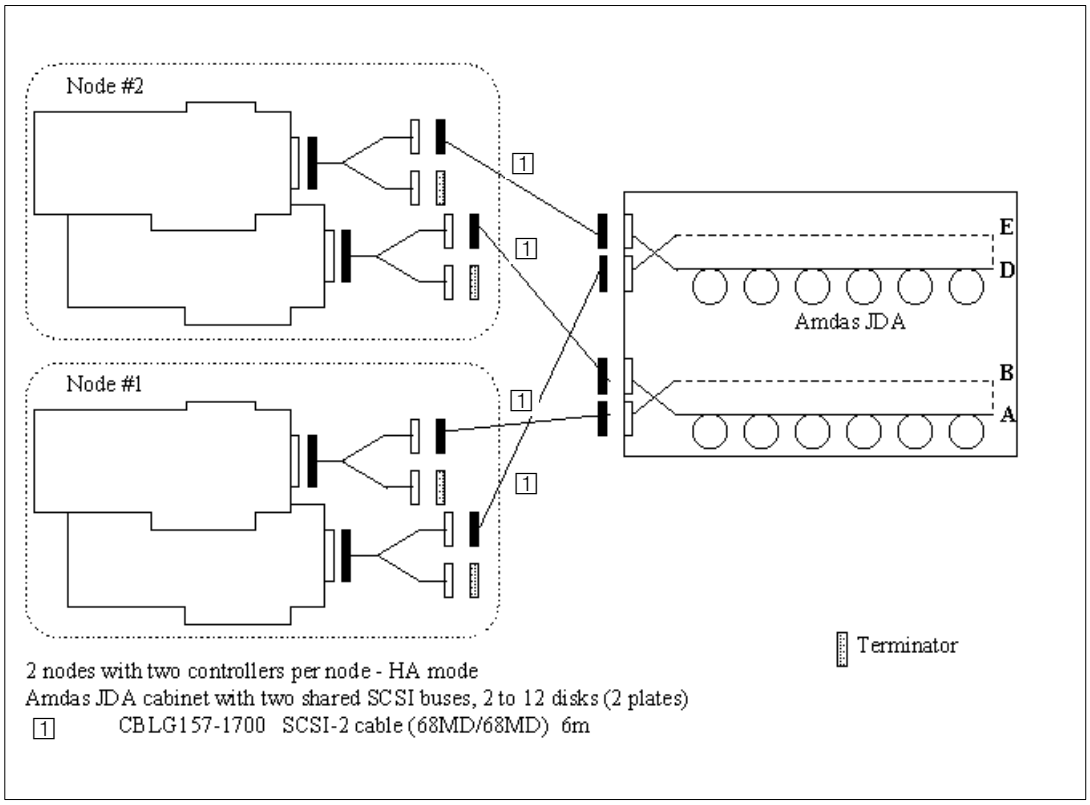


Figure 120. JDACF09: 2 nodes + 2 controllers per node – HA mode, 2 shared SCSI buses, 2 plates.

JDACF10 2 nodes + 2 controllers per node – HA mode, 2 shared SCSI buses, 4 plates

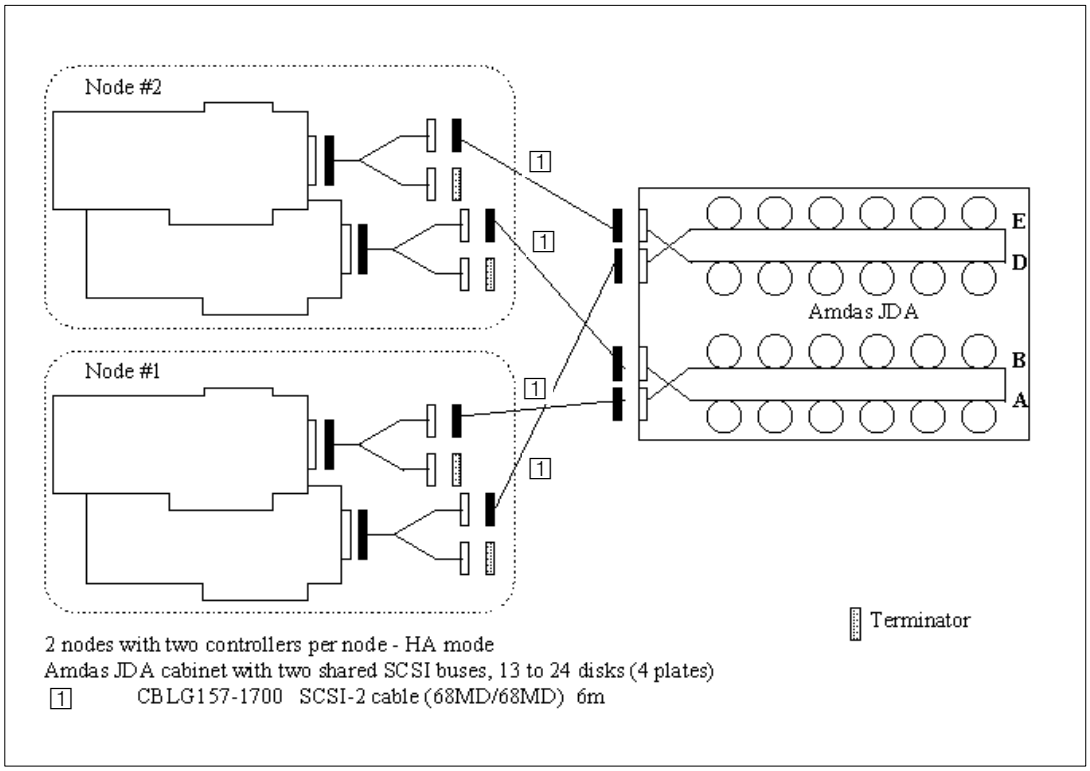


Figure 121. JDACF10: 2 nodes + 2 controllers per node – HA mode, 2 shared SCSI buses, 4 plates.

Configuration Procedures

The following gives the installation procedure of AMDAS JDA in an EPC800 configuration. This procedure does not pretend to replace the set of documentation which deals with AMDAS, from which those procedure are extracted from.

The referenced publications are:

- *Bull DPX/20 Escala AMDAS JBOD Storage System – Setup & Operator Guide*
- *Peripherals AMDAS Storage Subsystem Installation Guide, Product Manual*
- *Peripherals JDA/SDA7 Storage SubSystem, Product Manual*

The procedures are specified with reference to the AMDAS disk configuration diagrams generated by the ordering document.

Configurations for JDACF01 & JDACF02

1. Withdraw the three terminators on the SCSI II Fast/Wide differential board before being implanted on the Escala node and if Y cables are used as links to the AMDAS cabinet.
2. Connect the Y cable.
3. Connect the terminator on the shorter branch of the Y cable.
4. Link the other branch of the Y cable and the first SCSI bus (J03 on AMDAS with a CBLG 157 cable).
5. Connect the other terminator on the connector J04 on the AMDAS.
6. Open the tray ” A ” and set the disk drives (1 to 6) in compliance with the implementation order:
   - 1 disk on slot 0
   - 2 disks on slots 0 and 1
   - 3 disks on slots 0, 1 and 2
   - and so on.

   The geographical slot gives the ID number of every disk. Refer to *Bull DPX/20 Escala AMDAS JBOD Storage Subsystem User’s Guide*, Pages 2 – 5.

   Note: Take into account the external bus ID number of the SCSI adapter on the node (7 is the default value). The bus ID cannot be given the following values: 1 to 5 nor 8 to 13 when all the disk slots of the AMDAS are used.

   Refer to the corresponding diagrams in this document.
7. Connect the RS232 plugs on the power units of the AMDAS (J31) to two TTY lines on the Escala node(s). This enables remote power–on/off of the AMDAS.
8. Set the configuration parameters of these two TTY ways under AIX as follows: 4800 bauds, 8 bit, 1 stop bit, none parity, ssmmgr as term type. Refer to *Bull DPX/20 Escala AMDAS JBOD Storage Subsystem User’s Guide*, Pages 2 – 14.
9. Install the ” Maintenance Manager Software ” (Lpp DMMGR). To install the Maintenance Manager, refer to *Bull DPX/20 Escala AMDAS JBOD Storage Subsystem User’s Guide*, Chapter 4.
   This link in particular allows to power ON/OFF the AMDAS and to invalidate one ore more disk drives.
10. Check on the rear panel that the switch number 7 of the DIP Switch is set to OFF. Refer to *Bull DPX/20 Escala AMDAS JBOD Storage Subsystem User’s Guide*, Pages 2 – 12.
11. Connect the power cords.
12. Power on. The switch is located under the fans on each power unit.
13. Under AIX, run the `cfgmgr` command that enables to discover the disks.

Configurations for JDACF03 & JDACF04

1. Follow the steps 1 to 3 of procedure above for each node to connect to an AMDAS.
2. Link the other branch of the Y cable of a node and the first SCSI bus (J03) on AMDAS with a CBLG 157 cable.
   Link the other branch of the Y cable of the other node and the first SCSI bus (J07) on AMDAS with a CBLG 157 cable.
3. Connect the two terminators to the connectors J04 and J08 on the AMDAS.
4. Set the disk drives (2 to 12) in the trays A and D and (13 to 24 disks) in the trays B and E of the AMDAS in compliance with the implementation order. Refer to *Bull DPX/20 Escala AMDAS JBOD Storage Subsystem User Guide*, Pages 2 – 5.

   Note: The ID number of the SCSI adapters on the nodes are set to 7 per default. These IDs cannot be given the following values: 1 to 5 nor 8 to 13 when all the disk slots of the AMDAS are used.
5. For the use of the " Maintenance Manager Software " (Lpp DMMGR),
   connect the RS232 serial lines as shown in the steps 7 to 9 of the procedure above, knowing that to power on/off the AMDAS, it is necessary to act on every power unit of the AMDAS.

Note: The two serial lines can be distributed on the two nodes. Using the " Maintenance Manager " to power off or power on the AMDAS does not prevent from using the physical switch on/off on each power unit

6. Follow the steps 10 to 13 of the procedure above in order to complete the installation of the AMDAS.

Configurations for JDACF05 & JDACF06

1. Follow the steps 1 to 3 of the procedure above: to withdraw the terminators on the adapters; to set; to connect the Y cables and the terminators.
2. Connect the other branch of the Y cable of one of the adapters to the first SCSI bus on J03 of the AMDAS with a cable CBLG 157.
3. Connect the other branch of the Y cable on the second adapter to the second SCSI bus on J07 of the AMDAS with a cable CBLG 157.
4. Connect the 2 terminators on the connectors J04 and J08 of the AMDAS.
5. Put the disk drives in the trays A and D (2 to 12 disks) and the trays B and E (13 to 24 disks) of the AMDAS in compliance with the implementation rules specified *AMDAS JBOD Storage Subsystem,* pages 2 to 5.

Note: The ID number of the SCSI II Fast/Wide adapters in the Powercluster nodes are given a value 7 per default. They cannot be given a value 1 to 5 nor 8 to 13, when all the disk slots of the AMDAS are used.

6. Follow the steps 7 to 13 of the procedure above.

Using AMDAS JBOD Disks as a System Disk Extension

Building a System Disk

1. Stop gracefully HACMP

   ```
   smit clstop
   ```

2. Stop all the applications
3. Make a system backup of hdisk0 that is currently running
4. Reboot the node on the AIX installation CD–Rom in service mode
5. If the maintenance screen appears, type:

   ```
   6   {System Boot}
   0   {Boot from List}
   ```

6. Answer the questions: choice of system console and language used for installation
7. When the menu Welcome to Base Operating System Installation and Maintenance appears, type:

   ```
   2   {Change/Show Installation Settings and Install}
   1   {Disk(s) where you want to install...}
   ```

8. Select the first disk of the AMDAS JBOD from the list displayed

   Warning: The internal disk is selected by default because rootvg was previously installed on it. Once the right disk is selected, start the installation from the tape.

9. During installation turn the key of the front panel to normal mode so that the node reboots automatically.
10. At this point the node is started and rootvg is installed on the AMDAS JBOD.

Mirroring a System Disk

For JBOD disks running as system disk, the hdisk number is assigned at boot time and changes according to the disk used as boot.

It is hdisk0 for example for a first JBOD disk and hdisk1 for a second JBOD disk.

1. Add hdisk1 to the rootvg volume group

   ```
   extendvg –f rootvg hdisk1
   ```

2. Modify the quorum option of rootvg at ”no”

   ```
   chvg –ay –Qn rootvg
   ```

3. Build a second boot logical volume on hdisk1

   ```
   mklv –y hd51 –t boot –a e rootvg 1 hdisk1
   ```

   with the command

   ```
   lspv –p hdisk0
   ```

   and

   ```
   lspv –p hdisk1
   ```

   check that hd5 and hd51 have the same physical partition number on the two disks.

4. Build a copy of each other logical volumes of hdisk0 on hdisk1:

```
Mklvcopy hd1 2 hdsik1                  # Filesystem /home
Mklvcopy hd2 2 hdsik1                  # Filesystem /usr
Mklvcopy hd3 2 hdsik1                  # Filesystem /tmp
Mklvcopy hd4 2 hdsik1                  # Filesystem /(root)
Mklvcopy hd6 2 hdsik1                  # paging space
Mklvcopy hd8 2 hdsik1                  # jfslog
Mklvcopy hd9 2 hdsik1                  # Filesystem /var
```

5. Build also a copy of all user filesystems.
6. Update the two boot logical volumes (on hdisk0 and hdisk1)

```
bosboot –a –l/dev/hd5 –d/dev/hdisk0
bosboot –a –l/dev/hd51 –d/dev/hdisk1
```

7. Build the normal bootlist with one netry for each disk

```
bootlist –m normal hdisk0 hdisk1
```

8. Synchronize the content of rootvg

```
syncvg –v rootvg
```

EMC^2 Symmetrics Disk Subsystem

MI List

M.I.	Designation	Length	FRU
DRWF006–0000	Just a Bunch of Disk Array Drawer		
CDAF333–1800	CDA3330–18 up to 32DRV–8SLT		
CDAF343–9000	CDA3430–9 up to 96DRV–12SLT		
CDAF370–2300	CDAF3700–23 up to 128DRV–20SLT		
MSUF303–1802	DRV3030–182 18X2GB 3,5”		
MSUF303–2302	DRV3030–232 23X2GB 5,25”		
CMMF001–0000	512MB Cache Mem. Init. Order		
CMMF002–0000	768MB Cache Mem. Init. Order		
CMMF003–0000	1024MB Cache Mem. Init. Order		
CMMF004–0000	1280MB Cache Mem. Init. Order		
CMMF005–0000	1536MB Cache Mem. Init. Order		
CMMF006–0000	1792MB Cache Mem. Init. Order		
CMMF007–0000	2048MB Cache Mem. Init. Order		
CMMF008–0000	2560MB Cache Mem. Init. Order		
CMMF009–0000	3072MB Cache Mem. Init. Order		
CMMF010–0000	3328MB Cache Mem. Init. Order		
CMMF011–0000	3584MB Cache Mem. Init. Order		
CMMF012–0000	4096MB Cache Mem. Init. Order		
DCDF003–0000	DP–PCD4 Parall Ch.4–port		
DCDF004–0000	DP–SCD2 Serial Ch. 2–port		
DCDF005–0000	DP–WSD4 FWD SCSI CH. 4–Port		
DCDF006–0000	DP–WSD4SW FWD SCSI CH. Switch		
DCDF007–0000	DP–RLD2 Remote Link Director		
DCDF008–0000	DP–USD4SW USCSI CH. Switch		
DCDF009–0000	DP–FCD2-MM FC Multimode 2-Loop		
SYMF001–0000	SYMMETRIX Manager Base		
SYMF002–0000	SYMMETRIX Manager SRDF		
SYMF003–3300	3300 SRDF Software LIC.		
SYMF003–3400	3400 SRDF Software LIC.		
SYMF003–3700	3700 SRDF Software LIC.		
SYMF005–3300	3300 ESP Software LIC.		
SYMF005–3400	3400 ESP Software LIC.		
SYMF005–3700	3700 ESP Software LIC.		
SYMF006–3300	3300 SMTF Software LIC.		
SYMF006–3400	3400 SMTF Software LIC.		
SYMF006–3700	3700 SMTF Software LIC.		
CMOF004–0000	256MB Cache UPG.for CDA4000		
CMOF005–0000	512MB Cache UPG.for CDA4000		

M.I.	Designation	Length	FRU
CMOF006–0000	1024MB Cache UPG.for CDA4000		
MSOF303–9002	DRV3030–92 9GBX2 3,5”		
MSOF303–2302	DRV3030–232 23GBX2 5,25”		
CBLF017–1800	6M SCSI /non AIX(SUN,HP,DEC..)		
CBLF018–1100	Y–CBL for IBM Cluster		
CBLF019–1100	Y–CBL for Sequent Cluster		
CBLF020–1100	Y–CBL for Multi Host Cluster		
CBLF009–1900	Wide DF SCSI Cable 68pin EPC800	12m	
CBLF009–2100	Wide DF SCSI Cable 68pin EPC800	25m	
CBLG157-1100	SCSI-2 Cable (68MD/68MD)	1m	90676006-002
CBLG157-1300	SCSI-2 Cable (68MD/68MD)	2m	90676002-002
CBLG157-1700	SCSI-2 Cable (68MD/68MD)	6m	90676003-002
CBLG157-1900	SCSI-2 Cable (68MD/68MD)	12m	90676004-002

General Overview

A Symmetrix box is composed of a dual internal bus (X and Y buses) on which are connected Channel Directors (CD), Cache memory cards and Disk Directors (DD).

The **Channel Directors** manage host links. They are available in two versions which can be mixed in the same Symmetrix subsystem:

- Ultra Wide SCSI Directors containing 4 host ports
- Fibre Channel Directors containing 2 host ports

The **DIsk Directors** manage four fast wide SCSI buses to the internal disks. Depending on the model, either 4 or 6 disks are connected on each internal SCSI bus.

Optionally, Remote Link Directors (RLD) can be plugged to connect two different Symmetrix boxes in an SRDF configuration which allows to manage mirrored volumes across the two boxes.

The attachment of a Symmetrix Fast Wide Differential SCSI port on an AIX server is made using the standard MCA or PCI adapters:

MCA:	MSCG020-0000	SCSI-2 F/W DE Enhanced Disk Adapter (WSA)
	MSCG012-0000	SCSI-2 F/W DE Ext Disk Adapter (Corvette Turbo)
PCI:	MSCG030-0000	Ultra SCSI Differential Disk Adapter on EPC1200/A
	MSCG023-0000	Ultra SCSI DE Disk Adapter on EPC400

The attachment of a Fibre Channel port of a Fibre Channel Director to an AIX/PCI server is made through an EMULEX LP7000E adapter. The LP7000E AIX driver supports the Symmetrix FC-AL subsystems.

Note: The Symmetrix Fibre Channel port uses a fiber optic connector. So, a fiber optic cable must be used for the connection to the Symmetrix and an MIA must be connected to the other end of the cable. The copper side of the MIA is connected to an Emulex adapter or to a hub port.

Examples of Use

Point-to-point Connection

One port of a Symmetrix box is connected to an Escala server through a single adapter (either Ultra Wide Differential SCSI or Fibre Channel). As there is no redundancy of any component on the link, a single failure (cable, adapter, Channel Director) may cause the loss of all data.

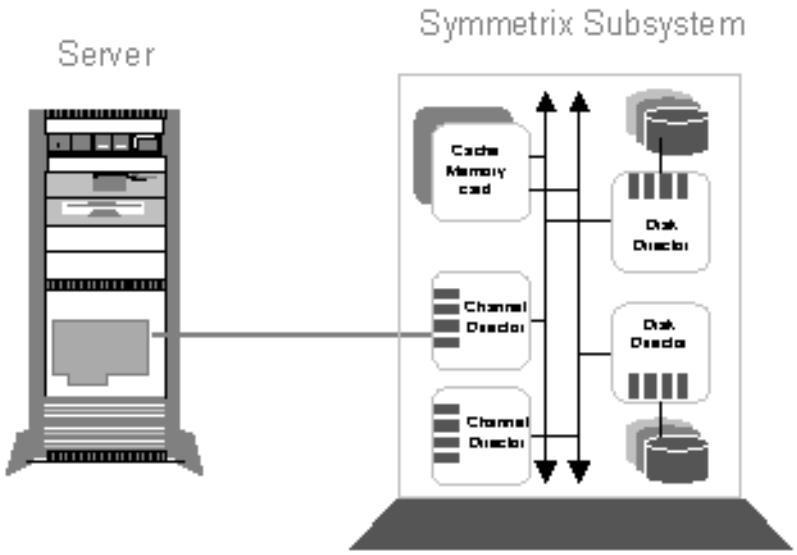


Figure 122. Point- to-point connection of an EMC^2 Symmetrix subsystem

For a Fast or Ultra Wide Differential connection (on both Escala MCA and PCI servers), the maximum cable length is 25 meters.

For a Fibre Channel connection, the maximum cable length is 500 meters with a multimode 50 μm fiber optic. An MIA is plugged on the Emulex PCI adapter.

Multiple Connection

One Symmetrix subsystem is connected to an Escala server through two or more channels (SCSI and/or Fibre Channel).

Each adapter drives separate data volumes with the advantage of adding bandwidth for data transfers. There is no constraint on where the links are connected; they can be plugged on the same Channel Director.

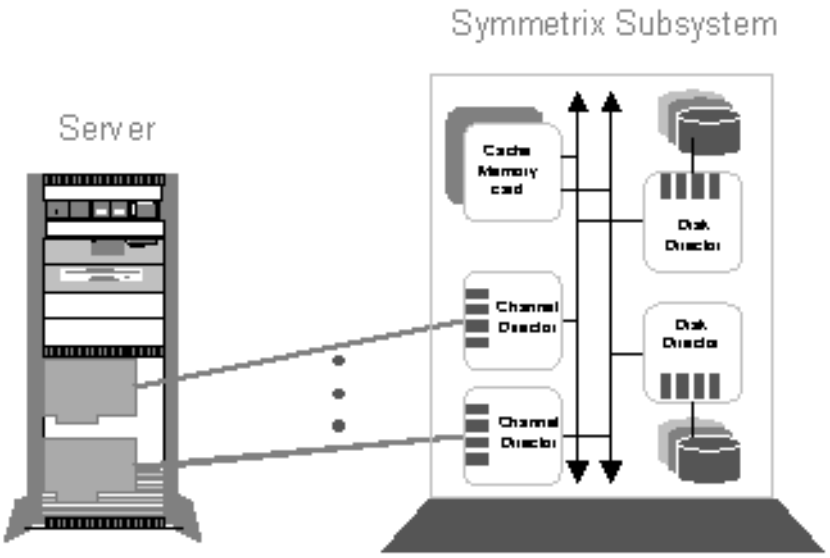


Figure 123. Multiple connection of an EMC^2 Symmetrix subsystem

Base Configuration with HACMP

The usual HA configuration with Symmetrix subsystems is to duplicate the point to point connection and to configure the Symmetrix in order to make the data volumes available to both servers through the two separate host ports.

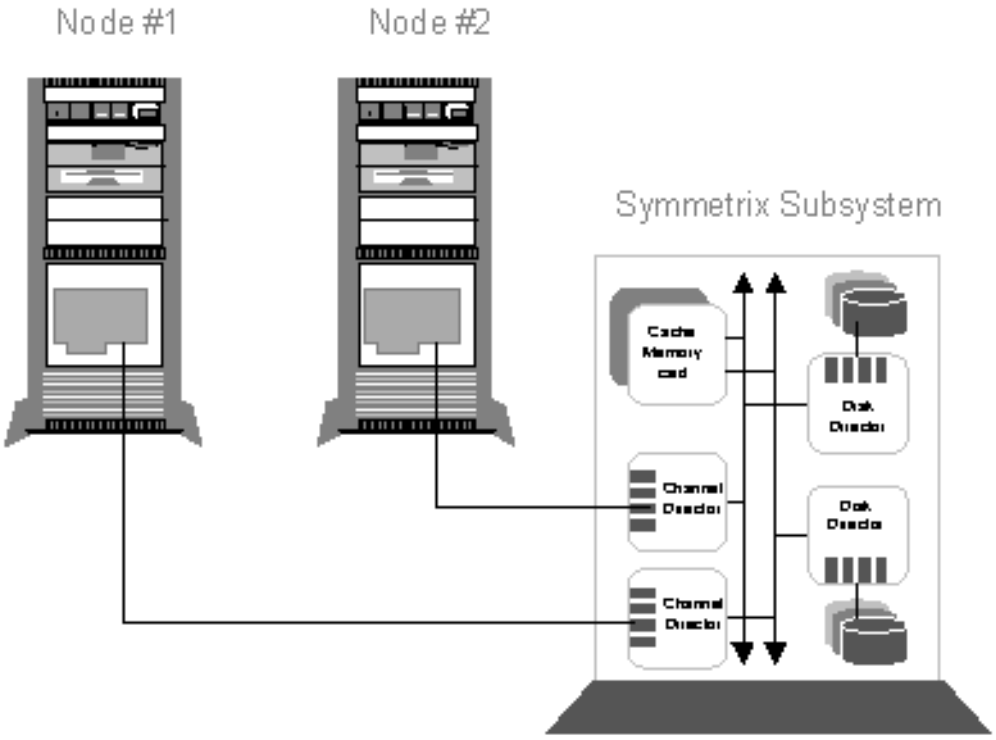


Figure 124. Base configuration of an EMC^2 Symmetrix subsystem with HACMP

Configuration with HACMP and Powerpath (multiple paths)

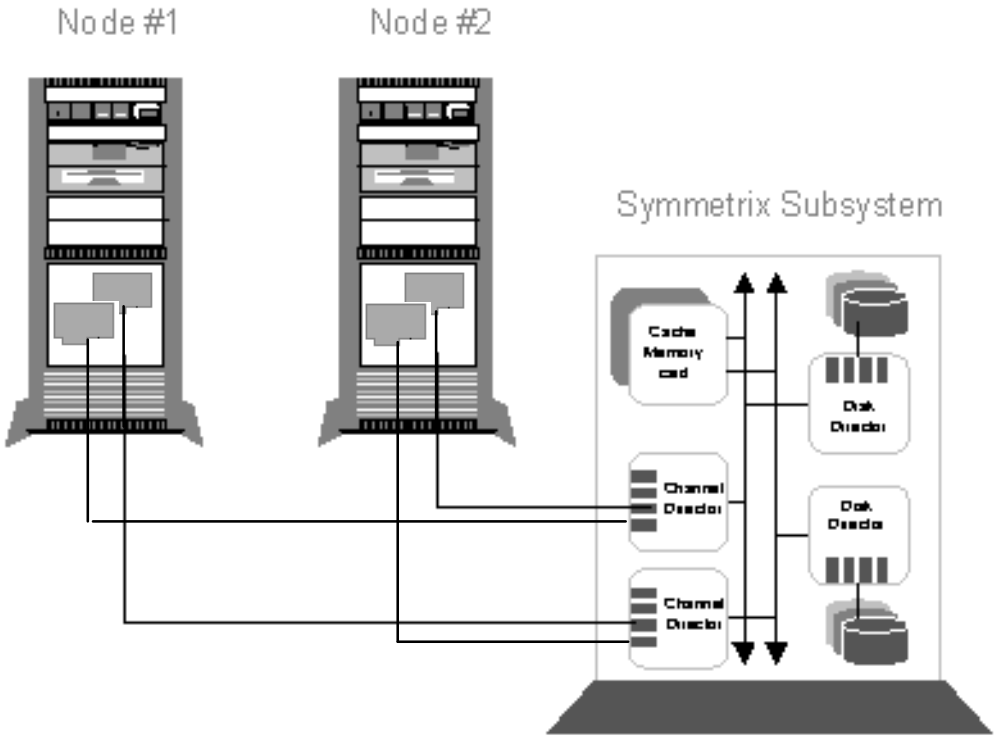


Figure 125. Configuration of an EMC^2 Symmetrix subsystem with Powerpath

Powrepath is a software driver which allows multiple paths between a node and a Symmetrix subsystem to provide path redundancy, and improve performance and availability.

HA Library

MI List

IDENTIFICATOR	DESCRIPTION
	EXTERNAL ADD'L MEDIA (DLT4000 & DLT7000)
MTSG014–0000	20/40GB EXTERNAL DLT DRIVE
MTSG017–0000	35/70GB EXTERNAL DLT DRIVE
CKTG080–0000	START & CLEAN UP KIT for DLT
	LXB 4000
CTLF026–V000	LibXpr LXB RackMount w/ 1 DLT4000
CTSF007–V000	DLT4000 for LibXpr LXB
	LXB 7000
CTLF028–V000	LibXpr LXB RackMount w/ 1 DLT7000
CTSF008–V000	DLT7000 for LibXpr LXB
	SCSI ADAPTERS
MSCG023–0000	PCI ULTRA SCSI DE ADAPTER EPC400
MSCG020–0000	MCA SCSI–2 F/W DE Enhanced DISK Adapter (WSA) EPC800
MSCG030–0000	Ultra SCSI Differential PCI Adapter (6207) EPC1200
	SCSI CABLES
CKTG049–0000	MCA 0,8M Y SCSI CABLE
CKTG050–0000	MCA 16–Bit Y SCSI CABLE
CKTG070–0000	PCI 1M Y SCSI CABLE (68MD/68MD)
CKTF003–0000	PCI 1M Y SCSI CABLE + TERMINATOR FEED THRU
CBLG157–1700	6M SCSI–2 CABLE (68MD/68MD)
CBLG102–1700	6M SCSI–2 DE CABLE (68MD)
CBLG072–1400	2,5M SCSI CABLE (50MD/50MD)
CBLF072–1800	6M SCSI CABLE (50MD/50MD)
CBLG152–1900	10M SCSI CABLE FOR LIBRARY & JUKE–BOX
CBLG158–1700	4,5M SCSI CABLE (50MD/68MD)

Examples of Use

In Escala EPC, an LXB library can be attached to a single node. The library can only be shared for high–availability by two homogeneous nodes (same node type).

	EPC400-N/430-N	**EPC800–N**	**EPC1200–N,/1200A-N, EPC440-N/EPC2400-N**
SCSI Adapters	MSCG023–0000 (68mD)	MSCG020–0000 (68mR)	MSCG030–0000 (68mD)
HA DLT4000 (DE – 50mD) Y cable / adapter	CKTF003–0000 = [CKTG070–0000 + (68mD/50mD) Feed Thru]	CKTG050–0000	CKTF003–0000 = [CKTG070–0000 + (68mD/50mD) Feed Thru]
6m Cable / adapter	CBLG157–1700	CBLF072–1800	CBLG157–1700

HA DLT7000 (DE – 68mD) Y cable / adapter 6m Cable / adapter	 [CKTG070–0000 CBLG157–1700	 CKTG049–0000 CBLG157–1700	 [CKTG070–0000 CBLG157–1700
DLT not shared Cable for DLT7000 Cable for DLT4000	 CBLG157–1700 CBLG158–1700	 CBLG102–1700 CBLG152–1900	 CBLG157–1700 CBLG158–1700

Case of the Shared Library

1. In addition to the Y–cable there is a terminator feed thru included in CKTF003 that allows to plug the 68mD cable (CBLG157–1700) into the DLT4000 (50mD).
2. Before connecting the Y-cable to the SCSI board, make sure you don't leave a terminator on the SCSI board. Remove one, if any. This is the case for EPC1200 or EPC1200A nodes where you must remove the terminator (P/N 42G3326) form the PCI Differential Ultra SCSI board (4-L – IBM FC 6207).
3. LXB 4000 and LXB 7000 are libraries that can be shared by two homogeneous nodes with HA Netbackup application. The Master server or the Slave Server can be redundant implementing hot standby or mutual recovery mode.
   It is important to underline that HA Netbackup is not integrated in ClusterAssistant.

Cabling Diagrams

Overall Diagram

Case of a Library not Shared

This configuration is an example of an EPC400 with a library attached to a node.

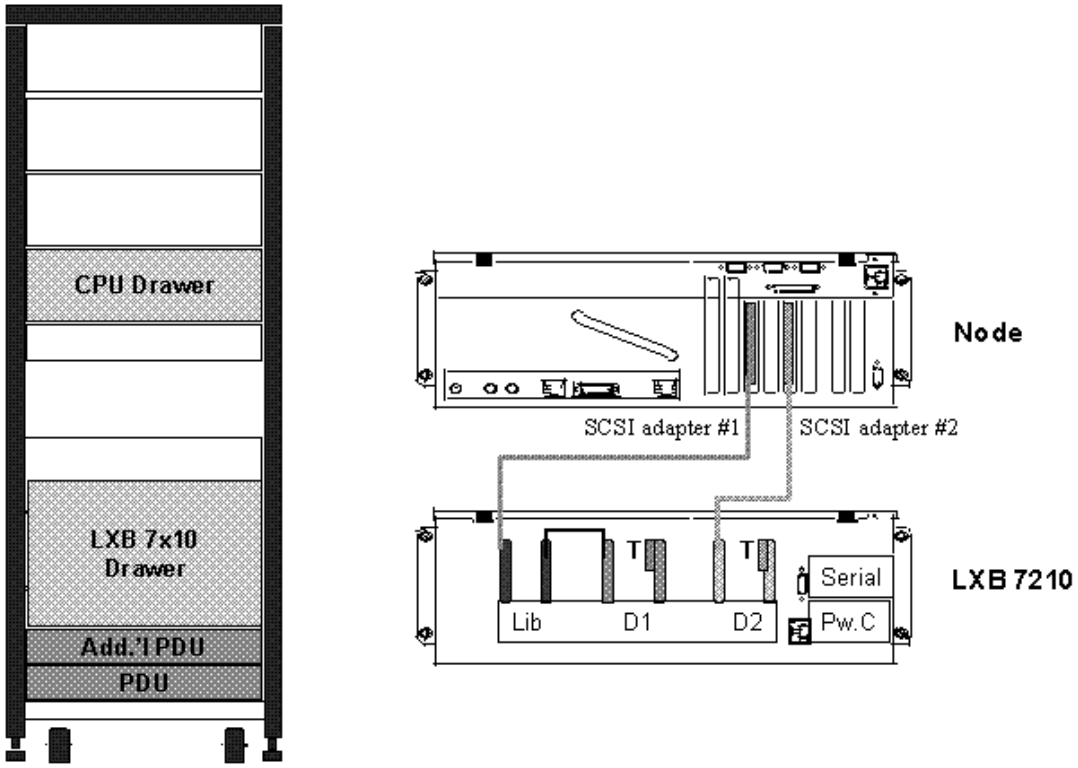


Figure 126. Overall Diagram – EPC400 with one library attached to a node (library not shared).

Case of a Shared Library

The following depicts a configuration example of an EPC400 with 2 nodes sharing an LXB for high availability only.

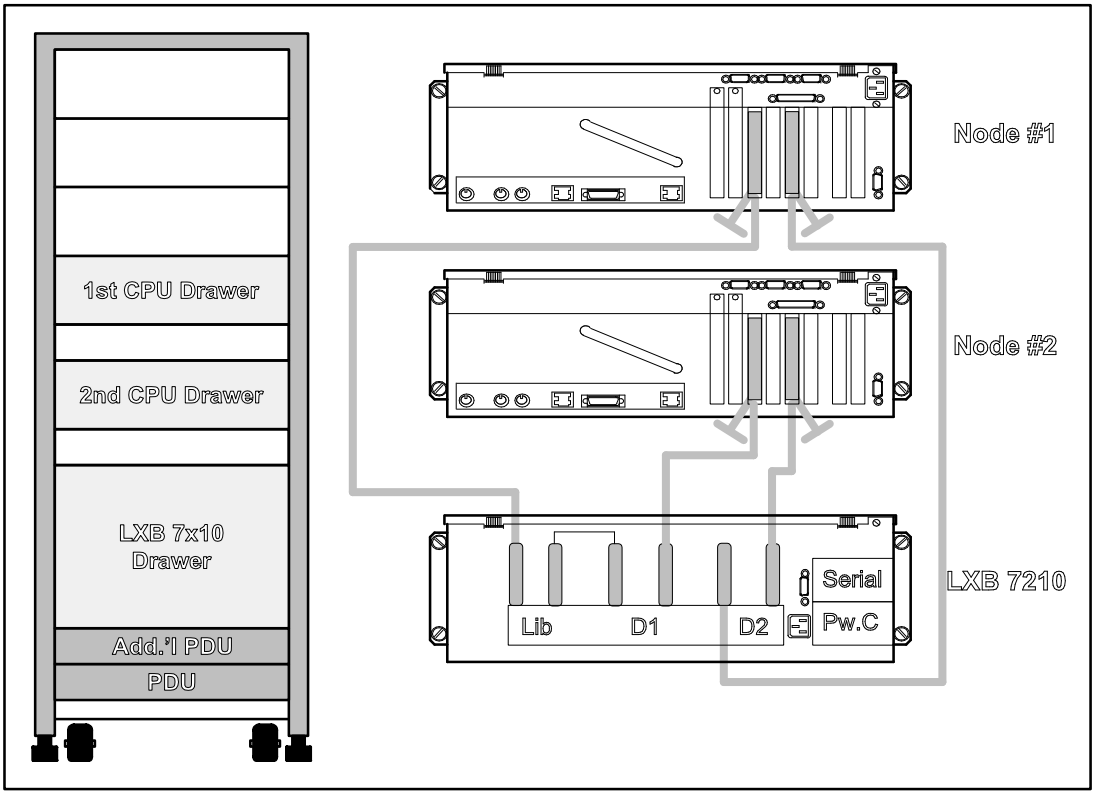


Figure 127. Overall Diagram – EPC400 with 2 nodes sharing an LXB.

Cabling Legend

Item	M.I.	Designation	Length	FRU
1	CKTG070–0000	PCI Y SCSI cable (68MD/68MD)	1m	90920001–001
1	CKTG049–0000	MCA 16 Bit Y-cable (IBM FC2426)	–	IBM52G4234
1	CKTG050–0000	MCA Y-cable (IBM FC2427)	–	IBM52G4234
2	CBLG157–1700	SCSI CABLE (68MD/68MD)	6 m	90667003–002
2	CBLG072–1400	SCSI CABLE (50MD/50MD) FC2423	2.5m	IBM52G7350
2	CBLF072–1800	SCSI CABLE (50MD/50MD)	6 m	IBM52G7350
3	CTLF026 & 27	Overland daisy chain cable	0.5 m	TBD
4	–	Terminator for Y-cable CKTG070	–	90054001–001
4	–	Terminator for Y-cable CKTG049	–	IBM61G8324
4	–	Terminator for Y-cable CKTG050	–	IBM52G7350
5	CKTF003–0000	Terminator Feed Thru (68/50mD)	–	9005401–001
6	CBLG158–1700	PCI/SCSI DE cable	4.75 m	90685001–001
6	CBLG152–1900	MCA/SCSI cable for library	10 m	90529003–001
6	CBLG102–1700	SCSI-2 DE cable (68 mD)	6 m	90176005–001

Cabling Examples for Non Shared LIbraries

No Y cables are used. An external terminator [4] is used to terminate a SCSI chain. One external terminator is included in the library in standard. A second external terminator (90054001-001) should also be provided in a library with two drives. For performance considerations, it is not recommended to chain the drives in a LBX7000 library.

Cabling for: 1 Node – 1 SCSI Adapters – 1 Attached Library – 1 or 2 Drives

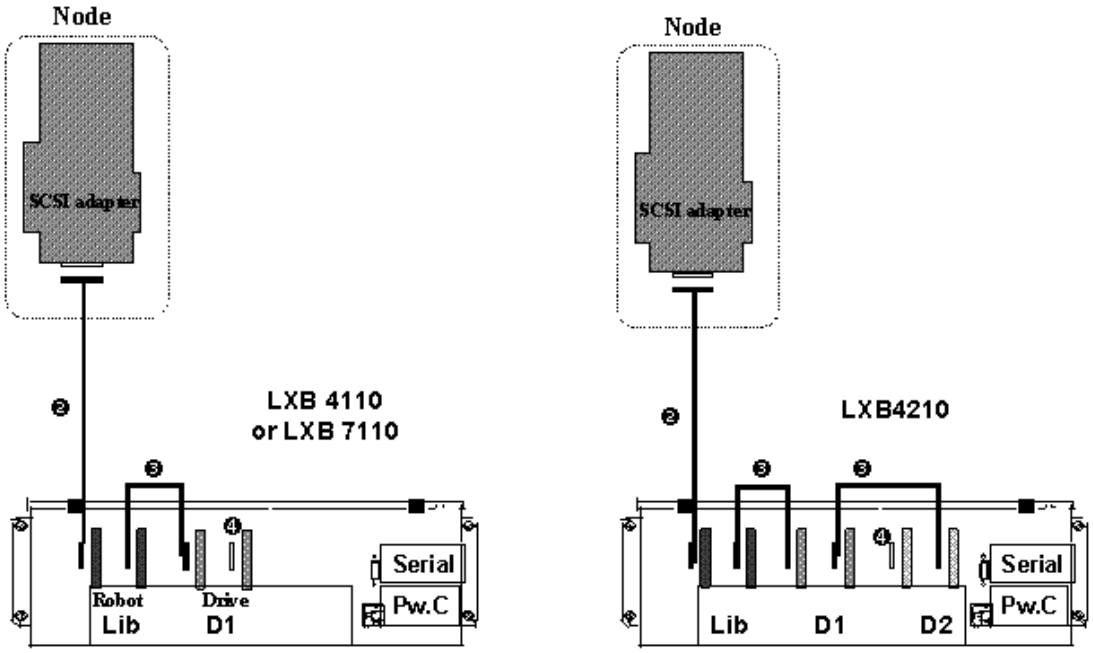


Figure 128. LIBCF04: 1 Node – 1 SCSI Adapter – 1 Library – 1 or 2 Drives

Cabling for: 1 Node – 2 SCSI Adapters – 1 Attached Library – 2 Drives

each SCSI adapter allows to access a separate DLT7000 drive. Two external terminators [2] are necessary.

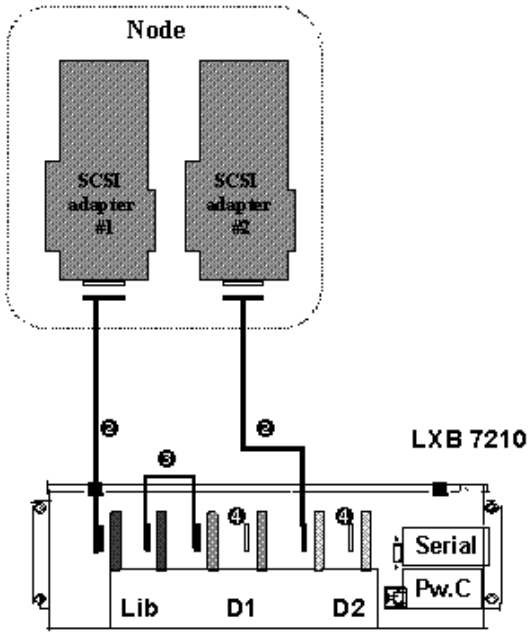


Figure 129. LIBCF05: 1 Node – 2 SCSI Adapters – 1 Library – 2 Drives

Cabling Examples for Shared LIbraries

Cabling for: 2 Nodes – 1 Adapter per Node – 1 Drive

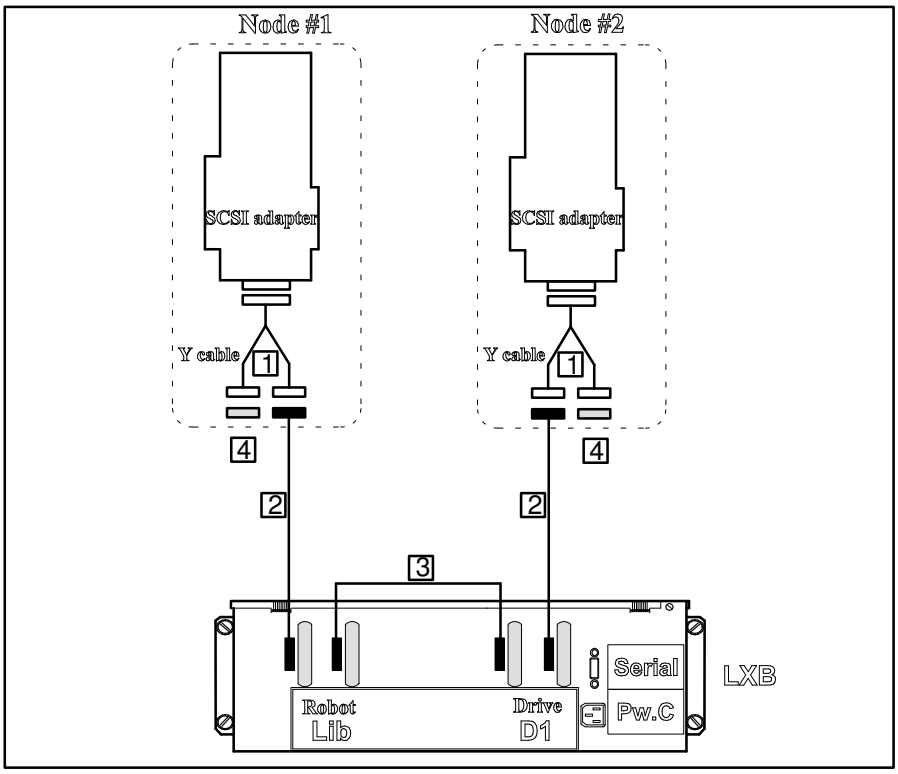


Figure 130. LIBCF01: 2 Nodes – 1 Adapter per Node – 1 Drive

Cabling for: 2 Nodes – 1 Adapter per Node – 2 Drives

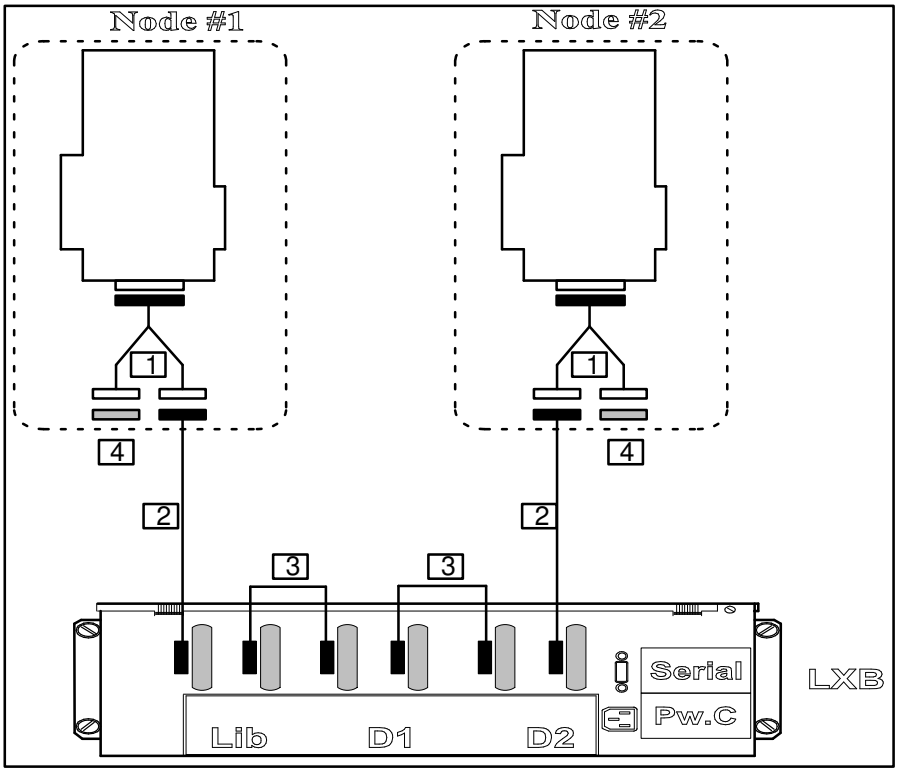


Figure 131. LIBCF02: 2 Nodes – 1 Adapter per Node – 2 Drives

Cabling for: 2 Nodes – 2 Adapters per Node – 2 Drives

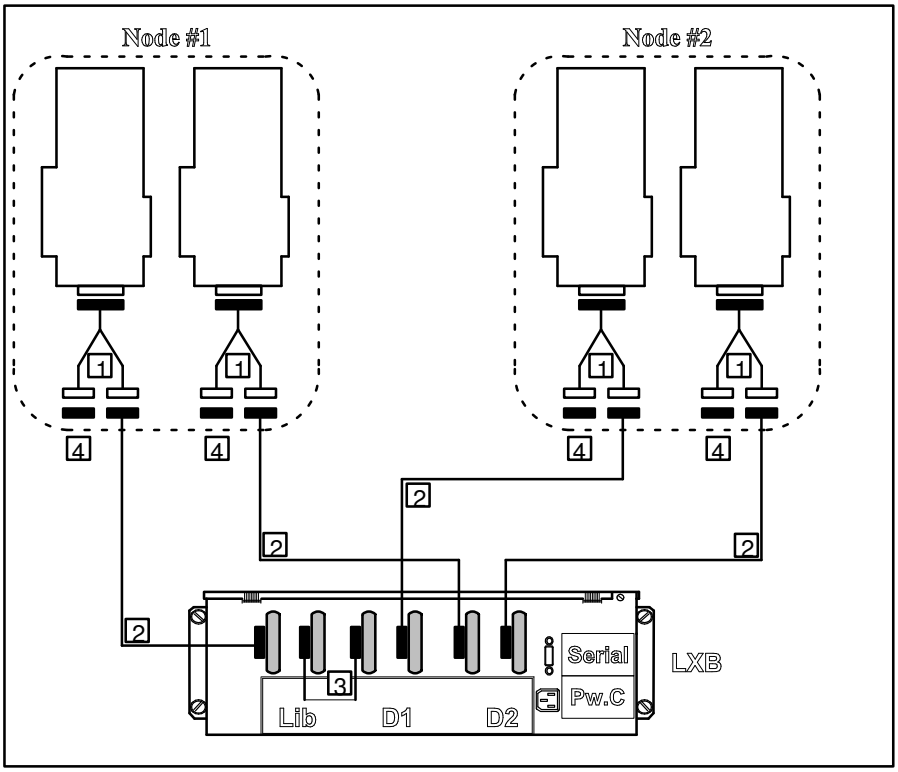


Figure 132. LIBCF03: 2 Nodes – 2 Adapters per Node – 2 Drives

Chapter 11. Tape Subsystems Cabling Requirements

Summarizing tape drive applications.

Tape Subsystems – Overview

Two tape subsystems are available for shelf mounting with the Escala Powercluster series:

- DLT 4000 (MI MTSG014)
- VDAT Mammoth (MI MTSG015).

The DLT 4000 drive can be connected to EPC400 only.

The VDAT Mammoth can be connected to EPC400 and EPC800 only.

Refer to the *Cabling Guide for Multiple Bus Systems* and the *Cabling Guide for MCA Systems* for details, together with the vendors' publications.

Chapter 12. Remote Maintenance

Describes remote maintenance solutions.

Remote Maintenance – Overview

Details in:

- Modems in Powercluster Configurations.
- Parts List, on page 12-2.
- Modem on PowerConsole, on page 12-3.
- Modem on a Node's S2 Plug, on page 12-5.
- Using Two Modems, on page 12-7.

Modems in Powercluster Configurations

RSF (Remote Services Facilities) performs system error monitoring and handles communications for remote maintenance operations. The modem, together with RSF, provide a link, via a phone line, between the system at the customer site and a Bull Customer Service.

The table below shows the number of modems and their type, according to the Powercluster configuration.

EPC	**uni-node**	**two-node without console concentrator**	**with Escala S100 PowerConsole 2**	**with console concentrator X terminal or PowerConsole**
EPC400	1 integrated modem	2 integrated modems	1 internal modem	1 integrated modem on node or 1 external modem
EPC800	1 external modem	2 external modems	1 internal modem	1 external modem
EPC1200 EPC1200A	1 external modem	2 external modems	1 internal modem	1 external modem
Mixed	–	2 external modems	1 internal modem	1 external modem
		RMCF01 Schema	**RMCF02 Schema**	**RMCF03 Schema**

The modem is an external modem if it is connected to an EPC800 or an EPC1200/EPC1200A/EPC440 node. For plugging the external modem to the serial port S2, a CBL1912 cable adapter (provided with the CPU drawer) may be used.

On an EPC400 node, there is an integrated modem (ISA board).

On the PowerConsole (Estrella) the modem is an external box whereas on the PowerConsole 2 (Escala S Series) the modem (MI DCCG086) is an integrated board.

In any configuration with a console concentrator (CS2600), the modem is either connected to the PowerConsole or to a particular node. In the latter case, the node must have a 8–port async board enabling to connect the node to port J9 on CS2600. In pure EPC400, configurations, the modem is integrated in a node. In other cases, it is an external modem. For mixed 2-node configurations, two modems are supplied. On an EPC400-N node, the modem is integrated. On EPC1200-N, EPC1200A-N, EPC440-N and EPC8000-N nodes, the modem is external.

For configuration RMCF02, the internal modem of the S100 is prepared and configured at manufacture. In other configurations, the integrated modem of any EPC400 is also prepared at manufacture (configuration of the modem and RSF dial-in).

The external modem is provided, installed and configured on the client site by the Customer Service.

An external modem is provided for EPC1200, EPC1200A and EPC440 servers:

DCUG002-11FE	MODEM V34 RTC INT
DCUG002-B1FE	MODEM V34 RTC BEL
DCUG002-D1FE	MODEM V34 RTC NLD
DCUG002-E1EE	MODEM V34 RTC GBR
DCUG002-F1FF	MODEM V34 RTC FRA
DCUG002-G1FG	MODEM V34 RTC DEU
DCUG002-T1FE	MODEM V34 RTC ITA

The ordering document makes use of schema identifiers.

The following correspondence table identifies the where the cabling figures regarding remote maintenance are described.

Figure	Page Number
RMCF01	12-7, and 12-7
RMCF02	12-3
RMCF03	12-6
RMCF04	12-4

Parts List

Item	M.I.	Designation	Length	FRU
1	CBL1912	Cable, Adapter RS232 (9M/25M)	0.3m	76958073-002
2	CBLG104-2000	Cable, local RS232 (25F/25M)	15m	90232001-001
3	CBLG105-1800	Cable, local RS232 (25F/25F)	7.5m	90233002-001
4	CBLG197-2000	Cable, remote RS232 (25M/25F)	15m	91287001-001
5	CBLG161-1900	Cable, Ethernet crossed RJ45/RJ45	10m	91093001-001
6	CBLG179-1900	Cable, Ethernet RJ45/RJ45 cat 5	10m	91094001-001
8	VCW3630	Cable, Ethernet to transceiver	5m	76958087-001

Modem on PowerConsole

Cabling Diagram with Console Concentrator

Diagram with Escala S100

Figure 133 shows an example which is relevant for any Powercluster configuration with an Escala S100 based PowerConsole, though this figure shows a configuration with a dedicated–administration network. In that case the modem is prepared and configured (RSF *callscarf* module on S100, and RSF *cluster* module on every node).

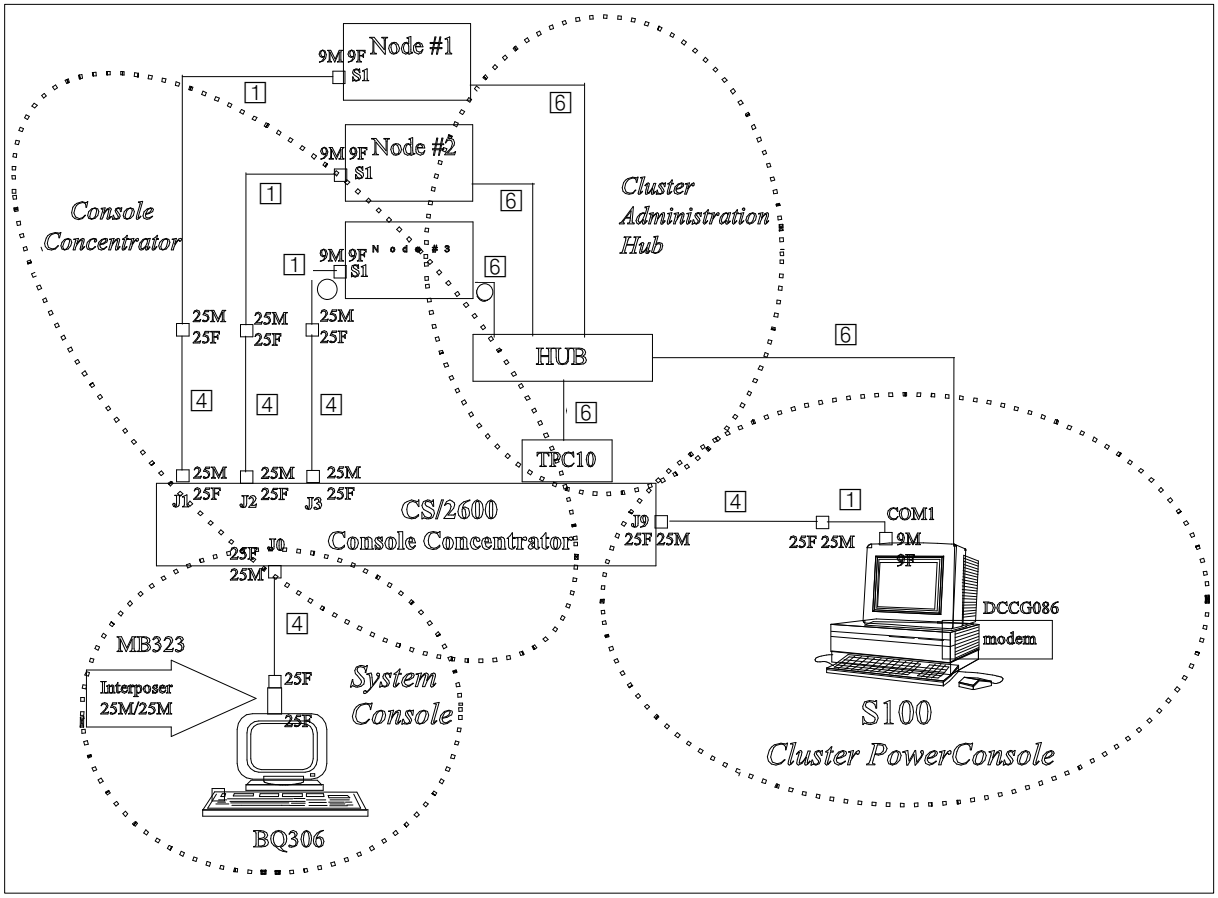


Figure 133. RMCF02:Remote maintenance: Modem on a PowerConsole (Escala S100)

Diagram with Escala S100 and one modem by node

Figure 134 shows an example which is relevant for any Powercluster configuration with an Escala S100 based PowerConsole 2, though this figure shows a configuration with a dedicated–administration network. In that case you may have one modem on the PowerConsole and/or one modem by node. This solution is more safety because in case of the PowerConsole is out of service you will be able to use RSF facilities.

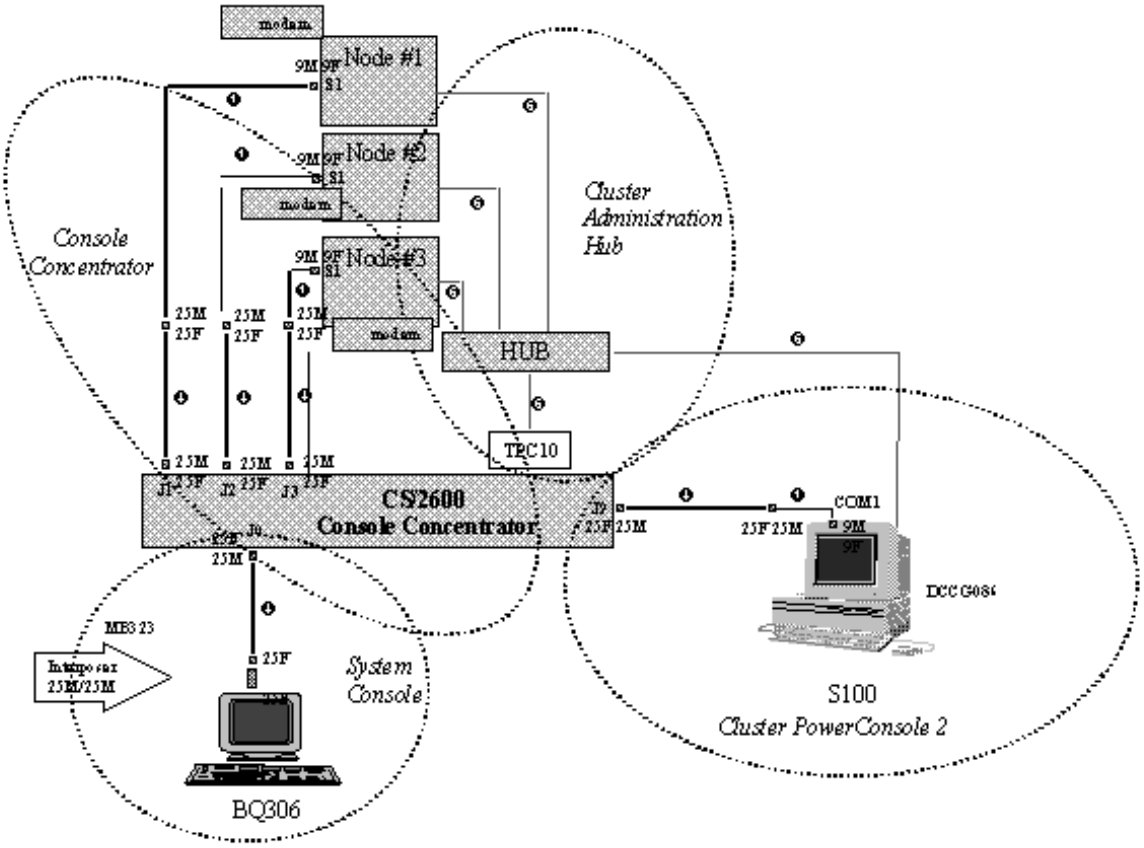


Figure 134. RMCF04:Remote maintenance: Modem on a PowerConsole (Escala S100) and a modem by node

Example of Use

The PowerConsole is directly linked to the console concentrator (CS/2600) with a serial line (RS232). A modem is a board inserted inside the Escala S100.

RSF is installed in a cluster distributed configuration. The PowerConsole is used by the remote maintenance as the access point to the nodes and the PowerConsole itself.

- RSF is configured with ”callscarf” module on PowerConsole to interface the remote maintenance center.
- RSF is configured with ”cluster” module on every node, enabling the messages sent to and from the nodes to be relayed by the PowerConsole.

Cabling the Powerconsole to the concentrator allows the management of EPC nodes even if the dedicated–administration network or the customer’s LAN network is out of order. In that case, it is assumed that there is a serial port left (e.g. J9) on the concentrator for connecting the Powerconsole enabling to reach the nodes for service.

Modem on a Node's S2 Plug

Basic Cabling for a Uni-node Configuration

- On an EPC 800 node the modem is external.
- On an EPC 400 node the modem is integrated (ISA board) inside the drawer.
- On an EPC1200 or EPC1200A system, the modem is external.

For ECP800, the modem support is put into the rack. An external modem is connected to the native serial port S2 on an EPC800 or EPC1200 node. The integrated modem of an EPC400 node is configured together with RSF software.

Cabling Diagram without Console Concentrator

Figure 135 applies for a 2-node EPC800 configuration with a Cluster Console (X terminal).

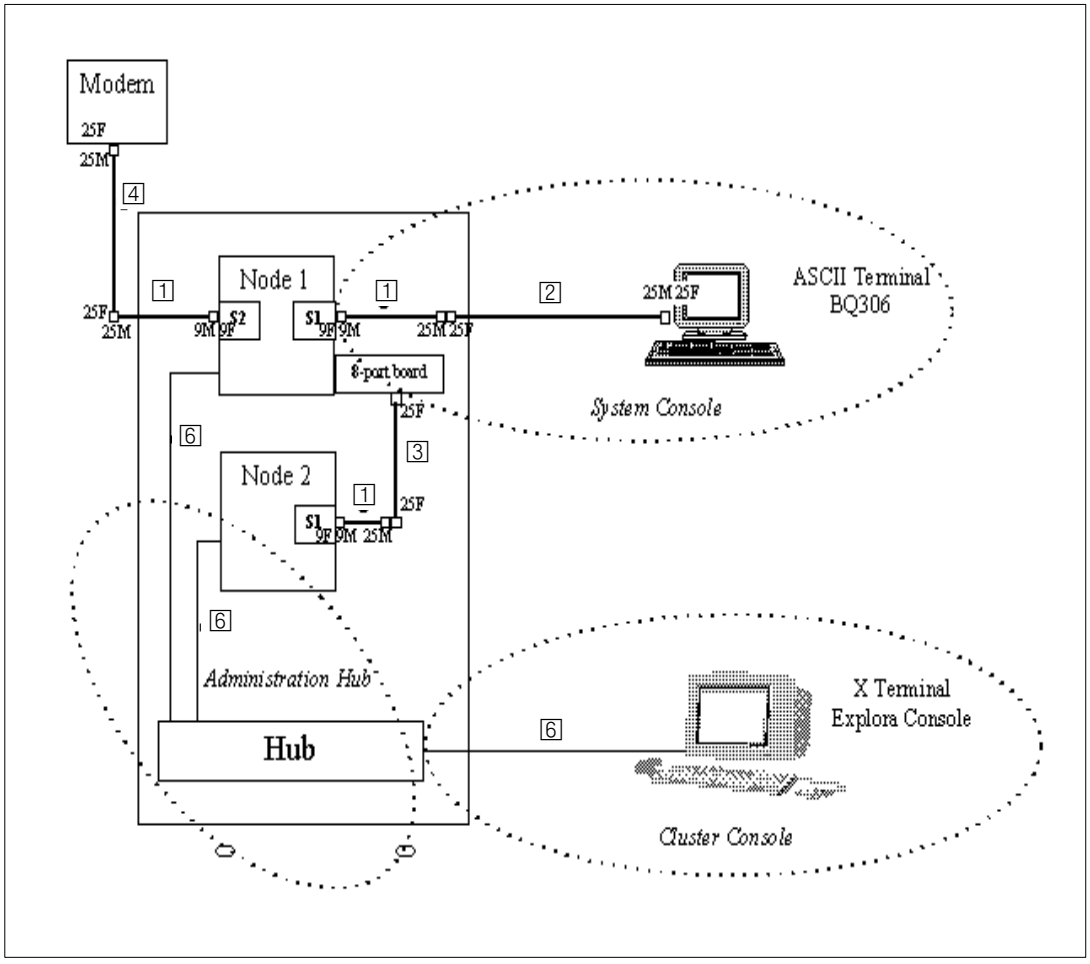


Figure 135. Remote maintenance: Modem on a Node's S2 plug without Console Concentrator.

Cabling Schema with Console Concentrator

This diagram shows a configuration with a Cluster Administration Hub. It still works for a configuration without a Cluster Administration Hub. In that case the nodes and the X Terminal are to be connected to the Customer's Ethernet network.

A CPU drawer of an Escala EPC is provided by default with an 8-port async. card. For remote maintenance purposes, in the case of a configuration with a cluster console, an 8-port async. card is necessary on the node to which the modem is connected.

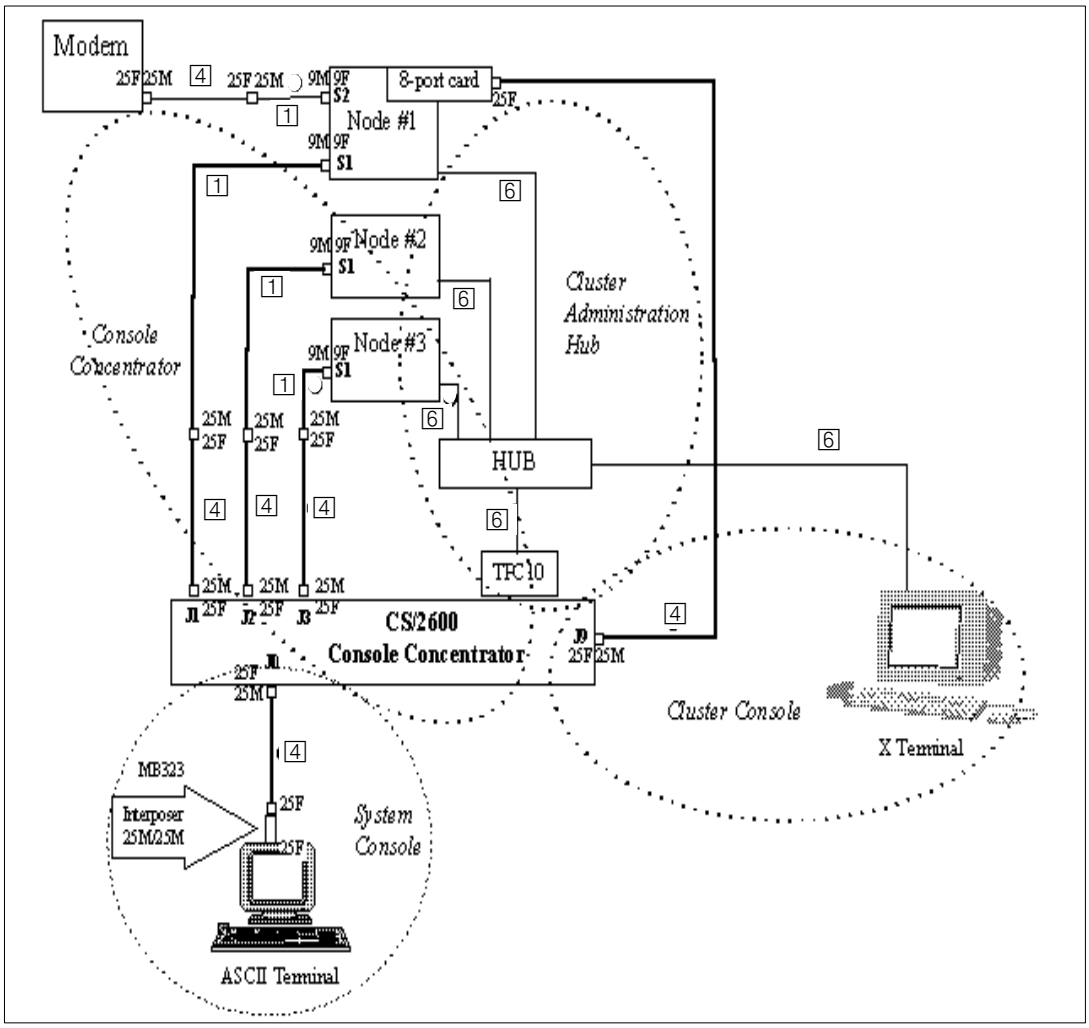


Figure 136. RMCF03: Remote maintenance: Modem on a Node's S2 plug w/ Console Concentrator

Example of Use

This solution is recommended:

- when there is a local ClusterConsole (as depicted in the figure)
- or when the Powerconsole is not wired to the Console Concentrator.

In a multiple-node EPC400 configuration there should be one node with an integrated modem. For any other EPC configuration type, an external modem is connected (as shown in the figure above) to the S2 port of a node (Node#1) type EPC1200-N, EPC1200A-N or EPC800-N.

RSF is installed in a cluster distributed configuration:

- RSF is configured with a 'callscarf' module on a node (Node #1) to interface the remote maintenance center
- RSF is configured with 'cluster' module on every node.

Cabling Node#1 from a serial port of its 8-port async. board to a port (e.g. J9) on the Console Concentrator allows to manage the EPC nodes even if the dedicated-administration network or the customer's LAN network is out of order.

Using Two Modems

Two modems are provided with every 2-node configuration which does not include any console concentrator. When extending a uni-node configuration with an additional node, an external modem is added. An original uni-node EPC RT model is provided with a modem integrated in the CPU drawer.

In any EPC400 configuration, there should be at least one node with an integrated modem.

CAUTION:
DAS management can be performed either with DAS manager tool or with ArrayGuide application (Navisphere for DAS57xx). In the former, there is a need to connect a serial cable between a node and a DAS service processor, which requires a serial port free on the node (S2 on ECP400). As conflicts on serial ports may happen, and as Array Guide can only be exerted from a graphical terminal, it is recommended to have a graphics display or an X terminal when the remote maintenance option is chosen. A 2-node EPC400 configuration with 2 system consoles is inadvisable.

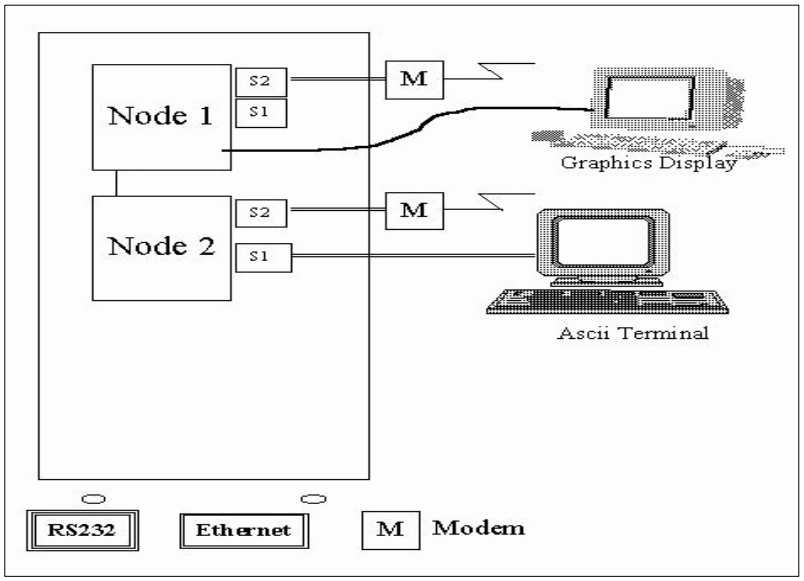


Figure 137. RMCF01: Remote maintenance: Two Modems without a Cluster Console.

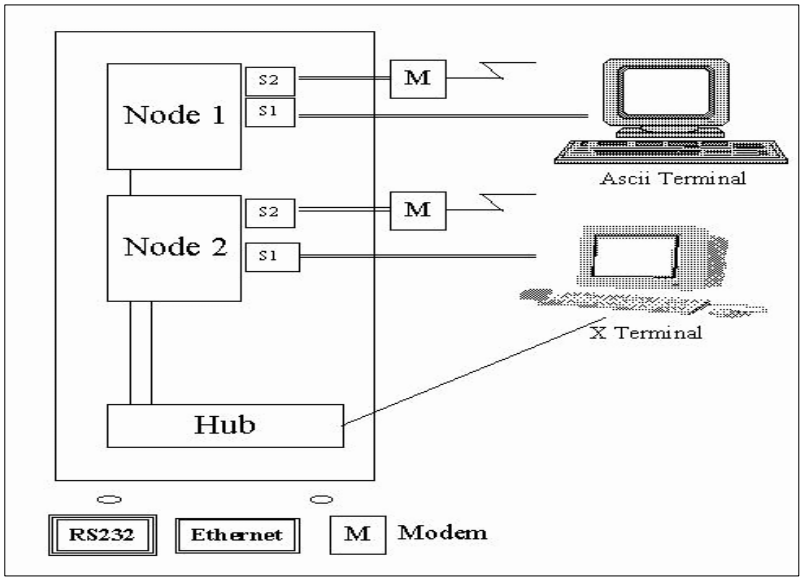


Figure 138. RMCF01: Remote maintenance: Two Modems with a Cluster Console.

Appendix A. Marketing Identifier Cross-References

Provides a way to trace the use, in this document, of Marketing Identifiers (M.I.) associated with EPC cabling.

M.I.s to page numbers.

Numbers

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Appendix B. Technical Support Bulletins

Where to find Technical Support Bulletins: linking M.I.s to spare parts; where are M.I.s used; history of Part Nos.

Technical Support Bulletins – Overview

Support Bulletins are available on-line, via the Web, providing up-to-date sources of data, including:

- correspondence between M.I.s and Spare Parts
- correspondence between M.I.s and Cables
- history of changes to Part Numbers
- complete spare parts catalogue (provided as a down-loadable compressed file).

On-Line Support URL

Address is:

```
http:/bbs.bull.net/bcs/bult.htm
```

Source is:

”Bulletins & How to Use Them”.

Access to most technical information is restricted to Customer Support Personnel with a user_id and password, however some information is freely available with the ”Guest” user_id.

Appendix C. PCI/ISA/MCA Adapter List

Lists of adapters (controllers) and their identification labels.

Adapter Card Identification

Adapter cards are identified by a label visible on the external side of the metallic plate guide.

For further details, about controllers description, configuration upgrading and removal procedures, refer to **Controllers** in the *Upgrading the System* manual.

A list of controller cards supported by your system is provided below.

Note: This list is not meant to be exhaustive and very recent controller cards may not be shown.

The description of each controller and its identification label is included in each controller's documentation.

The following tables provide the cross reference between the controller card model and the identification label.

PCI Bus

Label	Description
4-N	SSA Multi-Initiator/RAID Enhanced Loop Adapter
8-T	Auto LAN Streamer Token Ring
9-F	TURBOWAYS 155 ATM
B1-2	64-bit Graphics Controller (MGA Millenium) 2MB RAM
B1-3	64-bit Graphics Controller (MGA Millenium) 4MB RAM
B5-6	Ethernet 10/100Mbps Controller
B2-G	1–Port Multiprotocol Serial I/O
B2-H	4–Port Multiprotocol Serial I/O
B3-9	128-Port Async Controller EIA 232
B3-A	8-Port Async Controller EIA 232
B3-B	8-Port Async Controller EIA 422A
B3-C	64-Port Async Controller EIA 422A
B4-4	SCSI RAID Controller
B4-5	Ultra SCSI SE Controller
B4-6	Ultra SCSI DE Controller
B4-7	Fibre Channel Adapter
B5-3	FDDI Fiber UTP Single Ring Controller
B5-4	FDDI Fiber Single Ring Controller
B5-5	FDDI Fiber Dual Ring Controller

ISA Bus

Label	Description
B5-2	ISDN Controller
B5-A	Internal Modem ISA FRANCE
B5-B	Internal Modem ISA UK
B5-C	Internal Modem ISA BELGIUM
B5-D	Internal Modem ISA NETHERLAND
B5-E	Internal Modem ISA ITALY

MCA Bus

Label	Description
4-D	SSA 4 Port Adapter
4-G	Enhanced SSa 4 Port Adapter
4-M	SSA Multi-Initiator/RAID EL Adapter

Appendix D. Cable and Connector Identification Codes

Details in:

- Cable Identification Markings
- Connector Identification Codes

Cable Identification Markings

Each end of any cable connecting two items has a FROM–TO label conforming to a specific format and object identification rules.

Figure shows the format of a FROM–TO label and an example of labeled cable between a DAS and a CPU.

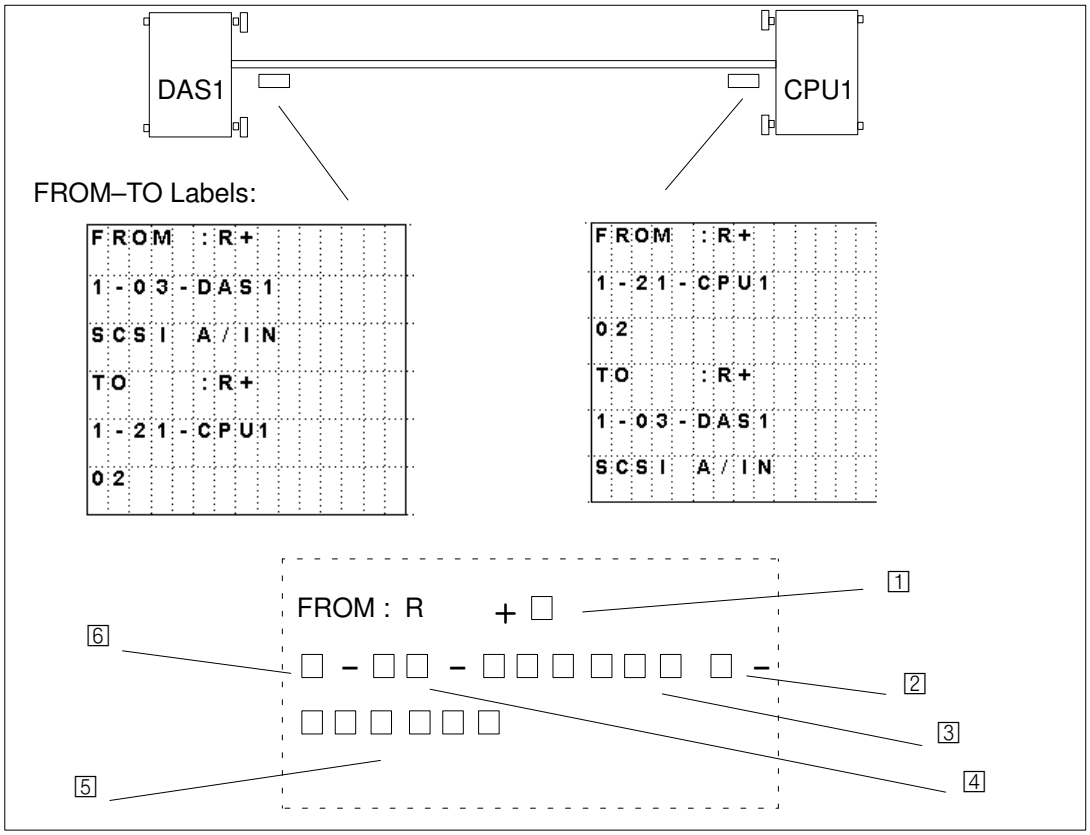

Figure 139. Cable Identification Codes on Labels.

Legend for Figure :

1 Number of already existing racks, in case of add-on on customer site.

2 Object number(1 char.) : 1–9

3 Object type (6 char.) according to the Object Identification on page D-2.

4 Number of the first U (lower) for the Drawer in the Rack or **EX** for external object (2 char.): 0–36

6 Rack Number from Ordering Document (1 char.) : 1–9 or **0** for external object.

5 Object position in the Drawer: Slot/Connector (up to 13 char.)

Object Identification for FROM–TO Labels

CPU	CPU Drawer
PCI	PCI Expansion drawer (EPC400)
CEC	Computing Rack (EPC1200)
I/O	I/O (EPC1200)
CONS	System Console
PWCONS	Power Console
SSA	SSA Disk Sub-system
DAS	DAS Disk Sub-system
JBOD	AMDAS/JBOD
LXB	Tape Drive Sub-system
CS2600	CS2600 Concentrator
CSCONS	CS2600 Concentrator Administration Console
HUB	Ethernet or FDDI Hub
FC-AL	Fibre Channel Hub
DISK	Media Drawer
VDAT	MAMMOTH VDAT
DLT	DLT4000/7000
QIC	QIC MLR1 Reader

Each object in a cabinet is identified with a label, indicating the object name and object number. Example: CPU1, HUB1, DAS1, etc..

Connector Identification Codes

CPU Drawer

S1	CPU Drawer Output S1 (EPC800 and EPC1200)
S2	CPU Drawer Output S2 (EPC800 and EPC1200)
S3	CPU Drawer Output S3 (EPC800)
COM1	CPU Drawer COM1 (EPC400)
COM2	CPU Drawer COM2 (EPC400)
COM3	CPU Drawer COM3 (EPC400)
SVGA	CPU Drawer SVGA (EPC400)
LAN10	LAN 10 Mbits Output (EPC400)
LAN100	LAN 100 Mbits Output (EPC400)
EOP	Operator Panel Extension (Front Panel CEC EPC1200)
OP	OP Connector (Rear Panel I/O EPC1200)
JTAG	JTAG Connector (Rear Panel CEC EPC1200)
RIOx	RIO Connector (Rear Panel I/O & CEC EPC1200) (1<x<=4)
Jxx	SPCN Connector (Rear Panel CEC EPC1200) (15<x<18)
SPCNx	SPCN Connector (Rear Panel I/O EPC1200) (x=1 or 2)

BQ306 System Console

MODEM	MODEM RS232 Plug for BQ306

CS2600 Concentrator

JxC	CS2600 Concentrator Serial Output (x 0 to 9)
TPC10	TPC10 Output

DAS 1300/2900/3200 Disk Sub-system

SCSI A/IN	SCSI Bus SPA IN (DAS)
SCSI A/OUT	SCSI Bus SPA OUT (DAS)
SCSI B/IN	SCSI Bus SPB IN (DAS)
SCSI B/OUT	SCSI Bus SPB OUT (DAS)
SPA/RS232	RS232 Serial Output Service Processor A (DAS)
SPB/RS232	RS232 Serial Output Service Processor B (DAS)

DAS 3500 Disk Sub-system

SPA/1	Fibre channel connector of Service processor A
SPB/1	Fibre channel connector of Service processor B
SPA/RS232	RS232 of Service processor A
SPB/RS232	RS232 of Service processor B

JBOD Disk Sub-system

J21,J22,J31	Asynchronous Console
J01 à J08	SCSI Bus

SSA Disk Sub-system

A1,A2,B1,B2	Connector output Adapter SSA
Jx	SSA Disk sub-system connector (01<x<16)

Ethernet HUB and 10/100MB Switch 3000 HUB

1x à 12x	RJ45 Output Ethernet HUB

FDDI HUB

A,B,S,M	Fibre Optic output

GADZOOX Fibre Channel HUB

PORT1 à PORT9	Fibre Channel output

OVERLAND Library

DLT1	OVERLAND Libraries SCSI Connector 1
DLT2	OVERLAND Libraries SCSI Connector 2

FDDI Adapter

A	FDDI adapter FDDI Connector port A
B	FDDI adapter FDDI Connector port B

PDU Power Supply Cables

Each power cable connected to the PDU is identified with a label identifying the object it supplies.

The rules for object names and numbering are applied (example, CPU1). See **Object Identification for FROM–TO Labels**, on page D-2.

Glossary

This glossary contains abbreviations, key–words and phrases that can be found in this document.

ATF
Application-Transparent Failover.

CPU
Central Processing Unit.

DAS
Disk Array Subsystem.

EPC
Escala Power Cluster.

FC–AL
Fibre Channel Abritrated Loop.

FDDI
Fibre Distributed data Interface.

FRU
Field Replaceable Unit.Media

HACMP
Name od software managing High Availability on Powercluster and HA solutions.

LSA Adapter
Intergrated Ethernet Card.

MCA
Micro Channel Architecture (Bus).

MDI
Media Dependent Interface.

MI
Marketing Identifier.

MIA
Media Interface Adapter.

PCI
Peripheral Component Interconnect (Bus).

PDB
Power Distribution Board.

PDU
Power Distribution Unit.

RSF
Remote Services Facilities.

SCSI
Small Computer System Interface.

SSA
Serial Storage Architecture.

URL
Uniform Resource Locator.

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