IBM System Storage DS8000

IBM

Installation Guide

Version 1 Release 2

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Contents

Notices and publication information

This section contains information about safety notices that are used in this guide, environmental notices for this product, publication information, and information about sending your comments to IBM.

Safety notices

Complete this task to find information about safety notices.

To find the translated text for a danger or caution notice:

1. Look for the identification number at the end of each danger notice or each caution notice. In the following examples, the numbers **1000** and **1001** are the identification numbers.

   DANGER

   > **A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.**
   >
   > **1000**

   CAUTION:
   A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

   1001

2. Find the number that matches in the *IBM System Storage™ Solutions Safety Notices for IBM Versatile Storage Server and IBM System Storage Enterprise Storage Server*, GC26-7229.

Environmental notices

This section identifies the environmental guidelines that pertain to this product.

Product recycling and disposal

This unit contains recyclable materials.

This unit must be recycled or discarded according to applicable local and national regulations. IBM® encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at http://www.ibm.com/ibm/environment/products/prp.shtml.
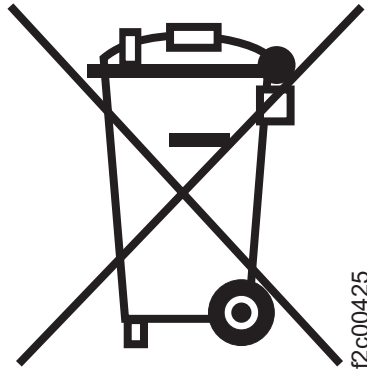
Notice: This mark applies only to countries within the European Union (EU) and Norway.

Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

This product may contain sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Please have the IBM part number listed on the battery available prior to your call.

In the Netherlands the following applies:
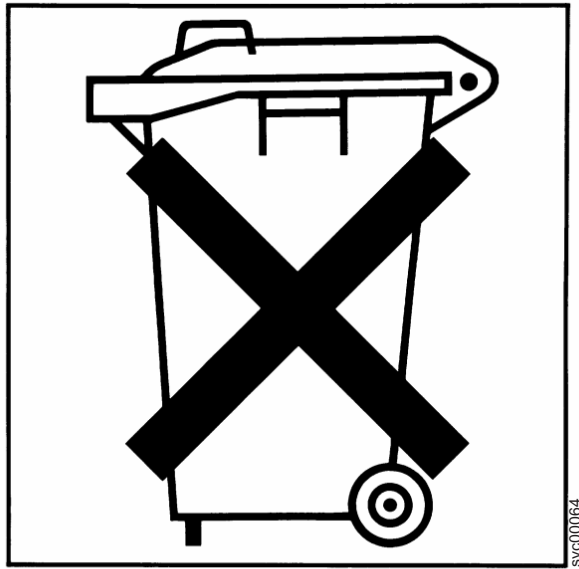
For Taiwan:

Please recycle batteries.

廢電池請回收

Conventions used in this guide

The following typefaces are used to show emphasis:

boldface

Text in **boldface** represents menu items and lowercase or mixed-case command names.

italics Text in *italics* is used to emphasize a word. In command syntax, it is used for variables for which you supply actual values.

`monospace`

Text in `monospace` identifies the data or commands that you type, samples of command output, or examples of program code or messages from the system.

Related information

The tables in this section list and describe the following publications:

- The publications that make up the IBM® System Storage™ DS8000™ series library
- Other IBM publications that relate to the DS8000 series
- Non-IBM publications that relate to the DS8000 series

DS8000 series library

These customer publications make up the DS8000 series library.

Unless otherwise noted, these publications are available in Adobe portable document format (PDF) on a compact disc (CD) that comes with the storage unit. If you need additional copies of this CD, the order number is SK2T-8825. These publications are also available as PDF files by clicking on the **Documentation link** on the following Web site:

http://www-1.ibm.com/servers/storage/support/disk

Title	Description	Order Number
IBM System Storage DS: Command-Line Interface User's Guide	This guide describes the commands that you can use from the command-line interface (CLI) for managing your DS8000 configuration and Copy Services relationships. The CLI application provides a set of commands that you can use to write customized scripts for a host system. The scripts initiate predefined tasks in a Copy Services server application. You can use the CLI commands to indirectly control Remote Mirror and Copy and FlashCopy® configuration tasks within a Copy Services server group.	SC26-7625 (See Note.)
IBM System Storage DS8000: Host Systems Attachment Guide	This guide provides guidelines for attaching the DS8000 to your host system and for migrating to fibre-channel attachment from a small computer system interface.	SC26-7628 (See Note.)
IBM System Storage DS8000: Introduction and Planning Guide	This guide introduces the DS8000 product and lists the features you can order. It also provides guidelines for planning the installation and configuration of the storage unit.	GC35-0495
IBM System Storage Multipath Subsystem Device Driver User's Guide	This publication describes how to use the IBM Subsystem Device Driver (SDD) on open-systems hosts to enhance performance and availability on the DS8000. SDD creates single devices (vpaths) that consolidate redundant paths for logical unit numbers. SDD permits applications to run without interruption when path errors occur. It balances the workload across paths, and it transparently integrates with applications.	SC30-4096
IBM System Storage DS8000: User's Guide	This guide provides instructions for setting up and operating the DS8000 and for analyzing problems.	SC26-7623 (See Note.)
IBM System Storage DS Application Programming Interface Reference	This publication provides reference information for the IBM System Storage DS application programming interface (API) and provides instructions for installing the Common Information Model Agent, which implements the API.	GC35-0493

Title	Description	Order Number
IBM System Storage DS8000 Messages Reference	This publication provides explanations of error, information, and warning messages that are issued from the DS8000 user interfaces.	GC26-7659
Note: No hardcopy book is produced for this publication. However, a PDF file is available from the following Web site: http://www-1.ibm.com/servers/storage/support/disk		

Other IBM publications

Other IBM publications contain additional information that is related to the DS product library.

The following list is divided into categories to help you find publications that are related to specific topics. Some of the publications are listed under more than one category. See "Ordering IBM publications" on page xiii for information about ordering these and other IBM publications.

Title	Description	Order Number
Data-copy services		
z/OS DFSMS Advanced Copy Services	This publication helps you understand and use IBM Advanced Copy Services functions. It describes three dynamic copy functions and several point-in-time copy functions. These functions provide backup and recovery of data if a disaster occurs to your data center. The dynamic copy functions are peer-to-peer remote copy, extended remote copy, and coupled extended remote copy. Collectively, these functions are known as remote copy. FlashCopy, SnapShot, and concurrent copy are the point-in-time copy functions.	SC35-0428
IBM Enterprise Storage Server	This publication, from the IBM International Technical Support Organization, introduces the Enterprise Storage Server and provides an understanding of its benefits. It also describes in detail the architecture, hardware, and functions, including the advanced copy functions, of the Enterprise Storage Server.	SG24-5465
Implementing Copy Services 0n S/390	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on an Enterprise Storage Server that is attached to an S/390 or zSeries host system. Copy Services functions include peer-to-peer remote copy (PPRC), extended remote copy (XRC), FlashCopy®, and concurrent copy. This publication describes the functions, prerequisites, and corequisites and describes how to implement each function into your environment.	SG24-5680
IBM TotalStorage ESS Implementing Copy Services in an Open Environment	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on UNIX, Windows NT®, Windows 2000, Sun Solaris, HP-UX, Tru64, OpenVMS, and iSeries host systems. The Copy Services functions that are described include peer-to-peer remote copy (PPRC) and FlashCopy. This publication describes the functions and shows you how to implement them into your environment. It also shows you how to implement these functions in a high-availability cluster multiprocessing environment.	SG24-5757
Fibre channel		

Title	Description	Order Number
Fibre Channel Connection (FICON) I/O Interface: Physical Layer	This publication provides information about the fibre-channel I/O interface. This book is also available as a PDF file from the following Web site: http://www.ibm.com/servers/resourcelink/	SA24-7172
Fibre Transport Services (FTS): Physical and Configuration Planning Guide	This publication provides information about fibre-optic and ESCON-trunking systems.	GA22-7234
IBM SAN Fibre Channel Switch: 2109 Model S08 Installation and Service Guide	This guide describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S08.	SC26-7350
IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide	This guide describes the IBM SAN Fibre Channel Switch and the IBM TotalStorage ESS Specialist. It provides information about the commands and how to manage the switch with Telnet and the Simple Network Management Protocol.	SC26-7349
IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide	This publication describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S16. It is intended for trained service representatives and service providers.	SC26-7352
IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide	This guide introduces the IBM SAN Fibre Channel Switch 2109 Model S16 and tells you how to manage and monitor the switch using zoning and how to manage the switch remotely.	SC26-7351
Implementing Fibre Channel Attachment on the ESS	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure fibre-channel attachment of open-systems hosts to the Enterprise Storage Server. It provides you with a broad understanding of the procedures that are involved and describes the prerequisites and requirements. It also shows you how to implement fibre-channel attachment.	SG24-6113
Open-systems hosts		
ESS Solutions for Open Systems Storage: Compaq AlphaServer, HP, and Sun	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure the Enterprise Storage Server when you attach Compaq AlphaServer (running Tru64 UNIX), HP, and Sun hosts. This book does not cover Compaq AlphaServer that is running the OpenVMS operating system. This book also focuses on the settings that are required to give optimal performance and on the settings for device driver levels. This book is for the experienced UNIX professional who has a broad understanding of storage concepts.	SG24-6119
IBM TotalStorage ESS Implementing Copy Services in an Open Environment	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on UNIX or Windows 2000 host systems. The Copy Services functions that are described include peer-to-peer remote copy and FlashCopy. This publication describes the functions and shows you how to implement them into your environment. It also shows you how to implement these functions in a high-availability cluster multiprocessing environment.	SG24-5757
Implementing Fibre Channel Attachment on the ESS	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure fibre-channel attachment of open-systems hosts to the Enterprise Storage Server. It gives you a broad understanding of the procedures that are involved and describes the prerequisites and requirements. It also shows you how to implement fibre-channel attachment.	SG24-6113

Title	Description	Order Number
	S/390 and zSeries hosts	
Device Support Facilities: User's Guide and Reference	This publication describes the IBM Device Support Facilities (ICKDSF) product that are used with IBM direct access storage device (DASD) subsystems. ICKDSF is a program that you can use to perform functions that are needed for the installation, the use, and the maintenance of IBM DASD. You can also use it to perform service functions, error detection, and media maintenance.	GC35-0033
z/OS Advanced Copy Services	This publication helps you understand and use IBM Advanced Copy Services functions. It describes three dynamic copy functions and several point-in-time copy functions. These functions provide backup and recovery of data if a disaster occurs to your data center. The dynamic copy functions are peer-to-peer remote copy, extended remote copy, and coupled extended remote copy. Collectively, these functions are known as remote copy. FlashCopy, SnapShot, and concurrent copy are the point-in-time copy functions.	SC35-0428
DFSMS/MVS V1: Remote Copy Guide and Reference	This publication provides guidelines for using remote copy functions with S/390 and zSeries hosts.	SC35-0169
Fibre Transport Services (FTS): Physical and Configuration Planning Guide	This publication provides information about fibre-optic and ESCON-trunking systems.	GA22-7234
Implementing ESS Copy Services on S/390	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on an Enterprise Storage Server that is attached to an S/390 or zSeries host system. Copy Services functions include peer-to-peer remote copy, extended remote copy, FlashCopy, and concurrent copy. This publication describes the functions, prerequisites, and corequisites and describes how to implement each function into your environment.	SG24-5680
ES/9000, ES/3090: IOCP User Guide Volume A04	This publication describes the Input/Output Configuration Program that supports the Enterprise Systems Connection (ESCON) architecture. It describes how to define, install, and configure the channels or channel paths, control units, and I/O devices on the ES/9000 processors and the IBM ES/3090 Processor Complex.	GC38-0097
IOCP User's Guide, IBM e(logo)server zSeries 800 and 900	This publication describes the Input/Output Configuration Program that supports the zSeries 800 and 900 servers. This publication is available in PDF format by accessing ResourceLink at the following Web site: www.ibm.com/servers/resourcelink/	SB10-7029
IOCP User's Guide, IBM e(logo)server zSeries	This publication describes the Input/Output Configuration Program that supports the zSeries server. This publication is available in PDF format by accessing ResourceLink at the following Web site: www.ibm.com/servers/resourcelink/	SB10-7037
S/390: Input/Output Configuration Program User's Guide and ESCON Channel-to-Channel Reference	This publication describes the Input/Output Configuration Program that supports ESCON architecture and the ESCON multiple image facility.	GC38-0401
IBM z/OS Hardware Configuration Definition User's Guide	This guide provides conceptual and procedural information to help you use the z/OS Hardware Configuration Definition (HCD) application. It also explains: • How to migrate existing IOCP/MVSCP definitions • How to use HCD to dynamically activate a new configuration • How to resolve problems in conjunction with MVS/ESA HCD	SC33-7988

Title	Description	Order Number
OS/390: Hardware Configuration Definition User's Guide	This guide provides detailed information about the input/output definition file and about how to configure parallel access volumes. This guide discusses how to use Hardware Configuration Definition for both OS/390® and z/OS V1R1.	SC28-1848
OS/390 V2R10.0: MVS System Messages Volume 1 (ABA - ASA)	This publication lists OS/390 MVS™ system messages ABA to ASA.	GC28-1784
Using IBM 3390 Direct Access Storage in a VM Environment	This publication provides device-specific information for the various models of the 3390 and describes methods you can use to manage storage efficiently using the VM operating system. It provides guidance on managing system performance, availability, and space through effective use of the direct access storage subsystem.	GG26-4575
Using IBM 3390 Direct Access Storage in a VSE Environment	This publication helps you use the 3390 in a VSE environment. It includes planning information for adding new 3390 units and instructions for installing devices, migrating data, and performing ongoing storage management activities.	GC26-4576
Using IBM 3390 Direct Access Storage in an MVS Environment	This publication helps you use the 3390 in an MVS environment. It includes device-specific information for the various models of the 3390 and illustrates techniques for more efficient storage management. It also offers guidance on managing system performance, availability, and space utilization through effective use of the direct access storage subsystem.	GC26-4574
z/Architecture Principles of Operation	This publication provides a detailed definition of the z/Architecture™. It is written as a reference for use primarily by assembler language programmers and describes each function at the level of detail needed to prepare an assembler language program that relies on a particular function. However, anyone concerned with the functional details of z/Architecture will find this publication useful.	SA22-7832
SAN		
IBM OS/390 Hardware Configuration Definition User's Guide	This guide explains how to use the Hardware Configuration Data application to perform the following tasks: • Define new hardware configurations • View and modify existing hardware configurations • Activate configurations • Query supported hardware • Maintain input/output definition files (IODFs) • Compare two IODFs or compare an IODF with an actual configuration • Print reports of configurations • Create graphical reports of a configuration • Migrate existing configuration data	SC28-1848
IBM SAN Fibre Channel Switch: 2109 Model S08 Installation and Service Guide	This guide describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S08.	SC26-7350
IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide	This guide describes the IBM SAN Fibre Channel Switch and the IBM TotalStorage ESS Specialist. It provides information about the commands and how to manage the switch with Telnet and the Simple Network Management Protocol (SNMP).	SC26-7349
IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide	This publication describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S16. It is intended for trained service representatives and service providers.	SC26-7352

Title	Description	Order Number
IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide	This guide introduces the IBM SAN Fibre Channel Switch 2109 Model S16 and tells you how to manage and monitor the switch using zoning and how to manage the switch remotely.	SC26-7351
Implementing Fibre Channel Attachment on the ESS	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure fibre-channel attachment of open-systems hosts to the Enterprise Storage Server. It provides you with a broad understanding of the procedures that are involved and describes the prerequisites and requirements. It also shows you how to implement fibre-channel attachment.	SG24-6113
Seascape family		
IBM Enterprise Storage Server	This publication, from the IBM International Technical Support Organization, introduces the Enterprise Storage Server and provides an understanding of its benefits. It also describes in detail the architecture, hardware, and functions, including the advanced copy functions, of the Enterprise Storage Server.	SG24-5465
IBM Enterprise Storage Server Performance Monitoring and Tuning Guide	This guide, from the IBM International Technical Support Organization, provides guidance on the best way to configure, monitor, and manage your Enterprise Storage Server to ensure optimum performance.	SG24-5656
IBM Versatile Storage Server: Introduction and Planning Guide	This publication introduces the IBM Versatile Storage Server™ and lists the features you can order. It also provides planning information for both 2105 Models B09 and 100.	GC26-7223
Implementing the IBM Enterprise Storage Server in Your Environment	This publication, from the IBM International Technical Support Organization, can help you install, tailor, and configure the Enterprise Storage Server in your environment.	SG24-5420
Storage management		
Device Support Facilities: User's Guide and Reference	This publication describes the IBM Device Support Facilities (ICKDSF) product used with IBM direct access storage device (DASD) subsystems. ICKDSF is a program that you can use to perform functions that are needed for the installation, the use, and the maintenance of IBM DASD. You can also use it to perform service functions, error detection, and media maintenance.	GC35-0033
IBM TotalStorage Solutions Handbook	This handbook, from the IBM International Technical Support Organization, helps you understand what makes up enterprise storage management. The concepts include the key technologies that you must know and the IBM subsystems, software, and solutions that are available today. It also provides guidelines for implementing various enterprise storage administration tasks so that you can establish your own enterprise storage management environment.	SG24-5250

Ordering IBM publications

You can order copies of IBM publications using the IBM publications center.

IBM publications center

The publications center is a worldwide central repository for IBM product publications and marketing material.

The IBM publications center offers customized search functions to help you find the publications that you need. Some publications are available for you to view or download free of charge. You can also order publications. The publications center displays prices in your local currency. You can access the IBM publications center through the following Web site:

http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/
pbi.cgi

Note: Open the Web site in a new browser window by right clicking on the link
and selecting "Open in New Window."

Web sites

The following Web sites provide information about the IBM System Storage
DS8000 series and other IBM storage products.

Type of Storage Information	Web Site
Concurrent Copy for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/
Copy Services command-line interface (CLI)	http://www-1.ibm.com/servers/storage/support/software/cscli/
DS8000 Information Center	http://publib.boulder.ibm.com/infocenter/ds8000ic/index.jsp
DS8000 series publications	http://www-1.ibm.com/servers/storage/support/disk Click **Documentation**.
FlashCopy for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/
Host system models, operating systems, and adapters that the storage unit supports	http://www.ibm.com/servers/storage/disk/ds8000/ Click **Interoperability matrix**.
IBM Disk Storage Feature Activation (DSFA)	http://www.ibm.com/storage/dsfa
IBM storage products	http://www.storage.ibm.com/
IBM System Storage DS8000 series	http://www-1.ibm.com/servers/storage/disk/ds8000
IBM version of the Java (JRE) that is often required for IBM products	http://www-106.ibm.com/developerworks/java/jdk/
Multiple Device Manager (MDM)	http://www.ibm.com/servers/storage/support/ Click **Storage Virtualization**.
Remote Mirror and Copy (formerly PPRC) for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/
SAN fibre channel switches	http://www.ibm.com/storage/fcswitch/
Storage Area Network Gateway and Router	http://www-1.ibm.com/servers/storage/support/san/
Subsystem Device Driver (SDD)	http://www-03.ibm.com/servers/storage/support/software/sdd
Technical notes and product tips	http://www.ibm.com/servers/storage/support/disk/ds8100/ Click **Technical notes** on the Troubleshooting tab.
z/OS Global Mirror (formerly XRC) for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/

How to send your comments

Your feedback is important to help us provide the highest quality information. If
you have any comments about this information or any other DS8000 series
documentation, you can submit them in the following ways:

- e-mail

  Submit your comments electronically to the following e-mail address:

starpubs@us.ibm.com

Be sure to include the name and order number of the book and, if applicable, the specific location of the text you are commenting on, such as a page number or table number.

- Mail

  Fill out the Readers' Comments form (RCF) at the back of this book. Return it by mail or give it to an IBM representative. If the RCF has been removed, you can address your comments to:

  International Business Machines Corporation
  RCF Processing Department
  Department 61C
  9032 South Rita Road
  TUCSON AZ 85775-4401

Chapter 1. Installing the DS8000 Model 92X/9AX, 93X/9BX

These procedures are for an installation of a DS8000 Model 92X/9AX, 93X/9BX.

DANGER

> HEAVY EQUIPMENT -- PERSONAL INJURY OR EQUIPMENT DAMAGE
> MAY RESULT IF MISHANDLED (D006)

Attention: The customer should prepare his environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, the final installation site should be prepared in advance such that professional movers/riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, the customer will need to make arrangements to have professional movers/riggers return to finish the transportation at a later date. Only professional movers/riggers should transport the equipment. The IBM authorized service provider will only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. The customer is also responsible for using professional movers/riggers in the case of equipment relocation or disposal.

Checking for the latest level of the installation instructions

These installation instructions are provided in two formats:

- **Hardcopy**: Hardcopy instructions (printed from a PDF file) are shipped with the subsystem. The PDF file is also available on the *IBM System Storage DS8000 series Service Documents CDROM* or from the DS8000 - Engineering Web site.
- **Information Center**: The Information Center is intended for online viewing. It is available on the *IBM System Storage DS8000 series Service Documents CDROM*, on the management console (HMC), or through the Intranet.

Ensure that you are using the latest version of the installation instructions.

1. If you are performing the installation using **hardcopy** instructions, the latest level of the PDF file for printing will be available on the DS8000 - Engineering Web site (https://ssgtech4.sanjose.ibm.com/PFE/Squadrons-S%20PE %20Support.nsf/WVhome) under "Related Links".

2. If you are performing the installation using the **Information Center**, the latest version will be available on the Intranet. Use the link from the DS8000 - Engineering Web site (https://ssgtech4.sanjose.ibm.com/PFE/Squadrons-S %20PE%20Support.nsf/WVhome) under "Related Links".

Beginning the installation of the DS8000 storage facility

Begin the installation of the storage facility by completing the tasks in the following sections.

Recording information for the installation report

Near the end of the installation process the system service representative (SSR) will be required to enter information to complete an Install Report that is automatically sent to IBM ("call home"). The required information includes the total number of hours for each phase of the installation.

- Each SSR working on installation activities must keep track of their times.
- You will be required to enter duration of time in hours and tenths of hours for the various phases of the installation.
- The time spent on problem resolution is kept separately.
- The installation instructions will remind you when to return here and enter your date and time information for each phase.

1. This step is an example of the Install Report information required for one of the installation phases.

   Example: Position, cable up, power and safety checks phase

   ```
   SSR #1 works Saturday, 9:00 AM to 10:00 AM and 12:30 PM to 1:00 PM
        (1.5 hours total)
   SSR #1 works on problem determination Saturday, 10:00 AM to 12:30 PM
        (2.5 hours total)
   SSR #2 works on problem determination Saturday, 11:00 AM to 12:30 PM
        (1.0 hour total)
   Phase started Saturday, 9:00 AM.  Phase ended at 1:00 PM (4.0 hours elapsed)
   ```

Table 1. Example of install phase information for second Install Report screen

Phase	Total SSR Hours	Elapsed Hours Start to Finish	SSR Hours for Problem Resolution
Check customer prep through safety checks	5.5	4.0	3.5
Note: enter hours in format xx.y (xx = hours, y=tenths)			

Total SSR hours
> Sum of hours by all IBM SSRs working on this phase. This includes problem resolution time on this phase.

Elapsed Time
> Number of clock hours between the start time and finish time of this phase.

Problem Resolution Time
> Sum of hours by all IBM SSRs spent doing problem resolution for this phase (does not include time spent doing problem resolution for other installation phases).

2. Complete the information in Table 2 to record the overall duration of the installation.

   Note: This does not include post installation actions and times that are recorded in Table 3 on page 3.

Table 2. Install time elapsed in hours

Start and End of Install (SC20 activity)	Date and time
Start time of first IBM SSR begins the install (SC20)	
End time when last IBM SSR completes the install (SC20 complete)	
Total Elapsed Time in hours	

Example:
Install started Saturday, 8:00 AM
Install completed Sunday 10:24 AM

Total elapsed time in hours = 26.4

3. Complete the following tables as you proceed through the phase of the install, post install, and any problem determination you do.

Table 3. Install actions and start/stop times

Phase	Start Time (date and time)	Stop Time (date and time)	Number of Hours (hours & tenths)
Check customer prep through safety checks			
HMC initial configuration			
Storage Facility bring-up			
HMC customization and communication tests			
End of install and clean up			

Table 4. Post install actions and start/stop times

Phase	Start Time (date and time)	Stop Time (date and time)	Number of Hours (hours & tenths)
Monitor Certify DDM			
HMC code upgrade (SC33)			
SF code upgrade (SC33)			

Table 5. Problem resolution for any phase

Record each phase that requires problem resolution on a separate line	Start Time (date and time)	Stop Time (date and time)	Number of Hours (hours & tenths)

Table 5. Problem resolution for any phase (continued)

Record each phase that requires problem resolution on a separate line	Start Time (date and time)	Stop Time (date and time)	Number of Hours (hours & tenths)

    4. Continue with the installation.

Checking customer preparations

1. Record the *start* date and time for the *Check customer prep through safety checks* phase in Table 3 on page 3, "Recording information for the installation report" on page 2.

2. Verify that the customer has two AC power sources for each rack in the DS8000 storage facility.

   For maximum fault tolerance, use two separate AC power sources.

   Note: The DS8000 is designed for connection to an IT power distribution system. In an IT power distribution system, the neutral conductor is isolated from earth (ground) by an impedance with exposed conductive parts in the installation that is tied directly to earth.

   No service representative action is needed. Information is for compliance with International Electrotechnical Commission Standard 950 for the safety of information technology equipment and electrical business equipment.

3. Verify the customer wall circuit breaker. The customer wall circuit breaker rating that protects each line cord depends on the voltage range as follows:
   - Low-voltage, three-phase installations (200 - 240 V) require wall circuit breakers that have a rating of 50 to 60 A. Do not exceed the wire rating of the facility.
   - High-voltage, three-phase installations (380 - 480 V) require wall circuit breakers that have a rating of 30 to 35 A. Do not exceed the wire rating of the facility.

4. If the DS8000 will be installed on a raised floor:
   a. Review the weight of each rack with the customer to verify that their raised floors have adequate support. An individual rack, fully configured can weigh a maximum of 2880 pounds (1307 kilograms). For details on the DS8000 rack weights, refer to *IBM System Storage DS8000 Introduction and Planning Guide*.
   b. To correctly cool a DS8000, place two floor tiles, that have holes for air flow, directly in the front and the rear of each DS8000 rack (for a total of 4). Also provide tiles with holes, for cable entry, under the rear tailgate.

5. If the DS8000 will not be installed on a raised floor, ensure the customer will provide adequate air flow and temperature around the DS8000.

   Notes:

a. For information about the temperature requirements of the operating environment, see the *IBM System Storage DS8000 Introduction and Planning Guide*.

b. The DS8000 rack cooling airflow enters through the front and rear covers and exits through the top and rear covers. The bottom of the DS8000 is sealed.

6. Verify that the customer has ordered, supplied, and routed the following cables to the DS8000 being installed. Routing of the customer cables must not be billed against the installation. If the customer wants the service representative to route the cables, that activity must be coded or billed separately.

a. ESCON host cables from the host to the DS8000 host adapters.

b. Fibre host cables from the host to the DS8000 host adapters.

c. An Ethernet LAN signal cable. This cable is required to connect the management console to the customer LAN.

d. If the rear of each CEC enclosure has a two-port Ethernet card in PCI slot 1 or 5 (counted from left to right), then the customer has ordered a feature code that installs additional Ethernet cards. The cards allow faster management of flash copy relationships. For each empty port, the customer should provide an Ethernet cable from their network to be connected.

e. A functional analog telephone line to the hardware management console (also referred to as HMC and management console) within 2.5 meters (8 feet) of the management console.

f. AC service for the service provider laptop within 2.5 meters (8 feet) of the DS8000.

g. AC service outlet for each component of an external management console.

Checking communications work sheets

Verify that the customer has provided a completed copy of the DS8000 work sheets. Refer to the *IBM System Storage DS8000 Introduction and Planning Guide*.

Checking for required microcode

1. Is the new storage facility being installed to an existing storage complex?

- Yes, ensure the code level of the existing storage complex and management consoles are already at a compatible level or same level as the new code levels. Then go to step 2.
- No, go to step 3.

   Note: Normally, if there are two management consoles, they both must be running the same level of code.

2. Ensure the code level of the existing storage plex and management consoles are already at a compatible level or same level as the new storage facility code levels.

   Note: Do not intermix the following bundles within a storage plex without the approval of next level of support.
   - bundle 6.1.6xx.xx or prior
   - bundle 6.2.0xx.xx or later

3. Determine if there is a required level of microcode available for your storage facility or management console. For IBM personnel, go to DS8000 - Engineering Web site (https://ssgtech4.sanjose.ibm.com/PFE/Squadrons-S%20PE

%20Support.nsf/WVhome). For non-IBM personnel, follow the established process to determine the required code level.

When the web site defines a code level as "required", it means that the storage facility must not be transferred over to the customer without the indicated code level installed.

When the web site defines a code level as "recommended", it means the IBM service representative can either:

- Give the storage facility to the customer when the installation is complete.
- Negotiate with the customer for a more convenient time to update the microcode.

Checking RETAIN for storage facility installation tips

1. Sign on to RETAIN.
2. Select HSF.
3. Search for 2107 Install (p;2107 Install). RETAIN may have information that corrects problems that are not yet addressed by the install instructions.

Checking for RETAIN registration

If you are installing the first DS8000 storage facility in the storage complex, sign on to RETAIN and check that the DS8000 that contains the management console is registered.

1. Enter `n;z/cpu 2NNNPPSSSSS` where:

   2NNN Machine type of 2107, 2421, 2422, 2423, or 2424

   PP Plant of manufacture

   SSSSS
   The last 5 digits of the serial number. You can find the serial number label on the DS8000 Rack-1 operator panel beneath the red UEPO switch.

2. If the command output returns 'UNKNOWN CPU SPECIFIED', ask the support center to register the DS8000.

Unpacking the storage facility and verifying the ship group is complete

1. Remove the CE Unpacking Instructions from the Customer Engineer envelope taped to the front of the storage facility below the CEC enclosures. Use the CE Unpacking Instructions to unpack the storage facility frame(s) and prepare it for installation.
2. Verify that all items in the ship group were received.
   a. The ship group comes in one or more large boxes on pallets. The customer may not allow the pallet and large box in their machine room. Consequently, you may end up with a pile of parts on the floor.
   b. If an expansion rack is included, the decorative covers that go between the racks are either packed in a separate long narrow box (old version) or are packed in the large ship group box (new version).
   c. The hardcopy listing of the ship group contents is shipped loose with the other parts inside the large boxes. If it is missing, check if it was accidently discarded along with the pallets and large boxes. An additional copy of the paperwork may be included in the CE Envelope.

d. The official ship group listing of parts is included in the ship group. Table 6 and Table 7 are for reference only.

Notes:

- Version 1 part numbers are *not* eligible for use in European Union member states.
- Version 2 part numbers are eligible for use everywhere including European Union member states.
- Only the most recent part numbers are listed. Your DS8000 or serviceable event FRU list may contain an older part number. The parts ordering system can automatically substitute a later part number as needed.

Table 6. Service ship group part numbers (base rack)

	Part number	
Description	Version 1	Version 2
Cable, Ethernet, black, 31.0 m	22R1798	22R1798
Cable, Ethernet, gray, 31.0 m	22R1799	22R1799
CD-ROM, Code Bundle	[1]	[1]
CD-ROM, Customer Documents	[1]	[1]
CD-ROM, Service Documents	[1]	[1]
Label, operator panel warning, translated	22R1789	22R1789
Publication, Service Provider Start Here	22R4228	22R4228
Publication, Installation Guide	[1]	[1]
Publication, Statement of Limited Warranty	22R5940	22R6401
Publication, Waste Equipment (WEEE)	22R5822	22R5822
Tag, "Do Not Operate"	23R0280	23R0280
Tie wrap	07J6655	07J6655
Wheel chocks (set of 4)	08J5557	08J5557
Wrap plug, ESCON	05N6767	12R9312
Wrap plug, Ethernet	00G2380	03N6070
Wrap plug, Fibre Channel, copper (device adapter)	23R0856	23R0856
Wrap plug, Fibre Channel, optic (host adapter)	12R9314	12R9314
Notes:		
1. The part number changes with each release. Call the next level of support.		

Table 7. Service ship group part numbers (expansion rack)

	Part number	
Description	Version 1	Version 2
Bolt, M8 x 20, interrack spacer	1621545	1621545
Cable, Ethernet, black, 31.0 m	22R1798	22R1798
Cable, Ethernet, gray, 31.0 m	22R1799	22R1799
CD-ROM, Code Bundle	[1]	[1]
CD-ROM, Customer Documents	[1]	[1]
CD-ROM, Service Documents	[1]	[1]

Table 7. Service ship group part numbers (expansion rack) (continued)

Description	Part number	
	Version 1	Version 2
Cover, interrack decorative, side (one-piece)	22R4964	22R4964
Cover, interrack decorative, side (two-piece, hinged)[2]	23R1050[2]	23R1050[2]
Cover, interrack decorative, top	22R4962	22R4962
Drawing, interrack spacer stud	22R5481	22R5481
Label, operator panel warning, translated	22R1789	22R1789
Publication, Service Provider Start Here	22R4228	22R4228
Publication, Installation Guide	[1]	[1]
Publication, Installing an Expansion Rack	[1]	[1]
Publication, Statement of Limited Warranty	22R5940	22R6401
Publication, Waste Equipment (WEEE)	22R5822	22R5822
Spacer stud, interrack	22R5046	22R5046
Tag, "Do Not Operate"	23R0280	23R0280
Tie wrap	07J6655	07J6655
Washer, M8, interrack spacer	84X5850	84X5850
Wheel chocks (set of 4)	08J5557	08J5557
Notes:		
1. The part number changes with each release. Call the next level of support.		
2. A bracket (23R2044) and two nuts (84X4841) secure the two pieces at the hinge.		

   3. Place the ship group parts list in the document enclosure (front upper left of
       rack 1). This list can be used for future removal of the storage facility.

Inspecting for shipping damage

   1. Inspect the storage facility for any damage that might have occurred during
       shipping.
   2. If you observe shipping damage or missing items, do not install the storage
       facility without IBM management approval. Report all observed damage
       immediately, following existing procedures.

Determining if a safety inspection is required

Find the condition that applies to your storage facility:

   • New storage facility from IBM. A safety inspection is not required. Continue
      with "Positioning and cabling the racks" on page 9.
   • Not a new storage facility from IBM and was maintained by IBM. A safety
      inspection is not required. Continue with "Positioning and cabling the racks" on
      page 9.
   • Not a new storage facility from IBM and was not maintained by IBM. A safety
      inspection is required. Continue with Safety inspection in the Service
      Information Center.

Positioning and cabling the racks

Use the following sections to position Rack-1 and to install additional storage racks.

Checking for earthquake resistance kit

The earthquake resistance kit, Feature Code 1906, provides additional hardware to be installed. The kit stiffens the rack from flexing and also ties the rack directly to the concrete floor. The kit can be installed on a raised floor or non-raised floor.

- If the rack is new from IBM, the MES hardware kit for FC 1906 would be shipped with the rack.
- If the rack has been discontinued from another account, and the earthquake resistance kit was originally installed there, the kit would have been removed and shipped separately.

  The original kit included parts to tie-down the rack to a non-raised floor, a low raised floor, and a high raised floor. Parts not used at the original installation may not have been kept and shipped. If you are installing on a different floor type than the original floor type, you may not have all the necessary parts. Call the next level of support.

Important: If FC 1906 is to be installed, the base rack and any attached expansion racks must all have FC 1906 installed.

1. Is the Earthquake Resistance Kit Feature (FC 1906) to be installed on this storage facility?
   a. Yes, go to Chapter 4, "Installing the earthquake resistance kit feature FC 1906," on page 113, then return here and continue at the next step.
   b. No, go to the next step.
2. Continue with "Positioning Rack-1."

Positioning Rack-1

If you have questions about floor loading and service clearances of the DS8000 racks, review the Site Requirements for the DS8000 section in the *IBM System Storage DS8000 Introduction and Planning Guide* which is available on the *IBM System Storage DS8000 series Service Documents CDROM*.

DANGER

> **HEAVY EQUIPMENT -- PERSONAL INJURY OR EQUIPMENT DAMAGE MAY RESULT IF MISHANDLED (D006)**

1. Verify that the new location meets the necessary service clearances for the storage facility which include any attached racks. Refer to the installation site requirements for the DS8000 in *IBM System Storage DS8000 Introduction and Planning Guide*.
2. Do you have more than one rack to install?
   - Yes, continue at the next step.
   - No, go to step 4 on page 10.
3. You must ensure that each expansion rack is installed to the base rack (Rack-1) that it was originally configured with.

   Note: If expansion racks for two storage facilities are accidentally intermixed, a successful install will not be possible.

- Each rack has a small label with its rack S/N under the operator panel cover. See Figure 1.
- Each rack has a large label with its rack number (position in the storage facility) and the S/N of the Rack-1 it must be installed to on the right of the operator panel cover. See Figure 1.
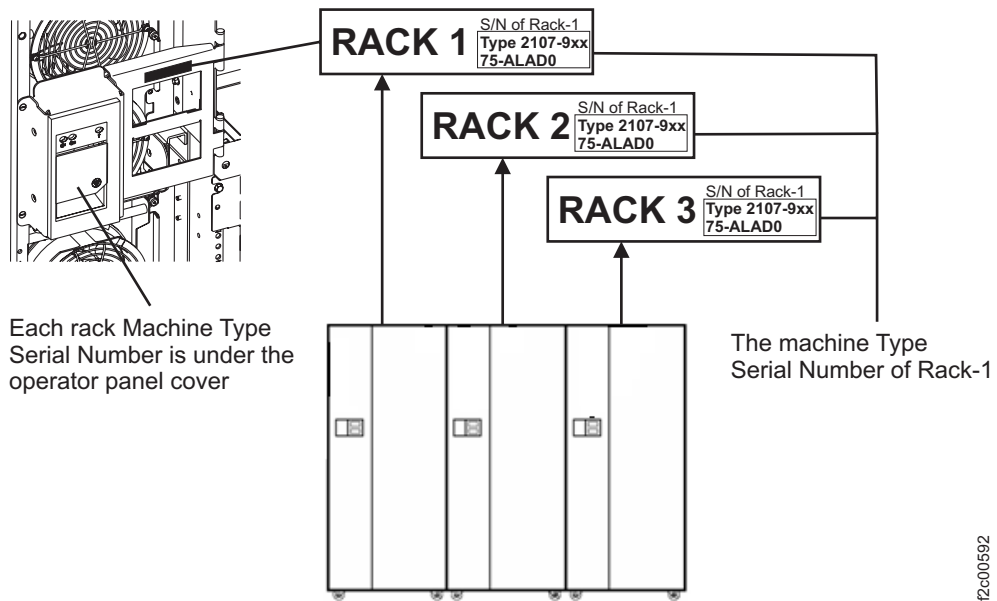
Figure 1. Rack serial number

4. Move Rack-1 to its permanent location. If installing on a raised floor, position the rack so the rear tailgate, especially the rightmost opening for the mainline power cables, is directly over the floor tile cutouts.
5. Install the wheel chocks **1** (located in the ship group) on all four casters. Refer to Figure 2.
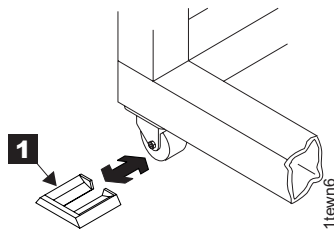
Figure 2. Wedge chocks

6. Ensure the rack operator panel UEPO switch clear access cover is present. If it is not installed, read the following note.

   Note: Some racks may be shipped with the cover removed and stored in a plastic bag in the document enclosure above the rack operator panel. The cover pivots on two small tabs at the top of the cover. To install the cover engage the left side tab **1** , push the cover gently to the right and then engage the right tab **2** . See Figure 3 on page 11.
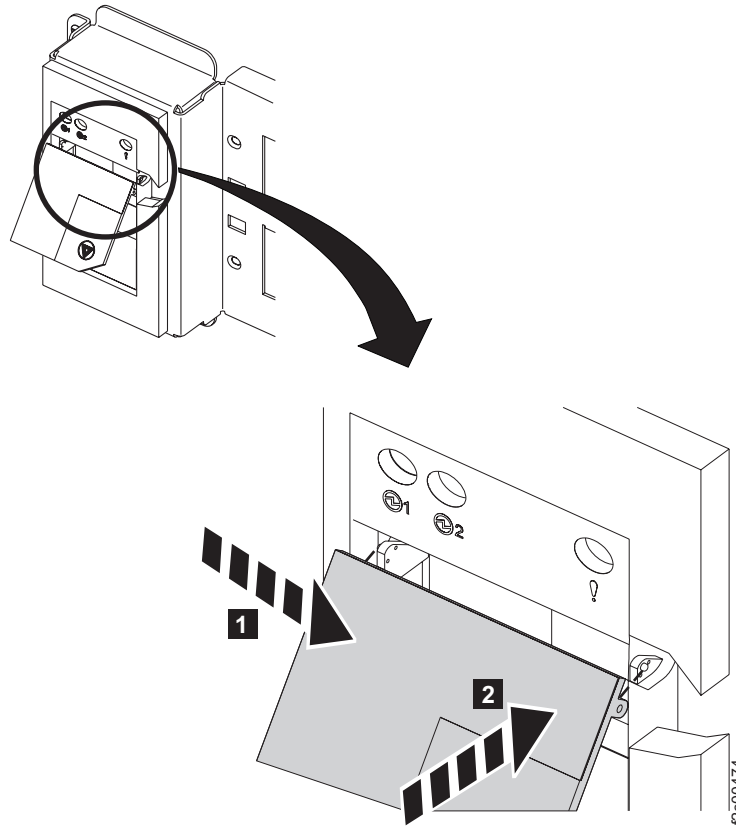
Figure 3. UEPO cover

7. Open the left rear cover (customer access area).
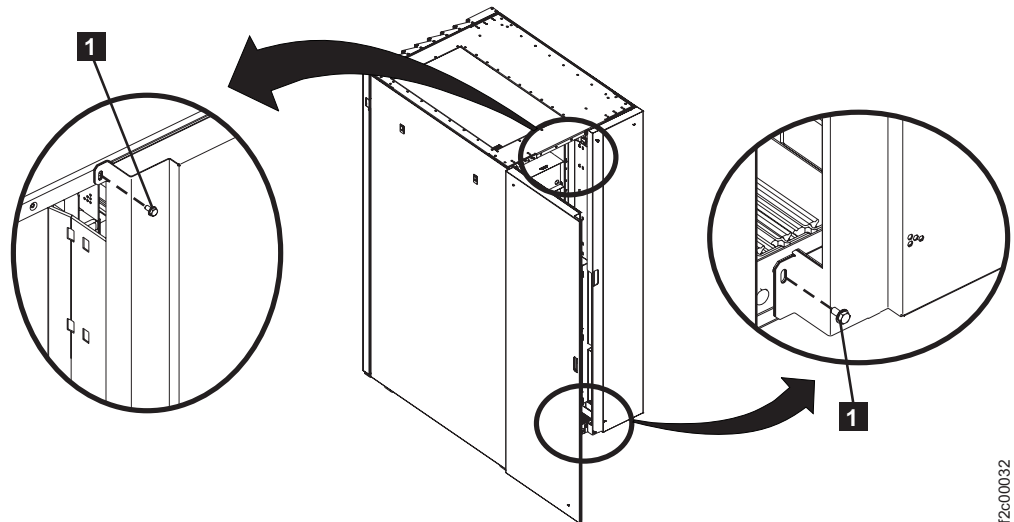
Figure 4. Removing retaining screws on right rear machine cover

8. Remove the orange shipping bracket from the rear of each CEC enclosure to prevent the CECs from overheating.

   a. Do not discard the shipping brackets, store them in the open space inside the rack beneath the lower CEC enclosure or in the document enclosure (top left at the front of the rack).

9. Open the right rear cover (trained service personnel access area only). Use a 3mm hex wrench to remove the two screws **1** . See Figure 4 on page 11.

> **Note:** The screws must be reinstalled when the cover is closed to prevent customer access.

10. Locate the 208VDC bus bar gate. Refer to Figure 5. Remove the two screws **1** and swing it out to the service position **3** .
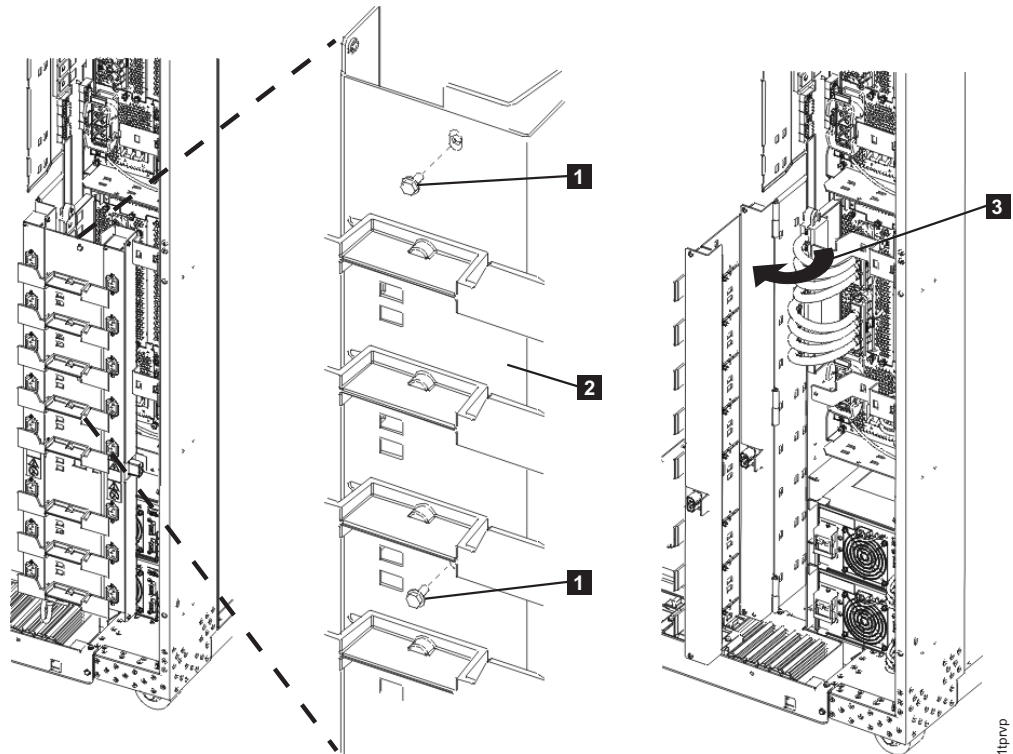
Figure 5. 208VDC bus bar gate

11. Remove the tailgate frame bracket. Remove two screws **2** as shown in Figure 6 on page 13. Loosen but do not remove the two top screws **1** . Slide the bracket out.
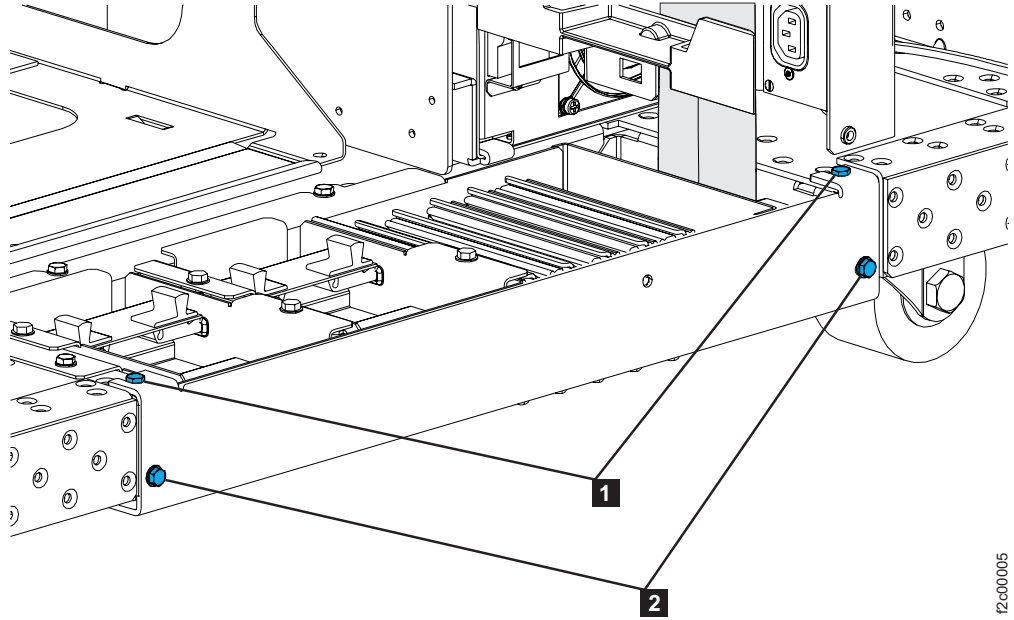
Figure 6. Tailgate frame bracket

12. Continue with the next section.

Checking for weight reduction feature

1. Does this rack have the Weight Reduction Feature (FC 0200) installed?

   Note: FC 0200 removes storage enclosures and sometimes rack battery modules to lighten the rack to meet weight limits of floors and/or elevators. The removed parts arrive on shipping pallets. If more than one rack has FC 0200 installed, it is critical that parts are not accidentally intermixed between the racks.

   - Yes, go to Chapter 3, "Installing hardware removed by weight reduction feature FC 0200," on page 105. Return here and continue when the storage enclosures have been reinstalled.
   - No, continue with the next step.

2. Continue with "Checking cables, HMCs, and expansion racks."

Checking cables, HMCs, and expansion racks

1. Check all cables to ensure they are connected and latched. Give special attention to these cables:
   - Gently push and pull on each big black RIO cable to ensure it is latched (CEC enclosures and I/O enclosures).

     Note: Loose RIO cables will cause difficult problems to repair after power up.
   - Gently push and pull on each blue FC-AL cable connector to ensure it is latched (I/O enclosures and storage enclosures).

2. Does the new storage facility contain a management console (HMC)?
   - Yes, continue with the next step.
   - No, go to step 4 on page 14.

3. Will this be the second management console in this storage complex?

- Yes, go to "Disconnecting the internal Ethernet cables to the secondary management console prior to power on."
- No, continue with the next step.

4. Does the storage facility to be installed have one or more storage expansion racks?
   - Yes, go to "Installing additional storage racks."
   - No, go to "Preparing to check DS8000 and customer power" on page 36.

Disconnecting the internal Ethernet cables to the secondary management console prior to power on

1. Locate the Ethernet switches in the rear of the Rack-1 that is being installed. See Figure 7.
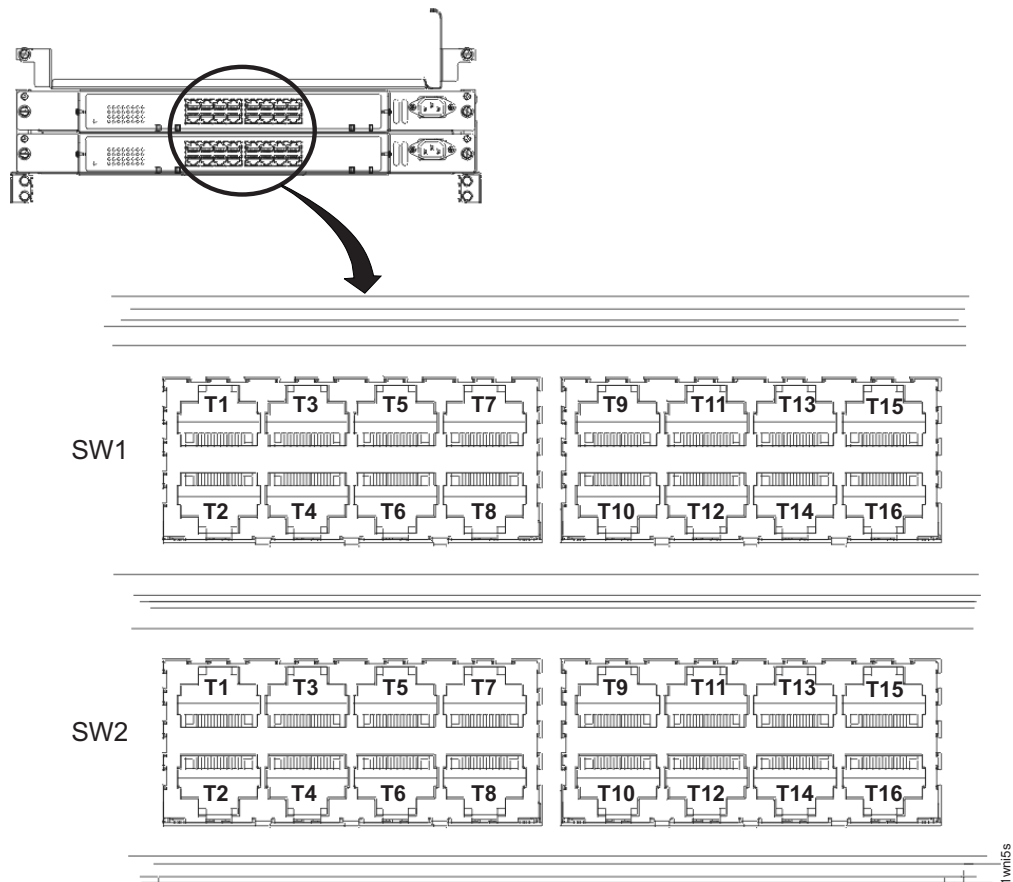
Figure 7. Ethernet switch port designations (SW1, SW2 - Tx)

2. Disconnect the management console cables that plug into SW1-T1 and SW2-T1. They will be reconnected in a later section.
3. Does the storage facility to be installed have one or more storage expansion racks?
   - Yes, go to "Installing additional storage racks."
   - No, go to "Preparing to check DS8000 and customer power" on page 36.

Installing additional storage racks

Use the following sections to install additional storage racks.

DANGER

HEAVY EQUIPMENT -- PERSONAL INJURY OR EQUIPMENT DAMAGE
MAY RESULT IF MISHANDLED (D006)

Removing right end and left rear covers from Rack-1

1. Observe the right end cover (viewed from the front) of Rack-1 to determine which version you have.

   - Older version has two cover retaining brackets as shown in Figure 8. Go to the next step.
   - Newer version does not have the two cover retaining brackets as shown in Figure 8. Go to step 3 on page 16.

2. Remove the old version of the right end cover (viewed from the front) from Rack-1.

   a. Release the two cover retaining brackets (pull them downward). See Figure 8. The cover is still secured to the frame by multiple "hook and loop" fasteners along each side of the cover.

      Note: Failure to follow the instructions in the following steps might result in a bent cover.
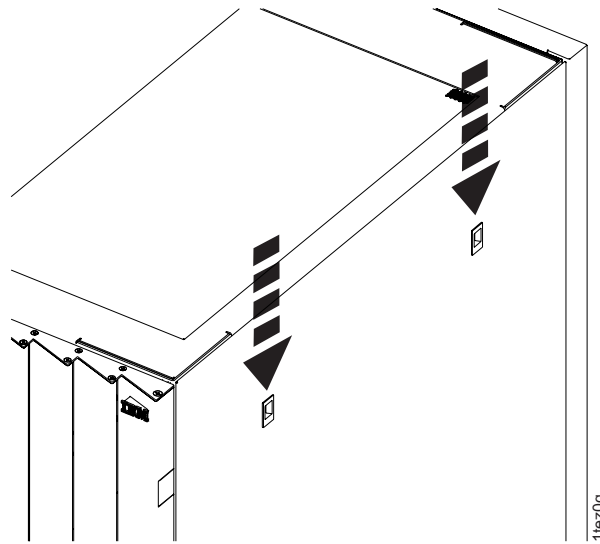
Figure 8. Disengaging the end cover

   Attention: Pull lower down on each side of the cover to release it from the lower "hook and loop" fasteners. Failure to do this may bend the cover.
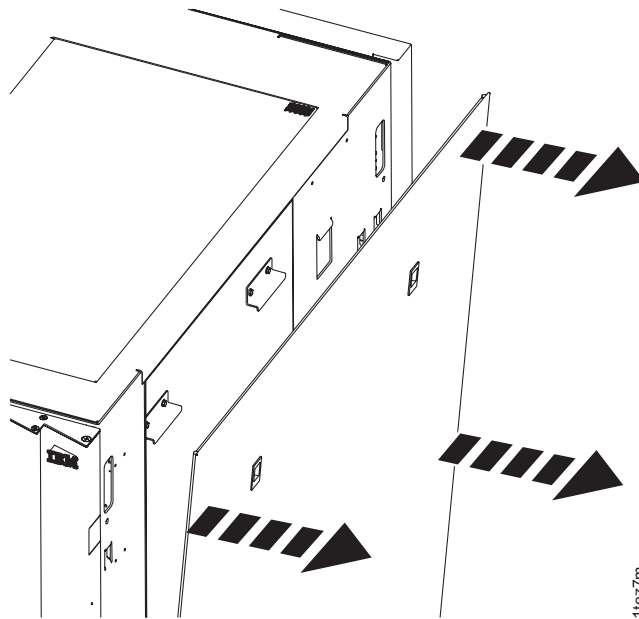
Figure 9. Removing the end cover

    b. Pull the upper corners of the cover away from the rack to release the upper "hook and loop" fasteners and apply even pressure working your way down the sides. See Figure 9.

    c. Further down, pull each side of the cover away from the rack to release the lower "hook and loop" fasteners and remove the cover.

    d. Remove the two end cover catch brackets from the rack. They will be reinstalled on the new end rack later.

    e. Go to step 4.

3. Remove the new version of the right end cover (viewed from the front) from Rack-1.

    a. Remove the two screws at the top of the end cover, they are not visible from the side of the rack. The cover is still secured to the frame by multiple "hook and loop" fasteners along each side of the cover.

        Note: Failure to follow the instructions in the following steps might result in a bent cover.

        Attention: Pull lower down on each side of the cover to release it from the lower "hook and loop" fasteners. Failure to do this may bend the cover.

    b. Pull the upper corners of the cover away from the rack to release the upper "hook and loop" fasteners and apply even pressure working your way down the sides. See Figure 9.

    c. Further down, pull each side of the cover away from the rack to release the lower "hook and loop" fasteners and remove the cover.

    d. Go to the next step.

4. Remove the left rear cover from Rack-1. Refer to Figure 10 on page 17.

    a. On the upper and lower door hinges, loosen the screw **1** and move the retention plate **2** that prevents the hinge pin **3** from being removed.

    b. Remove the hinge pins, remove the rear cover and place it in a safe location.
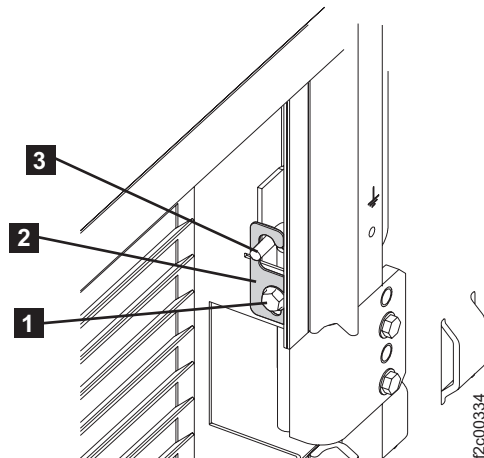
Figure 10. Removing rear left cover on Rack-1

5. Continue with "Positioning the storage expansion racks."

Positioning the storage expansion racks

If you have questions about floor loading and service clearances of the DS8000 racks, review the Site Requirements for the DS8000 section in the *IBM System Storage DS8000 Introduction and Planning Guide* which is available on the *IBM System Storage DS8000 series Service Documents CDROM*.

Perform steps 1 through 5 for each additional storage expansion rack that you install with Rack-1.

1. Each rack has a rack number label **1** . See Figure 11. The label defines the following:
   - the position of this rack in a storage facility.
   - the serial number of the Rack-1 that the rack must be re-connected to (these racks have already been partially installed together at the factory).
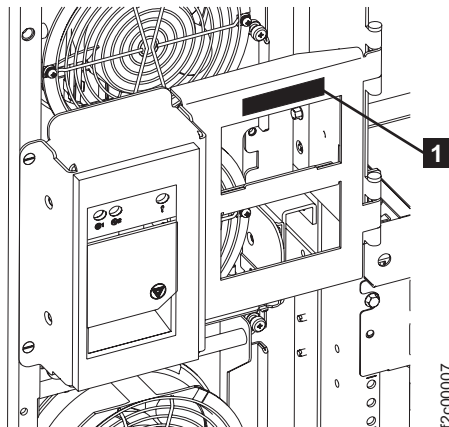
Figure 11. Rack operator panel label

2. View the rack number label **1** on the expansion rack that you are installing. See Figure 11.
   - The rack number defines the location of the expansion rack in the storage facility you are installing.

- The Rack-1 serial number defines the only Rack-1 that this expansion rack can be installed to.
- The unique serial number of each rack is found on the bar code label under the plastic UEPO switch cover on the rack operator panel.

Attention: If the Rack-1 serial numbers do not match, stop the installation and call the next level of support.

3. Facing the front of Rack-1, install all additional racks to the right. Move the storage expansion rack into position approximately 3″ (75mm) from the existing rack.

4. Locate 4 x spacer studs P/N 22R5046, 7 x spacer mounting bolts P/N 1621545 and 7 x M8 washers P/N 84X5850 located in the ship group.

5. Install the bottom spacer stud at the rear of the existing rack (Rack 1 or the storage expansion rack that is already installed).

    a. Refer to Figure 12. Install a spacer stud `3` in the lower rear left corner of the rack using a mounting bolt `1` and a washer `2`. Leave the bolt loose so that it will be easier to align the spacer stud with the bolt from the new frame.
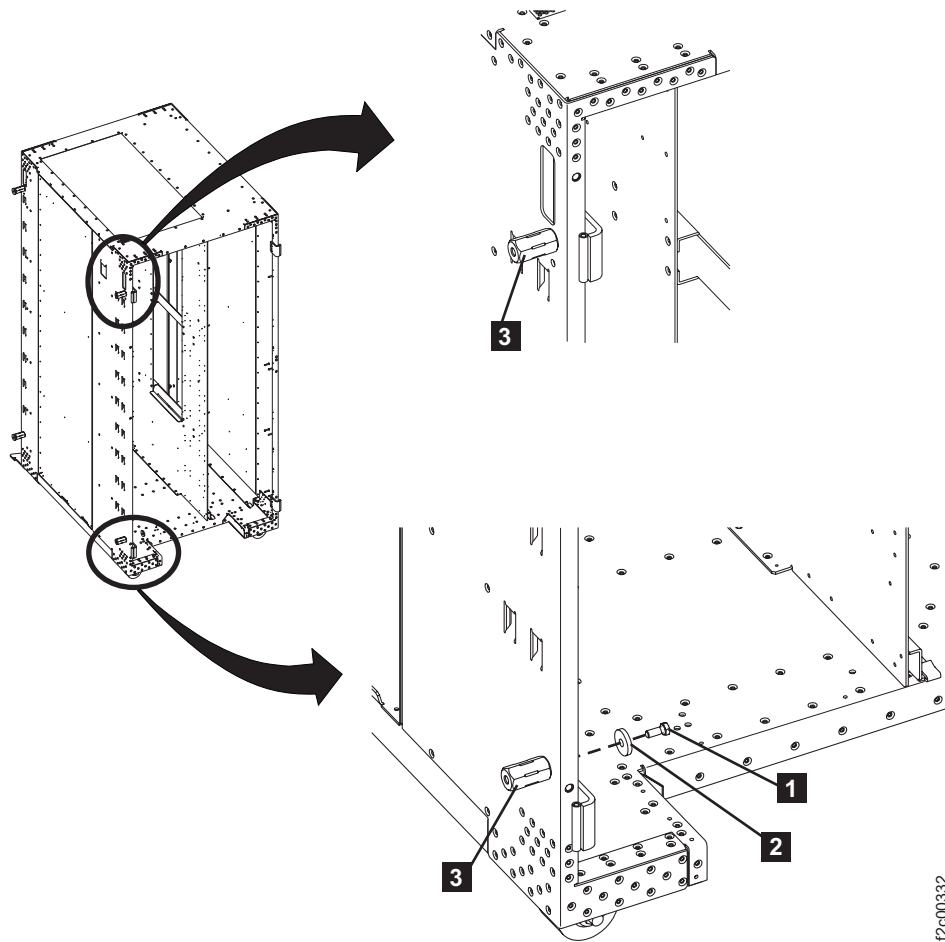
Figure 12. Interrack spacer studs

6. Determine the part number (P/N) of the interrack decorative side covers in your ship group. The P/N is printed near the middle of each side cover. There are two side covers and one top cover in the long narrow shipping box.

- P/N 22R0786 (original version) go to step 7.
- P/N 22R4964 (new version) go to step 8.

7. In the upper rear left corner of the existing rack, next to the hinge are two holes, one above the other. Use the upper hole and install a spacer stud **3** using a mounting bolt **1** and a washer **2**, see Figure 12 on page 18. Do not tighten the bolt fully as some alignment will be needed. You can hold the side cover next to the spacer studs to ensure the spring clips align properly before going to step 9.

   Note: On early frames, it may be necessary to remove the rear left top hinge and spacer plate to allow the mounting bolt to be inserted. Reinstall the hinge and plate when the bolt has been tightened.

8. In the upper rear left corner of the existing rack, next to the hinge, there are two holes; one above the other. Use the lower hole and install a spacer stud **3** using a mounting bolt **1** and a washer **2**, see Figure 12 on page 18. **Do not** tighten the bolt fully as some alignment will be needed. You can hold the side cover next to the spacer studs to ensure the spring clips align properly before going to step 9.

   Note: On early frames, it may be necessary to remove the rear left top hinge and spacer plate to allow the mounting bolt to be inserted. Reinstall the hinge and plate when the bolt has been tightened.

9. On the rear of the storage expansion rack being installed, perform the following steps to remove the right cover.
   a. Open the rear left machine cover.
   b. Remove and retain the two screws **1** and open the rear right machine cover. Refer to Figure 14 on page 20.

      Note: The screws must be reinstalled later to prevent non-service personnel from accessing a hazardous section of the machine.
   c. On the upper and lower door hinges, loosen the screw **1** and move the retention plate **2** that prevents the hinge pin **3** from being removed. Refer to Figure 13.
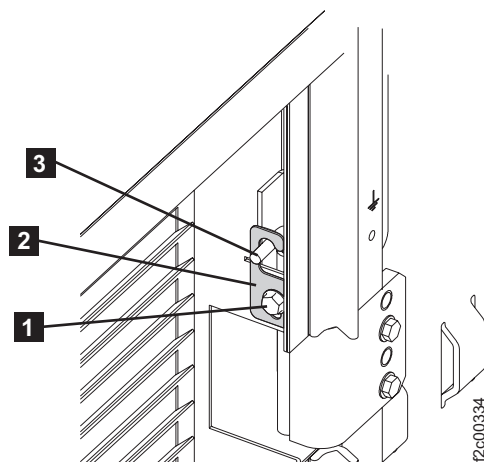
Figure 13. Removing rear left cover on Rack-1

   d. Remove the hinge pins, remove the rear cover and place it in a safe location.
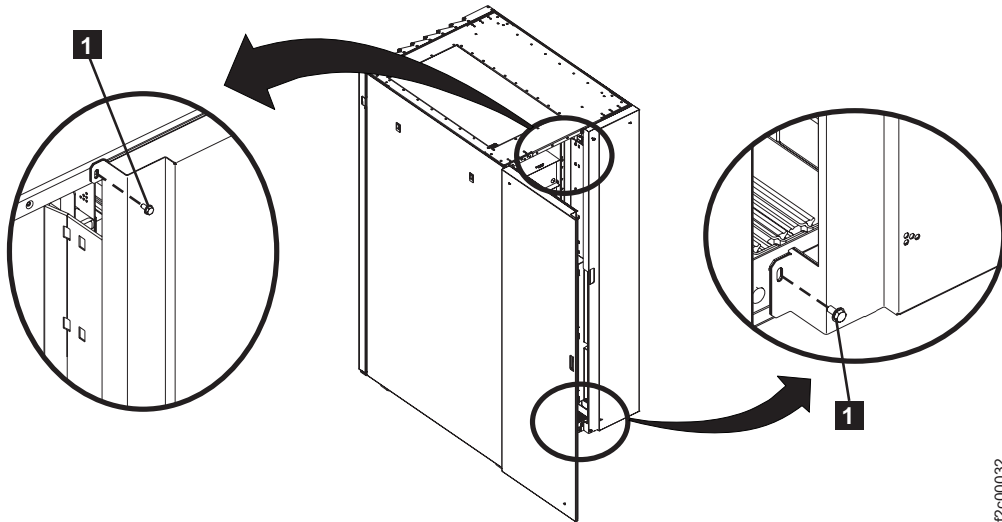
Figure 14. Removing retaining screws on right rear machine cover

10. Return to the front of the racks. Do not remove any front covers. Install 2 spacer studs on the front left of the storage expansion being installed.

   a. Install a spacer stud in the *lower* front left corner of the rack using a mounting bolt and a washer. **Do not** tighten the bolt fully as some alignment will be needed.

   b. Install a spacer stud in the *upper* front left corner of the rack using a mounting bolt and a washer. **If there are two frame holes near the hinge, use the same hole (upper or lower) as you did at the rear of the rack. Do not** tighten the bolt fully as some alignment will be needed.

11. Move the storage expansion rack being installed into its final position.

12. At the rear, secure the storage expansion rack being installed to the existing rack using one bolt and washer in the upper position only. The bolt is screwed into the spacer stud previously installed. Do not tighten the bolt fully.

13. At the front, insert two bolts and washers from the left rack and screw into the spacer studs previously installed in the right rack. When the alignment is correct, tighten all the bolts that have been installed.

14. Install the wheel chocks **1** (located in the ship group) on all four casters. If caster locks are available, engage the caster locks on all casters. Refer to Figure 15.
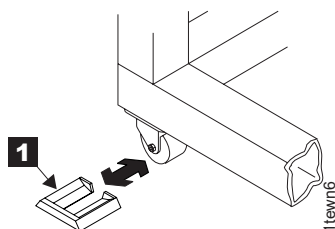
Figure 15. Wedge chocks

Reinstalling the right end cover on the right-most rack

The right end cover was previously removed in the task "Removing the right end cover from the existing rack".

1. Which version of the Rack-1 end cover do you have?

- Old version has two cover retaining brackets. Go to the next step.
- New version has two screws at the top of the cover. Go to step 3.

2. Install the two cover catch brackets from Rack 1 on the expansion rack. Install the right end cover (removed earlier) on the expansion rack, then go to step 4.
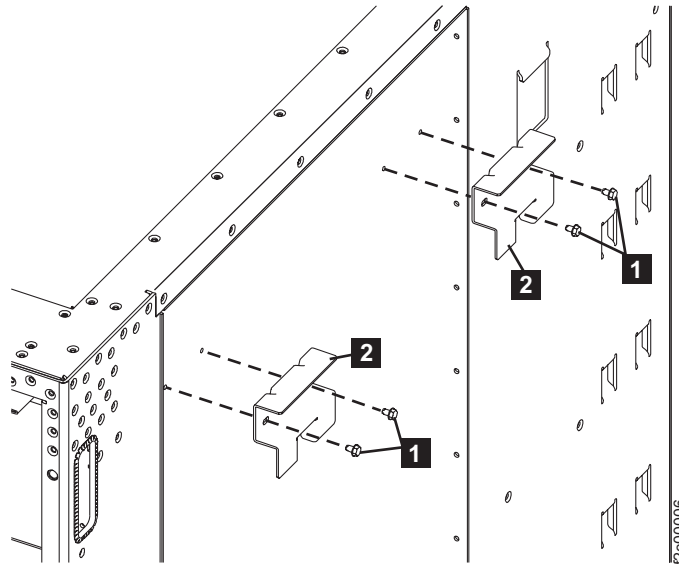
Figure 16. Removing/replacing right end cover

3. Does the expansion rack have the two screw holes in the top of the rack for the right end cover?
   - Yes, install the right end cover (removed earlier) on the expansion rack securing it with the two top screws.
   - No, call the next level of support. You will need to order the old version right end cover, retaining brackets and screws. Continue the installation without the right end cover.
4. Continue at the next section.

Checking for weight reduction feature

The weight reduction feature removes storage enclosures and/or battery modules to reduce the total rack weight. These parts are then shipped on a separate pallet and must be reinstalled.

1. Was the Weight reduction feature (FC 0200) ordered for this storage expansion rack?

   Note: If FC 0200 was ordered, the Storage Enclosures will have been removed in manufacturing and shipped separately.
   - Yes, go to Chapter 3, "Installing hardware removed by weight reduction feature FC 0200," on page 105. Return here and continue when the Storage Enclosures have been reinstalled.
   - No, continue with the next step.
2. Continue with "Routing and connecting the interrack cables" on page 22.

Routing and connecting the interrack cables

Perform the following steps for each storage expansion rack that you install.

DANGER

Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid shock hazard:
- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.**
- **Connect any equipment that will be attached to this product to properly wired outlets.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described below when installing, moving, or opening covers on this product or attached devices.**

To disconnect:
1. **Turn everything OFF (unless instructed otherwise).**
2. **Remove power cords from the outlet.**
3. **Remove signal cables from connectors.**
4. **Remove all cables from devices.**

To connect:
1. **Turn everything OFF (unless instructed otherwise).**
2. **Attach all cables to devices.**
3. **Attach signal cables to connectors.**
4. **Attach power cords to outlet.**
5. **Turn device ON.**

(D005)

1. There are two versions of the Air baffle, determine which one you have:
   - Old version - one piece of sheet metal that must be removed before the 208VDC bus bar gate to the right of the baffle can be swung to the open position. Go to the next step.
   - New version - sheet metal with a flexible plastic cutout at the right rear (**3** in the figure that follows). The plastic cutout bends out of the way when the 208VDC bus bar gate is swung open. Go to step 3 on page 23.
2. Remove the two screws **1** and take out the Air baffle **2** as shown in Figure 17 on page 23. Retain the parts for later reinstallation.
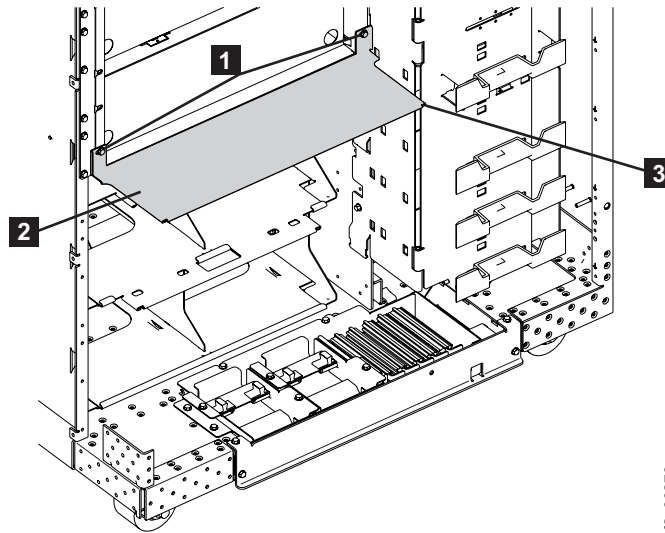
Figure 17. Air baffle

3. Remove the two screws **1** and pivot the 208VDC bus bar gate to the service position **2** , as shown in Figure 18.
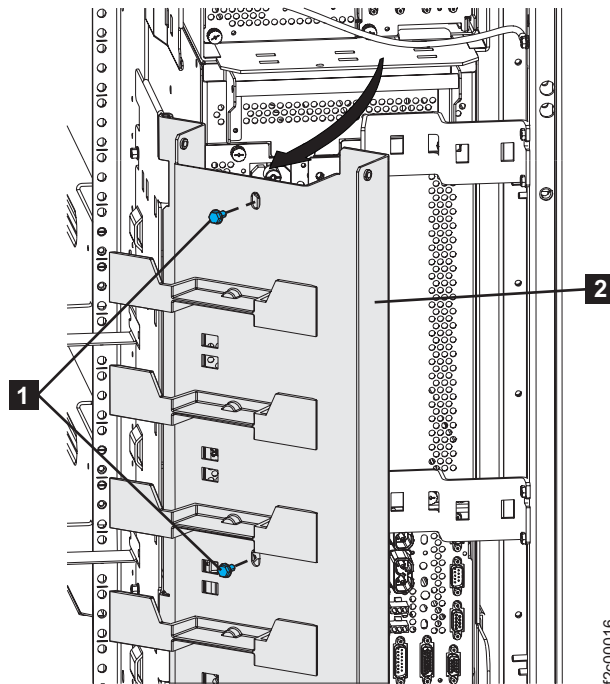
Figure 18. 208VDC bus bar gate service position

4. Remove the tailgate frame bracket. Remove two screws **2** as shown in Figure 19 on page 24. Loosen but do not remove the two top screws **1** . Slide the bracket out.
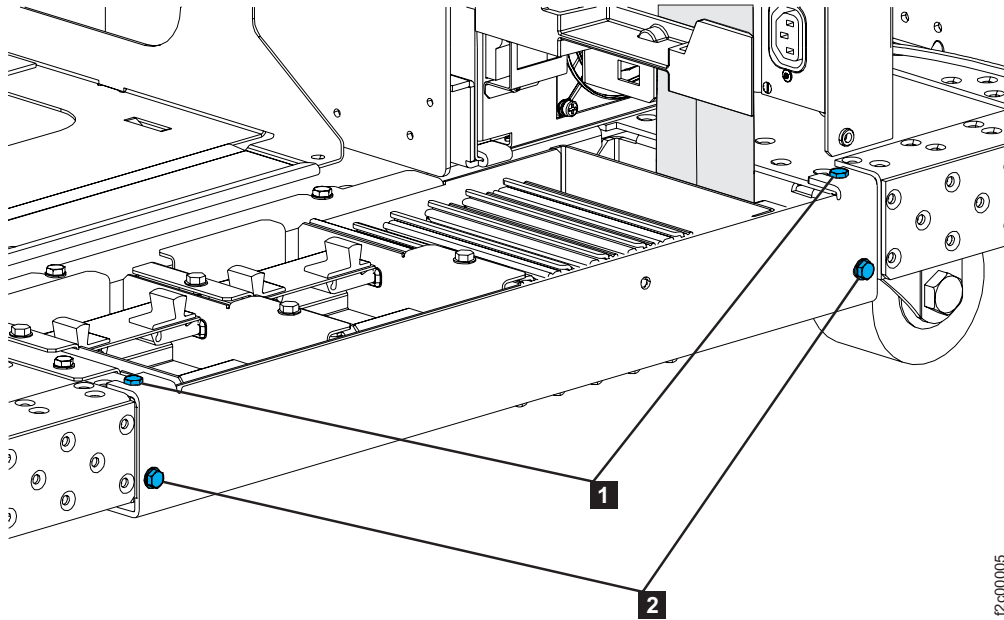
Figure 19. Tailgate frame bracket

5. Route and connect cables to RPC cards.

    a. Locate the two RPC cables in the top rear of the expansion rack. Route the cables through the hole at the top rear right side to the RPC cards in Rack 1. If this is not Rack 2, then the cables will need to be routed through all the intermediate racks between this one and Rack 1.

    Note: On early production racks the cables may be labeled with 'Base Rack'. On later production racks they will be labeled as Rack 1.

6. Plug the cables into the RPC connector as indicated in Table 8 and Figure 20 on page 25.

    Note: On some early production Storage Expansion Racks, the cables were labeled RPC-0 and RPC-1. The cable labeled RPC-0 must be plugged to RPC1 and the cable labeled RPC-1 must be plugged to RPC2.

    Important: It is very important that the cables are not crossed between the RPC cards. This could result in an unscheduled power drop during repair activities. If the RPC number labeling is not clear, then trace the cables back to the PPS. The cable to RPC1 originates from connector J1 on both PPSs. The cable to RPC2 originates from connector J2 on both PPSs.

Table 8. Rack numbers and RPC connector locations

Rack Number	2	3	4	5	6	7
RPC 1 and RPC 2 connector	J203	J205	J207	J209	J211	J213

RPC2
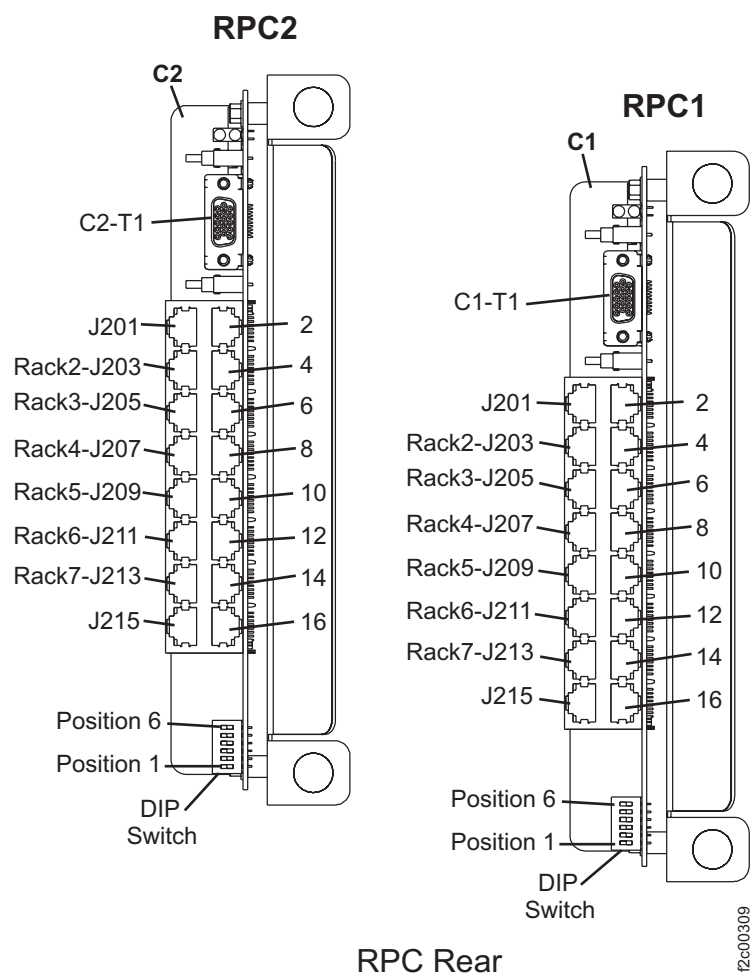
Figure 20. RPC card locations

7. Determine if this expansion rack has FC-AL blue cables that need to be routed and connected to another rack.

   Note: The FC-AL cables create the loops that connect storage enclosure FCIC cards to other storage enclosure FCIC cards or to I/O enclosure device adapter cards.

   Does this expansion rack have four I/O enclosures at the bottom of the rack?
   - Yes, all FC-AL cables in this rack are already connected. Go to step 11 on page 28.
   - No, this rack has FC-AL cables that need to be routed and connected to another rack. Go to step 8.

8. The unconnected end of the FC-AL cables to be routed are coiled at the top of the rack. Check the front and rear of the rack to find them. The cable connectors have black rubber protective covers. Uncoil the cables. Locate the attached labels that identify the destination rack and storage or I/O enclosure number. Route the cables through the holes at the top of the rack to the destination rack and enclosure. Use existing cable trays and "hook and loop" fastener straps. Refer to Figure 21 on page 26 and Figure 22 on page 27.

Cables to Storage Enclosures

Rack Number ─────────── FCIC Card
                              Connector

Rx-XSxx-P1-Cx-Tx

Storage Enclosure
Location

Cables to I/O Enclosures

Rack Number ─────────── DA Card
                              Connector

Rx-XIx-P1-Cx-Tx

I/O Enclosure
Location

Front View

Rack 1	Expansion Rack
XS11	XS11
XS12	XS12
XS13	XS13
XS14	XS14
	XS15
	XS16
	XS17
	XS18

Rear View

Expansion Rack

| XS21 |
| XS22 |
| XS23 |
| XS24 |
| XS25 |
| XS26 |
| XS27 |
| XS28 |

| XI1 | XI2 |
| XI3 | XI4 |

Rack 1

| XS21 |
| XS22 |
| XS23 |
| XS24 |

| XI1 | XI2 |
| XI3 | XI4 |

f2c00327

Figure 21. Cable labels, storage and I/O enclosure locations

Note: Figure 21 shows a fully configured expansion rack. Additional racks may be installed. Expansion racks may not contain I/O enclosures or be fully populated with storage enclosures.
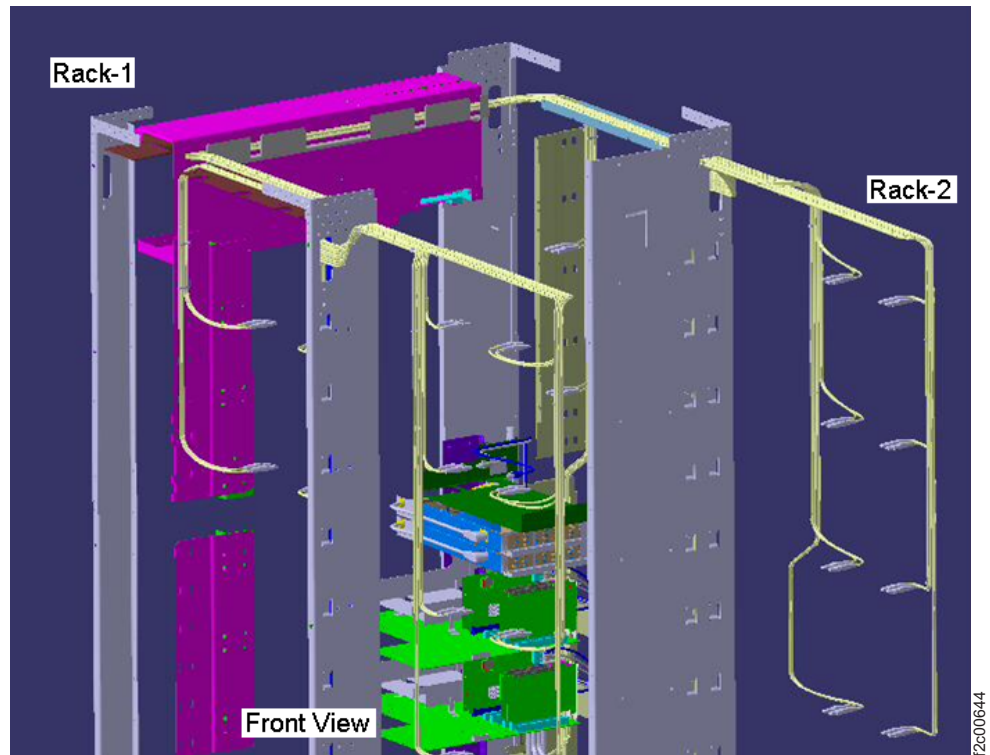
Figure 22. Mechanical routing of the FC-AL cables (rack-to-rack)

9. Remove the black rubber protective connector covers and then plug the FC-AL cables into the connectors on the DA cards in the I/O enclosures or FCIC cards in the storage enclosures as indicated on the cable labels. Refer to Figure 23 on page 28.

   Note: Do not discard the connector covers, you can store them in the rack 1 documents enclosure (front upper left).

Cables to I/O Enclosures

Rack Number — DA Card Connector

Rx-XIx-P1-Cx-Tx

I/O Enclosure Location

Cables to Storage Enclosures

Rack Number — FCIC Card Connector

Rx-XSxx-P1-Cx-Tx

Storage Enclosure Location

P1-C3-T1
P1-C3-T2
P1-C3-T3
P1-C3-T4

P1-C6-T1
P1-C6-T2
P1-C6-T3
P1-C6-T4

I/O Enclosure XI1,XI2,XI3 & Xi4
Connector Locations

P1-C1 **P1-C2**

P1-C1-T1   not used   P1-C2-T1   not used
P1-C1-T2   P1-C1-T3   P1-C2-T2   P1-C2-T3
P1-C1-T4   P1-C2-T4

Storage Enclosure XS11-XS28
Connector Locations

f2c00328

Figure 23. Cable labels to I/O Enclosures and Storage Enclosures

10. Continue with "Installing the interrack decorative covers kit" on page 34.
11. Prepare the tailgate in the new and existing racks.
    a. For the earlier version of the tailgate design (5 cable slots to the right) as shown in Figure 24 on page 29, remove the cable retention clamps **3**, as appropriate. Do this by removing the screws **1** from the underside and releasing the retention pins **2**.
    b. For the later tailgate design (4 cable slots to the left and 2 cable slots to the right), no additional preparation is needed.
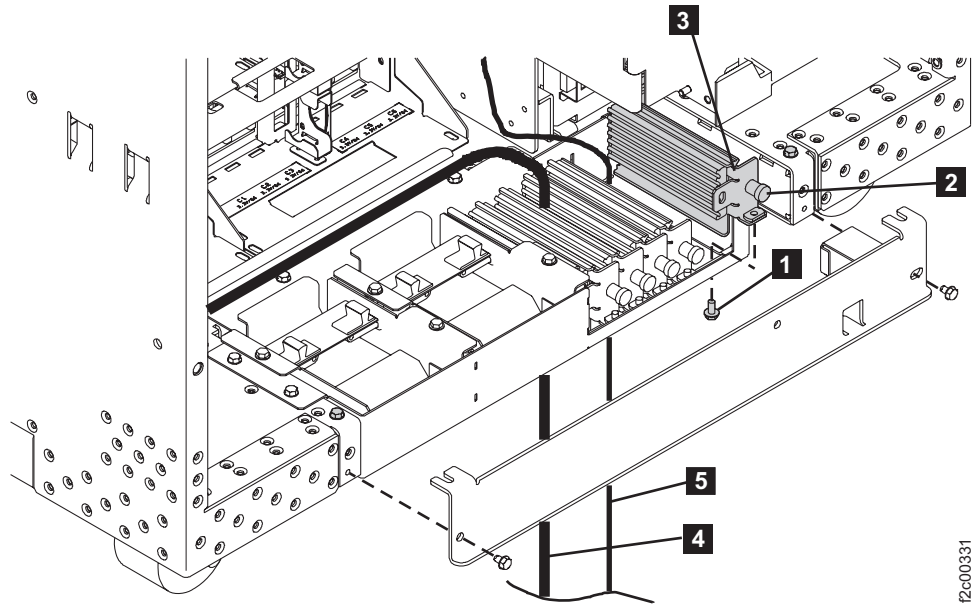
Figure 24. RIO & SPCN cable (remove or install)

12. This step shows an overview of the rack to rack routing of the RIO and SPCN cables. Do not route or connect the cables until directed in later steps.
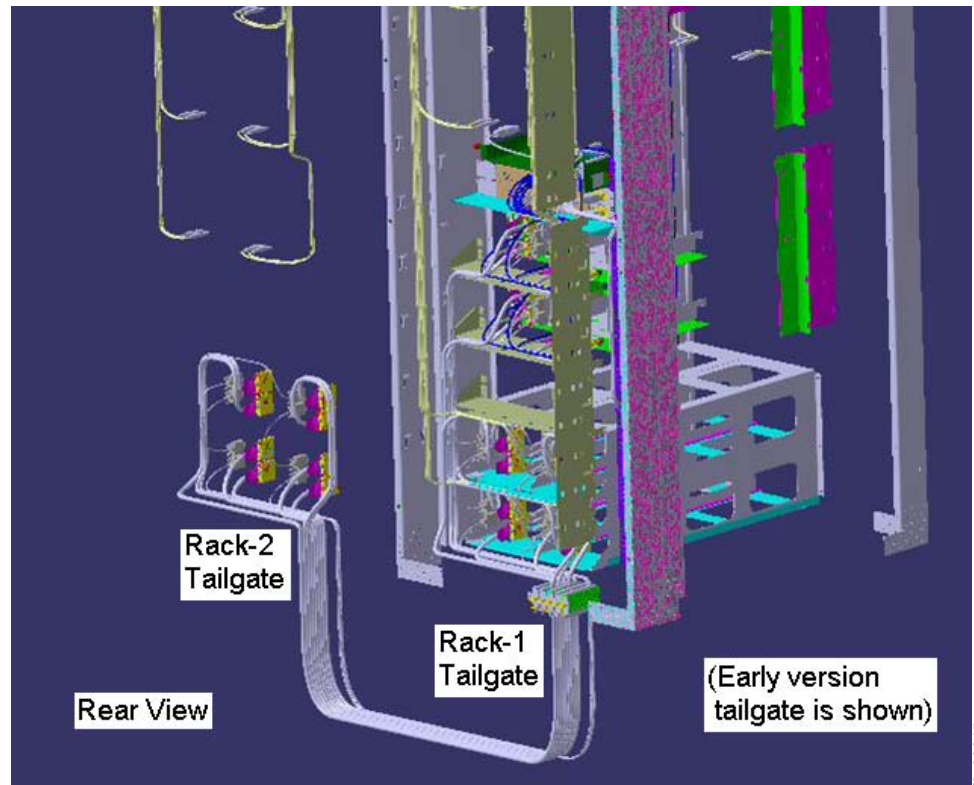
Figure 25. Mechanical routing of the RIO and SPCN cables (rack-to-rack)

- On a raised floor, the cables are run down through the tile cutouts and underneath the floor.
- On a non-raised floor, the cables are run beneath the racks.

13. Locate the thick black RIO cables that will be coiled near the tailgate and uncoil them. Locate the destination labels that are attached to the cables and identify to which rack and I/O enclosure the cables need to be routed. Refer to Figure 26.

   Note: On early production racks the cables may be labeled with 'Base Rack' or 'Expansion Rack'. On later production racks they will be labeled with the Rack number.

RIO and SPCN Cable Label Locations
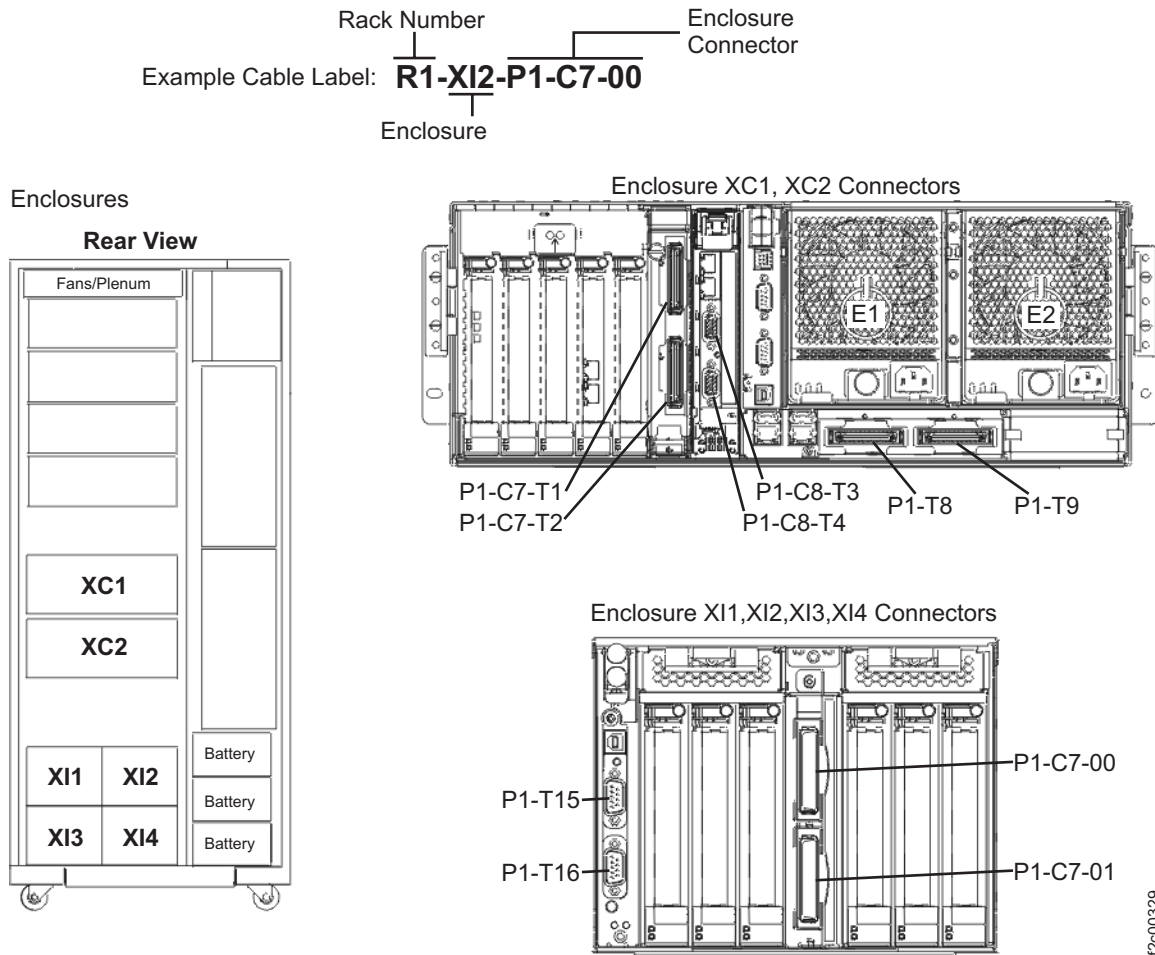
Figure 26. RIO and SPCN cable label locations

14. Route the RIO cables.
   - For cable routing inside of the rack, see Figure 27 on page 31.
   - If you have the earlier version of the tailgate (all five cable slots on the right side of the tailgate), route all RIO cables through slot 3. See Figure 27 on page 31.
   - If you have the later version of the tailgate (four cable slots on the left and two cable slots on the right), route the RIO cables as follows:
     – Route the RIO cables on the left side of the rack through slot 1. See Figure 28 on page 32.
     – Route the RIO cables on the right side of the rack through slot 6. See Figure 28 on page 32.

Routed
On Top

Cable Ties

Routed On
Bottom

No Cable Ties
Along Bottom

Base
Rack
Only

Base Rack or
Expansion Rack

Slot 1 2 3 4 5

Slot 3

RIO Cables

f2c00337

Figure 27. RIO cable routing (early version tailgate)
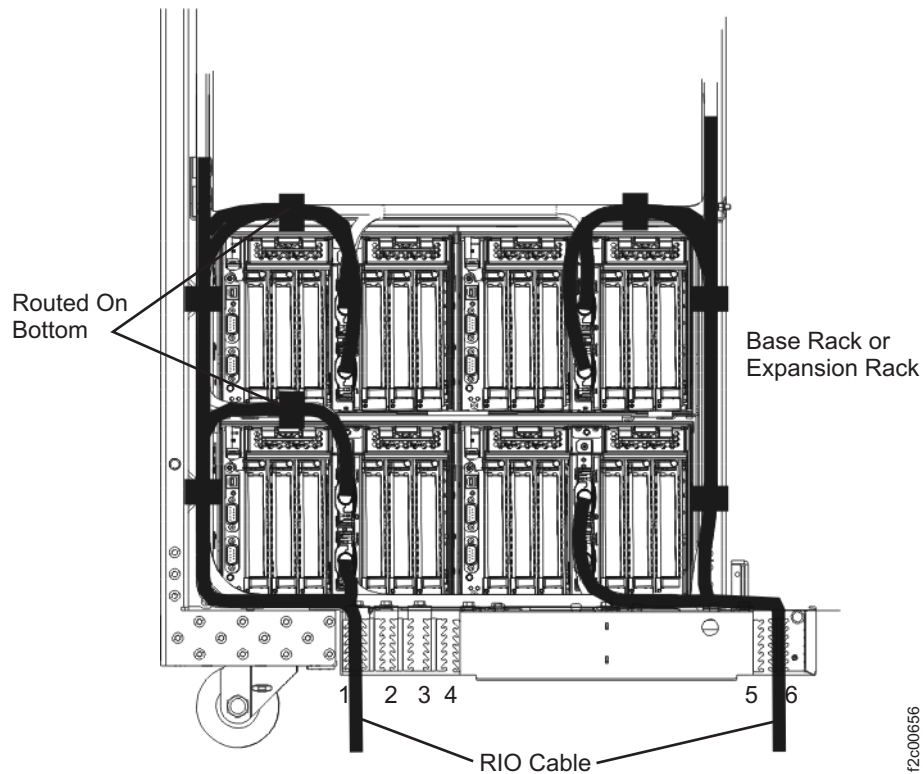
Figure 28. RIO cable routing through the tailgate (later version tailgate)

15. Locate the thin brown SPCN cables that will be coiled near the tailgate and uncoil them. Locate the destination labels that are attached to the cables and identify to which rack and I/O enclosure the cables need to be routed.

    Note: On early production racks the cables may be labeled with 'Base Rack' or 'Expansion Rack'. On later production racks they will be labeled with the Rack number.

16. Route the SPCN cables.
    - For cable routing inside of the rack, see Figure 29 on page 33.
    - If you have the earlier version of the tailgate (all five cable slots on the right end of the tailgate), route all SPCN cables through slot 5. See Figure 29 on page 33.
    - If you have the later version of the tailgate (four cable slots on the left and two cable slots on the right), route the SPCN cables as follows:
      - Route the SPCN cables on the <u>left</u> side of the rack through slot 2. See Figure 30 on page 34.
      - Route the SPCN cables on the <u>right</u> side of the rack through slot 5. See Figure 30 on page 34.
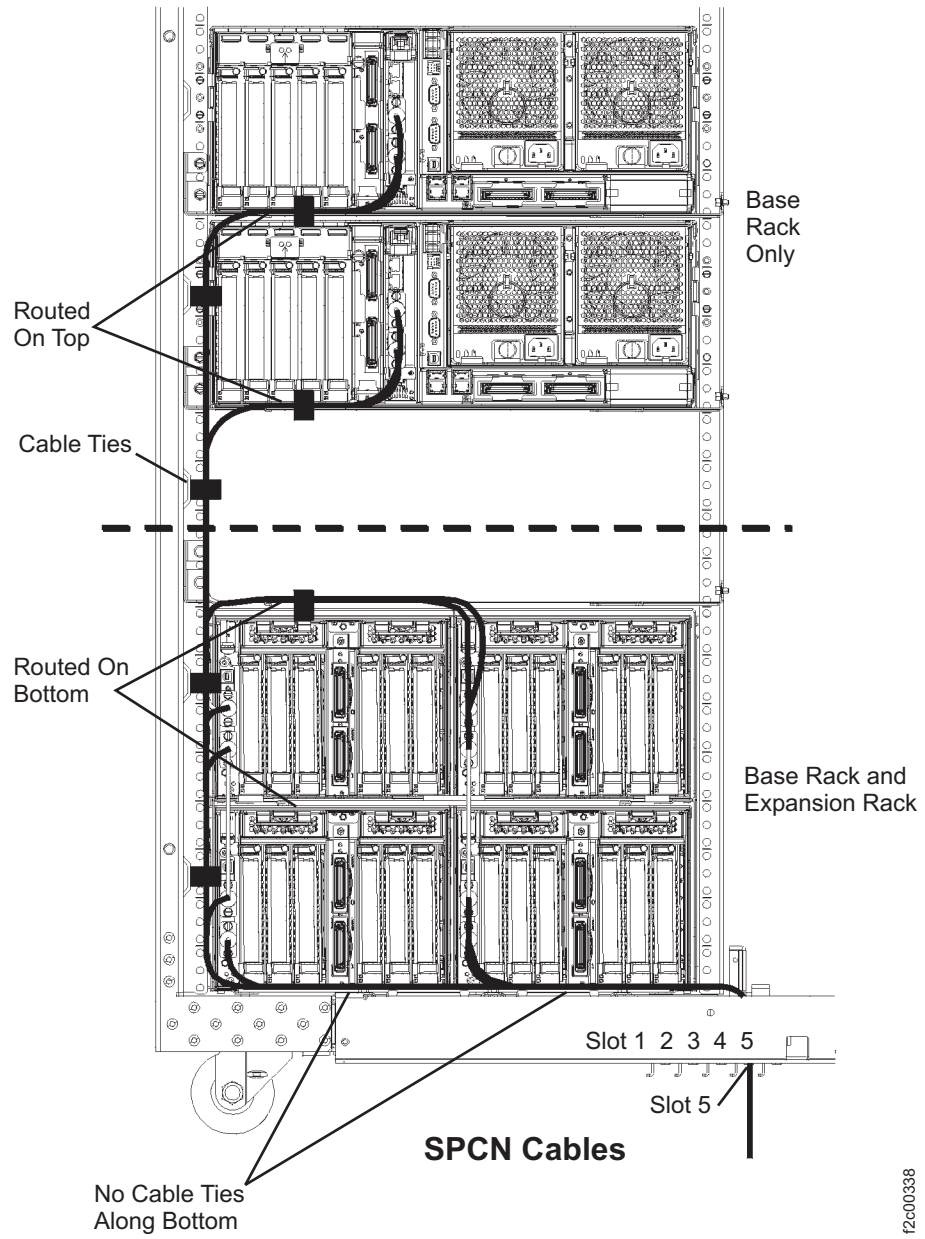
Figure 29. SPCN cable routing (early version of tailgate)

Routed On Bottom

Base Rack and Expansion Rack

1 2 3 4 5 6

SPCN Cable

f2c00657
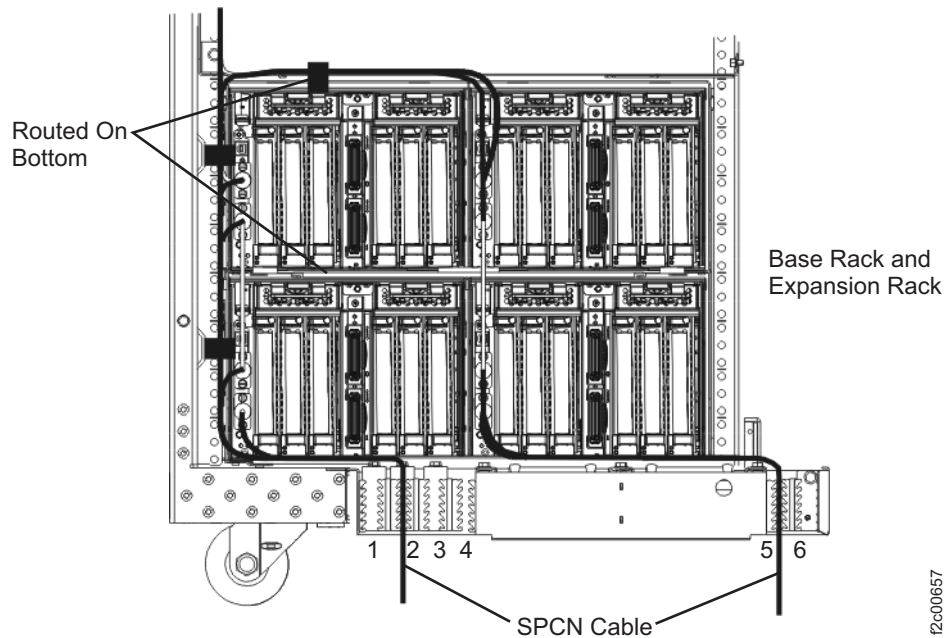
Figure 30. SPCN cable routing through the tailgate (later version tailgate)

17. Plug the RIO-G and SPCN cables into the indicated connector on the destination I/O enclosure. Figure 26 on page 30 displays the connector locations.

18. Reinstall the tailgate cable retention clamps to secure the RIO and SPCN cables in the tailgate.

19. Continue with "Installing the interrack decorative covers kit."
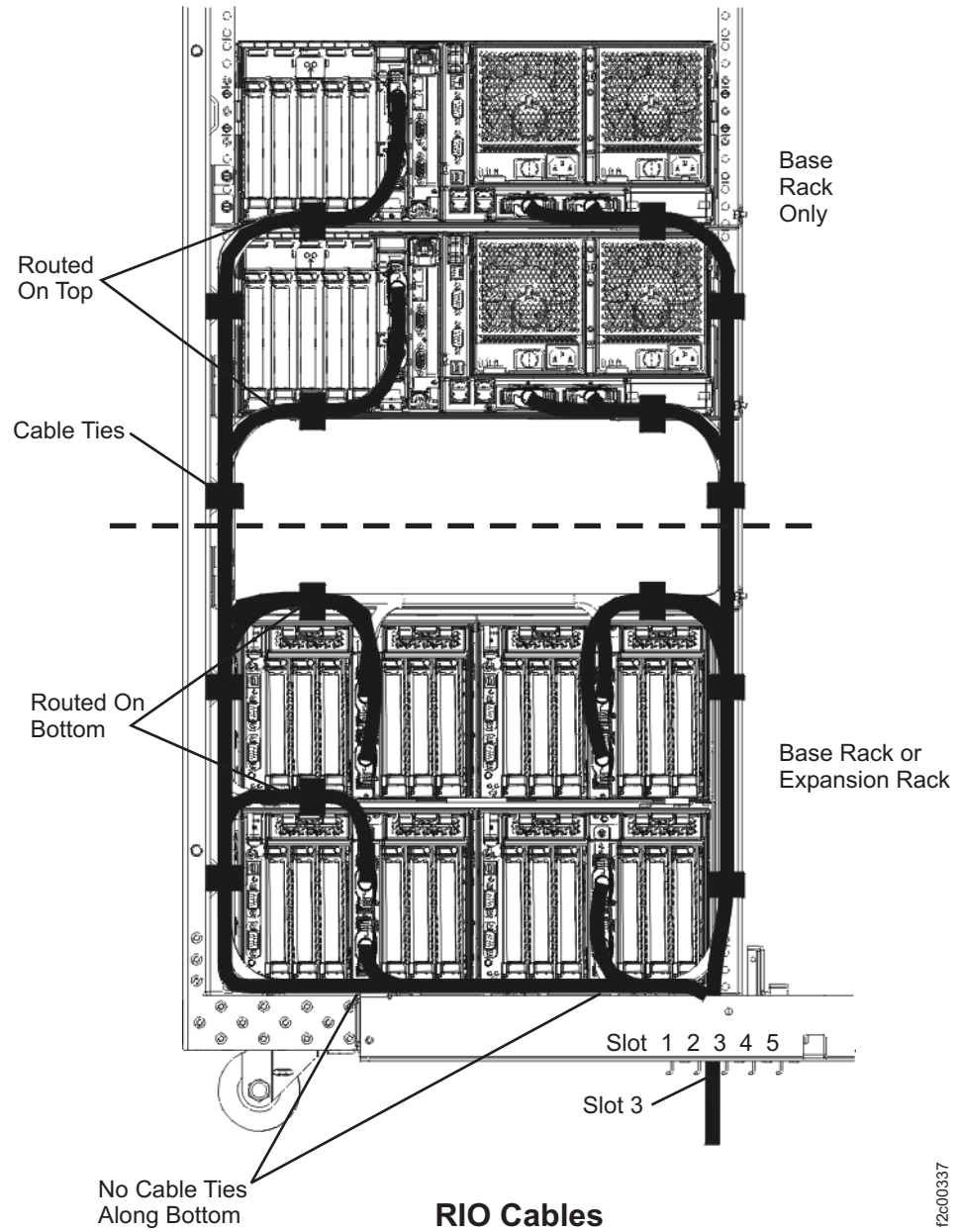
Installing the interrack decorative covers kit

Perform the following steps for each storage expansion rack that you are installing or adding.

1. Locate the interrack decorative covers kit. It contains two side interrack covers and one top interrack cover. There are two versions of the interrack decorative covers kit.

   - Early version - the covers are packaged in a long narrow cardboard box normally taped to the expansion rack. The side interrack covers are one piece. Go to step 3.

   - Later version - the covers are packaged in the large ship group box. Each side interrack cover is in two pieces that are hinged together. Go to the next step.

2. Assemble each of the side interrack covers as follows:

   a. Open the hinged side interrack cover **1** so that it is straight. See the following figure.

   b. Loosen the two nuts **2** on the threaded studs next to the hinge points.

   c. Slide the plate **3** so that it engages both studs.

   d. Tighten both nuts.
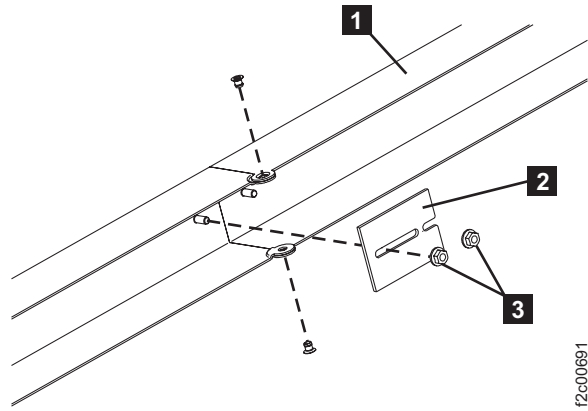
Figure 31. Assembling the later version of the interrack decorative side covers

3. Install each of the two interrack side covers **1** by pushing the cover into place over the interrack spacing studs. Take care not to interfere with any interrack cables. See Figure 32.

4. Install the top interrack cover **2** by pressing it down squarely. The spring clips should hold the cover in place. See Figure 32.
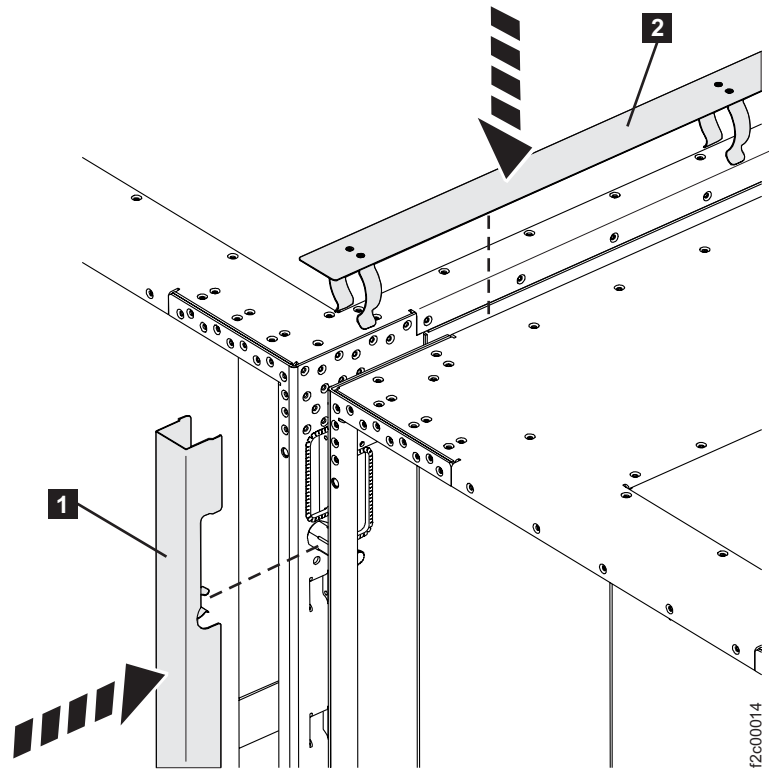
Figure 32. Installing the interrack decorative covers

5. Continue with "Performing the power and safety checks" on page 36.

Performing the power and safety checks

Preparing to check DS8000 and customer power

DANGER

> **Lethal voltages are present in this area of the machine.**

You will need the following tools to perform the power safety checks:

- For resistance checks, IBM analog ohmmeter P/N 00P7029 (Mastech Model 7040).
- For voltage checks, IBM digital multimeter P/N 8496278 (Fluke Model 179).
- For probing, high voltage test probe tips P/N 43L0951.

Note: Use the listed part number (P/N) or an equivalent P/N that is approved by IBM.

Steps

1. Read the Danger notice and requirements above.
2. Continue with "Routing the mainline power cables."

Routing the mainline power cables

Repeat the following steps for each rack that you are installing.

1. Uncoil the mainline power cables from the ship group.
2. The mainline power cable that connects to PPS-1 (upper) **5** is longer than the mainline power cable that connects to PPS-2 (lower) **6** . See Figure 33 on page 37. Use the cable label and part number (P/N) to identify the longer cable.

Table 9. Cable label and part number

Feature Code	P/N of shorter cable	P/N of longer cable
1090 - 3 phase 60A non EMEA	22R1190	22R2222
1091 - 3 phase 60A EMEA	22R3794	22R3795
1092 - 3 phase 60A Japan	22R1191	22R2224
1093 - 3 phase 60A Chicago	22R1188	22R1189

CAUTION:
Do not connect the DS8000 mainline power cables to customer power until instructed to do so.
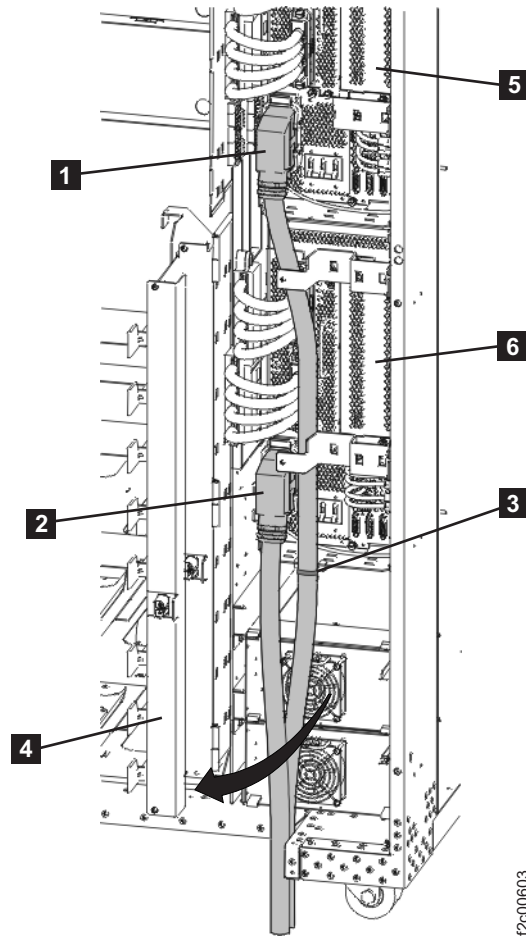
Figure 33. Base rack power cables

3. Ensure the 208VDC bus bar gate **4** is in the open position. See Figure 33.
4. For a base rack or expansion rack, complete the following steps.

   a. Route the longer mainline power cable **1** up through the tailgate as shown and connect it to PPS-1 (upper).
   b. Use a "hook and loop" fastener cable tie **3** to fasten it to the bracket.
   c. Route the shorter mainline power cable **2** up through the tailgate as shown and connect it to PPS-2 (lower).

   Notes:
   - If this is on a raised floor, route the cables down through the floor cutout and near the customer power connectors.
   - If this is not on a raised floor, route the cables underneath the frame behind the rear caster so they exit to the side. The cables must not exit the rack in the front or rear service areas.

5. Route and connect the mainline power cables. For this task, you have the option of disconnecting the 5/12V DDM "Y" power cables. See Figure 34 on page 38. The four screws **2** that secure these cables to the PPSs are not captive, so do not let them fall when you remove them.

   a. Route the longer mainline power cable **3** up through the tailgate and behind the 5/12V DDM "Y" power cables **1**. See Figure 34 on page 38. To make this easier, you can temporarily disconnect the right-most connector of each "Y" power cable.

b. Connect the mainline power cable to PPS-1 (upper). Use a "hook and loop" fastener cable tie **3** to fasten the upper cable to the bracket.

c. Route the shorter cable **2** up through the tailgate. Connect it to PPS-2 (lower) similarly to what is shown in Figure 33 on page 37.

Notes:

a. If this is on a raised floor, route the cables down through the floor cutout and near the customer power connectors.

b. If this is not on a raised floor, route the cables underneath the frame behind the rear caster so they exit to the side. The cables must not exit the rack in the front or rear service areas.

CAUTION:
Do not connect the DS8000 mainline power cables to customer power until instructed to do so.
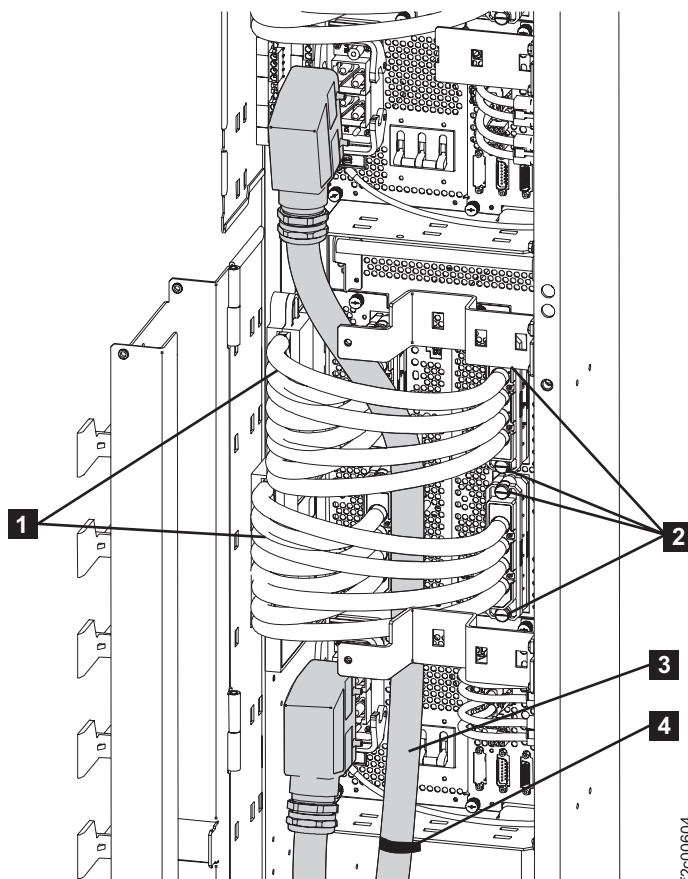
Figure 34. Expansion rack power cables

Determining mainline power cable type (plug in or wired)

Repeat the following steps for each DS8000 rack that you are installing.

1. Locate the customer end of the mainline power cables from all the DS8000 frames that you are installing.

2. Determine if the customer end of the mainline power cables are for plug- in or wired installations.

- Plug-in: The mainline power cable has a plug at both ends. Go to "Checking customer power for a plug-in mainline power cable."
- Wired: The mainline power cable has a plug at one end and loose wires at the other end. Go to "Checking customer power for a ″wired″ mainline power cable" on page 42

Checking customer power for a plug-in mainline power cable

Repeat the following sections for both mainline power cables in each rack being installed.

Checking power system ground continuity and voltage (plug in)

Attention: Use an IBM-approved analog multimeter. Do not use a digital meter.

1. Switch off the customer circuit breaker that supplies AC voltage to the mainline power cables.

   CAUTION:

   Do not connect the mainline power cables until instructed to do so.

2. **Attention:** Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to each customer circuit breaker that was switched off.

3. Verify the MAIN LINE circuit breaker **1** (CB00) on the rear of each primary power supply is set to Off (down). Refer to Figure 35.
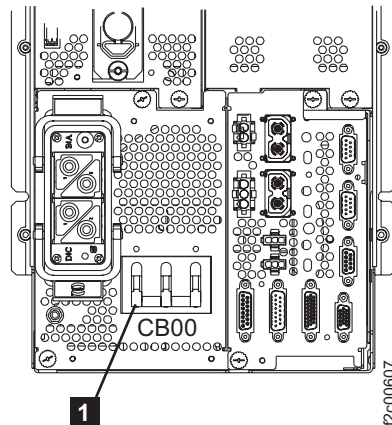
Figure 35. Rear view of PPS showing CB00

4. Verify the DS8000 mainline power cables are not connected to the customer power.

5. Prepare the multimeter to measure 0.1 ohm or less resistance. Place one lead of the multimeter on the ground pin of the male plug on the mainline power cable. Place the other lead on the conductive metal of its primary power supply enclosure. Refer to Figure 36 on page 40 for the location of the ground pin. Do this for each mainline power cable.

   Is there more than 0.1 ohm of resistance?

   - Yes, go to MAP2330 Repair rack ground continuity. To display the MAP, open the service Information Center on the management console, then open the **Isolation MAPs and Symbolic FRU procedures** section to locate the MAP.
   - No, go to "Checking customer receptacle ground pin continuity with customer CB off (plug in)" on page 40.

Three-Phase 30/50 amp   Three-Phase 60 amp

Figure 36. Three-phase amp

Checking customer receptacle ground pin continuity with customer CB off (plug in)

1. Prepare the multimeter to measure 1.0 V ac or less. Measure the voltage at the customer's AC power outlet between the ground pin and the building ground.

   Is the voltage less than 1.0 V ac?

   - Yes, go to step 3.
   - No, continue with the following step.

2. Voltage is present at a customer outlet with the customer circuit breakers off.

   DANGER

   > **Inform the customer that, even though the circuit breaker is off, voltage higher than 1.0 V ac is measured at the failing customer voltage outlet pins. Do not continue until the voltage is less than 1.0 V ac. (1003)**

3. Prepare the multimeter to measure 1.0 ohm or less of resistance.

4. Measure the resistance between the customer AC power outlet ground pin and the building ground. Refer to Figure 37 for the location of the ground pin.

   Is the resistance 1.0 ohm or less?

   - Yes, continue with "Checking customer receptacle voltage pins with customer CB off (plug in)."
   - No, inform the customer. **Do not continue until the resistance is 1.0 ohm or less.**

Three-Phase 30/50 amp   Three-Phase 60 amp
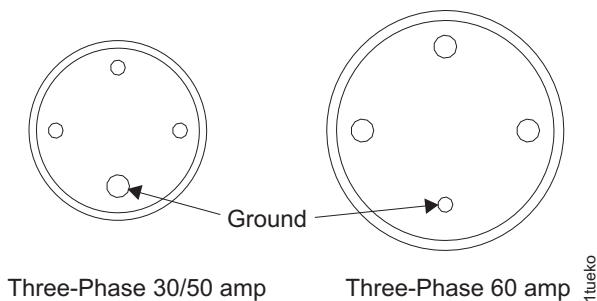
Figure 37. Three-phase amp

Checking customer receptacle voltage pins with customer CB off (plug in)

Prepare the multimeter to measure 1.0 V ac or less. Measure the voltage between each pair of voltage pins (**A**, **B**, and **C**) on the customer outlet. Also, measure the

voltage between each voltage pin and ground pin on the customer outlet. Did any voltage measure more than 1.0 V ac? Refer to Figure 38 for the location of the voltage pins.

- Yes, inform the customer that one or more voltage pins on the customer receptacle measured greater than 1.0 V ac even though the circuit breaker is off. **Do not continue until the voltage is less than 1.0 V ac.**
- No, continue with the next task, "Checking customer receptacle voltage pins with customer CB on (plug in)."
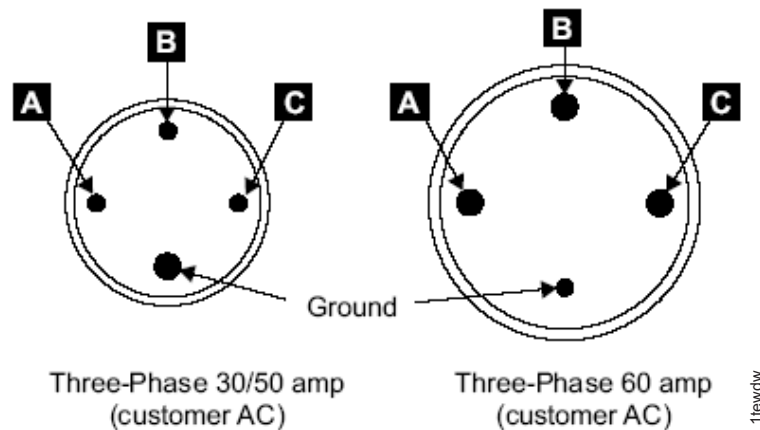
Figure 38. Measuring voltage between each pair of pins

Checking customer receptacle voltage pins with customer CB on (plug in)

1. Remove the "Do Not Operate" tag and the lockout padlock from each customer mainline AC voltage circuit breaker and then switch on the customer circuit breaker.
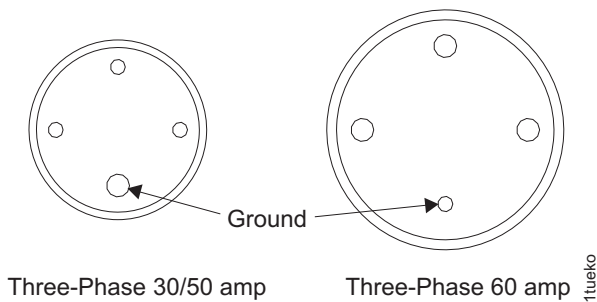2. Prepare the multimeter to read line voltage AC.

   DANGER

   > **Dangerous voltages may be present. Do not touch the internal parts (pins and connectors) of the customer receptacle.**

3. Measure the voltage between the ground pin and each voltage pin (**A** , **B** , and **C**) on the customer outlet. Refer to Figure 39 on page 42 for the location of the voltage pins.

   Are the voltages within 10% of each other?

   - Yes, continue with the next step.
   - No, inform the customer that the voltages are not correct. **Do not continue until the voltages are correct.**

4. Locate the DS8000 information label located near the top of the left side panel at the rear of the DS8000. Measure the voltage between each pair of voltage pins (**A** to **B** , **B** to **C** , and **C** to **A**) on the customer outlet. Refer to Figure 39 on page 42 for the location of the voltage pins. Verify that the customer AC input voltage that you just measured matches the machine input voltage information on the label.

   Do the voltages correspond with the label?

   - Yes, continue with "Connecting the mainline power cables on the racks (plug in)" on page 42.

- No, **do not continue with the installation**. Contact the marketing representative to confirm that the DS8000 was ordered with the correct power input feature.
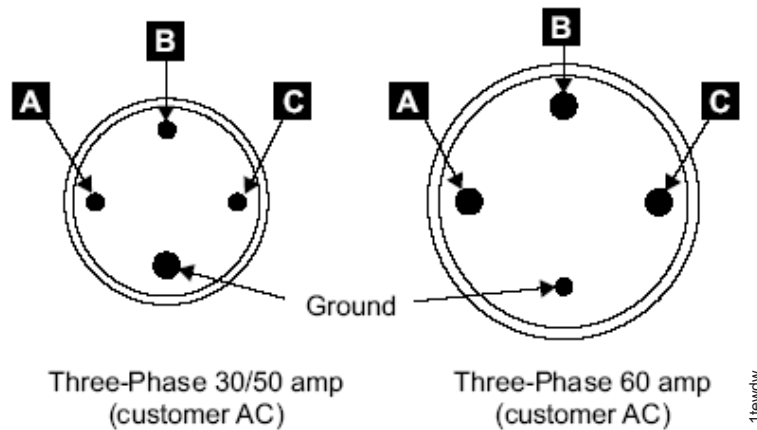
Figure 39. Measuring voltage between each pair of pins

Connecting the mainline power cables on the racks (plug in)

DANGER

> **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D004)**

Repeat steps 1 through 3 for each rack that you install.

1. Switch the customer circuit breaker to Off for the mainline power cables.

   Attention: Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to each circuit breaker.

2. Verify the mainline circuit breaker (CB00) on the rear of each primary power supply is set to Off (down).

3. Connect each storage facility mainline power cable plug to the customer AC outlet.

4. Continue with "Checking the rack switch settings" on page 47.

Checking customer power for a "wired" mainline power cable

Use the following power sections to check the customer's power for a wired mainline power cable. Repeat the following steps for each rack being installed.

Checking power system ground continuity and voltage (wired)

Attention: Use an IBM-approved analog multimeter. Do not use a digital meter.

Repeat the following steps for each rack that you are installing.

1. Switch off the customer circuit breaker that supplies the AC voltage to the mainline power cables.

   CAUTION:
   Do not connect the mainline power cables until instructed to do so.

2. **Attention:** Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to each customer circuit breaker that was switched off. Refer to the *Electrical Safety for IBM Customer Engineers*.

3. Verify the MAIN LINE circuit breaker **1** (CB00) on the rear of each primary power supply is set to Off (down). Refer to Figure 40.
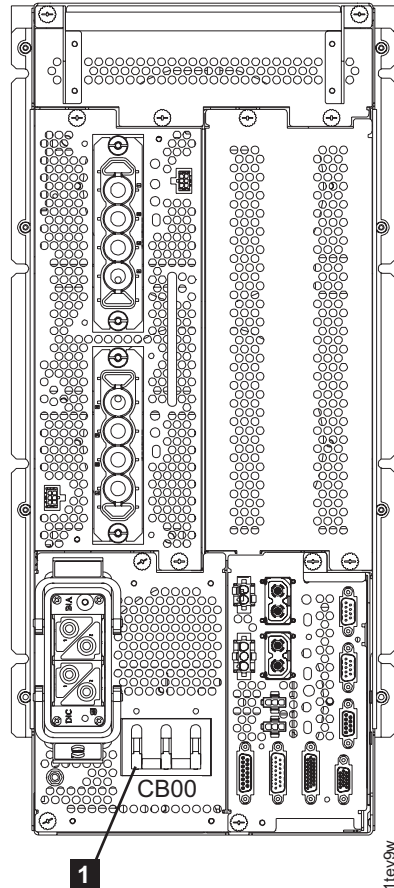
Figure 40. Rear view of PPS showing CB00

4. Verify the DS8000 mainline power cables are not connected to the customer power.

5. Connect the DS8000 mainline power cable to each primary power supply (PPS) input power connector.

   Note: Ensure that you connect the long mainline power cord to the upper primary supply and the short mainline power cord to the lower primary supply.

6. Prepare the multimeter to measure 0.1 ohm or less resistance. Place one lead of the multimeter on the green and yellow wire at the customer end of each mainline power cable. Place the other lead on the conductive metal of each PPS enclosure. Refer to Figure 41 on page 44.

   Is there more than 0.1 ohm of resistance?

   • Yes, go to MAP2330 Repair rack ground continuity.
   • No, continue with the next step.
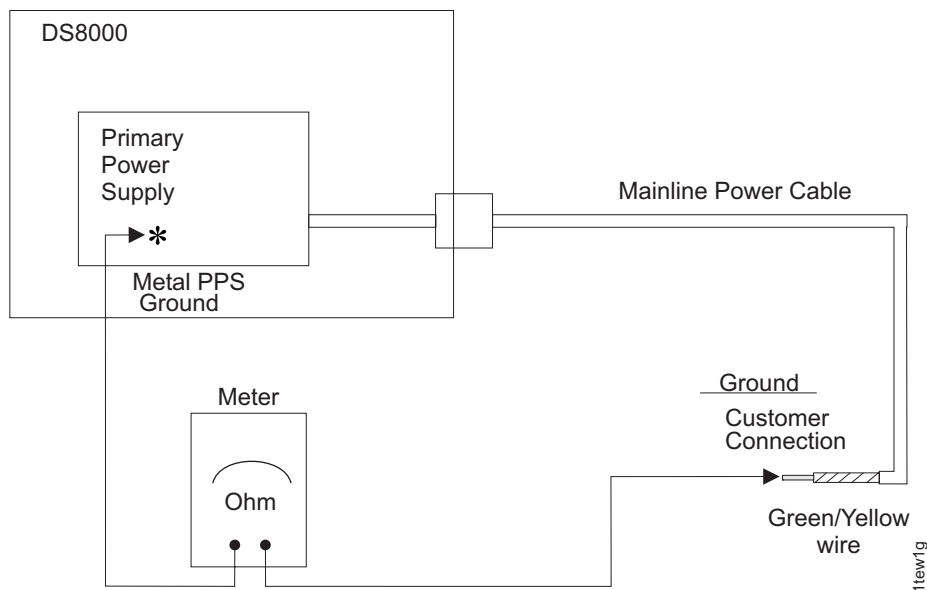
Figure 41. Prepare multimeter to measure ohm resistance

7. Disconnect the DS8000 mainline power cables from each PPS input power connector.

8. Instruct the customer to call a licensed electrician to connect each wired mainline power cable to the customer mainline power source.

   Attention: For EMEA installations, provide the following information to the electrician.
   EMEA Electrician Information

   The mainline power cord of this machine must be connected to the customer's mainline power source by a licensed electrician. The mainline power cable cannot be modified in any way.

   • For 3-phase machines:

     This machine must be connected to a 3-phase AC power. The mainline power cable is a four-conductor cable with the following color code:
     – L1 (phase 1) = black
     – L2 (phase 2) = blue
     – L3 (phase 3) = brown
     – PE (ground) = green/yellow

   Note: The connection to the AC power must be made without neutral, the blue wire must be used as a phase.

9. Continue with "Checking customer ground continuity with customer CB off (wired)."

Checking customer ground continuity with customer CB off (wired)

1. Prepare the multimeter to measure 1.0 V ac or less. Measure the voltage on the female ground pin on each mainline power cable and building ground. Refer to Figure 42 on page 45.

   Is the voltage less than 1.0 V ac?

   • Yes, go to step 3 on page 45.
   • No, continue at the following step.
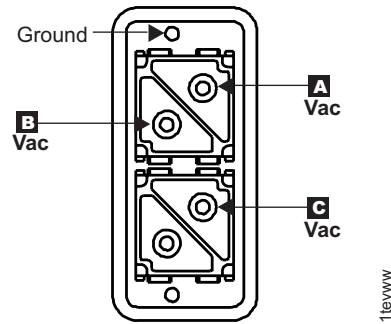
Figure 42. Mainline power cable connector

2. Voltage is present at a customer outlet with the customer circuit breakers off.

   DANGER

   > **Inform the customer that even though the circuit breaker is off, voltage higher than 1.0 V ac is measured at the failing customer voltage outlet pins.**
   >
   > **Do not continue until the voltage is less than 1.0 V ac.**

3. Prepare the multimeter to measure 1.0 ohm or less of resistance.
4. Measure the resistance between the female connector ground pin on each mainline power cable and the building ground.

   Is the resistance 1.0 ohm or less?

   - Yes, continue with "Checking customer voltage with customer CB off (wired)."
   - No, inform the customer. **Do not continue until the resistance is 1.0 ohm or less**.

Checking customer voltage with customer CB off (wired)

1. Prepare the multimeter to measure 1.0 V ac or less.
2. Measure the voltage between each pair of voltage pins on the female connector on each mainline power cable. Also, measure the voltage between each voltage pin (**A**, **B**, and **C**) and the ground pin on each mainline power cable. Refer to Figure 43 on page 46.

   Did any voltage measure more than 1.0 V ac?

   - Yes, inform the customer that one or more voltage pins on the customer supply measured greater than 1.0 V ac even though the circuit breaker is off. **Do not continue until the voltage is less than 1.0 V ac.**
   - No, continue with "Checking customer voltage with customer CB on (wired)" on page 46.
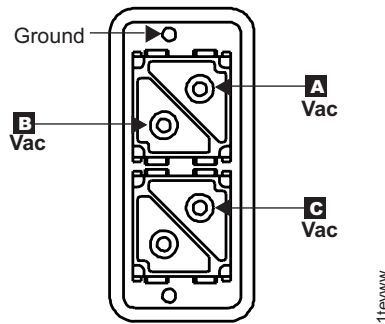
Figure 43. Mainline power cable connector

Checking customer voltage with customer CB on (wired)

1. Remove the "Do Not Operate" tag and the lockout padlock from each customer mainline AC voltage circuit breaker and then switch on the customer circuit breaker.

2. Prepare the multimeter to read line voltage AC.

   DANGER

   > **Dangerous voltages may be present. Do not touch the internal parts (pins and connectors) of the customer receptacle.**

3. Measure the voltage between the ground pin and each voltage pin (**A** , **B** , and **C**) on each mainline power cable. Refer to Figure 44.

   Are the voltages within 10% of each other?

   - Yes, continue with the next step.
   - No, inform the customer that the voltages are not correct. **Do not continue until the voltages are correct.**
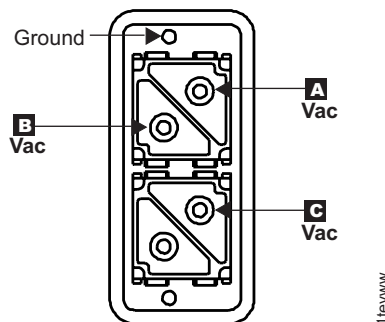
Figure 44. Mainline power cable connector

4. Locate the DS8000 information label located on the top of the left side panel at the rear of the storage facility. Measure the voltage between each pair of voltage pins (**A** to **B** , **B** to **C** , and **C** to **A**) on each mainline power cable. Refer to Figure 44. Verify that the customer AC input voltage that you just measured matches the machine input voltage information on the label.

   Does the voltage measured match the voltage on the DS8000 information label?

   - Yes, continue with "Connecting the mainline power cables on the racks (plug in)" on page 42.

- No, **do not continue with the installation.** Contact the marketing representative to confirm that the DS8000 was ordered with the correct power input feature.

Connecting the mainline power cables on the racks (wired)

DANGER

> **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D004)**

1. Switch the customer circuit breaker to Off for the mainline power cables.

   Attention: Attach a "Do Not Operate" tag (S229-0237) and the safety lockout padlock to each circuit breaker.
2. Verify the mainline circuit breaker (CB00) on the rear of each primary power supply is set to Off (down).
3. Connect each storage facility mainline power cable plug to the PPS then continue with "Checking the rack switch settings."

Checking the rack switch settings

1. Verify the setting of the following switches on Rack-1.

Table 10. Switch settings and locations

Switch	Setting	Location	Figure reference
Battery enclosure circuit breakers CB0 and CB1.	On (up)	On each battery assembly (rear of rack)	**4** in Figure 45 on page 48
UEPO red switch	Off (down)	Rack operator panel (front of rack) **Note:** Press the recessed switch towards the bottom. It will appear flat when off.	n/a
RPC card DIP switches 1, 2, 4, 5, 6 (Both cards)	Off (right)	Both RPC cards (top rear of rack)	**1** in Figure 45 on page 48
RPC card DIP switch 3 (Both cards)	Off (right)	System z® power feature **is not** installed (LR card) **Note:** The ZLR card shown in **2** in Figure 45 on page 48 differs from the LR card in that it has four large connectors on the left side.	**1** in Figure 45 on page 48
	On (left)	System z power feature **is** installed (ZLR card)	**1** in Figure 45 on page 48
Local Remote switch	Local (down)	LR or ZLR card (rear of rack)	**2** in Figure 45 on page 48

Figure 45 on page 48 shows the rear view of the rack:
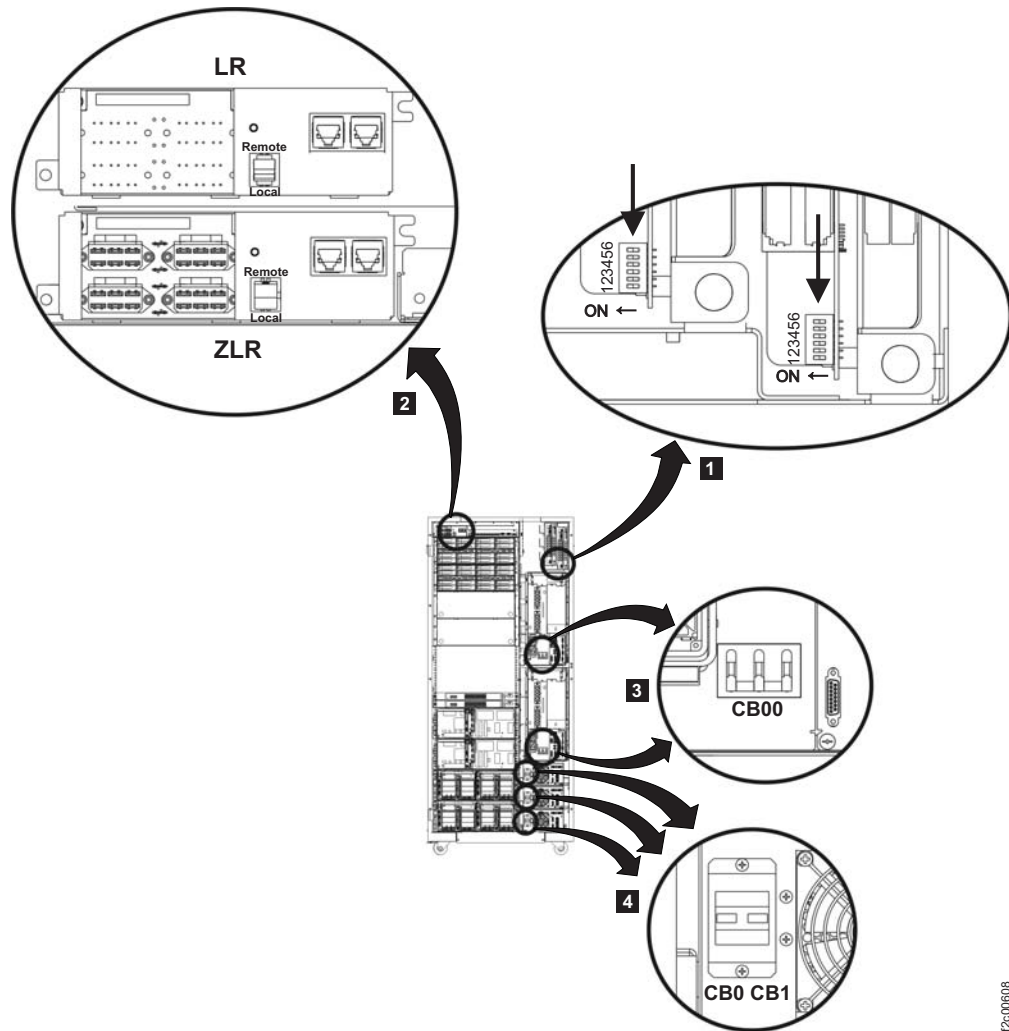
Figure 45. Rack rear view

Figure 46 on page 49 shows the enable disable switches for the primary power supply sequencer module.

2. Continue verifying the settings of the following switches on Rack-1.

Table 11. Switch settings and locations

Switch	Setting	Location	Figure reference
Primary power supply circuit breaker CB00	Off (down)	On each PPS, on the AC input power module (rear of rack)	**3** in Figure 45
Primary power supply sequencer module three enable/disable switches	Enabled (up)	Three switches on each PPS (rear of rack)	**1** in Figure 46 on page 49
Enable/disable switches on the PPS 5/12 V DDM power module	Enabled (up)	Two switches on each PPS (rear of rack)	**1** in Figure 47 on page 50
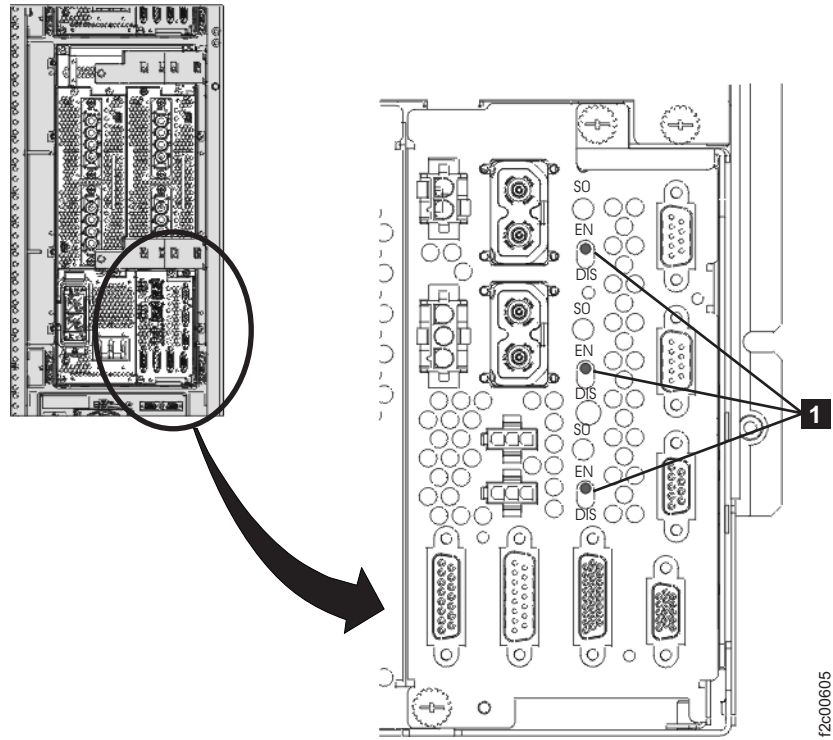
Figure 46. PPS sequencer module and LED enable/disable switch

Figure 47 on page 50 shows the enable disable switches for the primary power supply DDM.
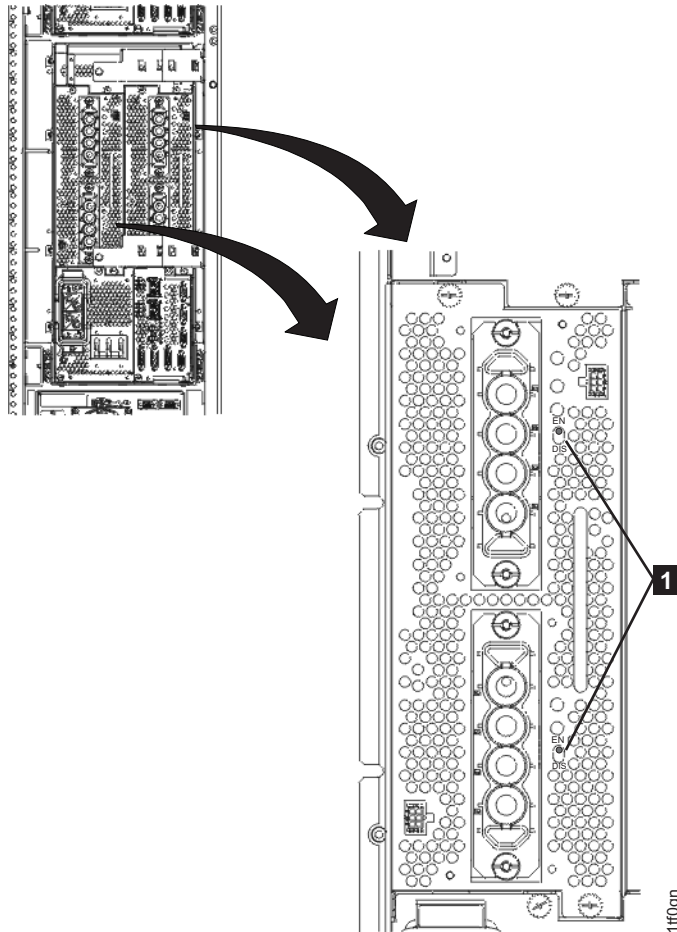
Figure 47. Enable/disable switches on a 5/12 V DDM power module (PPS)

3. Do you have additional storage expansion racks?
   - Yes, continue with step 4.
   - No, continue with step 5 on page 51.
4. Verify the setting of the following switches on each expansion rack. Each rack has:
   - One UEPO switch
   - Two PPSs
   - Zero to three battery enclosures

Table 12. Switch settings and locations for storage expansion racks

Switch	Setting	Location	Figure reference
UEPO red switch	Off (down)	Rack operator panel (front of rack) **Note:** Press the recessed switch towards the bottom. It will appear flat when off.	n/a
Primary power supply CB00	Off (down)	On AC input power module	**3** in Figure 45 on page 48

Table 12. Switch settings and locations for storage expansion racks (continued)

Switch	Setting	Location	Figure reference
Battery enclosure circuit breakers CB0 and CB1.	On (up)	On each battery enclosure (rear of rack)	**4** in Figure 45 on page 48
Primary power supply sequencer module enable/disable switches	Enabled (up)	On PPS modules (rear of rack)	**1** in Figure 46 on page 49
Primary power supply DDM module enable/disable switches	Enabled (up)	On PPS modules (rear of rack)	**1** in Figure 47 on page 50

5. Continue with "Checking rack UEPO switch operation."

Checking rack UEPO switch operation

Start with Rack-1, and then repeat the following steps for each additional storage facility that you are installing.

1. Remove the "Do Not Operate" tag and the lockout padlock from each customer mainline AC voltage circuit breaker that supplies power to the storage facility that you are installing.

2. Switch on each customer circuit breaker.

3. Switch the MAINLINE CB00, on the rear of each primary power supply to On (up).

4. Observe the six vertical LED indicators at the front of each primary power supply (to the left of the fans).

   - If you are here for Rack 1, the Rack 1 UEPO switch must already be in the Off position as indicated in the section "Checking the rack switch settings" on page 47.

   - If you are here for a subsequent Rack, the Rack 1 UEPO switch must already be in the On position as indicated in step 5.

   Use Table 13 to find the condition that applies:

Table 13. LED indicators when MAINLINE CB00 is on

AC INPUT GOOD	UEPO LOOP GOOD	PPS Status Display	Action
On	Off	Ignore	Normal condition, continue with the next step
On	On	Ignore	UEPO fault, go to MAP21F0 UEPO loop good LED should be off
Off	Off	Ignore	Input power fault, go to MAP2050 Loss of AC Input to a single primary power supply. **Note:** If both PPSs are failing, then repeat the customer voltage checks done previously.

5. Push a thin paper clip through the small hole in the operator panel to reset the UEPO red switch to the On (up) position.

Use Table 14 to find the condition that applies.

Table 14. LED indicators when UEPO switch is on

AC INPUT GOOD	UEPO LOOP GOOD	PPS Status Display	Action
On	On	Blank, U0, XC, or XD **Note:** Some levels of PPS firmware will cause an XC or XD error code to be displayed. This is a false error. The condition will remain until the DDM power supply is turned on in a later step. No action is required. Continue with the next step.	Normal condition, continue with the next step.
On	On	Error code	Go to MAP21A0 PPS fault isolation during install.
On	Off	N/A	UEPO fault, go to MAP21E0 UEPO Loop Good LED should be on.

6. Observe the six vertical LED indicators at the front of each primary power supply (to the left of the fans). Use Table 13 on page 51 to find the condition that applies.

7. Swing the 208VDC bus bar gate back into its non-service position. Reinstall and tighten the two retaining screws **1** . See Figure 48.

8. For an expansion rack, if you removed the air baffle **2** earlier to allow the 208VDC bus bar to swing open, then reinstall it now. See Figure 48.
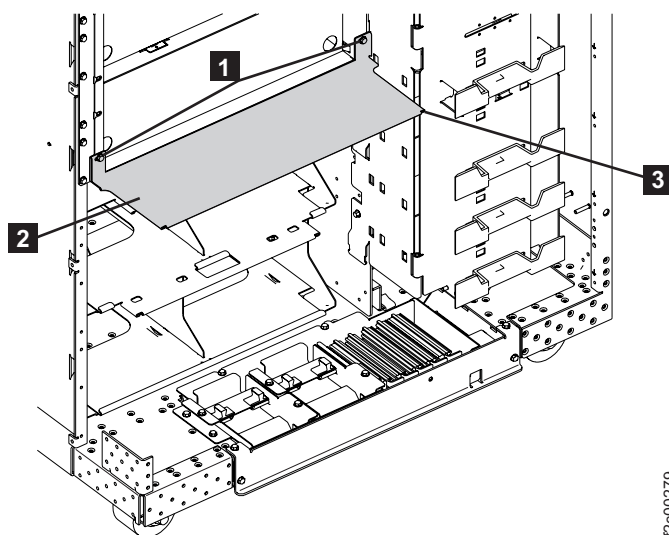
Figure 48. Air baffle

9. Continue with "Determining the management console configuration."

Configuring the management console

Determine which management console task you need to perform.

Determining the management console configuration

1. Record the following date and time:
   a. Record the *stop* date and time for the <u>Check Customer Preparation through Safety Checks</u> phase in Table 3 on page 3, "Recording information for the installation report" on page 2.
   b. Record the *start* date and time for the <u>HMC Initial Configuration</u> phase in Table 3 on page 3, "Recording information for the installation report" on page 2.
2. Review the following information for an overview of a storage plex and management console MC 1 versus MC 2:
   a. A storage complex is one or more storage facilities that share one or two management consoles (HMCs).
   b. The storage facilities in a storage complex have Ethernet cables that connect their internal rack mounted Ethernet switches together into a private network.
   c. The first HMC for a storage complex MUST BE assigned the role of primary management console (MC 1).
   d. MC 1 runs a DHCP server to assign the IP addresses on the private networks (gray and black). It also collects and maintains all information about the storage complex hardware and code.
   e. If there is a second HMC for the same storage complex, it MUST BE assigned the role of secondary management console (MC 2).
   f. The secondary HMC can be:
      - an external HMC installed in an IBM or customer-provided utility rack that is cabled to the same storage complex.
      - an internal HMC in a storage facility that is part of the same storage complex.
   g. MC 1 and MC 2 both run DHCP servers. DHCP lease information and other storage complex data is automatically synchronized between them. MC 1 and MC 2 provide backup for each other to ensure continuous availability of HMC functions in the event of a single HMC failure.
   h. MC 1 must be completely installed and configured before MC 2 can be connected to the private network. This ensures MC 2 gets a complete copy of all the needed information from MC 1.
   i. If two storage facilities each having an internal HMC are being installed at the same time:
      - The first storage facility in the storage complex must have the primary management console (MC 1)
      - The other storage facility must have the secondary management console (MC 2)
      - The install of the second storage facility will have to wait until the install of the first storage facility has completed the section titled "Testing of management console communications". This will ensure MC 1 is

completely configured and ready to provide a copy of its information to
MC 2 when it is connected into the storage complex.

3. If you are:
   - Installing the first storage facility in a storage complex, go to Table 15.
   - Adding astorage facility to an existing storage complex, go to Table 16.

Table 15. Installing the first storage facility in a storage complex

The storage facility being installed contains:	Action
One integrated management console (one in Rack 1).	Go to "Configuring the management console in rack 1 as the primary management console."
One integrated management console and one external management console.	Go to "Configuring the management console in rack 1 as the primary management console." **Note:** Installation of the external management console (MC 2) will be performed after the storage facility and primary management console are installed. The external management console harvests configuration information from MC 1.

Table 16. Adding a storage facility to an existing storage complex

The storage facility being installed contains:	Action
New storage facility has an integrated management console in Rack 1.	Go to "Configuring the management console in rack 1 as the secondary management console" on page 59.
New storage facility does not have an integrated management console in Rack 1.	Go to "Connecting a new storage facility to an existing storage plex" on page 64.

Configuring the management console in rack 1 as the primary management console

Perform the following steps to configure a primary management console (MC 1) in
rack 1. If you also have an external management console to install, then that task
will be performed later in the install sequence.

1. Check the HMC TCP/IP address selected on the customization worksheets
   provided by the customer. This is the address to be assigned to the HMC
   network port (eth2) for connection to the customer network.

   Is the address in either of the following ranges?

   `172.16.0.0 - 172.16.255.255` or `172.17.0.0 - 172.17.255.255`
   - No, go to step 3.
   - Yes, go to step 2.

2. There is the potential of an address conflict between the customer networks
   and the DS8000 private networks. Call the next level of support. The next
   level of support will need to assist you in converting the private network
   (gray and black) address ranges to one of the optional addresses that the
   customer has selected on the "Management console network settings work
   sheet". They will have a special procedure to allow this network address
   conversion to occur during an install.

Refer to MAP7005 Determining which private network address range is selected to ensure that the address range selected is the same as what is already in use for the primary management console (MC 1).

3. Observe the power LED on the front of the management console server. See Figure 49 (X335 server) or Figure 50 (X336 server).

    Is the LED indicator off?

    - Yes, go to MAP6520 Management console power problem.
    - No, go to the next step.
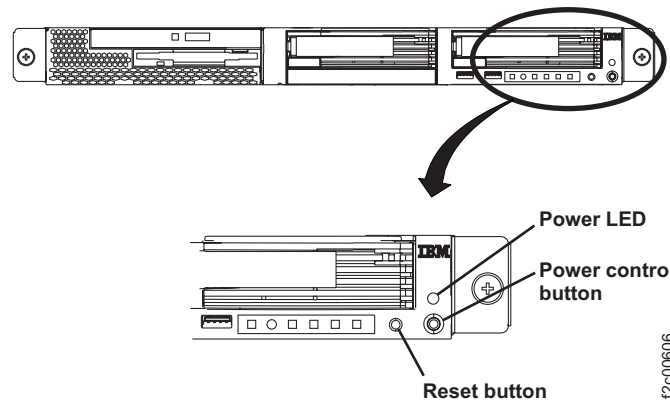
Figure 49. X335 management console server (front view)
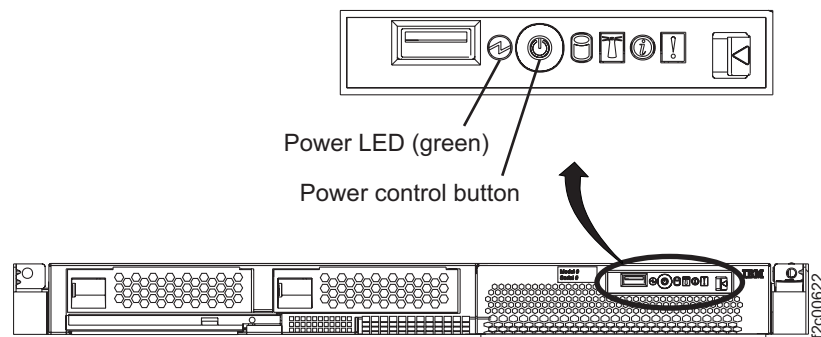
Figure 50. X336 management console server (front view)

4. Is the power LED indicator flashing?

    - Yes, push in the Power control button and then continue with the next step.
    - No, continue with the next step.

5. Slide the management console keyboard and display drawer out to the service position and raise the display panel. If necessary, press the power on button to turn on the display. Wait up to **5** minutes for the HMC ROLE SELECTION MENU to be displayed. For example:

```
******************************************************
*               WELCOME TO THE                       *
*            HMC ROLE SELECTION MENU                 *
******************************************************

ENTER A MENU OPTION FROM THE LIST
1)   ASSIGN HMC AS PRIMARY
2)   ASSIGN HMC AS SECONDARY
99)  EXIT

ENTER YOUR SELECTION AND HIT THE "ENTER" KEY
--> __
```

Is the HMC ROLE SELECTION MENU displayed?

- Yes, continue with the next step.
- No, this indicates that either the HMC Role has already been assigned (HMC login screen is displayed) or that the management console is not booting correctly.

  Important: To reset all the HMC code objects to prepare for the installation, the HMC role must transition from *Primary* to *Secondary* or *Secondary* to *Primary* at least once. If the role does not transition, the code objects will not be reset.

  – If the management console login screen is displayed, then go to MAP6090 HMC Role selection not displayed as expected. Return here and continue with step 6 when you correct the problem.
  – If the management console login screen is not displayed, go to *MAP6020 Management console problem determination*.

6. Assign this management console as the primary management console:
   a. Type 1 and press **Enter**.
   b. Type Yes and press **Enter** to confirm the selection.
   c. Check the HMC label located on the front of the management console keyboard tray. If it does not indicate MC 1, then locate the label in the ship group and attach it.

7. When the keyboard layout configuration screen is displayed (as shown below), type 2 and press **Enter**.

```
If you are using a non English US keyboard, you can choose to change your
keyboard layout configuration.  You can make your selection by pressing a number
key then press enter.  If you don't press any key within 30 seconds, this
program will terminate automatically.

1 -- Do not change keyboard layout and run this program again on the next
        system boot.
2 -- Do not change keyboard layout and do not run this program again on
       the next system boot.
3 -- Change to a new keyboard layout.

Your selection is:
```

8. Wait up to 5 minutes for the HMC configuration to be updated, and the HMC login screen to display. Is the management console login screen displayed?
   - Yes, continue with the next step.
   - No, go to *MAP6020 Management console problem determination*.

9. The management console is shipped with predefined user IDs and passwords. The user IDs and passwords are case-sensitive. Enter the user ID and password as shown below.

ID: CE

Password: serv1cece

10. If any "License Agreement" pop-up panels are displayed, accept the agreements.

11. Use the customization worksheets provided by the customer to perform the management console customization tasks in Table 17. Additional guidance is available through the *IBM System Storage DS8000 Introduction and Planning Guide*.

To access the management console navigation item listed in the second column of Table 17, do the following:

a. In the HMC Navigation area, open the **Management Environment**, select and open the HMC.

b. Select and open the HMC (localhost.localdomain).

c. Open **HMC Management**, then **HMC Configuration**.

d. In the right content area, select the desired HMC configuration from the second column of Table 17.

Table 17. Management console customization tasks

You are here to set the following HMC option:	HMC Configuration Option	Notes
Console Date / Time and Timezone	Customize Console Date and Time	1. Set the date and time to the local time.
		2. Choose a location that has the same time zone and daylight savings settings as the storage facility location. **Note:** The date, time, and time zone that you select will be used later by an automated process to update those settings in the storage facility. Ensure that you set this accurately.
		3. Click **OK** on the Reboot warning panel, but do not reboot at this time.
HMC Network Settings	Customize Network Setting	1. Set the Console Name, Domain Name and description per the worksheets.
		2. Click on the LAN adapters Tab, select eth2, click on details and set up the customer network connection.
		3. Click on the Name Services Tab and configure the customer's DNS (if required).
		4. Click on Routing Tab and configure the customers Gateway (if required). Set the Gateway Device to **eth2**.
		5. Perform a quality check of all the entered data.
		6. Press **Apply**.

12. Logoff and reboot the management console by performing the following steps:

a. From the task bar, click on **Console**.

b. Select **Exit**, and then click **Exit now**.

c. From the selection box, select **Reboot Console**.

d. Click **OK**.

13. Wait for the management console logon panel to display.

14. Route and connect the customer Ethernet cable.

a. Locate the customer-supplied Ethernet cable.

b. Route the Ethernet cable through the tailgate and up to the rear of the management console server.

c. Connect the cable to the customer Ethernet port (eth2) on the management console server. Refer to Figure 51 (X335 server) or Figure 52 (X336 server).

> **Note:** If the customer requests the Media Access Control (MAC) address of the HMC port they will connect to, refer to *MAP6010 Displaying the HMC MAC address for the customer connection.*
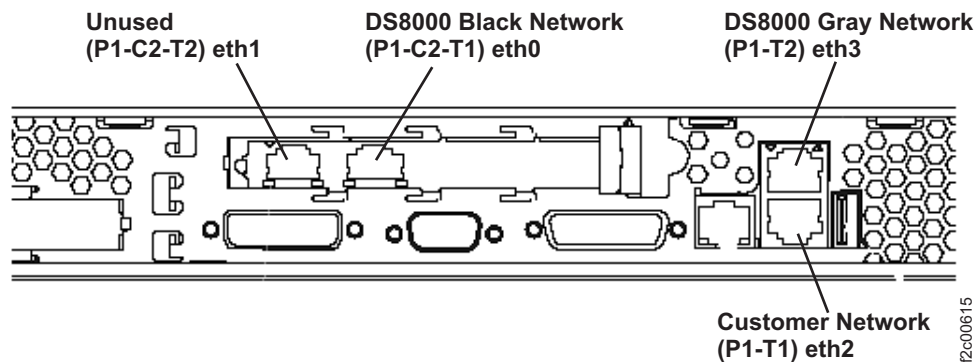
Figure 51. Ethernet connectors on the rear of the X335 management console server
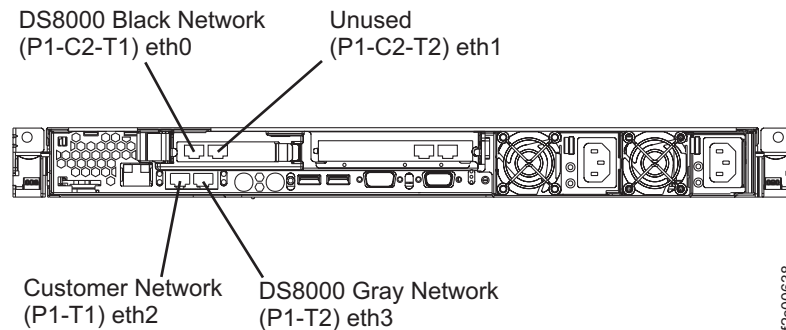
Figure 52. Ethernet connectors on the rear of the X336 management console server

15. Route and connect the customer's phone line cable by performing the following steps:

a. Locate the customer's phone line cable.

b. Plug the customer's phone line cable into the line connector on the modem card at the rear of the management console server. See Figure 53 on page 59 (X335 server) or Figure 54 on page 59 (X336 server).

c. Route the customer's phone line cable through the storage facility tailgate.

d. Plug the other end of the telephone cable into the customer's telephone line connector.

Modem-RJ-11
Line Connector
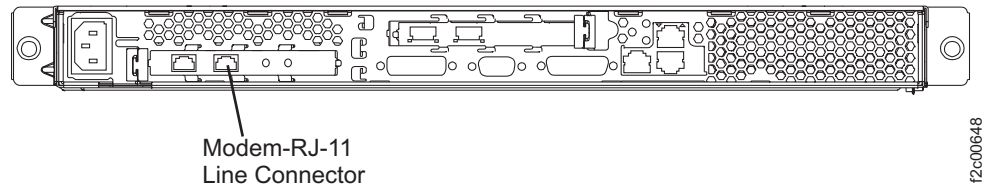
Figure 53. The modem connector (RJ-11 phone line) on the rear of the X335 management console server

Customer phone line,
modem RJ-11 Connector
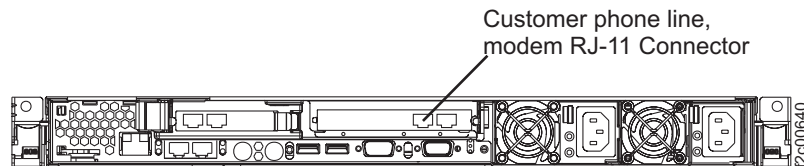
Figure 54. The modem connector (RJ-11 phone line) on the rear of the X336 management console server

16. Continue with "Powering on and verifying the storage facility" on page 66.

Configuring the management console in rack 1 as the secondary management console

Perform the following steps to configure a secondary management console (MC 2) in rack 1.

Attention: This section is used when adding a storage facility containing a management console to an **existing** storage plex. The management console will be configured as the secondary management console **before** connecting it to the DS8000 private network.

1. Check the HMC TCP/IP address selected on the customization worksheets provided by the customer. This is the address to be assigned to the HMC network port (eth2) for connection to the customer network. Is the address in either of the following ranges?

   172.16.0.0 - 172.16.255.255 or 172.17.0.0 - 172.17.255.255

   • No, go to step 3.
   • Yes, go to step 2.

2. There is the potential of an address conflict between the customer networks and the DS8000 private networks. Call the next level of support. The next level of support will need to assist you in converting the private network (gray and black) address ranges to one of the optional addresses that the customer has selected on the "Management console network settings work sheet". They will have a special procedure to allow this network address conversion to occur during an install.

   Refer to MAP7005 Determining which private network address range is selected to ensure that the address range selected is the same as what is already in use for the primary management console (MC 1).

3. Observe the power LED on the front of the management console server. See Figure 55 on page 60 (X335 server) or Figure 56 on page 60 (X336 server).

   Is the LED indicator off?

   • Yes, go to MAP6520 Management console power problem.
   • No, go to the next step.
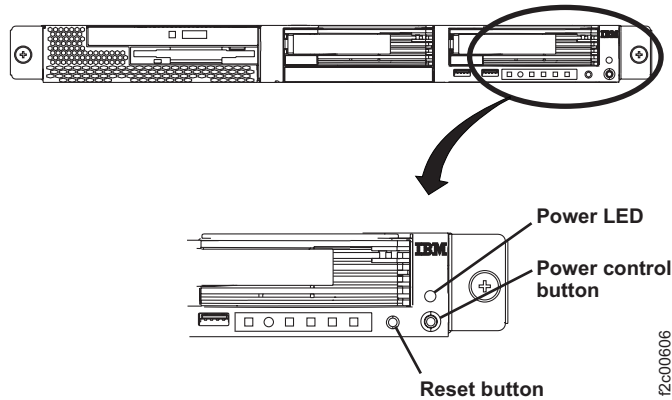
Figure 55. X335 management console server (front view)
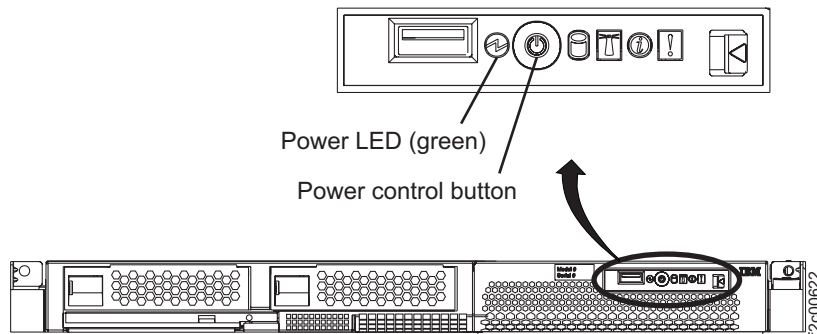
Figure 56. X336 management console server (front view)

4. Is the power LED indicator flashing?

   - Yes, push in the Power control button and then continue with the next step.
   - No, continue with the next step.

5. Slide the management console keyboard and display drawer out to the service position and raise the display panel. If necessary, press the power on button to turn on the display. Wait up to **5** minutes for the HMC ROLE SELECTION MENU to be displayed. For example:

```
****************************************************
*                 WELCOME TO THE                   *
*            HMC ROLE SELECTION MENU               *
****************************************************

ENTER A MENU OPTION FROM THE LIST
1)   ASSIGN HMC AS PRIMARY
2)   ASSIGN HMC AS SECONDARY
99)  EXIT

ENTER YOUR SELECTION AND HIT THE "ENTER" KEY
-->  __
```

Is the HMC ROLE SELECTION MENU displayed?

   - Yes, continue with the next step.
   - No, this indicates that either the HMC Role has already been assigned (HMC login screen is displayed) or that the

   Important: To reset all the HMC code objects to prepare for the installation, the HMC role must transition from *Primary* to *Secondary* or

– If the management console login screen is displayed, then go to MAP6090 HMC Role selection not displayed as expected. Return here and continue with step 6 when you correct the problem.

– If the management console login screen is not displayed, go to *MAP6020 Management console problem determination*.

6. Assign this management console as the secondary management console (MC 2) by performing the following steps:

   a. Type 2 and press **Enter**.

   b. Type Yes and press **Enter** to confirm the selection.

   c. Locate the MC 2 label in the ship group. Attach the label to the front of the management console keyboard tray.

7. When the keyboard layout configuration screen is displayed (as shown below), type 2 and press **Enter**.

```
If you are using a non English US keyboard, you can choose to change your
keyboard layout configuration.  You can make your selection by pressing a number
key then press enter.  If you don't press any key within 30 seconds, this
program will terminate automatically.

1 -- Do not change keyboard layout and run this program again on the next
        system boot.
2 -- Do not change keyboard layout and do not run this program again on
        the next system boot.
3 -- Change to a new keyboard layout.

Your selection is:
```

8. Wait up to 5 minutes for the HMC configuration to be updated, and the HMC login screen to display. Is the management console login screen displayed?

   • Yes, continue with the next step.

   • No, go to *MAP6020 Management console problem determination*.

9. The management console is shipped with predefined user IDs and passwords. The user IDs and passwords are case-sensitive. Enter the user ID and password as shown below.

   ID: CE
   Password: serv1cece

10. Ensure the code LIC level of the new management console code (MC 2) is compatible with the LIC level of the existing management console (MC 1). Normally they must be at the same level. Contact your next level of support if they are not.

    a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

    b. Open **Licensed Internal Code Maintenance → HMC Code Update**.

    c. In the right content area, the Status section displays the HMC LIC levels.

11. Use the customization worksheets provided by the customer to perform the management console customization tasks in Table 18 on page 62. Additional guidance is available through the *IBM System Storage DS8000 Introduction and Planning Guide*.

    To access the management console navigation item listed in the second column of Table 18 on page 62, do the following:

    a. In the HMC Navigation area, open the **Management Environment**, select and open the HMC.

b. Open **HMC Management** → **HMC Configuration**, in the right content area, select the desired HMC configuration option.

Table 18. Management console customization tasks

You are here to set the following HMC option:	HMC Configuration Option	Notes
HMC Network Settings	Customize Network Setting	1. Set the Console Name, Domain Name and description per the worksheets. 2. Click on the LAN adapters Tab, select eth2, click on details and set up the customer network connection. 3. Click on the Name Services Tab and configure the customer's DNS (if required). 4. Click on Routing Tab and configure the customers Gateway (if required). Set the Gateway Device to **eth2**. 5. Perform a quality check of all the entered data. 6. Press **Apply**.
Console Date / Time and Timezone	Customize Console Date and Time	1. Set the date and time to the local time. 2. Choose a location that has the same time zone and daylight savings settings as the storage facility location. **Note:** The date, time, and time zone that you select will be used later by an automated process to update those settings in the storage facility. Ensure that you set this accurately. 3. Click **OK** on the Reboot warning panel, but do not reboot at this time.

12. Logoff and reboot the management console by performing the following steps:
    a. From the task bar, click on **Console**.
    b. Select **Exit**, and then click **Exit now**.
    c. From the selection box, select **Reboot Console**.
    d. Click **OK**.
13. Route and connect the customer Ethernet cable.
    a. Locate the customer-supplied Ethernet cable.
    b. Route the Ethernet cable through the tailgate and up to the rear of the management console server.
    c. Connect the cable to the customer Ethernet port (eth2) on the management console server.

    Note: If the customer requests the Media Access Control (MAC) address of the HMC port they will connect to, refer to *MAP6010 Displaying the HMC MAC address for the customer connection*.

Unused (P1-C2-T2) eth1
DS8000 Black Network (P1-C2-T1) eth0
DS8000 Gray Network (P1-T2) eth3
Customer Network (P1-T1) eth2
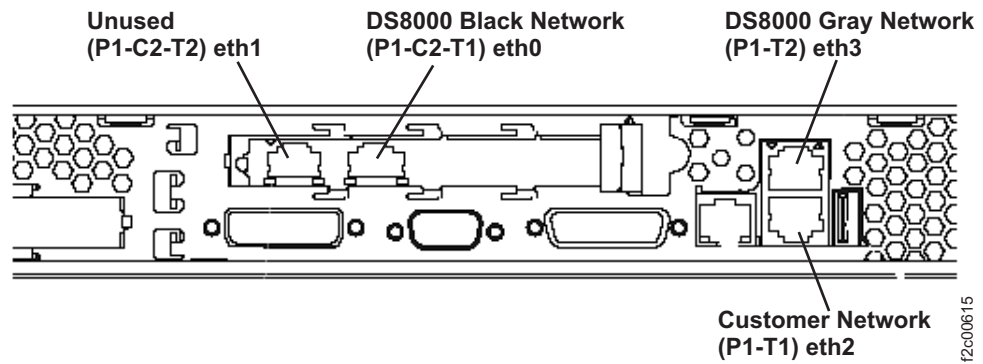
Figure 57. Ethernet connectors on the rear of the X335 management console server

DS8000 Black Network (P1-C2-T1) eth0
Unused (P1-C2-T2) eth1
Customer Network (P1-T1) eth2
DS8000 Gray Network (P1-T2) eth3
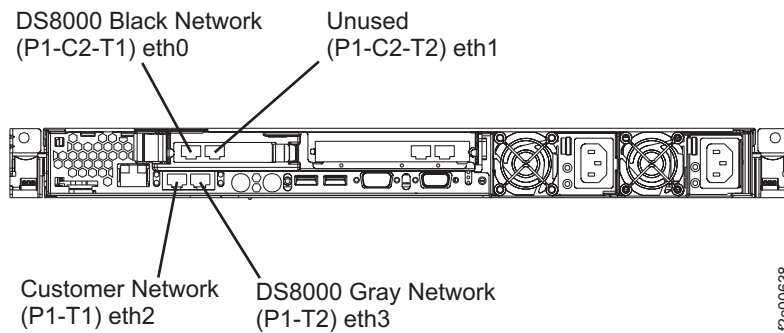
Figure 58. Ethernet connectors on the rear of the X336 management console server

14. Route and connect the customer's phone line cable.

   a. Locate the customer's phone line cable.

   b. Connect the customer's phone line cable to the line connector on the modem card at the rear of the management console server. See Figure 59 (X335 server) or Figure 60 on page 64 (X336 server).

   c. Route the customer's phone line cable through the storage facility tailgate.

   d. Plug the other end of the customer's phone line cable into the customer's telephone line connector.

Modem-RJ-11 Line Connector
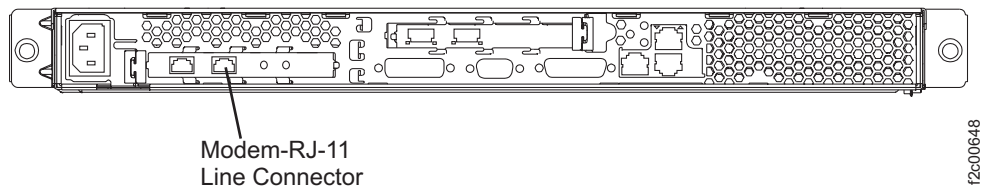
Figure 59. The modem connector (RJ-11 phone line) on the rear of the X335 management console server

Customer phone line,
modem RJ-11 Connector
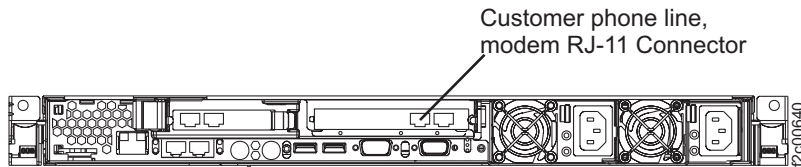
Figure 60. The modem connector (RJ-11 phone line) on the rear of the X336 management console server

15. Wait for the management console logon panel to appear and then continue with "Connecting a new storage facility to an existing storage plex."

Connecting a new storage facility to an existing storage plex

DANGER

> **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (D004)**

This section provides the additional steps to connect a new storage facility to an existing storage plex.

Attention: If you will be installing more than one new storage facility to an existing storage plex, completely install one storage facility at a time.

1. This step is a reminder to ensure the code level of the existing storage plex and management consoles are already at a compatible level or same level as the new storage facility code levels.

2. Ensure the code level of the existing storage plex and management consoles are already at a compatible level or same level as the new storage facility code levels.

   Note: Do not intermix the following bundles within a storage plex without the approval of next level of support.
   - bundle 6.1.6xx.xx or prior
   - bundle 6.2.0xx.xx or later

3. Read the following information before going to the next step.
   a. You will be routing and connecting two Ethernet cables from the Ethernet switches in the new storage facility (SF) to the Ethernet switches in the first SF (SF1) in the existing storage complex.
   b. The SF number of the new storage facility is set by the Ethernet switch port it is connected to in the existing SF1. This is to facilitate private network isolation procedures that assume the connections to be in a particular sequence. All Ethernet switch ports have equal function.
   c. The first SF in a storage complex is always SF1 and its Ethernet cables are connected to its Ethernet switches port T-1.
   d. Additional SFs being installed must be connected in the sequence shown in Table 19 on page 65.

e. Removing an SF from an existing storage plex may leave a gap in the storage facility number sequence. This is acceptable. (Example: The storage plex had 3 SFs; SF1, SF2, and SF3. SF2 was removed leaving only SF1 and SF3.)

f. A new SF must be connected to the lowest SF number port available. In the example above, a new SF would be connected to the T15 port to become SF2. This would fill in the gap and once again you would have SF1, SF2 and SF3. The next SF connected to the T13 port would become SF4.

Table 19. Storage Facility Number connection sequence

Sequence	Storage Facility Number	Ethernet Switch Connector Port
1	SF1	T1
2	SF2	T15
3	SF3	T14
4	SF4	T13
5	SF5	T12
6	SF6	T11
7	SF7	T10
8	SF8	T9
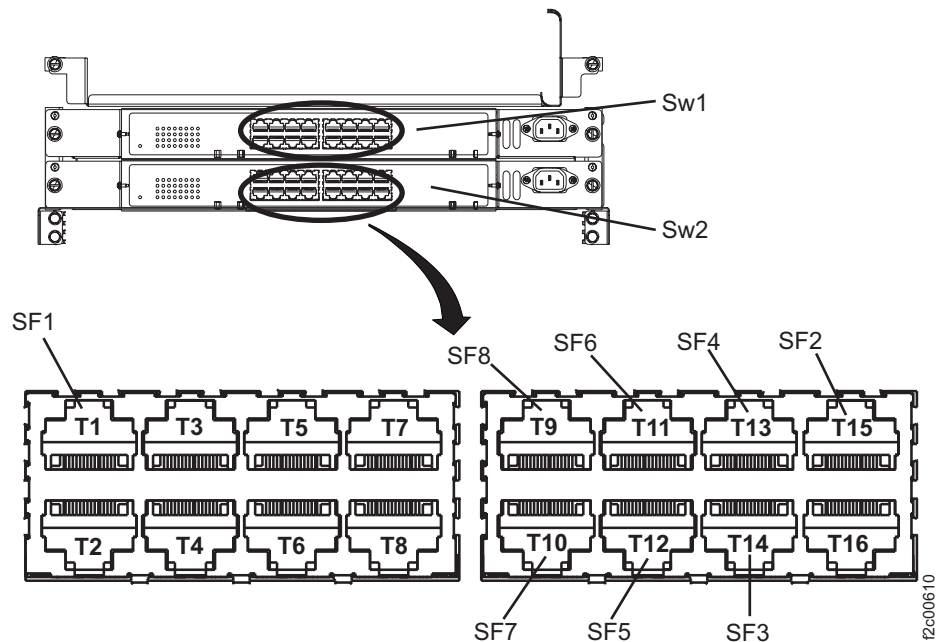
Figure 61. Ethernet switch port designations (SW1 & SW2)

4. Label, route, and connect the 31 meter long *black* Ethernet cable from the ship group.

   Note: All existing cables connected to these two Ethernet switches should be black.

Table 20. Routing Ethernet cables, switch 1

From new storage facility	To first SF in existing storage complex
Ethernet switch SW1 (upper) Port T16	Ethernet switch SW1 (upper) Port T*xx* (*xx*=first free port in sequence, see Table 19 on page 65.)

5. Label, route, and connect the 31 meter long *gray* Ethernet cable from the ship group.

   Note: All existing cables connected to these two Ethernet switches should be gray.

Table 21. Routing Ethernet cables, switch 2

From new storage facility	To first SF in existing storage complex
Ethernet switch SW2 (lower) Port T16	Ethernet switch SW2 (upper) Port T*xx* (*xx*=first free port in sequence, see Table 19 on page 65.)

6. Continue with "Powering on and verifying the storage facility."

Powering on and verifying the storage facility

DANGER

> **The DS8000 will be powered on automatically during this procedure. Hazardous voltages will be present. Ensure that all safety covers are in place and that normal safety precautions are taken.**

1. Record the date and time as follows:
   a. Record the *stop* date and time for the HMC Initial Configuration phase in Table 3 on page 3, "Recording information for the installation report" on page 2.
   b. Record the *start* date and time for the Storage Facility Bring-up phase in Table 3 on page 3, "Recording information for the installation report" on page 2.
2. On Rack-1 set the Local/Remote switch **1** on the LR/ZLR card to Remote (up ↑ position).
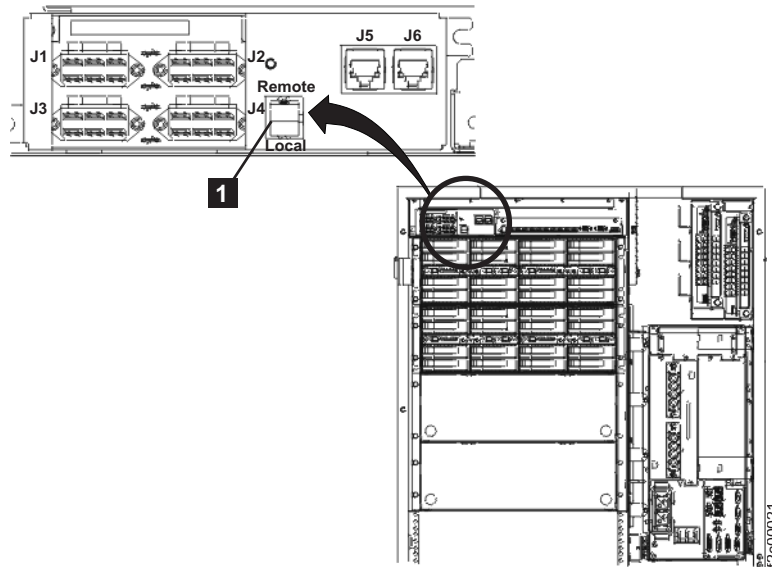
Figure 62. LR, ZLR card location

3. If you are adding a new Storage Facility to an existing Storage Complex, then ensure that the Ethernet cables have been installed and connected to the Storage Facility that contains primary management console (MC 1).

   Note: If you are installing a storage facility containing a secondary management console, then do not reconnect the secondary management console cables until instructed to do so in a later section.

4. Power on and verification of the new storage facility must be performed from the primary management console (MC 1). If not done previously, slide the keyboard/display drawer out to the service position and raise the panel display. If not done previously, log on to the management console. The CE user ID and password are as follows: If not done previously, log on to the management console. The CE user ID and password are as follows:

   ID: CE
   Password: serv1cece

   Note: If the management console panel is not functioning correctly, go to MAP6020 Management console problem determination.

5. Display the storage facility Install State.
   a. Log into the management console (HMC) for rack 1.
   b. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).
   c. Open **Service Applications** → **Service Focal Point**.
   d. In the right content area, select **Install/Add/Remove Hardware**. A window displays a list of storage facilities.
   e. Observe the displayed Install State for the storage facility being installed.

6. Is the Machine Type and Serial Number for the storage facility being installed listed on the panel as "Ready for Install" or "New"?
   • Yes, select the storage facility to be installed. Go to the next step.
   • No, go to step 1 of MAP1400 HMC is reporting an installation error prior to serviceable events being created.

7. Click on **Selected**, and then from the drop-down select **Storage Facility Field Install**.

8. Follow the on-screen instructions to perform the following tasks:

   a. The certify DDM process must be performed for all installations.

      Note: Record the start date and time for the Monitor Certify DDM phase in Table 4 on page 3, in section "Recording information for the installation report" on page 2.

   b. Confirm if a call home is required on completion of the certify DDM phase. If you will leave the customer site before the certify DDM completes, a call home is required so the customer can be notified by the next level of support that the storage facility is ready for use. If you will stay onsite until the certify DDM is complete and you will notify the customer, then the call home is not required.

   c. If prompted, install the storage facility configuration CD into the HMC CD/DVD-RAM drive. The CD/DVD is included in the ship group.

      Note: The CD should be in the CE envelope. If it is not in the envelope, check the customer envelope and the shipping material for the rack.

9. The on screen message will indicate that the Storage Facility Field Install process will now start. This action may take up to 1.5 hours to complete.

   Note: If errors occur during the automated installation process, on-screen messages will direct you to "MAP1400 Repair a problem found during install storage facility process". Use the guidance in that MAP to resolve the problem and then restart the installation process. To display the MAP, open the service Information Center on the management console, then open the **Isolation MAPs and Symbolic FRU procedures** section to locate the MAP.

10. While the Storage Facility Field Install process is in progress, you should perform two separate install processes in parallel to minimize the installation time. Use Table 22 and Table 23 on page 69 to perform **Install Process A** and **Install Process B** at the same time.

Table 22. Install Process A

Install Process A	
A1	**Do not** log off or reboot the management console.
A2	Check the WebSM GUI every 10 minutes and respond to any pop-up messages from the Installation process that may appear. If an error is detected, follow the on-screen directions to go to MAP1400 HMC is reporting an installation error prior to serviceable events being created to repair the problem and restart.
A3	A message will display that indicates Field Installation Verification for the Storage Facility has completed. You may be asked to check if any problems were logged. Read the on-screen instructions carefully, **keep the message box open** and **do not reply to the message until after you have checked for problems**.
A4	A message will display that indicates Certify DDM has started. Continue with the remaining actions in this installation section.

Table 23. Install Process B

Install Process B	
B1	Do one of the following: • If you are installing a storage facility that contains an integrated management console, then continue with "Completing the management console customization and configuration." • If you are installing a storage facility which does not contain an integrated management console then continue with "Completing the install" on page 76.

Completing the management console customization and testing communications

Use the following sections to complete the customization of the management console. If you installed a storage facility that contains a management console, you can use this section to test management console communications.

Completing the management console customization and configuration

Perform these steps if you installed a storage facility that contains a management console. Otherwise, go to "Completing the install" on page 76.

1. Record the date and time for the following:
   a. Record the *stop* date and time for the <u>Storage Facility Bring-up</u> phase in Table 3 on page 3, "Recording information for the installation report" on page 2.
   b. Record the *start* date and time for the <u>HMC Initial Configuration</u> phase in Table 3 on page 3, "Recording information for the installation report" on page 2.
2. Are you installing a storage facility containing a secondary management console?
   • Yes, continue with the next step.
   • No, continue with step 5.
3. Locate the management console cables that were previously disconnected. Relabel and reconnect them to the SW1-T2 and SW2-T2 positions as follows:
   a. Relabel the Ethernet cable previously removed from SW1-T1 to SW1-T2 and plug it into the Ethernet cables in SW1-T2.
   b. Relabel the Ethernet cable previously removed from SW2-T1 to SW2-T2 and plug it into the Ethernet cables in SW2-T2.
4. Press the power control button to power on the management console.
5. Wait for the HMC logon panel to appear and then logon with user ID `CE` and password `serv1cece`.
6. Set the HMC remote support options using the customer work sheets.

   To access the management console navigation item listed in the second column of Table 24 on page 70, do the following:
   a. In the HMC Navigation Area, open the **Management Environment**, select and open the HMC.
   b. Open **Service Applications** → **Remote Support**, in the right content area, select the desired HMC Remote Support options.

Note: Additional guidance is available through the on-line Help button and the
IBM System Storage DS8000 Introduction and Planning Guide.

Table 24. Management console customization tasks for remote support

Task	Management console navigation option	Customer Work Sheet	Done
Customer information	**Customize Customer Information**	Company information work sheet.	
Outbound connectivity	**Customize Outbound Connectivity →** **Local Modem** **Note:** To set the Dial prefix, click the **Modem configuration** button.	Company Information work sheet and Outbound (call home) work sheet.	
Outbound connectivity See Note 1 for new VPN information to support existing customization work sheets.	**Customize Outbound Connectivity →** **Internet VPN**	Outbound (call home) work sheet	
Outbound connectivity	**Customize Outbound Connectivity →** **Pass Through**	Management console network settings work sheet	
Inbound Connectivity	**Customize Inbound Connectivity**	Inbound (remote services) work sheet	
Note 1: The following is new information that may not be in the version of the customization work sheet provided by the customer. • Selecting "By VPN" means that the customer allows the management console (MC) to use VPN over an internet connection when a connection is established to the IBM service center. IBM's VPN implementation is a client/server VPN. The two VPN endpoints are on the MC and on the IBM Boulder/Rochester VPN server. There is no need for additional VPN hardware in the customer network infrastructure. • If you use VPN, the management console (MC) must have access through your internet firewall to the following: IBM Boulder VPN server, IP address 207.25.252.196 IBM Rochester VPN server, IP address 129.42.160.16 IBM Boulder test VPN server no longer used • If VPN connectivity is not an option, FTP can be configured for faster offload of log and trace data. • Even if VPN is configured the modem can serve as a backup. If configured it also allows IBM support personnel to remotely access the MC without a person on-site having to initiate a connection. • General information: The remote support work sheets enable you to specify whether you want outbound (call home) or inbound (remote services) remote support. IBM recommends that you enable both outbound and inbound support to help you maintain the highest availability of your data. When you enable outbound (call home) support, your management console sends an electronic call home record to IBM support when there is a problem within the storage complex. In the header of each call-home record, a callback password appears. If inbound remote services is also enabled, this password enables IBM service representatives to remotely sign on to the management console in response to the service call. If outbound support is enabled, but inbound remote services is not enabled, the IBM service representative must physically come out to your location to troubleshoot and service the storage complex. When inbound remote services are enabled, service representatives can perform service tasks remotely. They can view error logs and problem logs, and initiate trace or dump retrievals.			

      7. Set HMC service agent options using the customer work sheets.

         To access the management console navigation item listed in the second column of Table 24, do the following:

         a. In the HMC Navigation area, open the **Management Environment**, select and open the HMC.

b. Open **Service Applications** → **Service Agent**, in the right content area, select the desired HMC Service Agent options.

Note: Additional guidance is available through the on-line Help button and the *IBM System Storage DS8000 Introduction and Planning Guide*.

Table 25. Management console customization tasks for Service Agent

Task	Management console navigation option	Customer Work Sheet	Done
MRPD settings FOR MC 1 ONLY! See **Note 1**	**Transmit Service Information** → **Transmit** • Click **Schedule when to transmit the service information** • Set the Frequency to 14 (days) • Set the Time when the storage facility will be powered on.	Not used.	
FTP settings	**Transmit Service Information** → **FTP** **Note:** This is only required if the customer has chosen to allow dumps and traces to be sent by FTP. • Leave the default settings for the FTP server. • If required, enter the customer firewall information. • Check 'Enable FTP offload of service information'.	Outbound (call home) work sheet.	
Customer e-mail notification	**Service Agent** → **Customer notification**	E-mail notification work sheet.	
SNMP alert	**Service Agent** → **Customer notification**	SNMP trap notification work sheet.	
Note 1: If you have a primary HMC (MC 1) and secondary (MC 2) management console, only set MC 1 to send MRPD data.			

8. If displayed, remove the default HMC hostname object (localhost.localdomain) from the HMC Navigation Area.

The figure that follows shows an example of two managed HMC names in the Management Environment after installation.
localhost.localdomain is the default HMC name at the beginning of the installation. This example shows ras88hmca.storage.sanjose.ibm.com as the HMC hostname set during installation by using the customer configuration work sheets.

Figure 63. Examples of HMCs in management environment

   a. At the top of the screen, click on **Console** → **Remove** → **Hosts**.

   b. A pop-up window should list the `localhost.localdomain`.
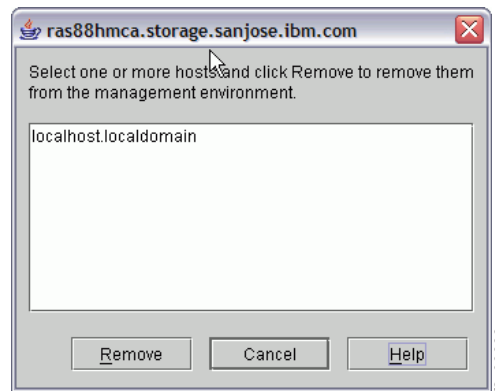
   c. Select localhost.localdomain and click **Remove**.

   d. Observe the HMC Navigation Area and ensure any other installed HMCs are still listed.

9. Continue with "Testing management console communications."

Testing management console communications

Perform these steps if you installed a storage facility that contains a management console. Otherwise, continue with "Completing the install" on page 76.

1. Are you installing a storage facility that contains a management console?
   - Yes, go to step 2.
   - No, continue with "Completing the install" on page 76.
2. Test the service communication methods.

Table 26. Tests for management console communications

Communication method	How to test
Remote support - Modem	Select **Service Applications** → **Remote Support** → **Customize Outbound Connectivity** → **Local Modem** → **Test**

Table 26. Tests for management console communications (continued)

Communication method	How to test
Remote support - VPN	Select **Service Applications** → **Remote Support** → **Customize Outbound Connectivity** → **Internet VPN** → **Test** If the test fails, go to MAP1301 Isolating Call Home/remote services failure. **Note:** If this test identifies incorrect network settings that require a management console reboot, do not reboot until the storage facility verification and DDM certification has completed.
Call Home	1. Select **Service Application** → **Service Focal Point** → **Service Utilities**. 2. Click on the storage facility that you are installing. 3. From the **Selected** drop down, click on **Test problem notification (PMH, SNMP, Email)**. 4. Ask the support center to verify that a test PMH was created on Retain. **Note:** You have previously verified that this storage facility is registered in Retain earlier in this installation. If the test fails, go to MAP1301 Isolating Call Home/remote services failure.
Remote Access **Note:** Follow your geographical guidelines to determine if this test is needed.	1. Select **Service Applications** → **Remote Support** → **Customize Inbound Connectivity**. 2. For Unattended Session, put a check for **Allow unattended sessions**. 3. For Duration, select **Temporary**, then click **OK**. 4. Ask the support center to test remote access. 5. After the test is complete, restore the Inbound Connectivity settings to the customer choice on the worksheets.

3. Test the customer communication methods.

Communication method	How to test
Customer e-mail notification	Select **Service Applications** → **Service Agent** → **Customer notification** → **Test e-mail**. Ask the customer if the e-mail was received. **Note:** If the test fails, go to MAP1310 Isolating e-mail notification problems.
Customer connection to DS8000 Storage Manager server in the management console	Ask the customer to test the access of the application or method that they will use to connect to the DS8000 Storage Manager in the management console. For information on testing the connection, see *IBM System Storage DS8000 User's Guide* included on the service and customer documentation CDROM. **Note:** If the test fails, go to MAP1301 Isolating Call Home/remote services failure.

4. Only perform this step if this storage facility is at code bundle 6.1.600.41 (October 2005 release) or higher.
   Set the management console heartbeat options (frequency and enable/disable):

   a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

b. Open **Service Applications** → **Service Focal Point**.

c. In the right content area, select **Service Utilities**. A window lists the storage facilities that are managed by this HMC.

d. Select the storage facility, click Selected (on top tool bar), and then select **Get HMCs**. A window lists the HMCs.

e. Select the HMC, click Selected (on top tool bar), and then select **View/Change Heartbeat Configuration**.

f. Select the frequency of the heartbeat (7 days is recommended).

g. Click **Schedule Heartbeat**. The window will refresh and display the current settings.

h. Click **Send Heartbeat Now** to send the first heartbeat.

Note: The management console heartbeat function verifies that the HMC continues to be available for call home and remote service. It will use the VPN connection if configured, or the modem if VPN is not configured. The service representative sets the frequency (1, 7, 14, or 28 days) selected by the customer. The recommended setting is 7 days. The heartbeat function uses the HMC to create a serviceable event (SE) with SRC BEF00012. The SE contains the frequency setting, and is sent to IBM with the normal SE call home function. If IBM does not receive these SEs at the recommended frequency, a service action to determine the cause can be initiated by next level of support.

5. Do you have an external management console to be installed?

- Yes, continue with Chapter 2, "Installing an external management console," on page 89 and then return here and continue. **Note:** If two service representatives are servicing the machine, one can perform this procedure while the other performs the procedure in the next step.

- No, go to the next step.

6. Continue with "Routing and connecting customer cables to the storage facility" on page 76.

Creating, sending, and verifying the management console public key-file

The management console public key file must be uploaded to IBM to allow the next level of support to access the management console remotely.

1. Create and send the management console public key-file by completing the following:

a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

b. Open **Service Applications** → **Service Focal Point**.

c. In the right content area, select **Service Utilities**.

d. Select the storage facility. Click **Selected** (on top tool bar), and then select **Get HMCs**.

e. Select the HMC. Click **Selected** (on top tool bar), and then select **Generate HMC Public Key**. Click **Yes** to confirm the action.

f. A serviceable event with SRC=BEF00010 should be created immediately.

2. Determine if a serviceable event with SRC=BEF00010 was created. Display open serviceable events as follows:

a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

b. Open **Service Applications** → **Service Focal Point**.

   c. In the right content area, select **Manage Serviceable Events**. A window displays a list of selection criteria.

   d. In the Error criteria section, click the down arrow for the reference code (SRC) criteria and look for BEF00010. The reference code is listed only if the serviceable event was created.

   Is the reference code BEF00010 listed?

   - Yes, select the BEF00010 reference code and click **OK** to display the serviceable event overview, then continue at the next step.

   - No, repeat step 1 on page 74 and if a serviceable event is still not created, call the next level of support.

3. Verify that the HMC public key was successfully delivered to the Retain system server.

   a. From the Serviceable Event Overview window, select the Problem #, click **Selected** (from the top tool bar), and then select **View Details**.

   b. In the Field Name column of the serviceable events details, scroll to the Data (EED) Offload status field. Read the text message to the right of this field. Select one of the following that applies:

   - Message includes the text "successfully transmitted problem information or SUBMITTED SUCCESSFULLY", go to step 6.

   - Message indicates Unavailable, go to step 4.

4. It can take up to one hour for the serviceable event to be called home and then stored away successfully. The serviceable event Data (EED) Offload Status field will be automatically updated when the process is complete. Redisplay the serviceable event details looking for a status of good. Are you running a level of code released prior to October 2005 (Bundle 6.1.600.41)?

   - Yes, go to step 5.

   - No, go to step 6.

5. The call home may have been successful, but the EED field may not be displaying the correct status. You can use the following alternate procedure to check the status:

   a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

   b. Open **HMC Management** → **HMC Configuration**.

   c. In the right content area, select **View Console Events**. A window opens that displays a list of console events.

   d. The View Console Events window displays event log text messages.

   e. Look for a Console Event log with text similar to:

   ```
   Successfully transmitted problem information:
    EED: /extra/data/vr/23/23.zip
   Reporting system:
    rashmc33a Machine type-model/serial: 2107-922/1300310 Problem..."
   ```

   Is the above console message log text listed?

   - Yes, the call home was successful, return to the procedure that sent you here.

   - No, the call home has not occurred yet, go to step 6.

6. You can continue other service activities now, but before you leave the customer account you must ensure the call home of the public key is successful. If it is not successful, remote support will not be possible.

> **Note:** If the management console call home tests in the prior section did not complete successfully, manually offload the public key file to a laptop directly connected to the private network and then upload it to IBM. Refer to the article "Retrieving the WebSM Public Key locally" on the DS8000 - Engineering Web site.

Completing the install

Use the information in the following sections to complete the installation.

Routing and connecting customer cables to the storage facility

1. Record the date and time as follows:

   a. Record the *stop* date and time for the HMC Customization and Communication Tests phase in Table 3 on page 3, "Recording information for the installation report" on page 2.

   b. Record the *start* date and time for the End of Install and Clean-up phase in Table 3 on page 3, "Recording information for the installation report" on page 2.

2. Has the customer ordered the remote power control feature?

   - Yes, go to the next step.
   - No, go to step 6 on page 78.

3. Route the remote power control cables **1** from each host up through the tailgate to the ZLR remote power control card connectors **3**. Use hook and loop bands to fasten the cable to the frame **2**. See Figure 64 on page 77.
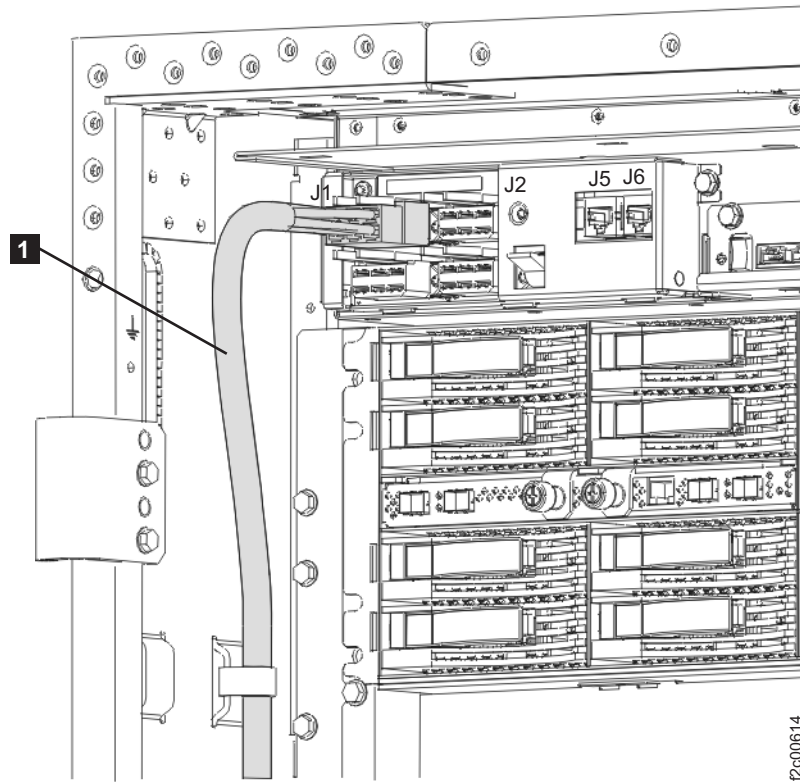
Figure 64. Remote power control cables from host to ZLR card

> **Attention:** The remote power control feature will be enabled in the next step. Remind your customers that they must test it.

4. Determine if the DS8000 Remote Mirroring, feature codes 1801, 1802, or 1803 are installed. These feature codes install a dual port Ethernet card for each storage facility image (SFI) in each CEC enclosure. The cards allow faster management of flash copy relationships. Does the rear of each CEC enclosure have a two-port Ethernet card in PCI slot 1 or 5?

   - Yes, go to step 5.
   - No, go to step 6 on page 78.

5. Do the following to set up for customer access:

   a. The customer must provide one Ethernet cable from their network that will be connected to the upper port of each dual port Ethernet Card in PCI slot 1 and 5.

   b. Route the customer Ethernet cables through the tailgate.

   c. Connect the cables only to the upper port on each card. The default network settings disable the port.

   d. After the storage facility installation is complete, the customer will use the DS Storage Manager GUI interface to set and enable the ports.

   e. If the customer encounters problems with setup or access, refer to MAP4770 Customer problem accessing Ethernet port for Flash Copy Establish feature.

Table 27. Ethernet card slot selection

CEC	Path or SFI	Slot
XC1	"B" or SFI-1	1 (XC1-P1-C1)
	"A" or SFI-2	5 (XC1-P1-C5)
XC2	"A" or SFI-2	1 (XC2-P1-C1)
	"B" or SFI-1	5 (XC2-P1-C5)

92x/93x Feature Code 1801
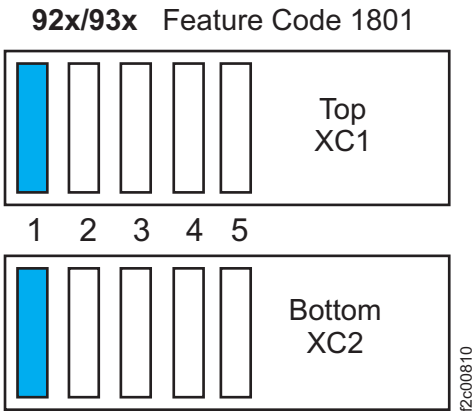
CEC enclosure rear views

Figure 65. Ethernet card pair on the rear of the CEC enclosures (FC1801)

9A2/9B2 Feature Code 1802   **9A2/9B2** Feature Code 1803

Storage image 2, LPAR 2 (Path A)   Storage image 1, LPAR 1 (Path B)
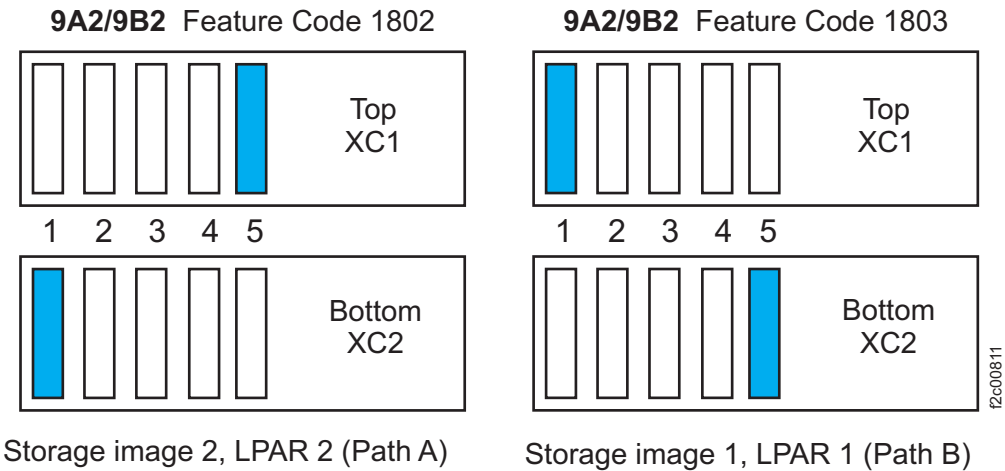
Figure 66. Ethernet card pairs on the rear of the CEC enclosures (FC1802 and FC1803)

6. Ask the customer to supply a diagram or output from the DS8000 Storage Manager to define the connectivity between the DS8000 host card ports and system host card ports.

7. Label the ESCON and fibre host cables from each customer host adapter.

8. Route the cables **1** to the rear of the appropriate DS8000 frame. See Figure 67 on page 79.

> **Note:** To allow correct connection and disconnection of external cables, label cables using the customer's current cable-identification plan and the labels provided by your customer.

9. In the tailgate, squeeze the black release levers **2** , pivot the retention bracket up and then remove it.
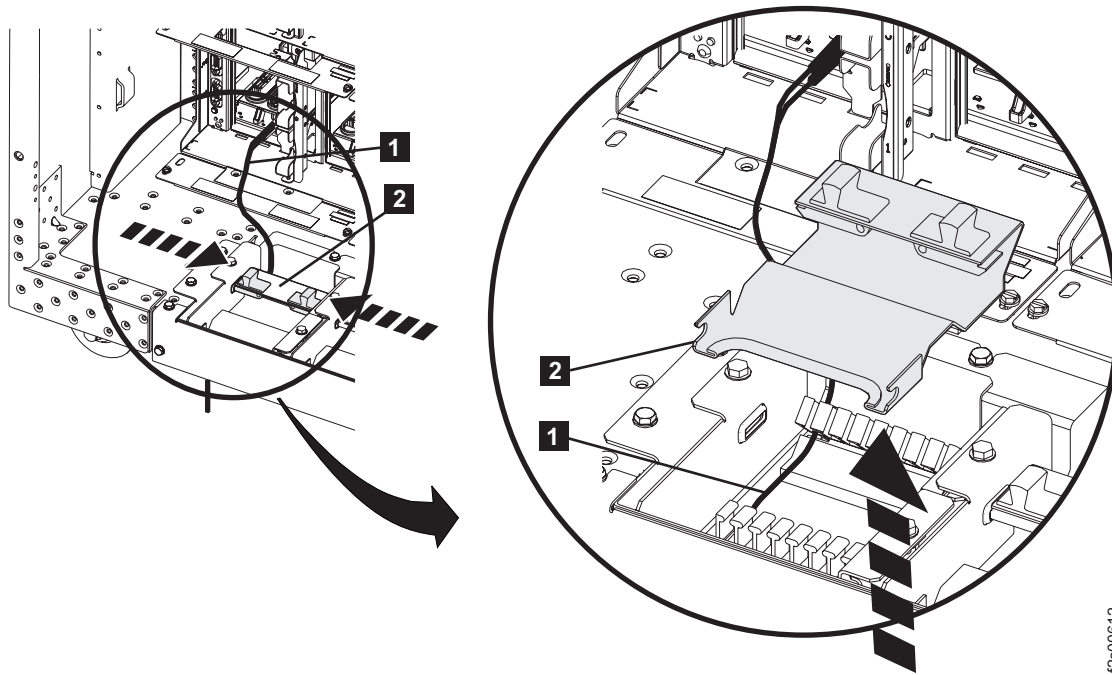
Figure 67. Tailgate cable and fibre channel cable retention

10. Identify the I/O enclosure that contains the host card and port to which the host cables from the host will be attached. See Figure 68.

Note: The syntax of the location code shown on the ICAT configuration tool might differ slightly from that shown in Figure 68. For the device adapter card connectors, the syntax might be R*x*-I*x*-C*x*-T*x* (the backplane identifier of P1 is missing and I*x* is equivalent to XI*x*).
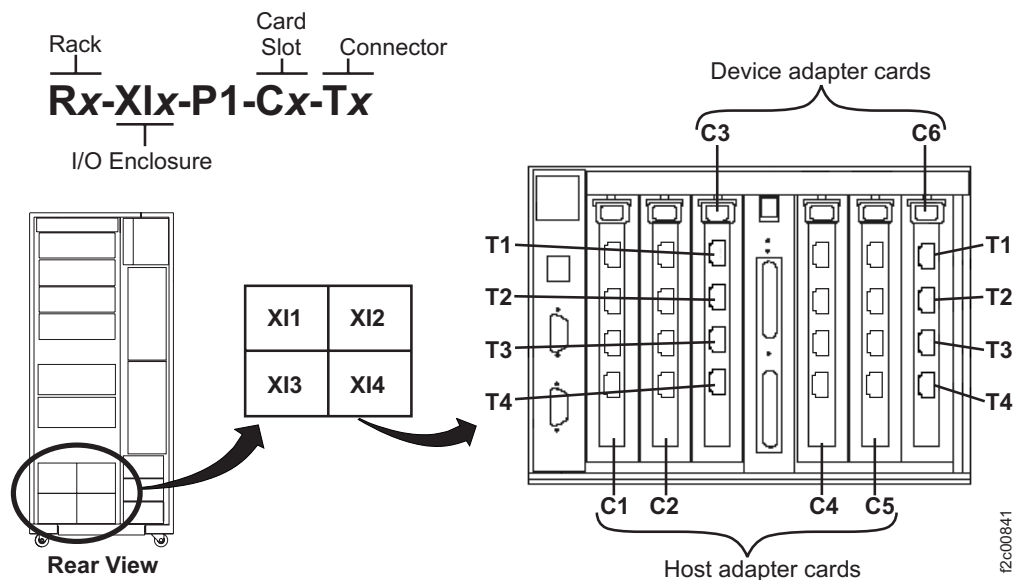
Figure 68. Location codes for device adapter and host adapter cards

11. Feed the host cables up through the tailgate and route them to the destination I/O enclosure and host card and plug them in.

   Notes:
   - Save the wrap tools removed from each Fibre or ESCON host card. The wrap tool can be used as a dust cover and also a wrap tool for diagnosis and repair.
   - There are two types of fibre channel cards:
     – Short wave
     – Long wave

12. Secure the host cables in the cable guide by pressing them into the slots.
13. Reinstall the retention bracket removed earlier.
14. Reinstall the tailgate brackets in all frames using the screws **2** removed earlier. Tighten all four screws **1** and **2** . See Figure 69
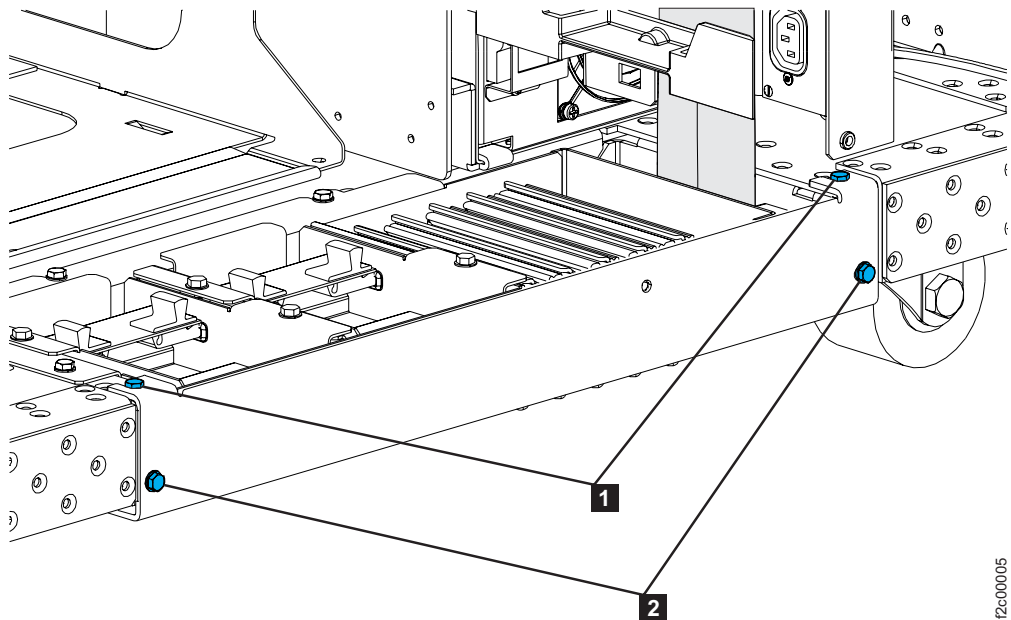
Figure 69. Tailgate frame bracket

Finish install and cleanup

1. Is there an external management console that is to be installed?
   - Yes, go to Chapter 2, "Installing an external management console," on page 89. Return here and continue with the next step when installation has been completed.
   - No, continue with the next step.
2. Set the storage facility rack power control mode that the customer has chosen on the configuration worksheet. For more information, see MAP2460 Configuring and overview of the DS8000 Power Control Mode.
   a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).
   b. Open **Service Applications** → **Service Focal Point**.
   c. In the right content area, select **Service Utilities**. A windows displays a list of Storage Facilities.

d. Select the Storage Facility that is being installed from the list. Click **Selected** from top tool bar, and then select **Manage Power Control**.

   e. Make the desired customer selections from the worksheets.

3. Verify the following Control Switch settings against the Customization Worksheets.

Table 28. Control switch settings

Control Switch Setting	Default Value
AS400 LUN Serial Suffix number	0
Fibre LUN Access Control	0 (Off)
CUIR support	0 (Off)

Do the control switch settings need to be changed from the default values shown?

- Yes, from the HMC GUI perform the following steps to alter the Control Switch Settings for each storage facility image that needs to be updated.

   a. In the HMC Navigation area, open **Management Environment**, select and open the HMC.

   b. Open **Service Applications** → **Service Focal Point**.

   c. In the right content area, select **Service Utilities**. A window displays a list of Storage Facilities.

   d. Select the Storage Facility that is being installed from the list. Click **Selected** from the top tool bar, and then select **Get Storage Facility Images**. A window displays a list of Storage Facility Images.

   e. Select the Storage Facility Image to be updated. Click **Selected** and choose Enable/Disable Control Switches.

   f. Update the values from the Customization Worksheets. Click **Set**, then **OK** in the message box, then **Cancel** to exit.

   g. Continue with the next step.

- No, continue with the next step.

4. Perform the following steps if you are installing a storage facility with a management console. Ensure the schedule to back up the HMC critical console data to DVD-RAM disc is set.

   Note: Microcode bundles at 6.2.xx.xx or later should preset the values to every Friday at 3:00:00 AM for an indefinite period of time.

   a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

   b. Open **HMC Management** → **HMC Configuration**.

   c. In the right content area, select **Schedule Operations**. A window displays a list.

   d. Select the management console that you want to back up and click **OK**.

   e. If the existing values are Friday, 3:00:00 AM, Indefinite, exit the screen and go to step 5 on page 82. If the existing values are not set, continue.

   f. Click **Options** from the top tool bar, and then select **New**.

   g. In the Add a Scheduled Operation window, select **Backup Critical Console Data** and click **OK**.

   h. In the appropriate fields, enter the time and date that you want this backup to occur.

    i. Click the **Repeat** tab and set the schedule to repeat with a 1 weekly interval with Infinite repetitions.

    j. When you are finished setting the backup time and date, click **Save**. When the Action Completed window opens, click **OK**.

5. Will you be installing additional racks, storage enclosures, or other hardware features to this storage facility as part of this installation activity?

   - Yes, the backup of critical console data will occur after all installation activity is complete. Go to step 9.
   - No, the backup of critical console data will occur now. Go to step 6.

6. Locate the critical console data back up DVD disc for each HMC on this storage plex. The DVD disc should be in the ship group during an installation or kept in the HMC DVD-RAM drive after installation.

   There are two versions of the DVD disc:

   - Newer version is labeled with the HMC machine type model S/N and also "HMC Critical Console Data Backup DVD, Keep in HMC DVD-RAM drive". If you have this version, go to 8.
   - Older version has no preprinted label, it should have the HMC machine type model S/N hand printed by the service representative. If you have this version, go to the next step.

7. Is the HMC machine type model and S/N printed on the DVD disc?

   - Yes, go to the next step.
   - No, hand print the HMC machine type model and S/N and "HMC Critical Console Data" on the DVD disc. For example: `HMC machine type model S/N: 8837-PLM 75KKTWT8R, HMC Critical Console Data`. Go to the next step.

8. Perform the following steps to back up critical console data on each HMC for this storage plex. Use the DVD disc with the HMC machine type model S/N for this HMC.

   a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

   b. Open **Licensed Internal Code Maintenance** → **HMC Code Update**.

   c. In the right content area, select **Back up Critical Console Data**.

   d. Select **Back up to DVD on local system** and click **Next**.

   e. Insert a formatted DVD-RAM media into the drive.

   f. Enter a description for the archive data.

   g. Click **OK** to store your critical console data on the DVD-RAM.

9. Place the following items in the front document enclosure for future reference:

   - Copies of the configuration worksheets
   - Spare ship group components
   - CD-ROMs
   - Spare labels
   - Cable planning worksheets
   - Host card wrap tools

10. Use the Network Topology Tool to verify connectivity with all nodes (Ethernet ports) on the DS8000 private network and then save the topology. The following lists examples of nodes.

    - Local HMC ports.
    - HMC ports on second HMC (if installed).

- Service processor card ports.
- LPAR (partition) ports on the CEC enclosure I/O backplane assembly or PCI Ethernet card.

Invoke the Network Topology tool as follows:

a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

b. Click **Service Applications** → **Service Focal Point**.

c. In the right content area, select **Service Utilities**, a window displays a list of storage facilities.

d. Select the storage facility, click **Selected** (on top tool bar), and then select **Get Storage Plex**. A window displays the storage plex.

e. Select the storage plex, click **Selected** (on top tool bar), and then select **View Network Topology**.

f. Wait several minutes for the tool to gather and present the results.

g. A window displays with the current network topology (port connections) listed on top, and the saved topology from the last time the tool was run and the Save button was selected. Normally the saved topology should be from results when all nodes on both private networks were fully present and operational.

   Note: The option to save the topology is used after all nodes on both private networks are determined to be present and operational.

h. Determine if all expected nodes are present. Refer to Figure 70 on page 84, Figure 71 on page 84, and the Notes list.

i. Are any nodes missing or failing?
   - Yes, go to MAP7000 Entry point for DS8000 private network problems in the DS8000 Service Information Center. To display the MAP, open the service Information Center on the management console (MC), then open the **Isolation MAPs and symbolic FRU procedures** section to locate the MAP.
   - No, go to step 11 on page 85

The left side of Figure 70 on page 84 shows an example of a 921 or 93x with a single management console. The right side shows an example of a 9A2 or 9B2 with two management consoles.
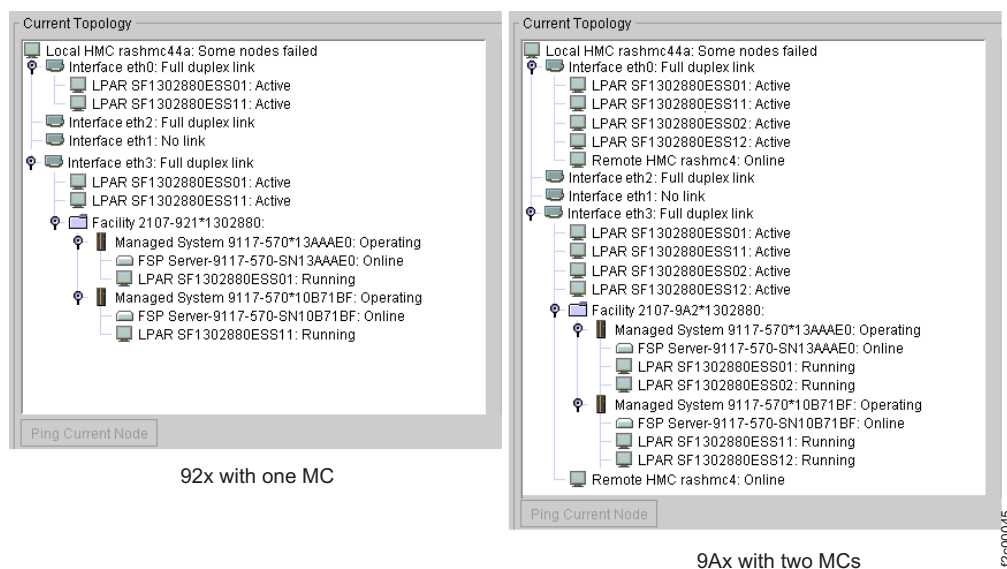
Figure 70. Two examples of the current topology screen
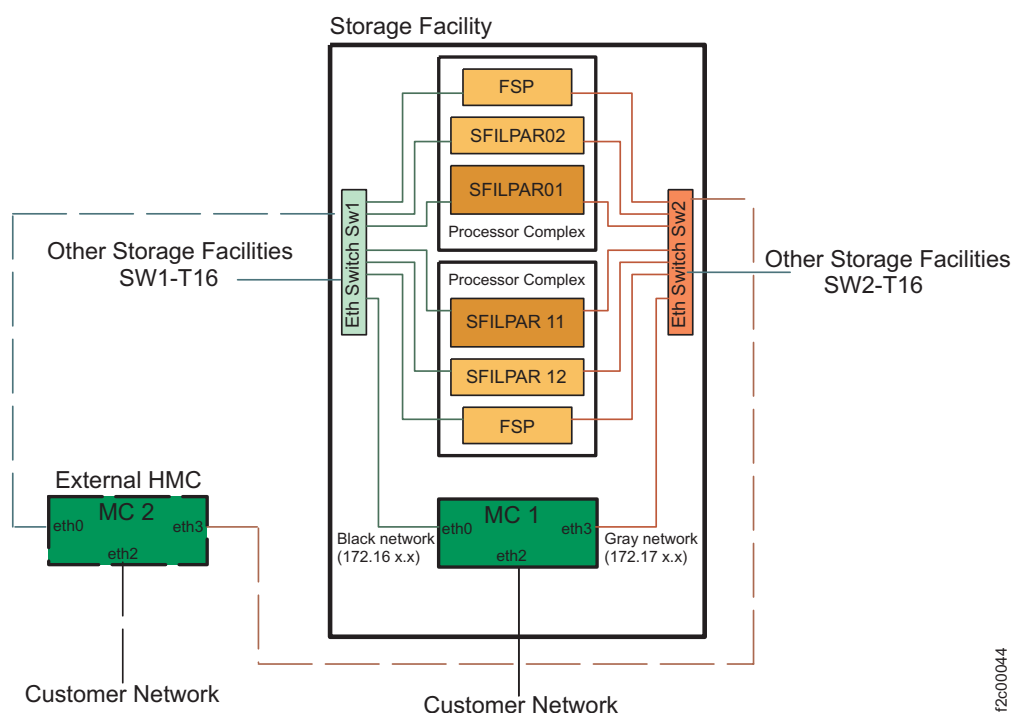
Figure 71. Diagram of the network topology

Notes:

- The tool provides a hierarchical view of the network from the management console which you logged in to.
- The Current Topology view shows the status of **detected** nodes on each of the two DS8000 private networks at the time the tool was launched or when **Refresh** was selected.
- The service processor cards are accessed through one of the two networks, so they will not appear on both. This is normal.

- The service processor cards are accessed by MC 1 through the GRAY network (default 172.17.xxx.xxx or one of three optional address ranges; to determine the range, see MAP7005 Determining which private network address range is selected). To display the MAP, open the service Information Center on the management console, then open the **Isolation MAPs and Symbolic FRU procedures** section to locate the MAP.
  - The service processor cards are accessed by MC 2 through the BLACK network (default 172.16.xxx.xxx or one of three optional address ranges; to determine the range, see MAP7005 Determining which private network address range is selected.).
- The Storage Facility system status information is displayed along with the associated service processor card, so it will not appear on both networks. This is normal.

11. If there is a second HMC in this storage complex, go to that HMC and save the network topology there also.

12. Store the customer provided configuration worksheets in the Rack 1 document enclosure (front upper right of rack).

13. Use the View Storage Facility Status utility to ensure there are no unreported or unexpected problems or conditions.

    a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

    b. Open **Service Applications** → **Service Focal Point**.

    c. In the right content area, select **Service Utilities**, a window appears displaying a list of storage facilities.

    d. Select a storage facility, click **Selected** (on top tool bar), and then select **View Storage Facility State**.

    e. A window opens listing passed/failed status for 25 or more system checks. You can display the details for each system check.

       Note: Further explanations and options are detailed in MAP1100 View storage facility state (end of call).

14. Observe the CEC enclosure system attention LED indicator **1** on the front of each CEC enclosure. Is the indicator lit?

    - Yes, go to MAP4050 Switching off the CEC enclosure system attention indicator (lit solid), then return here and continue with the next step.

       Note: When the CEC enclosure attention indicator is lit solid, the rack operator panel attention LED indicator will also be lit solid.

    - No, go to the next step.
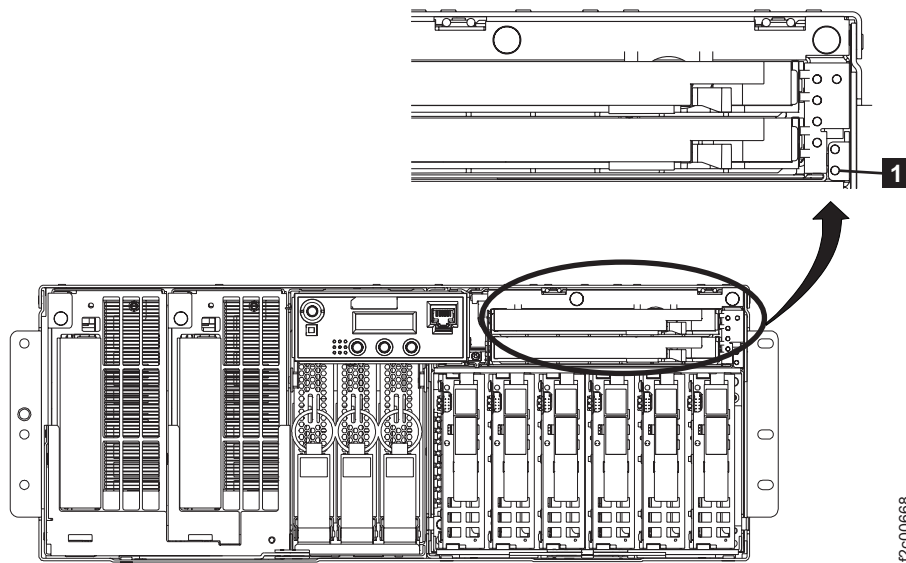
Figure 72. CEC enclosure system attention LED indicator

15. Reminder, if you installed a management console and the HMC public key file upload status was not complete, refer to "Creating, sending, and verifying the management console public key-file" on page 74, step 3 on page 75 to ensure it is complete before you continue.

16. Reference the pack/unpack instructions for return/discard information. Discard the shipping material locally.

17. The storage facility is now regarded as "Installation complete".

    a. Record the stop date and time for the End of Install and Clean-up phase in Table 2 on page 2, "Recording information for the installation report" on page 2.

    b. Update the account records to show the install is complete.

    c. Record any additional time to install features, ECs, and MESs to the correct service code. Do not charge the additional time to the DS8000 installation.

    d. Go to the next step.

18. Determine if the management console software or storage facility LIC level needs to be updated by completing the steps that follow. Compare the installed versions with the versions determined in the task "Checking for required microcode" on page 5.

    a. At the top of the management console interface, select **Help**.

    b. Select **About Hardware Management Console**. A window opens that displays information on the level of the management console software.

    c. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

    d. Open **Licensed Internal Code Maintenance** → **Licensed Internal Code Updates**.

    e. In the right content area, select **Change Internal Code**. A window displays a list of Storage Facilities.

    f. Select the Storage Facility that is being installed from the list. Click **Selected** from the top tool bar, and then select **Display Installed Code Levels**.

    Does the management console software or storage facility LIC need to be updated?

- Yes, go to step 23.
- No, go to the next step.

19. Did you choose the recommended option for the storage facility to call home on Certify DDM completion?
    - Yes, go to 20.
    - No, go to 22.

20. The on-site service actions are now complete.

    a. Inform the customer that the machine will be available for configuration when the DDM certification completes.

    b. Upon receipt of the call-home, the IBM support center will call the contact name and telephone number entered earlier and inform them that the DS8000 is now available.

    c. Go to step 26 on page 88 to complete the storage facility Install Report.

       Note: There are three fields in the report for Monitor Certify DDM. Please enter the value "00.0" in each field as you will not be waiting for the certify to complete. This value will indicate that you selected the call home on certify DDM completion option.

21. If the rear of each CEC enclosure has a two-port Ethernet card in PCI slot 1 or 5 (counted from left to right), then customer has ordered a feature code that installs additional Ethernet cards. The cards allow faster management of flash copy relationships.

    a. The customer must configure the network settings for each port by using the DS Storage Manager GUI interface (**Storage images main table** → **Configure Network Ports**).

    b. The customer must test the connections. If there are any problems, refer to MAP4770 Customer problem accessing Ethernet port for Flash Copy Establish feature.

22. Monitor the certify DDM process for completion.

    a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

    b. Open **Service Applications** → **Service Focal Point**.

    c. In the right content area, select **Service Utilities**, a window displays a list of Storage Facilities.

    d. Select the Storage Facility that is being installed from the list. Click **Selected** from the top tool bar, and then select **Certify DDM**.

    e. When the certify DDM process is complete, inform the customer that the storage facility is now available for configuration.

       Note: Use Table 4 on page 3, "Recording information for the installation report" on page 2 to record the stop date and time for the Monitor Certify DDM phase.

    f. Go to step 26 on page 88 to complete the storage facility Install Report.

23. To save time, acquire the LIC code bundle while monitoring the certify DDM process for completion.

    a. Refer to the Microcode installation instructions to acquire the LIC code bundle.

    b. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

    c. Open **Service Applications** → **Service Focal Point**.

> d. In the right content area, select **Service Utilities**. A window displays a list of Storage Facilities.
>
> e. Select the Storage Facility that is being installed from the list. Click **Selected** from the top tool bar, and then select **Certify DDM**.
>
> f. Wait until the certify DDM process is complete.
>
>> **Note:** Use Table 4 on page 3, "Recording information for the installation report" on page 2 to record the stop date and time for the Monitor Certify DDM phase.
>
> g. Use the supplied LIC Installation Instructions to update the storage facility LIC.
>
>> **Note:** Use the table in "Recording information for the installation report" on page 2 to record the start date and time for the SF Code Upgrade (SC33) phase.
>
> h. When the LIC is complete, inform the customer that the storage facility is now available for configuration.
>
>> **Note:** Use the table in "Recording information for the installation report" on page 2 to record the start date and time for the SF Code Upgrade (SC33) phase.
>
> i. Go to step 26.

24. If the customer has purchased LIC features, the customer is responsible for retrieving the keys and activating the licenses by using the procedures in the *IBM System Storage DS8000 User's Guide* (see Activating Licenses).

> **Note:** If the customer cannot access the keys on the DSFA Web site the customer is instructed to open a service call. The service representative can have PFE (via the next level of support) manually generate and provide the keys to the customer.

25. If the customer has problems creating the logical configuration, they may come to you for help. You can check for any open serviceable events related to the I/O enclosures or storage enclosures to be repaired. If there are none, have the customer contact IBM support and ask for software help with the logical configuration and the GUI interface.

26. Complete the storage facility Install report.

> a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).
>
> b. Open **Service Applications** → **Service Focal Point**.
>
> c. In the right content area, select **Service Utilities**, a window displays a list of Storage Facilities.
>
> d. Select the Storage Facility that is being installed from the list. Click **Selected** from the top tool bar, and then select **Generate Storage Facility Install Report**.

Chapter 2. Installing an external management console

This section guides you on how to physically install an external management console, perform the configuration and customization, connect the console to the storage complex and perform a communications test.

Installing the external management console in the rack

This section provides guidance on how to perform the physical installation of an external management console in a standard 19″ rack.

The rack will be ordered and supplied with the console from IBM or it will be provided by the customer. The detailed instructions provided with the management console server and monitor/keyboard tray will be used.

1. Identify the following items in the shipping carton.
   - x-server rack installation kit and instructions.
   - x-server.
   - Monitor/keyboard tray and installation instructions.
2. The management console ship group contains two private network Ethernet cables that are 31 meters (101 feet) in length. Will the cables reach from the external management console to the nearest storage facility in the storage plex to be managed?
   - Yes, go to step 4.
   - No, go to step 3.
3. Do one of the following and then go to step 4:
   - Have the customer select a new rack location that will allow the cables to reach.
   - Have the customer provide two Ethernet cables that are straight 4-pair UTP CAT 5E with RJ-45 jacks, and a maximum length of 100 meters (328 feet). One cable must be labeled as "Black" on both ends and the other must be labeled as "Gray". All private network cables are marked as Black or Gray to visually separate the redundant network cabling.
4. Do you have an IBM-supplied rack to install?
   - Yes, use the instructions provided with the rack to install the rack in the customer designated location.
   - No, the rack must already be installed by the customer. If that is not complete, then ask the customer to do that before you continue. Ask the customer to identify the location in the rack where the server and monitor and keyboard is to be installed. 1U of vertical rack space is required for each of the two items.
5. Install the x-server rails into the rack. Use the hardcopy instructions *(P/N 33P2616)* from the ship group.
6. Slide the x-server into the rack by sliding it in from the front. Secure the x-server in place by tightening the two thumbscrews at the front.
7. Install the monitor and keyboard tray in the rack. Use Chapter 2 of the *Flat Panel Monitor Console Kit Installation and Maintenance Guide* in the ship group.

8. If you are installing an x335 server, route and then plug the C2T cable from the keyboard and monitor into the C2T OUT connector on the rear of the x-server. See Figure 73 for locations.

C2T OUT
Connector

f2c00423
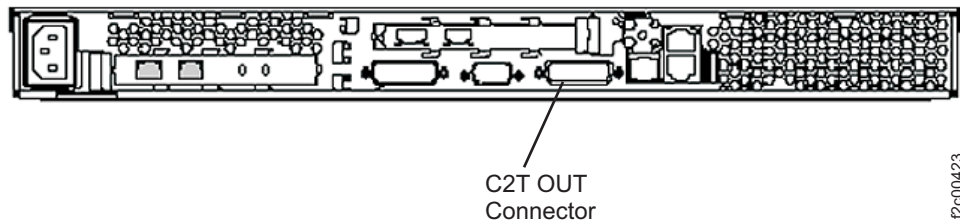
Figure 73. Rear view of X335 management console server

9. If you are installing an x336 server, route and then connect the three cables from the keyboard, mouse, and monitor into the appropriate connectors on the rear of the x-server. See Figure 74.

Video

Mouse   Keyboard

f2c00641
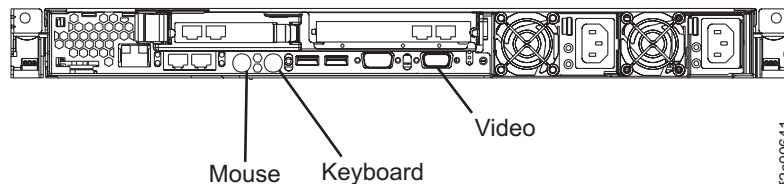
Figure 74. X336 management console keyboard/mouse/video ports

10. Route the power cables from the x-server and the monitor and keyboard tray power supply to the power strip in the rack. Plug the cables in at both ends.

11. Continue with "Power on and initial configuration of the external management console."

Power on and initial configuration of the external management console

This section provides guidance on how to power on, set the HMC role to secondary (MC 2), and configure the management console.

Note: If you are following a hardcopy or PDF version of these instructions and you are sent to a MAP, then go to the *Isolation MAPs and symbolic FRU procedures* section in the DS8000 Service Information Center. This can be accessed on the *IBM System Storage DS8000 series Service Documents CDROM* CD or launched from WebSM on a working management console.

1. Check the HMC TCP/IP address selected on the customization worksheets provided by the customer. This is the address to be assigned to the HMC network port (eth2) for connection to the customer network.

   Is the address in either of the following ranges?

   `172.16.0.0 - 172.16.255.255` or `172.17.0.0 - 172.17.255.255`

   - No, go to step 3.
   - Yes, go to step 2.

2. There is the potential of an address conflict between the customer networks and the DS8000 private networks. Call the next level of support. The next level of support will need to assist you in converting the private network (gray and black) address ranges to one of the optional addresses that the

customer has selected on the "Management console network settings work sheet". They will have a special procedure to allow this network address conversion to occur during an install.

Refer to MAP7005 Determining which private network address range is selected to ensure that the address range selected is the same as what is already in use for the primary management console (MC 1).

3. Slide the monitor and keyboard tray out and switch on the monitor.
4. Check the power LED on the front of the server. See Figure 75 (X335 server) or Figure 76 (X336 server).
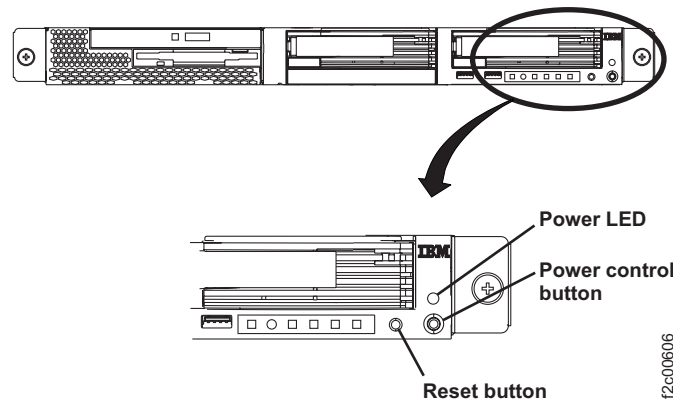
Figure 75. X335 management console server (front view)
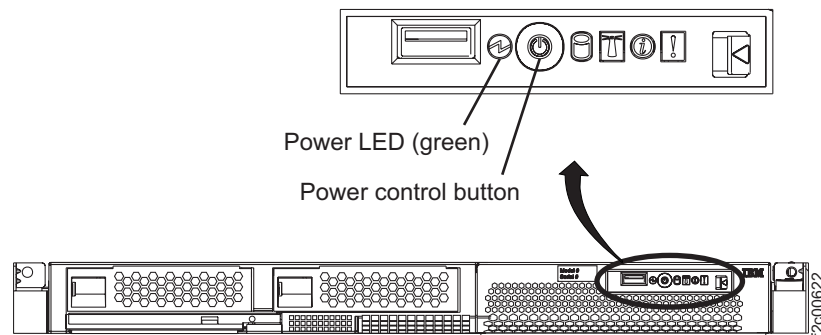
Figure 76. X336 management console server (front view)

- If the LED is lit, then continue with the next step.
- If the LED is flashing, then press the power control button and continue with the next step.
- If the LED is off, then verify that power input is available. If no problem is found then go to MAP6520 Management console power problem.

5. Wait up to **5** minutes for the HMC ROLE SELECTION MENU to be displayed on the monitor. For example:

```
****************************************************
*              WELCOME TO THE                      *
*            HMC ROLE SELECTION MENU               *
****************************************************


ENTER A MENU OPTION FROM THE LIST
1)   ASSIGN HMC AS PRIMARY
2)   ASSIGN HMC AS SECONDARY
99)  EXIT

ENTER YOUR SELECTION AND HIT THE "ENTER" KEY
--> __
```

Is the HMC ROLE SELECTION MENU displayed?

- Yes, continue with the next step.
- No, this indicates that either the HMC Role has already been assigned (HMC login screen is displayed) or that the

  Important: To reset all the HMC code objects to prepare for the installation, the HMC role must transition from *Primary* to *Secondary* or *Secondary* to *Primary* at least once. If the role does not transition, the code objects will not be reset.

  – If the management console login screen is displayed, then go to MAP6090 HMC Role selection not displayed as expected. Return here and continue with step 6 when you correct the problem.
  – If the management console login screen is not displayed, go to *MAP6020 Management console problem determination*.

6. Assign this management console as the secondary management console (MC2) by performing the following steps:

   a. Type 2 and press **Enter**.

   b. Type Yes and press **Enter** to confirm the selection.

   c. Locate the MC 2 label in the ship group. Attach the label to the front of the management console keyboard tray.

7. When the keyboard layout configuration screen is displayed (as shown below), type 2 and press **Enter**.

```
If you are using a non English US keyboard, you can choose to change your
keyboard layout configuration.  You can make your selection by pressing a number
key then press enter.  If you don't press any key within 30 seconds, this
program will terminate automatically.

1 -- Do not change keyboard layout and run this program again on the next
        system boot.
2 -- Do not change keyboard layout and do not run this program again on
        the next system boot.
3 -- Change to a new keyboard layout.

Your selection is:
```

8. Before the change locale screen is displayed, decide which of the three options below you will select. When the change locale screen is displayed, you will only have 20 seconds to click a radio button and then press the **Enter** key.

```
You can change the locale now in order to run the HMC in a
different locale.  If you do not make a selection in 20 seconds,
the dialog exits.  Enter your selection.

* Change Locale
* Exit now and don't prompt for locale again.
* Exit now and prompt again for it.
```

9. Wait up to 5 minutes for the HMC configuration to be updated, and the HMC login screen to display. Is the management console login screen displayed?
   - Yes, continue with the next step.
   - No, go to *MAP6020 Management console problem determination*.

10. The management console is shipped with predefined user IDs and passwords. The user IDs and passwords are case-sensitive. Enter the user ID and password as shown below.

    ID: CE
    Password: serv1cece

11. Use the customization worksheets provided by the customer to perform the management console customization tasks in the following table. Additional guidance is available through the *IBM System Storage DS8000 Introduction and Planning Guide*.

Table 29. Management console customization tasks

Task	Management Console Navigation Item	Notes
Console Date / Time and Timezone	**Management Environment** → **(HMC hostname)** → **HMC Management** → **HMC Configuration** → **Customize Console Date and Time**	1. Set the date and time on the HMC being installed as close as possible to the values on the existing HMC. 2. The HMC will be rebooted when it is power cycled in later steps.
HMC Network Settings	**Management Environment** → **(HMC hostname)** → **HMC Management** → **HMC Configuration** → **Customize Network Setting**	1. On the LAN Adapters tab, select Ethernet eth2 and click Details to set the TCP/IP address and network mask. 2. Use other tabs for remaining settings. 3. When all settings have been entered, click **OK**. 4. The HMC will be rebooted when it is power cycled in later steps.

12. Shutdown and power off the management console as follows:
    a. At the upper left of the HMC task bar, click **Console**.
    b. From the drop down menu, click **Exit**.

c. At the exiting Web-based System Manager screen, click **Exit Now**.

d. From the selection box, select **Shutdown Console**, and then click **OK**.

The HMC will shutdown and power off to standby mode (green power LED will be slow blinking).

13. Continue with "Cabling and connecting the management console to the storage complex."

Cabling and connecting the management console to the storage complex

Use this section to connect the external management console to the storage complex.

1. Route and connect the management console to the customer network Ethernet cable by performing the following steps:

   a. Locate the customer-supplied Ethernet cable.

   b. Route the Ethernet cable through the tailgate and up to the rear of the management console server.

   c. Connect the cable to the customer Ethernet connector (eth2) on the rear of the management console server. See Figure 77 (X335 server) or Figure 78 (X336 server).
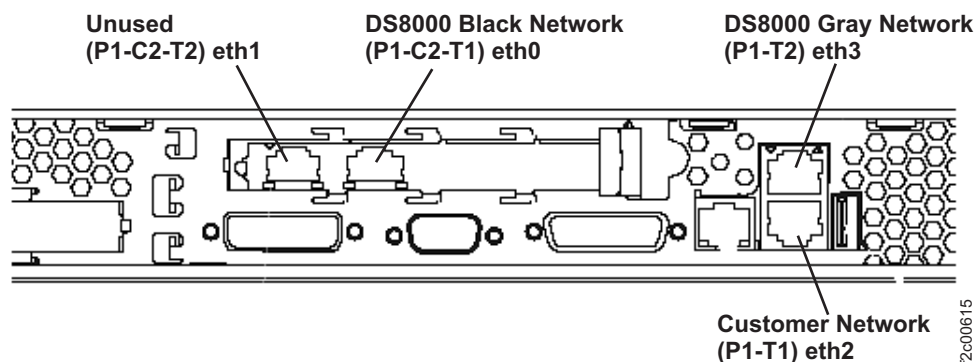
Figure 77. Ethernet connectors on the rear of the X335 management console server
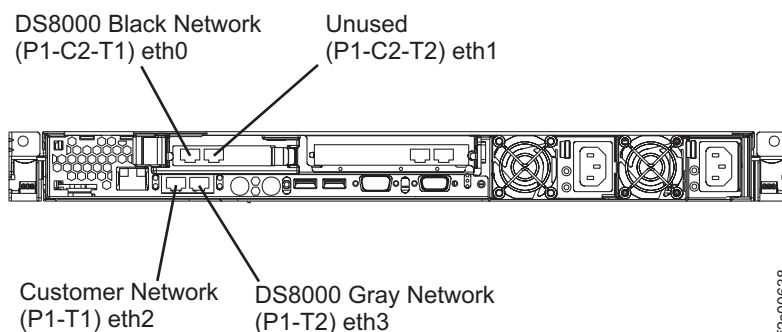
Figure 78. Ethernet connectors on the rear of the X336 management console server

2. Route and connect the customer's phone line cable by performing the following steps:

a. Locate the customer's phone line cable.
b. Connect the customer's phone line cable to the modem RJ-11 line connector on the modem card at the rear of the management console server. See Figure 79 (X335 server) or Figure 80 (X336 server).

Modem-RJ-11
Line Connector
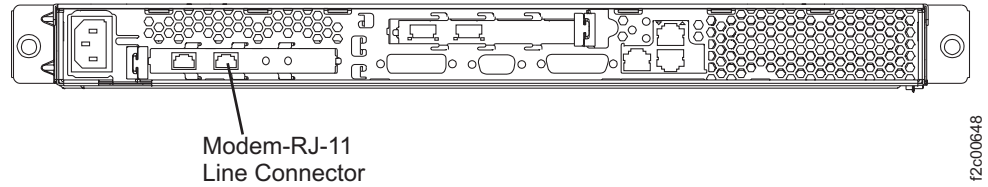
Figure 79. The modem connector (RJ-11 phone line) on the rear of the X335 management console server

Customer phone line,
modem RJ-11 Connector
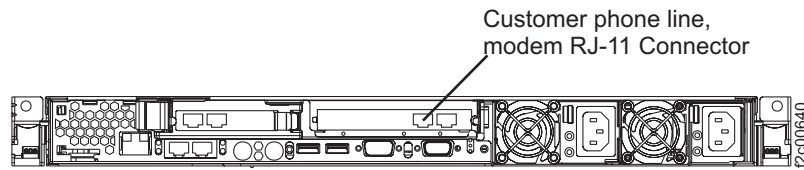
Figure 80. The modem connector (RJ-11 phone line) on the rear of the X336 management console server

c. Route the telephone cable through the tailgate.
d. Connect the other end of the customer's phone line cable to the customer's phone line cable connector.

> **Note:** If required, use the telephone adapter that is supplied in the ship group to make this connection.

3. Locate the DS8000 that contains the other HMC for this storage complex. The HMC being installed will be cabled to the Ethernet switches in that DS8000.

4. Locate the two 31-meter (101 feet) Ethernet cables for the private network in the ship group (black cable P/N 22R1798; gray cable P/N 22R1799), or the two extended length customer-provided cables if the standard cables are not long enough. Prepare the cables for connection between the HMC and the Ethernet switch by labeling their ends according to the "From (HMC)" and "To (storage facility)" columns in Table 30.

> **Note:** Ethernet cables are also supplied with each storage facility. They are not needed for the SF that contains MC 1 and will be stored in the storage box located inside the storage facility. If none are supplied with the HMC, then these can be used instead.

Table 30. Ethernet cables

Color	Part Number	From (HMC)	To (storage facility) Ethernet switch
Black	22R1798	P1-C2-T1	SW1-T2 (upper switch)
Gray	22R1799	P1-T2	SW2-T2 (lower switch)

5. Route but do not connect the two cables (prepared in step 4) from the HMC being installed to the DS8000 identified in step 3.

6. Route the two cables through the storage facility tailgate and plug the cables into port "T2 HMC2" in each Ethernet switch as shown in Table 31 on page 96.

Table 31. Ethernet switch port designations

T1	T3	T5	T7	T9	T11	T13	T15
HMC1	FSP1	ESS01	ESS02	SF #8	SF #6	SF #4	SF #2
T2	T4	T6	T8	T10	T12	T14	T16
HMC2	FSP2	ESS11	ESS12	SF #7	SF #5	SF #3	OUT

7. At the rear of the HMC, plug the black cable into the P1-C2-T1 connector (eth0) and the gray cable into the P1-T2 connector (eth3) at the rear of the HMC as shown in Figure 77 on page 94 (X335 server) or Figure 78 on page 94 (X336 server).

8. Continue with "Completing the installation of the external management console."

Completing the installation of the external management console

This section provides guidance on how to complete the installation of the external management console. Final customization and testing will be performed.

1. Press the power control button to power on the management console server.

2. Wait for the management console logon panel to appear and log on with the user ID CE and password serv1cece.

3. Use the customization worksheets provided by the customer and Table 32 to perform the management console customization tasks.

   Note: Additional guidance is available through the on-line Help button and the *IBM System Storage DS8000 Introduction and Planning Guide*.

Table 32. Management console customization tasks

Task	Management Console Navigation Item
RSF settings - Customer information	Service applications/Remote Support **Customize Customer Information**
RSF settings - Outbound See Note 1 for new VPN information to support existing customization work sheets.	Service applications/Remote support **Customize Outbound Connectivity**
RSF settings - Inbound	Service applications/Remote Support **Customize Inbound Connectivity**
MRPD settings See **Note** in the next column.	Service applications/Service Agent **Transmit Service Information / Transmit** • Click **Schedule when to transmit the service information** • Set the Frequency to 14 (days) • Set the time to a value when you know that the DS8000 will be powered on. **Note:** You must designate **only** one management console to send MRPD data. If MC 1 was already configured to send MRPD data, then **do not** configure it on this management console.

Table 32. Management console customization tasks (continued)

Task	Management Console Navigation Item
FTP settings	Service applications/Service Agent **Transmit Service Information / FTP** **Note:** This is only required if the customer has chosen to allow dumps and traces to be sent by FTP. • Leave the default settings for the FTP server. • If required, enter the customer firewall information. • Check 'Enable FTP offload of service information'.
Customer e-mail notification	Service Agent/Customer notification
SNMP alert	Service Agent/Customer notification

Note 1: The following is new information that may not be in the version of the customization work sheet provided by the customer.

• Selecting "By VPN" means that the customer allows the management console (MC) to use VPN over an internet connection when a connection is established to the IBM service center. IBM's VPN implementation is a client/server VPN. The two VPN endpoints are on the MC and on the IBM Boulder/Rochester VPN server. There is no need for additional VPN hardware in the customer network infrastructure.

• If you use VPN, the management console (MC) must have access through your internet firewall to the following:

  IBM Boulder VPN server, IP address 207.25.252.196
  IBM Rochester VPN server, IP address 129.42.160.16
  IBM Boulder test VPN server no longer used

• If VPN connectivity is not an option, FTP can be configured for faster offload of log and trace data.

• Even if VPN is configured the modem can serve as a backup. If configured it also allows IBM support personnel to remotely access the MC without a person on-site having to initiate a connection.

• General information: The remote support work sheets enable you to specify whether you want outbound (call home) or inbound (remote services) remote support. IBM recommends that you enable both outbound and inbound support to help you maintain the highest availability of your data.

  When you enable outbound (call home) support, your management console sends an electronic call home record to IBM support when there is a problem within the storage complex. In the header of each call-home record, a callback password appears.

  If inbound remote services is also enabled, this password enables IBM service representatives to remotely sign on to the management console in response to the service call. If outbound support is enabled, but inbound remote services is not enabled, the IBM service representative must physically come out to your location to troubleshoot and service the storage complex. When inbound remote services are enabled, service representatives can perform service tasks remotely. They can view error logs and problem logs, and initiate trace or dump retrievals.

4. If displayed, remove the default HMC hostname object (localhost.localdomain) from the HMC Navigation Area.

   The figure that follows shows an example of two managed HMC names in the Management Environment after installation.
   `localhost.localdomain` is the default HMC name at the beginning of the installation. This example shows `ras88hmca.storage.sanjose.ibm.com` as the

HMC hostname set during installation by using the customer configuration work sheets.

Figure 81. Examples of HMCs in management environment

    a. At the top of the screen, click on **Console** ˃ **Remove** ˃ **Hosts**.

    b. A pop-up window should list the `localhost.localdomain`.
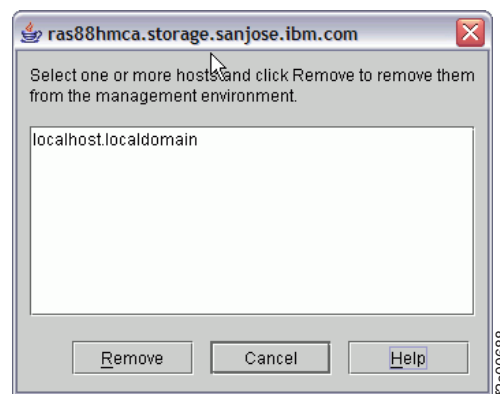
    c. Select localhost.localdomain and click **Remove**.

    d. Observe the HMC Navigation Area and ensure any other installed HMCs are still listed.

5. Test the service communication methods. Perform these tests if this management console was enabled as a call home server.

Table 33. Tests for a management console enabled as a call home server

Communication method	How to test
Remote support - Modem	Select **Service Applications** ˃ **Remote Support** ˃ **Customize Outbound Connectivity** ˃ **Local Modem** ˃ **Test**
Remote support - VPN	Select **Service Applications** ˃ **Remote Support** ˃ **Customize Outbound Connectivity** ˃ **Internet VPN** ˃ **Test** If the test fails, go to MAP1301 Isolating Call Home/remote services failure. **Note:** If this test identifies incorrect network settings that require a management console reboot, do not reboot until the storage facility verification and DDM certification has completed.

Table 33. Tests for a management console enabled as a call home server (continued)

Communication method	How to test
Call Home	1. Select **Service Application → Service Focal Point → Service Utilities**.
	2. Click on the storage facility that you are installing.
	3. From the **Selected** drop down, click on **Test problem notification (PMH, SNMP, Email)**.
	4. Ask the support center to verify that a test PMH was created on Retain. **Note:** You have previously verified that this storage facility is registered in Retain earlier in this installation. If the test fails, go to MAP1301 Isolating Call Home/remote services failure.
Remote Access **Note:** Follow your geographical guidelines to determine if this test is needed.	1. Select **Service Applications → Remote Support → Customize Inbound Connectivity**.
	2. For Unattended Session, put a check for **Allow unattended sessions**.
	3. For Duration, select **Temporary**, then click **OK**.
	4. Ask the support center to test remote access.
	5. After the test is complete, restore the Inbound Connectivity settings to the customer choice on the worksheets.

6. Test the customer communication methods.

Communication method	How to test
Customer e-mail notification	Select **Service Applications → Service Agent → Customer notification → Test e-mail**. Ask the customer if the e-mail was received. **Note:** If the test fails, go to MAP1310 Isolating e-mail notification problems.
Customer connection to DS8000 Storage Manager server in the management console	Ask the customer to test the access of the application or method that they will use to connect to the DS8000 Storage Manager in the management console. For information on testing the connection, see *IBM System Storage DS8000 User's Guide* included on the service and customer documentation CDROM. **Note:** If the test fails, go to MAP1301 Isolating Call Home/remote services failure.

7. Set the management console heartbeat options (frequency and enable/disable):

a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

b. Click **Service Applications → Service Focal Point**.

c. In the right content area, click **Service Utilities**. A list of storage facilities is displayed.

d. Select the storage facility. On the main menu (top tool bar), choose **Selected → Get HMCs**. A list of HMCs is displayed.

e. Select the HMC. On the main menu, choose **Selected → View/Change Heartbeat Configuration**.

f. Select the frequency of the heartbeat (7 days is recommended).

g. Click **Schedule Heartbeat**. The window is refreshed and the current settings are display.

h. Click **Send Heartbeat Now** to send the first heartbeat.

Note: The management console heartbeat function verifies that the HMC continues to be available for call home and remote service. It will use the VPN connection if configured, or the modem if VPN is not configured. The service representative sets the frequency (1, 7, 14, or 28 days) selected by the customer. The recommended setting is 7 days. The heartbeat function uses the HMC to create a serviceable event (SE) with SRC BEF00012. The SE contains the frequency setting, and is sent to IBM with the normal SE call home function. If IBM does not receive these SEs at the recommended frequency, a service action to determine the cause can be initiated by next level of support.

8. Allow 10 minutes to pass since the last power on of the management console and then verify that the external management console has access to all the Storage Facilities in this storage complex.

a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by host name).

b. Click **Server and Partition** → **Server Management**.

Are all expected processor complexes listed (two 9117 servers should appear for each storage facility)?

- Yes, continue with the next step.
- No, verify that all previous steps were completed and that all cables were connected. Go to MAP7000 Entry point for DS8000 private network problems to check for network problems. If no problem was found, then call your next level of support.

9. Do any 9117 servers show a state of `No Connection`?

- Yes, go to MAP7000 Entry point for DS8000 private network problems to check for network problems. If no problem was found, then call your next level of support.
- No, continue with the next step.

10. Create and send the management console public key-file.

a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

b. Click **Service Applications** → **Service Focal Point**.

c. In the right content area, click **Service Utilities**. A list of storage facilities is displayed.

d. Select the storage facility. On the main menu (top tool bar), choose **Selected** → **Get HMCs**.

e. Select the HMC. On the main menu, choose **Selected** → **Generate HMC Public Key**. Click the **Yes** button to confirm.

f. A serviceable event with SRC=BEF0010 should be created immediately.

11. Display open serviceable events in order to determine if a serviceable event with SRC=BEF00010 was created.

a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

b. Click **Service Applications** → **Service Focal Point**.

c. In the right content area, click **Manage Serviceable Events**. A window that lets you specify selection criteria for serviceable events is displayed.

d. In the Error criteria section, click the down arrow for the reference code (SRC) criteria and look for BEF00010. The reference code is listed only if the serviceable event was created.

Is the reference code BEF00010 listed?

- Yes, select the BEF00010 reference code and click **OK** to display the serviceable event overview, then go to step 10.
- No, repeat step 10 on page 100 and if a serviceable event is still not created, call the next level of support.

12. Verify that the HMC public key was successfully delivered to the Retain system server.

   a. From the Serviceable Event Overview window, select the Problem #. On the main menu, choose **Selected** → **View Details**.

   b. In the Field Name column of the serviceable events details, scroll to the Data (EED) Offload status field. Read the Text messages to the right of this field. Select one of the following that applies:

   - Message includes the text "successfully transmitted problem information or SUBMITTED SUCCESSFULLY", go to step 15.
   - Message indicates Unavailable, go to step 13.

13. It can take up to one hour for the serviceable event to be called home and then stored away successfully. The serviceable event Data (EED) Offload Status field will be automatically updated when the process is complete. Redisplay the serviceable event details looking for a status of good. Are you running a level of code released prior to October 2005 (Bundle 6.1.600.41)?

   - Yes, go to step 14.
   - No, go to step 15.

14. The call home may have been successful, but the EED field may not be displaying the correct status. You can use the following alternate procedure to check the status:

   a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).

   b. Click **HMC Management** → **HMC Configuration**.

   c. In the right content area, select **View Console Events**. A list of console events is displayed.

   d. The View Console Events window displays event log text messages.

   e. Look for a Console Event log with text that is similar to:

   ```
   Successfully transmitted problem information:
     EED: /extra/data/vr/23/23.zip
   Reporting system:
     rashmc33a Machine type-model/serial: 2107-922/1300310 Problem..."
   ```

   Is the above console message log text listed?

   - Yes, the call home was successful, return to 22 on page 104.
   - No, the call home has not occurred yet, go to step 15.

15. You can continue the installation at step 16 on page 102 now, but before you leave the customer account you must ensure the call home of the public key is successful. If it is not successful, remote support will not be possible.

   Note: If the management console call home tests in the prior section did not complete successfully, manually offload the public key file to a laptop

directly connected to the private network and then upload it to IBM. Refer to the article "Retrieving the WebSM Public Key locally" on the DS8000 - Engineering Web site.

16. Will you be installing additional racks, storage enclosures, or other hardware features to this storage facility as part of this installation activity?

    - Yes, the backup of critical console data will occur after all installation activity is complete. Go to step 22 on page 104.
    - No, the backup of critical console data will occur now. Go to step 17.

17. Locate the critical console data back up DVD disc for each HMC on this storage plex. The DVD disc should be in the ship group during an installation or kept in the HMC DVD-RAM drive after installation.

    There are two versions of the DVD disc:

    - Newer version is labeled with the HMC machine type model S/N and "HMC Critical Console Data Backup DVD, Keep in HMC DVD-RAM drive". If you have this version, go to step 19.
    - Older version has no preprinted label, it should have the HMC machine type model S/N hand printed by the service representative. If you have this version, go to the next step.

18. Is the HMC machine type model and S/N printed on the DVD disc?

    - Yes, go to the next step.
    - No, hand print the HMC machine type model and S/N and "HMC Critical Console Data" on the DVD disc. For example: `HMC machine type model S/N: 8837-PLM 75KKTWT8R, HMC Critical Console Data`. Go to the next step.

19. Back up critical console data on each HMC for this storage plex by performing the following steps. Use the DVD disc with the HMC machine type model S/N for this HMC.

    a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).
    b. Expand **Licensed Internal Code Maintenance** → **HMC Code Update**.
    c. In the right content area, select **Back up Critical Console Data**.
    d. Select **Back up to DVD on local system** and click **Next**.
    e. Insert a formatted DVD-RAM media into the drive.
    f. Enter a description for the archive data.
    g. Click **OK** to store your critical console data on the DVD-RAM.

20. Use the Network Topology Tool to verify connectivity with all nodes (Ethernet ports) on the DS8000 private network and then save the topology. The following lists examples of nodes.

    - Local HMC ports.
    - HMC ports on second HMC (if installed).
    - Service processor card ports.
    - LPAR (partition) ports on the CEC enclosure I/O backplane assembly or PCI Ethernet card.

    Invoke the Network Topology tool as follows:

    a. In the HMC Navigation area, under the **Management Environment**, expand the HMC (identified by hostname).
    b. Click **Service Applications** → **Service Focal Point**.
    c. In the right content area, select **Service Utilities**, a window displays a list of storage facilities.

d. Select the storage facility, click **Selected** (on top tool bar), and then select **Get Storage Plex**. A window displays the storage plex.

e. Select the storage plex, click **Selected** (on top tool bar), and then select **View Network Topology**.

f. Wait several minutes for the tool to gather and present the results.

g. A window displays with the current network topology (port connections) listed on top, and the saved topology from the last time the tool was run and the Save button was selected. Normally the saved topology should be from results when all nodes on both private networks were fully present and operational.

   Note: The option to save the topology is used after all nodes on both private networks are determined to be present and operational.

h. Determine if all expected nodes are present. Refer to Figure 82, Figure 83 on page 104, and the Notes list.

i. Are any nodes missing or failing?

   - Yes, go to MAP7000 Entry point for DS8000 private network problems in the DS8000 Service Information Center. To display the MAP, open the service Information Center on the management console (MC), then open the **Isolation MAPs and symbolic FRU procedures** section to locate the MAP.

   - No, go to step 21 on page 104.

The left side of Figure 82 shows an example of a 921 or 93x with a single management console. The right side shows an example of a 9A2 or 9B2 with two management consoles.
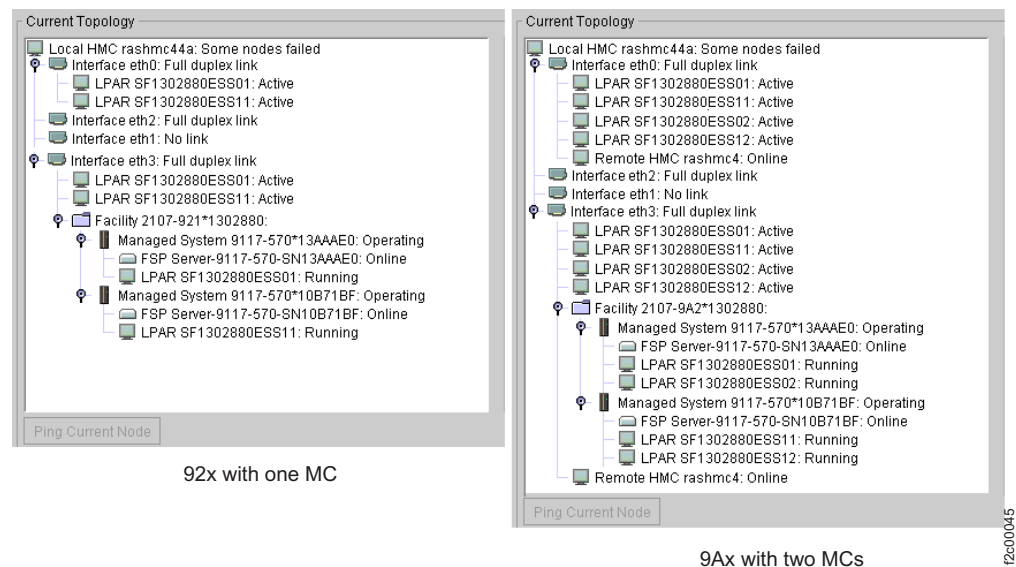
Figure 82. Two examples of the current topology screen
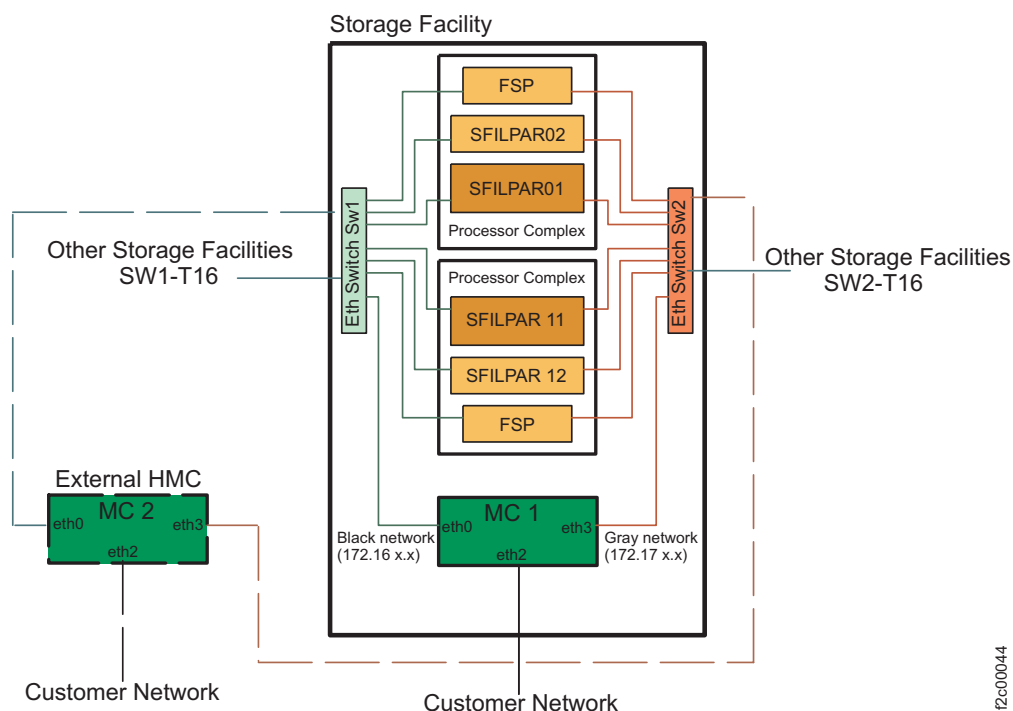
Figure 83. Diagram of the network topology

Notes:

- The tool provides a hierarchical view of the network from the management console which you logged in to.
- The Current Topology view shows the status of **detected** nodes on each of the two DS8000 private networks at the time the tool was launched or when **Refresh** was selected.
- The service processor cards are accessed through one of the two networks, so they will not appear on both. This is normal.
  - The service processor cards are accessed by MC 1 through the GRAY network (default 172.17.xxx.xxx or one of three optional address ranges; to determine the range, see MAP7005 Determining which private network address range is selected). To display the MAP, open the service Information Center on the management console, then open the **Isolation MAPs and Symbolic FRU procedures** section to locate the MAP.
  - The service processor cards are accessed by MC 2 through the BLACK network (default 172.16.xxx.xxx or one of three optional address ranges; to determine the range, see MAP7005 Determining which private network address range is selected.).
- The Storage Facility system status information is displayed along with the associated service processor card, so it will not appear on both networks. This is normal.

21. If there is a second HMC in this storage complex, go to that HMC and save the network topology there also.
22. The installation of the management console is now complete. If you were sent to this topic during the installation of a DS8000, then continue with the remaining steps in that installation topic.

Chapter 3. Installing hardware removed by weight reduction feature FC 0200

Feature Code 0200 removes storage enclosures and sometimes battery modules to reduce the shipping weight of a rack. This is required if the weight limit of building floors or elevators is less than the weight of a fully loaded rack. The parts that are removed are shipped on separate pallets. Feature Code 0200 can be installed by:

- Manufacturing prior to shipment when ordered by the customer.
- The service representative on the computer room floor after rack discontinue or relocate if required.

  Note: IBM packing materials must have been ordered to properly protect the removed parts.

- The service representative at the customer loading dock prior to the rack being moved to the computer room floor if required.

  Note: IBM packing materials must have been ordered to properly protect the removed parts.

The instructions describe how to:

- Reinstall the battery modules in their original locations in the battery module chassis.
- Reinstall the storage enclosures in their original locations in the storage facility.

Copies of the *Weight Reduction Status* chart are in the CE envelope which may be taped to the front covers, or may be in the document enclosure (front upper left of rack) and each box on the pallet.

Attention: The DS8000 retains configuration information that was established during manufacture. If all components are not reinstalled into their original locations, significant problems will result.

CAUTION:
The weight of a fully populated storage enclosure exceeds the safe lifting limit for one service representative. Installation of this feature requires two service representatives.

To determine the estimated weight of a rack, use Table 34.

Table 34. Rack weight (estimated) after all shipping materials have been removed

Rack model	Rack weight without FC 0200 (non-reduced weight)[1, 2]	Rack weight with FC 0200 (reduced weight)[1, 2]
921, 931	1243 kg (2740 lbs)	934 kg (2060 lbs)
922, 9A2, 932, 9B2	1313 kg (2895 lbs)	950 kg (2095 lbs)

92E, 9AE
  with FC 1300[3]
  without FC 1300[4]
	
	1338 kg (2950 lbs)
	1089 kg (2400 lbs)
		
		776 kg (1710 lbs)
		689 kg (1520 lbs)

Table 34. Rack weight (estimated) after all shipping materials have been removed (continued)

Rack model	Rack weight without FC 0200 (non-reduced weight)[1, 2]	Rack weight with FC 0200 (reduced weight)[1, 2]
Notes:		

1. If the shipping materials are still in place on the rack, add the following weight:
  • If the rack is in the carton but not crated, add 115 kg (250 lbs)
  • If the rack is in the carton and crated without desiccant/barrier bag, add 140 kg (310 lbs)
  • If the rack is in the carton and crated with desiccant/barrier bag, add 147 kg (325 lbs)
2. The estimated weights assume that both primary power supplies (PPSs) in the rack contain booster modules. (From the rear of the rack, if a booster module is present it is at the top of the PPS in the horizontal orientation.) If booster modules are not present, subtract 11kg (25 lbs) from the rack weight.
3. Four I/O enclosures.
4. No I/O enclosures.		

Continue with "Installing battery module sets."

Installing battery module sets

Perform this task on any rack from which the battery module sets have been removed.

1. Locate the weight reduction status chart:
   - If the rack is new and IBM manufacturing applied FC 0200, the status sheet will be computer generated. Continue to the next step.
   - If the rack is not new from IBM manufacturing and FC 0200 was applied by a field service representative, the status sheet will be hand printed. Go to step 3 on page 107.
2. Remove the Weight Reduction Status chart from the CE envelope. Additional copies are in the boxes on the pallet. The Weight Reduction Status chart contains a record of the original installed location of each battery module. For a sample chart, see Figure 84 on page 107. For a description of the columns in the chart, see Table 35 on page 107. Then go to step 4 on page 107.

   Note: If the status chart cannot be found, contact the next level of support. There is a procedure to get a PDF copy sent from San Jose manufacturing.

Weight Reduction Status

MCSN	CRMMDL	CRINPN	CRINSQ	CRPLL2	CRPLL3	CRCDES	PARTFAMC	
Machine Serial Number: 0028970, Generated at Fri May 06 19:33:35 CEST 2005								
0028970	922	0000022R1128	YM10C04AC091	E10		BBU Sub-asm		
0028970	922	0000017P7655	Y1W0NE4C2055	E10		BBU Battery Module	BBUM1	B1
0028970	922	0000017P7655	Y1WONE4C2056	E10		BBU Battery Module	BBUM1	B2
0028970	922	0000017P7655	Y1WONE4C2057	E10		BBU Battery Module	BBUM1	B3
0028970	922	0000022R1128	YM10C04AC093	E11		BBU Sub-asm		
0028970	922	0000017P7655	Y1WONE4C2059	E11		BBU Battery Module	BBUM1	
0028970	922	0000017P7655	Y1WONE4C2060	E11		BBU Battery Module	BBUM1	
0028970	922	0000017P7655	Y1WONE4C2061	E11		BBU Battery Module	BBUM1	
0028970	922	0000022R0879	YM10750004E9	XS11		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750006D2	XS12		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM1075000502	XS13		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750004FB	XS21		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750006F2	XS22		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750004EF	XS23		16PACK MPACK 73GB 15K	MPC11	

Figure 84. Sample of a Weight Reduction Status chart

Table 35. Description of columns in a sample Weight Reduction Status chart

Column in chart	Description of column
CRINSQ	Battery module serial number
CRMMDL	Rack model number (*mmm* in the location code for the battery module chassis: U2*nnn*.*mmm*.sssssss-E1x-E2)
MCSN	Machine serial number
CRPLL2	Location of the battery module chassis (*xxx* in the location code for the battery module chassis: U2*nnn*.mmm.sssssss-*xxx*-E2; see Figure 85 on page 108)
(margin to the right of the table)	Location of the battery module, handwritten by manufacturing (when the rack is viewed from the front, B1 is on the left; see Figure 85 on page 108)

3. Locate the Weight Reduction Status chart, it should be included in one of the boxes for the removed parts. The Weight Reduction Status chart contains a record of the original installed location of each battery module.

4. Use the information in the status chart to determine where each battery module must be installed, and then go to step 5 on page 108.

Rack-1
Front View

Battery Module (B3)

Battery Module (B2)

Battery Module (B1)

Battery Module Chassis
U2nnn.mmm.sssssss-E10

Battery Module Chassis
U2nnn.mmm.sssssss-E11

Battery Module Chassis
U2nnn.mmm.sssssss-E12

f2c00454
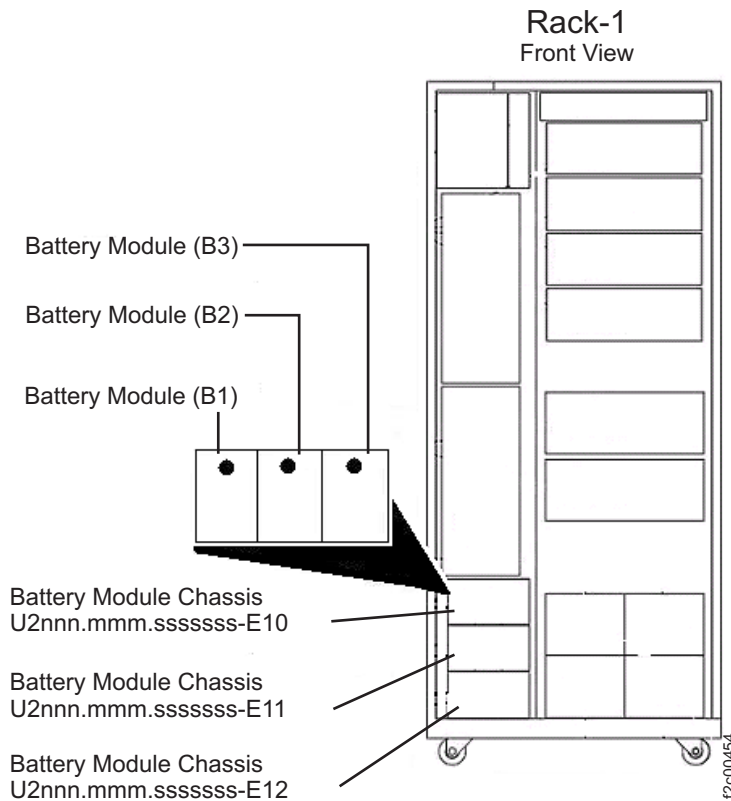
Figure 85. Locations of the battery modules

5. Using the location information from step 2 on page 106, slide each battery module into its original location and secure it with the thumbscrew. For additional guidance, go to Exchange the battery module set.

6. Continue with "Installing storage enclosures."

Installing storage enclosures

Perform this task on any rack from which the storage enclosures have been removed.

1. Remove the Weight Reduction Status chart from the CE envelope. The Weight Reduction Status chart contains a record of the original installed location of each storage enclosure. For a sample chart, see Figure 86 on page 109.

Weight Reduction Status

Machine Serial Number: 0028970, Generated at Fri May 06 19:33:35 CEST 2005								
MCSN	CRMMDL	CRINPN	CRINSQ	CRPLL2	CRPLL3	CRCDES	PARTFAMC	
0028970	922	0000022R1128	YM10C04AC091	E10		BBU Sub-asm		
0028970	922	0000017P7655	Y1W0NE4C2055	E10		BBU Battery Module	BBUM1	B1
0028970	922	0000017P7655	Y1WONE4C2056	E10		BBU Battery Module	BBUM1	B2
0028970	922	0000017P7655	Y1WONE4C2057	E10		BBU Battery Module	BBUM1	B3
0028970	922	0000022R1128	YM10C04AC093	E11		BBU Sub-asm		
0028970	922	0000017P7655	Y1WONE4C2059	E11		BBU Battery Module	BBUM1	
0028970	922	0000017P7655	Y1WONE4C2060	E11		BBU Battery Module	BBUM1	
0028970	922	0000017P7655	Y1WONE4C2061	E11		BBU Battery Module	BBUM1	
0028970	922	0000022R0879	YM10750004E9	XS11		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750006D2	XS12		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM1075000502	XS13		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750004FB	XS21		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750006F2	XS22		16PACK MPACK 73GB 15K	MPC11	
0028970	922	0000022R0879	YM10750004EF	XS23		16PACK MPACK 73GB 15K	MPC11	

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Figure 86. Sample of a Weight Reduction Status chart

2. Use the information in the chart to determine where each storage enclosure must be installed. For a description of the columns in the chart, see Table 36.

Table 36. Description of columns in a sample Weight Reduction Status chart

Column in chart	Description of column
CRINSQ	Storage enclosure serial number (on the front of the storage enclosure, at the far right, between the rack mounting screws; the number is in a vertical orientation)
CRMMDL	Rack model number
MCSN	Machine serial number
CRPLL2	Location of the storage enclosure (see Figure 87 on page 110 and Figure 88 on page 111)

Rack-1

Front View

Fan Sen. RPC	Fans/Plenum
	Storage **XS11** Enclosure
PPS	Storage **XS12** Enclosure
	Storage **XS13** Enclosure
	Storage **XS14** Enclosure
PPS	CEC **XC1** Enclosure
	CEC **XC2** Enclosure

B1 B2 B3

IO/Encl **XI2**	IO/Encl **XI1**
IO/Encl **XI4**	IO/Encl **XI3**

Rear View

Fans/Plenum	Fan Sen. RPC
Storage **XS21** Enclosure	
Storage **XS22** Enclosure	PPS
Storage **XS23** Enclosure	
Storage **XS24** Enclosure	
CEC **XC1** Enclosure	PPS
CEC **XC2** Enclosure	

B3 B2 B1

IO/Encl **XI1**	IO/Encl **XI2**
IO/Encl **XI3**	IO/Encl **XI4**

f2c00145

Figure 87. Physical location codes (Rack-1)

Storage Expansion Rack

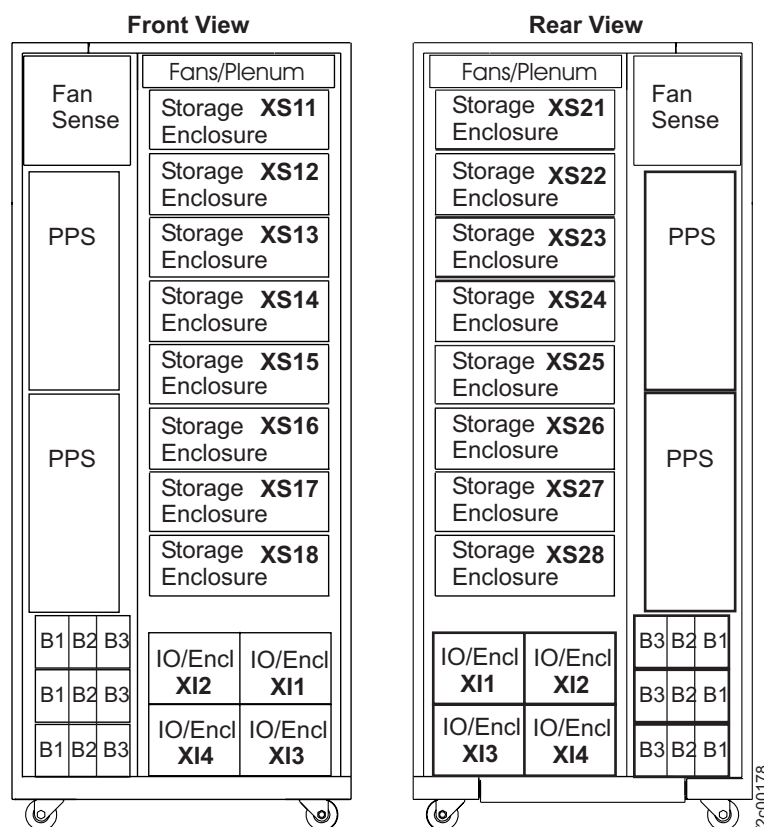| Front View				Rear View			
Fan Sense	Fans/Plenum			Fans/Plenum		Fan Sense	
	Storage **XS11** Enclosure			Storage **XS21** Enclosure			
	Storage **XS12** Enclosure			Storage **XS22** Enclosure			
PPS	Storage **XS13** Enclosure			Storage **XS23** Enclosure		PPS	
	Storage **XS14** Enclosure			Storage **XS24** Enclosure			
	Storage **XS15** Enclosure			Storage **XS25** Enclosure			
PPS	Storage **XS16** Enclosure			Storage **XS26** Enclosure		PPS	
	Storage **XS17** Enclosure			Storage **XS27** Enclosure			
	Storage **XS18** Enclosure			Storage **XS28** Enclosure			
B1 B2 B3						B3 B2 B1	
B1 B2 B3	IO/Encl **XI2**	IO/Encl **XI1**		IO/Encl **XI1**	IO/Encl **XI2**	B3 B2 B1	
B1 B2 B3	IO/Encl **XI4**	IO/Encl **XI3**		IO/Encl **XI3**	IO/Encl **XI4**	B3 B2 B1	

f2c00178

Figure 88. Physical location codes (expansion rack)

CAUTION:
A fully populated storage enclosure weighs 121 kgs (55 lbs). This weight exceeds the safe lifting limit for a single service representative. Installation of this feature requires two service representatives.

Note: DDMs are logically configured to a particular slot and if removed must be put back in the same slot.

3. Using the location information from step 2, install the storage enclosures in their original locations.

   a. Unlatch the sheet metal air flap so it can swing to the up position.

   b. Install the storage enclosure in the rack and fasten it with the four screws **2** provided. See Figure 89 on page 112.
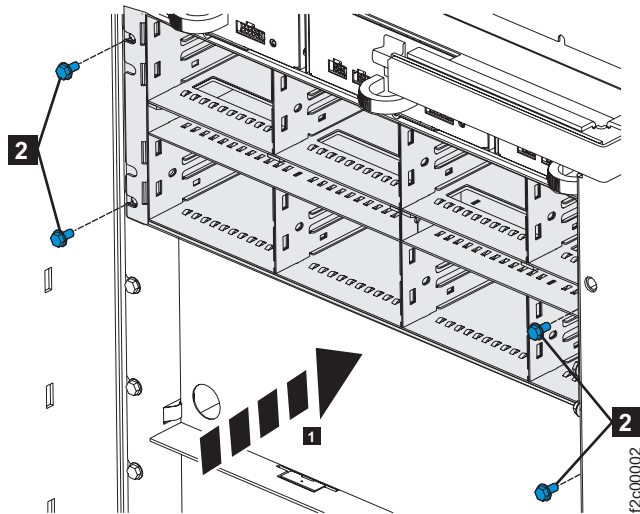
Figure 89. Install the storage enclosure

    c. Connect the FC-AL cables to the Fiber Channel Interface Card connectors. For connector locations, see Figure 90.
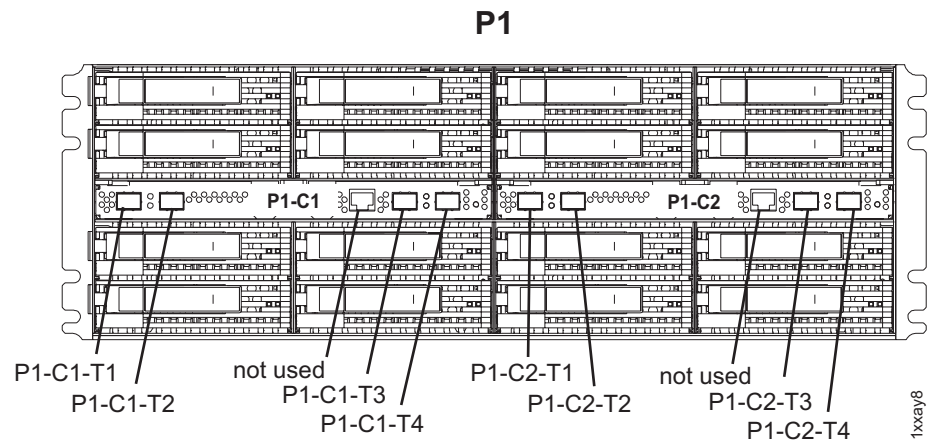
P1

P1-C1-T1   not used   P1-C2-T1   not used
   P1-C1-T2   P1-C1-T3   P1-C2-T2   P1-C2-T3
                 P1-C1-T4   P1-C2-T4

Figure 90. Storage enclosure locations

    d. Repeat step 3 for each storage enclosure to be installed.

4. At each unused storage enclosure position, make sure that the sheet metal air flap is latched down in order to maintain correct cooling air flow to the installed storage enclosures.

5. Return to the procedure that sent you here.

Chapter 4. Installing the earthquake resistance kit feature FC 1906

Use this section to install the earthquake resistance kit, feature code 1906.

Earthquake resistance kit model 9xx FC 1906

The earthquake resistance kit, Feature Code 1906, provides additional hardware to be installed. The kit stiffens the rack from flexing and also ties the rack directly to the concrete floor. The kit can be installed on a raised floor or non-raised floor.

- If the rack is new from IBM, the MES hardware kit for FC 1906 would be shipped with the rack.
- If the rack has been discontinued from another account, and the earthquake resistance kit was originally installed there, the kit would have been removed and shipped separately.

The original kit included parts to tie-down the rack to a non-raised floor, a low raised floor, and a high raised floor. Parts not used at the original installation may not have been kept and shipped. If you are installing on a different floor type than the original floor type, you may not have all the necessary parts. Call the next level of support.

Customer responsibility for site preparation

1. The marketing representative should have previously notified the customer of the prerequisites for the floor(s). The floor mounting requirements are defined in *IBM System Storage DS8000 Introduction and Planning Guide* (GC35-0515-01), which is included on the service documentation CD in the ship group.

2. The customer is responsible to obtain the service of a qualified consultant or Structural Engineer, to determine the appropriate anchoring for the lockdown plate, as needed, for the non-raised floor installation, as well as the determination of the heavy duty concrete or slab floor eyebolts for the raised floor(s) installation.

3. Are the storage facility racks being installed on a raised floor?
   a. Yes, go to "Raised floor installation."
   b. No, go to "Non-raised floor tie-down hardware" on page 117.

Raised floor installation

1. If the earthquake resistance kit is being installed, it must be installed on all racks in a storage facility (base rack and attached expansion racks).

2. Read this entire section to understand the rack stiffening and floor tie-down installation before you return to the installation instructions that sent you here. You will need to decide during the rack installations when to use the information in this procedure to install the earthquake resistance kit.

3. Inspect the floor where the storage facility racks are to be installed. Refer to Figure 91 on page 114 and ensure the following are already present for each rack:
   a. Floor tiles have one cable cutout.
   b. Floor tiles have four tie-down hardware holes.
   c. The concrete floor has four customer provided eyebolts installed.

Note: Customer floor preparation specifications are documented in *IBM System Storage DS8000 Introduction and Planning Guide* which is included on the *IBM System Storage DS8000 series Service Documents CDROM* and the customer documentation CDROM.
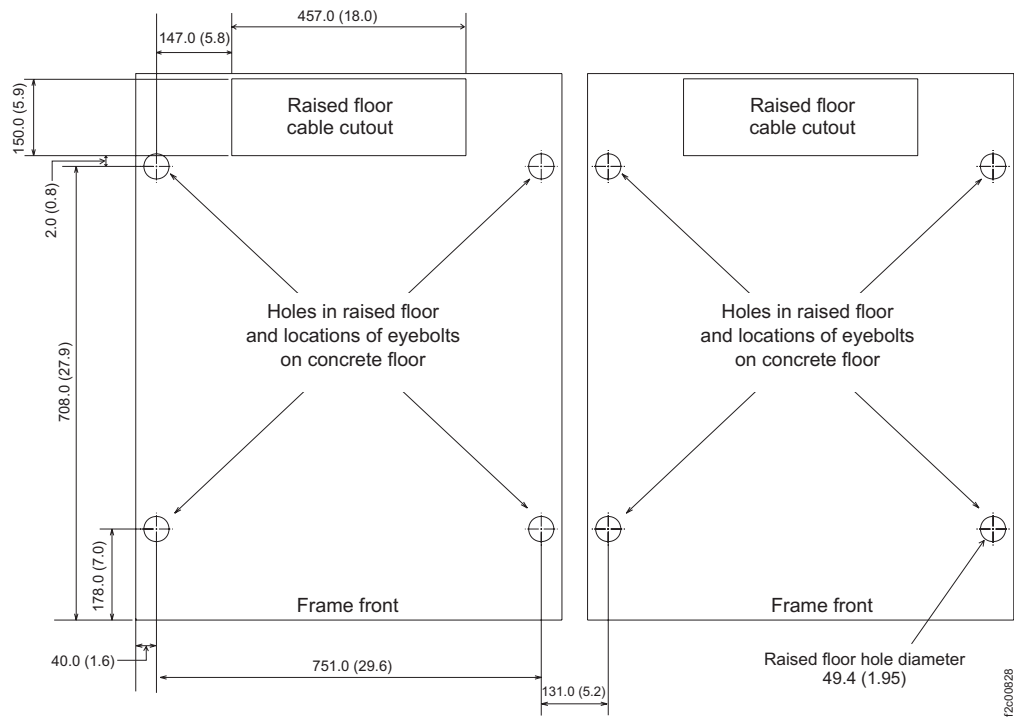

Figure 91. Locations for cable cutouts and rubber bushing holes for raised floor and eyebolt installation on concrete floor

4. Familiarize yourself with the MES kit hardware. Refer to "MES kit bill of materials, figures, and part numbers" on page 125.

5. Do the following after the rack is in its final position over the raised floor cutouts.

   a. Move one rack to the location and install the floor tie-down hardware before moving the next frame into position to have the tie-down hardware installed.

   b. Do not tighten the tie-down turnbuckles until all of the racks have been installed.

   c. There are two versions of the turnbuckle supplied in this kit, a short turnbuckle, and a long turnbuckle. The difference in the versions is for the height of the raised floor. The installation procedure is the same for both.

6. This is an overview of the floor tie-down hardware.

   • The leveler nut and support plate lift the rack up slightly to take the weight off the wheel caster.

   • The frame stud pulls the rack down against the floor to keep it from tipping over.
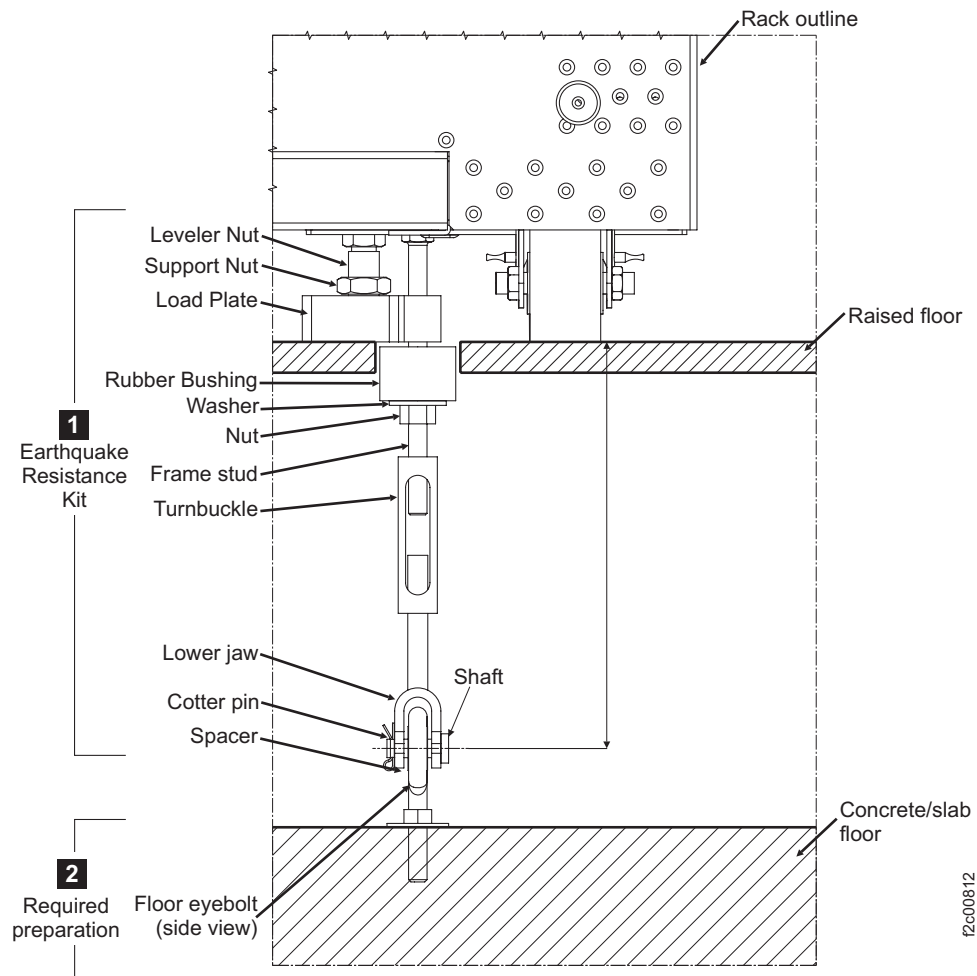
Figure 92. Floor tie-down hardware

7. The MES kit should include two frame jack assemblies. They can be used to raise one side of the rack at a time, so you have more clearance between the rack and the floor to install the floor tie-down hardware.
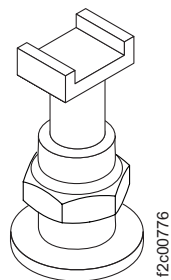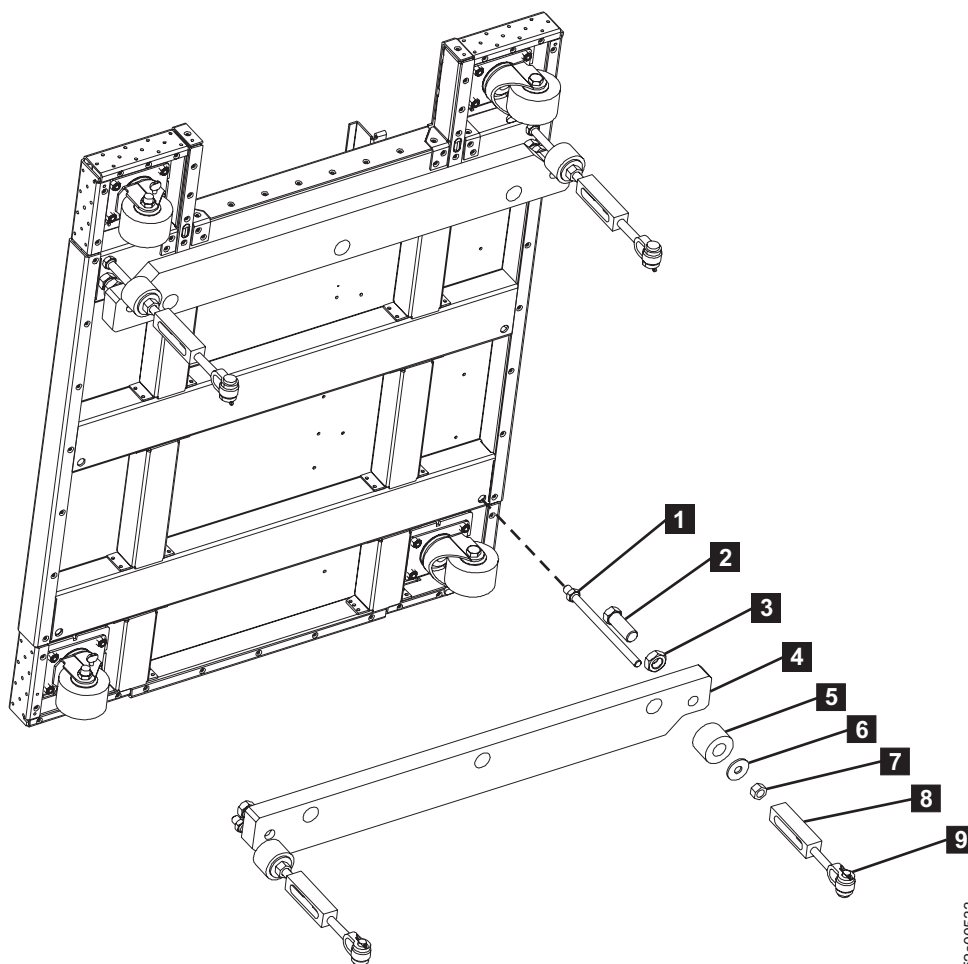

Figure 93. Frame jack tool

The following shows the raised floor tie-down hardware:

Figure 94. Raised floor tie-down

8. Install the jam nut ❸ on leveler ❷ and thread it on fully.

9. Install two levelers on each load plate ❹ .

10. Position the load plates under the rack.

11. Install the tie-down studs ❶ into the rack. You can do this from above or below the raised floor.

   Note: A frame jack tool assembly is provided to lift the frame as an aid in attaching the tie-down frame stud to the frame. Place them on the outside corners of one side of the frame. Attach the tie-down hardware to one side of the frame. Move the frame jack assembly to the outside corners of the other side of the frame to aid in attaching the tie-down hardware to the other side of the frame. This tool is to be used on unbolted frames.

12. Raise the leveler ❷ by tightening until it is tight against the frame and then tighten it an additional one-half turn. This will take the rack weight off the caster wheel.

13. Use the jam nut ❸ to lock the leveler.

14. Install the rubber bushing ❺ , washer ❻ and nut ❼ on the frame stud ❶ . This must be done from beneath the raised floor.

15. Tighten the nut until the rubber bushing is secure against the load plate and protects the frame stud from touching the sides of the raised floor hole.

16. Screw in the lower jaw assembly ◼9 into the turnbuckle ◼8 .

17. Screw the turnbuckle assembly onto the frame stud ◼1 ensuring that both shafts are equally inserted so that there is room to tighten them later.

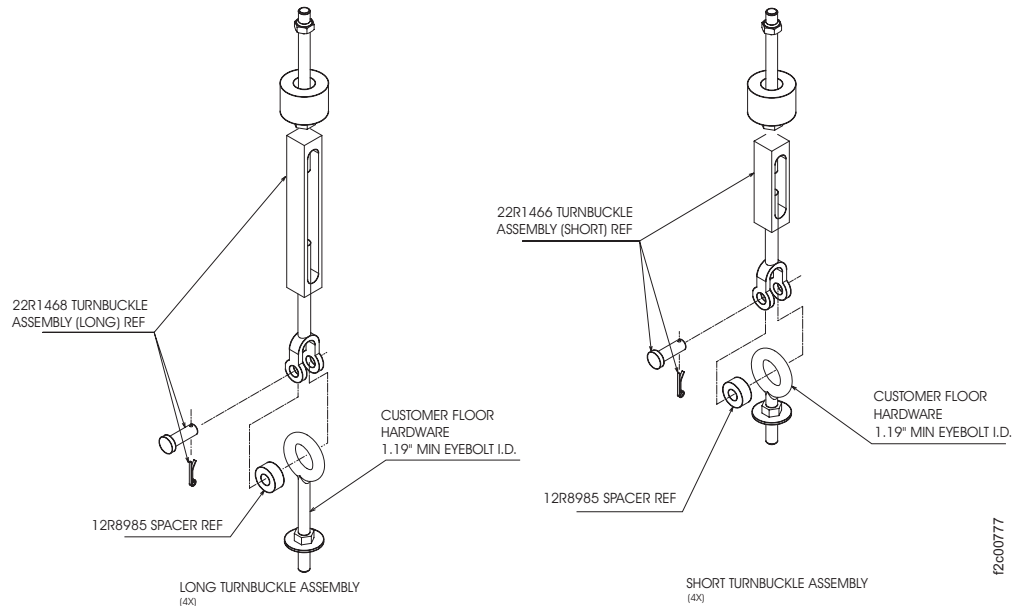18. Place the spacer into the customer-installed eyebolt.

Figure 95. Turnbuckle assembly

19. Install the lower jaw onto the floor eyebolt with the shaft. Secure the shaft with cotter pin.

20. After installing all frames, tighten the turnbuckles by hand until snug, then tighten it an additional one-half turn to ensure that the tie-down assembly is sufficiently secure.

   Note: If you are working with a two or three frame storage facilities, you can leave the turn buckles loose until you have completed the installation of all the frames and then you can fully tighten them.

21. Repeat the above steps for each of the four corners in the frame.

22. Repeat these steps for each frame in the storage facility

23. Continue with "Installing front and rear rack stiffening hardware" on page 120.

Non-raised floor tie-down hardware

1. If the earthquake resistance kit is being installed, it must be installed on all racks in a storage facility (base rack and attached expansion racks).

2. Read this entire section to understand the rack stiffening and floor tie-down installation before you return to the installation instructions that sent you here. You will need to decide during the rack installations when to use the information in this procedure to install the earthquake resistance kit.

3. Inspect the floor where the storage facility racks are to be installed. Refer to Figure 96 on page 118 and ensure the following are already present for each rack:

   a. The concrete floor must have three fasteners per load plate.

b. Refer to Figure 97 on page 119, if the customer has threaded holes in the floor, you must be given three bolts and washers used to fasten each load plate to the floor. If the customer has provided studs, you must be given three nuts and washers to fasten each load plate to the floor.
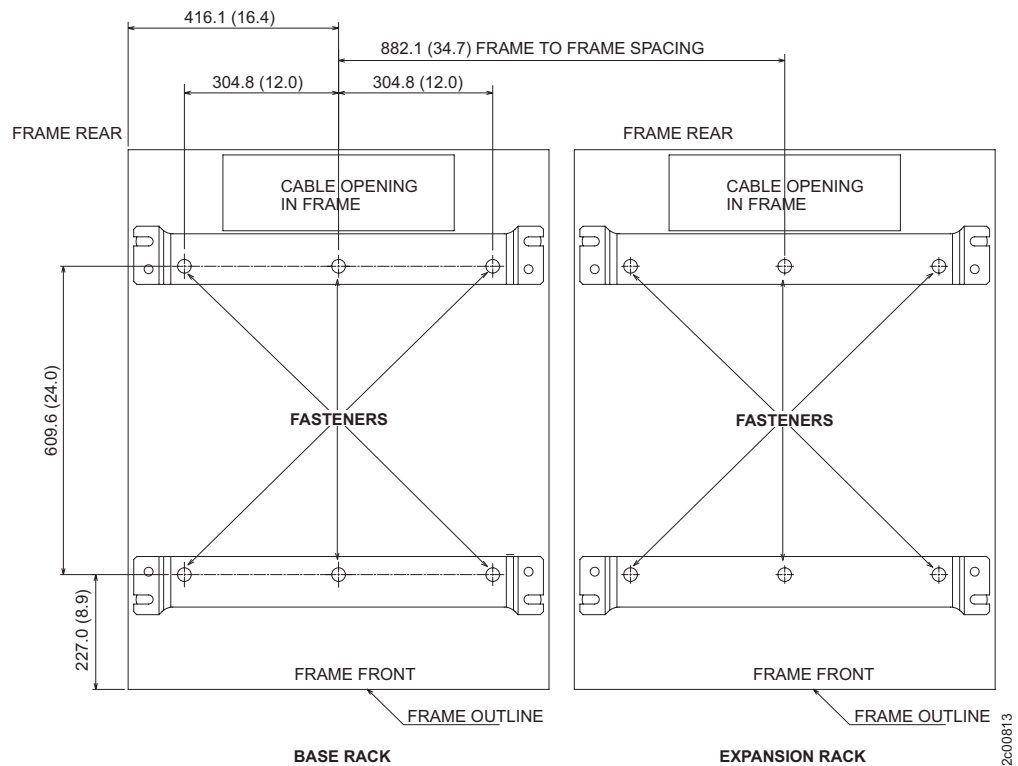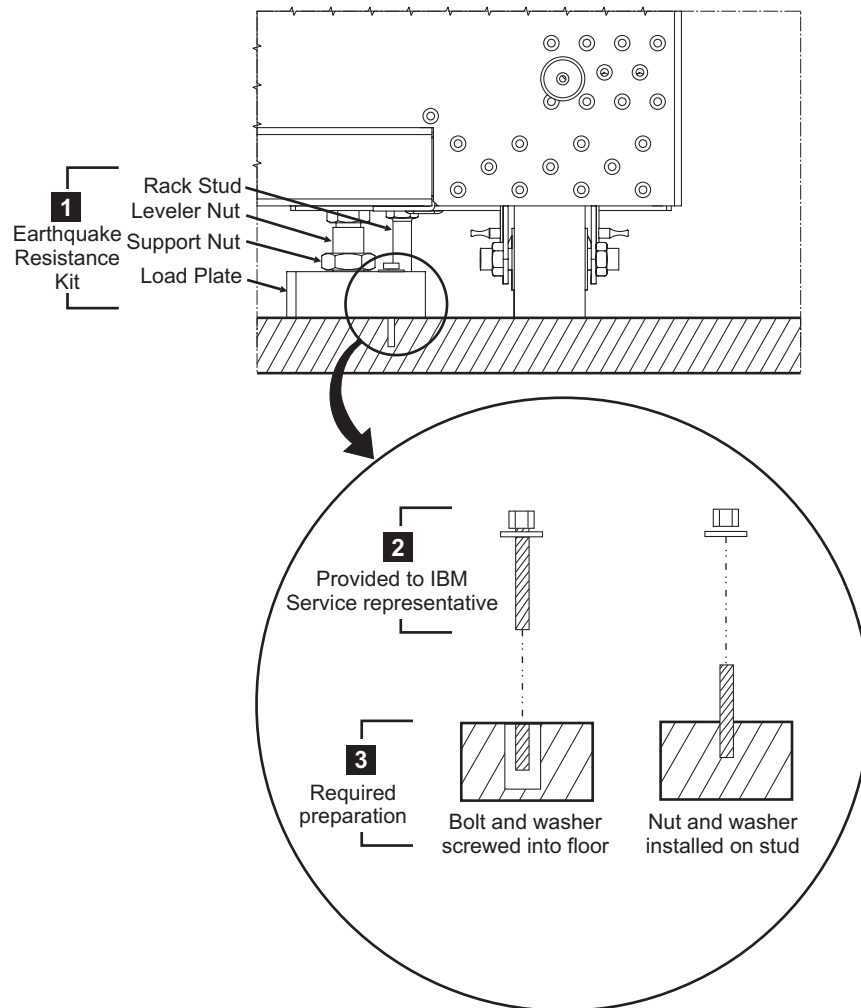

Figure 96. Locations for fastener installation (non-raised floor). Dimensions in millimeters (inches)

4. Familiarize yourself with the MES kit hardware. Refer to "MES kit bill of materials, figures, and part numbers" on page 125.

5. Do the following after the rack is in its final position.

   a. Move one rack to the location and install the floor tie-down hardware before moving the next frame into position to have the tie-down hardware installed.

6. This is an overview of the floor tie-down hardware.

   • The leveler nut and support plate lift the rack up slightly to take the weight off the wheel caster.

   • The frame stud pulls the rack down against the floor to keep it from tipping over.

Rack Stud
Leveler Nut
Support Nut
Load Plate

1 Earthquake Resistance Kit

2 Provided to IBM Service representative

3 Required preparation

Bolt and washer screwed into floor

Nut and washer installed on stud

f2c00827

Figure 97. Earthquake resistance kit - common fasteners

7. The MES kit should include two frame jack assemblies. They can be used to raise one side of the rack at a time, so you have more clearance between the rack and the floor to install the floor tie-down hardware.
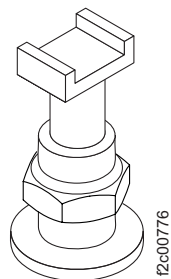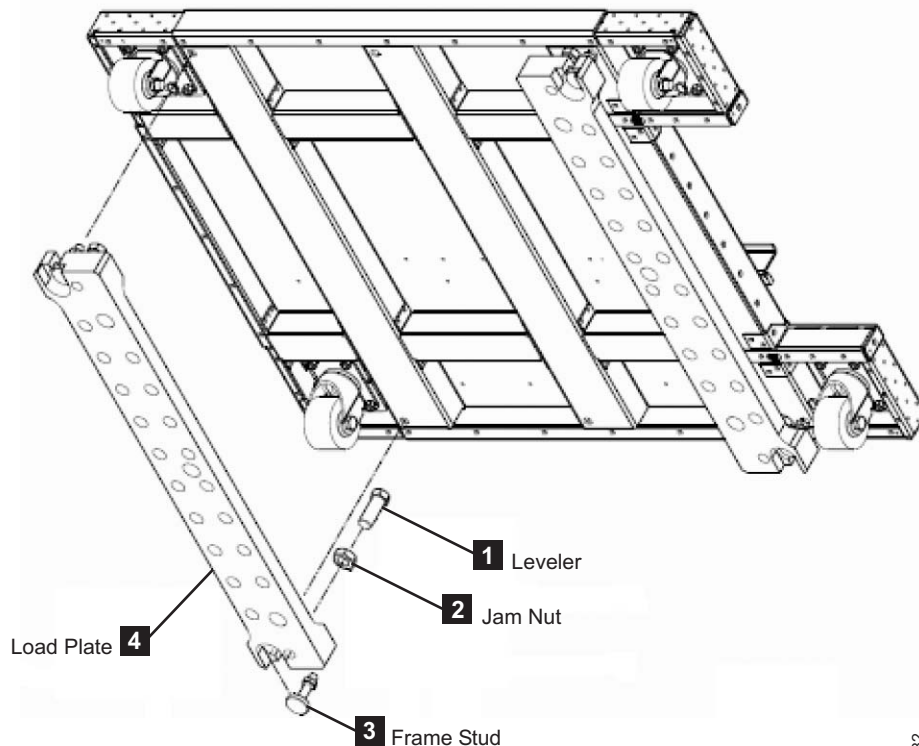

f2c00776

Figure 98. Frame jack tool

The following shows non-raised floor tie-down hardware.

Non-raised Floor Tie-down

f2c00782

Figure 99. Non-raised floor tie-down hardware

8. Fasten the load plate to the concrete floor using the six fasteners for each rack provided to you by the customer.

    Note: A frame jack tool assembly is provided to lift the frame as an aid in attaching the tie-down frame stud to the frame. Place them on the outside corners of one side of the frame. Attach the tie-down hardware to one side of the frame. Move the frame jack assembly to the outside corners of the other side of the frame to aid in attaching the tie-down hardware to the other side of the frame. This tool is to be used on unbolted frames.

9. Install the leveler **1** and jam nut **2** onto the load plate.

10. Position the rack and install the frame studs into the rack. The frame stud goes into the slot at the bottom of the load plate and then threads into the bottom of the rack. After you have installed the frames, remove the jack tool from beneath the frame.

11. Raise the leveler by tightening the leveler until the frame stud head is tight against the load plate, then tighten it an additional one-quarter turn. This will remove some weight off the wheel caster.

12. Tighten the frame stud so it holds the rack securely down to the load plate.

13. Continue with "Installing front and rear rack stiffening hardware."

Installing front and rear rack stiffening hardware

Use this section to install the front and rear rack stiffening hardware for the earthquake resistance kit.

Rack front bracing

1. Remove the cover from the front of the rack.

2. Remove the front cover latch bracket **12** from the left side of the frame, near the rack operator panel. Refer to Figure 100. The cover latch bracket **7** will then be mounted on the frame extension **1** using the same screws in a later step.
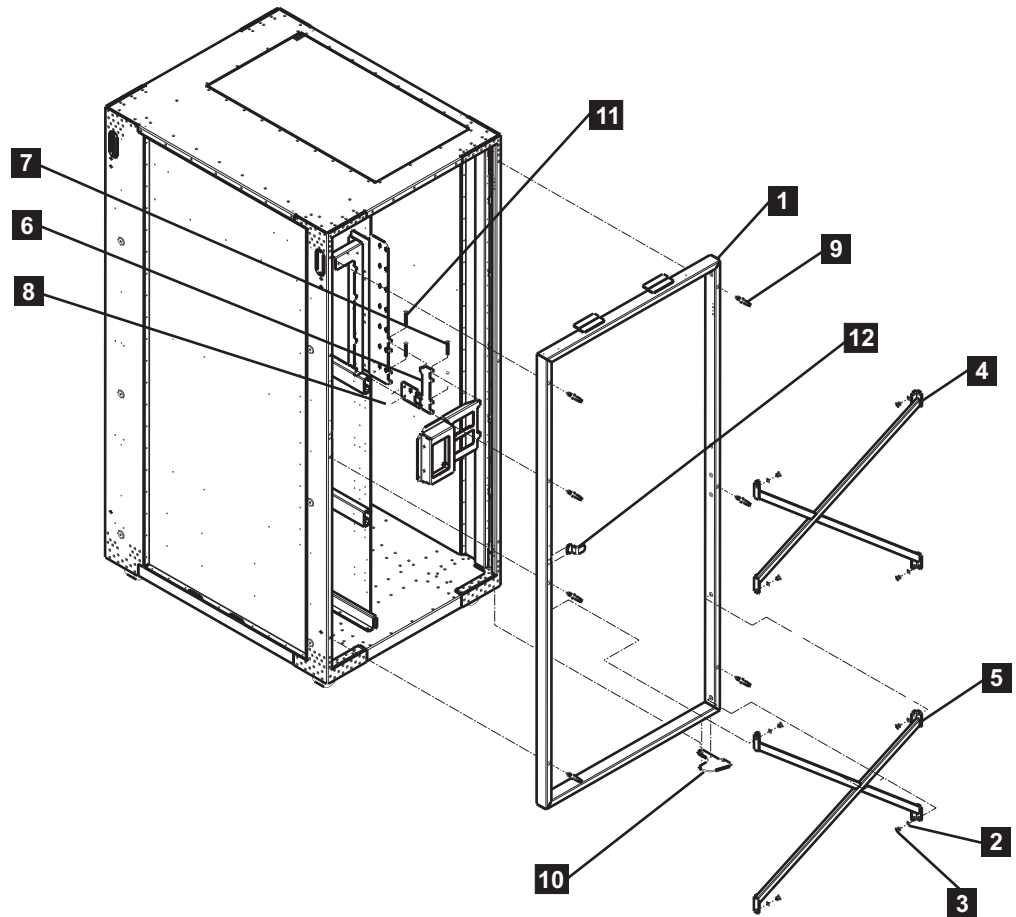
Frame Front Seismic Bracing

Figure 100. Earthquake resistance kit - front frame bracing

3. Remove the front cover hinges from the frame and the stop strap from the top of the frame.

4. Install the seven screws that secure the brace extension frame to the front of the rack. See Figure 100.

   Note: The brace extension frame weighs 17.0 kg (37.4 lbs). Installation of this assembly requires two service representatives.

5. Reinstall the latch bracket **7** on the extension frame **1** .

6. Relocate the front cover hinges from the frame to the extension frame with the existing screws.

7. Remove the operator panel pivot pins **11** from the existing bracket. See Figure 101 on page 122.
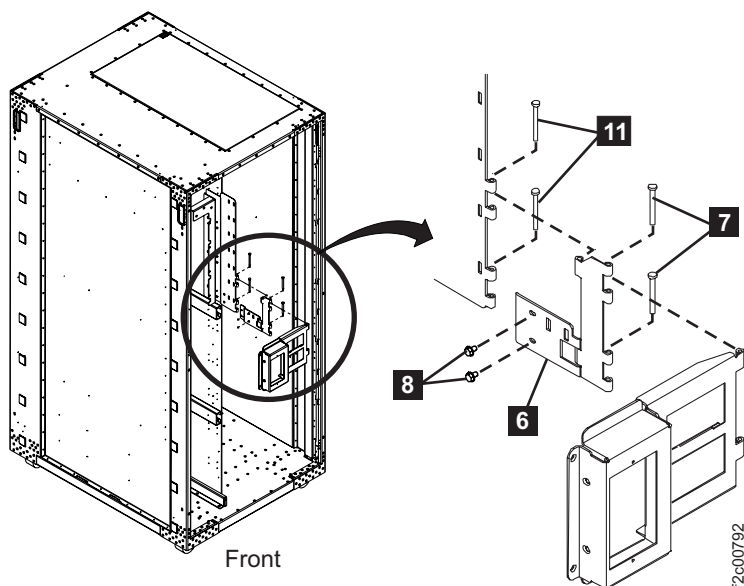
Figure 101. Earthquake resistance kit

8. Attach the rack operator panel relocation bracket **6** using the removed pivot pins **7** and screws **8** .

9. Remove the operator panel cable from the first cable tie above the operator panel.

10. Attach the operator panel to the relocation bracket using new pivot pins.

11. Install the upper X-brace **4** with screws and washers to the brace extension frame. See Figure 100 on page 121.

12. Install the lower X-brace **5** with screws and washers to the brace extension frame. See Figure 100 on page 121.

13. Reinstall the front cover and the stop strap on the top of the extension frame.

Note: You might have to close the HMC to install the cover.

CEC enclosure rear bracing

You must install the CEC enclosure rear support brackets.

Figure 102. CEC support bracing
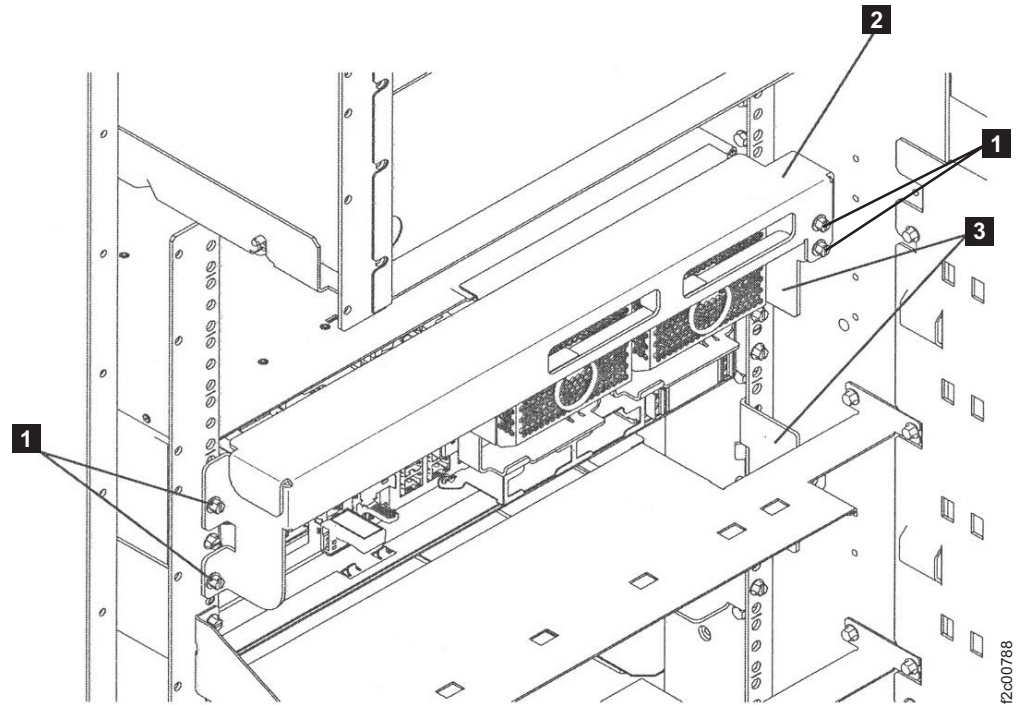
1. Earlier frames do not have the bracket **3**. If the bracket is missing from the frame, go to 2. If the bracket is present on the frame, go to 3.
2. Use two (2) screws to install the supplied bracket **3**. Repeat the installation for the second CEC enclosure.
3. Use four (4) screws to install the CEC support bracket **2** to the frame. Repeat the installation for the second CEC.

Rack rear bracing

1. Remove the covers from the rear of the rack.
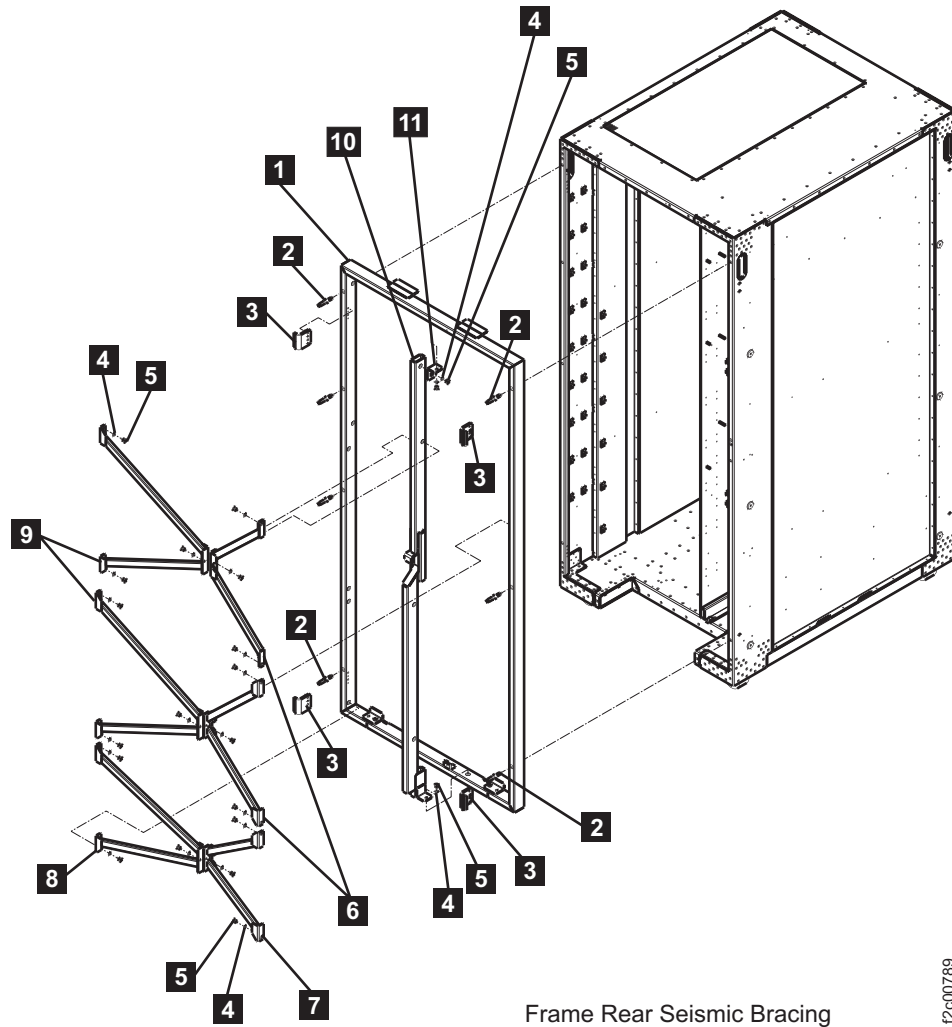
Frame Rear Seismic Bracing

f2c00789

Figure 103. Frame rear

2. Remove the rear cover hinges (quantity 4 of item **3**) from the brace extension frame **1**.

3. Install the seven (7) screws that secure the brace extension frame to the rear of the rack. See Figure 103.

4. Reinstall the four (4) hinges with existing screws on the extension frame.

5. Install the rear center post **10** to the top and bottom mounting brackets that are installed on the brace extension frame with screws and washers.

6. Install the left side V-braces **8** **9** with screws and washers to the brace extension frame.

7. Install the right side V-brace **6** **7** with screws and washers to the brace extension frame.

8. Secure the V-braces with screws and washers to the rear center post.

9. Reinstall the rear covers on the extension frame.

MES kit bill of materials, figures, and part numbers

FFBM - 22R6616 basic kit
FFBM - 22R2053 for the 92x, 93x, and 9x2 models only

Earthquake resistance kit parts at the front of the rack (stiffeners)

Use the figures and tables that follow to locate information about the earthquake resistance kit brackets (stiffeners) at the front of the rack.

Figure 104. Frame jack tool

Table 37. Frame jack tool parts

Part name	Part number
Jack tool	17P8369

Front View

f2c00583
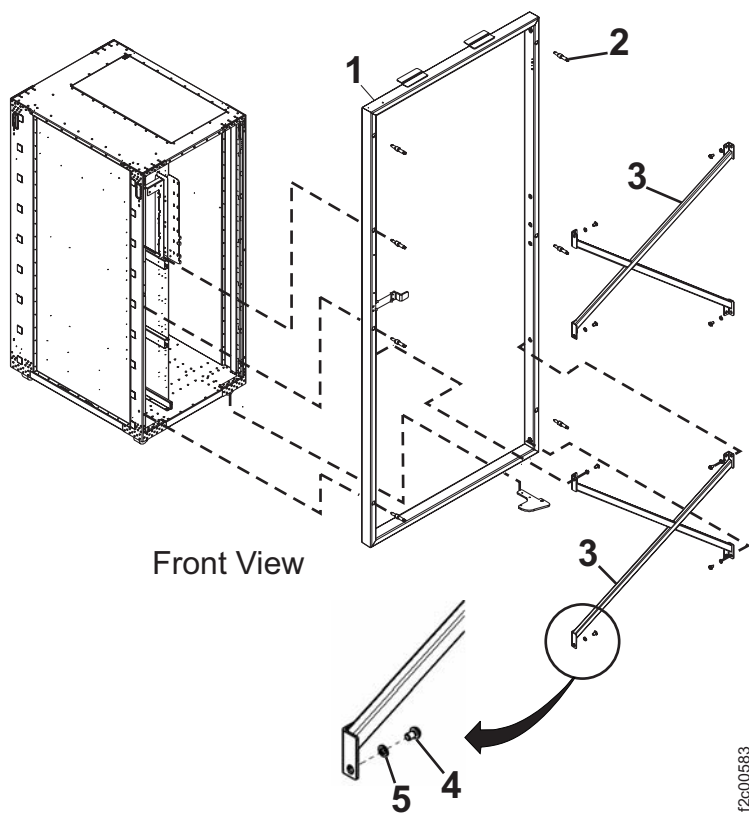
Figure 105. Earthquake resistance kit parts at the front of the rack

Table 38. Earthquake resistance kit parts (except relocation bracket for the operator panel)

Index	Part name	Part number
1	Brace extension frame	22R1317
2	Screw	22R2193
3	X-brace	22R1321
4	Screw (20mm)	1621538
5	Washer, Lock	1622321
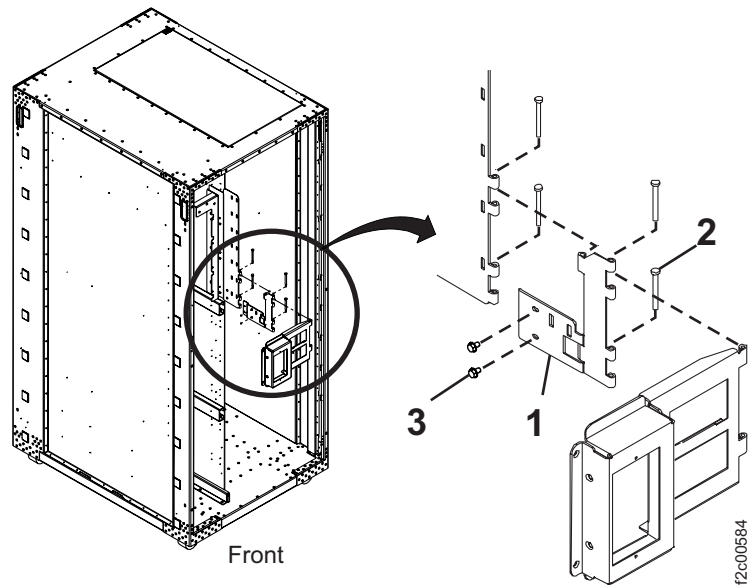
Figure 106. Earthquake resistance kit parts - Relocation bracket for the operator panel

Table 39. Earthquake resistance kit relocation bracket for the operator panel

Index	Part name	Part number
1	Bracket, relocation	22R1793
2	Pin, pivot	22R1794
3	Screw	1621842
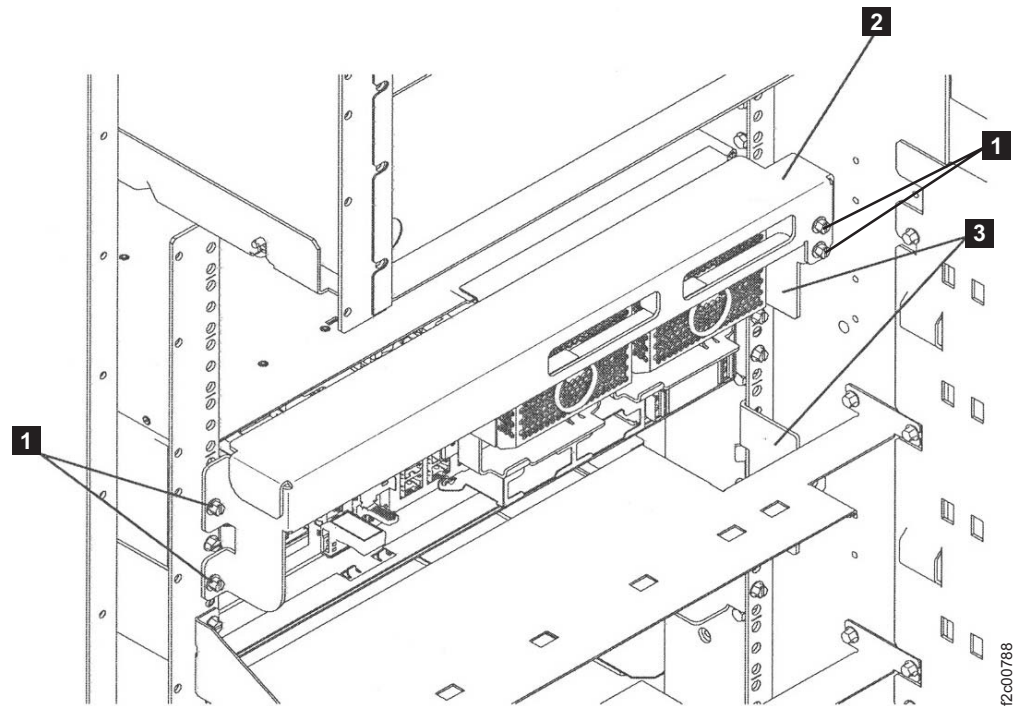
Figure 107. CEC support bracing

Table 40. CEC stiffeners

Index	Part name	Part number
1	Screw	23R1520
2	Bracket, stiffener	22R6856
3	Bracket, mounting	17P8485

Earthquake resistance kit parts at the rear of the rack (stiffeners)

Use the figures and tables that follow to locate information about the earthquake resistance kit brackets (stiffeners) at the rear of the rack.
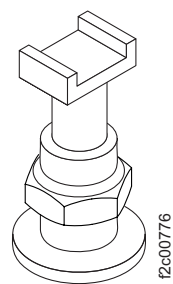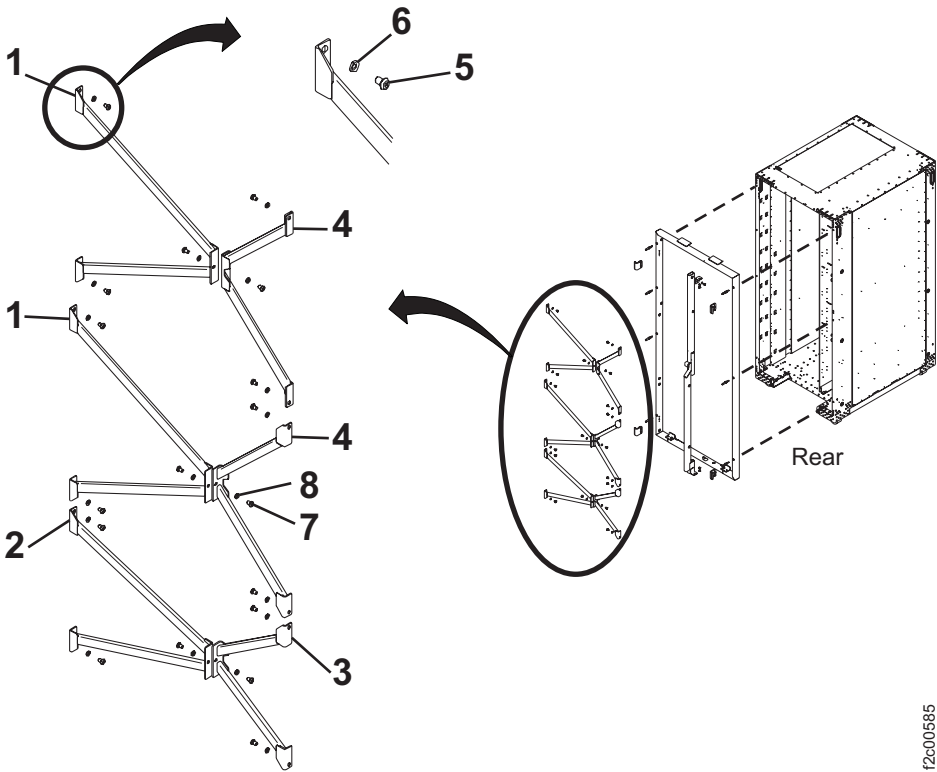

Figure 108. Earthquake resistance kit V-braces at the rear of the rack

Table 41. Earthquake resistance kit V-braces

Index	Part name	Part number
1	V-brace, main, upper	22R1313
2	V-brace, main, lower	22R1315
3	V-brace, power, lower	22R1316
4	V-brace, power, upper	22R1314
5	Screw (20mm)	1621538
6	Washer, Lock	1622321
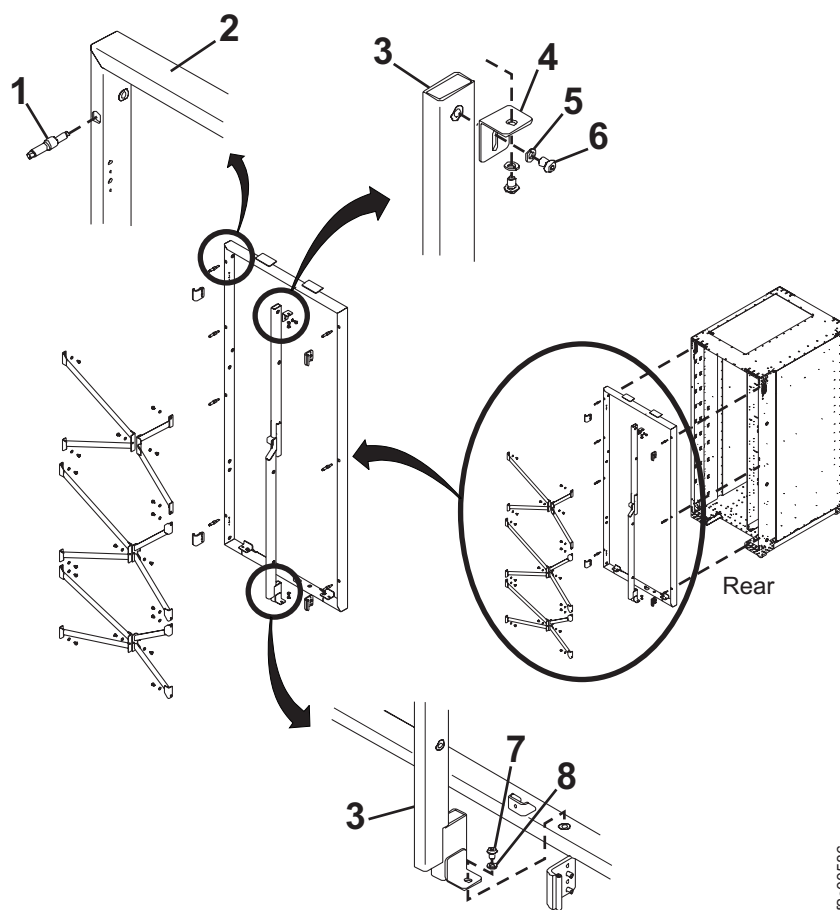
Figure 109. Earthquake resistance kit parts at the rear of the rack (except V-braces)

Table 42. Earthquake resistance kit parts (except V-braces)

Index	Part name	Part number
1	Screw	22R2193
2	Brace extension frame	22R5959
3	Vertical brace	22R1304
4	Bracket, vertical brace to frame	22R5960
5	Washer	1622321
6	Screw	1621538
7	Screw	1621538
8	Washer	1622321

Earthquake resistance kit parts at the floor (tie-downs)

Use the figures and tables that follow to locate information about the earthquake resistance kit parts that tie the rack to the floor.

*Figure 110. Floor tie-down parts of the earthquake resistance kit (non-raised floor)*

Table 43. Floor tie-down parts of the earthquake resistance kit (non-raised floor)

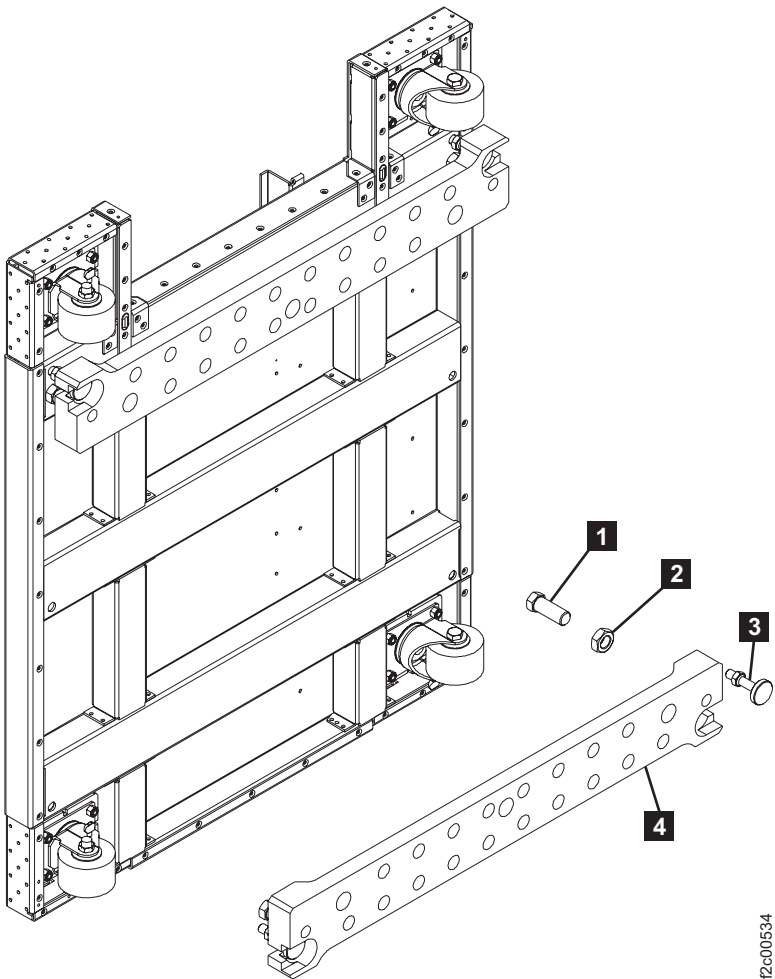| Index	Part name[1]	Part number
1	Leveler	22R1462
2	Jam nut	22R1463
3	Stud	22R1461
4	Load plate	22R1515
Notes		
[1] - Part of the tie-down hardware kit P/N 22R1472.		
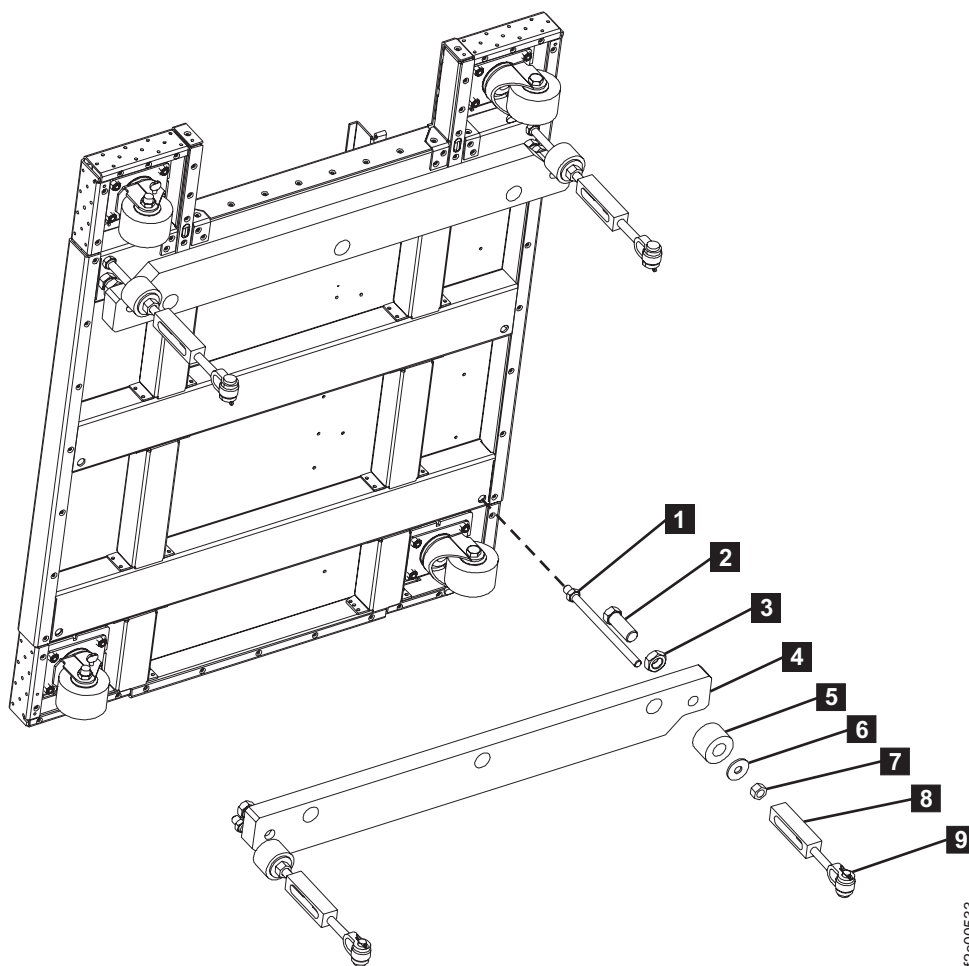
Figure 111. Floor tie-down parts of the earthquake resistance kit (raised floor)

Table 44. Floor tie-down parts of the earthquake resistance kit (raised floor)

Index	Part name	Part number
1	Stud, frame-to-turnbuckle	22R1464
2	Leveler	22R1462
3	Jam nut	22R1463
4	Load plate	22R1301
5	Bushing, rubber	44P2997
6	Washer (M12)	[1]
7	Nut (M12x1.75)	[2]
8	Turnbuckle, short[3]	22R1465
8	Turnbuckle, long[4]	22R1467
9	Spacer, jaw-to-floor hardware, cotter pin, and holding pin	[3], [4]
Notes		
[1] - McMaster-Carr P/N 91100A180 or IBM approved equivalent.		
[2] - McMaster-Carr P/N 90591A181 or IBM approved equivalent.		
[3] - Part of the short tie-down hardware kit (P/N 22R1466).		

Table 44. Floor tie-down parts of the earthquake resistance kit (raised floor) (continued)

Index	Part name	Part number
[4] - Part of the long tie-down hardware kit (P/N 22R1468).		

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Index

A
accessibility   136

C
cables to route, FC-AL   22
cables, RIO-G   22
cables, routing and connecting interrack
    FCIC   22
    RIO-G   22
    RPC   22
    SPCN   22
cables, RPC   22
cables, SPCN   22
configuration of the external management
  console   90
covers, interrack decorative   34
create management console public
  key-file   69

D
damage, inspecting for shipping   8

E
electrician information, EMEA   42
EMEA Electrician Information   42
Ethernet
    switch locations and ports   59
Ethernet switch port designations   64
external management console,
  configuration of the   90

F
FC-AL cables to route   22

I
inbound connectivity, management
  console customization   69
installation tips, checking RETAIN   6
installing
    additional storage racks   15
    covers, interrack decorative   34
    finish and cleanup   76
    initial steps   1
    interrack decorative covers   34
interrack decorative covers, installing   34

K
keyboards
    accessibility features   136

L
legal
    terms and conditions   137
localhost.localdomain, removing the
  default HMC hostname   69
log in to management console   66

M
mainline power cables on racks (plug in),
  connecting   42
management console
    ID and password for service   66
    overview   53
    public key-file   74
    registration   6
management console, configuration of the
  external   90

N
Network Topology Tool   82, 102

O
outbound connectivity, management
  console customization   69
overview of a storage complex and
  management console   53

P
password and ID, management
  console   66
positioning Rack-1   9
power on external management
  console   90
primary and secondary   53
primary management console, configure
  for rack 1   54
public key-file, management console
  create and send   69

R
Rack-1, positioning   9
registration, checking RETAIN for
  management console   6
registration, management console   6
removing the default HMC hostname
  (localhost.localdomain)   69
RETAIN for storage facility installation
  tips, checking   6
RIO-G cables   22
route, FC-AL cables to   22
RPC cables   22

S
safety inspection, determine if
  required   8
ship group, verify   6
shipping damage, inspecting for   8
SPCN cables   22
storage complex and management
  console, overview of a   53
storage facility, new connection to an
  existing storage plex   64
switch port designations, Ethernet   64
switch settings, check rack   47

T
Topology Tool, Network   82, 102
Trademarks   137

V
vertical interrack covers   34

W
wheel chocks, install   9

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Installation Guide
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