

Stratus ftServer 2300: Site Planning Guide

Stratus Technologies
R562-01

Notice

The information contained in this document is subject to change without notice.

UNLESS EXPRESSLY SET FORTH IN A WRITTEN AGREEMENT SIGNED BY AN AUTHORIZED REPRESENTATIVE OF STRATUS TECHNOLOGIES, STRATUS MAKES NO WARRANTY OR REPRESENTATION OF ANY KIND WITH RESPECT TO THE INFORMATION CONTAINED HEREIN, INCLUDING WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PURPOSE. Stratus Technologies assumes no responsibility or obligation of any kind for any errors contained herein or in connection with the furnishing, performance, or use of this document.

Software described in Stratus documents (a) is the property of Stratus Technologies Bermuda, Ltd. or the third party, (b) is furnished only under license, and (c) may be copied or used only as expressly permitted under the terms of the license.

Stratus documentation describes all supported features of the user interfaces and the application programming interfaces (API) developed by Stratus. Any undocumented features of these interfaces are intended solely for use by Stratus personnel and are subject to change without warning.

This document is protected by copyright. All rights are reserved. No part of this document may be copied, reproduced, or translated, either mechanically or electronically, without the prior written consent of Stratus Technologies.

Stratus, the Stratus logo, ftServer, Continuum, Continuous Processing, StrataLINK, and StrataNET are registered trademarks of Stratus Technologies Bermuda, Ltd.

The Stratus Technologies logo, the ftServer logo, Stratus 24 x 7 with design, The World's Most Reliable Servers, The World's Most Reliable Server Technologies, ActiveService, ftGateway, ftMemory, ftMessaging, ftStorage, Selectable Availability, XA/R, SQL/2000, and The Availability Company are trademarks of Stratus Technologies Bermuda, Ltd.

VERITAS, VERITAS SOFTWARE, the VERITAS logo, Business Without Interruption, VERITAS The Data Availability Company, and VERITAS Volume Manager are trademarks or registered trademarks of VERITAS Software Corporation in the U.S. and/or other countries.

All other trademarks are the property of their respective owners.

Manual Name: *Stratus ftServer 2300: Site Planning Guide (R562)*

Part Number: R562

Revision Number: 01

Software Release Number: 4.0.0

Publication Date: April 2005

Stratus Technologies, Inc.
111 Powdermill Road
Maynard, Massachusetts 01754-3409

© 2004 Stratus Technologies Bermuda, Ltd. All rights reserved.

Contents

| | |
|----------------|----|
| Preface | ix |
|----------------|----|

| | |
|--------------------------------------------------------------|-----|
| 1. Welcome to Site Planning for ftServer 2300 Systems | 1-1 |
| Site Planning Overview | 1-1 |
| Site Planning for Fault-Tolerant Systems | 1-2 |
| Site Planning Checklist | 1-3 |
| System Documentation | 1-5 |

| | |
|--------------------------------------------|-----|
| 2. Cabinet and Monitor Requirements | 2-1 |
| Cabinet Requirements | 2-1 |
| Monitor Requirements | 2-4 |

| | |
|--------------------------|-----|
| 3. Space Planning | 3-1 |
| Room Requirements | 3-1 |
| Planning for Cables | 3-2 |

| | |
|------------------------------------------------------------|------|
| 4. Electrical (AC) Power Planning | 4-1 |
| Redundant Power Sources | 4-1 |
| AC Power Service Requirements | 4-2 |
| Power Outlet Requirements | 4-4 |
| Connecting a System Directly to Two Separate Power Sources | 4-5 |
| Stratus-Supplied Power Cords | 4-7 |
| ftServer 2300 System Power Cords | 4-7 |
| PDU Power Cords | 4-8 |
| Power Cords for Optional Components | 4-9 |
| Power Cords for Modems | 4-10 |

| | |
|----------------------------------------------------|-----|
| 5. UPS Planning | 5-1 |
| Qualified APC UPS Models | 5-1 |
| Communicating with a UPS over a Network | 5-3 |
| Connecting the A-Side PDU to a UPS | 5-3 |
| Connecting ftServer 2300 Systems Directly to a UPS | 5-5 |

| | |
|-------------------------------------------------|-----|
| 6. Network and Telephone Line Planning | 6-1 |
| Network Cable Requirements | 6-1 |
| Telephone Line Requirements | 6-2 |
| Site Planning for Systems in an ftGateway Group | 6-3 |

| | |
|---------------------------------------|-----|
| 7. Rack Configuration Planning | 7-1 |
| Using PDUs | 7-1 |
| Determining PDU Requirements | 7-2 |
| Sample PDU Usage Calculation | 7-4 |

| | |
|----------------------------------------------------|-----|
| Appendix A. System Specifications | A-1 |
| Pedestal ftServer 2300 System Specifications | A-1 |
| Rack-Mountable ftServer 2300 System Specifications | A-5 |

| | |
|------------------------------------------------------------|------|
| Appendix B. Specifications of Peripheral Components | B-1 |
| V128 LCD Monitor Unit Specifications | B-2 |
| V129 LCD Monitor Unit Specifications | B-4 |
| V115 Keyboard Specifications | B-5 |
| AAP41104 PDU Specifications | B-6 |
| AK470 KVM Switch Specifications | B-8 |
| AK438 USB Floppy Disk Drive Specifications | B-10 |
| T521 and T522 Tape Drive Enclosure Specifications | B-11 |
| C719 External Modem Specifications | B-12 |

| | |
|--------------------------------------------------------------|-----|
| Appendix C. Electrical Circuit and Wiring Information | C-1 |
| Fault Protection Requirements | C-1 |
| Grounding Considerations | C-1 |
| Circuit Wiring Diagrams | C-3 |
| Electrical Power Connectors | C-9 |

Appendix D. Standards Compliance

D-1

Index

Index-1

Figures

| | | |
|-------------|----------------------------------------------------------------------------------------|------|
| Figure 2-1. | Rail Clearance | 2-3 |
| Figure 4-1. | ftServer 2300 System Connected Directly to AC Power | 4-6 |
| Figure 4-2. | Pedestal ftServer 2300 Systems Connected Directly to AC Power | 4-6 |
| Figure 5-1. | ftServer 2300 Systems: Top PDU Connected to a UPS | 5-4 |
| Figure 5-2. | ftServer 2300 Systems: A-Side Power Connected Directly to a UPS | 5-5 |
| Figure 5-3. | Pedestal ftServer 2300 Systems: A-Side Power Connected Directly to a UPS | 5-6 |
| Figure A-1. | Pedestal ftServer 2300 System - Front View | A-2 |
| Figure A-2. | Pedestal ftServer 2300 System - Rear View | A-3 |
| Figure A-3. | Rack-Mountable ftServer 2300 System - Front View | A-6 |
| Figure A-4. | Rack-Mountable ftServer 2300 System - Rear View | A-7 |
| Figure B-1. | V128 LCD Monitor Unit | B-2 |
| Figure B-2. | V129 LCD Monitor Unit | B-4 |
| Figure B-3. | AAP41104 PDU | B-6 |
| Figure B-4. | AK470 KVM Switch | B-8 |
| Figure B-5. | AK438 USB Floppy Disk Drive | B-10 |
| Figure B-6. | T521 and T522 Tape Drives | B-11 |
| Figure C-1. | Star Ground Example | C-2 |
| Figure C-2. | Power Input Labeling | C-3 |
| Figure C-3. | Single-Phase 120-Volts AC Circuit Connection | C-4 |
| Figure C-4. | Single-Phase 240-Volts AC Circuit Connection | C-5 |
| Figure C-5. | Split-Phase 120/240 Volts AC Circuit Connection | C-6 |
| Figure C-6. | Three-Phase 208-Volts AC, Y-, or Δ -Source Circuit Connection, Phase-to-Neutral | C-7 |
| Figure C-7. | Three-Phase 208-Volts AC, Y-, or Δ -Source Circuit Connection, Phase-to-Phase | C-8 |
| Figure C-8. | Three-Phase 380-Volts AC, Y-, or Δ -Source Circuit Connection, Phase-to-Neutral | C-9 |

Tables

| | | |
|-------------|------------------------------------------------------------------|------|
| Table 1-1. | ftServer 2300 Documents | 1-6 |
| Table 3-1. | Cables Supplied by Stratus | 3-2 |
| Table 4-1. | AC Power Service Requirements | 4-2 |
| Table 4-2. | Worksheet for Determining A-Side Power Requirements | 4-3 |
| Table 4-3. | Worksheet for Determining B-Side Power Requirements | 4-3 |
| Table 4-4. | Worksheet for Determining External Power Requirements | 4-4 |
| Table 4-5. | Worksheet: A-Side External Power Outlet Requirements - PDUs Used | 4-4 |
| Table 4-6. | Worksheet: B-Side External Power Outlet Requirements - PDUs Used | 4-4 |
| Table 4-7. | Worksheet: A-Side External Power Outlet Requirements - No PDUs | 4-5 |
| Table 4-8. | Worksheet: B-Side External Power Outlet Requirements - No PDUs | 4-5 |
| Table 4-9. | System Power Cords to AC Power | 4-7 |
| Table 4-10. | System Power Cords to a UPS | 4-8 |
| Table 4-11. | PDU Power Cords to AC Power | 4-9 |
| Table 4-12. | System Power (<i>Jumper</i>) Cables to a PDU | 4-9 |
| Table 4-13. | Power Cords for Optional Components | 4-9 |
| Table 4-14. | Modem Power Cords | 4-10 |
| Table 5-1. | APC Symmetra Models for PDUs or for Multiple Systems | 5-1 |
| Table 5-2. | APC Smart-UPS Models for a Single Rack-Mountable System | 5-2 |
| Table 5-3. | APC UPS Models for a Single Pedestal System | 5-2 |
| Table 6-1. | Customer-Supplied Ethernet Cables | 6-2 |
| Table 7-1. | Current and Rack-Space Requirements | 7-2 |
| Table 7-2. | Calculating A-Side PDU and Rack-Space Requirements | 7-3 |
| Table 7-3. | Sample: Current and Rack-Space Requirements | 7-4 |
| Table 7-4. | Sample: Calculating A-Side PDU and Rack-Space Requirements | 7-4 |
| Table A-1. | Pedestal ftServer 2300 System Specifications | A-4 |
| Table A-2. | Rack-Mountable ftServer 2300 System Specifications | A-7 |
| Table B-1. | V128 LCD Monitor Unit Specifications | B-3 |
| Table B-2. | V129 LCD Monitor Unit Specifications | B-4 |
| Table B-3. | V115 Keyboard Specifications | B-5 |
| Table B-4. | AAP41104 PDU Specifications | B-7 |
| Table B-5. | AK470 KVM Switch Specifications | B-8 |
| Table B-6. | AK438 USB Floppy Disk Drive Specifications | B-10 |

| | | |
|------------|---------------------------------------------------|------|
| Table B-7. | T521 and T522 Tape Drive Enclosure Specifications | B-11 |
| Table B-8. | C719 External Modem Specifications | B-12 |
| Table C-1. | Connectors for AC Power Outlets | C-10 |
| Table D-1. | EMI Standards | D-1 |
| Table D-2. | Immunity Standards | D-2 |
| Table D-3. | Safety Standards | D-2 |
| Table D-4. | Noise Standards | D-2 |

Preface

Purpose of This Document

The *Stratus ftServer 2300: Site Planning Guide* (R562) documents the site requirements and customer responsibilities related to preparing a site for the installation of ftServer 2300 systems.

Audience

This document is intended for those responsible for preparing a site for the installation of ftServer 2300 systems.

Revision Information

This document is a revision.

This revision incorporates the following changes:

- Documentation of a power cord for use in China
- Site planning information for systems that will contain U531 Optical Fibre Channel PCI Adapters and connect to an EMC CLARiiON® AX100® storage system
- Site planning information for systems that will contain U529 Fibre Channel PCI Adapters and connect to a D540 storage enclosure
- Removal of site planning information for T511 tape drives, which are no longer available
- Corrected information about the marketing IDs of the power cords available for tape drives, LCD monitor units, and KVM switches

Notation Conventions

This document uses the notation conventions described in this section.

Warnings, Cautions, and Notes

Warnings, cautions, and notes provide special information and have the following meanings.



WARNING

A warning indicates a situation where failure to take or avoid a specified action could cause bodily harm or loss of life.



CAUTION

A caution indicates a situation where failure to take or avoid a specified action could damage a hardware device, program, system, or data.

NOTE

A note provides important information about the operation of an ftServer 2300 system.

Typographical Conventions

The following typographical conventions are used in ftServer 2300 system documents:

- The bold font emphasizes words in text or indicates text that you type, the name of a screen object, or the name of a programming element. For example:

Before handling or replacing a PCI adapter, make sure that you are properly grounded by using a grounded wrist strap.

In the **System Properties** dialog box, click the **Hardware** tab.

Call the **RegisterDeviceNotification** function.

- The italic font introduces new terms and indicates programming and command-line arguments that the user defines. For example:

Many hardware components are *customer-replaceable units* (CRUs), which can be replaced on-site by system administrators with minimal training or tools.

copy *filename1 filename2*

Pass a pointer for the *NotificationFilter* parameter

- The monospace font indicates sample program code and output, including message text. For example:

```
#include <iostream.h>
```

```
The operation completed successfully.
```

Getting Help

If you have a technical question about ftServer 2300 system hardware or software, try these online resources first:

- **Online support from Stratus Customer Service.** You can find the latest technical information about your ftServer 2300 system through online product support at the Stratus Technical Support Web site at:

<http://www.stratus.com/support/technics.htm>

- **Online product support for Microsoft® products.** Your primary source for support is the computer manufacturer who provided your software, or an authorized Microsoft Support Provider. You can also find the latest technical information about Microsoft Windows® and other Microsoft products through online product support at the Microsoft Help and Support Web site at:

<http://support.microsoft.com/>

If you are unable to resolve your questions with the help available at these online sites, and your ftServer 2300 system is covered by a service agreement, please contact the Stratus Customer Assistance Center (CAC) or your authorized Stratus service representative. For information about how to contact the CAC, see:

<http://www.stratus.com/support/cac/>

Your system administrator may have configured a Stratus Support phone number in ftServer Management Console (ftSMC), a snap-in to Microsoft Management Console (MMC). In ftSMC, under **ftServer Configuration**, click **ActiveService Network** to display the node's properties in the Details pane. The properties include a **Stratus Support Phone** item. The value of this property, if configured, is a telephone number you can call for support. For more information about ftSMC, see the *Stratus ftServer W Series: System Administrator's Guide* (R014W).

Chapter 1

Welcome to Site Planning for ftServer 2300 Systems

For an overview of the information you need to know and of the tasks you need to perform to prepare a site for ftServer 2300 systems, see:

- [“Site Planning Overview” on page 1-1](#)
- [“Site Planning for Fault-Tolerant Systems” on page 1-2](#)
- [“Site Planning Checklist” on page 1-3](#)
- [“System Documentation” on page 1-5](#)

Site Planning Overview

[Site planning for fault-tolerant systems](#) includes:

- [Space planning](#)

Provide adequate space for the system or cabinet and for a desk or table to accommodate components outside a cabinet. Also provide enough space for servicing the systems and components.

- [Purchasing an appropriate cabinet and monitor](#)

If you do not purchase a monitor from Stratus, provide a monitor that meets the system's requirements.

If you do not purchase the cabinet that Stratus references, provide a cabinet that meets the system's requirements.

- [Electrical \(AC\) power planning](#)

Provide electrical power sources that meet the system's requirements, optionally including a qualified uninterruptible power supply (UPS).

- [Network and telephone line planning](#)

Provide sufficient network and analog telephone lines.

Use the [“Site Planning Checklist” on page 1-3](#) to track your site preparation progress.

For a list of other documents related to your ftServer 2300 system, see “[System Documentation](#)” on page 1-5.

During the site planning and preparation processes, work closely with your facilities group or contractor to determine space, power, and environmental requirements. Enlist their help to provide a suitable location with sufficient alternating current (AC) power, heating, ventilation & air conditioning (HVAC) capabilities, and network and telephone connections.

If your system is covered by a service agreement and you need help with site planning, contact the Stratus Customer Assistance Center (CAC) or your authorized Stratus service representative. If you have a contract with the CAC or your authorized Stratus service representative to install the system, contact them after you have prepared the installation site and moved the system to the site. For more information about the CAC, see the CAC Web site at:

<http://www.stratus.com/support/cac/>

See [Appendix A, “System Specifications”](#) for ftServer 2300 system specifications and [Appendix B, “Specifications of Peripheral Components”](#) for specifications of other components.

Site Planning for Fault-Tolerant Systems

In addition to the usual site planning tasks, such as planning sufficient AC electrical power and providing network connections, consider the following specific fault-tolerant features of ftServer 2300 systems:

- Lockstep technology in ftServer 2300 systems means that the systems contain redundant hardware. ftServer 2300 systems contain two full computing environments (each containing a CPU and an I/O element), one on each side of the system.

In the event of a component malfunction, the system fails operation over to the other side and continues to operate normally, except that it is less fault tolerant. At a convenient time, the system can be brought down and either the failed component or the entire system can then be removed and replaced. Because the system continues to provide normal operation until a time to repair the system can be scheduled, data is not lost.

- ftServer 2300 systems can connect to the Stratus ActiveService Network (ASN).

Connecting a system to the ASN allows the CAC or your authorized Stratus service representative to remotely diagnose, troubleshoot, and resolve problems online.

To enable connectivity to the ASN, an external modem is attached directly to the system or to two partnered Virtual Technician Modules (VTMs) in the system.

Systems that connect to the ASN using partnered VTMs provide the highest level of availability. VTMs provide ASN connectivity even when the operating system is not operational. VTMs also allow internal administrators to remotely service the system over a telephone line or IP network, regardless of the state of the operating system.

Without VTMs, ASN connectivity is only possible if the operating system is operational.

Site Planning Checklist

Referring to the information in this document, answer the following questions:

Planning for ASN Connectivity

- ☐ Will your system use VTMs to connect to the ASN?
- ☐ If your system uses VTMs, will you connect them to a network so that you can manage the systems from a remote system? Are there maintenance network connections to which you can connect the VTMs?
- ☐ Do you have an external analog telephone line available for the ASN modem?

NOTE _____

A dedicated phone line provides the most reliable service. ASN calls routed through a PBX may be slow due to load on the PBX, or may not complete successfully due to disconnections. If you must use a PBX, do not route the telephone extension through a switchboard; instead, provide a direct-dial analog number.

- ☐ Do you have an additional telephone line and telephone near the operator's station for voice communications when calling for support?

Planning for Optional Components

- ☐ The system contains two 10/100/1000 megabits-per-second (Mbps) Ethernet ports. Will your system additionally include any of the following PCI adapters for network communications? If so, indicate how many of each and plan network connections for all Ethernet ports you will use.

| Adapter | Number of Ports |
|------------------------------------------------|-----------------|
| U574 Dual-Port Fiber Gigabit Ethernet Adapter | |
| U575 Dual-Port Copper Gigabit Ethernet Adapter | |

- ☐ Will your system connect to an EMC CLARiiON® AX100® storage system? If so, the ftServer 2300 system requires one pair of U531 Optical Fibre Channel PCI Adapters, which are provided when you order the storage system.
- ☐ Will your system connect to EMC CLARiiON® CX or to EMC Symmetrix® storage systems? If so, the ftServer 2300 system requires one pair of U525 Optical Fibre Channel PCI Adapters, which are provided in the AK415 Attachment Kit.
- ☐ Will your system connect to a D540 storage enclosure? If so, the system requires a pair of U529 Fibre Channel PCI Adapters, which are provided when you order the storage enclosure.
- ☐ Will you supply your own monitor or will Stratus supply the monitor? Is the monitor rack-mountable or do you need to provide a table or desk?

NOTE _____

Use the USB keyboard and mouse supplied by Stratus.

- ☐ Will your system include any tape drives? Are the tape drives rack-mountable or do you need to provide a table or desk? One or two U527 Ultra320 SCSI PCI Adapters are installed in the system to support the tape drives, if ordered.
- ☐ Will the components in a cabinet include a keyboard-video-mouse (KVM) switch?

Planning AC Power

- ☐ Will you provide power through a power distribution unit (PDU)?
- ☐ Will you provide power from a UPS?
- ☐ What are the AC power requirements of your system, including all optional components?
- ☐ Is the AC power service wired properly?
- ☐ What are the lengths and types of the power cords provided with your system? What type of receptacles do you need to provide?

Planning Space for Your System

- ☐ Will your system and its external components fit where you plan to place them?
- ☐ If you are rack-mounting the system, what is the height of the cabinet you will use and what is the total height of the systems and components that will be installed in the cabinet? Will the items fit into the cabinet?
- ☐ What components will be located outside the cabinet?
- ☐ What are the lengths and types of all interface and communication cables provided with your system?
- ☐ Have you created a sketch of how you plan to arrange the system at the installation site? Consider the available cable lengths, the placement of external devices, and the location of network and voice communication connections.

On the sketch, show the following:

- Location of the system and its external components
- Power cords, and telephone and interface cables
- Locations of AC power receptacles, phone jacks, Ethernet jacks, switches, and/or hubs

NOTE

Make sure that all cords and cables are long enough to reach between their respective components and connectors. Route all cables out of the way of foot traffic.

Working with Other Groups

- ☐ Have you provided your facilities group and contractors with the sketch and copies of the following?
 - Tables 4-2 through 4-4, worksheets for determining AC power requirements
 - Tables 4-5 and 4-6, worksheets for determining the number of external power outlets required if you **are** using PDUs
 - Tables 4-7 and 4-8, worksheets for determining the number of external power outlets required if you are **not** using PDUs
 - [Appendix C, “Electrical Circuit and Wiring Information”](#)
 - Any notes you have about site planning
- ☐ Have you reviewed and discussed the requirements with the facilities personnel and contractors to ensure that all site modifications are understood and implemented?

If you have any questions about the number and types of components, contact your Stratus account executive or distributor.

System Documentation

When you receive your system, you receive a printed copy of the *Stratus ftServer 2300: Installation Guide* (R564).

You can order additional copies of the system documentation set (part number R1500W), consisting of the *Stratus ftServer 2300: Installation Guide* (R564) and the StrataDOC ftServer CD (part number R002FCDK). You can also order printed copies of the *Stratus ftServer 2300: Operation and Maintenance Guide* (R563).

To order documentation, customers in North America can call the CAC at (800) 221-6588 or (800) 828-8513, 24 hours a day, 7 days a week. Customers outside North America can contact the nearest Stratus Sales office, CAC office, or distributor.

The software installation program installs these and other documents in online formats on the ftServer 2300 system, and optionally, on a remote system. On the Windows desktop, the **ftServer Help and Manuals** folder contains the ftServer 2300 documents.

To gain access to the documents on the World Wide Web, point your browser to the ftServer StrataDOC Web site at:

<http://stratadoc4ftserver.stratus.com>

Table 1-1 lists ftServer 2300 documents and the tasks described in each document.

Table 1-1. ftServer 2300 Documents

| Document | Task |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Stratus ftServer 2300: Site Planning Guide</i> (R562) | Prepare a site for installation of a system |
| <i>Stratus ftServer 2300: Installation Guide</i> (R564) | Install a system, including mounting the system in a cabinet Find the part number of a customer-replaceable unit (CRU) Respond to Mini-Setup questions on your new ftServer 2300 system Install ftServer W Series System Software and Windows server software on your new system |
| <i>Stratus ftServer 2300: Operation and Maintenance Guide</i> (R563) | Start up, shut down, and operate a system Troubleshoot system hardware Remove and replace CRUs |
| <i>Release Notes: Stratus ftServer W Series System Software</i> (R004W) | Learn the contents of the latest ftServer W Series System Software release Learn the latest information about the product Learn about significant known problems and how to work around or avoid the problems |

Table 1-1. ftServer 2300 Documents *(Continued)*

| Document | Task |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Stratus ftServer W Series: Software Installation and Configuration Guide</i> (R002W) | <p>Respond to Mini-Setup questions</p> <p>Install or reinstall ftServer W Series System Software and Windows</p> <p>Upgrade software and BIOS, BMC, and VTM firmware</p> <p>Configure ftServer W Series System Software</p> <p>Connect a UPS to an ftServer 2300 system</p> |
| <i>Stratus ActiveService Network Configuration Guide</i> (R013W) | <p>Configure the ftServer 2300 system for support by the Stratus ASN</p> <p>Install the ASN support modem and configure the VTMs</p> |
| <i>Stratus Virtual Technician Module User's Guide</i> (R561) | Configure and use VTMs to remotely control, monitor, and troubleshoot an ftServer 2300 system |
| <i>Stratus ftServer W Series: System Administrator's Guide</i> (R014W) | <p>Use tools provided in Windows or by Stratus and other vendors to manage the system</p> <p>Use ftServer Management Console (ftSMC) to administer or troubleshoot your ftServer 2300 system</p> |
| <i>Stratus ftServer Software Availability Manager User's Guide</i> (R007W) | Monitor the performance of critical system components and the status of user applications |
| <i>Stratus ftServer W Series: PCI Adapter Guide</i> (R461) | Install, configure, replace, or troubleshoot PCI adapters |
| <i>Stratus ftServer W Series: Technical Reference Guide</i> (R550) | Consult technical reference information for ftServer 2300 systems |
| <i>Attaching an EMC CLARiiON AX100 Storage System to an ftServer W Series System</i> (R565) | <p>Connect an AX100 storage system to an ftServer W Series system</p> <p>Plan for the installation, configuration and troubleshooting of the host bus adapters, and attach the Fibre Channel cables.</p> <p>Preserve system and data integrity during a power outage for ftServer systems that are connected to an uninterruptible power supply.</p> |

Table 1-1. ftServer 2300 Documents *(Continued)*

| Document | Task |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Stratus D540 Storage Enclosure Connection Guide (R554)</i> | Connect the D540 storage enclosure to an ftServer W Series system. Learn about disk configuration, LED implementation, and recommended usage practices. |

Commenting on the Documentation

Stratus welcomes any corrections and suggestions for improving its documentation. Send your comments in one of the following ways:

- By clicking the **site feedback** link at the bottom of a Help topic. Information to identify the topic is supplied in the StrataDOC Web Site Feedback form.
- By email to Comments@stratus.com. If it is possible, please include specific information about the documentation on which you are commenting:
 - For a printed document or a document in PDF format, include the title and part number from the Notice page and the page numbers.
 - For online documentation, include the Help subject and topic title.

This information will assist Stratus Publications in making any needed changes to the documentation. Your assistance is most appreciated.

Chapter 2

Cabinet and Monitor Requirements

For requirements related to supplying your own cabinet and monitor, see:

- [“Cabinet Requirements” on page 2-1](#)
- [“Monitor Requirements” on page 2-4](#)

Cabinet Requirements

If you are providing your own cabinet for an ftServer 2300 system, make sure the cabinet contains a 19-in. wide rack that meets the Electronic Industries Association (EIA) 310-D standard.

Make sure that:

- The cabinet contains two front and two rear vertical EIA rails, one in each corner of the cabinet, that have the EIA universal square-hole pattern as defined in the EIA 310-D specification.
- The front vertical rails extend at least 0.5 in. (1.27 cm) beyond the inside edge of the accessory leg, if present, to allow the mounting rails to be fitted. See [Figure 2-1](#).
- The distance between the front and rear vertical rails is between 24.5 in. and 30 in. (62.23 cm and 76.20 cm).
- The vertical mounting rails accept 10-32 cage nuts and mounting hardware.
- The distance between the front vertical rails and the inside of the front door is at least 3.0 in. (7.62 cm).
- The distance between the rear of the system chassis and the inside of the rear door is at least 6.0 in. (15.24 cm).
- The vertical mounting rails are plated or some other method is used to ensure continuity for grounding between installed equipment.
- Cable management brackets are provided to support and constrain data and power cords so that the cables do not interfere with air flow out of the rear of the enclosures, and so that the connectors do not disconnect or break.
- The cabinet provides enough stability so that system components pass Telcordia GR-63-CORE Section 5.4.2 regulations for operational vibration.

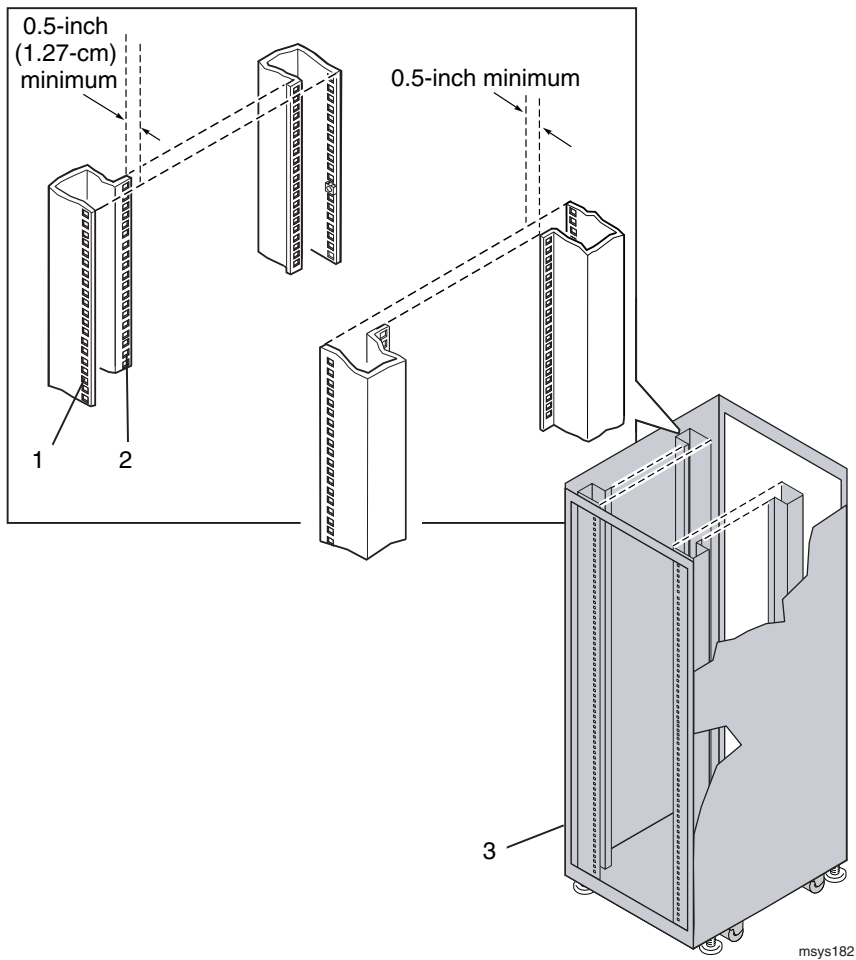
- To prevent stray voltages, all components are grounded together through the vertical mounting rails to the cabinet frame, and then to local building ground. To ensure signal quality, use a grounding cable provided by Stratus for local building ground.
- There is a plan for maintaining cables and wires to the cabinet by either running them under the floor or placing them overhead in an overhead cable tray.
- Air flows through the cabinet from front to back.
- Filler panels cover any unused rack space to prevent air recirculation.
- Vents are evenly distributed on the front and rear doors and comprise at least 63% of the surface area.

NOTE _____

If your cabinet does not have vented front and rear doors, you can remove the doors from the cabinet while the system is operating.

[Figure 2-1](#) shows the required rail clearance between the front vertical rails and the inside edge of an accessory leg.

Figure 2-1. Rail Clearance



- 1 Front vertical EIA rail
- 2 Accessory leg
- 3 Front of cabinet

Monitor Requirements

If you are using a monitor that is not supplied by Stratus, make sure that:

- The monitor accepts universal 100–240 VAC, 50–60 Hz power.
- The VGA cable has a 15-pin D-sub connector.
- The power cord for the monitor is long enough to reach the power source.
- The plug type on the power cord is compatible with the external power source at the site.

Use the keyboard and mouse provided by Stratus.

Chapter 3

Space Planning

For information about planning sufficient space for your ftServer 2300 system, see:

- [“Room Requirements” on page 3-1](#)
- [“Planning for Cables” on page 3-2](#)

Room Requirements

To ensure that the installation site provides a properly equipped, cooled, and sized environment, make sure that the site:

- Provides clearances for air circulation and servicing the system
Locate the front and rear of the system at least 2.5 ft (0.76m) away from walls and other obstructions.
- Maintains reasonable temperature and humidity levels and has a thermometer and humidistat to monitor room temperature and humidity
- Is as free of dust as possible
Dust buildup in the system can impede air circulation and heat transfer, causing components to become less reliable as the ambient temperature rises.
- Provides a table or desktop for external devices such as a telephone, modem, tape drives, and an external monitor or LCD monitor unit, keyboard, and mouse
- Provides cutouts in the floor for routing cables, if the site has an elevated floor



CAUTION

Do not place the system in an area of high electrostatic discharge. Static electricity may damage components.
Do not locate components near transformers or other electromagnetic devices.

Planning for Cables

To accommodate cables from your ftServer 2300 system, make sure to provide:

- Two telephone lines:
 - One telephone line for use when calling for service
 - One telephone line for the ASN modem, if ordered
- Ethernet jacks, switches, or hubs, as needed
- Two electrically separate grounded AC wall outlets, or a UPS and a wall outlet, within reach of the power cords from the system or PDUs and any other components that do not connect to a PDU

See [Chapter 4, “Electrical \(AC\) Power Planning”](#) for more information about electrical planning.

Make sure that cables you plan to connect to the system are long enough to reach between the system and external components or connections. [Table 3-1](#) lists the cables Stratus supplies and, for space planning, specifies the lengths of each cable.

Table 3-1. Cables Supplied by Stratus

| Component | Cable Description | Length |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| V128 1U flat-panel LCD monitor unit with integrated keyboard and trackpad | One VGA cable attached to the LCD monitor unit and which connects to the VGA port at the rear of the system | 72 in. (183 cm) |
| | One USB cable attached to the LCD monitor unit and which connects to another USB cable, which is connected at the rear of the system | 72 in. (183 cm) |
| V129 table top LCD monitor unit | One VGA cable attached to the LCD monitor unit and which plugs into the VGA port at the rear of the system | 72 in. (183 cm) |
| | One USB cable attached to the keyboard and which plugs into a USB port at the rear of the system | 72 in. (183 cm) |
| | One USB cable attached to the mouse and which plugs into the keyboard USB hub | 72 in. (183 cm) |
| T521 or T522 rack-mounted tape drive enclosure | One SCSI-3 high-density cable with one 0.8 mm VHDC connector, and one 68-pin SCSI-3 connector that connects to the SCSI port at the rear of the system. | 10 ft (305 cm) |

Table 3-1. Cables Supplied by Stratus *(Continued)*

| Component | Cable Description | Length |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Second tape drive in a T522 tape drive enclosure | One SCSI-3 daisy chain cable with a 68-pin SCSI-3 connector at each end | 3 ft (91.5 cm) |
| External modem | One serial cable | N/A |
| | One phone cable with RJ11 connectors (for use in the United States and Canada) Global adapters are provided in the localization kit. | N/A |
| Cabinet ground leakage cable | 10AWG ground leakage cable with 1/4 in. (6.35 mm) and M8 ring lugs | 15 ft (4.6m) |

Chapter 4

Electrical (AC) Power Planning

For information about planning appropriate AC electrical power for your ftServer 2300 systems, see:

- [“Redundant Power Sources” on page 4-1](#)
- [“AC Power Service Requirements” on page 4-2](#)
- [“Power Outlet Requirements” on page 4-4](#)
- [“Connecting a System Directly to Two Separate Power Sources” on page 4-5](#)
- [“Stratus-Supplied Power Cords” on page 4-7](#)

Related Topics

- [Chapter 5, “UPS Planning”](#)
- [Chapter 7, “Rack Configuration Planning”](#)

Redundant Power Sources

ftServer 2300 systems require at least two separate and independent AC power sources: an *A-side* power source and a *B-side* power source, which provide power to the system’s power receptacles, labeled, respectively, A and B. Either source must be capable of continuing to provide power if power to the other source is lost.

The A-side power source provides power to one side of each system, as well as to components that do not require two sources of power: a modem, tape drive, KVM switch, and monitor. If you use a uninterruptible power supply (UPS), the UPS is the A-side power source.

The B-side power source provides power to the other side of each system.

The wattage required from the A-side power source will always be equal to or greater than the wattage required from the B-side power source. See [“AC Power Service Requirements” on page 4-2](#) and [“Power Outlet Requirements” on page 4-4](#) for detailed planning information.

AC Power Service Requirements

[Table 4-1](#) describes the nominal input line voltage (volts AC) and frequency (Hz) required for ftServer 2300 systems and optional components. The table also specifies the receptacle you must provide for each item or provides a reference to a table that lists the receptacles.

Table 4-1. AC Power Service Requirements

| Component | Nominal Input Voltage; Frequency Range | Receptacle |
|-------------------------------------------------|-------------------------------------------------------------|----------------------------------|
| Single ftServer 2300 system | 100–127V; 50–60 Hz 200–240V; 50 Hz 200–240V; 50–60 Hz | See Table 4-9 . |
| PDU | 200–240V; 50–60 Hz | See Table 4-11 . |
| V129 LCD monitor unit | 90–265V; 47–63 Hz | See Table 4-13 . |
| V128 LCD monitor unit | 90–265V; 47–63 Hz | See Table 4-13 . |
| KVM switch | 90 to 264V; 47–63 Hz | See Table 4-13 . |
| T521 and T522 rack-mounted tape drive enclosure | 100–250V; 47–60 Hz | See Table 4-13 . |
| D540 storage enclosure | 100–240V; 50/60 Hz | See Table 4-13 . |
| Modem power transformer | 100–240V; 50–60 Hz | See Table 4-14 . |

NOTE _____

Circuit breakers must provide a protective earth ground current at a maximum of 3.5 milliamperes for each AC power cord.

Use the following worksheets to determine AC power requirements for the site.

- In [Table 4-2](#), determine the power requirements at the A-side power source.
- In [Table 4-3](#), determine the power requirements at the B-side power source.
- In [Table 4-4](#), determine the power requirements for components outside the cabinet. These components can share a power source with the A-side or B-side components.

The power service must be properly wired and grounded according to local standards and regulations. See [Appendix C](#) for electrical circuit and wiring information.

To determine power requirements

1. In the Quantity column, write the number of each type of component.
2. Multiply the entry in the Quantity column by the number in the @ Power (Watts) column, and enter the result in the AC Power (Extended) column.
3. Add the values in the AC Power (Extended) column, and enter the sum on the bottom line. This value indicates the maximum power requirement for each power source.

Table 4-2. Worksheet for Determining A-Side Power Requirements

| System Component | Quantity | | @ Power (Watts) | | AC Power (Extended) |
|----------------------------------------|----------|---|-----------------|---|---------------------|
| ftServer 2300 system | | x | 420 | = | |
| V128 1U LCD monitor unit | | x | 21 | = | |
| KVM switch | | x | 20 | = | |
| T521 and T522 tape drive enclosure | | x | 500 | | |
| D540 storage enclosure | | | 300 | | |
| TOTAL A-SIDE POWER REQUIREMENTS | | | | | |

Table 4-3. Worksheet for Determining B-Side Power Requirements

| System Component | Quantity | | @ Power (Watts) | | AC Power (Extended) |
|----------------------------------------|----------|---|-----------------|---|---------------------|
| ftServer W 2300 | | x | 420 | = | |
| D540 storage enclosure | | x | 300 | = | |
| TOTAL B-SIDE POWER REQUIREMENTS | | | | | |

Table 4-4. Worksheet for Determining External Power Requirements

| System Component | Quantity | | @ Power (Watts) | | AC Power (Extended) |
|---------------------------------------------------|----------|---|-----------------|---|---------------------|
| V129 LCD monitor unit and V115 keyboard and mouse | | x | 30 | = | |
| Modem power transformer | | x | 5 | = | |
| Other external components | | | | | |
| TOTAL EXTERNAL POWER REQUIREMENTS | | | | | |

Power Outlet Requirements

If you use a pair of PDUs in the cabinet, use Tables 4-5 and 4-6 to determine the total number of power outlets required **outside the cabinet**.

1. In the Quantity column, write the number of each type of component.
2. Multiply the value in the Quantity column by the value in the Outlets column, and enter the total in the Subtotal column.
3. Add the values in the Subtotal column and enter the sum next to TOTAL NUMBER OF EXTERNAL POWER OUTLETS.

Table 4-5. Worksheet: A-Side External Power Outlet Requirements - PDUs Used

| Component | Quantity | | Outlets | Subtotal |
|---------------------------------------------|----------|---|---------|----------|
| PDUs | | x | 1 | |
| External monitors | | x | 1 | |
| Other external components | | | | |
| TOTAL NUMBER OF A-SIDE POWER OUTLETS | | | | |

Table 4-6. Worksheet: B-Side External Power Outlet Requirements - PDUs Used

| Component | Quantity | | Outlets | Subtotal |
|---------------------------------------------|----------|---|---------|----------|
| PDUs | | x | 1 | |
| External monitors | | x | 1 | |
| Other external components | | | | |
| TOTAL NUMBER OF B-SIDE POWER OUTLETS | | | | |

If you do not use PDUs in the cabinet, use Tables 4-7 and 4-8 to determine the number of power outlets required **outside the cabinet**.

1. In the Quantity column, write the number of each type of component.
2. Multiply the value in the Quantity column by the value in the Outlets column, and enter the total in the Subtotal column.
3. Add the values in the Subtotal column and enter the sum next to TOTAL NUMBER OF EXTERNAL POWER OUTLETS.

Table 4-7. Worksheet: A-Side External Power Outlet Requirements - No PDUs

| Component | Quantity | | Outlets | Subtotal |
|---------------------------------------------|----------|---|---------|----------|
| Systems | | x | 1 | |
| D540 storage enclosure | | x | 1 | |
| Monitors | | x | 1 | |
| Tape drives | | x | 1 | |
| TOTAL NUMBER OF A-SIDE POWER OUTLETS | | | | |

Table 4-8. Worksheet: B-Side External Power Outlet Requirements - No PDUs

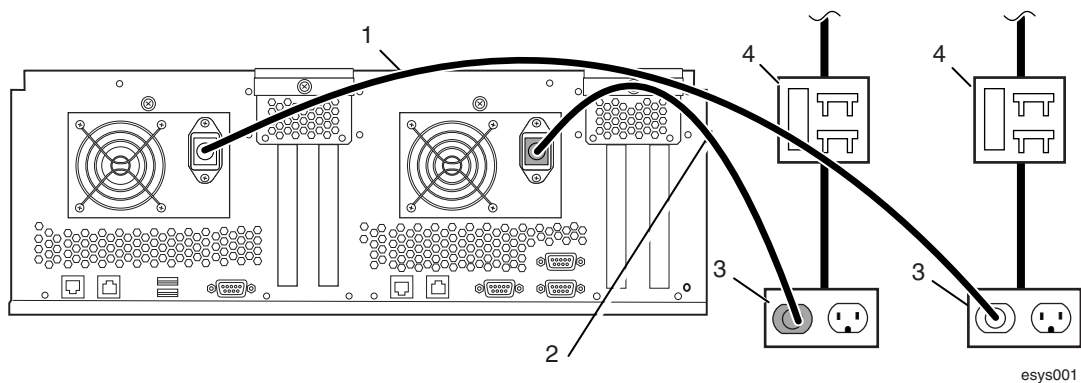
| Component | Quantity | | Outlets | Subtotal |
|---------------------------------------------|----------|---|---------|----------|
| Systems | | x | 1 | |
| D540 storage enclosure | | x | 1 | |
| TOTAL NUMBER OF B-SIDE POWER OUTLETS | | | | |

Connecting a System Directly to Two Separate Power Sources

If you do not connect the ftServer 2300 system or PDUs to a UPS, provide two AC power sources that are as electrically independent of each other as the installation site allows. At a minimum, the two power sources must be powered by separate circuit breakers to an AC power and, if possible, be independent of each other beyond that level. The more electrical separation between the two power sources, the less likely they will both fail at the same time. Due to redundancy in ftServer 2300 systems, power to either side of the system keeps the system in operation, although the system is no longer fault-tolerant.

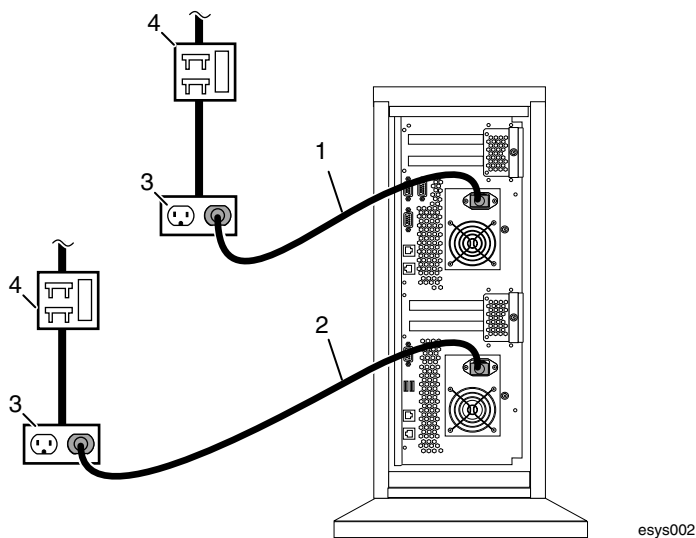
Figure 4-1 shows an ftServer 2300 system directly connected to two separate AC power source and Figure 4-2 shows the power connections for a pedestal ftServer 2300 system connected directly to two separate power source.

Figure 4-1. ftServer 2300 System Connected Directly to AC Power



- 1 B-side power cord
- 2 A-side power cord
- 3 AC power outlets
- 4 Circuit breakers

Figure 4-2. Pedestal ftServer 2300 Systems Connected Directly to AC Power



- | | |
|----------------------------|--------------------|
| 1 B-side system power cord | 3 AC power outlets |
| 2 A-side system power cord | 4 Circuit breakers |

Stratus-Supplied Power Cords

Stratus supplies power cords for:

- [ftServer 2300 systems](#)
- [PDUs for ftServer 2300 systems](#)
- [Optional components](#)
- [Modems](#)



WARNING

Place all power cords out of the way of foot traffic.

ftServer 2300 System Power Cords

[Table 4-9](#) lists the power cords that connect ftServer 2300 systems directly to an AC power source (not to a PDU or to a UPS). See [“Electrical Power Connectors” on page C-9](#) for detailed descriptions of the connectors listed in these tables.

[Table 4-10](#) lists the power cords that connect ftServer 2300 systems to [qualified UPS models](#) from American Power Conversion Corporation (APC).

Table 4-9. System Power Cords to AC Power

| Locale | Marketing ID | Length | Rating | Connector Type |
|--------------------------------------------|--------------|--------------|----------|------------------------------|
| North America and Japan locking power cord | B50161 | 15 ft (4.5m) | 20A/250V | NEMA L6-20 |
| International, locking power cord | B50153 | 4.5m | 16A/250V | IEC 60309 (formerly IEC 309) |
| North America (Chicago) | B50101 | 7 ft | 15A/127V | NEMA 5-15 |
| North America (domestic) | B50104 | 15 ft | 15A/127V | NEMA 5-15 |
| Australia and New Zealand | B50124 | 4.5m | 10A/250V | AS/NZS 3112:1993 |
| China | B50162 | 4.5m | 10A/250V | GB1002-1996 |
| Europe (Continental) | B50112 | 4.5m | 16A/250V | CEE 7 VII |
| Israel | B50132 | 4.5m | 16A/250V | SI 32:1971 |
| Italy | B50136 | 4.5m | 10A/250V | CEI23-16 |
| Japan | B50160 | 15 ft (4.5m) | 15A/127V | NEMA 5-15 |

Table 4-9. System Power Cords to AC Power (Continued)

| Locale | Marketing ID | Length | Rating | Connector Type |
|------------------------|--------------|--------|----------|------------------------|
| South Africa and India | B50152 | 4.5m | 16A/250V | SABS164-1:1992 ZA/3 |
| Switzerland | B50140 | 4.5m | 10A/250V | SEV 1011-S24507 |
| United Kingdom | B50116 | 4.5m | 13A/250V | BS 1363/A, |

Table 4-10. System Power Cords to a UPS

| Locale | Marketing ID | Length | Rating | Connector Type |
|------------------------------------|--------------|-----------------|--------|----------------------------------------------|
| North America (Chicago) and Japan | B50104 | 15 ft (4.5m) | 120V | NEMA 5-15 to IEC 60320 (formerly 320) C13 |
| North America (Domestic) and Japan | B50161 | 15 ft (4.5m) | 250V | NEMA L6-20 to IEC 60320 C13 |
| International | B50301 | 3.5m | 250V | IEC 60320 C14 to IEC 60320 C13 |

PDU Power Cords

The AA-P41104 PDU supplies power to ftServer 2300 systems. [Table 4-11](#) lists the available power cords for PDUs to connect directly to an AC power source and to APC Smart-UPS® and APC Symmetra® UPS models.

[Table 4-12](#) describes the gray and black power (*jumper*) cables that are provided to connect ftServer 2300 systems to PDUs.

See [“Electrical Power Connectors” on page C-9](#) for more detailed descriptions of the connectors listed in these tables.

Table 4-11. PDU Power Cords to AC Power

| Locale | Marketing ID | Length | Rating | Connector Type |
|--------------------------|--------------|-----------------|-----------|--------------------------------------------------------------------------------|
| North America and Japan† | B50155 | 15 ft | 20A/ 250V | IEC 60320 (formerly 320) C19 to NEMA L6-20P |
| North America | B50156 | 15 ft | 30A/250V | IEC 60320 C19 to NEMA L6-30P (Receptacle must be fused at no more than 20A) |
| International† | B50154 | 15 ft (4.6m) | 16A/250V | IEC 60320 C19 to IEC 60309 |

† Use this power cord to connect the PDU directly to the AC power mains or to a UPS.

Table 4-12. System Power (*Jumper*) Cables to a PDU

| Marketing ID | Length | AC Power Connector | |
|--------------|--------|--------------------|------------------------------|
| | | Rating | To PDU |
| B50502 | 2.0m | 10A/250V | IEC 60320 (formerly 320) C14 |

Power Cords for Optional Components

[Table 4-13](#) lists the available power cords to connect LCD monitor units, tape drives, storage enclosures, and KVM switches directly to external AC power sources.

Table 4-13. Power Cords for Optional Components

| Locale | Marketing ID | Length | Rating | Connector Type |
|---------------------------|--------------|--------|----------|----------------------|
| North America and Japan | B501-01 | 7 ft | 15A/120V | NEMA 5-15 |
| North America and Japan | B501-02 | 10 ft | 15A/120V | NEMA 5-15 |
| United States (Domestic) | B501-06 | 10 ft | 15A/127V | NEMA 5-15 |
| Australia and New Zealand | B501-21 | 2.5m | 10A/250V | AS/NZS 3112:1993 |
| China (CCC) | B50162-8F | 2.5m | 10A/250V | GB1002-1996 |
| Europe (Continental) | B501-09 | 2.5m | 10A/250V | CEE 7 VII |
| India | B501-49 | 2.5m | 13A/250V | SABS164-1:1992; ZA/3 |
| Israel | B501-29 | 2.5m | 16A/250V | SI 32:1971 |

Table 4-13. Power Cords for Optional Components (Continued)

| Locale | Marketing ID | Length | Rating | Connector Type |
|----------------|--------------|--------|----------|----------------------|
| Italy | B501-33 | 2.5m | 16A/250V | CEI23-16 |
| South Africa | B501-49 | 2.5m | 13A/250V | SABS164-1:1992; ZA/3 |
| Switzerland | B501-37 | 2.5m | 10A/250V | SEV 1011-S24507 |
| United Kingdom | B501-13 | 2.5m | 13A/250V | BS1363/A |

Power Cords for Modems

[Table 4-14](#) lists the specifications of the power cords that connect the modem to an external AC power source.

Table 4-14. Modem Power Cords

| Locale | Marketing ID | Length | Rating | Connector Type |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|----------|------------------|
| Brazil, Canada, Japan, Mexico, Philippines, Bolivia, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Panama, Saudi Arabia, Venezuela, Taiwan, United States | AK-000369 | 6 ft (1.83m) | 120V/15A | NEMA 5-15 |
| Argentina, Chile, China, Cyprus, Czech Republic, Greece, Hong Kong, Hungary, Indonesia, Korea, Liechtenstein, Luxembourg, Poland, Portugal, Bahrain, Egypt, Estonia, Israel, Ivory Coast, Jordan, Kuwait, Malaysia, Oman, Pakistan, Paraguay, Peru, Qatar, Slovak Republic, Slovenia, Thailand, Ukraine, United Arab Emirates, Uruguay, Yemen, Russia, Singapore, Spain, Turkey | AK-000370 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| Australia | AK-000371 | 6.5 ft (2.0m) | 250V/10A | AS/NZS 3112:1993 |
| Austria | AK-000372 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| Belgium | AK-000373 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |

Table 4-14. Modem Power Cords *(Continued)*

| Locale | Marketing ID | Length | Rating | Connector Type |
|-------------------------|---------------------|---------------|---------------|-----------------------|
| Denmark | AK-000374 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| Finland, Norway | AK-000375 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| France, Morocco | AK-000376 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| Germany | AK-000377 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| Iceland, Sweden | AK-000378 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| India | AK-000379 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| United Kingdom, Ireland | AK-000380 | 6.5 ft (2.0m) | 250V/10A | BS1363/A |
| Italy | AK-000381 | 6.5 ft (2.0m) | 250V/10A | CEI 23-16 |
| Netherlands | AK-000382 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| New Zealand | AK-000383 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |
| Switzerland | AK-000384 | 6.5 ft (2.0m) | 250V/10A | CEE 7 VII |

Chapter 5

UPS Planning

For information about planning for an uninterruptible power supply (UPS) to use with your ftServer 2300 systems, see:

- “Qualified APC UPS Models” on page 5-1
- “Communicating with a UPS over a Network” on page 5-3
- “Connecting the A-Side PDU to a UPS” on page 5-3
- “Connecting ftServer 2300 Systems Directly to a UPS” on page 5-5

Qualified APC UPS Models

Stratus has qualified certain UPS models from American Power Conversion Corporation (APC) for use with ftServer 2300 systems. The qualified models are listed in Tables 5-1, 5-2, and 5-3.

NOTE

Site planning information for the UPS, which you must supply, is of a general nature only. Do not rely exclusively on the UPS information in this document. For detailed UPS specifications, documentation, and ordering information, contact APC at: <http://www.apcc.com>.

Table 5-1. APC Symmetra Models for PDUs or for Multiple Systems

| Locale | APC Symmetra Model | AC Power Input | AC Power Output |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
| North America and South America | SYH2K6RMT-P1, SYH4K6RMT-P1, SYH6K6RMT-P1, SYA8K16RMP, or SYA12K16RMP With SYA8K16RMP and SYA12K16RMP also order AP7582, a rack PDU extender. | 208V | 120V or 208V |
| Japan | SYH2K6RMJ-P1, SYH4K6RMJ-P1, or SYH6K6RMJ-P1 | 200V | 100V or 200V |

Table 5-1. APC Symmetra Models for PDUs or for Multiple Systems *(Continued)*

| Locale | APC Symmetra Model | AC Power Input | AC Power Output |
|---------------|-------------------------------------------------------------|-----------------------|------------------------|
| International | SYK2K6RMI, SYK4K6RMI, SYK6K6RMI, SYA8K16RMI, or SYA12K16RMI | 230V | 220V, 230V or 240V |

Table 5-2. APC Smart-UPS Models for a Single Rack-Mountable System

| Locale | Smart-UPS | AC Power Input | AC Power Output |
|---------------------------------|--------------------|-----------------------|------------------------|
| North America and South America | Model SUA1500RM2U | 120V | 120V |
| Japan | Model SUA1500RMJ2U | 100V | 100V |
| International | Model SUA1500RMI2U | 230V | 220V, 230V or 240V |

Table 5-3. APC UPS Models for a Single Pedestal System

| Locale | Smart-UPS | AC Power Input | AC Power Output |
|---------------------------------|------------------|-----------------------|------------------------|
| North America and South America | Model SUA1500 | 120V | 120V or 208V |
| Japan | Model SUA1500J | 100V | 100V |
| International | Model SUA1500I | 230V | 220V, 230V or 240V |

Communicating with a UPS over a Network

Use the following additional tools to enable an ftServer 2300 system and a UPS to communicate over the network:

- APC Network Management Card EX (APC part number AP9617)

An APC Network Management Card EX is a standard component of the Symmetra UPS, but you must purchase the network card for the APC Smart-UPS®.

- APC PowerChute® Network Shutdown for the ftServer 2300 system

When you install your ftServer 2300 system, download PowerChute Network Shutdown from APC, and install and configure the tool on the ftServer 2300 system, as described in the *Stratus ftServer W Series: Software Installation and Configuration Guide* (R002W). PowerChute Network Shutdown monitors the UPS for an imminent power loss, and initiates a shutdown of the system before power is lost.

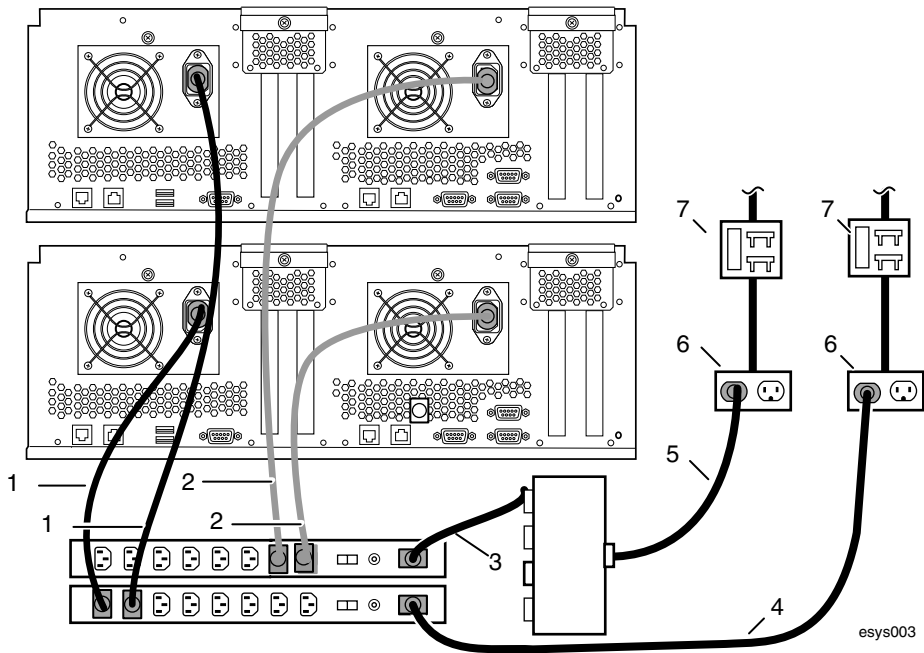
Connecting the A-Side PDU to a UPS

When you plan for PDUs, note the following:

- Only the top PDU is connected to the UPS.
- The bottom PDU is connected directly to an AC power source (mains).
- Optimally, plan to connect the UPS and the bottom PDU to separate AC power sources (mains). However, if another AC power source is not available, you can connect both the UPS and the bottom PDU to the same AC power source.

[Figure 5-1](#) shows how to connect a UPS to the top PDU.

Figure 5-1. ftServer 2300 Systems: Top PDU Connected to a UPS

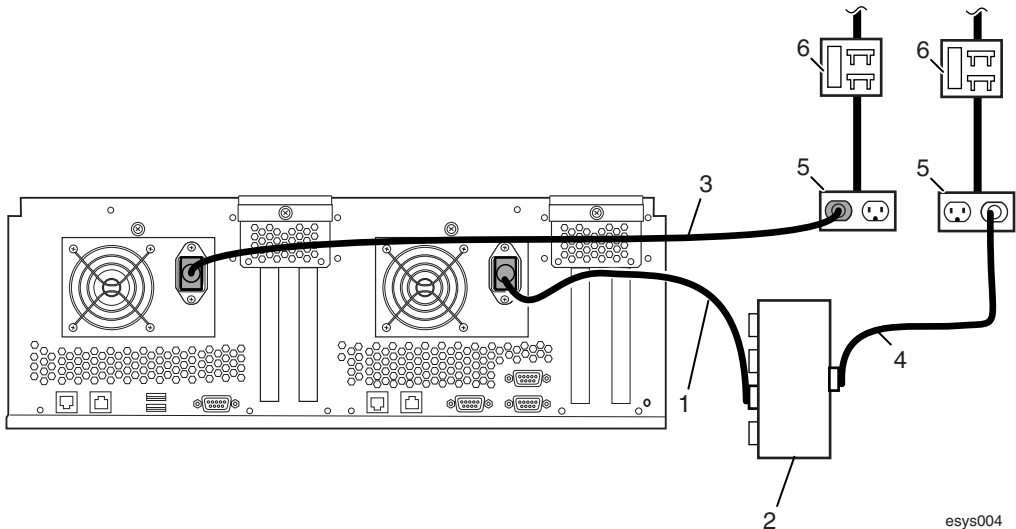


- 1 B-side system power cables (Black)
- 2 A-side system power cables (Gray)
- 3 Power cord for top (A-side) PDU
- 4 Power cord for bottom (B-side) PDU
- 5 UPS power cord
- 6 AC power outlets
- 7 Circuit breakers

Connecting ftServer 2300 Systems Directly to a UPS

You can connect the A-side power connector of an ftServer 2300 system directly to a UPS, as shown in [Figure 5-2](#).

Figure 5-2. ftServer 2300 Systems: A-Side Power Connected Directly to a UPS

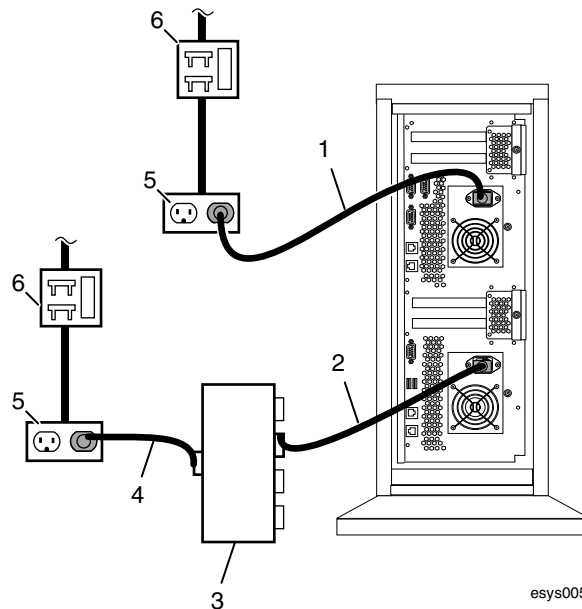


- 1 A-side system power cord
- 2 UPS
- 3 B-side system power cord
- 4 UPS power cord
- 5 AC power outlets
- 6 Circuit breakers

esys004

Figure 5-3 shows how to connect a UPS to a pedestal ftServer 2300 system.

Figure 5-3. Pedestal ftServer 2300 Systems: A-Side Power Connected Directly to a UPS



- 1 B-side system power cord
- 2 A-side system power cord
- 3 UPS
- 4 UPS power cord
- 5 AC power outlets
- 6 Circuit breakers

Chapter 6

Network and Telephone Line Planning

For information about planning network and telephone lines for your ftServer 2300 systems, see:

- “Network Cable Requirements” on page 6-1
- “Telephone Line Requirements” on page 6-2
- “Site Planning for Systems in an ftGateway Group” on page 6-3

Network Cable Requirements

Ethernet PCI adapters are typically supplied in pairs and teamed in software for fault tolerance. Each member of the pair requires a cable.



WARNING

Make sure Ethernet cables can be routed out of the way of foot traffic.

[Table 6-1](#) describes the Ethernet cables you must supply. Be sure to provide a cable of sufficient length for the distance between the system and a wall jack or hub.

NOTES

1. Software upgrade services are available from Stratus Professional Services.
2. If you have a unique network requirement, also contact Stratus Professional Services.

For a list of available services from Stratus Professional Services, see:
<http://www.stratus.com/services/ps/offerings.htm>.

3. See the *Stratus ftServer W Series: PCI Adapter Guide* (R461) for more information about the adapters Stratus supplies for ftServer 2300 systems.

Table 6-1. Customer-Supplied Ethernet Cables

| Component | Quantity | Cable |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VTM Ethernet port | 2 | <p>24 AWG, 4-pair, Unshielded Twisted Pair (UTP) EIA/TIA-Verified, Category-3 or Category-5 wire, with RJ-45 modular connectors terminated with pair-wiring adhering to the EIA/TIA 568-A or EIA/TIA 568-B standard.</p> <p>For connections to an Ethernet hub or switch, provide a straight-through cable.</p> <p>For 100- or 1000-Mbps (fast Ethernet) operation, provide full-duplex, or Category-5 Ethernet cables.</p> <p>The maximum allowable distance from an Ethernet port to a switch or a hub is 100 meters.</p> |
| 10/100/1000-Mbps system Ethernet port | 2 | |
| 10/100/1000Base-T Ethernet PCI Adapter (gigabit copper adapter for servers) | 2 for each pair of 10/100/1000Base-T Ethernet ports | |
| 1000Base-SX Ethernet PCI Adapter (gigabit fiber-optic adapter for servers) | 2 or 4 for each pair of two-port 1000Base-SX Ethernet PCI Adapters | Multimode, 62.5-micron, DUAL fiber cable with two LC-type connectors, and two connectors that are compatible with the network switch. |

Telephone Line Requirements

Generally, two telephone lines are required to ensure technical support for your ftServer 2300 system:

- One telephone line for use when calling for service
- One analog telephone connection point for the modem

NOTES _____

1. If you implement ftGateway groups, you do not need to supply telephone connection points for each system. See [“Site Planning for Systems in an ftGateway Group” on page 6-3](#) for more information.

2. A dedicated phone line provides the most reliable service. ASN calls routed through a PBX might be slow due to the load on the PBX, or might not complete successfully because the calls can become disconnected. If you must use a PBX, do not route the telephone extension through a switchboard; instead, provide a direct-dial analog number.

Site Planning for Systems in an ftGateway Group

Multiple ftServer W Series systems at a single site can share a single telephone connection to the ASN by implementing an *ftGateway group*. Unless VTMs are installed in each system, the systems in the group must be connected to a **single** physical Ethernet subnetwork. One system acts as a *gateway* for ASN connectivity. This gateway system requires an analog telephone line that connects to the modem. Other systems in the *gateway group*, called *gateway slaves*, connect to the gateway system over the network. In this case, Ethernet connections are required for each system, but only two analog telephone lines for each site are required.

Each ftGateway group is limited to a maximum of 20 systems. All systems in a group must connect to the same subnetwork through system Ethernet ports, ports Ethernet adapters, or VTMs. Using VTMs provides the highest level of manageability by allowing the system to be serviced even when the operating system is not operational.

Make sure that only layer 1 and layer 2 devices separate the gateway and slave systems. During a connection, the gateway system assigns the slave system a temporary IP address from an IP address range reserved by Stratus and uses that address for all traffic.

Chapter 7

Rack Configuration Planning

For information about planning a rack configuration, see:

- [“Using PDUs” on page 7-1](#)
- [“Determining PDU Requirements” on page 7-2](#)
- [“Sample PDU Usage Calculation” on page 7-4](#)

Using PDUs

ftServer 2300 systems have two power receptacles. Correspondingly, two power distribution units (PDUs) provide power to the receptacles.

Use of PDUs is optional unless you have a support agreement with Stratus. If you do have a support agreement with Stratus, use pairs of PDUs to provide AC power to systems and components in a cabinet **if six or more power cords would otherwise exit from the cabinet.**

The A-side (top) PDU provides power to:

- The A-side of each system
- A V128 1U rack-mounted LCD monitor unit
- A KVM switch
- A D540 storage enclosure
- Any rack-mounted tape drives

The B-side (bottom) PDU provides power to the other side of each system and to the second side of a D540 storage enclosure.

Because the A-side PDU always uses at least as many power cords and consumes at least as much power as the B-side PDU, plan the cabinet configuration so that the A-side PDU can support the configuration.

NOTES

1. Connect each PDU to a separate AC power source.
2. Install a maximum of two pairs of PDUs in a rack.

Use “[Determining PDU Requirements](#)” on page 7-2 to plan the rack configuration for ftServer 2300 systems. “[Sample PDU Usage Calculation](#)” on page 7-4 shows how to use the information you gather for planning the rack configuration.

Determining PDU Requirements

Using the nominal voltage rating of the power receptacle at your site and the total wattage of the components that will draw power from the A-side PDU, complete the information in Tables 7-1 and 7-2 to determine the current ftServer 2300 systems and optional components will draw and whether you need a second pair of PDUs.

To complete [Table 7-1](#)

1. Obtain the nominal voltage available at your location. Consult a facilities manager at your site to make sure you know the correct voltage.
2. For each type of component you plan to place in the rack, calculate the required current, as follows: Divide the wattage of the element, listed in the Watts column of [Table 7-1](#), by the voltage available at your site. Multiply the result by 1.25 and enter the value in the **Current** column.

Table 7-1. Current and Rack-Space Requirements

| Component | Watts | Current | Rack Space |
|------------------------------------|-------|---------|------------|
| ftServer 2300 system | 420 | | 4U |
| V128 1U LCD monitor unit | 21 | | 1U |
| KVM switch | 20 | | 1U |
| T521 and T522 tape drive enclosure | 500 | | 3U |
| D540 storage enclosure | 300 | | 2U |

To complete Table 7-2

1. In column 1, write the names of each system or optional component in the rack. If you have more than one system, use a row for each system.
2. In column 2, write the cumulative number of rack units (Us): Add the number of Us (see [Table 7-1](#)) for the component to the value in the space above and write the result.
3. In column 3, write the cumulative number of outlets required: For each component add 1 to the value in the space above and write the result.
4. In column 4, write the cumulative current required: For each component, add the current for the component, which you entered in [Table 7-1](#), to the value in the space above and write the result.

You need another pair of PDUs if the cumulative number of outlets exceed 8 or if the cumulative current exceeds 15A. Use the information in column 2 to plan the size and number of racks required.

Table 7-2. Calculating A-Side PDU and Rack-Space Requirements

| 1. Component | 2. Cumulative Space Used | 3. Cumulative Number of Outlets | 4. Cumulative Current (A) |
|--------------|--------------------------|---------------------------------|---------------------------|
| PDU Pair | 2U | 0 | 0.00 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Sample PDU Usage Calculation

Table 7-3 shows how to use the information from Table 7-1 to calculate the current when the PDU is connected to a NEMA L6-20R receptacle in the United States, with a power voltage of 208V.

Table 7-3. Sample: Current and Rack-Space Requirements

| Component | Watts | Current | Rack Space |
|------------------------------------|-------|---------|------------|
| ftServer 2300 system | 420 | 1.80A | 4U |
| V128 1U LCD monitor unit | 21 | 0.36 | 1U |
| KVM switch | 20 | 0.12 | 1U |
| T521 and T522 tape drive enclosure | 500 | 3.00 | 3U |

Table 7-4 and the explanation which follows shows how to use the information from Table 7-3 to determine when you need to buy an additional pair of PDUs or calculate the size and number of cabinets you need.

Table 7-4. Sample: Calculating A-Side PDU and Rack-Space Requirements

| 1. Component | 2. Cumulative Space Used (U) | 3. Cumulative Number of A-side Outlets | 4. Cumulative Current (A) |
|------------------------------------|------------------------------|----------------------------------------|---------------------------|
| PDU pair | 2 | 0 | 0.00 |
| ftServer 2300 system | 6 | 1 | 1.80 |
| V128 1U LCD monitor unit | 7 | 2 | 2.16 |
| KVM switch | 8 | 3 | 2.28 |
| T521 and T522 tape drive enclosure | 9 | 4 | 5.29 |
| ftServer 2300 system | 13 | 5 | 7.09 |
| ftServer 2300 system | 17 | 6 | 8.89 |
| ftServer 2300 system | 21 | 7 | 10.70 |
| ftServer 2300 system | 25 | 8 | 12.50 |
| ftServer 2300 system | 29 | 9 | 14.30 |
| PDU pair | 31 | 9 | 14.30 |
| ftServer 2300 system | 33 | 10 | 16.11 |

In this calculation, components were added one by one, calculating:

- The total current demanded by the components
- The total space used in the rack
- The total number of outlets required

In this example, two PDUs can provide enough current for the LCD monitor unit, KVM switch, tape drive enclosure, and **six** ftServer 2300 systems.

You must connect one power cord from each system to the top (A-side) PDU. **Five** systems plus the LCD monitor unit, KVM switch, tape drive enclosure use all eight outlets in the A-side PDU. To add another system, you need to first add another pair of PDUs.

Also note that, in this example, the cumulative space used by the PDUs, an LCD monitor unit, KVM switch, tape drive enclosure, and five ftServer 2300 systems is the capacity of a 25U rack. Adding a sixth system requires that you have a rack that is at least 31U.

Appendix A

System Specifications

For system specifications see:

- [“Pedestal ftServer 2300 System Specifications” on page A-1](#)
- [“Rack-Mountable ftServer 2300 System Specifications” on page A-5](#)

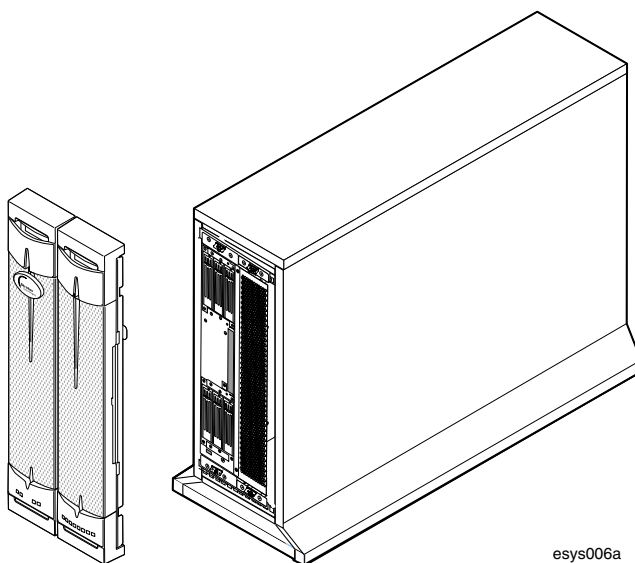
NOTE

The system temperature and humidity requirements, defined in [Table A-1](#) and [Table A-2](#) are the **minimum** requirements the site must provide. The temperature and humidity requirements for other components are provided in [Appendix B, “Specifications of Peripheral Components”](#) for your reference.

Pedestal ftServer 2300 System Specifications

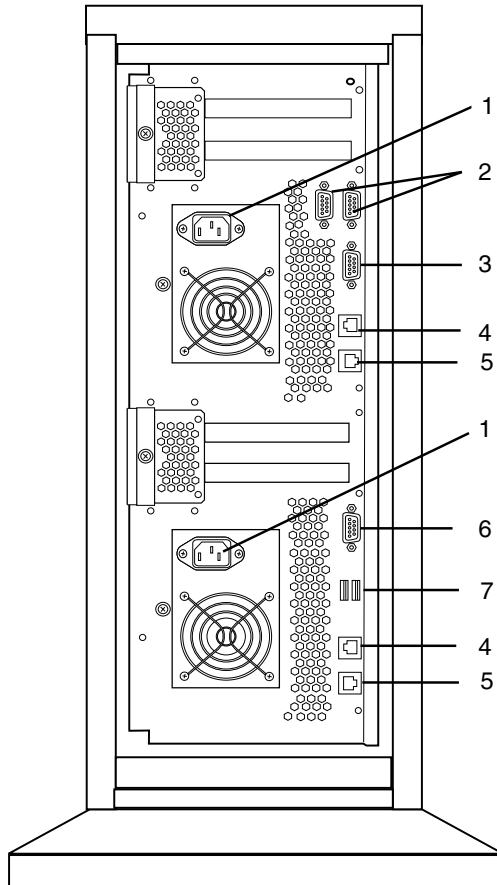
[Figure A-1](#) shows the front of a pedestal ftServer 2300 system, its bezel pulled forward. [Figure A-2](#) shows the rear of a pedestal ftServer 2300 system, specifying the locations of the connectors at the back of the system. [Table A-1](#) lists specifications for the pedestal ftServer 2300 system.

Figure A-1. Pedestal ftServer 2300 System - Front View



esys006a

Figure A-2. Pedestal ftServer 2300 System - Rear View



esys007

- 1 Power receptacles
- 2 Serial (COM) ports
- 3 COM port for VTM
- 4 10/100/1000-Mbps Ethernet port
- 5 VTM 10/100-Mbps Ethernet port
- 6 VGA (monitor) port
- 7 USB ports

Table A-1. Pedestal ftServer 2300 System Specifications

| Power | |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Input power | A-side: 420W (AC) B-side: 420W (AC) |
| Nominal input voltage | 100-240 volts AC +/- 10%; 50/60 Hz |
| Protective earth ground current | 3.5 milliamperes maximum for each AC power cord |
| Physical Dimensions | |
| Height | 23.25 in. (59.05 cm) |
| Width | 8.62 in. (21.89 cm); 12.88 in. (32.72 cm) with case and skirt |
| Depth | 31.38 in. (79.71 cm) |
| Weight | Total: 117 lb. (53.07 kg) System: 63.9 lb (28.98 kg) Rails: 5.6 lb (2.54 kg) Case: 47.5 lb (21.55 kg) |
| Environmental | |
| Operating temperature | 41°F to 95°F (5°C to 35°C) For every 800 ft (243.8m) above 2,000 ft (609.6m), lower the maximum operating temperature (35°C) by 1°C. |
| Storage temperature | -38° F to 140° F (-40° C to 60° C) |
| Operating altitude | 0 ft to 10,000 ft (0m to 3,048m) |
| Maximum rate of temperature change during operation | 18°F/hr (10°C/hr) or 0.30°F/min (0.17°C/min) |
| Relative humidity during operation | 20% to 80% (noncondensing) |
| Relative humidity during storage | 8% to 80% |
| Heat dissipation | BTUs per hour |
| Features | |
| Processors | One physical Intel® Xeon™ 3.06 GHz processors with Hyper-Threading Technology in each side, for a total of two processors |
| Memory | Four physical dual data rate (DDR) inline memory module (DIMM) slots, for a total of eight DIMM slots |

Table A-1. Pedestal ftServer 2300 System Specifications *(Continued)*

| | |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ports | <p>In each side, one 10/100-Mbps Ethernet port dedicated to the Virtual Technician Module (VTM), a system management module, for a total of two Ethernet ports for VTMs</p> <p>One 10/100/1000-Mbps Ethernet port in each side, for a total of two system Ethernet ports</p> <p>A total of two AC power connectors, one VGA port, one serial dedicated to the VTM, two system serial ports, and three USB ports</p> |
| PCI slots | Two user-configurable PCI adapter slots operating at 64-bits and 33 MHz in each side, for a total of two slots |
| VTM | Optionally, one VTM, a system management module, on each side of the system, for a total of two VTMs |
| Disk drives | Three Serial ATA (SATA) disk drives on each side of the system, for a total of six drives |

Rack-Mountable ftServer 2300 System Specifications

[Figure A-3](#) shows the front of a rack-mountable ftServer 2300 system, mounted in a rack with its bezel pulled forward. [Figure A-4](#) shows the rear of a rack-mountable ftServer 2300 system, specifying the locations of the connectors at the back of the system. [Table A-2](#) lists the specifications for the rack-mountable ftServer 2300 system.

Figure A-3. Rack-Mountable ftServer 2300 System - Front View

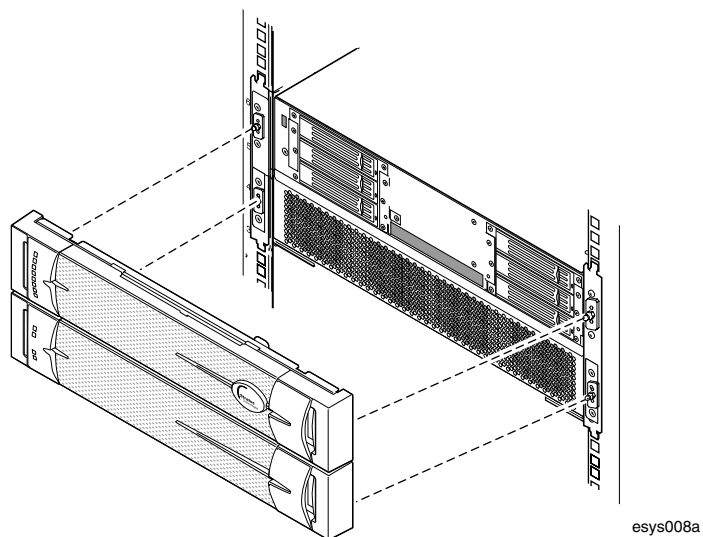
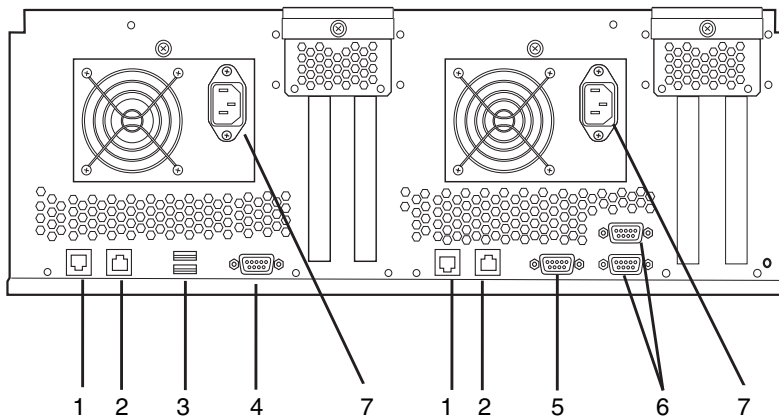


Figure A-4. Rack-Mountable ftServer 2300 System - Rear View

esys009

- 1 VTM 10/100-Mbps Ethernet port
- 2 10/100/1000-Mbps Ethernet port
- 3 USB ports
- 4 VGA (monitor) port
- 5 COM port for VTM
- 6 Serial (COM) ports
- 7 Power receptacles

Table A-2. Rack-Mountable ftServer 2300 System Specifications

| Power | |
|---------------------------------|------------------------------------------------------------------------------|
| Input power | A-side: 420W (AC); B-side: 420W (AC) |
| Nominal input voltage | 100-240 volts AC +/- 10%; 50/60 Hz |
| Protective earth ground current | 3.5 milliamperes maximum for each AC power cord |
| Physical Dimensions | |
| Height | 6.8 in. (17.27 cm; 4U) |
| Width | 17.54 in. (44.55 cm) |
| Depth | 24.32 in. (61.77 cm), excluding screws and bezel |
| Weight | 69.7 lb. (31.62 kg) System: 63.9 lb (28.98 kg) Rails: 5.8 lb (2.63 kg) |

Table A-2. Rack-Mountable ftServer 2300 System Specifications (Continued)

| Environmental | |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating temperature | 41° F to 95° F (5° C to 35° C) For every 800 ft (243.8 m) above 2000 ft (609.6 m), lower the maximum operating temperature (35°C) by 1°C. |
| Maximum rate of temperature change during operation | 18° F/hr (10° C/hr) or 0.30° F/min (0.17° C/min) |
| Relative humidity during operation | 20% to 80% (noncondensing) |
| Relative humidity during storage | 8% to 80% |
| Heat dissipation | 3500 BTUs per hour |
| Features | |
| Processors | One physical Intel® Xeon™ 3.06 GHz processors with Hyper-Threading Technology in each side, for a total of two processors |
| Memory | Four physical dual data rate (DDR) inline memory module (DIMM) slots, for a total of eight DIMM slots |
| Ports | In each side, one 10/100-Mbps Ethernet port dedicated to the Virtual Technician Module (VTM), a system management module, for a total of two Ethernet ports for VTMs One 10/100/1000-Mbps Ethernet port in each side, for a total of two system Ethernet ports A total of two AC power connectors, one VGA port, one serial dedicated to the VTM, two system serial ports, and three USB ports |
| PCI slots | Two user-configurable PCI adapter slots operating at 64-bits and 33 MHz in each side, for a total of two slots |
| Virtual Technician Module (VTM) | Optionally, one VTM, a system management module, on each side of the system, for a total of two VTMs |
| Disk Drives | Three Serial ATA (SATA) disk drives on each side of the system, for a total of six drives |

Appendix B

Specifications of Peripheral Components

For specifications of optional components, see:

- “V128 LCD Monitor Unit Specifications” on page B-2
- “V129 LCD Monitor Unit Specifications” on page B-4
- “V115 Keyboard Specifications” on page B-5
- “AAP41104 PDU Specifications” on page B-6
- “AK470 KVM Switch Specifications” on page B-8
- “AK438 USB Floppy Disk Drive Specifications” on page B-10
- “T521 and T522 Tape Drive Enclosure Specifications” on page B-11
- “C719 External Modem Specifications” on page B-12

NOTE

The system temperature and humidity requirements, defined in [Appendix A, “System Specifications”](#) are the **minimum** requirements the site must provide. The temperature and humidity requirements for other components are specified for your reference.

V128 LCD Monitor Unit Specifications

[Figure B-1](#) shows the rack-mountable V128 LCD monitor unit, which contains an integrated keyboard and trackpad. [Table B-1](#) lists the specifications for the V128 LCD monitor unit.

Figure B-1. V128 LCD Monitor Unit

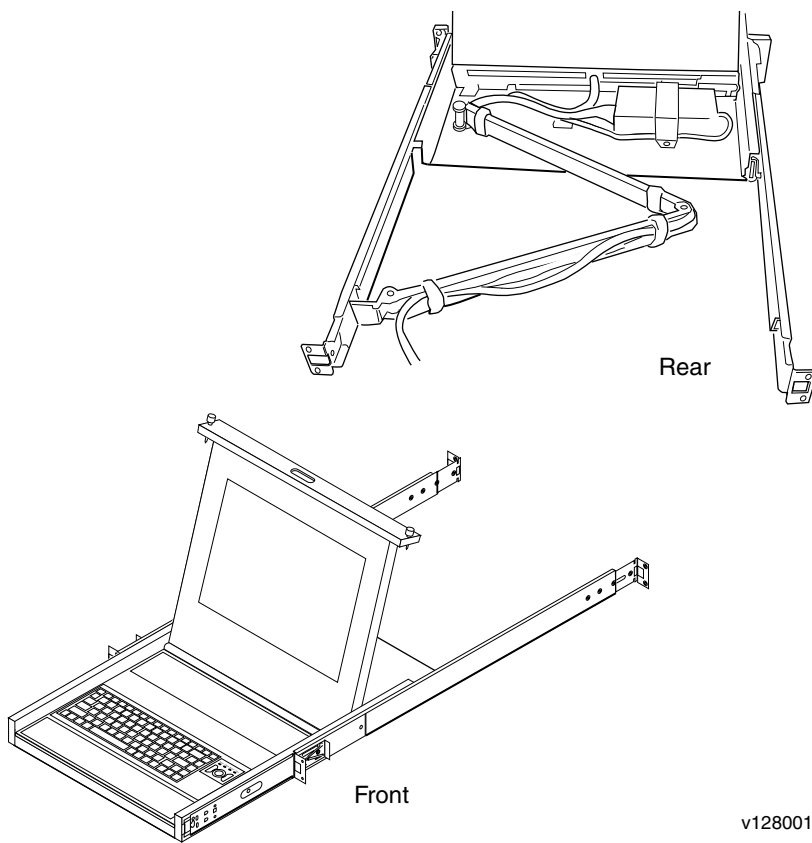


Table B-1. V128 LCD Monitor Unit Specifications

| | |
|------------------------------------|----------------------------------|
| Power | |
| Input power | 21 W (AC) |
| Input voltage | 90-265 volts AC; 47-63 Hz |
| Physical | |
| Height | 1.75 in. (4.45 cm; 1U) |
| Width | 19 in. (48.3 cm) |
| Depth | 24 in. (61 cm) |
| Environmental | |
| Operating temperature | 32°F to 104°F (0°C to 40°C) |
| Storage temperature | -13°F to +140°F (-25°C to +60°C) |
| Relative humidity during operation | 10% to 80% (noncondensing) |
| Relative humidity during storage | 5% to 95% (noncondensing) |
| Heat dissipation | 38 BTUs per hour |

V129 LCD Monitor Unit Specifications

Figure B-2 shows the V129 LCD monitor unit, which requires a table or desk. Table B-2 lists the specifications for the V129 LCD monitor unit.

Figure B-2. V129 LCD Monitor Unit

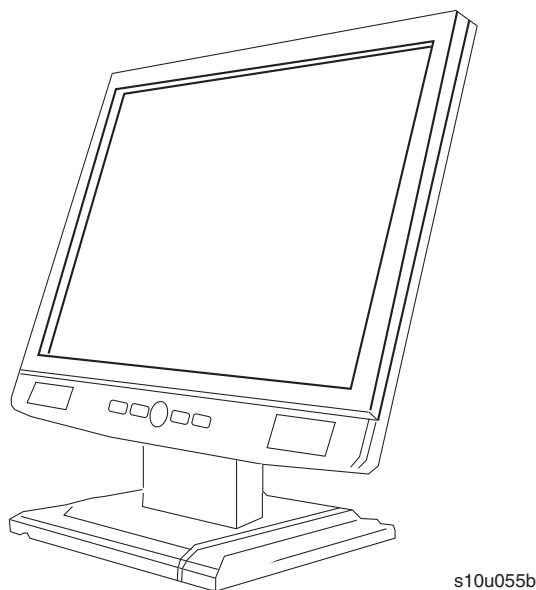


Table B-2. V129 LCD Monitor Unit Specifications

| Power | |
|----------------------------------|---------------------------|
| Input power | 30 W (AC) |
| Nominal input voltage; Frequency | 90–265 volts AC; 47–63 Hz |
| Physical | |
| Height | 14.3 in. (36.2 cm) |
| Width | 13.6 in. (34.2 cm) |
| Depth | 7.3 in. (18.5 cm) |
| Weight | 5.7 lb (2.6 kg) |

Table B-2. V129 LCD Monitor Unit Specifications *(Continued)*

| Environmental | |
|------------------------------------|------------------------------|
| Operating temperature | 41°F to 95°F (5°C to 35°C) |
| Storage temperature | 41°F to +113°F (5°C to 45°C) |
| Relative humidity during operation | 30% to 80% (noncondensing) |
| Relative humidity during storage | 5% to 90% (noncondensing) |
| Heat dissipation | 103 BTUs per hour |

V115 Keyboard Specifications

[Table B-3](#) lists the specifications for the V115 keyboard.

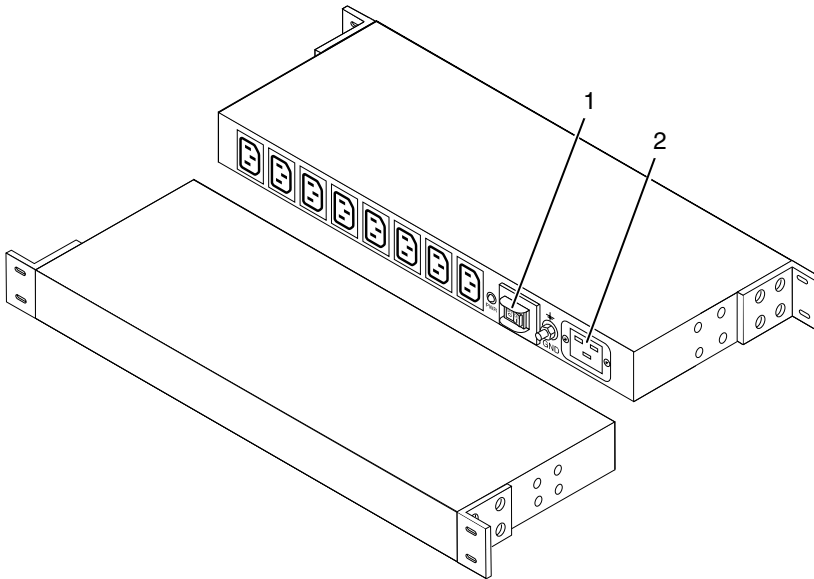
Table B-3. V115 Keyboard Specifications

| | |
|--------|----------------------|
| Height | 2.5 in. (6.4 cm; 2U) |
| Width | 19 in. (48.3 cm) |
| Depth | 8 in. (20.3 cm) |

AAP41104 PDU Specifications

[Figure B-3](#) illustrates the AAP41104 PDU you can use to supply power to ftServer 2300 systems and optional rack-mountable components. [Table B-4](#) lists the specifications for the AAP41104 PDU.

Figure B-3. AAP41104 PDU



ssys108

- 1 Power switch
- 2 Power receptacle

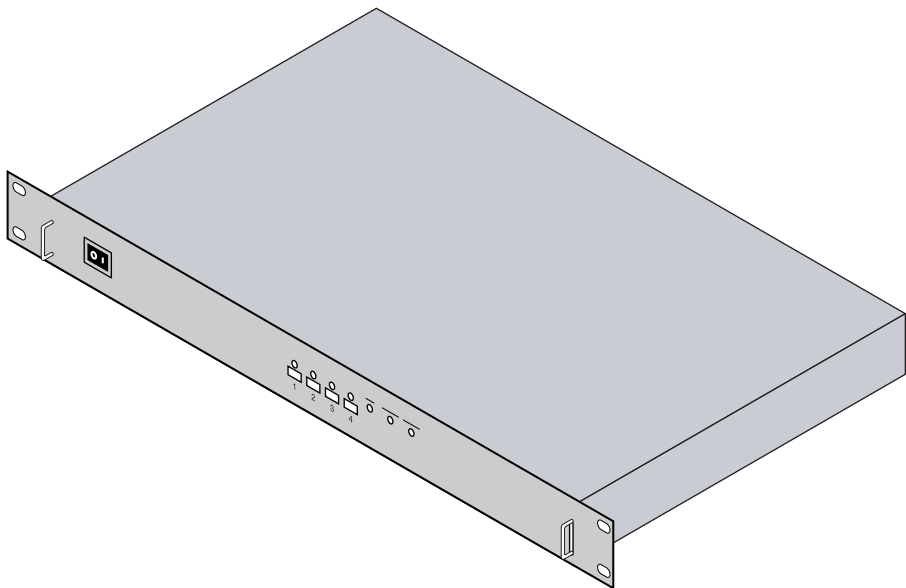
Table B-4. AAP41104 PDU Specifications

| | |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Power | |
| Input power | N/A |
| Nominal input voltage; Frequency range | 200–240 volts AC; 50–60 Hz |
| Physical Dimensions | |
| Height | 1.75 in. (4.45 cm) |
| Width | 19.1 in. (48.51 cm) |
| Depth | 6.75 in. (17.15 cm) |
| Environmental | |
| Operating temperature during operation | 41° F to 95° F (5° C to 35° C) For every 800 ft (243.8m) above 2,000 ft (609.6m), lower the maximum operating temperature (35° C) by 1° C. |
| Maximum rate of temperature change during operation | 12°C per hour or 0.2°C per minute |
| Relative humidity during operation | 10% to 80% (noncondensing) |
| Storage temperature to 40,000 ft (12.2 km) | -38° F to 140° F (-40° C to 60° C) |
| Relative humidity during storage | 5% to 95% (noncondensing) |

AK470 KVM Switch Specifications

Figure B-4 shows the AK470 keyboard-video-mouse (KVM) switch. Table B-5 lists the specifications for the AK470 KVM switch.

Figure B-4. AK470 KVM Switch



s10u056

Table B-5. AK470 KVM Switch Specifications

| Power | |
|---------------------|------------------------------|
| Input power | 20 W (AC) |
| Input voltage | 90 to 264 volts AC; 47–63 Hz |
| Physical Dimensions | |
| Width (front) | 19 in. (48.26 cm) |
| Width (rear) | 16.75 in. (42.55 cm) |
| Depth | 10 in. (25.4 cm) |
| Height | 1.75 in. (4.45 cm; 1U) |
| Weight | 5 lb (2.27 kg) |

Table B-5. AK470 KVM Switch Specifications *(Continued)*

| Environmental | |
|-----------------------------------------------------|------------------------------------|
| Operating temperature 0 to 2000 ft (0 to 609.6m) | 0° F to 100.4° F (0° C to 38° C) |
| Storage temperature | -22° F to 140° F (-30° C to 60° C) |
| Relative humidity during operation | 20% to 80% (noncondensing) |
| Relative humidity during storage | 17% to 90% (noncondensing) |

AK438 USB Floppy Disk Drive Specifications

Figure B-5 illustrates the optional AK438 floppy disk drive. Table B-6 lists the specifications for the AK438 USB floppy disk drive.

Figure B-5. AK438 USB Floppy Disk Drive

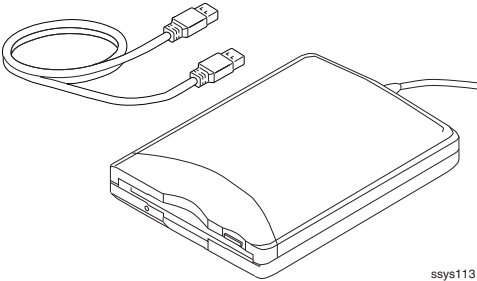


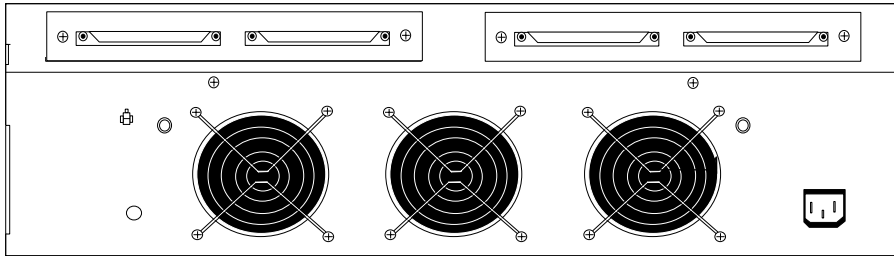
Table B-6. AK438 USB Floppy Disk Drive Specifications

| Physical Dimensions | |
|------------------------------------|------------------------------------|
| Width | 4 in. (10.3 cm) |
| Depth | 5.6 in. (14.2 cm) |
| Weight | 9.9 oz. (280 g) |
| Disk capacity | 1.44 MB |
| Environmental | |
| Operating temperature | 41° F to 95° F (5° C to 35° C) |
| Storage temperature | -4° F to 140° F (-20° C to +60° C) |
| Relative humidity during operation | 20% to 80% (noncondensing) |
| Relative humidity during storage | 10% to 90% (noncondensing) |

T521 and T522 Tape Drive Enclosure Specifications

Figure B-6 illustrates the T521 and T522 rack-mountable tape drive enclosures. The T521 enclosure contains a single tape drive and the T522 enclosure contains two tape drives. Table B-7 lists the specifications for the T521 and T522 tape drive enclosures.

Figure B-6. T521 and T522 Tape Drives



tape012

Table B-7. T521 and T522 Tape Drive Enclosure Specifications

| Power | |
|----------------------------------|----------------------------|
| Input power | 500 W (AC) maximum |
| Nominal input voltage; Frequency | 100–250 volts AC; 47–60 Hz |
| Physical Dimensions | |
| Height | 5 in. (127 mm; 3U) |
| Width | 19 in. (48.26 cm) |
| Depth | 18 in. (457.2 mm) |
| Weight, T521 | 30.25 lb (13.8 kg) |
| Weight, T522 | 35.5 lb (14.2 kg) |

C719 External Modem Specifications

Table B-8 lists the specifications for the C719 external modem.

Table B-8. C719 External Modem Specifications

| | |
|----------------------------------------|----------------------------|
| Power | |
| Input power | N/A |
| Nominal input voltage; Frequency range | 100–240 volts AC; 50–60 Hz |
| Physical Dimensions | |
| Height | 1.00 in. (2.5 cm) |
| Width | 4.25 in. (10.8 cm) |
| Depth | 5.60 in. (14.2 cm) |

Appendix C

Electrical Circuit and Wiring Information

For electrical circuit and wiring information that you need to provide to the contractor and/or facilities personnel responsible for wiring the power at the system installation site, see:

- [“Fault Protection Requirements” on page C-1](#)
- [“Grounding Considerations” on page C-1](#)
- [“Circuit Wiring Diagrams” on page C-3](#)
- [“Electrical Power Connectors” on page C-9](#)

Fault Protection Requirements

Each ftServer 2300 system contains internal fault/overload current protection. However, the system relies on the power distribution system at your site for protection against potential faults in the power cords and the wiring in the system base.

- If you are using a pair of PDUs in the cabinet, use 30A or less circuit breakers in each power distribution branch that feeds the PDUs.
- To connect a single system to power, use 20A or less circuit breakers in each power distribution branch that feeds the systems.

Grounding Considerations

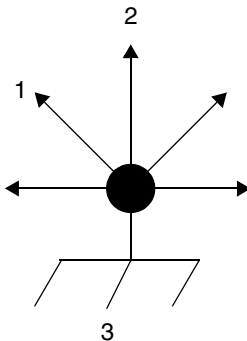
The system obtains an earth reference ground through the power cords attached to the system. Similarly, each peripheral device connected to the system obtains ground through its power cord. For each peripheral device, you **must** ensure that a high-integrity safety-ground conductor is installed as part of the wiring system (in accordance with U.S. national electric code NFPA 70 or the equivalent). The international safety standard (EN60950) for electronic data processing (EDP) equipment also requires a ground conductor, but calls it a protective earth (PE) ground.

Depending upon local conditions, ground potentials may differ between the system base and any peripheral devices connected to the system base. All grounds in the system **must** return to the same reference point in the power distribution system, as close as possible to **zero (0) volt potential** relative to earth reference ground. Earth

reference ground is typically a metal stake in the ground to which the ground conductors from one or more buildings are attached.

As shown in [Figure C-1](#), a *star ground* is often used to obtain the same earth reference ground. Each earth reference ground, such as the system base ground, is returned separately to a common point where a zero-volt (0V) earth ground exists. The star ground ensures that all equipment is at the same potential and that no noise or safety problems associated with an unpredictable or uncharacterized grounding system will occur.

Figure C-1. Star Ground Example



- 1 To monitor
- 2 To ftServer 2300 system
- 3 Earth reference ground (0V)

Circuit Wiring Diagrams

The following circuit wiring diagrams show how the hot, ground, and/or neutral AC signals should be connected to the system's power input plug:

- [Figure C-3](#) illustrates a single-phase 120-volts AC circuit connection.
- [Figure C-4](#) illustrates a single-phase 240-volts AC circuit connection.
- [Figure C-5](#) illustrates a split-phase 120/240-volts AC circuit connection.
- [Figure C-6](#) illustrates a three-phase 208-volts AC, Y-, or Δ -source circuit connection, phase-to-neutral.
- [Figure C-7](#) illustrates a three-phase 208-volts AC, Y-, or Δ -source circuit connection, phase-to-phase.
- [Figure C-8](#) illustrates a three-phase 380-volts AC, Y-, or Δ -source circuit connection, phase-to-neutral.

In the diagrams in this appendix, the power inputs for the ftServer system are labeled X and Y, as shown in [Figure C-2](#), to eliminate any ambiguities in the nomenclature. For single-phase applications, the X input is connected to the L (Line) *hot* input, and the Y input is connected to the N (Neutral) input. However, for split-phase or three-phase applications, the X and Y inputs are connected to L1, L2, or L3 (separate lines). Therefore, for split-phase or three-phase applications, both X and Y can be electrically hot with respect to the system base (earth reference ground). [Figure C-2](#) shows the physical locations of the X and Y inputs on the system base.

Figure C-2. Power Input Labeling

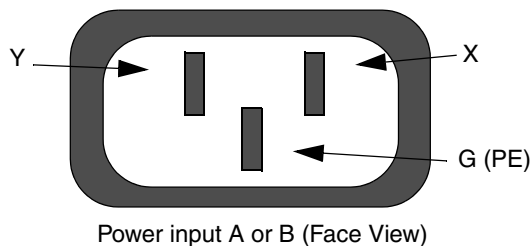


Figure C-3 shows a single-phase 120-volts AC circuit connection. Note that this application requires a single-pole circuit breaker.

Figure C-3. Single-Phase 120-Volts AC Circuit Connection

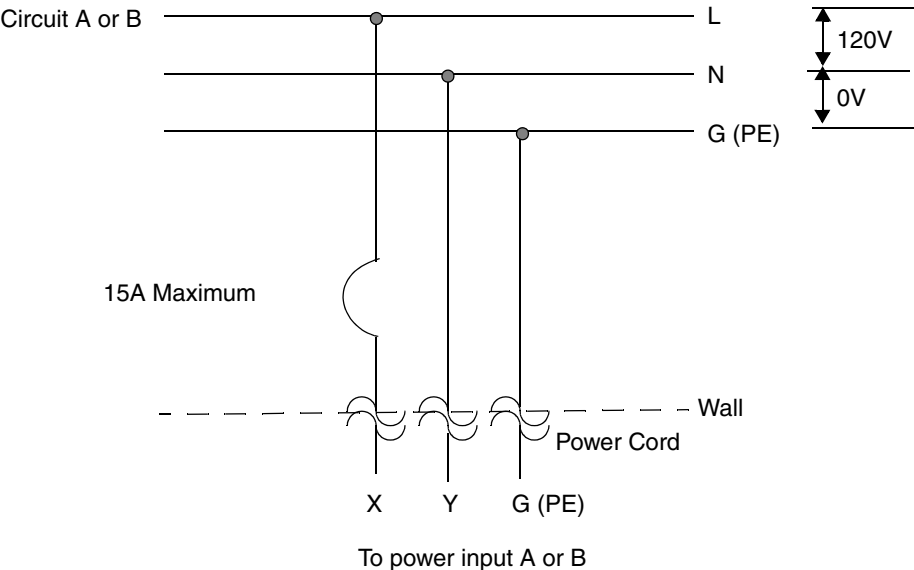


Figure C-4 shows a single-phase 240-volts AC circuit connection. Note that this application requires a single-pole circuit breaker.

Figure C-4. Single-Phase 240-Volts AC Circuit Connection

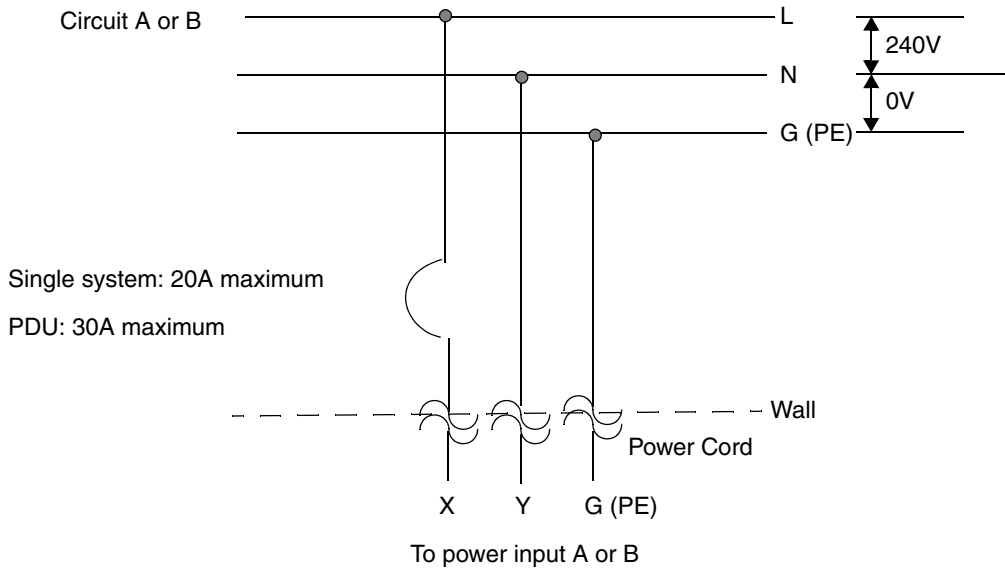


Figure C-5 shows a split-phase 120/240-volts AC circuit connection. Note that this application requires a double-pole circuit breaker.

Figure C-5. Split-Phase 120/240 Volts AC Circuit Connection

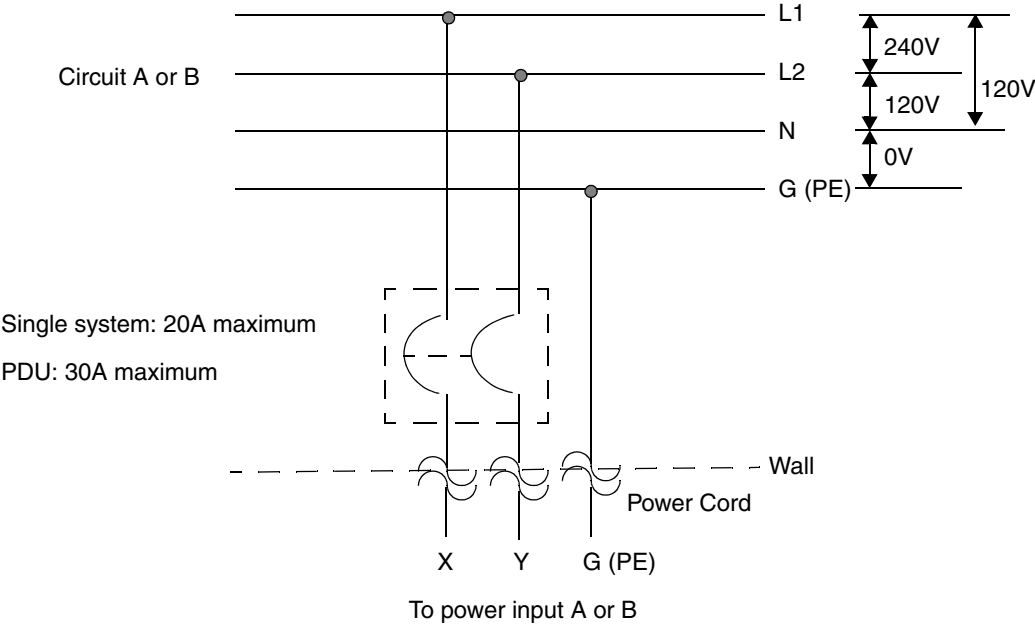


Figure C-6 shows a three-phase 208-volts AC, Y-, or Δ -source circuit connection, which is a phase-to-neutral source connection. Note that the ftServer X input can be connected from L1, L2, or L3. This application requires a single-pole circuit breaker.

Figure C-6. Three-Phase 208-Volts AC, Y-, or Δ -Source Circuit Connection, Phase-to-Neutral

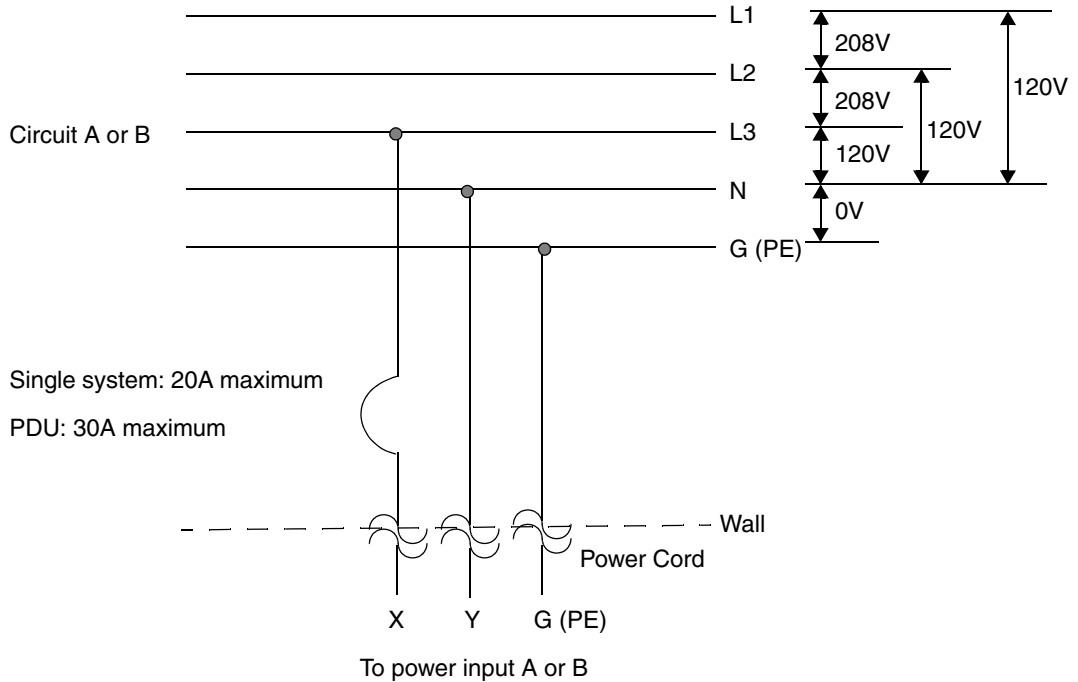


Figure C-7 shows a three-phase 208-volts AC, Y-, or Δ -source circuit connection, which is a phase-to-phase source connection. Note that the ftServer X and Y inputs can be connected from L1 and L2, L2 and L3, or L1 and L3. This application requires a double-pole circuit breaker.

Figure C-7. Three-Phase 208-Volts AC, Y-, or Δ -Source Circuit Connection, Phase-to-Phase

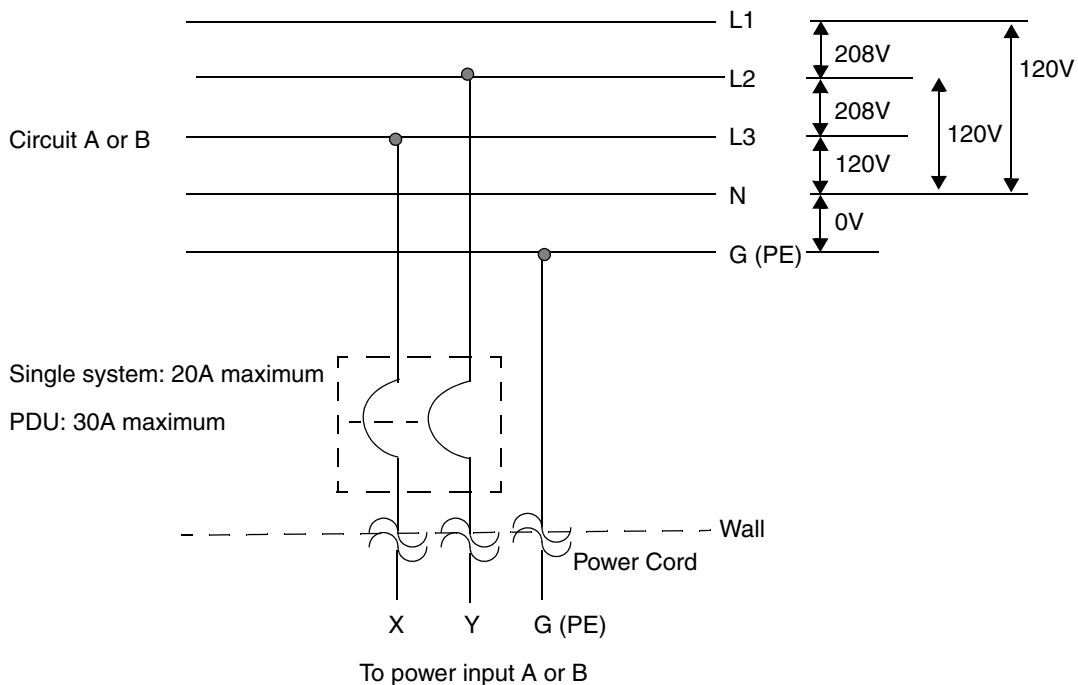
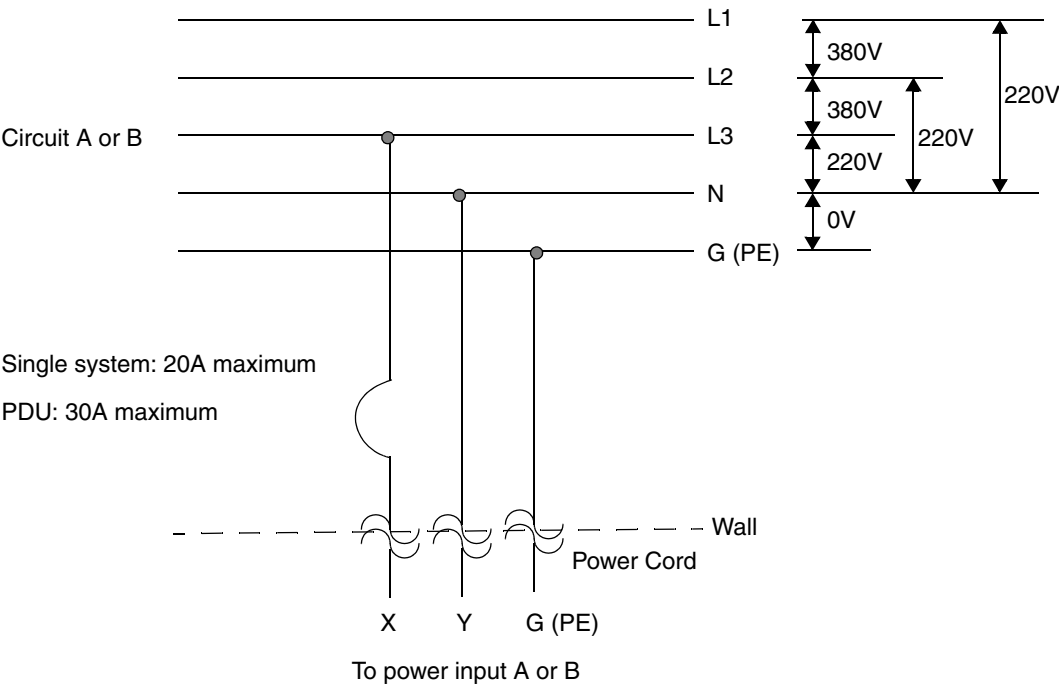


Figure C-8 shows a three-phase 380-volts AC, Y-, or Δ -source circuit connection, which is a phase-to-neutral source connection. Note that the ftServer X input can be connected to L1, L2, or L3. This application requires a single-pole circuit breaker.

Figure C-8. Three-Phase 380-Volts AC, Y-, or Δ -Source Circuit Connection, Phase-to-Neutral



Electrical Power Connectors

Table C-1 describes the connectors on the power cords supplied to connect systems and optional components, such as tape drives, to AC power outlets.

Table C-1. Connectors for AC Power Outlets

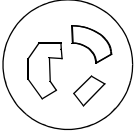
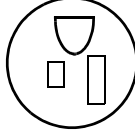
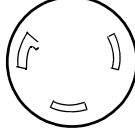
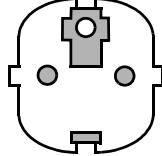
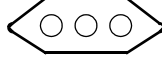
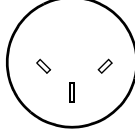
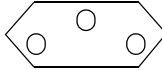
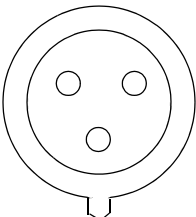
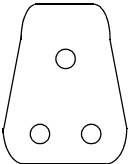
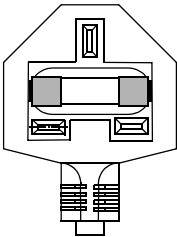
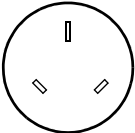
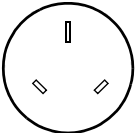
| Connector | Configuration | Rating | Description |
|-----------------|-------------------------------------------------------------------------------------|-------------------|----------------|
| NEMA L6-20 |  | 20A, 250 volts AC | 2-pole, 3-wire |
| NEMA 5-15 |  | 15A, 125 volts AC | 2-pole, 3-wire |
| NEMA L6-30 |  | 30A, 250 volts AC | 2-pole, 3-wire |
| CEE (7) VII |  | 20A, 250 volts AC | 2-pole, 3-wire |
| CEI-23-16 |  | 16A, 250 volts AC | 2-pole, 3-wire |
| SI 32/1971 |  | 16A, 250 volts AC | 2-pole, 3-wire |
| SEV 1011-S24507 |  | 10A, 250 volts AC | 2-pole, 3-wire |

Table C-1. Connectors for AC Power Outlets *(Continued)*

| Connector | Configuration | Rating | Description |
|------------------------------|-------------------------------------------------------------------------------------|----------------------|----------------|
| IEC 60309 |  | 16-20A, 250 volts AC | 2-pole, 3-wire |
| SABS 164-1:1992 |  | 16A, 250 volts AC | 2-pole, 3-wire |
| BS 1363/A |  | 13A, 250 volts AC | 2-pole, 3-wire |
| AS/NZS 3112-1993 |  | 15A, 250 volts AC | 2-pole, 3-wire |
| SAA/3/15 AS/NZS 3112-1993 |  | 15A, 250 volts AC | 2-pole, 3-wire |

Appendix D

Standards Compliance

ftServer systems comply with the electromagnetic interference (EMI), immunity, safety, and noise regulations listed in Tables D-1 through D-4. All necessary agency labels are on the system.

NOTES _____

1. This system must be configured with the components listed and described in the product configuration specifications. Deviations from this list of components will void agency certification.
2. You must install all wiring, including power and communications cables, in compliance with local and national electrical code (in the United States, national electrical code NFPA 70). In addition, you must use shielded communications cables to remain in compliance with Federal Communications Commission (FCC) and other international Electromagnetic compatibility (EMC) regulations.
3. All EMC emissions compliance tests are performed at a third-party certified test laboratory. You can obtain compliance reports for these tests from your Stratus account representative, who will contact the Product Compliance Group in the Stratus engineering organization.

Table D-1. EMI Standards

| Standard | Description | Country/Region |
|---------------------|------------------------------------------------------------------------------------------------------------|----------------|
| FCC Part 15 Class A | Code of Federal Regulations 47 (1998) Class A | North America |
| EN 55022 | Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment | European Union |

Table D-1. EMI Standards (Continued)

| Standard | Description | Country/Region |
|--------------|------------------------------------------------------------------------------------------------------------|-----------------------|
| AS/NZS 3548 | Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment | Australia/New Zealand |
| CNS13438 | Chinese National Standard 13438 | Taiwan |
| VCCI Class A | Voluntary Control Council for Interference by Information Technology Equipment | Japan |

Table D-2. Immunity Standards

| Standard | Description | Country/Region |
|------------|---------------------------------------------------------------------------------------------------------|----------------|
| EN 50082-1 | Generic Immunity Standard, Electromagnetic Compatibility, Residential, Commercial, and Light Industrial | European Union |
| EN 55024 | Limits and methods of measurement of immunity characteristics of Information Technology Equipment | European Union |

Table D-3. Safety Standards

| Standard | Description | Country/Region |
|----------|--------------------------------------------|----------------|
| UL 60950 | Safety of Information Technology Equipment | North America |
| EN 60950 | Safety of Information Technology Equipment | European Union |

Table D-4. Noise Standards

| Standard | Description | Country/Region |
|------------|--------------------------------------------------------------------------------------|----------------|
| ISO 9614-2 | Acoustics. Determination of Sound Power Levels of Noise Source using Sound Intensity | European Union |
| ISO 7779 | Measurements of Airborne Noise emitted by Computers and Business Equipment | European Union |

VCCI Note

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

BSMI Note**警告使用者**

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

Index

A

AAP41104 PDU, B-6
ActiveService Network (ASN). *See* ASN
AK438 USB floppy disk drive, B-10
AK470 KVM switch, B-8
American Power Conversion. *See* APC
APC
 Network Management Card EX, 5-3
 PowerChute Network Shutdown, 5-3
AS/NZS 3112-1993 connector, C-11
A-side power source, 4-1
ASN, site planning, 1-2, 1-3, 3-2

B

BS 1363/A connector, C-11
B-side power source, 4-1

C

C719 external modem, B-12
cabinets
 configuration planning, 7-1
 requirements, 2-1
cables
 Ethernet network, 6-1
 ground, 3-3
 interface, 3-2
 USB, 3-2
 VGA, 3-2
CAC, getting assistance, 1-2
checklist for site planning, 1-2
circuit, electrical
 planning information, C-1
 wiring diagrams, C-3
compliance, standards, D-1
connectors (AC), C-9
Customer Assistance Center. *See* CAC

D

D540 storage enclosures
 power service requirements, 4-2
disk drives, USB floppy specifications, B-10
documentation, ordering, 1-6

E

earth reference ground, C-1
electrical grounding, C-1
electrical wiring, C-1
electromagnetic interference, D-1
environmental requirements
 maximum rate of temperature
 change, A-4, A-8
 operating humidity, A-4, A-8
 operating temperature, A-4, A-8
 storage humidity, A-4, A-8
Ethernet network cables, 6-1

F

floppy disk drives, specifications, B-10
ftGateway, site planning information, 6-3

G

ground leakage cables, 3-3
grounding the system, 2-2, C-1

I

immunity regulations, D-2

K

keyboards, V115 specifications, B-5
keyboard-video-mouse (KVM) switches. *See*
 KVM switches
KVM switches
 power service requirements, 4-2
 specifications, B-8

L

- LCD monitor units
 - power cords, 4-9
 - power service requirements, 4-2
 - V128 specifications, B-2
 - V129 specifications, B-4

M

- modems, external
 - power cords, 4-10
 - power service requirements, 4-2, 4-4
 - specifications, B-12
- monitors
 - power cords, 4-9
 - requirements, 2-4
 - See also* LCD monitor units

N

- network (Ethernet) cables, 6-1
- noise regulations, D-2

P

- PDU specifications, B-6
- power (AC)
 - cords
 - LCD monitor units, 4-9
 - modem, 4-10
 - monitors, 4-9
 - storage enclosures, 4-9
 - tape drives, 4-9
 - electrical requirements, 4-2
 - service requirements, 4-2, 4-3, 4-4, 4-5
 - A-side, 4-4, 4-5
 - B-side, 4-4, 4-5
 - sources, 4-1
 - sources, no UPS, 4-5
- printed documentation, ordering, 1-6
- protective earth ground, C-1

R

- racks
 - configuration planning, 7-1
 - requirements, 2-1

S

- SAA/3/15 AS/NZS 3112-1993 connector, C-11
- safety regulations, D-2
- SCSI cables
 - daisy chain, 3-3
 - tape drive, 3-2
- single-phase 120-VAC circuit connection, C-4
- site planning checklist, 1-2
- space planning, 3-1
- specifications
 - AC power, 4-2
 - external modem, B-12
 - KVM switches, B-8
 - PDU, B-6
 - pedestal system, A-1
 - rack-mountable system, A-5
 - tape drives
 - T521 and T522, B-11
 - V115 keyboards, B-5
 - V128 LCD monitor units, B-2
 - V129 LCD monitor units, B-4
- standards compliance, D-1
- star ground, C-2
- Stratus Customer Assistance Center. *See* CAC

T

- T521 and T522 tape drive enclosures
 - power service requirements, 4-2
 - specifications, B-11
- tape drives
 - power cords, 4-9
 - specifications, B-11
- technical support. *See* CAC
- telephone lines, 6-2
 - for support calls, 1-3

U

- UPS
 - PDU connections, 5-3
 - pedestal system connections, 5-6
 - rack system connections, 5-5
 - site planning, 5-1
- USB cables, 3-2
- USB floppy disk drives
 - specifications, B-10

V

- V115 keyboards, specifications, B-5
- V128 LCD monitor units
 - power service requirements, 4-2
 - specifications, B-2
- V129 LCD monitor units
 - power service requirements, 4-2, 4-4
 - specifications, B-4
- VGA cables, 3-2
- Virtual Technician Modules. *See* VTMs
- VTMs, site planning, 1-2

W

- wiring, electrical, C-1

