Stratus ftServer V 100, V 200, and V 400 Systems: Site Planning Guide

Notice

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

Manual Name: *Stratus ftServer V 100, V 200, and V 400 Systems: Site Planning Guide*

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Preface

The *Stratus ftServer V 100, V 200, and V 400 Systems: Site Planning Guide* (R543) describes how to prepare a site for the installation of a Stratus ftServer V 100, V 200, or V 400 system. It provides the specifications for cabinets, peripheral devices, and communications cables, as well as grid pages and templates for site-layout planning.

This manual is intended for those responsible for preparing their site for the installation of a Stratus ftServer V 100, V 200, or V 400 system.

Manual Version

This manual is a revision. This revision incorporates information about the AA-E97900 RSN console server and the AA-C72100 RSN dialup console modem throughout.

Manual Organization

This manual contains four chapters and three appendixes.

Chapter 1 introduces site planning for ftServer V 100, V 200, and V 400 systems and provides a site planning checklist.

Chapter 2 describes electrical power requirements, provides worksheets to help you determine the specific needs for your configuration, and describes the power cords that Stratus supplies.

Chapter 3 describes the environmental and space requirements of the room where the system will be installed.

Chapter 4 describes the communications cables that are required.

Appendix A lists the specifications of ftServer V 100, V 200, and V 400 systems.

Appendix B provides electrical circuit and wiring information you may need to provide to the contractor and/or facilities personnel responsible for wiring the AC power at the system installation site.

Appendix C lists the electronic interference, immunity, safety, and noise level standards with which the systems comply.

Related Manuals

Refer to the following Stratus manuals for related documentation.

- *Migrating VOS Applications from Continuum Systems* (R607)

- *Software Release Bulletin: OpenVOS Release 17.1.0* (R622)

- *Stratus ftServer: Network I/O Enclosure Guide* (R608)

- *Stratus ftServer V 200 and V 400 Systems: Operation and Maintenance Guide* (R557)

- *Stratus ftServer V 100 Systems: Operation and Maintenance Guide* (R581)

Notation Conventions

This manual uses the following notation conventions.

Warnings, Cautions, and Notes

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

W A R N I N G ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

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

C A U T I O N ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

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

N O T E ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

A note provides important information about the operation of a Stratus system.

Typographical Conventions

The following typographical conventions are used in this manual:

- Italics introduces or defines new terms. For example:

  The *master disk* is the name of the member disk from which the module was booted.

- Boldface emphasizes words in text. For example:

  Every module **must** have a copy of the `module_start_up.cm` file.

- Monospace represents text that would appear on your terminal's screen (such as commands, subroutines, code fragments, and names of files and directories). For example:

  ```
  change_current_dir (master_disk)>system>doc
  ```

- Monospace italic represents terms that are to be replaced by literal values. In the following example, the user must replace the monospace-italic term with a literal value.

  ```
  list_users -module module_name
  ```

- Monospace bold represents user input in examples and figures that contain both user input and system output (which appears in monospace). For example:

  ```
  display_access_list system_default
  ```

  ```
  %dev#m1>system>acl>system_default
  ```

  ```
  w   *.*
  ```

Online Documentation

The OpenVOS StrataDOC Web site is an online-documentation service provided by Stratus. It enables Stratus customers to view, search, download, print, and comment on OpenVOS technical manuals via a common Web browser. It also provides the latest updates and corrections available for the OpenVOS document set.

You can access the OpenVOS StrataDOC Web site at `http://stratadoc.stratus.com`. A copy of OpenVOS StrataDOC on supported media is included with this release. You can also order additional copies from Stratus.

This manual is available on the OpenVOS StrataDOC Web site.

For information about ordering OpenVOS StrataDOC on supported media, see the next section, "Ordering Manuals."

Ordering Manuals

You can order manuals in the following ways.

- If your system is connected to the Remote Service Network (RSN™), issue the `maint_request` command at the system prompt. Complete the on-screen form with all of the information necessary to process your manual order.

- Customers in North America can call the Stratus Customer Assistance Center (CAC) at (800) 221-6588 or (800) 828-8513, 24 hours a day, 7 days a week. All other customers can contact their nearest Stratus sales office, CAC office, or distributor; see `http://www.stratus.com/support/cac/index.htm` for CAC phone numbers outside the U.S.

Manual orders will be forwarded to Order Administration.

Commenting on This Manual

You can comment on this manual by using the command `comment_on_manual`. To use the `comment_on_manual` command, your system must be connected to the RSN. Alternatively, you can email comments on this manual to `comments@stratus.com`.

The `comment_on_manual` command is documented in the manual *OpenVOS System Administration: Administering and Customizing a System* (R281) and the *OpenVOS Commands Reference Manual* (R098). There are two ways you can use this command to send your comments.

- If your comments are brief, type `comment_on_manual`, press ⌷Enter⌷ or ⌷Return⌷, and complete the data-entry form that appears on your screen. When you have completed the form, press ⌷Enter⌷.

- If your comments are lengthy, save them in a file before you issue the command. Type `comment_on_manual` followed by `-form`, then press ⌷Enter⌷ or ⌷Return⌷. Enter this manual's part number, `R543`, then enter the name of your comments file in the `-comments_path` field. Press the key that performs the CYCLE function to change the value of `-use_form` to `no` and then press ⌷Enter⌷.

> N O T E —————————————
>
> If `comment_on_manual` does not accept the part number of this manual (which may occur if the manual is not yet registered in the `manual_info.table` file), you can use the `mail` request of the `maint_request` command to send your comments.

Your comments (along with your name) are sent to Stratus over the RSN.

Stratus welcomes any corrections and suggestions for improving this manual.

Chapter 1
Site Planning Overview

This chapter explains how to prepare your site for installation of ftServer V 100, V 200, and V 400 systems. It contains the following sections:

- "System Components to Consider for Site Planning" on page 1-1
- "Site Planning Considerations" on page 1-3
- "Site Planning Checklist" on page 1-9
- "Preparing to Install a System" on page 1-11
- "Safety Precautions" on page 1-13

Use the "Site Planning Checklist" on page 1-9 to track your site preparation progress.

System Components to Consider for Site Planning

This section describes the main components and peripheral components associated with ftServer V 100, V 200, and V 400 systems. Table 1-1 lists the main components in a system. Refer to Appendix A for specifications for these components.

Table 1-1. ftServer V 100, V 200, and V 400 System Main Components *(Page 1 of 2)*

Component	Description
ftServer V 100, V 200, and V 400 main cabinet	The 38U ftServer V 100, V 200, and V 400 system main cabinet provides space for the module's CPU enclosures, I/O enclosures, tape-drive enclosure, two Fibre Channel (FC) disk enclosures, two power distribution units (PDUs), optional ftScalable Storage arrays, and one optional network I/O enclosure.
PC Console	Use the PC console (or a V109 console if you have one) to boot the system. See "System Console Requirements" on page 4-3
Expansion storage-system cabinets	Each optional expansion E124 storage-system cabinet provides space for up to eight additional D910 FC disk enclosures (112 disks). A ftServer V 100, V 200, and V 400 system supports up to two E124 expansion storage-system cabinets.

Table 1-1. ftServer V 100, V 200, and V 400 System Main Components *(Page 2 of 2)*

Component	Description
Uninterruptible power supplies	Uninterruptible power supply (UPS) units provide system operation during power outages. UPS units are not supplied by Stratus. See "Selecting a UPS Unit for ftServer V 200 and V 400 Systems" on page 2-4 or "Selecting a UPS Unit for ftServer V 100 Systems" on page 2-9 for details.

Table 1-2 lists other supported components to consider for site planning.

Table 1-2. Other Components *(Page 1 of 2)*

Component	Description
ftScalable Storage array	Optional ftScalable Storage arrays provide fault-tolerant hardware RAID storage. See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for more information.
AA-E97900 and AA-E96600 RSN dialup console server and AA-C72100 and AA-C72000 modem	The AA-E97900 and the AA-E96600 RSN dialup console server and the AA-C72100 and AA-C72000 RSN modem support automatic communication with the Customer Assistance Center (CAC) via the Remote Service Network (RSN) when a component in the system fails. They are typically located outside the main cabinet. The modem can be used in most locations worldwide. See "RSN Connection" on page 4-8 and the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for more information.
or	
AA-E97700 RSN Internet console server	The AA-E97700 RSN Internet console server requires OpenVOS 17.1.0 or later. It supports automatic communication with the CAC via the RSN when a component in the system fails. It provides a secure SSL communications channel. It is typically located outside the main cabinet. See "RSN Connection" on page 4-8 and the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for more information.
PCI adapters	PCI adapters reside in the I/O enclosures. The types of PCI adapters that you purchase with your system determine the type of communications cabling required. See "PCI Adapter Cables" on page 4-13 for details.
U772 and U773 switches	The optional U772 and U773 switches provide a private maintenance network and more module configuration options, respectively. They are required for configurations with the ftScalable Storage array. See "Optional U772 and U773 Switches" on page 4-1 for more information.

Table 1-2. Other Components *(Page 2 of 2)*

Component	Description
PICMG 2.16 adapters	PICMG 2.16 adapters reside in the optional network I/O enclosure. The PICMG 2.16 adapters that you use determine the type of communications cabling your site requires. See "Network I/O Enclosure PICMG 2.16 Adapter Cables" on page 4-12 for details.
Cables	Stratus supplies power cords and most communications cables for adapters and peripherals. You may need to provide some Ethernet cables. See "Power Cord Summary" on page 2-10 and Chapter 4, "Communications Line Planning," for details.

Site Planning Considerations

This section discusses the site-planning topics you should consider when selecting a site for your ftServer V 100, V 200, or V 400 system. Work with your building facilities group when selecting and preparing a site. See "Working with Other Groups" on page 1-12 for details.

- "Location and Space Considerations" on page 1-3
- "Cabinet Mounting and Leveling Considerations" on page 1-4
- "Electrical Power Considerations" on page 1-4
- "Communications Cabling Considerations" on page 1-6
- "Environmental Considerations" on page 1-8
- "Underwriters Laboratories Recommendations" on page 1-8

Location and Space Considerations

Consider the following information when selecting a location for the system:

- The system must be installed in a computer room with a controlled environment. See Appendix A for environmental specifications.

- The room must have sufficient space for opening cabinet doors, removing cabinet panels, and servicing the system from the front and rear.

- The room must have sufficient floor space for external components, such as the optional external E124 storage-system cabinets.

- Each PC console, telephone, RSN console server, and modem (if present) requires table or desktop space. You **cannot** place a peripheral on top of a system cabinet.

- You must place the system and peripheral devices within the room so that power cords and communications cables of the maximum length will reach their

respective power receptacles, telephone jacks, and other connection points. See Chapter 2 for power cord details. See Table 4-4, Table 4-5, and Table 4-6 for details about communications cables.

- Consider space requirements for future expansion.

Figure 1-1 illustrates the space-planning considerations.
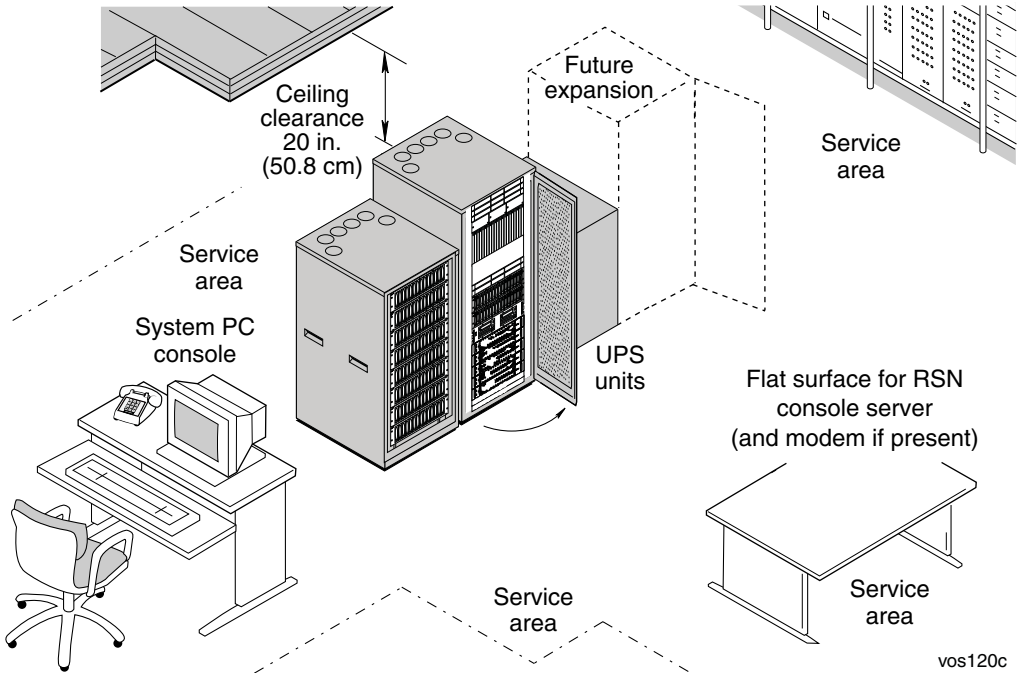
Figure 1-1. Space-Planning Considerations

Cabinet Mounting and Leveling Considerations

The main cabinet has cabinet-leveling feet. Anti-tip brackets are optional. The cabinet-leveling feet and the anti-tip brackets rest on top of the floor, so you do not need to drill holes in the floor.

Electrical Power Considerations

Consider the following information when providing electrical service for the system:

- ftServer V 100, V 200, and V 400 systems require AC power. See "AC Power and HVAC Worksheets" on page 2-2 for details.

- ftServer V 100, V 200, and V 400 systems require external uninterruptible AC power sources. See "Redundant Power Sources" on page 2-1 for details.

- The main cabinet requires separate circuits for its two power cords. Special power outlets may be needed.

- Each external peripheral requires separate electrical circuits and outlets.

- Power cords should be located out of the way of foot traffic.

- The power service must be properly wired and grounded according to local standards and regulations. See Appendix B for electrical circuit and wiring information.

- Determine the lengths and types of the power cords provided with your system. See Table 2-1 for details.

Figure 1-2 illustrates the AC power considerations. The table shown in this figure (or other suitable surface) is required to hold an RSN dialup console server and the RSN modem (if present).
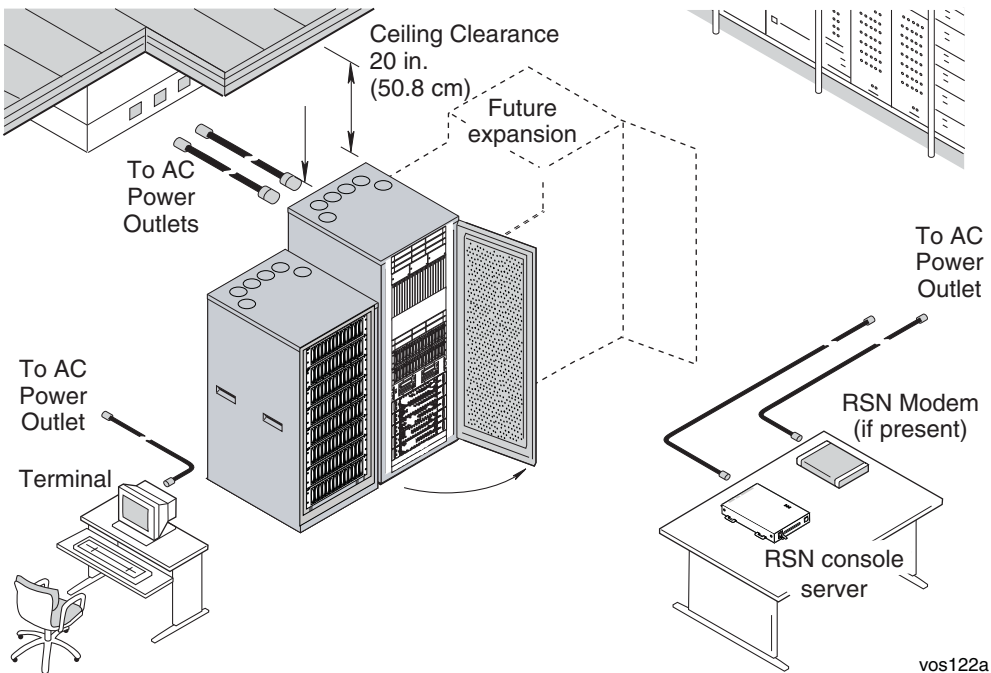
Figure 1-2. AC Power Considerations

Communications Cabling Considerations

Consider the following information when deciding where to route cables for the system:

- Existing LAN and WAN communications connections must be within cabling distance to the system.

- A telephone and telephone line must be provided for voice communications when calling for support. The telephone should be placed such that it can be used by a person who has access to the PC console, the front of the system, and to the back of the system.

- If you are using the AA-E97900 or AA-E96600 RSN dialup console server, a telephone jack with a connection to an additional external analog telephone line (not switched through a PBX) must be near the installation site for connection to your system's RSN modem.

  NOTE

  A dedicated phone line provides the most reliable service. RSN calls routed through a PBX might be slow due to load on the PBX, or might 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.

- Consider cabling needs for future expansion. For example, you may need to install additional cabling in your building to support any additional devices that may be required. By prewiring wall outlets for data communications, you can add terminals as needed.

- Cables can exit from the top or bottom of the cabinet and can be routed along the ceiling or under the floor.

Figure 1-3 illustrates cabling considerations with a dialup console server and modem.
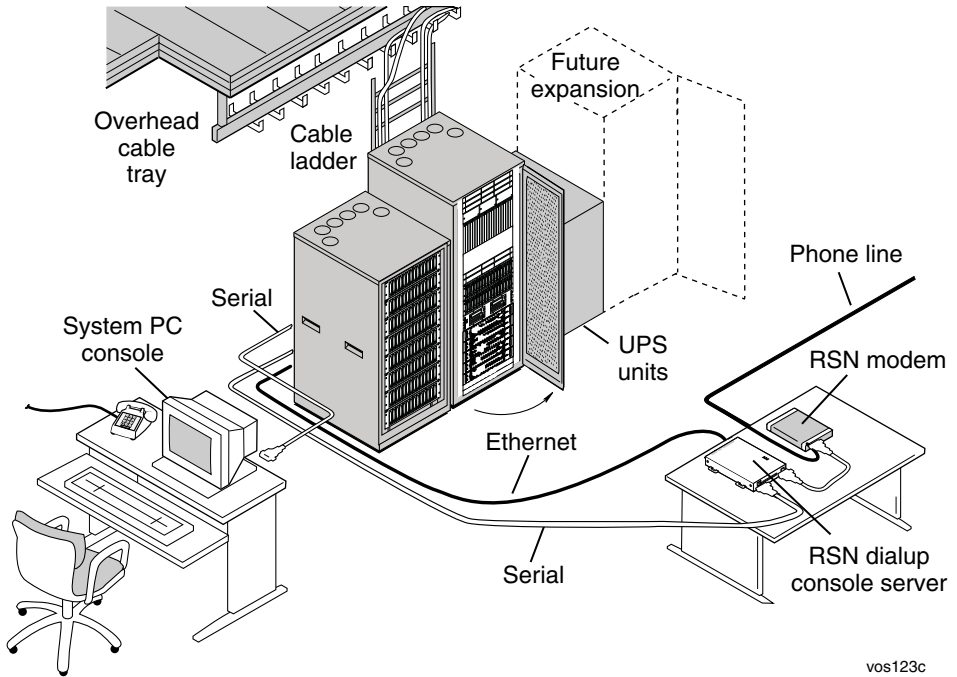
Figure 1-3. Cabling Considerations with RSN Dialup Console Server and Modem

Figure 1-4 illustrates cabling considerations with an AA-E97700 RSN Internet console server.

vos237
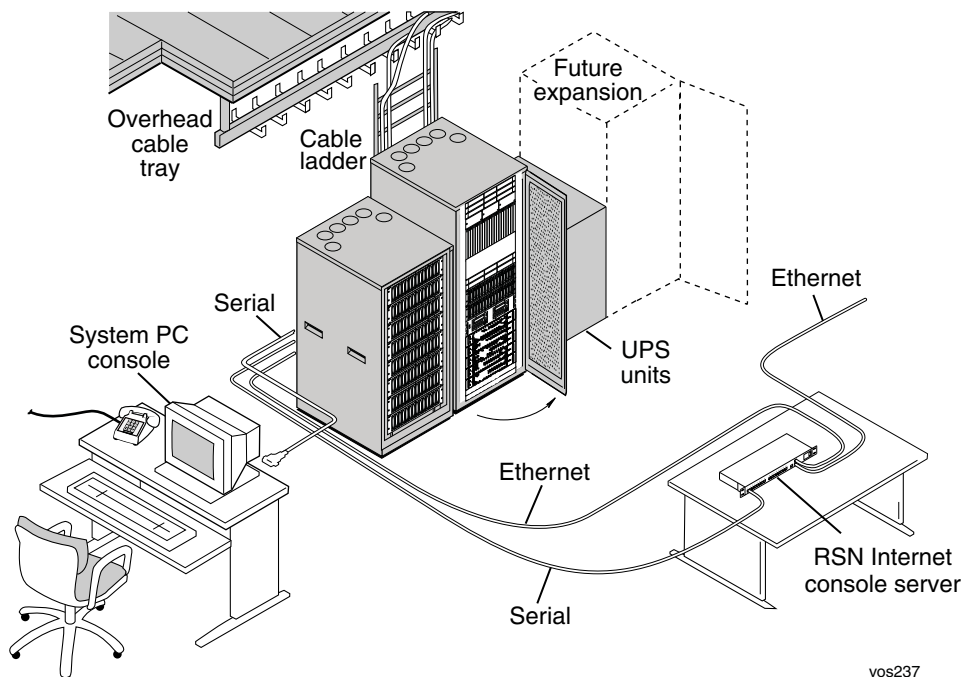
Figure 1-4. Cabling Considerations with RSN Internet Console Server

Environmental Considerations

The operating environment must maintain reasonable temperature and humidity levels and be as free of dust as possible. See Appendix A for a list of the system's environmental requirements.

Underwriters Laboratories Recommendations

Consider the following Underwriters Laboratories (UL®) safety recommendations:

- Elevated operating ambient—If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. You should install the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

- Reduced air flow—Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.

- Mechanical loading—Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.

- Circuit overloading—Give consideration to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Use equipment nameplate ratings when addressing this concern.

- Reliable earthing—Maintain reliable earthing of rack-mounted equipment. Give particular attention to supply connections other than direct connections to the branch circuit (for example, the use of power strips).

Site Planning Checklist

This section contains a site planning checklist that you can use to plan and prepare your site for installation of an ftServer V 100, V 200, or V 400 system and associated peripherals. The remaining chapters of this manual provide additional site planning reference information about each component of ftServer V 100, V 200, and V 400 systems.

During the site planning process, you should work closely with your facilities group or contractor to determine power, cooling, and other requirements for your installation site. See "Working with Other Groups" on page 1-12 for details.

❏ Determine the location of the installation site. You may want to plan for possible expansion of the system and site.

❏ In Table 2-1, check off the products that you have purchased. If you have any questions about which products you have purchased, contact your Stratus account executive or distributor.

❏ Use Table 2-1 to determine the quantity and type of AC power outlets required. Also use Table 2-1 to determine the lengths of the AC power cords. See Appendix A and the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for specifications for the components of your ftServer V 100, V 200, or V 400 system. See Appendix B for AC plug types and connector diagrams.

> N O T E
>
> If you do not know the available voltage at your proposed installation site, contact your facilities group or contractor.

❏ Use Table 2-2 to determine the AC power and HVAC (cooling) requirements.

❏ Determine what communications connections, such as Ethernet, synchronous, system console, RSN console server, and telephone lines, will be required. For more information about communications cabling, see Chapter 4.

❏ If you are using an AA-E97700 RSN Internet console server, provide an Ethernet connection to the Internet.

❏ Obtain an outside telephone line for use when calling for service.

❏ If you are using the AA-E97900 or AA-E96600 RSN dialup console server, obtain a second outside telephone line for the RSN modem.

⚠ **C A U T I O N**

    RSN calls can be routed through a PBX, but this may cause data **loss**. Stratus **strongly** recommends that you use an outside line. If you must use a PBX, you cannot route the phone extension through a switchboard; it **must** be a direct-dial number.

❏ Use the equipment templates in Figure 3-1 and the site-layout grid in Figure 3-2 to create a sketch of how the system will be arranged at the installation site. When locating your system, consider the lengths of available power cords and communications cables and the locations of power plugs, phone jacks, and communications connectors. Use the information you provided in Table 2-1 and Table 2-2.

❏ Provide the completed Tables 2-1 and 2-2, the site-layout grid, any notes you make, and a copy of Appendix B to the facilities group or contractors who will be performing site modifications.

❏ After providing the site planning information to your facilities group or contractor, you may want to review and discuss the requirements to ensure that all site modifications are addressed and understood.

❏ Determine where your system and peripheral devices will be unpacked. Plan to unpack the ftServer V 100, V 200, or V 400 system as close to the installation site as possible.

❏ Walk the path over which you will move your system from the delivery site to the unpacking site. Determine if the door, hallway, and elevator dimensions are wide enough to allow access. See "Main Cabinet" on page A-2 for dimensions of an ftServer V 100, V 200, or V 400 system and its shipping container.

N O T E

    Doorways must be a minimum of 28 in. (71 cm) wide. Elevators must be a minimum of 28 in. (71 cm) wide, 41 in. (104 cm) long, and 74 in. (188 cm) high to accommodate the passage of a system removed from its shipping container. If a doorway or elevator is too small, plan to unpack the shipping container before moving a cabinet through the doorway or into the elevator.

❏ If you are installing the system on a raised floor, obtain two or three pieces of plywood. Before you move the cabinets across the raised floor, lay the plywood on the floor to prevent the floor tiles from popping up.

❏ Review your responsibilities for preparing to install a system in "Preparing to Install a System" on page 1-11.

If you have any questions during the site planning process, contact the CAC or Stratus distributor. The CAC telephone numbers are provided on the CAC Web site at http://www.stratus.com/support/cac.

Preparing to Install a System

To prepare for the installation of an ftServer V 100, V 200, or V 400 system by a Stratus field engineer, you must perform the following tasks:

1. Complete all site preparation work.

2. Take delivery of the system (as described in "Preparing to Take Delivery of a System" on page 1-11).

3. Move the system to its installation site (as described in "Moving the System to the Installation Site" on page 1-12).

Preparing to Take Delivery of a System

Before you take delivery of your system, perform the following tasks:

1. Secure traffic permits for the delivery vehicle and security clearances for moving the shipping container within your facility if necessary.

2. Determine a suitable delivery site with enough space for unloading the system.

3. Make sure that the delivery site will accommodate the delivery vehicle.

> N O T E ─────────────────────────────
>
> Depending on the system configuration and the components you have ordered, a separate carton containing components may be shipped with your system.

When your system arrives, do the following:

• Check the Tip-N-Tell and Shockwatch motion sensors to determine if they have been activated. If a sensor has been activated, or if there is any damage, report it immediately to the carrier and to the Stratus CAC.

• Check the packing list. If you received the wrong shipment, or if the shipment is incomplete, report it immediately to the carrier and to the Stratus CAC.

Moving the System to the Installation Site

Before moving your system to the installation site, you should do the following:

> N O T E ─────────────────────
>
> Moving the system requires **two** able-bodied persons.

1. Obtain a forklift or pallet jack to move your system from the delivery area to the installation site.

2. Check the dimensions of doorways and the load capacities of floors and elevators. You should walk the path over which you will move the system to ensure that it can be easily moved to the installation site. If your system will not fit through the doorways, you may need to arrange for rigging.

   > N O T E ─────────────────────
   >
   > Each cabinet is shipped on a pallet that is slightly larger than a standard door opening. A standard door opening is 35 in. (89 cm) wide, and all pallets are 41.0 in. (104.2 cm) wide by 53.0 in. (134.6 cm) deep.

3. If you are moving the system across a raised floor, lay plywood on the raised floor to prevent floor tiles from popping up when you move the system.

4. Move the system as close to the installation site as possible.

Working with Other Groups

After you complete your site planning analysis, you may want to discuss your requirements with a person from your building facilities and HVAC group. Provide your facilities group and/or contractors with the floor-plan sketch and copies of the following:

- Table 2-1 and Table 2-2, which provide information for determining power and HVAC requirements

- Appendix B, "Electrical Circuit and Wiring Information"

- Any notes you have taken about site planning

Review and discuss the requirements with the facilities personnel and/or 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.

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 AC power, HVAC capabilities, and network and telephone connections.

Safety Precautions

! W A R N I N G

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions provided with the battery.

! W A R N I N G

If you receive locking power cords with your system, do not substitute other power cords. Use of the locking power cords ensures proper grounding of the system.

! W A R N I N G

The system uses two power cords to provide redundant sources of power. To fully remove power from a system, disconnect both power cords. To reduce the risk that electrical shock could injure a person or damage the system, exercise caution when working in the unit even when only one power cord is connected.

! W A R N I N G

To prevent a cabinet from tipping over and injuring a person or damaging the system, start installing systems from the bottom of the cabinet upward.

! W A R N I N G

If you replace the modem cable supplied by Stratus, use a cable with a gauge of at least 26 AWG to prevent fire.

W A R N I N G

Do not install the equipment where you may need an extension cord. Use of an extension cord that does not meet the power specifications introduces a risk of overheating that could lead to a fire.

W A R N I N G

Do not disassemble, repair, or alter the server, except as described in the *Stratus ftServer V 200 and V 400 Systems: Operation and Maintenance Guide* (R557) or the *Stratus ftServer V 100 Systems: Operation and Maintenance Guide* (R581). There is a risk of an electric shock or fire as well as equipment malfunction if you do not observe the instructions in the *Stratus ftServer V 200 and V 400 Systems: Operation and Maintenance Guide* (R557) or the *Stratus ftServer V 100 Systems: Operation and Maintenance Guide* (R581).

W A R N I N G

To avoid fire, electric shock, and equipment breakdown, prevent water or foreign objects from getting into the equipment. Do not let water or foreign objects, such as pins or paper clips, enter the equipment.

W A R N I N G

To prevent fire or current leakage, do not plug the power cord into a nonconforming outlet. Use a power outlet with appropriate voltage and power type, as specified in this guide.

W A R N I N G

Disconnect the power cords from the server or power source before you install or relocate the equipment. All voltage is removed only when the power cords are disconnected.

⚠ **W A R N I N G**

Do not install or store the equipment in an unsuitable place. Install or store the equipment in a place that meets the requirements specified in this guide. Avoid the following conditions to avoid the risk of fire.

- Dust
- High humidity, such as a place near a boiler
- Direct sunlight
- Instability, such as places not stabilized against earthquakes

⚠ **W A R N I N G**

Do not use or store this product in a corrosive environment.

Avoid using or storing this product in an environment which may contain corrosive gases. Such gases include, but are not limited to, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia or ozone.

Avoid installing this product in a dusty environment or one that may contain corrosive materials such as sodium chloride or sulfur.

Avoid installing this product in an environment which may contain excessive metal flakes or conductive particles in the air.

Such environments may cause corrosion or short circuits within this product, resulting in not only damage to this product, but also fire.

If there are any concerns regarding the environment at the planned site of installation or storage, please contact your CAC.

⚠ WARNING ───────────────────────

Do not connect an interface cable while the server is connected to a power source. Make sure to power off the server and remove the power cord from the server or a power outlet before you install or remove any internal device, or connect or disconnect any interface cables to or from the server. Even if the server is powered off but still connected to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulting from a short circuit.

⚠ WARNING ───────────────────────

Do not place any object on top of the server. The object may fall off and cause injuries, damage to hardware, or a fire.

⚠ WARNING ───────────────────────

Do not leave the DVD tray ejected. Dust may enter the equipment and cause it to malfunction. The ejected tray may also become a cause of injuries.

安全注意事項

⚠ WARNING ───────────────────────

不要插入未指定的插座。

電源請使用指定電壓及電源的壁式插座。使用未指定的電源會造成火災和漏電。
請避免使用延長線安裝設備。

⚠ WARNING ————————————————

不要插入未指定的插座。

電源請使用指定電源及電源的型式插座。使用未指定的電源會造成火災和漏電。
請避免使用延長線安裝設備。如果連接與本產品電源規格不相符的電線，會內過
熱而導致火災。

⚠ WARNING ————————————————

在安裝或移動設備之前請拔下電源插頭。

在安裝或移動設備之前要切斷設備電源，並拔下電源插頭。只有在拔下電源線後，
設備的電壓才會消除。

⚠ WARNING ————————————————

不要安裝或存放在未指定的場所。

不要將本設備放置在如下場所和本書未指定的場所，有導致火災的危險。
■ 灰塵較多的場所
■ 熱水器旁等濕氣較高的場所
■ 陽光直射的場所
■ 不平穩的場所

⚠ WARNING ————————————————

不要在腐蝕性環境中使用或存放設備。

不要在有腐蝕性氣體（如二氧化硫、氫化硫、氯、氮、氨或臭氧等）的環境中使
用或存放本產品。
不要將本產品安裝在灰塵較多或含有腐蝕性物質如氫化鈉或硫磺等的地方。
不要將本產品安裝在空氣中含有過量金屬碎末或傳導粒子的地方。
上述環境可能導致本產品腐蝕或短路，以而摧毀產品、甚至引起火災。
對產品安裝或存放環境有任何疑問，請與總銷商或維修服務公司聯繫。

⚠ WARNING ─────────────────────

不要在插入插頭的狀態下進行信號線的連接。

在安裝/拆除可選配件或者拆裝信號線前先將電源線從插座拔下。即使電源已切斷，在電源線連接的狀態下，可能因接觸信號線和介面產生觸電、或因短路而引起火災。

⚠ WARNING ─────────────────────

不要自行拆卸、修理或改造本伺服器。

除本書記載的情況外，不要進行拆卸、修理、改造。否則，不但可能導致設備不能進行正常運行，還有發生觸電和火災的危險。

⚠ CAUTION ─────────────────────

不要將光碟機托盤拉出放置。

防止托盤中進入灰塵引起運轉錯誤。同時防止因碰撞等造成托盤損傷。

不要在設備附近使用行動電話或呼叫器。

在本產品附近時請關閉行動電話及呼叫器電源，防止因電波影響導致運轉錯誤。

<div align="right">

Chapter 2
AC Power Planning

</div>

This chapter describes the AC power requirements of ftServer V 100, V 200, and V 400 systems. It contains the following sections:

AC Power Overview

For fault tolerance, each ftServer V 100, V 200, and V 400 system requires two separate and independent AC power sources. These power sources feed two UPS units. The UPS units feed power to a pair of power distribution units (PDUs) inside the main cabinet that, in turn, distribute power to the system's components.

Expansion storage-system cabinets also require two separate and independent AC power sources, each fed by two UPS units. The same UPS units can feed the ftServer system and any expansion storage-system cabinets. Use one of the UPS models that Stratus has qualified. See "Selecting a UPS Unit for ftServer V 200 and V 400 Systems" on page 2-4 or "Selecting a UPS Unit for ftServer V 100 Systems" on page 2-9 for more information.

You must also provide AC power to peripherals located outside the main cabinet, such as the system console, RSN console server, and RSN modem (if present).

Redundant Power Sources

Each ftServer V 100, V 200, and V 400 system requires two separate and independent AC power sources: an *A-side* power source and the *B-side* power source. Because either side must be capable of continuing to provide power if power to the other side is lost, each power source must provide uninterruptible AC power.

Each PDU receives power from its power source (through a permanently attached power input cord) and distributes power to the components inside the cabinet (through six power outlets and a permanently attached power output cord).

The top PDU in the cabinet receives power from the A-side power source (typically a UPS unit) and distributes power to:

- The A-side of the system backplane
- The A-side of the optional network I/O enclosure
- One side of each FC disk enclosure
- The AA-T53300 SDLT Single Tape-Drive Enclosure or AA-T53400 SDLT Dual Tape-Drive Enclosure

The bottom PDU in the cabinet receives power from the B-side power source (typically a UPS unit) and distributes power to:

- The B-side of the system backplane, in stand-by mode (the B-side power source is used if power to the A-side source is interrupted)
- The B-side of the optional network I/O enclosure, in stand-by mode (the B-side power source is used if power to the A-side source is interrupted)
- One side of each FC disk enclosure

AC Power and HVAC Worksheets

When planning for the system's electrical needs, consider the following:

- The AC power service required at the site
- The number and types of the power outlets
- Power cord lengths, plug types, and current rating

This section contains the following worksheets:

- Table 2-1, a site planning worksheet for determining the number and types of AC outlets required at the site and the lengths of the power cords. See "Power Cord Summary" on page 2-10 for more information about power cords.
- Table 2-2, a site planning worksheet for AC power and HVAC requirements.

Place check marks in the boxes for those products that you have purchased. For each row that you check marked in Table 2-1:

- Fill in the **Quantity of Product Purchased** column.
- Multiply it by the supplied value in the **No. of AC Outlets Required** column.
- Write the result in the **Subtotal of AC Outlets** column.

- Determine the total number of AC outlets by adding the values in the **Subtotal of AC Outlets** column.

Table 2-1. Site Planning Worksheet for AC Outlets and Cord Lengths

Product Purchased	Quantity of Product Purchased	No. of AC Outlets Required	Subtotal of AC Outlets	Type of Plug	AC Cord Lengths
Main cabinet (two PDU AC power cords for each ftServer system)	—	—	0†	NEMA L6-30P, NEMA L6-20P, IEC60309 30A, IEC60320-C20P, or hardwire to AC output terminals. See Tables 2-5, 2-6, and 2-9 for details.	V 200 and V 400 United States and Japan – 12 ft. V 100 United States and Japan – 15 ft. V 200 and V 400 International – 12 ft. V100 International – 15 ft.
UPS units (two for each ftServer system)		x 1 =		Hardwire power cord with plug that matches site receptacles to UPS	Provided by customer
E124 expansion storage-system cabinet		x 2 =		See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582)	See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582)
Total AC connectors					

† Each PDU in the main cabinet connects to a UPS unit.

In Table 2-2, determine the watts of AC power required by the system and its BTU output. For each row:

- Fill in the **Quantity** value and multiply it by the supplied **Watts** value.

- Write the result in the **Watts Subtotal** column.

- Determine the total number of watts of AC power required by adding the values in the **Watts Subtotal** column.

- Multiply each entry in the **Watts Subtotal** column by 3.41 and enter the number of BTUs in the **BTUs/hr. Subtotal** column.
- Determine the total number of BTUs per hour by adding the values in the **BTUs/hr. Subtotal** column.

Table 2-2. Work Sheet for AC Power and HVAC Requirements

Product Purchased	Quantity	Watts	Watts Subtotal	Convert to BTUs	BTUs/hr. Subtotal
ftServer V 200 or V 400 systems main cabinet[†]		x 3150 =		x 3.41 =	
V 100 systems main cabinet[‡]		x 1950 =		x 3.41 =	
Optional network I/O enclosure (fully loaded)		x 750 =		x 3.41 =	
Additional D910 FC disk enclosures (fully populated) in E124 expansion storage-system cabinet		x 363 =		x 3.41 =	
Total BTUs/hr.					
Total watts					

† Value for V 200 and V 400 systems is for a configuration that includes three four-way CPU enclosures, four fully populated I/O enclosures, one dual tape-drive enclosure, and two fully populated D910 FC disk enclosures.
‡ Value for V 100 systems is for a configuration that includes two CPU enclosures, two fully populated core I/O enclosures, one single tape-drive enclosure, and two fully populated D910 FC disk enclosures.

Selecting a UPS Unit for ftServer V 200 and V 400 Systems

Stratus does not sell or service UPS units. However, Stratus has qualified UPS models for use with ftServer V 200 and V 400 systems.

Each 38U cabinet (with or without expansion storage-system cabinets) uses two UPS units: one to supply power to the A-side power distribution system and one for the B-side. Stratus does not supply the UPS units. You must purchase them directly from the UPS vendor.

See Table 2-3 to select a qualified Chloride UPS model for your ftServer V 200 or V 400 system.

Table 2-3. Qualified Chloride UPS Models for ftServer V 200 or V 400 Systems

Region or Country	ftServer System Configuration	UPS Quantity, Model Number, and Options	Power Output of One UPS (Watts)
North and South America	ftServer system	Two LT081XAT-0H8SX	4760
	ftServer system with network I/O enclosure	Two LT081XAT-0H8SX and two LPBP610-2 batteries (one for each UPS)	4760
International	ftServer system	Two LT081XIT-0E3ZX	4760
	ftServer system with network I/O enclosure	Two LT081XIT-0E3ZX and two LPBP610-2 batteries (one for each UPS)	4760
Japan	ftServer system	Two LT081XJT-0E0SX	4760
	ftServer system with network I/O enclosure	Two LT081XJT-0E0SX and two LPBP610-2 batteries (one for each UPS)	4760

For UPS specifications, documentation, and ordering information, see Chloride Power Protection at http://www.chlorideups.com.

See Table 2-2 to determine the number of watts your system requires and use Table 2-4 to select a qualified American Power Conversion Corporation (APC®) UPS model for your ftServer V 200 or V 400 system.

Table 2-4. Qualified APC UPS Models for ftServer V 200 or V 400 Systems

Region or Country	ftServer V 200 or V 400 System Configuration[†]	UPS Quantity and Model Number	Power Output of One UPS (Watts)
North and South America	No E124 expansion storage-system cabinets	Two SYA8K16RMP (with SYPD3 backplate kit)	6400
	With one E124 expansion storage-system cabinet	Two SYA12K16RMP (with SYPD3 backplate kit)	9600
	With two E124 expansion storage-system cabinets	Two SYA16K16RMP (with two SYPD3 backplate kits)	12800

Table 2-4. Qualified APC UPS Models for ftServer V 200 or V 400 Systems

Region or Country	ftServer V 200 or V 400 System Configuration†	UPS Quantity and Model Number	Power Output of One UPS (Watts)
International	No E124 expansion storage-system cabinets	Two SYA8K16RMI	5600
	With one E124 expansion storage-system cabinet	Two SYA12K16RMI	8400
	With two E124 expansion storage-system cabinets	Two SYA16K16RMI	11200
Japan	No E124 expansion storage-system cabinets	Two SYA8K8RMJ (with SYPD3 backplate kit)	5600
	With one E124 expansion storage-system cabinet	Two SYA12K16RMJ (with SYPD3 backplate kit)	8400
	With two E124 expansion storage-system cabinets	Two SYA16K16RMJ (with two SYPD3 backplate kits)	11200

† For ftServer V 200 or V 400 system with up to three four-way CPU enclosures, four fully populated I/O enclosures, one dual tape-drive enclosure, and two fully populated D910 FC disk enclosures.

For UPS specifications, documentation, and ordering information, see APC at http://www.apcc.com.

V 200 and V 400 AC Power Connections to Qualified UPS Models

AC input power cords must be hardwired to the qualified UPS models. Table 2-5 lists how the ftServer system PDU AC input cords connect to qualified UPS models.

⚠ **W A R N I N G**

**A qualified electrician must supply and hardwire the
UPS AC input cord, and if required an AC output cord,
distribution panel, or conduit to each UPS unit in
compliance with local and national electrical codes.**

Table 2-5. AC Power Cords for Chloride UPS Models -ftServer V 200 and V 400 Systems

UPS Model	UPS to PDU Power Connection
Chloride - LT081XAT-0H8SX	The A-side and B-side PDU AC input cords plug into L6-30R receptacles on the A-side and B-side UPS units, respectively.
Chloride - LT081XIT-0E3ZX	The A-side and B-side PDU AC input cords plug into IEC60309 receptacles on the A-side and B-side UPS units, respectively.
Chloride - LT081XJT-0H0SX	The A-side and B-side PDU AC input cords plug into L6-30R receptacles on the A-side and B-side UPS units, respectively.

AC input power cords must be hardwired to the qualified UPS models. Table 2-5 lists how the ftServer V Series system PDUs and the E124 storage-system cabinet power cords connect to the qualified APC UPS models.

⚠ **W A R N I N G**

**A qualified electrician must supply and hardwire the
UPS AC input cord, and if required an AC output cord,
distribution panel, or conduit to each UPS unit in
compliance with local and national electrical codes.**

Table 2-6. AC Power Cords for APC UPS Models - ftServer V 200 and V 400 Systems *(Page 1 of 2)*

APC Model	UPS to PDU Power Connection	E124 Storage-System Cabinet
SYA8K16RMP (with SYPD3 backplate kit)	The A-side and B-side PDU AC input cords plug into L6-30R receptacles on the A-side and B-side UPS units respectively.	N/A

Table 2-6. AC Power Cords for APC UPS Models - ftServer V 200 and V 400 Systems *(Page 2 of 2)*

APC Model	UPS to PDU Power Connection	E124 Storage-System Cabinet
SYA12K16RMP (with SYPD3 backplate kit) or SYA16K16RMP (with SYPD3 backplate kit)	The A-side and B-side PDU AC input cords plug into L6-30R receptacles on the A-side and B-side UPS units respectively.	The A-side and B-side input power cords (two per cabinet) plug into L6-20R receptacles on the A-side and B-side UPS units respectively. See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582).
SYA8K16RMI	The A-side and B-side PDU AC input cords are hardwired to the power output terminals on the A-side and B-side UPS units respectively.	N/A
SYA12K16RMI or SYA16K16RMI	The A-side and B-side PDU AC input cords are hardwired to the power output terminals on the A-side and B-side UPS units respectively.	The A-side and B-side input power cords (four per cabinet) plug into IEC 320 C19 receptacles on the A-side and B-side UPS units respectively. See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582).
SYA8K8RMJ (with SYPD3 backplate kit)	The A-side and B-side PDU AC input cords are hardwired to the power output terminals on the A-side and B-side UPS units respectively.	N/A
SYA12K16RMJ (with SYPD3 backplate kit)	Each UPS unit's AC output is hardwired to an ITE distribution panel which feeds a conduit. The A-side and B-side PDU AC input cords plug into L6-30R receptacles on the A-side and B-side UPS units respectively. .	The A-side and B-side input power cords (four per cabinet) plug into L6-20R receptacles on the A-side and B-side UPS units respectively.
SYA16K16RMJ (with two SYPD3 backplate kits)	Each UPS unit's AC output is hardwired to an ITE distribution panel which feeds a conduit. The A-side and B-side PDU AC input cords plug into L6-30R receptacles on the A-side and B-side UPS units respectively.	The A-side and B-side input power cords (four per cabinet) plug into L6-20R receptacles on the A-side and B-side UPS units respectively.

Selecting a UPS Unit for ftServer V 100 Systems

Stratus does not sell or service UPS units. You must purchase them directly from the UPS vendor. However, Stratus has qualified UPS models for use with ftServer V 100 systems.

Each cabinet uses two UPS units: one to supply power to the A-side power distribution system and one for the B-side.

See Table 2-8 to select a qualified Chloride UPS model for your ftServer V 100 system.

Table 2-7. Qualified Chloride UPS Models for ftServer V 100 Systems

Region or Country	ftServer System Configuration	UPS Quantity, Model Number, and Options	Power Output of One UPS (Watts)
North and South America	ftServer system	Two LT081XAT-0H8SX	4760
	ftServer system with network I/O enclosure	Two LT081XAT-0H8SX and two LPBP610-2 batteries (one for each UPS)	4760
International	ftServer system	Two LT081XIT-0E3ZX	4760
	ftServer system with network I/O enclosure	Two LT081XIT-0E3ZX and two LPBP610-2 batteries (one for each UPS)	4760
Japan	ftServer system	Two LT081XJT-0E0SX	4760
	ftServer system with network I/O enclosure	Two LT081XJT-0E0SX and two LPBP610-2 batteries (one for each UPS)	4760

For UPS specifications, documentation, and ordering information, see Chloride Power Protection at http://www.chlorideups.com.

See Table 2-8 to select an APC Symmetra® UPS model for an ftServer V 100 system.

Table 2-8. Qualified APC Symmetra Models for ftServer V 100 Systems

Region or Country	UPS Quantity and Model Number[†]	UPS Power Output (Watts)
North and South America	Two SYH4K6RMT	2800, expandable to 4200
International	Two SYH4K6RMI	2800, expandable to 4200
Japan	Two SYH4K6RMJ	2800, expandable to 4200

† For V 100 systems with up to two CPU enclosures, two fully populated core I/O enclosures, two fully populated D910 FC disk enclosures, a network I/O enclosure and a AA-T53300 single tape-drive enclosure.

Contact APC at http://www.apcc.com for specifications, documentation, and ordering information for qualified APC Symmetra models for ftServer V 100 systems.

AC Power Connections to Qualified UPS Models for V 100 Systems

AC input power cords must be hardwired to the qualified UPS models. Table 2-9 lists how the ftServer system PDU AC input cords connect to qualified UPS models.

⚠ **W A R N I N G**

A qualified electrician must supply and hardwire the AC input cord, and, if required, an AC output cord, distribution panel, or conduit to each UPS unit in compliance with local and national electrical codes.

Table 2-9. UPS to PDU AC Power Cords for V 100 Systems

UPS Model	UPS to PDU Power Cord
Chloride - LT081XAT-0H8SX	Use two B50155-45M cords to connect the A-side and B-side PDUs to the A-side and B-side UPS units, respectively.
Chloride - LT081XIT-0E3ZX	Use two B52700-45V power cords for the A-side and B-side PDUs to the A-side and B-side UPS units, respectively.
Chloride - LT081XJT-0E0SX	Use two B50155-45M cords to connect the A-side and B-side PDUs to the A-side and B-side UPS units, respectively.
APC - SYH4K6RMT	Use two B50155-45M cords to connect the A-side and B-side PDUs to the A-side and B-side UPS units, respectively.
APC - SYH4K6RMI	Use two B52700-45M cords to connect the A-side and B-side PDUs to the A-side and B-side UPS units, respectively.
APC - SYH4K6RMJ	Use two B50171-45M cords to connect the A-side and B-side PDUs to the A-side and B-side UPS units, respectively.

Power Cord Summary

Table 2-10 describes where you can find more information about PDU, UPS, and Legacy E124 expansion storage-system cabinet power cords.

⚠️ **W A R N I N G**

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

Table 2-10. Power Cords

Component	Power Cord
UPS (Chloride model qualified by Stratus)	220 VAC input - Customer supplied (hardwired to UPS AC input terminals)
	220 VAC output - See Table 2-5
UPS (APC model qualified by Stratus)	220 VAC input - Customer supplied (hardwired to UPS AC input terminals)
	220 VAC output - See Table 2-6
PDU for V 200 and V 400 systems	220 VAC input cord permanently attached to PDU - See Table A-4
	220 VAC output. Detachable jumper cords from PDU output receptacles to system component input receptacles - See Table A-6
PDU for V 100 systems	220 VAC removable input cord attaches to PDU - See Table A-8
	220 VAC output. Detachable jumper cords from PDU output receptacles to system component input receptacles - See Table A-9
Expansion storage-system components	E124 storage-system cabinet. AC source to power strips in cabinet - See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582)

Main Cabinet Ground Cables

Table 2-11 provides information about the main cabinet ground cable.

Table 2-11. Main Cabinet Ground Cable

Component	Cable Description	Stratus PN	Length
Cabinet ground leakage cable	10AWG ground leakage cable with 1/4 in. (6.35 mm) and M8 ring lugs	AW002000	15 ft (4.6m)

Chapter 3
Space Planning

This chapter describes the physical and environmental requirements of the installation site. It contains the following sections:

- "Room Requirements" on page 3-1
- "Creating a Floor Plan" on page 3-2
- "Supported Ethernet Configurations" on page 3-6

Room Requirements

This section describes the requirements of the room in which the ftServer V 100, V 200, or V 400 system will be placed.

> ⚠ **C A U T I O N**
>
> 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.

Make sure the location where you will install the ftServer V 100, V 200, or V 400 system:

- 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 temperature and humidity levels within the allowable ranges and has a thermometer and humidistat to monitor room temperature and humidity. See Appendix A for temperature and humidity requirements.

- 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.

  Dust buildup in the system can impede air circulation and heat transfer, causing components to become less reliable as the ambient temperature rises.

> Fans clogged by dust fail to expel hot air, causing circuit boards to overheat and fail.
>
> Dust on circuit boards raises the temperature, thus reducing the component's mean time between failure (MTBF)
>
> Dust circulating in the room increases the risk of fire within the room by providing potential combustible material within the environment
>
> Dust contamination on tape devices causes mis-reads and -writes, leading to failure of attempts to back up and restore data.

- Provides table or desktop space for external devices such as a telephone, system console, RSN console server and RSN modem (if present).
- Provides cutouts in the floor for routing cables, if the site has an elevated floor.
- Provides sufficient telephone lines:
  - All modules need a telephone and one line for use when calling for service.
  - If you are using an RSN dialup console server, an additional analog telephone line that is not routed through a PBX is required for connection to the RSN modem.
- Provides Ethernet jacks, switches, or hubs as needed.
- Provides communications cable connectors or patch panels as needed.
- Provides two electrically separate grounded AC wall outlets, within reach of the power cords from UPS units.
- Provides grounded AC wall outlets for external components that do not connect to a PDU.

Creating a Floor Plan

This section provides equipment templates and a site-layout grid to help you plan the placement of the components within the room. Appendix A provides detailed specifications for each of the system's components.

Use the equipment templates in Figure 3-1 and the site-layout grid in Figure 3-2 to create a floor plan of the installation site for your ftServer system. On this floor plan, sketch the:

- Locations of the system and all external components
- Locations and types of AC power outlets
- Lengths and routes of power cords
- Locations of phone jacks, Ethernet jacks, switches, and/or hubs

- Lengths and routes of telephone and other communications and interface cables

  N O T E ————————————————————

  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.

Figure 3-1 contains the equipment templates to be used in the site-layout grid.

The site-layout grid in Figure 3-2 represents a room measuring 20 ft. by 25 ft. (6 m by 8m). Note that the minimum room size for the core system components is 8 ft. by 8 ft. (2.6m by 2.6m). The scale of Figure 3-2 is 1/4-inch (0.64 cm) equals 1 foot (30.5 cm).

In Figure 3-2, outline the room in which you will install your ftServer system. Then, photocopy and cut out the templates in Figure 3-1 and arrange them to represent your configuration. The equipment templates are drawn to the same scale as the grid page.
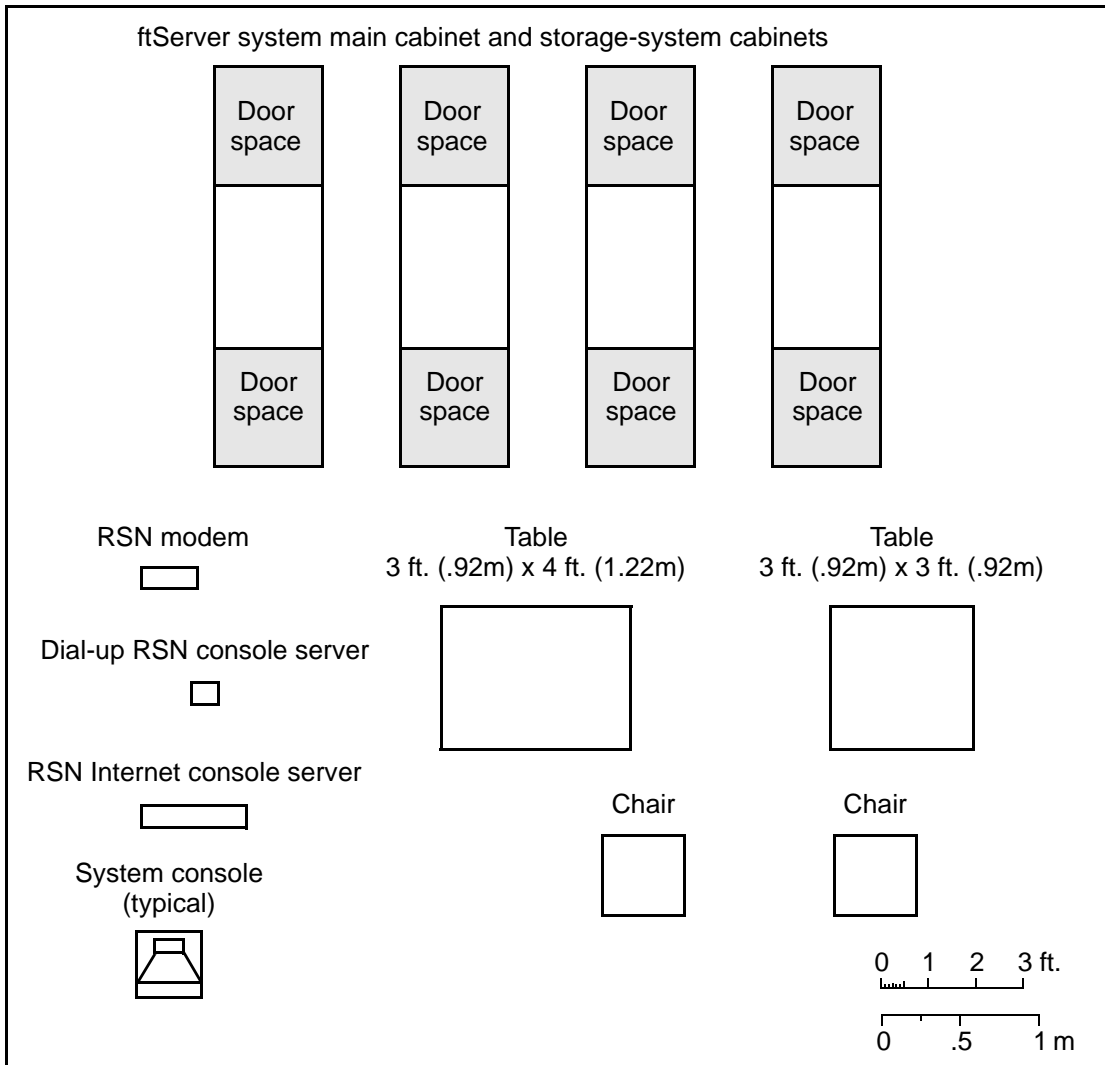
Figure 3-1. ftServer System Equipment Templates

NOTE

The shading on the templates indicates the access area required for servicing.
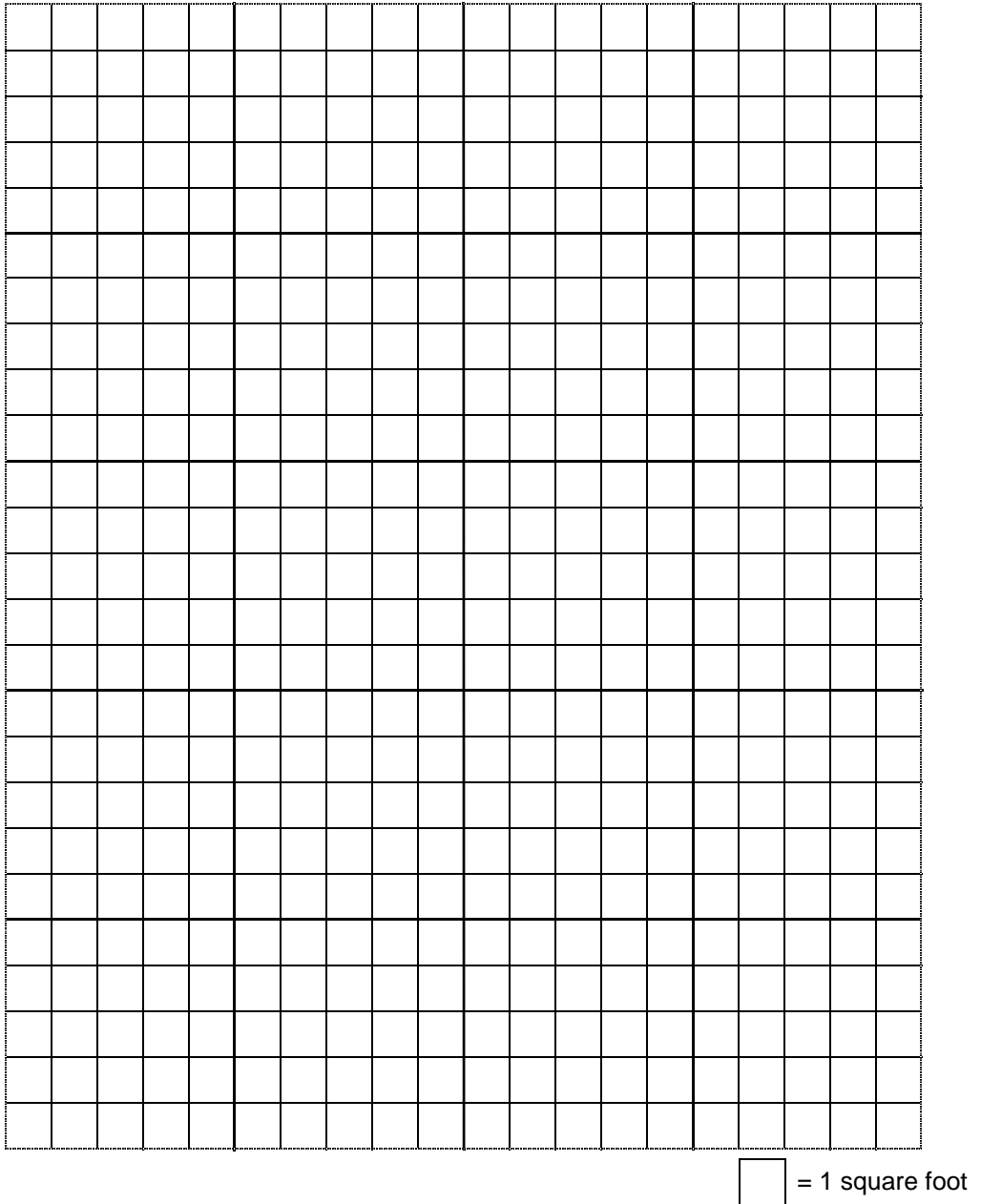
= 1 square foot

Figure 3-2. Site-Layout Grid

Supported Ethernet Configurations

ftServer V 100, V 200, and V 400 modules support configurations with or without the optional network I/O enclosure and U772 Ethernet switches. The Ethernet connection to the module is the same for both the dialup and Internet RSN console servers.
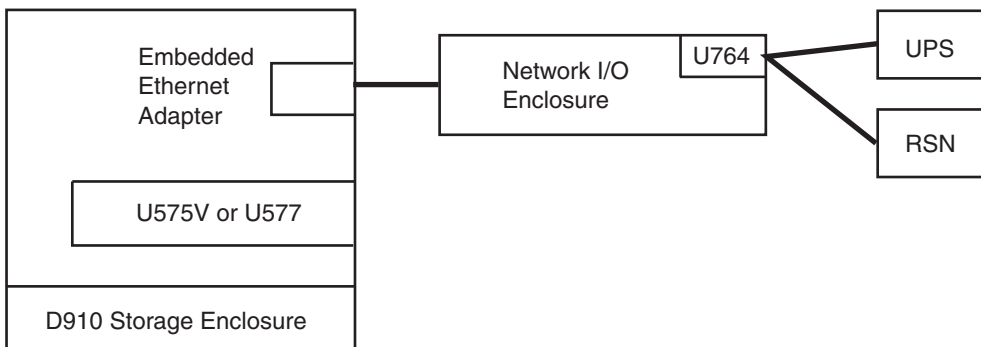
Figure 3-3 shows a base configuration without the optional network I/O enclosure and U772 Ethernet switches.
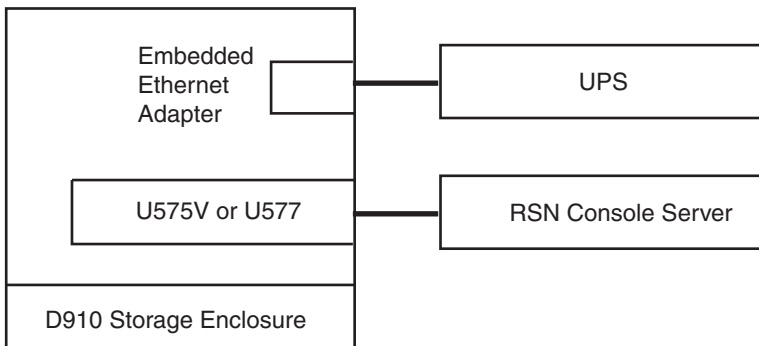
vos204a

Figure 3-3. ftServer V 100, V 200, and V 400 Module Base Configuration

Figure 3-4 illustrates a configuration that includes the optional network I/O enclosure but does not include the optional U772 Ethernet switches.


vos205a

Figure 3-4. Configuration With Optional Network I/O Enclosure

Figure 3-5 illustrates a configuration that includes the optional U772 24-Port 10/100 Ethernet Switches. The shaded boxes represent other optional components.

- In this configuration the embedded Ethernet adapters connect to the U772 Ethernet switches and the optional network I/O enclosure connects to Ethernet PCI adapters.

- You must use this configuration when optional ftScalable Storage arrays are connected to the module.
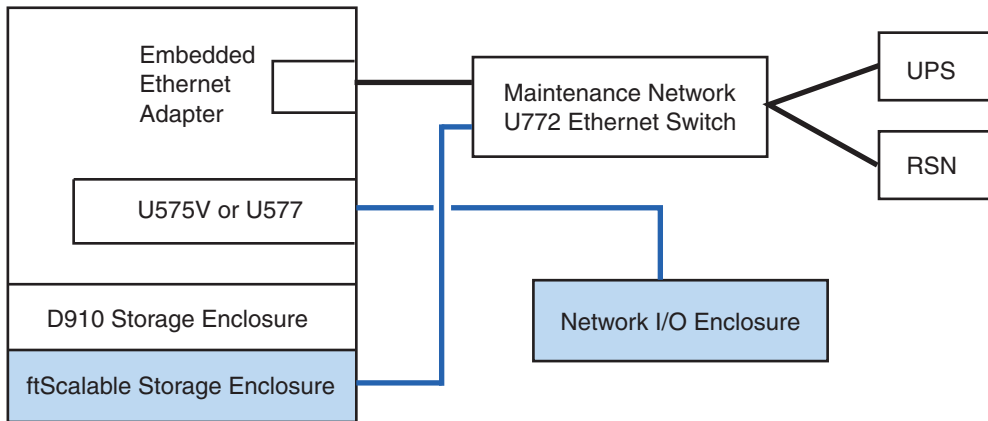
vos206a

Figure 3-5. Configuration With Optional U772 Ethernet Switches

Chapter 4
Communications Line Planning

This chapter describes the communications cables that ftServer V 100, V 200, and V 400 systems require. It contains the following sections:

Optional U772 and U773 Switches

Two U772 24-Port 10/100 Ethernet Switches and two U773 12-Port Fibre Channel Switches connected in a supported configuration is an available option. This option enables you to:

- Free up PCI adapter slots. Use U534V Dual-Port Optical Fibre Channel PCI Adapters and U773 12-Port Fibre Channel Switches in place of single port U528 Optical Fibre Channel PCI Adapters.

- Add an optional ftScalable Storage array. You must use the supported U772 Ethernet and U773 fibre channel switches if your system includes an ftScalable Storage array.

If the U772 Ethernet and U773 fibre channel switches are present in your system, you must connect:

- The U772 Ethernet switches to the ftServer system's embedded Ethernet ports. If your module has a network I/O enclosure you must disconnect it from the embedded Ethernet ports and connect it to U575V or U577 Ethernet adapters.
- The RSN console server and UPS units to the U772 Ethernet switches.

You can also connect the PC console to a U772 Ethernet switch for management of ftScalable Storage arrays.

Maintenance Network

The CAC or other authorized Stratus service representative uses the U772 Ethernet switches as a private maintenance network for remote service and debug operations.

Do not connect any other network to the U772 Ethernet switches. Instead, connect the site Ethernet ports, hubs, or switches (that you must supply) to unused Ethernet adapter ports in your ftServer system.

N O T E S

1. The U772 Ethernet switches are reserved for Stratus support and maintenance operations only. You cannot connect any other devices to them.

2. The U772 24-Port 10/100 Ethernet Switch is the only supported Ethernet switch. You cannot use any other type of hub or switch in the maintenance network.

Fibre Channel Connections

The following Fibre Channel devices can connect to the ftServer module.

- AA-T53300 and AA-T53400 tape-drive enclosures connect to U528 or U534V PCI adapters.
- In a base ftServer module configuration (with no U772 Ethernet and U773 fibre channel switches), D910 storage enclosures connect to U528 or U534V PCI adapters.
- In an ftServer module configuration that includes U772 Ethernet and U773 fibre channel switches, D910 storage enclosures and the optional ftScalable Storage arrays connect to U773 12-Port Fibre Channel Switches. The switches connect to U534V adapters. If ftScalable Storage arrays are **not** present, the switches may connect to U528 PCI adapters.

System Console Requirements

For newly shipped systems, you must provide a PC to be the system console. The PC must have:

- The Microsoft® Windows® 7, Windows® XP, or Windows Vista® operating system freshly installed.

- A serial port or USB-to-serial port converter.

- TinyTerm terminal emulation software installed. Stratus provides this terminal emulation software.

A serial cable provided with your system connects the PC console to the ftServer module's COM2 port to provide OpenVOS module console capabilities. A provide Ethernet cable connects the PC console to a U772 24-Port 10/100 Ethernet Switch to provide web management for an optional ftScalable Storage array. Optionally, you can provide your own Ethernet cable if the provided 6 foot (1.8m) Ethernet cable is not long enough for your site.

See the *OpenVOS System Administration: Configuring a System* (R287) manual for information about how to configure the emulation software on the PC console.

Planning for Communications and Data Cables

Make sure that you plan the locations of your system and its external components so that all communications and data cables will reach their connection points. The cables you need to consider vary depending on your system's configuration:

- "Configurations With No U772 or U773 Switches" on page 4-3
- "Configurations That Include U772 and U773 Switches" on page 4-4
- "For All Configurations" on page 4-4

Configurations With No U772 or U773 Switches

For ftServer systems that do not include U772 Ethernet and U773 fibre channel switches, you will need to consider the following cables:

- Ethernet cables to connect:
  - RSN console server to host (or to network I/O enclosure if one is present)
  - Host to network I/O enclosure (if network I/O enclosure is present)
  - UPS units to host (or to network I/O enclosure if one is present)

- Serial cables to connect:
  - PC system console to host

– RSN console server to host

– RSN dialup console server (if present) to modem

- Hydra communications cables for U760 PICMG 2.16 adapter in network I/O enclosure

Configurations That Include U772 and U773 Switches

For ftServer systems that include U772 Ethernet and U773 fibre channel switches, you will need to consider the following cables:

- Ethernet cables (AW-B38029):
  – One cable to connect one U772 Ethernet switch to RSN console server
  – Two cables to connect two U772 Ethernet switches to two embedded Ethernet ports (one on each core I/O enclosure)
  – Two cables to connect the two U772 Ethernet switches to two U773 fibre channel switches
  – If ftScalable storage array is present, one cable to connect one U772 Ethernet switch to the PC console (which you must supply) for Web management of ftScalable Storage array
  – If ftScalable storage array is present, four cables to connect two U772 Ethernet switches to two ftScalable Storage RAID controller trays
- Two Ethernet cables which you must supply to connect two UPS units to two U772 Ethernet switches
- If a network I/O enclosure is present, two Ethernet cables to connect port 1 of a U575V Ethernet adapter in slot 0 of each core I/O enclosure to the network I/O enclosure Ethernet switches
- Serial cables to connect:
  – System console to the ftServer system
  – RSN console server to an ftServer system
  – RSN dialup console server (if present) to modem
- Fibre Channel cables (AW-B90000-020) to connect Fibre Channel PCI adapters, U773 fibre channel switches, and ftScalable Storage arrays (if present)
- Hydra cables for U760 PICMG 2.16 adapters in network I/O enclosure

For All Configurations

You will need to consider the cables for PCI adapters in your system. See Table 4-6 for cable descriptions.

- U520 Single-Port 4/16-Mbps Token-Ring PCI Adapter—Token ring cable, which you must provide, for each PCI adapter

- U528 Optical Fibre Channel PCI Adapter—Optical fibre-channel cable, which you must provide, from each PCI adapter to each E124 storage-system cabinet

- U534V Dual-Port Optical Fibre Channel PCI Adapter

  - Optical Fibre Channel cables, which are provided with the adapter, from the U534V PCI adapter to each E124 storage-system cabinet

  - If U773 fibre channel switches are present, Fibre Channel cable (AW-B90000-020) from ports on each U534V PCI adapter to each U773 12-Port Fibre Channel Switch and tape drive

- U574V-LC Dual-Port Fiber Gigabit Ethernet Adapter—Multi-mode, dual-fiber cables, which you must provide, from each PCI adapter to each site network connection point. See the *Stratus ftServer Systems: PCI Adapter Guide* (R461) for more information about cables.

- U575V Dual-Port Copper Gigabit Ethernet Adapter—Unshielded twisted pair (UTP) Ethernet cable, which you must provide, from each PCI adapter to each site network connection point. See the *Stratus ftServer Systems: PCI Adapter Guide* (R461) for more information about cables.

- U576 One-Port 1000Base-SX Ethernet PCI Adapter—Multimode fiber Ethernet cable with an SC-type fiber-optic connector, which you must provide, from each PCI adapter to each site network connection point. See the *Stratus ftServer Systems: PCI Adapter Guide* (R461) for more information about cables.

- U577 One-Port 10/100/1000 Base-T Ethernet PCI Adapter—Unshielded twisted pair (UTP) Ethernet cable, which you must provide, from each PCI adapter to each site network connection point. See the *Stratus ftServer Systems: PCI Adapter Guide* (R461) for more information about cables.

In addition to the communications cables, you must also plan to provide:

- Network connection points for the network Ethernet cables from host (customer must provide)

- Separate IP subnets for various system components. See "IP Subnet Requirements" on page 4-7 for details.

- A telephone and one or two telephone lines:

  - One telephone and line for use when calling for service. The telephone should be placed such that it can be used by a person who has access to the PC console, the front of the system, and to the back of the system.

  - If you are using an RSN dialup console server, an additional analog telephone line is required for connection to the RSN modem.

NOTE _____

A dedicated phone line provides the most reliable service.
RSN 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.

Table 4-1 describes component location considerations due to standard cable lengths.

Table 4-1. Cable Length and Component Location Considerations

Component 1	Component 2	Consideration Due to Shortest Cable	Cable Length
PC console	ftServer V 100, V 200, or V 400 system	Locate the system console less than 25 ft. away from the host, due to the length of the **null modem cable** (B20253-25) provided by Stratus.	25 ft. (7.62m)
RSN console server (Internet or dialup)	ftServer V 100, V 200, or V 400 system	Locate the RSN console server less than 20 ft. away from the host, due to the length of the **Ethernet cable** (B000919-20 or B000925-20) provided by Stratus.	20 ft. (6.10m)
RSN modem (if present)	AA-E97900 RSN dialup console server	Locate the RSN modem less than 6 ft. away from the RSN console server, due to the length of the full modem cable provided by Stratus.	6 ft. (1.83m)
RSN modem (if present)	AA-E96600 RSN dialup console server	Locate the RSN modem less than 10 ft. away from the RSN console server, due to the length of the full modem cable (B10102-10) provided by Stratus.	10 ft. (3.05m)
UPS units	ftServer V 100, V 200, or V 400 system	Locate each UPS unit less than 12 ft. away from the PDUs in the host due to the length of each PDU **AC input cord** provided by Stratus.	12 ft. (3.65m)

IP Subnet Requirements

Table 4-2 lists the separate IP subnet requirements for systems with U772 Ethernet switches.

Table 4-2. IP Subnet Requirements With U772 Ethernet Switches

System Configuration	Separate IP Subnets
ftServer system **with** an optional network I/O enclosure	One subnet in the form 10.10.1.0/24 to connect the host system to the U772 Ethernet switches. See "Maintenance Network" on page 4-2 for more information.
	A second subnet in the form 10.20.1.0/24 to connect the host system and the network I/O enclosure.
	Additional subnets to connect the host system to site networks
ftServer system **without** an optional network I/O enclosure	One subnet in the form 10.10.1.0/24 to connect the host system to the U772 Ethernet switches. See "Maintenance Network" on page 4-2 for more information.
	Additional subnets to connect the host system to site networks

Table 4-3 lists the minimum separate IP subnet requirements for systems that do not include U772 Ethernet switches.

Table 4-3. IP Subnet Requirements Without U772 Ethernet Switches

System Configuration	Separate IP Subnets
ftServer V 100, V 200, or V 400 system **with** optional network I/O enclosure	One subnet in the form 10.10.1.0/24 to connect the host system and the network I/O enclosure. The Ethernet ports on the UPS units and the RSN console server are connected to this subnet.
	A second subnet to connect the host system to a site network
ftServer V 100, V 200, or V 400 system **without** optional network I/O enclosure	Two subnets in the form 10.10.10.0/24 and 10.10.11.0/24 to connect the host system to the two UPS units
	A third subnet in the form 10.10.1.0/24 to connect the host system to the RSN console server
	Additional subnets to connect the host system to site networks

RSN Connection

Connecting a system to the Stratus RSN allows the CAC to remotely diagnose, troubleshoot, and resolve problems online.

See the manual *OpenVOS System Administration: Configuring a System* (R287) for information about making RSN entries in the devices.tin file.

Depending on the type of RSN console server, ftServer V 100, V 200, and V 400 systems can connect to the Stratus RSN over the Internet, a phone line, or an X.25 line. For more information, see the manuals *VOS Communications Software: X.25 and StrataNET Administration* (R091) and *OpenVOS System Administration: Administering and Customizing a System* (R281).

There are two types of RSN console servers. The following sections describe their connections:

- "Connecting the AA-E97700 RSN Internet Console Server" on page 4-8
- "Connecting the AA-E97900 or AA-E96600 RSN Dialup Console Server" on page 4-9

Connecting the AA-E97700 RSN Internet Console Server

The AA-E97700 RSN Internet console server requires OpenVOS Release 17.1.0 or later. It connects to the module and the Internet as follows:

- L2 Ethernet port:
  - If a maintenance network with U772 Ethernet switches is present in the system, connect the RSN console server L2 port to a U772 Ethernet switch.
  - If no U772 Ethernet switches are present but a network I/O enclosure is present, connect the RSN console server L2 port to a U764 PICMG 2.16 switch in the network I/O enclosure.
  - If neither U772 Ethernet switches nor a network I/O enclosure are present in the system, connect the RSN console server L2 port to a U575V or U577 PCI adapter.

- L1 Ethernet port:

  Connect the RSN console server L1 Ethernet port to an external network connected to the Internet.

- Serial port 1:

  Using the supplied RJ-45 to DB-9 cable, connect serial port 1 to the ftServer module's COM1 port.

See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for the locations of the L1 Ethernet port and serial port 1. See the *Stratus ftServer V 200 and V 400 Systems: Operation and Maintenance Guide* (R557) or the *Stratus ftServer V 100 Systems: Operation and Maintenance Guide* (R581) for connection details.

Connecting the AA-E97900 or AA-E96600 RSN Dialup Console Server

The AA-E97900 or AA-E96600 RSN dialup console server connects to the module and the RSN modem as follows:

- Ethernet port:
  - If a maintenance network with U772 Ethernet switches is present in the system, connect the RSN console server to a U772 Ethernet switch.
  - If no U772 Ethernet switches are present but a network I/O enclosure is present, connect the RSN console server to a U764 PICMG 2.16 switch in the network I/O enclosure.
  - If neither U772 Ethernet switches nor a network I/O enclosure are present in the system, connect the RSN console server to a U575V or U577 PCI adapter.

- P2 serial port:

  Connect the P2 serial port to the ftServer system's COM1 port.

- P1 serial port:

  Connect the P1 serial port to the RSN modem.

See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for the locations of the P1, P2, and Ethernet ports. See the *Stratus ftServer V 200 and V 400 Systems: Operation and Maintenance Guide* (R557) or the *Stratus ftServer V 100 Systems: Operation and Maintenance Guide* (R581) for connection details.

Cables for External Components

Table 4-4 lists the cables used to connect ftServer V 100, V 200, and V 400 systems to external components and specifies the source of the cable (supplied by Stratus or which you must provide). If they are supplied by Stratus, the table lists the marketing ID and length of the cable.

Table 4-4. Cables for External Components *(Page 1 of 2)*

Component	Cable Description	Source of Cable	Marketing ID	Length
PC console	One DB-9 male to DB-9 female asynchronous null modem cable for connecting to the COM2 port on the ftServer system	Stratus	B20253-25	25 ft. (7.62m)
RSN modem (if present)	For AA-E97900, one DB-9 to DB-25 full modem cable for connecting port 1 of the console server to the modem	Stratus	—	6 ft. (1.83m)
	One telephone cord from the phone service jack to the modem	Provided by customer	—	—
RSN modem (if present)	For AA-E96600, one DB-25 to DB-25 full modem cable for connecting port 1 of the console server to the modem	Stratus	B10102-10	10 ft. (3.05m)
	One telephone cord from the phone service jack to the modem	Provided by customer	—	—
UPS unit	If U772 Ethernet switches are present: two Ethernet cables for connecting the management cards of the two UPS units to the two U772 Ethernet switches	Provided by customer	—	—
	If U772 Ethernet switches are **not** present, but a network I/O enclosure is present: two Ethernet cables for connecting the management card of each UPS to port 20 of each U764 PICMG 2.16 switch in the network I/O enclosure	Stratus	B000919-20	20 ft. (6.10m)
	If neither U772 Ethernet switches nor a network I/O enclosure are present: two Ethernet cables for connecting the management card of each UPS to the embedded Ethernet port in each core I/O enclosure	Stratus	B000925-20	20 ft. (6.10m)
Network I/O enclosure	Two Ethernet cables to connect port 25 of each U764 PICMG 2.16 switch to an embedded Ethernet port in a core I/O enclosure	Stratus	B38100-10	10 ft. (3.05m)

Table 4-4. Cables for External Components *(Page 2 of 2)*

Component	Cable Description	Source of Cable	Marketing ID	Length
RSN console server	For AA-E97900 or AA-E96600 – one DB-9 female to DB-9 female null modem cable for connecting port 2 of the console server to the COM1 port on the ftServer system	Stratus	B10106-25	25 ft. (7.62m)
	In configurations where the RSN console server connects through one of the maintenance network's U772 Ethernet switches, one UTP Ethernet cable with RJ-45 connectors, minimum Category 5, which is provided with the console server, for connecting the RSN console server to a U772 Ethernet switch	Stratus	B38029-06V	6 ft. (1.83m)
	In configurations where the RSN console server connects through a network I/O enclosure, one Ethernet cable for connecting the console server to port 21 of the U764 PICMG 2.16 switch in slot 2 of the network I/O enclosure	Stratus	B000919-20	20 ft. (6.10m)
	In configurations where the RSN console server connects directly to a PCI adapter, one Ethernet cable for connecting the console server to a U575V or U577 PCI adapter.	Stratus	B000925-20	20 ft. (6.10m)

Network I/O Enclosure PICMG 2.16 Adapter Cables

Communications cables connect to the various PICMG 2.16 adapters installed in the network I/O enclosure. Table 4-5 lists cables that connect to the U760 Eight-Port Serial Synchronous PICMG 2.16 Adapters.

Table 4-5. Network I/O Enclosure Communications Cable

PICMG 2.16 Adapter	Cable Description	Marketing ID or Customer Supplied	Length
U760 Eight-Port Serial Synchronous PICMG 2.16 Adapter	Two RS-232C Hydra Cables for breaking out each four-channel connector on the rear transition module to four separate cables	B001141	12.0 ft. (3.65m)
	Two RS-449 Hydra Cables for breaking out each four-channel connector on the rear transition module to four separate cables	B001143	12.0 ft. (3.65m)
	Two V-35 Hydra Cables for breaking out each four-channel connector on the rear transition module to four separate cables	B001144	12.0 ft. (3.65m)

PCI Adapter Cables

Each U520 Single-Port 4/16-Mbps Token-Ring PCI Adapter requires a single cable.

U528 PCI adapters that attach to D910 FC disk enclosures are teamed for fault tolerance. A cable for each member of the pair is required.

U534V PCI adapters that attach to D910 FC disk enclosures or to U773 12-Port Fibre Channel Switch are teamed for fault tolerance. Two cables for each adapter are supplied with the adapter.

U574V-LC PCI adapters and U575V PCI adapters are typically used in pairs and grouped for fault tolerance. You must supply up to two Ethernet cables for the ports on each U574V-LC and U575V PCI adapter.

U576 and U577 Ethernet PCI adapters are typically used in pairs and grouped for fault tolerance. A cable for each member of the pair is required.

⚠ W A R N I N G

Make sure communications cables are routed out of the way of foot traffic.

Table 4-6 describes the token-ring cable, Fibre Channel, and Ethernet cables you may need to provide. Be sure to provide a cable of sufficient length for the distance between the system and its connection point at the wall jack, hub, or peripheral device.

Table 4-6. PCI Adapter Cables *(Page 1 of 2)*

Component	Quantity	Cable
U520 Single-Port 4/16-Mbps Token-Ring PCI Adapter	One per system	A standard, Token-Ring Media Access Unit (MAU) cable with a DB-9 connector (male) on one end and an IBM® Cabling System Data Connector on the other end. See *Migrating VOS Applications from Continuum Systems* (R607) for details.
U528 Optical Fibre Channel PCI Adapter	One for each U528 PCI adapter	2m LC-LC Optical Cable B90020
U534V Dual-Port Optical Fibre Channel PCI Adapter	Up to two for each U534V PCI adapter	Fibre Channel optical cable, which is supplied with the U534V PCI adapter

Table 4-6. PCI Adapter Cables *(Page 2 of 2)*

Component	Quantity	Cable
U574V-LC Dual-Port Fiber Gigabit Ethernet Adapter	Up to two for each U574V-LC PCI adapter	Two multi-mode, 62.5 or 50 micron dual-fiber cables, which you must provide, each cable having an LC-type connector for the U574V-LC PCI adapter and a connector on the other end that is compatible with your site network switch
U577 One-Port 10/100/1000 Base-T Ethernet PCI Adapter and U575V Dual-Port Copper Gigabit Ethernet Adapter	One for each U577 PCI adapter Two for each U575V PCI adapter	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 For connections to an Ethernet hub or switch, provide a straight-through cable. For 100-Mbps (fast Ethernet) or 1000-Mbps (gigabit Ethernet) operation, provide Category-5 or better Ethernet cables. The maximum allowable distance from an Ethernet port to a switch or a hub is 100 meters.
U576 One-Port 1000Base-SX Ethernet PCI Adapter	One for each U576 PCI adapter	Multi-mode, 62.5-micron, dual fiber cable with one SC-type connector on one end, and a connector that is compatible with the network equipment on the other end

Appendix A
System Specifications

This appendix provides specifications for the components and cables associated with ftServer V 100, V 200, and V 400 systems. Use these specifications to plan for incorporating the system into your site.

> **N O T E**
>
> The system temperature and humidity requirements, defined in Table A-2, are the **minimum** requirements the site must provide; the temperature and humidity requirements for other components are provided for your reference.

This appendix contains the following sections:

- "Main Cabinet" on page A-2
- "Backplane and Enclosures" on page A-3
- "PDU Specifications" on page A-9

> **N O T E**
>
> Stratus has qualified specific UPS models for use with ftServer V 100, V 200, and V 400 systems. See "Selecting a UPS Unit for ftServer V 200 and V 400 Systems" on page 2-4 or "Selecting a UPS Unit for ftServer V 100 Systems" on page 2-9 for a list of the qualified models. For UPS specifications, see the manufacturer's documentation.

Main Cabinet

Table A-1 describes the dimensions and weights of the main cabinet with and without its shipping container.

Table A-1. ftServer V 100, V 200, and V 400 Main Cabinet Dimensions

38U Shipping Container	
Height (including pallet)	79.75 in. (202.6 cm)
Width	41 in. (104.2 cm)
Depth	53 in. (134.6 cm)
38U Cabinet	
Height (including casters)	74 in. (187.9 cm)
Width	27.1 in. (68.8 cm)
Depth	40 in. (1.01m)
Weight, empty	344 lb. (156 kg)
Weight, empty with pallet and shipping container	512 lb. (232.2 kg)

Backplane and Enclosures

The backplane provides connectivity between the CPU enclosures and I/O enclosures. It also has two serial ports, COM1 and COM2. The following sections describe the backplanes for ftServer V 200 and V 400 systems and ftServer V 100 systems.

- "V 200 and V 400 Backplane and Enclosures" on page A-3
- "V 100 Backplane and Enclosures" on page A-6

V 200 and V 400 Backplane and Enclosures

Figure A-1 illustrates the front of ftServer V 200 and V 400 systems. The figure shows the CPU, core I/O, and expansion I/O enclosures in a backplane with the bezel pulled forward.

Core I/O enclosures

CPU enclosures

Expansion I/O enclosures
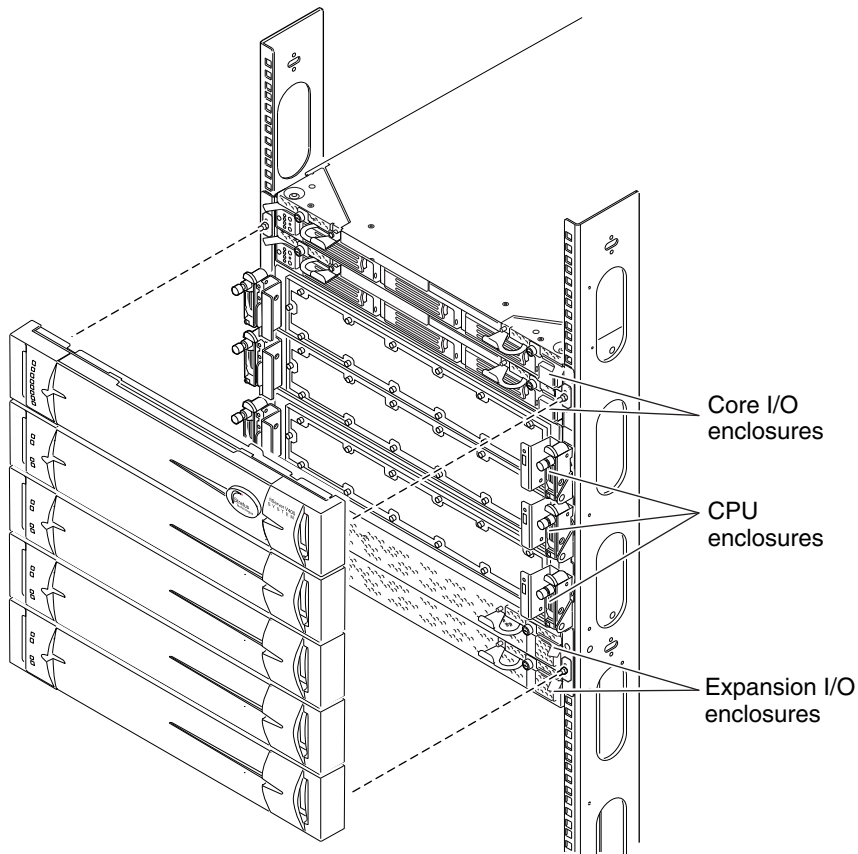
vos138

Figure A-1. ftServer V 200 and V 400 Systems CPU and I/O Enclosures: Front View

Figure A-2 illustrates the backplane for ftServer V 200 and V 400 systems and shows the locations of connectors and the rear of the CPU and I/O enclosures.
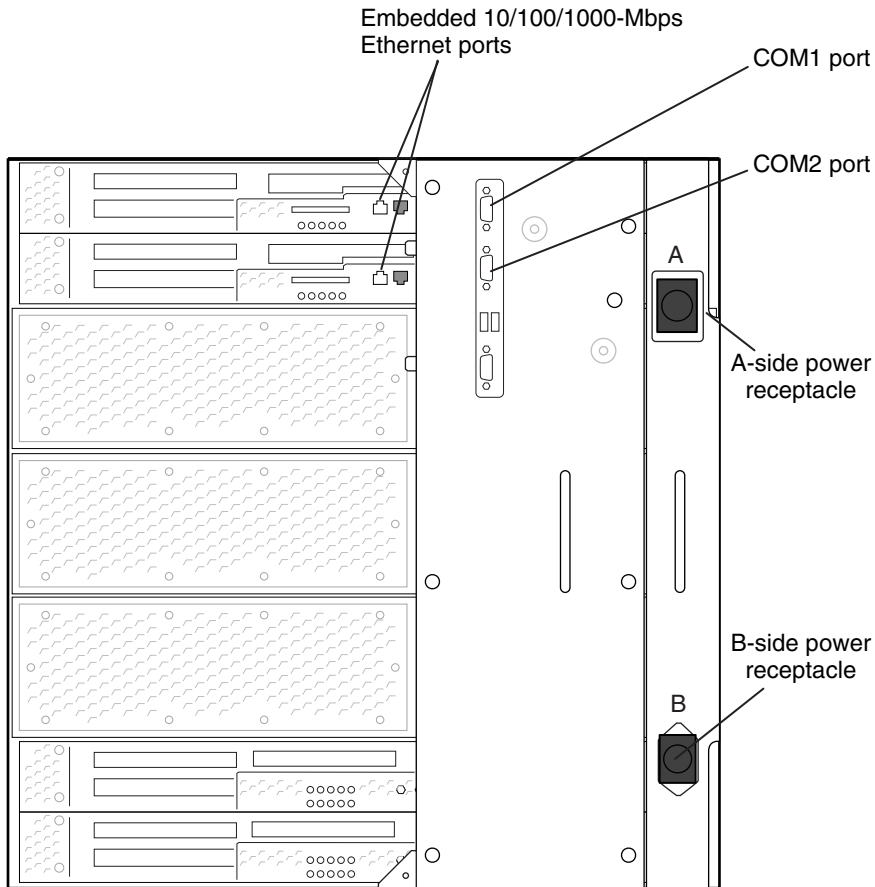
vos125

Figure A-2. ftServer V 200 and V 400 Systems Backplane: Rear View

Table A-2 lists CPU and I/O enclosure specifications for ftServer V 200 and V 400 systems.

Table A-2. ftServer V 200 and V 400 Systems Specifications *(Page 1 of 2)*

Power	
Output wattage	A-side power: 1300 W (AC) B-side power: 900 W (AC)
Nominal input voltage; frequency	200–240 VAC; 50-60 Hz
Physical Dimensions	
Height	17.75 in. (45 cm) (10U)
Width	19 in. (48.26 cm)
Depth	30 in. (76.2 cm)
Weight	310 lb. (136 kg)
Environmental Requirements	
Operating temperature	41°F to 95°F (5°C to 35°C) For every 800 ft. (243.8m) above 2000 ft. (609.6m), lower the maximum operating temperature (95°F/35°C) by 1.8°F (1°C)
Storage temperature	-38°F to 140°F (-40°C to 60°C)
Operating altitude	0 ft. to 10000 ft. (0m to 3048m)
Maximum rate of temperature change during operation	53.6°F/hr. (12°C/hr.)
Relative humidity during operation	10% to 80% (noncondensing)
Relative humidity during storage	5% to 95% (noncondensing)
Heat dissipation	7500 BTUs per hour
CPU Enclosure Features	
Processors	Two or four Intel® Xeon™ processors in each CPU enclosure
Memory	Utilizes four or eight dual-inline memory module slots in each CPU enclosure Up to 12 gigabytes (GB) logical memory
I/O Enclosure Features	
Ports	One embedded 10/100/1000-Mbps Ethernet port on each core I/O enclosure Two AC power connectors

Table A-2. ftServer V 200 and V 400 Systems Specifications *(Page 2 of 2)*

PCI slots	Twelve user-configurable PCI adapter slots: – One 32-bit 33MHz slot in each core I/O enclosure – Two 64-bit 33MHz slots in each core I/O enclosure – Three 64-bit 66 MHz slots in each expansion I/O enclosure

V 100 Backplane and Enclosures

Figure A-3 illustrates the front of an ftServer V 100 system, showing the CPU and core I/O enclosures in a backplane, with the bezel pulled forward.
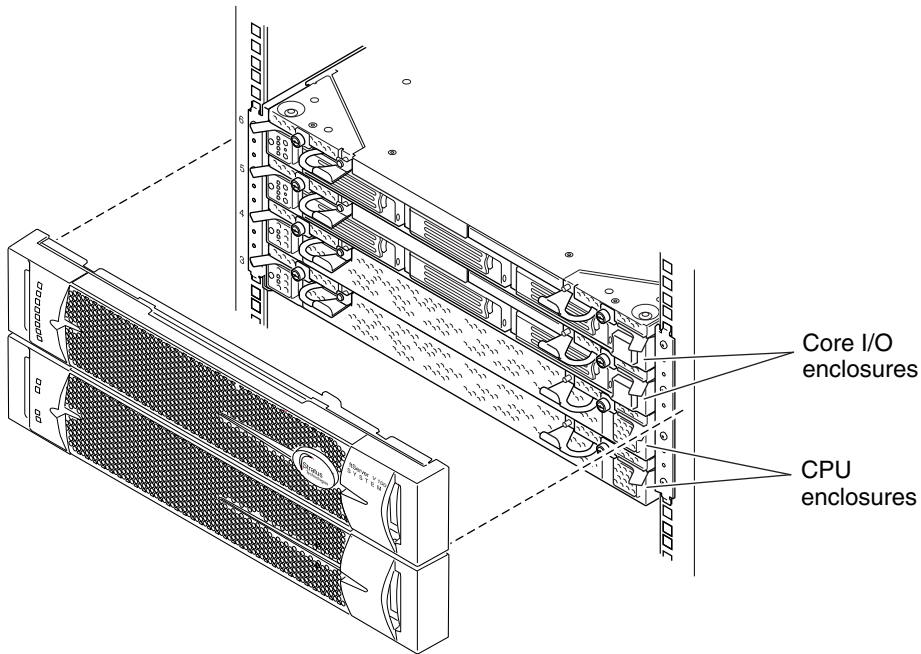
vos173

Figure A-3. ftServer V 100 System CPU and I/O Enclosures: Front View

Figure A-4 illustrates the backplane for ftServer V 100 systems and shows the locations of connectors and the rear of the CPU and I/O enclosures.
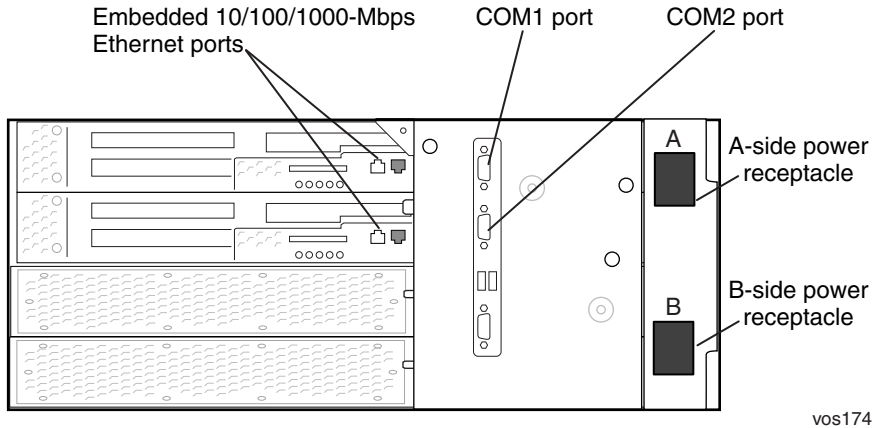
Figure A-4. ftServer V 100 Systems Backplane: Rear View

Table A-3 lists specifications for the ftServer V 100 system backplane, CPU enclosures, and I/O enclosures.

Table A-3. ftServer V 100 System Specifications *(Page 1 of 2)*

Power	
Output wattage	A-side power: 500 W (AC) B-side power: 500 W (AC)
Nominal input voltage; frequency	200–240 VAC; 50-60 Hz
Physical Dimensions	
Height	7 in. (17.8 cm) (4U)
Width	17.75 in. (45.1 cm)
Depth	29.23 in. (74.2 cm)
Weight	124 lb. (56.25 kg) to 137 lb. (62 kg)

Table A-3. ftServer V 100 System Specifications *(Page 2 of 2)*

Environmental Requirements	
Operating temperature	41°F to 95°F (5°C to 35°C) For every 800 ft. (243.8m) above 2000 ft. (609.6m), lower the maximum operating temperature (95°F/35°C) by 1.8°F (1°C)
Storage temperature	-38°F to 140°F (-40°C to 60°C)
Operating altitude	0 ft. to 10,000 ft. (0m to 3048m)
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% (noncondensing)
Heat dissipation	3500 BTUs per hour
CPU Enclosure Features	
Processors	One Intel Xeon processor in each CPU enclosure.
Memory	Six dual data rate (DDR) inline memory module (DIMM) slots in each CPU enclosure Up to 6 gigabytes (GB) logical memory
I/O Enclosure Features	
Ports	One embedded 10/100/1000-Mbps Ethernet port on each core I/O enclosure Two AC power connectors and two serial ports
PCI slots	Six user-configurable PCI adapter slots: – One 32-bit 33MHz slot in each core I/O enclosure – Two 64-bit 33MHz slots in each core I/O enclosure

PDU Specifications

PDUs distribute AC power to the system's components from an AC power source.

The following sections describe the PDUs for ftServer V 200 and V 400 systems and ftServer V 100 systems.

- "AAP41105V PDUs for V 200 and V 400 Systems" on page A-9
- "AAP41104V PDU for V 100 Systems" on page A-11

AAP41105V PDUs for V 200 and V 400 Systems

Figure A-5 illustrates the AAP41105V PDU for V 200 and V 400 systems. Table A-4 lists PDU marketing IDs, power cord lengths, and connector types.

pdu41150
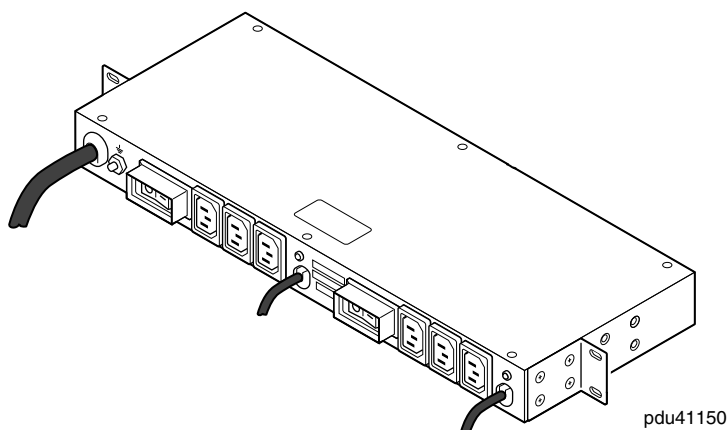
Figure A-5. AAP41105V PDU

Table A-4. AAP41105V PDU Part Numbers, Power Cords, and Connectors

Location	Marketing ID	Input Power Cord Length	Input Power Cord Connector Type
United States	AAP41105V	12 ft. (3.65m)	L6-30P
International	AAP41150V-I	12 ft. (3.65m)	IEC 309[†]
Japan	AAP41150V-J	12 ft. (3.65m)	L6-30P

† Your qualified electrician must remove the plug and hardwire the PDU power cord to the power output terminals on the SYP8K12RMI or SYP12K12RMI UPS units in compliance with local and national electrical codes.

Table A-5 lists the specifications for the AAP41105V PDU.

Table A-5. AAP41105V PDU Specifications

Power	
Nominal input voltage; frequency	200–240 VAC; 50-60 Hz
Physical	
Height	1.75 in. (4.45 cm)
Width	19.1 in. (48.51 cm)
Depth	6.75 in. (17.15 cm)
Weight	20 lb. (9.1 kg)
Environmental	
Operating temperature	41°F to 95°F (5°C to 35°C) For every 800 ft. (243.8m) above 2000 ft. (609.6m), lower the maximum operating temperature (95°F/35°C) by 1.8°F (1°C).
Maximum rate of temperature change during operation	21.6°F (12$\circ$C) per hour or .36°F (0.2$\circ$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)
Maximum rate of temperature change during storage	21.6°F (12$\circ$C) per hour or .36°F (0.2$\circ$C) per minute

Table A-6 lists the jumper cords that distribute power from the PDUs to the V 200 or V 400 system components.

Table A-6. AAP41105V PDU Power Jumper Cords

Power Jumper Cord Description	Connector Types	Length	Marketing ID
Grey 10A 250V	C13 to C14	6.56 ft. (2.0m)	B50502-02M
Black 10A 250V	C13 to C14	6.56 ft. (2.0m)	B50503-02M

AAP41104V PDU for V 100 Systems

Figure A-6 illustrates the AP41104V PDU for V 100 systems.
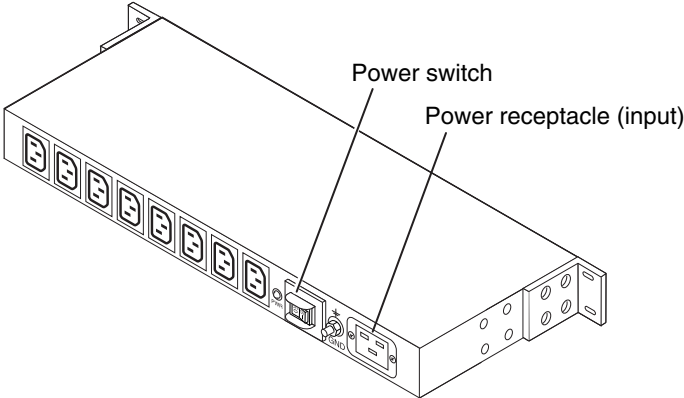
vos175

Figure A-6. AAP41104V PDU

Table A-7 lists the PDU and the power cords that connect the V 100 system's PDUs mounted inside the cabinet to your power source.

Table A-7. AAP41104V PDU and PDU Power Cords Rated at 200-240 VAC 50-60 Hz

CRU	Part Number
PDU, 16 Amp, 8 outlet	AA-P41104
NEMA L6-20, 250 VAC, 20A, 15 ft. (4.5m)	AW-B50155-45M
NEMA L6-30, 250 VAC (receptacle must be fused at no more than 20A), 30A, 15 ft. (4.5m)	AW-B50156-45M
IEC-309, 250 VAC, 20A, 15 ft. (4.5m)	AW-B50154-45M

Table A-8 lists the power cables that connect the V 100 system's PDU to a UPS.

Table A-8. Cables From AAP41104V PDUs to a UPS

Cable	Part Number
United States, domestic NEMA L6-20 to IEC-320 C19, 208V, 15 ft (4.5m)	AW-B50155-45M
Japan, NEMA L6-20 to IEC-320 C19, 200V, 15 ft (4.5m)	AW-B50155-45M
International, IEC-320 C14 to IEC-320 C19, 230V 3.5m	AW-B38003

Table A-9 lists the power cables that distribute power from the PDUs to the V 100 system components.

Table A-9. AAP41104V PDU Power Jumper Cords

Power Jumper Cord Description	Connector Types	Length	Marketing ID
Grey 10A 250V	C13 to C14	6.56 ft. (2.0m)	B50502-02M
Black 10A 250V	C13 to C14	6.56 ft. (2.0m)	B50503-02M

Table A-10 lists the specifications for the AAP41104V PDU.

Table A-10. AAP41104V PDU Specifications *(Page 1 of 2)*

Power	
Output wattage	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.

Table A-10. AAP41104V PDU Specifications *(Page 2 of 2)*

Environmental (*continued*)	
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)

Appendix B
Electrical Circuit and Wiring Information

You should provide electrical circuit and wiring information to the contractor and/or facilities personnel responsible for wiring the power at the system installation site. The information you need to provide includes:

Fault Protection Requirements

Each enclosure in the ftServer V 100, V 200, or V 400 system contains 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.

- Use 30A or less circuit breakers in each power distribution branch feeding the PDUs.
- To connect a single system to power, use 20A or less circuit breakers in each power distribution branch feeding 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 on 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 B-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.
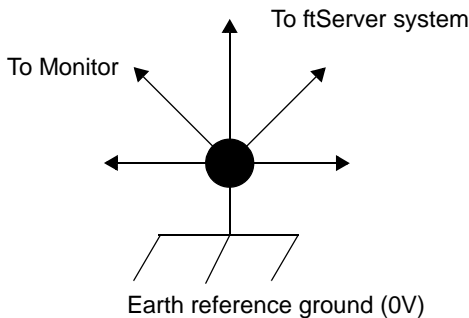
Figure B-1. Star Ground Example

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 B-3 illustrates a single-phase 240-VAC circuit connection.

- Figure B-4 illustrates a split-phase 240-VAC circuit connection.

- Figure B-5 illustrates a three-phase 208-VAC, Y-, or Δ-source circuit connection, phase-to-neutral.

- Figure B-6 illustrates a three-phase 208-VAC, Y-, or Δ-source circuit connection, phase-to-phase.

- Figure B-7 illustrates a three-phase 380-VAC, Y-, or Δ-source circuit connection, phase-to-neutral.

N O T E ───────────────────────────

As shown in Figure B-2, the power inputs for the ftServer system are labeled X and Y in the diagrams in this appendix 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 B-2 illustrates the physical locations of the X and Y inputs on the system base.

Power input A or B (Face View)
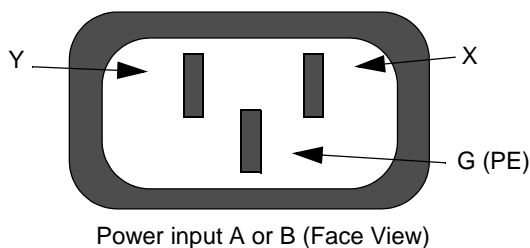
Figure B-2. Power Input Labeling

Figure B-3 illustrates a single-phase 240-VAC circuit connection. Note that this application requires a single-pole circuit breaker.
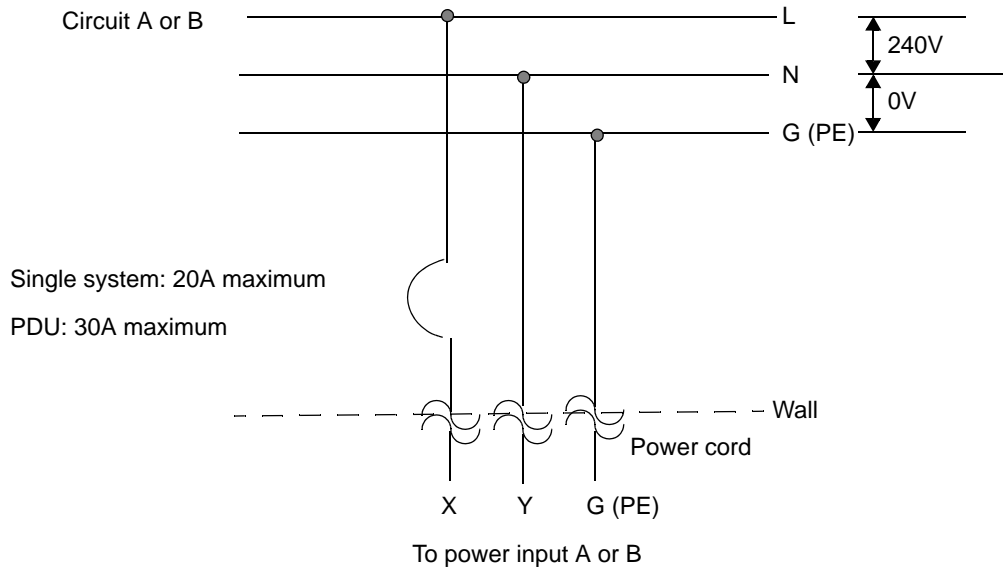
Figure B-3. Single-Phase 240-VAC Circuit Connection

Figure B-4 illustrates a split-phase 120/240-VAC circuit connection. Note that this application requires a double-pole circuit breaker.
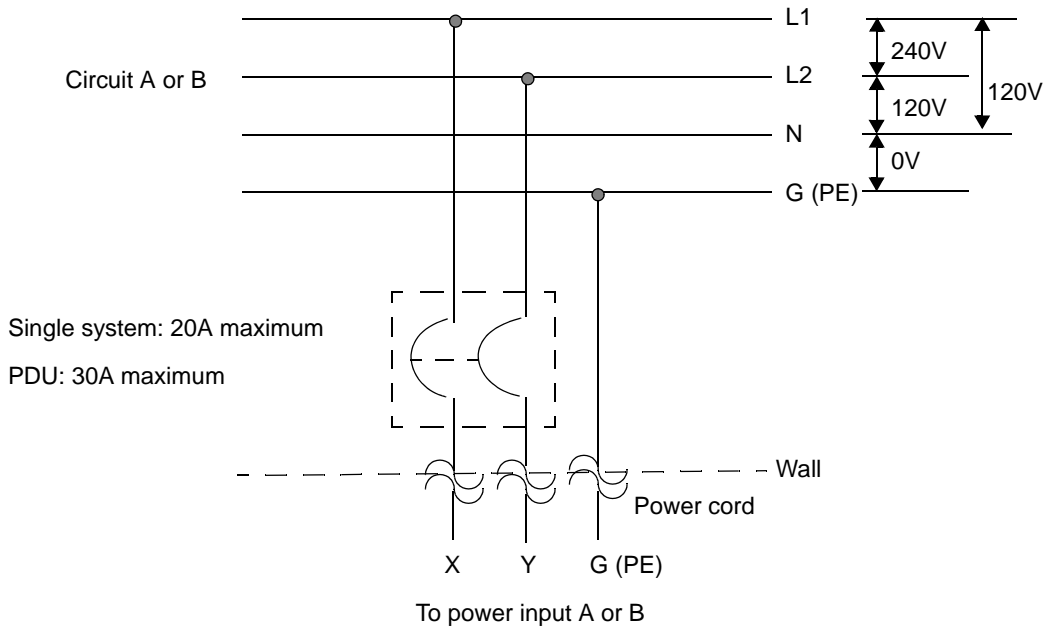
Figure B-4. Split-Phase 120/240 VAC Circuit Connection

Figure B-5 illustrates a three-phase 208-VAC, Y-, or Δ-source circuit connection, which is a phase-to-neutral source connection. Note that the ftServer system X input can be connected from L1, L2, or L3. This application requires a single-pole circuit breaker.
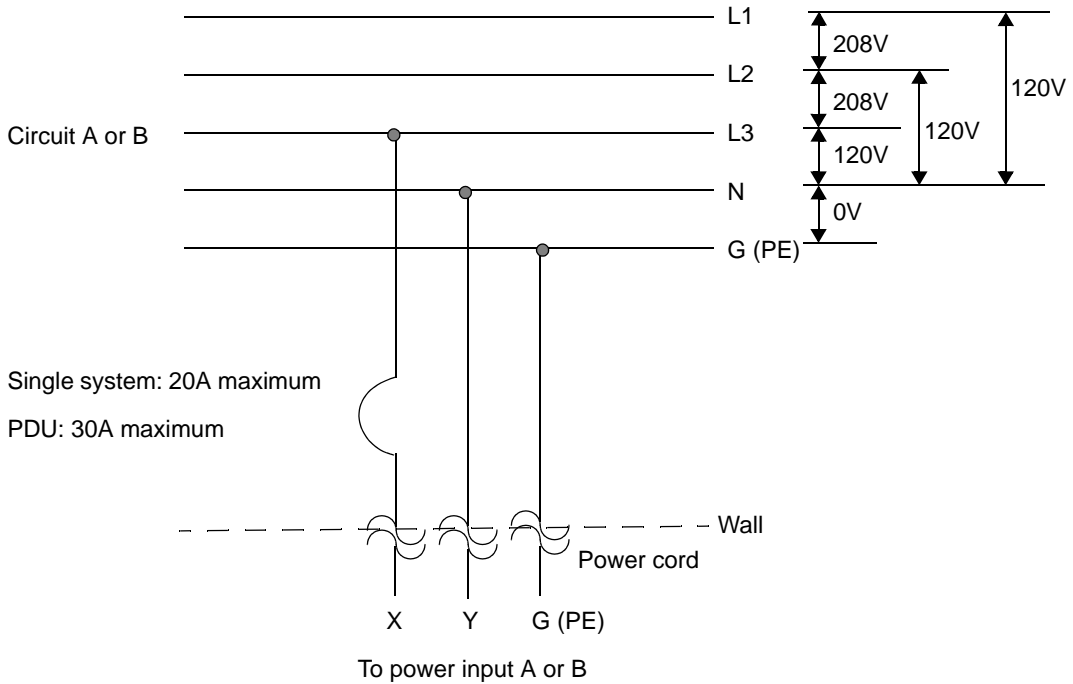
Figure B-5. Three-Phase 208-VAC, Y-, or Δ-Source Circuit Connection, Phase-to-Neutral

Figure B-6 illustrates a three-phase 208-VAC, Y-, or Δ-source circuit connection, which is a phase-to-phase source connection. Note that the ftServer system 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.
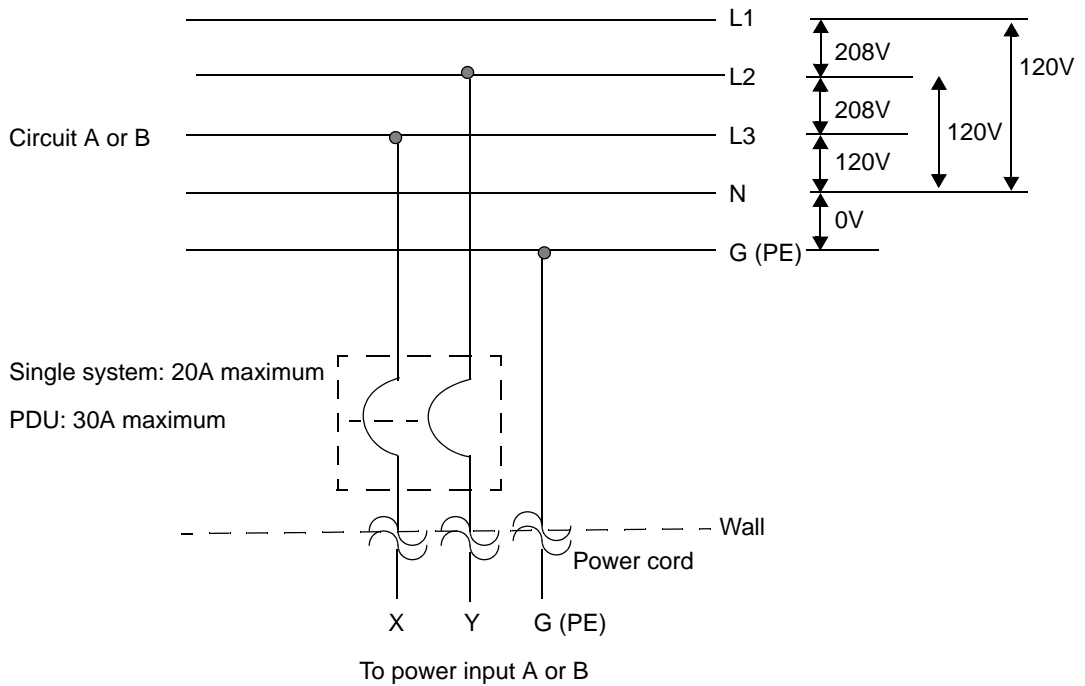
Figure B-6. Three-Phase 208-VAC, Y-, or Δ-Source Circuit Connection, Phase-to-Phase

Figure B-7 illustrates a three-phase 380-VAC, Y-, or Δ-source circuit connection, which is a phase-to-neutral source connection. Note that the ftServer system X input can be connected to L1, L2, or L3. This application requires a single-pole circuit breaker.
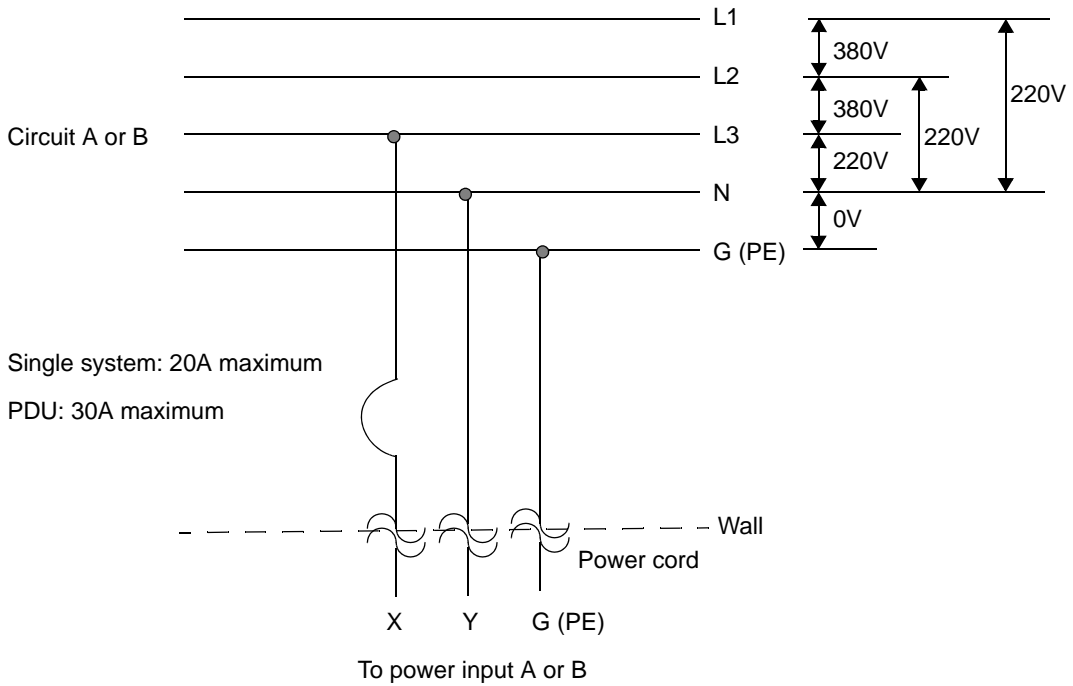
Figure B-7. Three-Phase 380-VAC, Y-, or Δ-Source Circuit Connection, Phase-to-Neutral

Electrical Power Connectors

Table B-1 describes the connectors that Stratus uses to connect the ftServer V 100, V 200, or V 400 system and its peripheral devices, such as tape drives, to AC power outlets.

Table B-1. Connectors for AC Power Outlets *(Page 1 of 3)*
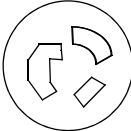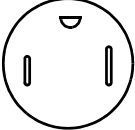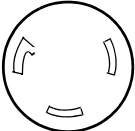
Connector	Configuration	Rating	Description
NEMA 6-15		15A, 250V	2-pole, 3-wire
NEMA L6-20		20A, 208/240V	2-pole, 3-wire
NEMA 5-15		15A, 125V	2-pole, 3-wire
NEMA L6-30		30A, 125/250V	2-pole, 3-wire

Table B-1. Connectors for AC Power Outlets *(Page 2 of 3)*
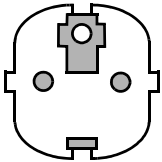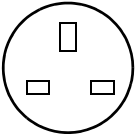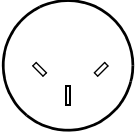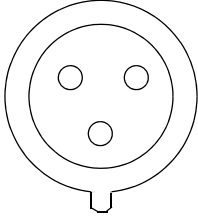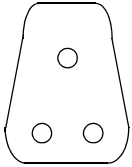
Connector	Configuration	Rating	Description
CEE (7) VII		20A, 250V	2-pole, 3-wire
BS 89 3		13A or 10A, 250V	2-pole, 3-wire
CEI-23-16		16A, 250V	2-pole, 3-wire
SI 32/1971		16A, 250V	2-pole, 3-wire
IEC-309		16-20A, 200-240V	2-pole, 3-wire

Table B-1. Connectors for AC Power Outlets *(Page 3 of 3)*

Connector	Configuration	Rating	Description
SABS 164-1:1992		16A, 250V	2-pole, 3-wire

Appendix C
Standards Compliance

For compliance information, see the following:

- "Electronic Interference, Immunity, Safety, and Noise Level Standards Compliance" on page C-1
- "Toxic and Hazardous Substances and Elements Disclosure" on page C-4

Electronic Interference, Immunity, Safety, and Noise Level Standards Compliance

All ftServer systems comply with the electromagnetic interference (EMI), immunity, safety, and noise regulations listed in Table C-1. 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.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction

manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Table C-1. Compliance Standards for ftServer V 100, V 200, and V 400 Systems

Standard	Title	Country
EN 55022:1998, A1: 2000, A2: 2003 Class A	Limits and methods of measurement of radio interference characteristics of Information Technology Equipment	European Union
CISP22: 1997/A1:2000/A2:2002 class A	Information Technology Equipment: Radio disturbance characteristics	European Union
FCC CFR47, Part 15: 8/14/2006, Class A	Code of Federal Regulations, Radio Frequency Devices	North America
ICES-003: issue 4, 2/2004, Class A	Electronic Emissions from Data Processing Equipment and Electronic Office Machines	Canada
EN 55024:1998, A1: 2001, A2: 2003 Class A	Information Technology Equipment - Immunity characteristics - Limits and methods of measurement	European Union
CE EN 60950 (2005)	Safety of Information Technology Equipment	European Union
CB SCHEME IEC 60950-1:2001 and EN 60950-1:2001, A11: 2004 1st Ed.	Safety of Information Technology Equipment	
CAN/CSA 60950-1-03, 1st Ed - ANSI/UL 60950-1, 1st Ed, Rev 1	Safety of Information Technology Equipment (CSA Certified to U.S. Standards)	North America

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

CCC Note

警　　告
本電池如果更換不正確會有爆炸敵危險
請依說明書處理用過之電池

Toxic and Hazardous Substances and Elements Disclosure

ftServer V 100, V 200, and V 400 systems are compliant with the European Union's Restriction of Hazardous Substances Directive (RoHS) based upon the exception for lead used in servers.

⚠ **W A R N I N G** ──────────────────────────

The lithium battery contains perchlorate material. Special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

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