ftServer V 150, V 250, V 300, V 500, and V 502 Systems: Site Planning Guide

Stratus Technologies
R605-02A

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

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Preface

The *Stratus ftServer V 150, V 250, V 300, V 500, and V 502 Systems: Site Planning Guide* (R605) documents the site requirements and customer responsibilities related to preparing a site for the installation of ftServer V 150, V 250, V 300, V 500, and V 502 systems.

This document is intended for those responsible for preparing a site for the installation of an ftServer V 150, V 250, V 300, V 500, or V 502 system.

Revision Information

This document is a revision. It includes:

- New marketing IDs for "Cables for External Components" and "Network I/O Enclosure PICMG 2.16 Adapter Cables".
- Updates to supported configurations in Figure 5-3 and Figure 5-4.
- Updated power specifications in Table A-2.
- New cable marketing IDs in Table A-4, Table A-5, Table A-6, Table A-8, Table A-9, and Table A-10.

Notation Conventions

This document uses the notation conventions described in this section.

Warnings, Cautions, and Notes

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

WARNING

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

CAUTION

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

NOTE

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

Typographical Conventions

This document uses the following notation conventions.

- 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  *.*
  ```

Getting Help

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

- **Online documentation at the StrataDOC Web site.** Stratus provides complimentary access to StrataDOC, an online-documentation service that enables you to view, search, download, and print customer documentation. You can access StrataDOC at the following Web site:

  http://stratadoc.stratus.com

  A copy of StrataDOC on supported media for your system is included with this release.

  To order additional copies of StrataDOC or to obtain copies of printed manuals, do one of the following:

  - If you are in North America, call the Stratus Customer Assistance Center (CAC) at (800) 221-6588 or (800) 828-8513, 24 hours a day, 7 days a week.
  - If you are located outside North America, contact your nearest Stratus sales office, CAC office, or distributor; for CAC phone numbers, see http://www.stratus.com/support/cac/index.htm.
  - If your system is connected to the Remote Service Network (RSN™), issue the OpenVOS `maint_request` command at the system prompt. Complete the on-screen form with all of the information necessary to process your manual order. You can use this command only on OpenVOS systems.

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

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

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

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

Commenting on the Documentation

To provide corrections and suggestions on the documentation, send your comments in one of the following ways:

- By clicking the **site feedback** link at the bottom of a Help topic. Information to identify the topic is supplied in the StrataDOC Web Site Feedback form.

- By email to Comments@stratus.com. If it is possible, please include specific information about the documentation on which you are commenting:
  - For a printed document or a document in PDF format, include the title and part number from the Notice page and the page numbers.
  - For online documentation, include the Help subject and topic title.

If you are connected to a OpenVOS system, you can comment on this document by using the command `comment_on_manual`. To use the `comment_on_manual` command, your system must be connected to the RSN.

The `comment_on_manual` command is documented in the document *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 document's part number, `R605`, 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.

NOTE

If `comment_on_manual` does not accept the part number of this document (which may occur if the document 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.

This information will assist Stratus Information Development in making any needed changes to the ftServer system documentation. Your assistance is most appreciated.

Chapter 1
Site Planning for ftServer V 150, V 250, V 300, V 500, and V 502 Systems

For an overview of the information you need to know and of the tasks you need to perform to prepare a site for ftServer V 150, V 250, V 300, V 500, and V 502 systems, see:

Site Planning Overview

Site planning for fault-tolerant systems includes:

- Electrical (AC) power planning

  Provide electrical AC power sources that meet the requirements of the system and optional components, including the purchase of a qualified uninterruptible power supply (UPS).

- Space planning

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

  Provide an environment that meets the system's requirements for ambient temperature and air quality.

- Communications line planning

  Provide sufficient network and analog telephone lines and plan the location of the system and external components to accommodate the lengths of the connecting cables.

- Provide a system console (PC running Windows® XP operating system), a serial cable, and an Ethernet cable to connect the console to the system.

Use the "Site Planning Checklist" on page 1-3 to track your site preparation progress.

For information about obtaining documents related to your ftServer system, see "System Documentation" on page 1-7.

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

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

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

See Chapter 5, "Supported Configurations" for illustrations of the rack configurations of your ftServer system and other rack-mounted components, and Appendix A, "Specifications" for the specifications of the base ftServer systems. See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for specifications of other components, both rack-mounted and external to the rack.

Site Planning for Fault-Tolerant Systems

Consider the following specific fault-tolerant features of ftServer systems for site planning:

- *Lockstep technology* means that the systems contain redundant hardware. The systems contain two enclosures, each containing a full computing environment that consists of a CPU element and an I/O element.

  If a component in a CPU element malfunctions, the corresponding CPU element in the other enclosure, which is processing the same information in *lockstep*, continues processing without interruption. If a component in the I/O element malfunctions, the system fails operation over to the corresponding element in the other enclosure and continues to operate normally. The only consequences are that the system is less fault tolerant, and any I/O throughput distributed between the enclosures may be reduced. To restore full fault tolerance, an enclosure can be replaced without taking the system offline.

- ftServer systems can connect to the Remote Service Network (RSN).

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

  To enable connectivity to the RSN, an RSN modem is connected to the system and managed by system software.

Site Planning Checklist

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

Planning for RSN Connectivity

❏ Will your system use an RSN modem to connect to the RSN?

❏ Do you have an external analog telephone line available for the RSN modem?

NOTE

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

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

Planning for Optional Components

❏ The system contains four embedded 10/100/1000 megabits-per-second (Mbps) Ethernet ports. Will your system additionally include any of the following PCI adapters for network communications? If so, in Table 1-1, indicate the total number of ports, and plan network connections for all Ethernet ports you will use.

Table 1-1. Ethernet PCI Adapters

Adapter	Number of Ports
U574V-LC Dual-Port Fiber Gigabit Ethernet Adapter	
U578V Quad-Port Copper Gigabit Ethernet Adapter	

❏ Do you have a system console, with a serial cable, located in the installation site? Plan to keep the console located with the system.

❑ To plan for the tape-drive and storage enclosures in your system, see the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for descriptions of the enclosures and the names of the required PCI adapters.

Planning AC Power

❑ Have you selected and purchased two UPS units for each ftServer system?

❑ What optional components will you use?

❑ What are the HVAC and AC power requirements of all optional components?

❑ What are the lengths and types of the power cords that are provided for the PDUs and optional components?

❑ What type of AC receptacles do you need to provide?

❑ Is the AC power service wired properly?

Planning Space for Your System

❑ Will your system and its external components fit where you plan to place them?

❑ What are the lengths and types of the interface and communications cables that will connect to your system?

❑ Have you created a sketch of how you plan to arrange the system at the installation site? Consider the available cable lengths, the placement of external devices, and the location of network and voice communication connections.

On the sketch, show the following:

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

NOTE

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

Working with Other Groups

❏ Have you provided your facilities group and contractors with the sketch and copies of the following?

- “Redundant Power Sources” on page 2-2
- Appendix B, “Electrical Circuit and Wiring Information”
- Any notes you have about site planning

❏ Have you reviewed and discussed the requirements with the facilities personnel and contractors to ensure that all site modifications are understood and implemented?

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

Preparing to Install a System

To prepare for the installation of a system by a field engineer, perform the following tasks:

1. Complete all site preparation work, as described in “Preparing to Take Delivery of a System” on page 1-5.
2. Take delivery of the system.
3. Move the system to its installation site, as described in “Moving the System to the Installation Site” on page 1-6.

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.

NOTE

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 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 CAC.

Moving the System to the Installation Site

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

NOTE

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.

NOTE

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.

System Documentation

When you receive your system, you receive a printed copy of the installation guide and warranty for your system and the full system documentation set on CD-ROM.

To order additional copies of the system documentation set on CD-ROM, request the StrataDOC OpenVOS Online Manuals CD-ROM (part number R003VCDK-05).

To request the CD-ROMs or obtain copies of printed manuals, do one of the following:

- If you are in North America, call the Stratus Customer Assistance Center (CAC) at (800) 221-6588 or (800) 828-8513, 24 hours a day, 7 days a week.
- If you are located outside North America, contact your nearest Stratus sales office, CAC office, or distributor; for CAC phone numbers, see http://www.stratus.com/support/cac/index.htm.
- If your system is connected to the Remote Service Network (RSN™), issue the OpenVOS `maint_request` command at the system prompt. Complete the on-screen form with all of the information necessary to process your manual order. You can use this command only on OpenVOS systems.

Stratus provides complimentary access to the documentation at the StrataDOC Web site: http://stratadoc.stratus.com.

Safety Precautions

WARNING

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

WARNING

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.

WARNING

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 150, V 250, V 300, V 500, and V 502 Systems: Operation and Maintenance Guide* (R606). 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 150, V 250, V 300, V 500, and V 502 Systems: Operation and Maintenance Guide* (R606).

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.

WARNING

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.

WARNING

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.

WARNING

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

WARNING

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。如果連接與本產品電源規格不相符的電線，會因過
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、氯化硫、氮、氯、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氯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，因而損壞產品，甚至引起火災。
對產品安裝或存放環境有任何疑問，請與經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。

Chapter 2
AC Power Planning

This chapter describes the AC power requirements of ftServer V 150, V 250, V 300, V 500, and V 502 systems. It contains the following sections:

AC Power Overview

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

Legacy E124 expansion storage-system cabinets also require two separate and independent AC power sources, each fed by two UPS units.

You can use one of the UPS models that Stratus has qualified. See "AC Power Connections to Qualified UPS Models" on page 2-8 for more information.

You must also provide AC power to the PC console, RSN console server, and RSN modem located outside the main cabinet.

Redundant Power Sources

Each ftServer system requires two separate and independent AC power sources: an *A-side* power source and a *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 and distributes power to the components inside the cabinet.

The top PDU in the cabinet receives power from the A-side power source and distributes power to the following components:

- The A-side CPU-I/O enclosure
- The A-side of the optional network I/O enclosure
- One side of each disk storage enclosure that is installed in the system cabinet
- Tape drive enclosures
- The A-side of a supported Ethernet switch
- On ftServer V 250, V 300, V 500, and V 502 systems, the A-side of a supported Fibre Channel switch.

The bottom PDU in the cabinet receives power from the B-side power source and distributes power to the following components:

- The B-side CPU-I/O enclosure
- The B-side of the optional network I/O enclosure
- One side of each disk storage enclosure that is installed in the system cabinet
- The B-side of a supported Ethernet switch
- On ftServer V 250, V 300, V 500, and V 502 systems, the B-side of a supported Fibre Channel switch.

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 cooling required to service dissipated power
- 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 2-9 for more information about power cords.
- Table 2-2, a worksheet for site AC power and HVAC requirements.

For each row 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. Worksheet for Planning Site AC Outlets and Cord Lengths

Product Purchased	Quantity of Product	No. of AC Outlets Required	Subtotal of AC Outlets	Type of Plug	AC Cord Lengths
ftServer V 150, V 250, V 300, V 500, or V 502	—	—	0†	NEMA L6-20P or hardwired to UPS AC output terminals. See Table 2-5.	15 ft. (4.5m)
UPS units (two for each ftServer system)		x 1 =		Hardwire to site AC power source.	Provided by customer.
Legacy E124 storage-system cabinet		—	0‡	See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582).	
Total AC connectors					

† All ftServer components plug into PDUs in the main cabinet. Each PDU receives power from a UPS unit.
‡ Each power strip in a legacy E124 storage-system 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 Site AC Power and HVAC Requirements

Product Purchased	Quantity	Watts	Watts Subtotal	Convert to BTUs	BTUs/hr. Subtotal
ftServer V 300 and V 500 systems		x 4200† =		x 3.41 =	
ftServer V 150 and V 250 systems		x 2500‡			
ftServer V 502 system in same cabinet with V 250, V 300, or V 500 system		x 6300§ =		x 3.41 =	
RSN console server		x 4.2 =		x 3.41 =	
RSN modem		x 22 =		x 3.41 =	
Optional network I/O enclosure (fully loaded)		x 750 =		x 3.41 =	
Legacy D910 FC disk enclosures (fully populated)		x 363 =		x 3.41 =	
Total BTUs/hr.					
Total watts					

† For maximum configuration ftServer V 300 and V 500 systems consisting of two CPU-I/O enclosures, one dual tape-drive enclosure, six fully populated ftScalable Storage trays, two Ethernet switches, and two Fibre Channel switches.
‡ For maximum configuration ftServer V 150 and V 250 systems consisting of two CPU-I/O enclosures, one single tape-drive enclosure, two fully populated ftScalable Storage trays, and two Ethernet switches.
§ For maximum configuration ftServer V 300 and V 500 systems with additional V 502 system in the cabinet. Configuration consists of four CPU-I/O enclosures, one dual tape-drive enclosure, eight fully populated ftScalable Storage trays, two Ethernet switches, and four Fibre Channel switches.

Selecting a UPS Unit for ftServer Systems

Stratus does not sell or service UPS units. However, Stratus has qualified UPS models for use with ftServer V 150, V 250, V 300, V 500, and V 502 systems.

Each 38U system cabinet uses two UPS units: one to supply power to the A-side power distribution system and one to supply power to the B-side. Stratus does not supply the UPS units. You must purchase them directly from the UPS vendor.

Use Table 2-2 to determine the number of watts your system requires and use Table 2-3 to select a qualified Chloride UPS model.

Table 2-3. Qualified Chloride UPS Models *(Page 1 of 2)*

Region or Country	ftServer System Configuration	UPS Quantity, Model Number, and Options	Power Output of One UPS (Watts)
North and South America	ftServer V 150 or V 250 system	Two LT081XAT-0H8SX	4760
	ftServer V 150 or V 250 system with network I/O enclosure	Two LT081XAT-0H8SX	4760
	ftServer V 300 or V 500 system	Two LT081XAT-0H8SX and two LPBP610-2 batteries (one for each UPS)	4760
	ftServer V 300 or V 500 system with network I/O enclosure	Two LT081XAT-0H8SX and two LPBP610-2 batteries (one for each UPS)	4760
	ftServer V 502 system in same cabinet with V 250, V 300, or V 500 system (without network I/O enclosure)	Four LT081XAT-0H8SX	4760
International	ftServer V 150 or V 250 system	Two LT081XIT-0E3KX	4760
	ftServer V 150 or V 250 system with network I/O enclosure	Two LT081XIT-0E3KX	4760
	ftServer V 300 or V 500 system	Two LT081XIT-0E3KX and two LPBP610-2 batteries (one for each UPS)	4760
	ftServer V 300 or V 500 system with network I/O enclosure	Two LT081XIT-0E3KX and two LPBP610-2 batteries (one for each UPS)	4760
	ftServer V 502 system in same cabinet with V 250, V 300, or V 500 system (without network I/O enclosure)	Four LT081XIT-0E3KX	4760

Table 2-3. Qualified Chloride UPS Models *(Page 2 of 2)*

Region or Country	ftServer System Configuration	UPS Quantity, Model Number, and Options	Power Output of One UPS (Watts)
Japan	ftServer V 150 or V 250 system	Two LT081XJT-0H0SX	4760
	ftServer V 150 or V 250 system with network I/O enclosure	Two LT081XJT-0H0SX	4760
	ftServer V 300 or V 500 system	Two LT081XJT-0H0SX and two LPBP610-2 batteries (one for each UPS)	4760
	ftServer V 300 or V 500 system with network I/O enclosure	Two LT081XJT-0H0SX and two LPBP610-2 batteries (one for each UPS)	4760
	ftServer V 502 system in same cabinet with V 250, V 300, or V 500 system (without network I/O enclosure)	Four LT081XJT-0H0SX	4760

Use 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.

Table 2-4. Qualified APC UPS Models *(Page 1 of 2)*

Region or Country	ftServer System Configuration	UPS Quantity, Model Number, and Options	Power Output of One UPS (Watts)
North and South America	ftServer V 150 or V 250 system	Two SYH4K6RMT	2800
	ftServer V 150 or V 250 system with network I/O enclosure	Two SYH4K6RMT (each with one SYBT2 battery)	2800
	ftServer V 300 or V 500 system	Two SYA8K16RMP (each with SYPD7 backplate kit and one SYBT5 battery)	6400
	ftServer V 300 or V 500 system with network I/O enclosure	Two SYA8K16RMP (each with SYPD7 backplate kit and two SYBT5 batteries)	6400
	ftServer V 502 system in same cabinet with V 250, V 300, or V 500 system (without network I/O enclosure)	Four SYH4K6RMT (each with one SYBT2 battery)	2800

Table 2-4. Qualified APC UPS Models *(Page 2 of 2)*

Region or Country	ftServer System Configuration	UPS Quantity, Model Number, and Options	Power Output of One UPS (Watts)
International	ftServer V 150 or V 250 system	Two SYH4K6RMI	2800
	ftServer V 150 or V 250 system with network I/O enclosure	Two SYH4K6RMI (each with one SYBT2 battery)	2800
	ftServer V 300 or V 500 system	Two SYA8K16RMI (each with one SYPT5 battery). Order two B52700-45V cords.	5600
	ftServer V 300 or V 500 system with network I/O enclosure	Two SYA8K16RMI (each with two SYPT5 batteries). Order two B52700-45V cords.	5600
	ftServer V 502 system in same cabinet with V 250, V 300, or V 500 system (without network I/O enclosure)	Four SYH4K6RMI (each with one SYBT2 battery)	2800
Japan	ftServer V 150 or V 250 system	Two SYH4K6RMJ	2800
	ftServer V 150 or V 250 system with network I/O enclosure	Two SYH4K6RMJ (each with one SYBT2FR battery)	2800
	ftServer V 300 or V 500 system	Two SYA8K16RMJ (each with SYPD7 backplate kit and one SYBT5FR battery)	5600
	ftServer V 300 or V 500 system with network I/O enclosure	Two SYA8K16RMJ (each with SYPD7 backplate kit and two SYBT5FR batteries)	5600
	ftServer V 502 system in same cabinet with V 250, V 300, or V 500 system (without network I/O enclosure)	Four SYH4K6RMJ (each with one SYBT2FR battery)	2800

Plan for sufficient UPS capacity if you want to connect legacy E124 storage-system cabinets to your ftServer system. Refer to Table 2-2 for wattage requirements of each D910 disk enclosure in your E124 cabinets. You may be able to connect your E124 cabinets to your ftServer UPS units as long as they provide sufficient output power. Contact your UPS vendor for more information.

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 PDU AC input power cords connect to the qualified UPS models.

WARNING

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 code.

Table 2-5. UPS to PDU AC Power Cords for Qualified UPS Models

UPS Model	UPS to PDU Power Cord
Chloride - LT081XAT-0H8SX APC - SYA8K16RMP (with SYPD7 backplate kit)	The A-side and B-side PDU AC input cords plug into L6-20R receptacles on the A-side and B-side UPS units, respectively.
Chloride - LT081XIT-0E3KX APC - SYA8K16RMI	Use two B52700-45V power cords for the A-side and B-side PDU AC input cords. These cords plug into the IEC C19 receptacles on the A-side and B-side UPS units, respectively.
Chloride - LT081XJT-0H0SX APC - SYA8K16RMJ (with SYPD7 backplate kit)	The A-side and B-side PDU AC input cords plug into L6-20R receptacles on the A-side and B-side UPS units, respectively.
APC - SYH4K6RMT	The A-side and B-side PDU AC input cords plug into L6-20R receptacles on the A-side and B-side UPS units, respectively.
APC - SYH4K6RMI	Use two B52700-45V power cords for the A-side and B-side PDU AC input cords. These cords plug into the IEC C19 receptacles on the A-side and B-side UPS units, respectively.
APC - SYH4K6RMJ	The A-side and B-side PDU AC input cords plug into L6-20R receptacles on the A-side and B-side UPS units, respectively.

Power Cord Summary

Table 2-6 describes where you can find more information about PDU, UPS, and Legacy E124 expansion storage-system cabinet power cords.

WARNING

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

Table 2-6. Power Cords

Component	Power Cord
UPS (qualified by Stratus)	UPS input - Customer supplied (hardwired to UPS AC input terminals). Refer to UPS manufacturer's requirements.
	UPS output - See "AC Power Connections to Qualified UPS Models" on page 2-8
PDU	See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582).
Legacy E124 storage-system cabinet	AC source to power strips in the cabinet - See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582)

Main Cabinet Ground Cables

Table 2-7 provides information about the main cabinet ground cable.

Table 2-7. 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

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

Room Requirements

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

- Is a computer room
- Provides clearances for air circulation, opening cabinet doors, removing cabinet panels, and servicing the system from the front and rear

  Locate the front and rear of the system at least 2.5 ft (0.76m) away from walls and other obstructions.

- Maintains reasonable temperature and humidity levels and has a thermometer and humidistat to monitor room temperature and humidity

  See Chapter 2, “AC Power Planning” for detailed information about HVAC planning.

- Is as free of dust as possible, meeting, at a minimum, ISO 14644-1 class 8 standards for a clean-room environment

  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.

- Has sufficient floor space for external components, such as the optional external E124 storage-system cabinets.
- Provides a table or desktop for external devices such as a telephone, RSN modem and console server, and a system console

  Each of these devices requires table or rack space. You **cannot** place a peripheral component on top of a system cabinet.

- Allows the system and peripheral devices to be placed within the room so that power cords and communications cables will reach their respective power receptacles, telephone jacks, and other connection points
- Provides communications cable connectors or patch panels as needed
- Provides two electrically separate grounded AC circuits, to connect to the UPS units
- Provides grounded AC wall outlets for external components that do not connect to a PDU
- Provides cutouts in the floor for routing cables, if the site has an elevated floor
- Contains space for future expansion

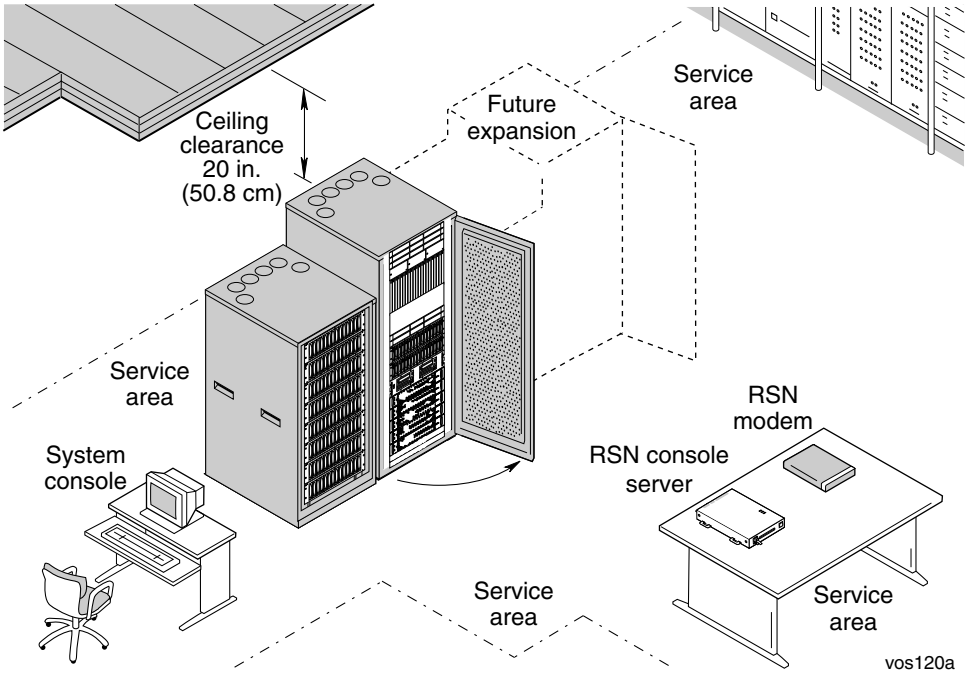
CAUTION

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

See Appendix A, “Specifications” and *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for the dimensions of system components.

Figure 3-1 illustrates the space-planning considerations.

Figure 3-1. 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.

Planning for Cables

At sites with solid (non-raised) floors, the cables exit from the top of the cabinet and are routed along the ceiling.

At sites with raised floors, the cables exit from the bottom rear of the cabinet and are routed under the floor.

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

- Two telephone lines:
  - One telephone line for use when calling for service
  - One telephone line for the RSN modem
- Ethernet jacks, switches, or hubs, as needed

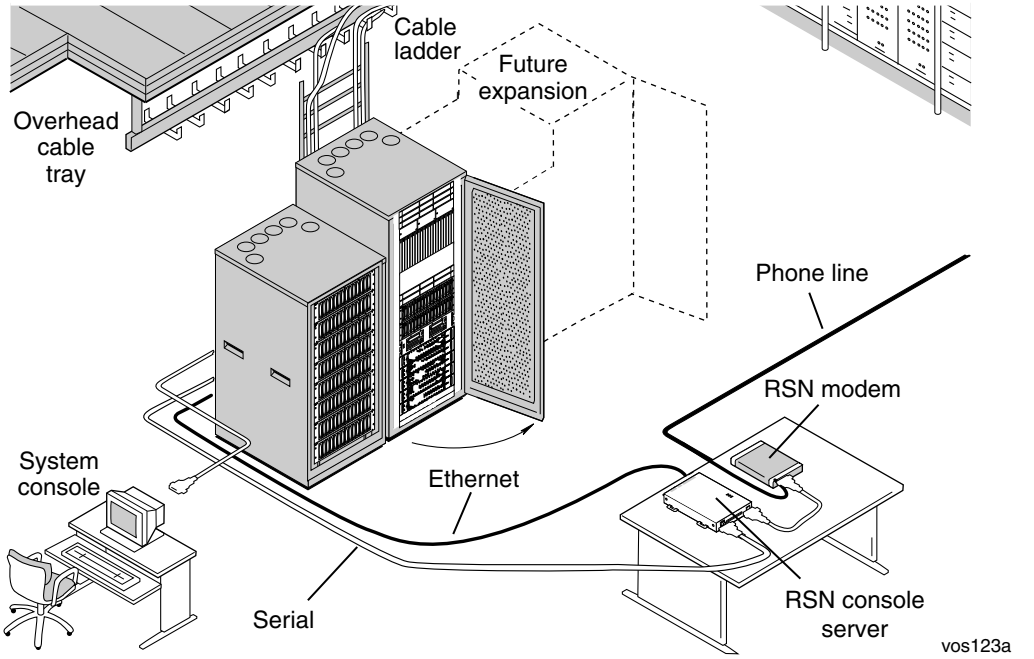
- Two UPS units, within reach of the power cords from the PDUs
- For external components, AC wall outlets within reach of the power cords from the components

Make sure that cables you plan to connect to the system are long enough to reach between the system and external components or connections. For information about specific cables and power cords, see the following:

- “Power Cord Summary” on page 2-9
- Chapter 4, “Communications Line Planning”
- *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for information about cable lengths for peripheral components available from Stratus.

Figure 3-2 illustrates various cabling considerations.

Figure 3-2. Cabling Considerations



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, “Specifications” provides detailed specifications for each of the system’s components.

Figure 3-2 illustrates a typical layout for the system cabinet, storage cabinet, the system console, and the RSN modem and console server.

Use the equipment templates in Figure 3-3 and the site-layout grid in Figure 3-4 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

NOTE

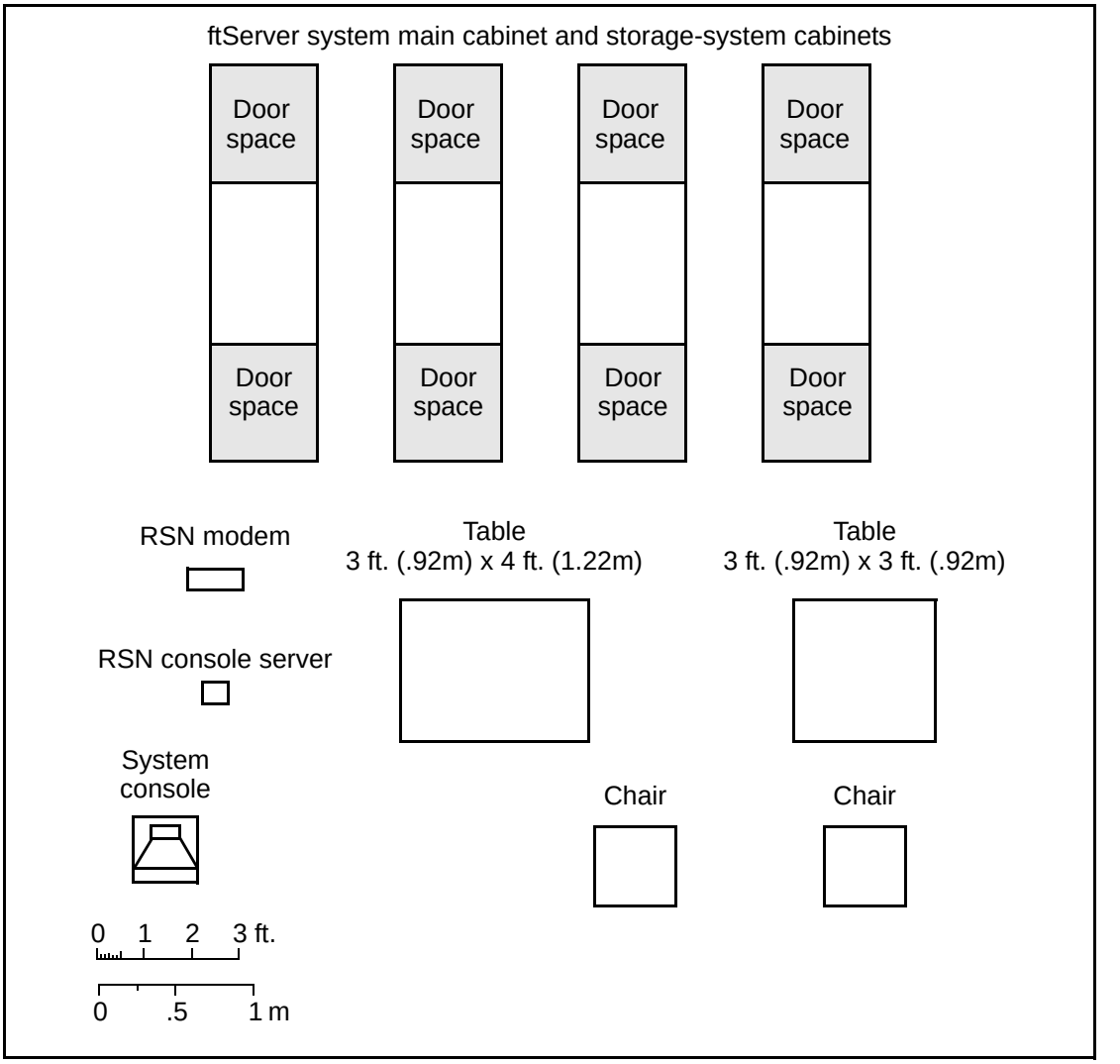
Make sure that all cords and cables are long enough to reach between their respective components and connectors. Route all cables out of the way of foot traffic.

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

The site-layout grid in Figure 3-4 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 3-4 is 1/4-inch (0.64 cm) equals 1 foot (30.5 cm).

In Figure 3-4, outline the room in which you will install your ftServer system. Then, photocopy and cut out the templates in Figure 3-3 and arrange them to represent your ftServer configuration. The equipment templates are drawn to the same scale as the grid page.

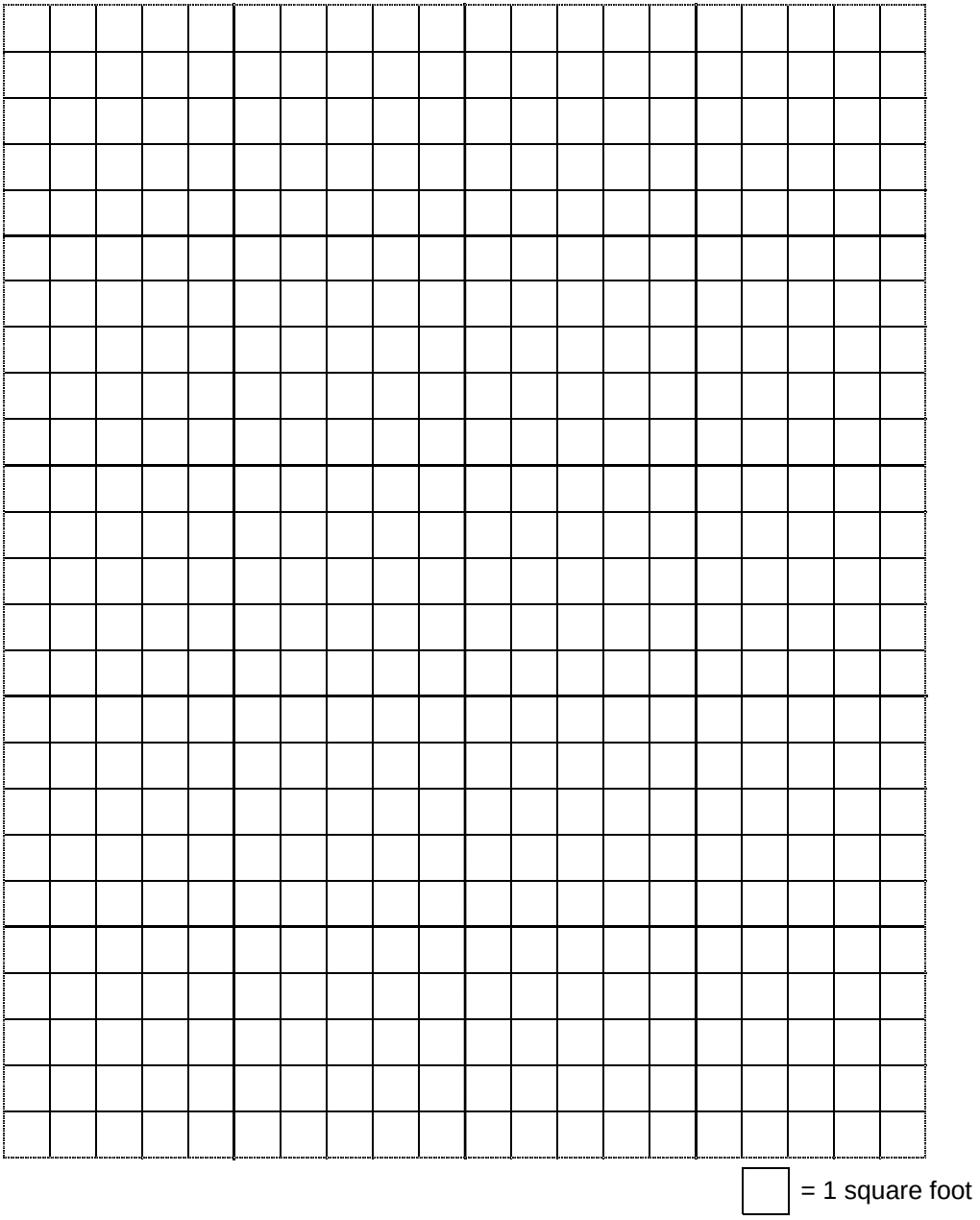
Figure 3-3. System Equipment Templates



NOTE

The shading on the templates indicates the access area required for servicing.

Figure 3-4. Site-Layout Grid



Chapter 4
Communications Line Planning

This chapter describes the communications cables that ftServer V 150, V 250, V 300, V 500, and V 502 systems require. It contains the following sections:

Maintenance Network Connections

Many of the components in V 150, V 250, V 300, V 500, and V 502 systems are connected to U772 24-Port 10/100 Ethernet Switches to form a maintenance network. These components include:

- ftScalable Storage RAID controller modules
- RSN console server
- UPS units
- PC console

The CAC or other authorized Stratus service representative uses this maintenance network for remote service and debug operations.

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

NOTES

1. The maintenance network is reserved for Stratus support and maintenance operations only. You should not connect any other devices to it.
2. The U772 24-Port 10/100 Ethernet Switch is the only supported switch. You cannot use any other type of hub or switch in the maintenance network.

Figure 4-1 shows the maintenance network's Ethernet and RS-232 connections for V 150 systems.

Figure 4-1. V 150 System Maintenance Network Ethernet and RS-232 Connections

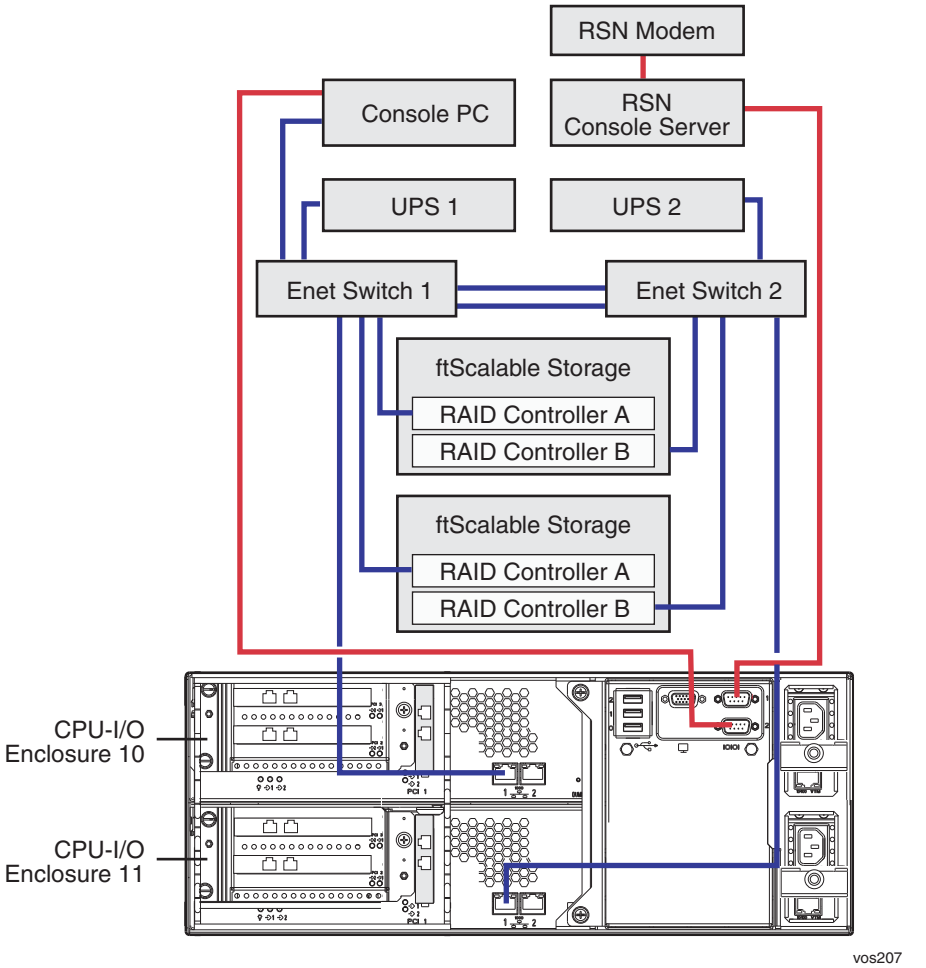
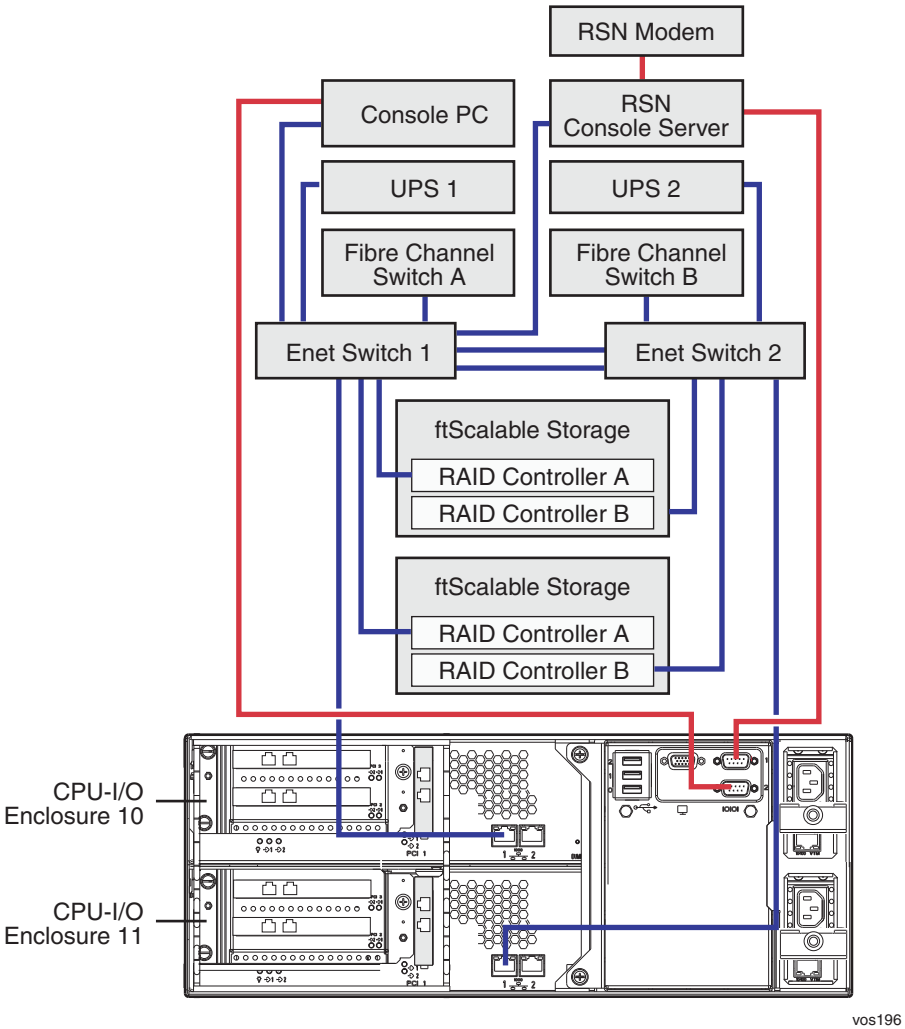


Figure 4-2 shows the maintenance network's Ethernet and RS-232 connections for V 250, V 300, V 500, and V 502 systems.

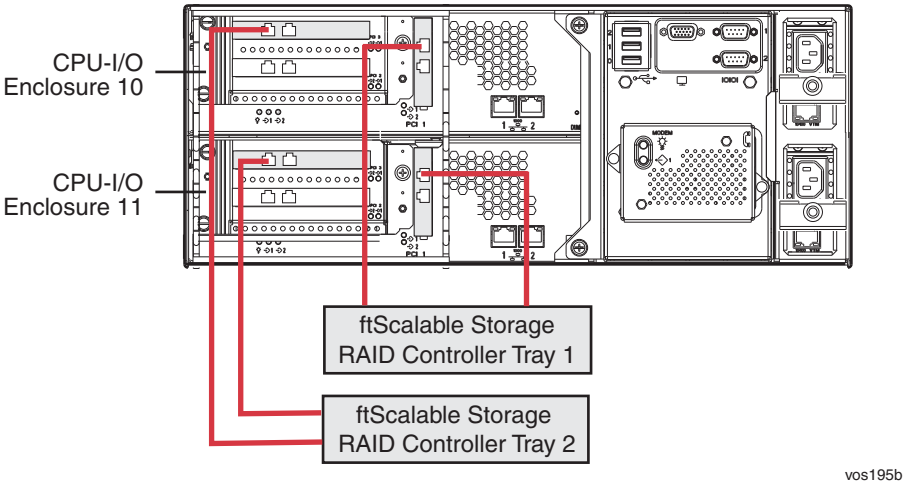
Figure 4-2. V 250, V 300, V 500, and V 502 System Maintenance Network Ethernet and RS-232 Connections



Fibre Channel Connections

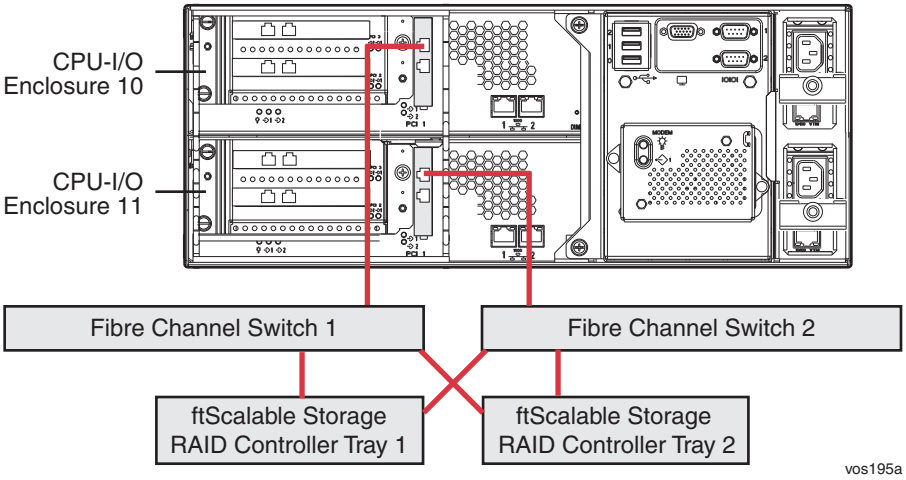
For ftServer V 150 systems, ftScalable Storage RAID controller trays connect directly to supported optical Fibre Channel PCI adapters. Figure 4-3 shows these connections.

Figure 4-3. ftServer V 150 System Fibre Channel Connections



For ftServer V 250, V 300, V 500, and V 502 systems, ftScalable Storage RAID controller trays connect to U773 12-Port Fibre Channel Switches. Figure 4-4 shows these connections.

Figure 4-4. Fibre Channel Connections with Switches



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. You will need to consider the following cables:

- Ethernet cables (AW-B38029) to connect:
  - RSN console server to a U772 Ethernet switch
  - Two embedded Ethernet ports on the system (PCI slot 5, port 0 of each CPU-I/O enclosure) to two U772 Ethernet switches
  - Two UPS units to two U772 Ethernet switches
  - The PC console (which you must supply) to a U772 Ethernet switch, for Web management of ftScalable Storage arrays
  - Network I/O enclosure (if network I/O enclosure is present) to two embedded Ethernet ports on the system (PCI slot 5, port 1of each CPU-I/O enclosure)
- Serial cables to connect:
  - System console to the CPU-I/O enclosure
  - RSN console server to modem
  - RSN console server to a CPU-I/O enclosure
- Hydra cables for U760 PICMG 2.16 adapters in network I/O enclosure
- Cables for PCI adapters in the CPU-I/O enclosures. See Table 4-5 for cable descriptions.
  - For ftServer V 250, V 300, V 500, and V 502 systems, fibre cable (AW-B90000-20) from ports on each U534V PCI adapter to each U773 12-Port Fibre Channel Switch and tape drive
  - For ftServer V 150 systems, fibre cable (AW-B90000-20) from ports on each U534V PCI adapter to each ftScalable Storage RAID controller tray and tape drive
  - Multi-mode, dual-fiber cables, which you must provide, to each U574V-LC Dual-Port Fiber Gigabit Ethernet Adapter
  - Copper Ethernet cable, which you must provide, from ports on each U578V PCI adapter to each network connection point
  - Optical Fibre-channel cables, which are provided with the adapter, from the U534V PCI adapter to each E124 storage-system cabinet

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

- Network connection points, which you must provide, for the network Ethernet cables from the CPU-I/O enclosures
- Separate class C Ethernet subnets for various system components. See "Ethernet Subnet Requirements" on page 4-7 for details.
- Two telephone lines:
  - One telephone line for use when calling for service
  - One analog telephone connection point for RSN modem cable

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
System console	CPU-I/O enclosures	Locate the system and system console within reach of the serial cable you will use.	25 ft. (7.62m)
RSN console server	CPU-I/O enclosures	Locate the RSN console server less than 20 ft. away from the system due to the length of the Ethernet cable (B000919-20 or B000925-20) provided with the system.	20 ft. (6.10m)
RSN modem	RSN 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 with the system.	10 ft. (3.05m)
UPS units	ftServer system	Locate each UPS unit less than 8 ft. away from the PDUs in the system cabinet due to the length of each PDU AC input cord provided with the system.	15 ft. (4.57m)

System Console Requirements

You must provide a PC running Windows XP to be the PC console. The PC must have:

- The Windows XP 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 the terminal emulation software package connects the PC console to the ftServer module's COM2 port to provide OpenVOS module console capabilities. An Ethernet cable which you must provide connects the PC console to a U772 24-Port 10/100 Ethernet Switch to provide web management capabilities of ftScalable Storage arrays.

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

Ethernet Subnet Requirements

Table 4-2 lists the minimum separate Class C Ethernet subnet requirements for systems with and without the optional network I/O enclosure.

Table 4-2. Ethernet Subnet Requirements

System Configuration	Separate Class C Ethernet Subnets
ftServer system **with** an optional network I/O enclosure	One subnet in the form 10.10.1.*X* to connect the host system to the maintenance network's U772 Ethernet switches. See "Maintenance Network Connections" on page 4-1 for more information.
	A second subnet in the form 10.20.1.*X* 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.*X* to connect the host system to the maintenance network's U772 Ethernet switches. See "Maintenance Network Connections" on page 4-1 for more information.
	Additional subnets to connect the host system to site networks

RSN Connection Planning

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.

ftServer systems can use a modem or an X.25 line to connect to the RSN. 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).

The modem connects to the RSN console server. You connect the ports on the RSN console server as follows:

- P2 serial port to the ftServer system's COM1 port
- P1 serial port to the RSN modem
- Ethernet port to a U772 24-Port 10/100 Ethernet Switch

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 150, V 250, V 300, V 500, and V 502 Systems: Operation and Maintenance Guide* (R606) for connection details.

Cables for External Components

Table 4-3 lists the cables used to connect ftServer systems to external components and specifies the source of the cable (supplied with the system, or which you must provide). For cables supplied with the system, the table lists its marketing ID and length.

Table 4-3. Cables for External Components *(Page 1 of 2)*

Component	Cable Description	Marketing ID	Length
PC console	One DB-9 to DB-9 asynchronous null modem cable for connecting the PC console to the COM2 port on the system	B20253-25	25 ft. (7.62m)
RSN modem	One DB-25 to DB-25 full modem cable for connecting port 1 of the console server to the modem	B10102-10V	10 ft. (3.05m)
	One telephone cord from the phone service jack to the modem, which you must provide	—	—

Table 4-3. Cables for External Components *(Page 2 of 2)*

Component	Cable Description	Marketing ID	Length
UPS unit	Two UTP Ethernet cables which you must provide for connecting the management cards of the two UPS units to the two U772 Ethernet switches	—	—
RSN console server	One DB-9 female to DB-9 female null modem cable, which is provided with the console server, for connecting port 2 of the RSN console server to the COM1 port on the system	B10106-25V	25 ft. (7.62m)

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 4-4 lists cables that connect to the U760 Eight-Port Serial Synchronous PICMG 2.16 Adapters.

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

PICMG 2.16 Adapter	Cable Description	Marketing ID	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	B001141V	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	B001143V	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	B001165V	12.0 ft. (3.65m)

PCI Adapter Cables

U574V-LC and U578V Ethernet 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 PCI adapter and up to four Ethernet cables for the ports on each U578V PCI adapter.

U534V PCI adapters that attach to FC disk enclosures are teamed for fault tolerance. Two cables for each adapter are supplied with the adapter.

Table 4-5 describes the Fibre Channel and Ethernet cables for these adapters. Be sure to provide Ethernet cables of sufficient length for the distance between the system and its connection point at the wall jack, hub, or peripheral device.

Table 4-5. PCI Adapter Cables

Component	Quantity	Cable
U574V-LC Dual-Port Fiber Gigabit Ethernet Adapter	Up to two for each U574V-LC PCI adapter	Two multi-mode, dual-fiber cables, which you must provide, that support either 62.5 or 50 micron wavelengths, 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
U578V Quad-Port Copper Gigabit Ethernet Adapter	Up to four for each U578V PCI adapter	Two UTP Ethernet cables which you must provide, with RJ-45 connectors, minimum Category 5
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

Chapter 5
Supported Configurations

This chapter contains information about supported cabinet configurations.

Cabinet Configurations

Figures 5-1 through 5-4 show the supported ftServer system cabinet configurations. The illustrations show the locations of components and filler panels.

Figure 5-1 illustrates an ftServer V 250 system and ftServer V 300 and V 500 systems without the optional ftScalable Storage expansion trays and network I/O enclosure. ftServer V 250 systems do not support ftScalable Storage expansion trays and only support a single tape drive.

Figure 5-1. Base ftServer V 250, V 300, or V 500 System

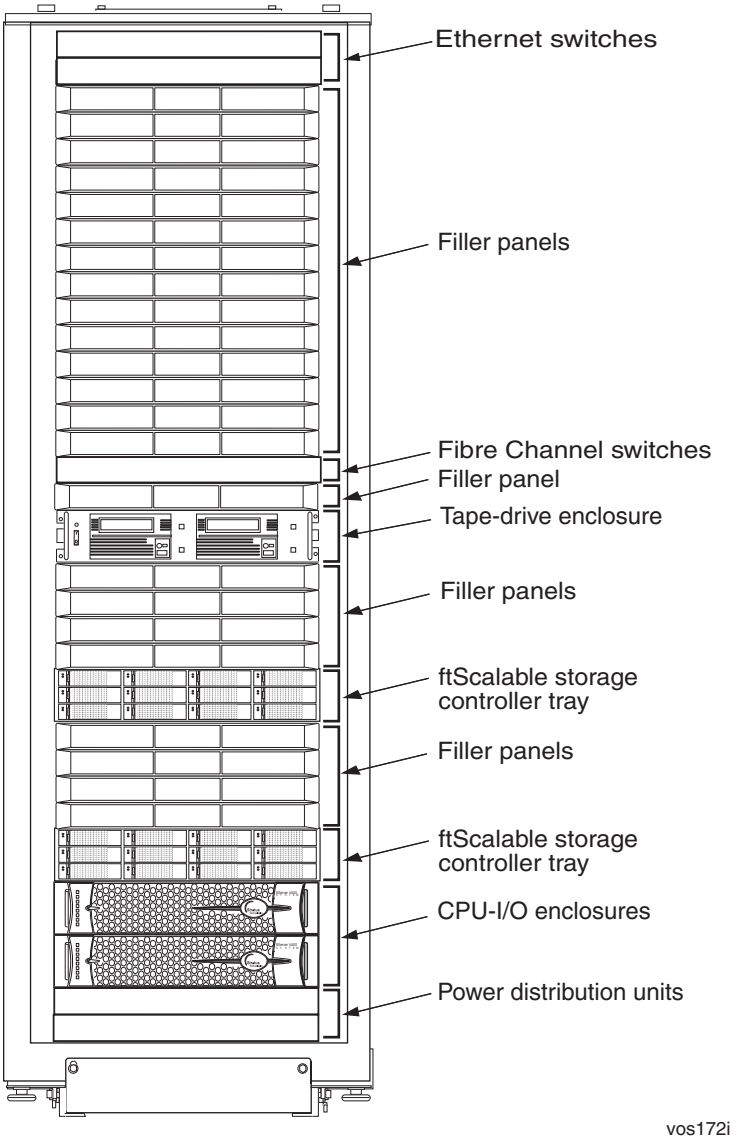


Figure 5-2 illustrates a fully configured ftServer V 300 or V 500 system that includes the optional ftScalable Storage expansion trays and network I/O enclosure.

Figure 5-2. Fully Configured ftServer V 300 or V 500 System

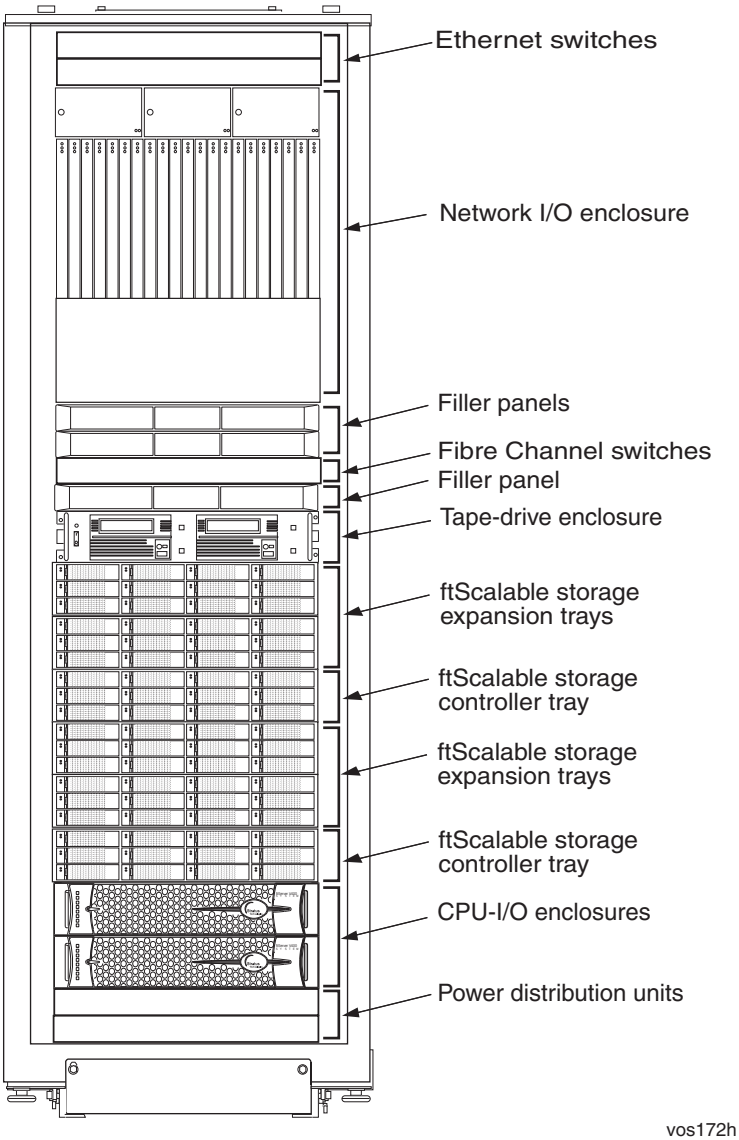


Figure 5-3 illustrates an ftServer V 500 system with the additional V 502 system installed in the cabinet. Both systems include the optional ftScalable Storage expansion trays.

Figure 5-3. ftServer V 500 System with V 502 System

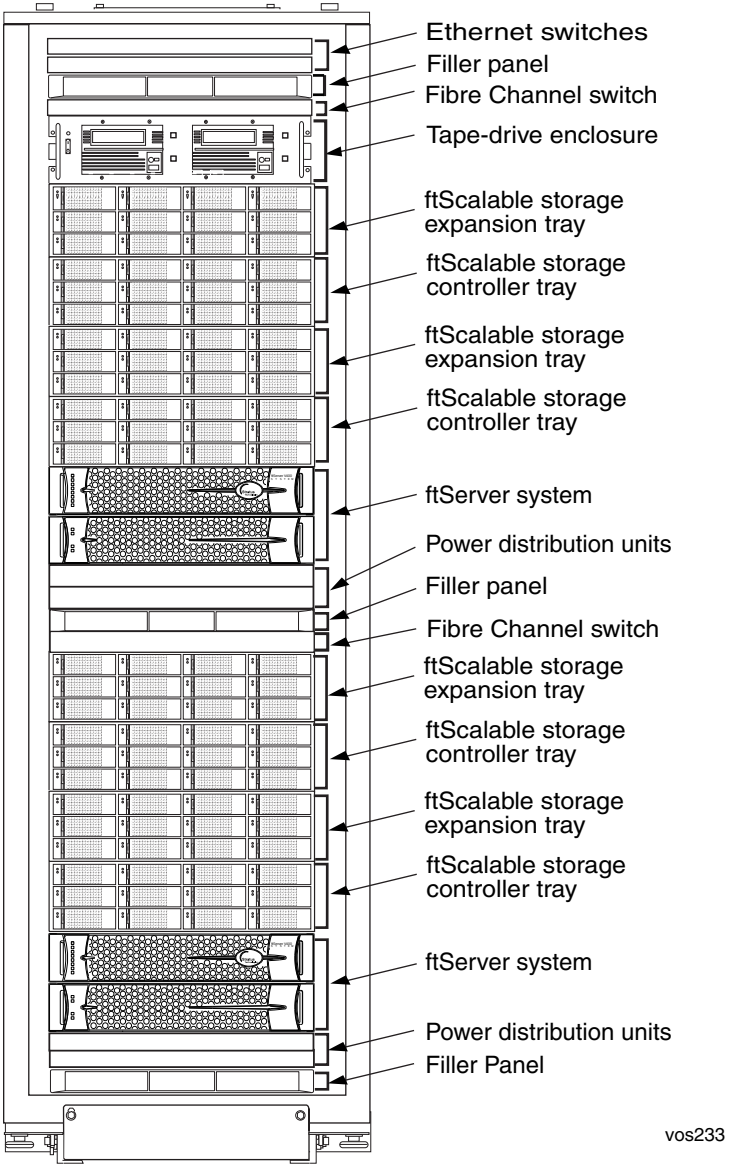
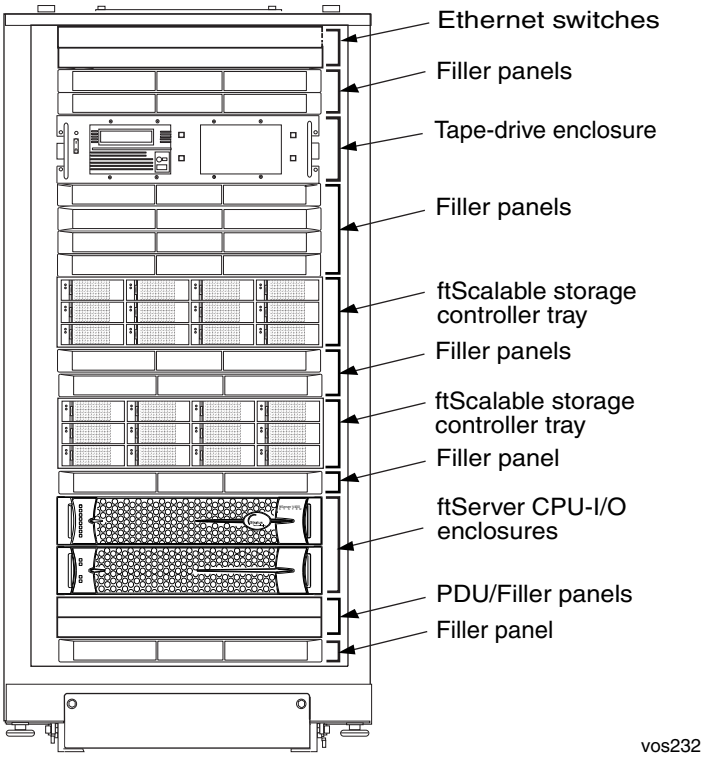


Figure 5-4 illustrates a base ftServer V 150 system without the optional network I/O enclosure. It is housed in a 24U cabinet. When ordered with the network I/O enclosure, it is housed in a 38U cabinet.

Figure 5-4. Base ftServer V 150 System



Appendix A
Specifications

For specifications, see:

See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for specifications of optional components.

System Cabinet Specifications

Table A-1 lists the specifications for the system cabinets and their shipping containers.

Table A-1. System Cabinet Specifications *(Page 1 of 2)*

Physical		
	24U Shipping Container	
	Height (including pallet)	56 in. (1.42m)
	Width	41 in. (1.04m)
	Depth	53 in. (1.35m)
	38U Shipping Container	
	Height (including pallet)	79.75 in. (2.03m)
	Width	41 in. (1.04m)
	Depth	53 in. (1.35m)

Table A-1. System Cabinet Specifications *(Page 2 of 2)*

	24U Cabinet	
	Height (including casters)	50 in. (1.27m)
	Width	27.1 in. (68.8 cm)
	Depth	40 in. (1.01m)
	Weight, empty	275 lb (124.8 kg)
	Weight, with ftServer system	631 lb (286.2 kg)
	Weight, with ftServer system, pallet, and shipping container	796 lb (361.1 kg)
	38U Cabinet	
	Height (including casters)	74 in. (1.9m)
	Width	27.1 in. (68.8 cm)
	Depth	40 in. (1.01m)
	Weight, empty	344 lb (156 kg)
	Weight, with ftServer system	725 lb (328.9 kg) to 1106 lb (501.7 kg), depending on ftServer model and options
	Weight, with ftServer system, pallet, and shipping container	890 lb (403.7 kg) to 1271 lb (576.5 kg), depending on ftServer model and options
Power		
	Input power	See Table 2-2
	Nominal input voltage (AC)	200-240 volts; 50/60 Hz
	Leakage current (maximum)	30 mA +/- 20%
Environmental		
	Operating temperature	41° F to 95° F (5° C to 35° C) For every 800 ft (243.8 m) above 2000 ft (609.6 m), lower the maximum operating temperature) by 1°C.
	Storage temperature	-38° F to 140° F (-40° C to 60° C), vented
	Operating altitude	0 ft to 10,000 ft (0m to 3,048m)

CPU I/O Enclosure Specifications

Figure A-1 shows the front of a CPU-I/O enclosure pair in an ftServer system cabinet, with its bezel pulled forward.

Figure A-1. ftServer CPU-I/O Enclosures - Front View

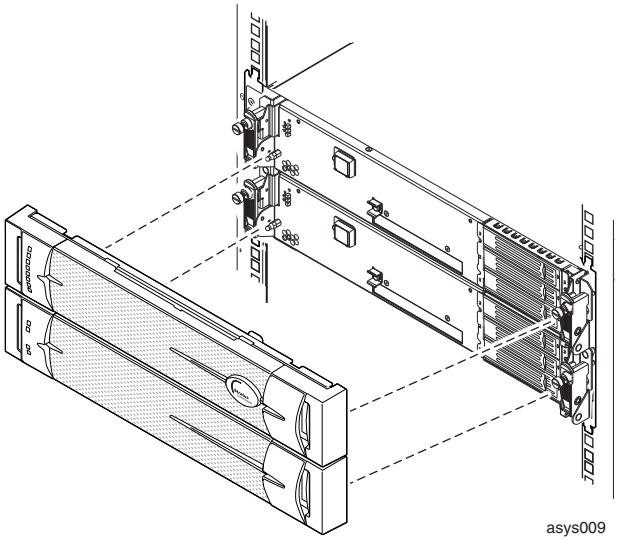
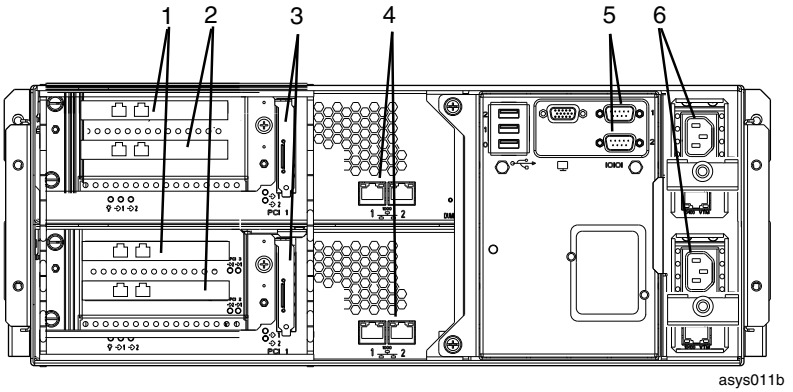


Figure A-2 shows the rear of a CPU-I/O enclosure pair in an ftServer system cabinet, specifying the locations of the connectors at the rear of the system.

Figure A-2. ftServer CPU-I/O Enclosures - Rear View



1	PCI slot 3	4	Embedded 10/100/1000-Mbps Ethernet ports (4)
2	PCI slot 2	5	Serial (COM) ports (2)
3	PCI slot 1	6	Power receptacles (2)

Table A-2 lists the specifications for the ftServer CPU-I/O enclosure and backplane assembly. The specifications in Table A-2 do not include information about other components such as storage enclosures or tape drives. See the *Stratus ftServer Systems Peripherals Site Planning Guide* (R582) for the specifications of these other components.

NOTE

The system temperature and humidity requirements, defined in Table A-2 are the **minimum** requirements the site must provide.

Table A-2. CPU-I/O Enclosures: Specifications *(Page 1 of 2)*

Power	
Input power, CPU-I/O enclosures only	A-side enclosure: 600W B-side enclosure: 600W
Nominal input voltage (AC)	200-240 volts; 50/60 Hz
Protective earth ground current	3.5 milliamperes maximum for each AC power cord

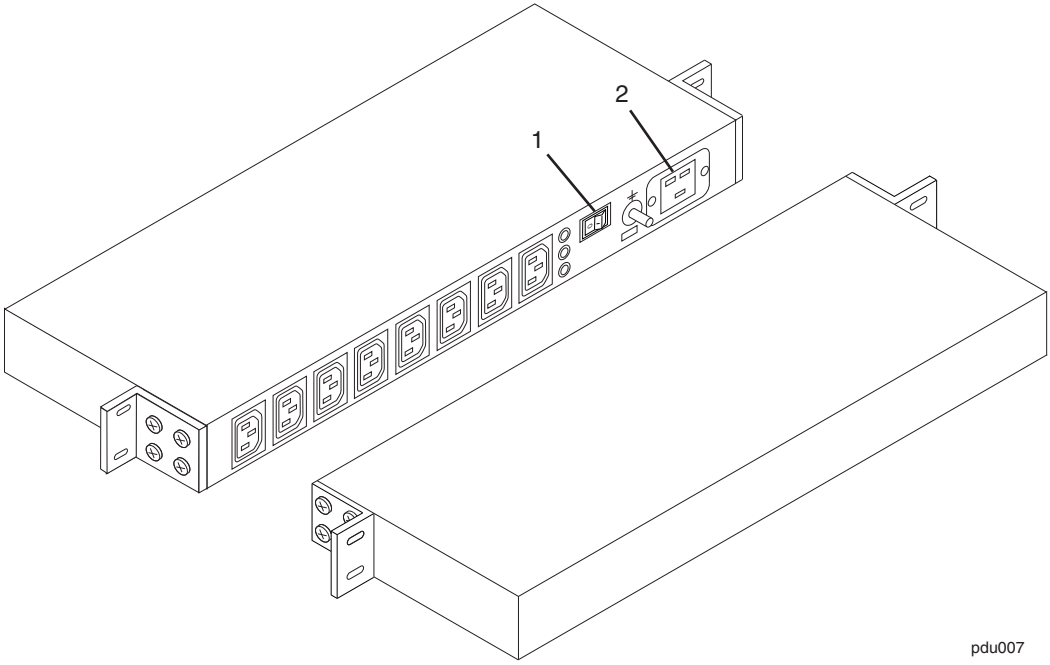
Table A-2. CPU-I/O Enclosures: Specifications *(Page 2 of 2)*

Physical Dimensions	
Height	7.0 in. (17.78 cm; 4U)
Width	17.50 in. (44.45 cm)
Depth	30 in. (76.2 cm), excluding screws and bezel
Weight, including 8 DIMMS, 4 processors	Two enclosures: 101 lb. (45.8 kg), fully loaded Rails and shelf unit: 13.8 lb (6.26 kg)
Environmental	
Storage temperature	-38° F to 140° F (-40° C to 60° C), vented
Operating altitude	0 ft to 10,000 ft (0m to 3,048m)
Relative humidity during operation	20% to 80% (noncondensing)
Relative humidity during storage	20% to 80%
Heat dissipation	Chapter 2, “AC Power Planning”
Air cleanliness	Meets ISO 14644-1 class 8 standards
Features	
Processors	ftServer V 150 and V 250: One Intel® Xeon® 3.2 GHz processor with Hyper-Threading Technology in each CPU-I/O enclosure ftServer V 300: Two Intel Xeon 3.2 GHz processors with Hyper-Threading Technology in each CPU-I/O enclosure ftServer V 500 and V 502: Two Dual-Core Intel Xeon 2.8 GHz processors with Hyper-Threading Technology in each CPU-I/O enclosure
Memory	Eight physical dual data rate (DDR) inline memory module (DIMM) slots in each CPU-I/O enclosure
Ports	Two 10/100/1000-Mbps Ethernet ports in each CPU-I/O enclosure Two AC power connectors and two serial ports
PCI slots	One low-profile PCI adapter slot and two full-height PCI adapter slots, each operating at 64-bits and 100 MHz, all user-configurable, in each CPU-I/O enclosure

AAP87600V PDU Specifications

The AAP87600V PDU, shown in Figure A-3, supplies power to ftServer systems and optional rack-mountable components.

Figure A-3. AAP87600V PDU



1 Power switch

2 Power receptacle

Table A-3 lists the specifications for the AAP87600V PDU.

Table A-3. AAP87600V PDU: Specifications

Power	
Input power	N/A
Nominal input voltage; frequency	200–240 VAC; 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 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	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)

AAP87600V PDU Power Cords

Table A-8 describes the power cords that connect AAP87600V PDUs to your power source. The power cords are rated at 200-240 VAC and 50-60 Hz.

Table A-4. AAP87600V PDU: Power Cords to AC Mains *(Page 1 of 2)*

Power Cord	PDU Marketing ID	Power Cord Marketing ID
US NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) UL Markings	AAP87600V	B50171-45MV
Japan NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) PSE Markings	AAP87600V	B50175V

Table A-4. AAP87600V PDU: Power Cords to AC Mains *(Page 2 of 2)*

Power Cord	PDU Marketing ID	Power Cord Marketing ID
IEC-309, 250 VAC, 20A, 15 ft (4.5m)	AAP87600V	B50154-45MV

Table A-9 describes the power cords that connect AAP87600V PDUs to a UPS.

Table A-5. AAP87600V PDU: Power Cords to a UPS

Power Cord	PDU Marketing ID	Marketing ID
US NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) UL Markings	AAP87600V	B50171-45MV
Japan NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) PSE Markings	AAP87600V	B50175V
United States/International Jumper C20 to C19, 16A/250V, 15ft (4.5m) Black	AAP87600V	B52700-45MV

Table A-10 describes the power jumper cords that distribute power from AAP87600V PDUs to an ftServer system and to its separately-powered components.

Table A-6. AAP87600V PDU: Power Jumper Cords

Power Jumper Cord	Connector Types	Length	Marketing ID
Grey 10A 250 VAC	IEC 320 C13 to IEC 320 C14	6.56 ft (2.0m)	B50502-02MV
Black 10A 250 VAC	IEC 320 C13 to IEC 320 C14	6.56 ft (2.0m)	B50503-02MV

Legacy AAP86900V PDU Specifications

Table A-7 lists the specifications for the legacy AAP86900V PDU.

Table A-7. AAP86900V PDU: Specifications

Power	
Input power	N/A
Nominal input voltage; frequency	200–240 VAC; 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 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	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)

Legacy AAP86900V PDU Power Cords

Table A-8 describes the power cords that connect legacy AAP86900V PDUs to your power source. The power cords are rated at 200-240 VAC and 50-60 Hz.

Table A-8. AAP86900V PDU: Power Cords to AC Mains *(Page 1 of 2)*

Power Cord	PDU Marketing ID	Power Cord Marketing ID
US NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) UL Markings	AAP86900V	B50171-45MV

Table A-8. AAP86900V PDU: Power Cords to AC Mains *(Page 2 of 2)*

Power Cord	PDU Marketing ID	Power Cord Marketing ID
Japan NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) PSE Markings	AAP86900V	B50175V
IEC-309, 250 VAC, 20A, 15 ft (4.5m)	AAP86900V	B50154-45MV

Table A-9 describes the power cords that connect legacy AAP86900V PDUs to a UPS.

Table A-9. AAP86900V PDU: Power Cords to a UPS

Power Cord	PDU Marketing ID	Marketing ID
US NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) UL Markings	AAP86900V	B50171-45MV
Japan NEMA L6-20P to IEC 320 C19 20A/250V 15ft (4.5m) PSE Markings	AAP86900V	B50175V
United States/International Jumper C20 to C19, 16A/250V, 15ft (4.5m) Black	AAP86900V	B52700-45MV

Table A-10 describes the power jumper cords that distribute power from legacy AAP86900V PDUs to an ftServer system and to its separately-powered components.

Table A-10. AAP86900V PDU: Power Jumper Cords

Power Jumper Cord	Connector Types	Length	Marketing ID
Grey 10A 250 VAC	IEC 320 C13 to IEC 320 C14	6.56 ft (2.0m)	B50502-02MV
Black 10A 250 VAC	IEC 320 C13 to IEC 320 C14	6.56 ft (2.0m)	B50503-02MV

Appendix B
Electrical Circuit and Wiring Information

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

Fault Protection Requirements

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

The pair of PDUs in the cabinet use 20A or less circuit breakers in each power distribution branch that feeds the PDUs.

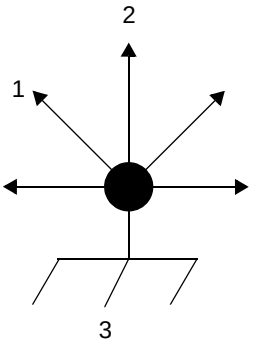
Grounding Considerations

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

Depending upon local conditions, ground potentials may differ between the system base and any peripheral devices connected to the system base. All grounds in the system **must** return to the same reference point in the power distribution system, as close as possible to **zero (0) volt potential** relative to earth reference ground. Earth reference ground is typically a metal stake in the ground to which the ground conductors from one or more buildings are attached.

As shown in Figure 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



1 To monitor

2 To ftServer system

3 Earth reference ground (0V)

Circuit Wiring Diagrams

For circuit-wiring information, see “AC Circuit Wiring” on page B-2.

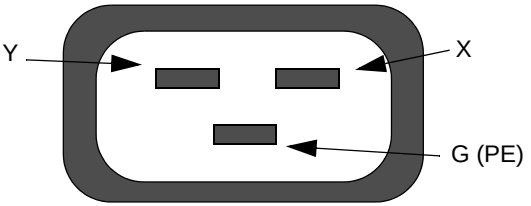
AC Circuit Wiring

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

- Figure B-3 illustrates a single-phase 120-volts AC circuit connection.
- Figure B-4 illustrates a single-phase 240-volts AC circuit connection.
- Figure B-5 illustrates a split-phase 120/240-volts AC circuit connection.
- Figure B-6 illustrates a three-phase 208-volts AC, Y-, or Δ-source circuit connection, phase-to-phase.
- Figure B-7 illustrates a three-phase 380V AC, Y-, or Δ-source circuit connection, phase-to-neutral.

In the diagrams in this appendix, the power inputs for ftServer V 150, V 250, V 300, V 500, and V 502 systems are labeled X and Y, as shown in Figure B-2, to eliminate any ambiguities in the nomenclature. For single-phase applications, the X input is connected to the L (Line) *hot* input, and the Y input is connected to the N (Neutral) input. However, for split-phase or three-phase applications, the X and Y inputs are connected to L1, L2, or L3 (separate lines). Therefore, for split-phase or three-phase applications, both X and Y can be electrically hot with respect to the system base (earth reference ground). Figure B-2 shows the physical locations of the X and Y inputs on the system base.

Figure B-2. Power Input Labeling



Power input A or B (Face View)

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

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

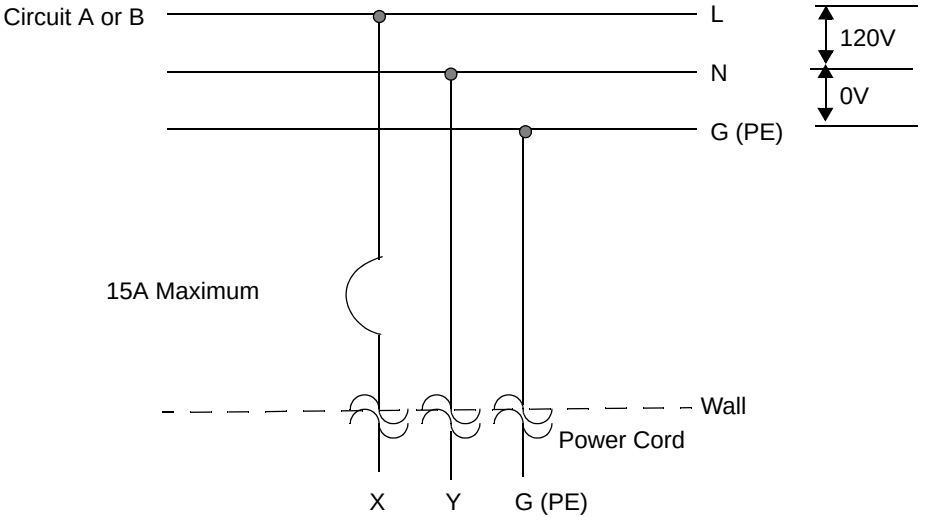


Figure B-4 shows a single-phase 240-volts AC circuit connection. Note that this application requires a single-pole circuit breaker.

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

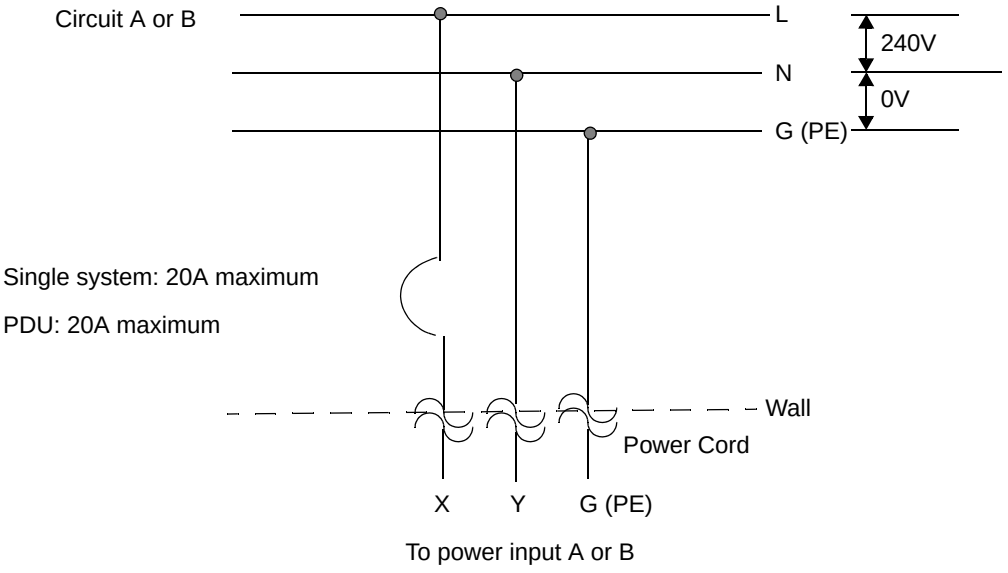


Figure B-5 shows a split-phase 120/240-volts AC circuit connection. Note that this application requires a double-pole circuit breaker.

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

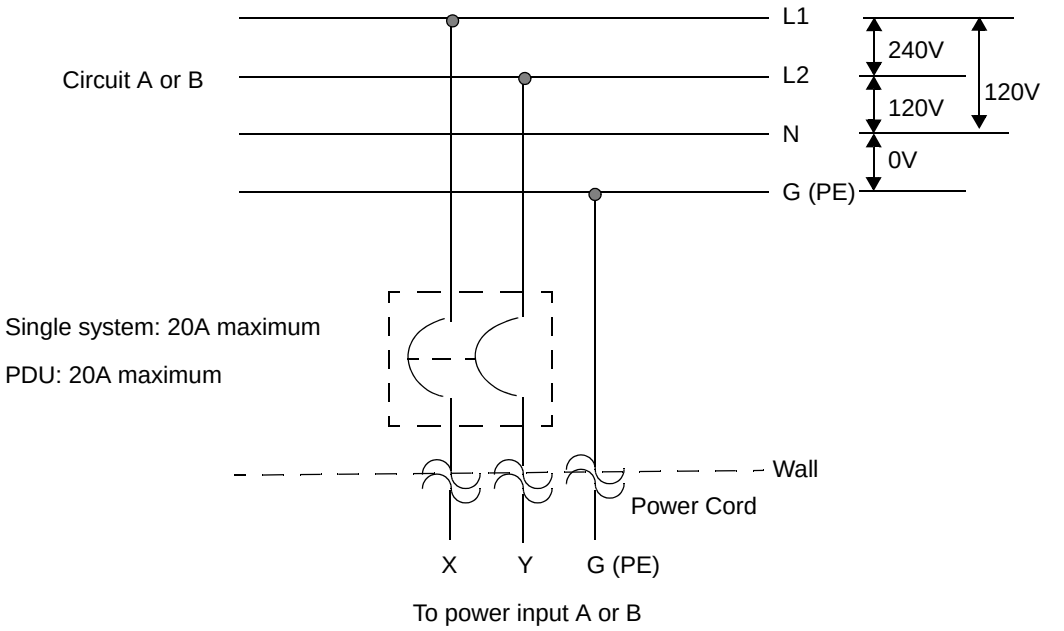


Figure B-6 shows a three-phase 208-volts AC, Y-, or Δ-source circuit connection, which is a phase-to-phase source connection. Note that the X and Y inputs on the system can be connected from L1 and L2, L2 and L3, or L1 and L3. This application requires a double-pole circuit breaker.

Figure B-6. Three-Phase 208-Volts AC, Y-, or D-Source Circuit Connection, Phase-to-Phase

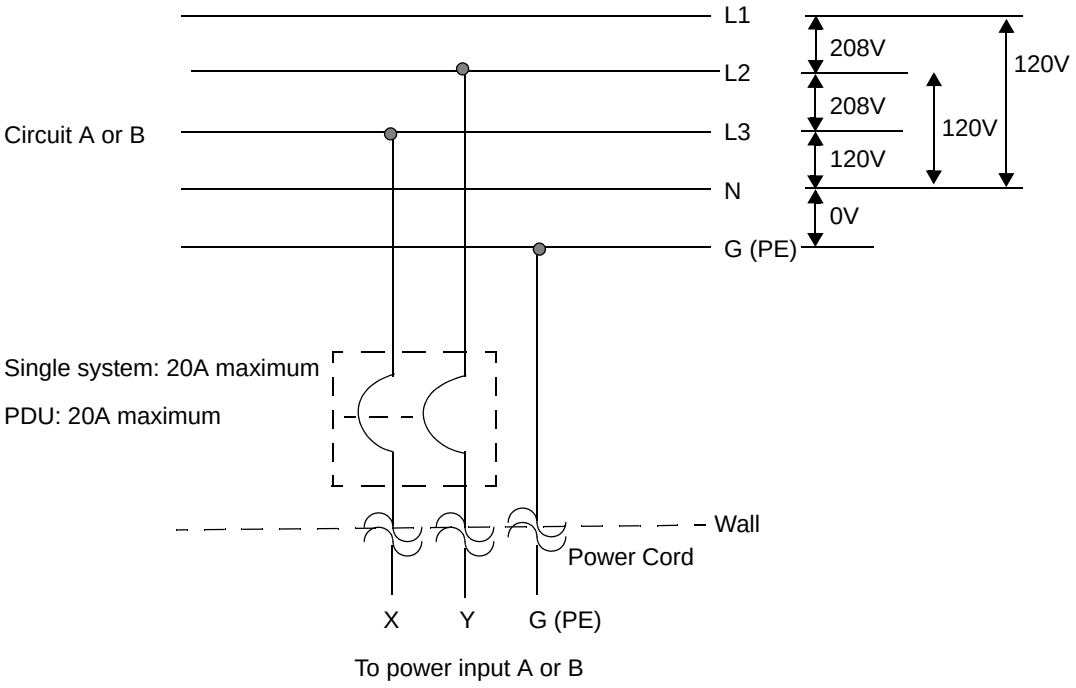
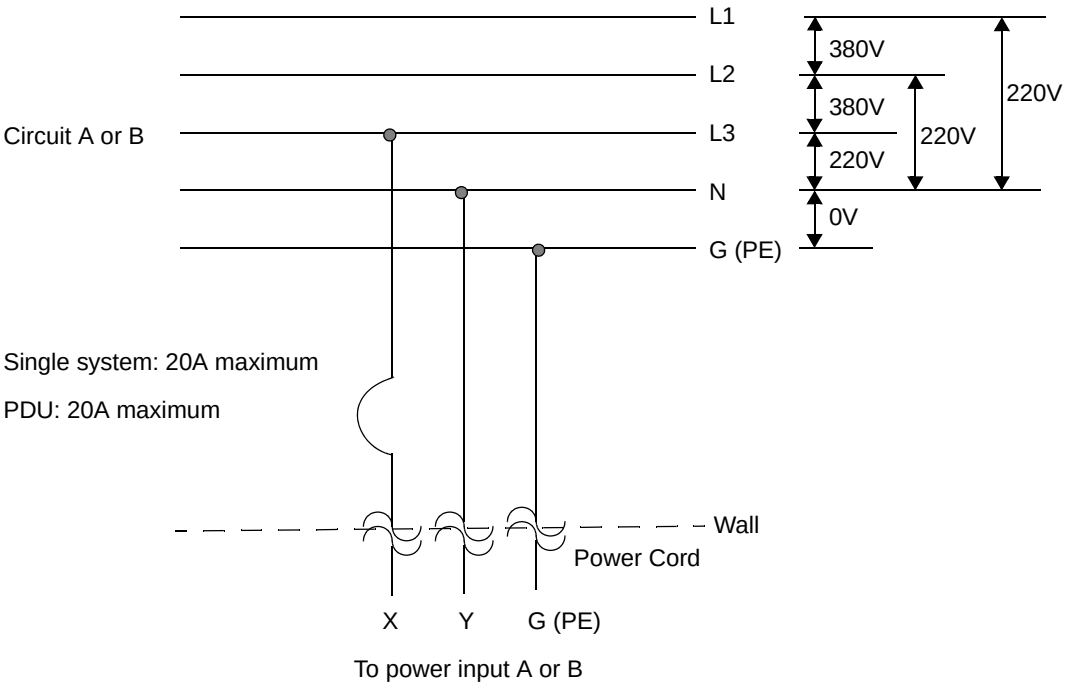


Figure B-7 shows a three-phase 380V AC, Y-, or Δ-source circuit connection, which is a phase-to-neutral source connection. Note that the system's X input can be connected to L1, L2, or L3. This application requires a single-pole circuit breaker.

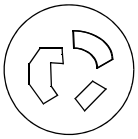
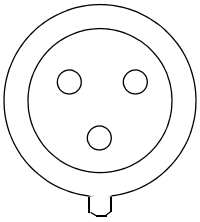
Figure B-7. Three-Phase 380V AC, Y-, or D-Source Circuit Connection, Phase-to-Neutral



Electrical Power Connectors

Table B-1 describes the connectors required by the PDU AC power cords that Stratus supplies with ftServer systems.

Table B-1. Connectors for AC Power Outlets

Connector	Configuration	Rating	Description
NEMA L6-20		20A, 250 volts AC	2-pole, 3-wire
IEC 60309 (formerly IEC 309)		16-20A, 250 volts AC	2-pole, 3-wire

Appendix C
Standards Compliance

For compliance information, see the following:

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 V 150, V 250, V 300, and V 500 Systems *(Page 1 of 2)*

Standard	Title	Country
EN 55022:2006 Class A	Limits and methods of measurement of radio interference characteristics of Information Technology Equipment	European Union
EN 55024:1998, A1: 2001, A2: 2003 Class A	Information Technology Equipment - Immunity characteristics - Limits and methods of measurement	European Union
EN 61000-3-2: 2000, A2: 2005	Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current <= 16 A per phase)	European Union
EN 61000-3-3: 1995, A1: 2001, A2:2005	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection	European Union
EN 60950-1 (2005)	Safety of Information Technology Equipment	European Union
CISP22: 2006 3rd Ed. Class A	Information Technology Equipment: Radio disturbance characteristics	N/A
FCC CFR47, Part 15: 8/14/2006, Class A	Code of Federal Regulations, Radio Frequency Devices	United States
AS/NZS CISPR 2006 3rd Ed. Class A	Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment	Australia and New Zealand
ICES-003: issue 4, 2/2004, Class A	Electronic Emissions from Data Processing Equipment and Electronic Office Machines	Canada
VCCI V-3 2006.04 Class A	Voluntary Control Council for Interference by Information Technology Equipment	Japan
MIC 2001-115, MIC 2001-116	Information Technology Equipment	South Korea

Table C-1. Compliance Standards for V 150, V 250, V 300, and V 500 Systems *(Page 2 of 2)*

Standard	Title	Country
CB SCHEME IEC 60950-1:2001 and EN 60950-1:2001, A11: 2004 1st Ed.	Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components	N/A
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
SABS IEC 60950	Safety of Information Technology Equipment	South Africa

VCCI Note

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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

Toxic and Hazardous Substances and Elements Disclosure

ftServer V 150, V 250, V 300, V 500 and V 502 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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