Stratus ftServer V 2404, V 4408, and V 6408 Systems: Site Planning Guide

Stratus Technologies
R645-03B

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Preface

The *Stratus ftServer V 2404, V 4408, and V 6408 Systems: Site Planning Guide* (R645) documents the site requirements and customer responsibilities related to preparing a site for the installation of V 2404, V 4408, and V 6408 systems.

This document is intended for those responsible for preparing a site for the installation of an ftServer V 2404, V 4408, or V 6408 system.

Revision Information

This manual is a revision. Change bars, which appear in the margin, note the specific changes to text since the previous publication of this manual. Note, however, that change bars are not used in new chapters or appendixes.

Changes include the following:

- Support for the AA-T53700 LTO-7 Single Tape-Drive Enclosure
- The removal of compliance information from this document. See “Regulatory Notice” for information about the new location of compliance information.
- The correction of some documentation errors

NOTICE

Contact your account representative for information about the availability of OpenVOS 19.*x* support for the NIO enclosure.

Notation Conventions

This document uses the notation conventions described in this section.

Warnings, Cautions, Notices, and Notes

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

WARNING

A warning indicates a hazardous situation that, if not avoided, could result in death or serious injury.

AVERTISSEMENT

Un avertissement indique une situation dangereuse qui, si pas évitée, pourrait entraîner la mort ou des blessures graves.

CAUTION

A caution indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

MISE EN GARDE

Une mise en garde indique une situation dangereuse qui, si pas évitée, pourrait entraîner des blessures mineures ou modérées.

NOTICE

A notice indicates information that, if not acted on, could result in damage to a system, hardware device, program, or data, but does not present a health or safety hazard.

NOTE

A note provides important information about the operation of an ftServer system or related equipment or software.

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

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

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

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/go/support/ftserver/location

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.

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

Regulatory Notice

All regulatory notices are provided in Compliance Information for Stratus Products (R002G), which is available on StrataDOC:

https://stratadoc.stratus.com/compliance_info/Compliance_Information_for_Stratus_Products.htm

Chapter 1
Site Planning for ftServer V 2404, V 4408, and V 6408 Systems

For an overview of required information and tasks you need to perform to prepare a site for ftServer V 2404, V 4408, and V 6408 systems, see:

Site Planning Overview

Site planning for fault-tolerant systems includes:

- Electrical power planning

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

- Space planning

  Plan the location of the system and external components to accommodate the lengths of the connecting cables.

  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.

- Other Infrastructure requirements

  Understand Ethernet requirements. Provide sufficient network and telephone connection points.

  Provide a PC to act as a system PC console. Stratus provides a serial cable for connecting the PC to the server. You must provide an Ethernet cable to connect the system PC console to the ftServer system.

Use the "Site Planning Checklist" on page 1-6 to track your site preparation progress.

For information about obtaining documents related to your ftServer system, see "System Documentation" on page 1-11.

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 or your authorized Stratus service representative to install the system, contact them after you have prepared the installation site and moved the system to the site. For more information about the CAC, see Getting Help in the Preface or the http://www.stratus.com/support/cac/ Web site.

See Chapter 5, "Supported Configurations" for illustrations of the rack configurations of your ftServer system and other rack-mounted components, and Appendix A, "System Specifications" for the specifications of the base ftServer systems and of PDUs. 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 as you plan the site:

- 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 or your authorized Stratus service representative to remotely diagnose, troubleshoot, and resolve problems online.

  Your system connects to the RSN by an RSN console server connected either to the Internet or to a modem. See “RSN Connections” on page 3-1 for more information.

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:

- One or two telephone lines as described in “Telephone Lines” on page 4-1:
- Ethernet ports, switches, or hubs, as needed
- Two UPS units, within reach of the power cords from the system or 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:

- Chapter 3, “Space Planning and Component Location”
- *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for information about cable lengths for peripheral components

Figure 1-1 shows cabling considerations for systems using the AA-E97900 RSN console server to connect to the Internet.

NOTE

The AA-E99100 RSN console server is located inside the system cabinet. Therefore, Figure 1-1 does not apply to systems using the AA-E99100 RSN console server.

Figure 1-1. AA-E97900 RSN Console Server Connections (Internet)

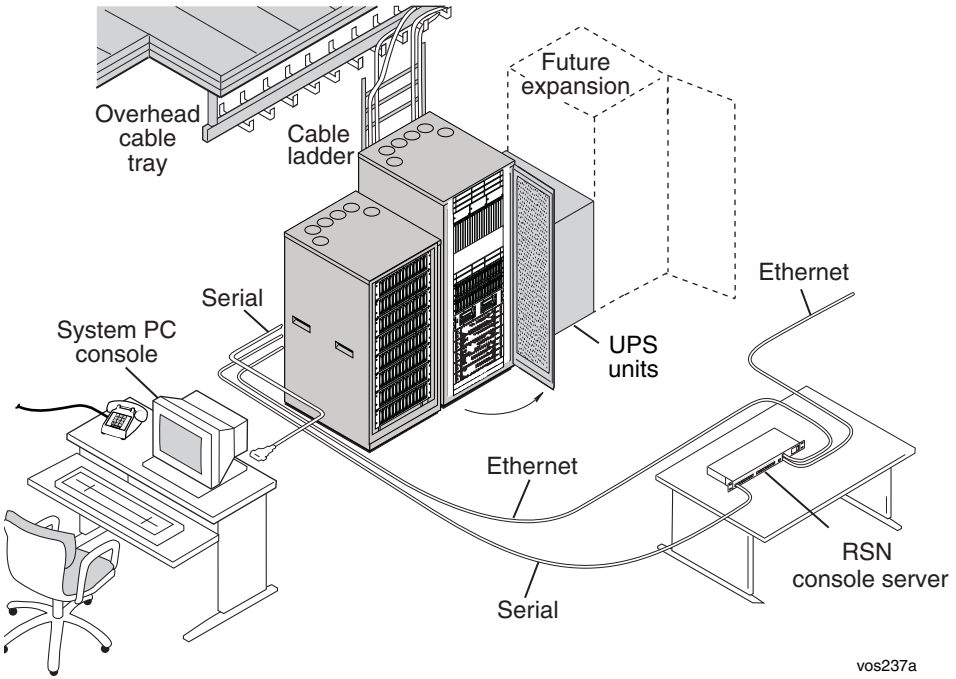


Figure 1-2 shows cabling considerations for systems using the AA-E99100 RSN console server to connect to a modem.

Figure 1-2. AA-E99100 Console Server Connections (Modem)

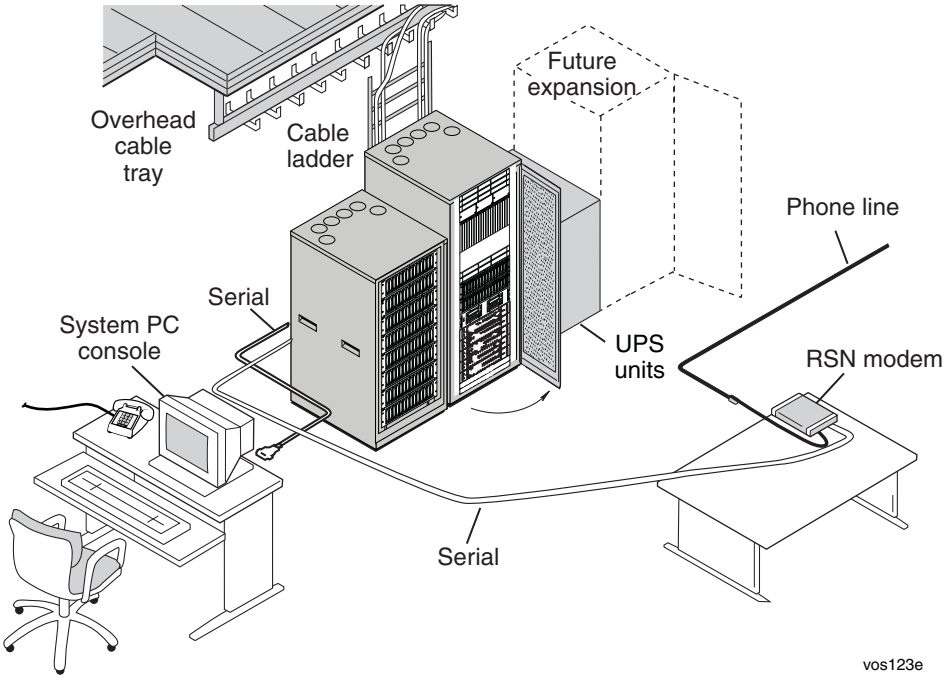
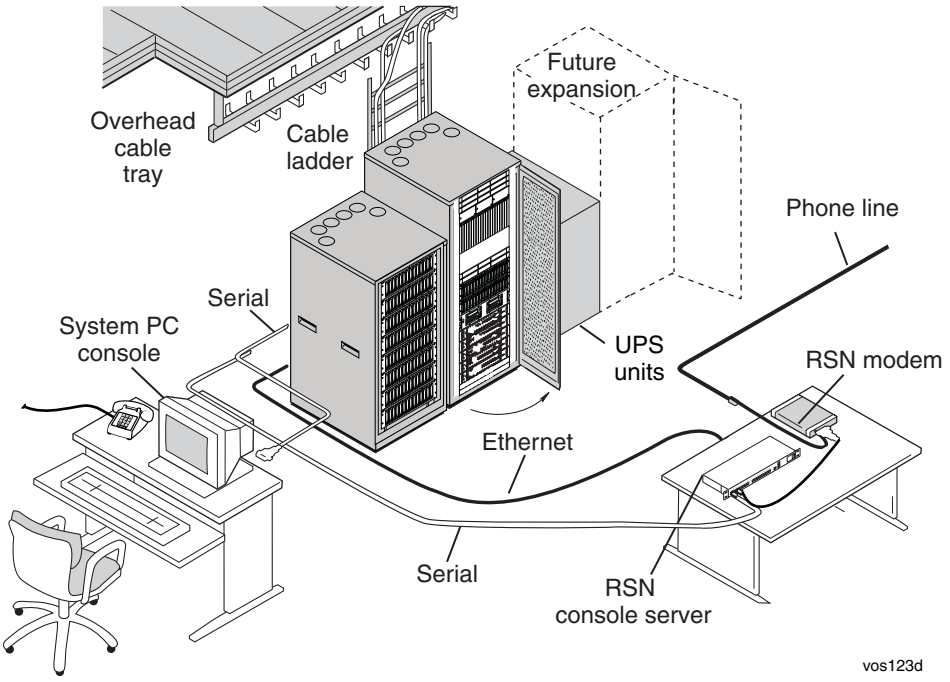


Figure 1-2 shows cabling considerations for systems using the AA-E97900 RSN console server to connect to a modem.

Figure 1-3. AA-E97900 Console Server Connections (Modem)



Site Planning Checklist

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

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

Planning for RSN Connectivity

- ❏ If using the AA-E99100 RSN console server to connect to the Internet, do you have an Ethernet connection to the Internet and do you have OpenVOS Release 18.0.0 or later installed?
- ❏ If using the AA-E97900 RSN console server to connect to the Internet, do you have an Ethernet connection to the Internet and do you have OpenVOS Release 17.1.0 or later installed?
- ❏ If using the AA-E99100 or AA-E97900 console server to connect to a modem, do you have an external telephone line available for the RSN modem?

NOTE

A dedicated phone line for the RSN modem 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.

Planning for Optional Components

- ❏ The system contains two 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	Total Number of Ports
U582V Quad-Port Gigabit Ethernet Adapter	4
U583V Quad-Port Fiber Gigabit Ethernet Adapter	4
U584V Dual-Port 10 Gigabit Ethernet Adapter †	2

† Not supported in V 2404 systems.

- ❏ Do you have a system PC console located at the installation site? Plan to keep the console located with the system.
- ❏ To plan for 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 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

  NOTICE

  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 of how you plan to arrange the system and copies of the following?
  - “Redundant Power Sources” on page 3-1
  - 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 1-9.
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 1-10.

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, perform the following tasks:

- Contact the CAC or your authorized Stratus service representative.
- Check the Shockwatch 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 or your authorized Stratus service representative.
- 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 or your authorized Stratus service representative.

Moving the System to the Installation Site

Before moving your system to the installation site, perform the following tasks:

NOTE

Moving a system requires **two** able-bodied persons.

1. Obtain a 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

Table 1-2 lists the hardware documents for ftServer V 2404, V 4408, and V 6408 systems, and the tasks described in each document.

Table 1-2. ftServer V 2404, V 4408, and V 6408 System Documentation

Document	Task
Stratus ftServer V Series Systems: PCI Adapter Guide (R679)	Install, configure, replace, or troubleshoot PCI adapters
Stratus ftServer Systems: Peripherals Site Planning Guide (R582)	Find information about optional equipment that you have ordered with your system that is needed to complete site preparation
Stratus ftServer V 2404, V 4408, and V 6408 Systems: Site Planning Guide (R645)	Prepare a site for installation of your ftServer system
Stratus ftServer V 2404, V 4408, and V 6408 Systems: Operation and Maintenance Guide (R646)	Start up, shut down, and operate your system Troubleshoot system hardware Remove and replace CRUs, including PCI adapters
Read Me First: Moving ftServer V 2404, V 4408, and V 6408 Systems to the Installation Site (R662)	Inspect and unpack ftServer system hardware

Safety Notices

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.

WARNING

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.

WARNING

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

WARNING

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

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.

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 or your authorized Stratus service representative.

WARNING

When installing a system or CRU, always connect the power cord first, before adding communications cables. The power cord contains the protective earth connection; it should be connected first and disconnected last, to maintain a grounded chassis.

Before attempting to remove a CRU from the system chassis, make sure to power off the CRU, disconnect communications cables, and then disconnect the power cord.

Never connect a power cord to a CRU when it is not located within the system chassis.

WARNING

Do not disassemble, repair, or alter the server, except as described in the operation and maintenance guide for your system. There is a risk of an electric shock or fire as well as equipment malfunction if you do not observe the instructions in the operation and maintenance guide for your system.

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.

CAUTION

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.

Consignes de sécurité

AVERTISSEMENT

Risque d'explosion si la batterie est remplacée par une autre de type incorrect. Jeter les batteries usagées conformément aux instructions fournies avec la batterie.

AVERTISSEMENT

Le système utilise deux cordons d'alimentation pour fournir des sources d'alimentation redondantes. Pour mettre un système entièrement hors tension, débrancher les deux cordons d'alimentation. Pour réduire le risque qu'un choc électrique puisse blesser une personne ou endommager le système, utiliser l'unité avec prudence même lorsqu'un seul cordon d'alimentation est branché.

AVERTISSEMENT

Pour éviter qu'une armoire ne bascule et blesse une personne ou endommage le système, commencer par installer les systèmes de bas en haut de l'armoire.

AVERTISSEMENT

En cas de remplacement du câble de modem fourni par Stratus, utiliser un câble homologué UL dont le calibre est d'au moins 26 AWG afin de prévenir les incendies.

AVERTISSEMENT

Pour éviter tout risque d'incendie, de choc électrique et de panne de matériel, empêcher l'eau ou les objets étrangers d'entrer dans l'équipement. Ne pas laisser d'eau ou d'objets étrangers, tels que des agrafes ou des trombones, entrer dans l'équipement.

AVERTISSEMENT

Pour éviter tout risque d'incendie ou de fuite de courant, ne pas brancher le cordon d'alimentation dans une prise non conforme. Utiliser une prise de courant avec une tension et un type d'alimentation appropriés, tel qu'indiqué dans ce guide.

AVERTISSEMENT

Ne pas installer l'équipement dans un lieu où une rallonge pourrait être nécessaire. L'utilisation d'une rallonge ne respectant pas les spécifications électriques présente un risque de surchauffe pouvant provoquer un incendie.

AVERTISSEMENT

Débrancher les cordons d'alimentation du serveur ou de la source d'alimentation avant d'installer ou de déplacer l'équipement. Toute la tension n'est coupée que lorsque les cordons d'alimentation sont débranchés.

AVERTISSEMENT

Ne pas installer ou entreposer l'équipement dans un lieu inadapté. Installer ou entreposer l'équipement dans un lieu qui satisfait aux exigences spécifiées dans ce guide. Éviter les situations suivantes pour empêcher le risque d'incendie:

- Poussière
- Forte humidité, comme à proximité d'une chaudière
- Exposition directe au soleil
- Instabilité, comme des endroits non stabilisés contre les tremblements de terre

AVERTISSEMENT

Ne pas utiliser ou entreposer ce produit dans un environnement corrosif.

Éviter d'utiliser ou d'entreposer ce produit dans un environnement qui pourrait contenir des gaz corrosifs. Ces gaz incluent, mais sans s'y limiter, du dioxyde de soufre, du sulfure d'hydrogène, du dioxyde d'azote, du

chlore, de l'ammoniac ou de l'ozone.

Éviter d'installer ce produit dans un environnement poussiéreux ou qui pourrait contenir des matériaux corrosifs, tels que du chlorure de sodium ou du soufre.

Éviter d'installer ce produit dans un environnement qui pourrait contenir des éclats de métal excessifs ou des particules conductrices dans l'air.

Ces environnements peuvent causer une corrosion ou des cours-circuits dans ce produit, ce qui endommage non seulement le produit, mais peut aussi provoquer un incendie.

Pour toute question concernant l'environnement sur le site planifié de l'installation ou de l'entreposage, veuillez communiquer avec votre centre d'assistance à la clientèle (CAC).

AVERTISSEMENT

Lors de l'installation d'un système ou d'une unité remplaçable par le client (CRU), commencez toujours par brancher le cordon d'alimentation, avant d'ajouter les câbles de communications. Le cordon d'alimentation est équipé d'une connexion de terre de protection; il doit être branché en premier et débranché en dernier afin de conserver un châssis relié à la terre.

Avant d'essayer d'enlever une CRU du châssis du système, veillez à bien mettre la CRU hors tension, à débrancher les câbles de communications, puis à débrancher le cordon d'alimentation.

Ne jamais brancher un cordon d'alimentation à une CRU lorsqu'elle n'est pas à l'intérieur du châssis du système.

AVERTISSEMENT

Ne pas démonter, réparer ni modifier le serveur, sauf comme décrit dans le manuel d'utilisation et d'entretien de votre système. Il existe un du manuel risque d'électrocution ou d'incendie ainsi qu'un risque de dysfonctionnement de l'équipement si vous ne respectez

pas les instructions d'utilisation et d'entretien de votre système.

AVERTISSEMENT

Ne placer aucun objet au-dessus du serveur. L'objet pourrait tomber et causer des blessures, endommager le matériel ou provoquer un incendie.

MISE EN GARDE

Ne pas laisser le plateau du DVD ouvert. De la poussière pourrait entrer dans l'équipement et causer une défaillance. Le plateau d'éjection pourrait également causer des blessures en position ouverte.

安全注意事項

WARNING

若錯誤更換電池類型，將產生爆炸風險。請按電池包裝說明，妥善丟棄已耗廢電池。

WARNING

系統採用兩條電源線，以提供冗餘電源。欲徹底清除系統電源，先拔下兩條電源線。為降低觸電所導致的人體傷害或系統損害，請小心操作機體，即使系統僅插入一條電源線。

WARNING

欲預防儲櫃翻倒，進而導致人體傷害或系統損害，請從儲櫃下方開始往上安裝系統。

WARNING

若您更換由Stratus供應的數據機纜線，請使用至少有26 AWG壓力的纜線，避免發生火災。

WARNING

避免火災、觸電、設備故障、液體或其他異物進入設備。不得讓液體或類似圖釘或迴紋針等異物進入設備。

WARNING

為避免火災或漏電，不得將電源線插入規格不符的的插座中。請使用本指南指定之電壓及電源類別的的插座。

WARNING

不得使用延長線安裝設備。使用與指定電源規格不符的延長線會產生設備過熱風險，進而可能導致火災。

WARNING

安裝或移動設備前，請從伺服器或電源拔下電源插頭。

只有在拔下電源線後，設備的所有電壓才會消除。

WARNING

不得在不適合場所安裝或存放設備。請按本指南指定且符合規格要求的場所安裝或存放設備。避免下列可能產生火災風險的地方：

灰塵較多
熱水器旁濕氣較重的地方
陽光直照的地方
不平穩位置，例如易受地震影響的地方

WARNING

不得在腐蝕性環境中使用或存放產品。避免在含腐蝕性氣體的環境使用或存放本產品，其中包括但不限於：二氧化硫、氫化硫、氮、氫、氯或臭氧。

不得將本產品安裝在灰塵較多或含類似氯化鈉或硫磺等腐蝕性物質的地方。

不得將本產品安裝在空氣中含過量金屬碎片或傳導粒子的地方。

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。若對產品安裝或存放的場地環境規劃有任何疑問，請與CAC或授權Stratus服務代表聯絡。

WARNING

不得在伺服器已連接電源的狀態下連接界面電纜。安裝或移除任何內建裝置，或從伺服器拔下或連接任何界面電纜前，確認已關閉伺服器的電源，並從伺服器或電插座拔下電纜線。即使伺服器電源已切斷，在仍連接電源的狀態下，碰觸內建裝置、電纜或連接器也可能產生觸電、或因短路而引起火災。

WARNING

除非按照系统操作和维护指南的说明，不能拆卸、修理或者改装服务器。如果您不遵守系统操作和维护指南的说明，会有触电或者火灾以及设备故障的风险。

WARNING

不得在伺服器上放置任何物件。物件可能會掉落而導致人體傷害、硬體損壞或火災。

CAUTION

DVD光碟機不得靜置於彈出位置。灰塵進入設備將導致功能異常。彈出的光盤也可能是導致設備損壞的來源。

Chapter 2
AC Power Planning

This chapter describes the AC power requirements of ftServer V 2404, V 4408, and V 6408 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.

You can use one of the UPS models that Stratus has qualified. See "Selecting a UPS Unit for ftServer Systems" on page 2-4 for more information.

You must also provide AC power to the system PC console, RSN console server, and RSN modem (if present) 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 (or if mounted vertically the left PDU when viewed from the rear) 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
- The A-sides of the supported Ethernet and Fibre Channel (FC) switches

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
- Tape drive enclosures, if present
- One side of each disk storage enclosure that is installed in the system cabinet
- The B-sides of the supported Ethernet and FC switches

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 "AC Power Connections to Qualified UPS Models" on page 2-4 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 2404, V 4408, or V 6408	—	—	0†	NEMA L6-20P or hardwired to UPS AC output terminals.‡	15 ft. (4.5m)
UPS units (two for each ftServer system)		x 1 =		Hardwire to site AC power source.	Provided by customer.
Total AC connectors					

† All ftServer components plug into PDUs in the main cabinet. Each PDU receives power from a UPS unit.

‡ See the Peripheral Equipment Available from Third Parties web page for more information.

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 2404 systems		x 2300† =		x 3.41 =	
ftServer V 4408 and V 6408 systems		x 4000‡ =		x 3.41 =	
RSN console server		x 35§ =		x 3.41 =	
RSN modem		x 4 =		x 3.41 =	
Optional network I/O enclosure (fully loaded)		x 750 =		x 3.41 =	
Optional tape enclosure		x 215¶ =			
Total BTUs/hr.					
Total watts					

† For maximum configuration ftServer V 2404 systems consisting of two CPU-I/O enclosures, two fully populated ftScalable Storage trays, and two Ethernet switches.
‡ For maximum configuration ftServer V 4408 and V 6408 systems consisting of two CPU-I/O enclosures, six fully populated ftScalable Storage trays, two Ethernet switches, and two FC switches.
§ This value represents the **highest** wattage consumed by supported RSN console servers. See the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for the wattage consumption of your specific RSN console server.
¶ This value represents the **highest** wattage consumed by supported tape enclosures. See the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for the wattage consumption of your specific tape enclosure.

Selecting a UPS Unit for ftServer 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 sell or service the UPS units. However, Stratus has qualified UPS models for use with ftServer V 2404, V 4408, and V 6408 systems. See the Peripheral Equipment Available from Third Parties web page to select an appropriate UPS model and purchase them directly from the UPS vendor.

AC Power Connections to Qualified UPS Models

Use only AC power cords specified by Stratus for the UPS-to-PDU AC power connections. For a complete list of approved power cords, see Table 2-3. For information about recommended UPS models, see the following:

- The Peripheral Equipment Available from Third Parties web page
- The documentation supplied with your UPS

Table 2-3. Power Cords for ftServer Systems

Marketing ID	Plug Types	Rating	Length	Locale
B50154F	IEC 60320 C19 to IEC 60309	16A/250V	15 ft (4.5m)	International
B50171F	IEC 60320 C19 to NEMA L6-20P	16A/250V	15 ft (4.5m)	North America UL approved
B50175	IEC 60320 C19 to L6-20P	20A/250V	15 ft (4.5m)	Japan PSE approved

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.

AVERTISSEMENT

Un électricien qualifié doit fournir et relier le câble d'entrée CA de l'onduleur, et si besoin, un câble de sortie CA, un panneau de distribution ou un conduit à chaque système d'onduleur, conformément au code électrique local et national.

CAUTION

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

MISE EN GARDE

Éloigner tous les cordons d'alimentation du passage.

Main Cabinet Ground Cables

Table 2-4 provides information about the main cabinet ground cable.

Table 2-4. 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 and Component Location

This chapter describes the space and location requirements for an ftServer V 2404, V 4408, or V 6408 system and its external components. As you plan the site, make sure that you locate external components so that all cords and cables between them and the system can reach their connection points.

This chapter describes the requirements for the following connections:

RSN Connections

ftServer V Series modules require a connection to the Remote Service Network (RSN), which allows the CAC or your authorized Stratus service representative to remotely diagnose, troubleshoot, and resolve problems online. The connection to the RSN is implemented through an *RSN bridge module*, which is a module that is physically connected to the Internet or a modem (a dialup connection).The RSN bridge module provides connectivity to the RSN for both itself and other modules in the same system.

Stratus provides and installs the RSN console server and related components.

When the RSN console server connects to a modem, in addition to the telephone line (which you must supply), the modem and console server use serial and Ethernet cables, which Stratus provides and installs. See "Component Location and Cabling Summary" on page 3-3 for more information about RSN cable requirements.

For additional information, see the following manuals:

- *OpenVOS System Administration: Administering and Customizing a System* (R281) for information on processes, files, and commands required for RSN support.
- *Stratus ftServer V 2404, V 4408, and V 6408 Systems: Operation and Maintenance Guide* (R646) for detailed information on RSN console server and RSN modem connections.
- *OpenVOS System Administration: Configuring a System* (R287) for information on the `devices.tin` file entries that OpenVOS requires for an RSN connection through a modem.

Fibre Channel Connections

ftServer V 2404, V 4408, and V 6408 systems support connections to ftScalable Storage G2 RAID controller enclosures and to optional tape drives through optical FC host bus adapters (HBAs) in the CPU-I/O enclosures. Stratus installs and connects ftScalable Storage G2 systems and tape drives as follows:

- ftServer V 4408 and V 6408 systems connect to ftScalable Storage G2 RAID controller enclosures through a U581V 20-Port Fabric Switch.
- ftServer V 2404 systems connect to ftScalable Storage G2 RAID controller enclosures directly through U580V Dual-Port 8-Gb Fibre Channel PCI Adapters.
- V 2404 systems support a single tape drive. The tape drive is optional and connects directly to the U580V Dual-Port 8-Gb Fibre Channel PCI Adapters.
- ftServer V 4408 and V 6408 systems support single or dual tape drives. Tape drives are optional and connect to the ftServer systems using a designated port on the U581V fabric switch.

The U580V PCI adapters are dual-ported. For connections to ftScalable Storage G2 RAID controller enclosures, ports are teamed in pairs for fault tolerance. For connections to tape drives, ports are not paired. If the system supports a dual tape drive, you can connect one or two tape drives to the HBA in a single PCI slot.

For more information on FC connections, see the following manuals:

- *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for information about the supported tape drives and PCI adapters.
- *ftScalable Storage G2: Getting Started Guide* (R651) for information about connecting to ftScalable Storage G2 systems.
- *Stratus ftServer V Series Systems: PCI Adapter Guide* (R679) for information about the adapters Stratus supplies for your ftServer system.

UPS Connections

For management of UPS units, each UPS unit connects to a different Ethernet switch. You must supply Ethernet cables to connect the management card of each UPS unit to its Ethernet switch (two cables). See “Maintenance Network” on page 4-3 for information about the Ethernet switches.

Stratus provides a PDU AC input cord for each UPS unit. See “Component Location and Cabling Summary” on page 3-3 for more information.

Component Location and Cabling Summary

Although many of the cords and cables are provided by Stratus, you must provide certain cord and cables. Table 3-1 summarizes the cords and cables you need to be aware of for site planning purposes and whether Stratus provides them or not.

Table 3-1. Cord and Cable Summary *(Page 1 of 2)*

Component	Cord or Cable Type	Source	Description
AA-E99100 RSN console server	Ethernet cable (1)	Provided by Stratus	RSN console to system - 7 ft. (2.10m)
	Serial cable (1)	Provided by Stratus	RSN console to system - 10 ft. (3.10m)
With an AA-C72100 modem	Serial cable (1)	Provided by Stratus	RSN console to system - 6 ft. (1.83m)
AA-E97900 RSN console server	Ethernet cable (1)	Provided by Stratus	RSN console to system - 20 ft. (6.10m)
	Serial cable (1)	Provided by Stratus	RSN console to system - 25 ft. (7.62m)
With an AA-C72100 modem	Serial cable (1)	Provided by Stratus	RSN console to system - 6 ft. (1.83m)
AA-C72100 modem	Telephone cord (1)	Customer supplied	Modem (RJ-11) to service jack - ensure that cord is long enough to reach telephone service jack. See “Telephone Lines” on page 4-1 for more information.

Table 3-1. Cord and Cable Summary *(Page 2 of 2)*

Component	Cord or Cable Type	Source	Description
UPS (2)	AC power cord (2)	Provided by Stratus	UPS output to system PDU input - 15 ft. (4.57m)
	Ethernet (2)	Customer supplied	Ensure that cables are long enough to reach from UPS units to Ethernet switches in system cabinet.
PC Console	Ethernet cable (1)	Provided by Stratus (optionally customer supplied)	PC console to system Ethernet port - 6ft. (1.83m). Provide your own cable if a longer cable is required.
	Serial cable (1)	Provided by Stratus	PC console to system COM port - 25 ft. (7.62m)
Telephone	Telephone cord (1)	Customer supplied	Ensure that the cord is long enough to reach from the telephone service jack to the telephone near the PC console.
Optional available Ethernet ports (embedded or PCI adapter)	Ethernet cable (1 for each optional port used)	Customer supplied	Ensure that cables are long enough to reach from site Ethernet port, hub, or switch. Cable type varies depending upon the type of Ethernet adapter. See the *Stratus ftServer V Series Systems: PCI Adapter Guide* (R679) for specific cable requirements.
Optional U760 Eight-Port Serial Synchronous PICM G 2.16 Adapter (in optional NIO enclosure)	RS-232C, RS-449, or V-35	Provided by Stratus	Optional NIO enclosure to network connection - 12ft. (3.65m)

The lengths of supplied cords and cables dictate the maximum distance between the ftServer V 2404, V 4408, or V 6408 system and its external components. Table 3-2 summarizes these constraints.

Table 3-2. Location of V Series System Components

Component	Location of Component	External Component Location
AA-E99100 RSN console server	Located inside the system cabinet	N/A
AA-E97900 RSN console server	Free standing, located outside the system cabinet	Place within 9 feet of system (length of Ethernet cable minus vertical runs)
AA-C72100 modem	Free standing. Typically located near the system cabinet	Place close to the RSN console server
UPS (2)	Typically located outside the system cabinet	Place within 8 feet of system (length of PDU AC input cords minus vertical runs)
PC Console	Located outside the system cabinet on a table or other suitable surface	Place immediately next to system (length of Ethernet cable minus vertical runs)
Telephone	Typically located near PC Console	Typically place within 17 feet of system
Optional U760 Eight-Port Serial Synchronous PICMG 2.16 Adapter	Inside NIO enclosure rackmounted in system cabinet	Place network connection points within 4 feet of system (length of adapter hydra cables minus vertical runs)

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 feet (ft) (0.76 meters (m)) 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 and Appendix A, “System Specifications” for detailed information about temperature and humidity requirements.

- Is as free of dust as possible of airborne contamination (particulate and gaseous).

  N O T I C E

  Due to the mission-critical nature of Stratus servers, data centers housing the equipment should follow the guidelines of airborne contamination (particulate and gaseous) as outlined in the ASHRAE (TC) 9.9 documentation. Particulate matter to adhere to ISO 14644-1 Class 8. Gaseous contamination, such as sulfur or chlorine-bearing gases to adhere to ANSI/ISA-71.04-1985 Severity level G1.

  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.
- Provides a table or desktop for external devices such as a telephone, RSN console server, RSN modem (if present), and a system PC console.

  You **cannot** place these peripheral components in or 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.

NOTICE

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.

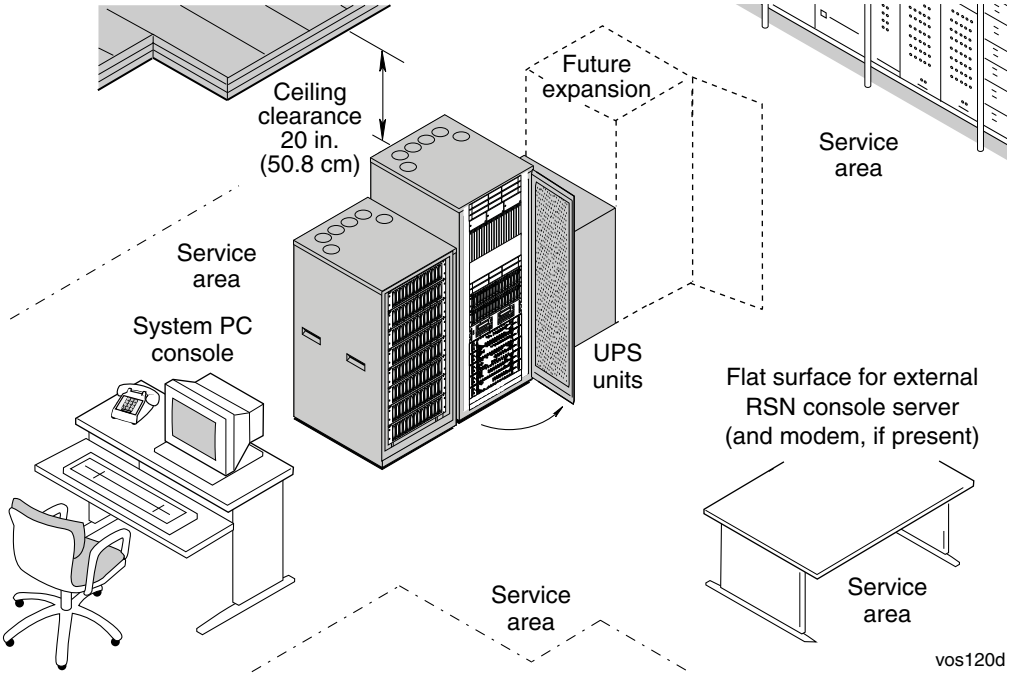
See Appendix A, "System Specifications" and *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for the dimensions of system components.

Figure 3-1 illustrates the space-planning considerations. You must provide a flat surface for the AA-E97900 RSN console server and the RSN modem (if present).

NOTE

The AA-E99100 RSN console server is located inside the system cabinet, not on an external flat surface.

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.

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

Figures 1-1, 1-2, and 1-2 illustrate a typical layout for the system cabinet, storage cabinet, UPS units, and system PC console.

Use the equipment templates in Figure 3-2 and the site-layout grid in Figure 3-3 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

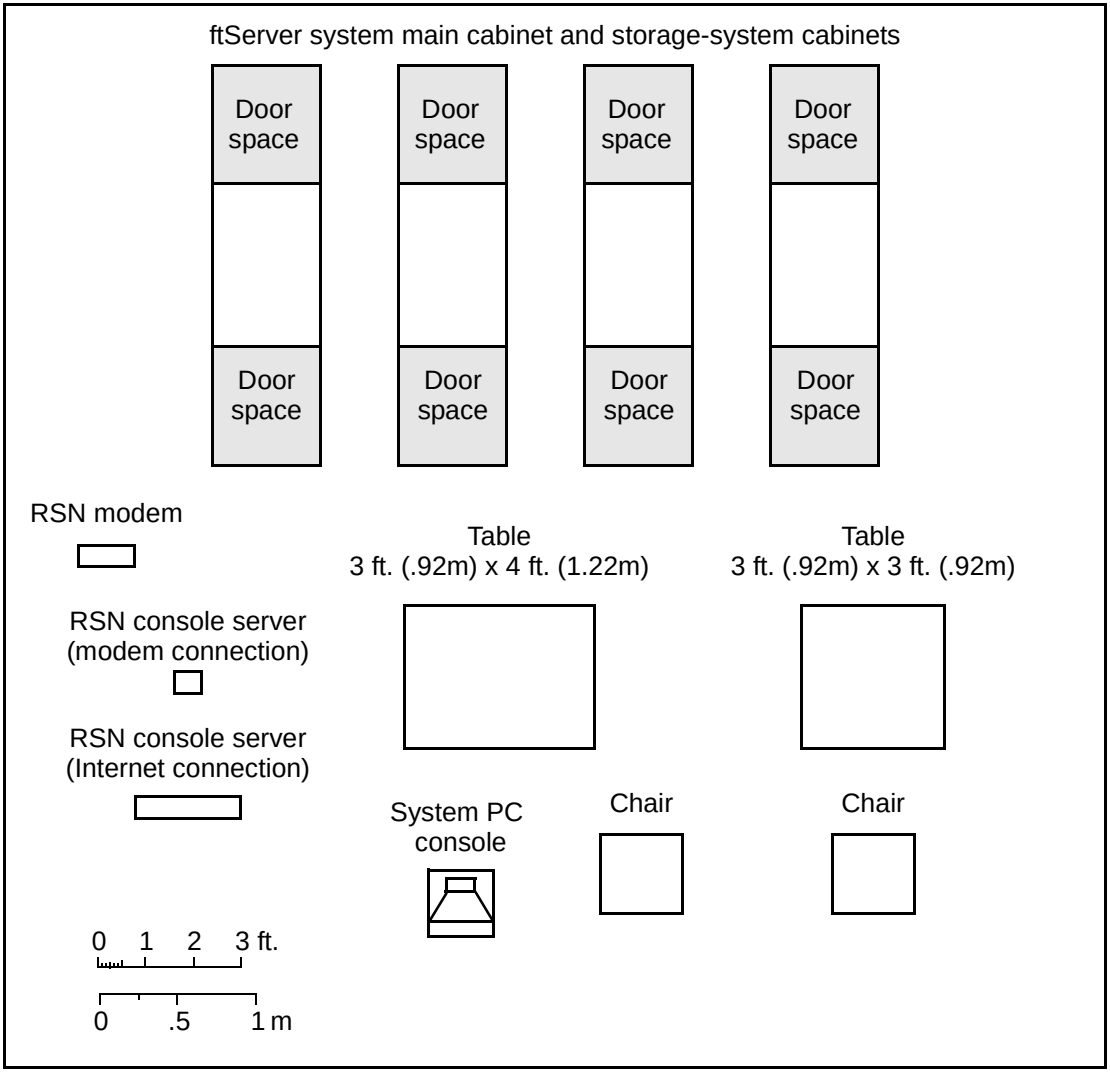
Make sure that all cords and cables are long enough to reach between their respective components and connectors. Route all cables out of the way of foot traffic.

Figure 3-2 contains the equipment templates to be used in the site-layout grid.

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

In Figure 3-3, trace the outline of the room in which the ftServer system will be located. Then, photocopy and cut out the templates in Figure 3-2 and arrange them to represent your ftServer configuration in the outline of the room. The equipment templates are drawn to the same scale as the grid page.

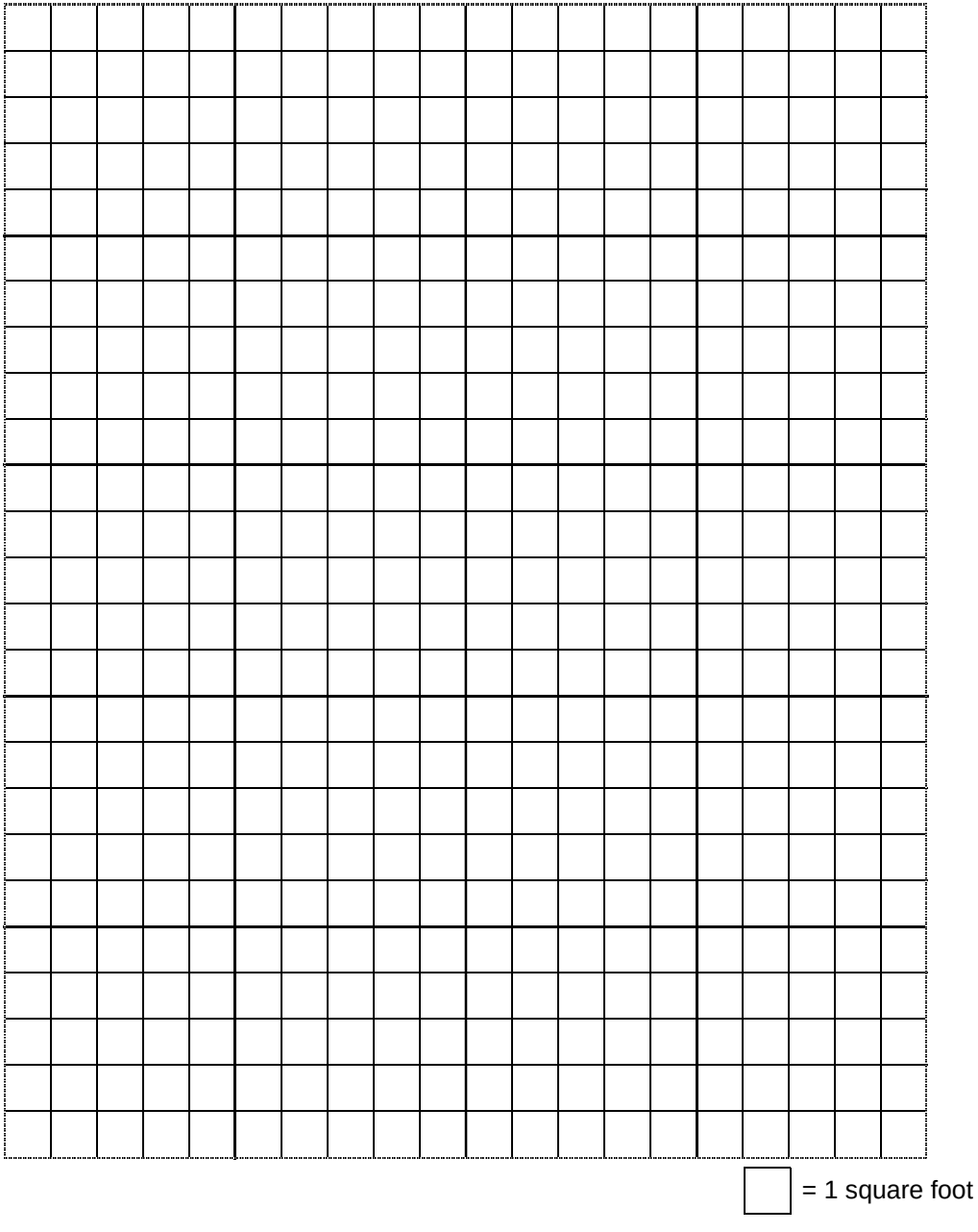
Figure 3-2. System Equipment Templates



NOTES

1. Figure 3-1 shows possible locations of the AA-E97900 RSN console server. The AA-E99100 RSN console server is located inside the system cabinet and therefore does not need to appear in your floor plan.
2. The shading on the templates indicates the access area required for servicing.

Figure 3-3. Site-Layout Grid



Chapter 4
Other Infrastructure Requirements

This chapter describes other infrastructure requirements, including telephone, Ethernet networks, and the system PC console. It contains the following sections:

Telephone Lines

You must provide one telephone and one or two telephone lines at your site:

- You must have one telephone and line that is reserved for making voice service calls. 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 the back of the system.
- When using an RSN console server with an RSN modem, you must supply an additional telephone line to connect to the modem. You must supply a sufficiently long telephone cable that has an RJ-11 connector on the end that connects to the modem.

NOTE

To provide the most reliable service for RSN connections, use a dedicated phone line for the modem. 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.

For additional information, see the following manuals:

- *OpenVOS System Administration: Administering and Customizing a System* (R281) for information on processes, files, and commands required for RSN support.
- *Stratus ftServer V 2404, V 4408, and V 6408 Systems: Operation and Maintenance Guide* (R646) for detailed information on modem connections.
- *OpenVOS System Administration: Configuring a System* (R287) for information on the `devices.tin` file entries that OpenVOS requires for an RSN connection through a modem.

Network Connections

The following sections provide site-planning information for networks:

NOTICE

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

- "Site Ethernet Networks" on page 4-2
- "Ethernet Subnet Requirements" on page 4-3
- "Maintenance Network" on page 4-3

Site Ethernet Networks

For connections to one or more optional Ethernet site networks, you must provide the following:

- Site Ethernet ports, hubs, or switches
- Ethernet cables

You connect a site network to the ftServer system using any available Ethernet ports in the embedded adapters or in supported Ethernet PCI adapters. See Table 1-1 for a list of supported adapters.

NOTE

Two Ethernet ports are typically paired and teamed in software for fault tolerance. Each member of the pair requires an Ethernet cable. For information on teaming the Ethernet ports in software, see the *OpenVOS STREAMS TCP/IP Administrator's Guide* (R419).

ftServer V 2404, V 4408, and V 6408 systems also support separate class C Ethernet subnets for various system components, as described in “Ethernet Subnet Requirements” on page 4-3.

Ethernet Subnet Requirements

ftServer V 2404, V 4408, and V 6408 systems require separate Class C Ethernet subnets. Table 4-1 lists the subnet requirements for different system configurations.

Table 4-1. 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 Ethernet switches. See “Maintenance Network” on page 4-3 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 Ethernet switches. See “Maintenance Network” on page 4-3 for more information.
	Additional subnets to connect the host system to site networks

Maintenance Network

The CAC or other authorized Stratus service representative uses a maintenance network for remote service and debugging of components in ftServer V 2404, V 4408, and V 6408 systems. The maintenance network connects the following components either to two U780 12-Port Ethernet Switches or to two U772 24-Port 10/100 Ethernet Switches:

- ftScalable Storage G2 RAID controller modules
- U581V 20-Port Fabric Switch
- RSN console server
- UPS units
- System PC console

N O T E S

1. The maintenance network is reserved for Stratus support and maintenance operations only. Do not connect other devices to it.

2. The U780 12-Port Ethernet Switch and the U772 24-Port 10/100 Ethernet Switch are the only supported switches. You cannot use any other type of hub or switch in the maintenance network.

Stratus creates this network when installing the system and supplies the cables for it (except for the UPS Ethernet cables, which are customer supplied).

System PC Console

You must provide a PC with the following software and port to operate as the system PC console:

- 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)

Optionally, you can provide your own Ethernet cable if the provided six-foot long Ethernet cable is not long enough for your site (see Table 3-1).

See “Component Location and Cabling Summary” on page 3-3 for information about PC console cable requirements. See the *OpenVOS System Administration: Configuring a System* (R287) manual for information about how to configure the emulation software on the system PC console.

Chapter 5
Supported Configurations

This chapter contains information about supported cabinet configurations.

Cabinet Configurations

Figures 5-1 through 5-3 show the supported ftServer system cabinet configurations. The illustrations show the locations of components and filler panels.

Figure 5-1 illustrates an ftServer V 4408 or V 6408 system without the optional ftScalable Storage expansion trays, tape-drive enclosure, and network I/O enclosure.

Figure 5-1. Base ftServer V 4408 or V 6408 System

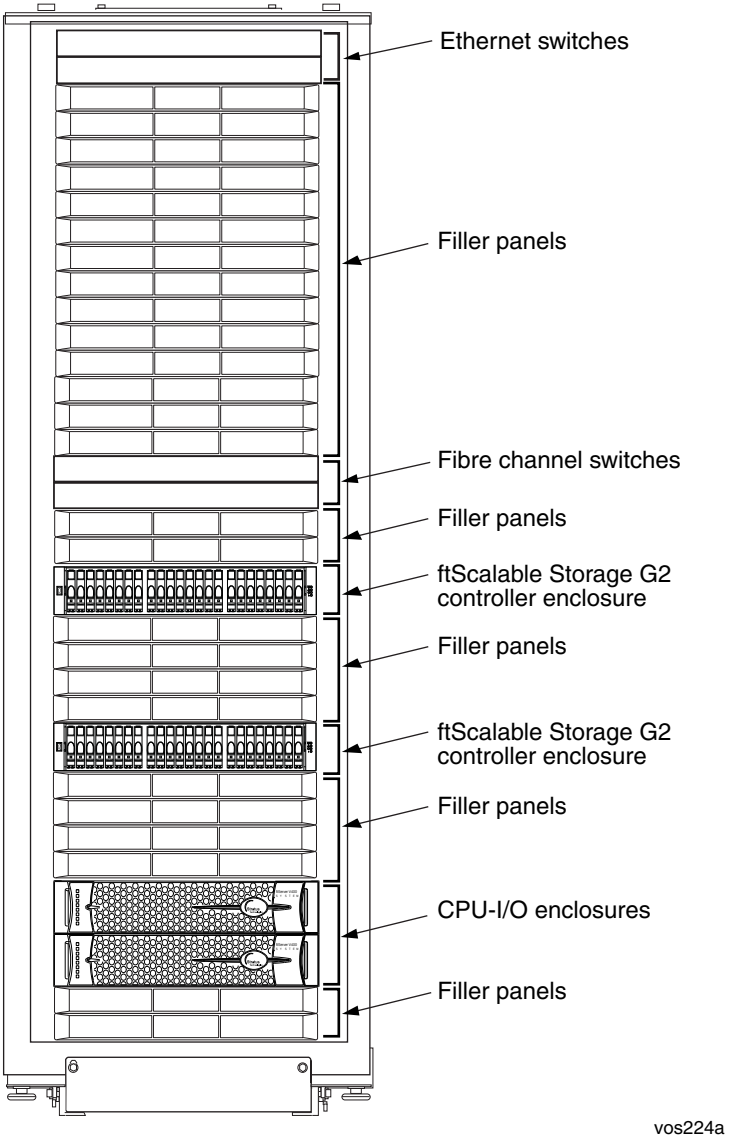


Figure 5-2 illustrates a fully configured ftServer V 4408 or V 6408 system that includes the optional ftScalable Storage expansion trays, tape-drive enclosure, and network I/O enclosure.

Figure 5-2. Fully Configured ftServer V 4408 or V 6408 System

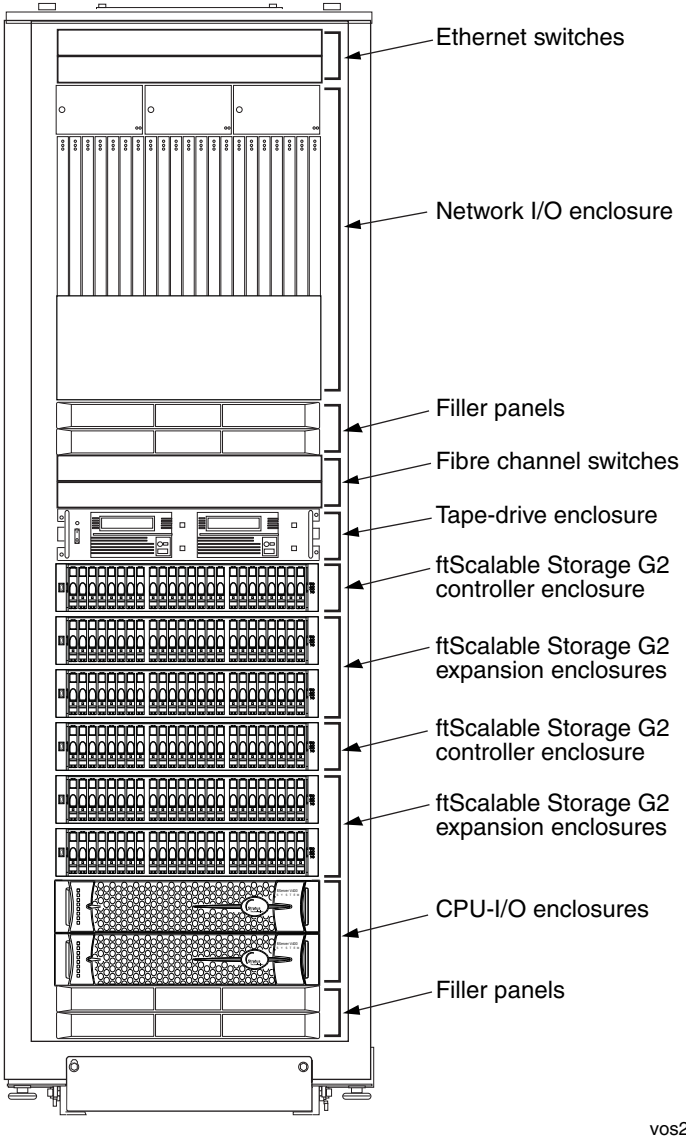
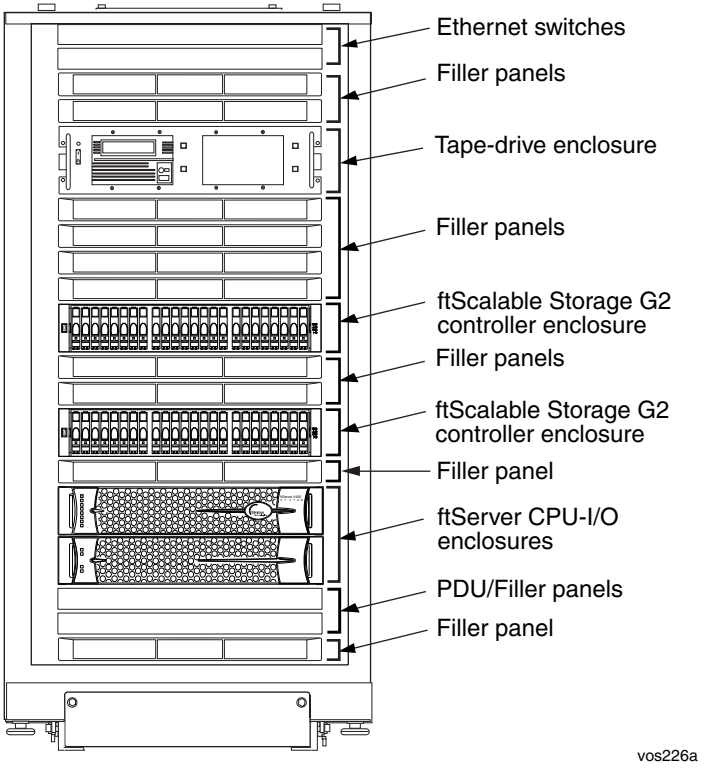


Figure 5-3 illustrates an ftServer V 2404 system without the optional network I/O enclosure in a 24U cabinet. When the V 2404 is ordered with the network I/O enclosure, it is housed in a 38U cabinet. The V 2404 system does not support ftScalable Storage G2 expansion enclosures.

Figure 5-3. ftServer V 2404 System Without Network I/O Enclosure



Appendix A
System Specifications

For system specifications, see:

NOTES

1. The system temperature and humidity requirements defined in Tables A-2 and A-3 are the **minimum** requirements the site must provide.
2. The temperature and humidity requirements for optional components are provided in the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582).

System Specifications

The following figures show front and rear views of the systems.

- 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-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.

Table A-1 lists the dimensions of the system cabinets. 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.

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

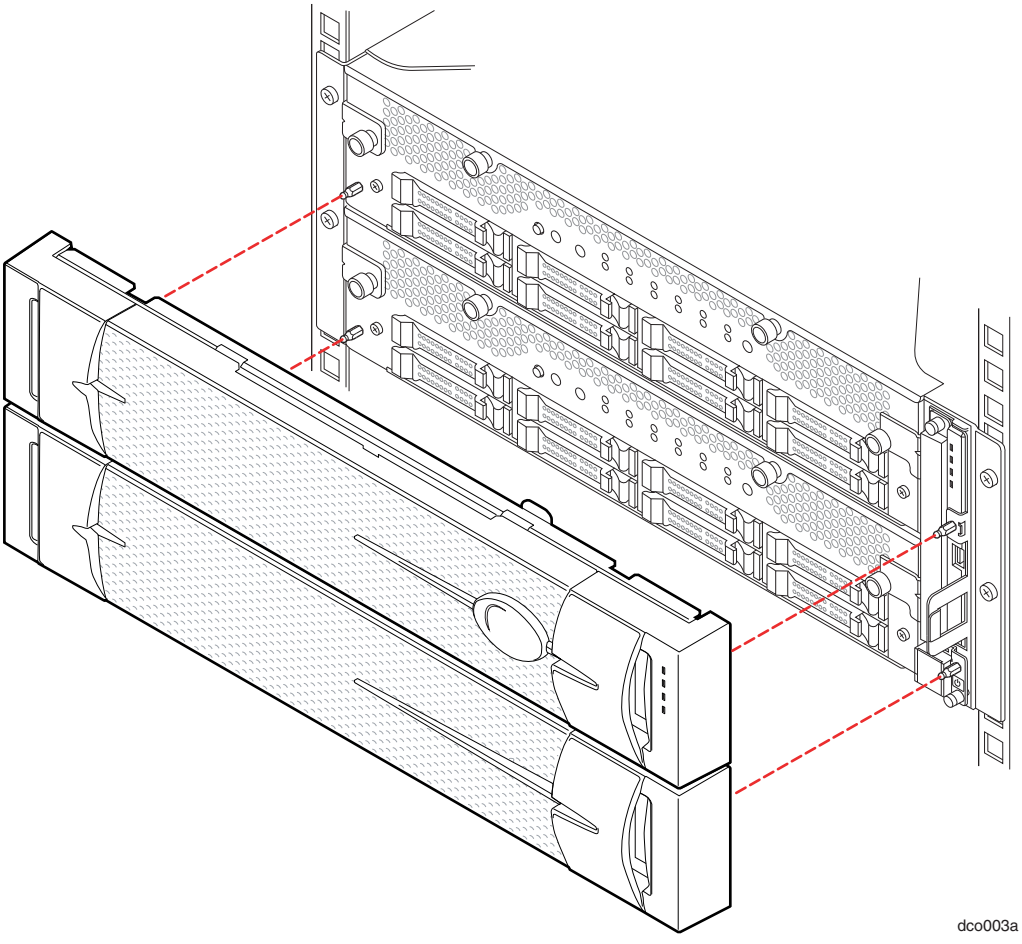
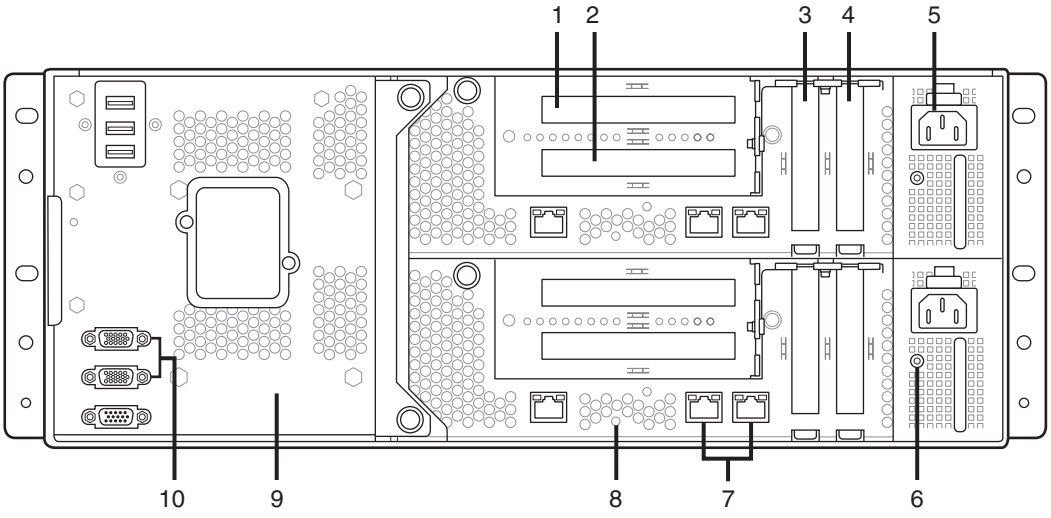


Figure A-2. ftServer CPU-I/O Enclosures: Rear View



1	PCIe adapter slot 3 (2)	6	Power supply LED (2)
2	PCIe adapter slot 4 (2)	7	Embedded 10/100/1000-Mbps Ethernet ports (4)
3	PCIe adapter slot 1 (2)	8	System backplane
4	PCIe adapter slot 2 (2)	9	System backplane
5	Power receptacles (2)	10	Serial (COM) ports (2)

Table A-1. Cabinet Dimensions

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)
24U Cabinet	
Height (including casters)	50 in. (1.27m)
Width	27.5 in. (70 cm)
Depth	41 in. (1.04m)
Weight, empty	275 lb (125 kg)
Weight, empty with pallet and shipping container	436 lb (197.8 kg)
Weight capacity	1500 lb (559.9 kg)
38U Cabinet	
Height (including casters)	74 in. (1.9m)
Width	27.5 in. (70 cm)
Depth	41 in. (1.04m)
Weight, empty	344 lb (156 kg)
Weight, empty with pallet and shipping container	512 lb (232.2 kg)
Weight capacity	1500 lb (559.9 kg)

Table A-2. V 2404, V 4408, and V 6408 System CPU-I/O Enclosure: Specifications *(Page 1 of 2)*

Power	
Input power	700W for each enclosure (1400W total)
Nominal input voltage	200-240VAC; 50/60 Hz
Protective earth ground current	3.5 mA maximum for each AC power cord
Physical Dimensions	
Height	7.0 in. (17.78 cm; 4U)
Width	17.50 in. (44.45 cm)
Depth	29.27 in. (74.34 cm), excluding rails and bezel
Weight, including 12 DIMMS, 4 processors	Two enclosures, fully loaded: 84 lbs (38 kg) Rails and shelf unit: 13.8 lb (6.26 kg)
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)
Maximum rate of temperature change during operation	12° C per hour
Relative humidity during operation	20% to 80% (noncondensing)
Relative humidity during storage	20% to 80%
Heat dissipation, each system (both enclosures)	4777 BTUs per hour
Air cleanliness	Meets ISO 14644-1 class 8 standards

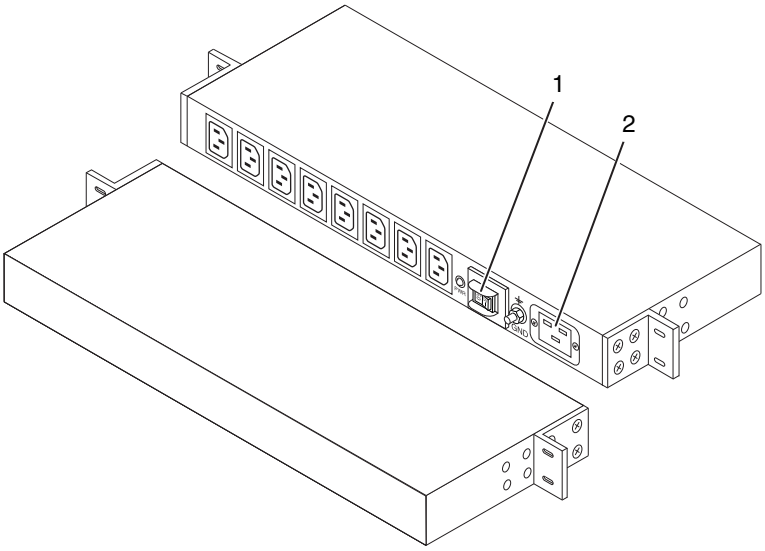
Table A-2. V 2404, V 4408, and V 6408 System CPU-I/O Enclosure: Specifications *(Page 2 of 2)*

Features	
Processors	ftServer 2404: One Quad-Core Intel® Xeon® 2.0 GHz processor in each CPU-I/O enclosure ftServer 4408: Two Quad-Core Intel Xeon 2.0 GHz processors in each CPU-I/O enclosure ftServer 6408: Two Quad-Core Intel Xeon 2.93 GHz processors in each CPU-I/O enclosure
Memory	Six physical, fully-buffered (FB) double-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	Two low-profile PCIe slots on the motherboard, 6.6 in (167.75 mm) maximum adapter length Optional PCIe riser with two full-height-capable slots: • Top riser slot (PCI 3): 7.7 in. (195.94 mm) maximum adapter length • Lower riser slot (PCI 4): 6.6 in. (167.75 mm) maximum adapter length
DVD drive	DVD (+/-R Drive) in the front panel for installation of OpenVOS software.

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



ssys108a

1 Power switch

2 Power receptacle

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

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)

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 uses 20A or less circuit breakers in each power distribution branch that feeds the PDUs.

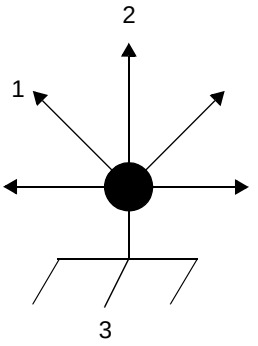
Grounding Considerations

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

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

- Figure B-3 illustrates a single-phase 120V AC circuit connection.
- Figure B-4 illustrates a single-phase 240V AC circuit connection.
- Figure B-5 illustrates a split-phase 120/240V AC circuit connection.
- Figure B-6 illustrates a three-phase 208V 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 following diagrams, the power inputs for ftServer V 2404, V 4408, and V 6408 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 PDU.

Figure B-2. Power Input Labeling

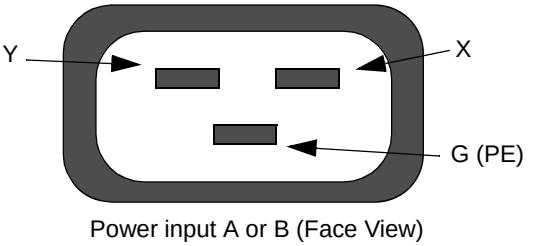


Figure B-3 shows a single-phase 120V AC circuit connection. Note that this application requires a single-pole circuit breaker.

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

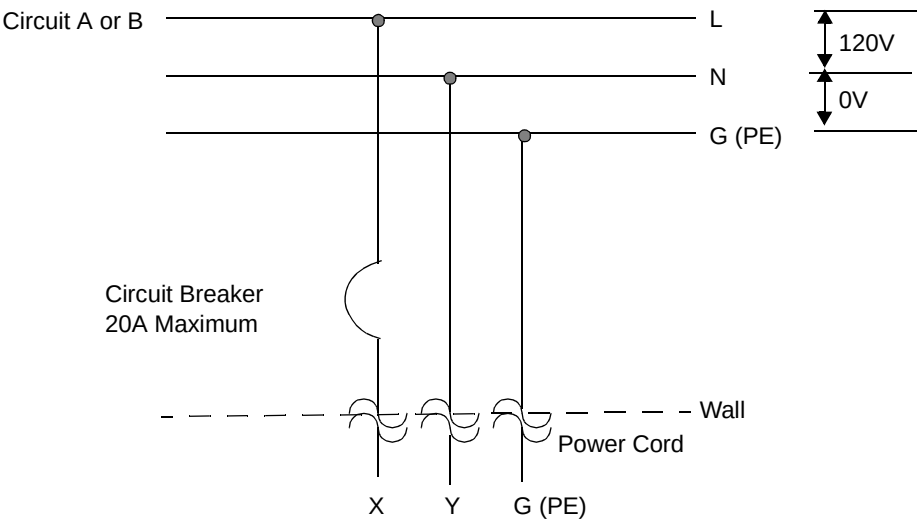


Figure B-4 shows a single-phase 240V AC circuit connection. Note that this application requires a single-pole circuit breaker.

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

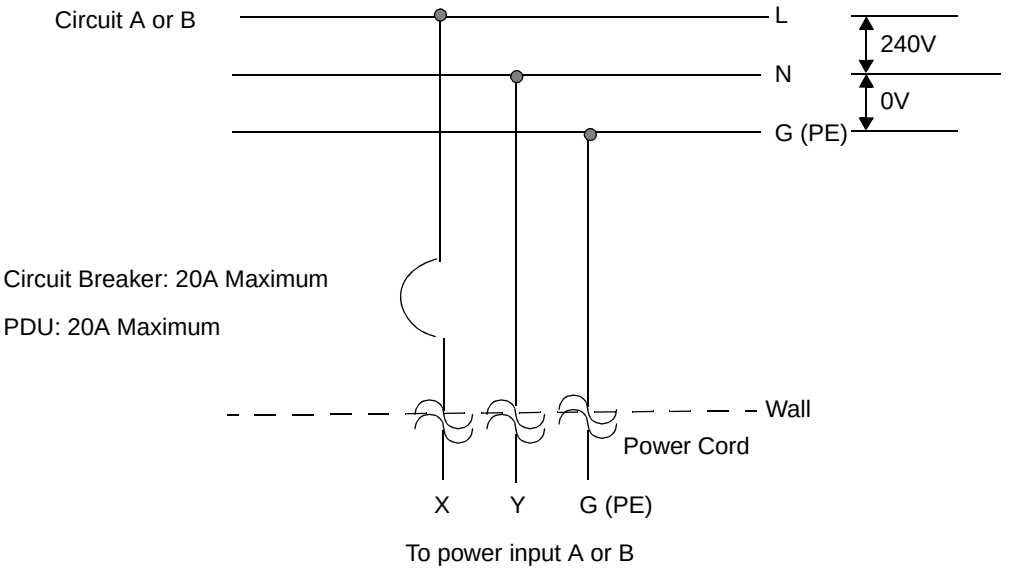


Figure B-5 shows a split-phase 120/240V AC circuit connection. Note that this application requires a double-pole circuit breaker.

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

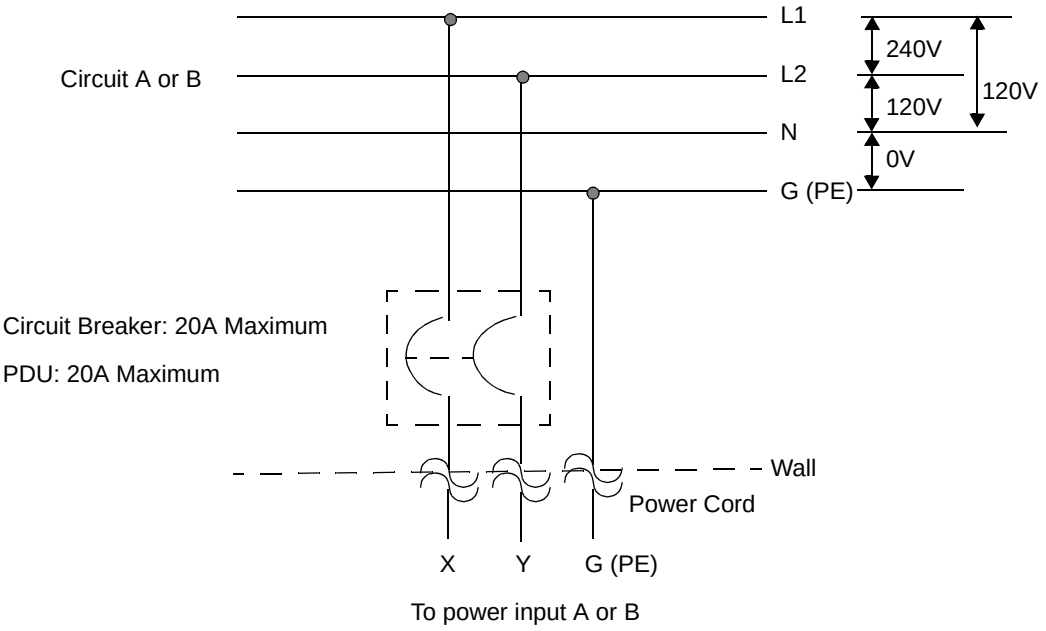


Figure B-6 shows a three-phase 208V AC, Y-, or Δ-source circuit connection, which is a phase-to-phase source connection. Note that the X and Y inputs on the system can be connected from L1 and L2, L2 and L3, or L1 and L3. This application requires a double-pole circuit breaker.

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

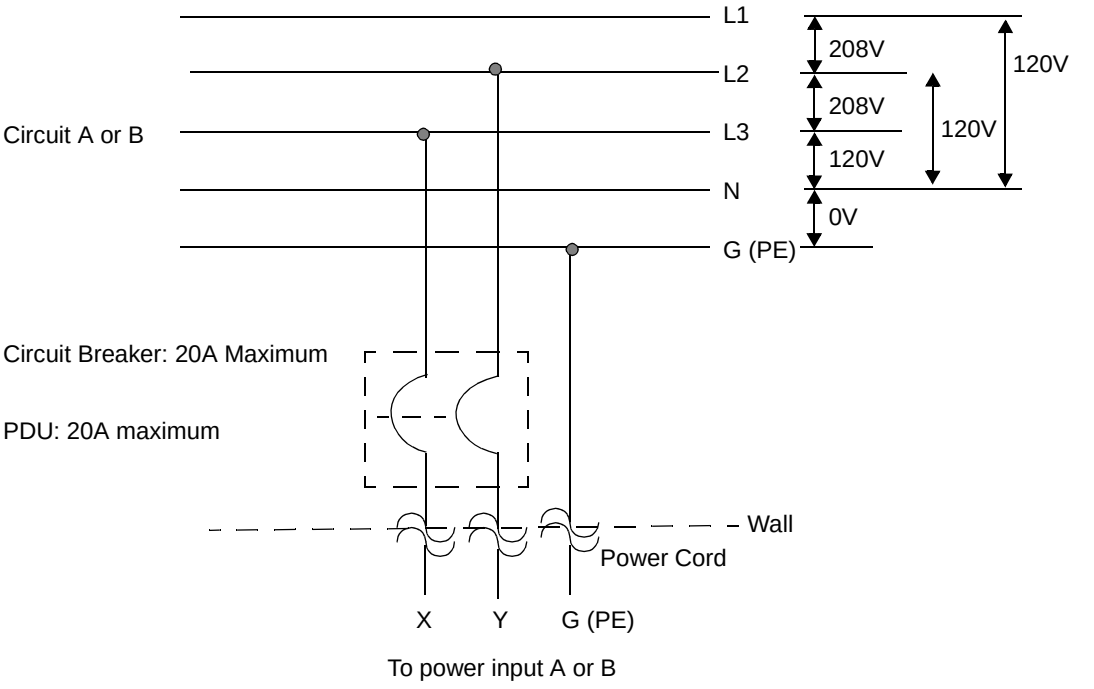
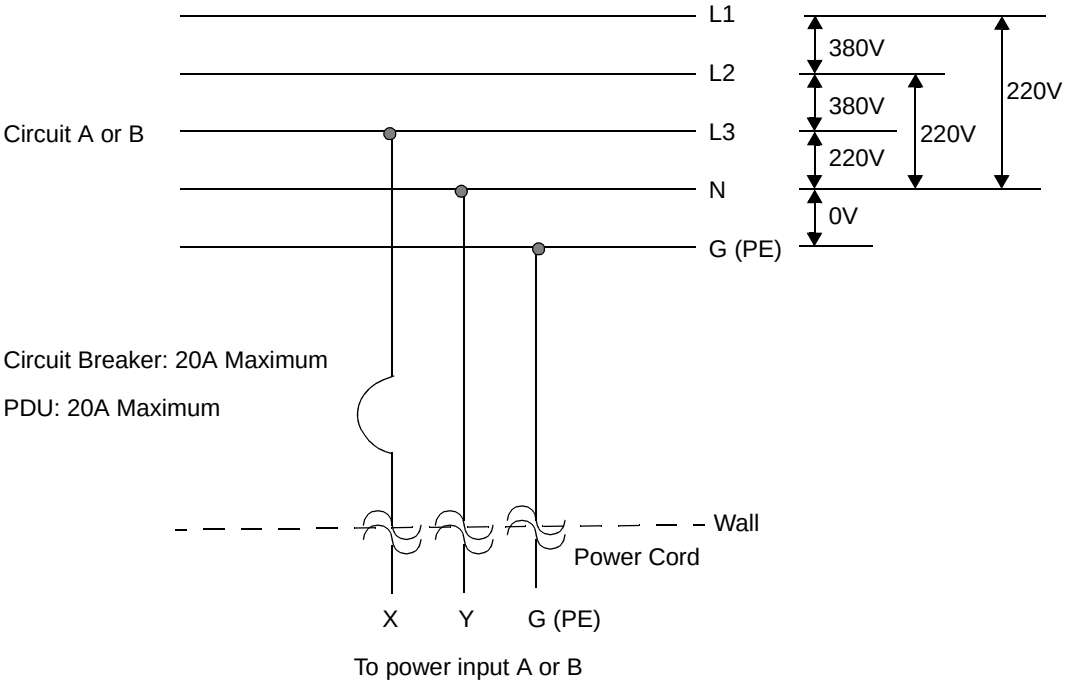


Figure B-7 shows a three-phase 380V AC, Y-, or Δ-source circuit connection, which is a phase-to-neutral source connection. Note that the system's X input can be connected to L1, L2, or L3. This application requires a single-pole circuit breaker.

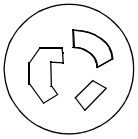
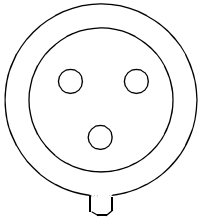
Figure B-7. Three-Phase 380V AC, Y-, or D-Source Circuit Connection, Phase-to-Neutral



Electrical Power Connectors

Table B-1 describes the connectors required by the 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

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