FUJITSU

SPARC Enterprise

T5440 Server

Site Planning Guide

C120-H029-02EN

FUJITSU

SPARC Enterprise™ T5440 Server Site Planning Guide

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Contents

Preface

This manual provides the specifications and site requirements you need when planning the installation of the SPARC Enterprise™ T5440 server.

For Safe Operation

This manual contains important information regarding the use and handling of this product. Read this manual thoroughly. Use the product according to the instructions and information available in this manual. Keep this manual handy for further reference.

Fujitsu makes every effort to prevent users and bystanders from being injured or from suffering damage to their property. Use the product according to this manual.

Related Documentation

The latest versions of all the SPARC Enterprise Series manuals are available at the following Web sites:

Global Site

(http://www.fujitsu.com/sparcenterprise/manual/)

Japanese Site

(http://primeserver.fujitsu.com/sparcenterprise/manual/)

Title	Description	Manual Code
SPARC Enterprise T5440 Server Getting Started Guide	Minimum steps to power on and boot the server for the first time	C120-E504
SPARC Enterprise T5440 Server Product Notes	Information about the latest product updates and issues	C120-E508
Important Safety Information for Hardware Systems	Safety information that is common to all SPARC Enterprise series servers	C120-E391
SPARC Enterprise T5440 Server Safety and Compliance Guide	Safety and compliance information that is specific to the server	C120-E509
SPARC Enterprise/ PRIMEQUEST Common Installation Planning Manual	Requirements and concepts of installation and facility planning for the setup of SPARC Enterprise and PRIMEQUEST	C120-H007
SPARC Enterprise T5440 Server Site Planning Guide	Server specifications for site planning	C120-H029
SPARC Enterprise T5440 Server Installation and Setup Guide	Detailed rackmounting, cabling, power on, and configuring information	C120-E510
SPARC Enterprise T5440 Server Service Manual	How to run diagnostics to troubleshoot the server, and how to remove and replace parts in the server	C120-E512
SPARC Enterprise T5440 Server Administration Guide	How to perform administrative tasks that are specific to the server	C120-E511
Integrated Lights Out Manager 2.0 User's Guide	Information that is common to all platforms managed by Integrated Lights Out Manager (ILOM) 2.0	C120-E474
Integrated Lights Out Manager 2.0 Supplement for SPARC Enterprise T5440 Server	How to use the ILOM 2.0 software on the server	C120-E513

Title	Description	Manual Code
Integrated Lights Out Manager 3.0 Concepts Guide	Information that describes ILOM 3.0 features and functionality	C120-E573
Integrated Lights Out Manager 3.0 Getting Started Guide	Information and procedures for network connection, logging in to ILOM 3.0 for the first time, and configuring a user account or a directory service	C120-E576
Integrated Lights Out Manager 3.0 Web Interface Procedures Guide	Information and procedures for accessing ILOM 3.0 functions using the ILOM web interface	C120-E574
Integrated Lights Out Manager 3.0 CLI Procedures Guide	Information and procedures for accessing ILOM 3.0 functions using the ILOM CLI	C120-E575
Integrated Lights Out Manager 3.0 SNMP and IPMI Procedure Guide	Information and procedures for accessing ILOM 3.0 functions using SNMP or IPMI management hosts	C120-E579
Integrated Lights Out Manager 3.x Feature Updates and Release Notes	Enhancements that have been made to ILOM firmware since the ILOM 3.0 release	C120-E600
Integrated Lights Out Manager 3.0 Supplement for SPARC Enterprise T5440 Server	How to use the ILOM 3.0 software on the server	C120-E587
External I/O Expansion Unit Installation and Service Manual	Procedures for installing the External I/O Expansion Unit on the SPARC Enterprise T5120/T5140/T5220/T5240/T5440 servers	C120-E543
External I/O Expansion Unit Product Notes	Important and late-breaking information about the External I/O Expansion Unit	C120-E544

Note – Product Notes are available on the website only. Please check for the recent update on your product.

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SPARC Enterprise T5440
Site Planning Guide

This guide provides SPARC Enterprise™ T5440 server specifications and site requirements that you can use to plan and prepare your site.

For safety and compliance information, refer to the *SPARC Enterprise T5440 Server Safety and Compliance Guide* and the documentation that came with your server.

Topic	**Links**
Physical dimensions of the server	"Physical Specifications" on page 2
Space required to access the server	"Minimum Clearance for Service Access" on page 2
Operating and non-operating environmental specifications	"Environmental Specifications" on page 3
Requirements for electrical and cooling infrastructure	"Power Source Requirements" on page 4
Acoustic emissions	"Acoustic Noise Emissions" on page 5
Safety and regulatory compliance information	"Agency Compliance Specifications" on page 6
Environmental considerations for installation	"Operating Environment Requirements" on page 6

Physical Specifications

TABLE: Physical Specifications for the SPARC Enterprise T5440 Server

Description	U.S.	Metric
Width	17.5 in.	445 mm
Depth	24.9 in.	633 mm
Height	6.92 in. (4U)	176 mm
Weight, approximate (without PCI cards and rackmounts)	88 lb	40 kg

Related Information

- "Environmental Specifications" on page 3
- "Power Source Requirements" on page 4

Minimum Clearance for Service Access

TABLE: Minimum Needed Clearances

Description	Specification
Clearance, front of system	36 in. (91 cm)
Clearance, rear of system	36 in. (91 cm)

Related Information

- *SPARC Enterprise T5440 Server Installation Guide*
- *SPARC Enterprise T5440 Server Service Manual*

Environmental Specifications

TABLE: Environmental Specifications for the SPARC Enterprise T5440 Server

Specification	Operating	Nonoperating
Temperature	• Sea level to 2953 ft. (900m): 41°F to 95°F (5°C to 35°C) • Above 2953 ft. (900m): Decrease the maximum allowable temperature by 1.6°F/1000 ft (1°C/300m) IEC 60068-2-1 Test Ad, and 60068-2-2 Test Bd	-40°F to 149°F (-40°C to 65°C) IEC 60068-2-1 Test Ab and 60068-2-2 Test Bb
Relative Humidity	10 to 90% RH, 27°C maximum wet bulb (noncondensing) IEC 60068-2-56 Test Cb	93% RH, 35°C maximum wet bulb (noncondensing) IEC 60068-2-56 Test Cb
Altitude	10,000 ft. (3,000m) IEC 60068-2-13 Test M, and 60068-2-41 Test Z/BM	40,000 ft. (12,000m) IEC 60068-2-13 Test M
Vibration	0.15 G (z-axis), 0.10 G (x-, y-axes), 5-500Hz swept sine IEC 60068-2-6 Test Fc	0.5 G (z-axis), 0.25 G (x-, y-axes), 5-500Hz swept sine IEC 60068-2-6 Test Fc
Shock	3 Gs, 11 ms half-sine IEC 60068-2-27 Test Ea	• Roll-off: 1-inch roll-off free fall, front to back rolling directions • Threshold: 25 mm threshold height at 0.75 m/s impact velocity ETE-1010-02 Rev A

Related Information

- "Physical Specifications" on page 2
- "Power Source Requirements" on page 4

Power Source Requirements

The SPARC Enterprise T5440 server has four autoranging power supplies. To ensure redundant operation of the power supplies, connect the power cords to at least two separate AC circuits.

Use the specifications in TABLE: SPARC Enterprise T5440 Power Specifications on page 4 only as a planning guide. For more precise power values, make power measurements on your specific server configuration using your planned workload.

TABLE: SPARC Enterprise T5440 Power Specifications

Description	Specification
General Specifications	
Operating input voltage range	100 - 240 VAC, 50 - 60 Hz (VAC tolerance +/- 10%)
Maximum operating input current at 100 VAC[*]	27.00 A
Maximum operating input current at 200 VAC	13.25 A
Maximum operating input power at 100 VAC	2700 W
Maximum heat dissipation	9212.8 BTU/hour or 9720 KJ/hour
Maximum standby power	70 W
Maximum Server Configuration Specifications	
Under Nominal Temperature and Voltage Conditions	
4 CMP, 1.6 GHz, 32 cores (8 cores each), 64 x 4 GByte 800mhz FB-DIMMs, 4 HDDs, 8 PCIe cards	
Idle AC input power	1671 W
Peak AC input power running SpecJBB	2213 W
Minimum Server Configuration Specifications	
Under Nominal Temperature and Voltage Conditions	
2 CMP, 1.2 GHz, 16 cores (8 cores each), 8 x 2 GByte FB-DIMMs, no HDDs, no I/O cards	
Idle AC input power	495 W
Peak AC input power running SpecJBB	590 W

[*] See TABLE: Maximum Operating Input Current Calculations on page 5

Related Information

- "Calculating Maximum Input Current" on page 5
- "Electrical Power" on page 6
- *SPARC Enterprise T5440 Server Service Manual*

Calculating Maximum Input Current

The maximum operating current values are based on P/V using the equations in TABLE: Maximum Operating Input Current Calculations on page 5.

TABLE: Maximum Operating Input Current Calculations

Range	Equation	Example
[90-120 V]	P = 3316 - 6.87 *V	I = 22.0 A @ 115V, or 11.0 A per line cord with two power supplies active.
[200-240 V]	P = 2447 + 0.375 * V	I = 12.0 A @ 210V, or 6.0 A per line cord with two power supplies active.

Related Information

- "Power Source Requirements" on page 4

Acoustic Noise Emissions

Declared noise emissions for the SPARC Enterprise T5440 server is in accordance with ISO 9296 standards. See TABLE: SPARC Enterprise T5440 Noise Emissions on page 5.

TABLE: SPARC Enterprise T5440 Noise Emissions

Description	Operating at idle	Operating at maximum power
Sound power level, LwAd (1 B = 10 dB)	7.4 B	8.9 B
Sound Pressure Level, LpAm (bystander positions)	63 dB	80 dB

Agency Compliance Specifications

Refer to the *SPARC Enterprise T5440 Server Safety and Compliance Guide* for a full list of agency compliance specifications.

Operating Environment Requirements

Your environmental control system must provide intake air for the server that complies with the limits specified in "Environmental Specifications" on page 3.

To avoid overheating, *do not* direct warmed air:

- Toward the front air intake of the server
- Toward the server access panels

Note – When you receive your server, place it in the environment where you will install it. Leave the server in its shipping crate at its final destination for 24 hours. This resting period prevents thermal shock and condensation.

The servers have been tested to meet all functional requirements when operating in the operating environmental limits presented in "Environmental Specifications" on page 3. Operating computer equipment in extremes of temperature or humidity increases the failure rate of hardware components. To minimize the chance of component failure, use the server within the optimal temperature and humidity ranges.

Electrical Power

Good practice is to connect each power supply to a separate circuit. This redundancy enables the system to remain operational if one of the circuits fails. Consult your local electrical codes for any additional requirements.

Ambient Temperature

An ambient temperature range of 21˚C (69.8˚F) to 23˚C (73.4˚F) is optimal for server reliability. At 22˚C (71.6˚F) it is easy to maintain safe relative humidity levels. Operating in this temperature range provides a buffer if the environmental support systems fail.

Ambient Relative Humidity

Ambient relative humidity levels between 45% and 50% are the most suitable for data processing operations in order to:

- Prevent corrosion
- Provide an operating time buffer in the event of environmental control system failure
- Help avoid failures caused by the intermittent interference from static discharges that occur when relative humidity is too low

Electrostatic discharge (ESD) is easily generated and less easily dissipated in areas where the relative humidity is below 35%. ESD becomes critical when levels drop below 30%.

Airflow Considerations

- Ensure unobstructed airflow through the chassis.
- Ensure that inlet air enters at the front of the server and exits from the back.
- Ensure that ventilation openings, such as cabinet doors, for both the inlet and exhaust of the server provide a minimum open area of 460 cm^2 (71.3 $in.^2$) each. This ventilation equates to a 60% open area perforation pattern across the front and rear area of the server. You must evaluate the impact of other open area characteristics that are more restrictive.
- Allow a minimum of 5 mm (0.2 in.) clearance at the front of the system and 80 mm (3.1 in.) at the rear of the server when mounted. These clearance values are based on the inlet and exhaust impedance (available open area). These values also assume a uniform distribution of the open area across the inlet and exhaust areas. Use greater clearance values to improve cooling performance.

Note – The combination of inlet and exhaust restrictions such as cabinet doors, and the spacing of the server from the doors can affect the cooling performance of the server. You must evaluate the effect of these criteria.

- Take care to prevent recirculation of exhaust air within a rack or cabinet.
- Manage cables to minimize interfering with the server exhaust vent.

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