FUJITSU

SPARC Enterprise
T5120 and T5220 Servers

Overview Guide

C120-E460-03EN

FUJITSU

SPARC Enterprise™ T5120 and T5220 Servers Overview Guide

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Preface

This guide provides an overview of the SPARC Enterprise™ T5120 and T5220 servers features.

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 T5120 Server Getting Started Guide	Minimum steps to power on and boot the server for the first time	C120-E518
SPARC Enterprise T5120 Server Getting Started Guide For Models That Run on DC Input Power	Minimum steps to power on and boot the server that run on DC input power for the first time	C120-E552
SPARC Enterprise T5220 Server Getting Started Guide	Minimum steps to power on and boot the server for the first time	C120-E519
SPARC Enterprise T5220 Server Getting Started Guide For Models That Run on DC Input Power	Minimum steps to power on and boot the server that run on DC input power for the first time	C120-E553
SPARC Enterprise T5120 and T5220 Servers Product Notes	Information about the latest product updates and issues	C120-E458
Important Safety Information for Hardware Systems	Safety information that is common to all SPARC Enterprise series servers	C120-E391
SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Guide	Safety and compliance information that is specific to the servers	C120-E461
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 T5120 and T5220 Servers Site Planning Guide	Server specifications for site planning	C120-H027
SPARC Enterprise T5120 and T5220 Servers Overview Guide	Product features	C120-E460
SPARC Enterprise T5120 and T5220 Servers Installation Guide	Detailed rackmounting, cabling, power on, and configuring information	C120-E462

Title	Description	Manual Code
SPARC Enterprise T5120 and T5220 Servers Service Manual	How to run diagnostics to troubleshoot the server, and how to remove and replace parts in the server	C120-E463
SPARC Enterprise T5120 and T5220 Servers Administration Guide	How to perform administrative tasks that are specific to the servers	C120-E464
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 T5120 and T5220 Servers	How to use the ILOM 2.0 software on the servers	C120-E465
Integrated Lights Out Manager (ILOM) 3.0 Concepts Guide	Information that describes ILOM 3.0 features and functionality	C120-E573
Integrated Lights Out Manager (ILOM) 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 (ILOM) 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 (ILOM) 3.0 CLI Procedures Guide	Information and procedures for accessing ILOM 3.0 functions using the ILOM CLI	C120-E575
Integrated Lights Out Manager (ILOM) 3.0 SNMP and IPMI Procedures Guide	Information and procedures for accessing ILOM 3.0 functions using SNMP or IPMI management hosts	C120-E579
Integrated Lights Out Manager (ILOM) 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 (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers	How to use the ILOM 3.0 software on the servers	C120-E577
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.

Conventions for Alert Messages

This manual uses the following conventions to show alert messages, which are intended to prevent injury to the user or bystanders as well as property damage, and important messages that are useful to the user.

Warning – This indicates a hazardous situation that could result in death or serious personal injury (potential hazard) if the user does not perform the procedure correctly.

Caution – This indicates a hazardous situation that could result in minor or moderate personal injury if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.

Alert Messages in the Text

An alert message in the text consists of a signal indicating an alert level followed by an alert statement. A space of one line precedes and follows an alert statement.

Caution – The following tasks regarding this product and the optional products provided from Fujitsu should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause malfunction.

Product Handling

Maintenance

Warning – Certain tasks in this manual should only be performed by a certified service engineer. User must not perform these tasks. Incorrect operation of these tasks may cause electric shock, injury, or fire.

- Installation and reinstallation of all components, and initial settings
- Removal of front, rear, or side covers
- Mounting/de-mounting of optional internal devices
- Plugging or unplugging of external interface cards
- Maintenance and inspections (repairing, and regular diagnosis and maintenance)

Caution – The following tasks regarding this product and the optional products provided from Fujitsu should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause malfunction.

- Unpacking optional adapters and such packages delivered to the users
- Plugging or unplugging of external interface cards

Remodeling/Rebuilding

Caution – Do not make mechanical or electrical modifications to the equipment. Using this product after modifying or reproducing by overhaul may cause unexpected injury or damage to the property of the user or bystanders.

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(http://www.fujitsu.com/global/contact/computing/sparce_index.html)

Understanding Server Features

These topics describe the features of the SPARC Enterprise T5120 and T5220 servers. The following topics are covered:

- "Server Highlights" on page 2
- "Features at a Glance" on page 4
- "Additional Feature Information" on page 8

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*
- *SPARC Enterprise T5120 and T5220 Servers Site Planning Guide*
- *SPARC Enterprise T5120 and T5220 Servers Installation Guide*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- Integrated Lights Out Manager (ILOM) software documentation
- *Integrated Lights Out Manager (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*
- Logical Domains (LDoms) software documentation (`http://docs.sun.com/app/docs/prod/ldoms`)
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*
- Solaris OS documentation (`http://docs.sun.com/app/docs/prod/solaris`)

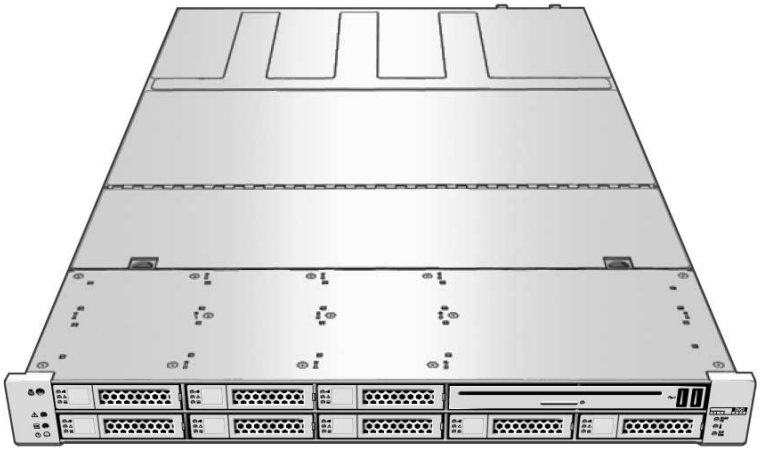
Server Highlights

The SPARC Enterprise T5120 (FIGURE: SPARC Enterprise T5120 Server on page 3) and T5220 (FIGURE: SPARC Enterprise T5220 Server on page 3) servers are scalable, reliable, high-performance, entry-level servers, optimized for enterprise data centers. These servers offer the following key features:

- The UltraSPARC T2 multicore processor with CoolThreads technology for high-throughput and energy savings.
- High levels of system uptime through the processor and memory reliability-availability-serviceability (RAS) features, coupled with redundancy of some systems components, support for hardware RAID (0+1), and the Predictive Self-Healing features of the Solaris 10 Operating System (Solaris OS).
- Both servers come in a space efficient, rack-optimized form factor chassis, 1U for the SPARC Enterprise T5120 server, and 2U for the SPARC Enterprise T5220 server.
- Investment protection with SPARC V9 binary application compatibility and the Solaris 10 OS. The Solaris 10 OS also provides features such as Solaris Predictive Self-Healing, Solaris Dynamic Tracing, and support across UltraSPARC platforms.
- Unified server management though the use of the Integrated Lights Out Manager (ILOM) interface. ILOM integrates and manages CoolThreads and x64 platforms with the same tool set, and in heterogeneous environments, using industry standard element management tools and enterprise frameworks.

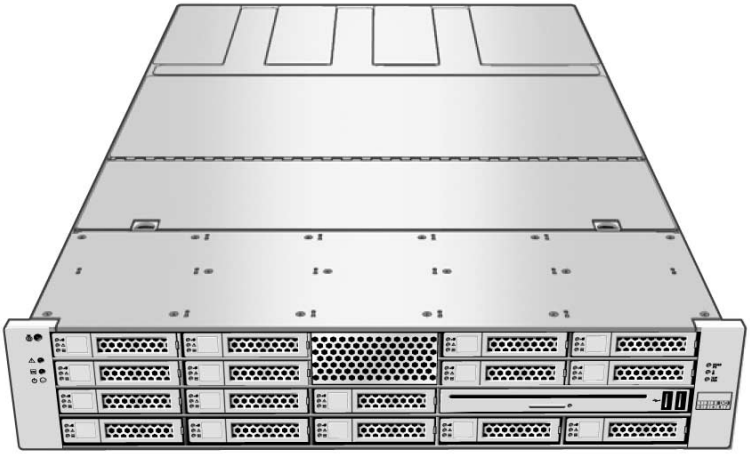
The following figure shows the SPARC Enterprise T5120 server chassis as viewed from the front and top.

FIGURE: SPARC Enterprise T5120 Server



The following figure shows the SPARC Enterprise T5220 server chassis as viewed from the front and top.

FIGURE: SPARC Enterprise T5220 Server



Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- Integrated Lights Out Manager (ILOM) software documentation

- *Integrated Lights Out Manager (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*
- Solaris OS documentation (http://docs.sun.com/app/docs/prod/solaris)

Features at a Glance

The following table describes in summary form the main features of the SPARC Enterprise T5120 and T5220 servers.

TABLE: Summary of Features

Feature	Description
Chassis dimensions and rackmounting hardware*	**T5120:** 1 rack unit (1U) • Width: 425 mm (16.75 in.) • Height: 44 mm (1.75 in.) • Depth: 714 mm (28.13 in.) **T5220:** 2 rack units (2U) • Width: 425 mm (16.75 in.) • Height: 88 mm (3.49 in.) • Depth: 714 mm (28.125 in.)
Processor	One UltraSPARC T2 multicore processor with one of the following number of cores: • 4 cores (32 threads); 1.2 GHz • 8 cores (64 threads); 1.2, 1.4, or 1.6 GHz
Memory Slots/Capacity	Sixteen FBDIMM slots supporting 2-, 4-, and 8-Gbyte modules (maximum capacity of 128 Gbytes of system memory)

TABLE: Summary of Features *(Continued)*

Feature	Description
Internal Hard Drives*	**T5120:** Up to eight 73-Gbyte, 146-Gbyte, or 300-Gbyte 2.5 inch SAS hard drives (hot-pluggable) Up to four solid-state drives can be used in conjunction with disk-based hard drives for a total of eight hard drive storage units. Integrated hard drive controller supports RAID 0 and RAID 1. **T5220:** Up to sixteen 73-Gbyte or 146-Gbyte, or 300-Gbyte 2.5 inch SAS hard drives (hot-pluggable). Up to eight solid-state drives can be used in conjunction with disk-based hard drives for a total of sixteen hard drive storage units. Integrated hard drive controller supports RAID 0 and RAID 1. **Note -** Some T5120 models only support up to four hard drives. Some T5220 models only support up to eight hard drives.
Optical Media Device	One, slot-loading, slimline DVD drive, supporting CD-R/W, DVD-R/W, DVD+R/W
Power Supplies	Two hot-swappable power supply units providing N+1 redundancy
Cooling*	**T5120:** Four to seven hot-swappable fan modules (two fans per module) **T5220:** Three to four hot-swappable fan modules (two fans per module)
Ethernet Ports	Four 10/100/1000 Mbps Ethernet, RJ-45-based, autonegotiating ports (on two separate controllers) **Note -** 10-Gbit Ethernet ports are available by adding XAUI cards to the I/O expansion slots. For each XAUI card added, one onboard 1-Gbit Ethernet port is disabled.

TABLE: Summary of Features *(Continued)*

Feature	Description
PCI Express Interfaces*	**T5120:** Three low-profile PCI Express slots with the following slot designated specifications†: • One slot – PCIe, 8-lane • Two slots – PCIe 4-lane (alternatively, these slots can be used for 10-Gbit Ethernet by adding XAUI cards) • Up to 5 additional PCIe slots are available using an External I/O Expansion Unit **T5220:** Six low-profile PCI Express slots with the following slot designated specifications† • Two slots – PCIe, 8-lane • Two slots – PCIe, 4-lane • Two slots – PCIe 4-lane (alternatively, these slots can be used for 10-Gbit Ethernet by adding XAUI cards) • Up to 10 additional PCIe slots are available using up to two External I/O Expansion Units **Note -** All PCIe cards are installed using supplied riser boards
USB Ports	Four USB 2.0 ports (2 forward, 2 rear facing).
Additional Ports	The following connectors are located on the rear of the server: • One RJ-45 serial management port (SER MGT) – the default connection to the service processor • One 10/100 Mbps Ethernet network management port (NET MGT) – connection to the service processor • One DB-9 serial port – connection to the host
Remote Management	Onboard Integrated Lights Out Manager (ILOM), with two command sets: • ILOM • ALOM CMT compatibility shell (legacy command set) Both command sets are accessible through the RJ-45 serial and 10/100 Mbps Ethernet interfaces.

TABLE: Summary of Features *(Continued)*

Feature	Description
Cryptography	Processor-integrated, cyptographic acceleration that supports industry-standard security ciphers Refer to the server product notes for information on the minimum version of supported OS and required patches
Operating System	Solaris 10 OS preinstalled on disk 0 Refer to the server product notes for information on the minimum version of supported OS and required patches.
Other Software	• Java Enterprise System • Logical Domains Manager • Sun Studio Refer to the server product notes for details about specific versions of the preinstalled software.

* This symbol marks a feature specification that differs between the two servers models.

† PCI-e and PCI-X specifications described in this table list the physical requirements for PCI cards. Additional support capabilities must also be provided (such as device drivers) for a PCI card to function in the server. Refer to the specifications and documentation for a given PCI card to determine if the required drivers are provided that enable the card to function in this server.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Site Planning Guide*
- *SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*
- *SPARC Enterprise T5120 and T5220 Servers Installation Guide*
- Integrated Lights Out Manager (ILOM) software documentation
- *Integrated Lights Out Manager (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*
- Logical Domains (LDoms) software documentation (http://docs.sun.com/app/docs/prod/ldoms)
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*
- Solaris OS documentation (http://docs.sun.com/app/docs/prod/solaris)

Additional Feature Information

- "Chip-Multithreaded Processor and Memory Technology" on page 8
- "Performance Enhancements" on page 9
- "Preinstalled Solaris Operating System" on page 9
- "Hardware-Assisted Cryptography" on page 10
- "Support for Virtualization Through Logical Domains (LDoms)" on page 10
- "Remote Manageability With ILOM" on page 11
- "High Levels of System Reliability, Availability, and Serviceability" on page 12
- "Fault Management and Predictive Self Healing" on page 16
- "Rackmountable Enclosure" on page 16

Chip-Multithreaded Processor and Memory Technology

The UltraSPARC T2 multicore processor is the basis of the SPARC Enterprise T5120 and T5220 servers. The UltraSPARC T2 processor is based on chip multithreading (CMT) technology that is optimized for highly threaded transactional processing. The UltraSPARC T2 processor improves throughput while using less power and dissipating less heat than conventional processor designs.

Depending on the model purchased, the processor has four, six, or eight UltraSPARC cores. Each core equates to a 64-bit execution pipeline capable of running eight threads. The result is that the 8-core processor handles up to 64 active threads concurrently.

Additional processor components, such as L1 cache, L2 cache, memory access crossbar, memory controllers, and the I/O interface have been carefully tuned for optimal performance.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Installation Guide*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

Performance Enhancements

The SPARC Enterprise T5120 and T5220 servers running the Solaris 10 OS provide several new performance enhancing technologies with its sun4v architecture and multicore, multithreaded UltraSPARC T2 processor.

Some of these enhancements are:

- A floating point unit (FPU) for each core
- Four independent dual-channel memory controllers that use the latest fully buffered memory technology
- Processor-integrated cyptographic acceleration
- Large page optimization
- Reduction on TLB misses
- Optimized block copy
- Support for 10-Gbit Ethernet with the addition of XAUI cards

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Installation Guide*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

Preinstalled Solaris Operating System

The SPARC Enterprise T5120 and T5220 servers are preinstalled with the Solaris 10 OS, and offer the following Solaris OS features:

- Stability, high performance, scalability, and precision of a mature 64-bit operating system.
- Support for over 12,000 leading technical and business applications.
- Solaris Containers – Isolate software applications and services using flexible, software-defined boundaries.
- DTrace – A comprehensive dynamic tracing framework for tuning applications and troubleshooting systemic problems in real time.
- Predictive Self-Healing – Capability that automatically diagnoses, isolates, and recovers from many hardware and application faults.
- Security – Advanced security features designed to protect the enterprise at multiple levels.

- Network Performance – Completely rewritten TCP/IP stack dramatically improves the performance and scalability of your networked services.

You can use the preinstalled Solaris 10 OS, or reinstall a supported version of the Solaris 10 OS from your network, CD, or downloaded copy. Refer to the *SPARC Enterprise T5120 and T5220 Servers Product Notes* for information on the supported OS releases for your server.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- Solaris OS documentation (http://docs.sun.com/app/docs/prod/solaris)

Hardware-Assisted Cryptography

The UltraSPARC T2 multicore, multithreaded processors provide hardware-assisted acceleration of symmetric, asymmetric, hashing and random number generation cryptographic operations as follows:

- Asymmetric algorithms – RSA, DSA, Diffie Hellman, and Elliptic Curve cryptography
- Symmetric algorithms – AES, 3DES, and RC$
- Hashing algorithms – SHA1, SHA256, and MD5

The Solaris 10 OS provides the multithreaded device driver that supports the hardware-assisted cryptography.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- Solaris OS documentation (http://docs.sun.com/app/docs/prod/solaris)

Support for Virtualization Through Logical Domains (LDoms)

The SPARC Enterprise T5120 and T5220 servers support the use of Logical Domains (LDoms) technology. Through the use of the Solaris OS and the built-in server firmware, and by installing the Logical Domains Manager software, you can virtualize the compute services that run on your server.

A *logical domain* is a discrete, logical grouping with its own operating system, resources, and identity within a single computer system. Each logical domain can be created, destroyed, reconfigured, and rebooted independently, without requiring a power cycle of the server.

You can run a variety of applications software in different logical domains and keep them independent for performance and security purposes.

Each logical domain can be managed as an entirely independent machine with its own resources, such as:

- Kernel, patches, and tuning parameters
- User accounts and administrators
- Network interfaces, MAC addresses, and IP addresses

Each logical domain can interact only with those server resources made available to it. The configuration is controlled using the Logical Domains Manager.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- Logical Domains (LDoms) software documentation (http://docs.sun.com/app/docs/prod/ldoms)

Remote Manageability With ILOM

The Integrated Lights Out Manager (ILOM) feature is a service processor that is built into the server, and enables you to remotely manage and administer the server.

The ILOM software is preinstalled as firmware, and initializes as soon as you apply power to the system.

ILOM enables you to monitor and control your server over an Ethernet connection (supports SSH), or by using a dedicated serial port for connection to a terminal or terminal server. ILOM provides a command-line interface and a browser-based interface that you can use to remotely administer geographically distributed or physically inaccessible machines. In addition, ILOM enables you to run diagnostics (such as POST) remotely that would otherwise require physical proximity to the server's serial port.

You can configure ILOM to send email alerts of hardware failures and warnings, and other events related to the server. The ILOM circuitry runs independently of the server, using the server's standby power. Therefore, ILOM firmware and software continue to function when the server operating system goes offline or when the server is powered off. ILOM monitors the following SPARC Enterprise T5120 and T5220 server conditions:

- CPU temperature conditions
- Hard drive status
- Enclosure thermal conditions
- Fan speed and status
- Power supply status
- Voltage conditions
- Solaris watchdog, boot time-outs, and automatic server restart events

In addition to the ILOM CLI and browser interface, you can set up the server to use the ALOM CMT compatibility CLI. The ALOM CMT compatibility CLI provides commands that approximate the ALOM CMT UI that was provided on some previous servers.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- Integrated Lights Out Manager (ILOM) software documentation
- *Integrated Lights Out Manager (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*

High Levels of System Reliability, Availability, and Serviceability

Reliability, availability, and serviceability (RAS) are aspects of a system's design that affect its ability to operate continuously and to minimize the time necessary to service the system. *Reliability* refers to a system's ability to operate continuously without failures and to maintain data integrity. System *availability* refers to the ability of a system to recover to an operational state after a failure, with minimal impact. *Serviceability* relates to the time it takes to restore a system to service following a system failure. Together, reliability, availability, and serviceability features provide for near-continuous system operation.

To deliver high levels of reliability, availability, and serviceability, the SPARC Enterprise T5120 and T5220 servers offer the following features:

- Ability to disable individual threads and cores without rebooting
- Lower heat generation, reducing hardware failures
- Hot-pluggable hard drives
- Redundant, hot-swappable power supplies (two)
- Redundant N+1 hot-swappable fan modules
- Environmental monitoring

- Internal hardware drive mirroring (RAID 1)
- Error detection and correction for improved data integrity
- Easy access for most component replacements

Related Information

- "Hot-Pluggable and Hot-Swappable Components" on page 13
- "Power Supply Redundancy" on page 13
- "Environmental Monitoring" on page 14
- "Support for RAID Storage Configurations" on page 15
- "Error Correction and Parity Checking" on page 15

Hot-Pluggable and Hot-Swappable Components

SPARC Enterprise T5120 and T5220 server hardware is designed to support hot-plugging of the chassis-mounted hard drives, and hot-swapping of fan units, and power supplies. By using the proper software commands, you can install or remove these components while the system is running. Hot-swap and hot-plug technology significantly increases the system's serviceability and availability by providing the ability to replace hard drives, fan units, and power supplies without service disruption.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- Integrated Lights Out Manager (ILOM) software documentation
- *Integrated Lights Out Manager (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*
- *SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Guide*

Power Supply Redundancy

The SPARC Enterprise T5120 and T5220 servers provide two hot-swappable power supplies, enabling the system to continue operating should one of the power supplies fail or if a power source fails.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

Environmental Monitoring

The SPARC Enterprise T5120 and T5220 servers feature an environmental monitoring subsystem that protects the server and its components against:

- Extreme temperatures
- Lack of adequate airflow through the system
- Power supply failures
- Hardware faults

Temperature sensors are located throughout the system to monitor the ambient temperature of the system and internal components. The software and hardware ensure that the temperatures within the enclosure do not exceed predetermined safe operation ranges. If the temperature observed by a sensor falls below a low-temperature threshold or rises above a high-temperature threshold, the monitoring subsystem software lights the amber Service Required LEDs on the front and back panels. If the temperature condition persists and reaches a critical threshold, the system initiates a graceful system shutdown. In the event of a failure of the service processor, backup sensors protect the system from serious damage, by initiating a forced hardware shutdown. The Service Required LEDs remain lit after an automatic system shutdown to aid in problem diagnosis.

The power subsystem is monitored in a similar fashion by monitoring power supplies and reporting any fault in the front and rear panel LEDs.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- Integrated Lights Out Manager (ILOM) software documentation
- *Integrated Lights Out Manager (ILOM) 3.0 Supplement for SPARC Enterprise T5120 and T5220 Servers*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

Support for RAID Storage Configurations

Using the on-board SAS controller, you can set up hardware RAID 1 (mirroring) and hardware RAID 0 (striping) configurations for any pair of internal hard drives, providing a high-performance solution for hard drive mirroring.

Additional RAID levels are supported by installing the StorageTek SAS HBA (internal PCIe card). This option requires a different set of internal cables.

By attaching one or more external storage devices to the SPARC Enterprise T5120 and T5220 servers, you can use a redundant array of independent drives (RAID) software application such as Solstice DiskSuite or VERITAS Volume Manager[1] to configure system drive storage in a variety of different RAID levels.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*
- Solaris OS documentation (http://docs.sun.com/app/docs/prod/solaris)
- Documentation for your hardware

Error Correction and Parity Checking

The UltraSPARC T2 multicore processor provides parity protection on its internal cache memories, including tag parity and data parity on the D-cache and I-cache. The internal L2 cache has parity protection on the tags, and ECC protection on the data.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

1. Software RAID applications such as VERITAS Volume Manager are not included with this server. You must obtain and license them separately.

Fault Management and Predictive Self Healing

The SPARC Enterprise T5120 and T5220 servers provide the latest fault management technologies. The Solaris 10 OS architecture provides a means for building and deploying systems and services capable of *Predictive Self-Healing*. Self-healing technology enables systems to accurately predict component failures and mitigate many serious problems before they actually occur. This technology is incorporated into both the hardware and software of the SPARC Enterprise T5120 and T5220 servers.

At the heart of the Predictive Self-Healing capabilities is the Solaris Fault Manager, a new service that receives data relating to hardware and software errors, and automatically and silently diagnoses the underlying problem. Once a problem is diagnosed, a set of agents automatically responds by logging the event, and if necessary, takes the faulty component offline. By automatically diagnosing problems, business-critical applications and essential system services can continue uninterrupted in the event of software failures or major hardware component failures.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Administration Guide*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*
- Solaris OS documentation (http://docs.sun.com/app/docs/prod/solaris)

Rackmountable Enclosure

The SPARC Enterprise T5120 and T5220 servers use a space-saving 1U or 2U-high rackmountable enclosure that can be installed into a variety of industry standard racks.

Related Information

- *SPARC Enterprise T5120 and T5220 Servers Product Notes*
- *SPARC Enterprise T5120 and T5220 Servers Getting Started Guide*
- *SPARC Enterprise T5120 and T5220 Servers Getting Started Guide (DC)*
- *SPARC Enterprise T5120 and T5220 Servers Site Planning Guide*
- *SPARC Enterprise T5120 and T5220 Servers Installation Guide*
- *SPARC Enterprise T5120 and T5220 Servers Service Manual*

- *SPARC Enterprise T5120 and T5220 Servers Safety and Compliance Guide*

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