

# Fujitsu SPARC M12-2S Server

The Fujitsu SPARC M12-2S server is a flexible and scalable system based on the latest SPARC64 XII processor, delivering high performance and high availability for mission-critical enterprise workloads and cloud computing. The SPARC64 XII processor core is up to 2.5 times faster compared to previous-generation SPARC64 cores. Innovative Software on Chip capabilities deliver dramatic performance increases by implementing key software functions directly in the processor. The Fujitsu SPARC M12-2S system can scale from 1 to 32 processors using a modular architecture, with the flexibility to create a large, scale-up server or a scale-out configuration. In addition, customers can enjoy the benefits of Capacity on Demand with core-level activation, as well as physical partitioning capabilities and a suite of built-in virtualization technologies included at no cost.

## PRODUCT OVERVIEW

### Flexibility and Scalability for Mission-Critical Clouds

The Fujitsu SPARC M12-2S server offers high reliability and outstanding processor core performance, and has flexible scalability by virtue of a modular, building-block expansion methodology. The Fujitsu SPARC M12-2S server can scale up to 32 processors and more than 3,000 threads, or it can be used in scaled-out



### Key Benefits

- Scalability and performance for large ERP, BIDW, SCM, CRM, big data, and analytics workloads
- Efficient consolidation of a large number of applications with diverse requirements on a single server
- High availability to support the most demanding 24/7 mission-critical applications
- Dramatic acceleration of Oracle Database In-Memory performance with new SPARC64 XII processor's Software on Chip capabilities
- Fast and economical system capacity growth in small increments with no downtime
- Higher levels of system utilization with flexible configurations and virtualization

configurations for parallel distributed processing. It is an ideal server for traditional enterprise-class workloads such as large-scale online transaction processing (OLTP), business intelligence and data warehousing (BI), enterprise resource planning (ERP), and customer relationship management (CRM), as well as new environments in cloud computing or big data processing.

The Fujitsu SPARC M12 servers incorporate the SPARC64 XII (“twelve”) processor that features improved throughput performance with eight threads per core, and significantly faster memory access through the use of DDR4 memory. Moreover, the Fujitsu SPARC M12 server delivers dramatic in-memory database performance increases by implementing key software processing functions onto the processor itself, a functionality called Software on Chip.

### **Mainframe-Class RAS and Maximum Scalability**

The Fujitsu SPARC M12-2S server delivers high availability to support the most demanding mission-critical applications. It comes with mainframe-class reliability, availability, and serviceability (RAS) features, including automatic recovery with instruction retry, extended error-correcting code (ECC) protection, guaranteed data path integrity, configurable memory mirroring, and many more RAS capabilities. Furthermore, major system components are redundant and hot swappable for increased availability and serviceability.

The Fujitsu SPARC M12-2S server utilizes a modular architecture that can create a large, scale-up system configuration. An entry configuration can start with a single SPARC64 XII 12-core processor in a one server chassis—or building block—which can be expanded to two processors. The system can be further expanded incrementally from 1 to up to 16 building blocks, or up to 32 processors and 384 cores. The building blocks are connected via a Fujitsu-developed interconnect technology that ensures high bandwidth, low latency, and linear scalability. The server also can be flexibly deployed and operated in a scale-out configuration, such as in a compute cluster.

In either scale-up or scale-out configuration, adding resources such as processors, memory, and PCIe expansion slots is a matter of gradually installing additional building blocks and connecting them via the high-speed interconnect. For example, the minimum configuration of one building block can be used for development and testing, and later more building blocks can be added to increase capacity when it’s time for deployment.

### **Oracle Solaris: the World’s Most Advanced Enterprise Operating System**

Only Oracle offers the Oracle Solaris binary application guarantee, with guaranteed binary and source-code compatibility for legacy applications. The Fujitsu SPARC M12-2S server supports Oracle Solaris 11 and 10, which offer the powerful Oracle Solaris ZFS file systems, and unmatched capabilities such as dynamic tracing (DTrace feature of Oracle Solaris), cryptographic infrastructure, user and process rights management, and the Oracle Solaris IP Filter feature. In addition, Oracle Solaris 9 and 8 are supported using Oracle Solaris Legacy Containers.

### **Advanced Virtualization and Consolidation**

SPARC-based servers are the industry’s best consolidation and virtualization platforms. The Fujitsu SPARC M12-2S server supports as many as 16 physical partitions, and Oracle VM Server for SPARC software enables as many as 256 logical domains to be deployed in each physical partition. Physical partitions or logical domains can be further virtualized with Oracle Solaris Zones, which supports thousands of virtual machines, enabling massive server consolidation and virtualization.

### **Key Features**

- The SPARC64 XII processor core is up to 2.5 times faster than previous-generation SPARC64 X+ processor cores.
- Dynamic scaling from 1 building block up to 16 building blocks with 32 processors and 384 cores
- Up to 48 TB of memory for large in-memory applications
- Mainframe-class RAS features, and on-line upgrades and servicing
- Software on Chip database acceleration on the SPARC64 XII processor
- Per core activation allows granular and agile response to changes in business requirements
- Layered virtualization includes Oracle VM Server for SPARC and Oracle Solaris Zones technologies
- New Vapor and Liquid Loop Cooling (VLLC) is three times more efficient than traditional cooling technology
- Server management is done through the independent service processor’s eXtended System Control Facility (XSCF).

# FUJITSU SPARC M12-2S SERVER SPECIFICATIONS

## ARCHITECTURE

### Processor

- 12-core, 4.25 GHz SPARC64 XII processor
- Dual-instruction pipeline per core
- 96 threads per processor (8 threads per core)
- 96 integer execution units per processor (8 per core)
- 96 floating-point units per processor (8 per core)
- 1 random number generator (1 per processor)

### Cache per Processor

- Level 1: instruction: 64 KB; data: 64 KB per core
- Level 2: 512 KB per core
- Level 3: 32 MB per processor

### System Configuration

- Fujitsu SPARC M12-2S is a modular system that can create a large, scale-up server with up to 32 processors in up to 16 building blocks, for maximum configuration flexibility
- Each Fujitsu SPARC M12-2S building block has one or two 12-core SPARC64 VII processors
- CPUs:
  - Up to 2 CPUs: 1-unit configuration
  - Up to 8 CPUs: 4-unit configuration
  - Up to 32 CPUs: 16-unit configuration
- Up to 24 dual inline memory module (DIMM) slots per processor using 16, 32, or 64 GB DDR4 DIMMs
- Main memory:
  - Up to 3 TB per unit, with 64 GB DIMM: 1-unit configuration
  - Up to 12 TB per unit, with 64 GB DIMM: 4-unit configuration
  - Up to 48 TB per unit, with 64 GB DIMM: 16-unit configuration
- I/O:
  - 8 PCI Express 3.0 short, low-profile slots (eight lanes): 1-unit configuration
  - 32 PCI Express 3.0 short, low-profile slots (eight lanes): 4-unit configuration
  - 128 PCI Express 3.0 short, low-profile slots (eight lanes): 16-unit configuration
  - Up to 1408 PCI Express slots with optional PCI expansion unit
  - 4-port 10 GbE, 1-port SAS, 2-port USB per unit
- Memory bandwidth (per chip): 153.6 GB/sec
- Service processor: one per unit

### System Architecture

- SPARC V9 architecture, ECC protected

## INTERFACES

- Network per unit: Four 10 GbE (100 Mb/sec/1 Gb/sec/10 Gb/sec), IEEE 802.3an (10GBASE-T) standards, auto-negotiation

- Disks and internal storage per unit: Two SAS-2 controllers providing hardware RAID 0, 1, and 1E/10 (ZFS file system provides higher levels of RAID)
- Expansion bus per unit: Eight low-profile PCIe 3.0 (eight x8) slots
- PCI Expansion Units per unit:
  - 1 CPU: Up to 48 slots (with four PCI expansion units connected)
  - 2 CPUs: Up to 88 slots (with eight PCI expansion units connected)
- Ports per unit: Two external USB (one front USB 2.0 and one rear USB 3.0)
- Administration interface per unit: two 1000Base-T (RJ45) network ports, one RJ45 serial management port, two USB ports (for maintenance only)

## MASS STORAGE AND MEDIA

Internal storage per unit:

- Up to eight 2.5-inch SAS-2 drives
  - 600 GB or 1.2TB hard disk drives (HDD)
  - 400 GB or 800 GB solid state drives (SSD)
- Fujitsu flash accelerator NVMe PCIe 3.0 cards
  - Fujitsu 3.2 TB Flash Accelerator, maximum of 8

External storage:

- Optional external DVD drive
- Oracle offers a complete line of best-in-class, innovative storage, hardware, and software solutions, along with renowned world-class service and support. For more information, please refer to [oracle.com/storage](https://oracle.com/storage)

## POWER SUPPLIES

- Four hot-swappable AC 1,800 W redundant (2 + 2) power supplies
- Voltage 200 to 240 VAC, frequency 50/60 Hz
- Maximum operating input current at 200 VAC: 16.8 A
- Maximum operating input power at
  - Single unit: 3,292 W at maximum
  - 8 units with one rack: 27,690 W at maximum
  - 16 units with two racks: 56,180 W at maximum

## KEY RAS FEATURES

- End-to-end ECC protection
- Guaranteed data path integrity
- Automatic recovery with instruction retry
- Dynamic L1, L2, and L3 cache way degradation
- ECC and extended ECC protection for memory, memory mirroring, periodic memory patrol, and Predictive Self Healing (a feature of Oracle Solaris)
- Hardware redundancy in memory (when mirroring), HDD/SSD, PCI cards (multipath configuration), power system, power supply unit (PSU), and fan
- Hot-pluggable HDD/SSD, PSU, PCI card, and fan
- Live operating system upgrades
- Firmware updates during system operation

## SOFTWARE

Operating System

Oracle recommends the latest version of Oracle Solaris 11.4 for enhanced performance and functionality, including features enabled by Software on Chip technology

- Control domain:
    - Oracle Solaris 11.3 + SRU11.3.17.5.0 or later
    - Oracle Solaris 11.2 + SRU11.2.15.5.1
    - Oracle Solaris 11.1 + SRU11.1.21.4.1
    - Oracle Solaris 10 1/13 plus required patches
  - The following versions are supported within guest domains:
    - Oracle Solaris 11.1 or later Oracle Solaris 10 1/13\*
    - Oracle Solaris 10 8/11\*
    - Oracle Solaris 10 9/10\*
- \* Plus required patches

Applications certified for Oracle Solaris 9 or 8 only may run in an Oracle Solaris 9 or 8 branded zone running within an Oracle Solaris 10 domain.

#### Software Included

- Oracle Solaris 11.4 (latest version), which includes Oracle VM Server for SPARC
- Oracle Solaris ZFS (default file system)

#### Virtualization

Built-in, no-cost Oracle VM Server for SPARC provides the flexibility and power for running multiple logical domains in a single server. Multiple Oracle Solaris Zones may be run within a single Oracle VM Server for SPARC logical domain.

### ENVIRONMENT

#### Operating temperature:

- 5° C to 35° C at 0 to 500 m (41° F to 95° F at 0 to 1,640 ft.)
- 5° C to 33° C at 501 to 1,000 m (41° F to 91° F at 1,641 to 3,280 ft.)
- 5° C to 31° C at 1,001 to 1,500 m (41° F to 88° F at 3,281 to 4,920ft.)
- 5° C to 29° C at 1,501 to 3,000 m (41° F to 84° F at 4,421 to 9,840 ft.)

#### Nonoperating temperature:

- -25° C to 60° C (-13° F to 140° F) (packed)
- 0 to 50° C (32° F to 122° F) (nonpacked)

Operating relative humidity: 20% to 80% relative humidity, noncondensing

Nonoperating relative humidity: 8 to 80% relative humidity, noncondensing

Operating altitude: 0 m to 3,000 m (0 feet to 9,840 feet)

#### Acoustic noise for a single unit

DESCRIPTION	ONE CPU INSTALLED	TWO CPUS INSTALLED
Sound power level	8.2 B	8.5 B
Sound pressure level	64 dB	68 B

## REGULATIONS (MEETS OR EXCEEDS THE FOLLOWING REQUIREMENTS)

### Safety:

- UL/CSA 60950-1, UL/CSA 62368-1, EN 60950-1, EN 62368-1, IEC 60950-1 CB scheme with all country differences, IEC 62368-1 CB scheme with all country differences

### EMC:

- Emissions: FCC 47 CFR 15, ICES-003, EN 55032, KN32, VCCI V3, EN 61000-3-2, EN 61000-3-3, JIS C 61000-3-2
- Immunity: EN 55024, KN35

### Certifications:

- North America Safety (NRTL), European Union (EU), International CB Scheme, BSMI (Taiwan), RCM (Australia), KCC (Korea), VCCI (Japan), EAC (Eurasia), BIS(India)

### European Union directives:

- Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU as amended, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU, WEEE Directive 2012/19/EU and Eco design Directive 2009/125/EC

All standards and certifications referenced are to the latest official version. For additional detail, please contact your sales representative.

Other country regulations/certifications may apply.

## DIMENSIONS AND WEIGHT

- Per unit
  - Height: 175 mm (6.9 inches); 4U
  - Width: 440 mm (17.3 inches)
  - Depth: 800 mm (31.5 inches)
  - Weight: 60 kg (133 lb.)
- Per rack
  - Height: 2000 mm (78.7 inches)
  - Width: 700 mm (27.6 inches)
  - Depth: 1050 mm (41.3 inches)
  - Weight: 780 kg (1720 lb.)

## WARRANTY

The Fujitsu SPARC M12-2 server comes with a one-year warranty. Visit [oracle.com/us/support/policies/](https://oracle.com/us/support/policies/) for more information about Oracle's hardware warranty.

## COMPLETE SUPPORT

With Oracle Premier Support, you will get the services you need to maximize the return on your investment in the Fujitsu SPARC M12-2 server. Complete system support includes 24/7 hardware service, expert technical support, proactive tools, and updates to Oracle Solaris, Oracle VM, and integrated software (such as firmware)—all for a single price. Learn more at [oracle.com/support](https://oracle.com/support)

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