

# 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 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/DW), 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

**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 32 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

**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 with 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

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.

**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)

**Cache Per Processor**

- Level 1: instruction: 64 KB, data: 64 KB per core
- Level 2: 512 KB L2 I\$ per core
- Level 3: 32 MB L3\$ per CPU

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### 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
- CPU: Up to 2 CPUs: 1-unit configuration  
Up to 8 CPUs: 4-unit configuration  
Up to 32 CPUs: 16-unit configuration
- 16 dual inline memory module (DIMM) slots per processor supporting half and fully populated memory configurations using 8, 16, 32, or 64 GB DDR4 DIMMs  
Main memory: Up to 2 TB per unit, with 64 GB DIMM: 1-unit configuration  
Up to 8 TB per unit, with 64 GB DIMM: 4-unit configuration  
Up to 32 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 928 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

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### System Architecture

- SPARC V9 architecture, ECC protected

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### INTERFACES (PER BUILDING BLOCK)

- Network: four 10 GbE (100 Mb/sec/1 Gb/sec/10 Gb/sec), IEEE 802.3an (10GBASE-T) standards, auto-negotiation
- Disks and internal storage: two SAS-2 controllers providing hardware RAID 0, 1, 1E, and 10 (ZFS file system provides higher levels of RAID)
- Expansion bus: eight low-profile PCIe 3.0 (11 x8) slots
- PCI expansion units:
  - 1 CPU: 38 slots (with three PCI expansion units connected)
  - 2 CPUs: 58 slots (with five PCI expansion units connected)
- Ports: two external USB (one front USB 2.0 and one rear USB 3.0)
- Administration interface: two 1000 Base-T (RJ45) network ports, one RJ45 serial management port, two USB ports (for maintenance only).

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### MASS STORAGE AND MEDIA (PER BUILDING BLOCK)

#### Internal storage:

- Up to eight 600 GB or 900 GB 2.5 in. SAS-2 drives
- Optional internal storage may be installed within the standard drive bays
  - 400 GB SSD drives, maximum of eight

#### External storage:

- External DVD drive as Fujitsu SPARC M12's option
- 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](http://oracle.com/storage).

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### 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 V AC: 17.6 A
- **Maximum operating input power at 200 V AC: 3,224 W**
  - Single unit: 3,224 W at maximum
  - 8 units with one rack: 27,140 W at maximum
  - 16 units with two racks: 55,090 W at maximum

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### KEY RAS FEATURES

- End-to-end ECC protection
  - Guaranteed data path integrity
  - Automatic recovery with instruction retry
  - Dynamic L1 and L2 cache way degradation
  - ECC and extended ECC protection for memory, memory mirroring, periodic memory patrol, and
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*predictive self-healing*

- Hardware redundancy in memory(when mirroring), HDD/SSD, PCI cards (multipath configuration), power system, PSU, fan, and liquid cooling pump
- Hot-pluggable HDD/SSD, PSU, PCI card, and fan, XSCF (2BB or mode configuration)
- Live operating system upgrades
- Firmware updates during system operation

**SOFTWARE****Operating System**

Oracle recommends Oracle Solaris 11.3 or later for enhanced performance and functionality, including features enabled by Software on Chip technology.

- *Control domain:*
  - Oracle Solaris 11.3 + required SRU 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 + required patches
- *The following versions are supported within guest domains:*
  - Oracle Solaris 11.3 or later
  - Oracle Solaris 11.2
  - Oracle Solaris 11.1
  - 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 11.3 or later, 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 of 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 (41° F to 95° F) 0 to 500 m
- 5° C to 33° C (41° F to 91° F) 501 to 1,000 m
- 5° C to 31° C (41° F to 88° F) 1,001 to 1,500 m
- 5° C to 29° C (41° F to 84° F) 1,501 to 3,000 m

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 ft. to 9,840 ft.)

**Acoustic noise**

<i>Description</i>	<i>1 CPU installed</i>	<i>2 CPUs installed</i>
Sound power level	8.2 B	8.5 B
Sound pressure level	64 dB	68 dB

**REGULATIONS (MEETS OR EXCEEDS THE FOLLOWING REQUIREMENTS)**

**Safety:** UL/CSA 60950-1, EN 60950-1, IEC 60950-1 CB Scheme with all country differences

**EMC:**

- *Emissions: FCC 47 CFR 15, ICES-003, EN 55032, KN32, VCCI V3/2015-04,*

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), MSIP (Korea), VCCI (Japan), EAC (Eurasia)

**European Union directives:** Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU, 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

- Height 175 mm (6.9 in.); 4U
- Width 440 mm (17.3 in.)
- Depth 800 mm (31.5 in.)
- Weight 60 kg

## Warranty





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

## Complete Support

With Oracle Premier Support, you'll get the services you need to maximize the return on your investment in Oracle's SPARC 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](http://oracle.com/support).

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For more information about the Fujitsu SPARC M12-2S server, visit [oracle.com](http://oracle.com) or call +1.800.ORACLE1 to speak to an Oracle representative.

## Integrated Cloud Applications & Platform Services

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