

# Datasheet

## Fujitsu SPARC M12-2S

### Unix Server

The Fujitsu SPARC M12-2S server is a high-performance, flexible and scalable system based on the latest SPARC64™ XII processor, delivering high availability for mission-critical enterprise workloads and cloud computing



#### Product Overview

The Fujitsu SPARC M12-2S server is a flexible and scalable system based on the latest SPARC64 XII ("twelve") 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 the previous generation SPARC64 core. 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 large, scale-up and/or scale-out server configurations. 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.

#### Flexibility and Scalability for Mission Critical Clouds

The Fujitsu SPARC M12-2S server offers high reliability and outstanding processor core performance and provides flexible scalability by virtue of a modular Building Block expansion methodology. The Fujitsu SPARC M12-2S server can scale up to 32 processors and over 3,000 threads or can be used in scale-out configurations for parallel distributed processing. The Fujitsu SPARC M12-2S 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.

#### Maximum Flexibility

Each Fujitsu SPARC M12-2S Building Block's minimum configuration includes one processor. With core-level CPU activation, a minimum of just two processor cores must be activated initially. Core resources can be gradually expanded, as needed, in increments of a single core using activation keys. Cores are activated dynamically while the system remains operational. In addition, the Fujitsu SPARC M12-2S Building Block Architecture can be used to create a large, scale-up server with as many as 32 processors and up to 48 TB of memory. Each Fujitsu SPARC M12-2S four rack unit (4RU) Building Block can scale to 24 cores and 192 threads. A Fujitsu SPARC M12-2S server can scale dynamically from 1 to 16 Building Blocks, for maximum configuration flexibility. The Building Blocks are connected via a Fujitsu-developed interconnect technology that ensures high bandwidth, low latency, and linear scalability. The server can also be flexibly deployed and operated in a scale-out configuration.



# Features and benefits

Main features	Benefits
<ul style="list-style-type: none"> <li>■ Up to 32 12-core, 4.25 GHz SPARC64 XII processors for a total of 384 cores and 3,072 powerful threads</li> <li>■ Flexible main memory configurations: from 64 GB to 48 TB, and supporting mixed DIMM capacities</li> <li>■ Mainframe-class reliability, availability, and serviceability (RAS) capabilities</li> <li>■ Modular Building Block Architecture</li> <li>■ High-speed interconnect technology</li> <li>■ Core-based CPU Activation</li> <li>■ Software-on-Chip instructions implementing key software functions directly in SPARC64 XII processors</li> <li>■ New Vapor and Liquid Loop Cooling (VLLC) technology for innovative and compact system design</li> <li>■ Layered virtualization including Oracle VM Server for SPARC and Oracle Solaris Zones technologies</li> <li>■ Supports Oracle Solaris 11 and Oracle Solaris 10, also Solaris 9 and 8 with Oracle Solaris Legacy Container</li> <li>■ Oracle Solaris Binary Application Guarantee</li> </ul>	<ul style="list-style-type: none"> <li>■ Superior enterprise application performance for small to large ERP, BIDW, SCM, CRM, Big Data, and Analytics workloads</li> <li>■ Maximum cost savings with efficient consolidation of a large number of applications with diverse requirements on a single server</li> <li>■ Radically improved response times and throughput performance by running entire databases in memory, eliminating costly disk accesses</li> <li>■ Robust RAS features availability to support the most demanding 24/7 mission-critical applications</li> <li>■ Dynamically expand resources easily and economically from 1 to 32 processor sockets</li> <li>■ Linear scaling from 1 Building Block to 16 Building Blocks to handle planned and unplanned workload growth</li> <li>■ Ability to pay for only the resources that are needed, minimizing initial investment and avoiding expensive upgrades</li> <li>■ Fast and economical system capacity growth in increments as small as a single processor core with no downtime</li> <li>■ Drastic performance gains for a wide range of applications such as encryption, decimal arithmetic operations, and database accelerators built into each CPU core</li> <li>■ 1.5 times higher memory access performance by adopting DDR4 memory directly attached to each processor accelerates Oracle Database in-memory dramatically</li> <li>■ Twice the cooling performance of Liquid Looping Cooling (LLC) technology used in Fujitsu M10 servers</li> <li>■ Dramatic reduction in space and completely self-contained, requiring no maintenance</li> <li>■ Higher levels of system utilization and cost reduction with flexible resource configurations</li> <li>■ Massive server consolidation without the need to acquire additional software</li> <li>■ Investment protection for application software as well as system management and administration expertise, avoiding costly and complex migrations</li> <li>■ Preservation of software investments with guaranteed compatibility, allowing existing SPARC Solaris applications to run unmodified</li> </ul>

# Topics

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## World-Class Enterprise Performance with Extreme Core Technology

Fujitsu SPARC M12 servers featuring the 12-core SPARC64 XII processor provide superior performance for mission-critical enterprise workloads and cloud computing. Employing proven Fujitsu supercomputer technology for highly parallel computing and an innovative cooling technology to achieve low latency access time between memory and CPU, the Fujitsu SPARC M12 servers can process large amounts of data in a short period of time. These technologies provide superior performance for enterprise workloads such as online transaction processing (OLTP), enterprise resource planning (ERP), business intelligence and data warehousing (BI), supply chain management (SCM), and customer relationship management (CRM), as well as new environments in cloud computing or data processing.

## Pay as You Grow Dynamic Scalability

The modern enterprise needs a flexible platform that provides superior performance and availability for current application environments as well as the ability to scale for future growth and technological needs. The Fujitsu SPARC M12-2S server features unique dynamic scaling to grow as the business grows. With CPU Activation, customers can activate CPU resources on a CPU core basis and expand from a single CPU socket and two cores, while paying for only the processor cores that are needed. In addition, Fujitsu SPARC M12-2S allows for the gradual addition of resources such as CPU, memory, and PCIe slots through the dynamic addition of Building Blocks connected via the high-speed interconnect. Together, CPU Activation and Building Block Architecture enable rapid, granular and cost-effective growth from a very small configuration up to as many as 32 CPU sockets and 384 processor cores.

## High Availability for Mission-Critical Applications

The Fujitsu SPARC M12-2S server delivers high availability to support 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.

## Innovative Software on Chip Technology

Fujitsu SPARC M12-2S servers feature Software on Chip (SWoC) technology, which implements common software code sequences directly in the processor hardware, offering significant enhancements for key database functions. Two Software on Chip technologies, SIMD (Single Instruction Multiple Data) and decimal floating point ALUs (Arithmetic Logical Units), directly accelerate Oracle Database in-memory processing with specific hardware instructions. SWoC encryption acceleration is also implemented, providing high-speed encryption processing (encryption/decryption) using the Oracle Solaris encryption library. Also, the load placed on the CPU when the database is encrypted is reduced and a secure work environment can be configured.

## New High-Efficiency Cooling Technology

The new Fujitsu hybrid cooling technology, Vapor and Liquid Loop Cooling (VLLC), in Fujitsu SPARC M12-2S servers is an innovative high-efficiency vapor and liquid cooling technology that maximizes performance, minimizes space, and reduces noise. VLLC achieves twice the cooling performance of Liquid Loop Cooling (LLC) used in Fujitsu M10 servers. VLLC also dramatically improves the internal layout of the server, allowing CPUs and memory to be packed closer together; reducing memory latency. VLLC is completely self-contained and requires no maintenance. This efficient cooling system can lead to significant cost savings for businesses.

## Advanced Virtualization and Consolidation

SPARC processor-based servers are among the world's best consolidation and virtualization platforms. The Fujitsu SPARC M12-2S server supports up to 16 physical partitions, and as many as 256 Oracle VM Server for SPARC domains per physical partition, enabling massive server consolidation and cost savings.

## Oracle Solaris: The World's Most Advanced Enterprise Operating System

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

# Specifications

## Processor

CPU	SPARC64 XII: 12-core processor, 8 Simultaneous Multithreading threads per core, Two instruction pipelines per core, SPARC V9 architecture, Error Checking and Correction (ECC) protection
Level 1 cache per core	64 K data cache and 64 K instruction cache
Level 2 cache per core	512 KB
Level 3 cache per CPU socket	32 MB
Clock speed	4.25 GHz
Software on Chip features	<ul style="list-style-type: none"> <li>• SIMD Single Instruction Multiple Data Vector Processing</li> <li>• Extended Floating-Point Registers</li> <li>• Decimal Floating-Point Processing. IEEE 754 standard and Oracle Number</li> <li>• Cryptographic Processing. Supported encryption modes are AES, DES, 3DES, DH, DSA, ECC, RSA and SHA</li> </ul>

## System

CPU	<ul style="list-style-type: none"> <li>• Up to 2 CPUs: 1 Building Block configuration</li> <li>• Up to 8 CPUs: 4 Building Block configuration</li> <li>• Up to 32 CPUs: 16 Building Block configuration</li> </ul>
Main memory	<ul style="list-style-type: none"> <li>• Up to 3 TB per unit, with 64 GB DIMMs: 1 Building Block configuration</li> <li>• Up to 12 TB per unit, with 64 GB DIMMs: 4 Building Block configuration</li> <li>• Up to 48 TB per unit, with 64 GB DIMMs: 16 Building Block configuration</li> </ul>
I/O	<ul style="list-style-type: none"> <li>• 8 PCI Express 3.0 short, low-profile slots (eight lanes): 1 Building Block configuration</li> <li>• 32 PCI Express 3.0 short, low-profile slots (eight lanes): 4 Building Block configuration</li> <li>• 128 PCI Express 3.0 short, low-profile slots (eight lanes): 16 Building Block configuration</li> <li>• Up to 1408 PCI Express slots with optional PCI Expansion Units</li> <li>• 4-port 10GbE, 1 SAS-2 port, 2-port USB per Building Block</li> </ul>
Memory bandwidth (per chip)	153 GB/sec
Service processor	One per Building Block

## Storage

Local storage	Up to eight 600 GB or 1.2 TB internal 2.5-in. SAS HDDs or 400 GB or 800GB eMLC SAS SSDs (can be mixed)
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## Software

Operating system	<p>Control Domain:</p> <ul style="list-style-type: none"> <li>• Oracle Solaris 11.4 or later</li> <li>• Oracle Solaris 11.3 + SRU 11.3.17.5.0 or later</li> <li>• Oracle Solaris 11.2 + SRU11.2.15.5.1</li> <li>• Oracle Solaris 11.1 + SRU11.1.21.4.1</li> <li>• Oracle Solaris 10 1/13 *</li> </ul> <p>Guest Domains:</p> <ul style="list-style-type: none"> <li>• Oracle Solaris 11.4 or later</li> <li>• Oracle Solaris 11.3 or later</li> <li>• Oracle Solaris 11.2 or later</li> <li>• Oracle Solaris 11.1 or later</li> <li>• Oracle Solaris 10 1/13*</li> <li>• Oracle Solaris 10 8/11*</li> <li>• Oracle Solaris 10 9/10*</li> </ul> <p>* Plus required patches</p> <p>Oracle Solaris 9 or 8 branded zones run within an Oracle Solaris 10 domain.</p>
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## Software

	Please see the <i>Fujitsu SPARC M12 Systems Product Notes</i> manual for SRU/patch requirements.
<b>Software included</b>	<ul style="list-style-type: none"> <li>Oracle Solaris 11.4 or later, which includes Oracle VM Server for SPARC</li> <li>Oracle Solaris ZFS (default file system)</li> </ul>
<b>Management software</b>	<ul style="list-style-type: none"> <li>XSCF monitoring/control facility</li> <li>XSCF software, which manages hardware configuration and health, domain configuration and status, error monitoring, and notifications.</li> </ul>
<b>System monitoring</b>	Oracle Enterprise Manager Ops Center 12c Release 3 Update 2 or later Oracle Enterprise Manager Cloud Control 13c Release 1 or later
<b>Virtualization</b>	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.

## Reliability, Availability, and Serviceability

<b>Key features</b>	<ul style="list-style-type: none"> <li>End-to-end ECC protection</li> <li>Guaranteed data path integrity</li> <li>Automatic recovery with instruction retry</li> <li>Dynamic L1, L2 and L3 cache way degradation</li> <li>ECC and Extended ECC protection for memory, memory mirroring, periodic memory patrol, and predictive self-healing</li> <li>Hardware redundancy in memory (when mirroring), HDD, SSD (Software RAID), PCI cards (Multipath configuration), power system, PSU, fan, vapor and liquid cooling pumps, and XSCF (on configurations with two or more Building Blocks)</li> <li>Hot-pluggable HDD/SSD, PSU, PCIe cards, fans, and XSCF (on configurations with two or more Building Blocks)</li> <li>Live operating system upgrades</li> <li>Firmware updates during system operation</li> </ul>
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## Environment

<b>AC power</b>	200 V to 240 V $\pm$ 10% (50/60 Hz)
<b>Power consumption</b>	Single Building Block maximum 3,292 W One rack, 8 Building Blocks maximum 27,690 W Two racks, 16 Building Blocks maximum 56,180 W
<b>Operating temperature</b>	<ul style="list-style-type: none"> <li>5° to 35° C (41° to 95° F) at an altitude of 0 m to 500 m</li> <li>5° to 33° C (41° to 91° F) at an altitude of 501 m to 1,000m</li> <li>5° to 31° C (41° to 88° F) at an altitude of 1,001 m to 1,500 m</li> <li>5° to 29° C (41° to 84° F) at an altitude of 1,501 m to 3,000 m</li> </ul>
<b>Non-operating temperature</b>	-25° C to 60° C (-13° F to 140° F) (packed) 0 to 50° C (32° F to 122° F) (non-packed)
<b>Altitude</b>	Up to 3,000 m (9,843 ft.)
<b>Acoustic Noise</b>	<ul style="list-style-type: none"> <li>8.2 B (1 CPU) / 8.5 B (2 CPUs)</li> <li>64 dB (1 CPU) / 68 dB (2 CPUs)</li> </ul>
<b>Cooling</b>	11,850 kJ/h per Building Block

## Dimensions and Weight per Building Block

<b>Height</b>	17.5 cm (6.9 in.)
<b>Width</b>	44.0 cm (17.3 in.)
<b>Depth</b>	80.0 cm (31.5 in.)
<b>Weight</b>	60 kg (132.3 lb.)

## Regulations

<b>Safety</b>	<ul style="list-style-type: none"> <li>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</li> </ul>
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**Regulations**

**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
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# More information

## Fujitsu products, solutions & services

### Products

[www.fujitsu.com/global/products/](http://www.fujitsu.com/global/products/)

In addition to the Fujitsu SPARC M12 Server, Fujitsu offers a full portfolio of other computing products.

### Computing products

- Storage systems: ETERNUS
- Server: PRIMERGY, PRIMEQUEST, Fujitsu SPARC M12, BS2000/OSD Mainframe
- Client Computing Devices: LIFEBOOK, STYLISTIC, ESPRIMO, FUTRO, CELSIUS
- Peripherals: Fujitsu Displays, Accessories
- Software
- Network

Product Support Services with different service levels agreements are recommended to safeguard each product and ensure smooth IT operation.

### Solutions

<https://www.fujitsu.com/global/solutions>

The Fujitsu solutions combine reliable Fujitsu products with the best in services, know-how and worldwide partnerships. Fujitsu's Solutions include parts of one or more activity groups (e.g., planning, implementation, support, management, and training services) and are designed to solve a specific business need.

**Infrastructure Solutions** are customer offerings created by bringing Fujitsu's best products, services and technologies together with those from partners to deliver benefit to our customers' businesses.

**Industry Solutions** are tailored to meet the needs of specific verticals.

**Business and Technology Solutions** provide a variety of technologies developed to tackle specific business issues such as security and sustainability, across many verticals.

### Services

[www.fujitsu.com/global/services/](http://www.fujitsu.com/global/services/)

Several customizable Fujitsu Service offerings ensure that IT makes a real difference and delivers true business value. We do this by leveraging our extensive experience in managing large, complex, transformational IT programs to help clients in planning, delivering and operating IT services in a challenging and changing business environment.

**Application Services** support the development, integration, testing, deployment and on-going management of both custom developed and packaged applications. The services focus on delivering business and productivity improvements for organizations.

**Business Services** respond to the challenge of planning, delivering and operating IT in a complex and changing IT environment.

**Managed Infrastructure Services** enable customers to deliver the optimal IT environment to meet their needs – achieving high levels of IT service quality and performance for data center and end user environments.

## Fujitsu green policy innovation

[Environment - Fujitsu Global](#)

Fujitsu Green Policy Innovation is our worldwide project for reducing burdens on the environment. Using our global know-how, we aim to resolve issues of environmental energy efficiency through IT. Please find further information at:



## More information

Learn more about Fujitsu, please contact your Fujitsu sales representative, Fujitsu business partner, or visit our website.

<https://www.fujitsu.com/sparc>

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