

## Frequently Asked Questions Fujitsu SPARC M12 Server

### Overview

The servers in Oracle's Fujitsu SPARC M12 Server family include the flexible entry level Fujitsu SPARC M12-1 and scalable Fujitsu SPARC M12-2 and Fujitsu SPARC M12-2S servers. These systems deliver high performance and high availability for mission-critical enterprise applications. The Fujitsu SPARC M12 Server platform is ideal for 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). It is also ideal for cloud computing and new workloads such as big data and analytics.

Fujitsu SPARC M12 Server systems use the latest SPARC64 XII ("twelve") processor, which has up to 2.5 times the core performance compared to the previous generation SPARC64 X+ processor. The Fujitsu SPARC M12-1 includes a single SPARC64 XII processor with 6 cores and up to 1 TB of memory whereas the Fujitsu SPARC M12-2 server can be configured with up to 2 processors and as many as 24 processor cores, 2 TB of memory, and large disk capacity. The Fujitsu SPARC M12-2S server is a modular system that can scale up to 32 processors and 32 TB of memory using two processor "building blocks" to create a large, scale-up server that can also be deployed in a scale-out configuration.

With these servers, you can enjoy the benefits of Capacity on Demand (COD) with core-level CPU Activation. Innovative Software on Chip (SWoC) capabilities of the SPARC64 XII processor deliver dramatic performance increases by implementing key software functions directly in the processor. The Fujitsu SPARC M12 servers enable highly flexible system configuration with a suite of built-in virtualization technologies included at no cost: Oracle VM Server for SPARC and Oracle Solaris Zones. The Fujitsu SPARC M12-2S server also includes physical partitioning (PPAR) capabilities, which divide physical hardware resources into multiple parts, and each part can be used as an independent system.

### Customer Benefits

#### Increased Performance

Processor and system design enhancements and innovations such as 12 cores per processor in Fujitsu SPARC M12-2 and M12-2S systems with up to 2.5 times faster core speeds, 32 MB of Level 3 cache, PCIe 3.0 I/O, DDR4-2400 memory, Software on Chip, and System on Chip dramatically improve performance with enterprise workloads. The Fujitsu SPARC M12-1 servers 6-core processor delivers up to 2.3 times per core performance compared to previous generation.

## Mainframe-Class Reliability, Availability and Serviceability

Many mainframe-class reliability, availability, and serviceability (RAS) features come standard in the Fujitsu SPARC M12 Server family of servers, including automatic recovery with instruction retry, up to 32 TB of system memory with error-correcting code (ECC) protection and extended ECC support, guaranteed data path integrity, and configurable memory mirroring.

The disks, power supply, I/O cards, and fans are redundant and hot-swappable. The building blocks of the Fujitsu SPARC M12-2S server are hot-swappable and can be configured redundantly to eliminate single points of failure.

### Dynamic Scaling

Fujitsu SPARC M12 Server systems can grow efficiently and economically from a minimum of two cores to a maximum of 384 cores in small increments by purchasing core-based CPU Activation licenses. You can start small, with just one Fujitsu SPARC M12-2S building block and grow over time as business requirements change. Fujitsu's high-speed interconnect technology with high bandwidth and low-latency between building blocks enables scalability up to the maximum 16-unit, 32-socket configuration with a single Oracle Solaris image. The 16-unit configuration accommodates up to 32 TB of memory.

### Investment Protection

The Fujitsu SPARC M12 Server family supports Oracle Solaris 11 and 10 on bare metal and in virtualized configurations. Oracle Solaris 8 and 9 environments can run on the servers with Oracle Solaris Legacy Containers. The Oracle Solaris Binary Application Guarantee ensures that legacy SPARC-based Oracle Solaris applications are guaranteed to run unmodified on Fujitsu SPARC M12 Server systems. You can easily migrate from physical servers to Oracle Solaris Zones using Oracle's P2V tools. This capability maximizes ROI and minimizes investment risks.

## Frequently Asked Questions

**Q:** What is the Fujitsu SPARC M12 Server family?

**A:** The servers in the Fujitsu SPARC M12 Server family are highly flexible systems powered by the latest SPARC64 XII processors with up to 2.5 times faster core performance

compared to the previous generation SPARC64 X+ processor.

The Fujitsu SPARC M12-1 server comes with a single processor in a compact 1U enclosure. The server can be upgraded incrementally from a minimum of two cores to a maximum of 6 cores by using core-based CPU Activation. It supports up to 1 TB of memory, 3 PCI Express (PCIe) 3.0 short low-profile slots, and up to 33 PCIe slots with the optional PCI Expansion Units.

The Fujitsu SPARC M12-2 server can be configured with one or two processors and upgraded incrementally from a minimum of two cores to a maximum of 24 by using core-based CPU Activation. It supports up to 2 TB of main memory using 64 GB dual inline memory modules (DIMMs), 11 PCIe 3.0 short low-profile slots, and up to 72 PCIe slots with the optional PCI Expansion Units.

The Fujitsu SPARC M12-2S server, which scales from one processor up to 32 processors, combines a building-block architecture with mainframe-class RAS and the Oracle Solaris operating system. Up to 16 Fujitsu SPARC M12-2S building blocks can be connected to create servers with up to 32 processors and 384 cores in a single system image. Each building block includes up to 32 DDR4 memory DIMM slots, eight PCIe 3.0 slots, and eight 2.5-inch drive bays. Up to 58 PCIe slots can be supported with the PCI expansion unit.

**Q:** What capabilities in the SPARC64 XII ("twelve") processor lead to the dramatic performance improvements of the Fujitsu SPARC M12 Server systems?

**A:** The SPARC64 XII processor applies supercomputer technology to business applications, achieving dramatically higher performance. Software on Chip (SWoC) capabilities, which implement key software functions directly in the processor, deliver a significant performance increase. Application developers can take advantage of these innovations through the familiar Oracle Developer Studio compilers and Oracle Solaris facilities. Software on Chip technologies include the following innovations:

- Single instruction, multiple data (SIMD) instructions

SIMD instructions are supported in the SPARC64 XII processor. Up to thirty-two 8-bit data elements can be processed simultaneously. This capability accelerates searching large amounts of data, compressing and decompressing data, performing in-memory database operations, and so on.

- Decimal floating-point operation unit

The SPARC64 XII processor has a decimal floating-point operation unit. This hardware processing unit can directly and quickly execute decimal floating-point operations that were previously executed by software. Oracle Database Number datatype operations and the IEEE754-2008 standard operations are supported.

- Encryption arithmetic

The SPARC64 XII processor includes an encryption processing unit that enables high-speed encryption and decryption processing without external adaptors or complex software. The SPARC64 XII encryption unit supports RSA, DSA, DES, 3DES, AES, DH, and SHA. The SPARC64 XII processor can improve data security with full database encryption.

**Q:** What other new technologies are implemented in the Fujitsu SPARC M12 Server family?

**A:** There are many new innovations in these servers. Among them are the following two examples:

High-speed interconnect

Fujitsu SPARC M12-2S servers employ an advanced high-speed interconnect technology for high capacity and extremely low latencies. This enables scalability from one to 16 building blocks with 32 processors.

Vapor and Liquid Loop Cooling

Vapor and Liquid Loop Cooling (VLLC) in Fujitsu SPARC M12 Server systems is an innovative high-efficiency vapor and liquid cooling technology that maximizes performance, minimizes space, and reduces noise. It achieves 70 percent higher cooling performance than the LLC technology used in Oracle's Fujitsu M10-4 and M10-4S servers, and it also reduces the Fujitsu SPARC M12-2 and M12-2S servers' noise by 8 dB. An industry-leading cooling technology—dual-phase coolant—is the key component of VLLC. It is circulated inside the VLLC system by small pumps. At the beginning of the circulation, liquid coolant is sent to the vaporizer that is mounted on the CPU. Inside the vaporizer, the coolant's phase is changed from liquid to vapor due to the heat generated by the CPU. Next, the coolant goes into the condensation radiator where forced air cools it and it becomes liquid again. The innovative VLLC technology improves latency (and performance), and it saves rack space by greatly increasing compute density—all with proven RAS and no additional maintenance requirements.

**Q:** Why should I use Fujitsu SPARC M12 Server systems?

**A:** These servers are ideal for mission-critical computing, scalability, and investment protection, and they are an ideal platform for single-threaded applications such as databases, business analytics and business intelligence (BA/BI) applications, data mining, and batch processing. In addition, these servers reduce the cost of software licensing due to their improved per-core performance.

**Q:** What virtualization technologies are available for Fujitsu SPARC M12 Server systems?

The no-cost virtualization capability of the servers in the Fujitsu SPARC M12 Server family enables configuration flexibility to improve server utilization. Multiple and independent logical domains can be configured using Oracle VM Server for SPARC. Also, multiple Oracle Solaris Zones can be configured inside a logical domain. Resource allocation of processors and memory between zones can be changed dynamically.

The Fujitsu SPARC M12-2S server also supports physical partitioning (PPAR). PPAR provides hardware partitions that have complete resource, security, fault, and service isolation. These partitions are dynamic and have a granularity of one building block. You can build flexible configurations with these three virtualization solutions.

**Q:** What is CPU Activation?

**A:** The CPU Activation feature of the SPARC64 XII processor, also known as "Capacity on Demand," allows you to pay only for the processor cores you need. This feature is available for all Fujitsu SPARC M12 server models. The servers can be configured with as few as two active processor cores (up to a maximum of 384 in Fujitsu SPARC M12-2S), and additional activation licenses can be purchased later as compute requirements grow. CPU Activation optimizes the resources in a timely manner in accordance with workload requirements. New per-core licenses can be activated using CPU Activation without stopping the system. Core activation licenses can be moved from one Fujitsu SPARC M12 Server system to other Fujitsu SPARC M12 Server systems. Furthermore, in the case of a CPU core failure, unlicensed cores will automatically take the place of the failed core.

**Q:** What memory, storage, and expansion options are supported on Fujitsu SPARC M12-2S servers?

**A:** The base configuration includes a single processor (12 cores) in the Fujitsu SPARC M12-2S building block.

That can be upgraded to dual processors and 24 cores. Furthermore, up to 16 building blocks can be connected to create large symmetric multiprocessing (SMP) servers of up to 32 CPUs (384 cores) with a single or multiple Oracle Solaris images.

Each building block supports up to 2 TB of memory (32 x 64 GB DIMM) for a maximum of 32 TB per system.

Each Fujitsu SPARC M12-2S building block contains eight PCIe 3.0 slots, and eight internal SAS drive bays; 600 GB and 900 GB hard disk drives (HDDs) plus 400 GB solid-state drives (SSDs) are supported. PCIe connectivity can scale up to 58 PCIe slots per building block (928 PCIe slots per system) with PCI expansion units.

**Q:** What system management options are available for Fujitsu SPARC M12 Server systems?

**A:** These servers include the same eXtended System Control Facility (XSCF) as the servers in Oracle's Fujitsu M10 Server family, which is driven by an integrated system service processor.

XSCF also has power management and power capping capabilities to help reduce energy consumption and costs. Oracle Enterprise Manager Ops Center can be used to manage all aspects of hardware and virtualization configuration, maintenance, and provisioning that is integrated with the complete Oracle stack. Oracle Enterprise Manager Ops Center is provided at no charge to customers who have Oracle Support for their Fujitsu SPARC M12 Server systems.

**Q:** What operating systems have been certified to run on Fujitsu SPARC M12 Server systems?

**A:** The servers in the Fujitsu SPARC M12 Server family support Oracle Solaris 11 and Oracle Solaris 10. Oracle

Solaris 8 and 9 can run on these servers using Oracle Solaris Legacy Containers.

**Q:** What are the power and cooling requirements for the Fujitsu SPARC M12 Server systems?

**A:** The online power calculator provides guidance for estimating the electrical and heat loads for typical operating conditions. Click [here](#) to access the Fujitsu power calculators.

**Q:** What are the service and support options?

**A:** Oracle offers tailored mission-critical services and support options. Comprehensive product installation, configuration, optimization and on-going monitoring, and tailored support are available from Oracle Advanced Customer Support Services. Oracle service professionals deliver the technical product expertise, tools, best practices, and project management knowledge to help ensure a smooth and highly optimized implementation.

**Q:** Can I choose my system configuration?

**A:** Yes you can. Fujitsu SPARC M12 Server systems are ordered as "assemble to order," which means that the configuration is defined before the system is ordered and built.

**Q:** Where can I get more information?

**A:** Please follow these links for more information on Fujitsu SPARC M12 Server systems. Look for data sheets and links for technical documentation, such as white papers and manuals:

[Fujitsu SPARC M12-1 Server](#)

[Fujitsu SPARC M12-2 Server](#)

[Fujitsu SPARC M12-2S Server](#)



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