

## Frequently Asked Questions

### SPARC T8 and SPARC M8 Servers: SPARC T8-1, T8-2, T8-4, M8-8

#### Overview

Oracle's SPARC T8 and M8 servers are the most advanced systems for enterprise computing, with unique capabilities that provide up to 2x faster performance for databases and Java applications compared with competitors' systems as well as end-to-end security features for maximum protection. Using breakthrough second-generation Software in Silicon technology and coengineering of Oracle hardware and software, Oracle's family of SPARC servers is ideal for Java software, databases, and enterprise applications, and the servers' rich feature set provides the foundation for building the best and most secure mission-critical cloud infrastructure.

Now in its second generation, Oracle's Software in Silicon technology in the SPARC M8 processor delivers innovation that's ready to deploy immediately—no waiting on software to catch up. You can run both OLTP and in-memory database queries on Oracle's SPARC servers, enabling real-time analytics on dynamically changing databases for better business insight. By using its Data Analytics Accelerator units, the SPARC M8 processor can run Oracle Database In-memory queries 7x faster than x86 processors on a per core basis.

Servers based on the SPARC M8 processor offer end-to-end network and data encryption, plus detection and prevention of unauthorized access to application memory, all in real time and with near-zero performance impact. These Security in Silicon features can stop security breaches through hardware, creating a unique barrier to malicious attacks and software errors. Coupled with the security features in the Oracle Solaris 11 operating system, storage, database, and application software, Oracle provides a layered defense strategy across the entire stack to protect your environment from business-damaging attacks.

With no compromises on enterprise security and extreme performance for Java, databases, and analytics, Oracle's SPARC platform is optimized for deployment in cloud-ready infrastructure. Oracle is the only vendor that can provide such a complete enterprise computing platform both on-premises and through an Infrastructure as a Service (IaaS) product in Oracle Cloud.

#### Customer Benefits

**Run Your Software Faster. Run Your Business Faster**

Software in Silicon technology is a breakthrough in microprocessor and server design, enabling databases and applications to run faster and with unprecedented security and reliability. Now in its second generation, this innovative technology includes Data Analytics Accelerator (DAX) units

designed directly into the SPARC M8 processor's silicon to handle SQL primitives, such as those used by Oracle Database In-Memory in Oracle Database 12c. Through the use of open APIs, the DAX units can also be leveraged by Java applications operating on streams of data. The DAX units operate on data at full memory speeds, taking advantage of the very high memory bandwidth of the processor. This produces extreme acceleration of in-memory queries and analytics operations while freeing processor cores to do other useful work. In addition, the ability of the DAX units to handle compressed data on the fly means that larger databases can be kept in memory or that less server memory needs to be configured for a given database size. Lastly, the SPARC M8 processor introduces Oracle Numbers units, which greatly accelerate Oracle Database operations involving floating point data. Consider the result: you can run fast in-memory analytics on your database, using much less memory than the size of your data, without significantly increasing server utilization rates or affecting your OLTP operations.

### Secure Your Applications with No Trade-Offs

The Silicon Secured Memory feature of the SPARC M8 processor provides the capability of detecting and preventing invalid operations on application data, through hardware monitoring of software access to memory. This can stop malware from exploiting software vulnerabilities, such as buffer overflows. The hardware approach of Silicon Secured Memory is much faster than traditional software-based detection tools, so security checks can be done in production without significant impact to performance. In addition, each processor core contains the fastest cryptographic acceleration in the industry, allowing IT organizations to deliver end-to-end data encryption and secure transactions with near-zero performance impact. In summary, you can easily activate data protection and encryption security, by default, without additional hardware investment.

### Engineered for the Cloud

Oracle's SPARC systems are engineered for the cloud and provide customers with effortless security, breakthrough efficiency, and straightforward simplicity. Oracle is the only vendor that can provide such a complete enterprise computing platform both on-premises environments and IaaS environments in Oracle Cloud.

## Frequently Asked Questions

**Q:** What are servers based on the SPARC M8 processor?

**A:** Servers based on the SPARC M8 processor are the world's most powerful systems for business-critical enterprise applications and virtualized cloud infrastructure. Utilizing second-generation Software in Silicon technology in the SPARC M8 processor, the servers provide breakthrough efficiency and performance as well as unprecedented levels of security.

**Q:** How many products comprise the family of servers based on the SPARC M8 processor?

**A:** There are four servers in the product family, which have from one to eight processors.

**SPARC T8-1:** The SPARC T8-1 server offers a single processor with 32 cores in a 2U chassis. It scales up to 1 TB of memory, offers up to eight 2.5-inch hot-serviceable SAS HDDs or solid-state drives (SSDs), supports up to four NVMe SSDs, and has six PCIe 3.0 slots.

**SPARC T8-2:** The SPARC T8-2 server offers two processors with a total of 64 cores in a 3U chassis. It scales up to 2 TB of memory, supports up to six 2.5-inch hot-serviceable SAS HDDs or SSDs, supports up to four NVMe SSDs, and has eight PCIe 3.0 slots.

**SPARC T8-4:** The SPARC T8-4 server offers two or four processors with up to 128 cores in a 6U chassis. It scales up to 4 TB of memory, supports up to eight 2.5-inch hot-serviceable SAS HDDs, SAS SSDs, or NVMe SSDs, and has 16 PCIe 3.0 slots utilizing hot-pluggable carriers.

**SPARC M8-8:** The SPARC M8-8 server offers up to eight processors in a single physical domain. The server scales up to 8 TB of memory and has up to 24 PCIe 3.0 (x16) slots.

**Q:** What are the common characteristics of servers based on SPARC M8 processors?

**A:** The servers contain the following common characteristics:

- Second-generation Software in Silicon features
- Fast DDR4 memory that lowers power consumption
- Dual inline memory module (DIMM) sparing that is enabled with fully populated memory slots, increasing system reliability and uptime
- x16-capable PCIe 3.0 slots, which provide more I/O throughput

**Q:** What is Software in Silicon?

**A:** Software in Silicon is a technology that places software functions directly into the processor chip, implemented as specialized units or off-load engines. Because specific functions are performed in hardware, software applications run much faster. And because the cores of the processor are freed to perform other functions, overall operations are speeded up as well.

**Q:** What are the key features of the SPARC M8 processor?

- A:** One of the key features of the SPARC M8 processor is **SQL in Silicon**, which includes two subfunctions, In-Memory Query Acceleration and In-Line Decompression, both of which are performed by the DAX units:
- **Data Analytics Accelerator (DAX)** units are additional on-chip accelerator engines that offload both In-Memory Query Acceleration and In-Line Decompression from the processor cores. There are eight DAX units per SPARC M8 processor, each with four pipelines. That means 32 in-silicon accelerator engines are available to all 32 processor cores. Each engine accelerates analytics primitives such as “search”, “join” and “filter”.
  - **In-Memory Query Acceleration** increases the performance of in-memory database queries by operating on data that is streamed directly from memory via extremely high-bandwidth interfaces. This technology can also be used by Java Streams applications, through an open API in the Oracle Solaris operating system.
  - **In-Line Decompression** significantly increases usable memory capacity. The SPARC M8 processor runs data decompression concurrently with the accelerated analytics functions. This capability allows compressed databases to be stored in memory while being accessed and manipulated at full speed.

Another key technology of the SPARC M8 processor is **Security in Silicon**, which includes two subfeatures: Silicon Secured Memory and Cryptographic Acceleration.

- **Silicon Secured Memory** ensures that an application is only able to access its own memory region, which lets software programmers identify issues related to memory allocation. It is designed to help prevent security hacks such as Heartbleed from putting systems at risk, and it enables hardware monitoring of memory requests by software processes in real time. It stops unauthorized access to memory whether that access is due to a programming error or a malicious attempt to exploit buffer overruns. It also helps accelerate code development and helps ensure software quality, reliability, and security.
- **Cryptographic Acceleration** enables wire-speed encryption capabilities for secure data center operation

without a performance penalty. This is provided by the processor’s 32 on-chip cryptographic accelerator units that can be accessed seamlessly through the Oracle Solaris Cryptographic Framework. These units accelerate the widest set of cyphers and hashes in the industry: Oracle has demonstrated that wide key encryption can be performed by the SPARC M8 processor with speeds that are 7x faster on a per core basis compared to the latest x86 processors.

**Q:** What types of applications are ideal for the servers based on the SPARC M8 processor?

**A:** The servers are ideal platforms for database, Java, middleware, and application workloads.

**Q:** Can I run in-memory applications on the servers based on the SPARC M8 processor?

**A:** Absolutely. The outstanding performance of the innovative SPARC M8 processor coupled with a large memory footprint allows many applications to run in memory on these servers. Running Oracle In-Memory Applications on the servers provides significant application performance boosts.

**Q:** Is Oracle Software in Silicon technology open?

**A:** Yes, software developers can leverage Silicon Secured Memory, the cryptographic instruction accelerators, and the DAX units. Oracle has released open APIs for both Silicon Secured Memory and the DAX units. In addition, the cryptographic accelerators are enabled via industry-standard APIs such as PKCS#11, OpenSSL, and others, and by using the Oracle Solaris Cryptographic Framework. Learn more [here](#).

**Q:** Is there a choice in system configurations?

**A:** Yes, servers based on the SPARC M8 processor can be customized through the Oracle assemble-to-order process.

**Q:** What operating systems are supported on the servers?

**A:** Oracle Solaris 11.3 SRU 24 or later is supported in a control domain on the SPARC T8-1, T8-2, T8-4, and M8-8 servers.

In the guest domains, Oracle Solaris 11.3 SRU 24 or later is supported and so is Oracle Solaris 10 1/13 (with required patches).

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

**Q:** What is the recommended operating system for the servers?

**A:** Oracle recommends the latest version of Oracle Solaris 11 for enhanced performance and functionality.

**Q:** What software is preinstalled on the servers?

**A:** The latest available version of Oracle Solaris 11, which includes Oracle VM Server for SPARC, is preinstalled.

**Q:** What virtualization technologies are supported on the servers?

**A:** With the use of Oracle VM Server for SPARC, multiple application stacks can be deployed on both Oracle Solaris 11 and Oracle Solaris 10, and they are fully supported side by side. Additionally, individual Oracle Solaris 11 and Oracle Solaris 10 instances can be virtualized with Oracle Solaris Zones for optimal utilization and application performance.

Even applications running on Oracle Solaris 9 and Oracle Solaris 8 can be virtualized on legacy Oracle Solaris Containers. Physical domains provide an additional level of partitioning on SPARC M8-8 servers, which feature electrical isolation.

**Q:** What are the systems management options on the servers?

**A:** Servers based on the SPARC M8 processor include Oracle Integrated Lights Out Manager (Oracle ILOM), which is driven by an integrated system service processor that also has power-management and power-capping capabilities to help reduce energy costs.

Oracle ILOM provides full remote keyboard, video, mouse, and storage (KVMS) support together with remote media functionality.

Oracle ILOM works with Oracle Enterprise Manager Ops Center, which provides the most-comprehensive management across Oracle servers, operating systems, and Oracle Solaris virtualization technologies, and it dramatically improves the efficiency of IT operations with its integrated lifecycle management and built-in automation.

In addition to Oracle ILOM, unified server virtualization management is achieved with Oracle VM Manager. Oracle VM Manager can be used to discover SPARC servers running Oracle VM Server for SPARC and perform virtual machine management tasks. Users can create SPARC server pools and virtual machines, as well as manage networking and storage.

**Q:** Can SPARC servers be managed with Oracle Enterprise Manager Ops Center 12c?

**A:** Yes. Oracle Enterprise Manager Ops Center 12c is an end-to-end management solution that can monitor and manage all aspects of hardware and virtualization configurations on the servers. It provides a complete cloud lifecycle management solution including self-service provisioning and integrated chargeback and capacity planning.

**Q:** What are the power and cooling requirements for the servers?

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

**Q:** Where can I obtain information about performance benchmarks?

**A:** Oracle's SPARC system benchmarks are available [here](#).

**Q:** Where can I find official end-user documentation for the family of servers based on the SPARC M8 processor?

**A:** Product documentation can be found at [docs.oracle.com](https://docs.oracle.com).

**Q:** What is the hardware warranty on these servers?

**A:** The servers come 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.

As with all product warranties, this warranty is designed to offer consumers basic recourse should a product defect be discovered. For more complete support, purchase the recommended support coverage at point-of-purchase to gain access to the services and resources you need and avoid potential reinstatement fees at a later date.

**Q:** What is the recommended support for the servers based on Oracle's SPARC M8 processor?

**A:** For all SPARC server products being used in critical production and test environments, Oracle recommends Oracle Premier Support for Systems. Features include:

- Award-winning, 24/7 service and support to help you keep your Oracle systems running at peak performance
- Comprehensive systems coverage that includes single-point accountability for Oracle server and storage hardware; integrated software (for example, firmware); and operating system software (Oracle Solaris, Oracle Linux, and Oracle VM)
- Fast answers and prompt resolution with around-the-clock access to Oracle product experts, hardware service, and self-help technical resources

- Tools and resources to proactively mitigate risk, simplify day-to-day IT operations, and maximize system performance including Oracle Enterprise Manager Ops Center software
- Access to Oracle operating system patches, security updates, enhancements, and upgrades without additional license or support fees

For more information, visit the [Oracle Premier Support for Systems](#) on oracle.com.

**Q:** Where can I obtain additional information?

**A:** Contact your Oracle sales representative directly or call 1-800- Oracle1. Additional information about Oracle's SPARC servers is available on [oracle.com](#).

<sup>1</sup> For Java and database workloads, at product release time. See the [performance blog](#)



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