ORACLE DATA SHEET

SPARC S7-2 and SPARC S7-2L Servers

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SPARC SERVERS

Oracle's SPARC S7 servers extend the world's most advanced systems for enterprise computing into scale-out and cloud applications, with unique capabilities for information security, core efficiency, and data analytics acceleration. Hardware security in silicon, combined with platform support, provides unmatched protection against data hacking and unauthorized access, while full-speed wide-key encryption allows transactions to be secured by default. Up to 1.7x better core efficiency than x86 systems lowers costs for running Java applications and databases. Hardware acceleration of data analytics, big data, and machine learning deliver 10x faster time-to-insight and off-load processor cores to run other workloads. The combination of Oracle's breakthrough Software in Silicon features and the highest performance is the foundation for building the most secure and efficient enterprise clouds.

KEY BUSINESS BENEFITS

- Common hacker exploits and programming errors can be prevented by Silicon Secured Memory.
- Data encryption can be enabled by default, without compromise in performance, using wide-key cryptography accelerated in hardware.
- Hackers are stopped from gaining a foothold through verified boot, and immutable zones and virtual machines.
- Up to 1.7x better core efficiency than x86 systems can lower costs for running Java applications and databases.
- Hardware acceleration delivers 10x better time-to-insight on data analytics, big data, and machine learning.

Overview

Oracle's SPARC S7-2 and S7-2L servers are designed to optimally address the requirements of scale-out and cloud infrastructure, by removing the tradeoff between security and high-performance, and improving the overall efficiency of deploying mixed workloads. The SPARC S7-2 and S7-2L servers are based on the SPARC S7 processor, which extends the Software in Silicon features of Oracle's SPARC M7 processor onto scale-out form factors.

The SPARC S7-2 server is a 1U system that favors compute density, and the SPARC S7-2L server is a 2U system that offers versatile storage options, including a large set of extreme-performance NVMe drives. Both servers take advantage of the integrated "system-on-chip" design of the SPARC S7 processor, resulting in unmatched efficiency in design, together with a reduced number of components, and high reliability for enterprise applications.

The outstanding efficiency and high performance of the SPARC S7 servers start with the SPARC S7 processor. It combines eight powerful fourth-generation cores, the same cores introduced with the SPARC M7 processor. Each SPARC S7 processor core handles up to eight threads using unique dynamic threading technology. The processor is designed to maximize efficiency, by integrating most of the hardware interfaces on the processor itself, allowing the server to achieve unmatched memory bandwidth and low latency, which translate into maximum overall and per core

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- Developer productivity and software quality is increased, and applications are accelerated by Software in Silicon features.
- Near-zero overhead virtualization increases efficiency and lowers cost per virtual machine.

KEY FEATURES

- Based on the SPARC S7 processor, the best processor for scale-out and cloud applications.
- SPARC S7-2 server offers one or two processors, with up to 1TB of memory.
- SPARC S7-2L server offers two processors and up to 98 TB of SAS-3 storage, or up to 38 TB of accelerated NVMe storage.
- Hardware integrated security and analytics acceleration through Software in Silicon technology.
- Oracle Solaris 11 OS for secure and compliant application deployment.
- Open APIs on Oracle Solaris for leveraging Software in Silicon features for security and analytics acceleration.
- Agile and open cloud management with OpenStack, and software-defined networking.
- Built-in, no-cost virtualization technology with Oracle Solaris Zones and Oracle VM Server for SPARC.

performance for Java applications and databases.

Software in Silicon features are breakthroughs in microprocessor and server design that enable databases and applications to run faster and with unprecedented security. It embeds features such as encryption accelerators, Silicon Secured Memory, and Data Analytics Accelerators (DAX) onto the processor silicon, off-loading processor cores to execute other workloads simultaneously.

Oracle's SPARC S7-2 and S7-2L systems running Oracle Solaris offer a superior and easy-to-manage platform for developers and enterprise users. Oracle Solaris 11 is a secure, integrated, and open platform engineered for large-scale enterprise cloud environments, with unique optimization for Oracle Database, middleware, and application deployments. Built-in virtualization capabilities in Oracle's SPARC servers include both Oracle Solaris Zones and Oracle VM Server for SPARC, which allow enterprise workloads to be run within many virtual machines with near-zero performance impact.

Security

Oracle's SPARC servers are designed to offer a secure platform, from the processor itself to the operating systems, virtualization environment, and applications.

The Silicon Secured Memory feature of Oracle's SPARC S7 processor provides the capability of detecting and preventing invalid operations to 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, meaning that 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.

On Oracle Solaris 11, security can be set up easily and enabled by default, while single-step patching and immutable zones and virtual machines allow compliance to be maintained with simplicity. In addition, Oracle Solaris offers high-level security features, like time-based user control, activity-based delegation, and remote tamper-proof auditing, among others. Virtualization also enhances security, by providing secure live migration, by which any user's session can be securely transferred between servers without interruption, with negligible performance impact.

Efficiency and Performance

Oracle's SPARC S7 systems offer tremendous efficiency in running enterprise workloads. They provide up to 1.7x better per-core performance than x86 systems for running Java, database, and analytics, which are the bases of cloud applications. This is the result of optimal core and processor design, and of bringing memory and PCIe controllers into the processor's silicon, which creates very low-memory latencies, extremely high-memory bandwidth, and efficient I/O expansion. SPARC S7 servers' per core efficiency can lower the cost of deploying cloud infrastructure. In addition, the large overhead due to virtualization that is common in cloud infrastructure implemented with x86 commodity computing is virtually eliminated with Oracle Solaris Zones and

Oracle VM Server for SPARC software.

Data analytics acceleration is another unique Software in Silicon feature in SPARC servers that offers performance without compromise. It is implemented through DAX engines specifically designed into the chip's silicon to handle SQL and analytics primitives, such as those used by big data, and machine learning, and by Oracle Database In-Memory in Oracle Database 12*c*. The accelerators 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 processor cores are freed up to do other useful work. In addition, the ability of these accelerators 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. Consider the result: you can run fast in-memory analytics, using much less memory than the size of your data, without significantly increasing server utilization rates or affecting other workloads.

SPARC S7 systems address the next generation of workloads implemented in a scale-out architecture such as big data and in machine learning applications such as fraud and intrusion detection, trend detection, click-stream, and social media sentiment analysis.

An Open Platform

Oracle's SPARC S7, T7, and M7 systems running Oracle Solaris comprise an open platform that developers can utilize to create new applications that are secure and run data analytics efficiently. These capabilities can be easily integrated on existing applications, during development, testing, and under deployment. Developers can use and validate Software in Silicon features by using Oracle's Software in Silicon open APIs, supported by a growing community of collaboration among developers, engineers, and experts offering resources to help you understand and integrate this revolutionary open technology on your applications.

Ease of Management

All Oracle servers ship with comprehensive server management tools at no additional cost. Oracle Integrated Lights Out Manager (Oracle ILOM) utilizes industry-standard protocols to provide secure and comprehensive local and remote management, including power management and monitoring, fault detection, and notification. Oracle Premier Support customers have access to My Oracle Support and multiserver management tools in Oracle Enterprise Manager Ops Center, a system management tool that, in conjunction with Oracle Enterprise Manager, coordinates servers, storage, and networking for a complete cloud infrastructure as a service (IaaS). Oracle Enterprise Manager Ops Center also features an automated service request capability, whereby potential issues are detected and reported to Oracle's support center without user intervention, assuring the maximum service levels and simplified support.

SPARC S7-2 and S7-2L Servers Specifications

ARCHITECTURE		
Processor	• *Eight-core, 4.27 GHz SPARC S7 processor* • *Up to 64 threads per processor (up to 8 threads per core)* • *Four data analytics accelerators per processor, each supporting four concurrent in-memory query operations with decompression* • *Eight on-chip encryption instruction accelerators with direct nonprivileged support for 15 industry-standard cryptographic algorithms: AES, Camellia, CRC32c, DES, 3DES, DH, DSA, ECC, MD5, RSA, SHA-1, SHA-224, SHA-256, SHA-384, SHA-512 (one per core)* • *Eight floating-point units per processor (one per core)* • *One random number generator (one per processor)*	
Cache per processor	• *Level 1: 16 KB instruction and 16 KB data per core* • *Level 2: 256 KB L2 I$ per four cores, 256 KB L2 D$ per core pair* • *Level 3: 16 MB L3$ on chip*	
System architecture	• *SPARC V9 architecture, ECC protected*	
SYSTEM CONFIGURATIONS	**SPARC S7-2 SERVER**	**SPARC S7-2L SERVER**
Processors	SPARC S7-2 servers are configured with one or two SPARC S7 processors, not expandable.	SPARC S7-2L servers are configured with two SPARC S7 processors.
Memory capacity	Eight dual inline memory module (DIMM) slots per processor support half and fully populated memory configurations using 16, 32, or 64 GB DDR4 DIMMs. • *1,024 GB maximum memory configuration with 64 GB DIMMs and two processors*	
Interfaces	Expansion bus: • *Three low-profile PCIe 3.0 x8 slots* Network ports: • *Four 10GBase-T Ethernet ports (100 Mb/sec, 1 Gb/sec or 10 Gb/sec), full duplex only, auto-negotiating* Management ports: • *One RJ45 serial port* • *One 1000Base-T port (10 Mb/sec, 100 Mb/sec or 1 Gb/sec)* Other ports: • *Two front USB 2.0 ports*	Expansion bus: • *Six low-profile PCIe 3.0 x8 slots* Network ports: • *Four 10GBase-T Ethernet ports (100 Mb/sec, 1 Gb/sec or 10 Gb/sec), full duplex only, auto-negotiating* Management ports: • *One RJ45 serial port* • *One 1000Base-T port (10 Mb/sec, 100 Mb/sec or 1 Gb/sec)* Other ports: • *Two front USB 2.0 ports*
Internal storage	Controllers: • *One 12 Gb/sec SAS-3 controller* One disk chassis option: • *Eight-disk chassis: Eight 2.5-inch drive bays, four drive bays support NVMe drives* Choice of three 2.5-inch drives: • *600 GB or 1,200 GB SAS-3 hard disk drives* • *400 GB SAS-3 solid-state drives* • *3.2 TB NVMe solid-state drives* SAS/NVMe mixing supported	Controllers: • *One 12 Gb/sec SAS-3 controller* Four disk chassis options: • *Eight-disk chassis: Eight 2.5-inch SAS-3 drive bays, four drive bays support NVMe drives* • *Twenty-six-disk chassis: Twenty-four front plus two rear 2.5-inch SAS-3 drive bays, four drive bays support NVMe drives* • *Twelve-disk chassis: Twelve 2.5-inch NVMe drive bays* • *Fourteen-disk chassis: Twelve front 3.5-inch SAS-3 drive bays and two rear 2.5-inch SAS-3 drive bays* Choice of three 2.5-inch drives: • *600 GB or 1,200 GB SAS-3 hard disk drives* • *400 GB SAS-3 solid-state drives* • *3.2 TB NVMe solid-state drives* Choice of 3.5-inch drives: • *8 TB SAS-3 hard disk drives* SAS/NVMe mixing supported on eight-disk and twenty-six-disk chassis options
External storage	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.	

	SPARC S7-2 SERVER	SPARC S7-2L SERVER
Power Supplies	• *Two hot-swappable AC 800 or 1,200 W redundant (N+1) power supplies* • *Voltage 100 to 120 VAC at 800 W, frequency 50/60 Hz* • *Voltage 200 to 240 VAC at 1,200 W, frequency 50/60 Hz* • *Max. operating input current at 100/200 VAC: 8.6/4.1 A* • *Max. operating input power at 100/200 VAC: 851/819 W*	• *Two hot-swappable AC 1,200 W redundant (N+1) power supplies* • *Voltage 200 to 240 VAC, frequency 50/60 Hz* • *Max. operating input current at 200 VAC: 5.2 A* • *Max. operating input power at 200 VAC: 1,048 W*
KEY RAS FEATURES		
	• *Hot-pluggable disk drives* • *Redundant, hot-swappable power supplies and fans* • *Environmental monitoring* • *Message retry, cache, and memory error correction* • *Oracle Solaris ZFS storage RAID* • *Fault Management Architecture including Predictive Self Healing—both are features of Oracle Solaris*	
SOFTWARE		

Operating system	Oracle recommends Oracle Solaris 11.3 or later for enhanced performance and functionality, including technologies enabled by Software in Silicon features
	• *Control domain: Oracle Solaris 11.3 or later*
	• *The following versions are supported within guest domains:*
	  • *Oracle Solaris 11.3 or later*
	  • *Oracle Solaris 10 1/13**
	** 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 guest 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 instances of Oracle Solaris Zones, a feature of Oracle Solaris, 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)* *Decrease in maximum temperature: above 900 m (2,952 ft.) 1° C/300 m (1.8° F/984 ft.)*	
Nonoperating temperature	*-40° C to 65° C (-40° F to 149° F)*	
Operating relative humidity	*10% to 90% relative humidity, noncondensing, 27° C (81° F) max. dew point*	
Nonoperating relative humidity	*93% relative humidity, noncondensing, 38° C (100° F) max. dew point*	
Operating altitude	*0 m to 3,000 m (0 ft. to 9,840 ft.) except in China markets where regulations may limit installations to a maximum altitude of 2,000 m*	
Nonoperating altitude	*0 m to 12,000 m (39,370 ft.)*	

Acoustic noise	SPARC S7-2 SERVER		SPARC S7-2L SERVER	
Description	***60% Fan Speed***	***100% Fan Speed***	***60% Fan Speed***	***100% Fan Speed***
Sound power level—LwAd (1 B = 10 dB)	7.7 B	8.6 B	7.9 B	8.6 B
Sound pressure—LpAm (energy average of four bystander positions)	62 dBA	72 dBA	65 dBA	72 dBA
Cooling	*Max. cooling input power: 2,904 BTU/hr.* *Max airflow: 77 cfm max.*		*Max. cooling input power: 3576 BTU/hr.* *Max airflow:* • *Eight-disk configuration: 153 cfm max.* • *Twenty-four plus two configuration: 118 cfm max.* • *Twelve NVMe-disk configuration: 118 cfm max.* • *Twelve 3.5-inch disk + two 2.5-inch disk configuration: 97 cfm max.*	

REGULATIONS	SPARC S7-2 SERVER	SPARC S7-2L SERVER
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, EN55022, EN61000-3-2, EN61000-3-3* • *Immunity: EN 55024* **Certifications:** North America Safety (NRTL), European Union (EU), International CB Scheme, BIS (India), BSMI (Taiwan), RCM (Australia), CCC (PRC), MSIP (Korea), VCCI (Japan), Morocco, Republic of Srpska, Vietnam. **European Union directives:** Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU, and WEEE Directive 2012/19/EU 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.	**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, EN55022, EN55032, KN32, EN61000-3-2, EN61000-3-3* • *Immunity: EN 55024, KN35* **Certifications:** North America Safety (NRTL), European Union (EU), International CB Scheme, BIS (India), BSMI (Taiwan), RCM (Australia), CCC (PRC), MSIP (Korea), VCCI (Japan), Morocco, Republic of Srpska. **European Union directives:** Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU, and WEEE Directive 2012/19/EU 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	**SPARC S7-2 SERVER**	**SPARC S7-2L SERVER**

	• *Height:43 mm (1.7 in.); 1U*
	• *Width: 437 mm (17.2 in.)*
	• *Depth: 737 mm (29 in.)*
	• *Weight: approx. Fully populated without rackmount kit*
	  • *19.5 kg (43 lb.)*
		• *Height: 88 mm (3.5 in.); 2U*
		• *Width: 436 mm (17.2 in.)*
		• *Depth: 737 mm (29 in.)*
		• *Weight: approx. Fully populated without rackmount kit*
		  • *Eight-disk configuration: 24.5 kg (54 lb.)*
		  • *Twenty-four plus two configuration: 29 kg (64 lb.)*
		  • *Twelve NVMe-disk configuration: 26 kg (57 lb.)*
		  • *Twelve 3.5-inch disk + two 2.5-inch disk configuration: 30 kg (66 lb.)*

Warranty

The SPARC S7-2 and SPARC S7-2L servers come with a one-year warranty. Visit 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.

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For more information about the SPARC S7-2 and S7-2L servers, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

[1] For Java and database workloads, at product release time. See the product benchmark pages.

Integrated Cloud Applications & Platform Services