ORACLE DATA SHEET

SPARC T7-1 Server

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SPARC SERVERS

The SPARC T7-1 server raises the bar on low-cost computing, with no compromises. It is the most advanced single processor server for enterprise workloads, with unique capabilities for securing application data, accelerating databases, running Java applications, and ultimately getting more work done when compared to competitive two-processor servers. Utilizing the revolutionary Software in Silicon technology in its SPARC M7 processor, this server can detect and prevent attacks to application data in memory, providing an extra layer of defense against malicious software. It also accelerates Oracle Database 12c In-Memory queries, allowing real time analytics to be performed on OLTP databases. With the advanced and efficient SPARC T7-1 server, your organization can implement clouds, ensure compliance with security requirements, make data-driven decisions without delays, and deliver more with your IT budget.

KEY BENEFITS

- Unique protection of application data from memory attacks or exploits of software vulnerabilities
- End-to-end encryption of data with near-zero performance impact
- Easy compliance management of application environments throughout their life cycle, ensuring security of cloud infrastructure
- Extreme acceleration of Oracle Database 12c In-Memory queries, especially for compressed databases
- Ability to run analytics on OLTP databases, enabling real-time insight on transactional data

Product Overview

Oracle's SPARC T7-1 server is a resilient, single processor system that enables organizations to respond to IT demands with extreme security and performance, at a lower cost compared to alternatives. It is ideal for a wide range of enterprise class workloads, including database, applications, Java and middleware, especially in a cloud environment. This system is based on the SPARC M7 processor, the first to use a revolutionary technology from Oracle referred to as Software in Silicon.

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. Application Data Integrity is 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 the Application Data Integrity feature 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 investment.

In-memory Query Acceleration is another unique Software in Silicon feature in SPARC M7-based servers. This is implemented through accelerators specifically designed into

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- Optimized for Java applications, middleware software, database and enterprise applications
- Near-zero overhead virtualization for deploying over a hundred virtual machines, lowering the cost per virtual machine
- Advanced design enables this single processor system to outperform competitive two-processor systems, lowering IT cost

KEY FEATURES

- SPARC M7: Advanced processor with first ever Software in Silicon technology for security, performance, and efficiency
- 2.5 times faster performance per processor compared to current competitive processors, or previous generation SPARC processors
- Scalability within the same family of servers from one to sixteen sockets with complete compatibility for applications and management
- Oracle Solaris 11: Secure and compliant application deployment through single-step patching and immutable zones; agile and open cloud management with OpenStack; powerful application driven Software Defined Networking
- Built-in, no-cost virtualization technology with Oracle Solaris Zones and Oracle VM Server for SPARC
- Guaranteed binary compatibility and support for legacy applications that run under Solaris 10, 9 and 8
- Up to 6.4 TB of accelerated storage utilizing industry standard NVMe technology in order to satisfy the most demanding I/O requirements
- Resilient server system with highest levels of reliability, availability, and serviceability (RAS) in a compact, energy-efficient footprint

the chip's silicon to handle database primitives, such as those used by Oracle Database 12c In-Memory. 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 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 on your database, using much less memory than the size of your data, without significantly increasing server utilization rates or affecting your OLTP operations.

The record breaking performance of the servers based on SPARC M7 processors comes from its 32 cores, each handling up to 8 threads using unique dynamic threading technology. The processor can dynamically adapt to provide extreme single-thread performance, or enable massive throughput by running up to 256 threads. The processor cores have been designed to accelerate Java workloads, especially Java 8 applications and beyond, and enterprise applications. Using this efficient design, together with Oracle Solaris virtualization technology with near-zero overhead, a much larger number of virtual machines can be supported on Oracle's SPARC servers when compared with Intel Xeon-based systems, resulting in a significant decrease in the cost per virtual machine.

The technology breakthrough in SPARC servers is enabled by the Oracle Solaris operating system. 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. Security can be easily set-up and enabled by default, while single-step patching and immutable zones allow compliance to be maintained with simplicity. You can create complete application software stacks, lock them secure, deploy them in a cloud, update them in a single step, all while maintaining compliance and easily generating audit reports. Oracle Solaris 11 combines OpenStack with powerful application driven Software Defined Networking for agile deployment of cloud infrastructure.

Built-in virtualization capabilities in Oracle's SPARC servers include both Oracle Solaris Zones and Oracle VM Server for SPARC. These allow enterprise workloads to be run within a virtual environment with near-zero performance impact. You can virtualize and consolidate many servers onto one, reducing the physical footprint on the data center as well as lowering the costs of operation, power, and cooling. Oracle Solaris Zones technology also provides the capability to run legacy applications that require earlier versions of Solaris.

Other advanced capabilities of the SPARC T7-1 server are large memory capacity, higher bandwidth and minimal latency, which are achieved through four enhanced memory controllers per socket, faster and reduced power DDR4 memory, and pre-fetch acceleration techniques. The I/O subsystem supports low-profile PCIe 3.0 adapters and industry standard NVMe flash technology to provide high capacity storage with minimal latency. Integrated controllers for networking, disks and management reduce the cost of the system and provide greater expandability.

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's Premier Support customers have access to My Oracle Support and multi-server 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 T7-1 Server Specifications

ARCHITECTURE

Processor

- *Thirty-two core, 4.13 GHz SPARC M7 processor*
- *Up to 256 threads per processor (up to eight threads per core)*
- *Eight accelerators per processor, each supporting four concurrent in-memory query operations with decompression*
- *Thirty-two on-chip Encryption Instruction Accelerators with direct non-privileged 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)*
- *Thirty-two 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: 64 MB L3$ on chip*

System Configurations

- SPARC T7-1 servers are always configured with a single M7 processor, not expandable
- Sixteen memory DIMM slots per processor supporting half and fully populated memory configurations using 16 or 32 GB DDR4 DIMMs
  - *512 GB maximum memory configuration with 32 GB DIMMs*

System Architecture

- *SPARC V9 architecture, ECC protected*

INTERFACES

- *Network: Four 10 GbE (100 Mbps/1 Gbps/10 Gbps), full duplex only, auto-negotiating*
- *Disks and internal storage: One SAS-3 controller providing hardware RAID 0, 1, and 1E/10 (ZFS file system provides higher levels of RAID)*
- *Expansion bus: Six low-profile PCIe 3.0 (four x8 and two x16 or x8 wired) slots*
- *Ports: Four external USB (two front USB 2.0 and two rear USB 3.0), one RJ45 serial management port, Console 10/100 network port, VGA port*

MASS STORAGE AND MEDIA

Internal storage:

- *Up to eight 1200 GB 2.5 in SAS-3 drives*
- *Integrated DVD drive*
- *Optional internal storage may be installed within the standard drive bays*
  - *800 GB SSD drives, maximum of eight*
  - *6.4 TB NVMe drives, maximum of four*

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.

POWER SUPPLIES

- *Two hot-swappable AC 1,000 W redundant (1 + 1) power supplies*
- *Voltage 200 to 240 VAC, frequency 50/60 Hz*
- *Maximum operating input current at 200 V AC: 6.7 A (Actual amperage draw may exceed rating by no more than 10%)*
- *Maximum operating input power at 200 V AC: 1,318 W (Actual power draw may exceed rating by no more than 10%)*

KEY RAS FEATURES

- *Hot-plug disk drives*
- *Redundant, hot-swappable power supplies and fans*
- *Environmental monitoring*
- *Extended ECC, error correction, and parity checking.*
- *DIMM sparing enabled with fully populated memory slots, increasing system reliability and uptime*
- *Easy component replacement*
- *Integrated disk controller with RAID 0, 1 and 1E/10*
- *Fault Management Architecture including Predictive Self Healing, a feature of Oracle Solaris*

SOFTWARE

Operating System

Oracle recommends Oracle Solaris 11.4 or later for enhanced performance and functionality, including features enabled by Software in Silicon technology

- *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**
  - *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 guest domain.

Software Included

- *Oracle Solaris 11.4 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 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) wet bulb

Nonoperating relative humidity: 93% relative humidity, noncondensing, 38° C (100° F) wet bulb

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

Non-operating altitude: 0 m to 12,000 m (0 ft to 39,370 ft)

Acoustic noise

Description	*Min. Fan Speed*	*Max. Fan Speed*
Sound Power Level - LwAd (1 B = 10 dB)	8.1 B	8.8 B
Sound Pressure Level - LpAm (energy average of 4 bystander positions)	62.0 dBA	69.7 dBA

Cooling: 4,279 BTU/hr / 150 cfm max

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, 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)

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

- *Height: 87.6 mm (3.5 in); 2U*
- *Width: 445.0 mm (17.5 in)*
- *Depth: 737 mm (29 in)*
- *Weight: Approx. 25.6 kg (56.4 lb), without rackmount kit*

Warranty

The SPARC T7-1 server comes 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 Oracle SPARC server investment—our 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.

CONTACT US

For more information about the SPARC T7-1 Server, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

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Hardware and Software, Engineered to Work Together