

## ORACLE SPARC SUPERCLUSTER T4-4

### DATA CENTER CONSOLIDATION AND CLOUD SERVICES

#### KEY FEATURES

- Extreme efficiency, costs savings and performance in a multi-purpose engineered system
- Optimized for the efficient consolidation of complex enterprise workloads, deployment of high performance applications, and rapid provisioning of secure cloud services
- Up to 16 SPARC T4 8-core processors and 4 TB of memory in a single rack
- Supports Oracle Solaris 11 and Oracle Solaris 10
- Optimized for Oracle Database and Exalogic Elastic Cloud with unique hardware acceleration
- Highly available ZFS storage cluster for high performance, fully redundant disk storage
- InfiniBand I/O fabric provides extremely scalable, reliable and high performance connectivity between all components
- Built-in, low overhead virtualization using Oracle VM Server for SPARC and Oracle Solaris Zones
- Fully integrated and fully redundant compute, storage and networking components for high availability
- Built-in, hardware encryption to provide end-to-end data security

#### RELATED PRODUCTS

- SPARC T4-4 server
- Oracle Exadata
- Oracle Exadata Storage Expansion Rack
- Sun ZFS Storage 7320 Appliance
- Sun Datacenter InfiniBand Switch 36
- Oracle Database 11g
- Oracle Real Application Clusters
- Oracle Exalogic Elastic Cloud
- Oracle Enterprise Manager Ops Center

*The Oracle SPARC SuperCluster T4-4 is the world's most efficient multi-purpose engineered system and the most optimized platform for consolidating mission critical applications and rapidly deploying cloud services. It delivers extreme efficiency, cost saving, and performance by combining the computing power of the SPARC T4-4 servers, the unmatched scalability of Oracle Solaris 11, the database optimization of Oracle Exadata, the accelerated processing of the Oracle Exalogic Elastic Cloud software, and the unified systems management of Oracle Enterprise Manager Ops Center 12c.*



Oracle SPARC SuperCluster T4-4

#### Extreme Efficiency

Oracle SPARC SuperCluster T4-4 delivers extreme efficiency making it ideal for multi-tier enterprise applications with web, database and application components, the consolidation of mission critical workloads and the rapid deployment of cloud services. Built-in Oracle Exadata Storage Servers and support for Oracle Exalogic Elastic Cloud software provide unequalled database and Java application server performance advantages on a single system. Oracle Solaris 11 provides a highly available, secure and scalable operating system with low overhead server, storage and network virtualization capabilities and best-in-class application performance resulting in greater consolidation ratios. Applications certified on Oracle Solaris 11, Oracle Solaris 10, Oracle Solaris 9, and Oracle Solaris 8 can run without modification simultaneously on a SPARC SuperCluster. Oracle Enterprise Manager Ops Center 12c actively monitors the entire hardware and virtualization environment on SPARC SuperCluster. Using Enterprise Manager 12c Cloud Control and Ops Center 12c, administrators can perform

- Oracle Solaris
- Oracle Solaris Cluster
- Oracle Optimized Solutions

**RELATED SERVICES**

- Oracle Advanced Customer Support Services
- Oracle Premier Support for Systems
- Oracle Infrastructure as a Service On-Premise (IaaS)
- Oracle Platinum Services
- Oracle PlatinumPlus Services
- Consulting Services
- Oracle University courses

automated monitoring and detailed configuration analysis on SPARC SuperCluster.

**Extreme Cost Savings**

The hundreds of years of engineering expertise built into the SPARC SuperCluster T4-4 speeds time to value up to 5x and reduces TCO up to 5x compared to do-it-yourself implementations. SPARC SuperCluster T4-4 is pre-configured with SPARC T4 servers, Oracle Exadata Storage Server X3-2, Sun ZFS Storage 7320 Appliance, InfiniBand technology and Oracle Solaris, is delivered with fully tested integrations, and ready to deploy out of the box. Oracle Optimized Solutions dramatically reduce deployment time, effort and risk while maximizing performance using tested and documented best practices. With SPARC SuperCluster T4-4, realize 3x lower operation and maintenance costs. Included is Oracle Enterprise Manager Ops Center 12c, which provides end-to-end monitoring of all components and simplified management of virtual infrastructure for easy application consolidation along with network and storage provisioning and automated firmware and software updates. Single vendor support, from Oracle Advanced Customer Support Services, eliminates guesswork and trial-and-error through on-site installation and bring up services. With Oracle Premier Support, integrated patching and testing ensures reduces risk and expedites updates. In addition, receive higher level of service with Oracle Platinum Services at no additional cost.

**Extreme Performance**

SPARC SuperCluster T4-4 combines a highly engineered architecture with the fastest technology. Integrated Exadata Storage Server X3-2 with flash database accelerates database performance up to 10x. Running Exalogic Elastic Cloud software on a SPARC SuperCluster can provide up to 10x Java application performance acceleration. SPARC SuperCluster T4-4 has full component redundancy built in and provides a highly available framework offering automatic application fail over and recovery to support the demands of mission critical applications. Optional Oracle Clusterware drastically improves database availability while optional Oracle Solaris Cluster provides industry leading application up time.

**Seamless Integration and Support**

By combining its industry-standard high performance servers and storage with the intelligence built into its best-in-class software, SPARC SuperCluster T4-4 delivers the industry’s highest levels of performance, scalability and reliability – all backed by Oracle Support. Only Oracle offers a single point of accountability and complete, integrated support for the entire Oracle technology stack—applications to disk—with 24/7 hardware service, expert technical support, proactive tools, and software updates. To help accelerate deployment and ensure operational readiness of your system, Oracle also offers lifecycle services to help with planning and guidance, installation, configuration, production readiness and patch deployment services. To further support the performance and high availability of your systems, Oracle Premier Support customers running certified configurations on SPARC SuperCluster can qualify to receive Oracle Platinum Services – the industry’s highest level of support which provides remote fault monitoring with faster response times and patch deployment at no additional cost.

SPARC SuperCluster Specifications	Half Rack	Full Rack
<b>SPARC T4-4 Compute Node</b>	<b>2</b>	<b>4</b>
Each SPARC T4-4 compute node configured with: <ul style="list-style-type: none"> <li>• 4 x eight-core SPARC T4 processors (3.0GHz)</li> <li>• 64 x 16 GB Memory</li> <li>• 6 x 600 GB 10,000 RPM disks</li> <li>• 2 x 300 GB solid state disks</li> <li>• 4 x dual-port InfiniBand QDR</li> <li>• 4 x dual-port 10 Gb Ethernet</li> </ul>		
<b>Exadata Storage Server X3-2</b>	<b>3</b>	<b>6</b>
Each Exadata Storage Server is configured with: <ul style="list-style-type: none"> <li>• Either 12 x 600 GB 15,000 RPM High Performance disks or 12 x 3TB 7,200 RPM High Capacity disks</li> <li>• 2 x six-core Intel® Xeon® E5-2630L for SQL processing</li> <li>• 4 x 400 GB Exadata Smart Flash Cache</li> </ul>		
<b>SPARC SuperCluster T4-4 with High</b>	Up to 5 GB/sec of uncompressed disk	Up to 10 GB/sec of uncompressed disk

<b>Performance Disks</b>	bandwidth <sup>1</sup> Up to 21 GB/sec of uncompressed Flash data bandwidth <sup>1</sup> Up to 10,800 Database Disk IOPS <sup>2</sup> 21 TB of raw data disk capacity <sup>3</sup> Up to 9.5 TB of uncompressed usable capacity <sup>4</sup>	bandwidth <sup>1</sup> Up to 43 GB/sec of uncompressed Flash data bandwidth <sup>1</sup> Up to 21,600 Database Disk IOPS <sup>2</sup> 43 TB of raw data disk capacity <sup>3</sup> Up to 19 TB of uncompressed usable capacity <sup>4</sup>
<b>SPARC SuperCluster T4-4 with High Capacity Disks</b>	Up to 3 GB/sec of uncompressed disk bandwidth <sup>1</sup> Up to 20 GB/sec of uncompressed Flash data bandwidth <sup>1</sup> Up to 6,000 Database Disk IOPS <sup>2</sup> 108 TB of raw data disk capacity <sup>3</sup> Up to 48 TB of uncompressed usable capacity <sup>4</sup>	Up to 7 GB/sec of uncompressed disk bandwidth <sup>1</sup> Up to 40 GB/sec of uncompressed Flash data bandwidth <sup>1</sup> Up to 12,000 Database Disk IOPS <sup>2</sup> 216 TB of raw data disk capacity <sup>3</sup> Up to 96 TB of uncompressed usable capacity <sup>4</sup>
<p>1 Bandwidth is peak physical scan bandwidth achieved running SQL, assuming no data compression. Effective data bandwidth is higher when compression is used.</p> <p>2 Based on read IO requests of size 8K running SQL.</p> <p>3 For raw capacity, 1 GB = 1 billion bytes. Capacity calculated using normal space terminology of 1 TB = 1024 x 1024 x 1024 x 1024 bytes. Actual formatted capacity is less.</p> <p>4 Actual space available for a database after mirroring (ASM normal redundancy) while also providing adequate space (one disk on Half Racks and two disks on a Full Rack) to reestablish the mirroring protection after a disk failure.</p>		
<b>Sun ZFS Storage 7320 Appliance</b>	<b>1</b>	<b>1</b>
<p>7320 Dual Controller, each with:</p> <ul style="list-style-type: none"> <li>• 2 x four-core 2.4GHz Intel® Xeon® processors</li> <li>• 6 x 16 GB Memory</li> <li>• 1 x dual-port InfiniBand HCA</li> <li>• 2 x 500 GB SATA disks</li> <li>• 4 x 512 GB read optimized solid state disk</li> </ul> <p>One SunDisk Shelf with the following:</p> <ul style="list-style-type: none"> <li>• 20 x 3 TB using high capacity 7,200 RPM disks</li> <li>• 4 x 73 GB write-optimized solid state disk</li> </ul>		
<b>Sun Datacenter InfiniBand Switch 36</b>	<b>3</b>	<b>3</b>
The Sun Datacenter QDR InfiniBand Switch 36 provides 36 port QDR (40 Gb/sec) InfiniBand Switches.		
<b>Additional Hardware Components</b>		
<p>Additional Hardware Components Included:</p> <ul style="list-style-type: none"> <li>• Ethernet management switch</li> <li>• 42U rack packaging</li> <li>• 2 x Redundant Power Distributions Units (PDUs)</li> <li>• InfiniBand and Ethernet cables</li> </ul> <p>Spares Included:</p> <ul style="list-style-type: none"> <li>• 1 x 600 GB High Performance disk or 1 x 3 TB High Capacity disk</li> <li>• 1 x 3 TB disk</li> <li>• 1 x 400 GB Exadata Smart Flash Cache card</li> <li>• InfiniBand cables</li> </ul>		
<b>Key Applications</b>		
<ul style="list-style-type: none"> <li>• Data center consolidation</li> <li>• Multi-tier enterprise</li> </ul>	<ul style="list-style-type: none"> <li>• Securely virtualize and consolidate applications to increase operating efficiency, reduce server count and conserve data center space and energy</li> <li>• Consolidate up to 100 legacy servers with one full rack of integrated server, storage, networking hardware,</li> </ul>	

applications <ul style="list-style-type: none"> <li>• Large to small databases and data warehouses</li> <li>• Oracle Optimized Solutions</li> <li>• Cloud services</li> </ul>	and systems software technology <ul style="list-style-type: none"> <li>• Run existing Oracle, ISV and custom applications without modification</li> <li>• Deploy high performance web, database, middleware, and application tiers on a single system</li> <li>• Built-in database acceleration delivers unsurpassed performance, scalability, and data protection</li> <li>• Minimize time to value and risk and maximize performance with Oracle Optimized Solutions</li> <li>• Rapidly deploy self-service cloud services using the most efficient virtualization and automated systems management</li> </ul>
<b>Software</b>	
Operating system	<ul style="list-style-type: none"> <li>• Oracle Solaris 11 for Oracle Database 11g, Oracle Elastic Cloud Software and general purpose applications</li> <li>• Oracle Solaris 10 8/11 for general purpose applications</li> </ul>
<b>Virtualization</b>	
Built-in, low overhead, Oracle VM Server for SPARC and Oracle Solaris Zones provide the flexibility to power virtual systems and thousands of zones – at no additional cost	
<b>SPARC SuperCluster Services and Support</b>	
Hardware Warranty	1 year with a 4 hour web/phone response during normal business hours (Mon-Fri 8AM-5PM), with 2 business day on-site response/Parts Exchange
Oracle Support	<ul style="list-style-type: none"> <li>• Oracle Platinum Services             <ul style="list-style-type: none"> <li>○ Remote fault monitoring with faster response times and patch deployment services to qualified Oracle Premier Support customers at no additional cost</li> </ul> </li> <li>• Oracle Premier Support for Systems             <ul style="list-style-type: none"> <li>○ Essential support services including 24x7 support with 2 hour on-site hardware service response (subject to proximity to service center), proactive tools, and online resources</li> </ul> </li> <li>• Oracle Customer Data and Device Retention</li> <li>• Oracle Auto Service Request (ASR)</li> </ul>
Oracle Start-Up Pack	<ul style="list-style-type: none"> <li>• Oracle Start-Up Advisory Service</li> <li>• Oracle Installation Service</li> <li>• Oracle Configuration Service</li> <li>• Oracle Production Support Readiness Service</li> <li>• Oracle Quarterly Patch Deployment Service</li> </ul>
Services from Oracle Advanced Customer Support Services	<ul style="list-style-type: none"> <li>• Oracle Installation and Configuration</li> <li>• Oracle Configuration of Exalogic</li> <li>• Advanced Monitoring and Resolution</li> <li>• Advanced Support Assistance</li> <li>• Business Critical Assistance</li> <li>• Solution Support Center</li> <li>• Advanced Support Engineer</li> </ul>
Services from Oracle Consulting	<ul style="list-style-type: none"> <li>• Migration Factory</li> <li>• Consolidation Services</li> <li>• Architecture Services</li> </ul>

<b>SPARC SuperCluster T4-4 Environmental Specifications</b>	<b>Full Rack</b>	<b>Half Rack</b>
<b>Dimensions:</b>	<ul style="list-style-type: none"> <li>• Height: 78.66" - 1998 mm</li> <li>• Width: 23.62" – 600 mm</li> <li>• Depth: 47.24" – 1200 mm</li> </ul>	
	Weight: 1,900 lbs	1,310 lbs
<b>Power:</b>	Maximum: 15.0 kW (15.8 kVA)	8.5 kW (8.9 kVA)

	Typical: 13.1 kW (13.8 kVA)	6.5 kW (6.9 kVA)
<b>Cooling:</b>	Maximum: 53,966 BTU/hour (56,937 kJ/hour) Typical: 47,087 BTU/hour (49,679 kJ/hour)	30,610 BTU/hour (32,295 kJ/hour) 23,543 BTU/hour (24,839 kJ/hour)
<b>Airflow:</b>	Maximum: 2,498 CFM Typical: 2,180 CFM	1,417 CFM 1,090 CFM
<b>Operating Temperature/Humidity:</b>	5 °C to 32 °C (41 °F to 89.6 °F), 10% to 90% relative humidity, non-condensing	
<b>Altitude Operation:</b>	Up to 9,840 feet (3,048 m) <sup>2</sup> , maximum ambient temperature is de-rated by 1° C per 300 m above 900 m	
<b>Regulations<sup>1</sup>:</b>	<ul style="list-style-type: none"> <li>• Safety: UL 60950-1 2nd Ed, EN60950-1:2006 2nd Ed, CB Scheme with all country differences</li> <li>• RFI/EMI: FCC CFR 47 Part 15 Subpart B Class A, EN 55022:2006+A1:2007 Class A, EN 61000-3-11:2000, EN 61000-3-12:2005, ETSI EN 300 386 V1.4.1 (2008)</li> <li>• Immunity: EN 55024:1998+A1:2001:+A2:2003</li> </ul>	
<b>Certifications<sup>1</sup>:</b>	<ul style="list-style-type: none"> <li>• Safety: UL/cUL, CE, BSMI, GOST R, S-Mark, CSA C22.2 No. 60950-1-07 2nd Ed, CCC</li> <li>• EMC: CE, FCC, VCCI, ICES, KCC, GOST R, BSMI Class A, AS/NZ 3548, CCC</li> </ul>	
<b>Other:</b>	Complies with WEEE Directive (2002/96/EC) and RoHS Directive (2011/65/EU)	
1 In some cases, as applicable, regulatory and certification compliance were obtained at the component level.		
2 Except in China where regulations may limit installations to a maximum altitude of 6,560 feet (2,000 m).		

### SPARC SuperCluster Upgrades

#### SPARC SuperCluster Half to Full Rack Upgrades

- 2 x SPARC T4-4 compute nodes
- 3 x Exadata Storage Server X3-2 with 12 x 600 GB 15,000 RPM High Performance disks or 12 x 3 TB 7,200 RPM High Capacity disks
- InfiniBand and Ethernet cables to connect all the components
- Upgrade to full rack spares kit

Increase storage capacity by connecting to Oracle Exadata Storage Expansion Rack

#### Multi-Rack Connection

- Connect any combination of SPARC SuperCluster, Oracle Exadata, Exadata Storage Expansion Racks, or Oracle Exalogic via the included InfiniBand fabric
- Up to 8 racks can be connected without requiring additional InfiniBand switches
- InfiniBand cables to connect 3 racks are included in the rack Spares Kit
- Additional optical InfiniBand cables are required when connecting 4 or more racks

Add fibre channel cards to compute nodes to connect to existing SAN infrastructure

### Oracle Software (Included)

- Oracle Solaris 11
- Oracle Solaris 10 8/11
- Oracle VM Server for SPARC
- Oracle Solaris Zones
- Oracle Enterprise Manager Ops Center 12c

### Oracle Software (Sold Separately)

- Oracle Database 11g Release 2
- Oracle Exadata Storage Server Software
- Exalogic Elastic Cloud Software
- Oracle Solaris Cluster 4.0 (Oracle Solaris 11); Oracle Solaris Cluster 3.3 5/11 (Oracle Solaris 10)

## Contact Us

For more information about Oracle SPARC SuperCluster T4-4, visit [oracle.com](http://oracle.com) or call +1.800.ORACLE1 to speak to an Oracle representative.



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**Hardware and Software, Engineered to Work Together**