

## ORACLE SUPERCLUSTER T5-8

ENGINEERED SYSTEM FOR  
DATABASES AND APPLICATIONS

### KEY FEATURES

- Up to 256 compute processors and 4 TB of memory in a single rack
- Supports Oracle Solaris 11, Oracle Solaris 10, Oracle Solaris 9, and Oracle Solaris 8
- Built-in, zero overhead virtualization using Oracle VM Server for SPARC and Oracle Solaris Zones
- Optimized for Oracle Database and Exalogic Elastic Cloud Software with unique hardware acceleration
- Highly available ZFS storage cluster for high performance, fully redundant disk storage
- InfiniBand I/O fabric that provides extremely scalable, reliable and high performance connectivity between all components
- 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

- Oracle SuperCluster M6-32
- Oracle SPARC T5-8 server
- Oracle Solaris
- Oracle Exadata
- Oracle Exadata Storage Expansion Rack
- Oracle Sun ZFS Storage Appliance
- Oracle Sun Datacenter InfiniBand Switch 36
- Oracle Database 11g
- Oracle Real Application Clusters (Oracle RAC)
- Oracle Exalogic Elastic Cloud
- Oracle Enterprise Manager Ops Center
- Oracle Solaris Cluster
- Oracle Optimized Solutions

*Oracle SuperCluster T5-8 is Oracle's most powerful Oracle database and application consolidation platform. It is an integrated server, storage, networking, and software system that provides maximum end-to-end database and application performance and minimal initial and ongoing support and maintenance effort and complexity at the lowest total cost of ownership. It is ideal for Oracle Database and best for Oracle applications, maximizing return on software investments, increasing IT agility and improves application usability and overall IT productivity. Oracle SuperCluster provides unique database, OLTP, and data warehouse performance and storage efficiency enhancements, unique middleware and application performance enhancements, is engineered and pre-integrated for easy deployment and minimizes overhead backed by the most aggressive support SLAs in the industry.*



Oracle SuperCluster T5-8

**Complete: Servers, Storage, Networking and Software. Optimized. Ready to Run.**

Oracle SuperCluster is pre-tested with integrated Oracle servers, storage, networking and software technologies optimized together to run Oracle Database, Java and enterprise applications unchanged. SuperCluster T5-8 accelerates Oracle Database and Java performance by up to 10x, while improving user response times and meeting service level agreements. With no single point of failure, SuperCluster T5-8 customers can achieve high application availability minimizing planned and unplanned downtime while providing the highest service

**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

levels for core business applications across all tiers of the data center. SuperCluster T5-8 runs both Oracle Database and enterprise applications on one system, lowering TCO through consolidation and delivering secure multi-tenant cloud services 5x faster than the traditional build-your-own IT approach.

**Extreme Performance**

SuperCluster T5-8 is based on the fastest database and application server, fastest database storage, and the world's fastest microprocessor and operating system combination, [with more than 17 world record benchmarks](#) for database, middleware and core business applications. Oracle's new SuperCluster T5-8 delivers up to 2.5x better performance improvement than the previous generation. Oracle Solaris 11 on SuperCluster provides a highly available, secure and scalable operating system with zero overhead server, storage and network virtualization capabilities and best-in-class application performance resulting in greater consolidation ratios. Applications certified on Oracle Solaris 8, Oracle Solaris 9, Oracle Solaris 10, and Oracle Solaris 11 can run without modification simultaneously on Oracle SuperCluster. InfiniBand networking technology is the communication backbone delivering low latency, high performance 40 Gigabits per second of bandwidth – many times higher than traditional server or storage networks.

Integration of Oracle's Exadata Storage Servers, Exadata Storage Server Software and Exalogic Elastic Cloud Software provide database and Java application performance advantages on a single system. Running Exalogic Elastic Cloud Software on a SuperCluster T5-8 can provide up to 10x increase in Java application performance acceleration. Exadata Storage Servers provide the database storage building block of SuperCluster T5-8, and are highly optimized for use with Oracle Database, employing a massively parallel architecture and Exadata Smart Flash Cache to dramatically accelerate Oracle Database processing and speed I/O operations. With the integration of Oracle Exadata Storage Servers, SuperCluster T5-8 full rack offers up to 1 million database IOPS and rapid query throughput, enabling databases and data warehouses to run 10x faster and deliver quicker results than with other platforms. SuperCluster T5-8 is capable of running 1 million secure transactions per second at the web, middleware, and database tiers, concurrently, with no performance impact.

**No Single Point of Failure**

SuperCluster T5-8 has no single point of failure due to built-in full component redundancy, and it provides a highly available framework offering automatic application fail over and recovery to support the demands of mission critical applications. SuperCluster T5-8 enables the high database and application availability to minimize planned and unplanned downtime providing the highest service level for core applications across all tiers of the data center. Oracle Clusterware drastically improves database availability while Oracle Solaris Cluster provides industry leading application uptime.

Oracle Enterprise Manager Ops Center 12c provides end-to-end monitoring of all components and simplified management of virtual infrastructure for easy application consolidation along with network and storage provisioning. With Oracle Platinum Support, SuperCluster T5-8 features real-time fault notification and resolution, and risk-free, simplified integrated stack patching with no service interruption ensuring reduced risk and expedites updates. SuperCluster T5-8 offers significant reductions in time for patching and minimizes downtime, ensuring maximum service levels for all applications.

SuperCluster T5-8 features a dynamic self tuning tool for highest availability. This tool acts as a virtual tuning expert – it constantly monitors and applies recommended best practices as required, detects potential risk scenarios and automatically takes corrective action, and applies performance optimizations automatically enhancing availability and performance while reducing risk.

**Highest Efficiency**

Compared to the build-it-yourself IT approach, SuperCluster T5-8 helps achieve high efficiency in the datacenter. Since Oracle's hardware and software are co-engineered, SuperCluster T5-8 speeds time to production and deployment of secure multi-tenant cloud services 5x faster than build-it-yourself deployments. Running Oracle Database and enterprise applications together on SuperCluster T5-8 offers significant price performance advantage over comparable build-it-yourself IT deployments. Upgrading an existing datacenter with SuperCluster T5-8 can also dramatically lower TCO, reducing datacenter footprint, power, and cooling costs. Additionally, SuperCluster T5-8 can lower operation and maintenance costs

by 3x.

Oracle Solaris 11 is the world's most powerful cloud operating system, featuring zero overhead virtualization. Oracle's virtualization technology, Oracle VM Server for SPARC, enables provisioning of databases and applications, across a range of performance, capacity and availability attributes to cost effectively manage SLAs.

As on Exadata, Hybrid Columnar Compression on Oracle SuperCluster T5-8 enables the highest levels of data compression due to reduced I/O. Hybrid Columnar Compression is optimized to use both database and storage capabilities on Oracle SuperCluster T5-8 to deliver up to 10x more data compression reducing or eliminating the need to add more expansive SAN-based storage.

Oracle Optimized Solutions dramatically reduce deployment time, effort and risk while maximizing performance using tested and documented best practices. Customers can deliver cloud services "out of the box" using Oracle Optimized Solutions offerings such as the database-as-a-service cloud. For example, on SuperCluster T5-8, database provisioning can be accelerated by 32x and database deployment can be simplified with 12x fewer steps. Oracle Optimized Solutions provides a template that customers can leverage to reduce operating costs on aging assets while delivering a more flexible service environment to internal application users. Customers can quickly deploy enterprise cloud services with 24/7 availability, secure multi-tenancy, and a radically simplified management, patching, and support model. The result is an agile database environment that is better able to support business needs by enabling higher end-user productivity, increased utilization, and reduced IT costs.

### Seamless Integration and Support

By combining its industry-standard high performance servers and storage with the intelligence built into its best-in-class software, Oracle SuperCluster T5-8 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 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 customers' systems, Oracle Premier Support customers who are running certified configurations on Oracle 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.

Oracle SuperCluster Specifications	Half Rack	Full Rack
<b>SPARC T5-8 Compute Nodes</b>	<b>2</b>	<b>2</b>
Each compute node configured with:	<ul style="list-style-type: none"> <li>• 4 x sixteen-core SPARC T5 processors (3.6GHz)</li> <li>• 64 x 16 GB of memory</li> <li>• 8 x 1.2 TB 10,000 RPM disks</li> <li>• 4 x dual-port QDR InfiniBand adapter</li> <li>• 4 x dual-port 10 GbE</li> </ul>	<ul style="list-style-type: none"> <li>• 8 x sixteen-core SPARC T5 processors (3.6GHz)</li> <li>• 128 x 16 GB of memory</li> <li>• 8 x 1.2 TB 10,000 RPM disks</li> <li>• 8 x dual-port QDR InfiniBand adapter</li> <li>• 8 x dual-port 10 GbE</li> </ul>
	128 CPU cores and 2 TB of memory for database and application processing (64 CPU cores and 1 TB of memory per compute node)	256 CPU cores and 4 TB of memory for database and application processing (128 CPU cores and 2 TB of memory per compute node)
<b>Exadata Storage Server</b>	<b>4</b>	<b>8</b>
Each Oracle Exadata Storage Server X4-2 is configured with:		
<ul style="list-style-type: none"> <li>• Either 12 x 1.2TB 10,000 RPM high performance disks or 12 x 4TB 7,200 RPM high capacity disks</li> <li>• 2 x six-core Intel Xeon E5-2630 v2 for SQL processing</li> <li>• 4 x 800 GB Exadata Smart Flash Cache</li> </ul>		
<b>Oracle SuperCluster T5-8 with High Performance Disks</b>	Up to 7 GB/sec of uncompressed disk bandwidth <sup>1</sup> Up to 29 GB/sec of uncompressed Flash	Up to 14 GB/sec of uncompressed disk bandwidth <sup>1</sup> Up to 58 GB/sec of uncompressed Flash data

	data bandwidth <sup>1</sup> Up to 14,400 Database Disk IOPS <sup>2</sup> 57.6 TB of raw data disk capacity <sup>3</sup> Up to 24 TB of uncompressed usable capacity <sup>4</sup>	bandwidth <sup>1</sup> Up to 28,800 Database Disk IOPS <sup>2</sup> 115.2 TB of raw data disk capacity <sup>3</sup> Up to 48 TB of uncompressed usable capacity <sup>4</sup>
<b>Oracle SuperCluster T5-8 with High Capacity Disks</b>	Up to 6 GB/sec of uncompressed disk bandwidth <sup>1</sup> Up to 29 GB/sec of uncompressed Flash data bandwidth <sup>1</sup> Up to 9,000 Database Disk IOPS <sup>2</sup> 192 TB of raw data disk capacity <sup>3</sup> Up to 80 TB of uncompressed usable capacity <sup>4</sup>	Up to 12 GB/sec of uncompressed disk bandwidth <sup>1</sup> Up to 58 GB/sec of uncompressed Flash data bandwidth <sup>1</sup> Up to 18,000 Database Disk IOPS <sup>2</sup> 384 TB of raw data disk capacity <sup>3</sup> Up to 160TB 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 (Oracle Automatic Storage Management normal redundancy) while also providing adequate space (one disk on half racks and two disks on a full racks) to reestablish the mirroring protection after a disk failure.</p>		
<b>Shared Storage Subsystem</b>	<b>1</b>	<b>1</b>
Oracle ZFS Storage ZS3-ES Dual Controller, each with: <ul style="list-style-type: none"> <li>• 2 x eight-core 2.1GHz Intel® Xeon® E5-2658 processors</li> <li>• 16 x 16 GB of memory</li> <li>• 1 x dual-port InfiniBand HCA</li> <li>• 2 x 900 GB SATA disks</li> <li>• 2 x 1.6 TB read optimized solid state disk (SSD)</li> </ul> Disk shelf: <ul style="list-style-type: none"> <li>• 20 x 4 TB high capacity 7,200 RPM disks</li> <li>• 4 x 73 GB write-optimized SSD</li> </ul>		
<b>InfiniBand Switches</b>	<b>3</b>	<b>3</b>
<ul style="list-style-type: none"> <li>• 36 port QDR (40 Gb/sec) InfiniBand switches</li> </ul>		
<b>Additional Hardware Components</b>		
Additional hardware components included: <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> Spares included: <ul style="list-style-type: none"> <li>• 1 x 1.2 TB high performance disk or 1 x 4 TB high capacity disk</li> <li>• 1 x 4 TB disk</li> <li>• 1 x 800 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 applications</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, and networking hardware, and systems software technology</li> </ul>	

<ul style="list-style-type: none"> <li>Large to small databases and data warehouses</li> <li>Private clouds</li> </ul>	<ul style="list-style-type: none"> <li>Run existing Oracle, independent software vendor (ISV) and custom applications without modification</li> <li>Deploy high performance web, database, middleware, and application tiers on a single system</li> <li>Leverage built-in database acceleration to deliver 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 11.1 for Oracle Database 11g, Elastic Cloud Software and general purpose applications</li> <li>Oracle Solaris 10 1/13 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>Oracle SuperCluster Services and Support</b>	
Hardware Warranty	1 year with 4 hour web/phone response during normal business hours (Monday-Friday 8 a.m. to 5 p.m.), 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 SuperCluster Start-Up Pack	<ul style="list-style-type: none"> <li>Oracle SuperCluster Start-Up Advisory Service</li> <li>Oracle SuperCluster Installation Service</li> <li>Oracle SuperCluster Configuration Service</li> <li>Oracle SuperCluster Production Support Readiness Service</li> <li>Oracle SuperCluster Quarterly Patch Deployment Service</li> </ul>
Services from Oracle Advanced Customer Support Services	<ul style="list-style-type: none"> <li>Oracle Standard System Installation</li> <li>Oracle Standard Software Configuration</li> <li>Oracle Exalogic Configuration Service</li> <li>Oracle Advanced Monitoring and Resolution</li> <li>Oracle Solution Support Center</li> <li>Oracle Business Critical Assistance</li> <li>Oracle Advanced Support Assistance</li> <li>Oracle Priority Service</li> <li>Oracle Quarterly Patch Deployment</li> <li>Oracle Business Critical Service for Systems</li> <li>Oracle Advanced Support Engineer for Engineered Systems</li> </ul>
Services from Oracle Consulting	<ul style="list-style-type: none"> <li>Oracle Migration Factory</li> <li>Consolidation services</li> <li>Architecture services</li> </ul>

Oracle SuperCluster T5-8 Environmental Specifications	Full Rack	Half Rack
<b>Dimensions:</b>	<ul style="list-style-type: none"> <li>Height: 78.66 inches – 1998 mm</li> <li>Width: 23.62 inches – 600 mm</li> </ul>	

	<ul style="list-style-type: none"> <li>Depth: 47.24 inches – 1200 mm</li> </ul>	
	Weight: 1,916 lb.	Weight: 1,556 lb.
<b>Power:</b>	Maximum: 15.1 kW (15.9 kVA) Typical: 12.6 kW (13.3 kVA)	Maximum: 8.6 kW (9.0 kVA) Typical: 7.1 kW (7.5 kVA)
<b>Cooling:</b>	Maximum: 54,505 BTU/hour (57.4 kJ/hour) Typical: 45,422 BTU/hour (47.8 kJ/hour)	Maximum: 31,013 BTU/hour (32.6 kJ/hour) Typical: 25,591 BTU/hour (26.97 kJ/hour)
<b>Airflow:</b>	Maximum: 2,523 CFM Typical: 2,103 CFM	Maximum: 1,436 CFM Typical: 1,185 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+A11:2009+A1:2010+A12:2011, CB Scheme with all country differences</li> <li>RFI/EMI (Class A): FCC CFR 47 Part 15 Subpart B, EN 55022:2010, ETSI EN 300 386 V1.6.1 (2012-09)</li> </ul> Immunity: EN 55024:2010; ETSI EN 300 386 V1.6.1 (2012-09)	
<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).		

### Oracle SuperCluster Upgrades

SuperCluster T5-8 Half Rack to Full Rack Upgrade, hardware components include:

- 8 x sixteen-core SPARC T5 processors (3.6GHz)
- 64 x 16 GB of memory
- 4 x Exadata Storage Servers X4-2 with 12 x 1.2TB 10,000 RPM High Performance disks or 12 x 4 TB 7,200 RPM High Capacity disks
- 8 x dual-port QDR InfiniBand adapter
- 8 x dual-port 10 GbE
- InfiniBand and Ethernet cables to connect all the components

Increase storage capacity by connecting to Oracle's Exadata Storage Expansion Rack

Multi-rack connection:

- Connect any combination of Oracle SuperCluster, Oracle Exadata, Exadata Storage Expansion Racks, or Oracle Exalogic via the included InfiniBand fabric
- Up to eighteen racks can be connected without requiring additional InfiniBand switches
- InfiniBand cables to connect three racks are included in the rack spares kit
- Additional optical InfiniBand cables are required when connecting four or more racks

Add Fiber Channel cards to compute nodes to connect to existing SAN infrastructure.

### Oracle Software (Included)

- Oracle Solaris 11.1
- Oracle Solaris 10 1/13
- Oracle VM Server for SPARC
- Oracle Solaris Zones
- Oracle Enterprise Manager Ops Center 12c

**Oracle Software (Sold Separately)**

- Oracle Database 11g Release 2; Oracle Database 12c
- Exadata Storage Server Software
- Exalogic Elastic Cloud Software
- Oracle Solaris Cluster 4.1 (Oracle Solaris 11.1); Oracle Solaris Cluster 3.3 3/13 (Oracle Solaris 10)

**Contact Us**

For more information about Oracle SuperCluster T5-8, 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**