

ORACLE SUPERCLUSTER M6-32



Oracle SuperCluster M6-32 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. With big memory, SuperCluster M6-32 can run databases and applications in memory while providing the highest levels of availability and serviceability. SuperCluster M6-32 can scale vertically, allowing customers to flexibly add compute and storage resources to meet the most demanding data center requirements.

BIG MEMORY ENGINEERED SYSTEM
FOR DATABASES AND APPLICATIONS

KEY FEATURES

- Up to 32 processors and 32 TB of memory
- Runs databases and applications in memory
- Highly scalable compute and storage resources
- 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 redundant compute, storage and networking components for high availability
- Built-in, hardware encryption to provide end-to-end data security

RELATED PRODUCTS

- Oracle SuperCluster T5-8
- Oracle SPARC M6-32 server
- Oracle Solaris
- Oracle Exadata Storage Expansion Rack
- Oracle ZFS Storage ZS3-ES
- Oracle Sun Datacenter InfiniBand Switch 36

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

Oracle SuperCluster is engineered with integrated Oracle servers, storage, networking and software technologies optimized together to run Oracle Database, Java and enterprise applications unchanged. SuperCluster M6-32 accelerates Oracle Database and Java performance by up to 10x, and even up to 20x with applications running in-memory, while improving user response times and service levels. SuperCluster M6-32 provides the highest levels of application availability minimizing planned and unplanned downtime while providing the highest service levels for core business applications across all tiers of the data center. SuperCluster M6-32 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 M6-32 is based on the fastest and most scalable database and application server, fastest database storage, fastest network and operating system combination for database, middleware and core business applications. The large memory capacity combined with Oracle In-Memory applications boosts performance by 10x-20x, resulting in faster, real-time decision

- Oracle Database
- Oracle Real Application Clusters (Oracle RAC)
- Oracle Exalogic Elastic Cloud
- Oracle Enterprise Manager Ops Center
- Oracle Solaris Cluster
- Oracle Optimized Solutions

RELATED SERVICES

- Oracle Advanced Customer Support Services
- Oracle Premier Support for Systems
- Oracle Platinum Services
- Consulting Services
- Oracle University courses

making. Oracle Solaris 11 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. Integration of Oracle's Exadata Storage Servers and optional Exalogic Elastic Cloud Software provide database and Java application performance advantages on a single system. Exadata Storage Servers provide the database storage building block of SuperCluster M6-32, 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 M6-32 minimum configuration offers up to 1.5 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 M6-32 is capable of running 1 million secure transactions per second at the web, middleware, and database tiers, concurrently with no performance impact. 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.

Highest Efficiency

Compared to the build-it-yourself IT approach, SuperCluster M6-32 helps achieve high efficiency in the datacenter. Since Oracle's hardware and software are co-engineered, SuperCluster M6-32 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 M6-32 offers significant price performance advantage over comparable build-it-yourself IT deployments. Upgrading an existing datacenter with SuperCluster M6-32 can dramatically lower TCO, reducing datacenter footprint, power, and cooling costs. Additionally, SuperCluster M6-32 can lower operation and maintenance costs by 3x.

SuperCluster M6-32 provides a highly virtualized environment for running database and applications in a single system. With built-in, zero-overhead virtualization, SuperCluster M6-32 helps maximize IT resources and brings new levels of server utilization and efficiency. SuperCluster M6-32 layered optimized virtualization technologies include Oracle VM Server for SPARC for logical domains, Oracle Solaris Zones for operating system virtualization, and Dynamic Domains for electrically isolated hardware partitioning, providing the highest level of isolation possible.

SuperCluster M6-32 features built-in mainframe RAS capabilities including redundancy of most major components, use of Dynamic System Domains for hardware fault isolation, end-to-end ECC memory protection, and Oracle Solaris Fault Management Architecture. Its highly available framework supports the demands of mission critical applications. It enables high database and application availability and minimizes planned and unplanned downtime. Optional Clusterware drastically improves database availability while Oracle Solaris Cluster can provide 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. SuperCluster M6-32 features real-time fault notification, and risk-free, simplified integrated stack patching - reducing risk and expediting updates. SuperCluster M6-32 offers significant reductions in time for patching and minimizes downtime, ensuring maximum service levels for all applications.

SuperCluster M6-32 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.

Best for Oracle Software

Oracle In-Memory application modules are highly optimized on SuperCluster M6-32. Leveraging Exadata Storage and Exalogic software optimizations delivers accelerated database queries and runs applications 20x faster. The big memory capacity of SuperCluster M6-32 combined with in-memory modules provides real-time data for faster decision making.

Hybrid Columnar Compression on Oracle SuperCluster M6-32 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 M6-32 to deliver up to 10x more data compression reducing or eliminating the need to add more expansive SAN-based storage.

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.

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 M6-32, 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 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.

Oracle SuperCluster M6-32 Specifications	Minimum	Maximum
SPARC M6-32¹	<ul style="list-style-type: none"> • 16 x twelve-core SPARC M6 processors (3.6GHz) • 512 x 16 GB, for 8 TB total memory • 16 x 1.2 TB 10,000 RPM disks • 16 x 10GbE ports • 8 x I/O base cards • 8 x dual-port QDR InfiniBand adapter • 2 x quad-port 1GbE, UTP 	<ul style="list-style-type: none"> • 32 x twelve-core SPARC M6 processors (3.6GHz) • 1024 x 32 GB, for 32 TB total memory • 32 x 1.2 TB 10,000 RPM disks • 32 x 10GbE ports • 16 x I/O base cards • 16 x dual-port QDR InfiniBand adapter • 4 x quad-port 1GbE, UTP
	Flexibly add compute and storage independently ¹ Deploy in one M6-32 for mainframe-class RAS, or in two M6-32 racks for extreme redundancy	
Exadata Storage Server	9 x Exadata Storage Servers X4-2 , each with: <ul style="list-style-type: none"> • Either 12 x 1.2TB 10,000 RPM high performance disks or 12 x 4TB 7,200 RPM high capacity disks • 2 x six-core Intel Xeon E5-2630 v2 for SQL processing • 4 x 800 GB Exadata Smart Flash Cache 	
	Oracle SuperCluster M6-32 with High Performance Disks	Oracle SuperCluster M6-32 with High Capacity Disks
	Up to 15.75 GB/sec of uncompressed disk bandwidth ¹ Up to 65.25 GB/sec of uncompressed Flash data bandwidth ¹ Up to 32,400 Database Disk IOPS ² 129.6 TB of raw data disk capacity ³ Up to 54 TB of uncompressed usable capacity ⁴	Up to 13.5 GB/sec of uncompressed disk bandwidth ¹ Up to 65.25 GB/sec of uncompressed Flash data bandwidth ¹ Up to 21,000 Database Disk IOPS ² 432 TB of raw data disk capacity ³ Up to 180 TB of uncompressed usable capacity ⁴
	Add up to seventeen additional Exadata Storage Expansion Racks	
	¹ Bandwidth is peak physical scan bandwidth achieved running SQL, assuming no data compression. Effective data bandwidth is higher when compression is used. ² Based on read IO requests of size 8K running SQL. 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. 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.	
Shared Storage Subsystem	Oracle ZFS Storage ZS3-ES Dual Controller, each with: <ul style="list-style-type: none"> • 2 x eight-core 2.1GHz Intel® Xeon® E5-2658 processors • 16 x 16 GB of memory • 1 x dual-port InfiniBand host channel adapter • 2 x 900 GB SATA disks • 2 x 1.6 TB read-optimized solid state disk Disk shelf: <ul style="list-style-type: none"> • 20 x 4 TB high capacity 7,200 RPM disks • 4 x 73 GB write-optimized solid state disk 	
InfiniBand Switches	3 x 36 port QDR (40 Gb/sec) InfiniBand switches	
Additional Hardware Components		

Additional hardware components included:

- Ethernet management switch
- InfiniBand and Ethernet cables

Spares included:

- 1 x 1.2 TB high performance disk or 1 x 4 TB high capacity disk
- 1 x 800 GB Exadata Smart Flash Cache card
- InfiniBand cables

Key Applications

<ul style="list-style-type: none"> • Data center consolidation • Multi-tier enterprise applications • Large to small databases and data warehouses • Private clouds 	<ul style="list-style-type: none"> • Securely virtualize and consolidate applications to increase operating efficiency, reduce server count and conserve data center space and energy • Consolidate up to 100 legacy servers with one full rack of integrated server, storage, and networking hardware, and systems software technology • Run existing Oracle, independent software vendor (ISV) and custom applications in memory without modification • Deploy high performance web, database, middleware, and application tiers on a single system • Leverage built-in database acceleration to deliver unsurpassed performance, scalability, and data protection • Minimize time to value and risk and maximize performance with Oracle Optimized Solutions • Rapidly deploy self-service cloud services using the most efficient virtualization and automated systems management
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Software

Operating system	<ul style="list-style-type: none"> • Oracle Solaris 11.1 for Oracle Database 12c and 11g Release 2, Elastic Cloud Software and general purpose applications • Oracle Solaris 10 1/13 for general purpose applications
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Virtualization

Built-in, low overhead, Oracle VM Server for SPARC, Oracle Solaris Zones, and Dynamic Domains provide the flexibility to power virtual systems and thousands of zones – at no additional cost

Oracle SuperCluster M6-32 Services and Support

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"> • Oracle Platinum Services • Remote fault monitoring with faster response times and patch deployment services to qualified Oracle Premier Support customers at no additional cost • Oracle Premier Support <ul style="list-style-type: none"> • 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 • Oracle Customer Data and Device Retention • Oracle Auto Service Request (ASR)
Oracle SuperCluster Start-Up Pack	<ul style="list-style-type: none"> • Oracle SuperCluster Start-Up Advisory Service • Oracle SuperCluster Installation Service • Oracle SuperCluster Configuration Service • Oracle SuperCluster Production Support Readiness Service • Oracle SuperCluster Quarterly Patch Deployment Service
Services from Oracle Advanced Customer Support Services	<ul style="list-style-type: none"> • Oracle Standard System Installation • Oracle SuperCluster Configuration Service • Oracle Exalogic on SuperCluster Configuration Service • Oracle Advanced Monitoring and Resolution • Oracle Solution Support Center

	<ul style="list-style-type: none"> • Oracle Business Critical Assistance • Oracle Advanced Support Assistance • Oracle Priority Service • Oracle Quarterly Patch Deployment • Oracle Advanced Support Engineer for Engineered Systems
Services from Oracle Consulting	<ul style="list-style-type: none"> • Oracle Migration Factory • Consolidation services • Architecture services

Oracle SuperCluster M6-32 Environmental Specifications	Minimum Configuration – Deployed in 1 x M6-32	Maximum Configuration – Deployed in 2 x M6-32
Dimensions:	<ul style="list-style-type: none"> • Height: 78.7 inches – 2000 mm • Width: 59.2 inches – 1504 mm • Depth: 57.1 inches – 1451 mm 	
	Weight ³ : 5,032 lb.	Weight ³ : 8,729 lb.
Power³:	Maximum: 14.8 kW (15.5 kVA) Typical: 11.6 kW (12.1 kVA)	Maximum: 32,8 kW (34.6 kVA) Typical: 27.0 kW (28.4 kVA)
Cooling³:	Maximum: 52,973 BTU/hour (55.8 kJ/hour) Typical: 41,542 BTU/hour (43.7 kJ/hour)	Maximum: 118,059 BTU/hour (124.4 kJ/hour) Typical: 97.1 BTU/hour (102.3 kJ/hour)
Airflow³:	Maximum: 2,452 CFM Typical: 1,923 CFM	Maximum: 5,466 CFM Typical: 4,494 CFM
Operating Temperature/Humidity:	5 °C to 32 °C (41 °F to 89.6 °F), 10% to 90% relative humidity, non-condensing	
Altitude Operation:	Up to 9,840 feet (3,048 m) ² , maximum ambient temperature is de-rated by 1° C per 300 m above 900 m	
Regulations (Meets or exceeds requirements)¹:	<ul style="list-style-type: none"> • Safety: EN 60950-1: 2006+A11:2009+A1:2010+A12:2011, IEC 60950-1:2005+A1:2009 2nd Edition, UL 60950-1 2nd Edition 2011-12-19, CAN/CSA-C22.2 No.60950-1-07, 2nd Edition,2011-12 • EMC: EN55022:2010 Class A, EN55024:2010, EN61000-3-2:2006+A1:2009+A2:2009, EN61000-3-3:2008, ETSI EN300386:2012 (V1.6.1) 47 CFR15 Subpart B (FCC) Class A, ICES-003 Issue 5 (2012), AS/NZS CISPR22:2009+A1:2010 Class A, CISPR22:2010 Class A • Regulatory markings: CE, FCC, ICES-003, C-Tick, VCCI, EAC , BSMI, KC, cULus (or equivalent), CCC <p>European Union directives: Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU</p>	
Certifications¹:	<ul style="list-style-type: none"> • Safety: UL/cUL, CE, BSMI, GOST R, S-Mark, CSA C22.2 No. 60950-1-07 2nd Ed, CCC • EMC: CE, FCC, VCCI, ICES, KCC, GOST R, BSMI Class A, AS/NZ 3548, CCC 	
Other:	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).		
³ Estimated.		

SuperCluster M6-32 Upgrades
Increase storage capacity by connecting to Oracle's Exadata Storage Expansion Rack
Multi-rack connection: <ul style="list-style-type: none"> • Connect any combination of Oracle SuperCluster, Oracle Exadata, Exadata Storage Expansion Racks, or Oracle Exalogic via the included InfiniBand fabric

- Up to seventeen racks can be connected without requiring additional InfiniBand switches

Add fibre channel cards to compute racks 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 Release 2

Oracle Software (Sold Separately)

- Oracle Database 12c; Oracle Database 11g Release 2
- 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 M6-32, 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