ORACLE DATA SHEET

Oracle SuperCluster M8

ORACLE SUPERCLUSTER

Oracle SuperCluster M8 is a ready-to-deploy secure cloud infrastructure for both databases and applications. It is an engineered system that combines compute, networking, and storage hardware with virtualization, operating system, and management software into a single system that is extremely easy to deploy, secure, manage, and maintain. Oracle SuperCluster M8 features the **industry's most advanced security**, incorporating a number of unique runtime security technologies, documented and tested system-wide security controls and best practices, and integrated automated compliance verification tools. Oracle SuperCluster M8 is the **world's fastest engineered system**, delivering incredible performance under a wide range of workloads ranging from traditional enterprise resource planning, to customer relationship management and data warehouses, to ecommerce, mobile applications, and real-time analytics. Equally importantly, it is **extremely cost effective** because of its low purchase price; the ease with which the system can be deployed, scaled, managed, and maintained; and its incredibly efficient use of space, power, compute resources, storage, memory, and software licenses.

KEY BENEFITS

- Built-in hardware encryption to provide end-to-end data security
- Unique protection of application data from memory attacks or exploits of software vulnerabilities
- Fast path to security compliance and ability to remain compliant easily with out-of-the-box security controls
- Coengineered Oracle Exadata storage technology and Oracle Database 12*c* to deliver unbeatable performance and efficiency
- Ability to start small and grow, flexibly and easily

The Industry's Most Advanced Security

Oracle SuperCluster integrates a range of unique technologies and approaches in order to provide a highly secure cloud infrastructure with minimal effort or risk, for example:

- **Silicon Secured Memory,** also a feature of Oracle's SPARC M8 processor, protects data in memory from unauthorized access. In modern computing systems, data that is in memory is not encrypted, making it vulnerable to attacks that take advantage of memory management defects that are pervasive in modern software programs. SPARC M8 processors provide the unique and revolutionary ability to ensure that no software programs may access physical system memory that they are not explicitly intended or authorized to access, eliminating the risk that data held in memory can be compromised through well-known exploits, even when the software programs have defects that would be easy to exploit on other platforms.
- **Cryptographic acceleration**, a feature of the SPARC M8 processor, provides near-zero overhead end-to-end data encryption with no performance compromise. By adding a broad range of enhanced cryptographic acceleration capabilities to the design of the SPARC M8 processor, it is possible to fully secure data that is stored on disks or transmitted over networks with virtually no perceptible impact on application or database performance and efficiency.

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KEY FEATURES

- Up to 512 CPU cores and 16 TB of memory per rack for database and application processing
- Up to 11 Oracle Exadata Storage Servers per rack
- Integrated ZFS application storage including 160 TB of storage capacity
- 40 Gb/sec (QDR) InfiniBand network
- Built-in, near-zero overhead virtualization using Oracle VM Server for SPARC and Oracle Solaris Zones
- Support for Oracle Solaris 11 and Oracle Solaris 10

- **Read-only virtual machines** (known as Oracle Solaris Immutable Zones) ensure that application administrators and compromised applications are unable to accidently alter the configuration of virtual machines in ways that would expose systems to attack.
- **End-to-end audit trails** allow who is responsible for potentially dangerous administrative actions and changes to be quickly determined so that corrective action can be taken immediately, without lengthy and error-prone forensic analysis.
- **Automated compliance reporting** allows security experts and system administrators to quickly and easily verify that IT systems are secure and compliant with mandated standards and best practices. Oracle SuperCluster supports both the Center for Internet Security (CIS) and Security Technical Information Guide (STIG) security benchmarks, and it is compliant with the Payment Card Industry Data Security Standard (PCI DSS).
- **Administrative access controls** allow fine-grained control over the rights and activities available to individual system administrators, including the ability to restrict certain administrative access to specific times and to restrict remote auditing and logging to prevent credential misuse.
- **Out-of-the-box security controls** and detailed best-practices guidance ensure that Oracle SuperCluster systems are delivered in a secure state, by default, and can be easily adapted to the particular deployment environment with minimal complexity and low risk of accidental security compromises.

The World's Fastest Engineered System

Oracle SuperCluster M8 is built on the fastest and most advanced server with the world's fastest processor, the fastest database storage, a fast networking and operating system combination, and unique capabilities for securing application data, accelerating databases, and running Java applications.

- The **SPARC M8 high-performance processor** is the world's fastest processor for general-purpose computing and integrates additional performance enhancements for cryptographic acceleration and Oracle Database 12*c* directly into the processor design.
- The SPARC M8 processor's **In-Line Decompression** feature allows **Oracle Database 12*c*** to store databases that are many times larger than the physical memory in the system entirely in memory in a highly compressed format using dedicated functions in the processor itself, and it frees valuable general-purpose compute cores for SQL processing.
- The SPARC M8 processor's **In-Memory Query Acceleration** feature for **Oracle Database In-Memory** in **Oracle Database 12*c*** provides simultaneous real-time analytics and transaction processing performance that is up to 9x better than with x86 or IBM Power systems.
- **Oracle Exadata Storage Server**, coengineered with Oracle Database, delivers the optimal balance of scalability, transaction processing, and batch performance for all Oracle Database workloads.
- **Oracle's InfiniBand fabric** is the low-latency, high throughput I/O fabric that ties all of the Oracle SuperCluster system components together, making it possible to horizontally scale the Oracle SuperCluster system.

RELATED PRODUCTS

- Oracle MiniCluster S7-2
- Oracle's SPARC M8-8 server
- Oracle Solaris
- Oracle Exadata Storage Server
- Oracle's Exadata Storage Expansion Rack
- Oracle ZFS Storage ZS5-ES appliance
- Oracle's Sun Datacenter InfiniBand Switch 36
- Oracle Database 11*g* and 12*c*
- Oracle Real Application Clusters (Oracle RAC)
- 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
- Oracle PlatinumPlus Services
- Oracle Consulting services
- Oracle University courses

Most Cost-Effective Secure Cloud Infrastructure

Oracle SuperCluster M8 provides a secure and cost-effective cloud infrastructure with the following characteristics:

- The system is **extremely efficient and provides secure multitenancy**. Seamlessly integrated scale-up virtualization and a scale-out InfiniBand fabric provide maximum performance and scalability with no wasted compute, memory, or software resources.
- The **low-cost, elastic, capacity-on-demand** configuration of Oracle SuperCluster M8 allows even small and midsize enterprises to deploy right-sized systems and seamlessly add capacity as business needs change over time.
- **Fine-grained software licensing** allows the partitioning of cores per server to be turned off and licensed only when needed. As the workload grows and more cores are needed, hard partitioning can be used to assign cores and license software.
- The system provides easy-to-use **infrastructure as a service (IaaS) and database as a service (DBaaS) self-provisioning** for users.

Conclusion

Oracle SuperCluster M8 is a secure cloud infrastructure for databases and applications. It is the most-advanced security platform, the most cost-effective secure cloud infrastructure, and the world's fast engineered system. Oracle SuperCluster is an engineered system featuring fast, secure, and scalable servers; scale-out intelligent storage servers; state-of-the-art PCI-based flash storage servers; efficient application storage; and an extremely high-bandwidth InfiniBand internal fabric that connects all servers and storage. Oracle SuperCluster runs all types of database workloads including online transaction processing (OLTP), data warehousing (DW), and in-memory analytics; as well as Oracle, independent software vendor (ISV), and custom applications.

ORACLE SUPERCLUSTER M8 HARDWARE SPECIFICATIONS

Rack Configuration	Minimum Rack	Maximum Storage Rack	Maximum Compute Rack
SPARC M8-8 Compute Chassis	**1**	**1**	**2**
• *Redundant Oracle Integrated Lights Out Manager (Oracle ILOM) service processors* • *6 x 3,000 watt AC power supplies (N+N)* • *8 x redundant hot-swappable fan modules*			
SPARC M8-8 Compute Node	**2**	**2**	**4**
Each compute node (physical domain) configured with:	• *1 x 32-core SPARC M8 processor (5.1 GHz)* • *16 x 64 GB of memory* • *1 x dual-port QDR InfiniBand adapter* • *1 x quad-port 10 GbE HCA with pluggable transceivers (2 port) and optical cables* • *1 x GbE adapter*	• *4 x 32-core SPARC M8 processors (5.1 GHz)* • *64 x 64 GB of memory* • *4 x dual-port QDR InfiniBand adapters* • *4 x quad-port 10 GbE HCA with pluggable transceivers (2 port) and optical cables* • *1 x GbE adapter*	• *4 x 32-core SPARC M8 processors (5.1 GHz)* • *64 x 64 GB of memory* • *4 x dual-port QDR InfiniBand adapters* • *4 x quad-port 10 GbE HCA with pluggable transceivers (2 port) and optical cables* • *1 x GbE adapter*
Oracle Exadata Storage Server	**3**	**11**	**6**

Each Oracle Exadata Storage Server is configured with:

- *2 x 10-core Intel® Xeon® Silver 4114 processor for SQL processing*
- *12 x 10 TB 7,200 RPM high-capacity disks and 4 x 6.4 TB NVMe PCIe 3.0 flash cards, or 8 x 6.4 TB NVMe PCIe 3.0 flash drives*

Shared Storage Subsystem	1	1	1

The Oracle ZFS Storage ZS5-ES appliance provides iSCSI LUNs for infrastructure storage including domain boot disks, zone root file systems, and application binaries and logs.

Each Oracle ZFS Storage ZS5-ES dual controller has:

- *2 x 18-core 2.3G Hz Intel® Xeon® E5-2699 v3 processors*
- *24 x 32 GB of memory*
- *1 x dual-port InfiniBand HCA*
- *2 x 1.2 TB hard disk drives*
- *2 x 3.2 TB read-optimized solid-state disks (SSDs)*

Disk shelf:

- *20 x 8 TB high-capacity SAS-3 7,200 RPM disks*
- *4 x 200 GB write-optimized SSDs*

InfiniBand Switches	2	3	3

36-port QDR (40 Gb/sec) InfiniBand switches

Additional Hardware Components

Additional hardware components included:

- *42U rack*
- *Ethernet management switch* that *provides 48 Ethernet ports; each port has a wire speed of 10/100/1000 Base-T*
- *2 x redundant power distribution units (PDUs)*
- *InfiniBand and Ethernet cables*

Spares included:

- *1 x 10 TB high-capacity disk and 1 x 6.4 TB NVMe PCIe 3.0 flash card, or 1 x 6.4 TB NVMe PCIe 3.0 flash drive*
- *InfiniBand cables to multirack three racks*

Software

Operating System	Oracle Solaris 11.3 for enhanced performance and functionality, including features enabled by the SPARC M8 processor's Software in Silicon technology

Virtualization

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.

Applications certified for Oracle Solaris 10 may run in an Oracle Solaris 10 Branded Zone.

ORACLE SUPERCLUSTER M8 ELASTIC CONFIGURATION OPTIONS

Compute Chassis	Storage Server	Multirack Connection
SPARC M8-8 chassis and two compute nodes (physical domain), each with: • *1, 2, 3, or 4 x 32-core SPARC M8 processors (5.1 GHz)* • *16, 32, 48, or 64 x 64 GB of memory* • *1, 2, 3, or 4 x dual-port QDR InfiniBand adapters* • *1, 2, 3, or 4 x quad-port 10 GbE adapters* An additional four-processor option with two physical domains and all four processors configured in one physical domain is available.	Expand up to 6 storage servers in a rack with two SPARC M8-8 compute chassis. Expand up to 11 storage servers in a rack with one SPARC M8-8 compute chassis.	Connect any combination of up to 18 Oracle SuperCluster racks, Exadata Storage Expansion Racks, Oracle Exadata, Oracle Exalogic, or Oracle Big Data Appliance via the InfiniBand fabric. Larger configurations can be built with external InfiniBand switches. Additional optical InfiniBand cables are required when connecting four or more racks.

ORACLE SUPERCLUSTER M8 UPGRADE OPTIONS

Hardware field upgrades:

- *SPARC M8-8 compute chassis, each with 1 x SPARC M8 processor, 16 x 64 GB of memory, 1 x dual-port QDR InfiniBand adapter, and 1 x quad-port 10 GbE adapter*
- *Compute node upgrade includes 1 x SPARC M8 processor, 16 x 64 GB of memory, 1 x dual-port QDR InfiniBand adapter, and 1 x quad-port 10 GbE adapter*
- *Storage servers*
- *InfiniBand switch*

ORACLE SUPERCLUSTER SERVICES AND SUPPORT

Hardware Warranty	One year with four-hour web/phone response during normal business hours (Monday–Friday 8 a.m. to 5 p.m.), with two-business-day onsite response/parts exchange

Oracle Support	• *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 for Systems: Essential support services including 24x7 support with two-hour onsite hardware service response (subject to proximity to service center), proactive tools, and online resources* • *Oracle Customer Data and Device Retention* • *Oracle Auto Service Request* • *Oracle Business Critical Assistance*
Oracle SuperCluster Start-Up Pack	• *Oracle SuperCluster Start-Up Advisory Service* • *Oracle SuperCluster Installation Service* • *Oracle SuperCluster Configuration Service* • *Oracle SuperCluster Production Support Readiness* • *Oracle SuperCluster Quarterly Patch Deployment Service*
Services from Oracle Advanced Customer Support Services	• *Oracle Supportability Planning and Design* • *Oracle Standard System Installation* • *Oracle Standard Software Installation and Configuration* • *Oracle Preproduction Readiness Review* • *Oracle Go-Live Support* • *Oracle Advanced Support Knowledge Workshop* • *Oracle Solution Support Center* • *Oracle Advanced Support Assistance* • *Oracle Priority Support* • *Oracle SuperCluster Quarterly Patch Deployment Service* • *Oracle Consolidation Planning Service* • *Oracle Migration Service* • *Oracle Advanced Support Engineer for Engineered Systems*
Services from Oracle Consulting	• *Oracle Migration Factory* • *Consolidation services* • *Architecture services*

ORACLE SUPERCLUSTER M8 ENVIRONMENTAL SPECIFICATIONS

	Minimum Rack	Maximum Storage Rack	Maximum Compute Rack
Dimensions	• *Height: 78.74 inches, 2,000 mm* • *Width: 23.66 inches, 610 mm* • *Depth: 47.17 inches, 1,197 mm*		
	Weight: 1,410 lb.	Weight: 1,886 lb.	Weight: 1,971 lb.
Power	Maximum: 12,523 kW (13,182 kVA) Typical: 9,969 kW (10,494 kVA)	Maximum: 17,153 kW (18,056 kVA) Typical: 13,542 kW (14,255 kVA)	Maximum: 22,693 kW (23,887 kVA) Typical: 17,828 kW (18,767 kVA)
Cooling	Maximum: 44,978 BTU/hour (47,407 kJ/hour) Typical: 35,807 BTU/hour (37,740 kJ/hour)	Maximum: 61,609 BTU/hour (64,936 kJ/hour) Typical: 48,639 BTU/hour (51,265 kJ/hour)	Maximum: 81,505 BTU/hour (85,906 kJ/hour) Typical: 64,034 BTU/hour (67,492 kJ/hour)
Airflow	Maximum: 2,082 CFM Typical: 1,658 CFM	Maximum: 2,852 CFM Typical: 2,252 CFM	Maximum: 3,773 CFM Typical: 2,965 CFM
Operating Temperature/Humidity	5º C to 32º C (41º F to 89.6º F), 10% to 90% relative humidity, noncondensing		
Altitude Operation	Up to 9,840 feet (3,048 m)[2], maximum ambient temperature is derated by 1° C per 300 m above 900 m		
Regulations[1,2,3]	• *Safety: UL/CSA 60950-1, EN 60950-1, IEC 60950-1 CB Scheme with all country differences* • *EMC: Emissions – FCC CFR 47 Part 15, ICES-003, EN55032, EN61000-3-11, EN61000-3-12; Immunity – EN55024* • *NRTL, EU, International CB Scheme, BIS HSE Exemption, BSMI, EAC, MSIP, VCCI, VNTA*		
Certifications[2]	NRTL, EU, International CB Scheme, BIS HSE Exemption, BSMI, RCM, MSIP, VCCI		
Other[3]	Complies with 2014/35/EU (2006/85/EC) Low Voltage Directive, 2014/30/EU (2004/108/EC EMC Directive, 2012/19/EU (202/96/EC)WEEE Directive, 2011/65/EU (2002/96/EC) RoHS Directive		

[1] All standards and certification referenced are to the latest official version.

[2] Other county regulations/certifications may apply.

[3] In some cases, as applicable, regulatory and certification compliance were obtained at the component level.

OPTIONAL CUSTOMER-SUPPLIED ETHERNET SWITCH INSTALLATION IN ORACLE SUPERCLUSTER

The Oracle SuperCluster M8 rack may have extra rack space available that can optionally be used by customers to install their own client network Ethernet switches in the Oracle SuperCluster rack instead of in a separate rack. The location and amount of available space will be dependent on actual configuration. Other space, power, cooling, and upgrade restrictions will apply.

OPTIONAL FIBRE CHANNEL CARDS IN ORACLE SUPERCLUSTER

Optional Fibre Channel cards can be installed in the available PCIe slots in the Oracle SuperCluster M8 compute nodes and support connectivity to existing SAN infrastructure. Quantities will be dependent on the actual configuration.

ORACLE SOFTWARE (INCLUDED)

- *Oracle Solaris 11.3*
- *Oracle VM Server for SPARC*
- *Oracle Solaris Zones*
- *Oracle Enterprise Manager 13c Release 2.2 (13.2.2)*
- *Oracle ZFS Storage Appliance Replication; Oracle ZFS Storage Appliance Cloning*

ORACLE SOFTWARE (SOLD SEPARATELY)

- *Oracle Database 12c ; Oracle Database 11g Release 2*
- *Oracle's Exadata Storage Server Software*
- *Oracle Solaris Cluster 4.3 (Oracle Solaris 11.3)*

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CONTACT US

For more information about Oracle SuperCluster M8, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

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