

ORACLE EXADATA DATABASE MACHINE X2-8

FEATURES AND FACTS

FEATURES

- 128 CPU cores and 2 TB of memory for database processing
- 168 CPU cores for storage processing
- 2 database servers
- 14 Oracle Exadata Storage Servers
- 5.3 TB of Exadata Smart Flash Cache
- QDR (40 Gb/second) InfiniBand Switches
- Uncompressed usable capacity of up to 150 TB per rack
- Uncompressed I/O bandwidth of up to 75 GB/second per rack
- Exadata Hybrid Columnar Compression often delivers 10X-15X compression ratios
- Complete redundancy for high availability
- Oracle Linux or Solaris based database servers

FACTS

- Ability to perform up to 1,500,000 I/O operations per second
- Easily upgrade to meet the needs of any size application
- Scale by connecting multiple Exadata Database Machine X2-8 racks. Up to 8 racks can be connected without requiring additional switches. Larger configurations can be built with additional switches
- Pre-configured system optimized for all database applications

The Oracle Exadata Database Machine X2-8 delivers extreme performance and scalability for all your database applications including Online Transaction Processing (OLTP), Data Warehousing (DW) and consolidation of mixed workloads. Built using industry-standard hardware from Sun, and intelligent database and storage software from Oracle, the Exadata Database Machine is a complete optimized package of software, servers, and storage. Simple and fast to implement, the Exadata Database Machine is ready to tackle your largest and most important database applications — and often run them 10x faster, or more.

Extreme Performance for Online Transaction Processing, Data Warehousing and Consolidating Mixed Workloads

Oracle is offering a fully integrated platform for hosting all your database applications. The Exadata Database Machine is an easy to deploy out of the box solution for hosting the Oracle Database. Ready to go day one much of the integration effort, cost and time of database deployment has been eliminated. Whether its OLTP, DW or mixed application workloads, a common deployment creates a tremendous opportunity for consolidation economies of scale in the data center. All this with breakthrough performance.

The unique technology driving the performance advantages of the Exadata Database Machine is the Oracle Exadata Storage Server. By pushing SQL processing to the Exadata Storage Server all the disks can operate in parallel, reducing database server CPU consumption while using much less bandwidth to move data between storage and database servers. As data volumes continue to grow exponentially, conventional storage arrays struggle to efficiently process terabytes of data, and push that data through storage networks to achieve the performance necessary for demanding database applications. Exadata Storage Servers provide a high-bandwidth, massively parallel solution delivering up to 75 GB per second of raw I/O bandwidth and up to 1,500,000 I/O operations per second (IOPS). Much of these performance gains come from the incorporation of Exadata Smart Flash Cache in each Exadata Storage Server and the Oracle Databases' storage hierarchy. With 14 Exadata Storage



RELATED PRODUCTS AND SERVICES

RELATED PRODUCTS

- Oracle Exadata Database Machine X2-2
- Oracle Exadata Storage Server X2-2
- Oracle Database 11g
- Real Application Clusters
- Partitioning
- Advanced Compression
- Advanced Security
- Active Data Guard
- Real Application Testing
- OLAP
- Data Mining
- Business Intelligence
- Enterprise Manager
- Oracle Linux
- Oracle Solaris

RELATED SERVICES

The following services are available from Oracle:

- Advanced Customer Services
- Consulting Services
- Oracle University courses
- Oracle Auto Service Request

Servers in a 42U Rack, 5.3 TB of Exadata Smart Flash Cache is integrated into the Exadata Database Machine X2-8.

In addition, Exadata Database Machine is the world's most secure database system. Building on the high security capabilities in every Oracle Database, Exadata Database Machine provides the ability to query fully encrypted databases with near zero overhead at hundreds of gigabytes per second. This is done by moving decryption processing from software into the Exadata Storage Server hardware.

Extreme Scalability

The Exadata Database Machine X2-8 is a full rack system with 2 database servers and 14 Exadata Storage Servers. Each database server comes with 64 Intel CPU cores (8 x eight-core Intel® Xeon® X7560 processors) and 1 TB of memory.

It is available with either 600 GB High Performance SAS disks or 2 TB High Capacity SAS disks..



While an Exadata Database Machine X2-8 rack is an extremely powerful system, a building-block approach is used that allows Exadata Database Machine X2-8 to scale to almost any size. Exadata Database Machine X2-8 racks can be connected using the integrated InfiniBand fabric. As new racks of Exadata Database Machines are incrementally added to a system, the storage capacity and performance of the system grow. A system composed of two Exadata Database Machines X2-8 racks is simply twice as powerful as a single rack system providing double the I/O throughput and double the storage capacity. It can be run in single system image mode or logically partitioned for consolidation of multiple databases. Scaling out is easy with Exadata Database Machine. Oracle Real Application Clusters (RAC) can dynamically add more processing power and Automatic Storage Management (ASM) can dynamically rebalance the data across Exadata Storage Servers to fully utilize all the hardware in each configuration.

Enterprise Ready

The Exadata Database Machine X2-8 has complete redundancy built in to support the demands of mission critical applications. Each Exadata Database Machine has redundant InfiniBand connectivity, redundant Power Distribution Units (PDU), and the servers all have hot-swappable power supplies for high availability. Oracle RAC protects against database server failure and ASM provides disk mirroring to protect against disk failures. Hot swappable components ensure the database can tolerate server and disk drive failure. In addition, data is mirrored across storage servers to protect against loss of data, or inhibit data accessibility.

Oracle Enterprise Manager is available to manage the software environment on the Exadata Database Machine. Also available is a system monitoring plug-in for the Exadata Storage Server that delivers comprehensive availability, performance, and configuration information for the Exadata environment. Using Enterprise Manager,

administrators can perform proactive monitoring and detailed configuration analysis of their Exadata Database Machine.

Software from Oracle, Hardware from Sun

The Exadata Database Machine builds upon years of Oracle and Sun jointly solving customers' business and technical challenges. Integrated hardware and software technology, and related hardware support services, are provided in a unified fashion by Oracle. By combining leading, industry-standard servers and storage hardware from Sun with the intelligence built into the Oracle software, the Exadata Database Machine delivers the industry's highest levels of performance, scalability and reliability, and is backed by Oracle Support.

Exadata Database Machine X2-8 Key Capabilities
Exadata Database Machine X2-8 Full Rack with High Performance SAS Disks
Up to 25 GB/second of uncompressed raw disk bandwidth
Up to 75 GB/second of uncompressed Flash data bandwidth
Up to 50,000 Disk IOPS
Up to 1,500,000 Flash IOPS
100 TB of raw disk data capacity ¹
Up to 45 TB of uncompressed usable capacity ²
Data Load Rate: Up to 12 TB/hour
Exadata Database Machine X2-8 Full Rack with High Capacity SAS Disks
Up to 14 GB/second of uncompressed raw disk bandwidth
Up to 64 GB/second of uncompressed Flash data bandwidth
Up to 25,000 Disk IOPS
Up to 1,500,000 Flash IOPS
336 TB of raw disk data capacity ¹
Up to 150 TB of uncompressed usable capacity ²
Data Load Rate: Up to 12 TB/hour
¹ For raw capacity, 1 GB = 1 billion bytes. Actual formatted capacity is less.
² Space available after mirroring (ASM normal redundancy) while also providing adequate space (one disk) to reestablish the mirroring protection after a disk failure.

Exadata Database Machine X2-8 Hardware

2 x Database Servers, each with:

- 8 x Eight-Core Intel® Xeon® X7560 Processors (2.26 GHz)
- 1 TB Memory
- Disk Controller HBA with 512MB Battery Backed Write Cache
- 8 x 300 GB 10,000 RPM SAS Disks
- 8 x InfiniBand QDR (40Gb/s) Ports
- 8 x 10 Gb Ethernet Ports based on the Intel 82599 10GbE Controller
- 8 x 1 Gb Ethernet Ports
- 1 x ILOM Ethernet Port
- 4 x Redundant Hot-Swappable Power Supplies

3 x 36 port QDR (40 Gb/sec) InfiniBand Switches

14 x Exadata Storage Servers X2-2 with 12 x 600 GB 15,000 RPM High Performance SAS disks or 12 x 2 TB 7,200 RPM High Capacity SAS disks

Includes 5.3 TB Exadata Smart Flash Cache

Additional Hardware Components Included:

- InfiniBand cables
- Ethernet switch for administration of the Database Machine
- 42U rack packaging

Spares Kit Included:

- 2 x 600 GB High Performance SAS disks or 2 x 2 TB High Capacity SAS disks
- 2 x 96 GB Exadata Smart Flash Cache cards
- InfiniBand cables

Exadata Database Machine X2-8 Support Services

- 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 Premier Support for Systems: Oracle Linux and Solaris support and 24x7 with 2 hour on-site hardware service response (subject to proximity to service center)
- Oracle Premier Support for Operating Systems
- Oracle Customer Data and Device Retention
- System Installation Services
- Software Configuration Services
- Oracle Exadata Start-Up Pack
- System Upgrade Support Services including hardware installation and software configuration
- Oracle Auto Service Request (ASR)

Exadata Database Machine X2-8 Upgrades

Upgradability: Connect multiple Exadata Database Machine X2-8 racks via included InfiniBand fabric

- InfiniBand cables to connect 3 racks come in the Spares Kit
- Additional optical InfiniBand cables required when connecting 4 or more racks
- Up to 8 racks can be connected without requiring additional InfiniBand switches

Exadata Database Machine X2-8 Environmental Specifications
<ul style="list-style-type: none"> • Height: 42U, 78.66" - 1998 mm • Width: 23.62" – 600 mm • Depth: 47.24" – 1200 mm
Weight: 2,080 lbs. (943.5 kg)
Power <ul style="list-style-type: none"> • Maximum power usage: 17.0 kW (17.4 kVA) • Typical power usage (varies by application load): 11.9 kW (12.2 kVA)
Cooling <ul style="list-style-type: none"> • At maximum usage: 58,050 BTU/hour (61,200 kJ/hour) • At typical usage: 40,630 BTU/hour (42,840 kJ/hour)
Airflow <ul style="list-style-type: none"> • At maximum usage: 2,690 CFM • At typical usage: 1,880 CFM • Airflow must be front-to-back
Acoustic noise: 8.5 B operating
Operating temperature/humidity: 5 °C to 32 °C (41 °F to 89.6 °F), 10% to 90% relative humidity, non-condensing Altitude Operating: Up to 3,048 m, max. ambient temperature is de-rated by 1° C per 300 m above 900 m
Regulations ¹ <ul style="list-style-type: none"> • Safety: UL 60950-1 2nd Ed, EN60950-1:2006 2nd Ed, CB Scheme with all country differences • 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) • Immunity: EN 55024:1998+A1:2001:+A2:2003
Certifications ¹ <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 (2002/95/EC)
¹ In some cases, as applicable, regulatory and certification compliance were obtained at the component level.

Oracle Database Software (sold separately)	
For database servers	Oracle Database 11g Release 2 Enterprise Edition (11.2.0.2 or higher required), Oracle Real Application Clusters, Oracle Partitioning, and other Oracle Database options
For storage servers	Oracle Exadata Storage Server Software
Oracle Software (included)	
For database servers	Oracle Linux 5 Update 5 with the Unbreakable Enterprise Kernel or Solaris 11 Express: selectable at install time Zero-loss Zero-copy Datagram Protocol (ZDP) InfiniBand protocol used to communicate between the Exadata Storage Servers and the Oracle Database which is based on the Reliable Datagram Sockets (RDS) OpenFabrics Enterprise Distribution (OFED)
Exadata Storage Software Features	
<ul style="list-style-type: none"> • Smart Scan Technology • Smart Flash Cache • IO Resource Manager • Storage Index Technology • Hybrid Columnar Compression • Smart Scans of Data Mining model scoring 	
High-Availability Features	
<ul style="list-style-type: none"> • Redundant power supplies for all servers • Redundant InfiniBand switches • Redundant Power Distribution Units • Oracle Automatic Storage Management: All database files mirrored; disk failures do not interrupt query processing • Oracle Real Application Clusters: database server failures are tolerated • Oracle Exadata Storage Server Software: storage server failures are tolerated • Backup is performed using Oracle Recovery Manager • Point in time restores are performed using Oracle Flashback Technologies • Oracle Data Guard for protection against disasters 	
Manageability Features	
<ul style="list-style-type: none"> • Oracle Embedded Integrated Lights Out Manager (ILOM) • Oracle Enterprise Manager Grid Control • Oracle Quality of Service Management (requires Oracle Database 11.2.0.2) 	

Contact Us

For more information about the Oracle Database Machine, please visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.



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