

ORACLE EXADATA CLOUD SERVICE X8M

DELIVERING TOP-TIER ELASTICITY AND NON-DISRUPTIVE UPGRADES TO THE ENTERPRISE

It's not an exaggeration to say that IT organizations across nearly every business segment suffer from an overabundance of data. Although data has become an essential basis of competitive differentiation, organizations generate it faster than they can consume it, and this volume of data stresses the systems that store and process it.

Cloud computing has provided IT architects with new tools and options to build a flexible IT infrastructure that can adapt to the enterprise's ever-changing needs while offering an attractive consumption-based pricing model. Simultaneously, however, cloud deployments can lead to a level of complexity and varying performance often at odds with business-critical applications and data management requirements.

Intelligently deploying cloud infrastructure that can maintain business-critical applications while consolidating hundreds or thousands of databases, supporting data warehouses, running packaged applications, and keeping pace with an emerging array of AI and machine learning applications is no small task. Critical infrastructure requires adopting technologies and working with partners with a proven ability to manage enterprise-scale data.

One such partner is Oracle, a company that continues to be at the forefront in delivering the advanced technology required for mission-critical, enterprise-scale data management. Enterprises understand which partners provide the most dependable data services. In fact, 97% of Fortune Global 100 companies are running Oracle Databases¹.

Oracle's solution to the complexities of managing data in an infrastructure composed of varied cloud services, managed services, and on-premises offerings is Oracle Exadata Database Machine. Exadata, first brought to market in 2008, is Oracle's next-generation, high-performance platform for running Oracle Database in both the cloud and customers' data centers.

The power of Exadata in the cloud stems from its ability to deliver elasticity, non-disruptive online patching, high performance, scalability, security, and availability in support of Oracle's converged database engine while bridging an increasingly hybrid infrastructure. It does this by providing an identical architecture in the cloud and on-

¹ Oracle Corporation

premises. Notably, 86% of Fortune Global 100 companies run Oracle Database on Exadata².

THE ORACLE EXADATA CLOUD SERVICE X8M

Oracle's vision for Exadata is simple: Combine a scale-out platform optimized for Oracle Database with intelligent system software tuned for mega-levels of database processing; deliver the automated manageability demanded by modern IT administrators, and you'll get the ideal database machine.

The ultimate expression of the Exadata vision (so far) is the Oracle Exadata X8M, which is available on Oracle Cloud Infrastructure (OCI), on customers' premises, and as a Cloud@Customer solution that brings OCI automation and consumption models into customer data centers. The underlying platform combines Oracle Database technology with performant and reliable technologies for compute, storage, and networking.

Exadata Cloud Service X8M delivers highly flexible and elastic scalable capabilities that are no longer tied to traditional on-premises, fixed-sized, rack configurations. A modestly-sized solution with eight compute servers and 600TB of usable storage capacity provides customers with the following capabilities:

- Up to 400 CPU cores and 11TB of memory for database processing
- Up to 576 CPU cores in intelligent storage servers for processing low-level SQL queries, analytics, and machine learning algorithms
- Up to 18TB of persistent memory for database-transparent acceleration of read and write operations
- Up to 307TB of flash storage
- A 100GB/s Remote Direct Memory Access over Converged Ethernet (RoCE)-based Ethernet interconnect that eliminates operating system and network stack overhead for low-latency and high-throughput operations

Business-critical database applications rely on performance. This is where the Oracle Exadata X8M excels. Oracle has tuned its database technologies, source-code engineered with the platform it's designed to run on, for the Exadata X8M.

This same Oracle Exadata Cloud Service X8M configuration described above can deliver up to:

² Ibid

- Approximately 19 microseconds of ultra-low latencies for OLTP applications
- 300GB/s of throughput for analytical applications
- 12 million 8K read input/output operations per second (IOPS) supporting all database workloads and consolidated environments

These are industry-leading performance numbers.

The Oracle Exadata Cloud Service X8M brings a fully elastic cloud experience to those wanting to leverage the power of the Exadata X8M with a cloud consumption model. The service gives users direct access to secure, high-performance, and highly expandable Exadata X8M infrastructure on OCI. Full specifications for the offering can be found on Oracle's [website](#).

COMPETITIVELY POSITIONED

There are many ways to compare a database service like Oracle Exadata Cloud Service X8M to other offerings. One could look at raw performance, the service's cost, regional availability, or even how the solution might reduce the overall complexity of database and application deployment and management. Oracle Exadata Cloud Service X8M is one of those rare offerings that succeeds in nearly every metric it's measured against.

Cloud services also need to be measured against similarly positioned cloud-based services, as well as against on-premises hardware options. Again, these are both areas in which the Oracle Exadata Cloud Service X8M excels.

ORACLE EXADATA CLOUD SERVICE X8M VS. LEADING CLOUD SERVICE PROVIDER

The dominant players in the public cloud database space provide a database-as-a-service offering. Cloud service providers (CSPs) don't disclose the underlying physical hardware hosting their database services, relying instead on a set of processor performance metrics coupled with tunable storage and networking parameters. Even so, it is possible to compare a leading CSP's capabilities with those offered by the Oracle Exadata Cloud Service X8M³.

The following table summarizes the key differences in both performance and scalability between the two offerings.

³ The source for the comparison metrics in this section are from Oracle Corporation.

TABLE 1: ORACLE EXADATA CLOUD SERVICE X8M VS. TOP CSP DATABASE-AS-A-SERVICE

	CSP Database-as-a-Service	Oracle Exadata Cloud Service X8M
Maximum Uncompressed Database Size	64TB	2.5PB
Maximum Data Warehouse Database Size	192TB (compressed)	25PB (compressed)
Read Latency	1 millisecond	19 microseconds
Maximum Database Cores per Workload	64	1,600
Maximum Cores per SQL Offload	0	3,072

(Source: Moor Insights & Strategy)

This comparison reflects Oracle’s distinct advantages in each of these categories. Oracle Exadata Cloud Service X8M can deliver 35 times the database size and 130 times the data warehouse size compared to the leading public cloud database-as-a-service offering.

It is 50 times faster in SQL read latency than the leading public cloud database-as-a-service by leveraging up to 25 times the amount of processing capabilities (with an even greater amount when factoring in Oracle’s dedicated SQL offload processing cores—a technology that cloud service providers cannot leverage).

ORACLE EXADATA CLOUD SERVICE X8M VS. TOP-TIER OEM STORAGE SYSTEM

Comparing a cloud-based solution to an on-premises implementation can be a complicated proposition. Ultimately, business issues drive the decision to move to the cloud. Still, compelling technological advantages in the cloud can accelerate those decisions because the public cloud’s economics promote an attractive OpEx-driven operating model—with no hardware acquisition cost to consider.

For some organizations, the perception that the same levels of on-site performance are not achievable in a cloud-based solution often offsets the benefits of moving to the

public cloud. Oracle, with its Exadata Cloud Service X8M, proves those assumptions wrong⁴.

Comparing the Input/Output (I/O) achievable on Oracle Exadata Cloud Service X8M to an industry-leading storage product demonstrates the difference. The following chart compares Oracle's cloud-based capabilities to one of the top-tier storage provider's flagship storage products. Keep in mind that this top-tier storage would still need to be paired with servers to achieve these numbers, which would result in additional costs.

TABLE 2: ORACLE EXADATA CLOUD SERVICE X8M VS. TOP-TIER STORAGE OEM

	Top-Tier Storage OEM	Oracle Exadata Cloud Service X8M
Minimum Read Latency	100 microseconds	19 microseconds
Storage Server Read IOPS	7.5 Million	18 Million
Storage Server Throughput	350GB/s	700GB/s
Additional IOPS and Throughput Scalability	Zero (maximum performance)	Up to 2.7X

(Source: Moor Insights & Strategy)

A scaled Oracle Exadata Cloud Service X8M with 12 compute nodes and 1,400TB of usable storage supports 2.4 times more total Input/Output Operations Per Second (IOPS), two times more total throughput, and achieves five times lower latency than the most powerful comparable on-premises storage system. The Exadata Cloud Service X8M delivers numbers that the industry hasn't seen before in a public cloud offering, providing up to an additional 2.7 times level of I/O scalability on top of this.

THE ANALYST'S VIEW

An enterprise's ability to derive value from its data directly ties to its ability to compete. Strategically utilized data is a competitive advantage. Conversely, inefficiently managed data can strip an enterprise of its competitiveness.

⁴ The source for the competitive metrics in this section is Oracle Corporation.

Few technology providers understand the value of data to an enterprise better than Oracle. The company was founded to redefine enterprise database technology and, in the process, triggered a wave of digital transformation that continues to this day.

The Oracle Exadata Cloud Service X8M continues in this tradition. The offering brings together the inherent benefits of the public cloud consumption model with the performance and scalability of a machine engineered to host challenging Oracle Database enterprise-scale workloads. In the process, Oracle has delivered what is perhaps the fastest and lowest-latency database cloud service ever made available.

Oracle's Exadata offerings map to the needs of an enterprise. The technology is available on-premises, on a subscription basis within your data centers as Exadata Cloud@Customer, and in the public cloud in Oracle Cloud Infrastructure.

Oracle's portfolio of architecturally identical offerings uniquely positions the company to help enterprises find success, no matter what stage of the digital transformation journey they're facing. Oracle can help improve your on-premises delivered database services, streamline your transition to the cloud, and ultimately help provide you with a fully self-driving and intelligent database infrastructure.

It's not an accident that Oracle Database powers 97% of the *Fortune* Global 100 and 86% run Oracle Database on Exadata. Oracle's time-proven technology is at the heart of the databases that underlie business-critical applications across industries worldwide.

The Oracle Exadata Cloud Service X8M sits in the top tier of available database services, from any vendor. Its scalable and elastic consumption model deserves thorough evaluation as the vehicle for your digital transformation journey, no matter where you are.

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