

OFFERING OVERVIEW

Oracle Exadata X8M: The Fastest Oracle Database Platform

**Critical Loads Can Benefit from New Platforms to
Enable Better Customer and Employee Experiences**



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EXECUTIVE SUMMARY

This report provides an overview of Oracle Exadata X8M and analyzes its capabilities to meet enterprises' needs for a next-generation computing platform. Oracle Exadata X8M is the fastest platform to run the Oracle Database, allowing enterprises to accelerate their mission-critical applications. The results are better customer and employee experiences, depending on the nature of the applications powered by Oracle Exadata X8M. CxOs will appreciate that the uptake of the new platform requires no code changes, sparing enterprises expensive quality assurance and validation cycles.

Oracle Exadata¹ X8M is a manifestation of Oracle's vision for the "chip-to-click" integrated technology stack (that is, from the CPU silicon, across all ISO layers and all the way to the end-user mouse click). As Oracle uses the same technology stack and machines in both its cloud and on-premises implementations, it has the highest degree of identity across these offerings to be found among all vendors that are part of Constellation Research's Market Overview² on next-generation computing platforms. The others are Amazon Web Services' Outposts offline portfolio,³ Google GKE On-Prem,⁴ IBM Cloud Private and Microsoft Azure Stack.⁵ Constellation expects Oracle to bring Oracle Exadata X8M capabilities to Oracle Cloud at Customer offerings in the near future.

Business Themes



New C-Suite



Future of Work



Data to Decisions



Technology Optimization

ABOUT ORACLE EXADATA X8M

Overview

Oracle has a unique vision among those in this field of technology vendors, creating the largest integrated “chip-to-click” integrated hardware and software offering—one that ranges from the silicon (the “chip”) to the user (the “click”) in software-as-a-service (SaaS) offerings. Exadata is an integral part of the overall Oracle Exadata product family, serving as the database platform in both the Oracle Cloud and Oracle Cloud at Customer offerings.

From all the vendors included in the underlying Constellation Research Market Overview, Oracle already has the largest functional scope available on-premises, including its SaaS, platform-as-a-service (PaaS)⁶ and infrastructure-as-a-service (IaaS) capabilities, running on Oracle Exadata, Private Cloud Appliance and ZFS Storage Appliance. Oracle Cloud at Customer is the closest that customers can get to having the Oracle chip-to-click cloud stack running in their own data centers. Recently, the company released Oracle Exadata X8, marking the 10-year anniversary of the Exadata product family. Remarkably, only a few months later, Oracle unveiled the newest member of the Exadata family, Oracle Exadata X8M, at Oracle OpenWorld 2019.

With Oracle Exadata X8M, Oracle enables new performance capabilities for the Oracle Database. Key highlights include:

- **Improved performance.** Thanks to the latest Intel Cascade Lake CPUs, Oracle Exadata X8M is experiencing a 15% faster clock rate. On the storage server side, Oracle uses the Intel Cascade Lake CPUs as well, adding 60% more cores, and offers 40% higher capacity disk drives, at 14 TB.
- **Improved architecture.** With Oracle Exadata X8M, Oracle is for the first time adopting RoCE (RDMA over Converged Ethernet), reducing costs and increasing familiarity on the networking layer, while maintaining performance. The addition of persistent memory accelerates data processing rates, effectively introducing a fourth tier to the

previous three-tier model of data storage (RAM, flash and HDD). And lastly, Oracle has switched to the popular KVM hypervisor to virtualize loads on Oracle Exadata X8M.

- **Engineered with the Oracle Database.** Because Oracle Exadata X8M is designed for the Oracle Database and Oracle, of course, owns the code to the Oracle Database, it's only logical that Oracle enables key operations—such as cross-machine memory access or flushing memory from RAM and persistent memory (PMEM), flash and HDD—directly on a code level. The result is even better performance on Oracle Exadata X8M.

Market Segment

Market Definition

Oracle Exadata competes in the next-generation computing platforms market as a hardware, software and services offering. A next-generation computing platform is defined as a computing paradigm that runs the same infrastructure (with some limitations) for or by an enterprise on-premises and in the public cloud. When it comes to Oracle, that infrastructure is, to a large part, Oracle Exadata.

There has been a lot of confusion around the term “cloud,” with vendors accusing each other of “cloud washing”—that is, trying to rebrand an old product by adding the word “cloud” to its name. In reality, cloud definitions vary from vendor to vendor and even from enterprise to enterprise.

For the purpose of this report, Constellation defines “cloud” as the elastic provisioning of computing, storage and networking. The elasticity manifests itself in the form of dynamic ramping up and ramping down of resource availability, driven by workload demand, even on a per-second basis. The mechanics for this kind of computing have been established and have matured with public cloud IaaS vendors.⁷

CxOs who have to manage on-premises workloads also find that value proposition—the elasticity of computing resources—attractive. IaaS vendors have realized this and added offerings that make parts of their IaaS infrastructure available on-premises. Effectively, the public cloud enables the era of “Infinite Computing.”⁸

This report discusses six trends shaping this market.

Market Trends

The following six market trends characterize the management of computing infrastructure (see Figure 1):

Heterogeneous Computing Demands

CxOs are confronted with rapidly changing computing demands. Barely having satisfied the business need for big data, the computing requirements that CIOs must answer stretch from support for machine learning to speech recognition for internal and external digital assistant/chatbot solutions, all the way to the edge of the enterprise. New computing platforms have entered the data center—for instance, with the advent of large GPU racks to run machine learning. A never-before-seen platform diversity manifests itself at the edge of the enterprise to support the Internet of Things (IoT). And the pace of change is not slowing down, as shown by new demands for additional workforce support (e.g., augmented/mixed/virtual reality) and new user experience support (e.g., holographic displays).

Figure 1. Seven Market Trends Defining HCM Systems for 2019 and Beyond



Source: Constellation Research

Data Center Utilization

As workloads move from enterprise data centers to public cloud vendors, CIOs struggle to reach the level of utilization they intended when originally planning and investing in their data centers. One part of the challenge is the business practice of letting divisions choose their automation tools, which results in a lower degree of predictability for available workloads in on-premises data centers. An additional hurdle for CIOs is that physical infrastructure requests are moving slower and have a much longer-lasting financial impact. Data center utilization can quickly change from full capacity to two-thirds of utilization. Dropping a single server-refresh cycle will create that scenario, which CxOs experience as they move workloads to the public cloud.

The Need for a Single Control Plane

The era of CxOs simply accepting that new products bring a new control plane is history. CxOs operating next-generation applications⁹ must run them as efficiently as possible, via a single control plane. This not only allows for more efficiency to manage infrastructure but also is the best way to manage a heterogeneous landscape effectively. Ramping down and ramping up resources as demand requires cannot be done from a “zoo” of instrumentation. At the same time, the automation of resource scaling is essential, so humans can focus on oversight instead of spending time and energy on operational tasks.

Rising Complexity of IT Operations

The cloud has not fulfilled its promise to simplify IT for most organizations because they are operating on a fluid automation plane that includes the public cloud and on-premises computing resources. Business priorities, timing and write-down cycles all determine the specific time a load may be moved to the public cloud or whether it should remain on-premises. Changes in executive management often result in a shifting workload mix (for instance, due to SaaS portfolio changes) that affects the overall computing mix. A greater diversity in workloads and new next-gen application use cases create more heterogeneity and increase the complexity of IT operations.

Compliance Pressure

Enterprises see themselves confronted with a rise in compliance requirements that, because of the operation of larger software portfolios, affect more of the computing and storage infrastructure than ever before. Data privacy and data residency regulations often require enterprises to move loads to different physical locations, and sometimes from the cloud back to on-premises. Enterprises have not even recovered from the European Union's recently enforced General Data Protection Regulation, and they see more data residency rules coming their way, such as the California Consumer Privacy Act. The rate of regulation will only increase, making CxOs desire a more fluid way to move workloads.

Degrees of Cloud Skepticism

Although many next-generation application use cases are best (and sometimes only) operated in the cloud, there is still a degree of skepticism over computing in the public cloud. It ranges from rational challenges (such as whether IaaS vendor data instances are available inside of a necessary jurisdiction) to reasonable challenges (hardware write-downs and connections to existing on-premises computing resources, such as mainframes) to less rational concerns (for instance, regarding data safety). Nonetheless, it means that CIOs need to implement and operate workloads in local data centers for at least the next decade.

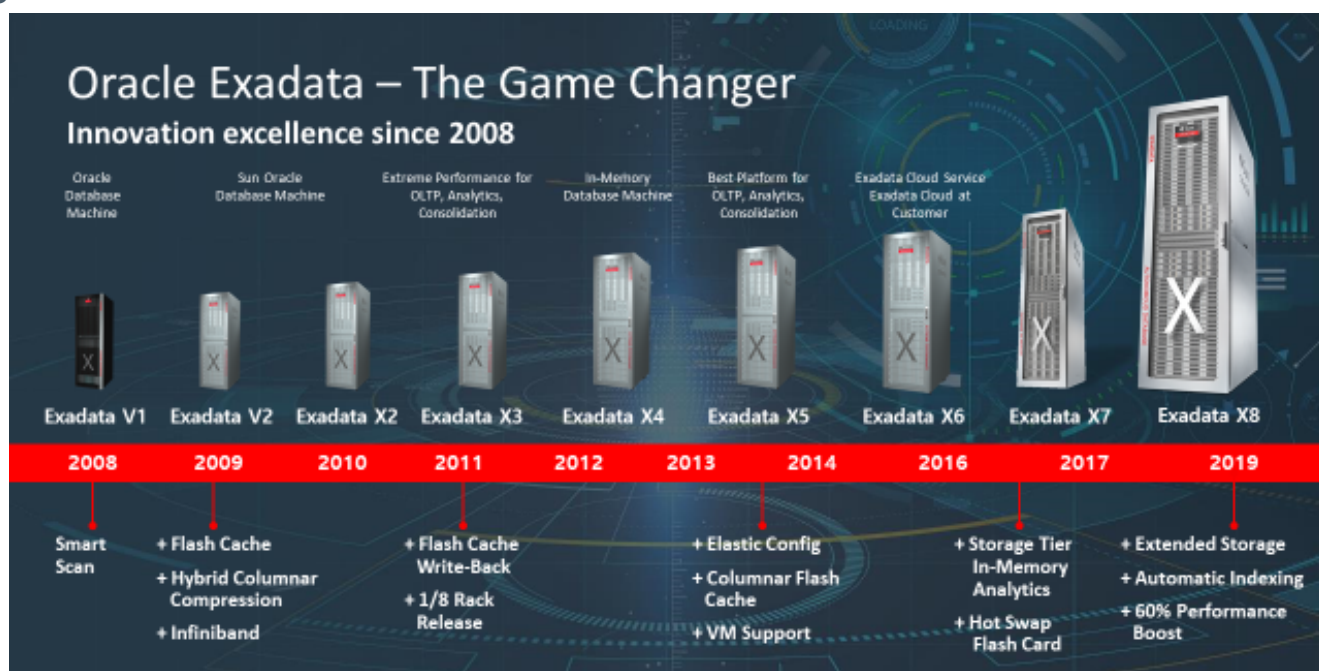
KEY CAPABILITIES

This section describes the key capabilities of the Oracle Exadata offering.

Exadata: A 10+ Year Proven Platform for Critical Enterprise Computing

Oracle started to ship Exadata in 2008 and has upgraded the platform over the last decade with new innovations featured on every release (see Figure 2). Originally a partnership between Oracle and Hewlett-Packard, Exadata V2 evolved to combine hardware assets from the subsequent Sun Microsystems acquisition as well as additional R&D. Oracle created a hardware and software combination engineered to work together, purpose-built to optimize the Oracle Database performance, which has been very well received in the market.

Figure 2. Oracle Exadata's Innovation Track Record



Source: Oracle

Today, Oracle Exadata can be found to a predominant degree within global enterprises that care the most for Oracle Database performance while operating under very challenging conditions from an operational uptime perspective.

- 77% of the Fortune Global 100 run Exadata.
- 25% of the Fortune Global 100 have adopted Exadata Cloud Service.
- Fortune Global 100 adoption of Exadata Cloud Service increased 150% in 2018.

In 2017, Oracle introduced Oracle Exadata Cloud at Customer, allowing enterprise users to deploy cloud-ready Oracle Exadata machines and architecture—completely managed by Oracle—on-premises (see Figure 3). CxOs welcomed that offering because it allowed them to let Oracle do what Oracle knows best: managing Oracle Databases. Oracle is able to offer these services in a very efficient manner because Oracle Cloud at Customer instances are managed the same way that Oracle handles its Oracle Exadata systems that make up the Oracle Cloud Infrastructure (OCI). In fact, customer instances of Oracle Cloud at Customer are logical extensions of OCI, giving CxOs the certainty that their instances are managed as well as Oracle manages its instances of Oracle Exadata that support Oracle Cloud.

Figure 3. The World's Fastest Database Machine

Oracle Exadata X8M—The World's Fastest Database Machine 2.5X to 10X Faster [At the Same Price](#)



Source: Oracle

- The First of its Kind Engineering: Industry's first database machine with integrated persistent memory and RoCE
- 16 million SQL read IOPS: 2.5X > than X8
- Ultra-low IO latencies: 19 microseconds: 10X < than X8
- Accelerates: high-frequency stock trading, ML, IoT data processing, real-time fraud, intrusion detection, financial trading, applications requiring real-time human interactions
- The latency of persistent memory, IOPs of flash, cost of disk
- Lower Costs: Run more workloads on fewer resources

No Application Changes Required

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The Newest Exadata Family Member: Oracle Exadata X8M

The Oracle Exadata team is not taking breaks. Oracle has followed up Exadata X8,¹⁰ released in spring 2019, with Oracle Exadata X8M, bringing three key innovations to Exadata:

- RoCE for networking
- Persistent memory for the introduction of a new tier of data caching
- KVM as its new hypervisor

Moreover, Oracle has improved the specs per rack of Oracle Exadata X8M

- **HDD storage:** 3.0 PB of raw disk
- **Flash:** 920 TB of flash memory
- **Persistent memory:** 27 TB of persistent memory

The result is the world's fastest database machine, which enterprises can take advantage of without any code changes to their applications.

Exadata is designed to scale as more racks are added, but the performance check on a single rack is impressive:

- **Faster reads.** Oracle has reached 16 million OLTP 8K read IOPS, 2.5x faster than the already swift Oracle Exadata X8.
- **Lower latency.** Latency for OLTP has been reduced to under 19 microseconds, 10x faster than Oracle Exadata X8.
- **Higher transaction rate.** Oracle has accelerated log writes, eliminating one of the key bottlenecks for database performance, about 8x faster than Oracle Exadata X8.

The results for customers are even more impressive because they can accelerate a diverse number of Oracle Database workloads. The key benefit is that the performance improvements are agnostic of the application, so no application code needs to be touched or modified to take advantage of these performance gains. Moreover, such compatibility reduces the need for additional testing/validation costs that can be prohibitive for enterprises that must guarantee uptime for their most critical applications:

- **Faster I/Os.** Persistent memory lowers latency for I/O, a benefit for all kinds of workloads.
- **Faster OLTP.** The key innovation here is faster log writes, enabling faster commits in the Oracle Database. Besides, 10x lower latency for I/Os and a 2.5x increase in throughput for I/Os help performance as well.
- **Faster data warehouse.** The addition of persistent memory reduces storage and CPU loads and enables smarter scans. And with 100-Gb RoCE, required RDMA operations are running faster as well.
- **Faster mixed loads.** A larger and better cache with persistent memory accelerates mixed workloads for better performance. Integrated resource management intelligently prioritizes latency-sensitive operations.

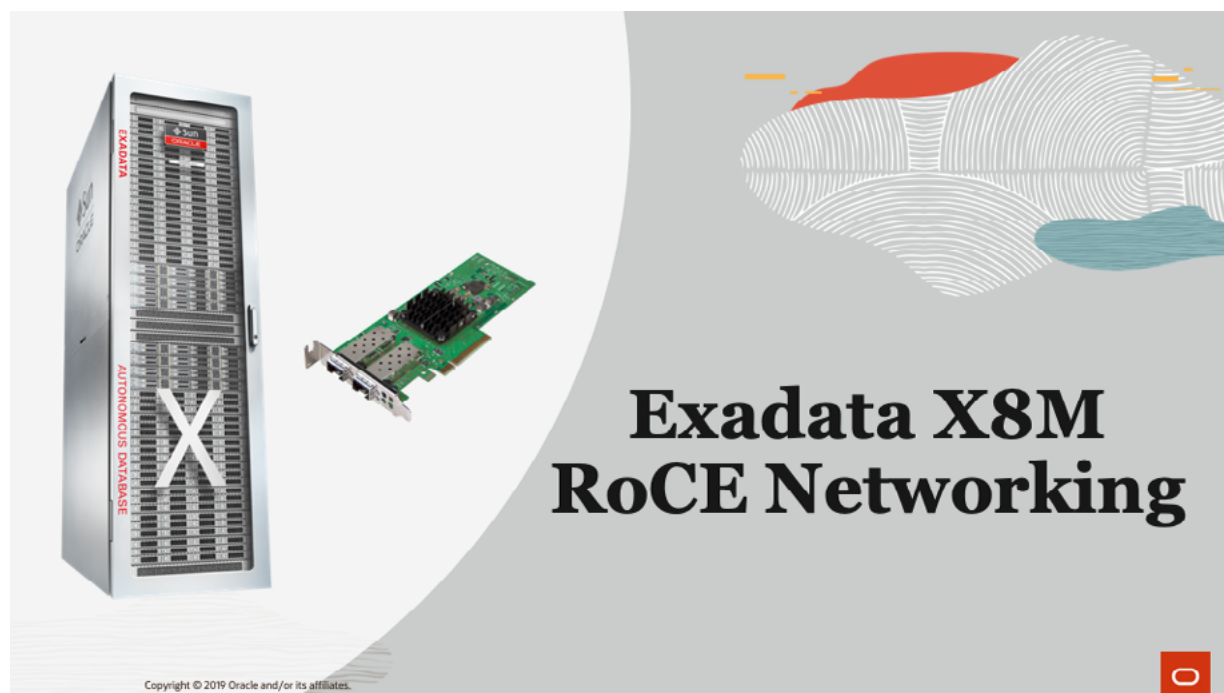
RoCE Standardizes RDMA on Familiar Ethernet

RDMA has been used and understood to enable high-performance computing (HPC) for some time. When it came to connecting multiple servers with multiple memory spaces via RDMA, the traditional (and pretty much only) solution has been InfiniBand. And while InfiniBand is established and has proven itself to be a high-performance networking standard, it has not seen the wide adoption of Ethernet. Among other drawbacks, InfiniBand is not very virtualization-friendly, a key enterprise requirement. Enter RDMA over Converged Ethernet, bringing the more widely known and accepted Ethernet protocol and networking to the RDMA options.

Oracle decided to make the switch for Oracle Exadata X8M from InfiniBand to RoCE to make good on its commitment both from an organizational DNA perspective (lower total cost of ownership) and philosophy (to embrace standards). RoCE lowers the costs of networking equipment for enterprises but does not compromise performance. And while InfiniBand is a standard as well, it is dwarfed by the adoption of the Ethernet as a standard in the enterprise. To keep compatibility and practice reuse of code assets, Oracle keeps using InfiniBand capabilities at the upper levels of the network protocol stack but opts for the less-expensive Ethernet UDP packaging architecture at a low level. This has tangible benefits for enterprises using Oracle Exadata X8M (see Figure 4):

- **Provides full compatibility for all Exadata RDMA optimizations.** Oracle did not want to lose the previous investment into RDMA, and all these capabilities are now enabled and powered by RoCE.
- **Bridges best of two worlds with ROCE.** RoCE provides the scalability and volume that comes from standard Ethernet while not compromising the speed of RDMA.
- **Drive TCO savings from standardization.** Running cluster and client switches on the same protocol, Ethernet, saves costs for customers, on both the hardware acquisition and support sides.

Figure 4. The Exadata X8M RoCE Card



Source: Oracle

RoCE brings a number of tangible benefits to enterprises using the Oracle Exadata X8M implementation:

- **Support high-priority networking.** RoCE service architecture allows packets to be sent on multiple classes of service, with separate network buffers. This enables network prioritization for latency sensitive application algorithms—e.g., the Oracle Database.
- **Avoid packet loss.** Packet loss is the enemy of HPC using RDMA across machines. Oracle's implementation of RoCE uses two mechanisms to avoid packet loss. First, it uses a priority-based flow control (PFC), which tells senders to pause sending when a switch buffer is full. But it also uses RoCE Explicit Congestion Notification (ECN), where an RoCE switch marks packet flow as being too fast and tells the source of the packets to slow down the packet flow.

- **Achieve constant failure detection.** Server failures are anathema for HPC. Because server health is checked over the network, RoCE has tangible advantages. As Oracle implemented failure detection via RDMA, it allows health checks on the port side, which are neither affected by overall server load nor depend on heartbeat timeouts.

Finally, there need be no concerns about RoCE being a short-lived standard. It is widely supported by vendors (for instance, on a network-card level by Broadcom, Intel and Mellanox, and on a switch level by Arista, Cisco, Juniper and Mellanox). Oracle decided to use a Mellanox network card and Cisco switches for the Oracle Exadata X8M.

Persistent Memory Adds a Fourth Level to Tuning

Since the rise of flash memory, there has been a three-tier model to make data available for applications. But with the recent advances of persistent memory, a fourth tier is now part of HPC best practices. Persistent memory is located between DRAM and flash memory, allowing a persistent extension of DRAM memory. Effectively, persistent memory enables content to survive if a power failure occurs. With reads being consistent to DRAM reads, HPC has a valuable extension to its data-caching tiering model.

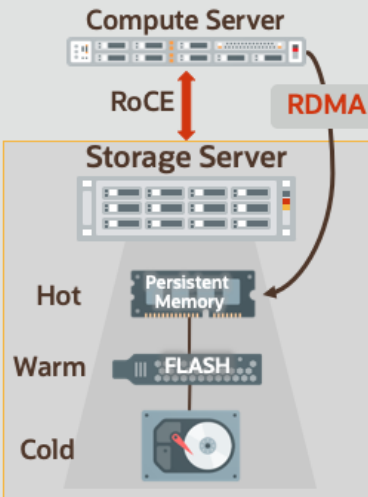
The addition of persistent memory adds tangible benefits to Oracle Exadata X8M by adding its persistent memory accelerator in front of flash memory (see Figure 5):

- **Realize higher throughput.** With the addition of the Oracle Persistent Memory Accelerator, Oracle Exadata X8M runs with 2.5x higher I/Os per second than the previous architecture.
- **Improve latency.** Because the Oracle Database uses RDMA instead of I/O to read persistent memory, it experiences 10x better latency.
- **Expand capacity.** By using persistent memory for the hottest data effective cache, capacity increases 10x.
- **Achieve higher fault tolerance.** Oracle Exadata X8M mirrors persistent data automatically across storage servers for fault tolerance.

Figure 5. How Persistent Memory Speeds Up in Exadata X8M

Exadata X8M With Persistent Memory Data Accelerator

World's First and Only Shared Persistent Memory Optimized for Database



- Exadata Storage Servers transparently add Persistent Memory Accelerator in front of Flash memory
 - 2.5X higher IOs per second than current – 16 Million IOPS
- Database uses RDMA instead of IO to read remote PMEM
 - Bypasses network and IO software, interrupts, context switches
 - 10X better latency - <19 μ sec for 8K database read
- PMEM Automatically tiered and shared across DBs
 - Using as a cache for hottest data increases effective capacity 10x
- Persistent Memory mirrored automatically across storage servers for fault-tolerance

Source: Oracle

The Oracle Exadata team has provided a number of key additional capabilities that leverage persistent memory:

- **Enable the Oracle Exadata X8M Commit Accelerator.** Log writes are usually the bottleneck for database performance. The Oracle Automatic Commit Accelerator enables the Oracle Database to directly write to persistent memory via RDMA. The results are up to 8x-faster log writes.
- **Optimize for Oracle Database.** Persistent memory in regular storage appliances can merely serve as a fast cache. Because Oracle has engineered Oracle Exadata X8M to work with the Oracle Database, it has enabled the database to use RDMA directly over the network, where network cards directly read and write to persistent memory.
- **Take advantage of shared Exadata storage.** Sharing persistent memory in Exadata storage has a number of benefits. Persistent memory can be shared and tiered across

databases. Security is increased because persistent memory can be accessed only via the database, so there is no operating system or local-level access. And the shared persistent memory allows usage by any server and database that needs it, making allocation of memory more efficient.

KVM Comes to Oracle Exadata X8M

The last two years have made clear that a once open battle between two hypervisors—Xen and KVM—has been won by KVM. Oracle has used Xen for virtualization in InfiniBand Exadata configurations.

With Oracle Exadata X8M, Oracle is switching to the current winner for hypervisors, KVM. Both RoCE and persistent memory are supported only via KVM (see Figure 6). This change will be welcomed by technical leaders because familiarity with KVM has eclipsed familiarity with Xen.

Figure 6. Oracle Adds KVM Support to Oracle Exadata X8M



Source: Oracle

Next to standardizing on KVM as the winner in the hypervisor wars, there are some tangible customer benefits for enterprises from the move:

- **More memory.** Oracle has doubled the memory available per guest VM, now to 1.5 TB per server.
- **Faster networks.** Client network latency has improved as well, giving customers faster access to their KVM workloads.
- **More capacity.** Oracle allows up to 50% more guest VMs per server, giving customers more workload diversity capacity.

PRICING

Oracle has optimized the pricing both from technical (minimum number of cores) and a usage (CPU-based pricing) perspectives. CxOs need to make sure that the minimum requirements are not too steep for their workloads and that they can derive a TCO advantage. As usual, enterprises should negotiate well with Oracle (as with any other vendor) because discounts, especially in the fourth quarter of the vendor's financial year, are always a possibility.

A detailed Exadata price list can be found here: <https://www.oracle.com/assets/exadata-pricelist-070598.pdf>

Pricing for the Oracle Exadata Cloud Service can be found here: https://cloud.oracle.com/en_US/database/exadata/pricing

And finally, pricing for Oracle Exadata Cloud at Customer can be found here: https://cloud.oracle.com/en_US/database/exadata-cloudatcustomer/pricing

ANALYSIS AND OBSERVATIONS

For CxOs making decisions regarding their next-generation computing platform, Oracle brings a lot to the table. With the highest identity of cloud and on-premises products available, Oracle makes it easy to transfer workloads from on-premises to the cloud and vice versa. Oracle Exadata is a key part

of the overall offerings, delivering on many of these benefits. The Exadata X8M delivers performance on a level so extreme that trying to build a similar server product yourself is the functional equivalent of mechanics going to the local auto parts shop trying to source parts to compete with Lewis Hamilton's AMG Formula One car—it's a total waste of time and simply not possible.

The biggest concern arises around commercial tactics.

Strengths

Oracle Exadata possesses the following strengths compared with others in the market (see Figure 7 on page 20):

- **Highest identity of cloud and on-premises functionality.** Oracle Exadata delivers flexibility at times of uncertainty, including from legislative, top management and best-practices perspectives. The main aspect of flexibility for computing platforms is the ability to transfer workloads between the cloud and on-premises. Enterprises are attracted to Oracle Exadata by the identity of the solution in this regard. They run on the same machines and have identical setups—Oracle Exadata machines. A customer can run Oracle Databases on Exadata on-premises and then move the same Oracle Databases to another Exadata in the cloud and not have to make any software changes. No Oracle competitor can offer that—yet.
- **Integrated, chip-to-click stack.** Oracle is pursuing its founder and CTO Larry Ellison's vision of becoming the IBM of the 21st century, offering a fully integrated technology stack, designed, engineered and operated together, from the silicon all the way to the mouse click of an end user using a SaaS application. No other vendor is currently pursuing that complete vision of a technology stack. This is likely one of the largest software and hardware engineering efforts of our time and, as such, offers substantial simplification, TCO and efficiency savings, and it all comes from Oracle. Users' desire for the legendary "one butt to kick" has never been closer to being achieved.

- **One database for all needs.** The Oracle Database doesn't only run relational database loads; it can also run Time Series, XML, Document, Graph and JSON natured database loads. Most Oracle competitors run these different loads in different databases. Oracle single-database approach makes administration and support easier and offers consolidation strategies using Exadata.
- **A very good product gets even better.** With an upgraded spec of Oracle Exadata X8M, which provides even better performance than even the recent Oracle Exadata X8 on-premises release, CxOs know they can rely on a better-performing platform. RoCE and KVM bring familiar technologies to the enterprise and persistent memory adds a fourth tier to data tiering, all making Oracle Exadata X8M the fastest Oracle Database platform available today.

Weaknesses

In trying to position Exadata, Oracle has the following weaknesses compared with others in the market:

- **Predominantly known as an RDBMS vendor.** Despite all the investments into PaaS¹¹ and SaaS, Oracle remains primarily known as a leading database vendor. CxOs traditionally have trusted various other vendors to enable their computing platform via a mix of hardware and networking solutions. Oracle needs to overcome that RDBMS perception from the past and position itself as a complete hardware, networking and software-layer vendor in the context of Exadata. Oracle Exadata can do much more than “just” run the Oracle Database very well. Overall, Oracle is starting to show signs that it has reached a leadership position in enterprise applications as well, as shown in recent market studies.
- **Catch-up mode on public cloud infrastructure vs. leaders.** Oracle has made numerous forays into the public cloud, but what Oracle calls second-generation IaaS has seen traction and success only recently. Oracle needs to showcase IaaS viability and capex investment to give CxOs the confidence that there will always be a cloud option to which they can migrate their workloads.

- **CxOs' perception of Oracle.** At best, CxOs see Oracle as a challenging vendor. Too many stories of unfavorable and harsh business tactics are out there—some true, some in the realm of myth. Oracle must make it easier to do business with and manage the transition from being a respected to a liked technology partner for CxOs.
- **Integrated stacks don't harmonize with heterogeneous systems landscapes.** As enterprises have built up considerable technical debt over time, they operate a vast number of systems and platforms. In some situations, enterprises need to keep operating these platforms for the foreseeable future and can't move to Oracle Exadata. But any Oracle Database that runs on x86 and Linux can move to Oracle Exadata.

Figure 7. Oracle Exadata X8M's Strengths and Weaknesses

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Highest identity of cloud and on-premises functionality • Integrated, chip-to-click stack • One database for all needs • A very good product gets even better 	<ul style="list-style-type: none"> • Predominantly known as an RDBMS vendor • Catch-up mode on public cloud infrastructure vs. leaders • CxOs' perception of Oracle • Integrated stacks don't harmonize with heterogeneous systems landscapes

Source: Constellation Research

RECOMMENDATIONS

The following are Constellation's recommendations for CxOs looking at their computing architecture:

- **Enable enterprise acceleration.** Enterprises need to move faster than ever, and IT/computing infrastructures cannot continue to be the shackles on agility that they've been in the past. This is why CxOs look for next-generation computing platforms that allow them to transfer workloads from on-premises to the cloud and vice versa. With architectural identity and workload mobility from on-premises to the cloud as well as higher performance, Oracle Exadata X8M addresses exactly this need.

- **Don't compromise on performance; evaluate Exadata X8M.** CxOs who experience performance bottlenecks in their mission-critical applications need to take a look at Oracle Exadata X8M and see what the fastest Oracle Database platform can solve for them. Not having to do any code changes brings a key advantage for a quick adoption and rollout of the new platform.
- **Select vendors that have the greatest identity capability.** Identity is the key to workload portability. The higher the identity between an on-premises architecture and a cloud architecture, the better the chances to seamlessly move workloads. This argument is intuitively clear to CxOs leading the digital transformation, and platforms with high identity are therefore clearly preferred. It's even better when vendors state that they design for identity and want to keep identity high—as high as technically feasible. As stated in this report, Oracle excels at identity between Exadata on-premises, Oracle Exadata Cloud Service, Oracle Autonomous Database and the Oracle Exadata Cloud at Customer platforms.
- **Evaluate Oracle Exadata X8M as existing Oracle Database customers.** Because most enterprises run the Oracle Database to support critical applications, it is important that they familiarize themselves with the most prominent member of the Oracle Exadata product family: Oracle Exadata X8M. Better performance has not caused negative feedback to CxOs, but CxOs must determine if they need the additional performance. CxOs also need to look at database consolidation as a driver to adopt Oracle Exadata X8M. Of course, experienced Oracle customers know that the best deals are usually available in the fourth quarter.
- **Consider Oracle's Exadata offerings as a prospect.** Database and tech-stack migrations are challenging, so non-Oracle customers will look at Oracle Exadata Cloud at Customer from some distance. The benefits of Oracle Exadata are substantial, however, and CxOs must talk with their respective cloud and technology stack vendors about what they can do in this regard. Should the projected gap of the future road map become too large and the potential cost savings with Oracle Exadata substantial enough, it is time to pay attention—but consider a potential migration.

Oracle Exadata X8M pushes that equation further out, increasing the performance for the Oracle Database while lowering its TCO.

- **Take a stance on commercial prudence.** No matter the vendor, enterprises must make sure that they obtain the value they seek. For Oracle Exadata, CxOs must pay attention that licenses and services (for instance, the costs to burst to the cloud) are still providing their enterprise with an attractive TCO. As with all services-related offerings, prices will fluctuate, need to be contractually agreed upon as long as desired and must be constantly monitored to avoid negative commercial surprises.

RELATED RESEARCH

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¹⁰ For more on Oracle Exadata X8, see Holger Mueller's upcoming report, fall 2019.

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