

BLOG POST

Oracle Launches Exadata X8M – the fastest platform for the Oracle Database

How an improved architecture propels a Next-
Generation Compute Platform



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INTRODUCTION

At Oracle OpenWorld 2019, held in San Francisco from September 16th till 19th, Oracle unveiled Oracle Exadata X8M, the latest member of the Exadata family. Oracle ExaData X8M is remarkable, as it creates the fastest platform to run the Oracle Database on.

WHAT ARE THE KEY TRENDS?

There are a number of trends that are changing the enterprise computing landscape now, so let's look at the most pertinent ones (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).
- **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 applications¹ 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.

Other relevant trends are the pressure to achieve high data center utilization, the rising complexity of the IT organizations and compliance pressure.

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



Source: Constellation Research

WHAT IS IT?

Oracle Exadata X8M is an appliance/server system that has been engineered to run Oracle workloads best—first and foremost, the Oracle Database, but also Oracle’s portfolio of platform-as-a-service (PaaS) and software-as-a-service (SaaS) applications.

The Oracle Exadata team is not taking breaks. Oracle has followed up Exadata X8², released in Spring of 2019, with Oracle Exadata X8M, bringing three key innovations to Exadata:

1. RDMA over Converged Ethernet (RoCE) for networking.
2. Persistent memory for the introduction of a new tier of data caching.
3. 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 and
- **Persistent memory:** 27 TB of persistent memory.

The result is the world’s fastest database machine, that enterprises can take advantage of – without any code changes to their applications. (See Figure 2)

- **Better SQL performance:** 2.5x faster than Oracle Exadata X8. 16 million SQL read IOPS.
- **Lower latency:** 10x faster than Oracle Exadata X8. Latency down to 19 μ s.
- **Lower costs:** More workloads on fewer resources.
- **Faster Applications:** Better performance of the most critical workloads in fraud prevention, IoT, Machine Learning, etc.

Figure 2. The Oracle Exadata X8M Benefits

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



- 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

ORACLE

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Source: Oracle

What sets Oracle X8M apart from other next-generation compute planes is the 100% Identity between running Exadata on-premises and running Exadata in the Oracle Cloud. No other vendor has the same physical hardware on both sides of the computing equation between on-premises and the public cloud.

High Identity gives CxOs the confidence that they can move compute loads across the compute architectures, across on-premises systems and the cloud, without having to make any changes. Identity on the hardware side ensures that there is no residual risk of hardware-related incompatibility that is possible in purely software abstraction solutions. This matters to enable key next-generation computing best practices such as bursting workloads and achieving cross-platform high availability.

WHY DOES IT MATTER?

There are a number of reasons why CxOs care about viable next-generation computing platforms (See Figure 3):

Old-Guard Vendors Are No Longer Viable

Humans are driven by habits, and CxOs are no exception. If they could still procure all of their computing needs from the vendors they dealt with in the 1990s, the majority of CxOs would likely do so. The problem with these “old-guard” vendors is that they have failed to innovate, are no longer viable from a cost perspective and often have switched to business models that are perceived as extortion. Therefore, innovation and commercial necessities require CxOs to deal with a new set of computing vendors.

Figure 3. The Five Buyer Challenges



Source: Constellation Research

Employee Scarcity and the Skills Shortage

The first world is quickly running out of hands because of unfavorable aging dynamics. Enterprises in general and IT departments more specifically are not immune to these changes, and CxOs find it increasingly harder to find employees with the right skills.³ Enterprises often pay regal amounts to IT outsourcing firms to solve this challenge. And enterprises that do not outsource find it increasingly hard to train and improve the skills of their workforce—a good reminder that no enterprise function is being more disrupted by the cloud than IT.

The Innovation Imperative

While software is eating the world, enterprises are turning into software companies, and, as such, they need to innovate faster than ever. This makes CxOs look for winning platforms and ideally allows them to move workloads as seamlessly across them as possible. As enterprises flock to platform-as-a-service (PaaS)⁴ products to help them build these next-generation applications⁵, workload portability is a key acquisition criterion and overall success factor for the selection of a PaaS⁶ platform.

Additionally, CxOs face challenges due to lack of skilled workers and contractual challenges that limit them to outdated and older platforms.

ADVICE FOR CXOS

The following recommendations can be made 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 have 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 that experience performance bottle necks 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.** As 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 need to 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 need to 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 need to make sure that they obtain the value they seek. For Oracle Exadata, CxOs must pay attention that licenses and services (for instance, 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 as long as desired and must be constantly monitored to avoid negative commercial surprises.

Oracle has invested for a long time, and practically gave up on short-term, incremental growth areas in the marketplace to get its systems engineered from the silicon all the way to the SaaS application suite products together in one technology stack. Oracle has always kept the ability to deploy the same infrastructure on-premises, likely to anticipate customer demands as well as knowing that Oracle's IaaS offering was the last of the Oracle "as-a-service" products to reach maturity. This has put Oracle Exadata in a favorable position compared with the competition for next-generation computing architectures because it gives CxOs the highest flexibility to fluidly deploy workloads across the cloud and on-premises.⁷

MYPOV

Oracle keeps pushing its 10 year old Exadata product line forward, at an accelerated pace, with two Exadata platforms coming out in summer 2019 – Oracle Exadata Cloud at Customer Gen2 as well as Oracle Exadata X8M. Along with that, Oracle keeps investing in its strategy of enabling identical machines and platforms that run both in the Oracle Cloud Infrastructure (OCI) and are equally available for customers to run on premises in their corporate data centers.

It is good to see enterprise IT vendors pursuing diverse strategies, and we can see the major players following distinct strategies. Diverse strategies mean different value propositions for enterprises, and that means more choices, which consequently gives CxOs more options to differentiate and accelerate their enterprise with information technology.

The current three approaches are:

1. The **software only** approaches that Google Cloud (with Anthos) and IBM (with IBM Cloud Private and, post Red Hat acquisition, more Red Hat assets) pursue.
2. The **partner hardware** strategy that Microsoft is using with Azure Stack. (It is too early to know where AWS will end up with Outposts).
3. And there is Oracle, which is building the **vertically integrated** product stack from silicon, across all ISO/OSI layers to the user click in a SaaS application.

The Oracle Exadata group of products is the manifestation of the merits of that strategy, as Oracle has designed Exadata X8M in such a way that it is de facto the best performing platform to run the Oracle Database. The introduction of innovations like persistent memory (PMEM) and RDMA over Converged Ethernet (RoCE) are key enablers for the next generation of performance of the Oracle Database. PMEM effectively introduces another level of data handling, expanding the traditional RAM, Flash and HDD troika to a quartet, inserting PMEM between RAM and Flash. And RoCE gives enterprises inmemory, cross server performance gains, while using familiar Ethernet protocols.

It is unlikely competitors will even attempt to run the Oracle database better than Oracle. Effectively, this means that Oracle database customers will have compelling reasons to remain ... Oracle customers.

So, for now, congratulations to Oracle on Oracle Exadata X8M—we will soon see how well the market will receive this new offering.

ENDNOTES

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- ¹ Holger Mueller, "The Era of Infinite Computing Triggers Next-Generation Applications," Constellation Research, June 1, 2018. <https://www.constellationr.com/research/era-infinite-computing-triggers-next-generation-applications>
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- ² For more on Oracle Exadata X8, see: Holger Mueller, "Oracle Exadata Powers Next-Gen Computing", June 12th 2019, <https://www.constellationr.com/research/oracle-exadata-powers-next-gen-computing>
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- ³ For the people-leader perspective on the skills shortage and the need for enterprise acceleration, see: Holger Mueller, "Why People Leaders Must Embrace Enterprise Acceleration," July 3, 2018. <https://www.constellationr.com/research/why-people-leaders-must-embrace-enterprise-acceleration>
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- ⁴ For more best-practice considerations for PaaS, offerings, see: Holger Mueller, "As PaaS Turns Strategic, So Do Implementation Considerations," May 9, 2018. <https://www.constellationr.com/research/paas-turns-strategic-so-do-implementation-considerations>
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- ⁵ For more on next-gen applications and PaaS offerings, see: Holger Mueller, "Why Next-Gen Apps Start with a Next-Gen Platform as a Service," April 5, 2018. <https://www.constellationr.com/research/why-next-gen-apps-start-next-gen-platform-service>
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- ⁶ For a Constellation ShortList™ on PaaS vendors, see: Holger Mueller, "Constellation ShortList™ PaaS Tool Suites for Next-Gen Apps," August 14, 2019. <https://www.constellationr.com/research/constellation-shortlist-paas-tool-suites-next-gen-apps-2>
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