Oracle Launches the SuperCluster M7 for On-Prem/Off-Prem Workloads

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Introduction

The Oracle SuperCluster M7 system announced at Oracle OpenWorld in San Francisco on Oct. 26, 2015, features many capabilities that fit well with Oracle’s emphasis on cloud enablement and cloud infrastructure. The key features for the M7 processor – security, on-chip encryption, performance and efficiency – will suit that purpose, and will provide an upgrade path for the installed base of Oracle’s SPARC-based hardware systems.

The Oracle SuperCluster M7 system is positioned as a high-performance, data-dense engineered system for both database and applications. As such, it will combine attributes of the Oracle Exadata engineered system for database workloads with support for applications on the same machine. The system is based on Oracle M7 processors, the latest version of the M line of SPARC processor chips.

Security, in the form of Silicon Secure Memory and on-chip cryptographic acceleration features, is directly built into the M7 chip itself. That can be expected to make encryption a faster process, with far less system overhead than would otherwise be the case. Performance – already high in previous SuperCluster models, is being enhanced via the SQL in Silicon Acceleration for Oracle Database feature, improving raw general-purpose compute performance. Efficiency, compared with older versions of the Oracle SuperCluster system, gained in-line memory decompression, and low-overhead virtualization.

Running in Hybrid Clouds

The M7-based SuperCluster plays a role in Oracle’s expansive cloud strategy, which supports both on-prem and off-prem data services. Oracle offers the Oracle SuperCluster M7 system for on-prem use, with the idea that, ultimately, that system can be run, on behalf of IT customers, in an Oracle-managed Cloud data center.

It’s significant that this Oracle SuperCluster M7 system has been engineered for deployment in hybrid cloud computing environments because it signals Oracle’s understanding that many mission-critical workloads will be migrating to cloud providers over the next five years. The phenomenon has already begun, impacting many systems vendors’ on-prem IT sales, across the industry, in CY2015.

Oracle SuperCluster M7 will sit at the intersection of on-premise and off-premise computing deployments – supporting data and application migrations from enterprise data centers to cloud platform services (such as Oracle Database and Java Platform-as-a-Service) from Oracle and other cloud service providers (CSPs). Customers can run the Oracle portfolio of database and application...
products on-premise, in their enterprise data centers, off-premise in the Oracle Cloud – or both. Neuralytix believes that migration of workloads to the cloud is likely gated by customer preference, government regulatory regulations, and concerns about data security and data protection.

**M7 for SPARC-based Engineered Systems**

Several years in development, the M7 processor is the product of the combined Sun/Oracle design teams – which began optimizing the hardware and software for the M7-based systems after Oracle acquired Sun Microsystems in January, 2010. The result is a 32-core RISC processor that is a building block for Oracle’s engineered SuperCluster systems. It also powers the newest generation of M7-based SPARC server systems.

Central to the Oracle Supercluster M7’s database acceleration, and encryption-enforced security is the hardware/software optimization that is expressed as Oracle’s Software on Silicon features. These features were designed to improve performance – and to ensure that workloads could be migrated off-prem with security.

**An Architectural Difference**

Most of Oracle’s engineered systems, including the Oracle Exadata database system and the Oracle Big Data Appliance and Oracle Exalytics systems, are based on x86 hardware running the Oracle Linux operating system. But the Oracle SuperCluster M7, with SPARC-based compute engines designed by Oracle, carries forward the large installed base of Sun SPARC systems running Solaris.

Very likely, the M7 will soon be a high-performance engine for Oracle’s cloud service offerings, via the Oracle Cloud, Neuralytix believes. If so, it will provide cloud services from Oracle’s data centers in the U.S., Europe and Asia/Pacific. However, customers looking at private cloud within their enterprise network now have an option to order an Oracle SuperCluster M7 to their specifications – and to run it on-premise, if they do not wish to locate their applications on data off-site.

The SPARC-based Oracle SuperCluster M7 runs the Solaris 11 operating system, and supports Solaris-specific workload isolation and virtualization features on SPARC, including LDOMs and Zones. These include Solaris Zones (containers) technology, which supports multiple VMs running within a single Solaris instance. Oracle SuperCluster M7 systems have been shipped to early customers for several months, in limited quantities, and early testing at customer sites has provided feedback for Oracle’s final product decisions for the system. Volume shipments have started, following the formal announcement of the Oracle SuperCluster M7 at the Oracle OpenWorld conference.

For Oracle customers with T-series and M-series systems, the M7-based systems provide faster performance and new security features not available before. For those with older SPARC-based systems, the M7-based systems will provide technology refresh, while maintaining a binary-compatible platform for earlier Solaris, Java and Oracle database software deployments.

**Key Features of the M7 Systems**

The most important aspect of M7 design stems from its Software in Silicon usage model – which brings important computing functions onto the chip for more efficient performance. This expedites the performance by having 32 Database acceleration co-processors, dedicated cryptographic accelerators and Silicon Secured Memory features on each M7 chip – one for each core on the processor.

From a software perspective, the M7 systems support on-premise and off-premise workloads—and can host cloud services located locally – at the customer site – or across the Internet.

A fully configured Oracle SuperCluster M7 system has 2.2 times the price/performance of the Oracle T5-8 SuperCluster system for standard workloads, Oracle reported in its announcement. Oracle also said the SuperCluster M7 is many times better than previous generations when running Oracle
Database 12c In-Memory – or other workloads with end-to-end run-time security fully enabled.

Customers can specify the mix of compute and storage when they acquire the system – and they have the option of adjusting it later on. The Oracle SuperCluster M7 systems also have large memory – up to 2 TB per compute node and up to 8 TB in a single rack, supporting the very largest databases and enterprise application workloads. The system supports up to 384 TB of database storage, and up to 162 TB of application and system storage.

**Go-to-Market Strategy for SuperClusters**

- There are several ways that Oracle can take the SPARC-based Oracle M7 SuperCluster to market, including the following:
- Replacement of scalable SPARC-based systems, with fine-grained Oracle software license control (sub-capacity licensing) on a per-core basis.
- Consolidation of Oracle databases and applications that had been running on multiple machines. Reduced “footprint in the data center” is a driver for such sales, as at Fortune 500 companies with hundreds of Oracle databases and enterprise applications.
- Move-up option for those customers who have had smaller systems – and want to move their applications and databases to a more powerful system, with more memory, more available storage – and more CPU capacity.
- Competitive replacements of older high-end systems made by IBM and HP, among others. In many cases, upgrades for older Unix systems from all vendors may have been delayed in customer sites, and those systems need to be updated with new technologies.

**A Differentiated Scalable System**

The M7 processors and SuperCluster give Oracle a highly differentiated systems offering, with built-in, on-chip encryption and improved SuperCluster performance that doubles the completion of some workloads compared with earlier models. Inside the Oracle SuperCluster M7 cabinet are multiple SPARC-based server nodes, clustered to work together, along with built-in Exadata Storage Servers for Oracle Database and enterprise NAS storage for application and system data.

Oracle has positioned the SuperCluster as a scalable engineered system designed to run Oracle’s databases and enterprise applications (e.g. ERP, CRM, HCM). But many customers will choose to deploy Oracle Exadata and other engineered systems for a range of reasons, including previous implementations of other systems from Oracle’s full line of engineered systems based on x86/Oracle Linux platforms (e.g. Exadata, Exalytics, Oracle Database Appliance).

**Competition in the Marketplace**

Clearly, the new Oracle SuperCluster M7 system will compete with IBM’s Power Systems and the IBM Pure converged-infrastructure systems based on IBM’s POWER processors. But, in a larger sense, Oracle SuperCluster M7 competes with a range of IBM and HP mission-critical systems, especially for longtime users of scalable Unix systems with high levels of reliability, availability and security. Both IBM and HP can be expected to market their own high-end systems in a competition for mind-share and market-share in the scalable systems space.

By combining two Oracle technologies, SPARC and Solaris, Oracle engineers worked to optimize and fine-tune the Oracle SuperCluster M7 system to run specific workloads in addition to Oracle Database, including ERP, financials, Java middleware, and data-intensive OLTP and database-related workloads.
Through its work on Oracle Cloud PaaS and SaaS, Oracle plans to bring a wide range of its traditional software products forward to run on the Oracle SuperCluster M7 system. This Oracle OpenWorld Conference showed a depth of investment in bringing that broad portfolio to cloud-involved on-premise/off-premise deployments.

Even though Oracle is taking a solutions approach to its platform product line, many IT shops remain focused on technical specifications and a feeds/speeds view of technology. That is why Oracle emphasized its internal testing reports of a substantial gain in performance, comparing older and new engineered system models from Oracle, providing a reason to move/upgrade.

**Conclusion**

The Oracle SuperCluster M7 plays a role in Oracle’s expansive cloud strategy, which supports both on-premise and off-premise data services. Oracle offers the SuperCluster M7 system on-premise, with the idea that, ultimately, that system could be run in an Oracle-managed Cloud data center.

Clearly, security and data protection are top-of-mind concerns for many of Oracle’s customers – especially the largest enterprises that must guarantee SLAs and QoS on behalf of their end-users.

Some of Oracle’s largest customers have adopted Exadata and SuperClusters to consolidate workloads, running them in less data-center space than before. But their concerns about security and data protection often outweighed their interest in moving critical workloads off-premise. Oracle engineered systems customers say that their cloud-infrastructure systems deployments must meet regulations across geographies (e.g. in Europe, many countries require data to remain within their borders) and verticals (e.g. healthcare, pharmaceuticals and government, which are highly regulated).

For on-prem installations, the pricing model for the Oracle M7 SuperCluster systems is becoming more flexible. As described at the Oracle OpenWorld conference, new pricing models will address initial acquisition cost – or will effectively reduce Oracle license costs by dedicating fewer cores per workload.

Other approaches customers could use include: using containers or Solaris Zones to house more VMs per physical rack. A single Oracle SuperCluster M7 system is capable of running thousands of VMs concurrently (with up to 4,096 vCPUs total), using a combination of Oracle VM Server for SPARC and Solaris Zones. In some cases, customers running Oracle Database 12c and other applications on x86 systems may see overall cost savings by moving to the SuperCluster, particularly when Oracle Database and application performance, security, vertical scalability and in-memory efficiency are critical.

Cloud-specific pricing for services provides another avenue to contain IT costs. The cloud subscription model aligns pricing with usage models, rather than requiring that customers order a fully configured model for installation on their data-center floor. The cloud delivery system also allows IT organizations to scale-up or scale-down demand for compute/storage resources.

The on-premise/off-premise strategy, as articulated by Oracle at Oracle OpenWorld, has come a long way from its first mentions more than four years ago. The ability to move a broad range of workloads to off-premise systems is aligned with the Oracle Cloud strategy and offerings. To put this in perspective, Oracle has 420,000 customer sites worldwide – but the number who have outsourced to the cloud is only a fraction of that number. For the most part, customers are marching forward with what they have, in terms of Oracle databases and applications – but they are willing to move to the off-premise model, over time and where appropriate.

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