Oracle takes the fight to AWS with new cloud database service

JASON STAMPER
DEC 2016

In keynotes at its annual OpenWorld conference, Oracle's executive chairman and CTO Larry Ellison was on hand to promote the virtues of Oracle Database in the Oracle Cloud, increasing its competitive positioning against Amazon Web Services.

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At Openworld, Oracle CTO Larry Ellison announced the latest, ‘cloud first’ version of its database, 12c Release 2, running on its Exadata hardware in the Oracle Cloud, and starting at just $175 per month. Today, Oracle Database 12c Release is available on all Oracle Cloud Database Services.

THE 451 TAKE
If there was any doubt about Oracle’s commitment to moving more of its technologies and customers to the Oracle Cloud, there shouldn’t be any longer. Not only was the latest version of Oracle Database launched in the cloud first, but CTO Larry Ellison spent a good portion of his keynotes at OpenWorld last week explaining why, in his view, Oracle Database in the Oracle Cloud is far superior to any relational databases in the cloud that Amazon Web Services (AWS) has to offer. While Oracle’s choice of competitor to put in the firing line is always telling – and Ellison’s focus on AWS arguably reflects the advantage that AWS has in terms of engaging with cloud database early adopters – we can’t help but agree that with the latest improvements to Oracle Database with 12c Release 2, there are indeed many reasons why Oracle’s offerings outshine those from AWS. After all, Ellison and Co. have been working on improvements to the Oracle Database since 1977, and as Ellison noted, one of its first customers was the CIA, so security has always been a critical design criterion.

BUSINESS CONTEXT
Ellison co-founded the erstwhile database company in 1977 and was for many years its CEO; he transitioned into the role of executive chairman and CTO in September 2014, leaving Mark Hurd and Safra Catz, both presidents at Oracle, joint CEOs in his stead.

Recently, at the company’s annual OpenWorld conference, Ellison made the latest announcements around Oracle Database 12c Release 2, and indeed, some new cloud-based database deals and price points.

Today, of course, Oracle is far more than a database company. It has a wide range of software products that it has either built or bought – with acquisitions including household names such as PeopleSoft, Siebel, BEA and more recently, cloud-based ERP and other business applications company NetSuite (the deal hasn’t been officially completed yet).

The Redwood Shores, California-based technology giant also made its intent to take on IBM and HP Inc clear with a broader portfolio of hardware, software and services when it acquired Sun Microsystems for $5.6bn in 2010.

In its Q1 FY17 announced mid-September, the company saw total revenue of $8.6bn, up 3% in constant currency. Cloud software as a service and platform as a service was highlighted, with revenue up 79% to $798m. Total net income was $1.8bn.

The company employs roughly 135,000 staff. At the end of fiscal year 2016, it said it had 420,000 customers, of which 310,000 were Oracle Database customers, 120,000 were Oracle Fusion Middleware customers, 100,000 Oracle Applications customers and 6,000 engineered systems customers (that’s the acquired Sun Microsystems hardware segment).

TECHNOLOGY BACKGROUND
Oracle has a number of databases in its portfolio. There is its main relational database, Oracle Database, which is used for transactional, analytic and mixed workloads. It also has a pure in-memory database called TimesTen, and the open source relational database MySQL.

The company also has a NoSQL database, Oracle NoSQL Database, so that it can compete with rival open source NoSQL databases such as MongoDB and Cassandra.

Oracle recently announced Oracle NoSQL Database version 4.2, which together with its 4.0 release added features such as Full Text Search using Elastic Search, Time-To-Live to allow expired data to be removed from the database, SQL syntax for developers, features for speeding up bulk puts and gets, and an import and export facility. The most recent release also allows for more optimal layout for the storage nodes, based on the topology selected. This can significantly increase the
amount of storage for the Oracle NoSQL Database without increasing costs.

Back in July 2014, Oracle launched Oracle Database In-Memory, which offered customers an in-memory column store for real-time analytics on their row-based OLTP databases. Oracle already had the TimesTen in-memory database, but there are some significant differences between TimesTen and Oracle Database In-Memory.

TimesTen is a database designed to sit at the application tier, primarily for low-latency response times for custom transaction-oriented OLTP workloads. Because the TimesTen database sits at the application tier, it can offer very low network latency to applications. TimesTen is for applications that are ‘embedded,’ such as in telecom networks and high-speed securities trading platforms. Applications that use TimesTen are custom-built rather than packaged applications. For customers with an existing Oracle Database, TimesTen can be used as an in-memory cache to speed up applications. In this scenario, it offers automatic data synchronization between TimesTen and the Oracle Database.

On the other hand, Oracle Database In-Memory, works transparently with any existing application – packaged or custom – that run on Oracle Database 12c. Oracle Database In-Memory stores the data in memory as a column store, which helps to speed up pure analytic workloads or analytic queries against live transactional data. Oracle has said queries of the Database will speed up by up to 100x while OLTP performance should also improve by 2x. As a result, Oracle said that Database In-Memory enables mixed workload applications supporting real-time transactions with an analytic component, thus enabling both advanced analytic and OLTP applications.

**OPENWORLD ANNOUNCEMENTS**

So what was the main news from a data platforms and analytics perspective announced at OpenWorld?

Well, there’s a new version of the main Oracle Database, 12c Release 2 that is currently available as a ‘cloud first’ release on all Oracle Cloud Database Services, including Database Services, Exadata Services and a new Exadata Express Cloud Service.

Exadata Express Cloud Service is ideally suited for departmental production applications, plus the development and test of the latest Oracle Database features. It offers Oracle Database 12c running on Exadata, complete with all relevant enterprise features such as partitioning, compression and in-memory. To be more precise, the company announced three price levels for Oracle Database 12 Release 2, running on Exadata Express Cloud Service. Exadata Express X20 includes Oracle Database Enterprise Edition, 20 gigabytes of disk storage (multiple compression techniques are available to effectively store hundreds of gigabytes of data) and 120GB of data transfer, for $175 per month. The cost for 50 gigabytes of disk storage and 300GB of data transfer is $750 per month, while if you want the In-Memory Option bundled in, that’s $950 per month, and comes with 5 gigabytes of memory for use with the columnar store (along with 50 gigabytes of disk storage and 300 gigabytes of data transfer). The latter price plan is called Exadata Express - X50IM.

Ellison also announced a new addition to Oracle’s Cloud at Customer program, the Exadata Cloud Machine (adding to the Oracle Cloud Machine introduced in March 2016). With Oracle Cloud at Customer, customers pay a subscription cost but receive the infrastructure (compute, block storage, networking, file storage, messaging, identity management services), data management (database, Oracle Exadata machine, Hadoop services), application development (Java, Ruby, PHP), as well as integration and management services – all behind a company’s own firewall.

Another change with Oracle Database 12c Release 2 in the Oracle Cloud is in the number of pluggable databases that can be managed as a single unit, thanks to improvements in its multi-tenant architecture – it’s increased the limit from 252 to 4,096. Multi-tenant is clearly one of the ways that Oracle has been able to reduce the cost of hosted Oracle Database instances for customers: it means Oracle can apply one patch to up to 4,096 databases at the same time. In addition, Oracle Database 12c Release 2 in the Oracle Cloud includes sharding capabilities that allow extreme horizontal scaling for specialized global web applications.

**CUSTOMERS**

Oracle was able to share with us the logos of over 50 companies that are already using Oracle Database in the cloud. However, most of those are not yet publicly referenceable. Those that are include business intelligence software company SAS and marketing optimization company Neustar. The company shared with us another list of 50 logos of companies that are already using the Oracle Database 12c In-Memory Option; again, this was only a
partial list, and also unfortunately can’t be made public at this time.

We spoke with marketing company Neustar, which offers clients a marketing optimization application called Neustar Marketshare, which involves the analysis of large amounts of spatial data. The company has been testing out the beta version of Oracle 12c Release 2.

It already has hundreds of Oracle Database instances in its infrastructure. Across those databases, which are strung together in Oracle Real Application Clusters, it has over 5 billion rows of spatial data. All its Oracle Database instances run on-premises. The company told us that using 12c Release 2, it has found spatial analytics to run three times faster where RTREE (spatial) indexes have been used, and up to 10x faster when querying across BTREE (key value) indexes.

**COMPETITION**

While the primary competition for the Oracle Database has shifted to database as a service offerings from cloud competitors like Amazon and Microsoft’s Azure, Oracle Database’s on-premises primary competition comes from Microsoft SQL Server and IBM’s DB2 or Informix. Other relational databases include Actian’s Ingres (which is object-relational) and Software AG’s Adabas. Since Oracle Database now has an in-memory capability, some will also consider in-memory databases that can handle transactional workloads, such as SAP HANA, VoltDB, MemSQL or NuoDB.

Some companies that have plenty of open source talent in their organization could go down the open source database route, where competition would include Oracle’s own MySQL, PostgreSQL (supported by EnterpriseDB) and MariaDB (a forked but compatible version of MySQL). Companies that don’t require the highest levels of transactional consistency could look to NoSQL databases, which include MongoDB, Cassandra, AWS’s DynamoDB and Oracle’s own NoSQL Database. Some NoSQL vendors, including MarkLogic, have been able to achieve ACID compliance for transactions.

Taking the fight to AWS, Ellison said that the entry level X20 version of the service is even cheaper than Amazon’s Aurora Database Service. He also highlighted Oracle’s security credentials, reminding the audience that one of Oracle’s first customers was the CIA.

AWS’s Relational Database Service (RDS) gives customers a choice of six databases – Amazon Aurora, Oracle, Microsoft SQL Server, PostgreSQL, MySQL and MariaDB – and the company also offers Amazon Redshift for analytic workloads, but Ellison also said Oracle Database runs far faster on Oracle Cloud than AWS (24x faster analytics, 8x faster OLTP), while noting that you also can’t easily scale Oracle Database on AWS because it doesn’t support Oracle’s Real Application Cluster (RAC) technology.

Ellison went so far as to claim that Oracle’s database as a service is up to 105x faster for analytic workloads and 35x faster for OLTP workloads. He said it’s up to 1,000x faster or even more for mixed workloads compared with Amazon’s cloud database offerings. He added that he believes Amazon is 20 years behind Oracle Database technology; for example, lacking parallel SQL, materialized views or support for mixed workloads.

Ellison also commented on the fact that AWS’s own Aurora database runs only on Amazon’s cloud, whereas Oracle Database runs in Oracle’s Cloud, AWS or on-premises. AWS is by no means the only cloud database provider in town, with Microsoft, IBM, Google, Rackspace and others also offering multiple cloud database services.
## SWOT Analysis

### Strengths
Oracle has highlighted some real capabilities of Oracle Database in the Oracle Cloud that are not available from rivals. The latest improvements to multi-tenancy scalability and automatic provisioning, as well as new price points, make Oracle Database 12c Release 2 more attractive in the cloud.

### Weaknesses
Since Oracle compared Database 12c Release 2 capabilities with AWS specifically, it must be noted that AWS offers a choice of not one but six different database engines, including Oracle. That said, Oracle does have its relational database, in-memory database TimesTen, Oracle NoSQL Database and open source database MySQL.

### Opportunities
Oracle reports that customers of cloud software as a service and platform as a service are a growth highlight, with sales up 79% in its latest quarter. The latest improvements with 12c Release 2 should help to maintain that momentum.

### Threats
Oracle’s relational database business faces threats from several directions, including the rival relational incumbents, pure in-memory databases, open source databases (including its own MySQL) and even NoSQL rivals.