Oracle Autonomous Database on Exadata Cloud@Customer

Dedicated Region Cloud@Customer

Oracle Cloud@Customer Brings Full Cloud Experience On-Premises by, David Floyer

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Oracle Autonomous Database on Exadata Cloud@Customer and Dedicated Region Cloud@Customer is a radical approach at bringing cloud services on-premises. Our initial take is those substantial customers running mission-critical Oracle applications can cut costs by up to 40% with this offering. This strategy is the most ambitious attempt we've seen in the industry to bring a full public cloud experience to organizations' premises.

Global 2000 customers running mission-critical large-scale applications on Oracle Databases should assume that they will migrate to one of Oracle's new Cloud@Custmer offerings. Wikibon recommends that CxOs begin engaging with Oracle to conduct their TCO/ROI/IRR analyses now.

Premise

Oracle Autonomous Database on Exadata Cloud@Customer

Dedicated Region Cloud@Customer

The most note-worthy Oracle cloud announcements made in early July 2020 are the availability of **Autonomous Database on Exadata Cloud@Customer (**including **Autonomous Data Guard)** and **Oracle Dedicated Region Cloud@Customer.** Together, they represent a radical approach to bringing cloud services on-premises. Our initial take is that customers running mission-critical Oracle applications can cut costs by up to 40% with these offerings. This strategy is the most ambitious attempt we've seen in the industry to bring a full public cloud experience to organizations' premises.

Oracle Cloud@Customer Announcements

On July 8, Oracle made two strategic announcements that span its cloud portfolio:

Autonomous Database on Exadata Cloud@Customer

Oracle's advanced Autonomous Database is now available on-premises. This new offering brings its machine-learning powered database to customer data centers. The starting commitment for Autonomous Database on Exadata Cloud@Customer is reduced to $10,800 per month for three years, a 20% discount. At the same time, Oracle has upgraded the infrastructure platform with the lower-latency Exadata X8M. The X8M uses persistent memory and RoCE to reduce storage latency, which is particularly important for heavy database workloads.

All the complexities of the Autonomous Database are handled over the control plane to the Oracle Cloud. No user data is shipped on the control plane.

Oracle has also announced Autonomous Data Guard, which allows seamless failover and switchover to and from a physical copy of the database. All the complexities are handled by the Autonomous Database service and orchestrated using the control plane within Oracle Cloud. This automation simplifies database operations and automates the testing of system high-availability. As a result, organizations can have increased confidence in compliance thru simplified high availability validation tests to meet internal and external auditing requirements.

Wikibon believes that Oracle Autonomous Database on Exadata Cloud@Customer will find broad acceptance from Oracle's global 2000 customers.

Oracle Dedicated Region Cloud@Customer

Dedicated Region Cloud@Customer makes Oracle's entire SaaS portfolio available on-premises and managed by the Oracle Cloud control plane. As with other services, no customer data is transferred across the control plane. The software supported includes Oracle's ERP, HCM, CRM, and CX packages. This provides an on-premises cloud experience for SaaS applications.

Exadata X8M hardware and software are included in the Dedicated Region. This infrastructure supports Autonomous Databases and services run on-premises and supported by Oracle over the Cloud@Customer control plane.

In addition, Oracle provides hyper-scale infrastructure on-premises, which can run Bare Metal

Compute, VMware services, Containers for Kubernetes, and many other services.

Overall there are 50 services in total. Notably, to take advantage of this capability, customers must commit to an $18M minimum spend over three years, or $500K per month. This figure may seem like "sticker shock." However, it's quite reasonable relative to the expense of running Oracle infrastructure with internal resources, and for large organizations, this is a relatively small investment over 3 years.

Oracle Cloud@Customer Background

Oracle focuses on sophisticated operational software to run large-scale mission-critical applications for global 2000 organizations. The Oracle Tier-1 Database is at the heart of this software and hardware stack.

Oracle is now focusing on bringing a complete cloud experience on-premises for these sophisticated environments.

The top half of Figure 1 summarizes the Autonomous Database on Exadata Cloud@Customer, which supports Autonomous Database on-premises deployed on Exadata X8M. The announcement of Autonomous Data Guard is an important extension.

The bottom half of Figure 1 summarizes Oracle Dedicated Region Cloud@Customer, which supports Autonomous Database on-premises deployed on Exadata X8M. It also supports all 50 0f the Oracle@Cloud services on other Oracle hyper-converged infrastructure, including Oracle SaaS products running on the Oracle Cloud.

Oracle Autonomous Database on Exadata Cloud@Customer
- **On-Premises**
- **Exadata X8M, Multiple VM Clusters, PCI-DSS Certification**
- **Autonomous Data Guard**

Oracle Dedicated Region Cloud@Customer
- **On-Premises**
- **Exadata X8M for Autonomous Database**
- **Oracle Hyperconverged Infrastructure**
- **All 50 Oracle@Cloud Services, including Oracle SaaS**

Figure 1: Oracle Cloud@Customer Announcement Summary
Source: © Wikibon 2020

The Autonomous Database services include all the layers of the stack. These include the operating system, Exadata X8M, and the Oracle Database. The Autonomous Database is supported on both Exadata Cloud@Customer and Oracle Dedicated Region Cloud@Customer.

Autonomous Operational Management is assisted by the Oracle Cloud control plane.

Autonomous Database services include:

Autonomous Linux;

Oracle Autonomous Transaction Processing;

Oracle Autonomous Data Warehouse;

Autonomous Data Guard;

In addition to the X8M architectural upgrades to Exadata Cloud@Customer, two new additions include:

Multiple VM Clusters per Exadata Rack, which enables organizations to share an Exadata system for production, DR, and dev/test. This capability provides isolation across departments and different use cases.

Support for the Payment Card Industry Data Security Standard requirements (PCI-DSS Certification).

Wikibon expects other database services (e.g., Blockchain) to become autonomous over time.

Automated backup is part of the Oracle Autonomous Database on Exadata Cloud@Customer and Dedicated Region Cloud@Customer. Organizations can choose where to store backups on-premises or in a cloud.

Oracle Cloud@Customer Strategy

Oracle's strategy is to migrate most customers to use the Oracle Cloud services (either on-premises or in the cloud). It can then use the volume of customers to accelerate the autonomous services provided.

Oracle Dedicated Region Cloud@Customer can run any Oracle SaaS Service such as Oracle E-Business Suite and the Oracle Cloud VMware service. This flexibility allows, for example, an in-house E-Business Suite service, which is tightly integrated with on-premises software and workflows, to be outsourced to the Oracle Cloud and retain the on-premises latency and location. Similarly, an Oracle Cloud VMware service can be run on-premises, and the provisioning and management of this service can be outsourced to the Oracle cloud.

This level of automation of all aspects of running and optimizing the stacks reduces the high-skilled staff required to operate organization IT support drastically. The business case for Global 2000 organizations running Autonomous Database on Exadata Cloud@Customer and Oracle Dedicated Region Cloud@Customer is compelling.

Comparison with AWS Outposts, Microsoft Azure Stack, Google Anthos, & SaaS Vendors

The AWS Outposts, Microsoft Azure Stack Hub, and Google Anthos solutions all bring the cloud hardware and control-plane to the organization data center. These solutions all enable migrating applications running in the cloud on-premises. These solutions can provide improved latency, data sovereignty compliance, and better workflow integration with other on-premises applications.

However, for sophisticated mission-critical operational software, the organization is responsible for the implementation, integration, security, updating, and service level agreements (SLAs) of the Tier-1 database environment.

At this time, most SaaS vendors have no on-premises cloud offerings at this time. Wikibon believes that SaaS vendors will need to provide the ability to offer an on-premises version. This approach protects the organization's data and makes it easier to integrate with other on-premises workflows. Wikibon believes that Oracle will benefit significantly from the ability to offer its SaaS portfolio in Oracle cloud and in Oracle Cloud@Customer.

AWS Outposts

AWS, for example, in its public cloud, claims that a combination of its Aurora transactional database together with functions from the PaaS layer can achieve high levels of recoverability. However, Wikibon

would emphasize that the organization is responsible for designing, implementing, updating & maintaining this environment. It is not a managed AWS service.

In addition, Wikibon's understanding is that neither AWS Aurora nor Redshift is currently available on AWS Outposts. MySQL and PostgreSQL are the only transaction and data warehouse databases currently available. In Wikibon's opinion, none of the previously mentioned AWS databases are suitable to run large-scale mission-critical business applications with aggressive SLAs for availability, recovery, and security.

Wikibon would also point out that AWS requires the back-up of all data residing on Outposts to an AWS public cloud region. It does not allow any on-premises data backup to a local storage device. This may void data residency and data sovereignty requirements of such a service.

Microsoft Azure Stack

Microsoft starts in a better position than AWS by having a Tier-1 database, Microsoft SQL Server, which they offer on Microsoft Azure. However, the Microsoft SQL for Azure Stack Hub is a subset of the original, with most of the Tier-1 capabilities unavailable.

In addition, an organization running Oracle would need to convert the Oracle applications to run on SQL Server. Microsoft advocates this strategy but does not offer to perform the conversion service. As Wikibon has stated before, customers should avoid converting from large-scale Oracle Databases to SQL Server like the plague.

Google Anthos

Google Anthos is for completely different workloads, such as Kubernetes. These are important workloads. However, at this moment, Google does not claim that Google Anthos is a suitable platform for large-scale mission-critical systems of record. Therefore, they are not a direct competitor to Oracle Cloud@Customer offerings.

SaaS Vendors

At this time, most SaaS vendors, such as Workday and Infor, have no on-premises cloud offerings at this time. Wikibon believes that SaaS vendors will need to provide the ability to offer an on-premises version. This approach protects an organization's data and makes it easier to integrate with other on-premises workflows.

Wikibon believes that there is an opportunity for Oracle to provide a non-intrusive option to SaaS ISV vendors wanting cloud and on-premises versions, and differentiate by showing how the Oracle architecture makes the ISV customer data and resource usage data safe.

Comparison Conclusions

Wikibon observes that AWS Outposts, Microsoft Azure Stack, and Google Anthos are providing hyper-scale technology focused on cost rather than performance. This is a good approach for the more traditional cloud services organizations that need on-premises capabilities.

However, for large-scale mission-critical Oracle Databases, latency and scale are important. For example, the IO latency on the Oracle Exadata X8M is less than 20 microseconds. A millisecond IO latency would be very fast for standard hyper-scale technology. Exadata can support over ten million database reads, whereas other cloud on-premises providers would struggle to achieve one million.

The additional advantage of high performance is that the number of database licenses required to run an application is reduced. The cost of Tier-1 database licenses from any vendor is significantly higher than the infrastructure costs.

Finally, the cost of conversion from an Oracle mission-critical database to an alternative database

environment is also an expensive and extremely high-risk undertaking. For example, Amazon has taken over five years so far to migrate from Oracle Databases and thousands of person-years of conversion services. Case studies of global 2000 AWS customers successfully migrating large-scale mission-critical databases to AWS or other traditional cloud vendors are conspicuous by their absence.

As Wikibon has stated before, organizations should avoid converting from Oracle Database to any cloud database at all costs.

Business Case for Oracle Cloud Strategy

Both the short-term and long-term business cases for migrating to Oracle Autonomous Database on Exadata Cloud@Customer and Oracle Dedicated Region Cloud@Customer are outstanding. The key benefits are migration to full cloud consumption models and the outsourcing of technical and operational skills to run the environment. Also, many of the administrative tasks such as provisioning, configuring, tuning, encryption, security patching while running, elastic scaling, backup, failover, and recovery are automated. Organizations can also outsource some parts of SLA responsibilities and will outsource keeping the IT environment up-to-date and keeping the data safe. Automated patching removes the need for manual labor and because of this eliminates manual errors.

Another expected area of improvement is the speeding up of run times with Autonomous Databases. As the most expensive part of the total system is the database, improving elapsed times of applications reduces the number of licenses needed. Also, the database licenses include access to almost all of the database features, which can further minimize database license costs. Additional benefits of the broader range of features include improving developer productivity and expanding application functionality.

In the longer term, the economies of scale will allow Oracle to enhance availability, recoverability, and security. Also, the time-to-market for application enhancements should improve as more robust change-management processes evolve. These business improvements will be significantly higher in value than the IT operational savings.

Wikibon recommends that organizations should shift resources away from providing operational support. Their focus should change to managing budgeting, building and deploying applications, monitoring the Oracle services, monitoring compliance, and maintaining security. Most importantly, Wikibon believes that Cloud@Customer allows organization management to focus on more strategic business priorities than patching, provisioning, and tuning databases.

Overall Conclusions

Wikibon concludes that for organizations with large-scale mission-critical applications requiring a Tier-1 database, both Oracle Autonomous Database on Exadata Cloud@Customer and Dedicated Region Cloud@Customer are superior to cloud alternatives from AWS, Microsoft, and Google. The Oracle implementation is lower risk, has higher functionality, and offers broader opportunities to redeploy or reduce internal skilled IT headcount. The latest Oracle Cloud@Customer offerings deliver an important first step in the cloud implementation of large-scale mission-critical applications. Above all else, organizations avoid the cost and risk of conversion from Oracle to alternative platforms.

Wikibon believes that Oracle is serious in migrating existing global 2000 customers to Oracle Cloud@Customer services. Success will help Oracle to develop further the automation and monitoring services, and establish better economies of scale. Wikibon believes that Oracle has a good chance to establish Cloud@Customer as the de facto standard for large-scale mission-critical Oracle Database cloud on-premises environments.

One concern that customers have expressed to Wikibon is the presenting of different cloud strategies by different Oracle sales teams. Wikibon recommends that Oracle should develop one joint overall strategic

plan for migration to Oracle Cloud services with its global 2000 customers.

Action Items

We believe that with this announcement, Oracle is redefining the cloud experience and breaking new ground. In our view, large Oracle customers running mission-critical applications on Oracle Databases should investigate this approach as a fundamental component of their cloud migration strategy. However, we believe it's also critical to have a concrete plan to redeploy existing labor into more strategic projects than database task management.

Global 2000 customers running mission-critical large-scale applications on Oracle Databases should assume that they will migrate to either Autonomous Database on Exadata Cloud@Customer or Dedicated Region Cloud@Customer. Wikibon recommends that CxOs begin engaging with Oracle to conduct their TCO/ROI/IRR analyses now.

References

Wikibon Analysis

Previous reports on Oracle's Exadata and Cloud@Customer strategies include:

Oracle Exadata X8M Powers Multi-Cloud Strategy *12/29/2019*
Oracle Ups its Game with Gen 2 Exadata Cloud at Customer *09/24/2019*

Oracle References

Wikibon is often critical of Oracle announcements for being signposts rather than available products. With this announcement, Oracle has provided a number of customers who have already installed Exadata and Cloud@Customer and are happy about the strategy and the experience.

Following are the links to the videos and the customers' quotes:

Samsung SDS

Samsung SDS is the largest organization cloud solutions provider in Korea, delivering data-driven digital innovations to customers in 41 countries worldwide. "Back in 2010, we adopted the first Exadata platform to improve a display manufacturing system," said Dr. WP Hong, CEO, Samsung SDS. "Now 10 years later, we have implemented nearly 300 Exadata systems for our customers in manufacturing, financial services, construction & engineering, and public & private sector services. Aligning with our digital innovation strategy and our journey to organization cloud, we have now adopted the first Exadata Cloud@Customer in one of our datacenters and look forward to deploying Autonomous Database."

The Samsung video is available at https://www.youtube.com/watch?v=q_TsuEKoUDY.

NTT DoCoMo

NTT DoCoMo is the number one mobile carrier in Japan with the largest customer base. "Oracle Exadata is implemented as our core engine to process the call, communication, and billing information of 80M users in real-time," said Taku Hasegawa, Senior Vice President and General Manager of Information Systems, NTT DoCoMo. "Thanks to Exadata, we could cut operation and maintenance costs in half, while realizing 10x performance. As the core infrastructure for DoCoMo's digital transformation and further business growth, I look forward to the continuous evolution of Oracle Exadata and the novel technology innovation driven by Autonomous Database on Exadata Cloud@Customer."

The NTT DoCoMo video is available at https://www.youtube.com/watch?v=NHilWEUCINw

Crédit Agricole CIB

Crédit Agricole CIB is the Corporate and Investment Banking arm of the Crédit Agricole Group, one of the world's largest banks. "Moving to Exadata Cloud@Customer has significantly improved our accounting information systems performance, which has enabled us to carry out our accounting closing process with much greater agility and to reduce our operational costs," said Pierre-Yves Bollard, Global Head of Finance IT, Crédit Agricole Corporate & Investment Bank. "The high value provided by the Exadata Cloud@Customer infrastructure has been recognized by all IT and business teams."

Entel

Entel is the largest telecom provider in Chile and the third largest in Peru. "We have used Exadata systems for the past five years to support many applications across dozens of lines of business, including crucial billing and network management systems," said Helder Branco, Head of IT Operations, Entel. "By using Exadata, we improved mission-critical Oracle Database performance by up to 3x and reduced our security exposure. We are taking our digital transformations to the next level by moving over 30 databases to Oracle Autonomous Database on Exadata Cloud@Customer and improving their security with its self-securing capabilities."

The Entel video is available at https://www.youtube.com/watch?v=67bVQbvA4jE

The State of Queretaro, Mexico

The State of Queretaro is located in central Mexico. "Based on a directive from the state governor and state secretary to address the COVID-19 crisis, we were asked to develop an application that would allow the citizens and patients of the State of Querétaro, Mexico, to carry out a self-diagnosis to help avoid the spread of infections," said Pedro Gonzalez, Director CIAS, Queretaro State Government, Mexico. "With Oracle Database on Exadata Cloud@Customer, we were able to react quickly and develop a mobile application in less than three weeks—plus we were able to adhere to state regulations to maintain the sensitive data of citizens and patients in our facilities. We look forward to investing in Oracle Autonomous Database this year, which will free up our staff and resources to focus on developing new business applications without spending any time on patching, tuning, and maintaining the database.

Nomura Research Institute (NRI)

Nomura Research Institute (NRI), Ltd. is the largest consulting firm and IT solutions provider in Japan. "With Oracle Dedicated Region Cloud@Customer, we can use Oracle Exadata as a cloud service and achieve greater agility, such as seamless expansion, while maintaining high availability at the same level as on-premises," said Tomoshiro Takemoto, Senior Corporate Managing Director, NRI. "Built in our own datacenter, it also enables us to not only provide SOC2 reports based on Japanese security standards in financial industries, but it also allows us to access broader cloud services and tools provided by Oracle and further increase our business value for our customers."

NRI Adopts Oracle Dedicated Region Cloud@Customer

Oman ICT Group

"Oracle Dedicated Region Cloud@Customer enables a variety of use cases, from migrating Oracle ERP and CRM applications to deploying custom-developed applications using Oracle Database, as well as implementing Digital Innovation Services (Blockchain, AI, Big Data) and High-Performance Computing (HPC), all while following the country regulations regarding data sovereignty," said Said Al-Mandhari, CEO, Oman ICT Group.

The Oman ICT Group video is available at https://www.youtube.com/watch?v=UqDqGmX5PQc

Oracle Cloud@Customer Brings Full Cloud Experience On-Premises

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