

OFFERING OVERVIEW

Oracle Raises the Stakes in the Next-Gen Compute Platform Market

How the Addition of Oracle Autonomous Database and Dedicated Region to Oracle Cloud@Customer Enables Infinite Computing



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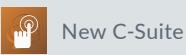
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EXECUTIVE SUMMARY

This Offering Overview examines the recent Oracle announcement of additions to Oracle Cloud@Customer—Oracle Autonomous Database and Oracle Dedicated Region—and how these change the market for next-generation compute platforms. The report describes the underlying market trends, introduces the vendor and presents key differentiators for Oracle's offering advancements. The report continues with an analysis of the strengths and weaknesses of the vendor and concludes with a set of tangible and actionable recommendations for CxOs.

Business Themes



New C-Suite



Data to Decisions



Technology Optimization

ABOUT ORACLE'S NEXT-GENERATION COMPUTE OFFERINGS

Overview

Oracle has a unique vision among those in this technology vendor field, creating the largest integrated “chip-to-click” integrated hardware and software offering on-premises and in the cloud—one that ranges from the silicon (the “chip”) to the user (the “click”) in software-as-a-service (SaaS) offerings. More recently, in the summer of 2018, Oracle announced its plans to deliver the Oracle Autonomous Database (see Figure 1).

A few months later, Oracle released the first versions of Oracle Autonomous Database at Oracle OpenWorld 2018. Oracle’s goal is to automate the operation of its database to a level where it

Figure 1. Larry Ellison Announced the Oracle Autonomous Database on August 7, 2018



Source: Constellation Research

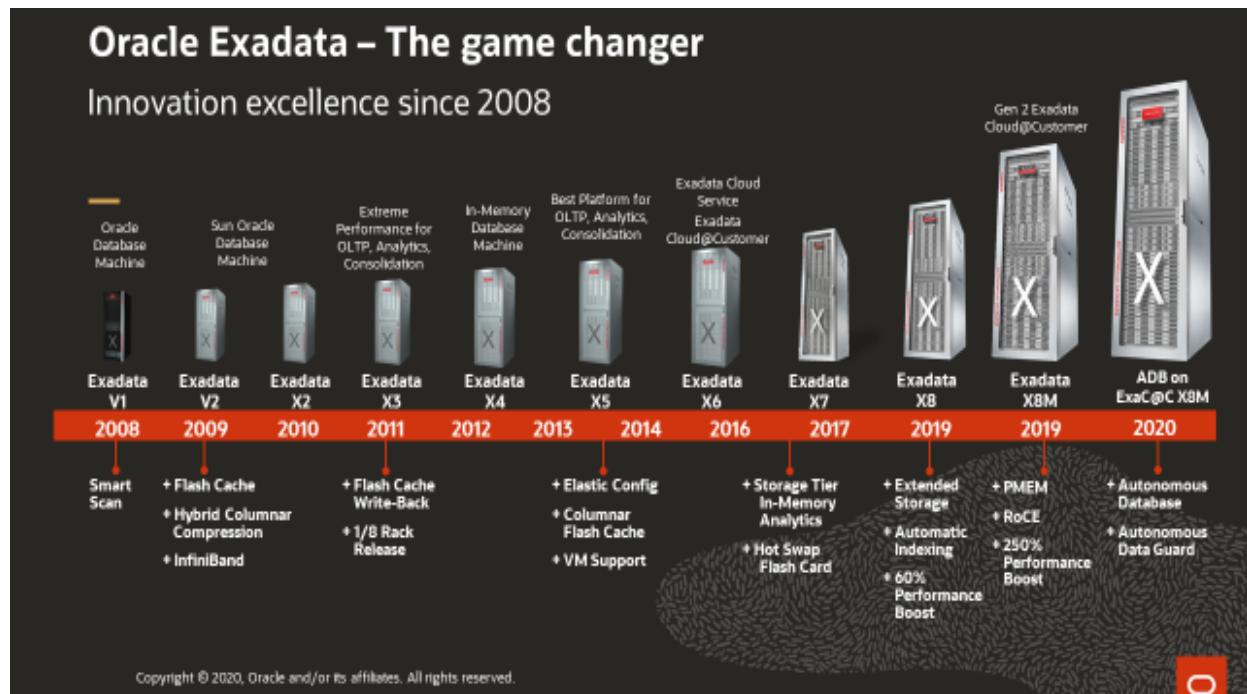
becomes “self-driving,” effectively managing itself. This is a radical departure from the human-operated administration of databases by database administrators (DBAs). Advances in compute, machine learning (ML) and the cloud enabled Oracle to develop the world’s first Autonomous Database.

The benefits of an autonomous software offering (especially in a software category that is mission-critical, like a database) are clear: Software is available 24/7, and unlike DBAs, it does not take a vacation, get sick or have bad days at work. Most importantly, it is always secure.

Surprisingly, that compelling vision has solicited practically no response from Oracle’s competitors in the database field—including AWS, Microsoft and IBM—creating a multiyear lead for Oracle in this important innovation area.

On the hardware side, Oracle has continued to build out its Oracle Exadata line of products (see Figure 2). The goal is to create a hardware and services platform designed to run the Oracle Database

Figure 2. Oracle Exadata's Innovation Track Record



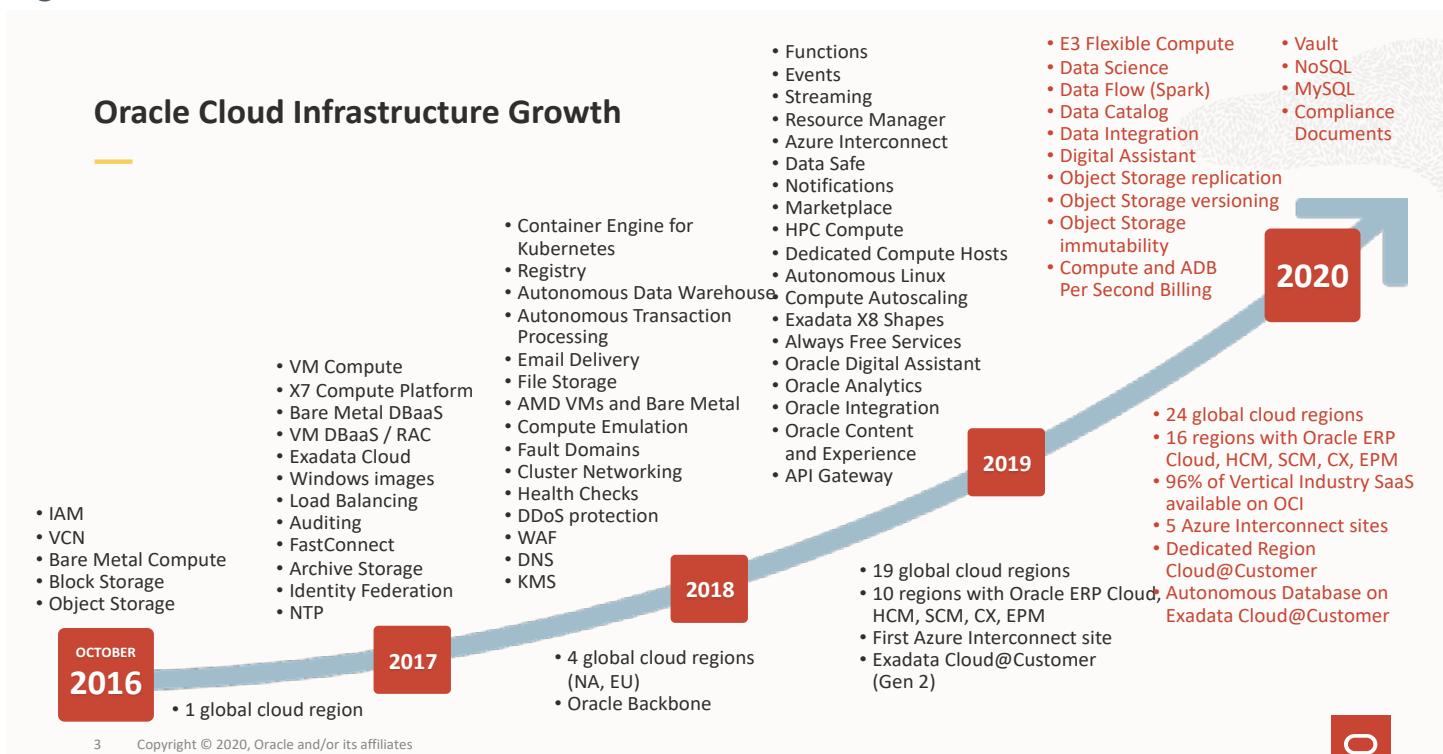
Source: Oracle

and other Oracle offerings faster and more efficiently than any other hardware platform. The latest version of Oracle Exadata is the X8M model.

The knowledge and experience gained in building the software gives Oracle a distinct advantage. It has helped Oracle to design the hardware platform and services offerings in such a way that customers experience a lower total cost of ownership (TCO) running Oracle Database on Oracle Exadata systems compared with any other platform available. This achievement is a key validation for engineered systems being superior at running the workloads for which they were designed—compared with other hardware designed for all-purpose uses.

On the cloud side, Oracle launched its second-generation cloud, Gen 2 Oracle Cloud Infrastructure (OCI), in 2018. The redesign of the second generation of cloud infrastructure has helped Oracle gain competitiveness in the general cloud market, featuring such differentiators as three data centers in a single region and more (see Figure 3).

Figure 3. The Evolution of Oracle Cloud Infrastructure Generation 2



Source: Oracle

Oracle has demonstrated a “cloud-first” approach to its innovations, bringing new offerings such as the Oracle Autonomous Database first to its own cloud infrastructure. This is a valid and proven approach, as CxOs appreciate when technology vendors implement their innovations first in a close and controlled environment, such as their own cloud infrastructure. At the same time, though, CxOs require innovation to run in their own data centers, for data residency/compliance, performance and continuation of IT’s modus operandi. Oracle has offered Oracle Exadata Cloud@Customer for these customers—those who have been successfully operating the full Oracle technology stack in their own data centers—all while being managed remotely by Oracle.

As of summer 2020, several Oracle product and service innovations have come together again with Oracle Autonomous Database on Oracle Exadata Cloud@Customer on the latest version of Oracle Exadata X8M, and also available as part of Dedicated Region Cloud@Customer, which includes all Oracle public cloud services, including SaaS, Bare Metal Compute, Kubernetes and more.

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 infrastructure-as-a-service (IaaS) vendors.¹

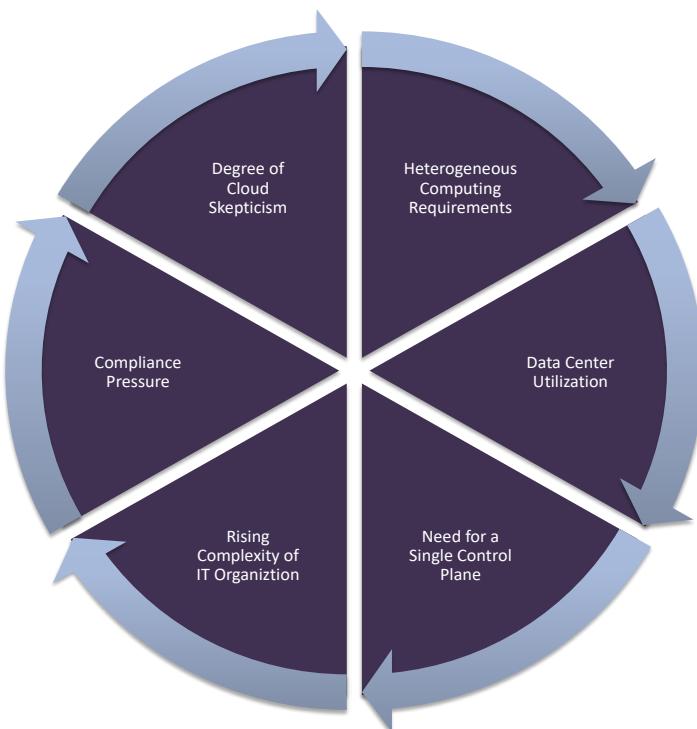
CxOs who have to manage on-premises workloads also find that value proposition—the elasticity of computing resources—attractive. IaaS vendors have realized this and added offerings that make parts of their IaaS infrastructure available on-premises. Effectively, the public cloud enables the era of “Infinite Computing.”²

This report discusses six trends shaping this market.

Market Trends

The following six market trends characterize the management of computing infrastructure (see Figure 4).

Figure 4. Six Market Trends Defining a Next-Gen Computing Platform



Source: Constellation Research

CxOs Must Support Heterogeneous Computing Demands

CxOs confront 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). In addition, 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).

CIOs Fear Fluctuations in 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.

Enterprises Seek a Single Control Plane

The era of CxOs simply accepting that new products bring a new control plane is history. CxOs operating next-generation applications³ must run them as efficiently as possible, via a single control plane. This not only allows 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.

Enterprises Face a 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 creates more heterogeneity and increases the complexity of IT operations.

The Compliance Pressure Increases

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 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.

Leaders Still Express 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.

The Automation Imperative

Human history is characterized by ingenuity in inventing tools and machinery to automate necessary activities with the purpose of improving living conditions. The manual labor component in the automation equation has been continuously decreasing over the centuries, with the biggest leaps in the last decades. Digitalization has been more than well described and touted as the Fourth Industrial Revolution. Traditional drivers for higher levels of automation have been the cost of labor, the inability of humans to perform tasks from a physiological perspective and, more recently, by unavailability or scarcity of talent. The automation equation may be viewed in yet another way in the light of “black swan” events such as the COVID-19 pandemic.

So, let's look at the two dimensions that define the automation decision space:

- **Affordability.** The required investment into automation needs to be affordable and “pay for itself” after a reasonable time of operation compared with the cost of human labor for the same task.
- **Quality.** The quality of an automated process needs to be comparable. It is defined by marketability and continuity on the lower end and by affordability at the high end.

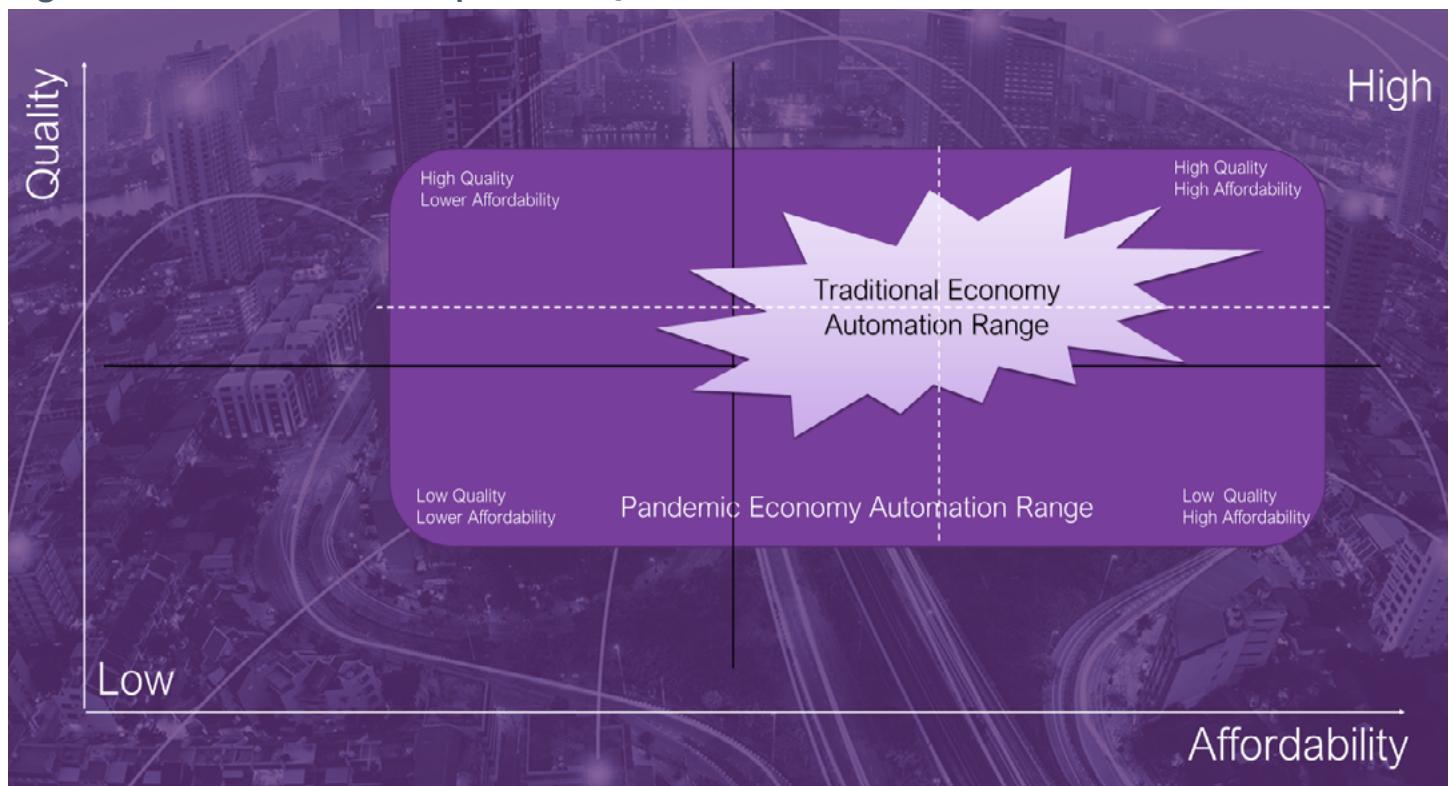
CxOs make decisions about automation every day, guided by affordability (asking: “Can we pay for this? Does this investment have a payback?”) and quality (asking: “Is this better or worse than what our employees can deliver? And, if worse, is it still marketable?”) (see Figure 5).

When events such as a pandemic happens, the automation range expands in all directions. As a result:

- **Higher/same affordability and higher/same quality:** These automation projects should have already been done, often a long time ago, but the enterprise did not get to them. These are the fabled “skeletons in the closet” that should and could have been addressed in the past.

Example: Replace layered, uncontrolled wired network infrastructure with Wi-Fi.

Figure 5. The Automation Imperative Quadrant



Source: Constellation Research

- **Lower affordability and higher/same quality:** These automation projects are defined by affordability. The affordability equation changes when human labor is not available for the task.

Example: Get automatic dishwashers into commercial kitchens to replace human dishwashers.

- **Higher/same affordability and lower quality:** These automation projects are defined by marketability and acceptance of the result. This is the traditional automation thrust of enterprises, fueled by the need to reach higher efficiency levels.

Example: Use an electronic assistant to answer customer service questions versus a human operator.

- **Lower affordability and lower quality:** These automation projects are still affordable to an enterprise but yield lower quality. They are still justified as they provide a marketable product/service or ensure and guarantee uptime. Often ROI is created over volume.

Example: Mass production of cheaper/lower-grade toys.

So, what determines the overall number of solutions that can span enterprises' candidates for an automation project? Because all investments require capital, it is naturally determined by capital at hand and expected cash flow that can replenish and grow the capital at hand. Naturally, CxOs will flock toward investments in automation that provide high affordability and high quality. However, in a people-challenged world during a pandemic, it is important to consider the less-affordable automation projects as well, especially if they offer the potential to keep the business going. Consider an office/facility cleaning robot that can keep a people workspace open at any given/wanted time that an enterprise needs the space.

A closer look at Oracle Autonomous Database and the solutions powered and enabled by the offering are clearly in the high-affordability and high-quality range. The additional cost of Oracle Autonomous Database is negligible compared with the cost of personnel handling the task. That affordability becomes even more valuable when considering that the COVID-19-related absence of human DBAs can bring an enterprise to a screeching halt. For CxOs, it means that adopting Oracle Autonomous Database is a “no-brainer” project. The benefits occur not only from automating the database-related tasks but also from freeing up scarce and costly resources for more challenging and innovative alternative work.

Finally, the autonomous automation capabilities of the Oracle Autonomous Database make the database IT services outsourcing market obsolete. Now CxOs do not have to rely on external service providers for crucial database management services but can take advantage of the built-in native automation capabilities of Oracle Autonomous Database. This not only benefits an enterprise with budget savings, it also reduces the complexity of database operations.

FUNCTIONAL CAPABILITIES

A 10+-Year Innovation Record Culminates with the Latest Release of Cloud@Customer

Oracle did not become the leader of relational database systems (RDBMSs) overnight. In fact, it has innovated on architecture, management and deployment of databases for over 40 years. Today, Oracle customers can benefit from that investment, as Oracle Autonomous Database in its turn benefits from the automation created over the last two decades (see Figure 6).

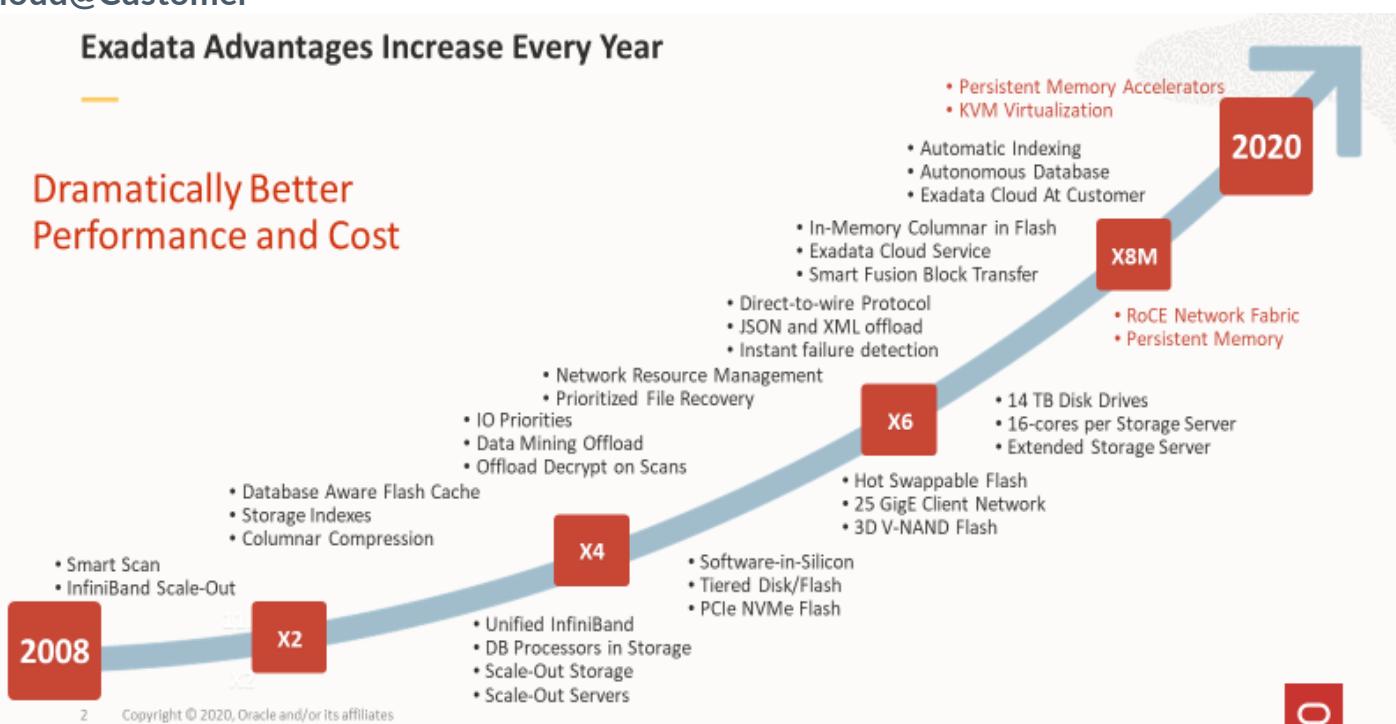
Dedicated Region Cloud@Customer Enables Full Cloud On-Premises

With Dedicated Region Cloud@Customer, Oracle has reached a new level in the next-generation compute market. Next-generation compute platforms are platforms that run in both the public cloud

Figure 6. Oracle's 10+-Year Innovation Record on the Way to Oracle Cloud@Customer

Exadata Advantages Increase Every Year

Dramatically Better Performance and Cost



Source: Oracle

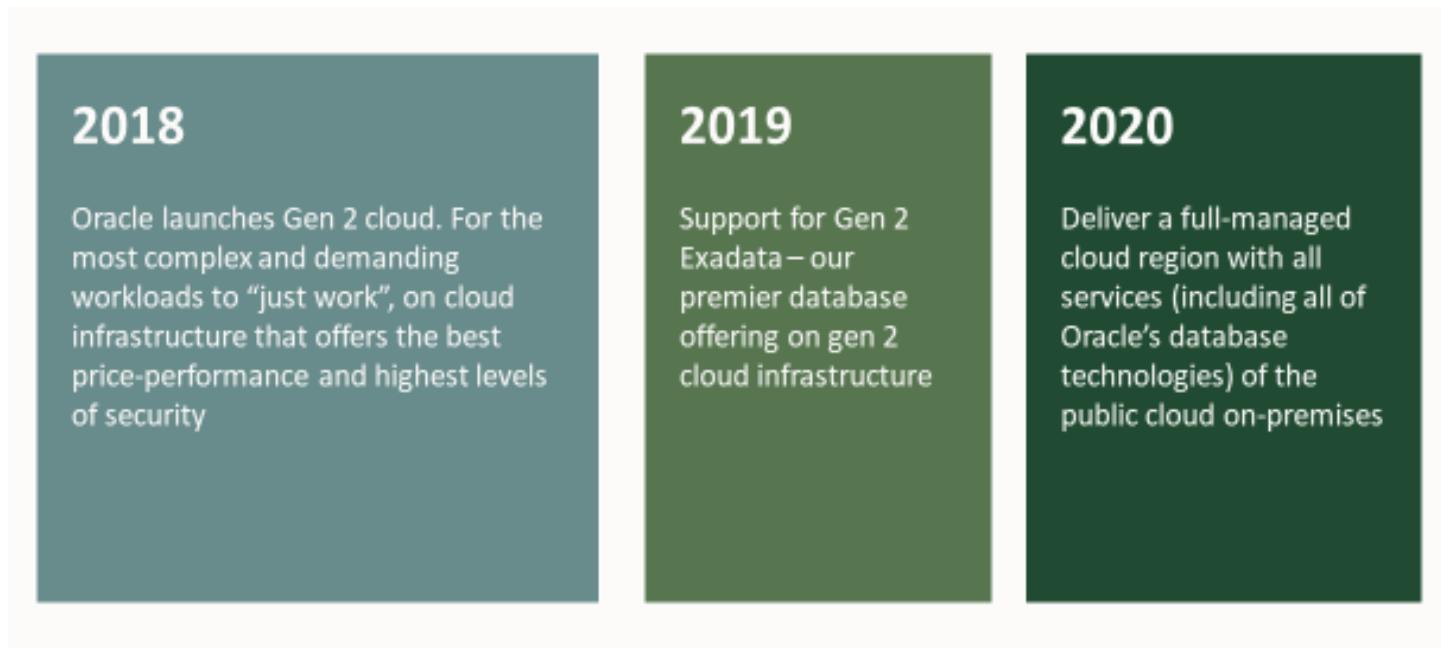
and on-premises. Successful offerings in that space offer a high degree of identicity between the deployment forms, allowing CxOs a high degree of workload portability and investment protection.

Oracle's Dedicated Region offering allows customers to match an on-premises deployment with a public cloud experience. Effectively, the customer data center running the Oracle stack becomes an Oracle region as part of the Oracle Cloud Infrastructure service. This gives CxOs the peace of mind that their on-premises Oracle stack is being managed as well and as efficiently as Oracle is managing its public cloud data centers. This is of huge value not only from the view of the complexity of the task at hand, but also because it allows teams to focus on more high-value activities for IT (see Figure 7).

In detail, Oracle Dedicated Region Cloud@Customer offers the following:

- **Attributes and benefits of the public cloud.** In effect, Oracle offers the same capabilities to customers in their data center as within an Oracle public cloud region. This means the same architecture, the same services, the same operations, the same

Figure 7. The Evolution of Oracle Cloud Infrastructure



Source: Oracle

service-level agreements (SLAs), the same security and the same billing model. This high degree of identicality makes the overall Oracle offering unique compared with its next-generation computing platform competitors.

- **Full isolation and security of on-premises infrastructure.** Delivery of Oracle cloud services happens on the dedicated Exadata and server infrastructure located within an enterprise's data center behind their firewall but fully managed by Oracle. As a result, data never leaves the enterprise data center.

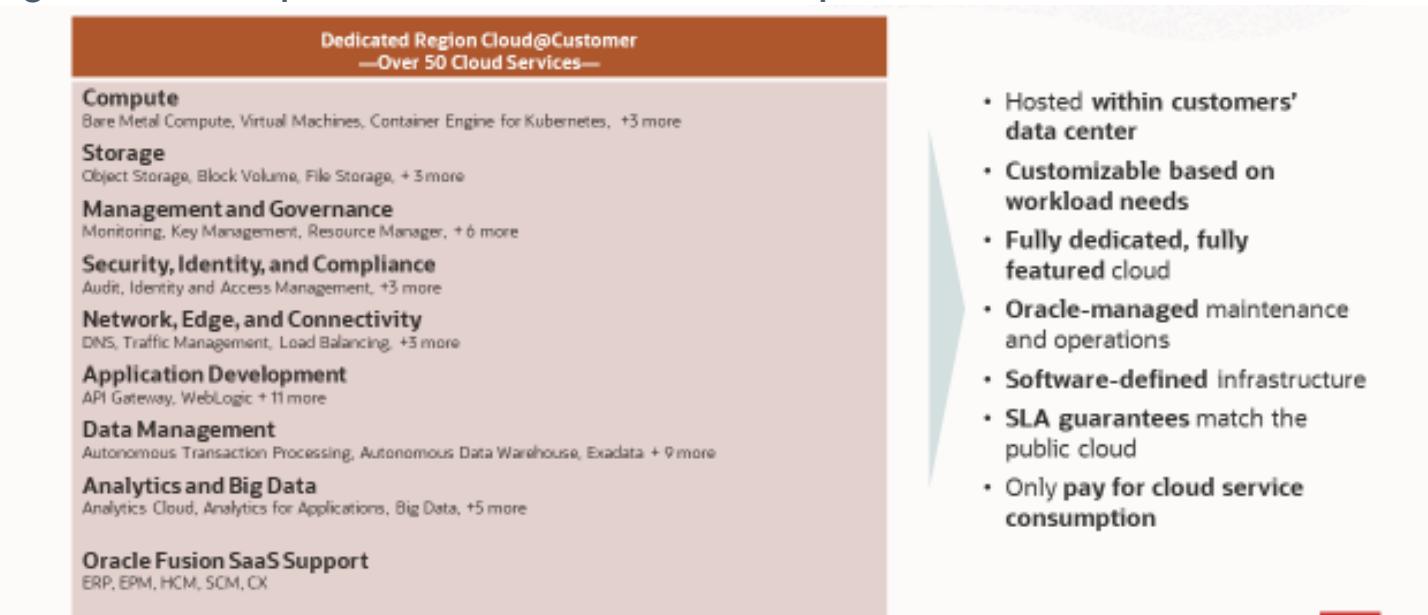
The Full Oracle Cloud Stack—On-Premises

Over the last two decades, Oracle technologies have continuously grown in all directions—vertically and horizontally. It is one of the few chip-to-click technology stacks remaining in the industry, and with that, it offers enormous automation advantages. However, like everything powerful, the Oracle technology stack also comes with significant management complexities. As a result, enterprises keen to pursue on-premises data automation find special value in being able to deploy the full Oracle public cloud technology stack in their local data centers (see Figure 8).

In practical terms, this enables a fully dedicated and fully featured cloud infrastructure for customers with no compromise on capabilities that are available in Oracle's public cloud and in their on-premises cloud deployment of Dedicated Region Cloud@Customer. True to its on-premises nature, Oracle Cloud@Customer allows customers to do more customization regarding specific workload needs—for instance, in data warehousing and the big data space.

Oracle Dedicated Region Cloud@Customer runs all database services on Exadata X8M platforms and all other Oracle Cloud services—including SaaS, Bare Metal Compute and Kubernetes—on Oracle x86 servers. Remarkably, Oracle offers the same SLA guarantees for Oracle Dedicated Region Cloud@Customer as on the Oracle Cloud. On the commercial side, Oracle brings the cloud model on-premises, as customers only pay for cloud services consumption starting at a rate of \$500,000 per month.

Figure 8. The Complete Oracle Stack Comes to Enterprise Data Centers



Source: Oracle

- Hosted within customers' data center
- Customizable based on workload needs
- Fully dedicated, fully featured cloud
- Oracle-managed maintenance and operations
- Software-defined infrastructure
- SLA guarantees match the public cloud
- Only pay for cloud service consumption

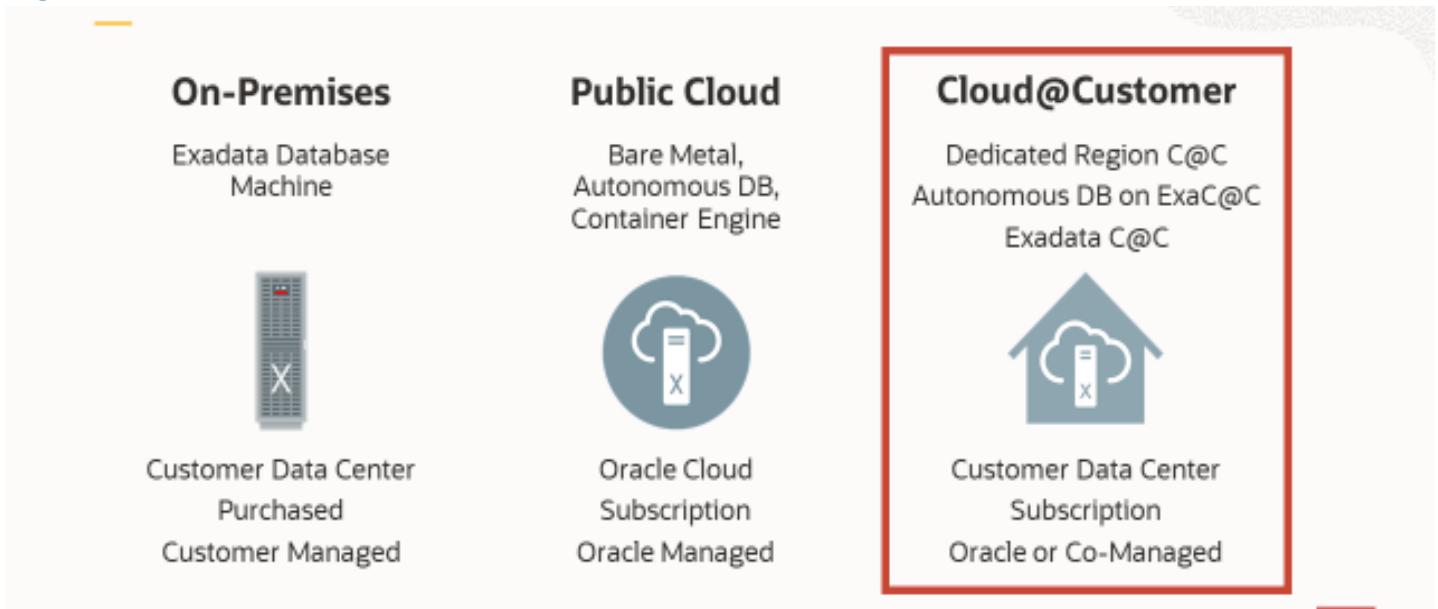
Deployment Flexibility

CxOs want deployment flexibility, allowing them to deploy data and software assets onto different platforms from on-premises to the cloud. This gives their enterprises freedom of choice that is often needed from both a statutory/legal as well as commercial perspectives. Nothing is worse for an enterprise than being locked into a deployment form that no longer delivers benefits.

Oracle offers three different forms of deployment for Autonomous Database (see Figure 9):

- **On-premises: Oracle Database on Exadata Database Machine.** This is the traditional way of operating IT—purchase hardware, Oracle Database licenses and in-house or outsourced management, support and maintenance. This approach has served enterprises well for many decades. It still delivers value for many enterprises around the world. Oracle currently enables certain features from Autonomous Database, such as Automatic Indexing, to run exclusively on on-premises Exadata systems.

Figure 9. Oracle Choice of Deployment for the Oracle Stack



Source: Oracle

- **Public cloud: Autonomous Database on Exadata Cloud Service.** In this public cloud deployment, Oracle runs the Oracle Autonomous Database on an Exadata-backed Oracle Cloud Infrastructure (OCI), offered as a subscription service. Typically, Oracle manages the complete infrastructure but also allows the customer to take the lead and offer a co-management model. In either case, Oracle has no visibility into customer data; the customer manages the data and database schemas.
- **Cloud@Customer: Autonomous Database and Dedicated Region on Exadata Cloud@Customer.** With its Cloud@Customer service, Oracle extends the benefits of cloud to local data center deployments. Enterprises still want/need to operate in their local data centers, usually motivated by performance reasons, statutory demands, performance or tightly integrated applications. However, by offering to manage or co-manage the resource and by offering a subscription, Oracle created new value for these customers, enabling a pay-as-you-go model for resource consumption. With the arrival of the Oracle Autonomous Database on Exadata Cloud@Customer, enterprises can now run Oracle's most advanced database offering on-premises for the first time. Moreover, with Dedicated Region Cloud@Customer, organizations can run the entire

catalog of more than 50 Oracle Cloud services, including Autonomous Database and SaaS applications.

Dedicated Region Cloud@Customer is for customers that want Cloud functionality beyond the database or want a large-scale deployment. Gen 2 Exadata Cloud@Customer is for customers that only want database cloud functionality and are planning to use their existing on-premises applications unchanged.

Constellation assumes that Oracle's experience in managing database workloads as a service via the Oracle Cloud@Customer offering was a major motivator behind the company's increased investments in autonomous database management services. Oracle was not merely motivated to provide a high-quality, highly reliable database management service; it was also motivated to provide that at competitive costs. This is likely to have triggered the realization that self-driving, autonomous databases are superior for customer experience and TCO. This unique situation creates extra motivation for Oracle to operate the Oracle Autonomous Database in a reliable and cost-effective way. These mechanics are key for CxOs to understand when they make database choices.

Autonomous Architecture Delivers Exponential TCO Reductions

A traditional problem of IT has been the sizing of compute infrastructure to run workloads optimally. Traditionally, enterprises had no choice but to disallow usage peaks or to size their hardware to support usage peaks. Both were compromises, with the former resulting in a subpar customer/employee experience, and the latter resulting in significant capex sunk into overprovisioned hardware.

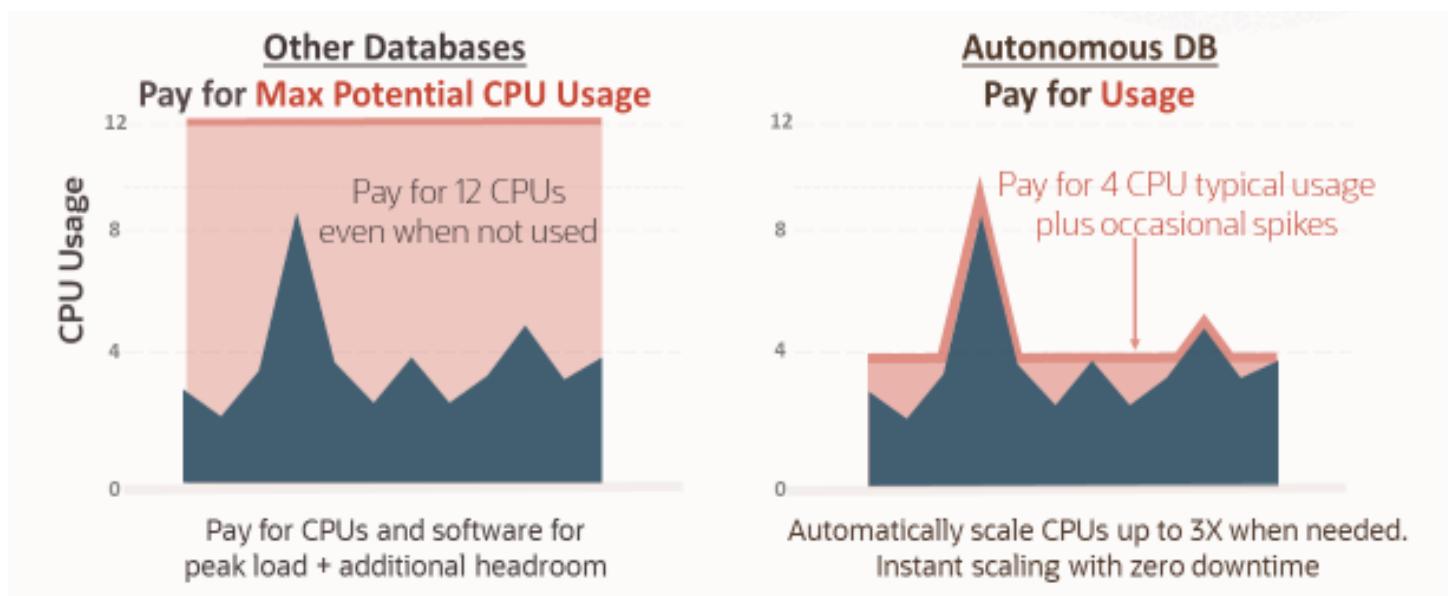
The automation capabilities of Oracle Autonomous Database put an end to this dilemma. In combination with the highly scalable Oracle Exadata infrastructure, this allows workloads to scale substantially. CxOs still must pick several Oracle Compute Units (OCpus), but they can be more conservative in looking for average loads to size them correctly. Workloads that peak beyond the OCPU level are handled by the Oracle Autonomous Database elastically all the way to 3x the OCPU capacity. Enterprises still must pay for the extra usage, but when picking the number of OCpus carefully, this setup can result in substantial savings compared with an overprovisioned system. OCPU levels drop back down when the peak usage is over. In either case, there is no downtime (see

Figure 10). In addition to true pay-per-use, Autonomous Database is also serverless so, when a user is done running a job, the server turns off and there is no charge. In contrast, other cloud providers keep charging for the server even though it is not being used.

With this approach, Oracle effectively offers the best of two worlds: provisioning for average workloads while paying for peak usage. The pay-per-use aspect is what CxOs value, as they often cannot foresee the peak usages of their enterprise. Ideally, the peak usage is also associated with revenue events that comprise the major value creation of the enterprise, which funds the additional cost for the extra capacity.

Oracle would not be able to offer this technical and commercial elasticity if it were not able to run Oracle Autonomous Database in a highly automated way for customers. It also helps that the Exadata platform on which these loads run was specifically designed as a scale-out architecture that can handle the peak usage without performance degradation.

Figure 10. True Pay-per-Use with Oracle Autonomous Database



Source: Oracle

Customer References

Oracle announced a number of customers along with its product news:

- **Samsung SDS.** South Korea's leading global IT services provider currently has over 300 Exadatas deployed across dozens of lines of business and hundreds of applications. It has adopted Exadata Cloud@Customer and is moving to Autonomous Database on-premises.
- **Entel.** The largest telco in Chile and third largest in Peru cited a 3x performance increase running Oracle Database on Exadata versus DIY equipment and is moving 30 databases on to Autonomous Database Exadata Cloud@Customer.
- **Oman ICT Group.** The Oman ITC Group chose Dedicated Region Cloud@Customer to meet the Sultanate's needs of digital transformation: the newest Oracle Cloud innovations always available, the highest level of data privacy, strong SLAs and the best economics.
- **Nomura Research Institute (NRI).** NRI can achieve agility, comply with strict regulations and reduce operational costs by using a full Oracle Cloud in its data center with Dedicated Region Cloud@Customer.

Oracle has thousands of customers using Oracle Autonomous Database. Here are a few of them:⁴

- **Agea halves TCO for Data Warehouse.** The largest newspaper of Argentina switched to Oracle Autonomous Data Warehouse and saw a reduction of TCO by 50%. Time-to-market for campaigns is now hours, down from four days. The switch allowed Agea Clarin to gain US\$2 million in revenue over 18 months.
- **CERN Openlab accelerates science with Oracle Database.** The European Laboratory for Particle Physics, CERN, uses the Oracle Autonomous Database to support the control systems of its Large Hadron Collider. CERN now sees the database scale

up faster by a factor of 10x, and Kubernetes scale up by a factor of 3x. CERN also developed a cloud-native app for 75,000 users in 75 days on the platform. And all that with zero resources spent on database management.

- **Kingold accelerates insights.** The Chinese property developer reduced its data warehouse timelines from 3–6 months to a few weeks. Complex reports now run in 41 seconds instead of 12 minutes. The new autonomous database strategy has empowered the organization to become more data-driven.
- **Mestec innovates with Oracle Autonomous Database.** Mestec is an Oracle ISV that specializes in manufacturing execution systems (MES). Mestec saw a 50% productivity increase in its factory automation processes. Using Azure Interconnect between Azure and Oracle increased performance by 600%. CPU and other hardware and labor costs were halved.
- **TaylorMade saves big on reporting.** The golf equipment maker moved a 1 TB database out of its on-premises ERP solution and reduced costs by 40%. It has also seen a 40x performance improvement for reporting workloads. All this while IT staff was freed up from database management tasks and focusing on higher-value work projects.

Oracle equally has numerous customers using Oracle Exadata Cloud@Customer, the version before the addition of Oracle Autonomous Database:

- **Crédit Agricole gets value Oracle Exadata Cloud@Customer.** 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," says Pierre-Yves Bolland, 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."

- **RKK saves and accelerates with Oracle Exadata Cloud@Customer.** RKK Computer Service is an IT consultancy based in Japan, focusing on local governments and financial institutions. “RKK Computer Service selected Oracle Exadata Cloud@Customer to host our shared platform that runs core business systems for 100 municipalities,” says Chihiro Sato, Deputy General Manager, Public Sector Planning and Development Division, RKK Computer Service. “Compared to our previous on-premises solution, we have 24% cost savings and more than 70% I/O performance improvement, which enables us to run concurrent batch processes for multiple municipalities. High availability is achieved with RAC and Data Guard. We believe that Oracle Exadata Cloud@Customer is a promising cloud platform for municipalities. RKKCS will continuously enhance our cloud infrastructure for municipalities by exploring Autonomous Database on Exadata Cloud@Customer to improve operational efficiency.”
- **Oracle Exadata Cloud@Customer helps the State of Querétaro in its COVID-9 response.** The State of Querétaro 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,” says Pedro Gonzalez, Director CIAS, Querétaro 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.”
- **Seneca College achieves student uptime with database migration to Oracle Exadata Cloud@Customer.** Seneca provides a polytechnic education to 30,000 full-time and 60,000 part-time students. “Refreshing our trusted on-premises Exadata with Exadata Cloud@Customer provides us the advantages of a performant and robust platform,

which we know, the flexibility of the cloud, and a seamless transition to Oracle Cloud Infrastructure,” says Radha Krishnan, CIO, Seneca College. “The Exadata C@Cs were deployed and activated within two weeks, and after migrating 60 databases in three months, we went to production. We were able to adopt cloud in a nondisruptive and controlled way, and the zero downtime updates allow us to transparently service our students without interruption.”

- **Siav benefits from Oracle managing its Oracle infrastructure on premises.** Siav is an enterprise content management software and IT services company based in Italy. “We chose Oracle Exadata Cloud@Customer to help us manage the constant growth of our business in cloud services and solutions,” says Nicola Voltan, CEO, Siav S.p.A. “Exadata Cloud@Customer provides the performance, scalability and security we need to offer the highest-quality service to our customers. It’s managed by Oracle in our data center, enabling us to comply with the Italian legislation related to the geographical location of the service provided.”

PRICING

Oracle Autonomous Database on Exadata Cloud@Customer pricing starts at \$10,800 per month; Oracle Dedicated Region Cloud@Customer pricing starts at \$500,000 per month.

Oracle requires a minimum three-year consumption-based commitment, and organizations pay only for what they use. Rates are transparent thanks to public rate cards. For Dedicated Region Cloud@Customer, the monthly \$500,000 service fee can be used against any Oracle IaaS and any platform-as-a-service (PaaS) offerings.

Constellation can provide price benchmarking for clients on request.

ANALYSIS AND OBSERVATIONS

Constellation sees the following strengths and weaknesses for the Oracle’s two new Cloud@Customer announcements (see Figure 11, p. 27).

Strengths

- **Innovation lead with Oracle Cloud@Customer.** Oracle has a major lead in the drive to create a next-generation compute platform that allows enterprises to move workloads between on-premises and the public cloud. Oracle offers the highest degree of identicality between the cloud and its on-premises offerings and, with that, CxOs gain key investment protection and peace of mind for running their next-generation applications. Oracle leads in architectural identicality with Oracle Cloud@Customer offerings compared with the other vendors in the Constellation Market Overview, including AWS, Google Cloud, IBM and Microsoft Azure. Oracle Autonomous Database, available on Exadata Cloud@Customer and Dedicated Region Cloud@Customer, adds more distance to this lead.
- **Proven product with tangible TCO.** As a mature offering, proven over three years in production, Oracle has shown that the Oracle Autonomous Database delivers tangible TCO advantages. The maturity and functional capabilities—built-in converged, multimode, multitenant and multiworkload architecture (ADW, ATP), combined with autonomous capabilities deliver superior TCO for Oracle Autonomous Database.
- **Lack of Autonomous Database competition.** None of Oracle's principal database competitors have delivered a machine-learning-powered database comparable to Oracle Autonomous Database—including Microsoft, AWS, IBM, Teradata, as well as emerging database vendors such as Snowflake and Google. Oracle is at least two generations ahead of everyone else with respect to delivering a production-proven autonomous database—available in the cloud and on-premises.
- **Number of cloud services available on-premises gives CxOs high identicality.** With Dedicated Region Cloud@Customer, Oracle offers over 50 cloud services, including SaaS applications, in customers' data centers. This is a significant lead over Oracle's closest cloud competitors, AWS Outposts and Microsoft Azure Stack/Arc. This allows CxOs to move workloads between the Oracle Cloud and on-premises, an important benefit regarding deployment flexibility that is key to achieve the coveted Enterprise Acceleration gains that all enterprises need.

Weaknesses

- **Not (yet) a fully autonomous stack.** Just as it is valuable for enterprises to use the Oracle Autonomous Database, it also is critical that the overall software technology stack of an enterprise becomes autonomous. Uptime and security of the database are critical, but when users cannot get to their application because their not-yet-autonomous application server is down, it is still a business disruption. It does not change if Oracle manages it as an Oracle Cloud region—it still remains work that depends on humans more than it should, but at least the database capabilities are now covered, which is a substantial lead over the competition.
- **Inertia of old best practices.** For more than six decades, CxOs have run and maintained their workloads on-premises. Like any innovator, Oracle needs to convince CxOs that an Oracle-managed, autonomous offering is advantageous for their enterprises. Moreover, while the facts clearly speak for Oracle Cloud@Customer, enterprise decision-making is not always rational. Oracle needs to evangelize its new offering and the new best practices that go along with it. With many customer testimonials at its announcement—including Crédit Agricole, RKK, NTT DoCoMo, NRI and Samsung SDS—Oracle demonstrated that it is having some success on this front.
- **Specialized databases vs. Oracle's converged database.** Specialized databases can have very specific functional benefits, but they may simultaneously introduce systems complexity and management burdens that are a huge problem for enterprises. Oracle Autonomous Database as a converged database holds the promise of providing similar/adequate functional value of a specialized database, without all the added complexity, but enterprises need to evaluate each specific functional capability against the specialized database to substantiate a consolidation strategy to a single converged database.

Figure 11. Oracle Autonomous Database's Strengths and Weaknesses

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none">• Innovation lead with Oracle Cloud@Customer• Proven product with tangible TCO• No competition• Number of cloud services available on-premises	<ul style="list-style-type: none">• Not (yet) a fully autonomous stack, (but emerging, for instance, with Autonomous Linux and Autonomous Data Guard)• Inertia of old best practices• Outcome of the converged vs. specialized database battle

Source: Constellation Research

RECOMMENDATIONS

Constellation has the following recommendations to CxOs regarding Oracle Autonomous Database:

- 1. Accept the automation imperative.** Enterprises need to look at automation to increase their productivity and efficiency. The shift from specialized operations to self-driving software is in full swing, and Oracle is a pioneer in this move to autonomous solutions. Enterprises have never scaled through people but by using tools and automation. This creates the automation imperative regarding IT operations, where CxOs need to look at any automation option that is at their disposal. Fast economic turns likely accelerated by pandemic outbreaks further increase the pressure to automate and strengthen the automation imperative—that is, if a process can be automated, it should be. Remarkably, Oracle Autonomous Database is the clear leader in automation because no database competitor has stepped up to challenge Oracle (yet).
- 2. Oracle Database customers should evaluate Oracle Autonomous Database on Exadata Cloud@Customer and Oracle Dedicated Region Cloud@Customer sooner rather than later.** Existing Oracle Database customers will not have a difficult time deciding whether to adopt the Oracle Autonomous Database or Oracle SaaS applications on-premises. Nonetheless, they are advised to perform a cost-benefit analysis. The uncertainties around talent availability and the constant technical skills challenge should make this an easy business case for on-premises deployment of Oracle Autonomous Database and SaaS applications.

- 3. Non-Oracle Database customers need to do a cost-benefit analysis for a potential switch to Oracle.** Given the slow (or no) response by Oracle's traditional database competitors on the innovation included in Autonomous Database, non-Oracle customers should consider a move to Oracle Autonomous Database. An analysis naturally needs to include the cost of migration, cost for new licenses and cost of long-term operations. Constellation believes that Oracle can prevail as a winner in most cases, with application rewrite costs likely being the deal maker or showstopper.
- 4. CxOs need to consider Exadata as a platform for Oracle Database.** Oracle has spent a lot of time designing and manufacturing the ideal database platform to run the Oracle Database: Oracle Exadata Database Machine. The latest Exadata X8M platform needs to be evaluated by CxOs who use the Oracle Database, no matter which deployment form: on-premises, on Oracle Cloud or on Oracle Cloud@Customer. Purpose-built hardware always beats general do-it-yourself hardware platforms from the likes of HPE, IBM, Dell EMC and Hitachi.
- 5. Consider Oracle Autonomous Database for next-generation applications.** Enterprises need to build next-generation applications that reflect the new best practices in the era of Infinite Computing. The Oracle Autonomous Database is highly likely to deliver deployment and operational TCO savings over the competition. And with Oracle Dedicated Region Cloud@Customer, CxOs get the flexibility of workload deployment between on-premises and public cloud that they need to operate their enterprise at its best.
- 6. Practice commercial prudence.** As always, CxOs need to practice commercial prudence when it comes to platform decisions. One-time costs, ongoing costs and lock-in effects are the key areas of consideration before making platform decisions. Database platform decisions are no exception to the consideration of commercial prudence in all phases of the buying, adoption and usage cycle. Another consideration is the potential savings as outsourced services to operate and maintain Oracle Databases become obsolete with the adoption of Oracle Autonomous Database. This not only benefits an enterprise with budget savings but also reduces the operational complexity of database operations.

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