

REPORT: ORACLE MYSQL CLOUD SERVICE

# Enterprise-Class MySQL Meets Oracle Cloud

Oracle Database Service Combines MySQL Enterprise Edition  
Advantages, Hybrid Flexibility and Oracle Cloud Integration



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# EXECUTIVE SUMMARY

MySQL is the most popular open-source database in the world, according to the authoritative DB-Engines survey, so it should be no surprise that MySQL also ranks among the most widely used databases in the cloud. Not only are an inestimable number of the more than 15 million MySQL deployments running on cloud Infrastructure-as-a-Service (IaaS), but every major public cloud provider also has a managed MySQL Database-as-a-Service (DBaaS) offering. DBaaS is the easiest and most cost-effective way to use database capacity in the cloud because the service provider automates provisioning, deployment and ongoing maintenance tasks, including backups, patching and software updates.

Enter the Oracle MySQL Cloud Service, released for production on the Oracle Cloud in September 2016. This report explores how Oracle MySQL Cloud Service differs from other MySQL DBaaS offerings. For starters, it's the only DBaaS service based on the commercial MySQL Enterprise Edition. This paper details Enterprise Edition-related advantages in monitoring, backup, security, high availability and support. The report also details hybrid deployment flexibility and Oracle Cloud integrations unique to the service.

Constellation sees Oracle MySQL Cloud Service as a good option for including supporting on-premises MySQL Enterprise Edition or Community Edition deployments with backup and test/dev instances in the cloud or for migrating on-premises applications built on these databases to the cloud. It's also a good fit when developing and proving new MySQL applications in the cloud before moving them back on premises or when powering Software-as-a-Service (SaaS) applications. Finally, Oracle MySQL Cloud Service is the only choice for customers who want MySQL Enterprise Edition capabilities as a cloud service or who want to integrate with Oracle Cloud services or Oracle Database and data-management services.

## Business Themes



Data to Decisions



Technology  
Optimization

## KEY DIFFERENTIATORS

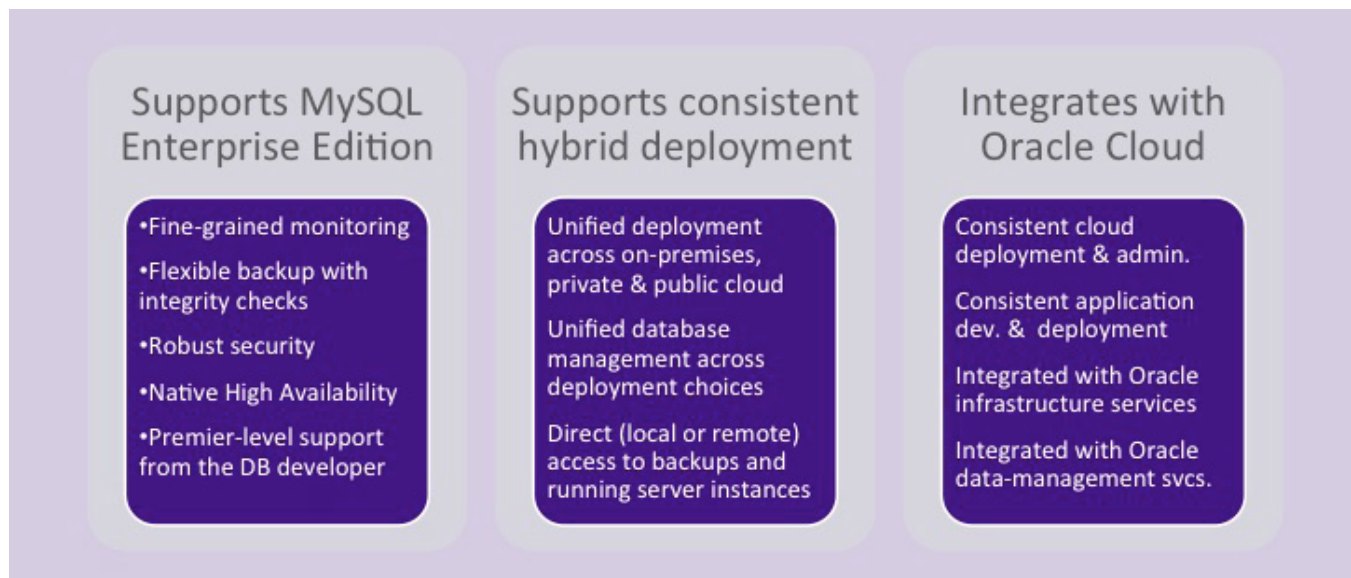
Cloud database services based on MySQL are available on every major public cloud, so what differentiates the Oracle MySQL Cloud Service? The differences fall into three categories: MySQL Enterprise Edition capabilities and support, hybrid deployment flexibility and integration with the Oracle Cloud services and software (see Figure 1). Here are details on these three key differences along with Constellation's analysis.

## MySQL Enterprise Edition Turns into a Cloud Service

Any vendor can make use of open-source MySQL software as the basis of a cloud service. As the owner and developer of MySQL since 2009, Oracle was in a position to offer a cloud service based on the commercial MySQL Enterprise Edition. This brings to the Oracle MySQL Cloud Service advanced monitoring, backup, security and support capabilities:

- **Monitoring:** All MySQL-based cloud services tend to offer monitoring of computing, memory, storage-capacity utilization, I/O

Figure 1. Oracle MySQL Cloud Service Differs from Other MySQL Cloud Services in Three Ways



Source: Constellation Research

activity and database instance connections.

MySQL Enterprise Monitor, a feature of MySQL Enterprise Edition, adds fine-grained insights into individual query performance as well as reporting and visual charting of database instance performance, availability, security and health. The MySQL Enterprise Monitor Query Analyzer can spot low-performing, most expensive and most frequent queries, with reports, graphs and detailed data supporting deep understanding of performance.

- **Backups:** MySQL Enterprise Backup supports online, non-blocking backups with full, incremental and partial approaches, point-in-time recovery and compression. Administrators can adjust retention periods and backup windows and initiate full snapshots on demand. Most cloud services also offer flexible control over the timing of backups and snapshots, but Oracle Enterprise Backup supports validations and file checksum matching internal to the database, thus ensuring backup integrity and consistency.

- **Security:** Security features unique to MySQL Enterprise Edition include Audit (using JSON rules to track database access and usage), Authentication (through various protocols) and Encryption (which protects data during transfer and at rest with secure key management). Enterprise Firewall guards against real-time attacks including SQL injection.
- **Support:** Oracle offers the only MySQL cloud service that is supported directly by the supplier of the database software. This puts Oracle in the unique position to resolve technical problems tied to the database software, prioritize bug fixes and issue forward-compatible hot fixes in advance of a next MySQL release. Other service providers file bug-fix requests along with all other users of MySQL. Oracle MySQL Cloud Service also bundles in premier-level, consultative support with initial response within 15 minutes for Severity 1 cases in which the service is stopped or severely compromised. Oracle's biggest cloud rivals only offer this level of support (with 15-minute response) across all cloud

services used, and they charge thousands to tens of thousands of dollars per month for the service. And where some support plans start with break-fix-oriented services aimed at simply getting you back up and running, in Oracle's case, "consultative" means you can ask for MySQL-specific how-to advice and guidance on database best practices and query tuning.

**Constellation's Analysis:** Third-party cloud providers are forced to match MySQL Enterprise Edition capabilities by adding monitoring, snapshotting and security features outside of the database. Monitoring options, for example, detail database-instance interactions with cloud resources, but they can't peer into the inner workings of the database and query performance, as can MySQL Enterprise Monitor. Third-party backups tend to rely on snapshotting approaches that lack the internal validation steps supported by Enterprise Backup. There's also no equivalent to MySQL Enterprise Firewall to thwart SQL injection.

In short, third-party MySQL service providers don't match the breadth of capabilities and support included with MySQL Enterprise Edition and, thus, Oracle MySQL Cloud Service. This point of differentiation will be enhanced this fall when Oracle adds a new Enterprise Monitor graphical user interface (GUI) for group replication to InnoDB Cluster high-availability provisioning and management capabilities. Oracle MySQL Cloud Service customers can configure and make use of InnoDB Cluster today by issuing commands through administrative interfaces. The Enterprise Monitor GUI being developed for Oracle MySQL Cloud Service, expected later this year, will better support high-availability automation and administration.

## Hybrid Deployments Welcome

Cloud computing is the fastest-growing software consumption and deployment choice, period. But for the vast majority of enterprises, hybrid strategies will be the reality for some time to come. For practical reasons, organizations might choose to keep legacy applications on premises while supporting

them with backup and test/dev instances in the cloud. Or they might keep data-sensitive, mission-critical or regulated applications on premises while moving non-sensitive or non-critical applications to the cloud. Some might choose to develop new applications in a flexible cloud environment but then move them on premises once workloads and infrastructure requirements are clear and stable.

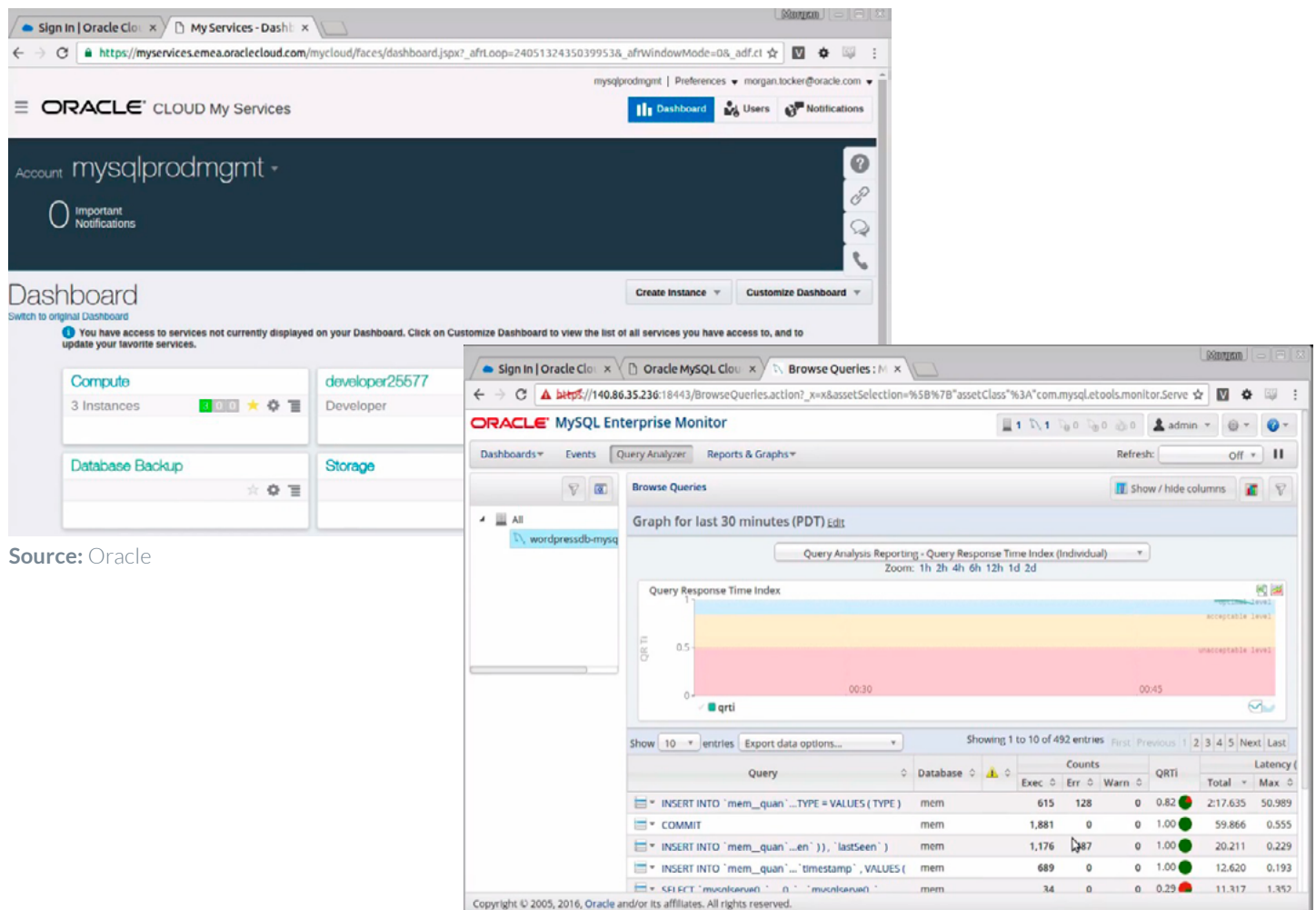
Oracle has hundreds of thousands of customers that still have on-premises data centers, so it made sense for the company to support hybrid cloud strategies using the same software, middleware and infrastructure used in on-premises deployments. Oracle has also developed unified administrative tooling that supports public-cloud, private-cloud and on-premises deployments and the shifting of workloads among these environments. Oracle Enterprise Manager, for example, supports “single-pane-of-glass” management across data centers, private clouds and Oracle Cloud with self-service provisioning and policy-based resource management.

This unified approach is also built into Oracle MySQL Cloud Service. For starters, the same MySQL Enterprise Edition management tools that you use on-premises, such as MySQL Enterprise Monitor (See Figure 2) and MySQL Workbench, are also used in the cloud. MySQL Enterprise Authentication can make use of the same directory services and security rules that you’ve set up for on-premises deployments. The support experience is also consistent, as cloud customers have access to the same MySQL engineering and support organization relied upon by on-premises customers.

Hybrid portability is also available to companies that are interested in running MySQL Community Edition deployments on premises. There’s 100 percent file compatibility between Enterprise Edition and Community Edition, so users of the Oracle MySQL Cloud Service can simply avoid implementing Enterprise-Edition features for applications that might be migrated and run on-premises using Community Edition software.

Finally, some of the nitty gritty details of cloud services can make a big difference where

Figure 2. Management of Oracle MySQL Cloud Service Starts with the Oracle Cloud Console (top left) and Extends to Fine-Grained Insight in the MySQL Enterprise Monitor Query Analyzer (bottom right).



Source: Oracle

hybrid portability is concerned. For example, most cloud providers do not offer direct, (local or remote) access to physical backups or running server instances, as does the Oracle MySQL Cloud Service. Direct access to backups is crucial when moving sizeable databases (over 10 gigabytes) to new locations

such as on-premises data centers. Without direct access to backups, you're forced to use logical data-dump tools and it might take far longer to rebuild the database than it would otherwise take using backups. The increased time could be hours or, in the case of large databases, days versus minutes. Access helps in



database tuning, administration and recovery scenarios. Direct access can make a big difference in cases where companies choose to develop and prove MySQL-based applications in the cloud but then move them on-premises once production workloads become stable and predictable.

**Constellation's Analysis:** Cloud-only vendors like Amazon Web Services and Google Cloud Platform don't address hybrid scenarios because they simply don't support on-premises deployments. Oracle, Microsoft and IBM all differ from cloud-only vendors in that they address hybrid deployment with integrated management and security as well as unified development and deployment options across on-premises, private clouds and public cloud options.

Consistent data platforms are crucial, but each vendor favors its own databases and data-management software for hybrid deployment. IBM and Microsoft do offer MySQL Community Edition-based cloud services. Only Oracle offers MySQL Enterprise Edition, whether on-premises or as a cloud service.

What's more, it's the only vendor that can deliver MySQL in hybrid deployment scenarios with consistent monitoring and management tools and a unified support experience.

Oracle's MySQL hybrid deployment options will be extended when the Oracle MySQL Cloud Service becomes available on the Oracle Cloud Machine later in 2017. Oracle Cloud Machine is a dedicated appliance that supports on-premises deployment of the same Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS) capabilities used in the Oracle Cloud. With this option, organizations can write cloud-native applications once, using Oracle Cloud platform services and then deploy the applications on-premises using Oracle Cloud Machine -- as might be desired or required by regulations such as national data-residency requirements. The combination also enables customers to run on premises on Oracle Cloud Machine with the ability to seamlessly burst to Oracle Cloud to meet peak-capacity requirements.

## In Sync with the Oracle Cloud

A third differentiator for Oracle MySQL Cloud Service is that it offers many points of integration relevant to Oracle Cloud customers. Integration starts at the administrative level with Oracle Enterprise Manager. As noted above in the hybrid-deployment analysis, Oracle Enterprise Manager supports single-view monitoring and management across data-center, private-cloud and public-cloud deployments. On Oracle Cloud, the Oracle Cloud Console is the consistent, consolidated administrative interface to all services, including Oracle MySQL Cloud Service.

Oracle-centric development and operations (DevOps) teams will appreciate that Oracle MySQL Cloud Service is integrated with Oracle PaaS services, including Oracle Java Cloud Service and the Oracle Application Container Cloud Service. Together, these services support development of applications in Java SE, Node.js, PHP and Python that can then be deployed in Oracle Cloud or in hybrid scenarios.

Oracle MySQL Cloud Service is also integrated with Oracle Cloud infrastructure services, including the Oracle Storage Cloud, which can be used as a backup destination. You can also set up VPN connections to data in on-premises data centers and build MySQL applications that run on the Oracle Compute Cloud Service.

Oracle-centric data-management professionals will appreciate integration with Oracle PaaS capabilities, including the Oracle GoldenGate Cloud Service and Oracle Data Integrator Cloud Service. Oracle Database customers, for example, could use the GoldenGate Cloud Service to offload basic reporting workloads to the less expensive Oracle MySQL Cloud Service. Similarly, straightforward ETL workloads could be offloaded to the combination of Oracle's Data Integrator Service and Oracle MySQL Cloud Service.

**Constellation's Analysis:** Oracle MySQL Cloud Service is an obvious choice for those who are planning to build or who are already building and deploying applications in the Oracle Cloud. It's also a natural choice for those who have standardized on Oracle data-management

software and services. The downside of the all-Oracle approach, or any commitment to any single supplier, is vendor lock-in. But the advantages of integration and consistency across Oracle Cloud administrative interfaces and PaaS and IaaS resources are compelling.

Oracle MySQL Cloud Service also complements Oracle Database and Oracle Database Cloud Service deployments where it can be used in conjunction with Oracle GoldenGate or Oracle Data Integrator services to offload reporting and ETL workloads and reduce the total cost of ownership of large Oracle Database deployments.

## PRODUCT OVERVIEW

This section digs into the details on Oracle MySQL Cloud Service, including supported software releases and operating systems, competitive positioning and pricing along with Constellation's analysis on each front.

## Key Offerings

Oracle MySQL Cloud Service runs MySQL 5.7 Enterprise Edition software on Oracle Linux. As noted, there's 100 percent file compatibility between Enterprise Edition and MySQL Community Edition, so customers who are worried about vendor lock-in and who are interested in moving applications developed on the Oracle MySQL Cloud Service to Community Edition on premises can do so. They simply have to avoid implementing Enterprise Edition features that aren't supported in Community Edition software.

MySQL 5.7 Enterprise Edition is the only database release supported at the time of this report's publication, but Oracle has stated it will support the last two releases of MySQL Enterprise Edition concurrently once MySQL 8.0, the next release of the software, becomes available in 2018 (Note: Oracle is skipping MySQL release designations 6.0 and 7.0). Oracle MySQL Cloud Service is not offered on alternative operating systems such as Windows or Debian.

**Constellation's Analysis:** Where most cloud providers support open-source MySQL 5.6 and MySQL 5.7 Community Edition, Oracle chose in the fall of 2016 to launch its commercial MySQL Enterprise Edition software as a database service. It also took a forward-looking approach by starting with MySQL 5.7, the latest release of the database. MySQL 5.7 has been available for less than 18 months, so Oracle MySQL Cloud Service appeals to recent licensees of MySQL 5.7 Enterprise Edition and those looking to upgrade to this release. The service is also 100 percent compatible with MySQL Community Edition. Another reason Oracle skipped MySQL 5.6 is that release 5.7 introduced significant enhancements, including JSON support, enhanced security and performance upgrades. This further distinguishes Oracle's cloud service from those based on MySQL 5.6 or on forked variants of earlier releases of MySQL, such as MariaDB.

In 2018, MySQL 8.0 will be released and, soon thereafter, a MySQL 8.0 Enterprise Edition-based Oracle MySQL Cloud Service offering will become available alongside the existing service based on MySQL 5.7

Enterprise Edition. The 8.0 release will bring common table expressions, window functions, a data dictionary, a document store and role-based privileges as well as performance enhancements that will further distinguish MySQL and Oracle's related cloud service from older versions and forks of MySQL software.

## Competitive Positioning

By starting with MySQL 5.7 Enterprise Edition and future releases, Oracle is targeting the Oracle MySQL Cloud Service at would-be cloud customers who want the latest version of the database and who are most likely to be interested in commercial-grade Enterprise Edition capabilities, including advanced monitoring, automated management, backup, security and consultative support directly from the publisher of MySQL software.

Further, Oracle is targeting customers who will be drawn by consistent deployment and management tooling that can be used across public-cloud, private-cloud and on-premises instances. Finally, integration with Oracle Cloud platform and infrastructure services will clearly appeal to customers that are moving

into Oracle Cloud and who want compatibility with related services.

**Constellation's Analysis:** Oracle MySQL Cloud Service is unique in the market in that all other MySQL services are based on open-source MySQL Community Edition. Where Amazon Web Services and Google Cloud Platform offer only cloud services, Oracle's MySQL service can be used in conjunction with on-premises and private-cloud deployments using the same management and administrative tooling. Microsoft and IBM also offer MySQL Community Edition-based services, but they don't offer Enterprise Edition as a service and they don't offer the same tooling continuity for hybrid deployments or similar integrations with their own cloud services. MySQL is a Community-edition-only orphan in these clouds, whereas Oracle service is a PaaS- and IaaS-integrated family member on Oracle Cloud.

Given the popularity of Amazon Web Services, Constellation sees Amazon RDS for MySQL and the MySQL 5.6-compatible Amazon Aurora service as the most formidable and

most direct competitors to Oracle MySQL Cloud Service. With Aurora, in particular, Amazon Web Services has tuned the database for performance specifically on its cloud infrastructure, claiming better performance than either MySQL 5.6- or 5.7-based cloud services. It has also added auto-storage scaling, auditing and monitoring capabilities, but in Constellation's view, these features do not match the advanced monitoring, availability, backup and security capabilities of Enterprise Edition. The key difference, however, is that services from Amazon Web Services are only available in its cloud. While it might be possible to replicate an Amazon RDS for MySQL-based deployment on premises or in another cloud, Amazon Aurora is a fork of MySQL that exists only on Amazon Web Services.

Another differentiator of Oracle MySQL Cloud Service versus any other MySQL cloud service is that it is supported directly by the owner of the database software. Oracle alone can expedite database software bug fixes and issue forward-compatible hot fixes in advance of a next MySQL release. Oracle also includes premier-level, consultative support with

15-minute response to mission-critical outages. This level of support on Amazon Web Services is only available across all cloud services in use (not individual services) and costs a minimum of \$15,000 per month.

## Pricing

Oracle MySQL Cloud Service entails charges for the database service as well as primary storage and backup storage capacity. These services are available on a metered (hourly) or non-metered basis. Non-metered offers a single discount level for one- to three-year subscriptions paid in advance. Customers should also pay close attention to variable charges for transferring data out of the cloud. While compute and storage pricing can be compared more directly, incremental data-transfer costs may add up quickly when dealing with data-intensive applications.

The metered database cost is \$0.233 per hour per Oracle CPU (OCPU). An OCPU provides capacity equivalent to one physical core of an Intel Xeon processor with two hardware execution threads provisioned with up to 15

gigabytes (GB) of RAM. Note that Oracle's standard and high-memory pricing is identical per OCPU, whereas many cloud providers charge higher prices for high-memory compute. Metered Block Storage costs start at \$0.05 per GB per month for hard-drive (HDD) storage or \$0.10 per GB per month for high-performance solid state disk storage, expected to be available with Oracle MySQL Cloud Service in August 2017. Backup is a separate storage requirement, but it can be filled by the Oracle Storage Cloud Service object store, which is \$0.024 per GB per month.

The discounted, non-metered rate for Oracle MySQL Cloud Service with a one-year subscription (paid in advance) is \$130.00 per month per OCPU. That's a 25 percent discount to the hourly metered rate, but discounts don't get any deeper if you opt for a two- or three-year subscription. Oracle says there are options to pay on a quarterly basis if you don't want to pay for a year in advance.

Note that the non-metered approach is tied to a one-terabyte per-month storage minimum, which is \$50 per TB per month. The one-TB

threshold also applies to the separate backup requirement, and Storage Cloud object storage is \$30 per TB per month.

**Constellation's Analysis:** Given Amazon Web Services' popularity, the most obvious pricing comparisons are Amazon RDS for MySQL (which runs MySQL 5.6 or 5.7 Community Edition) and Amazon Aurora, which supports one-way migration of MySQL 5.6 Community Edition deployments into Amazon's cloud.

As detailed in Figure 3, Oracle MySQL Cloud Service metered pricing (\$0.233 per hour for standard- or high-memory OCPU instances) is more expensive than Amazon's MySQL-Community-Edition-based RDS for MySQL service when using standard (db.m4.large) compute instances (which cost \$0.175 per hour), but slightly less expensive as compared to Amazon Web Service's db.r3.large high-memory compute instances (which cost \$0.240 per hour). Amazon Aurora requires high-memory instances, so the comparison is \$0.233 for Oracle MySQL Cloud Service on OC1M compute instances versus \$0.290 for Aurora running on db.r3.large instances.

Note that Amazon Web Services asserts that Aurora, which is tuned specifically and only for Amazon Web Services infrastructure, offers faster read and write performance than either MySQL 5.6 or 5.7. That's worth considering (and testing) if you're only interested in cloud-based deployment, but keep in mind that Aurora is only available on Amazon Web Services, so there are no options for cloud portability or hybrid cloud deployment.

One key difference in pricing between Oracle MySQL Cloud Service and any other MySQL cloud service is that the former includes premier-level support. Premier-level support changes the cost equation dramatically if consultative support and 15-minute, mission-critical response times are important. This level of service on Amazon Web Services is only available across all services in use (not individual services) and costs a minimum of \$15,000 per month.

Oracle's non-metered pricing is less competitive with Amazon Web Services options, due in part to Oracle's 1TB non-metered monthly storage minimums and

**Figure 3. Oracle MySQL Cloud Service Pricing vs. Amazon Web Services Options**

Database Service	Database/Compute	Storage	Backup
<b>Oracle MySQL Cloud Service</b>	<b>MySQL 5.7 Enterprise Edition/OC3 or OC1M</b>	<b>Block Storage (HDD)</b>	<b>Storage Cloud (obj. store)</b>
Metered	\$0.233/per hr.	\$0.05 per GB per mo.	\$0.024 per GB per mo.
Non-metered	\$130.00/per mo. (1 year paid in advance)	\$50 per TB per mo.	\$30 per TB per mo.
Includes premier-level, consultative support with 15-minute mission-critical response times.			
<b>Amazon RDS for MySQL</b>	<b>MySQL 5.6 or 5.7 Community/db.m4.large</b>	<b>Storage (SSD)</b>	<b>S3 (object store)</b>
On-Demand	\$0.175/per hr.	\$0.115 per GB per mo.	Included
Reserved	\$73.58/per mo. (1 year paid in advance)	\$0.115 per GB per mo.	Included
<b>Amazon RDS for MySQL</b>	<b>MySQL 5.6 or 5.7 Community/db.r3.large</b>	<b>Storage (SSD)</b>	<b>S3 (object store)</b>
On-Demand	\$0.240/per hr.	\$0.115 per GB per mo.	Included
Reserved	\$94.33/per mo. (1 year paid in advance)	\$0.115 per GB per mo.	Included
Case-specific Business Support with 1-hr. response starts at \$100 per mo.			
Consultative Enterprise Support with 15-minute response starts at \$15,000 per mo.			
<b>Amazon Aurora</b>	<b>Aurora (5.6 compatible)/ db.r3.large</b>	<b>Storage and I/Os</b>	<b>Included</b>
On-Demand	\$0.29/per hr.	\$0.10 per GB /\$0.20 per Mil. I/Os	Included
Reserved	\$115.41/per mo. (1 year paid in advance)	\$0.10 per GB/ \$0.20 per Mil. I/Os	
Case-specific Business Support with 1-hr. response starts at \$100 per mo.			
Consultative Enterprise Support with 15-minute response starts at \$15,000 per mo.			

**Source:** Constellation Research



Amazon Web Services' steeper discounts for prepayments and one-year and three-year reserved instances. For database instances managing 500 GB of data or less, it's more cost-effective to choose Oracle's metered pricing, particularly if you take advantage of Oracle's pre-paid credits option, in which you can gain five percent to 10 percent discounts for purchasing metered cloud credits in advance. Below 500 GB, the 1-TB-monthly-minimum storage costs erase the discount on compute costs.

Cloud service cost differences diminish in importance if you're trying to cut down on development costs by designing database applications just once and deploying them flexibly in on-premises, private-cloud and public-cloud deployments. Oracle MySQL Cloud Service is the only such service tied to unified and consistent hybrid deployment options.

## RECOMMENDED SCENARIOS

Oracle MySQL Cloud Service offers advantages, including MySQL Enterprise

Edition functionality and support, unified tooling for consistent hybrid deployment as well as management and deep integration with Oracle Cloud. If Enterprise Edition functionality and support are not required, you're operating exclusively in the cloud and your cloud standard is not Oracle Cloud, so this is not the service for you. But if these three traits are important to you, Constellation sees Oracle MySQL Cloud Service as particularly attractive to customers looking to support any of these five scenarios:

- 1. Handling disaster recovery and dev/test in the cloud.** Organizations running MySQL Enterprise Edition or MySQL Community Edition on-premises can free up data center capacity and administrative resources by flexibly spinning up disaster recovery and development and test instances using Oracle MySQL Cloud Service. Once the development and testing are done, turn off the capacity. This approach is more cost effective than reserving dedicated on-premises capacity for dev/test work.

- 2. Migrating existing on-premises applications to the cloud.** Organizations looking to move some or all of their workloads to managed, public-cloud services can migrate existing MySQL Enterprise Edition or Community Edition databases and related applications to the Oracle MySQL Cloud Service. Similarly, organizations running MySQL workloads on Infrastructure-as-a-Service (either on Oracle Cloud or a third-party cloud) can let Oracle handle the database administration and maintenance by using this managed cloud service.
- 3. Developing new applications in the cloud, then moving them on premises.** New applications often sprout up as experiments. You may need to iterate, get feedback and maybe even start over. Innovation and agility go together and both requirements are well supported in a flexible cloud development environment. Once an application is proven, you may take it into production in the cloud initially if you're not sure what level of resources you'll need. Once workloads are predictable, perhaps then you'll want to migrate that application

into an on-premises data center. Oracle supports hybrid deployment with unified management and administrative tooling and integrated options, including Oracle Cloud Machine, Oracle Java Cloud Service and Oracle Application Container Cloud Service.

- 4. Offloading reporting or ETL workloads in the cloud.** Shrewd Oracle customers know their way around the Oracle data management stack and they know when and where they need the flagship Oracle Database and when they don't. Using the Oracle GoldenGate Cloud Service, customers can offload reporting workloads from Oracle Database applications to the Oracle MySQL Cloud Service. Similarly, the Oracle Data Integrator Cloud Service can be used to lower costs by supporting ETL workloads on the Oracle MySQL Cloud Service.
- 5. Supporting Software-as-a-Service in Oracle Cloud.** Oracle software and/or services are used by many SaaS vendors in addition to the vendor's own SaaS applications, all of which run in Oracle Cloud. Naveex, a vendor

of customer experience management, CRM and ERP software based in Finland, is running its cloud-based Naveex 7 application on Oracle MySQL Cloud Service and Oracle Cloud IaaS. Naveex's CEO, Jalo Kaaminen, told Constellation that global data-center coverage, support for European Union governance requirements and customer comfort with Oracle Cloud security all figured in the company's selection of Oracle MySQL Cloud Service and Oracle Cloud.

## ANALYST BIO

# Doug Henschen

## Vice President and Principal Analyst

Doug Henschen is Vice President and Principal Analyst at Constellation Research, Inc., focusing on data-driven decision making. His Data-to-Decisions research examines how organizations employ data analysis to reimagine their business models and gain a deeper understanding of their customers. Data insights also figure into tech optimization and innovation in human-to-machine and machine-to-machine business processes in manufacturing, retailing and services industries.

Henschen's research acknowledges the fact that innovative applications of data analysis require a multi-disciplinary approach, starting with information and orchestration technologies, continuing through business intelligence, data visualization, and analytics, and moving into NoSQL and Big Data analysis, third-party data enrichment, and decision management technologies. Insight-driven business models and innovations are of interest to the entire C-suite.

Previously, Henschen led analytics, Big Data, business intelligence, optimization, and smart applications research and news coverage at InformationWeek. His experiences include leadership in analytics, business intelligence, database, data warehousing, and decision-support research and analysis for Intelligent Enterprise. Further, Henschen led business process management and enterprise content management research and analysis at Transform magazine. At DM News, he led the coverage of database marketing and digital marketing trends and news.

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- Organizers of the Constellation Connected Enterprise – an innovation summit and best practices knowledge-sharing retreat for business leaders.
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