

ORACLE

MySQL HeatWave



—
One MySQL Database Service for OLTP, OLAP, and ML – without ETL



#1 Open Source Database in Oracle Cloud, AWS, and Azure

Looking to simplify your database infrastructure while getting real-time analytics and lowering costs?

MySQL HeatWave is the only cloud database service that combines transactions, analytics, and machine learning services into one MySQL Database, delivering real-time, secure analytics without the complexity, latency, and cost of ETL duplication.



The simplicity of transaction and real-time analytics in one service

Eliminate the cost and complexity of separate analytics database, ML, and ETL services. Avoid the latency and security risks of data movement between data stores.

Unmatched price performance

MySQL HeatWave is 6.5X faster than Amazon Redshift at half the cost, 7X faster than Snowflake at one-fifth the cost, and 1,400X faster than Amazon Aurora at half the cost.

Ready for the distributed cloud

Deploy MySQL HeatWave on OCI, AWS, Azure, or in your data center with OCI Dedicated Region.

ORACLE CLOUD
Infrastructure



Open Source in the Enterprise

The 2022 survey published in The State of Enterprise Open Source report¹ found that among developers and businesses:

- 95% considered enterprise open source important
- 89% believe enterprise open source is as or more secure than proprietary software
- 76% use enterprise open source to more easily adopt a hybrid cloud infrastructure



Through 2025, more than 70% of enterprises will increase their IT spending on open source software, compared with their current IT spending, according to Gartner's 2021 Hype Cycle for Open-Source Software.

Open source technologies are often adopted to get applications into production faster. Projects are frequently unfunded or need instant IT approval. Projects start small and solve an immediate need, but over time many evolve into business-critical applications. Success with the initial use of MySQL generally translates into additional MySQL projects.

As organizations consolidate and standardize on a select few IT technologies, MySQL becomes a strategic part of their technology infrastructure.

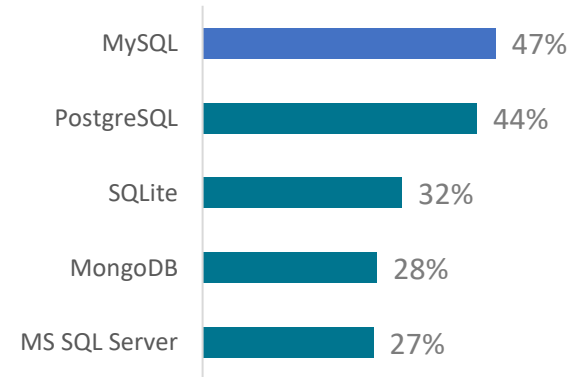
¹ Red Hat, February 2022: [The State of Enterprise Open Source](#)

The #1 Choice for Developers

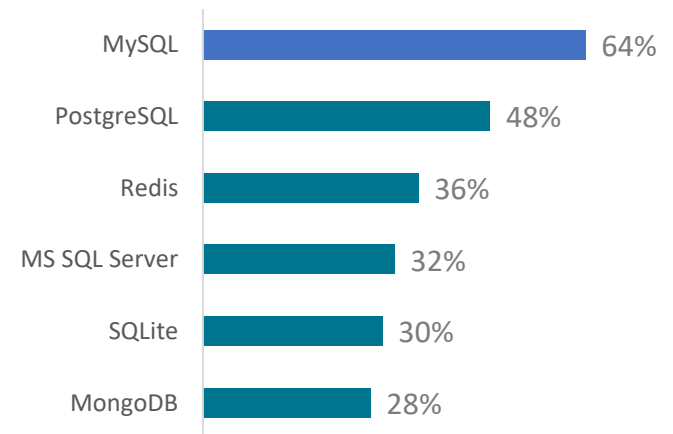


Surveys from Stack Overflow and JetBrains rank MySQL as the most popular database among developers. Its clear leadership position translates into an entire ecosystem of tools and applications that support MySQL, as well as a very large number of developers and DBAs with extensive MySQL experience and skills.

Most popular databases (Stack Overflow)²



Which databases have you used in the last 12 months? (JetBrains; SQL is primary)³



² Stack Overflow, [Stack Overflow survey 2022](#)

³ JetBrains, [The State of Developer Ecosystem 2022](#)

Innovative Enterprises Across Many Industries Run MySQL

Social

facebook



LinkedIn



Pinterest

eCommerce

Booking.com

NETFLIX

UBER



淘宝网
Taobao.com

阿里巴巴
Alibaba.com

Tech



GitHub

HubSpot

zendesk



Finance



J.P.Morgan



VISA

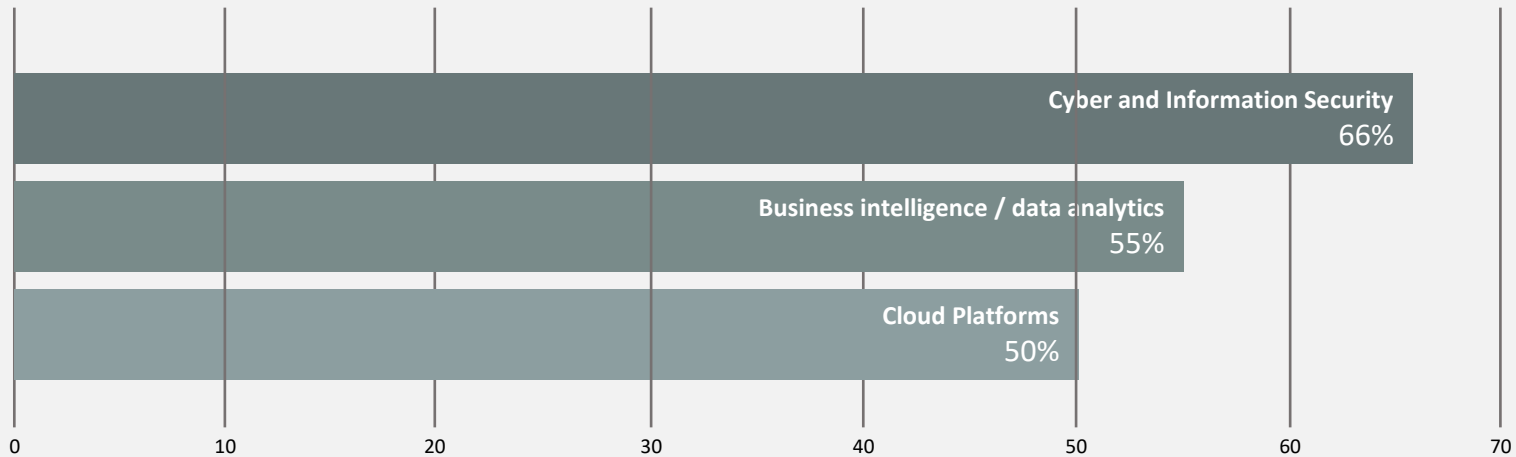


Manufacturing

TESLA



CIOs' Top Areas of Increased Investment



1. Cyber and information security **66%**
2. Business intelligence / data analytics **55%**
3. Cloud Platforms **50%**

Data: Your Most Valuable Asset

In today's digital world, data is arguably your organization's most valuable asset.

Data is about your customers, employees, and partners. Data is about your IP, mergers and acquisitions, strategy, as well as sales figures.

The data might be generated by your organization, or it might have been entrusted to you, such as PII (Personally Identifiable Information), PCI (Payment Card), or PHI (Personal Health Information) data.

Your data presents great value for thieves, state-sponsored criminals, and malicious insiders who will do anything to obtain it.



Recent Data Breach Statistics

\$4.35 million

Average cost of a data breach

\$164

Average per record cost of a data breach

277 days

Average time to identify and contain a data breach

83% of organizations

Have had more than one data breach

60% of organizations'

Breaches led to increases in prices passed on to customers

45% of breaches

Were cloud-based

Security and Compliance

Always Up to Date with the Latest Security Fixes. Get the latest MySQL security updates from the MySQL Engineering Team to limit your exposure to security vulnerabilities.

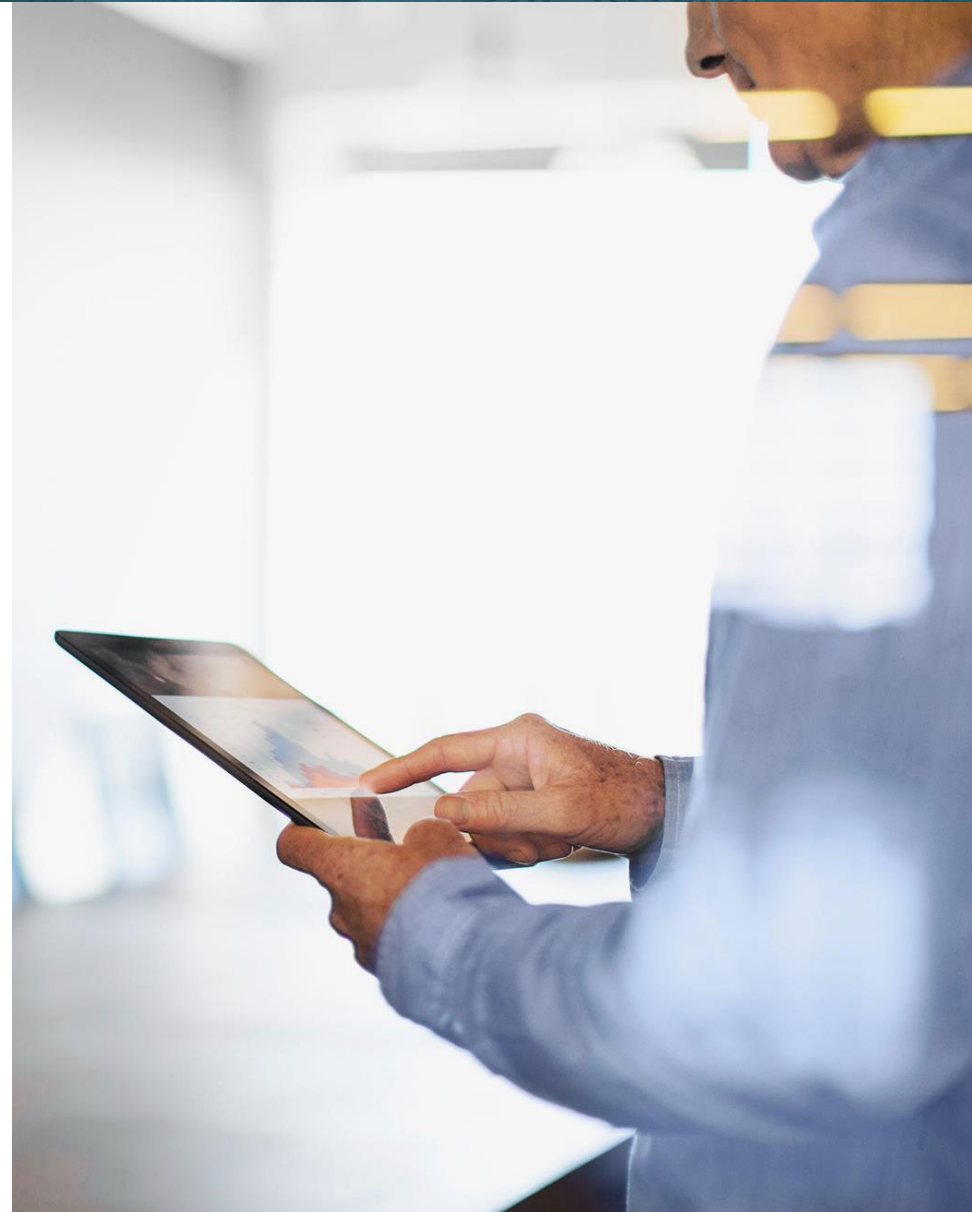
Advanced Security Features to Help Meet Regulatory Requirements. Access built-in MySQL security features to help you protect data and comply with governments' data privacy laws and regulatory requirements for GDPR, HIPAA, etc.



A Fully Managed Service

MySQL HeatWave is a fully managed service. It enables you to:

- Instantly provision and connect to production-ready, pre-configured MySQL HeatWave instances.
- Automate database management tasks such as configuration, security patching, backup, and monitoring.
- Accelerate MySQL performance by orders of magnitude for analytics and mixed workloads with the HeatWave in-memory query accelerator.
- Deliver high availability with automatic failover.
- Build, train, deploy, and explain machine learning models with in-database ML.
- Save significant time and effort for developers, DBAs, and DevOps teams with machine learning-powered automation.
- Monitor the health of your resources, optimize the performance of your applications, and respond to anomalies in real time.

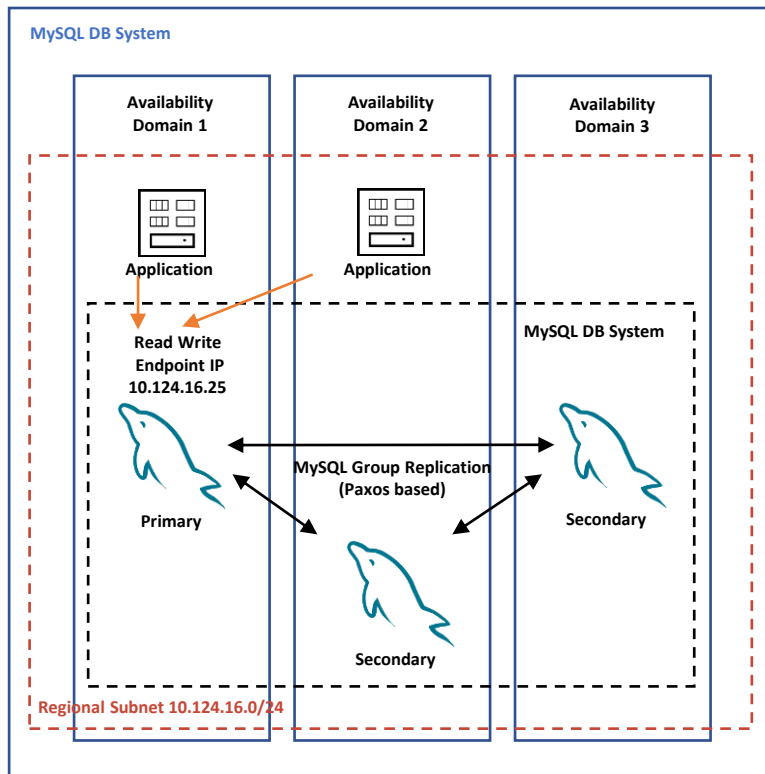


100% Developed, Managed, and Supported by Oracle

MySQL HeatWave: fully managed database service

	Automation	MySQL HeatWave
Database	High Availability	✓
	Read Replicas	✓
	Backup	✓
	Query Acceleration	✓
	AutoPilot	✓
	AutoML	✓
	Security Patch & Upgrade	✓
	Provision & Configure	✓
OS	OS Security Patch & Upgrade	✓
	OS Installation	✓
Server	Hardware Purchase & Maintenance	✓
Storage	Storage Purchase & Maintenance	✓
Data Center	Rack & Space	✓
	Power, HVAC, Networking	✓

Native High Availability



MySQL HeatWave uses native MySQL Group Replication for High Availability

Increased uptime

To achieve high availability, the database system must be resilient to many types of failures such as server, network, power, or entire data center. Companies can protect their data and ensure business continuity using native MySQL HA technologies with automatic failover. For ultimate high availability, MySQL HeatWave optimizes the placement of database instances in different Availability and Fault Domains.

Zero data loss

Built on native MySQL Group Replication, MySQL HeatWave includes 3 MySQL instances provisioned and spread across different physical locations. One instance is the “primary” instance, accepting the database traffic, while the “secondary” instances stand ready to take over the database traffic in case of failure, without any data loss.

Multi-Cloud Deployments with MySQL HeatWave



“

When Oracle delivered its superfast version of MySQL, called MySQL HeatWave, we decided not to just deliver it inside the Oracle Cloud but also make it available to AWS users on AWS, and to also make it available to Azure users. Taking a service and making it available on multiple clouds.”

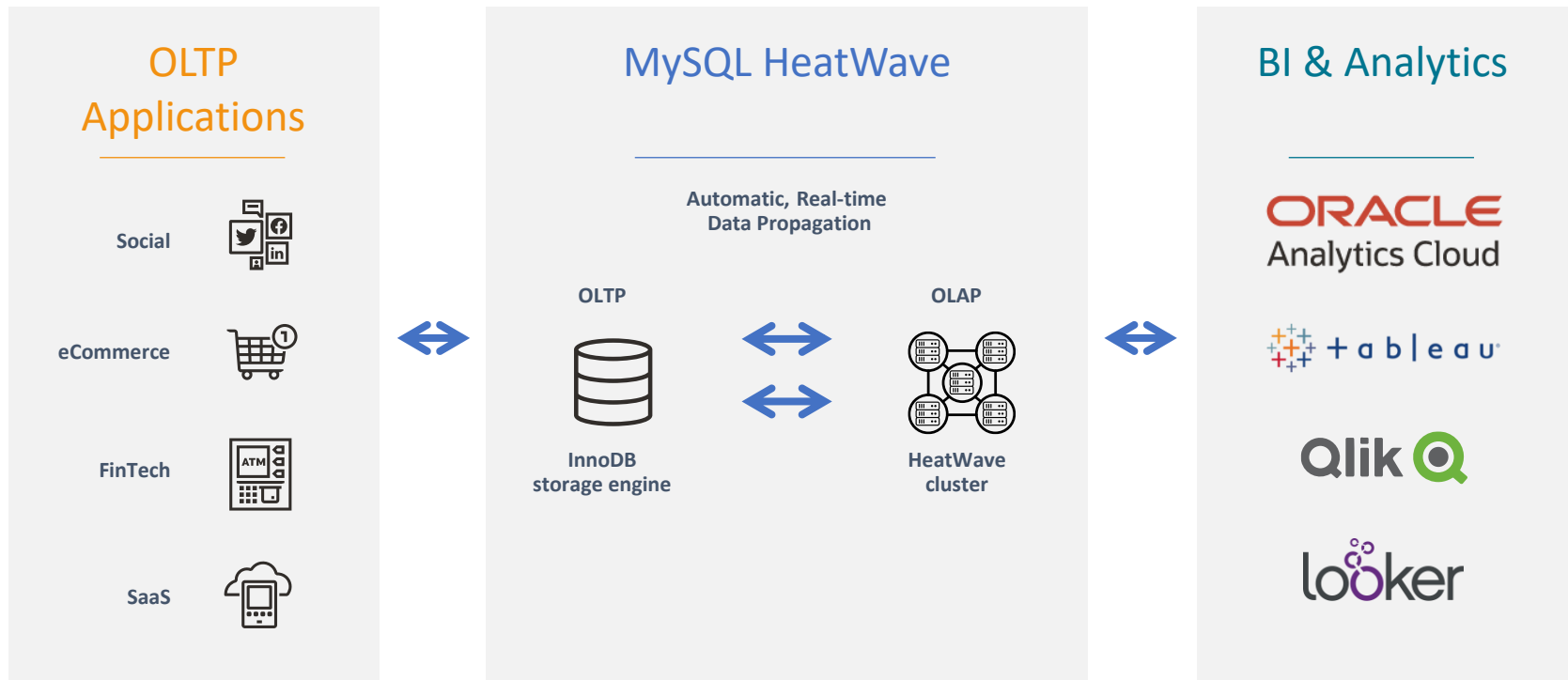
Larry Ellison, Chairman, CTO, Oracle
Oracle CloudWorld 2022

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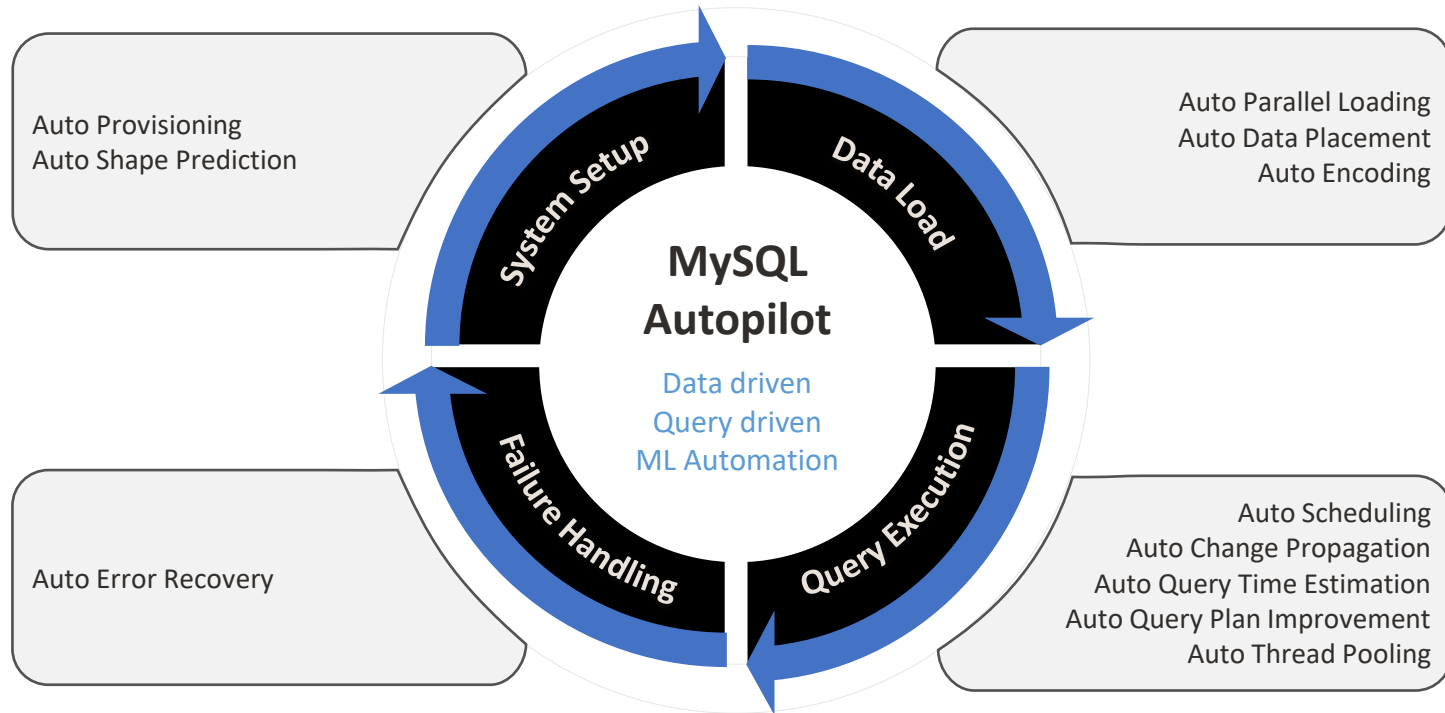


Single MySQL Database for OLTP and OLAP

Customers can run both OLTP and OLAP workloads in MySQL without the need to move data out of MySQL databases (no ETL) and without requiring any proprietary syntax or changes to their applications.



MySQL Autopilot: Machine Learning-Powered Automation

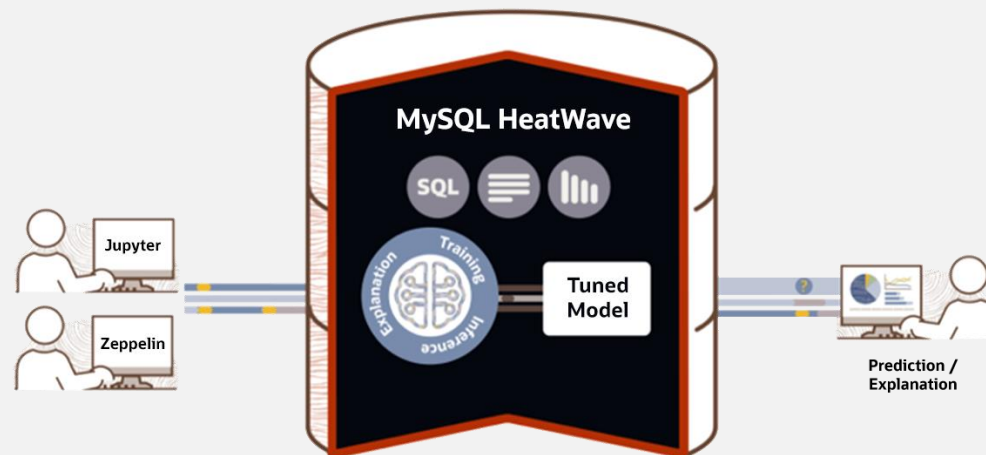


MySQL Autopilot provides workload-aware, machine learning-powered automation of various aspects of the application lifecycle, including provisioning, data loading, query execution, and failure handling. It also provides capabilities designed for OLTP workloads, which further improve MySQL HeatWave price performance compared to Amazon RDS and Aurora.

MySQL HeatWave AutoML: Native, In-Database Machine Learning

HeatWave AutoML delivers native, in-database machine learning, enabling developers and data analysts to build, train, and deploy machine learning models within MySQL HeatWave. HeatWave AutoML delivers predictions with an explanation of the results, helping organizations with regulatory compliance, fairness, repeatability, causality, and trust.

- Accelerate ML initiatives, increase security, and reduce costs.
- Build machine learning models using familiar SQL commands.
- Apply ML training, inference, and explanation to data stored inside MySQL HeatWave.
- Leverage integration with popular notebooks such as Jupyter and Apache Zeppelin.



HeatWave AutoML makes machine learning with MySQL easy.

100% Supported by the MySQL Team



Get the highest level of MySQL expertise

MySQL Support together with Oracle Premier Support and the industry's most experienced MySQL Engineers provide a unified support solution for both cloud infrastructure and MySQL. It includes:

- 24/7 production support in 29 languages
- Unlimited support incidents
- Knowledge base and maintenance releases
- Bug fixes, patches, and updates
- MySQL consultative support

No other cloud vendor can deliver such comprehensive support for the MySQL database.

Tetris.co Migrated from Amazon for Scalability and 50% Cost Reduction



“MySQL HeatWave reduced our cloud database costs by 50 percent as compared to using a combination of Amazon Aurora and Redshift. We are no longer moving data around and we now have blazing-fast, real-time insights with no effort. More importantly, scalability has made our expansion plan possible, allowing us to onboard more data and new clients without financial impact. It's a dream come true.”

Pablo Lemos

Co-founder
Tetris.co

FANCOMI Increases Database Performance by 10X, Significantly Reducing Costs



“

With MySQL HeatWave we improved database performance by 10X and significantly dropped our costs after migrating from Amazon Aurora. We also did not have to modify our application for a great experience.”

Kanami Suzuki

Developer
FANCOMI

Tamara Migrated to MySQL HeatWave for Speed and Cost Saving



“

We recently migrated our production workload from another cloud solution to MySQL HeatWave. Doing so reduced our cost by 3X and it also significantly accelerated many of our queries which were taking a long time before. Given the speedup we are observing with HeatWave, we expect to enhance our application by writing more complex queries which do not execute in a reasonable amount of time with the other cloud solution.”

Chien Hoang

Director of Engineering
Tamara

Johnny Bytes Speeds Queries up to 90 Times Compared to Amazon RDS and Aurora



“

MySQL HeatWave on AWS simplifies our data platform with a consolidated database for both transaction processing and analytics. We have seen 60 to 90X faster complex queries compared to AWS RDS and Aurora that generates real-time analytics we need for targeted, multichannel campaigns. We now have greater scalability to onboard more data and new clients of any size without increasing IT administration.”

Thomas Henz

Chief Executive Officer
Johnny Bytes

Bionime Improves Patients' Lives with 50X faster Queries than Amazon RDS



“

MySQL HeatWave on AWS has 50X faster complex queries compared to AWS RDS. That not only provides us with real-time insights to accelerate application development, but also helps us improve patients' lives.”

Kyle Yang

Assistant Manager
Bionime

LeanTaaS Increases Performance 6X by moving to MySQL HeatWave on AWS



“

MySQL HeatWave on AWS is an excellent solution for us as a small team. Having one database for both OLTP and OLAP workloads with six times higher performance compared to AWS RDS delivers real-time insights that helps us to continually enhance our iQueue platform, improve user experience, as well as reduce complexity and administrative overhead for our team.”

Gokhan Oner

Senior Engineering Manager
LeanTaaS

6D Technologies Accelerates Queries by 139X with MySQL HeatWave on AWS



“

MySQL HeatWave on AWS has 139X faster complex queries compared to Amazon RDS and Aurora that gives us a great opportunity to simplify our data infrastructure for both OLTP and OLAP with sub-second response time. Also, the web console is easy to configure and provides us the visibility to workload-related performance metrics with interactive reporting. MySQL HeatWave is a great fit for our microservices and cloud native product roadmap to deliver a superior experience and performance for our customers.”

Anish Kumar

Associate Vice President
6D Technologies

ITSP Accelerates Gets up to 30X Faster Queries with MySQL HeatWave on AWS



“

MySQL HeatWave on AWS is a game changer. We were pleasantly surprised with the ease-of-use and performance with 10 to 30X faster queries without complicated database tuning and performance improvement, using a similar database configuration. With a single database for OLTP and OLAP workloads for large volume of data sets, we no longer need index creation and maintenance which accelerates time to value for our clients.”

Wenjin Zhou, PhD

Chief Technology Officer
ITSP, Inc.

Centroid Systems Expands with 15X Query Performance Gains



“

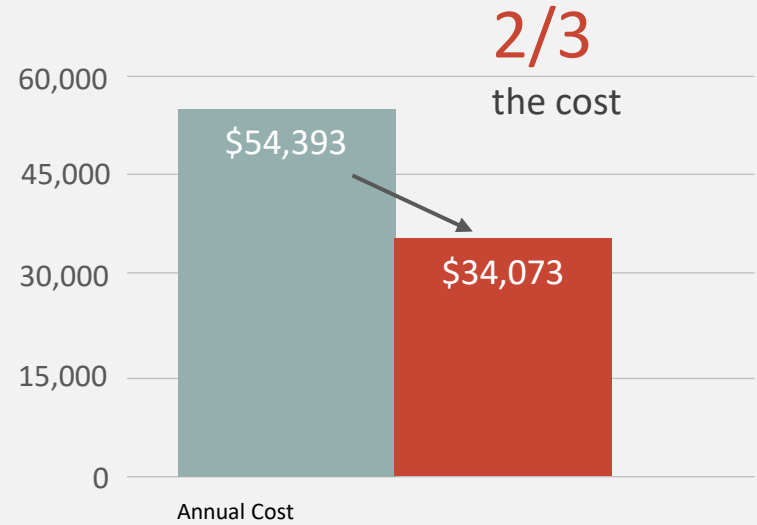
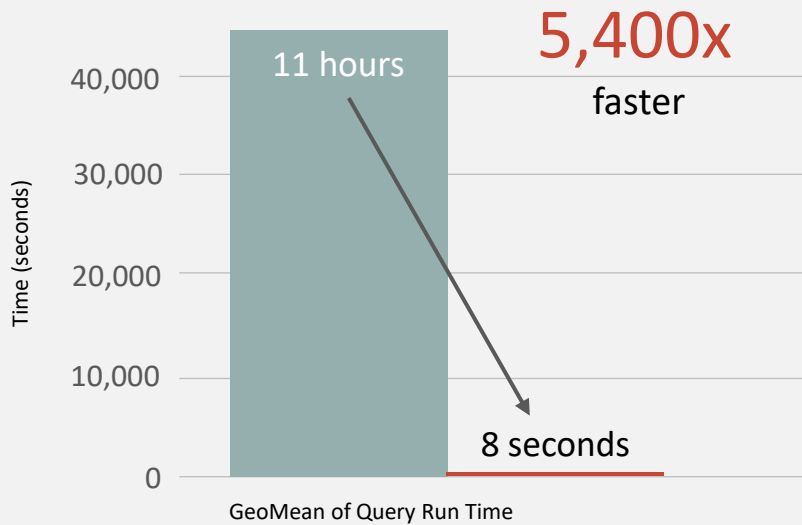
We found MySQL HeatWave on AWS improved query performance by 15X with no changes to our application compared to using MariaDB on AWS RDS. With MariaDB for analytics along with Tableau for visualization, we had been experiencing multiple outages because of the volume of data and patches impacting the SQL query performance. The performance gains from MySQL HeatWave gave our business confidence to expand and bring more offerings to the market.”

Ajay Arora

Chief Technology Officer
Centroid Systems

MySQL HeatWave vs. Amazon RDS

4TB TPC-H

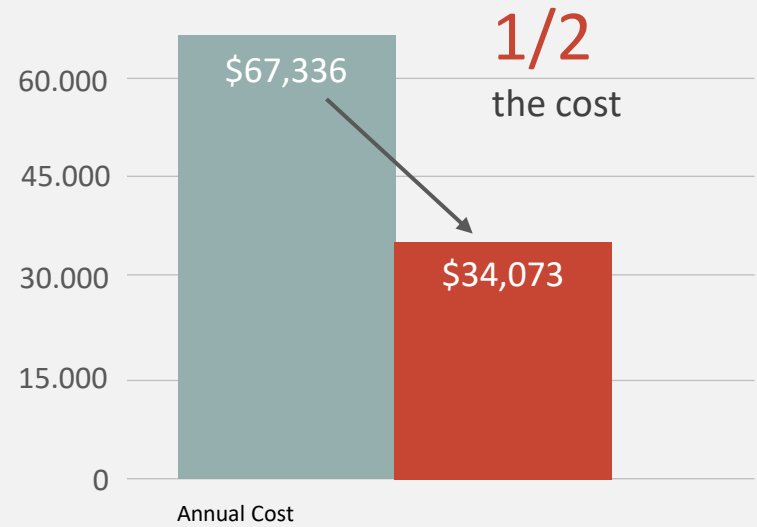
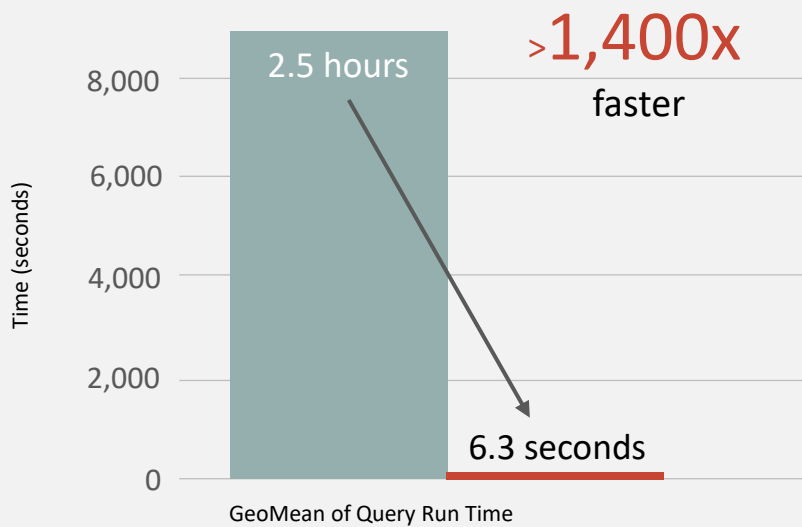


- RDS (db.r5.24xlarge)
- MySQL HeatWave (10 E3 nodes)

* Benchmark queries are derived from the TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with the TPC-H specification.

MySQL HeatWave vs. Amazon Aurora

4TB TPC-H

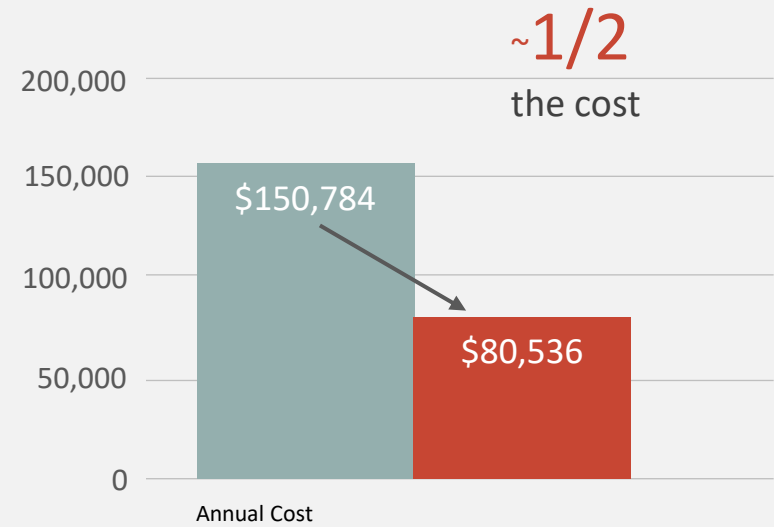
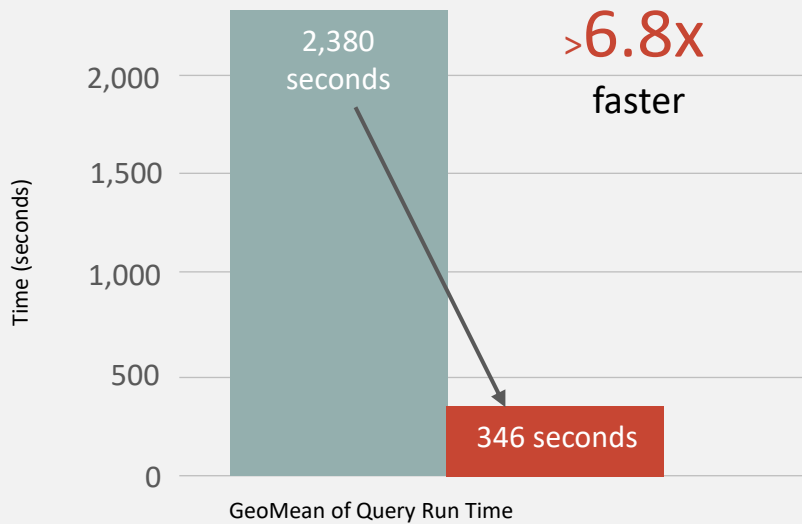


- Aurora (db.r5.24xlarge)
- MySQL HeatWave (10 E3 nodes)

* Benchmark queries are derived from the TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with the TPC-H specification.

MySQL HeatWave vs. Amazon Redshift AQUA

10TB TPC-H

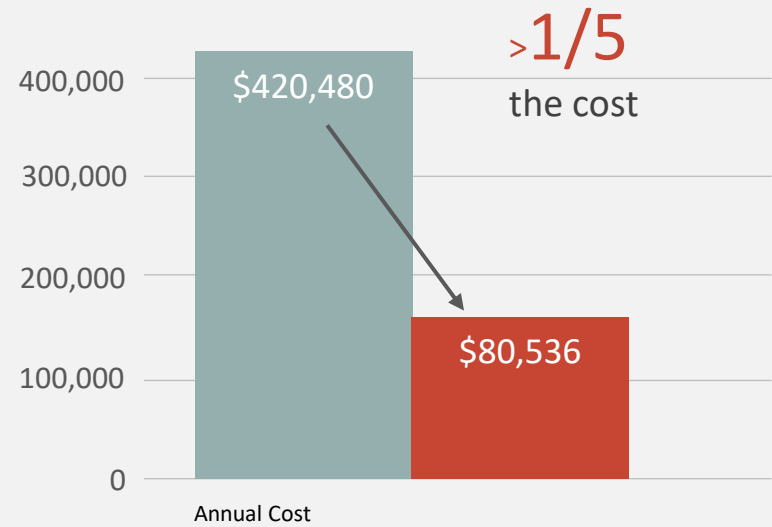
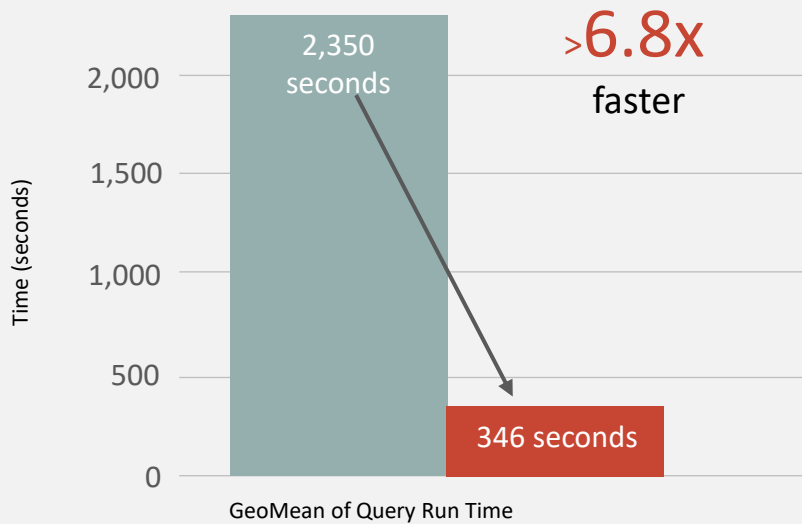


- Redshift (8 nodes of RA3.4xlarge)
- MySQL HeatWave (25 E3 nodes)

* Benchmark queries are derived from the TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with the TPC-H specification.

MySQL HeatWave vs. Snowflake

10TB TPC-H



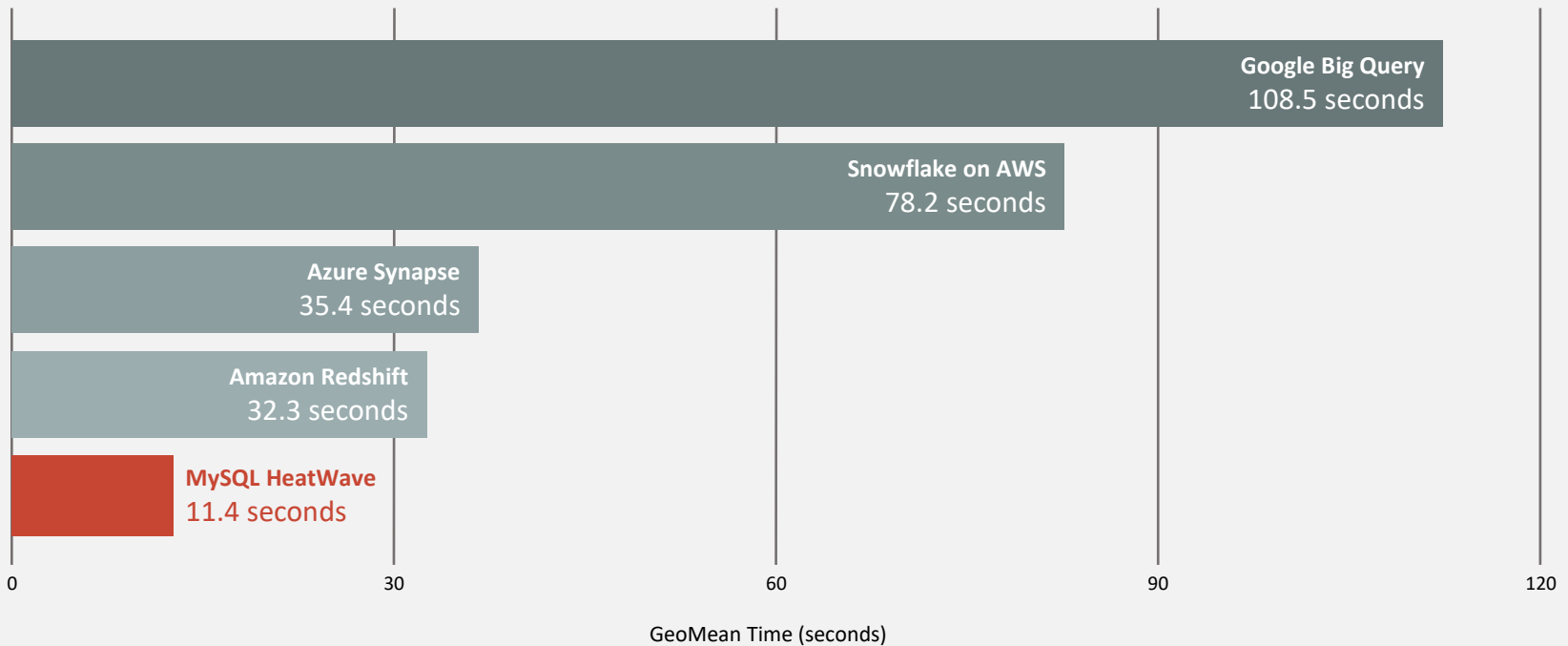
- Snowflake (Xlarge Cluster)
- MySQL HeatWave (25 E3 nodes)

* Benchmark queries are derived from the TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with the TPC-H specification.

Performance Comparison

PERFORMANCE BENCHMARK [30 TB TPC-H]

HeatWave is **faster** than all competitive database services.



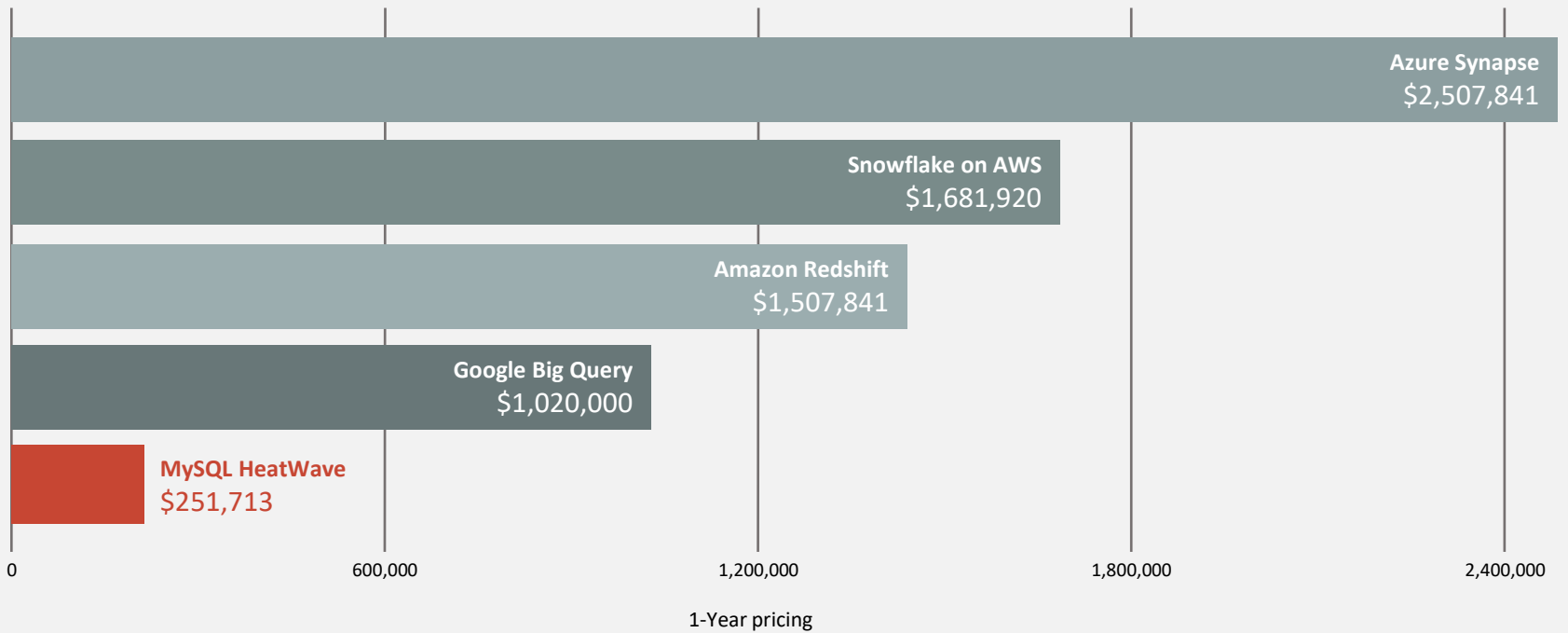
3rd party numbers derived from GigaOm report of October 2020.

* Benchmark queries are derived from the TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with the TPC-H specification.

Price Comparison

PRICE BENCHMARK [30 TB TPC-H]

HeatWave is **less expensive** than all competitive database services.



3rd party numbers derived from GigaOm report of October 2020.

Using PAYG pricing for Snowflake. Other prices are based on 1-year pricing.

* Benchmark queries are derived from the TPC-H benchmark, but results are not comparable to published TPC-H benchmark results since they do not comply with the TPC-H specification.

Benefits Across the Organization

Developer

- Accelerate time to market with a single database for OLTP, OLAP, and ML – avoiding the complexity of ETL duplication.
- Easily add ML capabilities to provide recommendations and enable smart apps.
- Develop in your favorite language (Java, PHP, Python, Ruby, NodeJS, etc.). Work with your open source apps of choice (WordPress, Drupal, Magento, Joomla, and more).

Data Scientist

- Automate the machine learning lifecycle with HeatWave AutoML.
- Train models 25X faster than with Amazon Redshift ML.
- Leverage popular notebooks such as Jupyter and Apache Zeppelin.

DBA

- Simplify your infrastructure with a single database for OLTP, OLAP, and ML
- Meet performance and uptime SLAs with higher performance than Amazon RDS, Aurora, Redshift, Snowflake and real-time elasticity with no downtime/read-only time.
- Save significant time with ML-powered automation (MySQL Autopilot)

VP of IT

- Lower costs with MySQL HeatWave – half the cost of Amazon Aurora and Redshift, one-fifth the cost of Snowflake.
- Enable business teams to make better and faster decisions with real-time analytics.
- Avoid the risks of data movement between data stores. Protect data and help ensure regulatory compliance with built-in advanced security features.

Industry Analysts about MySQL HeatWave



“May very well be the single greatest innovation in open source cloud databases in the past 20 years.”



“One MySQL HeatWave database is simpler than two from AWS plus all the associated ETL tools and data movers—that’s a fact, not an opinion.”



"MySQL HeatWave represents the fiscally responsible approach to cloud databases while AWS Redshift and Snowflake represent the fiscally reckless approach."



“You can spend \$80K on HeatWave and that would cost you \$420K to run on Snowflake. It’s a no brainer...”



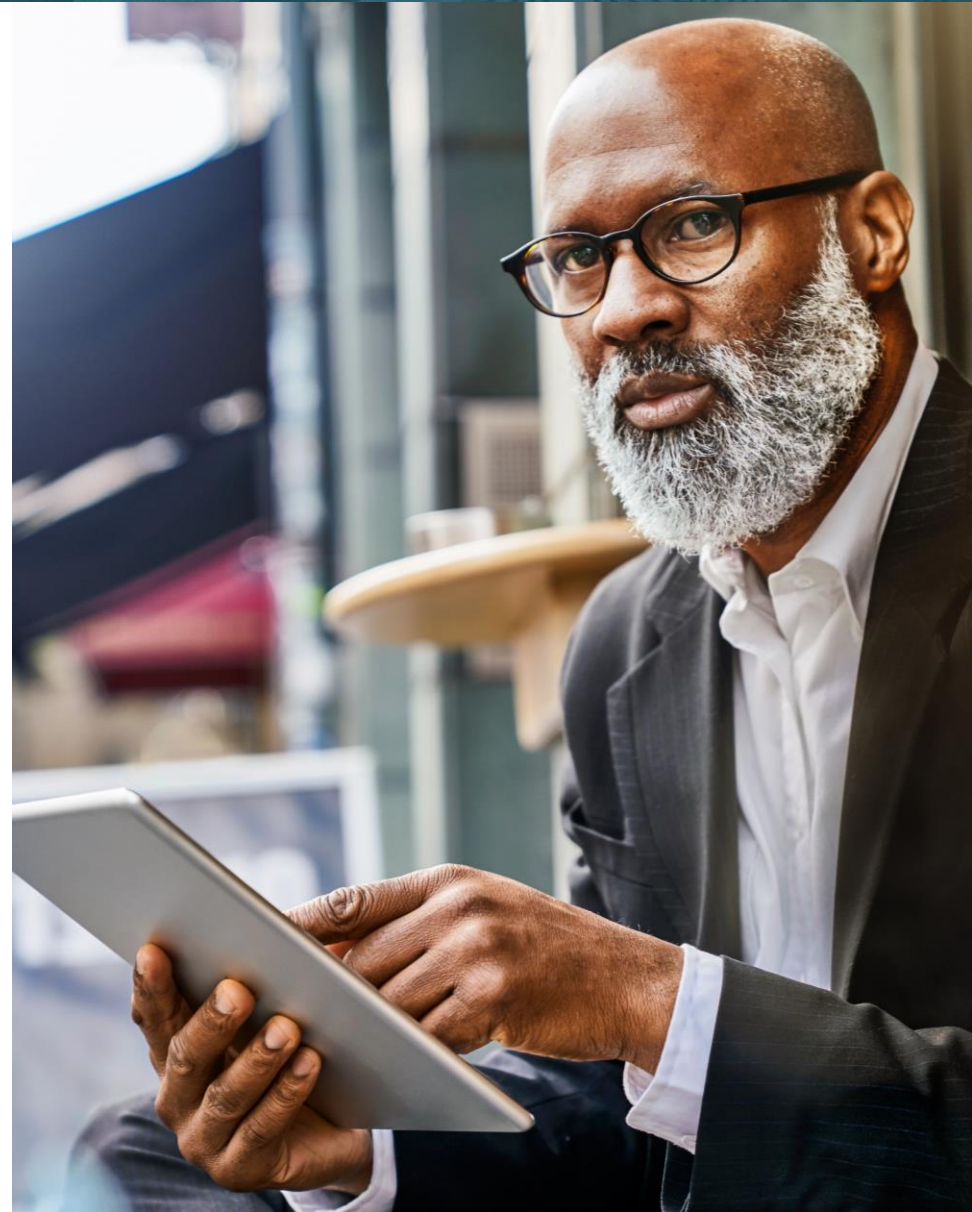
“With HeatWave ML, machine learning is democratized, it’s fast, uses up-to-date data, and costs less than other cloud database services.”



Conclusion

With MySQL HeatWave, you can drastically simplify your infrastructure and get real-time analytics while improving data security and reducing costs. You can democratize machine learning, making it easy for various departments to build, train, deploy, and explain machine learning models—without requiring expert data scientists. You can choose where to deploy MySQL HeatWave-powered applications: on OCI, AWS, Azure, or in your data center with OCI Dedicated Region.

MySQL HeatWave customers significantly improve productivity, deliver a better customer experience, and scale to onboard more clients or bring new offerings to market faster.



Learn More about MySQL HeatWave

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MORE

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FREE

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