ORACLE

Tech: Sales Plays

MySQL Apps & Cloud Native

Sales enablement presentation

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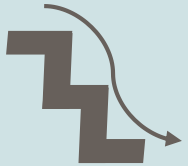
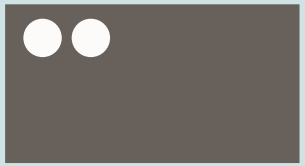
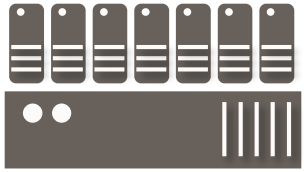
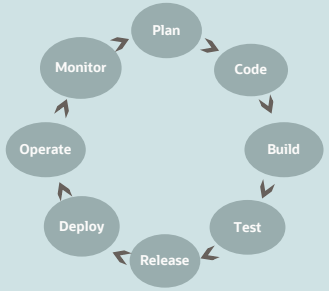
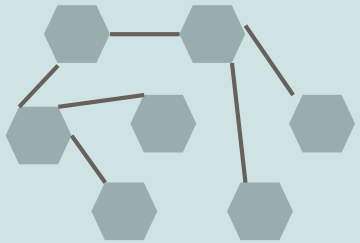
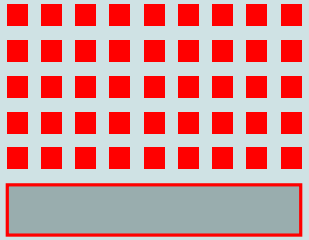
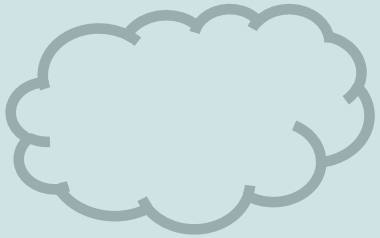
What is Cloud Native?

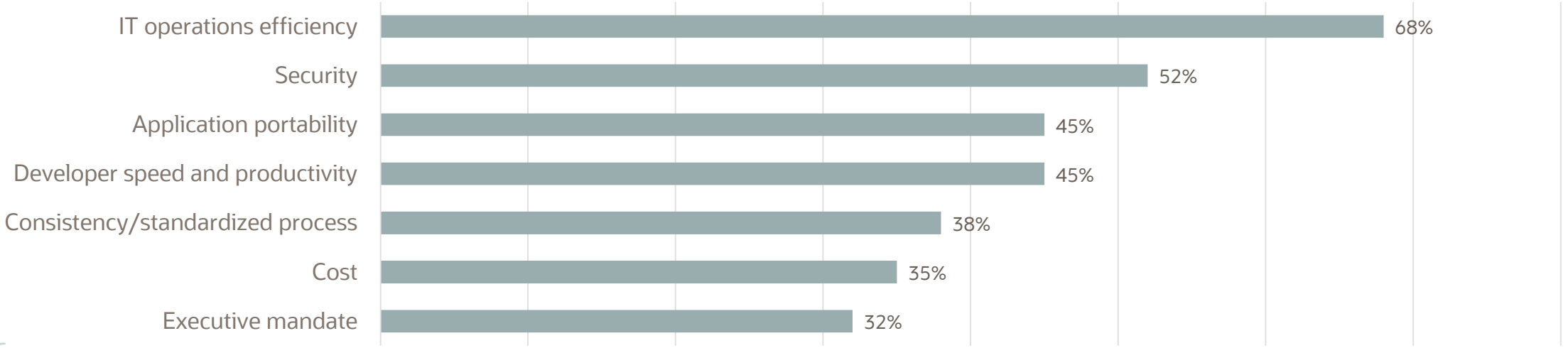
Evolution of Application Development and Deployment

	Development Process	Application Architecture	Deployment and Packaging	Application Infrastructure
~ 1980 – ~ 1990	Waterfall 	Monolithic 	Physical Server 	Datacenter 
~ 2000	Agile 	N-Tier 	Virtual Servers 	Hosted 
Cloud Native: ~ 2010 – Now	DevOps 	Microservices 	Containers 	Cloud 

Why develop modern cloud-native applications?

451 Research | S&P Global Market Intelligence

Top benefits of containers, serverless, and other cloud-native technologies



Personas Challenges in Cloud Native World

Senior IT

Responsible for delivering on stakeholder such as developers and LOB users expectations

- ✓ Worries about cost of providing services
- ✓ Worries about lack of data security and system unavailability due to hack,
- ✓ Not confident on disaster recovery preparedness

IT Architects

Responsible for designing reliable, scalable data platform for various enterprise users

- ✓ Worries about data governance, validity / change propagation across systems
- ✓ Worries about security hacks with disjointed security policy endpoints
- ✓ Lack of comprehensive mechanism that meet RTO / RPO

Developers

Build and deliver cloud native applications and modernize existing applications with AI / ML capabilities

- ✓ Need instant provisioning and automatic scaling of services without complexity or downtime
- ✓ Need flexibility to use any data model and language of choice without constraints
- ✓ Get transactional consistency, security and continuity without adding complex code

Operations/DBAs

Deliver scalable, reliable Cloud Services that meet LOB and Enterprise needs

- ✓ Need for comprehensive, unified data management platform
- ✓ Ability to configure and automate data recovery and replication that meet Business SLAs
- ✓ Need comprehensive set of automation tools, best practice guidelines

OCI meets you where you are – to simplify your cloud-native journey

Build new

Easily take advantage of Cloud-Native, Events-driven apps, AI, APIs, Streaming, other advanced capabilities

Reduce complexity with design blueprints, native integrated services, and pre-built templates. Accelerate development and TTM, while ensuring optimal runtime experience & lower TCO.

Enhance, optimize existing

Continuously add new functionality, optimization

Iteratively extend your applications to add new functionality, APIs, integrations. Easily support new use cases and evolving requirements.

Migrate and modernize

Containerize existing applications

From lift-and-shift to decomposition, OCI enables you to modernize existing apps to take advantage of containers and cloud-native benefits.

The MySQL HeatWave opportunity

Larry Ellison, Chairman, CTO, Oracle
June 15, 2021

The world's two most popular databases are the Oracle Autonomous Database and Oracle MySQL," said Oracle Chairman and CTO, Larry Ellison. "The Oracle Database once again delivered solid revenue growth in FY21. And while our Oracle Database business as measured by revenue currently dwarfs our MySQL database business—that is about to change because the latest version of Oracle MySQL has been upgraded to include a revolutionary new ultra-high-performance parallel processing query engine called HeatWave.

Independent analysts have tested and confirmed that Oracle MySQL with HeatWave runs 10 to 100 times faster than Amazon's version of MySQL called Aurora. This technological breakthrough is causing several of Amazon's customers to start moving their Aurora workloads to Oracle MySQL. And industry analysts are telling us they are seeing a 10x increase in Oracle Cloud Infrastructure customer inquiries.

Both the Oracle Autonomous Database and Oracle MySQL with HeatWave technology have captured the technology high-ground in the cloud database business—and that bodes well for the future of the Oracle Cloud."

MySQL HeatWave represents a fantastic opportunity for you

70%	of your customers are using MySQL	Large opportunity **within your installed base**
100%	of major cloud vendors offer MySQL-based services	MySQL HeatWave is the **only cloud database service** that combines **OLTP, OLAP, and ML services in ONE MySQL Database**
70%	of enterprises will increase their IT spending on open source through 2025 (Gartner)*	Open source databases in the cloud are **growing extremely fast**
100%	Compensation on MySQL HeatWave	For tech reps selling **MySQL HeatWave on OCI**

* Source: https://www.zdnet.com/article/2022-technology-trend-review-part-one-open-source-cloud-blockchain/

Different databases for different applications

	MySQL HeatWave	Autonomous Database Exadata Database Service
Maximum database size	50TB	479TB Uncompressed /4.7PB 10:1 2.5PB Uncompressed /25PB 10:1
Supported applications	Open-Source Applications; WordPress, Drupal, Magento, Joomla, phpBB	Oracle Fusion Cloud SaaS Applications; eBusiness Suite, PeopleSoft, et al
Open Source	Yes, quarterly MySQL code contributions	No
Developer-optimized	Yes, with PHP, Python, Ruby, Go, Rust, NodeJS, and others	Yes, with APEX, Autonomous JSON, MongoDB API, Java, Python, R, JavaScript, and others

Detailed positioning information available in internal FAQ in Sales Accelerator

Introduction to MySQL

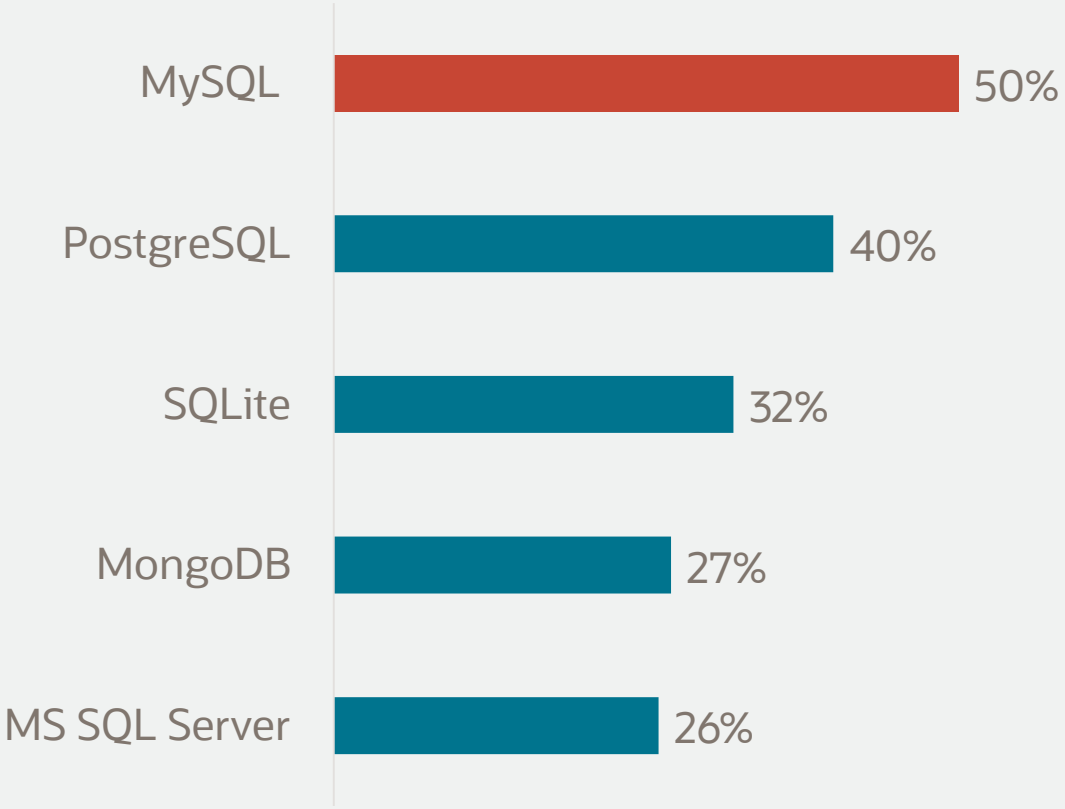
MySQL is the #1 Open Source Database

Rank Apr 2022	Rank Mar 2022	Rank Apr 2021	DBMS	Database Model	Apr 2022
1.	1.	1.	Oracle	Relational, Multi-model	1254.82
2.	2.	2.	MySQL	Relational, Multi-model	1204.16
3.	3.	3.	Microsoft SQL Server	Relational, Multi-model	938.46
4.	4.	4.	PostgreSQL	Relational, Multi-model	614.46
5.	5.	5.	MongoDB	Document, Multi-model	483.38

DB-ENGINES

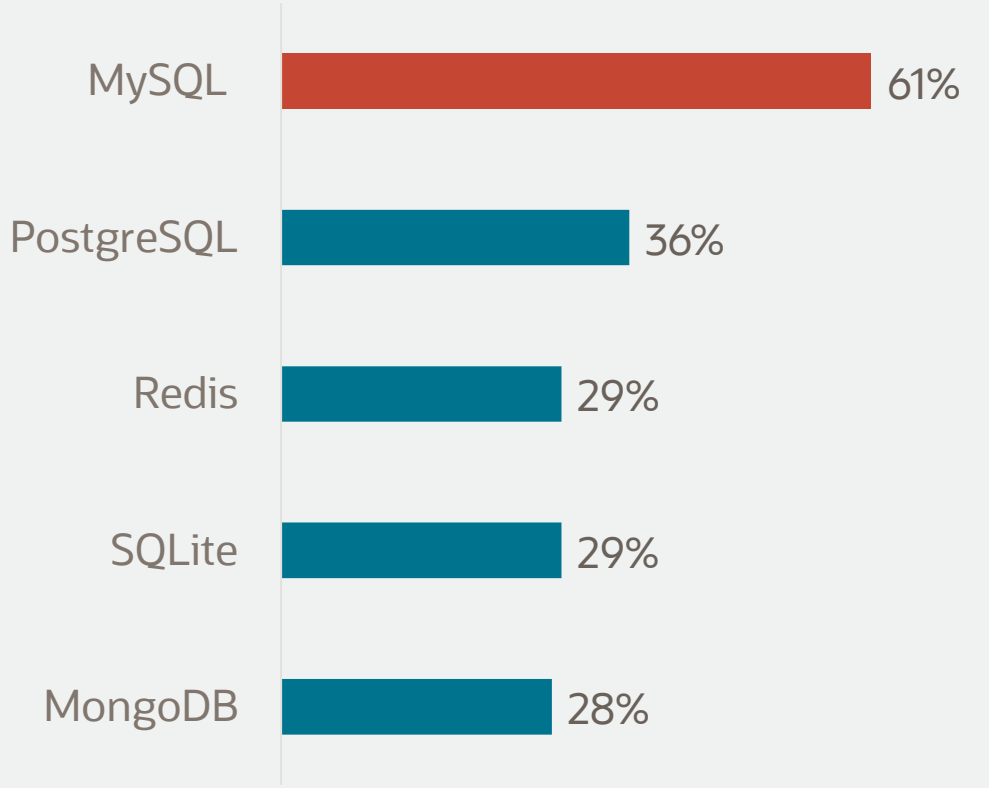
MySQL is the most popular database for developers

Most popular databases



Stackoverflow survey

Which databases have you used in the last 12 months?



Jetbrains survey

Innovative enterprises across many industries run MySQL

Social

- facebook
- twitter
- LinkedIn
- WeChat
- Pinterest

E-Commerce

- Booking.com
- NETFLIX
- UBER
- airbnb
- 淘宝网 Taobao.com
- 阿里巴巴 Alibaba.com

Tech

- APPDYNAMICS part of Cisco
- GitHub
- HubSpot
- zendesk
- intuit mint
- New Relic

Finance

- Bank of America
- J.P.Morgan
- citi
- Fidelity INVESTMENTS
- VISA
- CA

Manufacturing

- TESLA
- VW
- TOYOTA
- CAT

MySQL powers Open Source applications

Custom Apps Development

Content management and eCommerce

Learning platforms

MySQL - versões

MySQL HeatWave

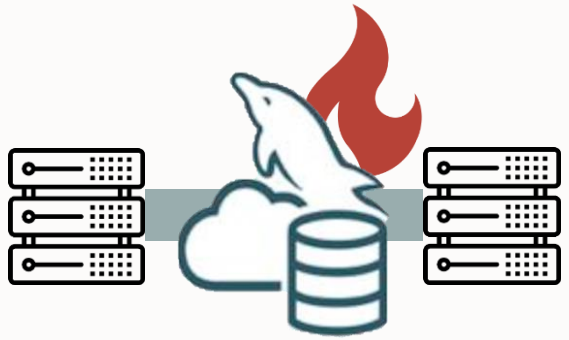
Feature	MySQL Community $0 - Free	MySQL Standard $	MySQL Enterprise Edition Enterprise $$$
Servidor de banco de dados (core)	Sim	Sim	Sim
Replicação	Sim	Sim	Sim
Alta disponibilidade	Sim	Sim	Sim
GUI & CLI clientes	Sim	Sim	Sim
Particionamento	Sim	Não	Sim
Premier Support	Não	Sim	Sim
Monitoramento - Enterprise Monitor	Não	Não	Sim
Desempenho - Thread pool	Não	Não	Sim
Segurança – Data Masking	Não	Não	Sim

MySQL Database Service na Oracle Cloud Infrastructure

100% desenvolvido, gerenciado e suportado pela Oracle

MySQL Database Service Standalone

MySQL Database Service com Alta Disponibilidade



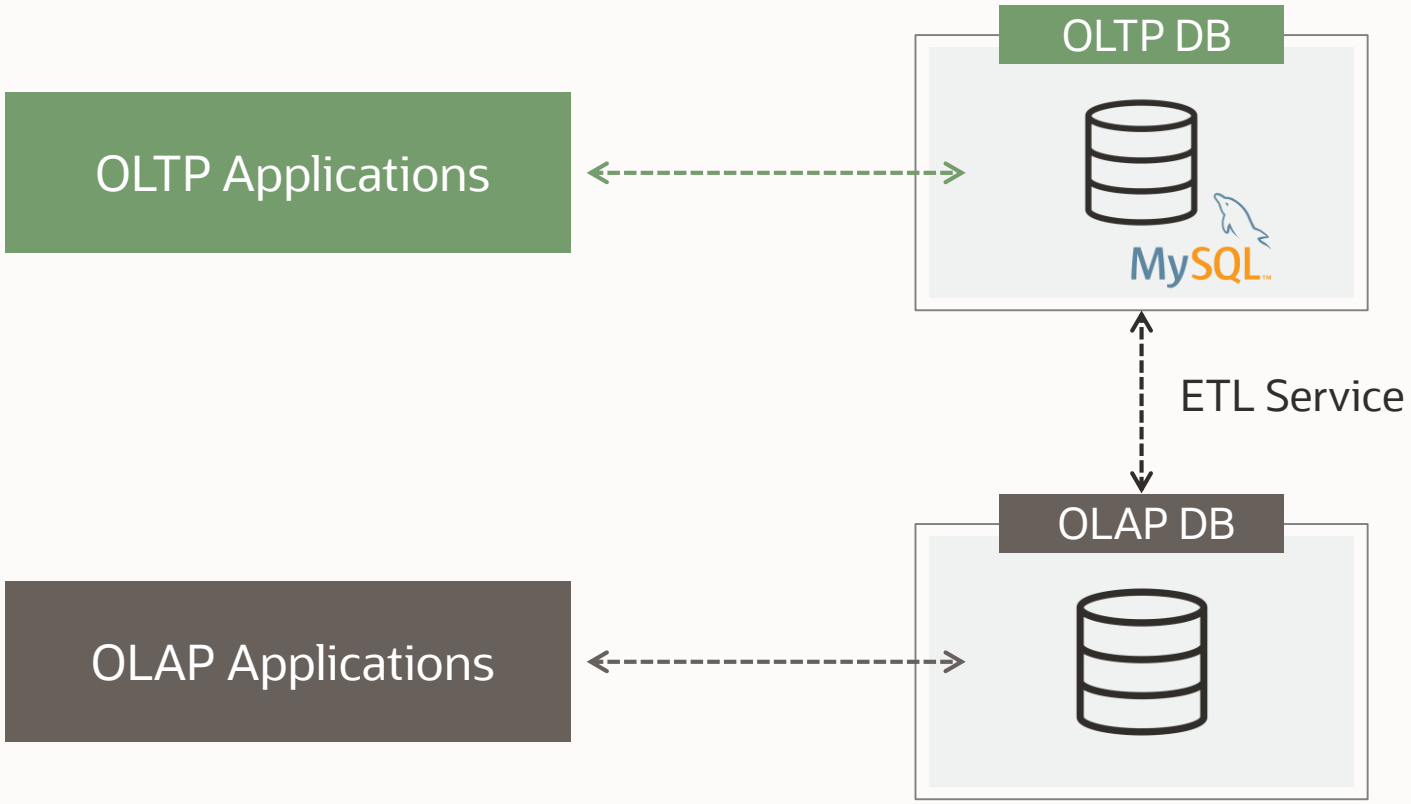
MySQL Database Service com HeatWave

Challenges for developers and DBAs…

…And how MySQL HeatWave uniquely addresses them

Challenge #1: Organizations need to use separate systems for transactions and analytics

MySQL is optimized for OLTP, not designed for analytic processing



Separate analytics database

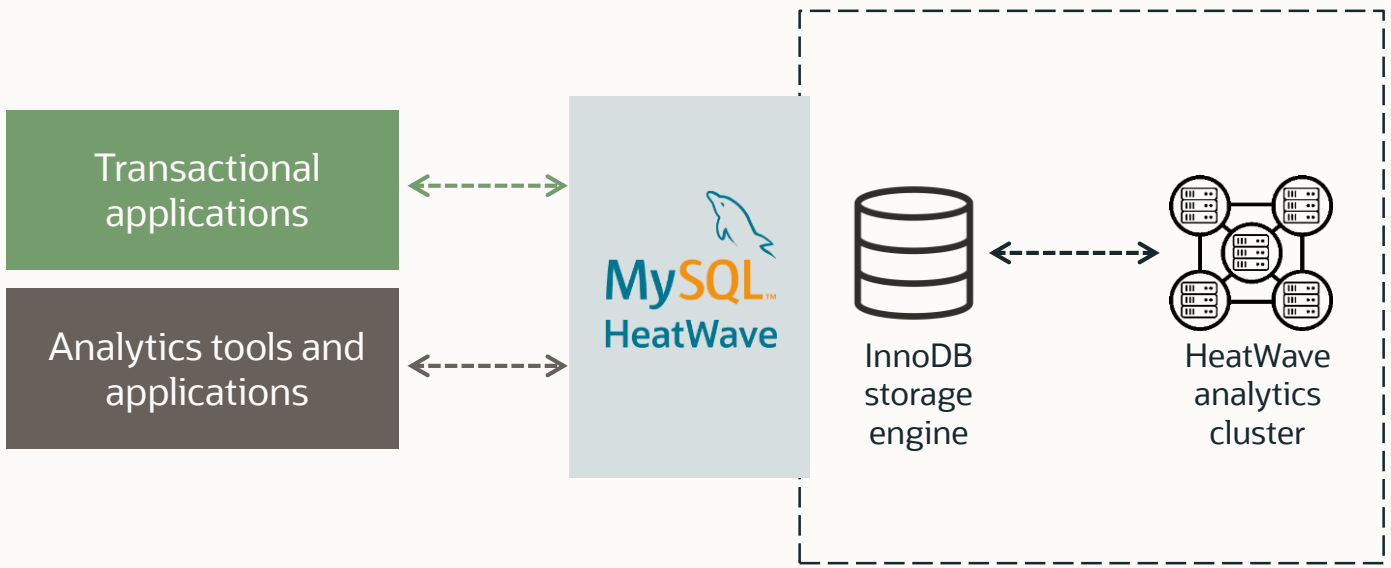
Complex ETL

No real-time analytics

Security & compliance risks

Increased costs

One database is better than two

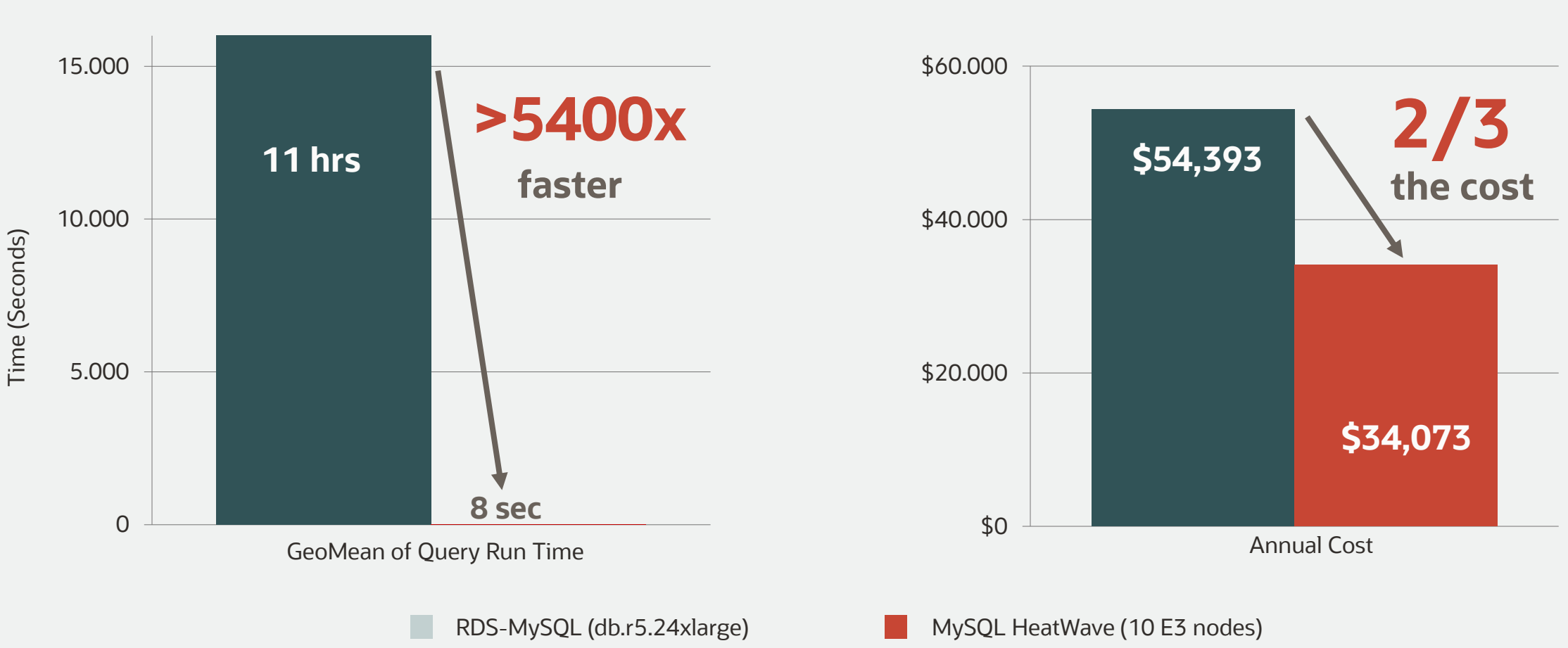


- One service for OTLP & OLAP
- No ETL duplication
- Unmatched performance, at a fraction of the cost
- Real-time analytics
- Improved security
- Applications work without changes

1>2 with MySQL HeatWave

MySQL HeatWave vs. Amazon RDS

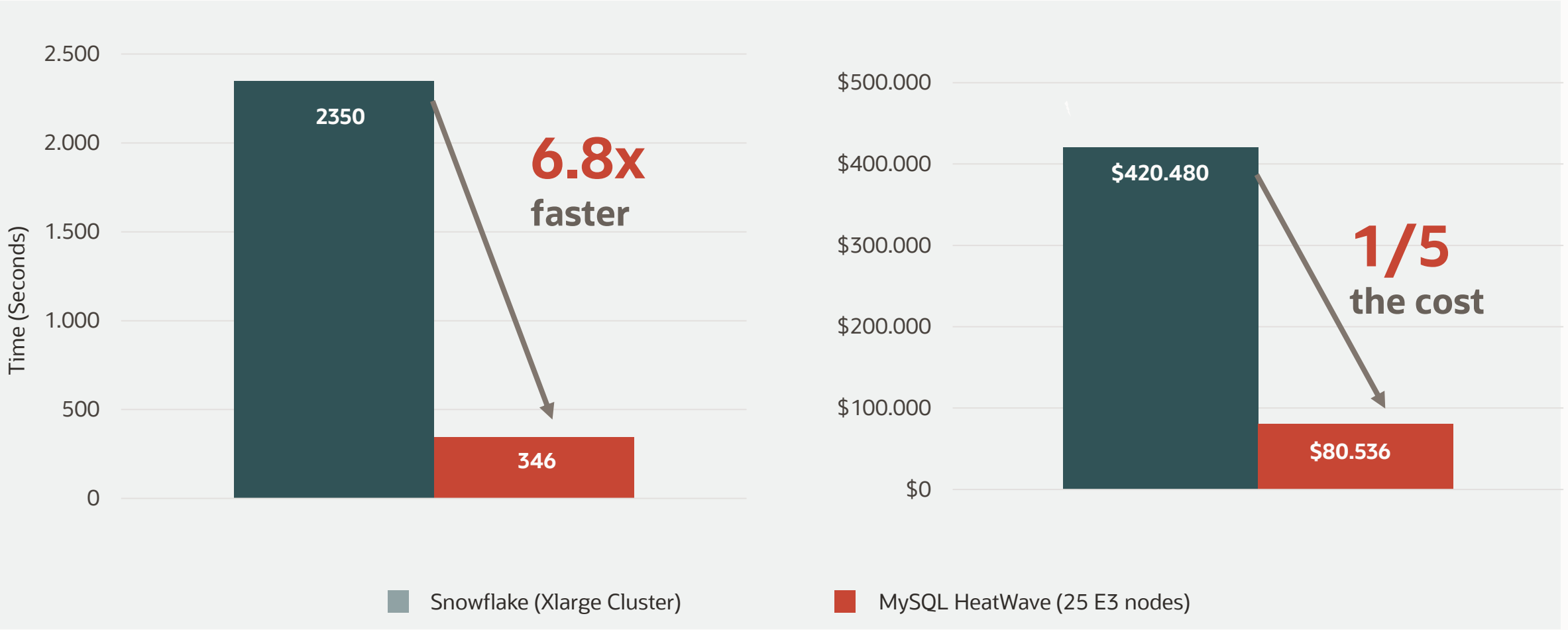
4 TB



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

MySQL HeatWave vs. Snowflake

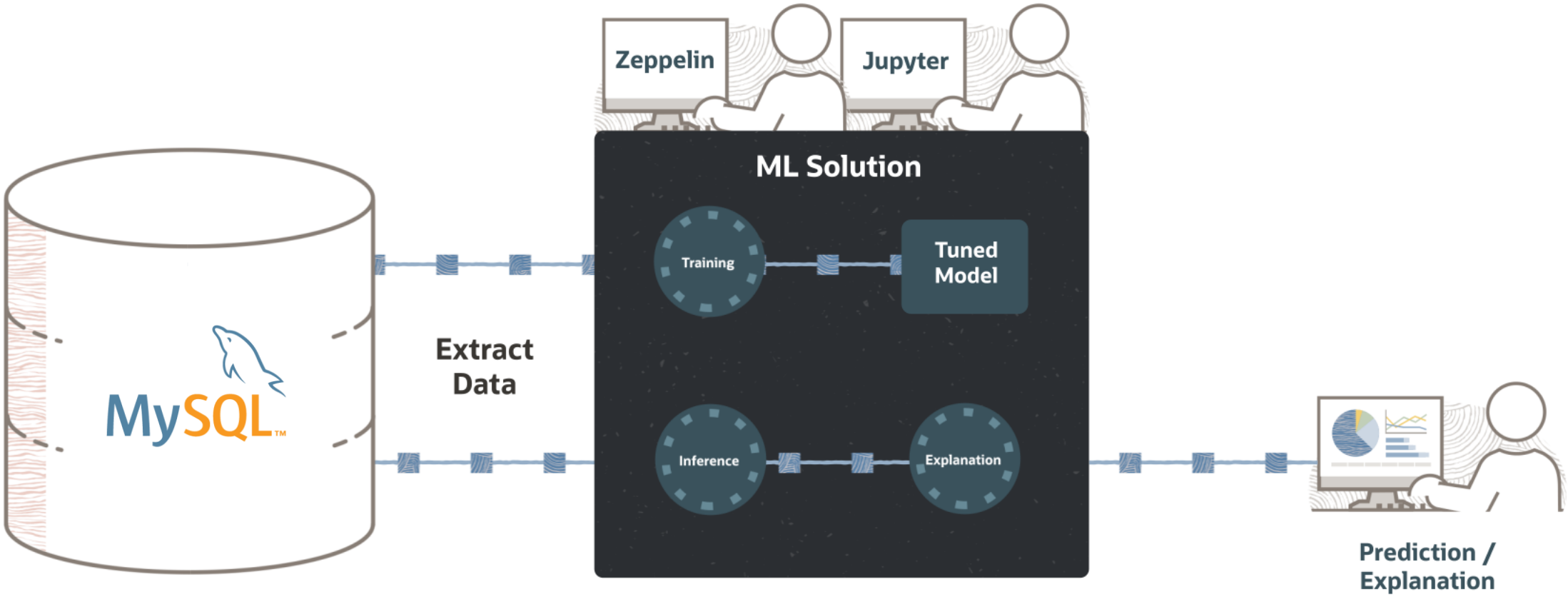
10 TB



*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

Challenge #2: Organizations need to use separate tools/services for machine learning

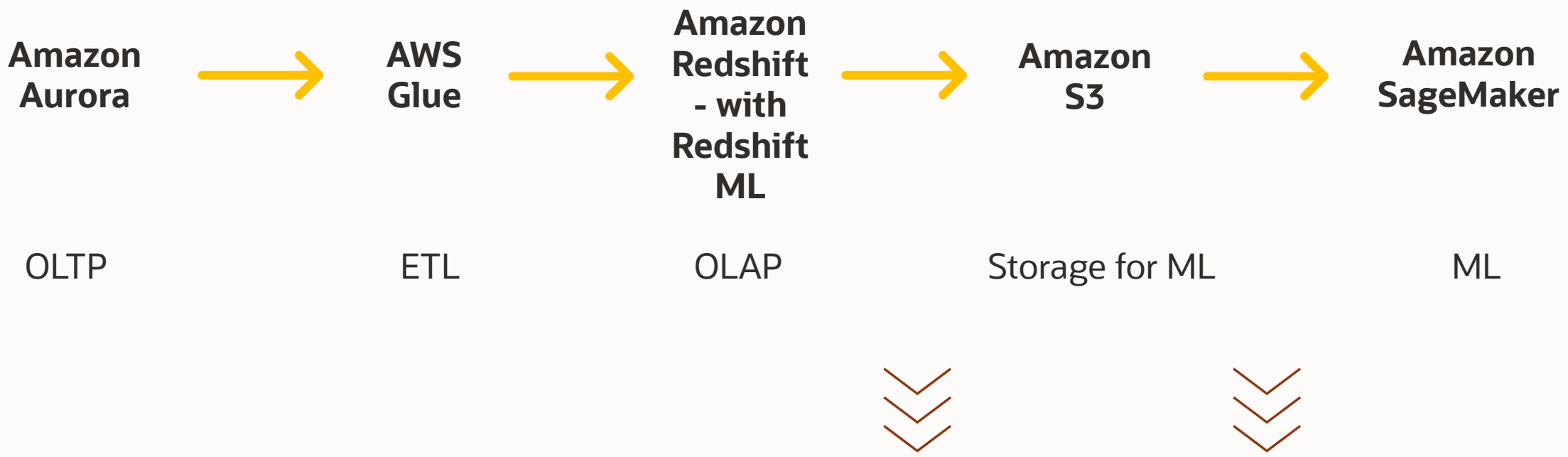
Need to ETL data to a separate ML solution for training and inference



- Complex, time-consuming
- Increases costs and risks
- Need to learn new tools/languages

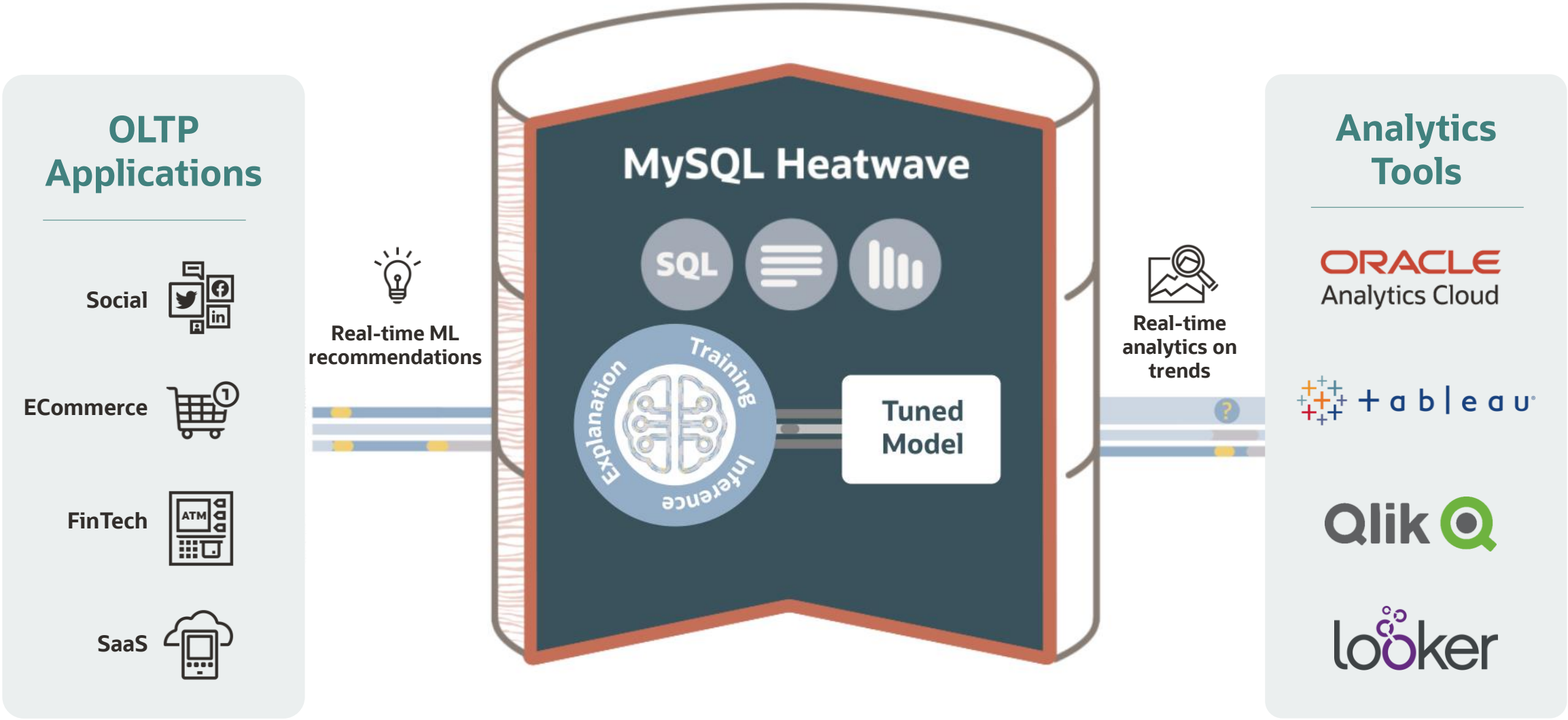
And it gets worse when using other databases…

The pain of using AWS services



Redshift ML does NOT provide in-database ML; exports data to SageMaker via Amazon S3

In-database machine learning with MySQL HeatWave



HeatWave ML vs Redshift ML: Benchmarks

- ✓ Produces more accurate results
- ✓ Trains models 25X faster on average
- ✓ 1% of the cost
- ✓ Scales as more modes are added

See Benchmark details: https://www.oracle.com/mysql/heatwave/performance/

Challenge #3: Organizations spend too much time on manual management tasks

Manual management tasks consume resources

- **On-premises**:
  - Database management: provisioning, configuration, backup, HA, patching, security & more
  - Operating system management: installation, patching, upgrades…
  - Infrastructure management: purchase and maintenance of servers, storage
  - Data center management: space, power, cooling, disaster recovery & more

- **In the cloud with a managed database service:**
  - Provisioning: right-sizing a database
  - Data loading: optimizing load time, memory usage, encoding, data placement
  - Query execution: performance tuning, prioritization of queries
  - Failure handling: actions to handle an error recovery

MySQL HeatWave: fully managed database service

100% developed, managed, and supported by Oracle

	Automation	MySQL On-Premises	MySQL HeatWave
Database	High Availability	✗	✓
	Backup	✗	✓
	Query Acceleration	✗	✓
	Machine Learning	✗	✓
	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	✗	✓

Sales guidance and resources

Where to Sell MySQL HeatWave

1. **Any customer running applications and workloads on MySQL** or derivatives (including Aurora, MariaDB, others)
2. Customers who are running **MySQL-based databases on AWS, Microsoft Azure, or Google Cloud Platform**
3. Customers who **require open source cloud databases** (Clickhouse, PostgreSQL)
4. Customers who are planning on **migrating to or using AWS Redshift, Microsoft Azure Synapse, Google BigQuery, or Snowflake** for MySQL analytics
5. Customers whose applications and databases **are 100% cloud-native—born in the cloud**—never had an on-premises environment
6. Customers using MySQL databases whose **machine learning projects are running behind schedule or can't even get them started**
7. **Oracle Database customers who also have MySQL databases** or other vendor's MySQL-based databases running on-premises
8. Oracle customers who **claim they are looking to leave the Oracle Database portfolio for open source databases**.

More details available in internal FAQ in Sales Accelerator

Discovery questions – examples

Understand environment

- What types of applications do you deploy on MySQL?
- How many MySQL-based applications do you have?
- How much data do you manage using MySQL?
- Where are your MySQL databases deployed? *(on-prem, competitor clouds…)*

Uncover pain/need

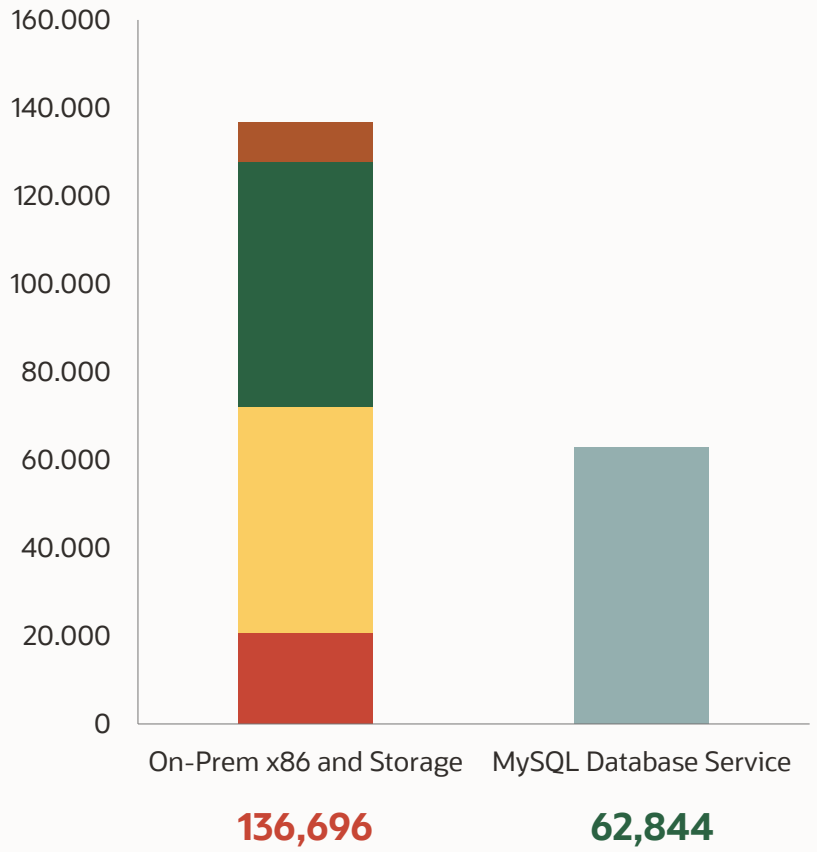
- How do you manage analytics on your OLTP data in MySQL? *(separate analytics DB? Mixed workloads in MySQL?)*
- How is performance when trying to run analytics reports?
- Do you get real-time analytics?
- What are your current pain points or concerns with your MySQL implementation?
- What would your ideal environment look like?
- How would you benefit from an integrated OLTP and OLAP solution?
- If we could drastically reduce the cost of your MySQL cloud service while significantly improving performance, what would it enable you to achieve?
- What machine learning initiatives do you have? How do you proceed to build, train, deploy, and explain ML models?
- Are you considering the cloud for your existing or new MySQL apps? Why? *(if on-prem)*

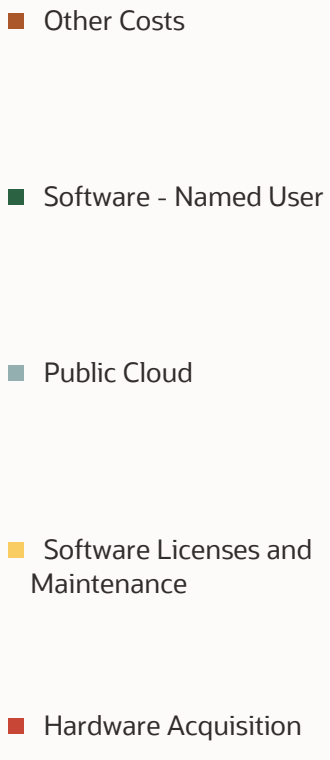
Costs

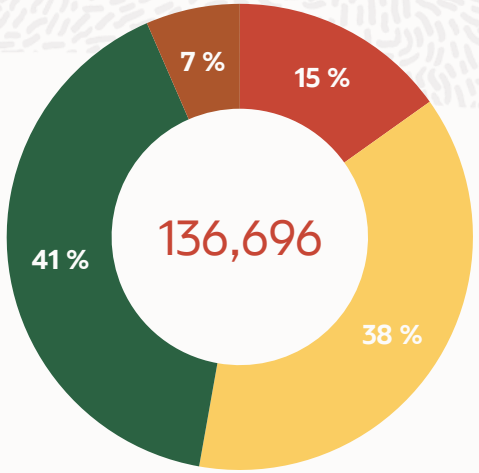
US$/Mes (PAYG)

	MySQL Database Service	AWS RDS MySQL	Azure MySQL	Google CloudSQL MySQL
Standard memory per Physical core/month	**$43.00** Standard.E3 AMD Rome (8GB/core)	**+208%** $127.22 M5 Intel (8GB/core)	**+217%** $ 130.94 General Purpose Intel (10GB/core)	**+160%** $ 107.58 N1-standard Intel (7.5GB/core)
High memory per Physical core/month	**$54.46** Standard.E3 AMD Rome (16GB/core)	**+228%** $ 178.56 R5 Intel (16GB/core)	**+224%** $ 176.33 Memory Optimized Intel (20GB/core)	**+157%** $ 140.17 N1-highmem Intel (13GB/core)
Storage (Data) per GB/month	**0.040**	**+188%** 0.115 General Purpose (SSD) Storage	**+188%** 0.115 General Purpose/Memory Optimized Storage	**+325%** 0.170 SSD provisioned
Backup per GB/month	**0.040** (with free quota)	**+138%** 0.095 (with free quota)	**+150%** 0.100 (with free quota)	**+100%** 0.080 (no free quota)

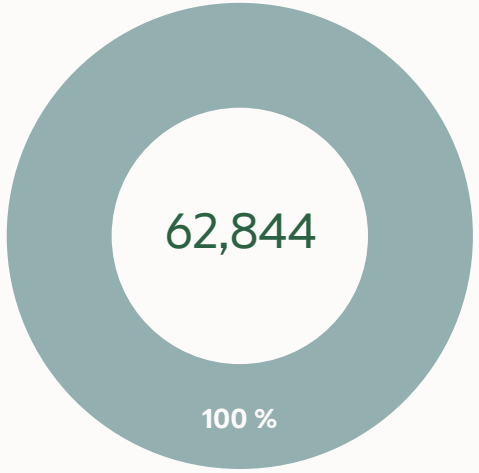
3 year TCO of a Bank reduced by 54% (PEN 73.852)







On-Prem x86 and Storage



MySQL Database Service

** Other Costs includes costs that are less than 5% of the total.

MySQL HeatWave customer momentum

330x faster & **85%** lower cost than Big Query

10x faster than Aurora

90x faster performance

3x faster and **60%** lower cost than another cloud service

1000x faster on complex queries & **60%** lower cost than Aurora

Millisecond speeds at **50%** lower cost than Aurora & Redshift

5x faster & **50%** lower cost than EC2

Modernizing applications MySQL HeatWave

One managed service for OLTP, OLAP, and ML

No separate analytics database and machine learning services

No complex, costly ETL duplication

MySQL and Amazon Aurora-based applications work without changes

Unmatched performance at a fraction of the cost

Integrated in-memory query accelerator

- 6.5X faster than Redshift at half the cost
- 7X faster than Snowflake at 20% the cost
- 1,400X faster than Aurora at half the cost

MySQL Autopilot: automation to achieve high query performance at scale

Real-time, secure analytics

Analytics queries always access the most up-to-date data

Avoid security risks of moving data between databases and ML services

Data always encrypted

Thank you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