MySQL Webinar Series

Using MySQL Database Service with Oracle Analytics Cloud

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MySQL Database Service - HeatWave
Agenda

• MySQL Database Service & HeatWave
• Oracle Analytics Cloud
  • Overview
  • Connectivity
  • Visualization
• Demo
MySQL is the most popular database for developers

<table>
<thead>
<tr>
<th>Most popular databases</th>
<th>Stackoverflow survey 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>MySQL</td>
<td>56%</td>
</tr>
<tr>
<td>PostgreSQL</td>
<td>36%</td>
</tr>
<tr>
<td>Microsoft SQL Server</td>
<td>33%</td>
</tr>
<tr>
<td>SQLite</td>
<td>31%</td>
</tr>
<tr>
<td>MongoDB</td>
<td>26%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Which databases have you used in the last 12 months?</th>
<th>Jetbrains survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>MySQL</td>
<td>60%</td>
</tr>
<tr>
<td>PostgreSQL</td>
<td>32%</td>
</tr>
<tr>
<td>MongoDB</td>
<td>30%</td>
</tr>
<tr>
<td>SQLite</td>
<td>28%</td>
</tr>
<tr>
<td>Redis</td>
<td>27%</td>
</tr>
</tbody>
</table>
Innovative enterprises across many industries run MySQL

Social
- facebook
- twitter
- LinkedIn
- WeChat
- Pinterest

E-Commerce
- Booking.com
- Netflix
- Uber
- Airbnb
- Taobao
- Alibaba

Tech
- AppDynamics
- HubSpot
- Zendesk
- Mint
- New Relic

Finance
- Bank of America
- J.P. Morgan
- Citi
- Fidelity
- Visa

Manufacturing
- Tesla
- Volkswagen
- Toyota
- Caterpillar
Problem: MySQL users need separate systems for OLTP and OLAP
MySQL Database Service & HeatWave

Easily run high performance analytics against your MySQL database, no ETL required

Single MySQL database for OLTP & analytics applications

All existing applications work without any changes

Extreme performance: 400x faster than MySQL, scales to thousands of cores

OLTP Applications

OLAP Applications

MySQL Database Service

MySQL Engine

OLTP Engine

Analytics Engine
All MySQL-compatible analytics applications run without any changes
MySQL Analytics Engine dramatically speeds up analytic queries

400G, 64 cores

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 Analytics Engine vs. Amazon Aurora

4TB

*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 Analytics Engine vs. Amazon Redshift’s fastest shape
4TB, 10 nodes

**Time (seconds)**

- **Analytics**
  - Geo Mean of 19 derived TPC-H Queries*: 19.7
  - Faster: 2.7x

- **OLTP + Analytics**
  - 7.3

**Annual Cost**

- **Analytics**
  - $110,560
  - Cheaper: 3x

- **OLTP + Analytics**
  - $37,022

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*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 Analytics Engine vs. Amazon Redshift’s low-cost shape

4TB

- **Geo Mean of 19 derived TPCH Queries**: 17.7x Faster

- **Time (seconds)**: 129.7 (Analytics) vs. 7.3 (OLTP + Analytics)

- **Annual Cost**:
  - Analytics: $38,286
  - OLTP + Analytics: $37,022

- **3% Lower cost**

*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 Database Service is integrated with other Oracle Services

End-to-end Integration from data ingestion to data visualization
Oracle Analytics

Complete Analytics Platform for Business Users, Developers and IT

Packaged Domain Analytics built on ADW and OAC
Analytics Needs Across the Organization

GOVERNED
- Dashboards
- Pixel Perfect Reports
- Semantic Models

AUGMENTED
- Machine Learning
- Natural Language
- Predictive Analytics
- Chatbots

SELF SERVICE
- Data Prep
- Data Visualizations
- Story Telling
- Collaboration
2020 Industry recognitions & awards

Visionary

Leader

Leader

Leader

The 10 Best Data Analytics And BI Platforms And Tools In 2020
Our Key Differentiators

Natural Language
- Support for 28 languages with text & speech recognition
- Advanced linguistic capabilities
- Embedded NLG engine for dynamic narratives

ML & Explainable AI
- Create models or integrate with external data science platforms
- Transactional & batch scoring
- Integrated explainability for model scoring
- Auto insights for data sets, key influencers, forecasting, etc.

Augmented Data Prep
- ML based data profiling with built-in & custom knowledge
- Intelligent data quality assessment, predictive model transformations, data enrichment
- Sensitive data detection & obfuscation

Storytelling
- Analytics presentations with dynamic narratives
- Advanced magazine-style layouts
- Digitize & animate any image with data
- Automated storytelling with system generated podcasts

What-If Analysis
- What-If and Writeback on any data source without data movement
- Scenario analysis with predictive models and forecasting

Open Semantics
- Semantic Modeling Markup Language
- Modern developer experience with Git integration
- Third party BI tool access via JDBC & ODBC drivers

Catalog
- Rich analytics catalog & integration with external data catalog
- Search and discovery by indexing metadata & data for all sources
- Lineage & impact analysis
Open Connectivity - Connect to Any Data Source

• Dozens of built in connectors to all types of data
  • Relational, NoSQL, big data, SaaS, 3rd cloud, on-premises

• Blend any data regardless of source or type

• Smart connectors to SaaS applications

• Secure access to on-premises data
Intuitive and Interactive Analytics

• Stunning visualizations for interactive exploration and dashboard creation
  • >50 built-in visualizations, dozens of plug-ins
  • “Beyond the basics” out-of-the-box visualization such as Sankey, Network, Pictogram, etc.

• Built in geospatial analytics, NLG, and diagnostics and predictive analytics

• Single-click advanced analytics
  • Trend lines, forecasting, clustering, outliers

• Create custom visualizations with built-in digitization tool and an open JS platform (D3.js compatibility)
Connecting Oracle Analytics Cloud to MySQL Database Service

- Updated connector to support MySQL Database Service
  - MySQL Connector / JDBC
  - Allows user to create self-service connections to MySQL Service
  - Supports both live and cache mode
- Much faster visualizations using HeatWave
- Fully interactive visualization experience with MySQL
- Allows MySQL users to take full advantage of all capabilities with OAC
Natural Language Processing - Interact using Natural Language

- Simplify the process of finding the right data
  - Customers report spending 20-40% of their time looking for the right data

- Ask any questions directly from the home page, mobile, or desktop

- Ability to scan all available sources for the best matched insight
  - Synonyms, abbreviations, auto-complete, dynamic filtering, dynamic calculation, time awareness, negation detection, and more

- Speech-enabled in 28 languages
Integrated Data Preparation

• Visual data transformation for Business Analysts
  • Reduce the ‘Export to Excel’ need for data wrangling

• Vast array of transformation capabilities
  • Join, Branch, Bin, Group, Filter, Aggregate, Custom calculations, and more

• Integrated scheduler

• Machine Learning capabilities enable the use predictive models within the flow

• Ability to consume Database Advance Analytics directly from the UI
Full Power of the Database Advanced Analytics Capabilities

- Ability to consume unsupervised ML database functions
  - Text Mining and Analytics
  - Market Basket Analysis
  - Graph Analytics
  - Pattern Matching
  - Approximate Analytics

- Function ship the complete execution to the database
Integration with Machine Learning Platforms

- Build and use machine learning models
- Register and use trusted machine learning models from external platforms
  - Function ship the execution to a database, dedicated ML compute, or other ML execution layers
- Batch and/or transactional (live and interactive) predictions
- Explain the AI/ML logic for each individual scored item as well as runner-up and why those were not selected
Deep Profiling and Data Enrichment

- Patented deep data profiling identifies the specific role of each column
- ML based recommendations for
  - Fixing bad formatting
  - Transformations
  - Remove sensitive information
  - Enrichment based on system and custom knowledge
Oracle Analytics Library

• Dozens of tutorials, workshops, map layers, plug-ins and videos

• Frequently updated

• Created and contributed by customers, partners, and various Oracle teams

• Open for everyone, Always free
Dynamic Automated Narratives in Natural Language

• Fully embedded NLG engine
  • Multiple languages, various levels of verbosity, various observations (trends, outliers, clusters, etc.)

• Describe data insights with a dynamically generated language narrative

• Simple to use, just like any other chart type

• Dynamic and fully automated
Use ML to Uncover Hidden Insights

• Machine Learning Driven Analysis and Insights

• With one click, ML algorithms analyze your data
  • Key drivers
  • Segmentation
  • Anomalies and outliers

• No PhD Required
  • Designed for users of any level

• Got a PhD?
  • Bring or train your own models

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NextGen Analytics on Mobile - Adaptive & Personalized

- Predictive, personalized, and proactive analytics on mobile
- System generated, customized feed of insights
  - Learned behavior, interests, and preferences
  - Content shared by other users
  - Seeded/pinned insights
- Infuse insights into daily activities based on your interests,
  - Alerts based on data events, location, time of day, other users activities
- Anticipates your needs and delivers appropriate information throughout the day
Available Resources

- Public OAC sandbox
  - Oracle.com/OACLive
- Oracle Analytics Library
  - bit.ly/OAClibrary
- Udemy Courses
  - bit.ly/OACourses
- YouTube Channel
  - bit.ly/OACTube
- OA Idea Lab
  - bit.ly/OAIdeaLab
Follow us on Social Media

mysql.com
oracle.com/mysql/analytics
twitter.com/mysql
facebook.com/mysql
linkedin.com/company/mysql
Q&A

Thank You!