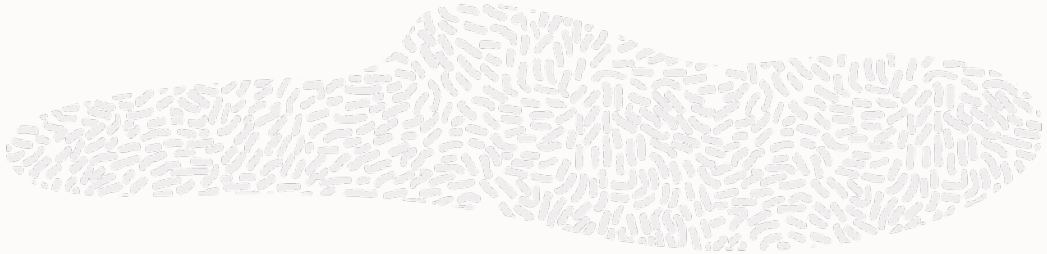
ORACLE DevLive | Level Up

Introduction to the

New MySQL Management Service

Sriram Vrinda
Product Management
Cloud Observability and Management
Mar 23, 2023

Agenda



- Introduction
- Overview of monitoring in MySQL Database service in OCI (MDS)
- Fleet monitoring and management
- Performance Hub for SQL performance management
- ML driven capacity and performance management
- Demo
- Q&A

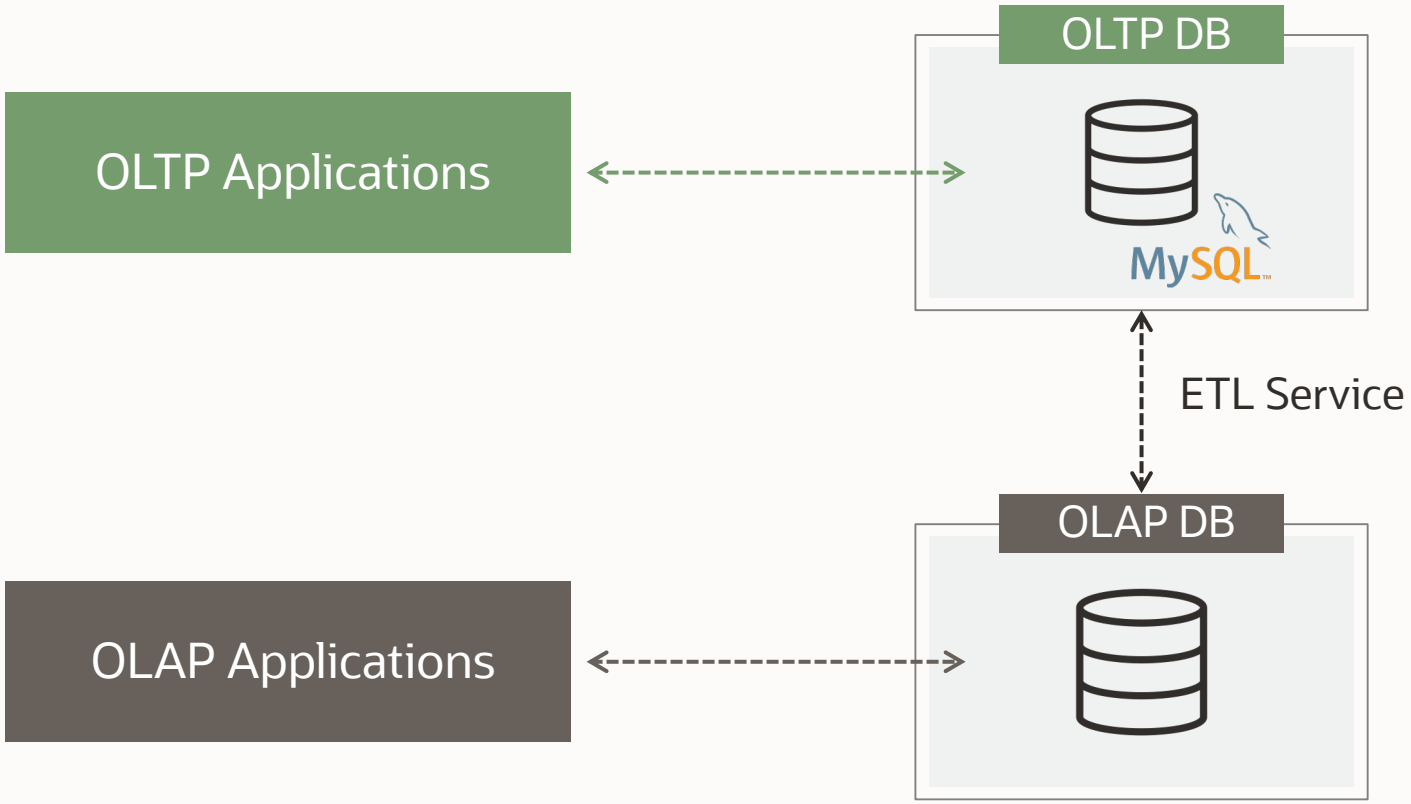
MySQL is #1 open source database

Rank Jan 2023	Rank Dec 2022	Rank Jan 2022	DBMS	Database Model	Jan 2023
1.	1.	1.	Oracle	Relational, Multi-model	1245.17
2.	2.	2.	MySQL	Relational, Multi-model	1211.96
3.	3.	3.	Microsoft SQL Server	Relational, Multi-model	919.39
4.	4.	4.	PostgreSQL	Relational, Multi-model	614.85
5.	5.	5.	MongoDB	Document, Multi-model	455.18

DB-ENGINES

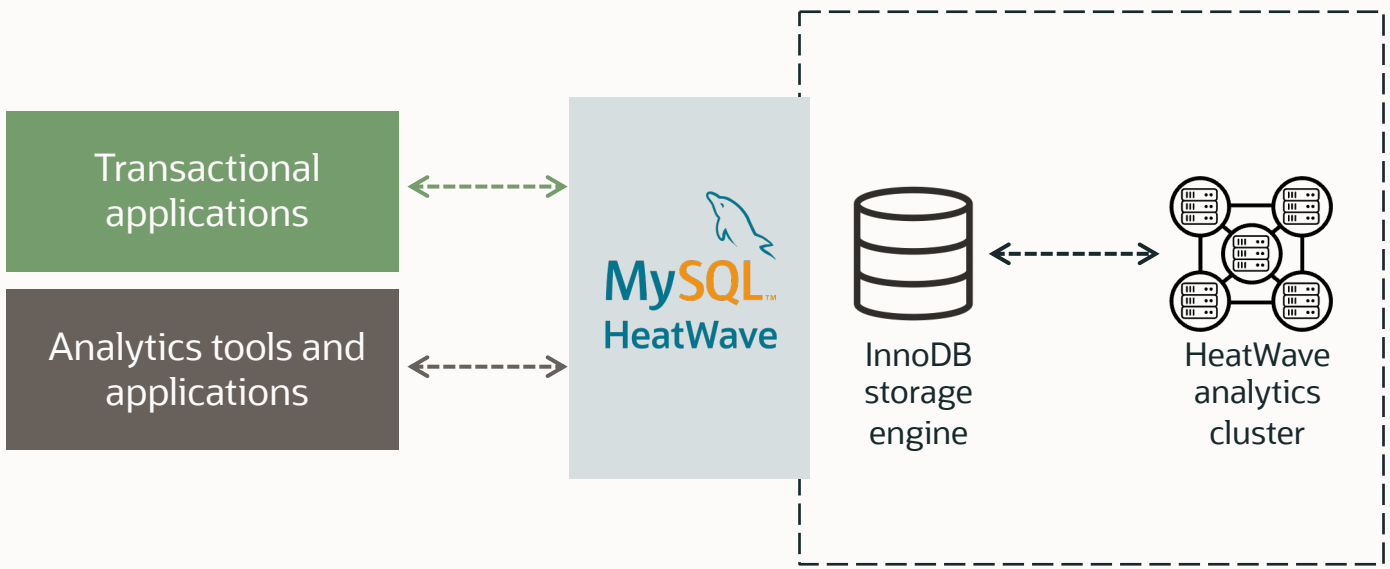
Areas of Innovation

MySQL is optimized for OLTP, not designed for analytic processing



- Separate analytics database
- Complex ETL
- No real-time analytics
- Security & compliance risks
- Increased costs

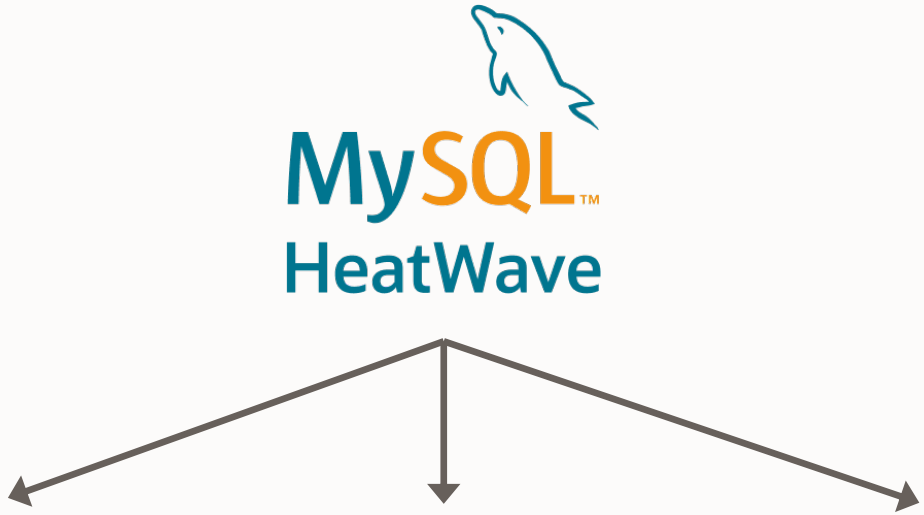
One database is better than two



- 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

Available in public clouds



ORACLE CLOUD Infrastructure

aws

NEW

NEW

Optimized to deliver the best price performance in each cloud

Oracle Observability & Management Overview

Complete choice of solutions to observe and manage your stack together

Cloud-native platform brings together all telemetry – traces, metrics, logs – for analysis, visualization, and advisement

Hybrid and multicloud support – across on-premises, Oracle Cloud and multicloud

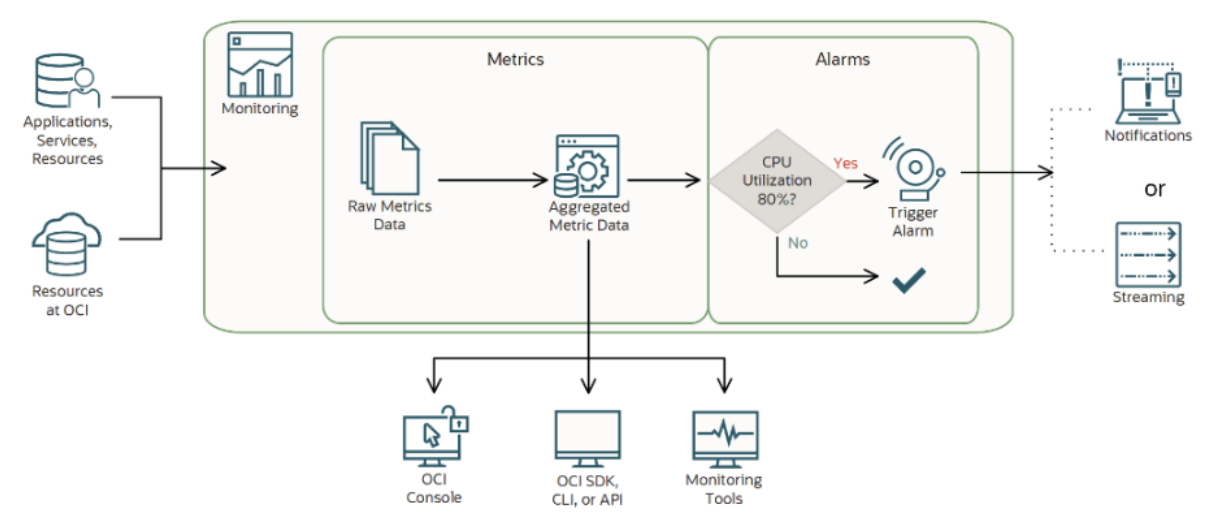
Extensible – based on open standards supporting 3rd-party technology collection

Comprehensive stack visibility across the enterprise – individual component, across complex application topologies, down to SQL

ML algorithms and models eliminate noise, detect problems, identify the root cause and help ensure availability and performance

Overview of monitoring in MySQL Database service in OCI (MDS)

Monitoring MySQL databases in OCI
OCI monitoring service



OCI Console supports native monitoring and management of MySQL DB System in OCI

Metrics

- MySQL metrics to diagnose and troubleshoot problems
- Create alarms on key metrics based on thresholds

Events and Notification

- OCI Events can be used get informed about state change of MySQL resources.
  - Example: create/terminate, backup operations etc.
- Monitoring, events and notification service can also be integrated with third party services like Pager duty and Slack for operations management

MySQL Metrics

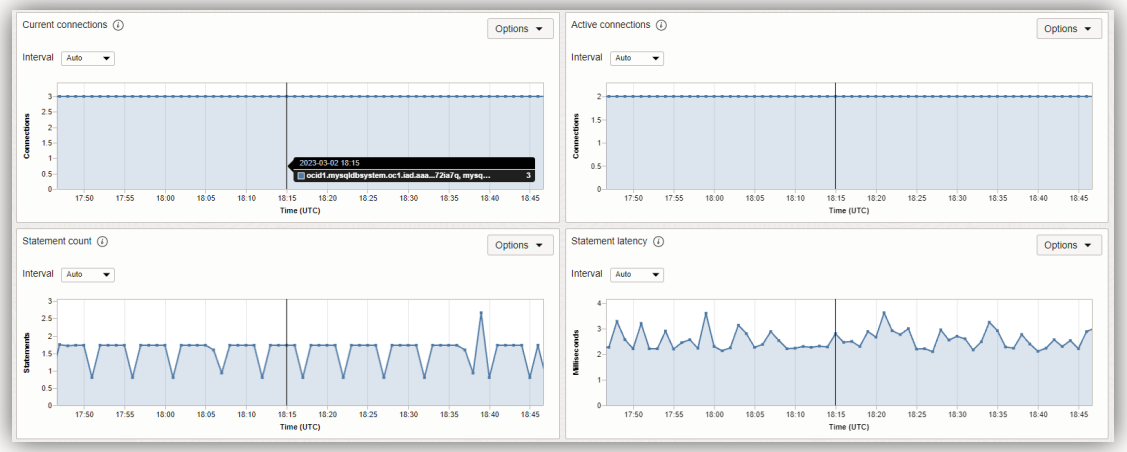
Measure useful quantitative data about MySQL and MySQL Heatwave instances Databases

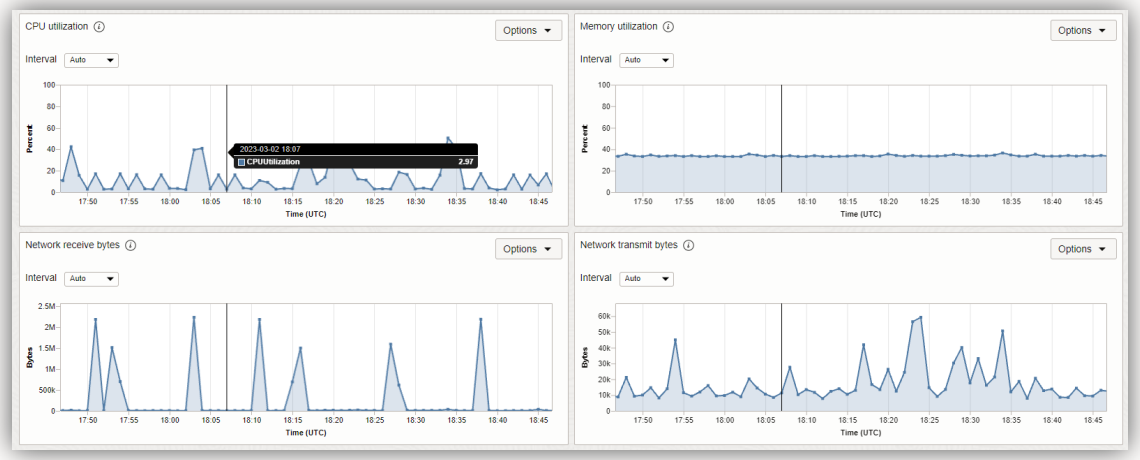
- CPU and storage utilization
- Current connections, statement count, etc.

Database service metrics for MySQL include the following Dimensions

- resourceId: Specifies the OCID of the resource.
- resourceName: Specifies the display name of the resource
- resourceType: Specifies the node type emitting the metric, mysql or heatwave
- heatWaveNode: Specifies the display name of the HeatWave node

Retention: 1 min for 7 days, 5 min for 30days and 1hr for 90 days





Fleet monitoring and management

Oracle Cloud Infrastructure Database Management Service

On-demand subscription based cloud service

Leading database performance diagnostics

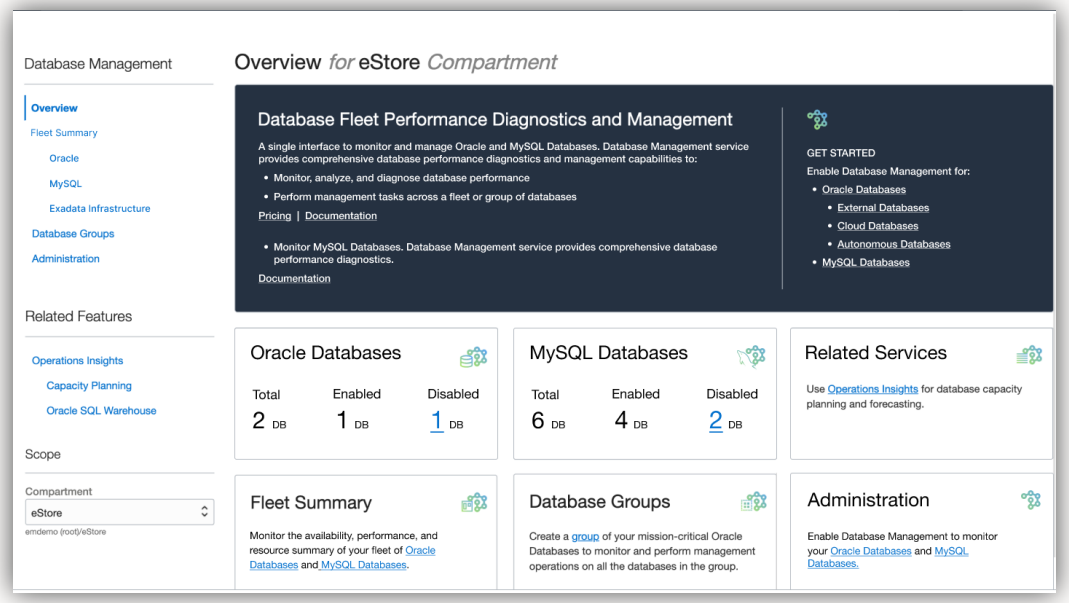
- Combines back-end instrumentation and tools with visualization-driven interfaces
- Single pane of glass management view for databases deployed anywhere

Cloud native

- Fully managed by Oracle
- True cloud elasticity, low operations cost

Key use cases

- Monitor fleet of databases
- Real-time performance diagnostics
- Monitor databases deployed on multicloud or on-premises



Fleet monitoring and management

Unified fleet view of databases across Oracle Cloud and on-premises

- On the Fleet Summary page, you can monitor multiple Databases
  - MySQL, Autonomous, On-premises

Native OCI metrics for DevOps event alarms and monitoring

Drill down from the Fleet Summary page to a specific MySQL database of interest

Visualization-driven load and performance analysis

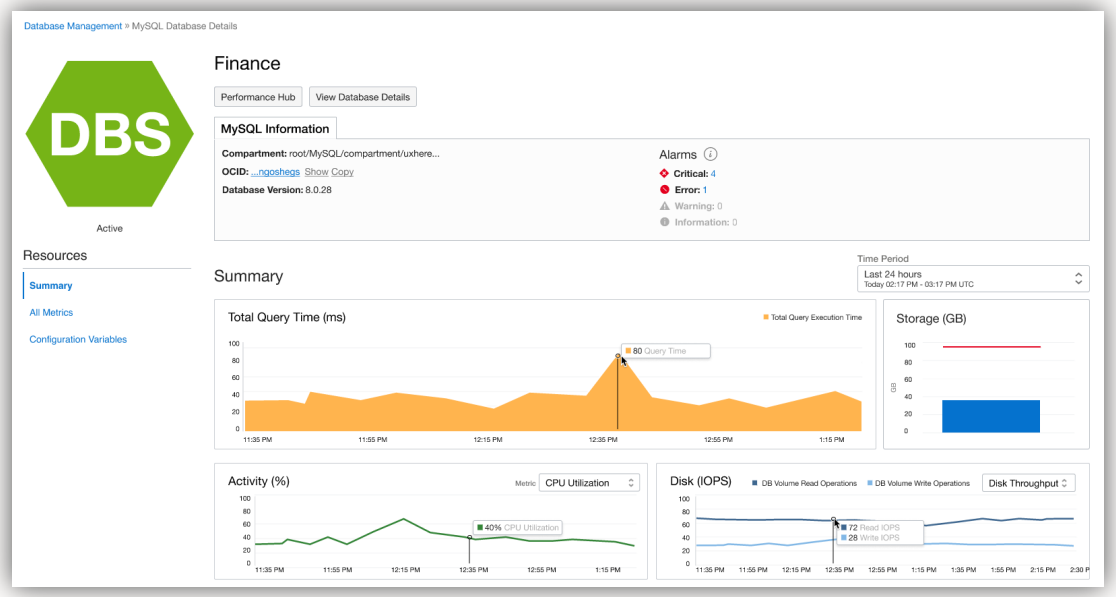
Performance summary

Drill down from the Fleet Summary page to a specific MySQL database of interest to monitor:

- Total Query Time
- CPU Utilization
- Disk IOPS
- Memory
- Network throughput

All metrics page for detailed charts of all the available metrics for better co-relation

Configuration variables used by the running instances, view them by various filters, etc.

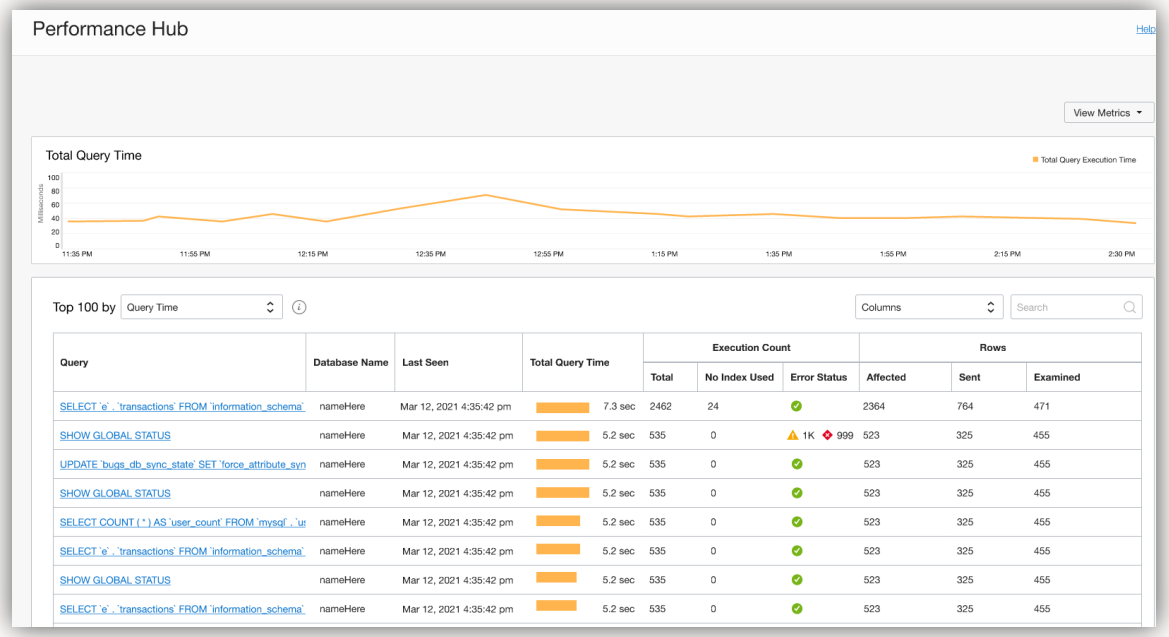


Performance Hub for SQL performance management

Performance Hub: Find and Fix Problem Queries

Monitor and troubleshoot query performance

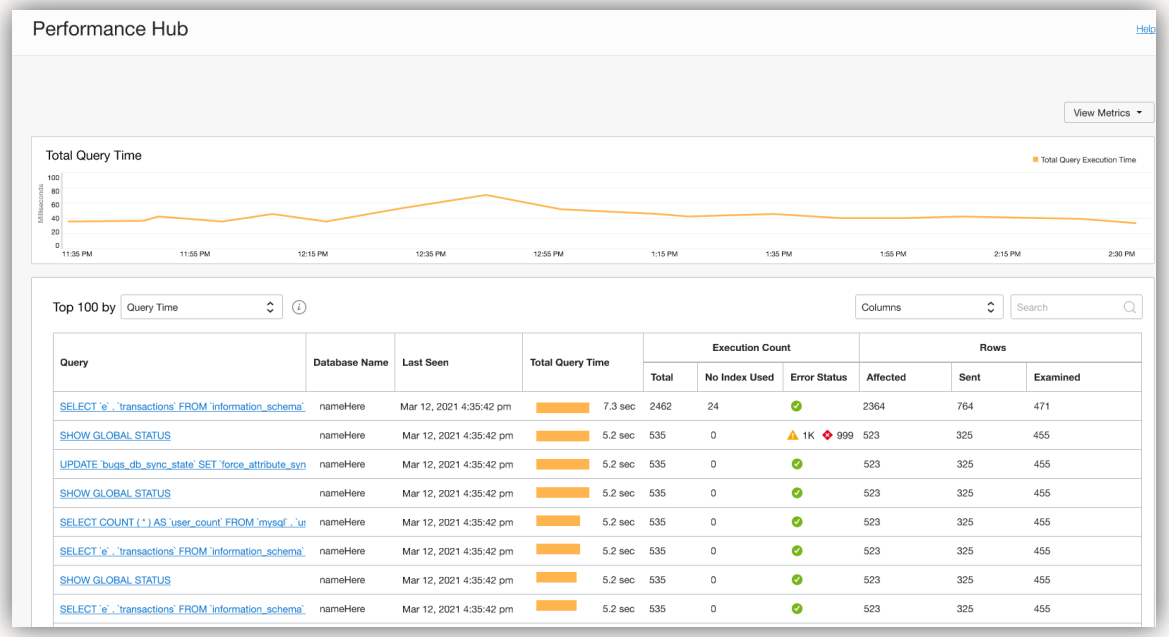
- Quickly identify expensive queries that impact the performance of their applications
- Visualize query activity to gain further insight into performance beyond query statistics
- Filter for specific query problems like full table scans and bad indexes using advanced global search options
- Fix the root causes of poor performance directly in the SQL code



Performance Hub: Find and Fix Problem Queries

Real-time aggregation of query content and performance statistics without relying on MySQL logs or SHOW PROCESS LIST

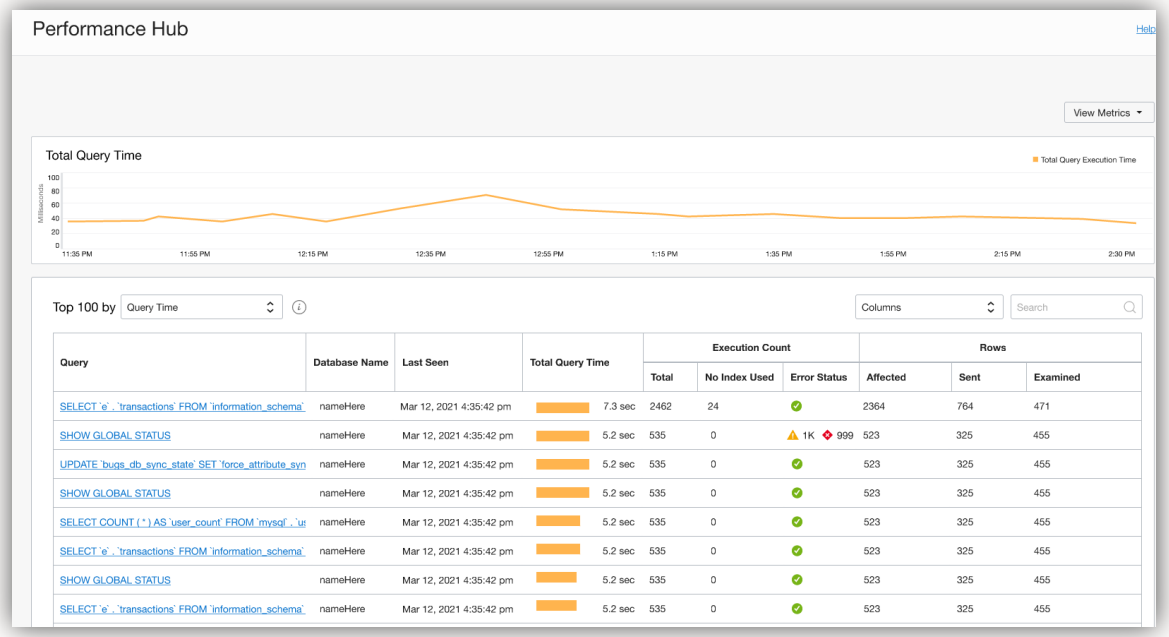
- Aggregated and searchable roll-ups of all queries
- Canonical form of all queries
- Total number of query executions
- Total execution time of queries
- Total data size of queries
- Date and time when a query was "first seen"



Performance Hub: Find and Fix Problem Queries

Analyzes data from Performance Schema to provide data about how statements generate their result sets drill down to specifics like:

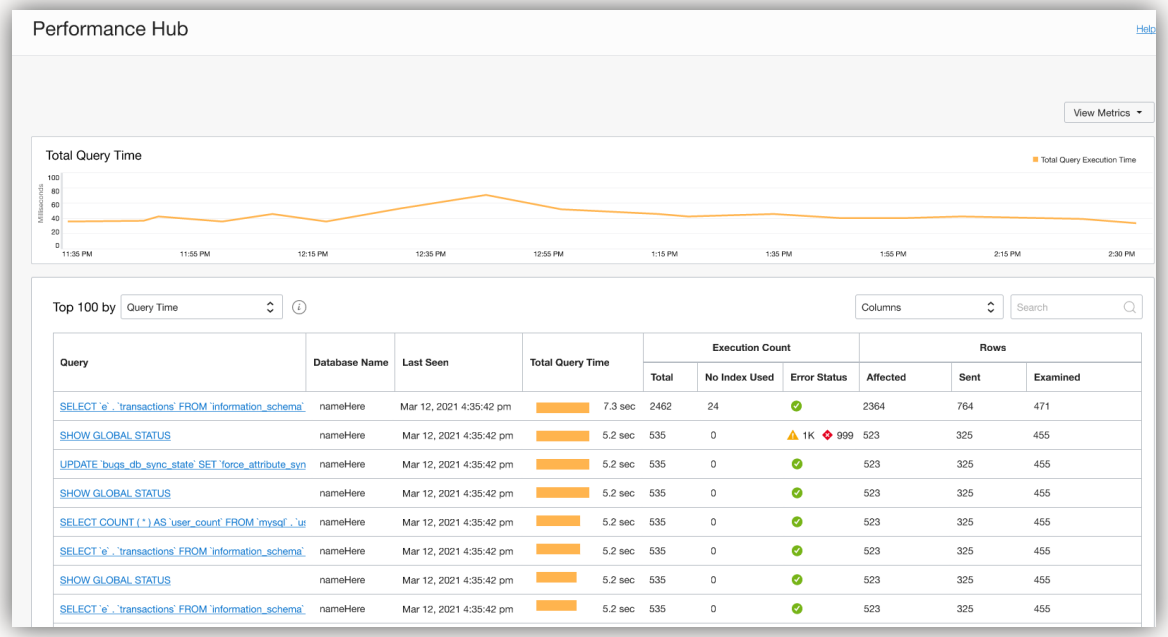
- Table Lock time
- How many rows were examined versus returned
- How many temporary tables were created, and whether any were created on disk
- Whether range scans were done, and in what form they were done
- Whether sorting happened, how many rows were sorted, and what form the sort took



Performance Hub: Find and Fix Problem Queries

Problem scenarios:

- Queries with high execution times
- Queries a high number of rows



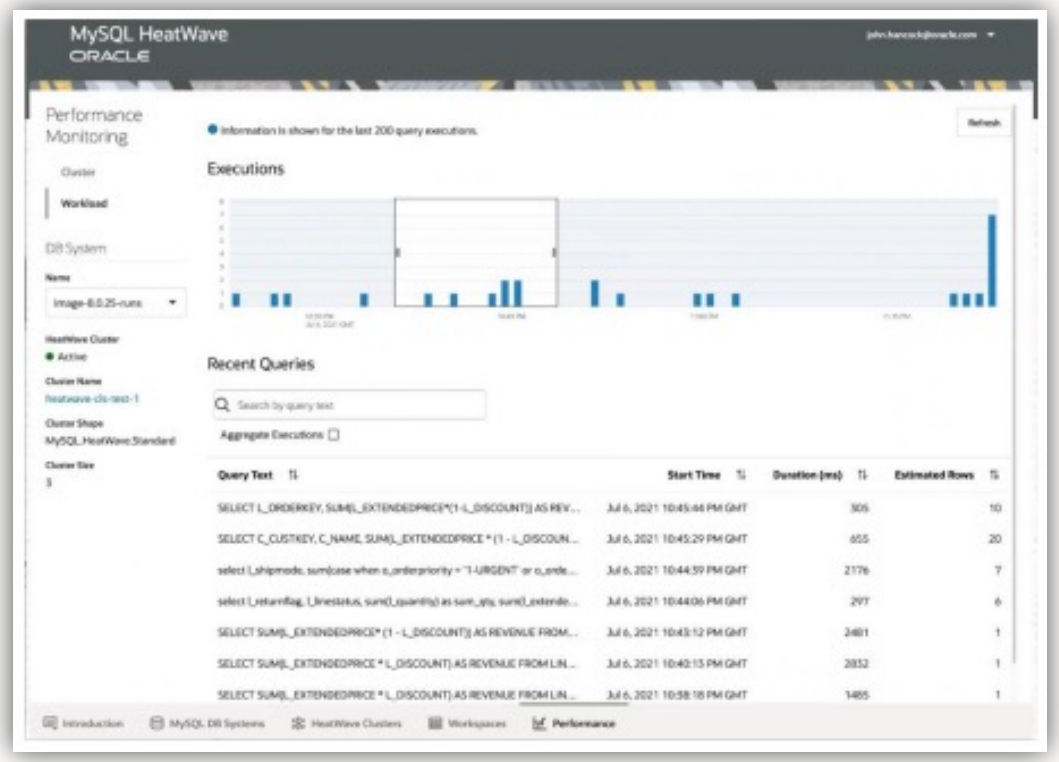
Solution approach using Performance Hub

- Identify queries with high execution times and small result sets
- Check if these queries are querying a large number of rows
- Determine if non-indexed columns are being used in the query
- Optimize the query by simplifying it or using indexed columns
- Monitor the performance of the query after optimization to ensure that the execution time has improved.

Monitoring MySQL HeatWave in AWS

AWS native feature that provides broad capabilities for monitoring and performance tuning of:

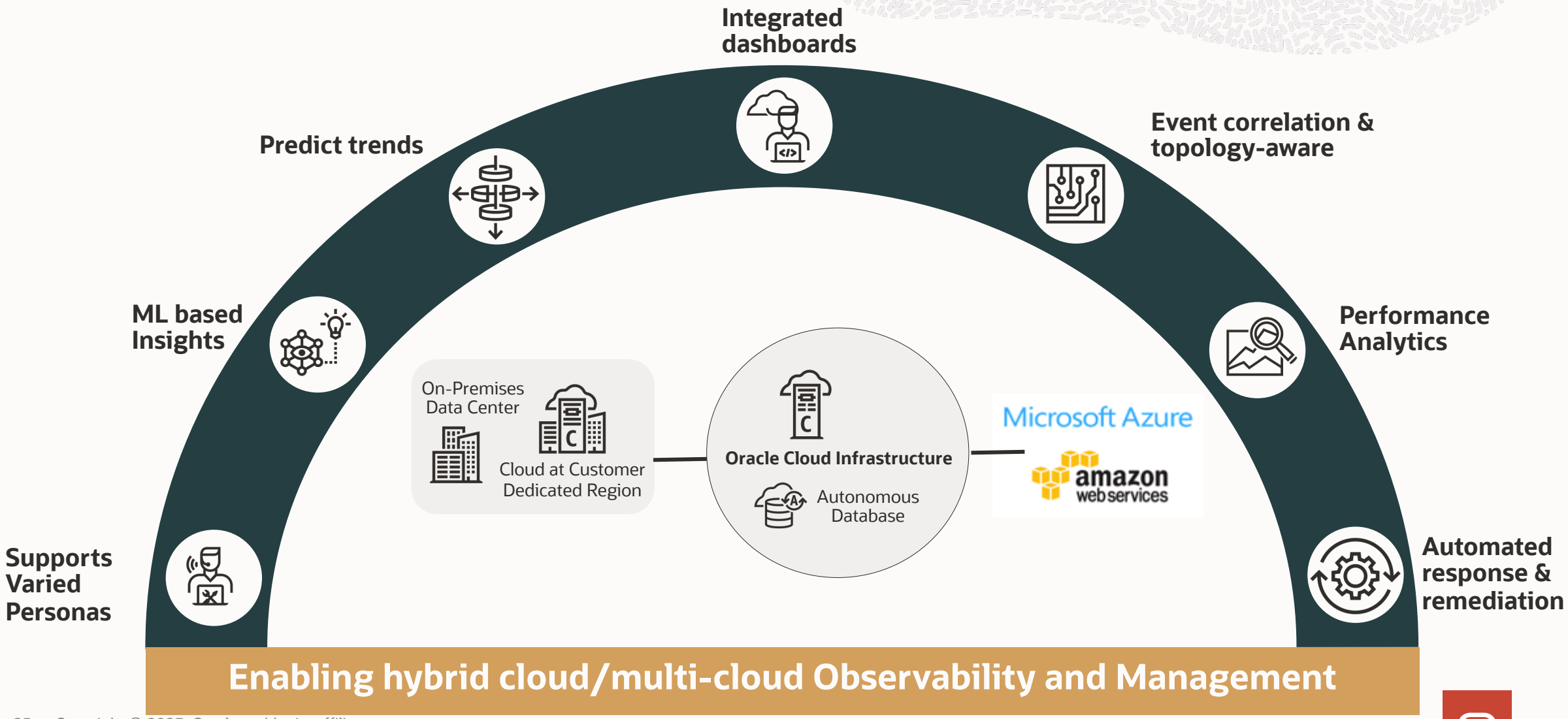
- MySQL DB system and HeatWave cluster performance
  - HeatWave cluster and node memory utilization
  - CPU and memory utilization
  - Storage usage
  - Disk operations
  - Connections
- Workload performance for a MySQL DB system with HeatWave
  - Recent queries
  - Query executions



ML driven capacity and performance management

Oracle's O & M strategy for AIOps

Lakehouse for ingesting telemetry from multiple data sources and services



Coming soon!

Predictive Insights

Predict demand from changing workloads

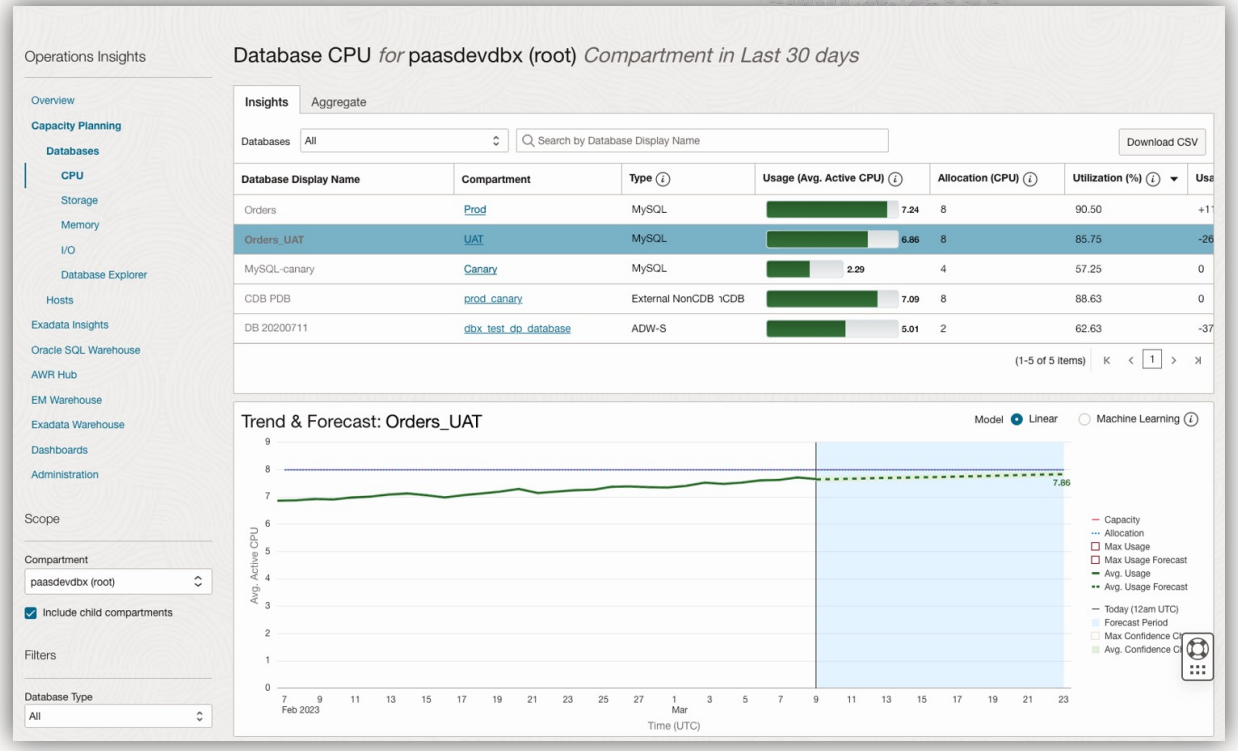
Forecast demand for changing workloads

- Max and average demand forecasts
- Machine learning seasonality models
- Automatic prediction of near-term issues

Quickly isolate the largest, most utilized, and fastest growing databases

Identify under-utilized and over-allocated footprint for right sizing

Insights and recommendations to right size your infrastructure and optimize resource utilization



Coming soon!

Predictive Insights

Insights into SQL performance

Detect performance degradation in business-critical SQL

Correlate performance

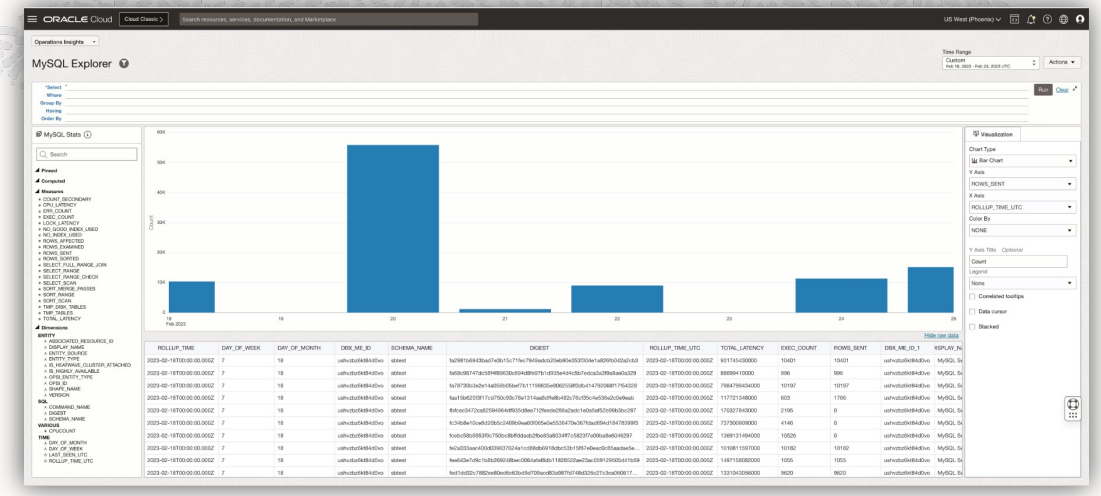
Aggregate and compare across databases

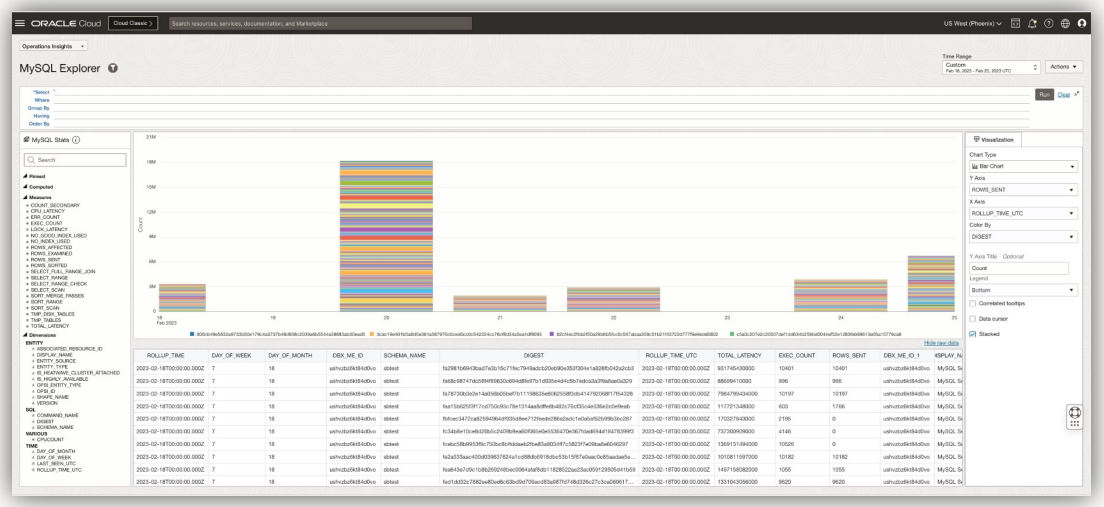
Identify application scalability and inefficiency issues

Trend and forecast metrics seasonality via custom analytics for solving specific issues

Detects causes, measure effects, then correlates them

- Causes: workload changes, configuration changes
- Effects: regressed SQL, reach resource limits (CPU, I/O, memory)





Demo

ORACLE DevLive | Level Up

Please rate this session.

Session ID – MS09

Oracle Observability & Management Overview

Complete choice of solutions to observe and manage your stack together

Cloud-native platform brings together all telemetry – traces, metrics, logs – for analysis, visualization, and advisement

Hybrid and multicloud support – across on-premises, Oracle Cloud and multicloud

Extensible – based on open standards supporting 3rd-party technology collection

Comprehensive stack visibility across the enterprise – individual component, across complex application topologies, down to SQL

ML algorithms and models eliminate noise, detect problems, identify the root cause and help ensure availability and performance

Sriram Vrinda
Sriram.vrinda@oracle.com