ORACLE

Managing and Monitoring MySQL: What's New?

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Product Management - MySQL Observability

Agenda

- Introduction
- Overview of monitoring in MySQL HeatWave service in OCI (MHS)
- New capabilities for Observability and Management of MySQL systems
- Demo
- Q&A

Introduction

Multicloud Environment

ORACLE Cloud Infrastructure

Microsoft Azure

aws

On-Premises

Oracle Cloud Observability and Management Platform

Observability and Management Advanced Services

- Application Performance Monitoring
- Stack Monitoring
- Logging Analytics
- Database and OS Management
- Capacity Planning SQL Insights

Observability and Management Data Sources

- Metrics
- Logs
- Events
- Traces
- SQL

Dashboard

Infrastructure Services

- Compute
- Storage
- Network
- Security

OCI services for a comprehensive database management solution

Public cloud, hybrid cloud, and multicloud

Database Management

Unified console for on-premises and cloud databases with lifecycle database management capabilities for monitoring, performance management, tuning, and administration

Stack Monitoring

Stack Monitoring provides discovery and monitoring of databases, hosts and other application tech stack components, enabling correlation of status and performance across the stack

Ops Insights

Predict and plan for future demand, eliminate systemic issues using advanced analytics on curated telemetry and long-term data

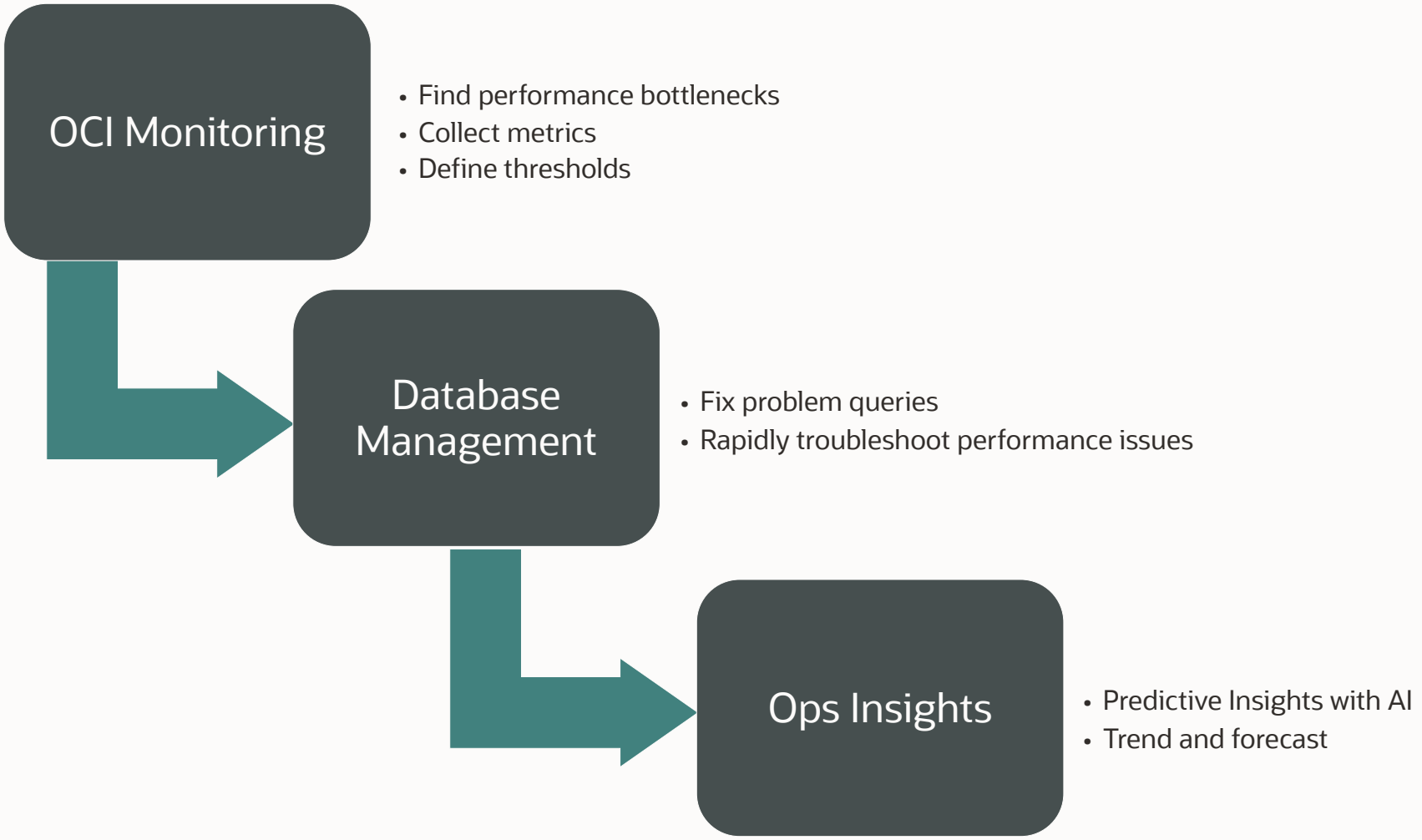
Logging Analytics

Proactive, repeatable, and automated problem detection and monitoring in a business context. Simplified IT Ops and DevOps using interactive ML/AI-driven advanced analytics

New Capabilities for MySQL Database Management

New Capabilities for MySQL Database Management

100% developed, managed, and supported by Oracle



Database Management services for MySQL

Categories	Capabilities
Database Management	General Availability: October. 2023 for MDS Fleet and single DB dashboard • Collects ~40 key metrics with monitoring UI showing 7 days of historical data for correlation • Utilizes OCI Monitoring service data store & OCI Alarm capability • Performance Hub: Database performance diagnostics and troubleshooting • Basic configuration information • Configuration parameters organized by categories & searchable with links to MySQL config template for modification
Operations Insights	General Availability: July 2024 for MDS • Capacity Planning and Forecasting • SQL Explorer plus Warehouse

Note: Support for On-premises deployment would be GA in July 2024

MySQL Enterprise Monitor

MySQL Enterprise Monitor (MEM) End of Life (EOL) Announcement (Doc ID 3008050.1)

APPLIES TO:

MySQL Enterprise Monitor - Version 1.0 to 8.0 [Release 1.0 to 8.0]
Information in this document applies to any platform.

DETAILS

MySQL Enterprise Monitor (MEM) will be end of life and deprecated with obsolescence as of January 1, 2025.

After this date, MySQL Enterprise Monitor will no longer receive security updates, non-security updates, bug fixes, or online technical content updates. It will transition to the Sustaining Support model.

ACTIONS

What to expect when MySQL Enterprise Monitor reaches the end of life (EOL):

- MySQL will cease all bug-fix activities for the product.
- MySQL will cease all security fix activities for the product.
- MySQL will cease all new feature work for the product.

Sustaining Support does not include:

- New program updates, fixes, security alerts, and critical patch updates
- New tax, legal, or regulatory updates
- New upgrade scripts
- Certification with new third party products/versions
- 24 hour commitment and response guidelines for Severity 1 service requests as defined in "Section 9 - Severity Definitions" in the document titled "Oracle Software Technical Support Policies"
- Previously released fixes or updates that Oracle has withdrawn from publication. Older or existing published software bundles will remain available as archived content.

For the set of Oracle Technical Support Policies, visit: https://www.oracle.com/support/policies.html
For an explanation of the different support models (like Sustaining Support), visit: https://www.oracle.com/support/lifetime-support/

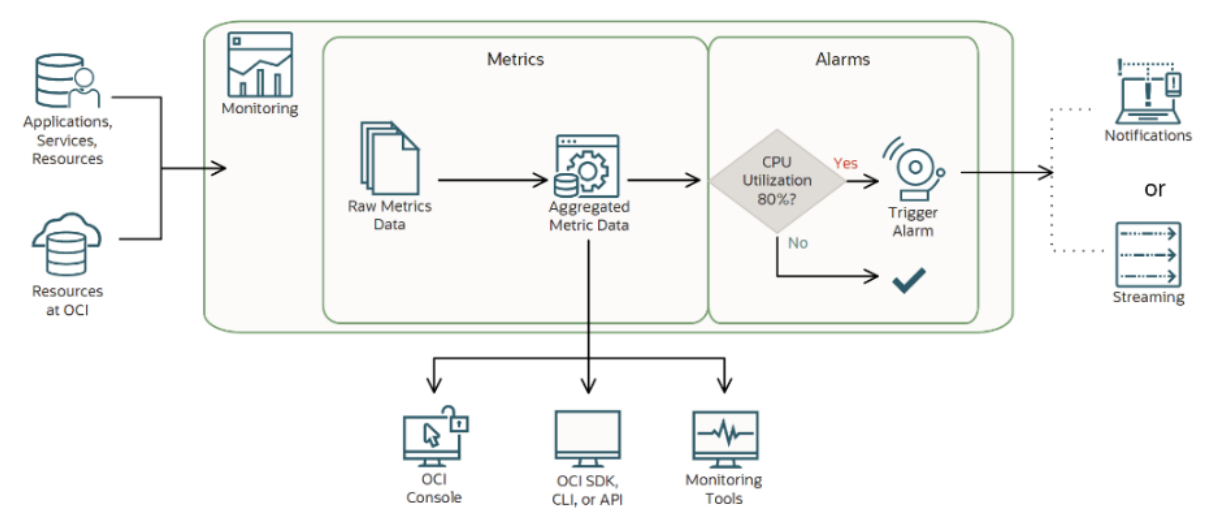
For customers that are currently using earlier versions of MySQL Enterprise Monitor, your options include:

- Use Enterprise Manager for MySQL. This is a free product for customers with a valid Oracle Support Contract.
  For more info, visit: https://blogs.oracle.com/observability/post/comprehensive-monitoring-and-compliance-management-for-mysql-databases-using-enterprise-manager

- Use the database monitoring capabilities of the OCI Database Management service. For MySQL on-premises customers, this is a paid feature that will be released soon.
  For more info, visit: https://blogs.oracle.com/mysql/post/database-management-for-mysql-heatwave

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

Oracle Cloud Infrastructure Database Management Service

On-demand subscription based cloud service

Leading database performance diagnostics

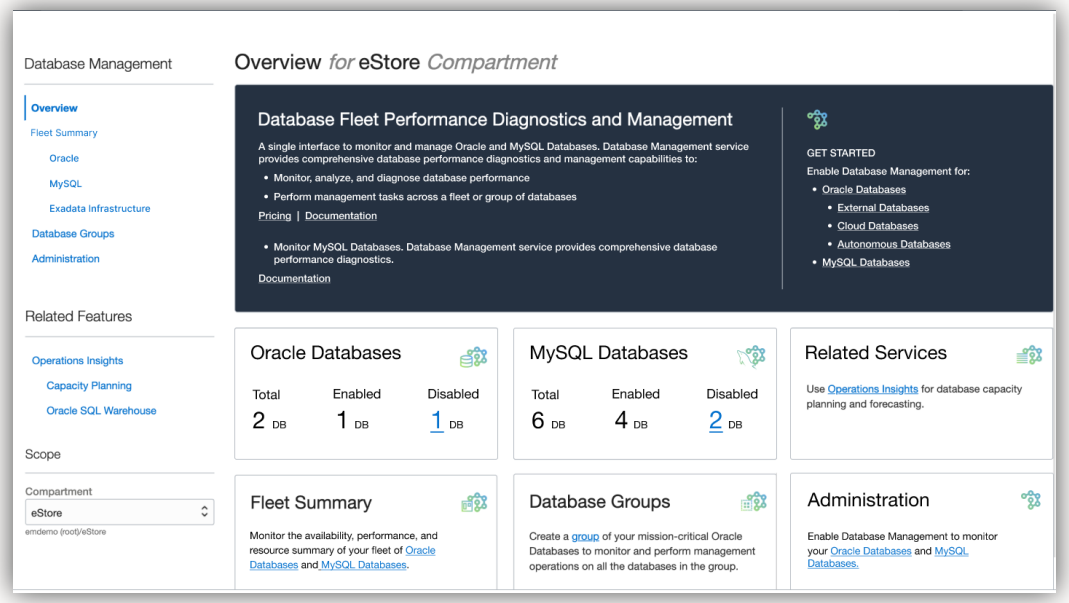
- Combines back-end instrumentation and tools with visualization-driven interfaces
- Single pane of glass management view for databases deployed anywhere

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

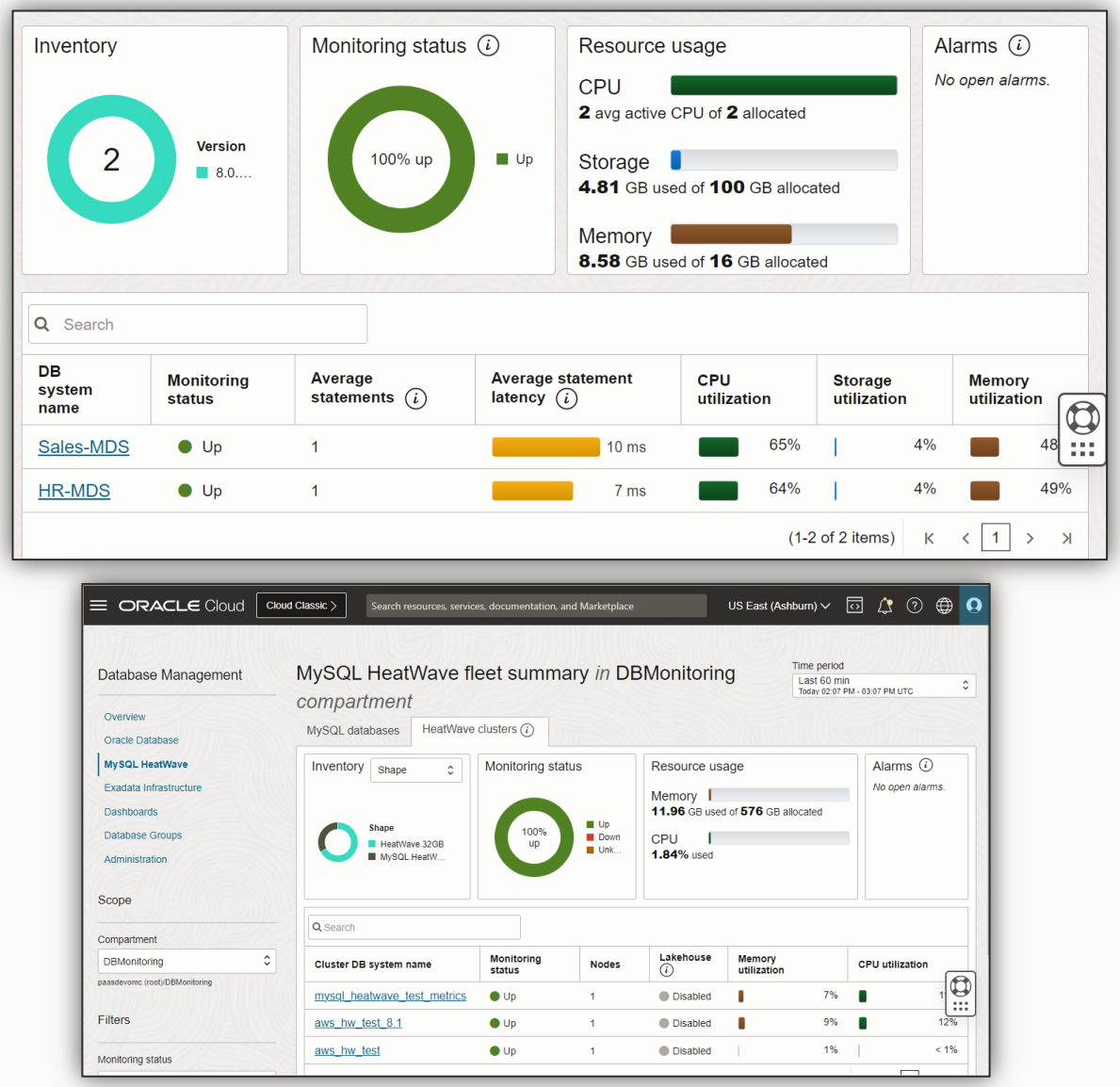
Unified fleet view of databases across Oracle Cloud and on-premises

- 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



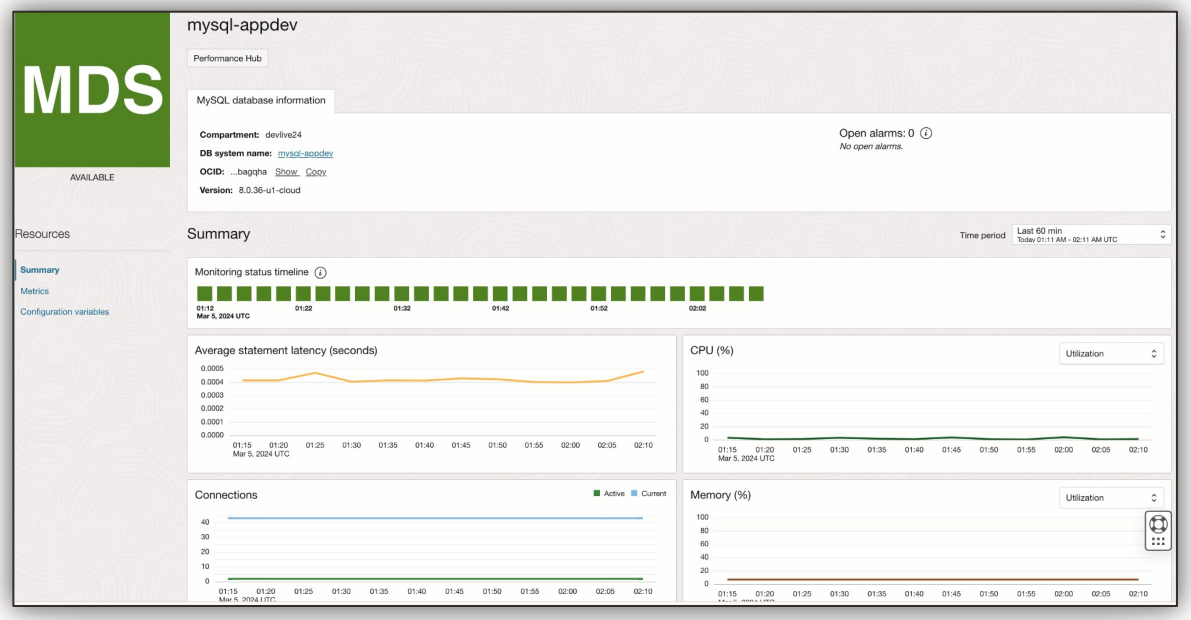
Performance summary

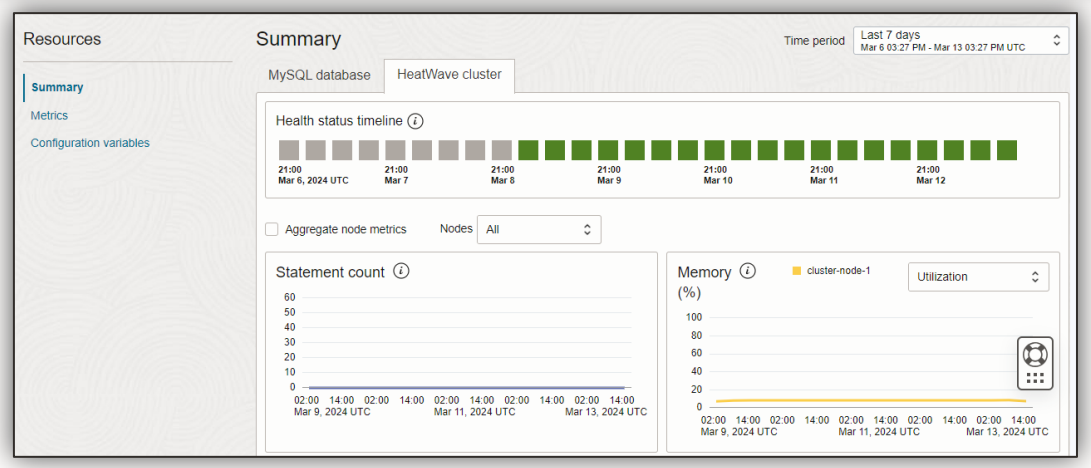
Drill down from the Fleet Summary page to a specific MySQL database of interest to monitor:

- Average statement latency
- CPU utilization
- Disk IOPS
- Memory
- Network throughput

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.



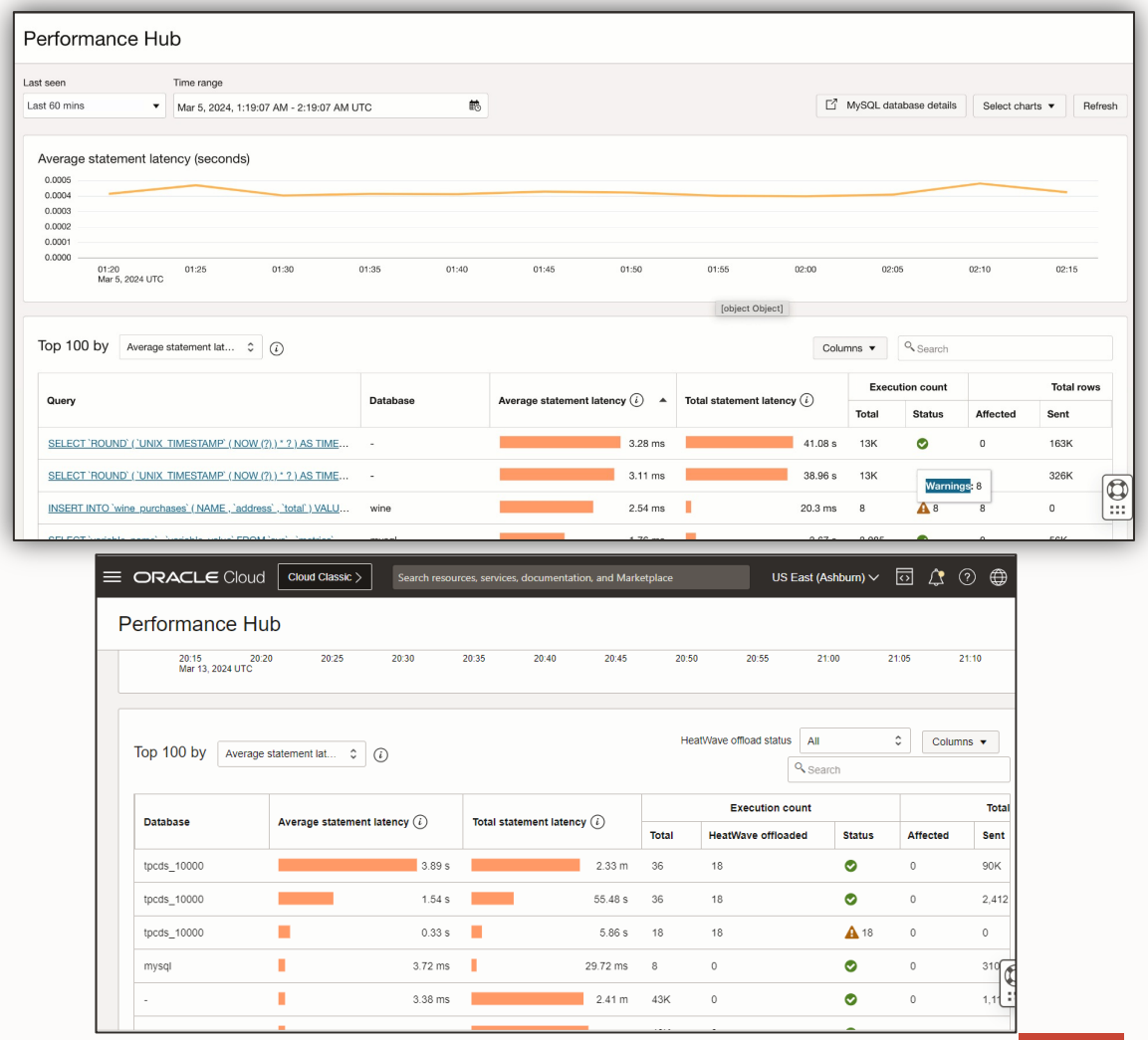


Performance Hub for SQL performance management

Performance Hub: Find and Fix Problem Queries

Monitor and troubleshoot query performance

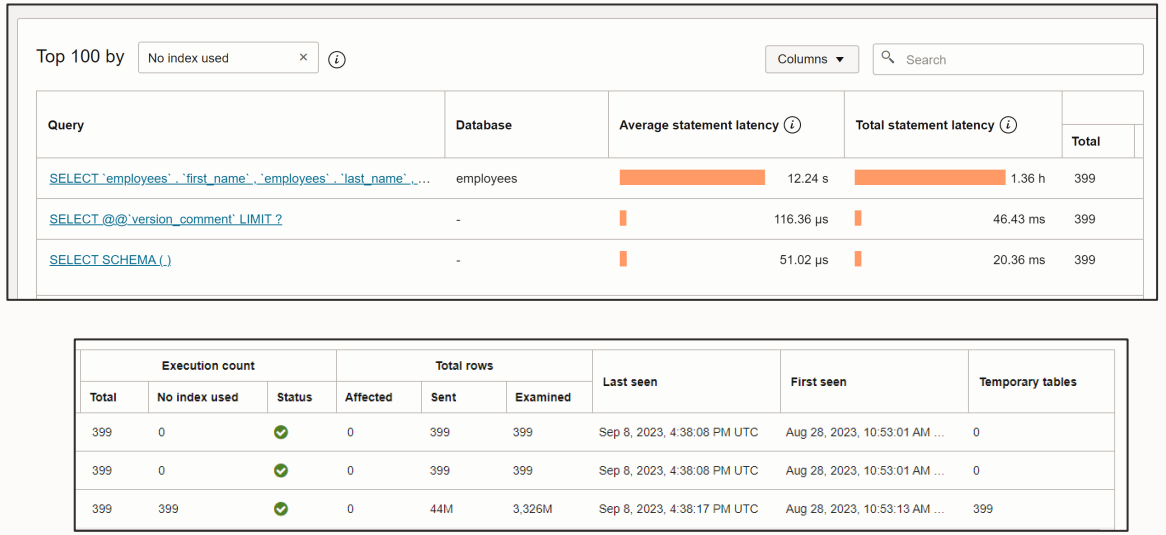
- Quickly identify expensive queries that impact the performance of their applications
- Visualize query activity to gain further insight into performance beyond query statistics
- Filter for specific query problems like full table scans and bad indexes using advanced global search options
- Filter for queries offloaded to HeatWave Cluster
- 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

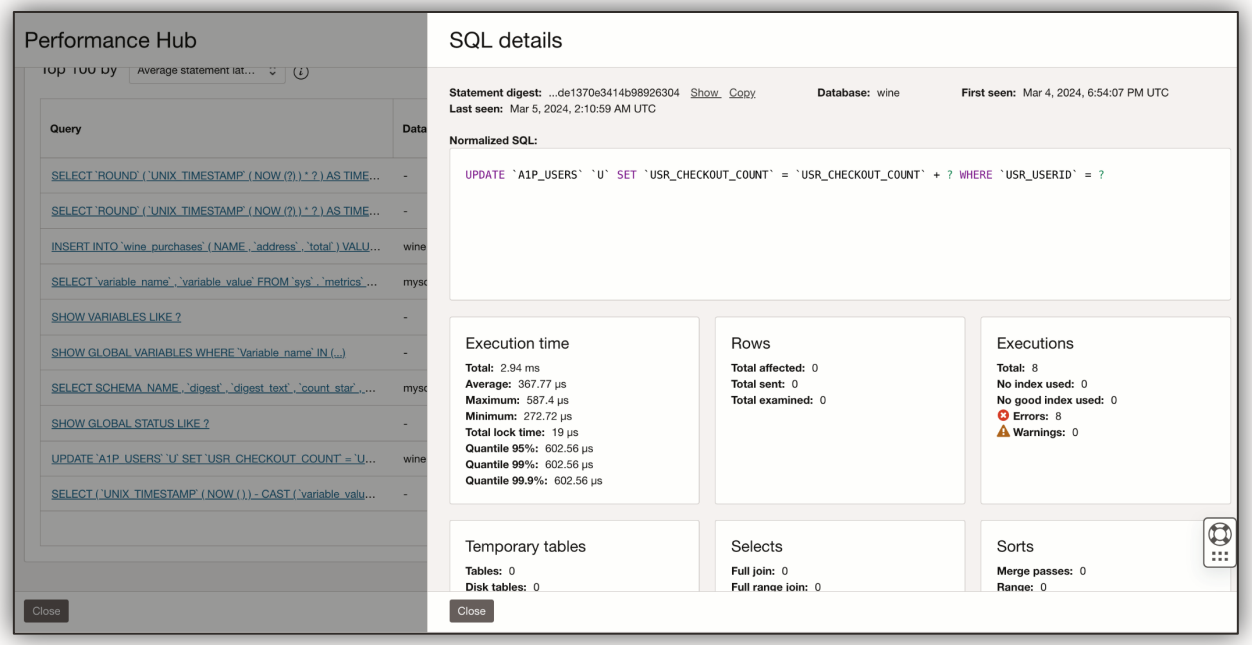
- Aggregated and searchable roll-ups of all queries
- Canonical form of all queries
- Total number of query executions
- Total execution time of queries
- Total data size of queries
- Date and time when a query was "first seen"



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:

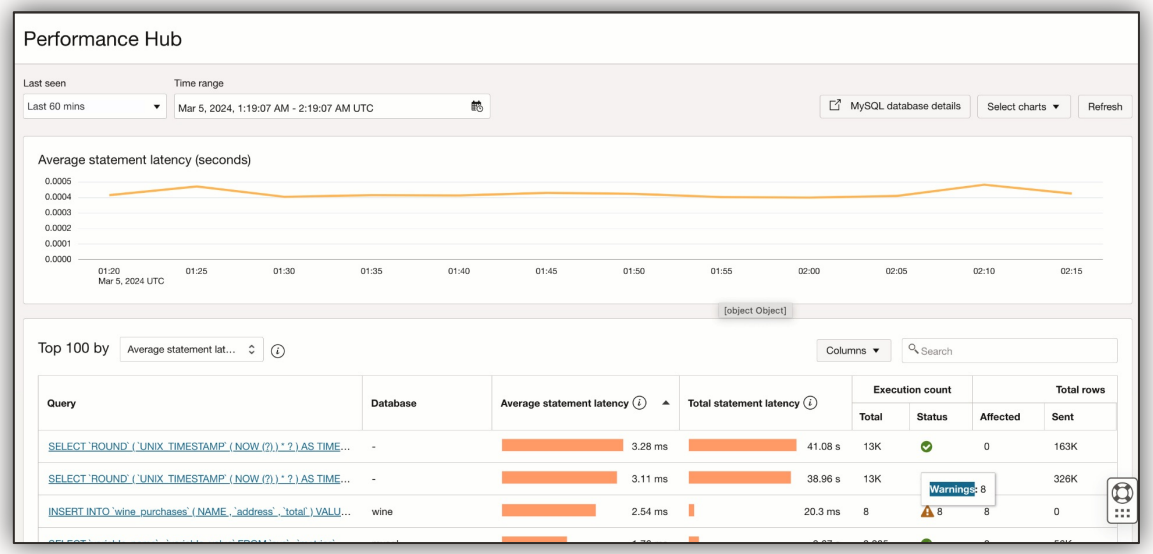
- Table Lock time
- How many rows were examined versus returned
- How many temporary tables were created, and whether any were created on disk
- Whether range scans were done, and in what form they were done
- Whether sorting happened, how many rows were sorted, and what form the sort took



Performance Hub: Find and Fix Problem Queries

Problem scenarios:

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

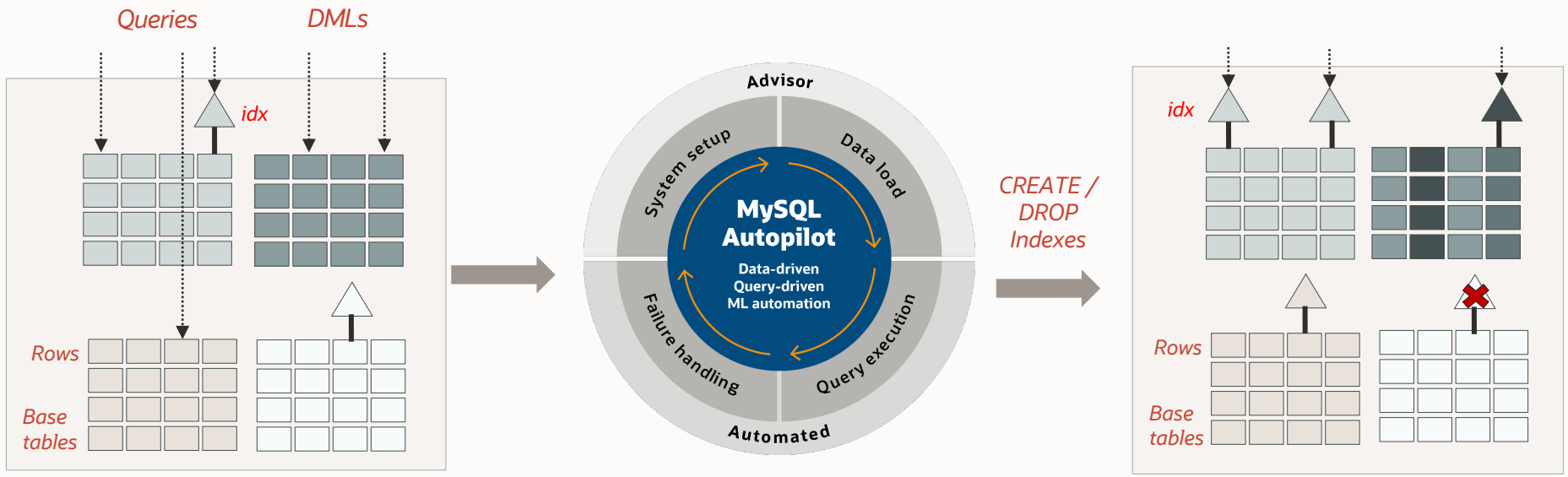


Solution approach using Performance Hub

- 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.

MySQL Autopilot indexing (Coming soon)

Recommends secondary indexes for OLTP workloads



Autopilot Indexing (Coming soon)

ML automation with MySQL HeatWave

Features

- ML-based feature designed to help optimize database systems for better cost and performance
- Considers both query and DML performance
- Recommends CREATE and DROP of indexes
- Generates DDLs for index creation/drop
- Provides performance prediction
- Provides storage prediction
- Continuous learning and adapting

Benefits

- DBAs no longer need to manually identify the secondary indexes for the database workload.
- Considers both the query performance and the cost of maintaining the indexes
- Predicts expected improvement without creating the indexes
- Provides explanation for the recommendations
- Oriented by performance objectives: throughput, latency, storage

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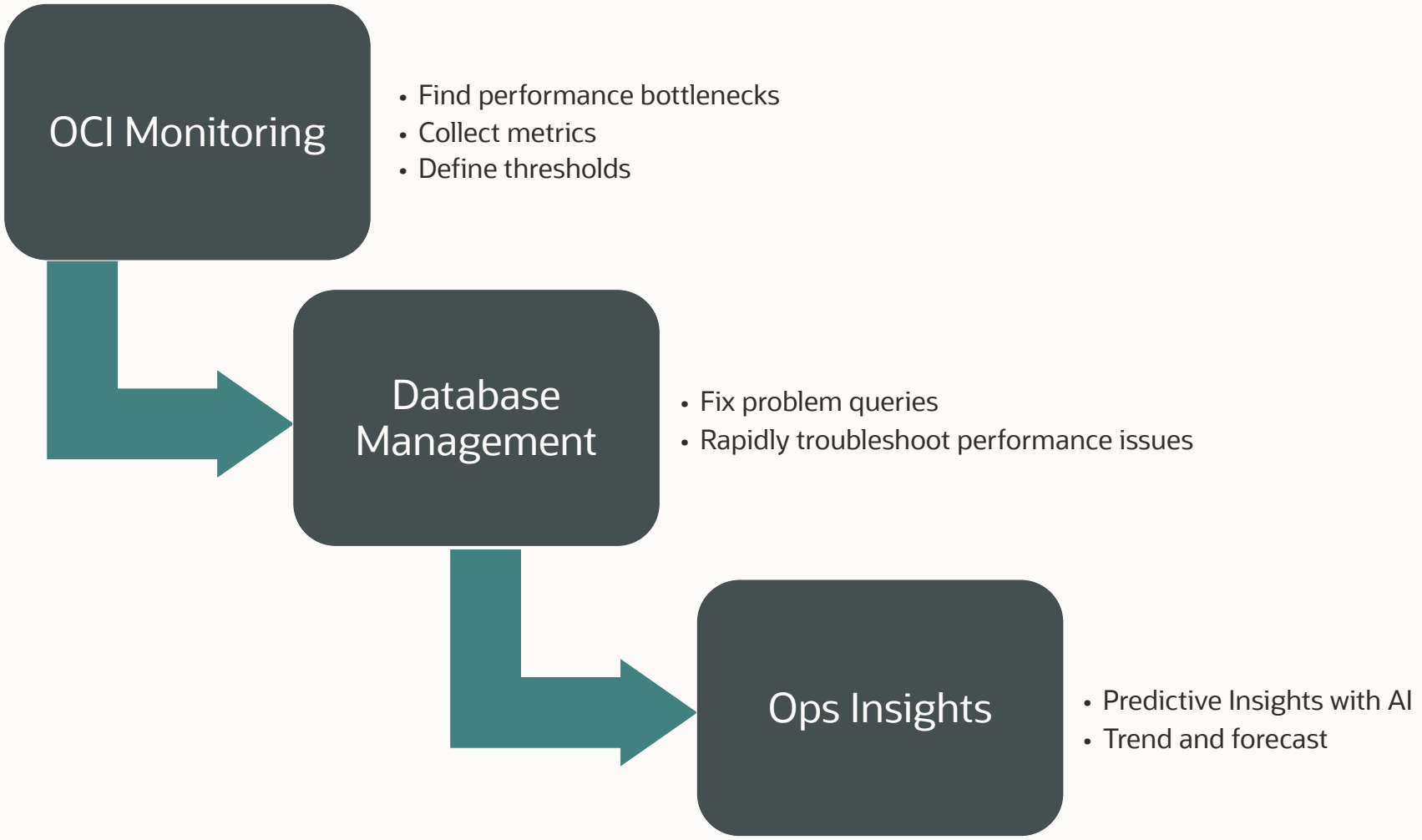


Coming soon!

Predictive Insights

Predict demand from changing workloads

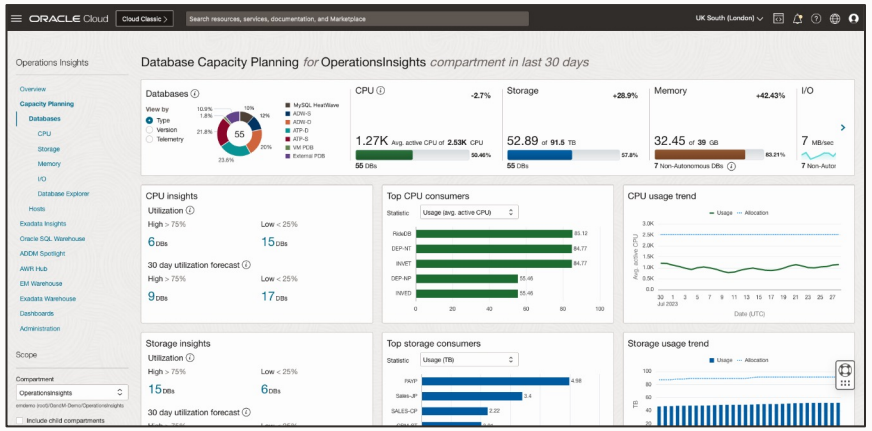
Forecast demand for changing workloads

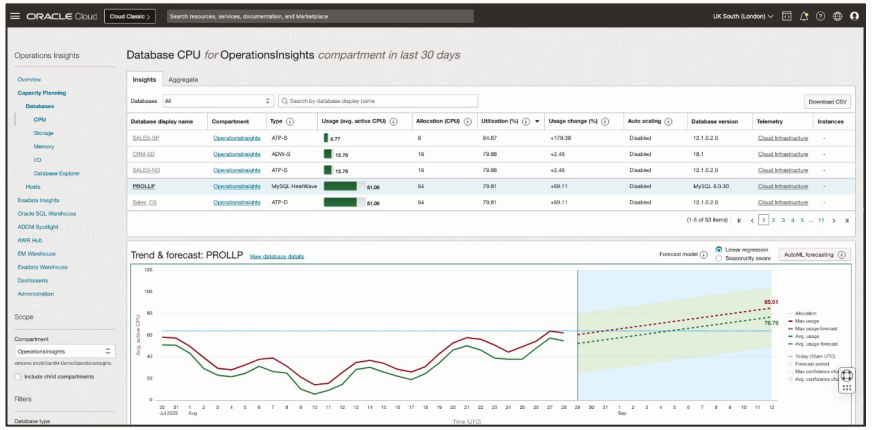
- Max and average demand forecasts
- Machine learning seasonality models
- Automatic prediction of near-term issues

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

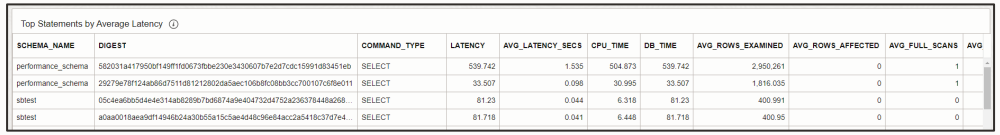
Correlate performance

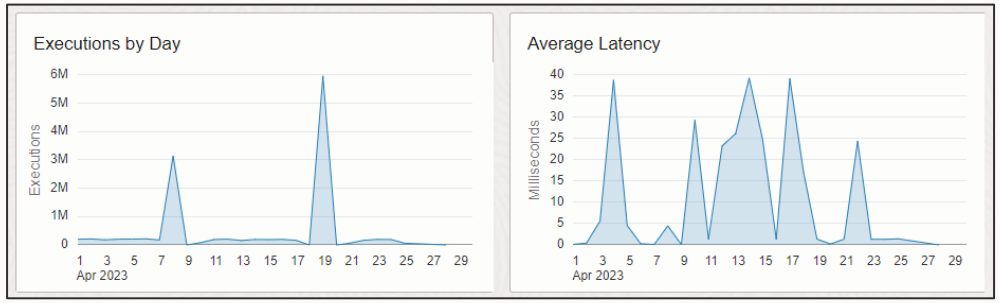
Aggregate and compare across databases

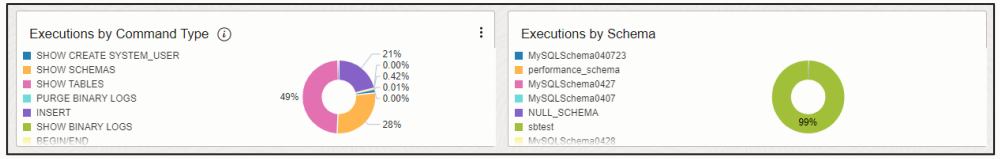
Identify application scalability and inefficiency issues

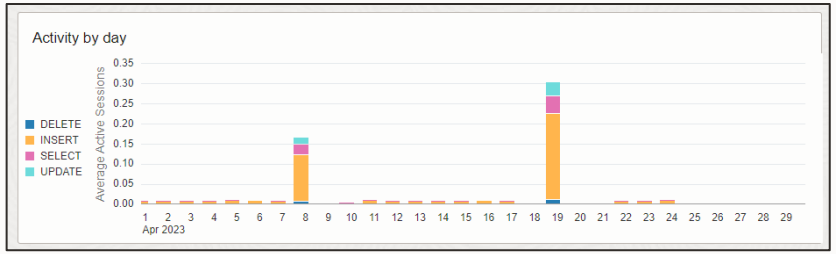
Trend and forecast metrics seasonality via custom analytics for solving specific issues

- Detects causes, measure effects, then correlates them
  - Causes: workload changes, configuration changes
  - Effects: regressed SQL, reach resource limits (CPU, I/O, memory)









Maximizing reliability with automated proactive monitoring

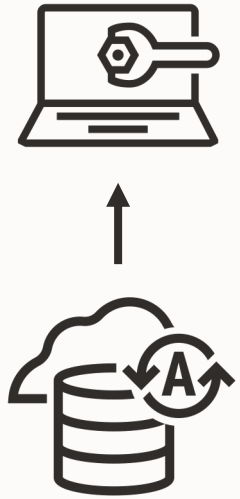
MySQL HeatWave service finds the problems before you do

Oracle Cloud Operations uses continuous monitoring for each database:
8000+ metrics and 1500+ alarms

- Much broader than any on-premises customer
- Consolidated monitoring of entire stack: infrastructure, load balancer, connection manager, database

Automatic service requests are generated for each deviation

- Immediate investigation and resolution by cloud ops
- Root cause analysis for every issue
- Zero customer actions required



DEMO

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