ORACLE

OCI Operations Insights – New Features

Technical Deep Dive on Observability and Management

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Observability and Management

Feb 27, 2024

NYOUG

Agenda

1. Observability & Management platform overview

2. Operations Insights overview

3. ADDM Spotlight

4. SQL Insights

5. Capacity Planning with AutoML based forecasting

6. Policy Advisor

7. News Report

8. Supported deployments and pricing
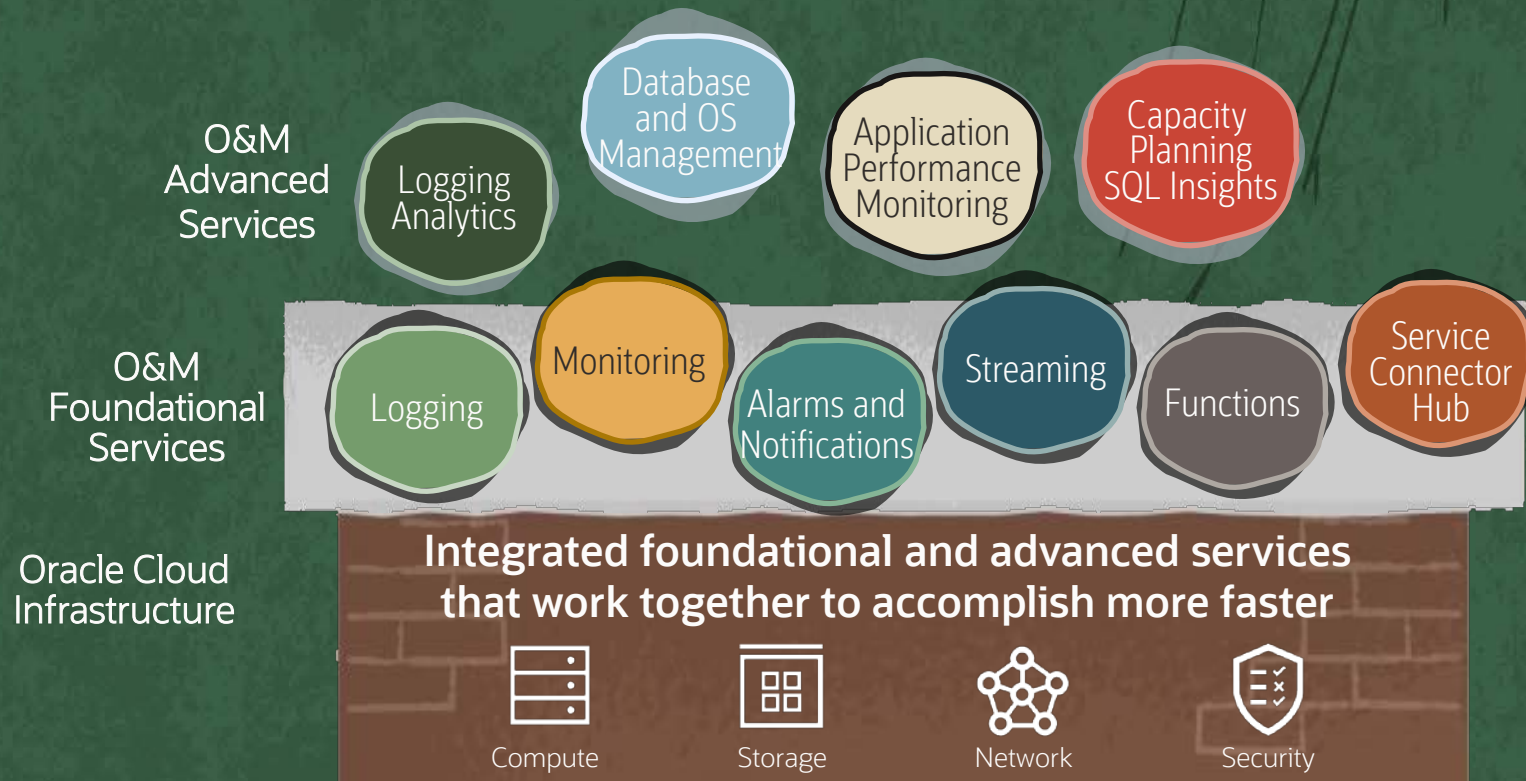
Observability and Management Overview

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

O&M Advanced Services

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

O&M Foundational Services

- Logging
- Monitoring
- Alarms and Notifications
- Streaming
- Functions
- Service Connector Hub

Oracle Cloud Infrastructure

Integrated foundational and advanced services that work together to accomplish more faster

- Compute
- Storage
- Network
- Security

What is OCI Operations Insights?

Multiple Data Deployments

Ingests data from multiple deployments i.e. on-premises, cloud and Enterprise Manager based targets

OOB Applications

Provide insights across data center assets to reduce cost of operation, increase business productivity and maximize application performance

Analytic Warehouses

Purpose-built warehouses that provide user's flexibility to reduce cost of operation, increase business productivity and maximize application performance

Operations Insights – Solution areas
Data-driven compute resource and performance management decisions

Capacity Planning

- Trend and forecast resource requirements
- Database, Hosts and Exadata

SQL Insights

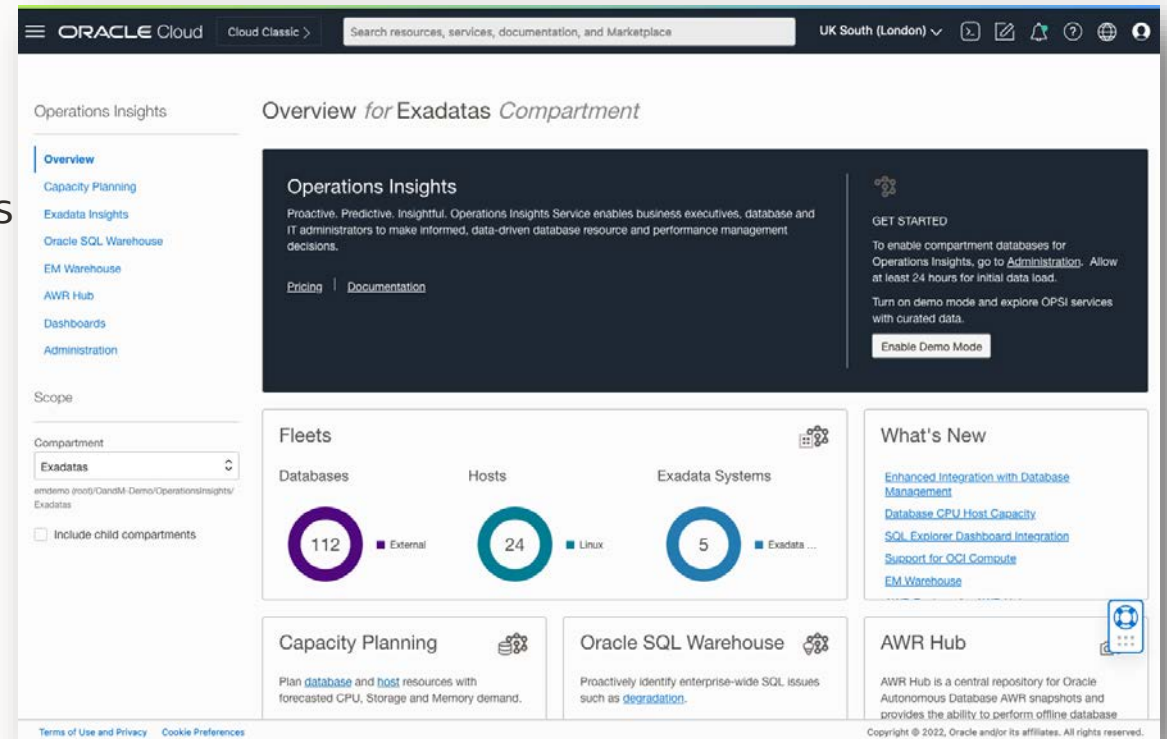- Fleet, Database and SQL-level performance insights

ADDM Spotlight

- Strategic Database performance insights

Data Explorers

- SQL Explorer and Exadata Explorer
- Interactive query builder and visualization

Analytic Warehouses

- AWR Hub and AWR Hub Explorer
- EM Warehouse
- Exadata Warehouse

Operations Insights enables business executives and administrators to make informed, data-driven resource and performance management decisions

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ADDM Spotlight

Aggregate expert tactical advice into strategic optimization insights

### ADDM findings are deep performance diagnostics

- Generated over 1-hour AWR snapshots
- Tactical in nature, diagnose incidents

ADDM Spotlight

- Categorizes and aggregates findings over longer periods and many ADDM runs
- Identify chronic issues over entire workload

Aggregates by finding and recommendation:

- Frequency of occurrence
- Overall Impact and benefit
- Maximum impact and benefit
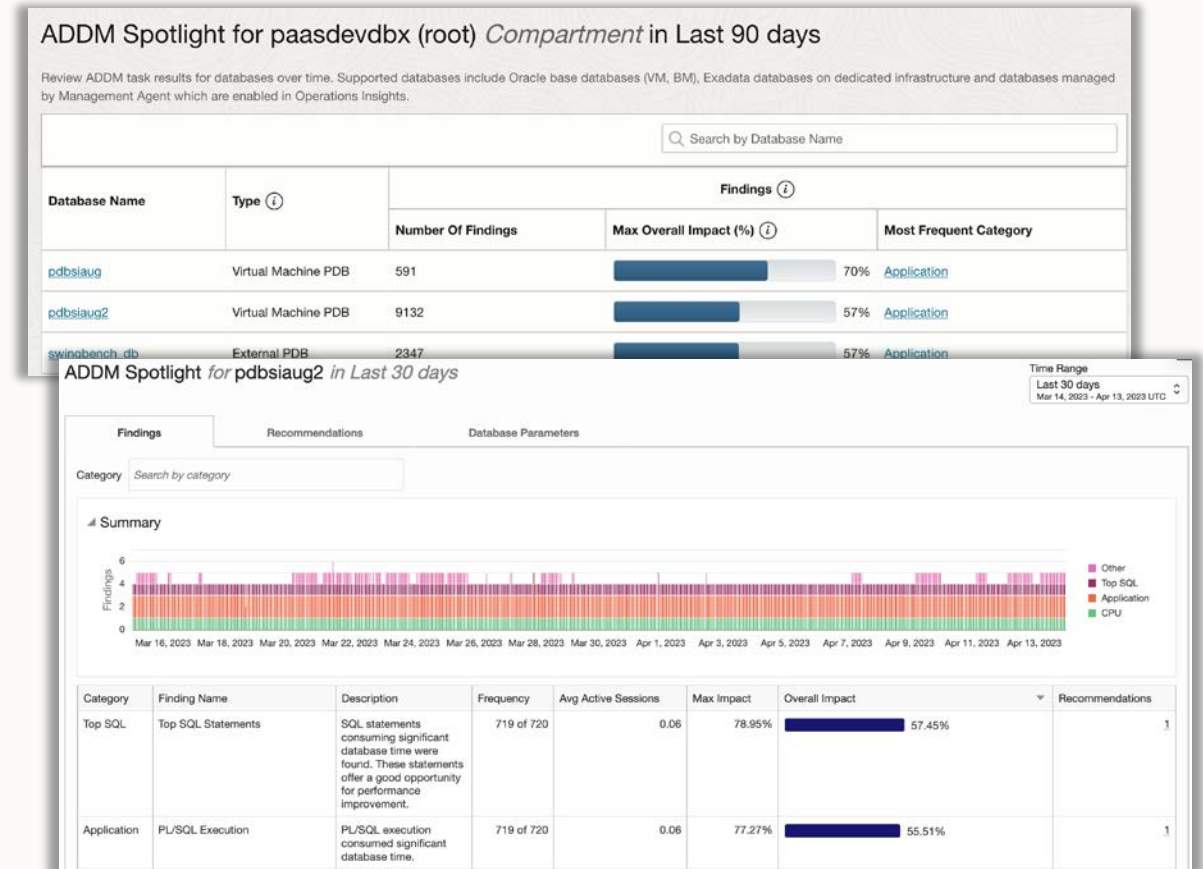
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SQL Insights

Aggregated view of SQL level performance insights across DB fleet

SQL stats analyzed at fleet, database and SQL level

- **Fleet analysis**: Inventory with global view of SQL across all DBs
- **DB analysis:** Aggregated insights over all SQLs collected for a DB
- **SQL analysis:** performance insights and history for a SQL_ID

Insights into SQL

- Improved or degraded plan changes
- Gradual SQL performance degradation
- New SQL since last week
- Aggregated impact of plan changes
- Databases with cursor sharing issues
- Invalidation storms
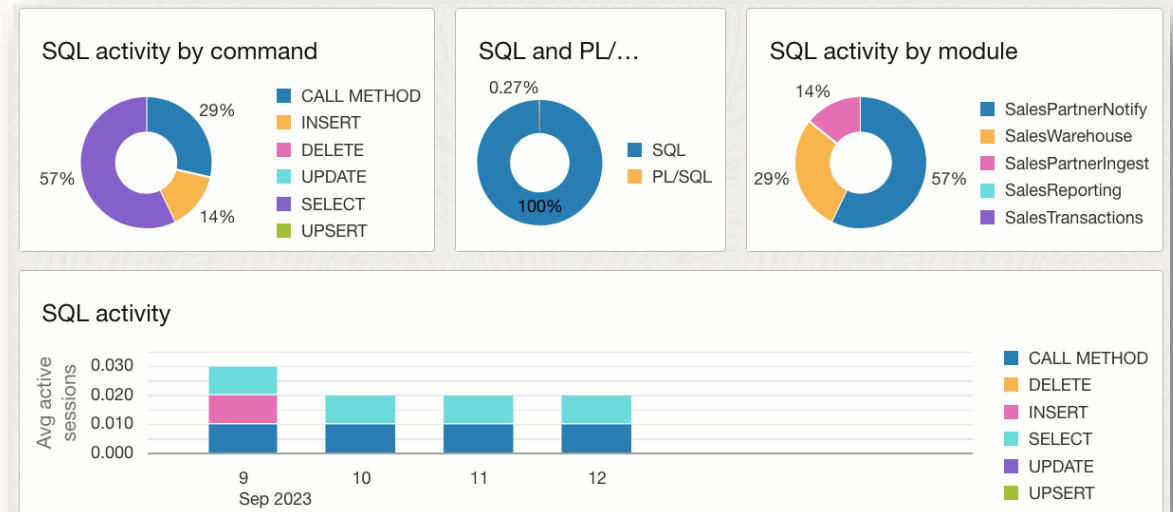
Fleet Analysis

Aggregated view of fleet inventory and a global tree-map view of SQL across all databases

Data

- Total DB time broken down by database and SQL command type
- Inventory view by database type
- Top databases by numerous SQL insights (sorted by AAS)

Insights

- Count of databases with degrading SQL (avg. latency > 20%)
- Count of databases with plan changes (> 10 changes per DB)
- Count of database with cursor sharing issues
- Count of databases with invalidation storms for 1+ days
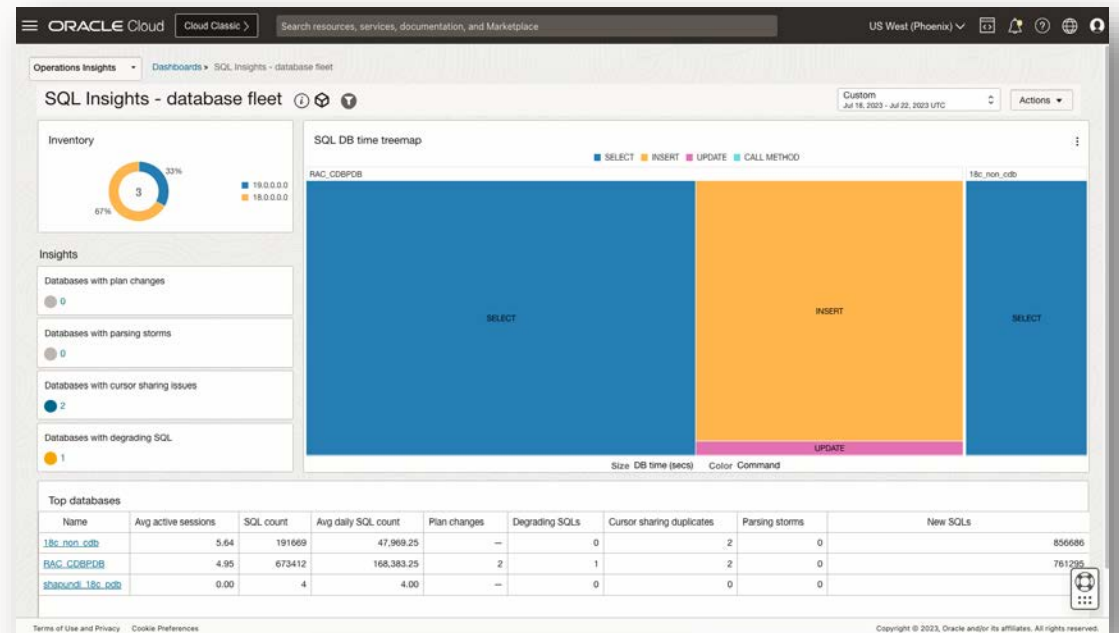
Database Analysis

Aggregated insights and workload analytics over all SQLs collected from a database

Data

- Total DB time broken down by SQL command, PL/SQL cursors and module
- SQL activity by command type over time
- Execution to parse ratio of collected SQL over time
- Total SQL and invalidated SQL count over time
- Top SQL by various numerous performance measures

Insights

- Count of gradually degrading SQL
- Aggregated plan change impacts, positive and negative
- New SQL for the selected time period
- Invalidation storms: Days where % of invalidated SQL >20%
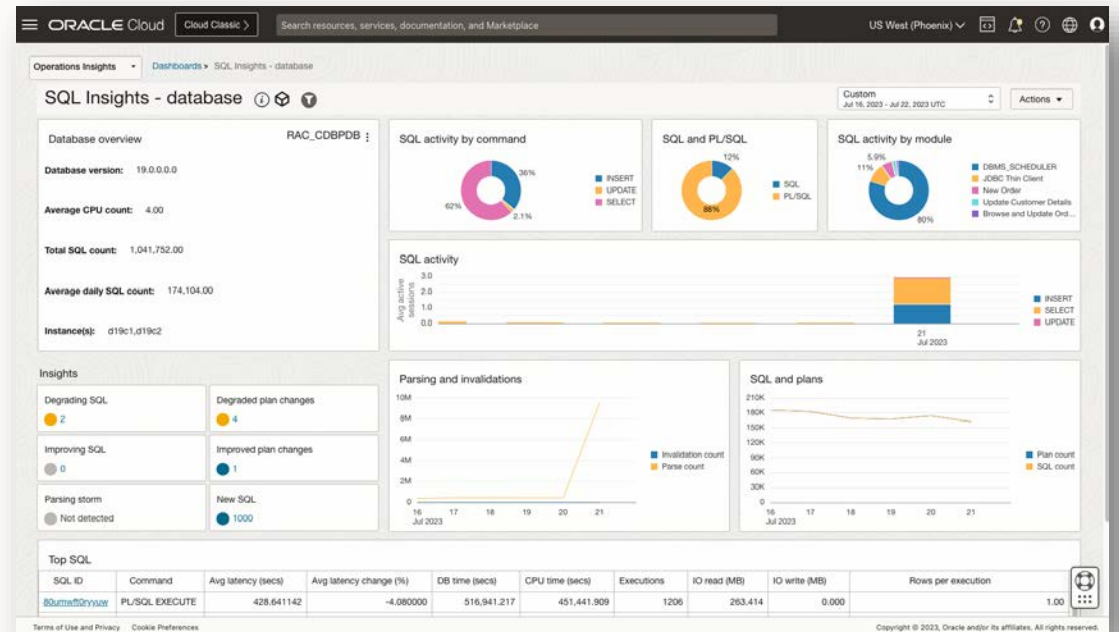
SQL Analysis

Performance insights and history for a given SQL_ID executed by a database

Data

- DB time breakdown by wait class by day
- Average latency by plan
- IO reads/writes volume per day

Insights

- Performance trend: Change in average latency
- Performance variability
  - High: Avg. latency range > 25% of elapsed time per execution
  - Low: Avg. latency range < 25% of elapsed time per execution
- Cursor sharing issues due to literals
  - # of duplicates and excess parse CPU time
- Plan changes
 - Detects single or multiple plan changes
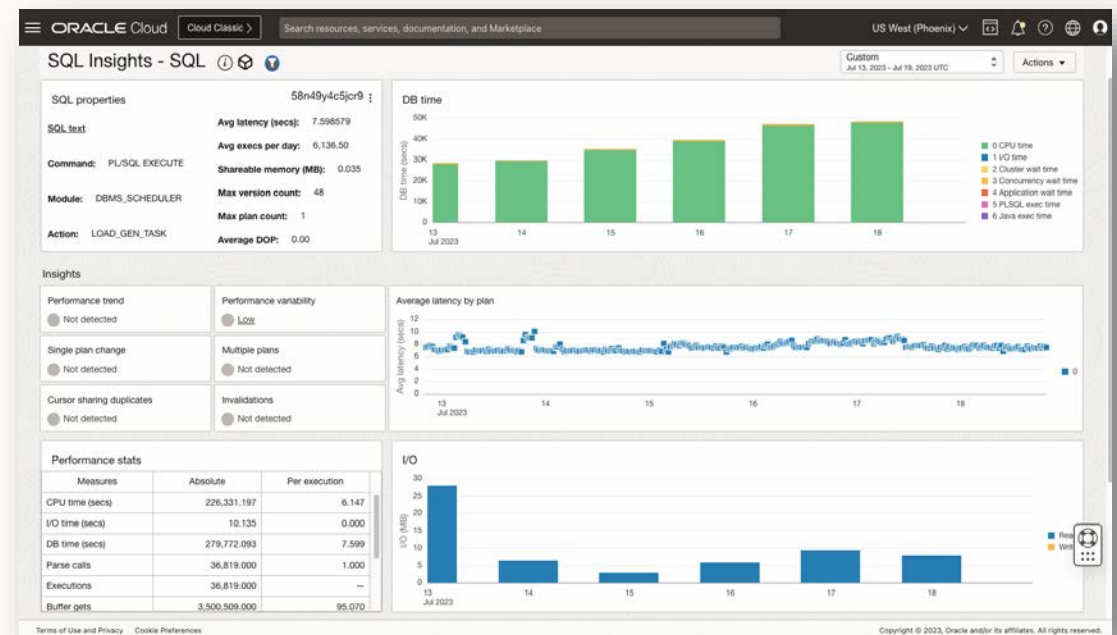
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Forecast resource requirements
Analyzing compute resource demand

- Aggregate demand compartment-wide

- Trend and forecast CPU, Storage, Memory and I/O needs

- Identify impending capacity issues

- Identify re-allocation opportunities

- Estimate cloud migration footprint

- Configure auto-scale for Oracle Autonomous Database
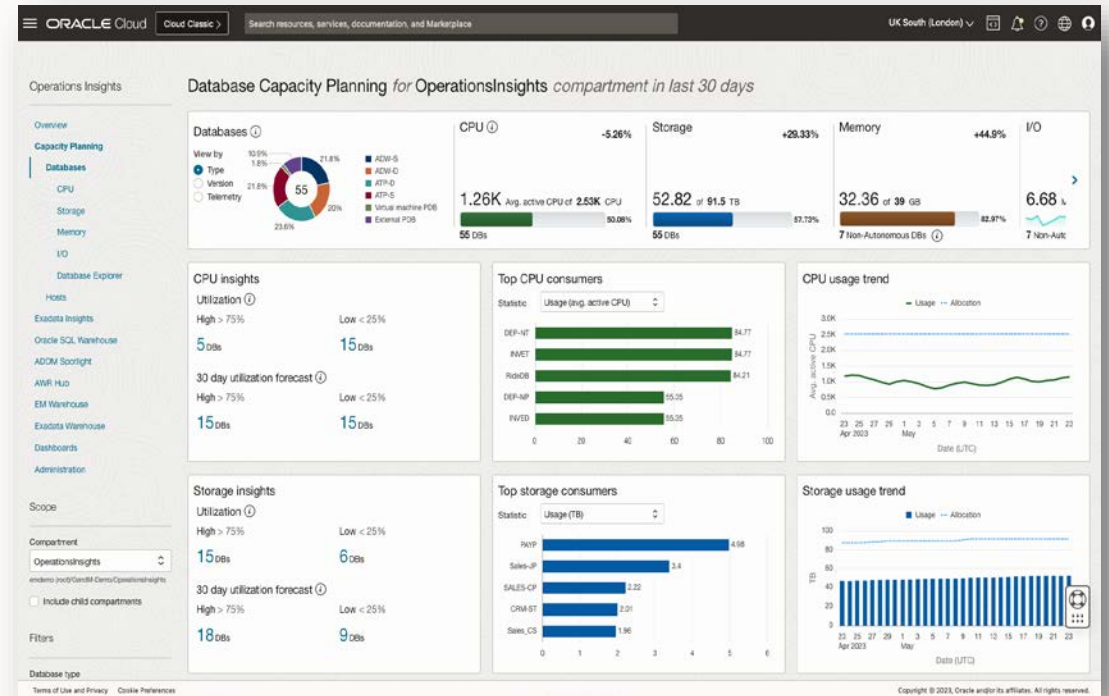
Forecast Capacity
Predict demand from changing workloads

Trend and forecast resource demand using up to 25 months historical data

Max and average demand:

- Allocate to the max ($ spent)

- Average is actual usage (value gained)

- Max – Avg = opportunity cost of workload volatility

Machine learning models:

- Linear regression

- Seasonality aware

- Oracle AutoML for advanced forecasting

Identify over-allocated systems for reclaiming CPU
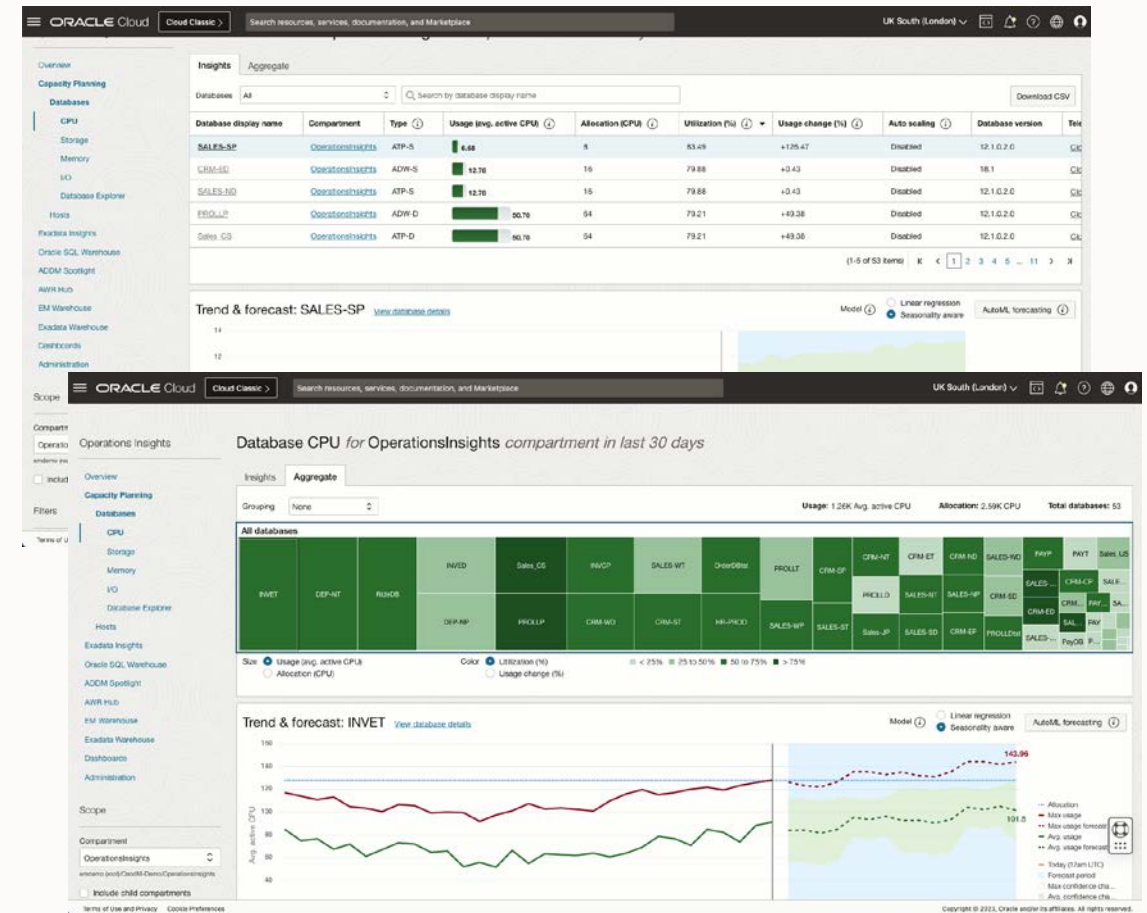
Capacity Planning with AutoML
Wide spectrum of models to provide workload-aware forecast

Oracle AutoML-powered forecasting
- Handles complex seasonality
- Includes 8 forecast models: Theta, ETS, STLwES, STLwARIMA , DynFactor, SARIMAX, VARMAX, Prophet
- Auto-selects, tunes the best forecast model
- Data trained on CPU, storage, memory and I/O
- Backtesting to assess forecast accuracy

Benefits
Capacity planners or FinOps doesn't have to be data scientists
- Improve SLAs by right sizing and optimized resource utilization

Exadata Insights
Forecast resource requirements

Analyze enterprise-wide analysis of resource utilization, capacity planning for Exadata

Improve resource utilization by identifying under & over utilized resources

Identify Exadata systems projected to reach high utilization

Identify total lead time to expand capacity using machine learning based forecast based on long term historic data to project future resource growth

Available to use with all Exadata systems i.e.
- Oracle Exadata Database Service on Dedicated Infrastructure (ExaDB-D)
- Oracle Exadata Database Service on Cloud@Customer (ExaDB-C@C) via EM only
- Exadata (On-premises)
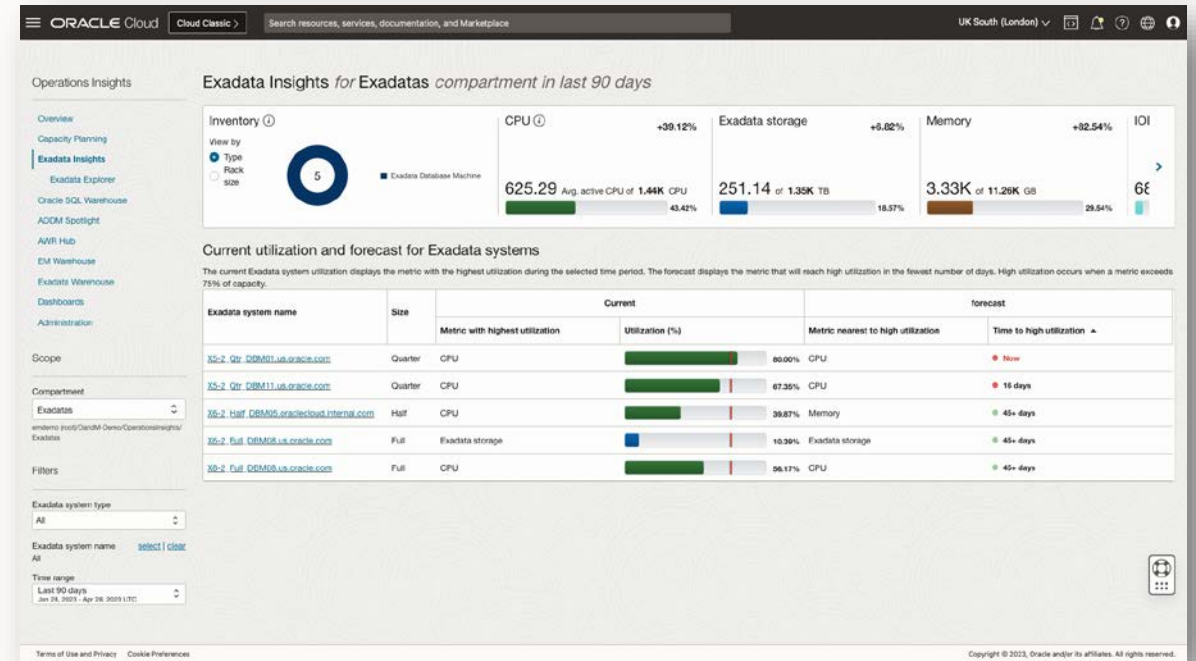
Exadata Insights
Consolidate Oracle Databases on Exadata

- Identify highly utilized Exadata servers and their critical compute resource

- Find low resource utilization servers

- Optimize resource allocation using demand trending and forecasting

- Plan ahead using performance history and seasonality

- Ensure service levels objectives can be met over time
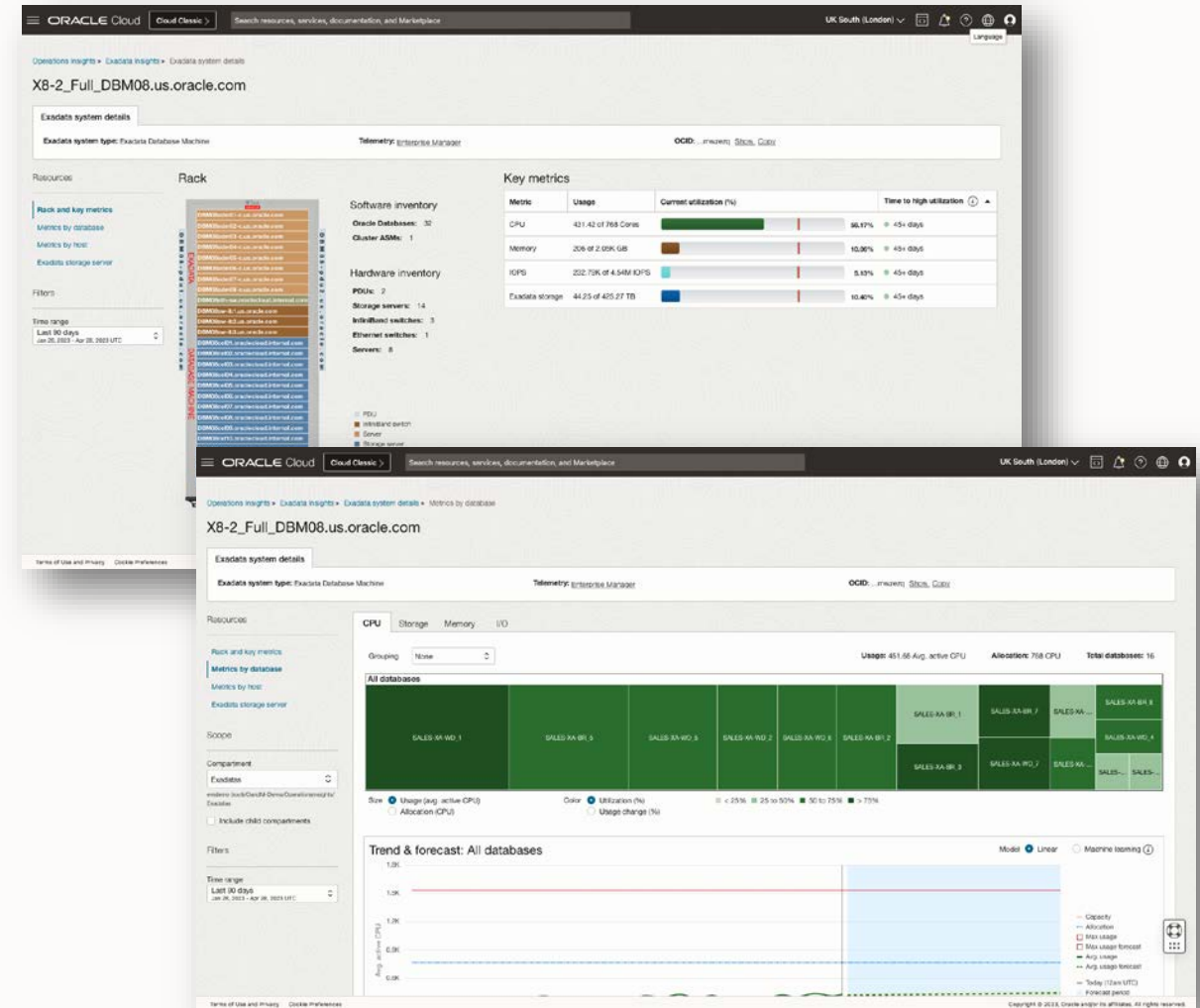
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Policy Advisor

Service guided policy setup

Guided policy setup for specified administrators and read-only users to configure and use the Operations Insights service

- Accessed from the service "Overview" page
- Quick and easy configuration to enable the service in your compartment
- Guided configuration for user group, resource type with component diagram, privilege, and compartment
- Grant and modify policies at the individual telemetry and resource types
- Allows to set up policies for demo mode (optional)
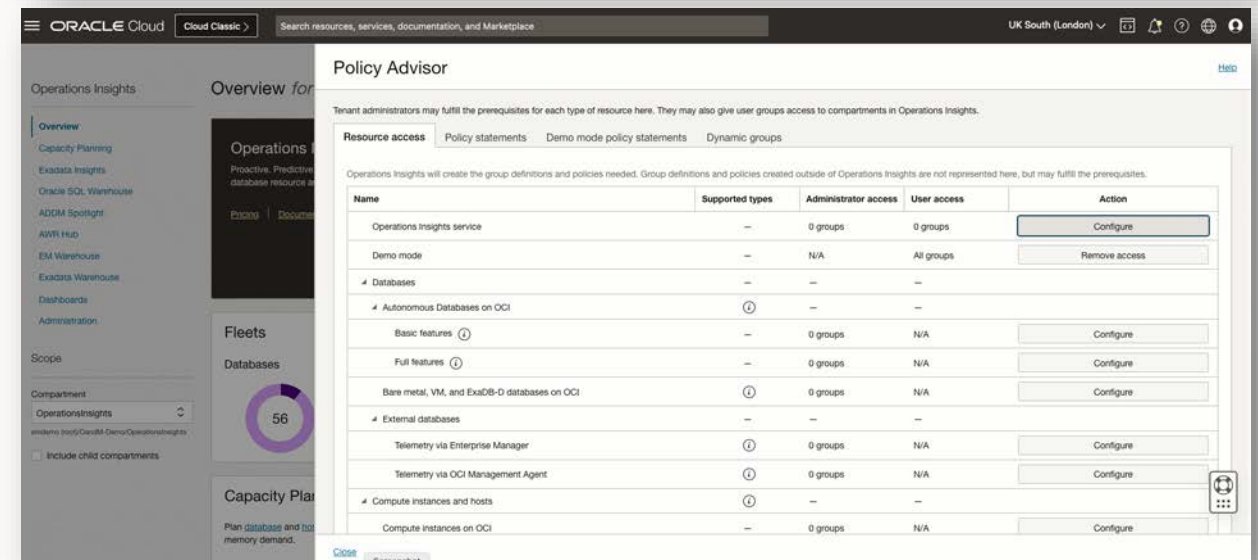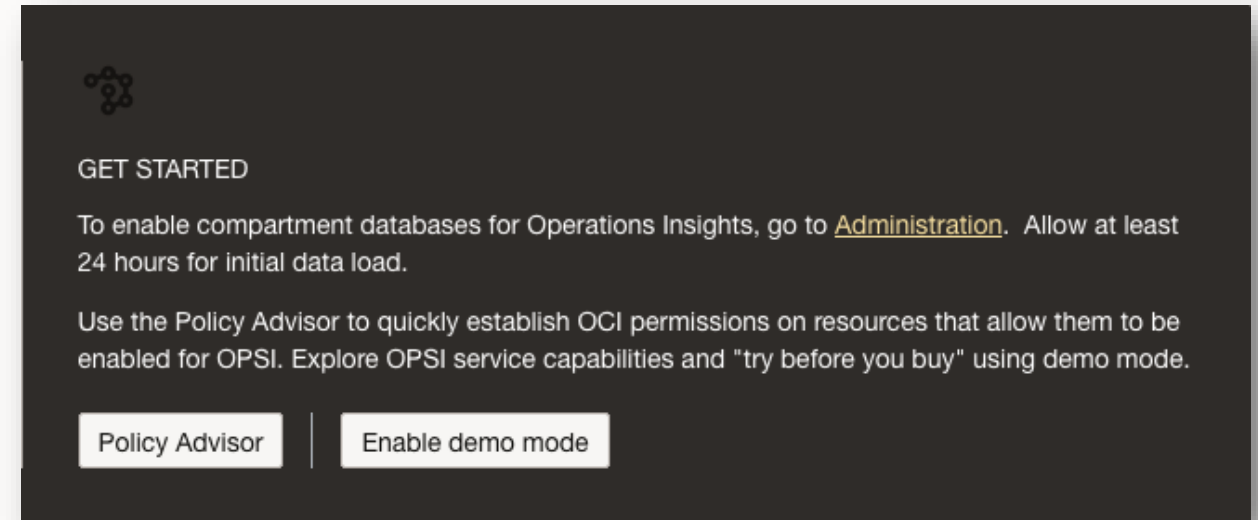
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News Report

Weekly notable insights report across fleet

New Highs

- Resources that have reached new utilization highs during the last week

Big Changes

- Resources that have an average +/- 25% utilization change over the prior week

Inventory

- Resources enabled/disabled in Operations Insights over the prior week

Key Use-cases

- Quickly identify resource(s) that have 90 days high on a weekly basis
- Keep an eye on big movers (utilization-wise) across your fleet
- Take note of inventory changes across your OPSI enabled fleet

ORACLE Cloud Infrastructure

Operations Insights **Capacity Planning** weekly report for 20-Jul to 27-Jul
Operations Insights weekly report for:
Tenancy -
Compartment - *paasdevdbx/dbanalytics/dbx-integration/dbx_integration_database*
Region - *us-phoenix-1*

Last Week

Last week's notable developments in terms of new highs, big changes and inventory changes across your fleet of databases, hosts and Exadata systems.

Summary

There are 3 databases, 5 hosts and 1 Exadata systems enabled and comprising the fleet for compartment

- No hosts reached new recorded high resource utilization levels last week.
- No Exadata reached new recorded high resource utilization levels last week.

New highs

Resources that reached new 90-day high utilization levels over the prior week.

Resource	Type	Metric utilization	New 90-day high value
displayName1	Database	CPU	1.01 %
displayName2	Database	CPU	2.02 %

Big changes

Resources that have an average +/- 25% utilization change over the prior week.

Resource	Type	Metric utilization	Change over prior week
displayName2	Database	CPU	Increased 2.22 %

Inventory

Operations Insights resources enabled/disabled over the prior week.

Resource type	Total	Enabled	Disabled
Database	3	2	1
Host	5	1	4
Exadata	1	1	0

You can always manage your reports via Operations Insights Administration

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Operations Insights – Generic Pricing*

Following features are applicable to below SKUs:
- Capacity Planning (Database & Host)
- Exadata Insights
- Oracle SQL Warehouse
- Data Object Explorer
- ADDM Spotlight
- Dashboard

Configuration (SKU)	Pricing	Metric	Details
Cloud Databases (B892889) **	$0.015	OCPU Per Hour	Supports BaseDB/ExaDB-D, ExaCC and Autonomous DB Full feature option based on OCPU metric
External Database and Host (B92890)	$0.015	Host CPU core per hour	On-Premises Databases with pre-requisite of Diagnostics and Tuning pack
Autonomous Databases Basic (B92888) *	$0.00	OCPU Per Hour	
Autonomous Databases Basic (B96199) *	$0.00	ECPU Per Hour	
Autonomous Databases Full (B97140) **	$0.0075	ECPU Per Hour	

*Applicable for Capacity Planning and Oracle SQL Warehouse applications only
** Applicable for SQL Explorer and other advance options

*Pricing subject to change
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Operations Insights - Warehouse Pricing*

Following features are applicable to below SKUs:

- AWR Hub
- EM Warehouse
- Exadata Warehouse

A single ADB Warehouse can support an entire enterprise's data collection and analytics. OCPU requirements for sizing the shared Warehouse instance is dependent on number, size, and activity of the source database(s). In the case of Exadata Warehouse, only one of the independent warehouse SKUs need to be enabled i.e. B89039 or B89040

Configuration (SKU)	Pricing	Metric	Details
Oracle Autonomous Data Warehouse BYOL (B89039)	$0.3226	OCPU Per Hour	Exadata Warehouse
Oracle Autonomous Data Warehouse (B89040)	$1.3441	OCPU Per Hour	Exadata Warehouse
Operations Insights for Warehouse – Instance (B93706)	$0.5377	OCPU Per Hour	AWR Hub, EM Warehouse
Operations Insights for Warehouse – Extract (B93705)	$2.00	Gigabyte per month	AWR Hub, EM Warehouse and Exadata Warehouse

*Pricing subject to change
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