ORACLE

Oracle Cloud DBA

Lear how to stay up to date on this Dbaas era – Day 2

Marcel Lamarca
Exadata Cloud Specialist
Oracle, Alliances and Channels LAD
February, 2024

SQL> select * from person where name = ‘Marcel Lamarca’

SCAN ME

MARCEL LAMARCA

Exadata Cloud Specialist

Upgrade, Utilities, Patching, Performance & Migrations

marcel-lamarca

marcel.lamarca@oracle.com

About My Career

- 22 Years dedicated to study and support Oracle Databases.
- 12 Years working with Exadata (On-prem, C@C and Cloud Services) .
- 5 Year working for Oracle do Brasil
- 2 Year on Alliances LAD knowledge Team

Certifications

Oracle Cloud Specialist (OCS)

- Exadata Database Machine X9M Certified Specialist
- OCI Foundation 2020 / 2023
- Oracle Autonomous Database professional Administrator 2019 / 2023
- Oracle Cloud Database Migration and Integration 2021
- OCI Cloud Certified Architect Associate 2022
- OCI Cloud Certified Architect Professional 2022
- OCI Multi-Cloud Architect Professional 2023
- Oracle Database Services Certified Professional 2023

Oracle Certified Professional (OCP)

- Oracle Database certified professional 10g, 11g, 12c and 19c.
- Mysql 8.0 Database Administrator Certified Professional

Oracle Certified Specialist (OCE)

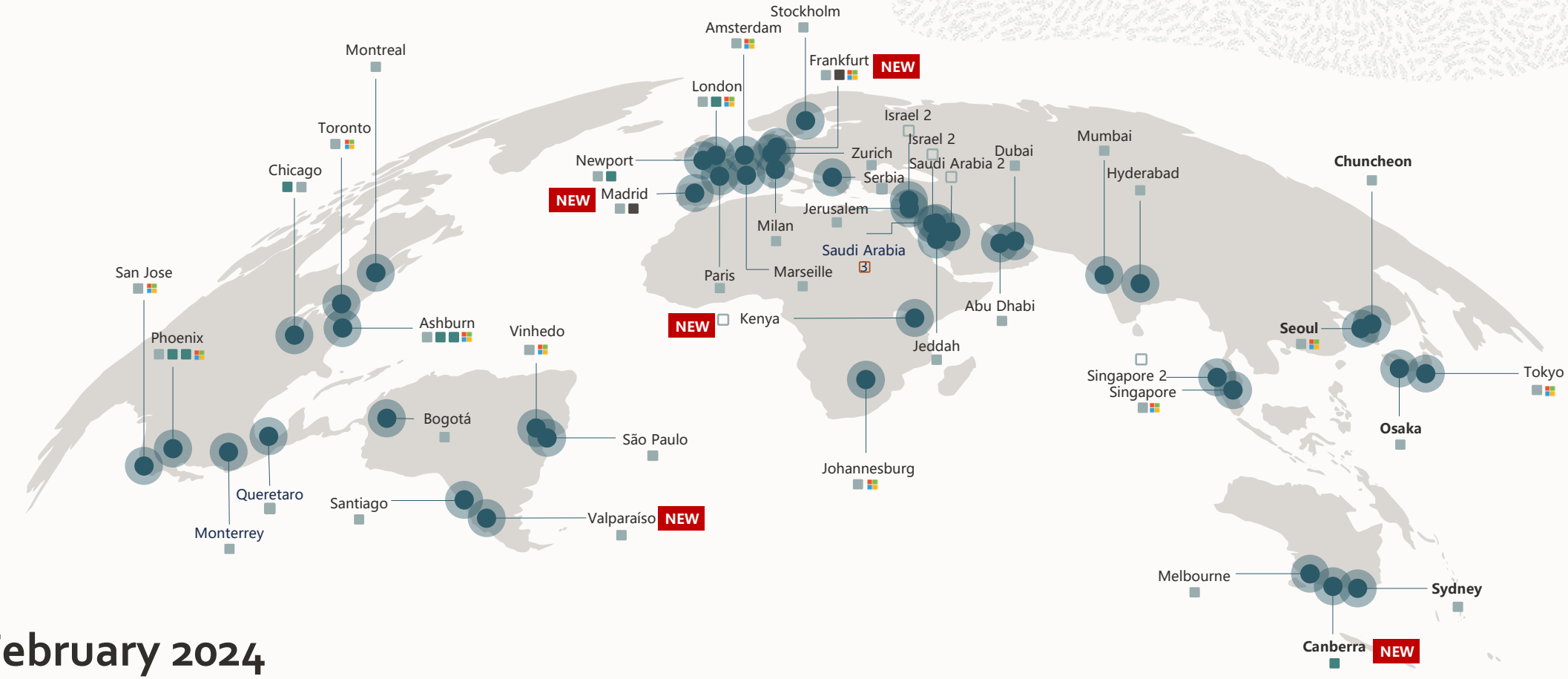
- Grid/RAC Database Administrator 11g
- Oracle Golden Gate 12c Certified Implementation Specialist

Agenda

1. Oracle Autonomous Database
2. Oracle Database Cloud Services (DBCS) Virtual Machine
3. Oracle OCI Data Safe
4. Resources

OCI Cloud Region Maps

Oracle Cloud Infrastructure Global Footprint



February 2024

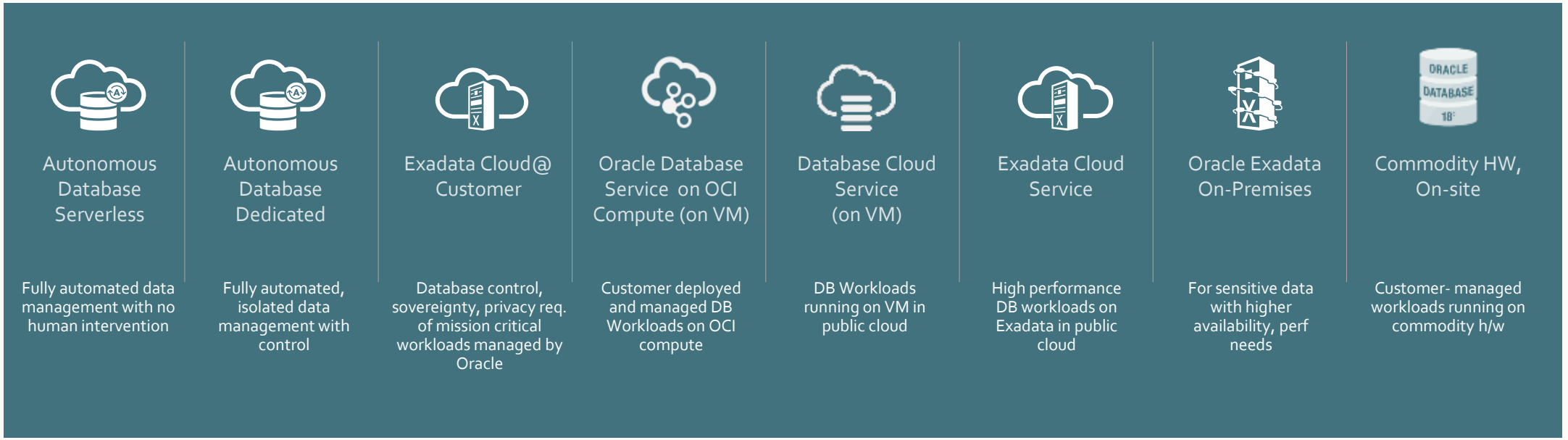
48 regions; 5 more planned

12 Azure Interconnect Regions

OCI Database deploy options

Choice of control and hybrid strategies

Use a single database for all deployments



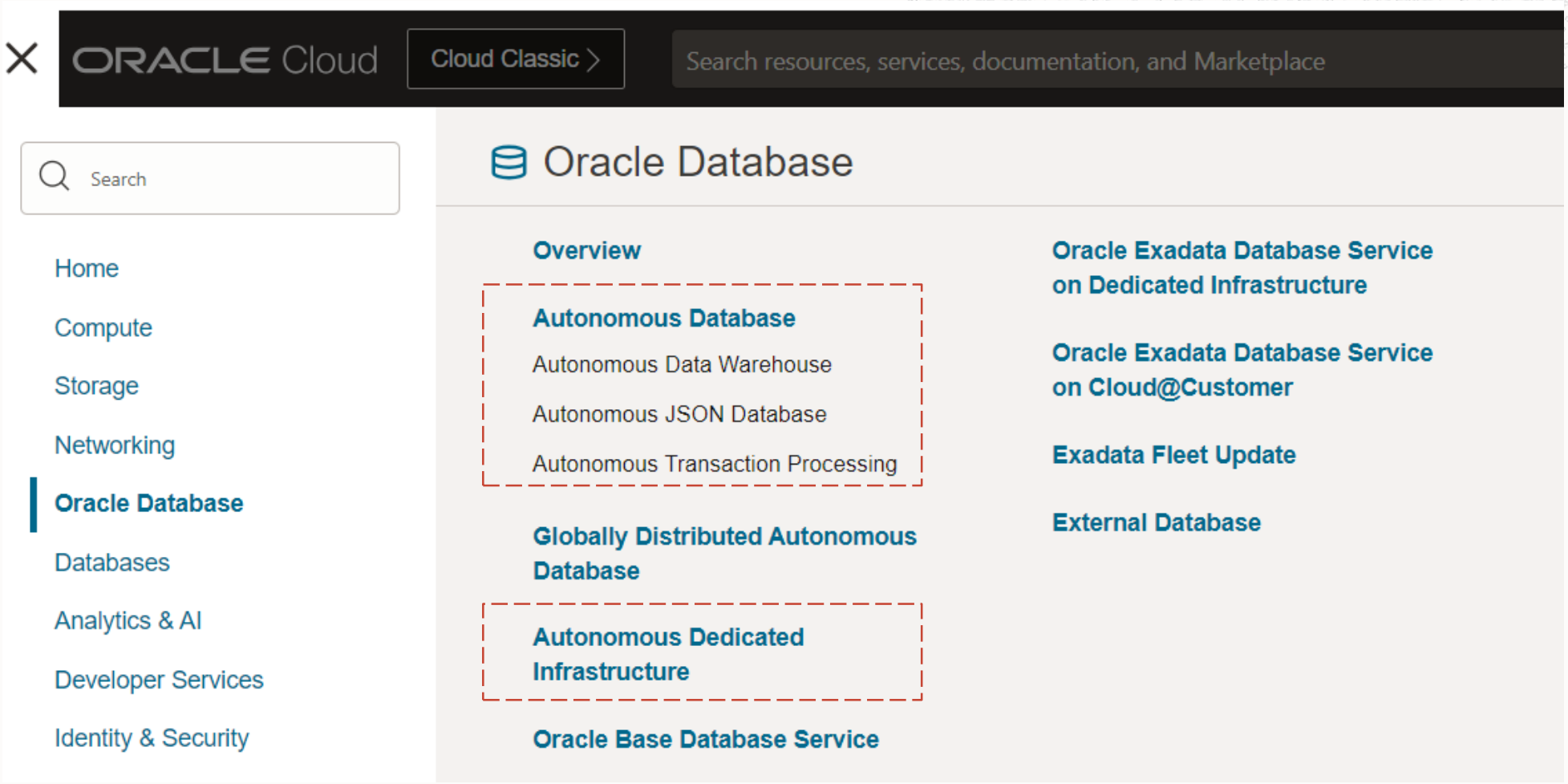
Oracle Autonomous Database

What is Oracle Autonomous Database?

Using the cloud to eliminate all the complexity of mission critical databases

Oracle Autonomous Database = **Complete Infrastructure Automation** + **Complete Database Automation and Machine Learning** + **Automated Data Center Operations**

Oracle Autonomous Database on OCI Console



Oracle Autonomous Database supports a wide range of transactional and analytics workloads

Oracle Autonomous Data Warehouse

Analytical and machine learning workloads

62% lower
total cost of operations

Oracle Autonomous Transaction Processing

Business applications and mixed workloads

50X better storage latency
than Amazon Aurora

Oracle Autonomous JSON Database

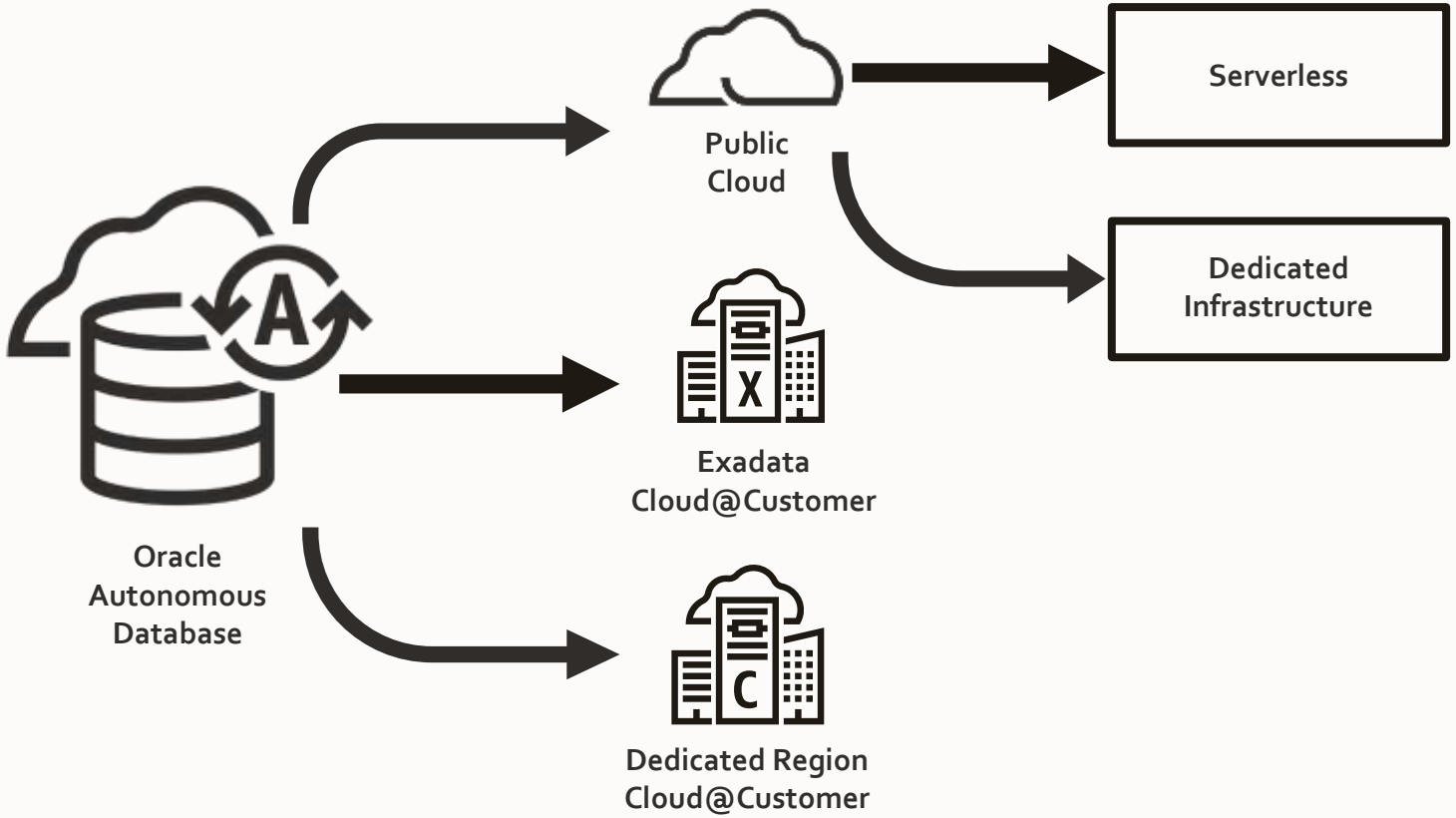
Document database

30% cheaper
than MongoDB Atlas

Support multiple data models without sacrificing security and governance controls

Multiple deployment choices

The most complete support for hybrid cloud strategies



Oracle Public Regions

Hyperscale cloud regions in more than 40 worldwide locations

Dedicated Regions

All OCI services, running in customer data centers

Exadata Cloud@Customer

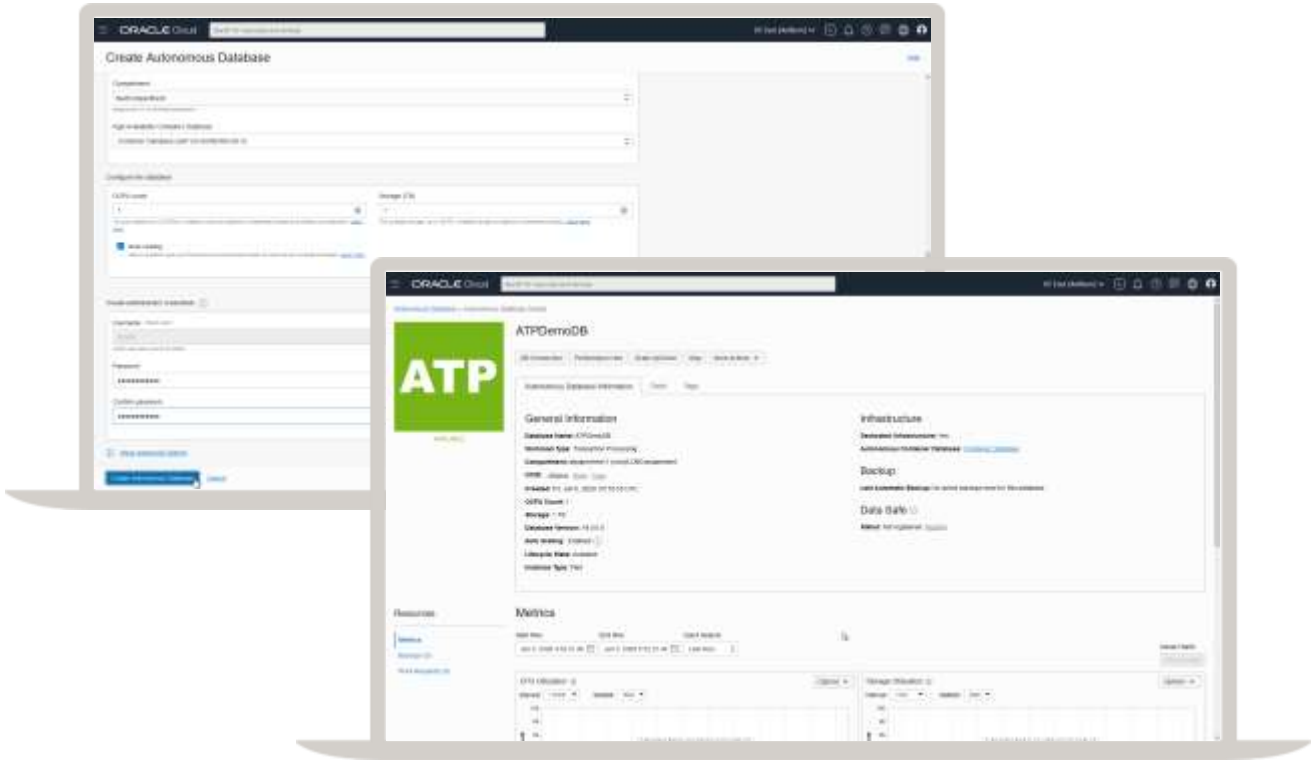
Cloud Autonomous Databases, running in your data center

Worldwide or exactly where you need it, with scale and control

Autonomous operations | Simplified application development | Complete data protection and security | High performance and availability above 99.95%

Features

- Automatic provisioning
- Automatic configuration
- Automatic encryption
- Automatic online patching and updating
- Automatic elastic scaling
- Automatic tuning



Autonomous operations | **Simplified application development** | Complete data protection and security | High performance and availability above 99.95%

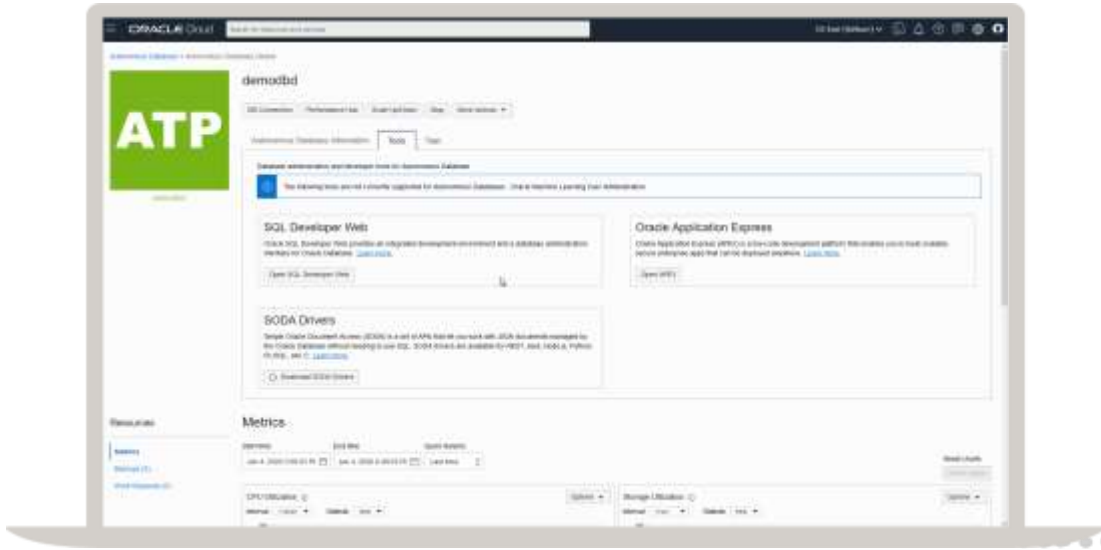
No-code/Low-code development
Eliminate 98% of hand coding with built-in low-code application development platform, APEX.

In-database machine learning (ML) algorithms
Easily build ML models and analytical dashboards without moving data out of the database.

Self-service data tools
Quickly load any data, run queries, build sophisticated analytical models, visualize information.

Native relational and nonrelational data models
Simpler application development using multiple data types including document, graph, spatial, JSON, XML, and more.

REST API support
Enable all your data for simpler and faster access.



Autonomous operations | Simplified application development | **Complete data protection and security** | High performance and availability above 99.95%

Always-on encryption
This ensures the data is always secure at rest and in motion.

Auto-patching
Applications continue to run as patching occurs.

Data privacy
Enables database administrators to perform all administrative tasks without ever seeing customer data.

Security for sensitive data
Oracle Data Safe, makes it easy to discover sensitive data, evaluate security risks, mask sensitive data, and implement and monitor security controls.

Advanced auditing
You can log & monitor all events with minimal impact on performance - analysis, forensics, and compliance.

Autonomous operations | Simplified application development | Complete data protection and security | **High performance and availability above 99.95%**

High performance

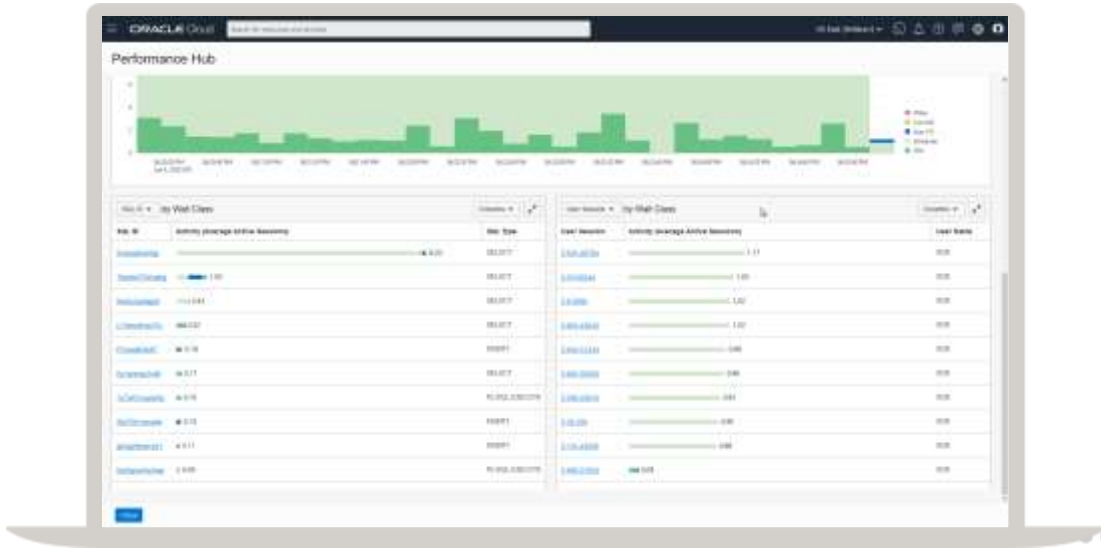
Delivers 80% lower latency and more than 5X throughput than other cloud providers by utilizing database-optimized hardware, automated tuning, and indexing.

Always online

Provides more than 99.95% availability using a combination of Oracle's Gen 2 Cloud Infrastructure, Oracle RAC, Autonomous Data Guard, and daily automatic backups.

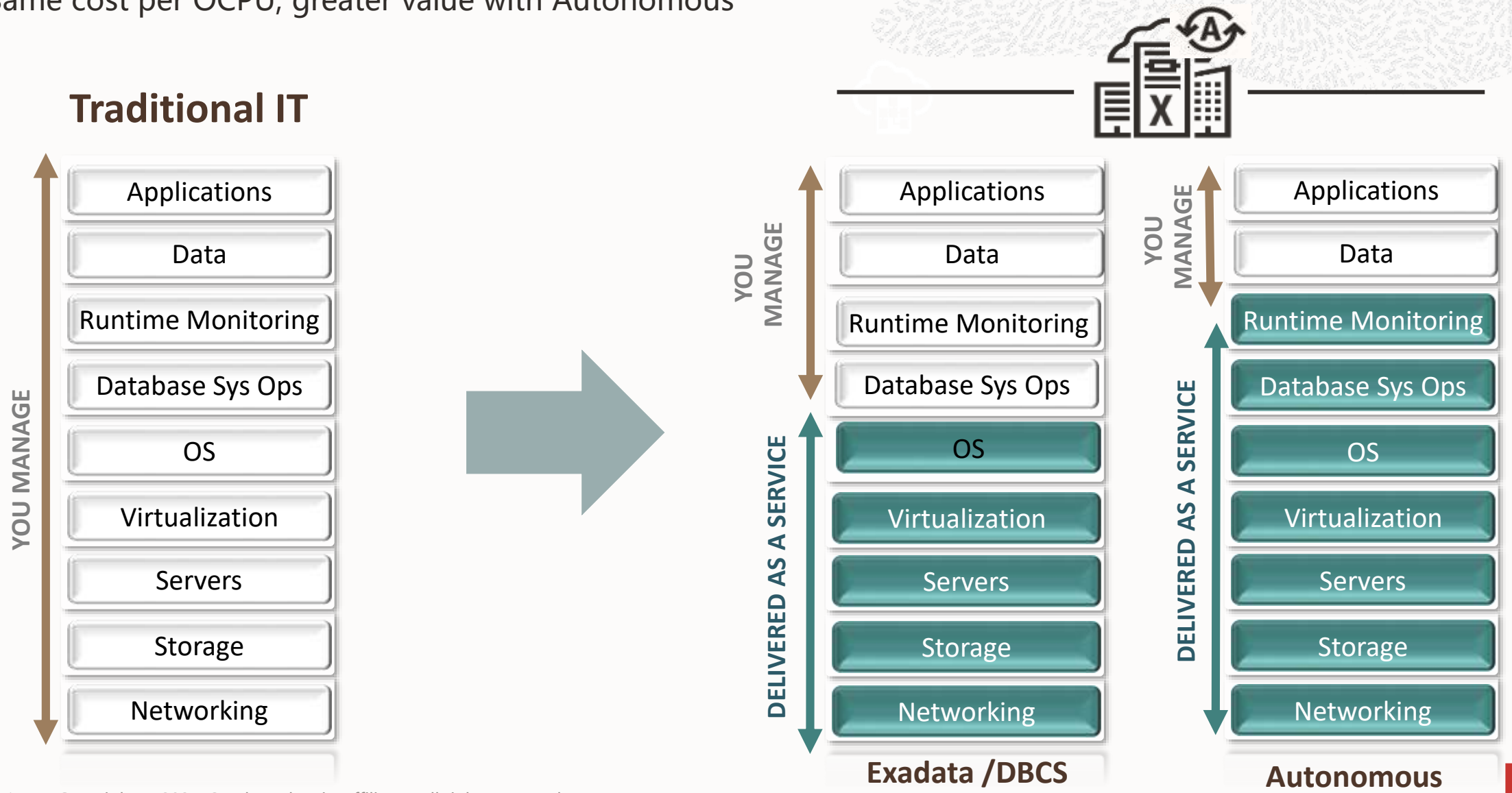
Protection from human error

Oracle Flashback, provided with Autonomous Transaction Processing, instantly rewinds accidental changes to application schemas, protecting users from human errors. It supports recovery at all levels including row, transaction, and table—and across the entire database.

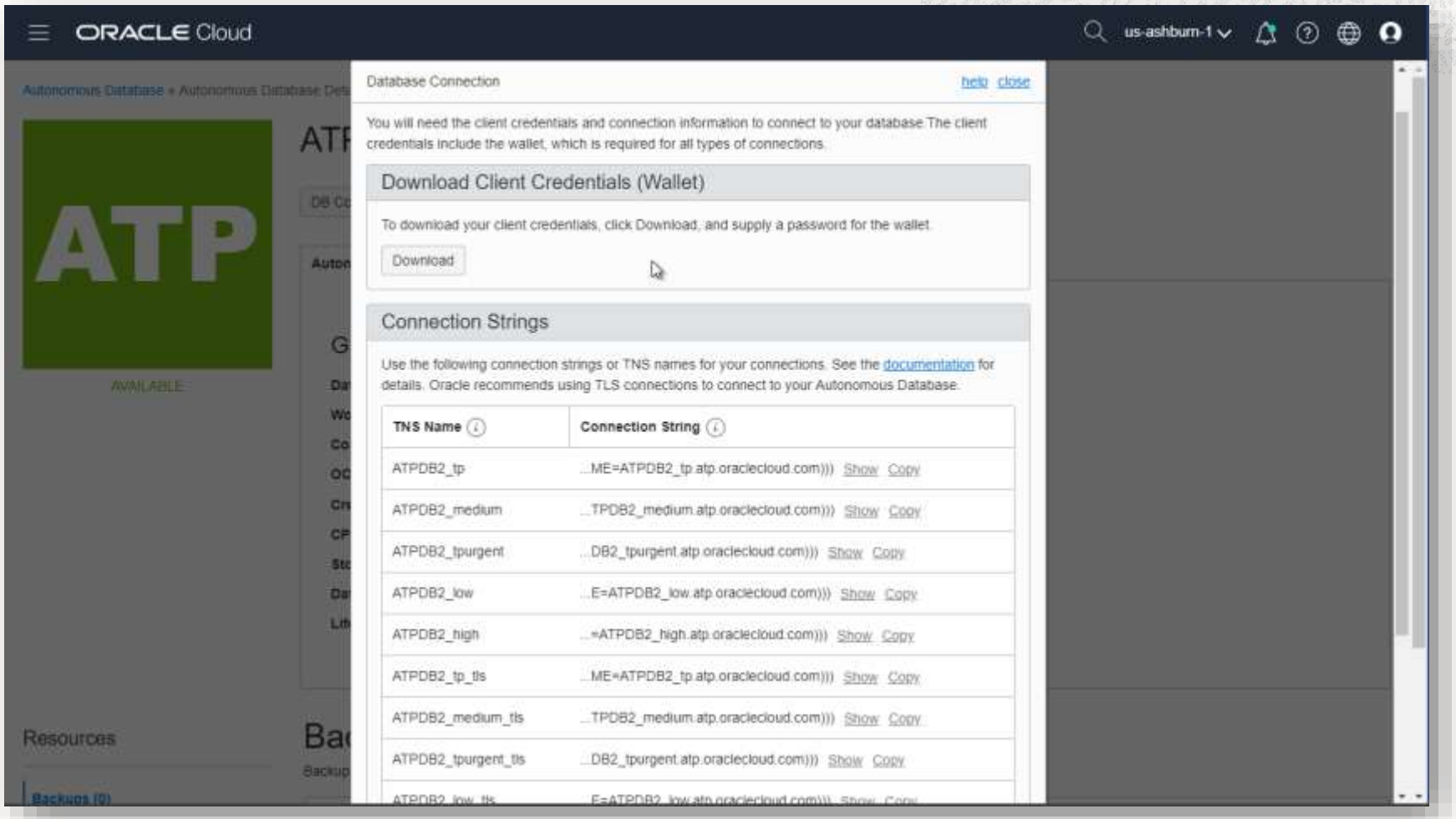


Transfer more responsibility to the service while lowering costs

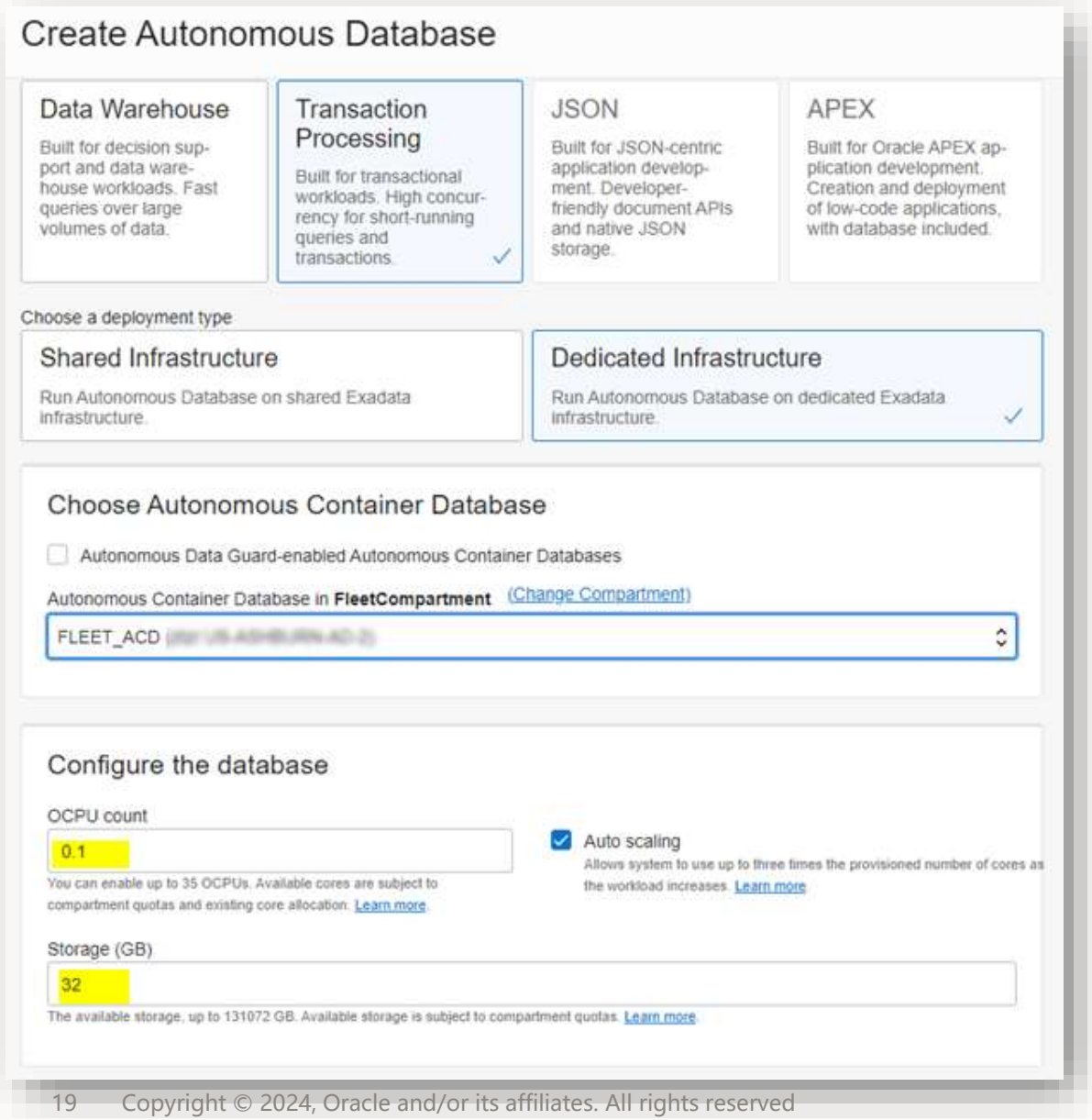
Same cost per OCPU, greater value with Autonomous

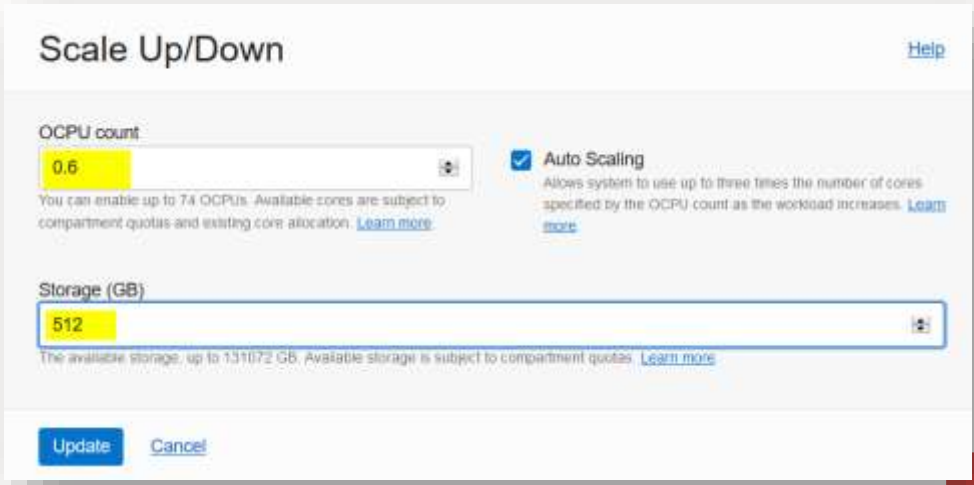


Oracle Autonomous secure connection | Credential Wallet



Oracle Autonomous Console Management





Automated data warehouse management

Run a high-performance, highly available, and secure data warehouse while reducing cost

Auto-provisioning

Deploys mission-critical databases (RAC on Exadata infrastructure) which are fault-tolerant and highly available.

Auto-configuration

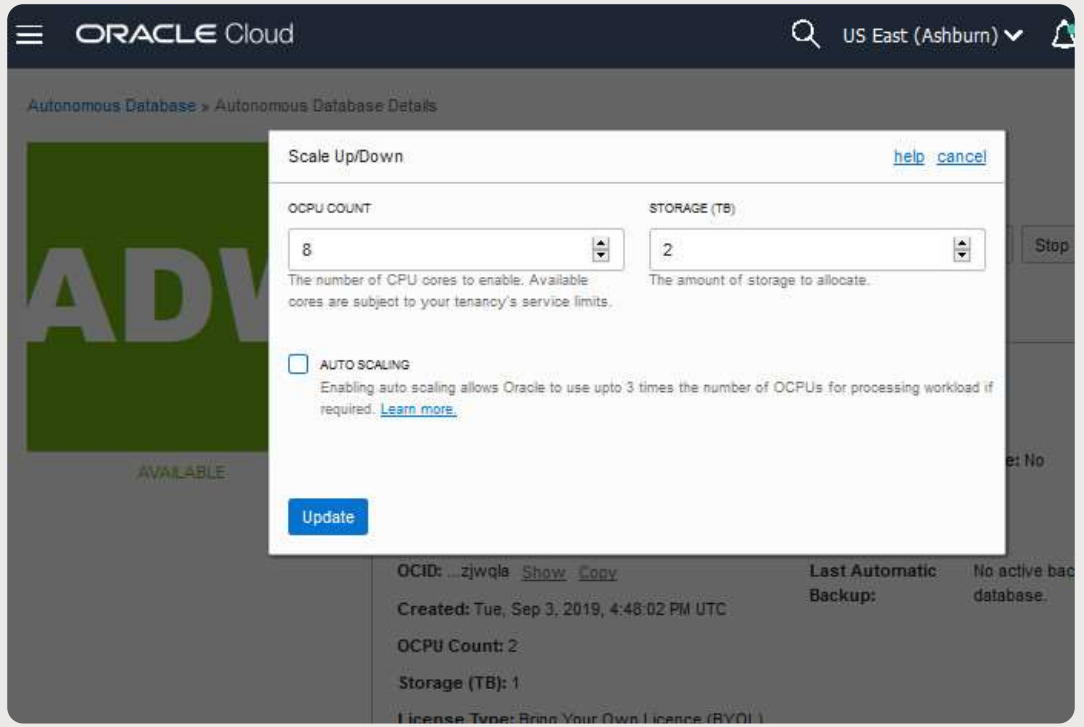
Automatically configures the database to optimize for data warehouse workloads.

Auto-scaling

Automatically scales compute resources when needed. Precision scaling occurs while applications is running–without downtime. Enables true pay per use.

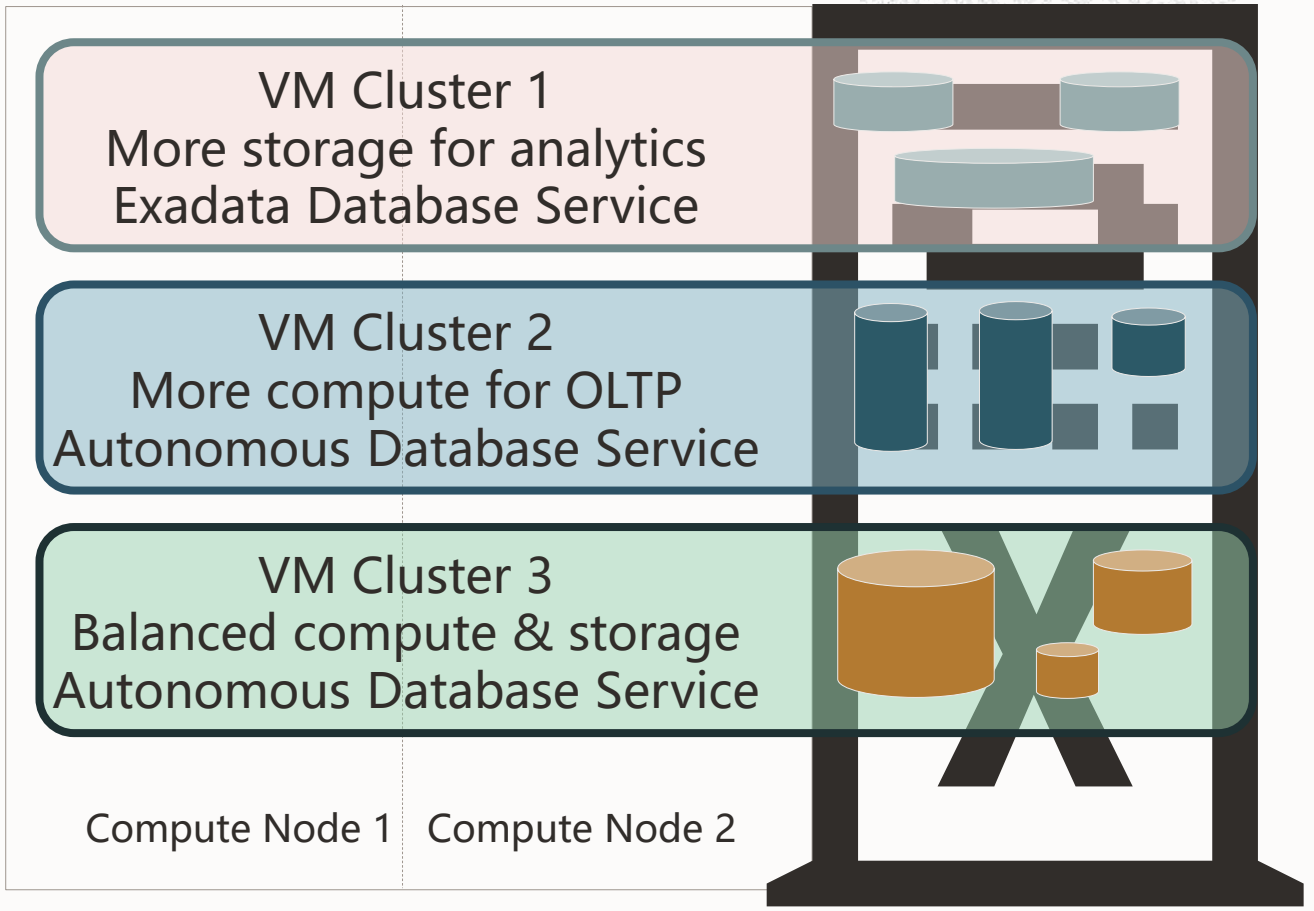
Automated security

Automatic encryption for the entire database, backups and all network connections.



Increasing Resource Utilization Efficiency and Consolidation Savings

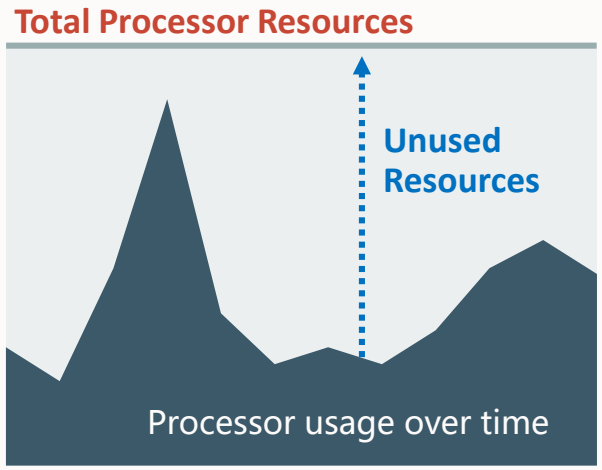
1. Multiple VM clusters can be created on Exadata Cloud@Customer Infrastructure
2. Each VM cluster can be configured to match workload needs (e.g. more storage for analytics or more compute for OLTP)
3. Each VM cluster can be used for either Autonomous or Exadata Database Service
4. Each VM cluster can support multiple databases for consolidation
5. More VM clusters can be added as needed using unallocated resources
6. Consumption in each cluster can be scaled independently



Available on Exadata Cloud@Customer Infrastructure X7 through X10M

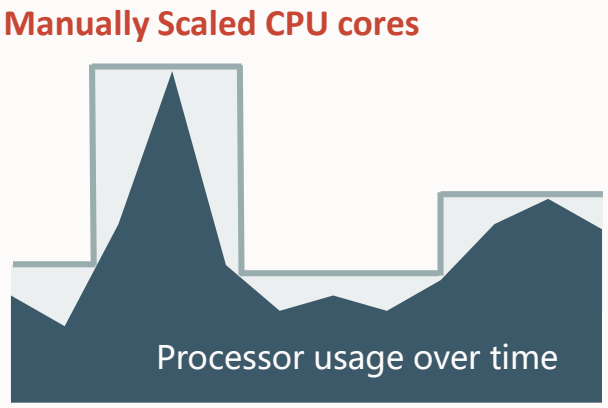
Autonomous Database Billing

Online, Elastic Scaling with Exadata and Autonomous Database Services Pay only for what you use, in OCI or your data center



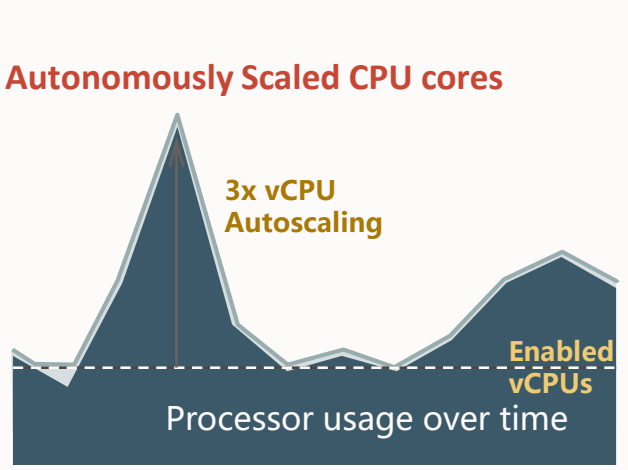
On-Premises & Other Clouds – Static

Purchase server processors and software licenses for **highest projected peak load**



Exadata Database Service – Elastic

Adjust enabled CPUs to match **actual workload** via APIs and web UI - CPUs are charged per second



Autonomous Database – Self-scaling

Automatically scales CPU core consumption based on **dynamic workload demands**, in real-time

Retirement Of The OCPU Billing Metric In ADB Database Serverless (Doc ID 2998742.1)

ACTIONS

What action do I need to take now?

We encourage customers to provision all new Autonomous Data Warehouse and Autonomous Transaction Processing databases or clones with the ECPU billing metric. We also encourage customers to update all existing databases to the ECPU billing metric, which is a simple and seamless button click or API call, as described in the documentation here. While you may choose not to update your existing databases' billing metric at this time, Oracle may convert your databases from the OCPU billing metric to the ECPU billing metric in the future.

Note: Autonomous Data Warehouse databases provisioned as part of Oracle Data Intelligence Platform (formerly Fusion Analytics Warehouse) service instance will be updated to the ECPU billing metric by Oracle. No user action is required on those databases.

How will updating my databases to the ECPU billing metric affect my service?

Updating your Autonomous Database Serverless to the ECPU billing metric will have **no impact to your service** and incur **no downtime**.

Which SKUs are affected by this retirement notice?

Oracle Autonomous Database will be retiring the OCPU-based SKUs and replacing them with the ECPU-based SKUs listed below:

Retired OCPU Billing Metric - SKU Name	Part Number	Metric
Oracle Autonomous Data Warehouse	B89040	OCPU Per Hour
Oracle Autonomous Data Warehouse - BYOL	B89039	OCPU Per Hour

Retirement Of The OCPU Billing Metric In ADB Database On Dedicated Infra (Doc ID 2998755.1)

ACTIONS

What action do I need to take now?

We encourage users to provision new Autonomous VM Clusters (AVM) with the ECPU billing metric. Oracle will offer an online conversion capability to update existing OCPU AVMs and their respective Autonomous Container Databases and Autonomous Databases to the ECPU billing metric via the OCI console and API in Q3 CY2024. In the meantime, users can also use database cloning to migrate existing OCPU ADBs to ECPU if they have AVMs configured with the ECPU billing metric. While you may choose not to update your existing databases' billing metric at this time, Oracle may convert your databases from the OCPU billing metric to the ECPU billing metric in the future.

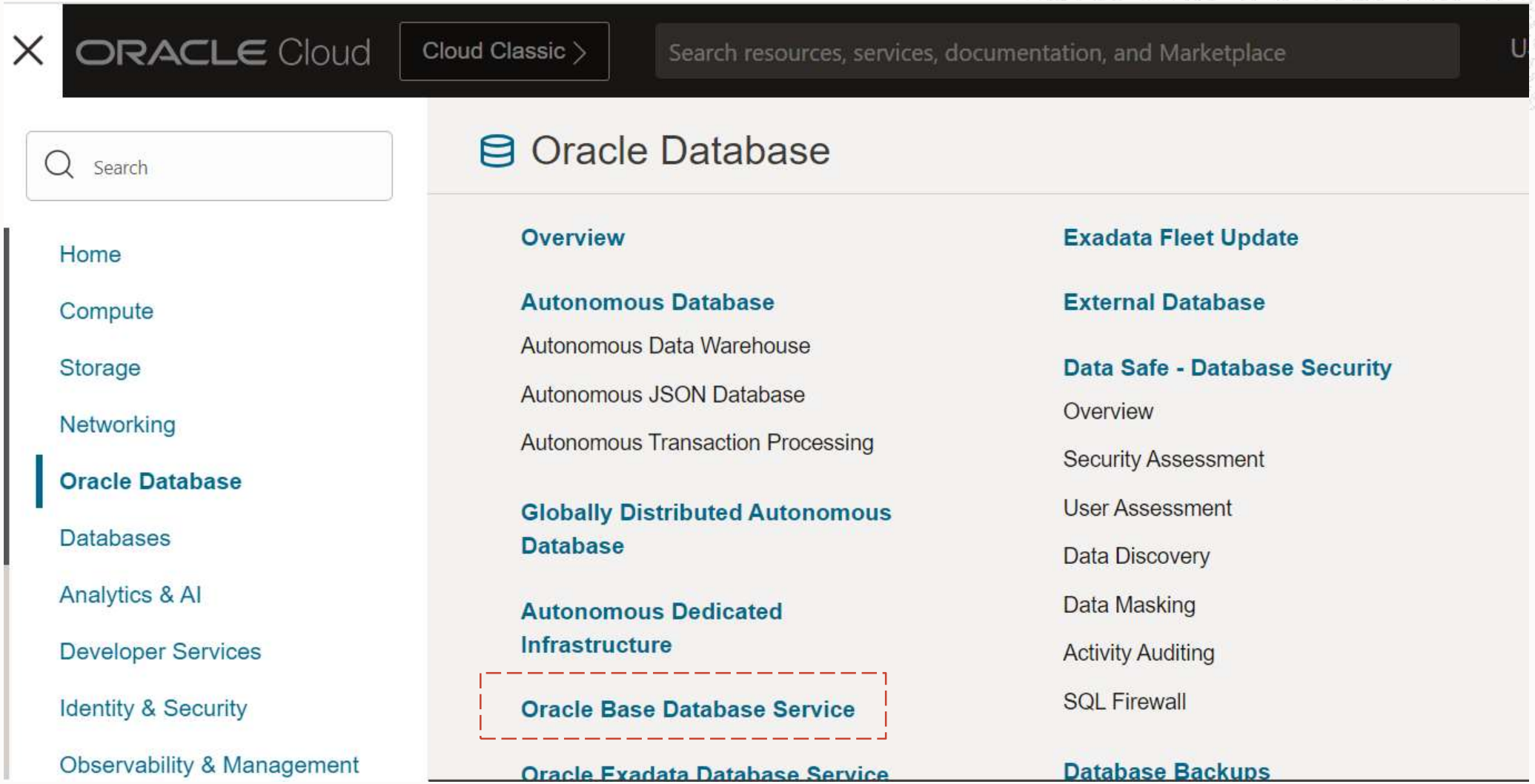
Which SKUs are affected by this retirement notice?

Oracle Autonomous Database on Dedicated Infrastructure will be retiring the OCPU-based SKUs and replacing them with the ECPU-based SKUs listed below:

Retired OCPU Billing Metric - SKU Name	Part Number	Metric
Oracle Autonomous Data Warehouse - Dedicated	B92182	OCPU Per Hour
Oracle Autonomous Data Warehouse – Dedicated - BYOL	B92184	OCPU Per Hour
Oracle Autonomous Transaction Processing - Dedicated	B92181	OCPU Per Hour
Oracle Autonomous Transaction Processing – Dedicated - BYOL	B92183	OCPU Per Hour

Oracle Database Service (DBCS)

Oracle DBCS Bare Metal Console Management



Database Cloud Service | Virtual Machine

Understanding Oracle OCI DBCS roles and limitations

Entry-level, provision with GI or LVM (fast-provision)

- 2 DB Systems types on VM

  One Node – One VB Database System
  Two Nodes – Two VM Clusters with Oracle RAC Features

- On A RAC shape, each node is assigned on a different fault domain

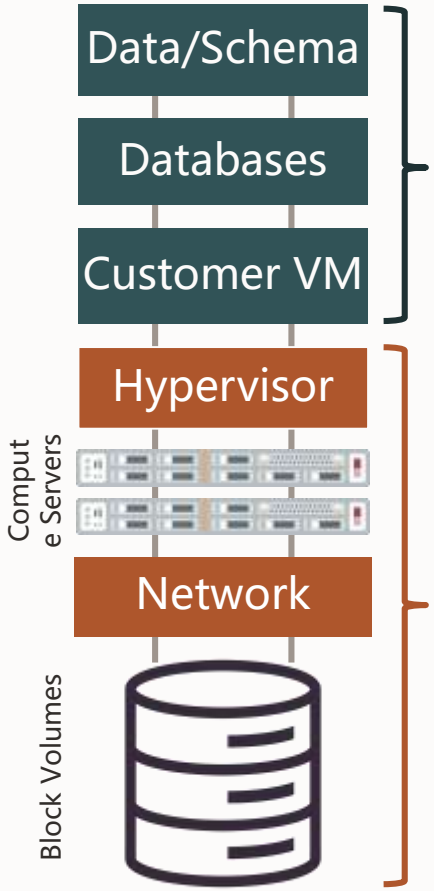
- **1** to **64 OCPU's** for Enterprise Edition

- **1** to **8 OCPU's** for Standard Edition

- **16 GB** memory per **OCPU**, up to **1 TB** total memory

- Up to **80 TB** of usable higher performance block-volume storage

Customer managed databases with Oracle managed infrastructure



Customer owns everything inside database

- Data, schema, encryption keys

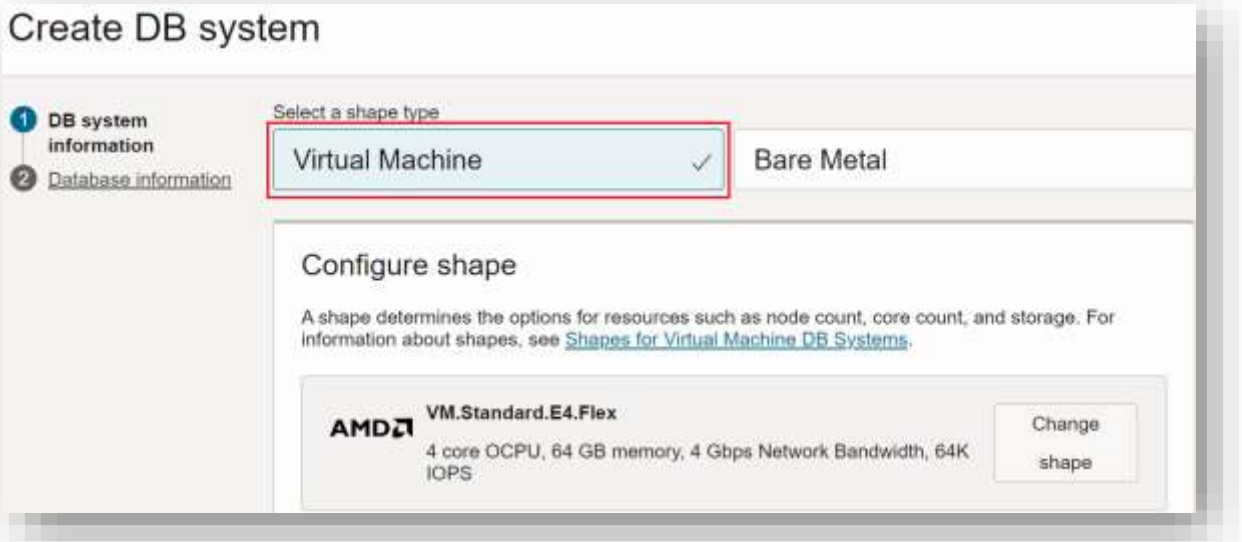
Customer subscribes to database services

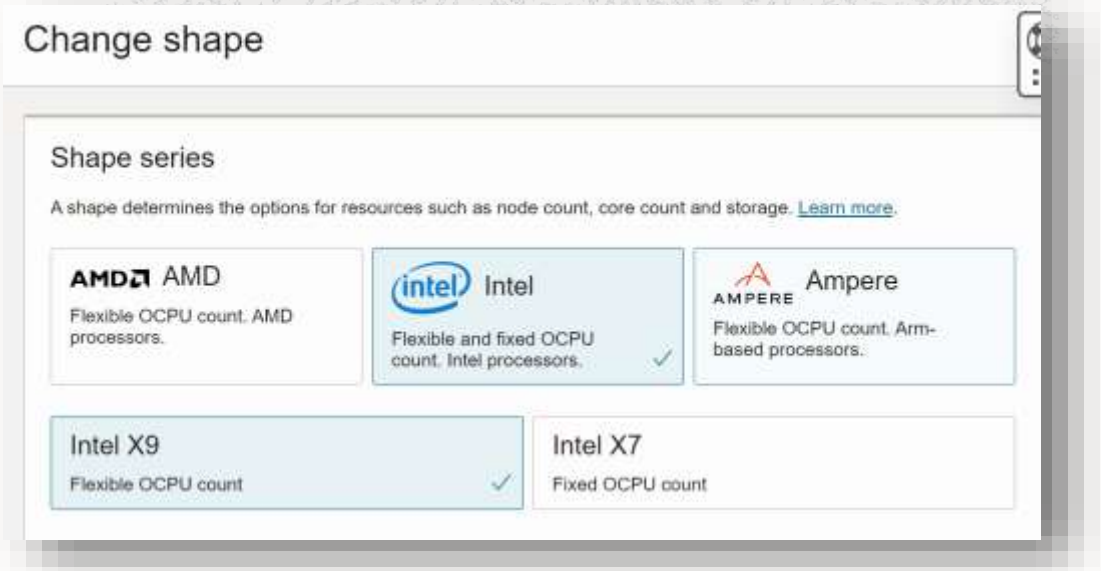
- Customer manages VMs and Databases using Cloud Automation (UI / APIs)
- Automation to create, delete, patch, backup, scale up/down, etc.
- Runs all supported Oracle Database versions
- Customer controls access to customer VM
- Customer can install and manage additional software in customer VM
- Oracle staff are not authorized to access customer VM

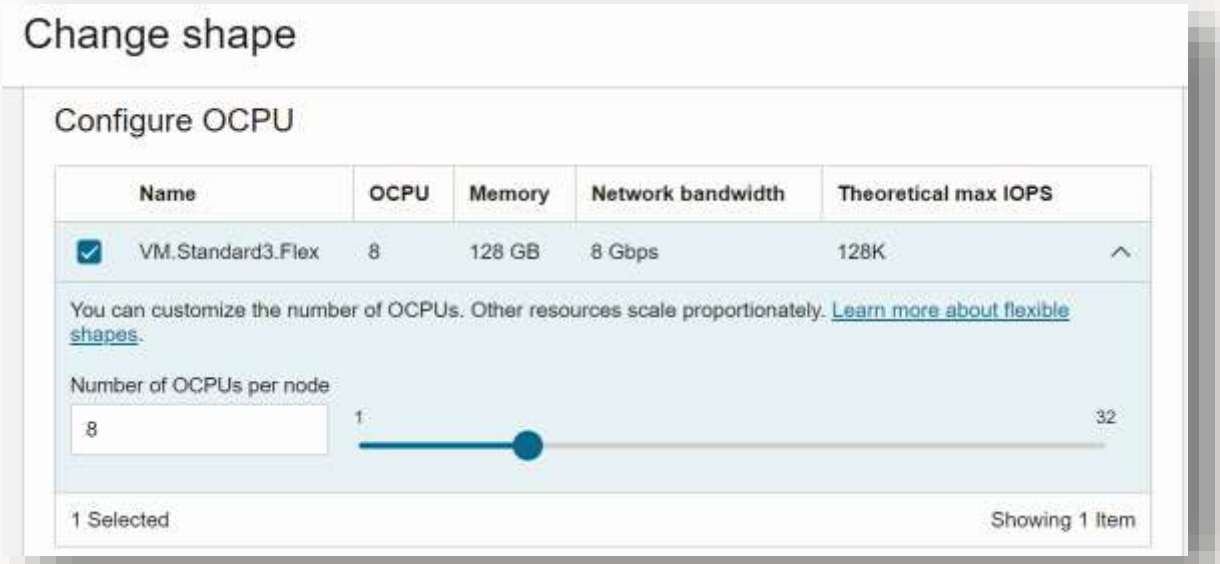
Oracle owns and manages infrastructure

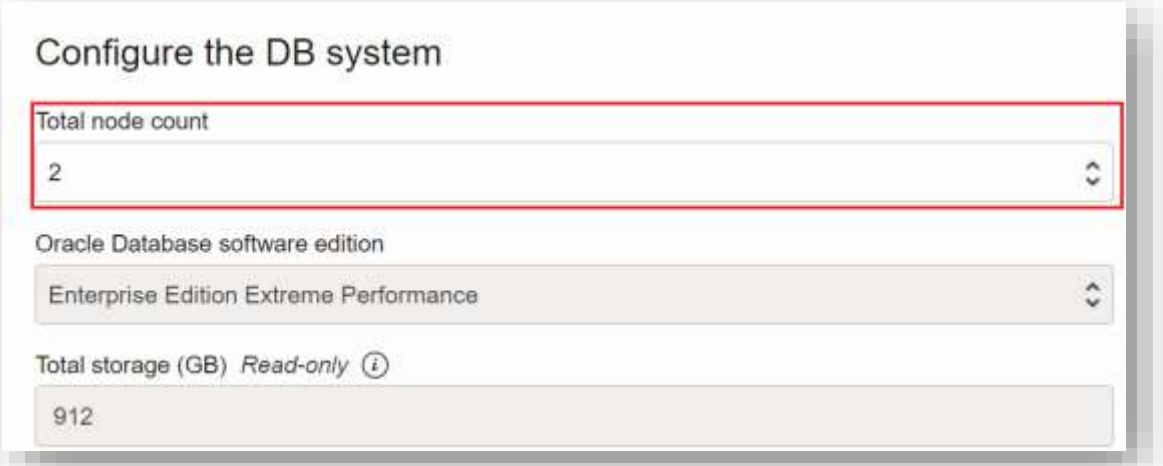
- Hypervisor, compute and storage infrastructure, network
- Patching, security scans, security updates
- Monitoring and maintenance
- Customer not authorized to access Oracle infrastructure

Oracle DBCS Virtual Machine Console Management

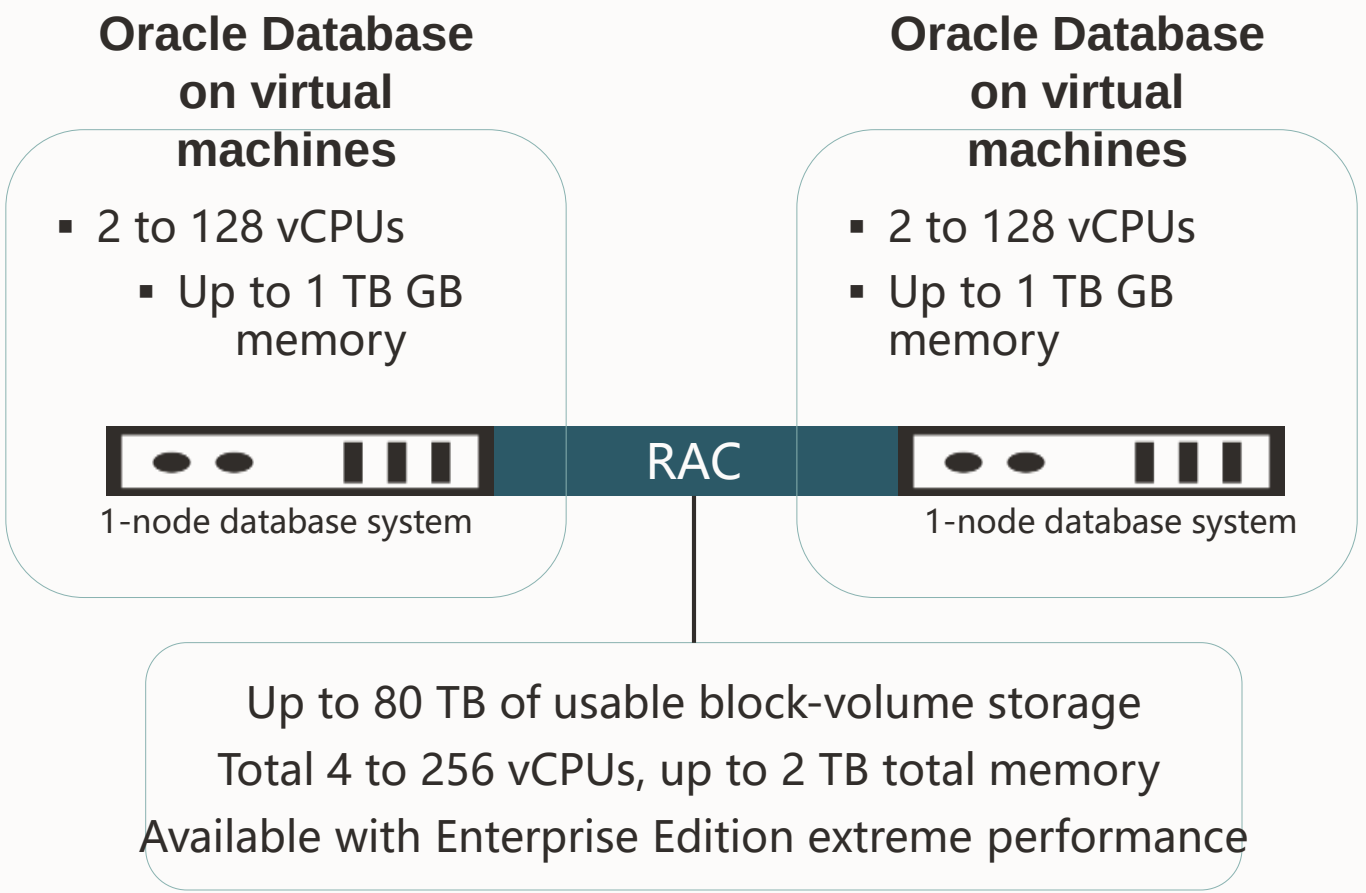








Continuous availability and scalability on 2-node Oracle Real Application Clusters

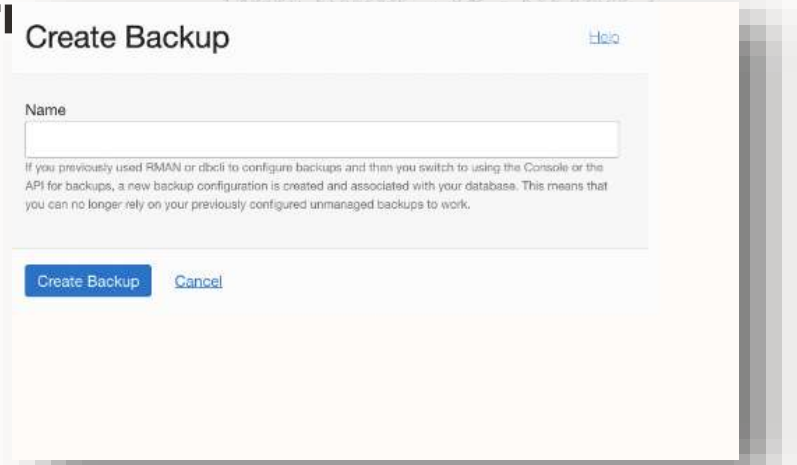


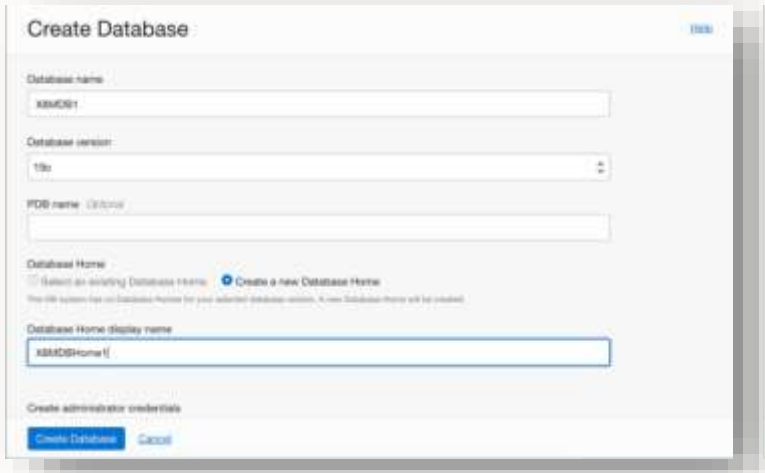
DBCS Database Management Tools

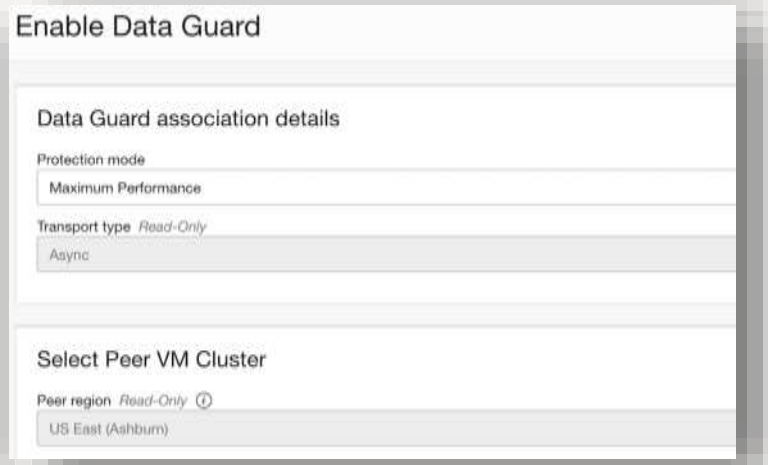
Cloud Automation for Common Lifecycle Tasks

Oracle Cloud Web base UI, REST APIs, SDK, CLI, Terrafor

- Scale OCPUs
- Create Database Homes and Databases
- Schedule Infrastructure Maintenance
- Update Operating System, Grid Infrastructure, and Databases
- Backup and recovery
- Enable Data Guard







OCI Command Line Interface (*dbcli*)

OCI Command Line Interface Database Options and doc references

Backup Commands

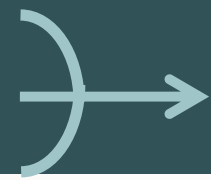
- ***dbcli*** create-backup
- ***dbcli*** getstatus-backup
- ***dbcli*** schedule-backup

DB Storage Commands

- ***dbcli*** list-dbstorages
- ***dbcli*** describe-dbstorage
- ***dbcli*** create-dbstorage
- ***dbcli*** delete-dbstorage

Database Home Commands

- ***dbcli*** create-dbhome
- ***dbcli*** describe-dbhome
- ***dbcli*** list-dbhome
- ***dbcli*** update-dbhome



CLI Command Line Interface

The database CLI (dbcli) is a command line interface available on bare metal and virtual machine DB systems. After you connect to the DB system, you can use the database CLI to perform tasks such as creating Oracle database homes and databases.

Note: The database CLI is not for use on Exadata DB systems.

The database CLI commands must be run as the root user.

• dbcli is in the /opt/oracle/dcs/bin/ directory. This directory is included in the path for the root user's environment.

• Oracle Database maintains logs of the dbcli command output in the dcscli.log and dcs-agent.log files in the /opt/oracle/dcs/log/ directory.

• The database CLI commands and most parameters are case sensitive and should be typed correctly. A few parameters are not case sensitive, you should look at parameter descriptions.

OCI Data Security

People are after your data

Insiders

Nation States

Former Employees

Personal Data
Financial Data
Trade Secrets
Regulated Data

Criminals

Curiosity Seekers

Hacktivists

Customers

Competitors

Integrated and Automated Security from Data to Identity

- Identity Federation
- Role-Based Policy
- Compartments & Tagging
- Instance Principals
- Resource Principals

- Encryption at Rest
- Encryption in Motion
- TLS
- **Data Safe**
- Managed Keys
- Custom Keys
- Managed Vault
- Oracle Vault Cross Regional Replication and Asymmetric Keys

- Root of Trust
- Off-box Networking
- Harden Disk Images
- Autonomous Linux
- Certificates
- Hardware Security Modules

- Virtual Cloud Network
- Interface Segmentation
- Private Networks
- FastConnect
- Secure VPN
- Bastion
- P2P, NAT, DRG Gateways

- Cloud Guard
- Security Zones
- Vulnerability Scanning
- Threat Detection
- Logging/Flows
- Governance
- Compliance

- Global PoPs
- DDoS Protection
- WAF Protection
- SD-WAN

Oracle Advanced Security

Encryption and redaction of sensitive data prevent out-of-band access

- **Transparent Data Encryption**
  - Stop would-be attackers from bypassing the database and reading sensitive information directly from storage by enforcing data-at-rest encryption in the database layer.
- **Data redaction**
  - Reduce the risk of unauthorized data exposure in applications by redacting sensitive data before it leaves the database. Partial or full redaction prevents large-scale extraction of sensitive data
- **Transparent to applications**
  - Encryption is implemented at the database kernel level, eliminating the need for any changes to applications.

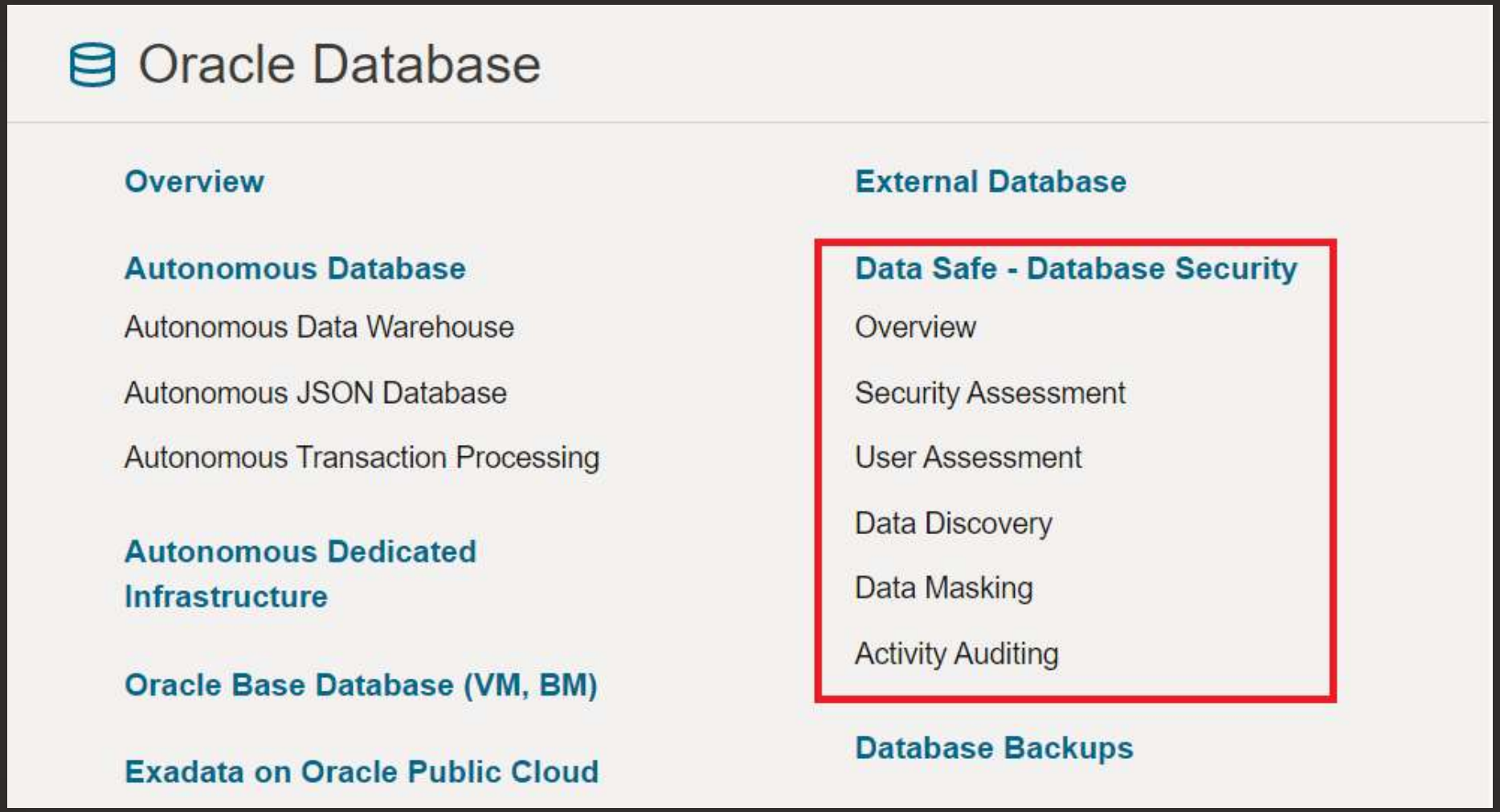
Oracle Database Vault

Restrict access to application data by privileged users with the principle of least privilege

- **Separation of duties**
  - Allow only security roles to manage users, profiles, and security controls while limiting admins to managing only the database.
- **Realms**
  - Block unauthorized access to sensitive data by creating restricted application environments within Oracle Database.
- **Command rules**
  - Block accidental or malicious changes to production databases attempted outside specific maintenance windows.
- **Trusted paths**
  - Use factors like client IP address, program, user name, and time of day to control access to data and data operations.

Oracle OCI Data Safe

Oracle Data Safe available on your OCI Tenancy



Introducing Oracle Data Safe

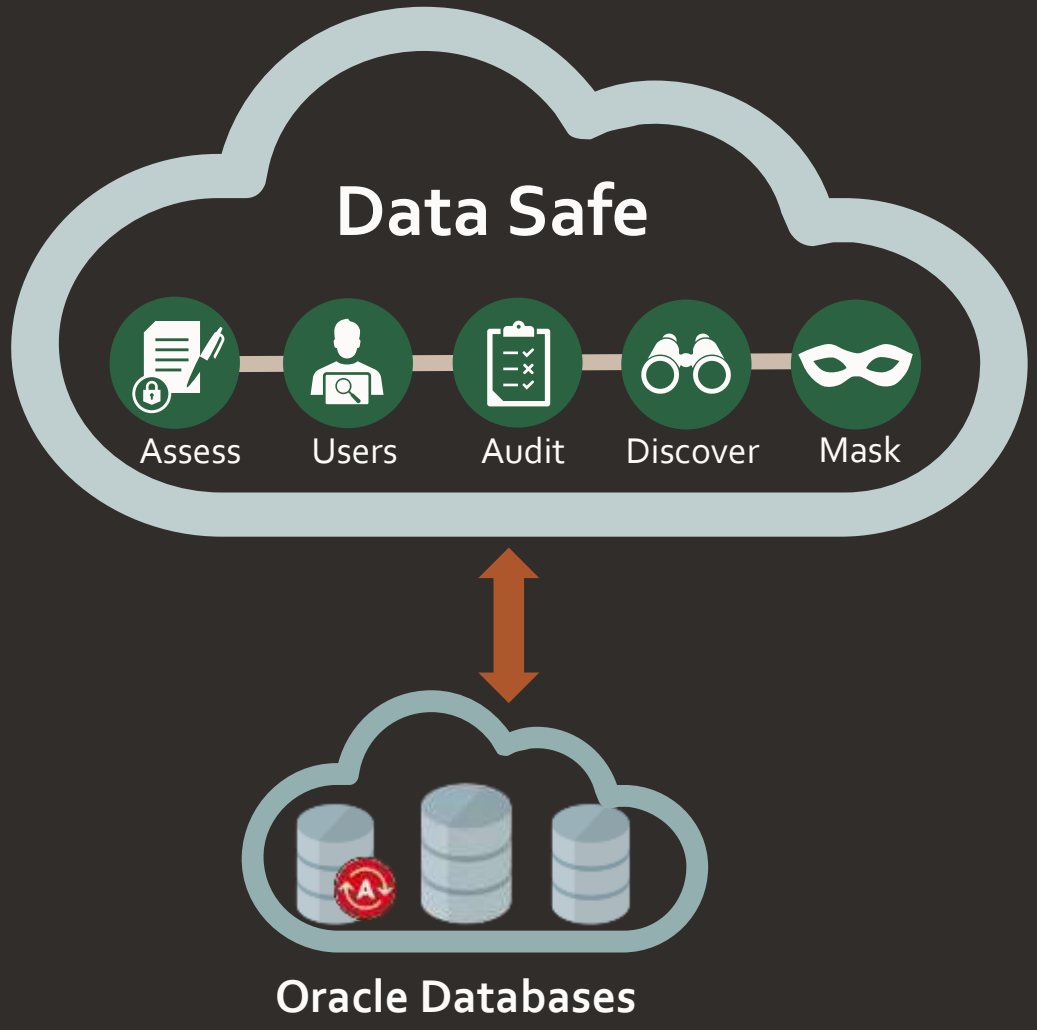
Unified database security control center

- Risk dashboard: configuration, data, users
- Monitor user activity
- Mask data for test
- Extensible - more features to come…

Benefits

- No special expertise needed: click-and-secure
- Saves time and mitigates security risks
- Defense-in-depth security for all customers

Now available for securing ALL Oracle Databases, on-premises and in the cloud



Data Safe components

Data safe comprises five components in a single integrated cloud service for securing Oracle Database targets

Security Assessment	User Assessment	Activity Auditing	Data Discovery	Data Masking

Security assessment

Instant feedback on configurations that may introduce unnecessary risk

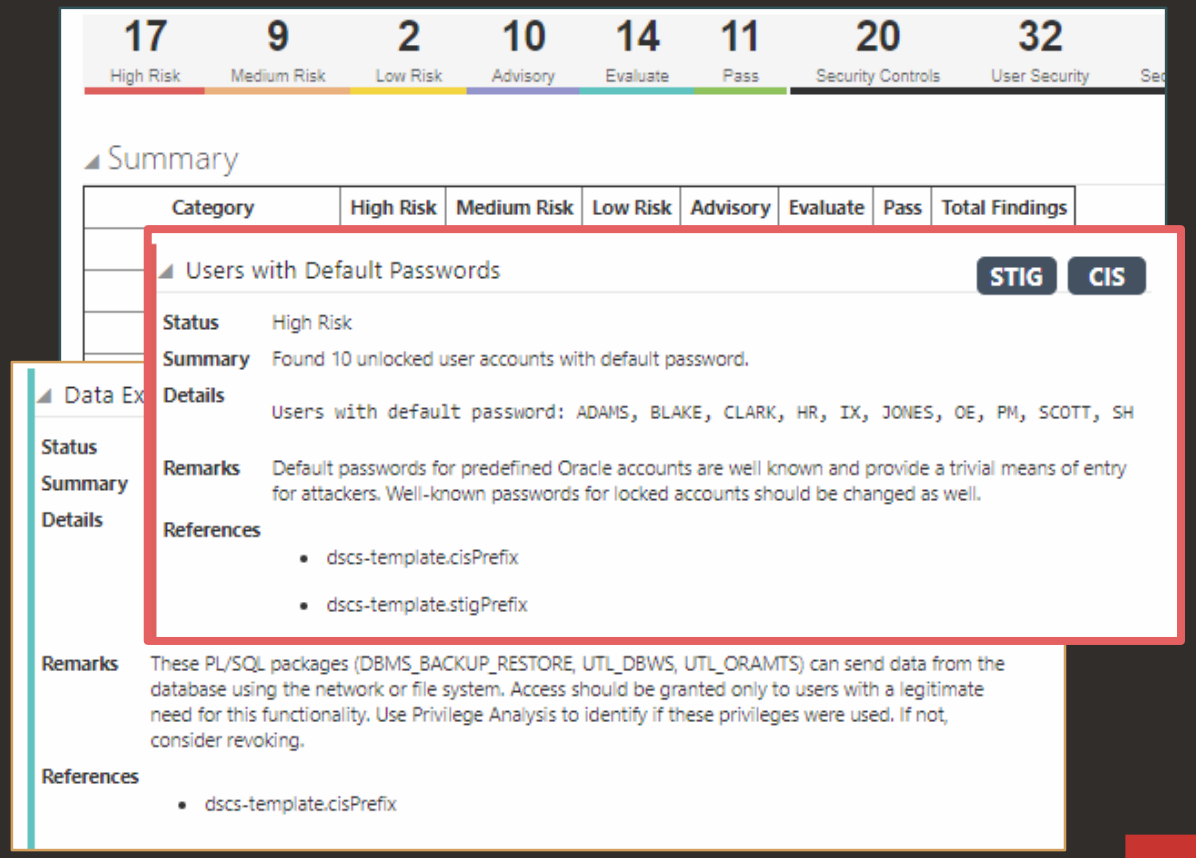
Comprehensive assessment

- Security parameters
- Security controls in use

Identify drift from best practices

Actionable reports

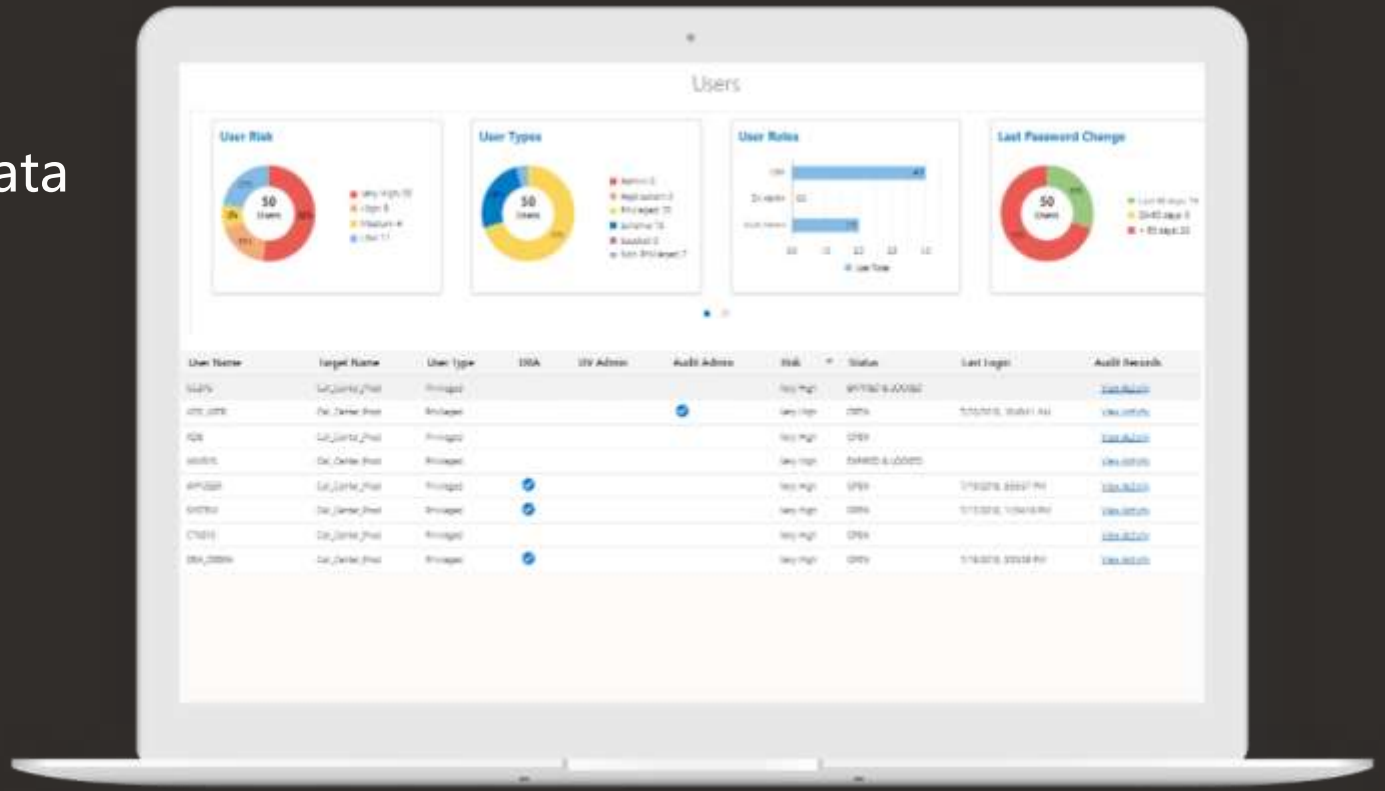
- Prioritized recommendations
- Compliance mappings (EU-GDPR, CIS)



User assessment

Reduce user risk by managing privileges and identifying risky behavior

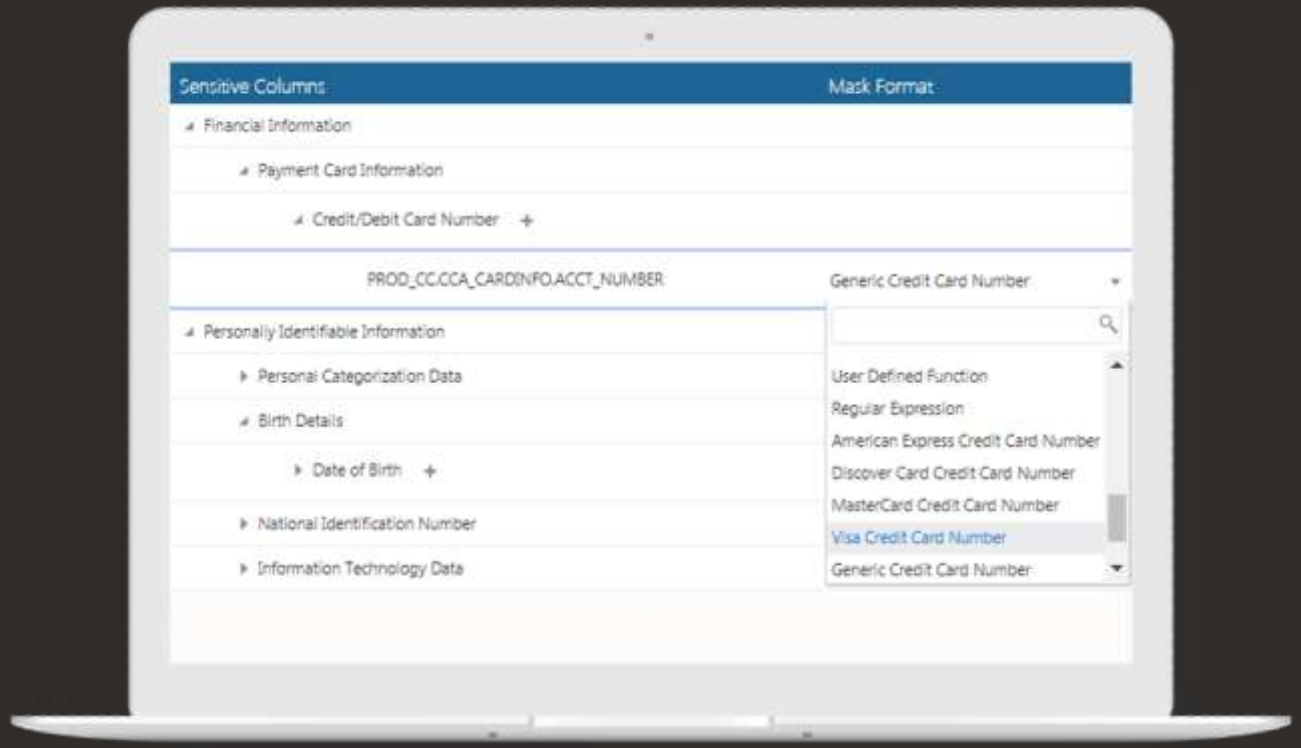
- Identify over-privileged risky users
- Static profile: type of user, password policies
- Dynamic profile: last login, audit data



Data masking

Minimize risk by replacing sensitive data with realistic yet obscured data for use in development, test, and partner environments

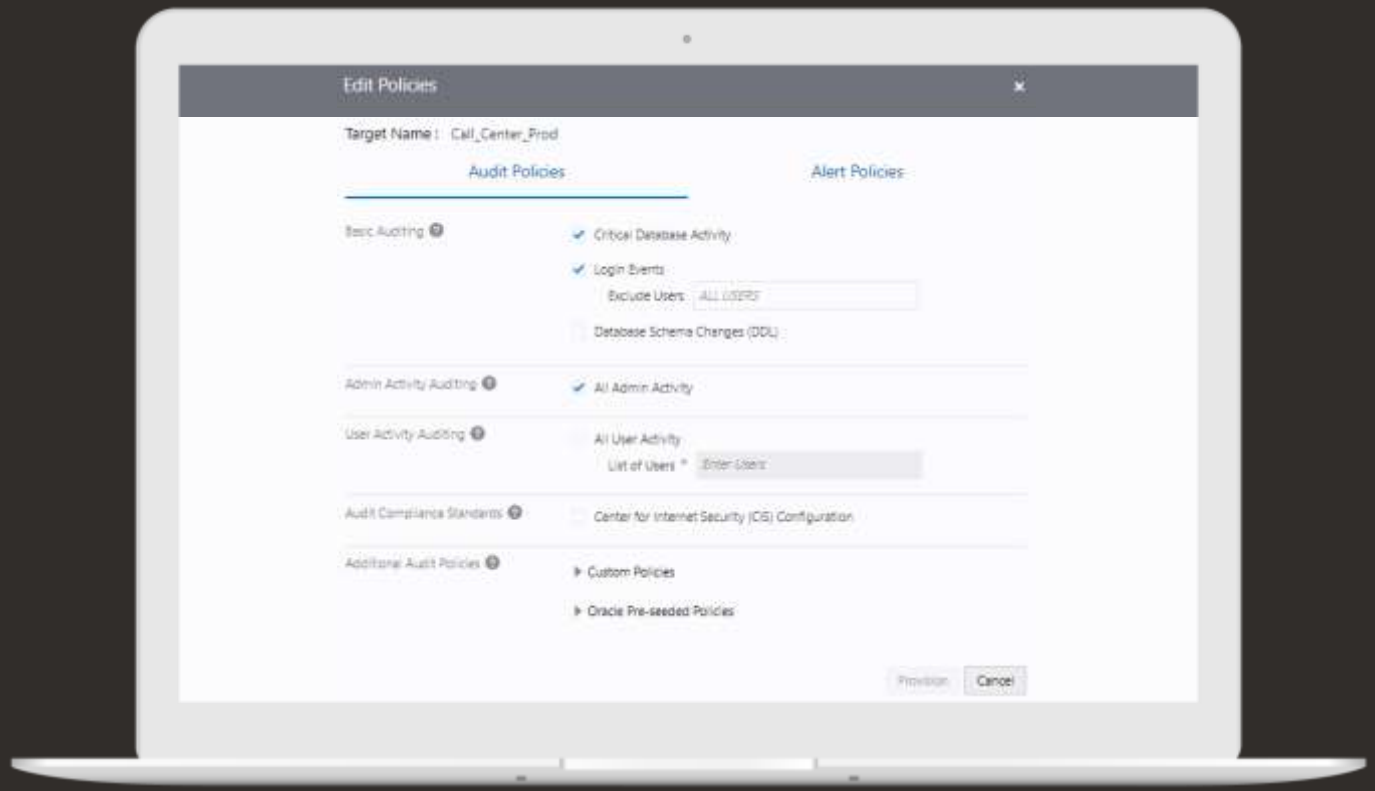
- Mask data identified as sensitive
- 55+ pre-defined masking formats
- Masking transformations
- Masking reports



Activity auditing

Track user actions and streamline auditing with policy-based reporting

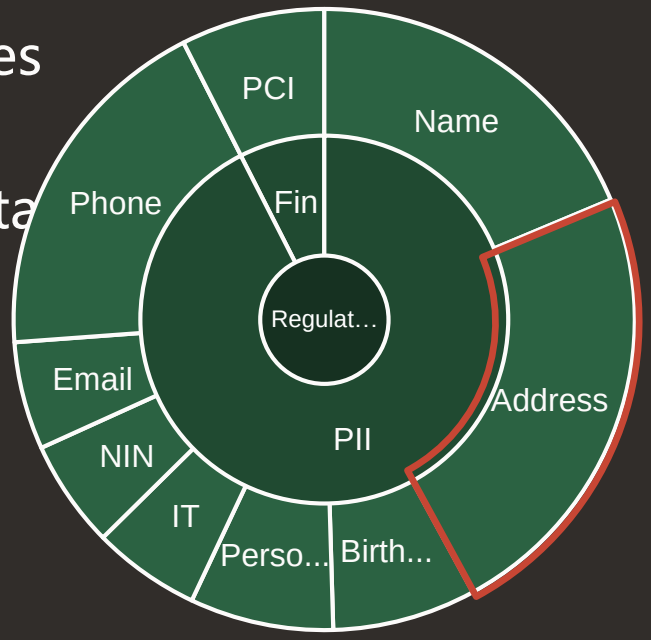
- Collect audit data from databases and track sensitive operations
- Provision audit, compliance, and alert policies
- Generate audit reports
  - Interactive and customizable reports
  - Summary and detailed reports



Data discovery

Prioritize security efforts by revealing the location, type, and amount of sensitive da

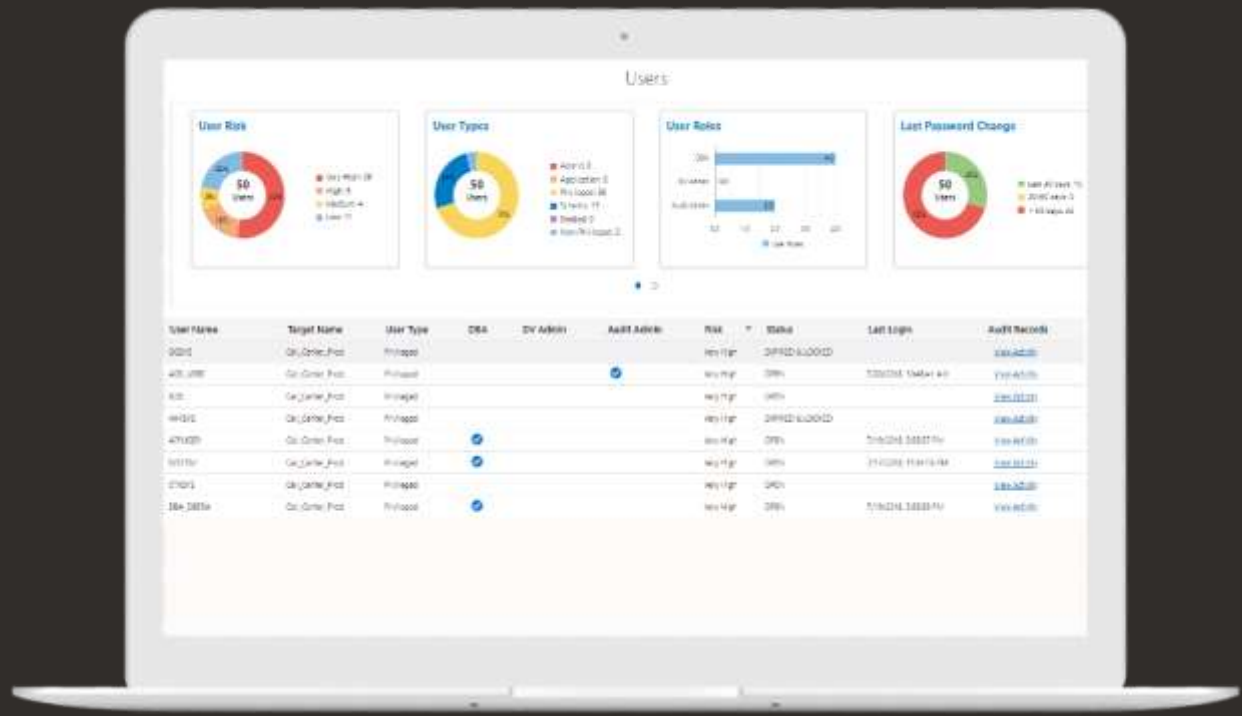
- Discovers and classifies 150+ sensitive data types
  - Name, address, SSN, salary, medical health, payment card information and many more
- Supports user-defined sensitive data types
- Supports incremental discovery
- Reports amount and type of sensitive data



16.6K Sensitive Values	12 Sensitive Types
4 Sensitive Tables	17 Sensitive Columns

Summary: Oracle Data Safe

- Unified security control center for cloud and on-premises databases
  - Immediate visibility into risks from data, users, and configurations
  - Click-and-secure: no special expertise required
  - Complete set of proven database security capabilities
- Cuts customer operational cost for securing their databases



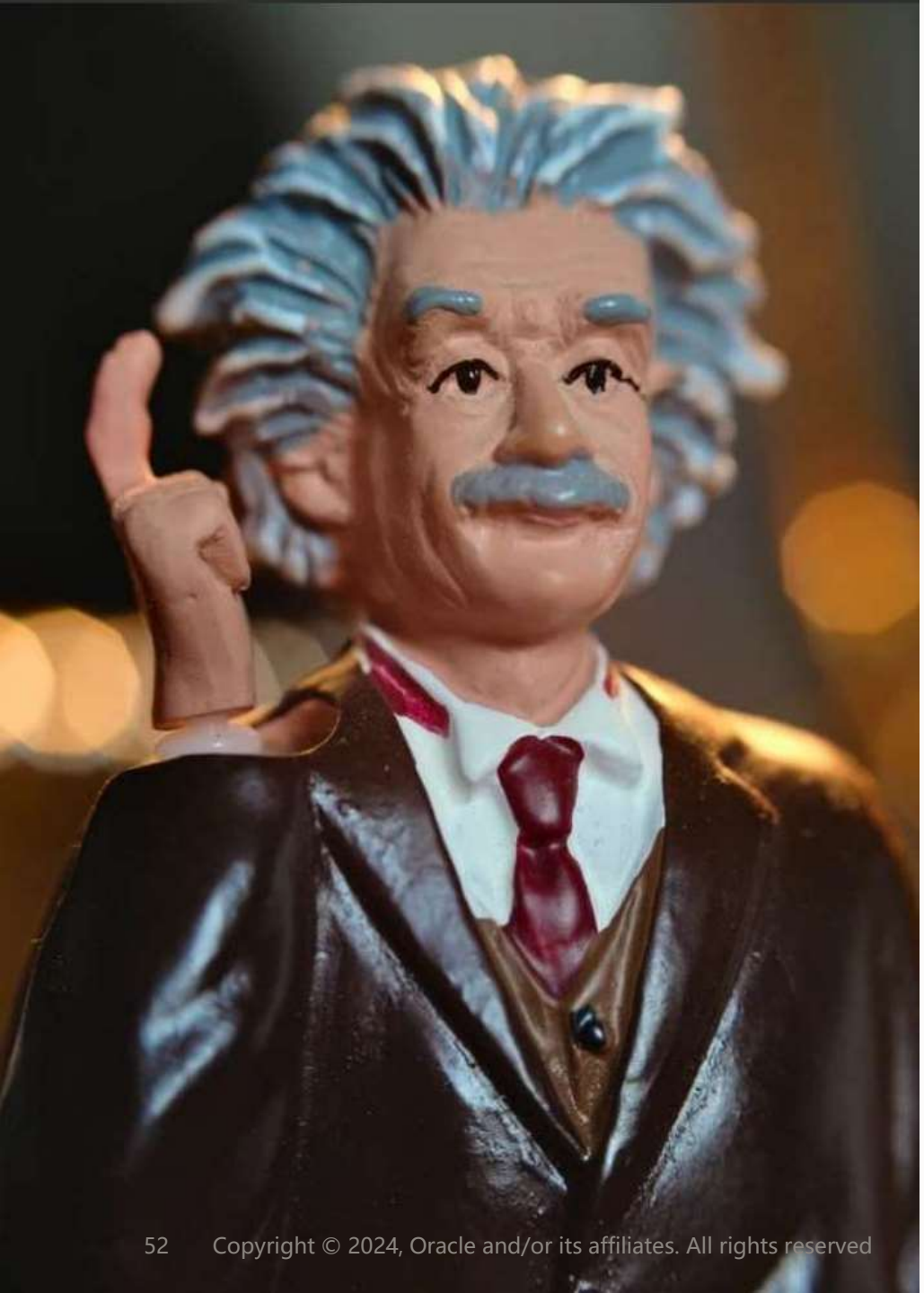
Raising the bar on security
for ***all*** Oracle Database customers

Learn More

[Read the ebook](#)

[Check out the infographic](#)

[Read the IDC report](#)



Demo 1 – Autonomous Database

- Autonomous Database Provisioning
- Autonomous Database Tour

Demo 2 – OCI Data Safe

- Data Safe Fast provisioning on ADB
- Enabling Data Safe on Autonomous
- Enabling audit trail
- Data Safe report

Resources

- **Autonomous Database Get Started**

https://www.oracle.com/autonomous-database/get-started

- **Autonomous Data Warehouse**

https://www.oracle.com/autonomous-database/autonomous-data-warehouse/

- **Autonomous Transaction Processing**

https://www.oracle.com/autonomous-database/autonomous-transaction-processing/

- **Autonomous JSON Database**

https://www.oracle.com/autonomous-database/autonomous-json-database

- **Autonomous Database Free services**

https://www.oracle.com/autonomous-database/free-trial/

- **Architecture Center Autonomous Database**

https://docs.oracle.com/en/cloud/paas/autonomous-database/index.html

- **Machine Learning on Oracle Databases**

https://www.oracle.com/br/artificial-intelligence/database-machine-learning/

- **Oracle Autonomous Database**

https://www.oracle.com/autonomous-database/

- **Autonomous Database on Exadata Cloud@Customer**

https://www.oracle.com/autonomous-database/

- **Oracle Database 23c**

https://www.oracle.com/autonomous-database/

- **Oracle Virtual-machine Database Documentation**

https://docs.oracle.com/en-us/iaas/base-database/doc/oracle-base-database-service.html#Bare

- **Oracle Cloud Free Tier**

https://www.oracle.com/cloud/free/

- **Oracle Database Service FAQ**

https://www.oracle.com/database/base-database-service/faq

- **Oracle Database DBCS dbcli command reference**

https://docs.cloud.oracle.com/iaas/Content/Database/References/dbacli.htm

- **Oracle Database Security**

https://download.oracle.com/database/oracle-database-security-primer.pdf

- **Oracle Database Cloud Service on X5 Bare Metal End-of-Support-Life (Doc ID 2761879.1)**

https://support.oracle.com/epmos/faces/DocumentDisplay?id=2761879.1

- **Oracle Database Security Site**

https://www.oracle.com/security/database-security/

- **Oracle Database Real Application Cluster (RAC)**

https://www.oracle.com/database/real-application-clusters/

- **Oracle Architecture Center Site**

https://docs.oracle.com/solutions/

- **Oracle OCI Free Tier**

https://www.oracle.com/cloud/free/

Thank you

Marcel Lamarca
marcel.lamarca@oracle.com


ORACLE