

ORACLE

OCI Foundations Day 2

Pass OCI Foundations Certification Exam

Sub-heading

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April, 2024



Safe harbor statement

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OCI Multicloud Architect Associate

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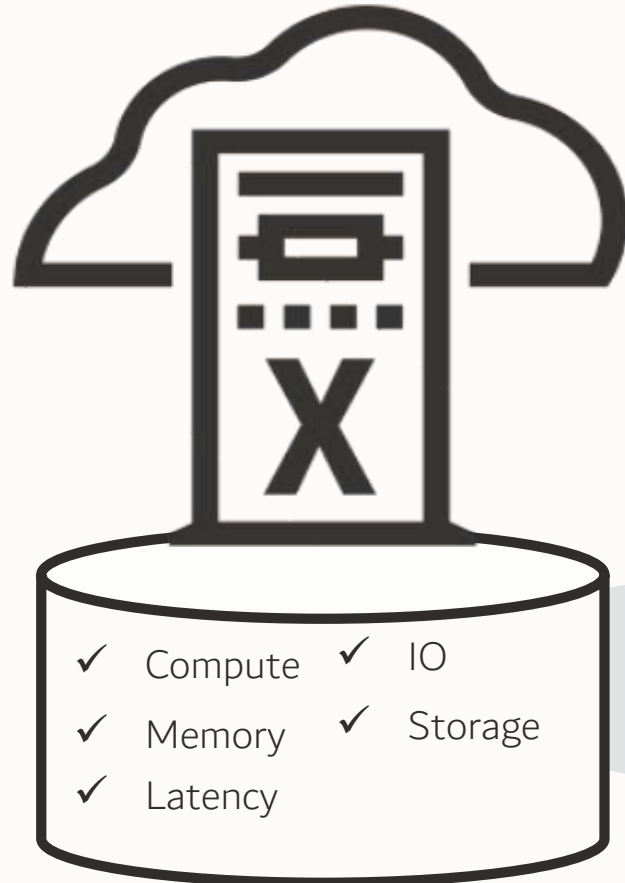
Agenda

- Free Training OU / OCI Foundations 2023
- Getting Started With OCI
- OCI Core Services: Compute Services
- OCI Core Services: Networking Services
- **OCI Core Services: Database Services**
- OCI Core Services: Storage Services
- Security and Compliance
- Governance and Administration

OCI Oracle Database



Exadata Cloud Service



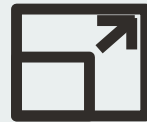
Workload Intensity

- ✓ Compute
- ✓ Memory
- ✓ Latency
- ✓ IO
- ✓ Storage

- Full Oracle Database with all advanced options
- On fastest and most available database cloud platform
 - Scale-Out Compute, Scale-Out Storage, Infiniband, PCIe flash
 - Complete Isolation of tenants with no overprovisioning
- All Benefits of Public Cloud
 - Fast, Elastic, Web Driven Provisioning
 - Oracle Experts Deploy and Manage Infrastructure



As low as 19μs. latency



Scale up to:

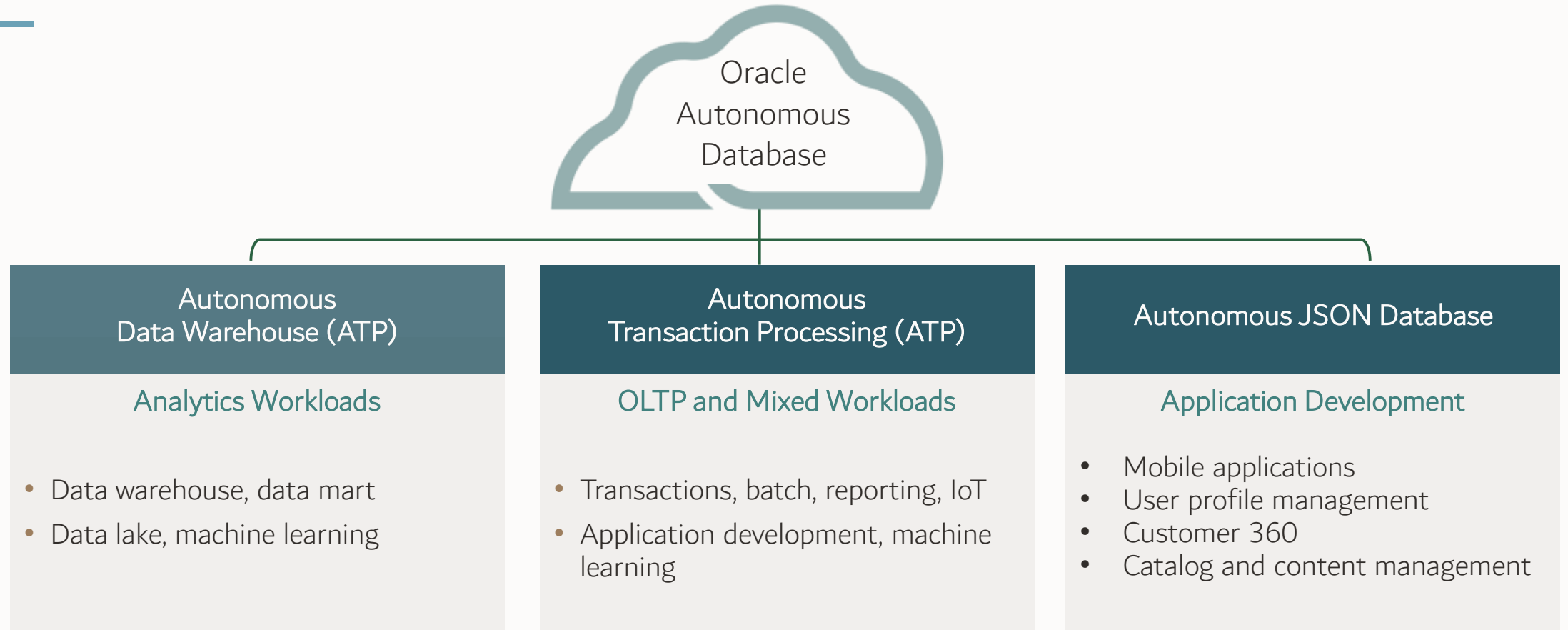
- 48 TB memory, 8,064 vCPUs
- 96 TB PMem, 1,638 TB NVMe flash
- 4 PB usable storage



Databases up to 31 PB in size*

* Assumes 10:1 HCC compression

Oracle Autonomous Database



Choose the one that best meets your workload needs

Consistent High Performance and Scaling

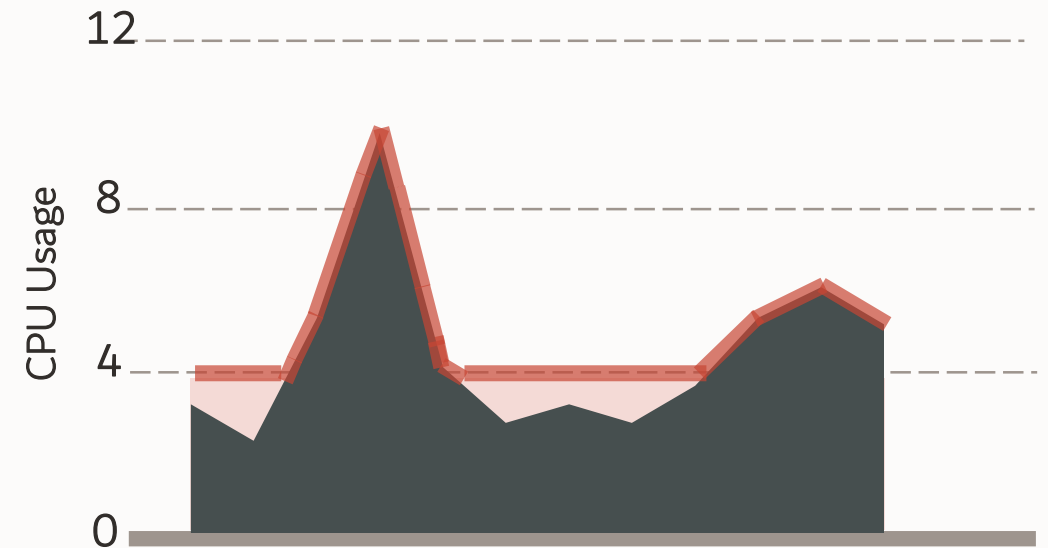


Size to number of OCPUs and TBs required

- Not constrained by fixed shape 't-shirt' sizes
- Simple incremental growth
- Lower operating costs

Auto-scaling for changing workloads

- Dynamically adjusts CPU and IO resources based on workload requirements
- Zero delay while scaling up or down
- No 'cache warm-up' after scaling

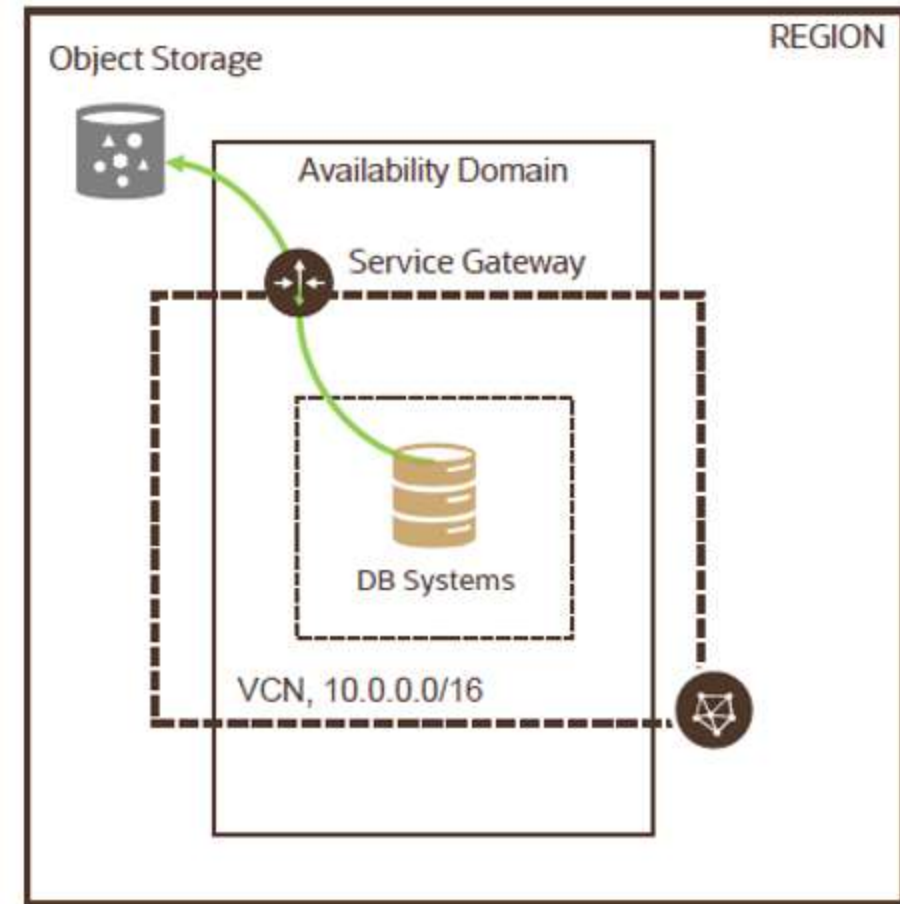


Dynamic auto-scale

Automatically scale with zero downtime

DB System Backup / Restore

- Manual or Automatic Backups
- Automatic Backups Written in Object Storage
- Preset Retention Period:
7, 15, 30, 45 and 60 days
- Recover Database from a Backup in Object Storage
 - Last to know good state
 - Using specific timestamp value
 - Using the SCN specified



DB Systems DR

Oracle Data Guard provides a set of services that create, maintain, manage and monitor one or more standby data bases, to enable Oracle databases to survive disasters and data corruption.

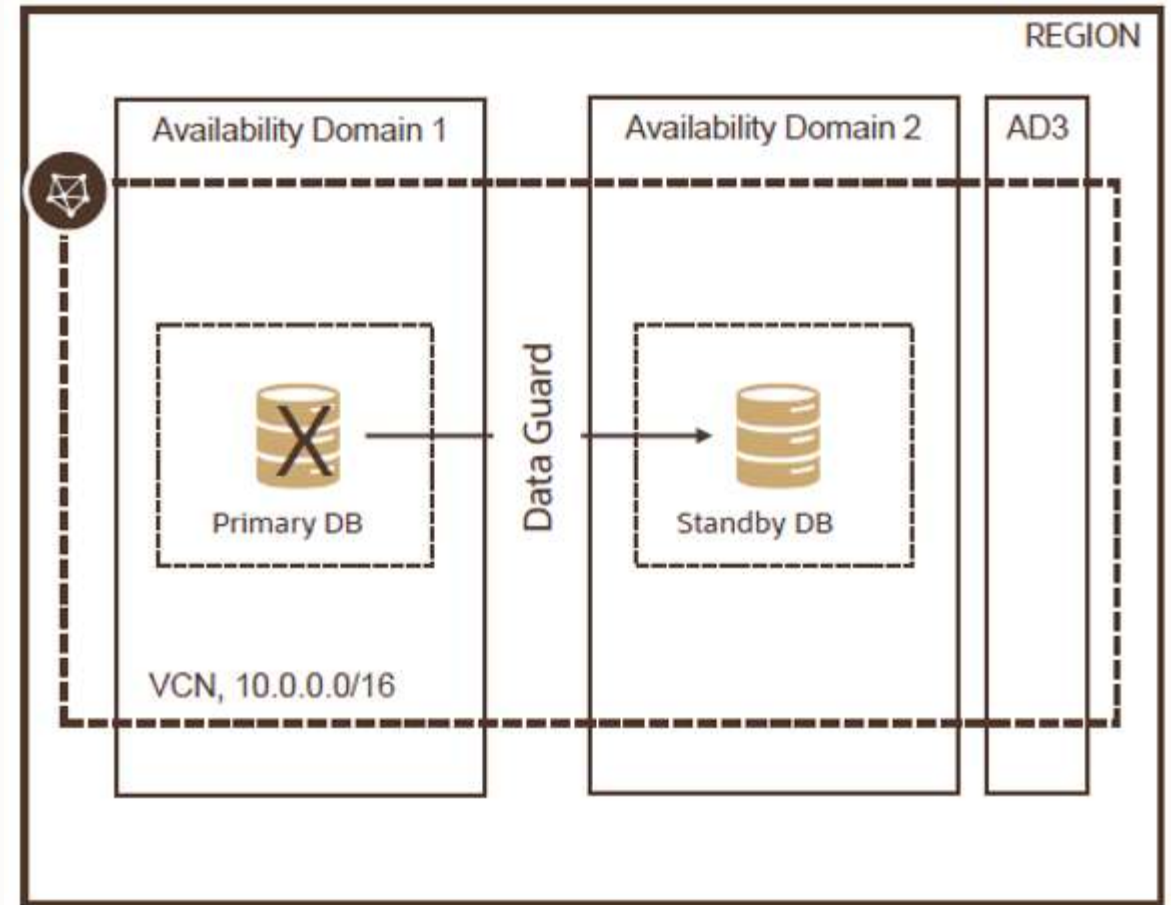
It maintains synchronization between the primary and the standby databases.

Active Data Guard extends the Data Guard by providing advanced features for data protection and availability. It's included in the Extreme Performance Edition and Exadata Service.

Two modes:

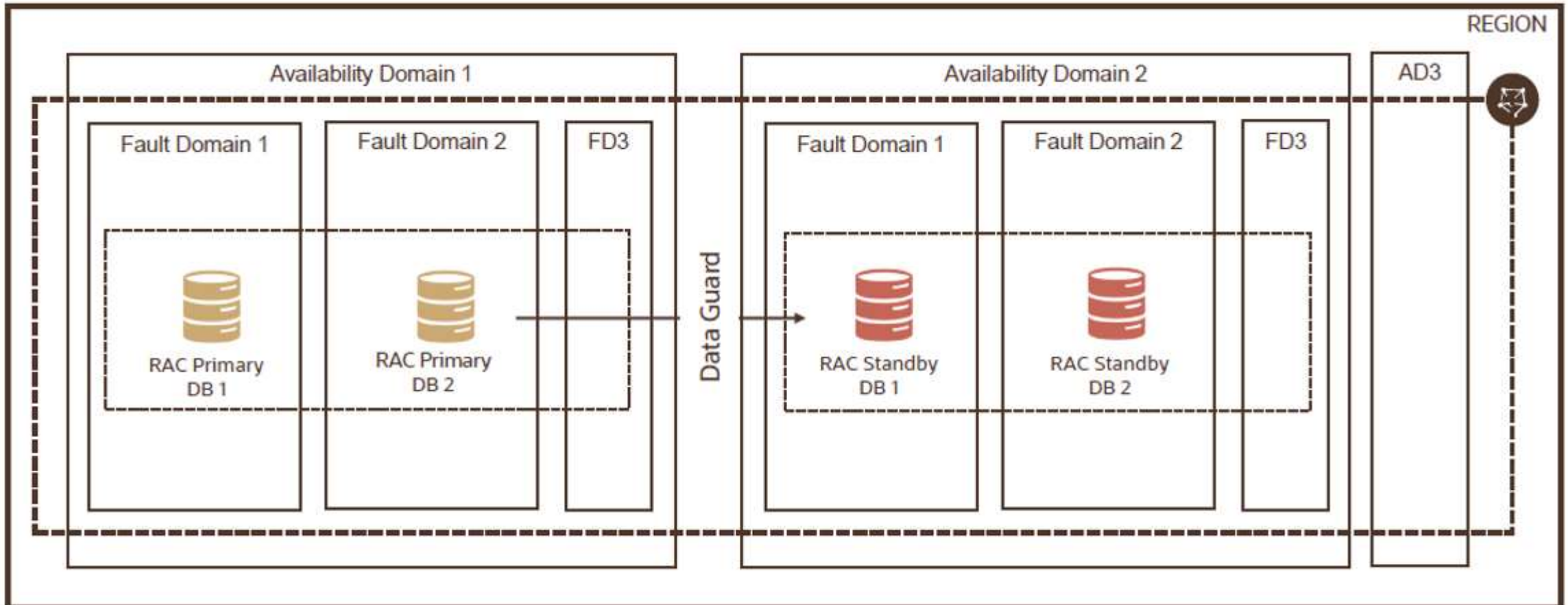
Switch Over, planned migration no data loss

Fail Over, unplanned migration minimal data loss



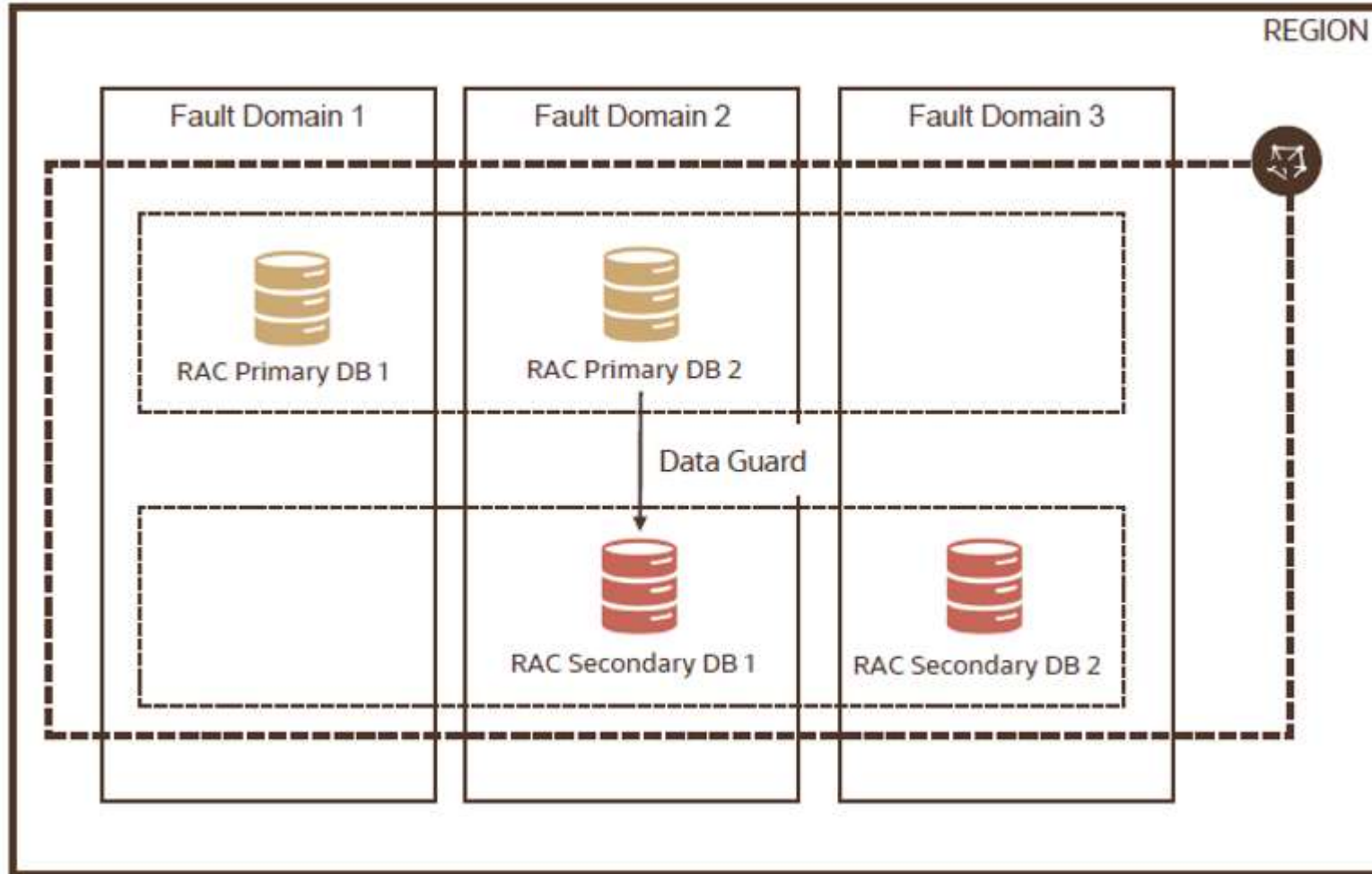
DB System HA and DR (multi AD region)

Primary and Standby Databases can be either single instance or RAC



DB System HA and DR (single AD region)

Primary and Standby Databases can be either single instance or RAC

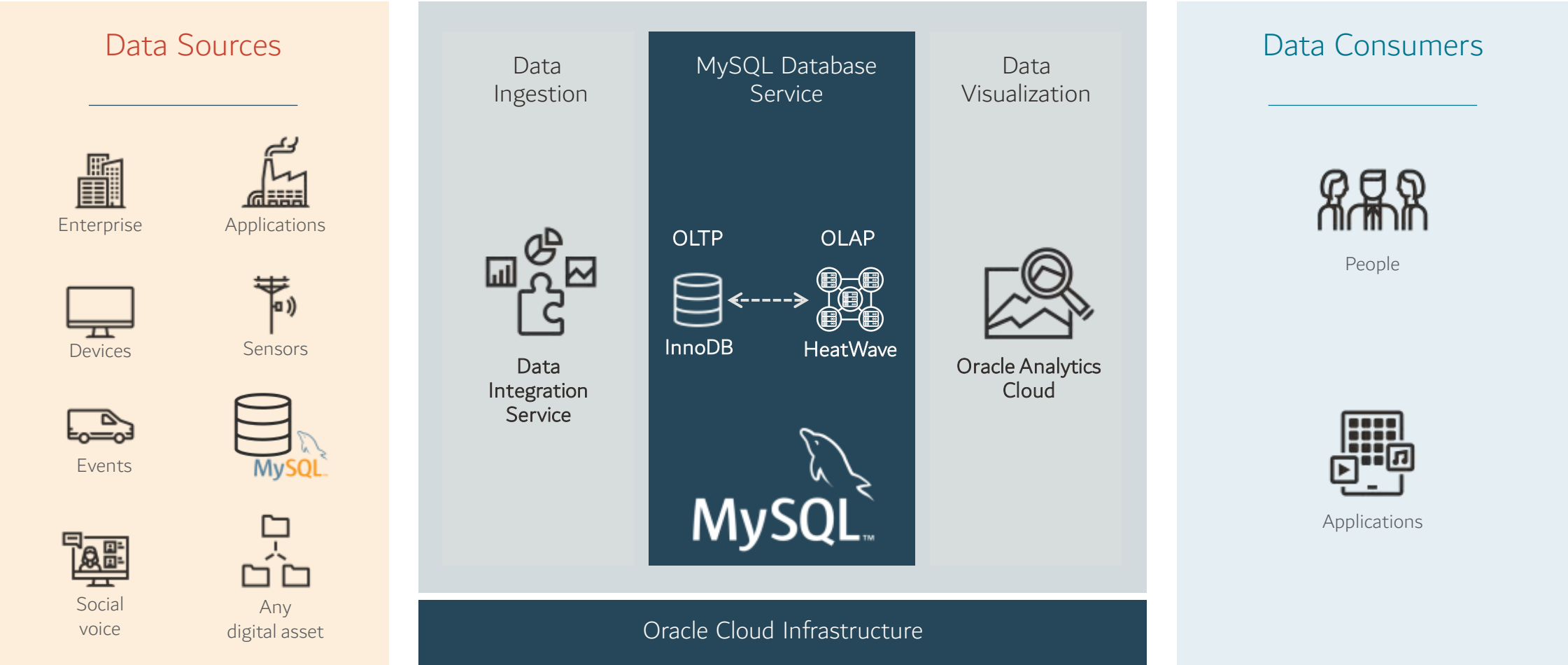


MySQL Database Service

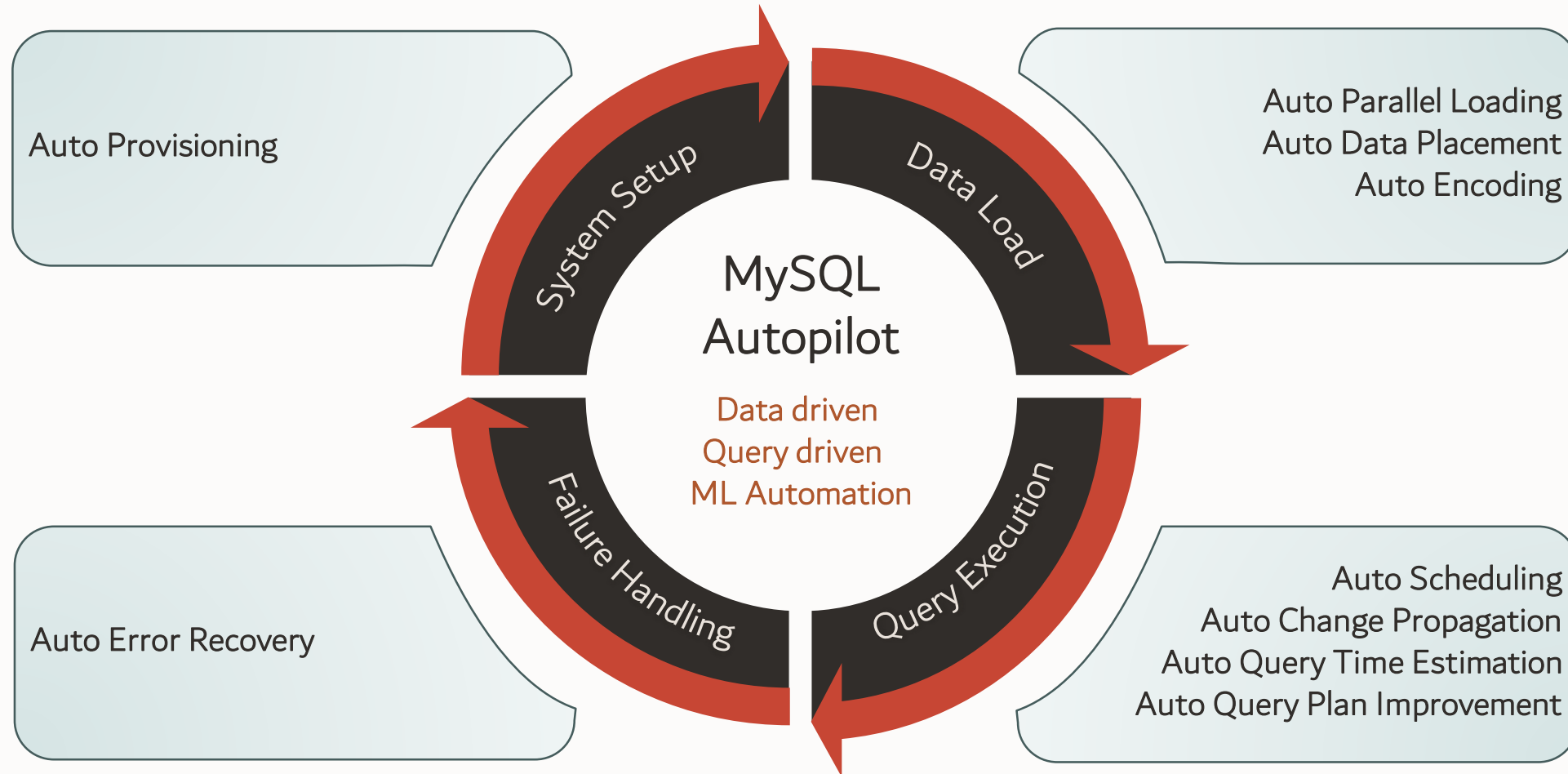
- Fully managed MySQL Enterprise database running on OCI
- MySQL automatizes a series of manual operations, such as scaling, applying patches and upgrades, OS management, etc...
- Cheaper than running MySQL on VMs in other clouds.
- Includes Security features like Masking, TDE, Audit and Backup.
- User may deploy Heatwave to leverage faster analytics via this OLAP Engine
- Possible to deploy HA architecture, replicated in 3 different sites.



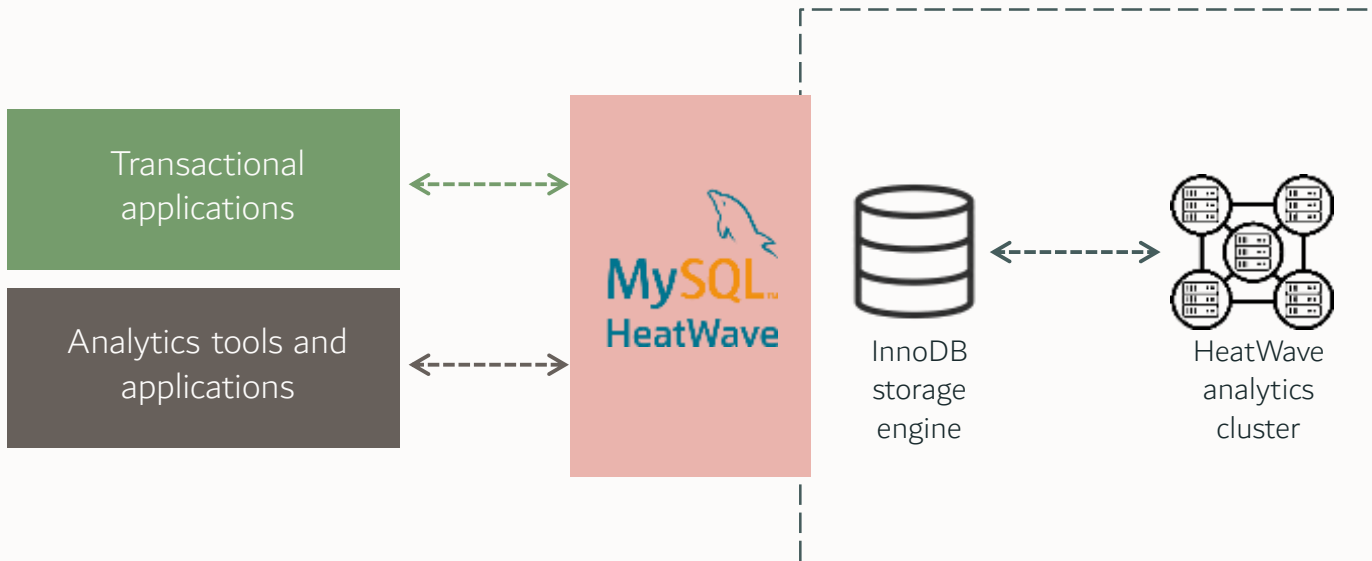
MySQL Database Services is integrated with other Oracle Services



Machine learning-powered automation for MySQL HeatWave



One Database is Better than Two



One service for OTLP & OLAP

No ETL duplication

Unmatched performance, at a fraction of the cost

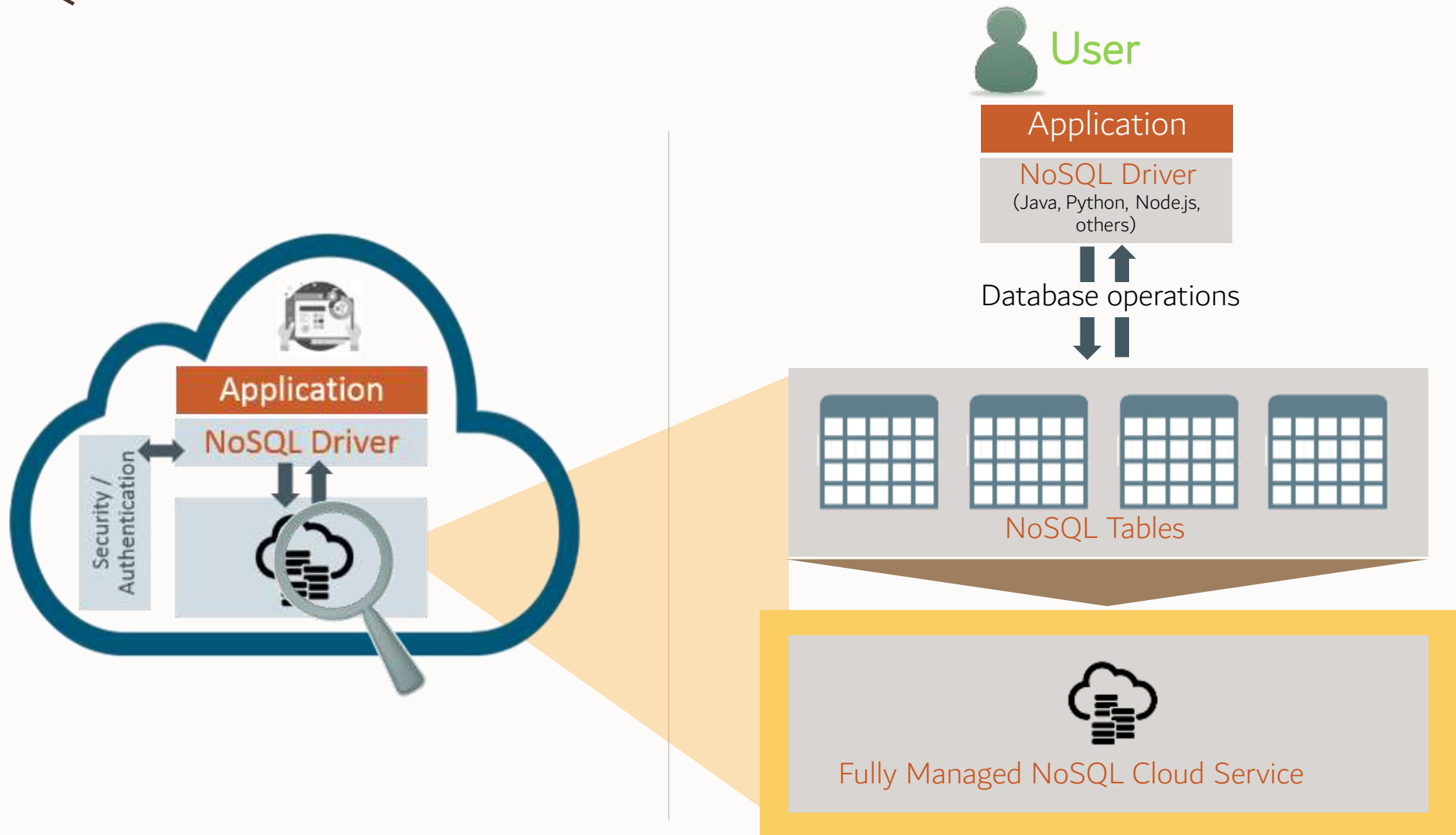
Real-time analytics

Improved security

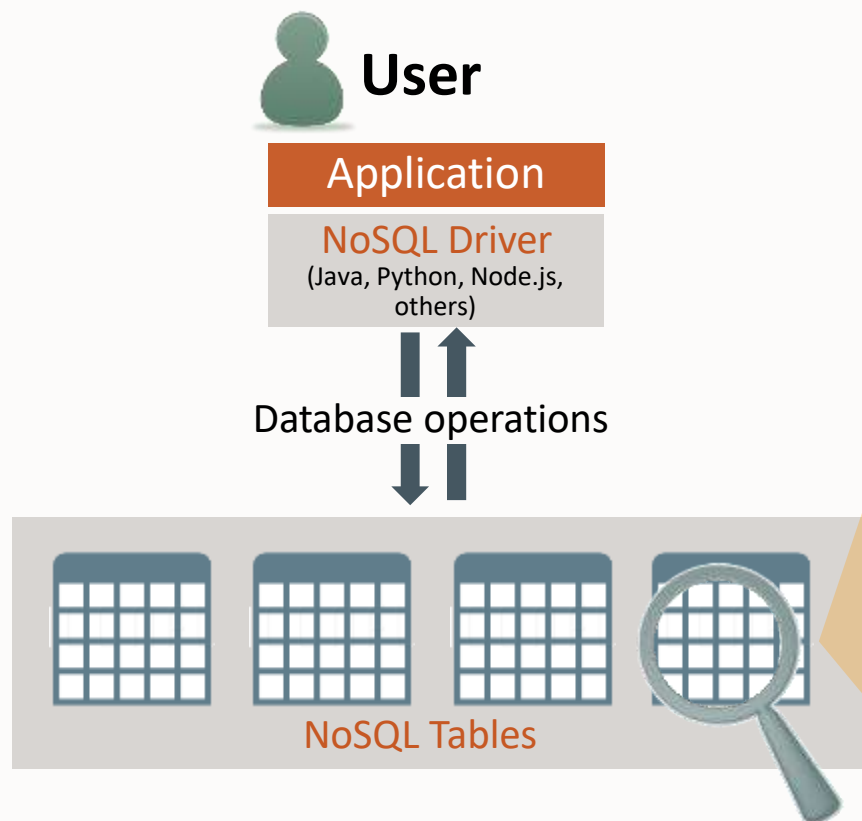
Applications work without changes

1>2 with MySQL HeatWave

NoSQL Service



NoSQL Table

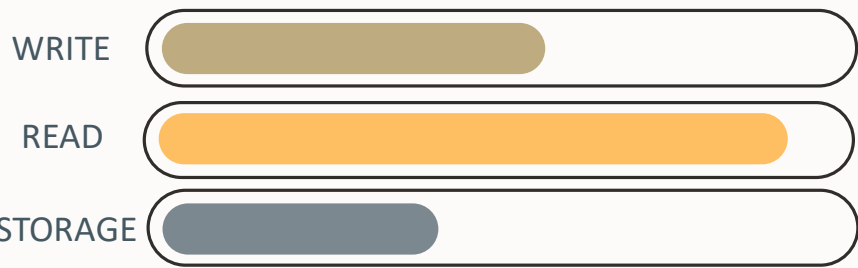


NoSQL Table

DATA

Integer (key)	String (data)	String (data)	Json (data)
num1	string1	string1	json1
num2	string2	string2	json2
num3	string3	string3	json3
num4	string4	string4	json4

CAPACITY PROVISIONED



Oracle NoSQL Database Cloud Service



Fully Managed

Database operation, maintenance, tuning are managed by Oracle



Elastic

Dynamically change throughput and storage capacities based on workloads



High Performance

Predictable low latency for all types of workloads



Data Model Flexibility

Document, columnar, key/value models supported with a single application interface



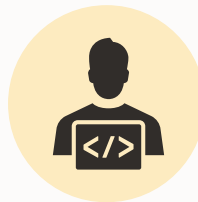
Security

Enterprise grade security with roles, privileges, encryption



Low Operating Cost

Pay only for the throughput and storage capacities provisioned



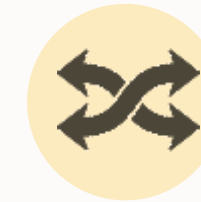
Developer Friendly

Easy-to-use APIs and integrated with different developer tools



Always Available

Built-in high availability to ensure business continuity



Hybrid Cloud

Interoperate with Oracle NoSQL on-premise solution using a single application interface

Summary

Oracle Database Cloud Services

DBCS, Autonomous DB, Exadata CS

MySQL Database Service and HeatWave

NoSQL Cloud Service

OCI Storage Options



Storage Requirements

Persistent v/s non-persistent?

What type of data?

Database, videos, audio, photos, text

Performance?

Max capacity, IOPS, throughput

Durability?

of copies of data

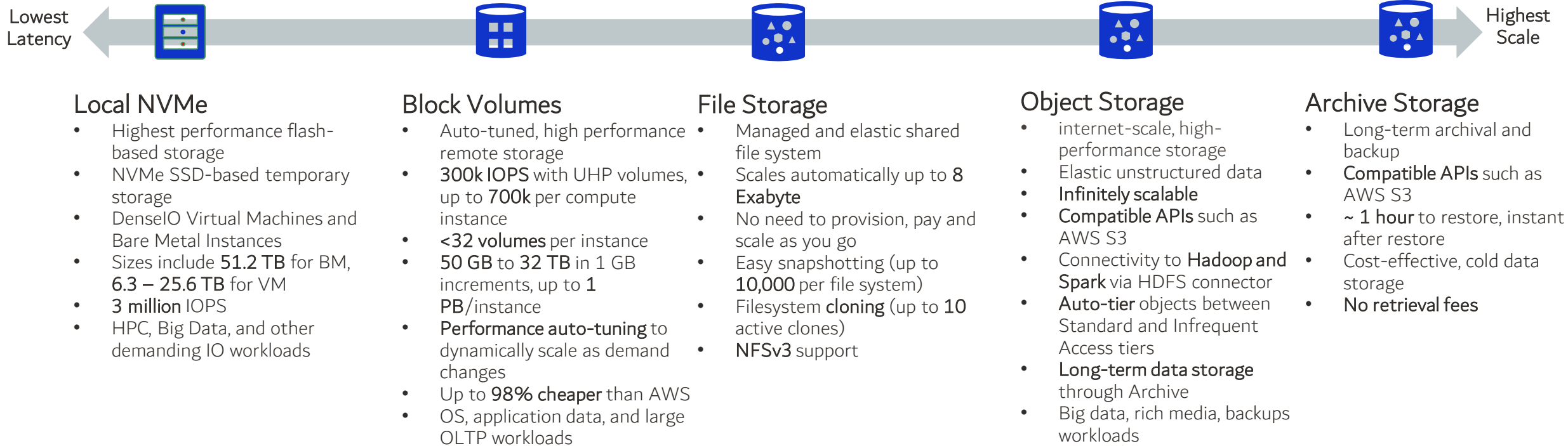
Connectivity?

Local v/s network, how does app access the data

Protocol

Block v/s File v/s HTTPs

OCI Storage Services



Summary

Block Volume

Local NVMe

File Storage

Object Storage

Archive Storage

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- **Governance and Administration**

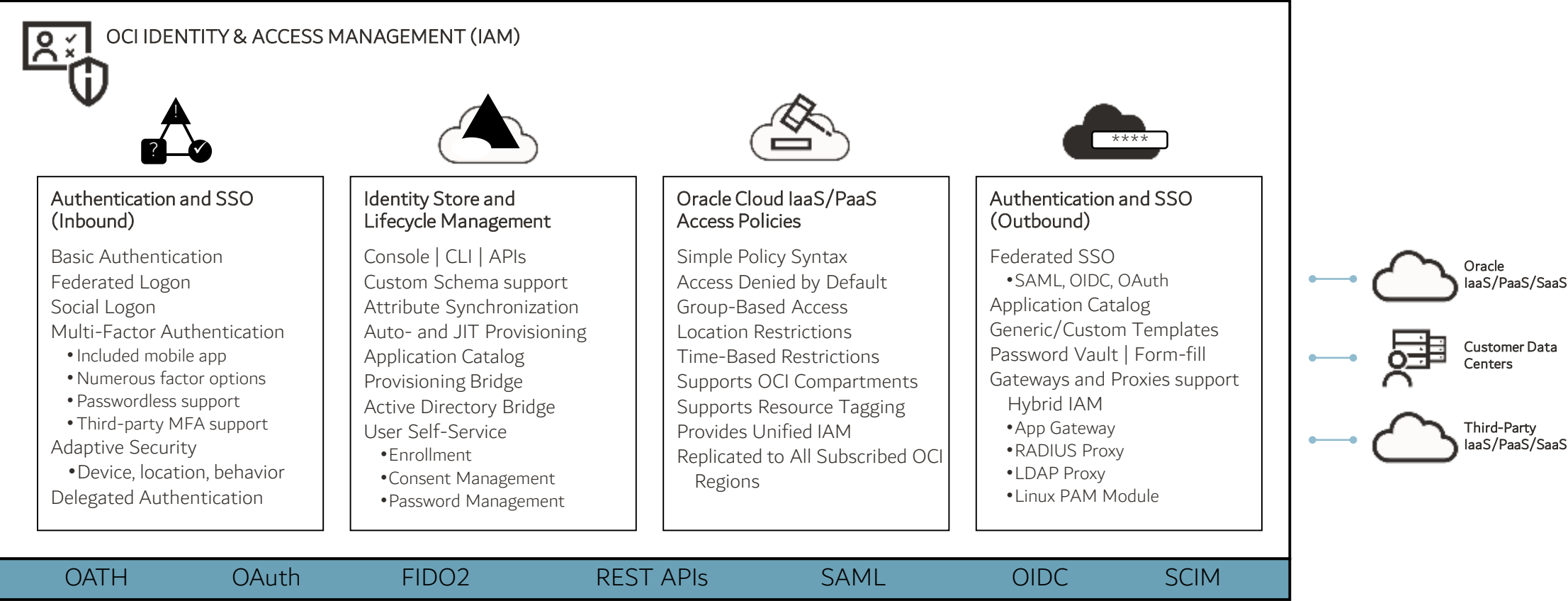
OCI Identity & Access Management (OCI IAM): Key Functional Pillars

**Enterprise Identity
& Access Management**
for complex, hybrid IT
environments

Access Control Plane
for Oracle Cloud
and SaaS applications

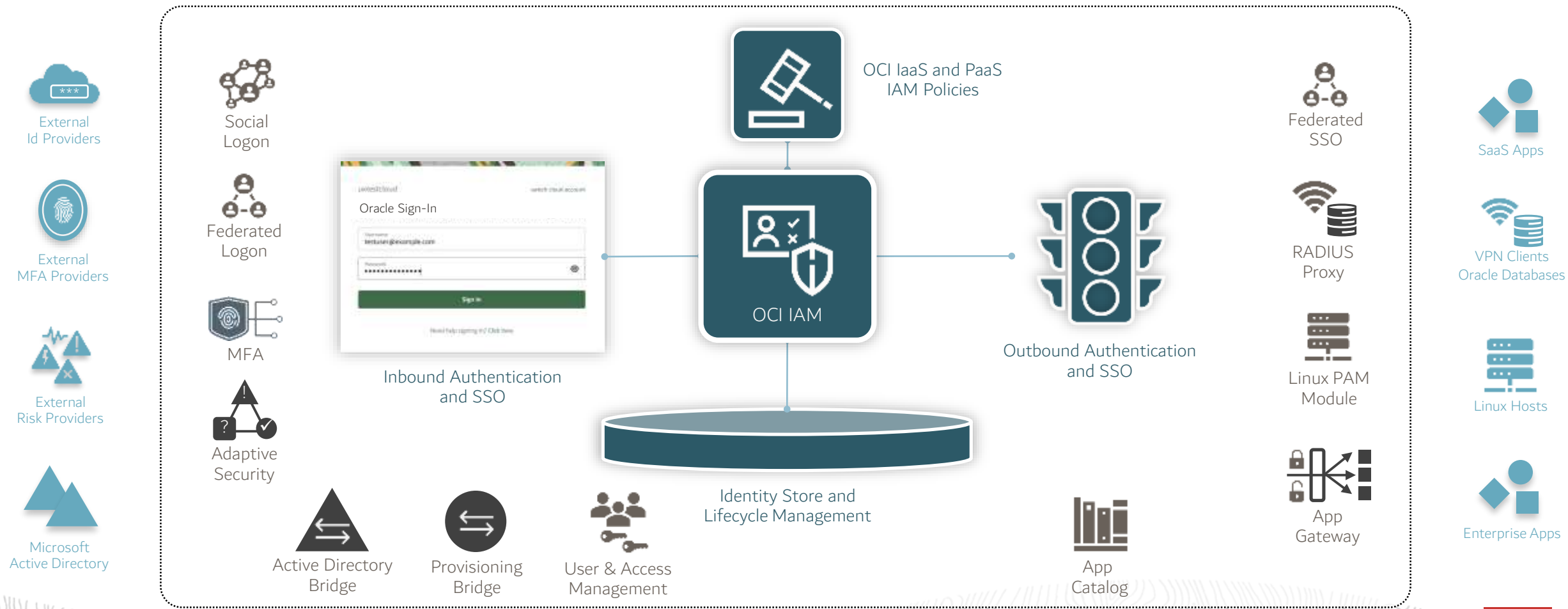
**Developer-friendly
IAM engine**
for custom and
consumer applications

OCI Identity & Access Management (OCI IAM): Core Functionality



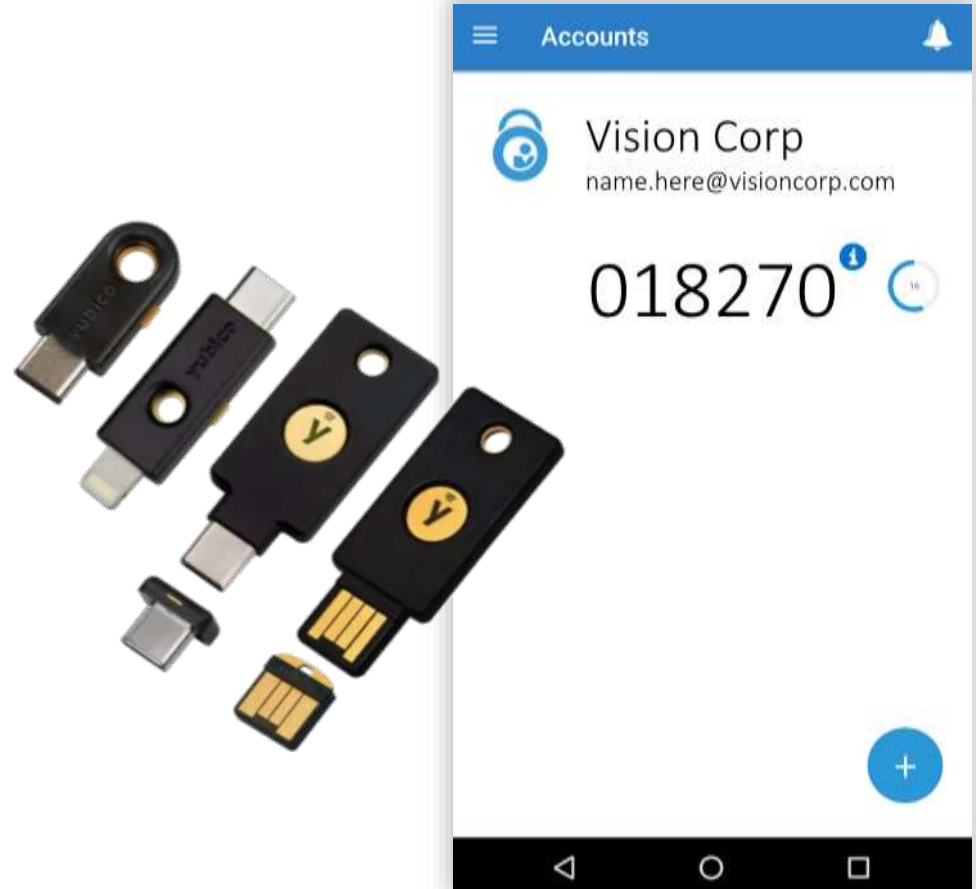
OCI Identity & Access Management (OCI IAM)

Enterprise Identity & Access Management



Inbound Authentication and SSO: Multi-Factor Authentication (MFA)

- FIDO2 Authenticators
- Voice Phone Call
- Mobile App Passcode or Notification
- SMS Text
- Security Questions
- Email
- Bypass Code
- Third-Party Authenticators
Duo, Yubico, TOTP, etc.
- Trusted Devices



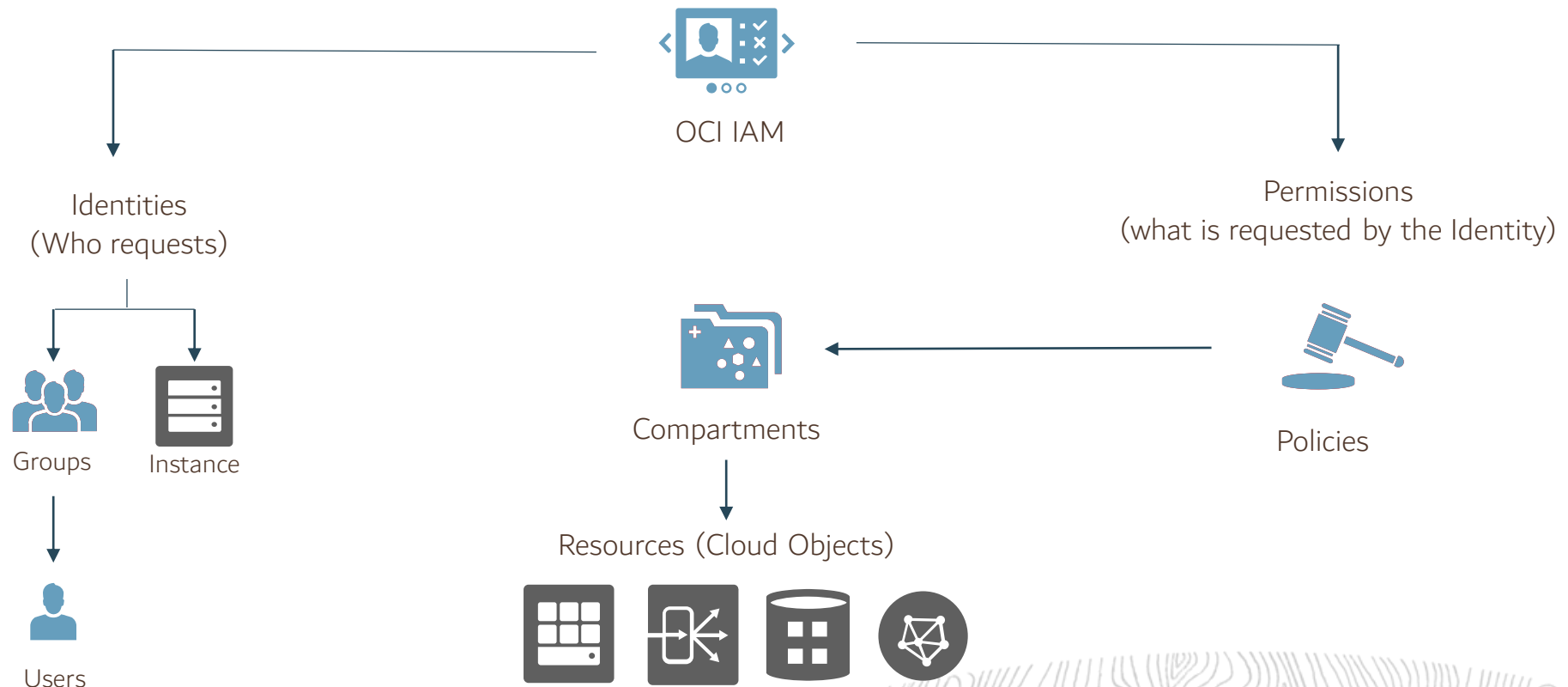
Inbound Authentication and SSO: Passwordless Authentication

1. User creates profile at first logon
2. User enrolls device and MFA app
3. When user attempts to authenticate, they can logon via a push notification in the MFA app – no password required!



IAM Overview

IAM uses traditional identity concepts such as Principals, Users, Groups, Dynamic Groups, AuthN, AuthZ and introduces a new capability called Compartment



Resource, Just one Cloud Object

— [Documentation Link](#)

Resource is a cloud object that you create and use in OCI
(e.g. compute instances, block storage volumes, Virtual Cloud Networks)

Each OCI resource has a unique, Oracle-assigned identifier called an Oracle Cloud ID (OCID)



Oracle Cloud ID (OCID)

ocid1.<RESOURCE TYPE>.<REALM>.[<REGION>].<FUTURE USE>.<UNIQUE ID>

Ex: Tenancy OCID: ocid1.tenancy.oc1..aaaaaaaaba3pv6wkcr4jqae5f44n2b2m2yt2j6rx32uzr4h25vqstifsfsdq

Compartment

Each resource belongs to a single compartment

Resources can interact with other resources in different compartments

Resources and compartments can be added and deleted anytime

Resources can be moved from one compartment to another

Resources from multiple regions can be in the same compartment

Compartments can be nested (six levels deep)

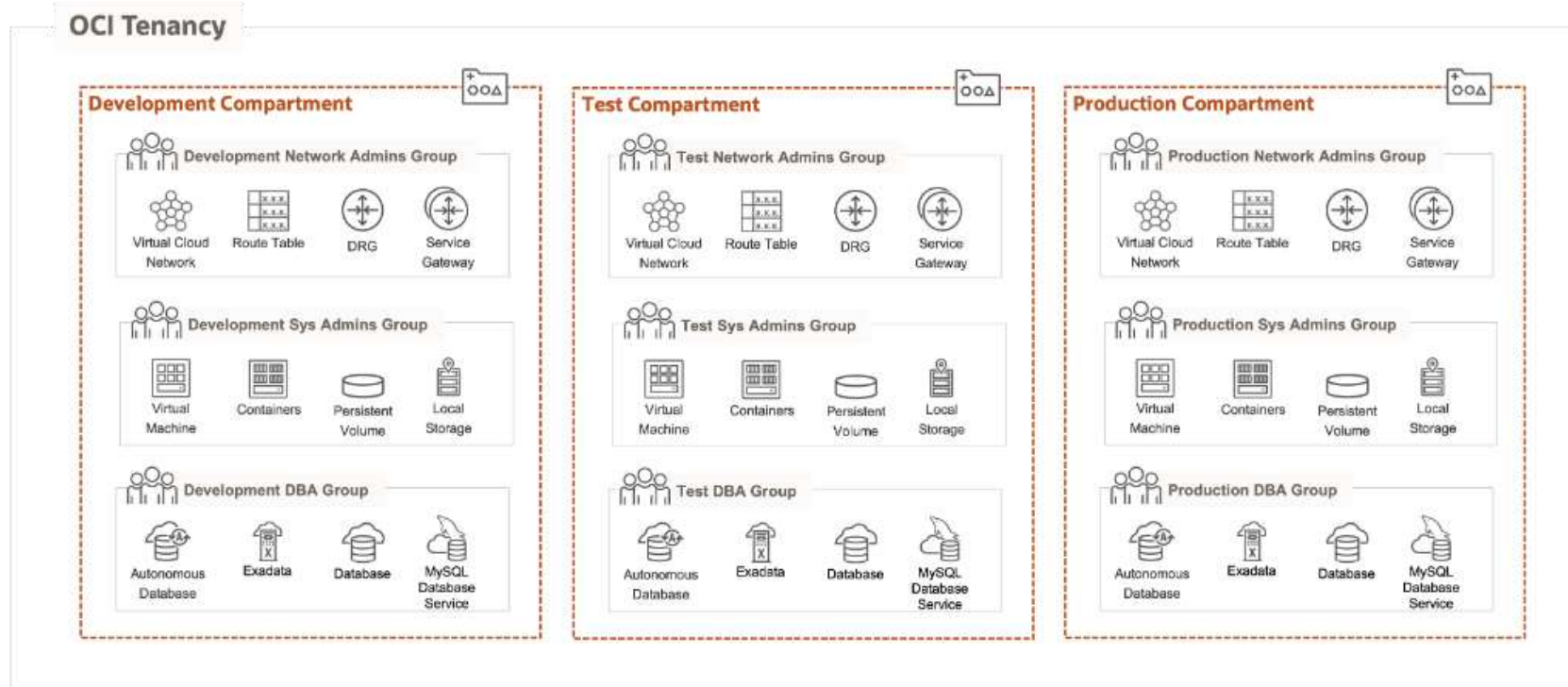
You can give group of users access to compartments by writing Policies

Analyze cost and assign budget for resources in compartments

Compartment Example

— [Reference DOC Link](#)

A compartment is a collection of related resources. It helps you isolate and control access to your resources



Root Compartment (OCI Tenancy) can hold all the cloud resources. Best practice is to create dedicated compartments when you need to isolate resources

Summary IAM Service

IAM Concepts

Authentication

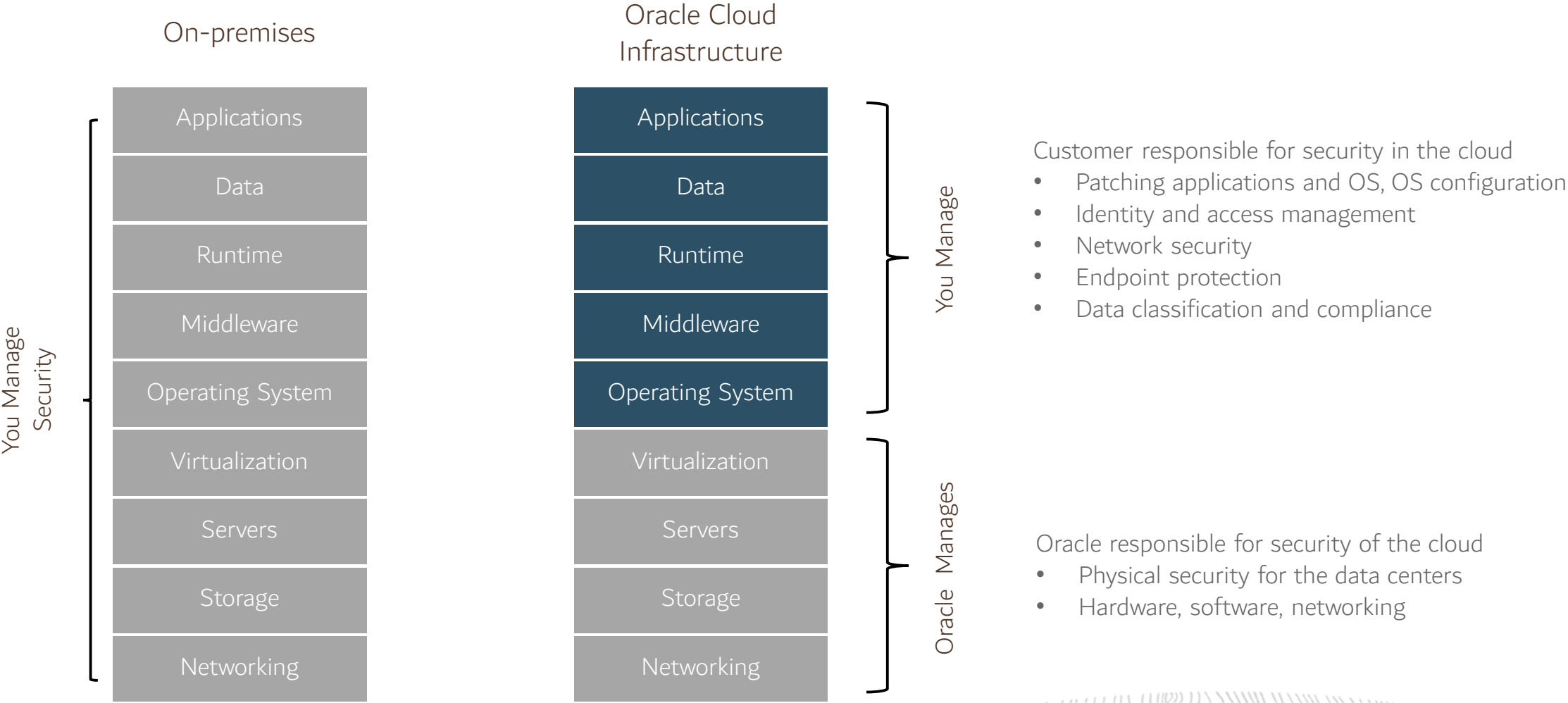
Authorization

Policies

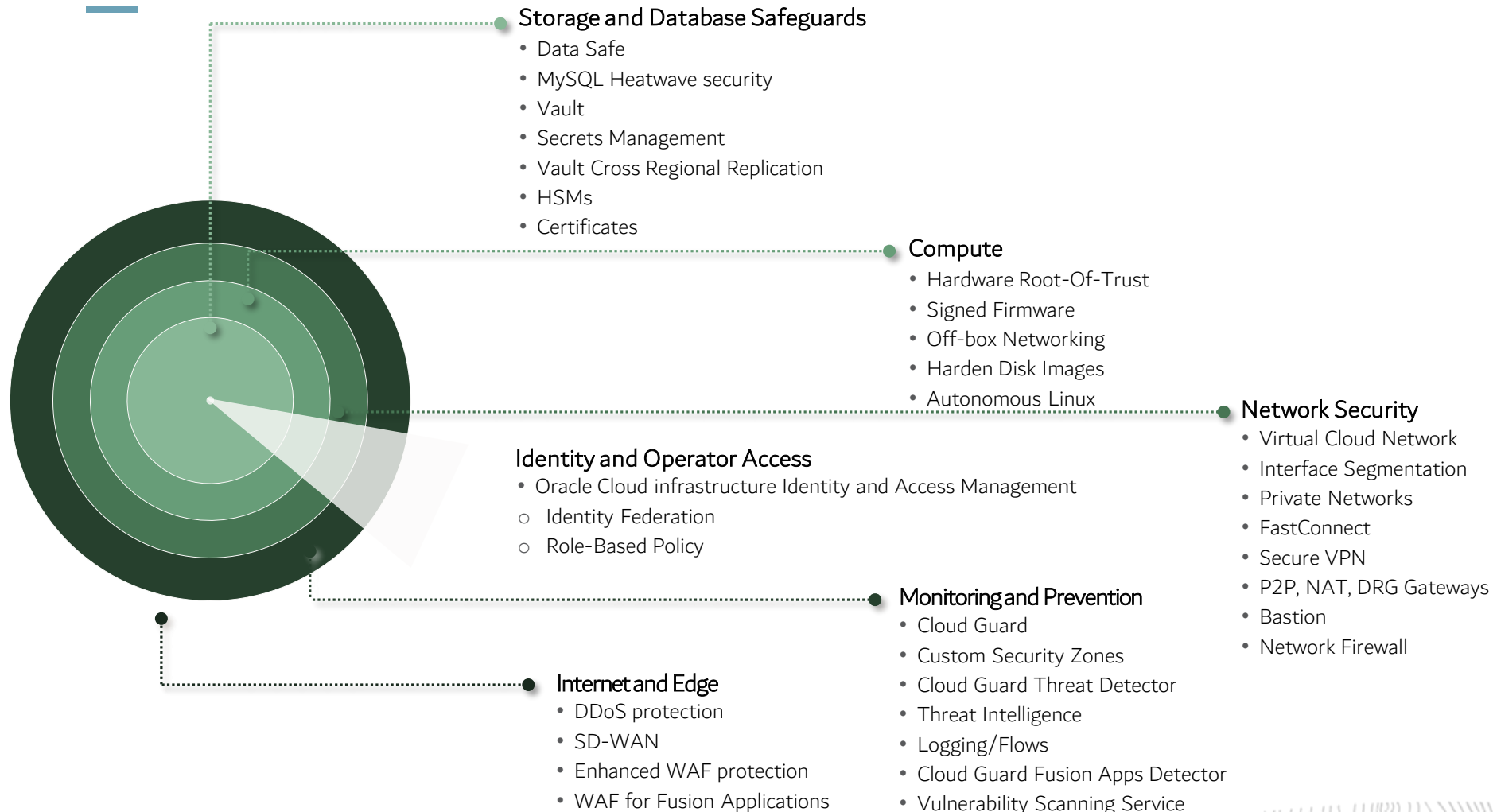
OCI Security



Shared Security Model



Defense-in-depth, from data to the edge



Oracle Data Safe

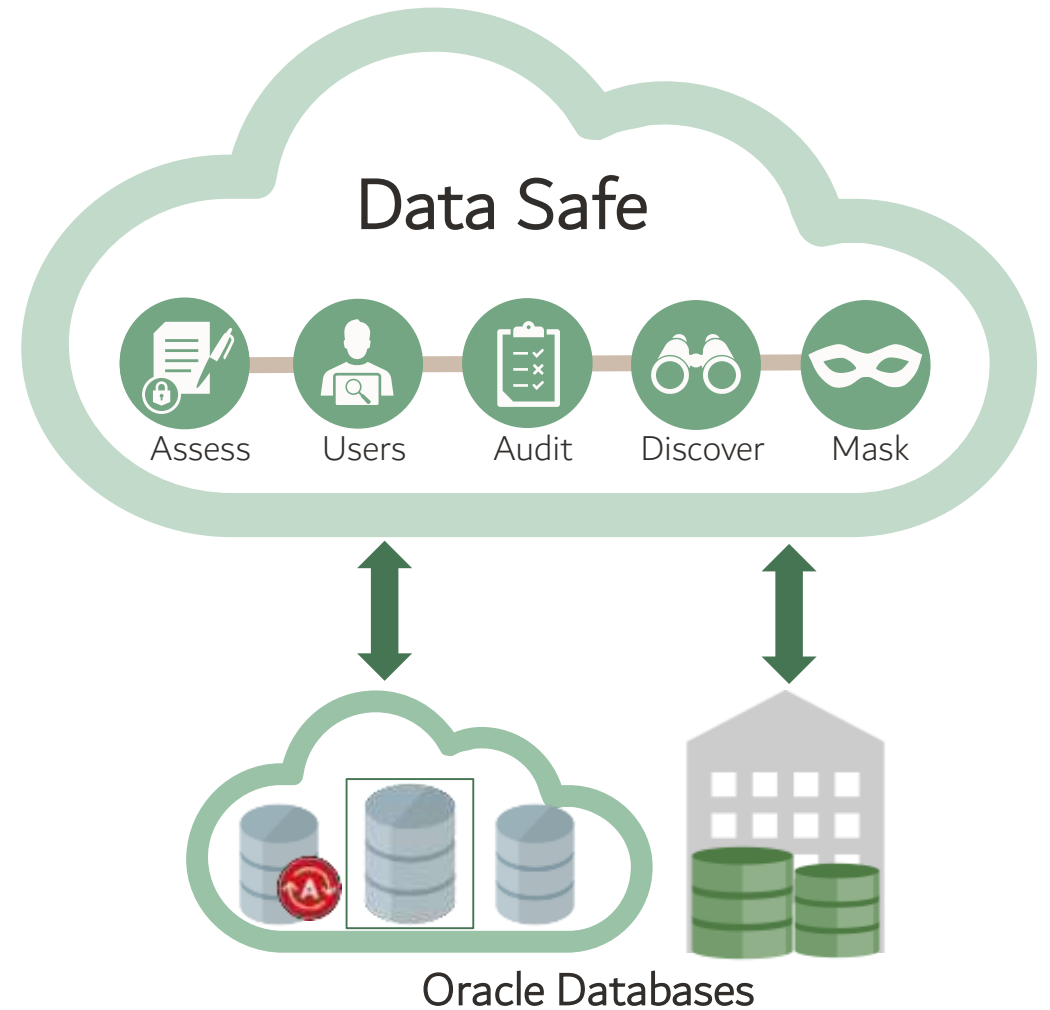
Unified database security control center

- Risk dashboard: configuration, data, users
- Monitor user activity
- Discover sensitive data and mask it for test/dev
- Extensible: more features to come...

Benefits

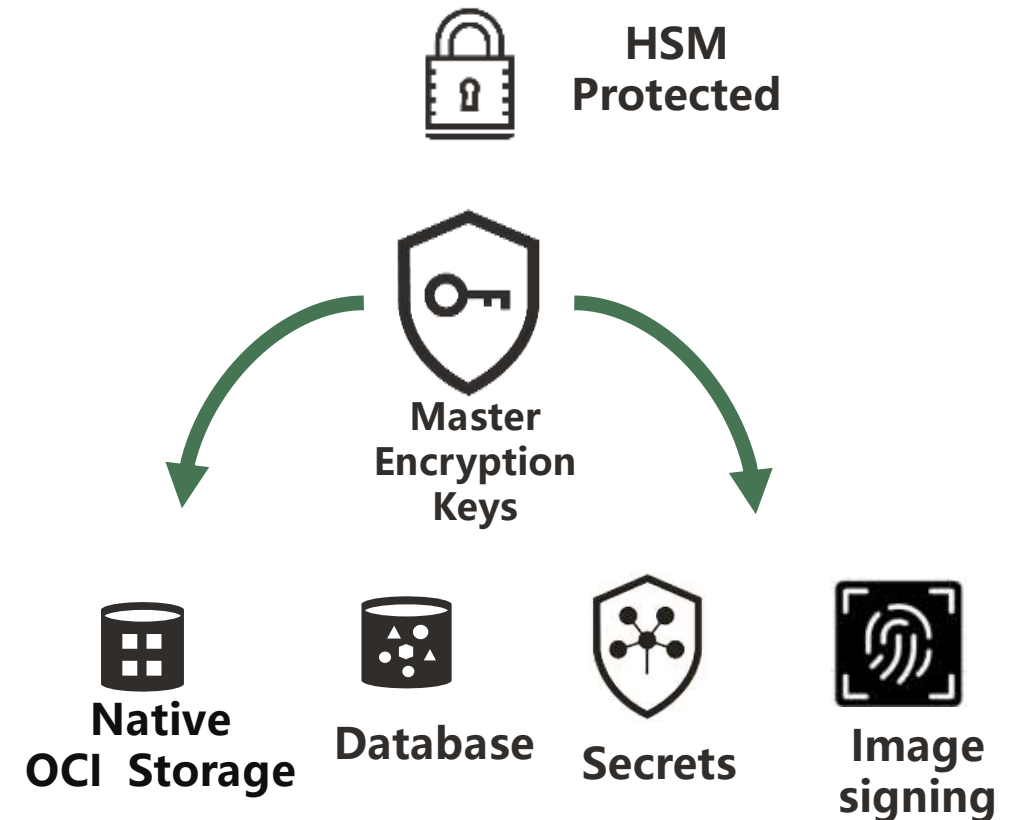
- No special expertise needed: click-and-secure
- Saves time and mitigates security risks
- Defense-in-depth security for all customers

Now available for securing on-premises databases

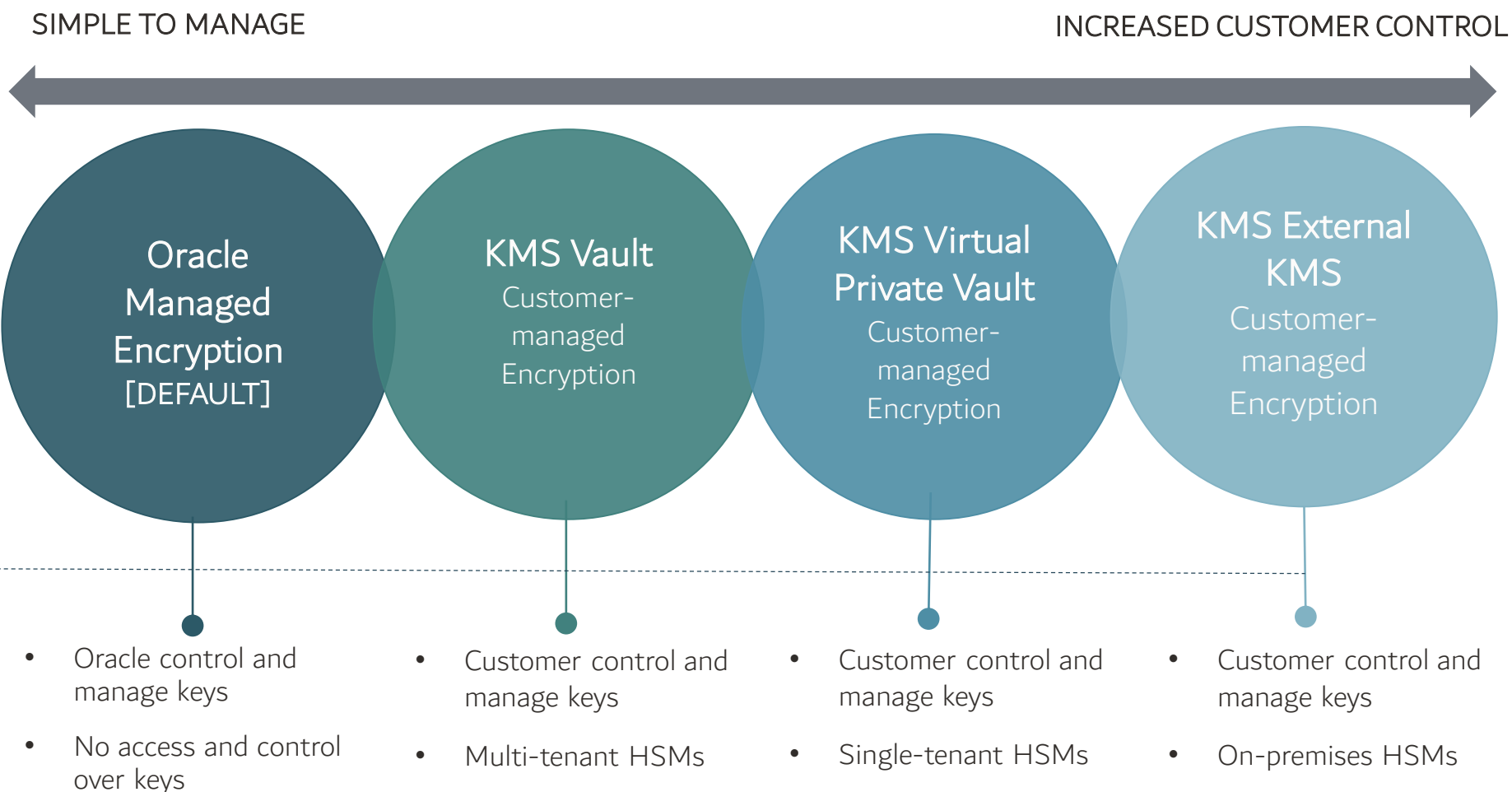


OCI Vault: Protect data and the secret credentials to securely access resources

- Managed service that allows central management of encryption keys
- Stores master encryption keys and secrets that might otherwise be stored in configuration files or in code
- Create and manage Vaults, Keys, and Secrets
- Centralized and customer controlled key management
 - Natively integrated to many OCI services: OCI-Native Storage, DBaaS (ADB-D, ExaCS), OKE, Streams
- Fully managed and highly available service
 - Availability - 99.9% SLAs and 99.99% SLOs
- Support regulatory compliance
 - Meets PCI DSS and FIPS 140-2 Level 3 standard for cryptographic processing



Oracle Cloud Encryption Options



Oracle Security Zones

SIMPLE

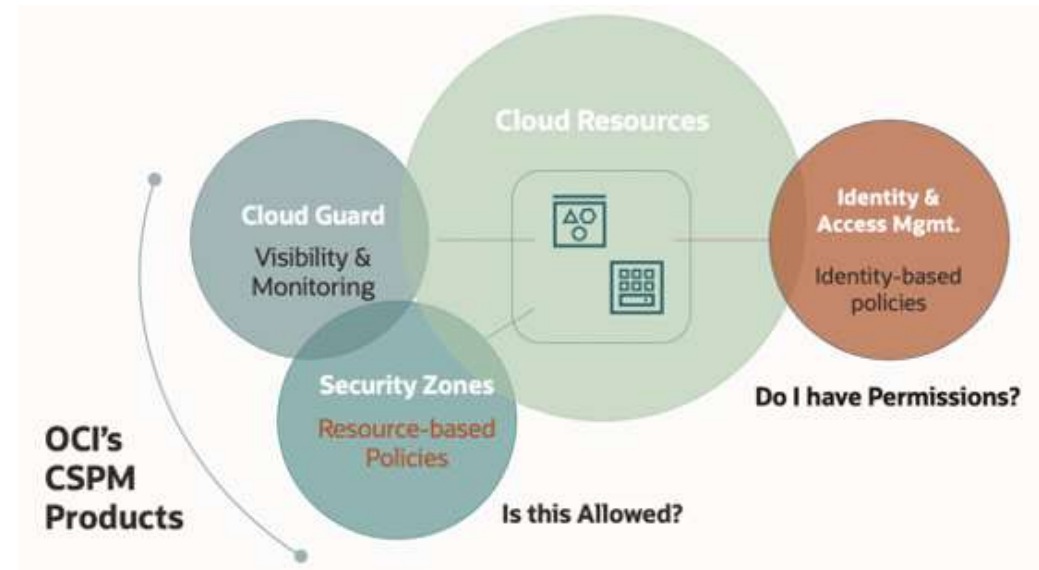
Select which Security Zone policies should apply to resources in one or more compartments.

PRESCRIPTIVE

Prevent weak configurations from being deployed with active policy enforcement

INTEGRATED

Integrated posture monitoring with Cloud Guard supporting a true 'trust and verify' model



“As we venture into the public cloud, Ferguson Enterprises is focused on cloud security. Oracle Security Zones integrated with Oracle Cloud Guard, helps Ferguson build safe environments and maintain security with true ‘trust and verify’ security posture management.”

Ferguson, Karen Cake, Cloud Architect

OCI Web Application Firewall (WAF)

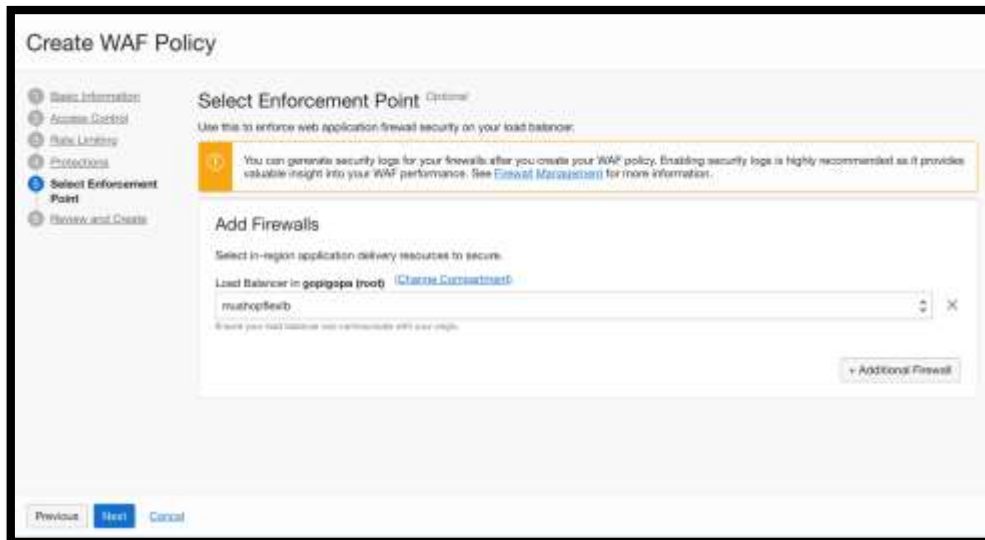
Protects against threats such as OWASP defined top-10 vulnerabilities.

Can be used to limit access to the application based on geography or the signature of incoming requests, block unwanted bots.

Protects your application infrastructure and workloads no matter where they reside: in OCI, on-premises, multi-cloud and anywhere in between.

CUSTOMER BENEFITS

- Layered defense and flexibility to enforce security at the edge closest to users as well as in-region closest to the application on flexible load balancers
- WAF policies can be enforced on internet facing web applications, and/or (public/private) flexible load balancer instances
- Protects internet facing and internal applications against both external and insider threats
- Supports access rules, protection rules, rate limiting and bot management

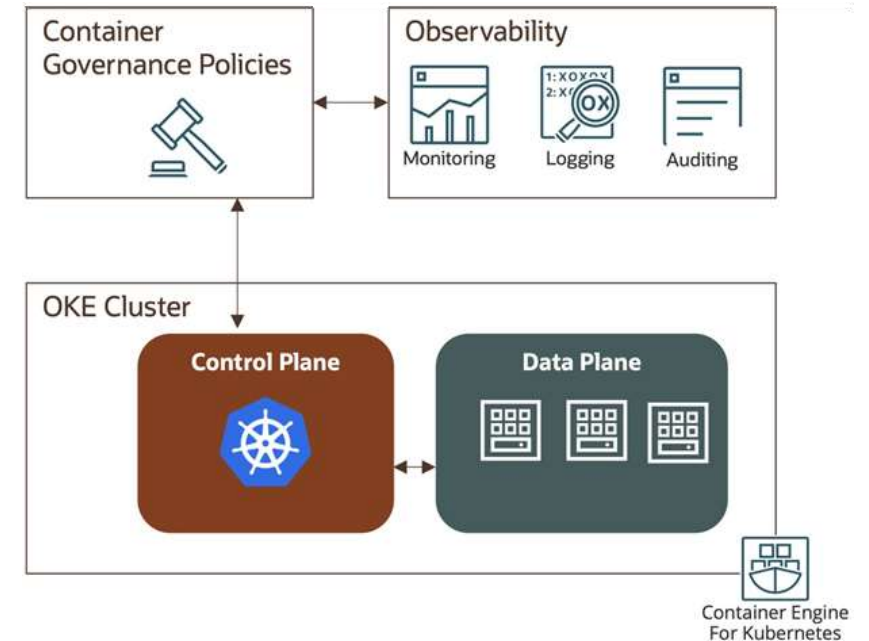


Cloud Guard: Monitor, Identify, Achieve and Maintain Strong Security Posture

- Find and fix security issues with containers, virtual machines, databases, networks, policies and much more
- Use automated enforcement of critical policies
- Reduce complexity with policy management for regulatory compliance and industry best practices
- Streamline audits and security reviews by ensuring container environments are within compliance
- Enable easy reporting with integration into OCI Logging and Monitoring
- Governance applied remotely so it does not consume data plane capacity

Workloads

- Works with managed and virtual nodes, ideal for production workloads



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Flexible consumption models with Universal Credits

Choice of Consumption Models

- Available with all Cloud Services BYOL, IaaS and/or PaaS subscriptions

Pay As You Go (PAYG)

Best when usage is uncertain

- No upfront fees or commitment
- Usage billed monthly in arrears
- Pay only for what you use

Annual Flex

Lowest cost without sacrificing flexibility

- Universal access to all IaaS and PaaS Oracle Cloud Services
- Annual consumption commitment of \$2k or more
- Minimum term of 1 year
- Billed in advanced and debited monthly based on actual usage
- Discounts available based on consumption levels and term
- Pricing remains fixed for term of agreement with any consumption overages billed at fixed price

Simplified business experience with one simple agreement describing financial relationship.

[UC Price list](#), [BYOL FAQs](#)

Factors that impact pricing

Resource Size

Bigger resources cost more!

Data Transfer

No Ingress cost
Careful with Egress cost

Resource Type

VMs v/s BMs
VMs v/s Functions
BYOL v/s managed DBs..

All OCI regions have the same
pricing!

Cost Estimator

— [Page Link](#)

- Generate Costs Estimates based cloud services usage.
- You can choose from single services, to Reference Architectures, and can customize the services based on the customer need
- You can see price details for your customer Architecture or OCI services
- Save the estimate or export as spreadsheet to compare the TCO, ROI or just monthly costs with others cloud provides costs

The screenshot displays the Oracle Cost Estimator web application. At the top, a dark green header bar contains the text "My Estimate" followed by a pencil icon and a link to "Configure and estimate costs for OCI services (Learn more)". To the right of this bar, there are buttons for "Start for Free", a currency selector set to "USD - US Dollar", and a display of the "Estimated Monthly Cost \$0.00" with a calendar icon.

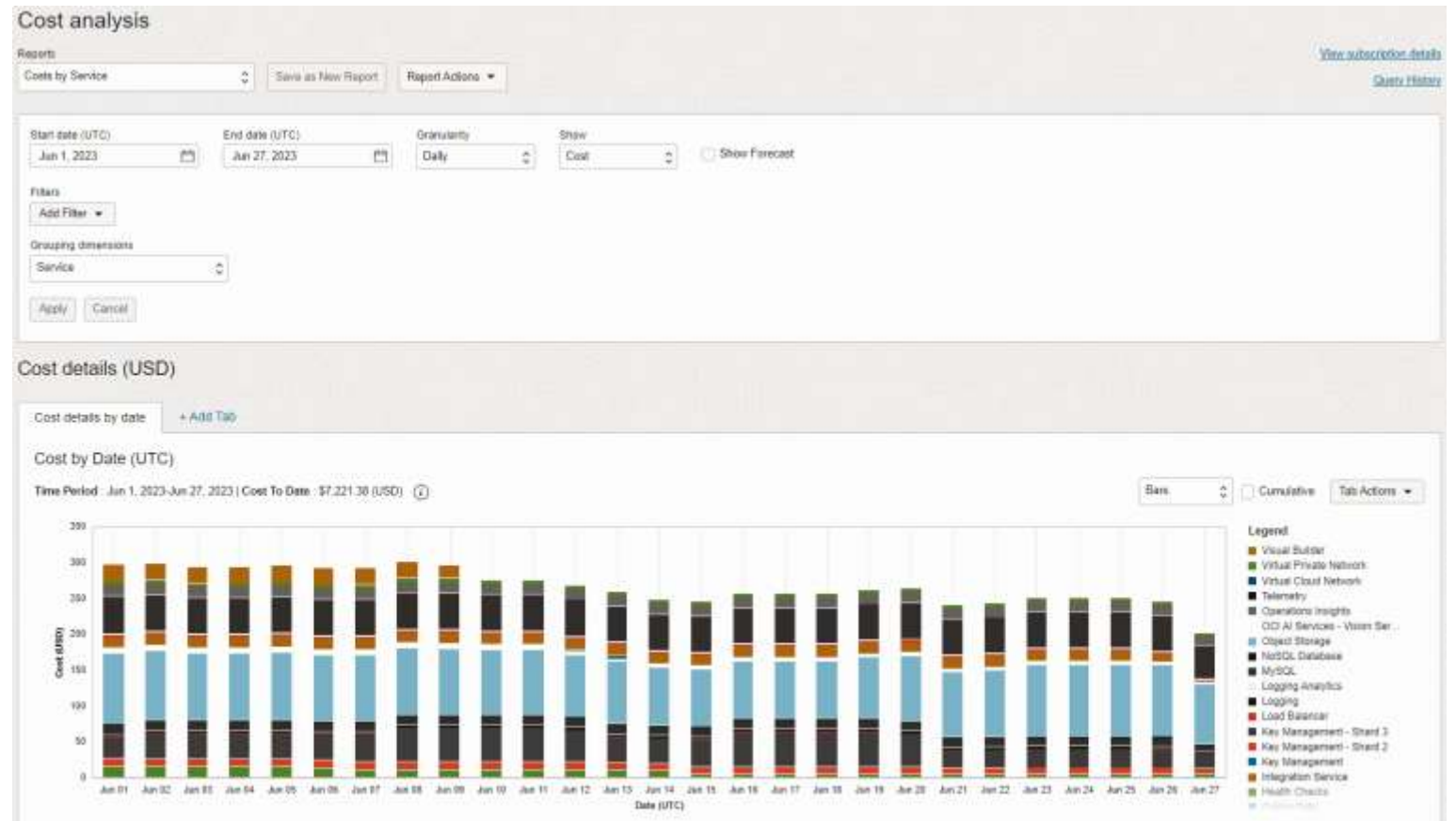
Below the header, a navigation bar includes links for "Services", "Compute shapes", "Reference architectures", "My favorites", and "Advanced Search". The "Services" link is currently selected.

The main content area features a search bar with a "Select category" dropdown menu (currently showing "All Categories") and a "Search" button. Below the search bar, a section titled "Most Popular Services" displays eight service cards in a 2x4 grid. Each card includes a title, a brief description, and a "Load" button at the bottom.

- Compute VM**: A fully scalable multi-tenant Virtual Compute environment to run applications with uncompromised performance, control and built-in resiliency.
- Base Database Service - Virtual Machine**: Base Database Service - Virtual Machine allows you to create and manage full-featured Oracle Database systems in the cloud. It can be provisioned on virtual machines with block storage to provide high performance and cost-efficient pricing.
- Object Storage**: Object Storage enables customers to store any type of data in its native format. This is ideal for building modern applications that require scale and flexibility, as it can be used to consolidate multiple data sources for analytics, backup, or archive purposes. Infrequent Access Storage and Archive.
- Block Volumes**: Oracle Cloud Block Volumes provide reliable, high-performance block storage designed to work with a range of virtual machines and bare metal instances. With built-in redundancy, Block Volumes are persistent and durable beyond the lifespan of a virtual machine and can scale to 1 PB.
- Autonomous Database**: Oracle Autonomous Database is a cloud database service that eliminates virtually all the complexities of operating a data warehouse, securing data, and developing data-driven applications.
- Exadata Database Service**: Oracle Exadata is the fastest platform to run the Oracle Database, allowing enterprises to accelerate their mission-critical applications while the uptake of the new platform requires no code changes, sparing enterprises expensive quality assurance and validation cycles.
- MySQL HeatWave for OLTP**: MySQL HeatWave for OLTP enables organizations to rapidly and securely develop and deploy modern, cloud-native applications using the world's most popular open source database. You can easily enable the HeatWave in-memory query accelerator to benefit from real-time analytics.
- APEX Application Development**: Oracle APEX Application Development (APEX Service) enables you to rapidly build and deploy low-code apps without having to learn complex web technologies. It provides a fully managed APEX instance running in Oracle Cloud and a specialized Autonomous Database for your app data.

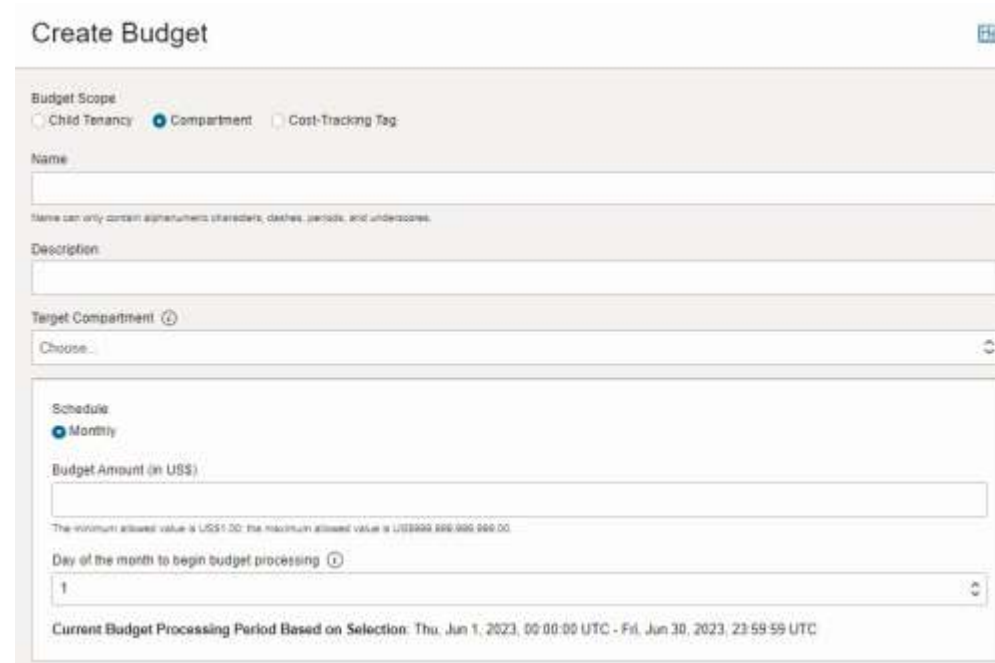
Cost Analysis

- Visualization tools Help understand spending patterns at a glance
- Filter costs by Date, Tags and Compartments
- To use Cost Analysis you must be a member of the Administrators group



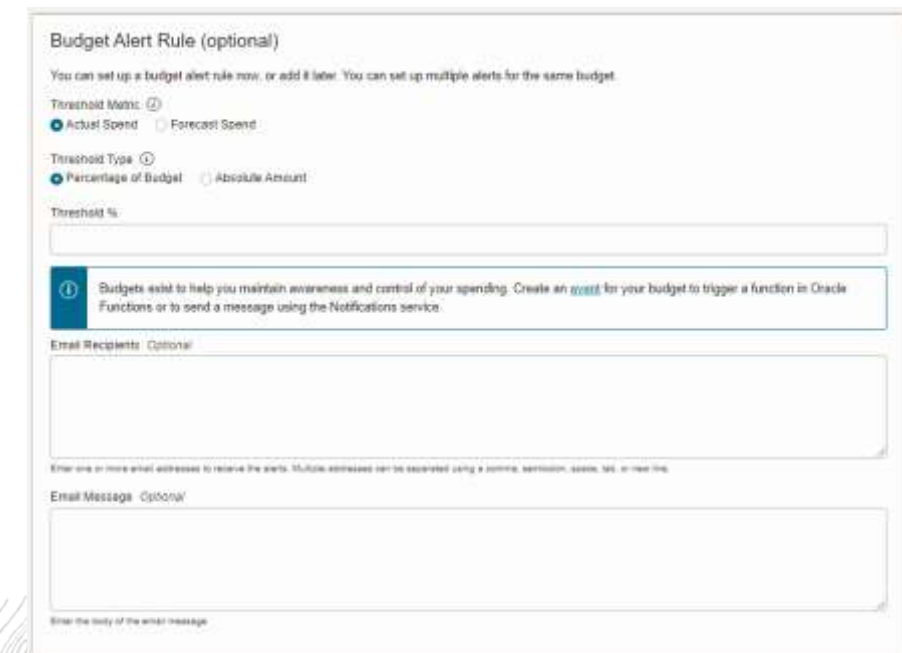
Budgets

- A monthly threshold you define for your OCI spend
- Can be set on cost-tracking tags or compartments and track all spending in the cost-tracking tag or compartment and any child compartments
- Can define email alerts that get sent out for your budget
- Alerts are evaluated every 15 minutes, and can be triggered when your actual or forecasted spending hits either a budget % or a specified amount



The 'Create Budget' form includes the following sections:

- Budget Scope:** Radio buttons for Child Tenancy, **Compartment** (selected), and Cost-Tracking Tag.
- Name:** A text input field with a note: 'Name can only contain alphanumeric characters, dashes, periods, and underscores.'
- Description:** A text input field.
- Target Compartment:** A dropdown menu with 'Choose...' and a search icon.
- Schedule:** Radio buttons for **Monthly** (selected) and Quarterly.
- Budget Amount (in US\$):** A text input field with a note: 'The minimum allowed value is US\$1.00; the maximum allowed value is US\$999,999,999,999.00.'
- Day of the month to begin budget processing:** A dropdown menu with '1' selected.
- Current Budget Processing Period Based on Selection:** Displays 'Thu, Jun 1, 2023, 00:00:00 UTC - Fri, Jun 30, 2023, 23:59:59 UTC'.



The 'Budget Alert Rule (optional)' form includes the following sections:

- Budget Alert Rule (optional):** A heading with a note: 'You can set up a budget alert rule now, or add it later. You can set up multiple alerts for the same budget.'
- Threshold Metric:** Radio buttons for **Actual Spend** (selected) and Forecast Spend.
- Threshold Type:** Radio buttons for **Percentage of Budget** (selected) and Absolute Amount.
- Threshold %:** A text input field.
- Help:** A blue information icon with a note: 'Budgets exist to help you maintain awareness and control of your spending. Create an [alert](#) for your budget to trigger a function in Oracle Functions or to send a message using the Notifications service.'
- Email Recipients (Optional):** A text input field with a note: 'Enter one or more email addresses to receive the alerts. Multiple addresses can be separated using a comma, semicolon, space, tab, or new line.'
- Email Message (Optional):** A text input field with a note: 'Enter the body of the email message.'

Cost Tracking Tags

- Create a Tag Namespace
- Create a Tag Key Definition and enable “Cost-Tacking”
- Use this tag on your services



Create Tag Namespace

Tag namespaces allow collections of tags within your tenancy to have the same policies. Use a Tag Namespace when:

- You want to have separate policies for a set of tags without creating a policy for each tag.
- You want to use a set of pre-existing tags defined by another tenancy administrator.
- You want to control access to certain tag definitions within your tenancy.

[Learn more](#)

Create in Compartment

talamos

adcmantid (root/talamos)

Namespace Definition Name

Development

Spaces and periods are not allowed.

Description

Tag for Dev Environments

Add tags to organize your resources. [What can I do with tagging?](#)

Tag namespace	Tag key	Tag value
None (add a free-form tag)		

[Add tag](#)

[Create Tag Namespace](#) [Cancel](#)

Create Tag Key Definition

This Tag Key Definition will be created in the "FaaS" Namespace

Tag Key

DevEnv1

Spaces and periods are not allowed.

Description

Tag for costs of Env 1

☒ Cost-Tracking ⓘ

Tag Value Type

☒ Static Value
User can enter a string to set the value for this key

☐ A list of values
User selects from a list to set the value for this key

[Create Tag Key Definition](#) [Cancel](#)

Oracle Cloud Advisor

Oracle Cloud Advisor

Cloud Advisor provides recommendations to help you maximize cost savings and improve security in your tenancy. Cloud Advisor finds inefficiencies in your tenancy and provides guided solutions explaining how to fix them. In addition, built-in Cloud Guard recommendations help you see and address security vulnerabilities. You can customize Cloud Advisor by postponing or dismissing recommendations that aren't applicable, allowing you to focus on the recommendations that matter most to you.

Cost Management

last checked Thu Oct 29 2020 09:06:01 UTC

[Details](#)

\$77 estimated savings*

9

1 Critical

0 High

8 Medium

0 Low

0 Minor

9 Recommendations

5 Implemented

9 Pending

Cost Management Recommendations help you reduce costs by finding and adjusting resources that are underutilized. For example, cost management recommendations help you find underutilized compute instances, over-provisioned Autonomous Data Warehouse instances, unattached block volumes or boot volumes, and Object Storage buckets without lifecycle policy rules.

Security

last checked Thu Oct 29 2020 22:14:00 UTC

[Details](#)

48 FAIR security posture rating

72

3 Critical

8 High

9 Medium

28 Low

24 Minor

72 Total

Problems by region

us-ashburn-1	
ap-mumbai-1	
ap-sydney-1	
eu-frankfurt-1	
uk-london-1	
us-sanjose-1	

Cloud Guard helps you monitor, identify, and maintain a strong security posture on Oracle Cloud. Use the service to examine your Oracle Cloud Infrastructure resources for security weakness and to examine your operators and users for risky behavior. Upon detection, Cloud Guard can suggest, assist, or take corrective actions, based on your configuration.

* Because Cloud Advisor is unable to calculate an estimated cost savings for some recommendations, this value understates the potential savings.

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Thank you