

# ORACLE AI World

## Empower Your Data with Oracle Database@AWS and Native AI Services

LRN 3532

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**Kambiz Aghili**

Vice President

Oracle Cloud Infrastructure (OCI), Multicloud

# Safe harbor statement

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# Empower Your Data with Oracle Database@AWS and Native AI Services

## Kambiz Aghili

Vice President, Product Management  
Oracle Cloud Infrastructure (OCI), Multicloud

1. Oracle Database@AWS, Overview, Introduction

## Avinash Singh

Vice President, Cloud Technologies and Architecture,  
Equifax

2. Equifax journey with Oracle Database@AWS

## Michael Barras

Senior Principal Product Manager  
OCI Multicloud

3. Deep dive on Oracle Database@AWS use cases



# Oracle Database@AWS Overview

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Kambiz Aghili

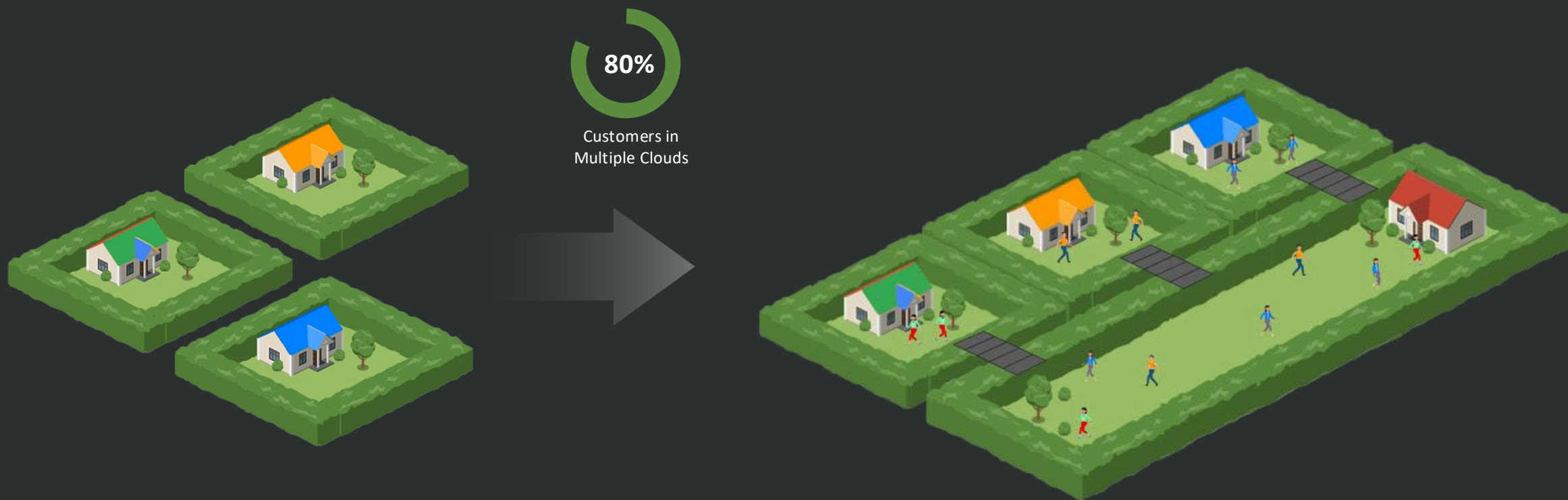
Vice President

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# Multicloud

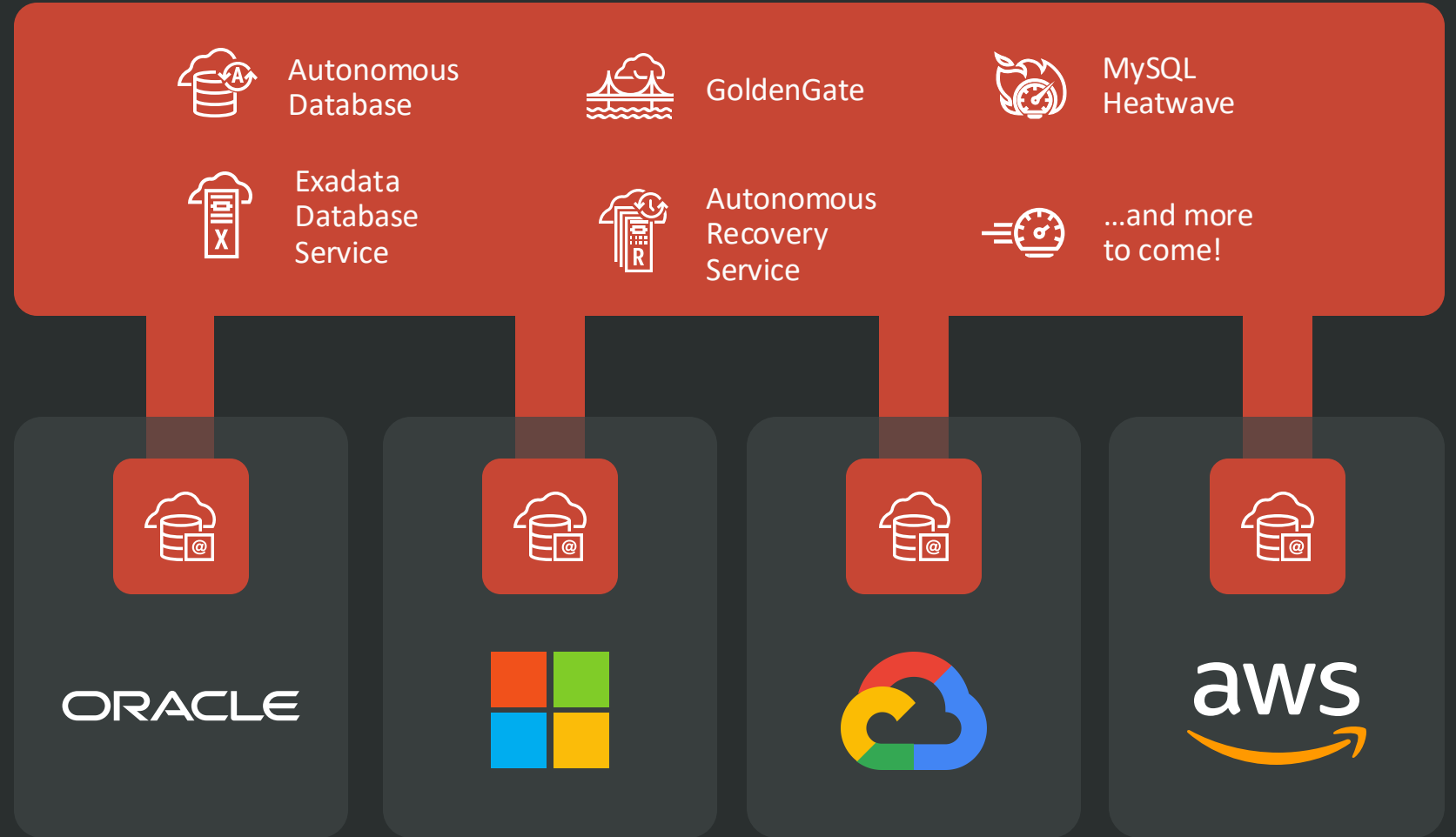


Multicloud is the Connecting Tissue



## Multicloud

Oracle is in  
**all** clouds





# What is Multicloud?

## Cloud Native Database Service Integration



ADB



ExaDB



BaseDB



## Unified Governance



Unified Governance



Console, APIs &  
Infrastructure-as-a-code



Networking



Storage & Backup



Marketplace



Security



Observability

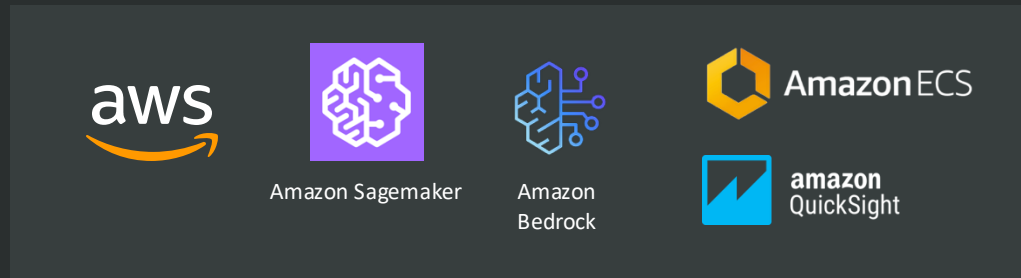
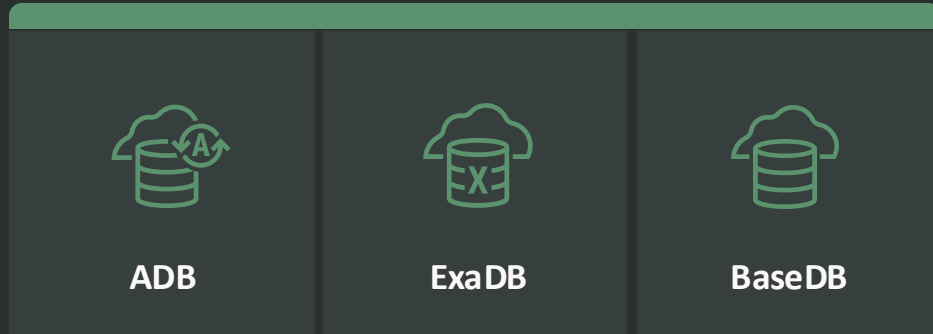


Deep Integration



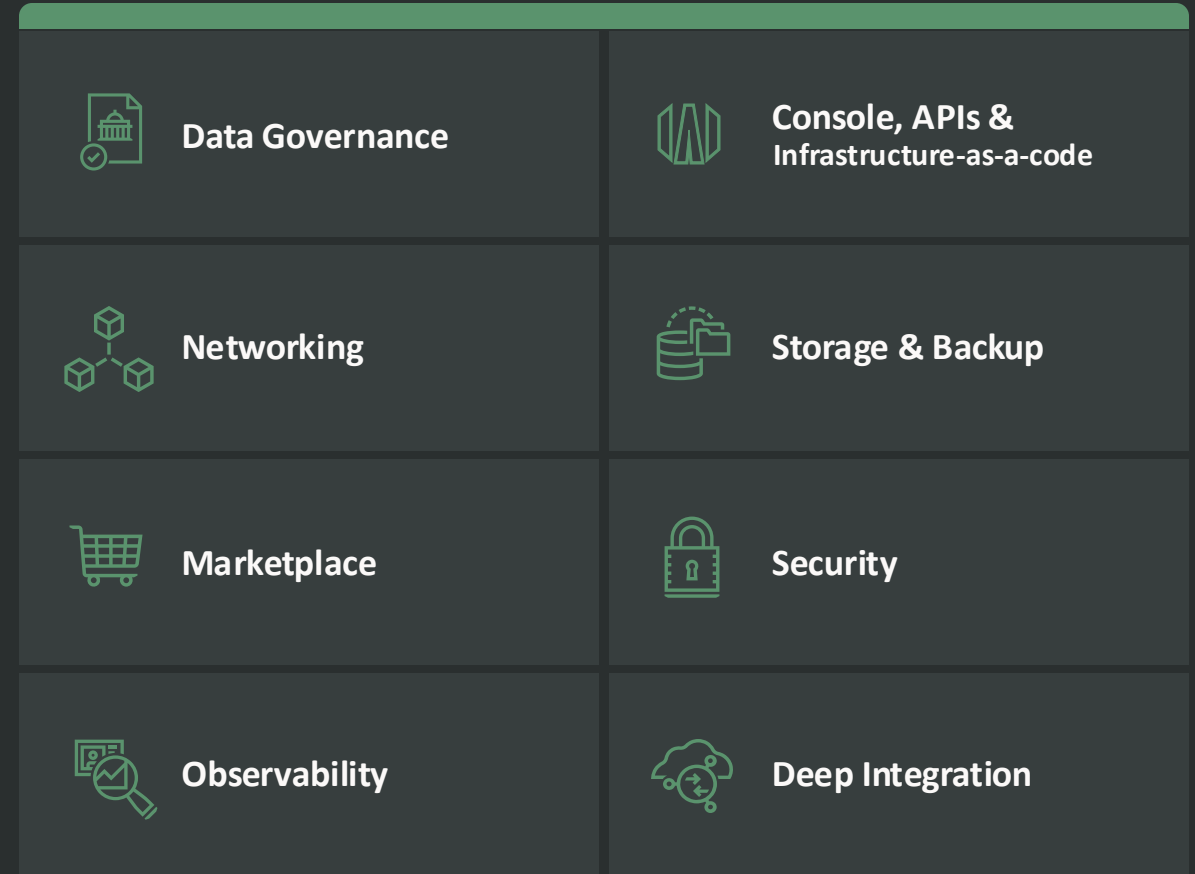
# What is Multicloud?

## Cloud Native Database Services



## Native Service Integration

## Unified Governance







# Multicloud

## Native Database Service Integration



**Autonomous Database**



**Exadata Database Service**



**Base Database Service**



## Interoperable Services



Defender



Sentinel



Synapse



Power BI



Vertex AI Platform



BigQuery

Gemini



Looker



Amazon Sagemaker



Amazon Bedrock



Amazon ECS



amazon QuickSight

# Oracle Database@AWS Service and Region Roadmap

Services	AWS	OCI
Oracle Exadata Database Service on Dedicated Infrastructure	✓	✓
Oracle Exadata Database Service on Exascale Infrastructure		✓
Oracle Autonomous Database (Serverless)		✓
Oracle Autonomous Database on Dedicated Exadata Infrastructure	✓	✓
Oracle Base Database Service		✓
Oracle Database Autonomous Recovery Service	✓	✓
Oracle GoldenGate		✓
Oracle Interconnect		
Exadata X11M	✓	✓
Exadata X9M	✓	✓

## Oracle Database @AWS

- US East
- US West

2 Live

20 Planned







# We help people live their financial best

As a trusted global leader in data, analytics and technology  
we deliver insights that power decisions to move people forward

Avinash Singh  
VP - Technology ( Global Platforms )  
Equifax Inc.

# Who We Are

## Our Commitment Reflect Our Values

We are nearly **15,000 bright minds** determined to do the right thing and put people first as we strive to create economically healthy individuals and communities everywhere we do business.



29M

**29 Million U.S. consumers** obtained loans to buy a car and 9.2M U.S. consumers secured a mortgage or home equity loan<sup>1</sup>



\$4B+

**\$4 Billion +** instances of online identity protection<sup>1</sup>

**\$3.3M total U.S. community impact** of the Equifax Foundation and Equifax Gives<sup>2</sup>



\$3.3M



25.5M

**The Work Number service fulfilled 25.5M verifications** for people seeking government assistance in the United States<sup>1</sup>

**All Products and services**

<https://www.equifax.com/business/all-products/#capabilities>



# Why Equifax

## We Drive Businesses Forward, Faster

Equifax continuously innovates to help organizations make intelligent decisions more rapidly and with greater confidence.

## Innovation That Accelerates Business Growth

Equifax has been driving responsible AI innovation for more than a decade with a commitment to ensuring transparency and explainability in the use of AI. Our more than 1,000 data and analytics professionals around the world anticipate the evolving challenges that our customers and consumers face - innovating not just for today, but for future growth.

## Insights That Provide Clarity and Confidence

Our robust data and advanced analytics capabilities generate **insights** that create a competitive **advantage** for our customers and open new **opportunities** for **consumers**.



### Differentiated Data

The breadth of our unique data gives our customers a more complete picture of consumers and competitive markets to drive quicker and confident decisions.



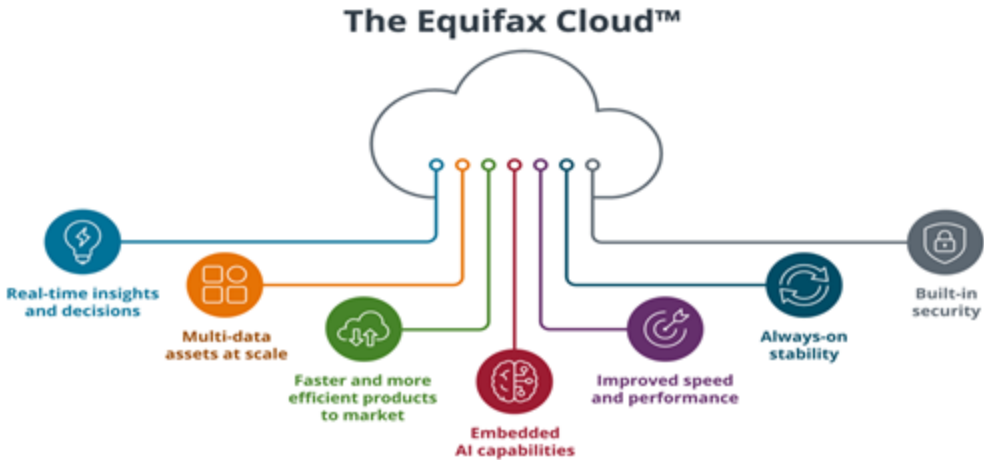
### Advanced Analytics

We apply patented Artificial Intelligence and trusted Machine Learning techniques to help customers get to results faster.



### Global Insights

The results are actionable insights our customers use to understand their markets, find new growth opportunities, protect against fraud and better serve consumers.



3.5B+

Over 3.5B Equifax delivered consumer credit files to US lenders YTD

708K+

Over 708K in the United Kingdom, Equifax helped people purchase a home

4.6M

4.6M Brazilian consumers secured a car loan through the support of Equifax

16M

16M Completed know-your-customer verification checks for customers in Canada

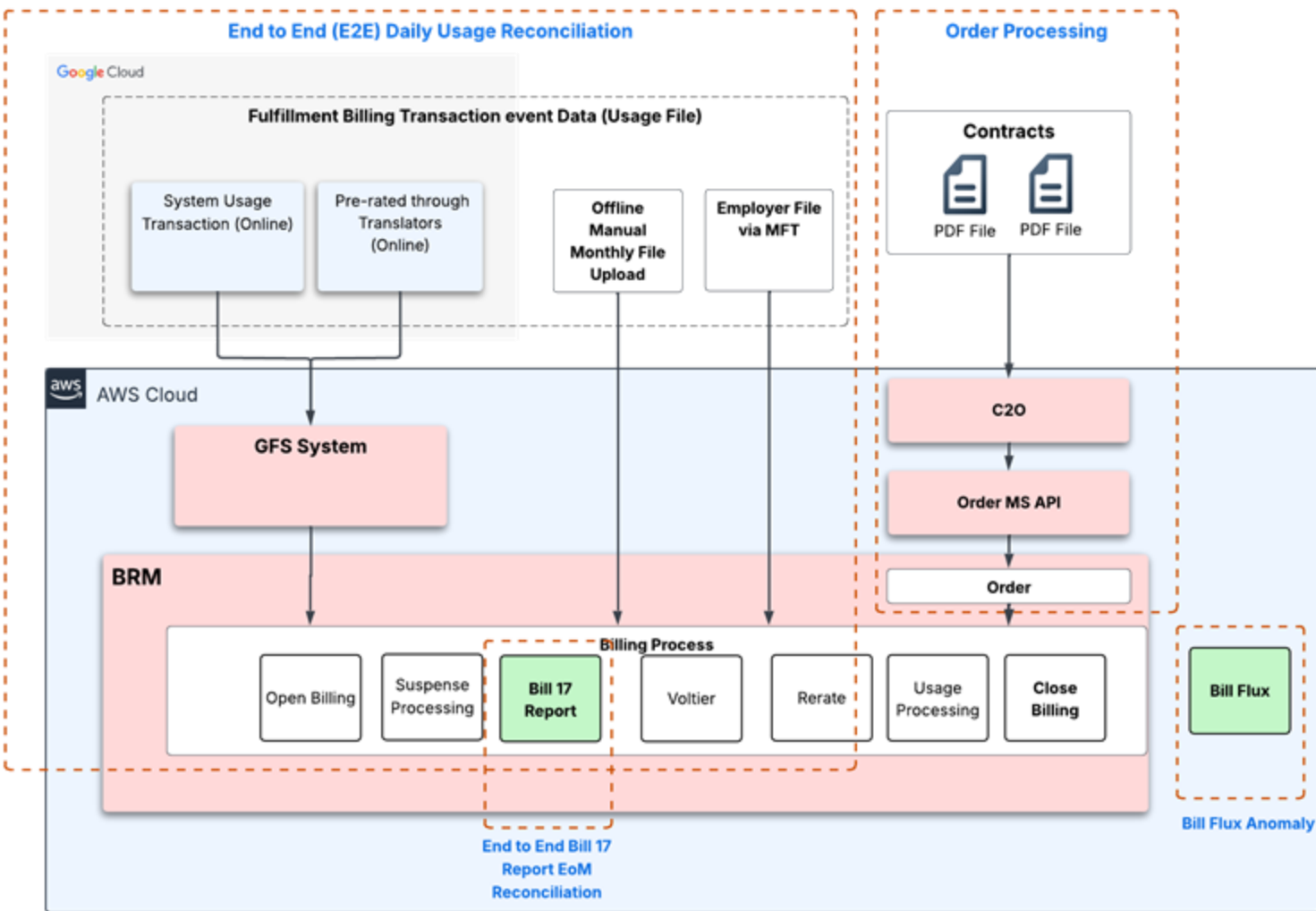
## Maximizing AI Performance with the Equifax Cloud™

The Equifax Cloud was custom built to maintain and manage the large volume of diverse, proprietary datasets needed to **maximize AI performance**. Our vision for the Equifax Cloud is to expand the depth and predictiveness of our data to help our customers innovate faster and create more effective insights into the people and communities they serve.

Equifax has introduced **100+ new product innovations** for five consecutive years.\*

\*100+ NPIs introduced in 2020, 2021, 2022, 2023 and 2024.

# Enterprise Data and Billing System



## BRM Processes Orders, execute Usage Transactions, run Billing and generate customer Invoices

- **High-Volume Usage Processing:** Ingests and processes millions of transactions daily from dozens of global platforms and data sources.
- **Dynamic Order Management:** Manages a high volume of new and modified customer orders daily, ensuring billing is always aligned with contracts.
- **Complex Billing & Rating:** Supports sophisticated rating, discounting, and billing rules to ensure accuracy.
- **Automated Reconciliation:** Generates comprehensive reconciliation and anomaly analysis reports to ensure financial integrity across the entire process.

BRM - Oracle Billing and Revenue Management  
 GFS - Global Financial System  
 C2O - Contract to Order, MS - Microservices



# Key Considerations - BRM Database



**RDS  
Storage  
Limitation  
( 64 TB )**



**Performance  
Bottleneck  
( Large  
Datasets )**

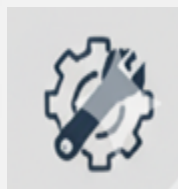


**RAC Unavailability  
( No clustered  
write )**

**Patching Downtime  
Disruptions  
( No Rolling Patch )**



**Heavy OLTP  
Throughput Issues  
( High Volumes  
Read and Write )**



**KEY CONSIDERATIONS**

**Scalability & High Availability**

**IMPACT**

**Operational Costs &  
Data Growth**



# Key Benefits

## Optimized Performance and Throughput

**Oracle Exadata** advanced processing power will be leveraged to significantly increase database throughput and accelerate processing for our **Billing and Revenue Management system**.

This enhancement is projected to **reduce the billing and invoice generation cycle time**, leading to faster financial closing and improved cash flow.

## Scalable Storage and Data Visibility

The availability of **petabytes of storage capacity** will minimize the need for frequent **purge and archival maintenance**, reducing administrative overhead and risk. Furthermore, maintaining a comprehensive, **live database** will empower Billing Operations and Business teams with **extended, long-term data visibility** for superior analysis and reporting.

## Unified Cloud Workload

The **Oracle Database Network (ODB)** on **AWS** provides a secure, seamless integration layer for our **Billing data and Analytics**. This setup efficiently connects the Oracle workload with existing AWS services, creating a **foundational architecture** that is ready for **ADB@AWS** and will accelerate data insights. This unlocks a broad spectrum of **future enhancements**.

## Strategic Focus and Reduced Operational Overhead

Implementation of **Autonomous Database capabilities** will automate routine database maintenance tasks (e.g., patching, tuning, security). This transition will allow the IT and database teams to shift their focus from reactive maintenance to **strategic business growth initiatives** and value-add activities.



# Oracle Database@AWS

## Select Use Cases

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Michael Barras

Senior Principal Product Manager

OCI Multicloud

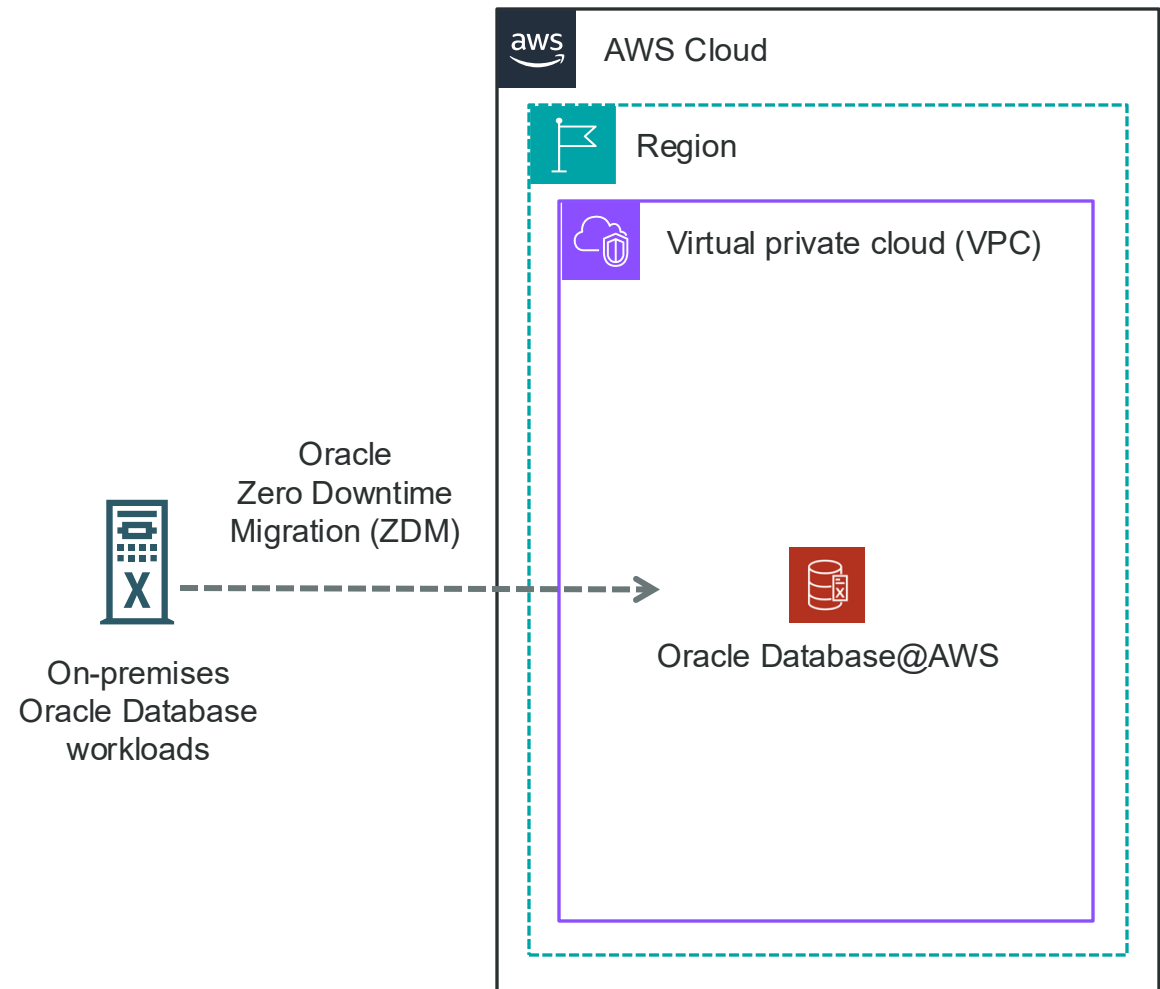


# Migrate, Lift and Shift On-premises workloads

**Lift and Shift** your Oracle Exadata workloads to Oracle Exadata Database Service or Oracle Autonomous Database on Dedicated Exadata Infrastructure within AWS with **minimal changes**.

Maintain full feature **availability**, architectural **compatibility**, and the same **performance** (or better) compared to on-premises.

Achieve **high resilience** with a combination of Oracle Real Application Clusters (RAC) and the **high availability** architecture of Oracle Database services across multiple AWS Availability Zones, along with Amazon S3 for database backups.



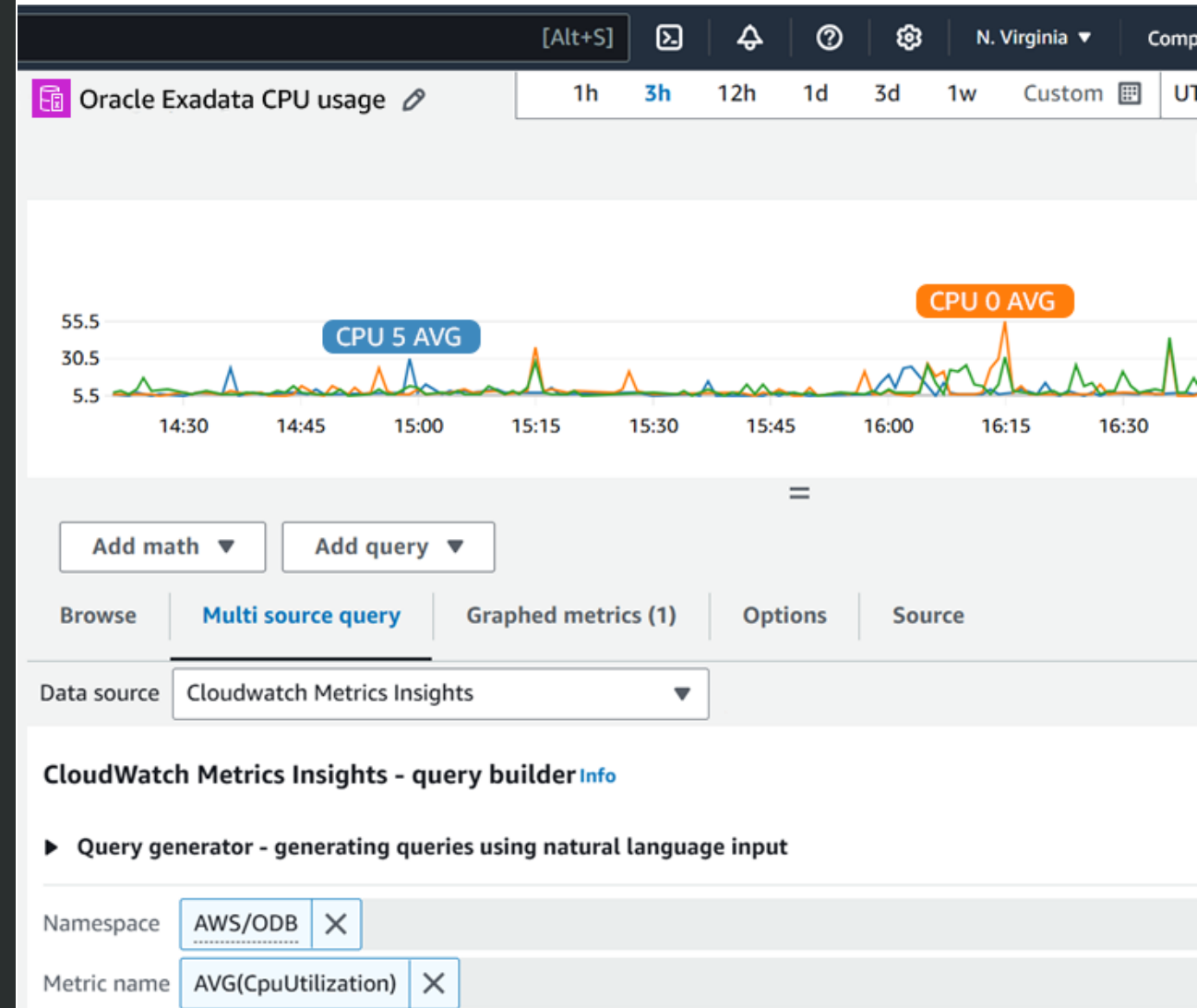
# Simplify data management, support, and operations

Benefit from a **unified experience** between Oracle and AWS with collaborative support, purchasing, management, and operations.

Usage of Oracle Database@AWS qualifies for your existing AWS commitments and Oracle license benefits, such as Oracle Support Rewards.

Leverage your **existing** AWS and Oracle Database skills, automation, and processes together in a **multicloud environment**.

Simplify management and operations **using native integration** with the AWS Management Console, CLI, APIs, and monitoring.

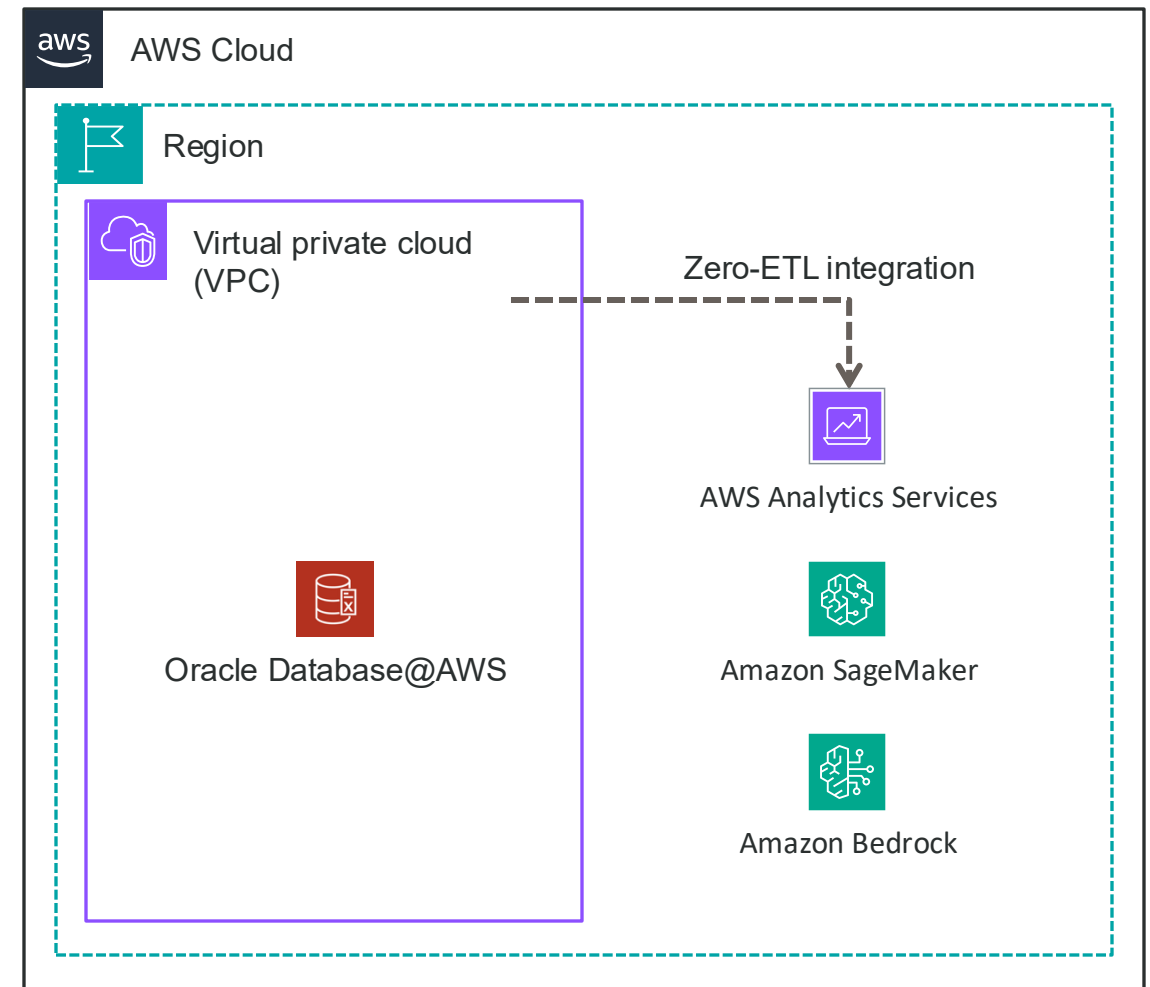


# Unify Data Architecture across Oracle – AWS, Simplify App Dev

Generate **deeper insights** and analytics **innovation** using **zero-ETL** to unify your data across Oracle and AWS for analytics, machine learning, and generative AI.

Build **new scalable microservices-based apps** by combining Amazon EC2, Amazon EKS, and Amazon ECS with Oracle Database features, such as AI Vector Search to accelerate modernization.

**Reduce management overhead** across the cloud, data estates, workloads, and use case.





# Unify – Generate **deeper insights** and develop **new innovation**

Empower your data with native AI services

- Unify your data across Oracle and AWS for machine learning and GenAI
- Enhance application intelligence and analytics
- Accelerate time to market for new features

## Unify use case example

### Problem

Existing image search returns low quality results due to large catalog of product titles with poor keyword searchability



### Solution

Enhance product search with GenAI and natural language processing to deliver more accurate results – making it easier for customers to find what they need and increasing sales conversions

# Unify

## Empower your data with native AI services

### Customer journey

- 1 Onboard with Oracle Database@AWS through the AWS Marketplace
- 2 Provision OCI database services into your AWS account
- 3 Combine the capabilities of Oracle Database 23ai with AWS AI services

# 1. Onboard with Oracle Database@AWS through the AWS Marketplace

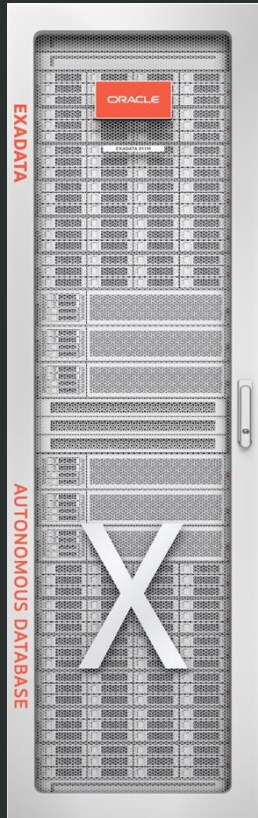
## Purchase a private offer through the AWS Marketplace

- Work with Oracle account team on private offer
- Pay AWS, consume against AWS commitments
- Earn Oracle Support Rewards towards your tech software license support bill
- Access **OCI, Oracle Database services** from within AWS data centers



# Exadata: Premier Platform for Oracle Database Services

Extreme performance, scalability, and availability for data and AI workloads, at a low cost



## Data optimized hardware

Scale-out, data optimized compute, networking, and storage

## Data intelligent software

Unique algorithms deliver extreme performance and efficiency for AI, analytics, and mission-critical apps, at any scale

## Engineered to run everywhere

On-premises, Cloud@Customer, Oracle Cloud, and Multicloud

# Autonomous Database Delivers the Best Data Experience

Fully-managed, cloud native, lowest TCO



Autonomous  
Database



Mission-Critical  
Database



Exadata



Automation,  
Best Practices  
and Data Tools

Automatically secures, tunes, and scales



Eliminates many  
manual tasks



Reduces  
human error



Simplifies  
scaling



Minimizes  
downtime

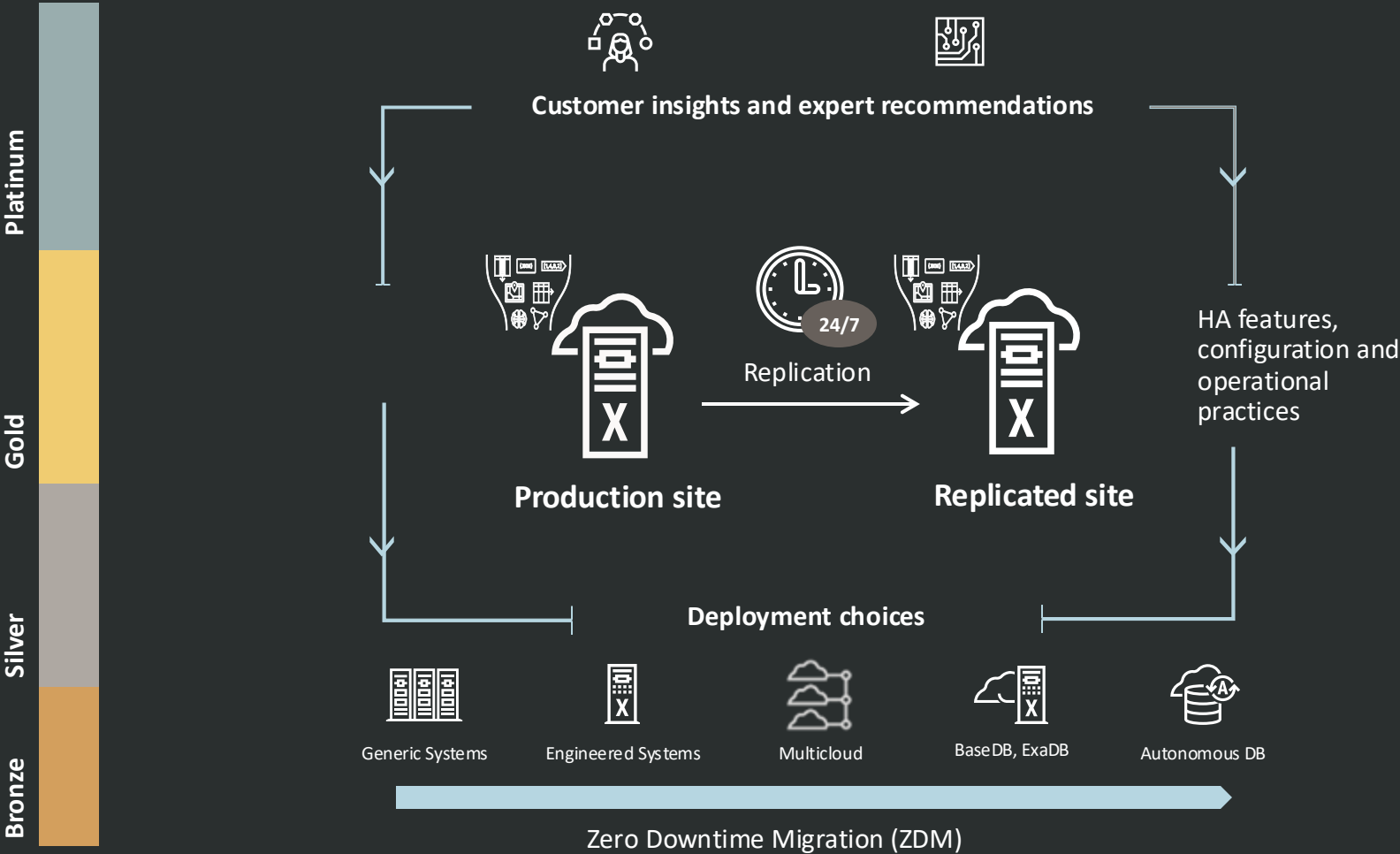


Aligns costs  
with demand

Runs on top of **Real Application Clusters** ♦ Up to **99.995% SLA** ♦ **Zero** regression SLO

# Oracle Maximum Availability Architecture (MAA)

Standard Reference Architectures for Never-Down Deployments



High performance

Resource Management

Database In-Memory

True Cache

Continuous availability

Application Continuity

Online Redefinition

Edition-based Redefinition

Data protection

Flashback

RMAN

ZDLRA+ ZRCV

Active replication

Active Data Guard

Full Stack DR

GoldenGate

Scale out & Lifecycle

RAC

Globally Distributed Database

FPP

Real Application Testing





## 2. Provision OCI database services into your AWS account

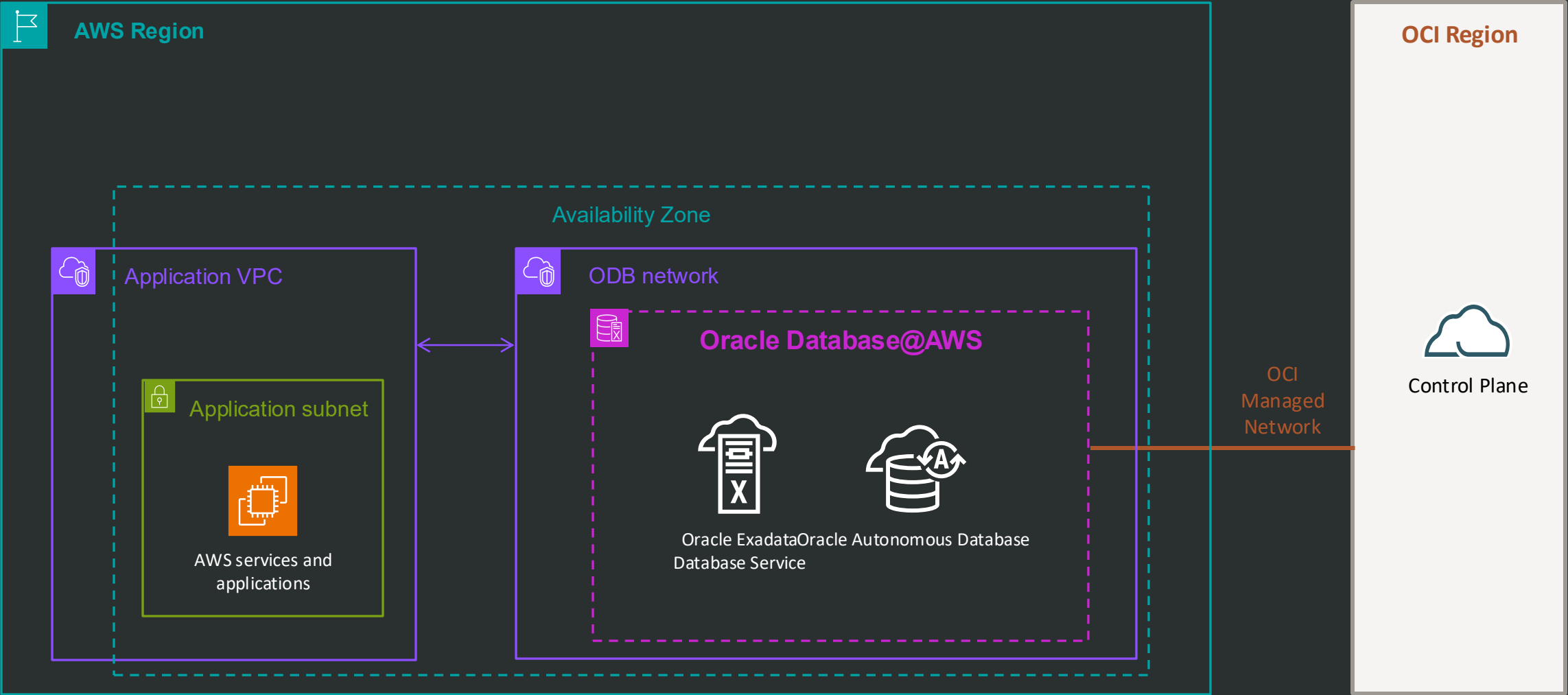
### Provision OCI database services in AWS

- AWS management console, CLI/API, CloudFormation, Terraform
- Control access with AWS Identity and Access Management
- Manage networking with Amazon Virtual Private Cloud
- Log API calls to AWS CloudTrail
- Monitor infrastructure with Amazon CloudWatch

### Manage OCI database services through OCI

- OCI console, CLI/API, Terraform, with identity federation
- Create and manage container and pluggable databases
- Manage backup and restore, Data Guard, OCI integrations

# Oracle Database@AWS architecture



# Create and peer Oracle Database Network

```
aws odb create-odb-network
```

```
--display-name      dev-cluster-odbn  
--availability-zone  us-east-1a  
--client-subnet-cidr 10.23.0.0/24  
--client-subnet-cidr 10.45.0.0/24
```

```
aws odb create-odb-peering-connection
```

```
--odb-network-id      odbnet_abcdef0123  
--peer-network-id      vpc-abcdef0123456789
```

# Deploy Exadata Infrastructure

```
aws odb create-cloud-exadata-infrastructure
--display-name      dev-exainfra
--availability-zone us-east-1a
--shape             Exadata.X11M
--compute-count     2
--storage-count     3
```



# Create VM Clusters on Exadata Infrastructure

```
aws odb create-cloud-vm-cluster
```

```
--display-name          dev-cluster-vmc1  
--cloud-exadata-infrastructure-id exa_abc123  
--odb-network-id        odbnet_abcdef0123  
--cpu-core-count        64  
--ssh-public-keys        ssh-rsa ABC123DEF456
```

```
aws odb create-cloud-autonomous-vm-cluster
```

```
--display-name          dev-cluster-avmc1  
--cloud-exadata-infrastructure-id exa_abc123  
--odb-network-id        odbnet_abcdef0123  
--cpu-core-count-per-node 32
```

# Create databases using OCI console/CLI

```
oci db database create
```

```
--db-home-id      ocid1.dbhome.oc123abc  
--db-name         cdb123
```

```
oci db autonomous-container-database create
```

```
--display-name    acdb123  
--patch-model     RELEASE_UPDATES  
--autonomous-vm-cluster-id ocid1.avmc.oc123abc
```

### 3. Combine the capabilities of Oracle Database 23ai with AWS AI services

#### Oracle Database 23ai

- AI Vector Search
  - **VECTOR()** data type for storing vector embeddings
  - SQL syntax and functions express similarity search with ease
  - Approximate search indexes packaged and tuned for high performance and quality
  - No need to move and synchronize data or manage multiple products

# Oracle AI Vector Search



An AI Vector is a sequence of numbers, called dimensions, that represent the semantic content of a document, image, or video

Developers create a vector for an object by just passing the object to a built-in vectorization function

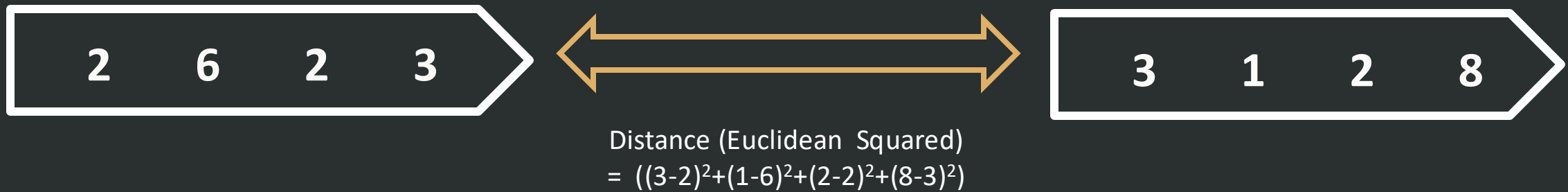
Oracle 23ai natively stores vectors and compares vectors to find objects with similar semantic content





# Oracle AI Vector Search

The main operation on vectors is the **Mathematical Distance** between them



*There are many mathematical distance formulas*

# Store and query vectors in Oracle Database 23ai



## 1. Extend schema

Add a new column of data type **VECTOR()** to store embeddings next to your existing data



## 2. Generate vectors

For each row of existing or new data, call Amazon Bedrock to generate vector embeddings to store in the database



## 3. AI Vector Search

Query product data with SQL, using new **VECTOR\_DISTANCE()** function to find closest matches

# Combine relational and AI search directly in SQL

```
SELECT product_id, title, image_url
FROM product
WHERE image_url is not null
ORDER BY VECTOR_DISTANCE(title_vr, :search_vr)
FETCH FIRST 10 ROWS ONLY;
```

Visit our booth in the Oracle AI World Hub to see the full demo



# Learn more about Oracle Database@AWS

<https://www.oracle.com/cloud/aws/>

Find solutions, pricing, video demos, documentation, or connect with a specialist and sign up

## **Visit our booth in the Oracle AI World Hub**

Chat with product experts and explore Oracle Cloud Infrastructure and our Multicloud offerings

**See the full Empower Your Data demo**

## **Visit the AWS booth in the Oracle AI World Hub**

Connect with our AWS partners and learn more

**Your feedback is important.**

**Scan this QR Code or use the  
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