ORACLE

Oracle Cloud DBA

Lear how to stay up to date on this Dbaas era – Day 3

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

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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)

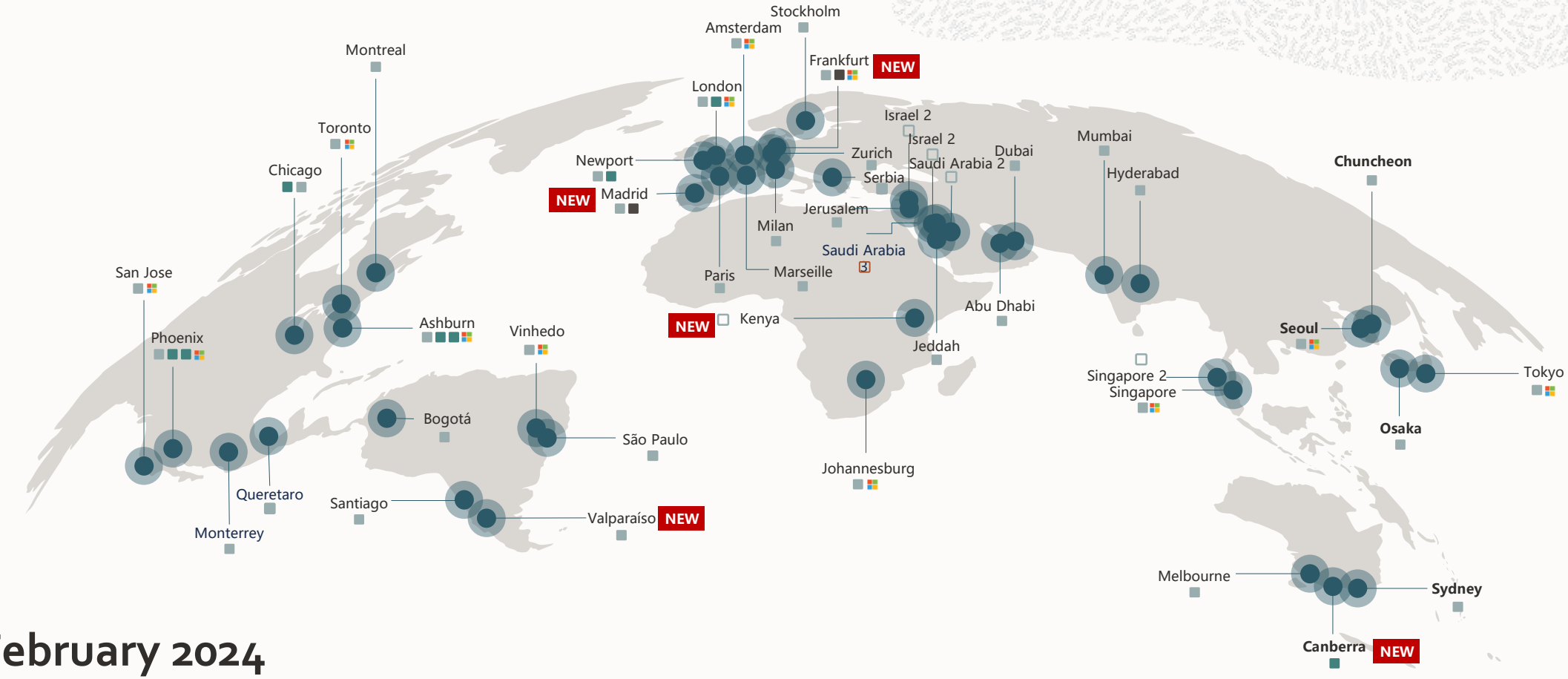
- Grid/RAC Database Administrator 11g
- Oracle Golden Gate 12c Certified Implementation Specialist

Agenda

1. Oracle OCI Database Data Guard
2. Oracle Database Pathing and Upgrade
3. OCI MySQL Database service
4. OCI PostgreSQL Database service
5. OCI License Manager concepts

OCI Cloud Region Maps

Oracle Cloud Infrastructure Global Footprint

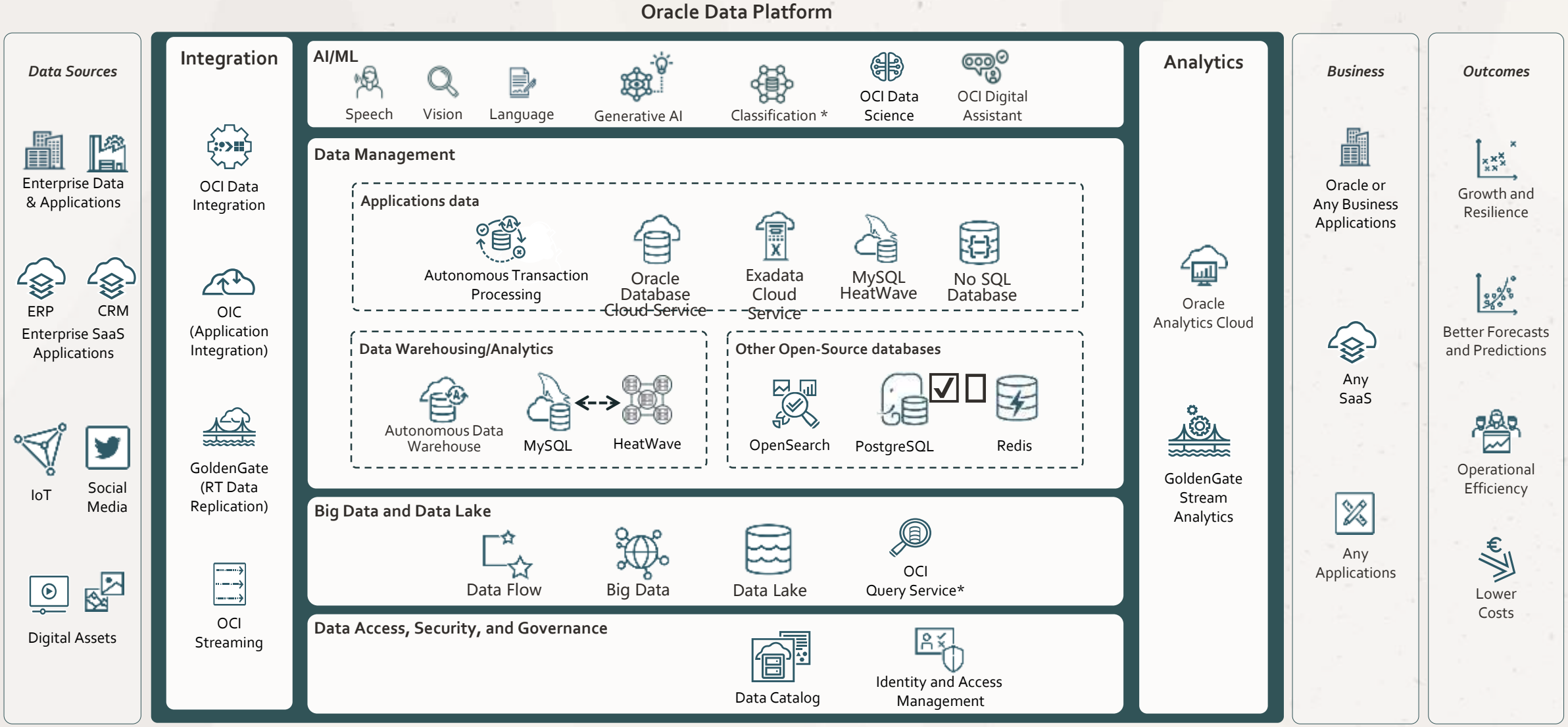


February 2024

48 regions; 5 more planned

12 Azure Interconnect Regions

Oracle Data Platform: A complete suite of services

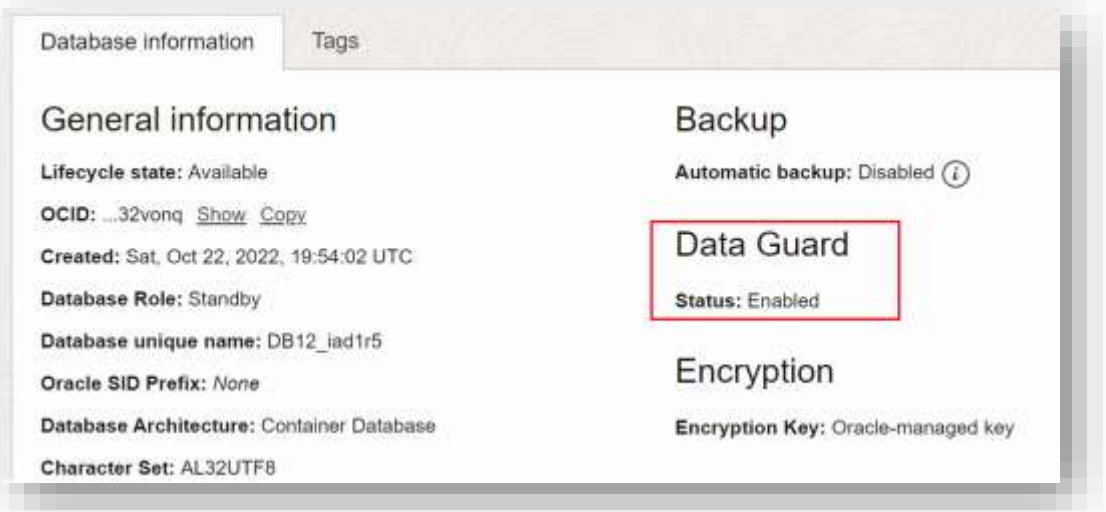


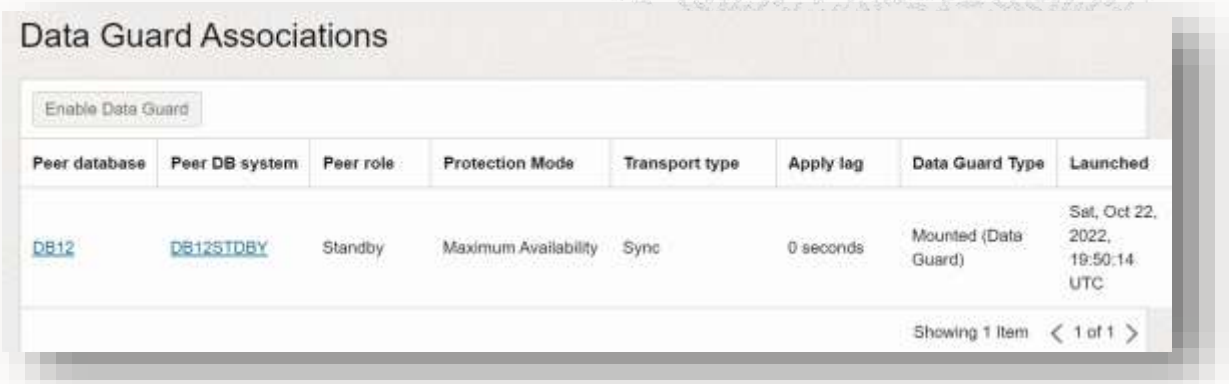
MAA OCI Data Guard

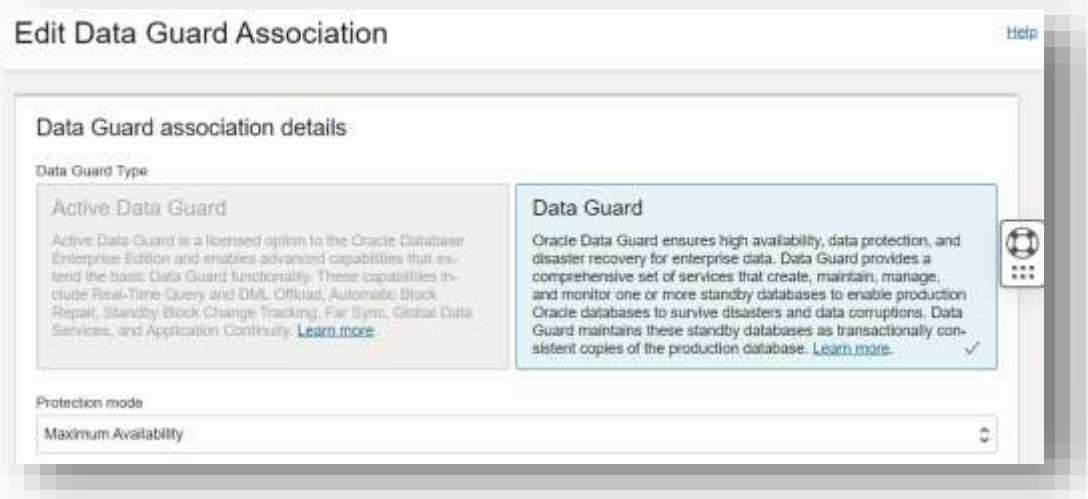
OCI Active Data Guard VS Data Guard

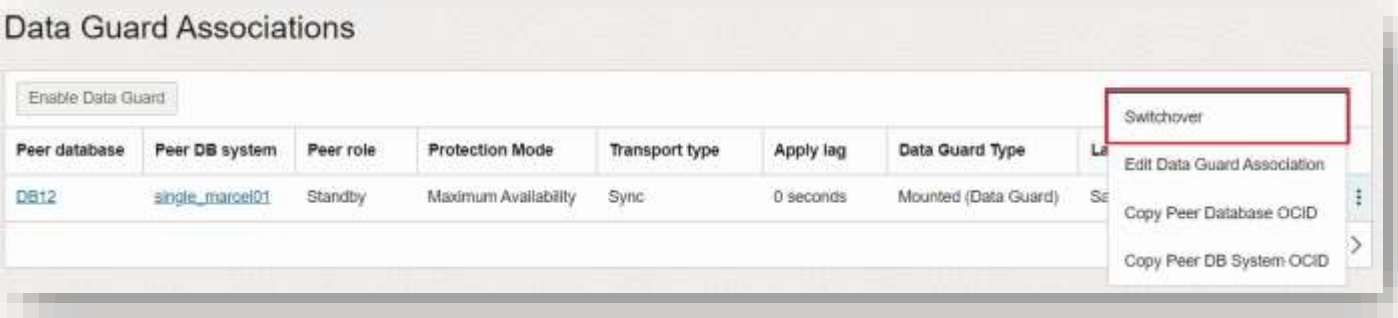
- Data Guard and Active Data Guard provide disaster recovery (DR) for databases with recovery time objectives (RTO) that cannot be met by restoring from backup.
- **Active Data Guard extends Data Guard capabilities** by providing advanced features for data protection and availability as well as **offloading read-only workload and fast incremental backups** from a production database. Active Data Guard is included in the Extreme Performance Edition and Exadata Service.
- To configure a Data Guard **system across regions or between on-premises** and Oracle Cloud Infrastructure DB systems, you must access the database host directly and use the **DGMGRL utility.**
- Oracle recommends that the DB system of **the standby database be in a different availability domain.**
- The standby databases in Oracle Cloud Infrastructure Database are physical standbys

Oracle OCI Physical Data Guard Console Management









Oracle OCI Data Guard Network Requirements

Avoid security know issues during physical OCI Data Guard provisioning

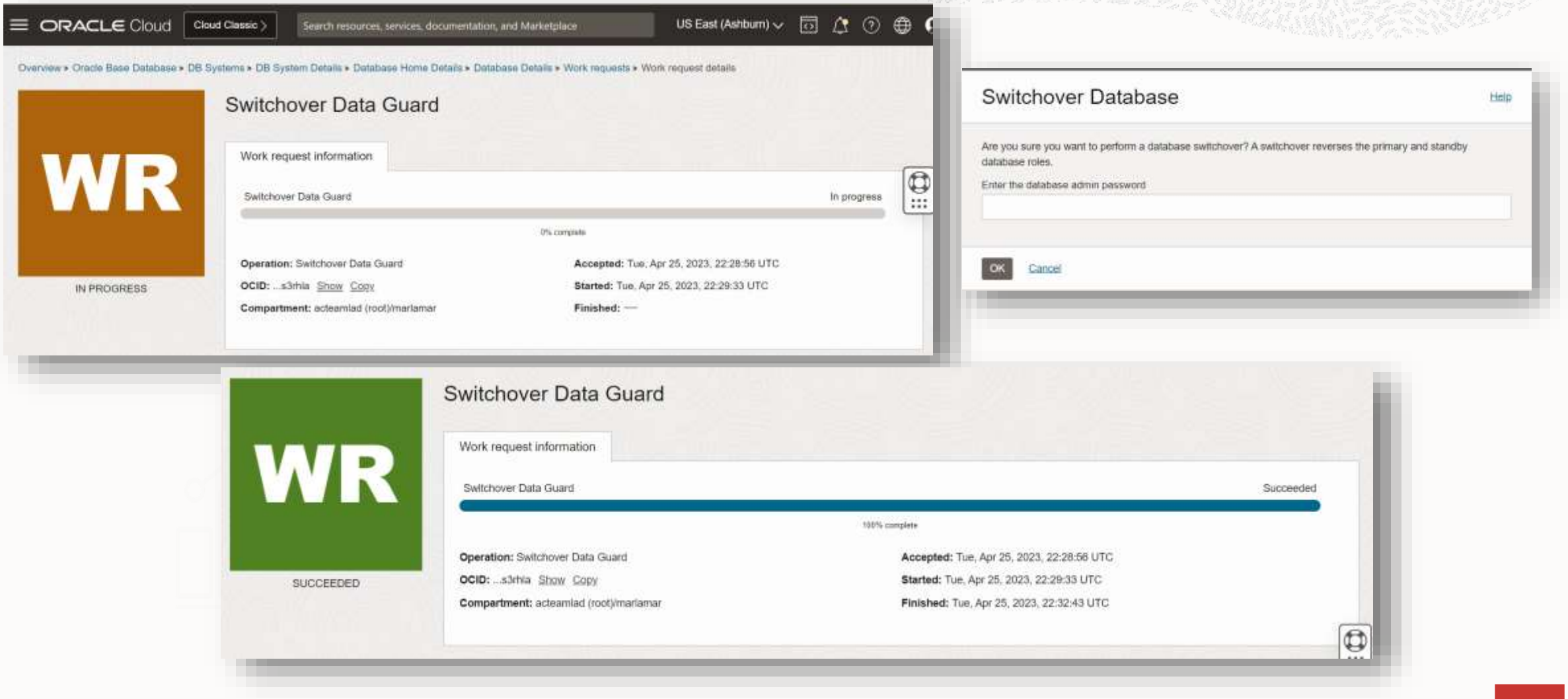
- **Properly configure the security list ingress and egress rules** for the subnets of both DB systems in the Data Guard association to allow TCP traffic to flow between the applicable ports. **Ensure that the rules you create are stateful (the default**).

- **The egress rules in the example show how to enable** TCP traffic only for port 1521, which is a minimum requirement for Data Guard to work. If TCP traffic is already enabled on all of your outgoing ports (0.0.0.0/0), then you need not explicitly add these specific egress rules. Service Gateway can provide NW connectivity.

Rules(Prod)	Stateless	Source	IP Protocol	Source Port	Dest Port
Ingress	No	10.0.01.0/24	TCP	All	1521
Egress	No	10.0.1.0/24	TCP	All	1521
Rules(Sby)	Stateless	Source	IP Protocol	Source Port	Dest Port
Ingress	No	10.0.0.0/24	TCP	All	1521
Egress	No	10.0.0.0/24	TCP	All	1521

Avoid Data Guard Provisioning Error | Change Ingress and Egress roles

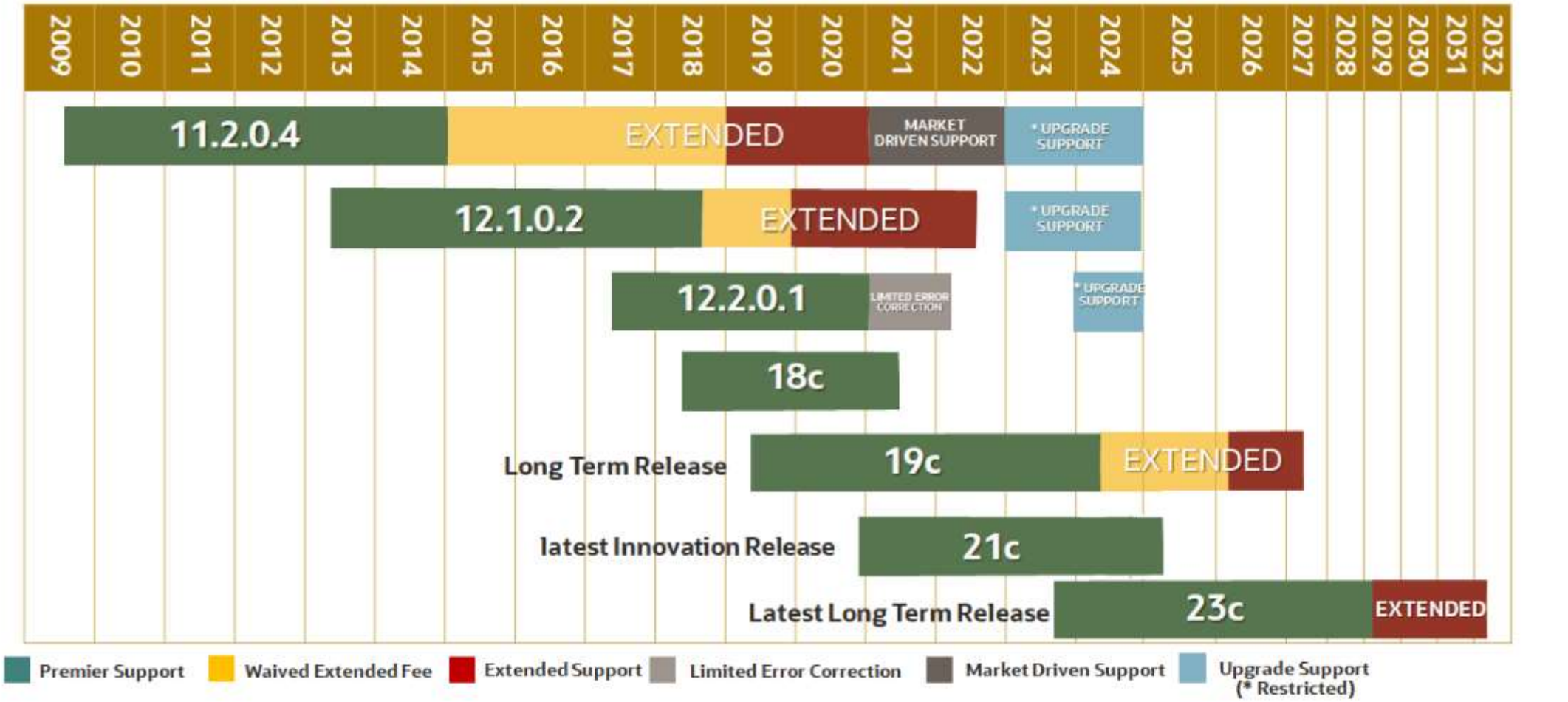
VM Data Guard Switchover through OCI Console



Oracle Database version timeline

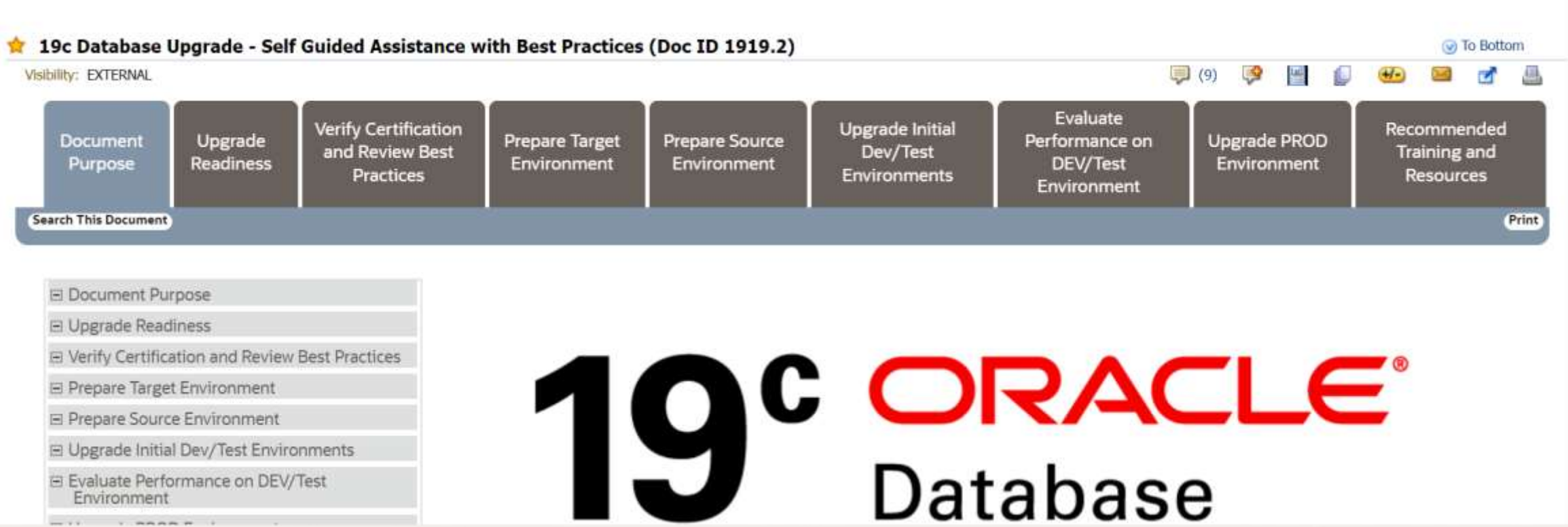
Oracle Database Releases and timeline

My Oracle Support Official Note (Doc ID 742060.1)



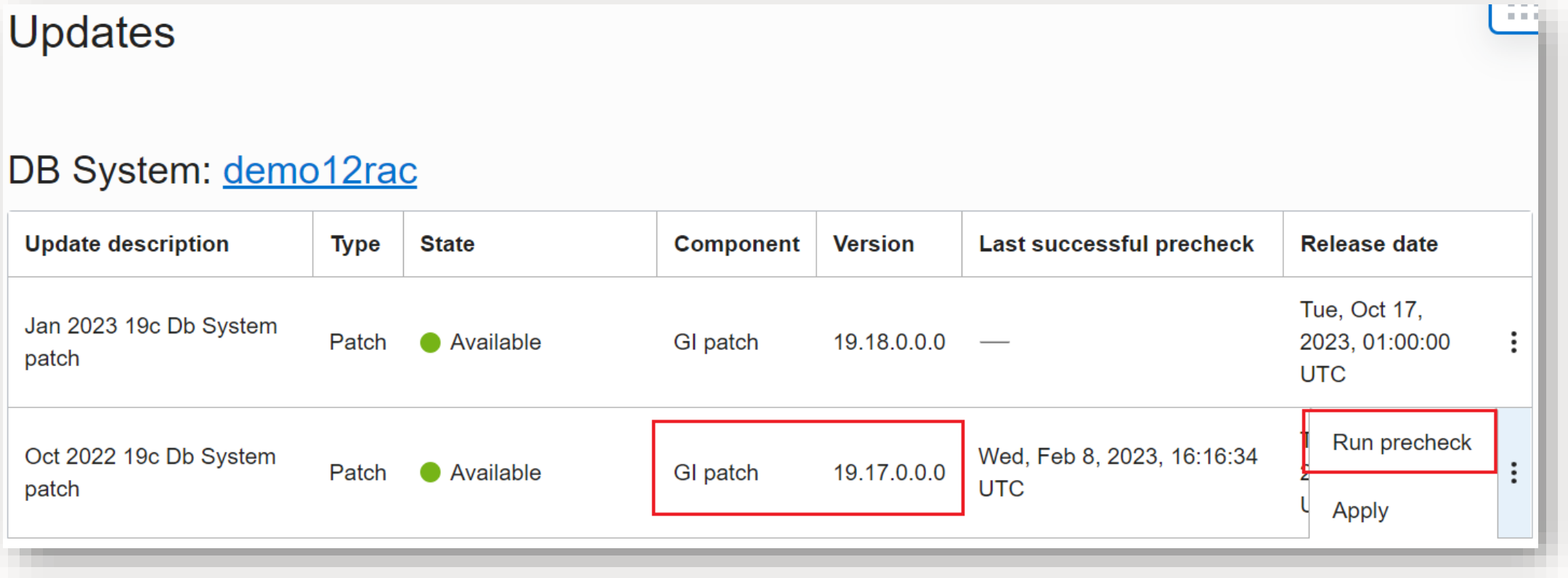
Upgrade your Oracle database to 19c

19c Database Upgrade - Self Guided Assistance with Best Practices (Doc ID 1919.2)



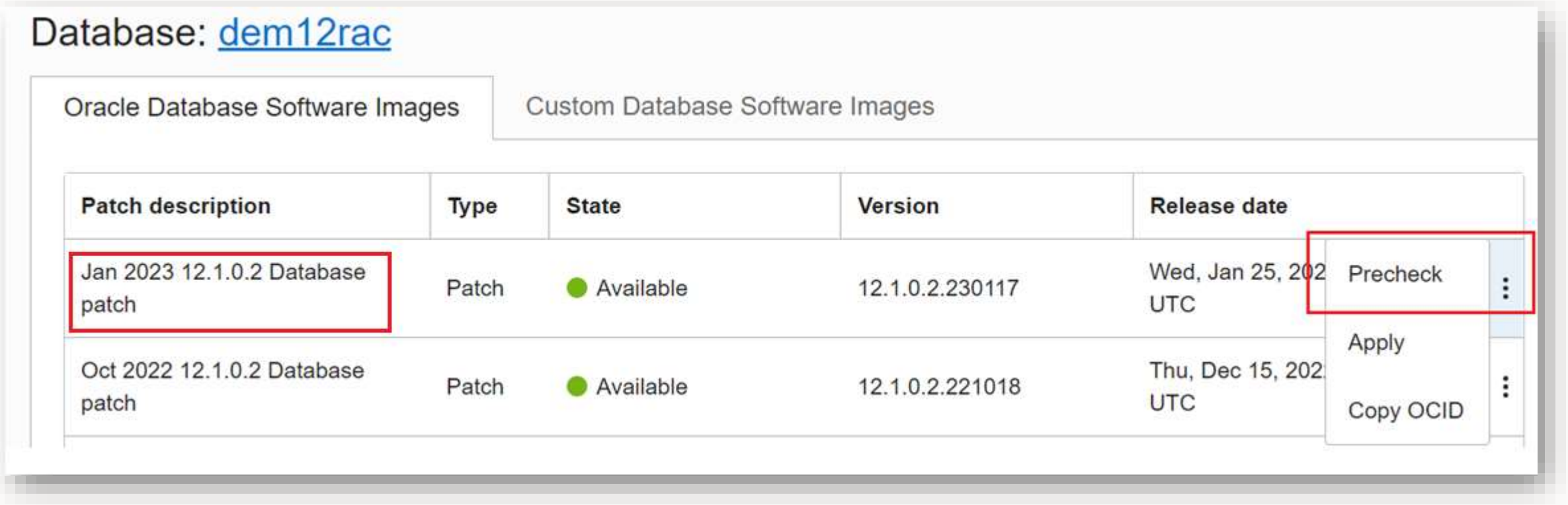
OCI DBCS Grid Patching

Pre check through OCI Console before change any bundle patch version



OCI VM System DBCS | Oracle Home Patching Precheck

Pre check through OCI Console



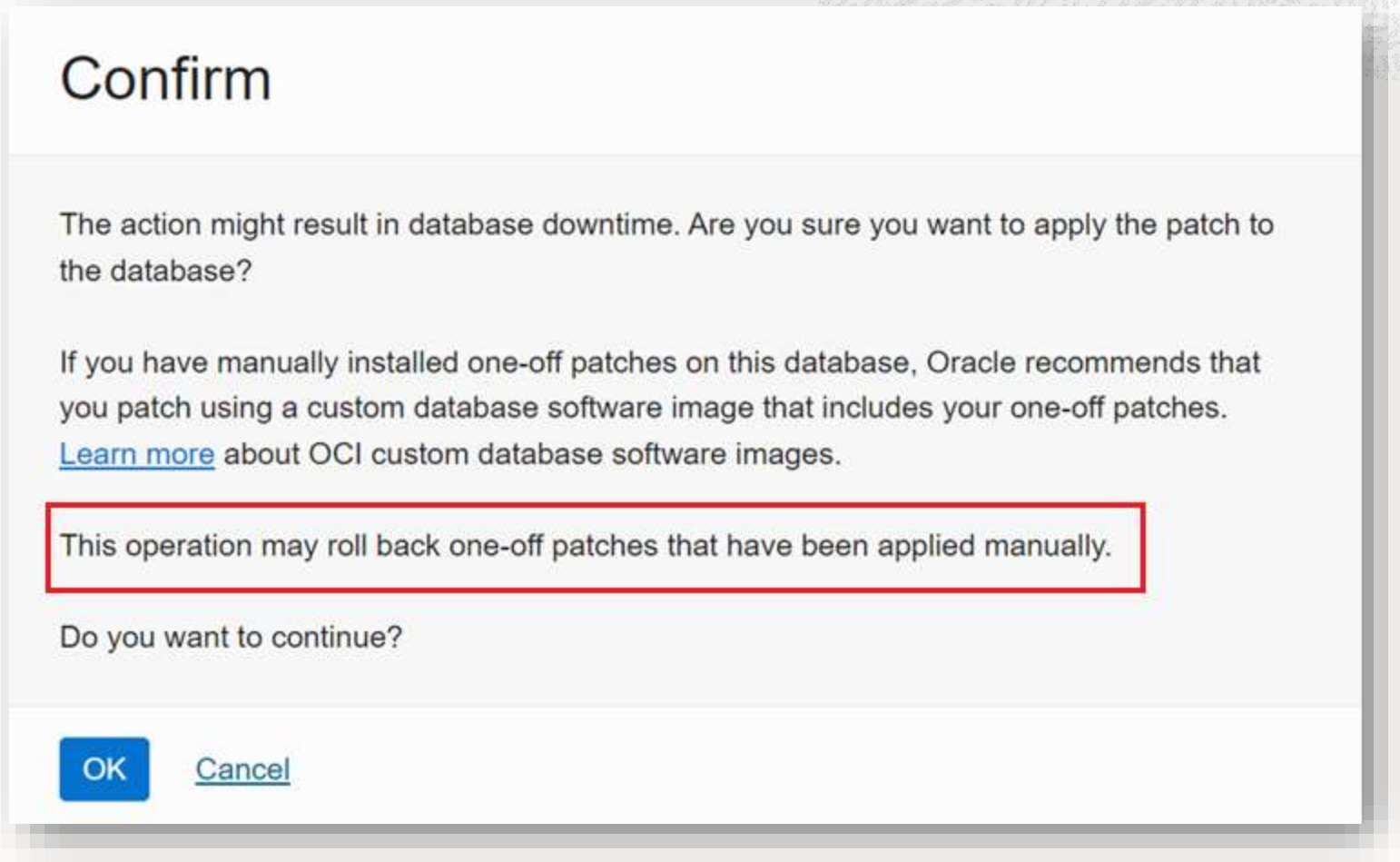
OCI VM System DBCS | RAC Grid Patching in rolling mode

For a DBCS RAC environment a Grid patch will run in rolling format

```
[grid@demo12crac2 ~]$ crsctl stat res -t
--------------------------------------------------------------------------------
Name           Target  State        Server                   State details
--------------------------------------------------------------------------------
Local Resources
--------------------------------------------------------------------------------
ora.DATA.COMMONSTORE.advm
               ONLINE  ONLINE       demo12crac2              STABLE
ora.LISTENER.lsnr
               ONLINE  ONLINE       demo12crac2              STABLE
ora.chad
               ONLINE  ONLINE       demo12crac2              STABLE
ora.data.commonstore.acfs
               ONLINE  ONLINE       demo12crac2              mounted on /opt/orac
                                                             le/dcs/commonstore,S
                                                             TABLE
ora.net1.network
               ONLINE  ONLINE       demo12crac2              STABLE
ora.ons
               ONLINE  ONLINE       demo12crac2              STABLE
ora.proxy_advm
               ONLINE  ONLINE       demo12crac2              STABLE
--------------------------------------------------------------------------------
Cluster Resources
--------------------------------------------------------------------------------
```

OCI DBCS Oracle Home | One-off Patch Messages

Check if you have one-off patch installed before any database patch activity



Patching Concepts | Out-Of-Place Patching

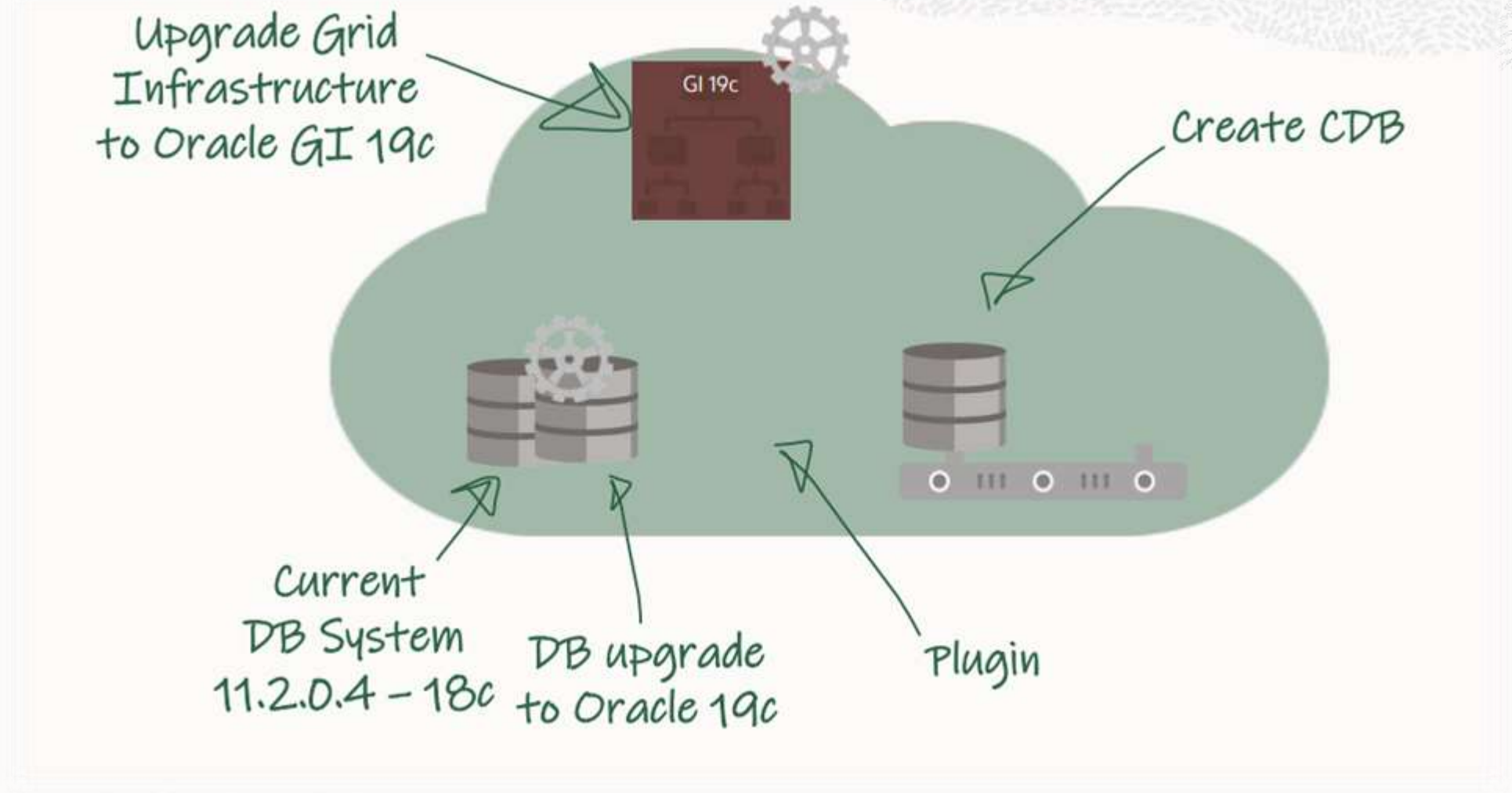
Oracle Home, 19.18.0

```
SQL> SHUTDOWN IMMEDIATE
```

```
# DATAPATCH
```

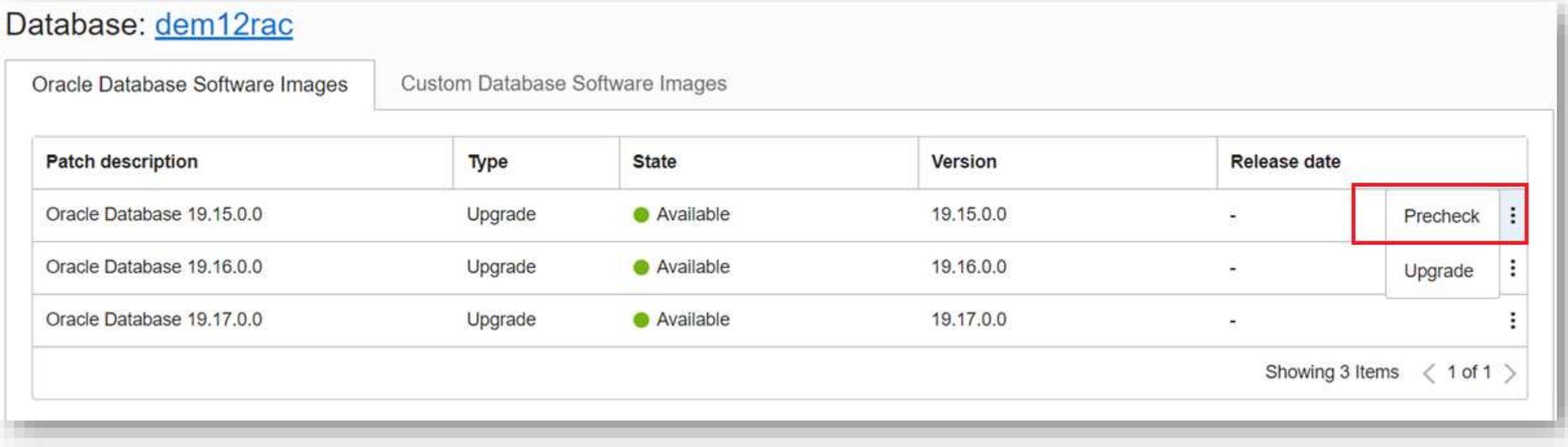
New Oracle Home, 19.20.0

Oracle Database | Upgrade Your Database to 19c



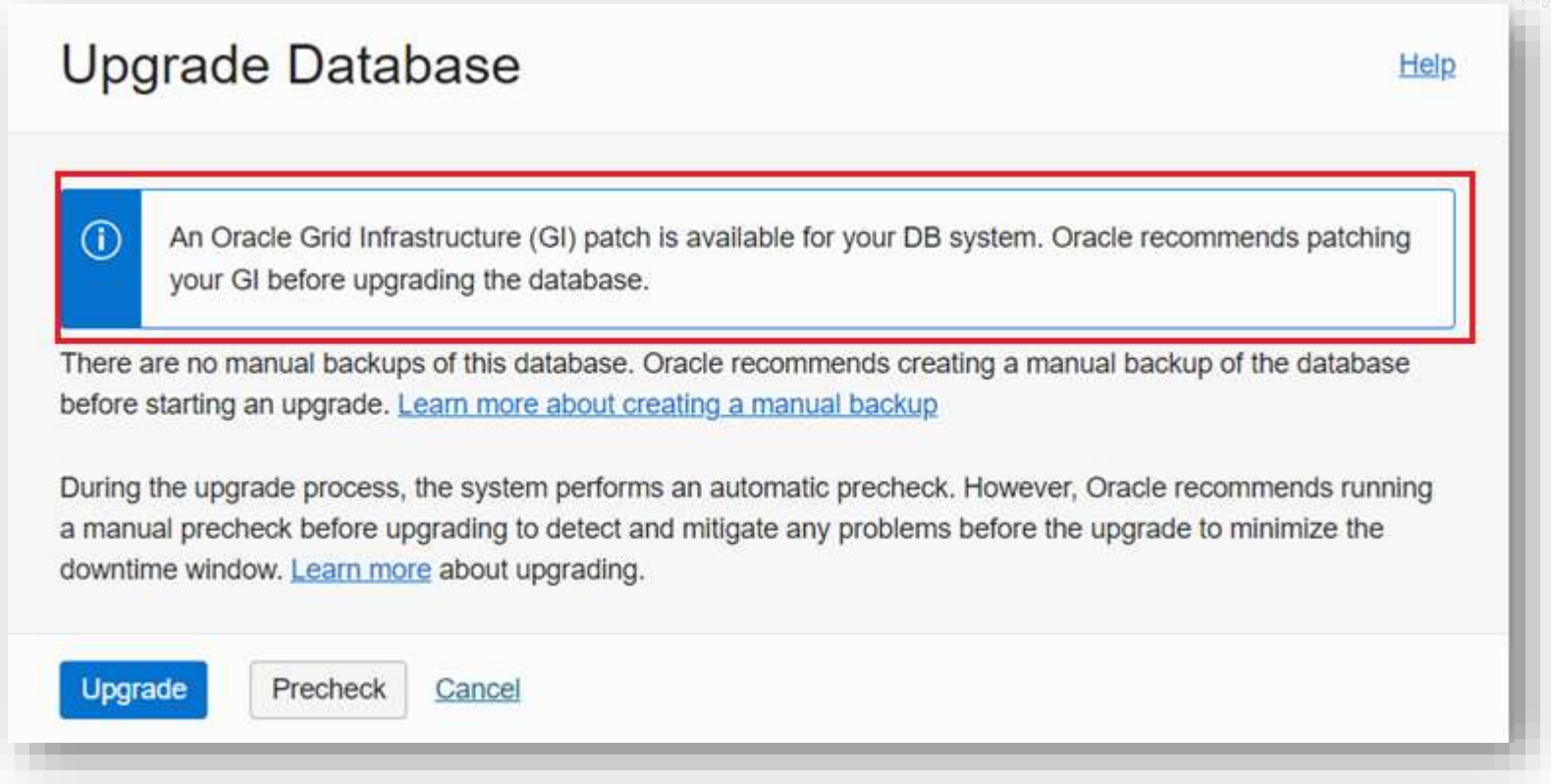
OCI VM System DBCS Upgrade Precheck

Oracle Database 19c Upgrade pre check using OCI console



OCI VM System DBCS | Upgrade Database

It’s recommended to update Gris Home first Oracle Database Upgrade



OCI VM System DBCS - Upgrade Pre check

Oracle Database 19c Upgrade pre check using OCI console

Work requests

Operation	State	% complete	Accepted	Started	Finished
Upgrade Database	In progress	0%	Sun, Feb 12, 2023, 12:52:22 UTC	Sun, Feb 12, 2023, 12:52:31 UTC	—
Patch DB Home	Succeeded	100%	Wed, Feb 8, 2023, 20:52:17 UTC	Wed, Feb 8, 2023, 20:52:46 UTC	Wed, Feb 8, 2023, 21:51:01 UTC
Patch DB Home	Succeeded	100%	Wed, Feb 8, 2023, 14:17:47 UTC	Wed, Feb 8, 2023, 14:17:59 UTC	Wed, Feb 8, 2023, 14:29:11 UTC
Create DB System	Succeeded	100%	Wed, Feb 8, 2023, 00:27:28 UTC	Wed, Feb 8, 2023, 00:27:52 UTC	Wed, Feb 8, 2023, 04:47:36 UTC

Showing 4 Items 1 of 1

OCI VM System DBCS - Grid Patching check

Current Database and Grid home using dbcli tool

```
SQL> select COMP_NAME, VERSION, STATUS from dba_registry;

COMP_NAME                                VERSION         STATUS
---------------------------------------- --------------- ---------------------
Oracle Database Catalog Views            19.0.0.0.0      VALID
Oracle Database Packages and Types       19.0.0.0.0      VALID
JServer JAVA Virtual Machine             19.0.0.0.0      VALID
Oracle XDK                               19.0.0.0.0      VALID
Oracle Database Java Packages            19.0.0.0.0      VALID
OLAP Analytic Workspace                  19.0.0.0.0      VALID
Oracle Real Application Clusters         19.0.0.0.0      VALID
Oracle XML Database                      19.0.0.0.0      VALID
Oracle Workspace Manager                 19.0.0.0.0      VALID
Oracle Text                              19.0.0.0.0      VALID
Oracle Multimedia                        19.0.0.0.0      VALID
Spatial                                  19.0.0.0.0      VALID
Oracle OLAP API                          19.0.0.0.0      VALID
Oracle Label Security                    19.0.0.0.0      VALID
Oracle Database Vault                    19.0.0.0.0      VALID

15 rows selected.

SQL>
```

OCI DBCS Compatible Database Parameter

Only change database compatible database when you are sure rollback is not necessary

```
Connected to:
Oracle Database 19c EE Extreme Perf Release 19.0.0.0.0 - Production

SQL> show parameter compatible

NAME                                 TYPE        VALUE
------------------------------------ ----------- ------------------------------
compatible                           string      12.1.0.2
noncdb_compatible                    boolean     FALSE
```

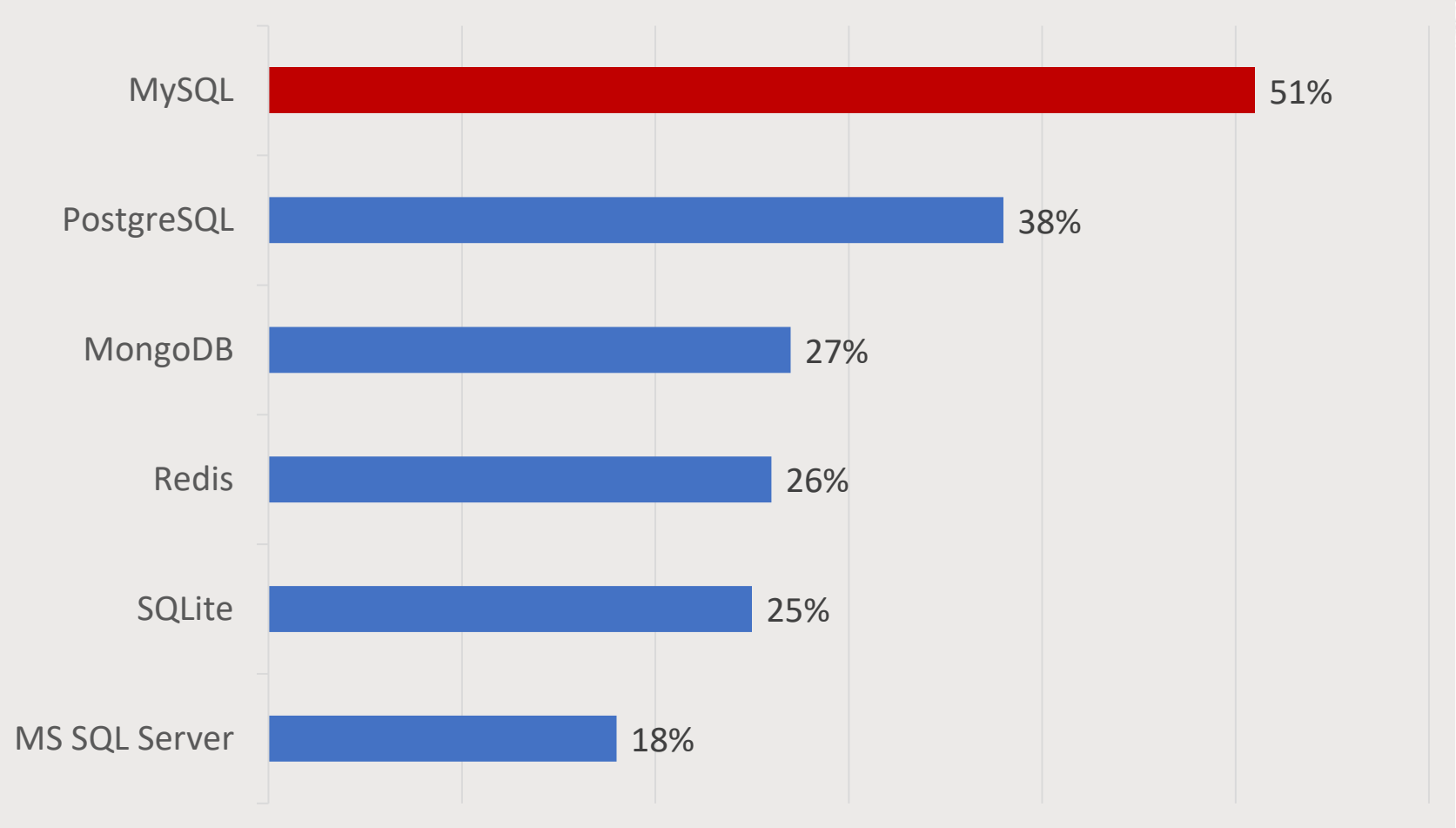
MySQL Database Service

MySQL is the #1 Open Source Database

Rank			DBMS	Database Model	
Dec 2023	Nov 2023	Dec 2022			Dec 2023
1.	1.	1.	Oracle	Relational, Multi-model	1257.41
2.	2.	2.	MySQL	Relational, Multi-model	1126.64
3.	3.	3.	Microsoft SQL Server	Relational, Multi-model	903.83
4.	4.	4.	PostgreSQL	Relational, Multi-model	650.90
5.	5.	5.	MongoDB	Document, Multi-model	419.15

DB-ENGINES

MySQL is the most popular database for developers



Innovative organizations across many industries run MySQL – Do you?

Social

facebook

LinkedIn

WeChat

Pinterest

E-Commerce

Booking.com

NETFLIX

UBER

airbnb

淘宝网 Taobao.com

阿里巴巴 Alibaba.com

Tech

APPDYNAMICS part of Cisco

GitHub

HubSpot

zendesk

intuit mint

New Relic.

Finance

Bank of America

J.P.Morgan

citi

Fidelity INVESTMENTS

VISA

CA

Manufacturing

TESLA

TOYOTA

CAT

MySQL Community VS Enterprise

MySQL Enterprise Edition

ORACLE

MySQL Community

Database Core

DB Engine (InnoDB), Replication, High Availability, Partitioning

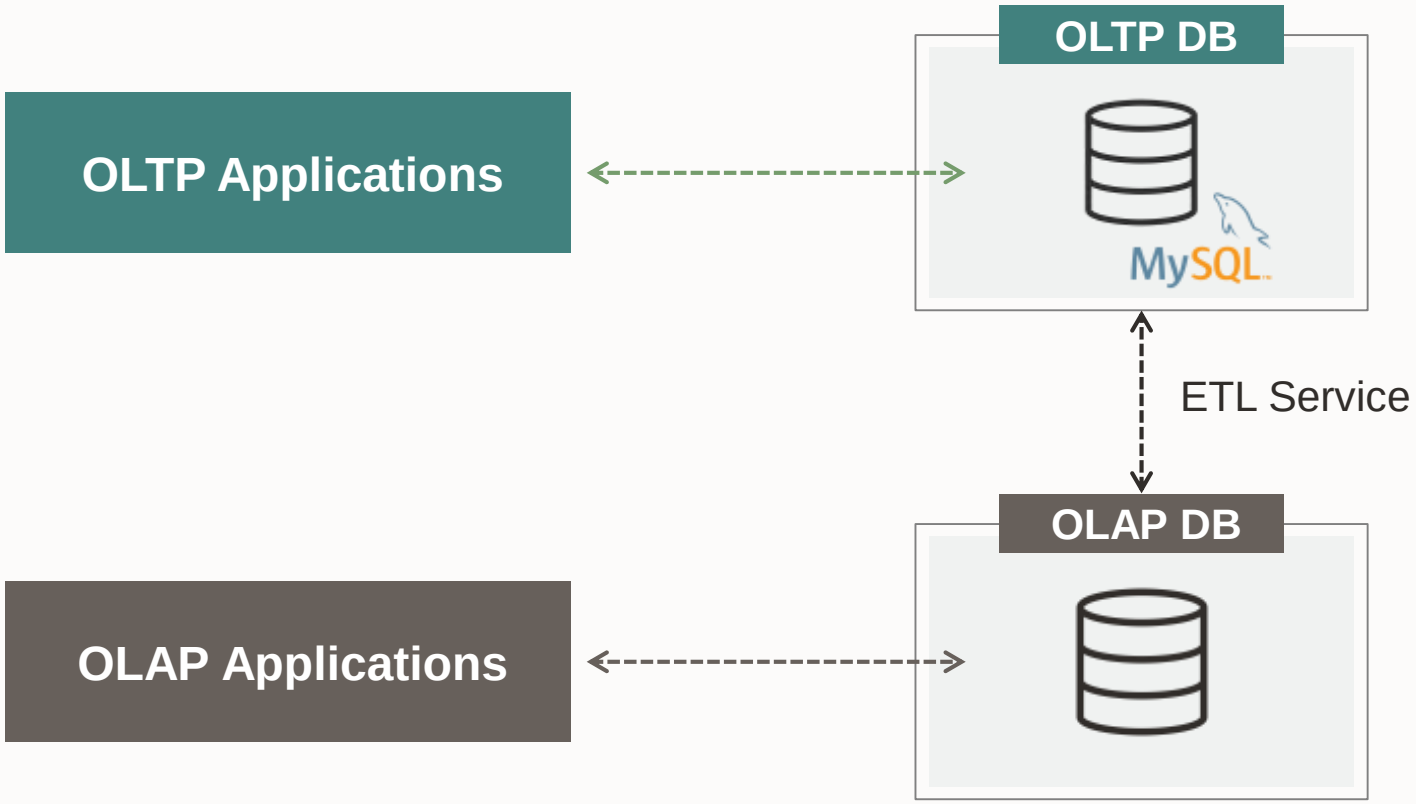
Premier Support

Enterprise Monitor

Encryption
Masking

Thread Pool

MySQL is optimized for OLTP, not designed for analytic processing



Separate analytics database

Complex ETL

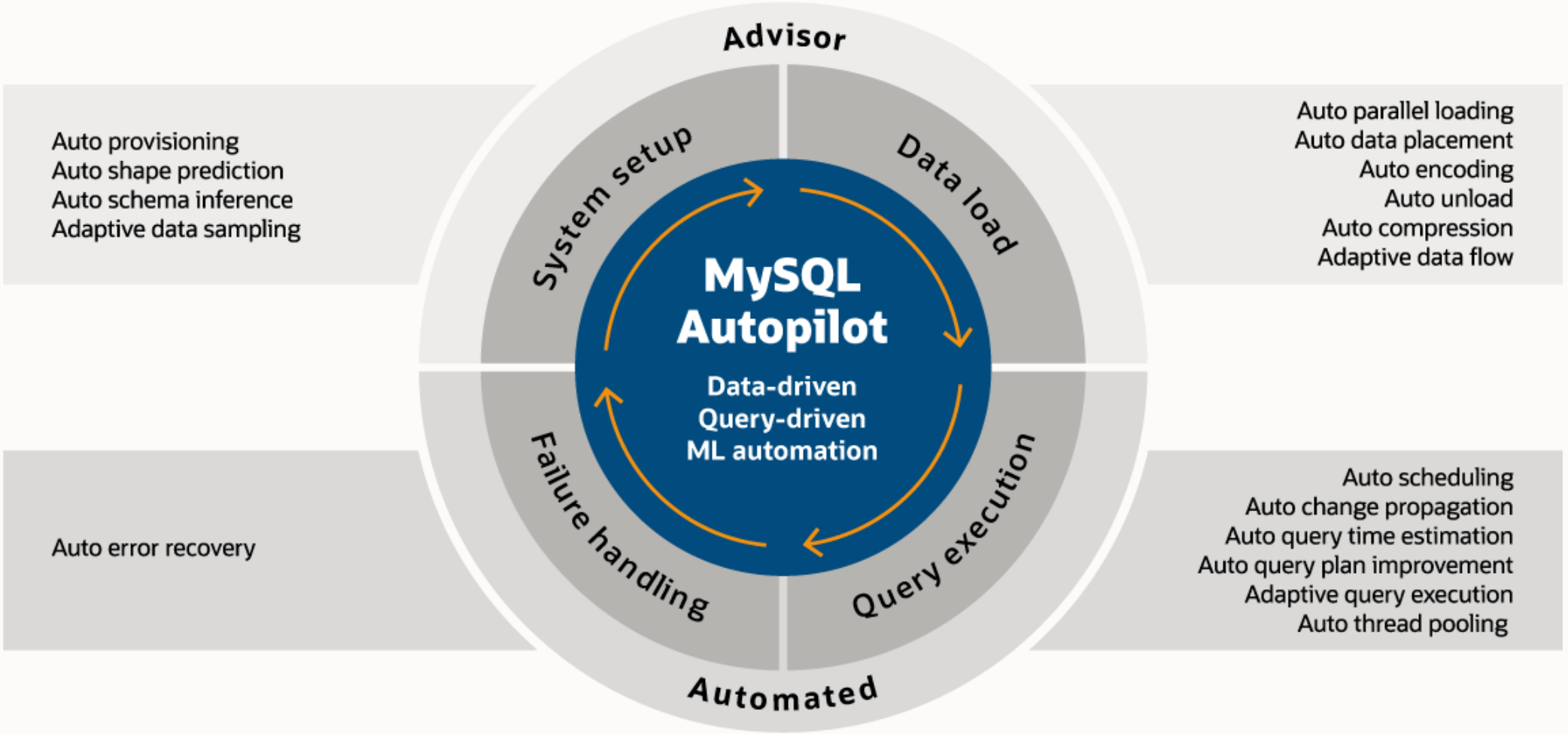
No real-time analytics

Security & compliance risks

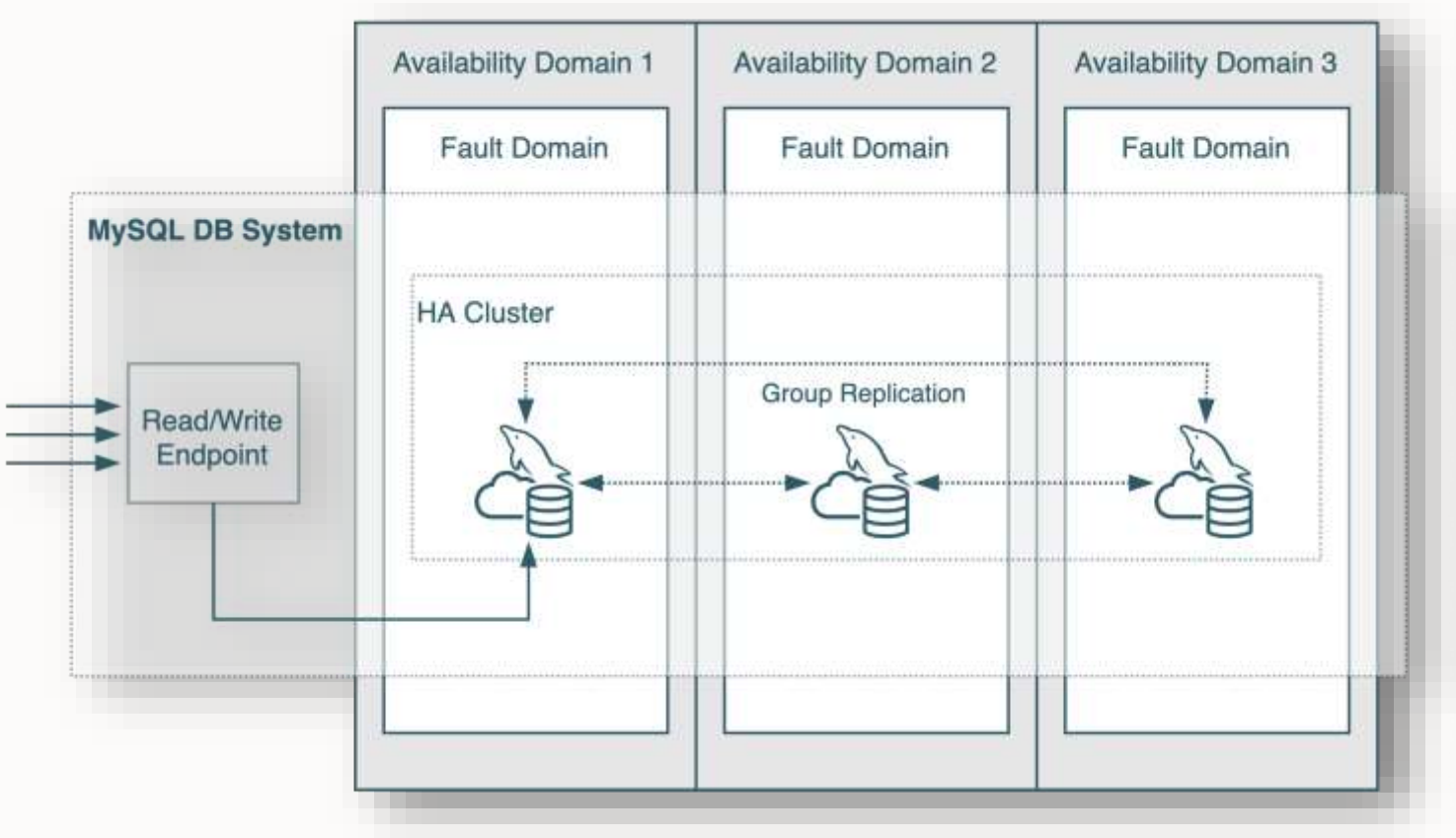
Increased costs

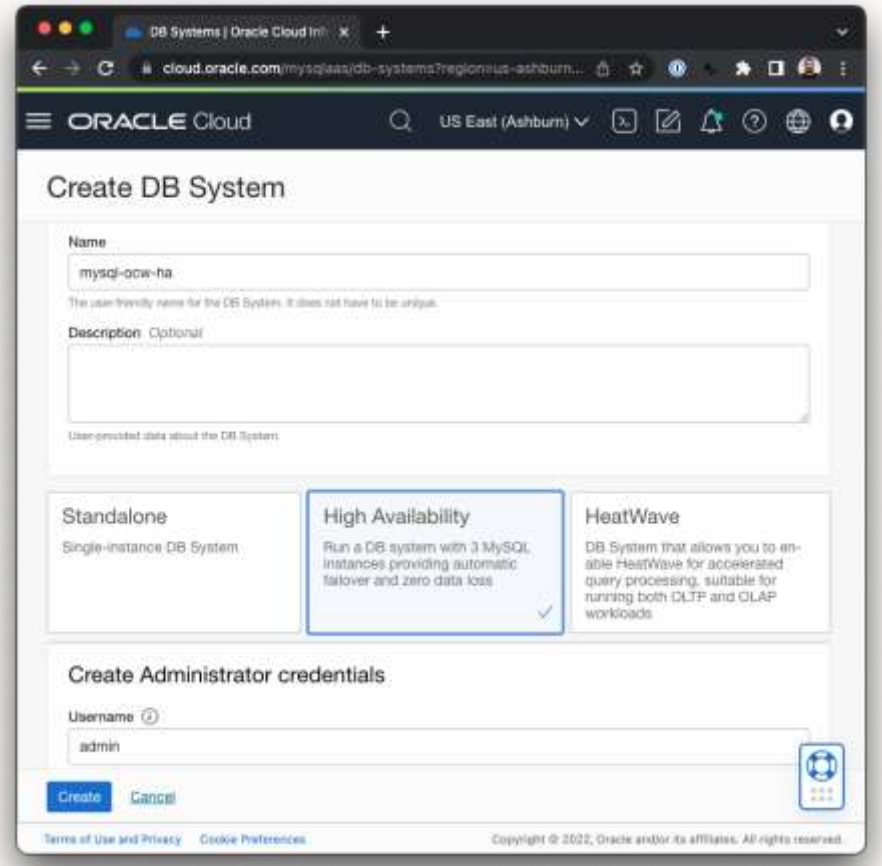
Machine learning-powered automation for MySQL HeatWave

High query performance at scale, higher OLTP throughput, and the best price performance

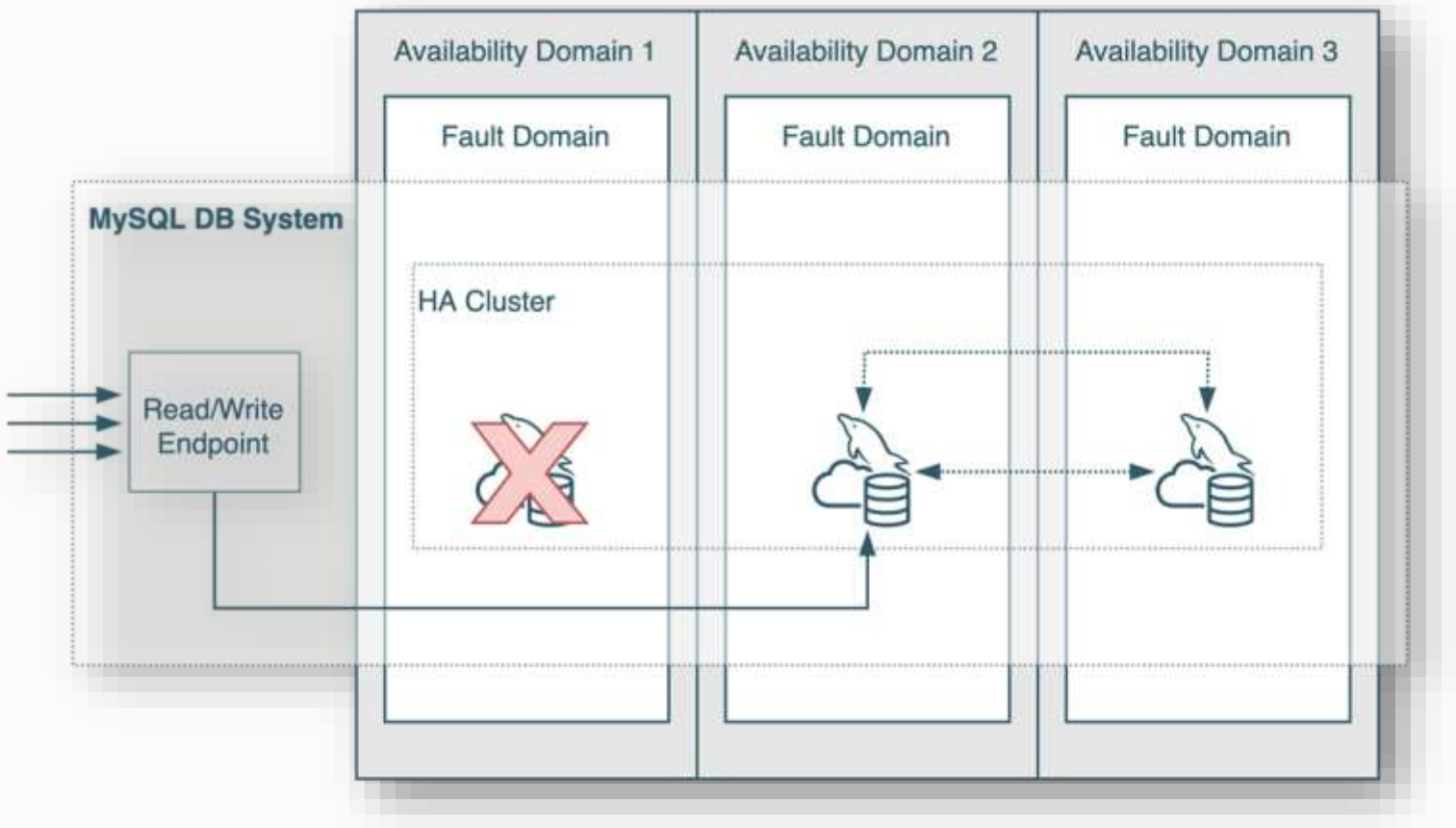


High Availability



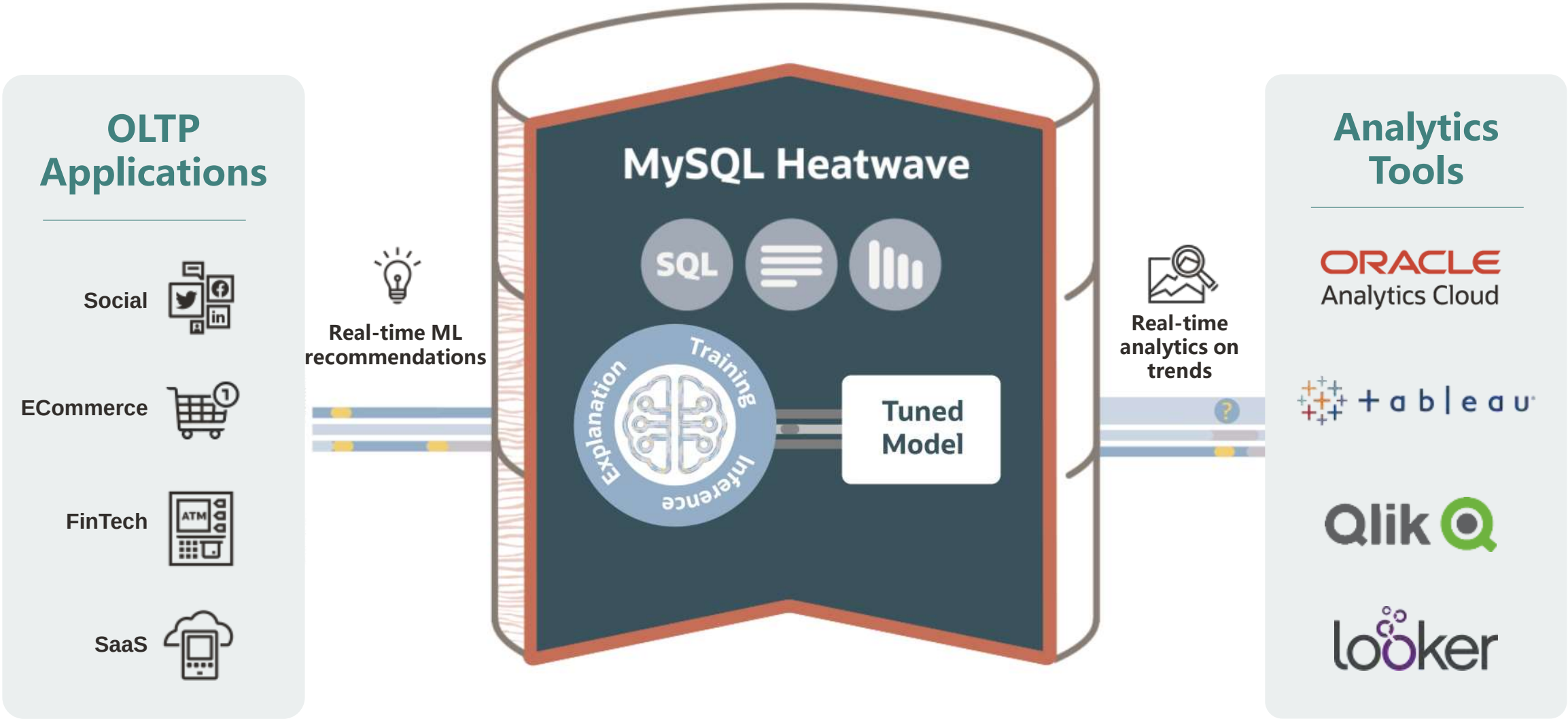


High Availability

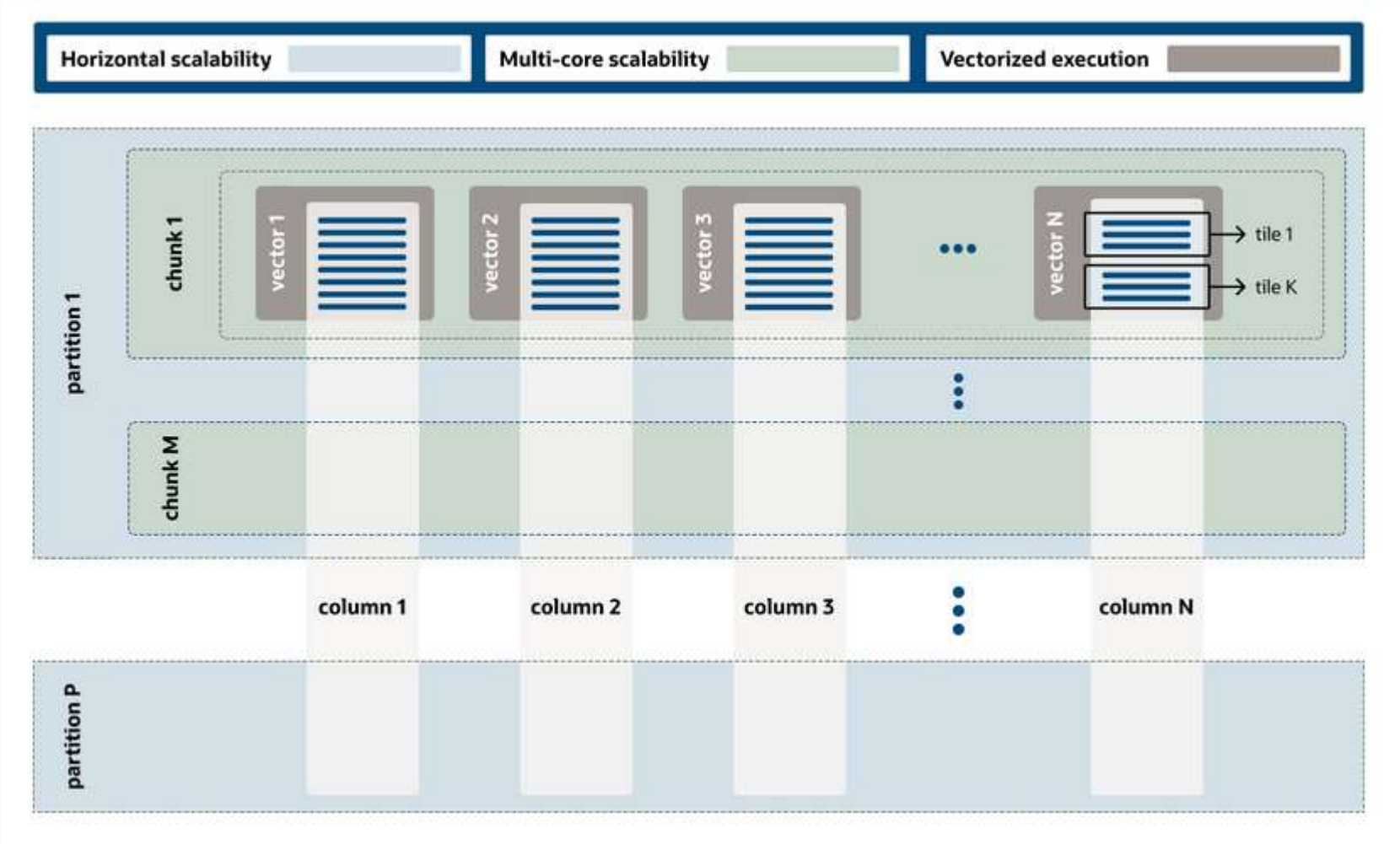


- SLA 99.99%
- Automatic failover
- Manual switchover
- Rolling upgrades during maintenance
  - Less than 1 minute impact
  - MySQL version upgrades and OS security patches
- RPO: 0
- RTO: Less than a minute

Machine learning em ação junto com MySQL HeatWave

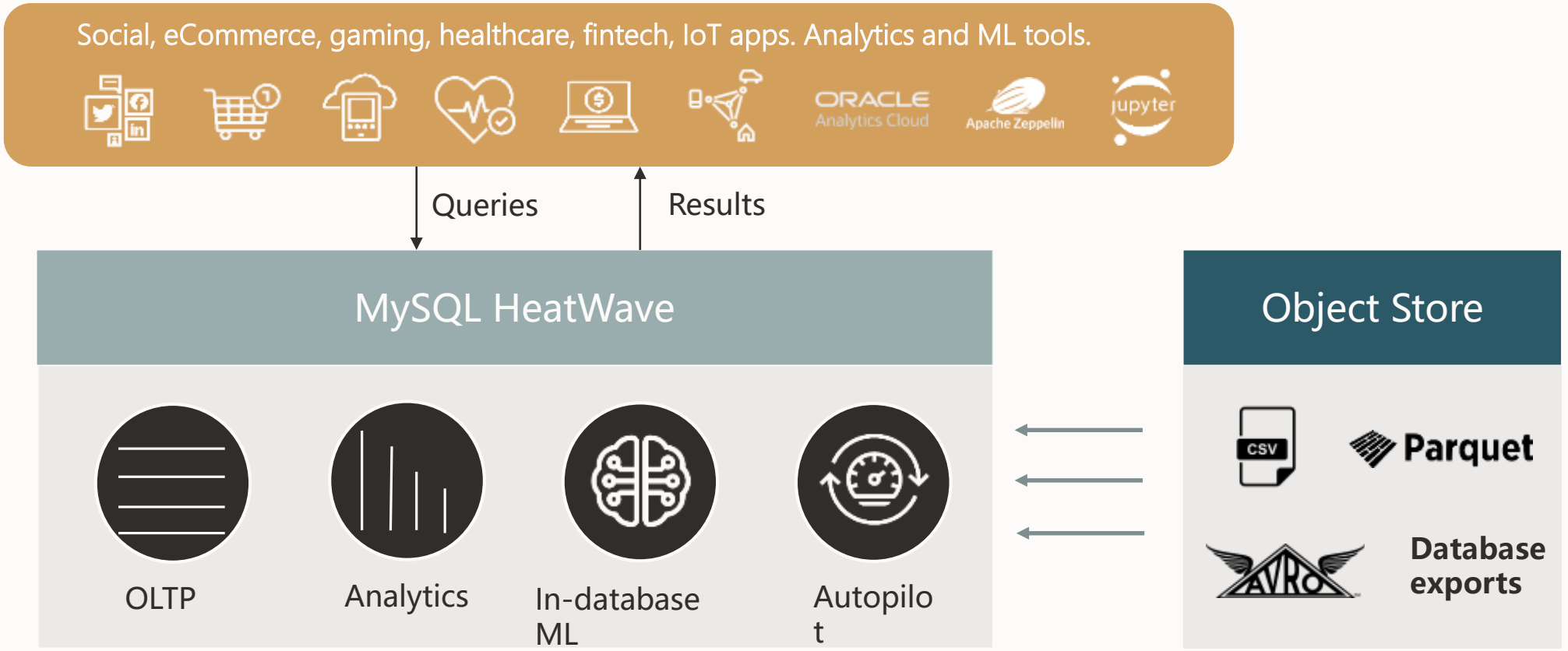


In-Memory hybrid Heatwave columnar Format



MySQL HeatWave overview

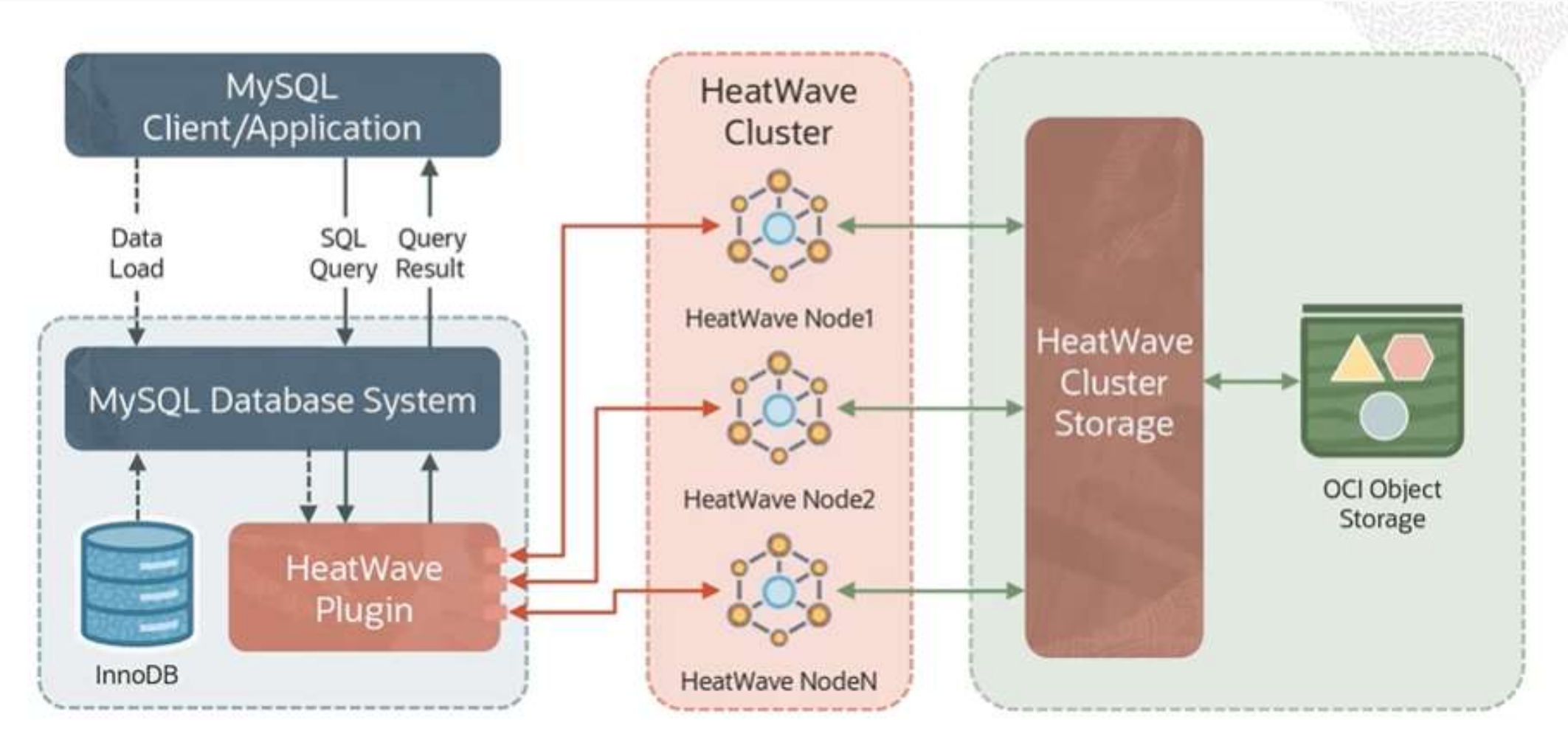
Transactions, real-time analytics across data warehouse and data lake, and machine learning in one database service



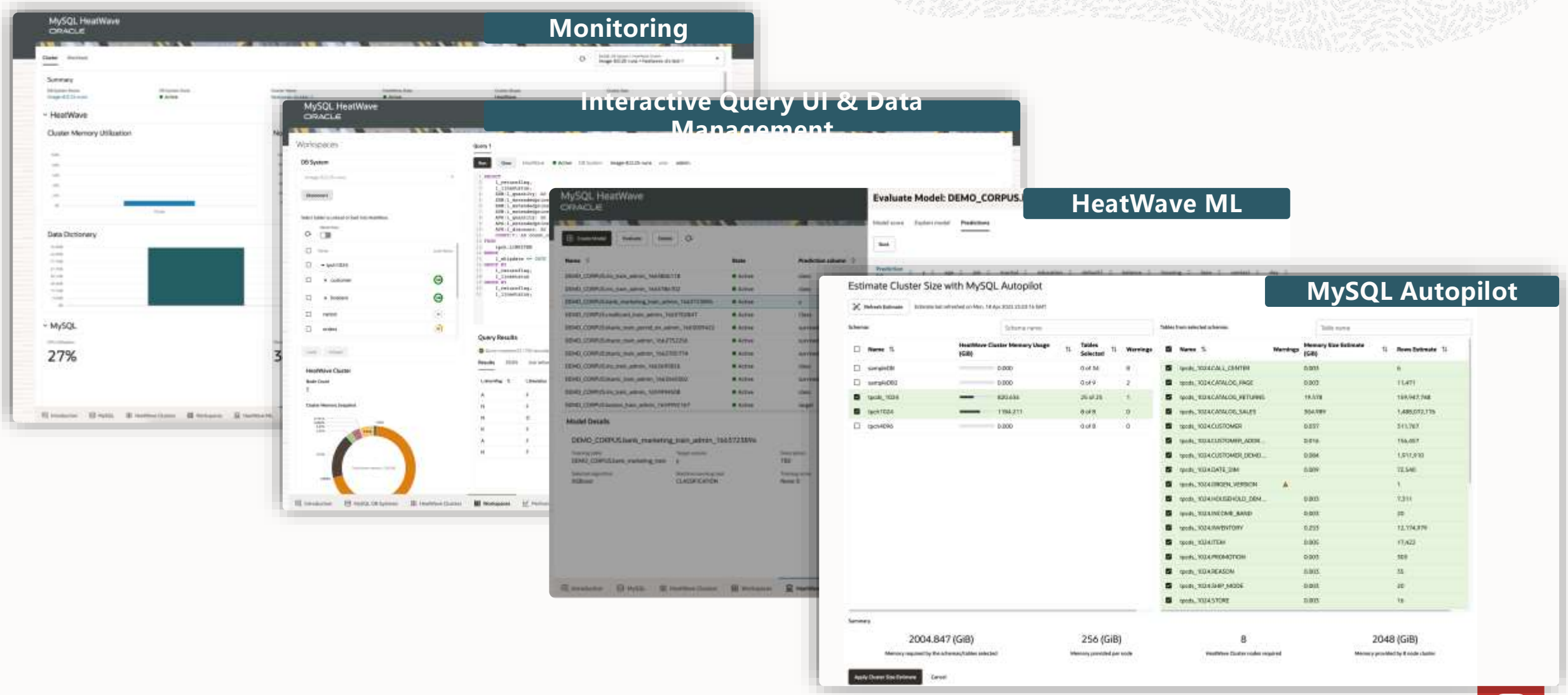
Data remains in object store, processing is done in HeatWave

For both non-MySQL and MySQL workloads

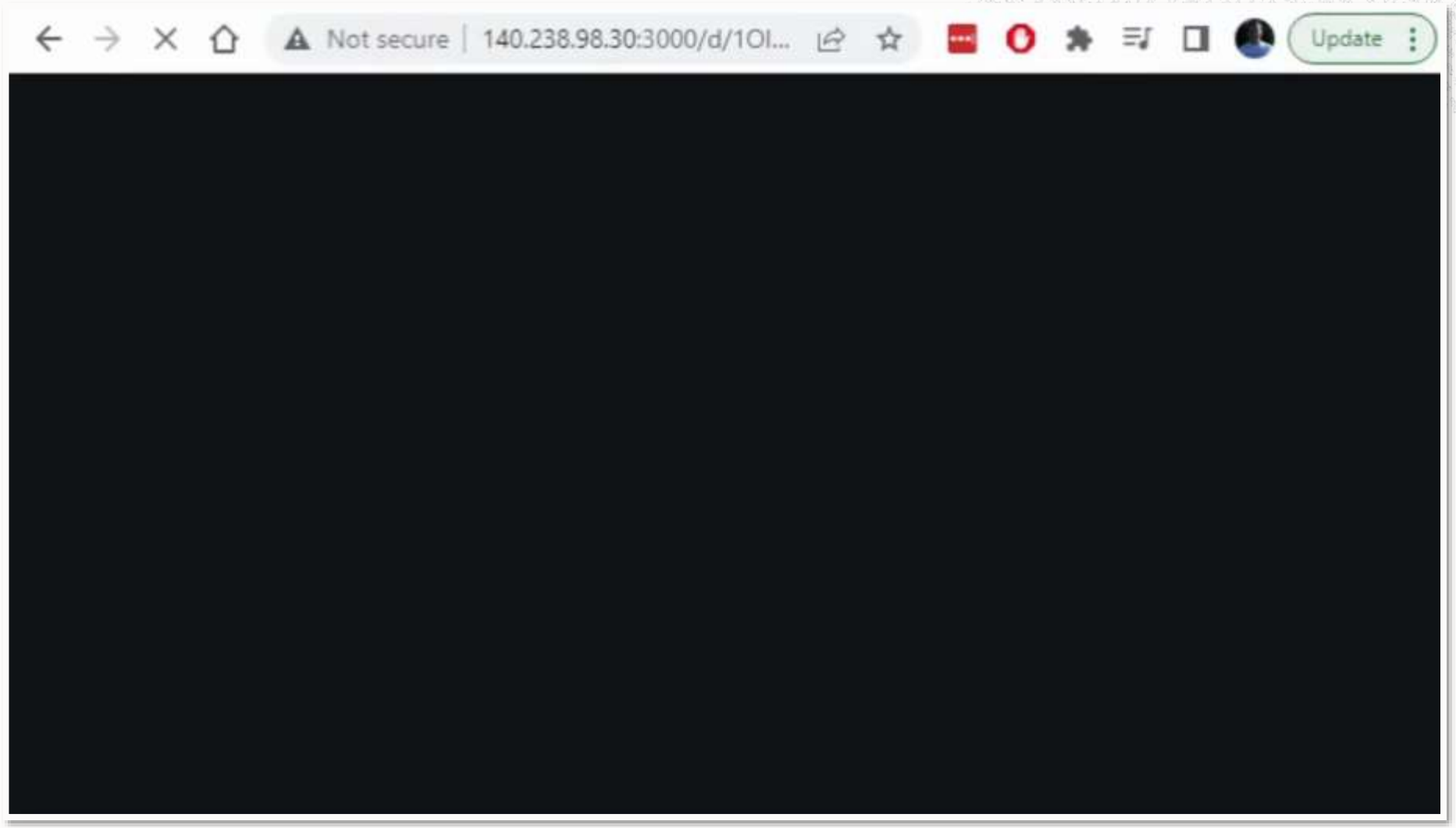
MySQL Heatwave Architecture



MySQL HeatWave Console



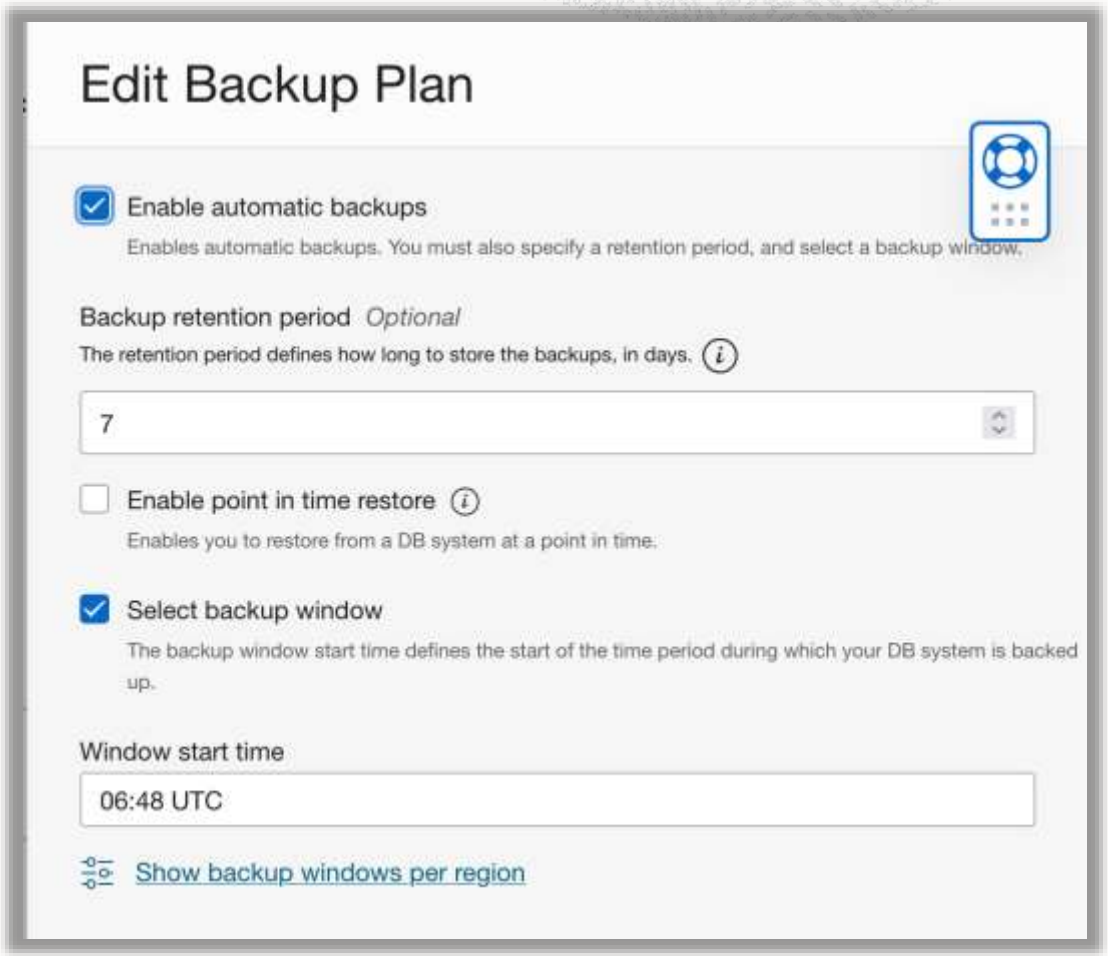
MySQL Heatwave working on report



Backups

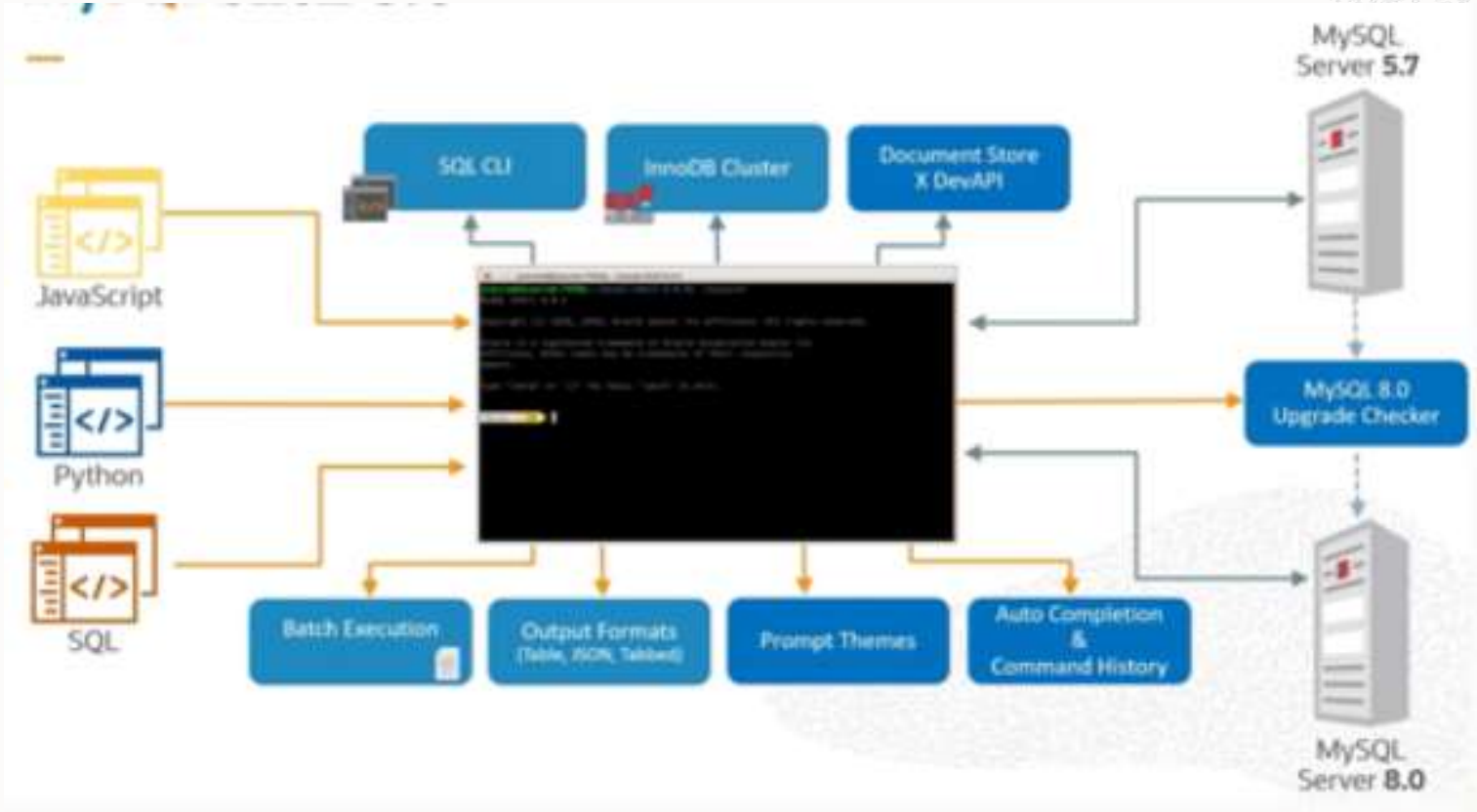
Manual or Automatic

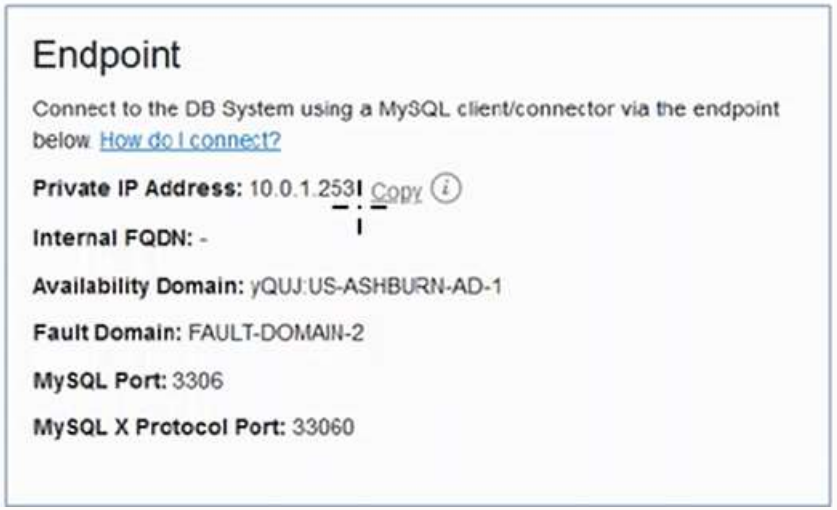
- Retention Period from 7 up to 35 days
- When to Backup
- Full or Incremental
- Point-in-Time Recovery (only non-HA DB Systems)



MySQL database management tool

Understanding MySQL shell tool

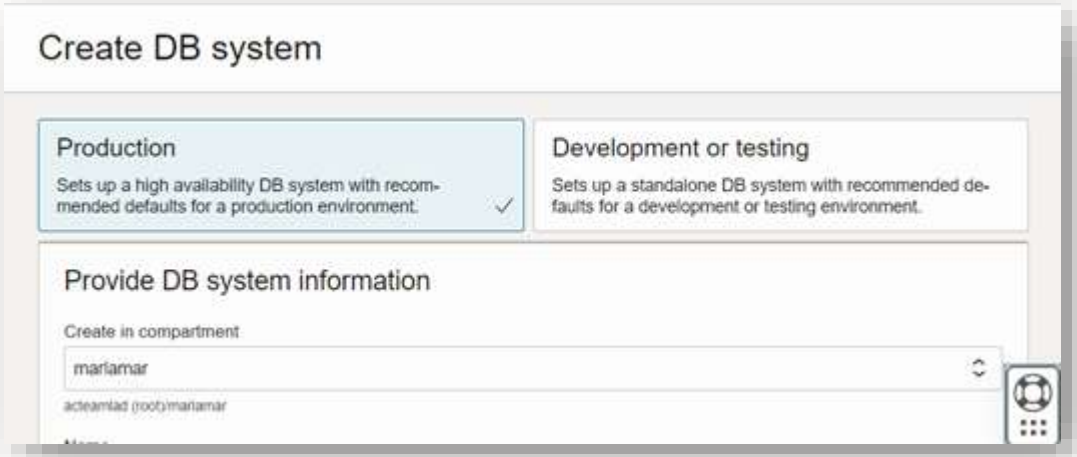


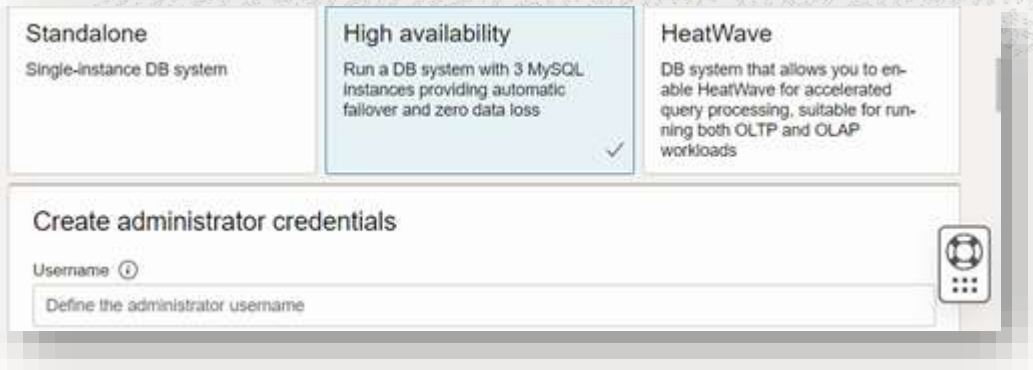


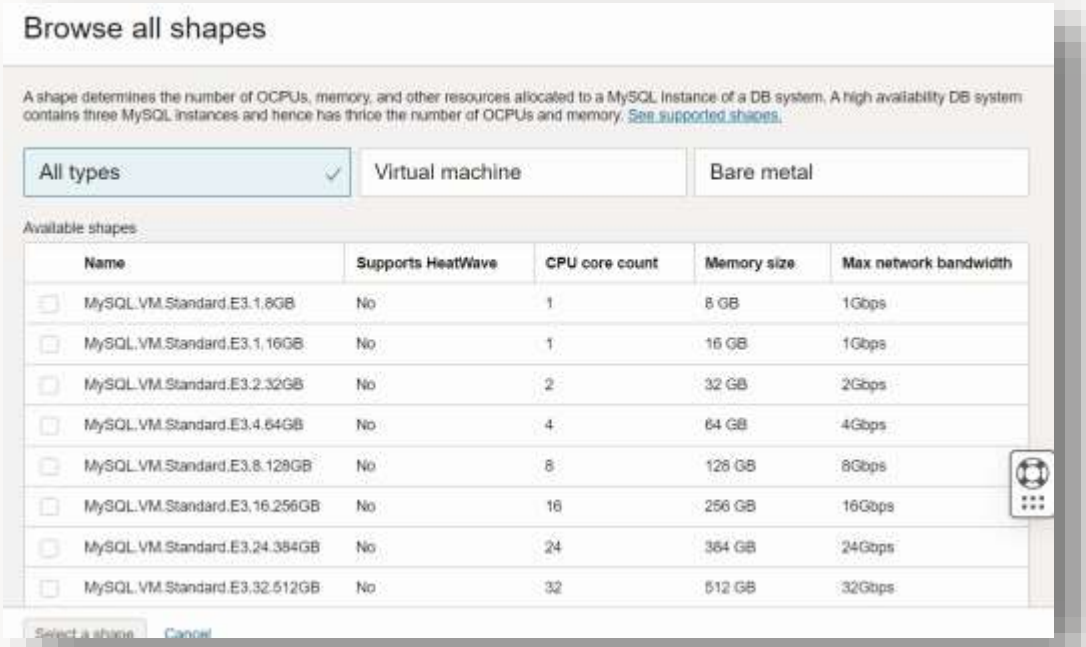
sudo yum -y install mysql-shell

MySQL Database provisioning

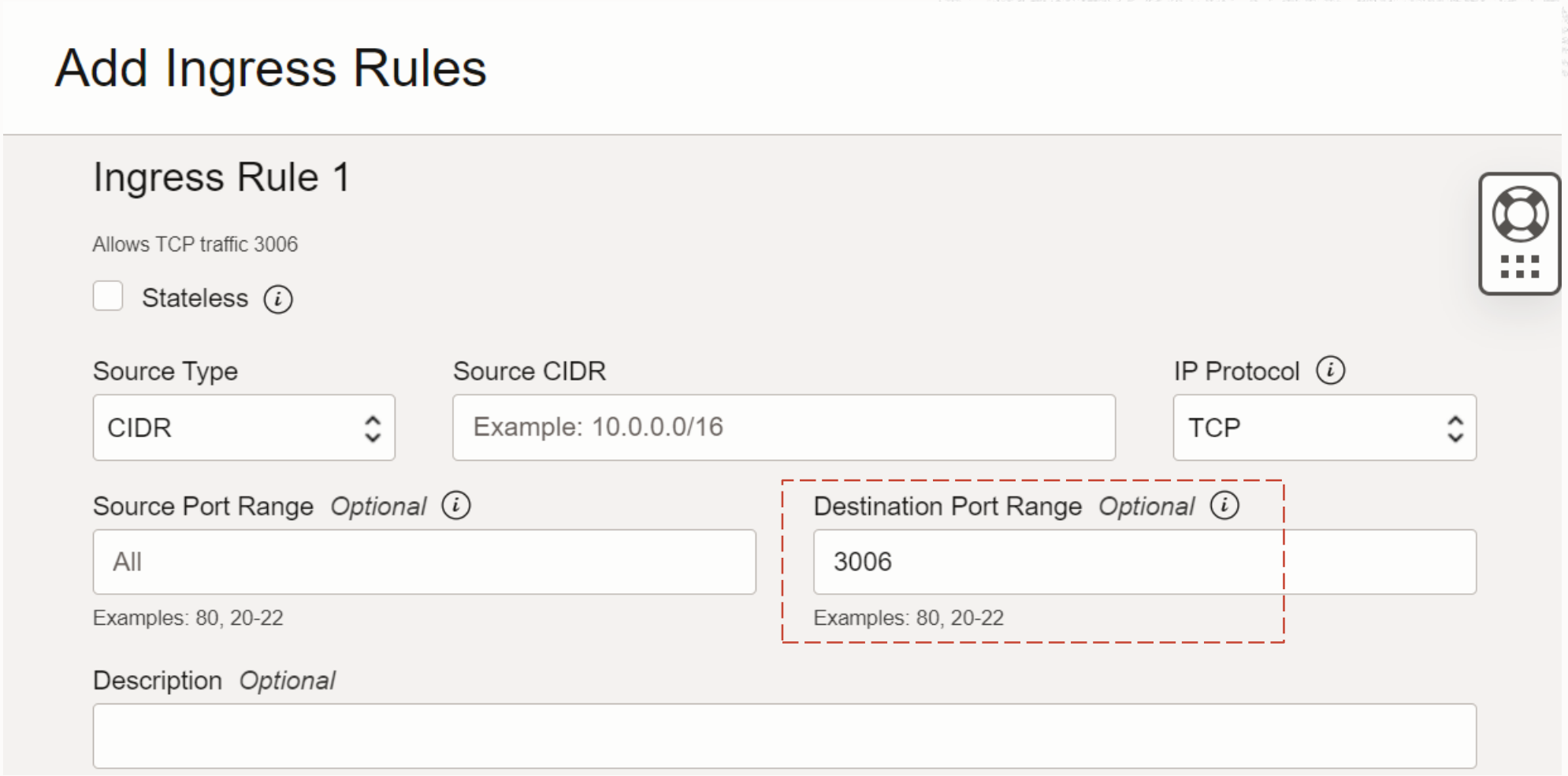
Oracle MySQL Cloud Console de Gerenciamento



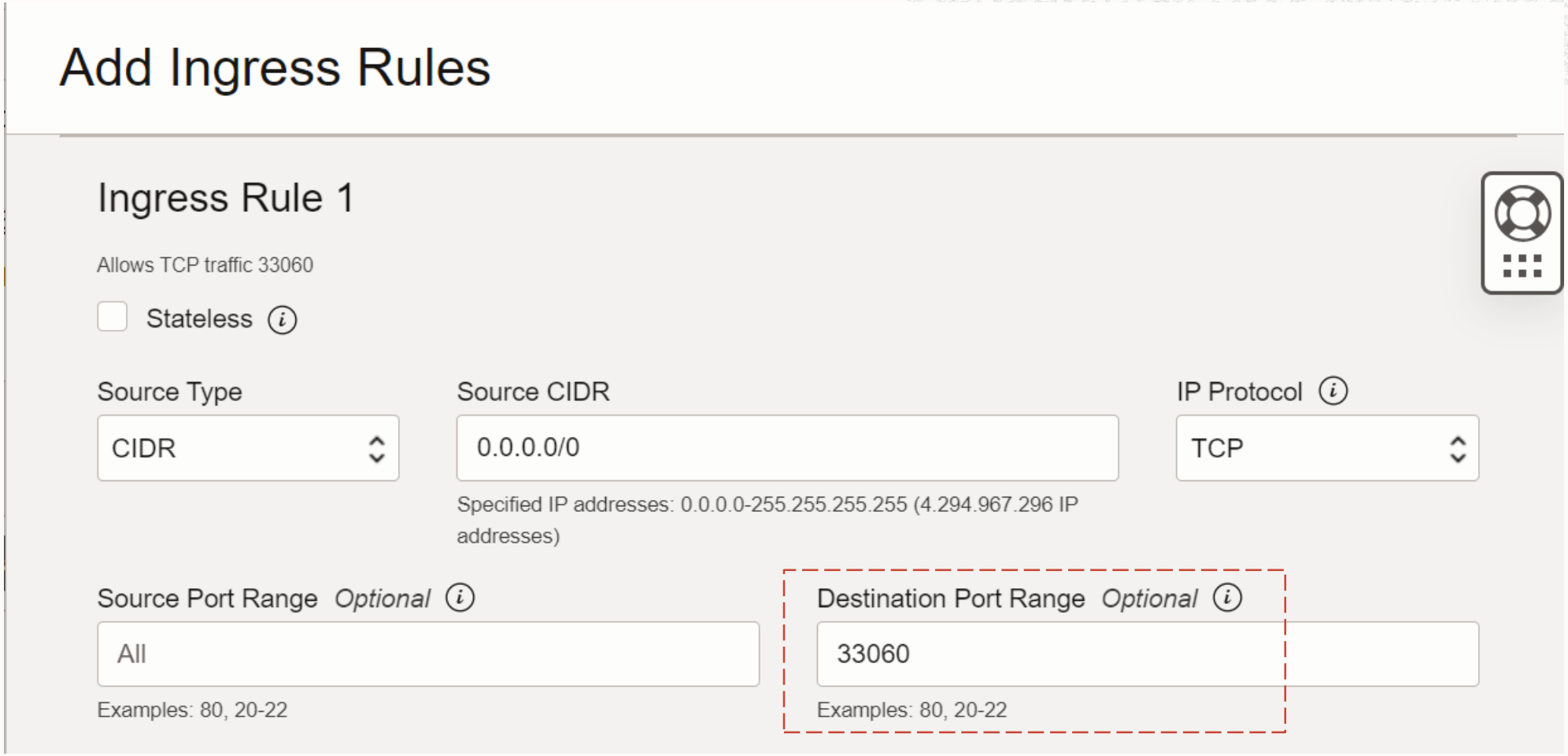




MySQL VCN requires port 3006 on ingress rules



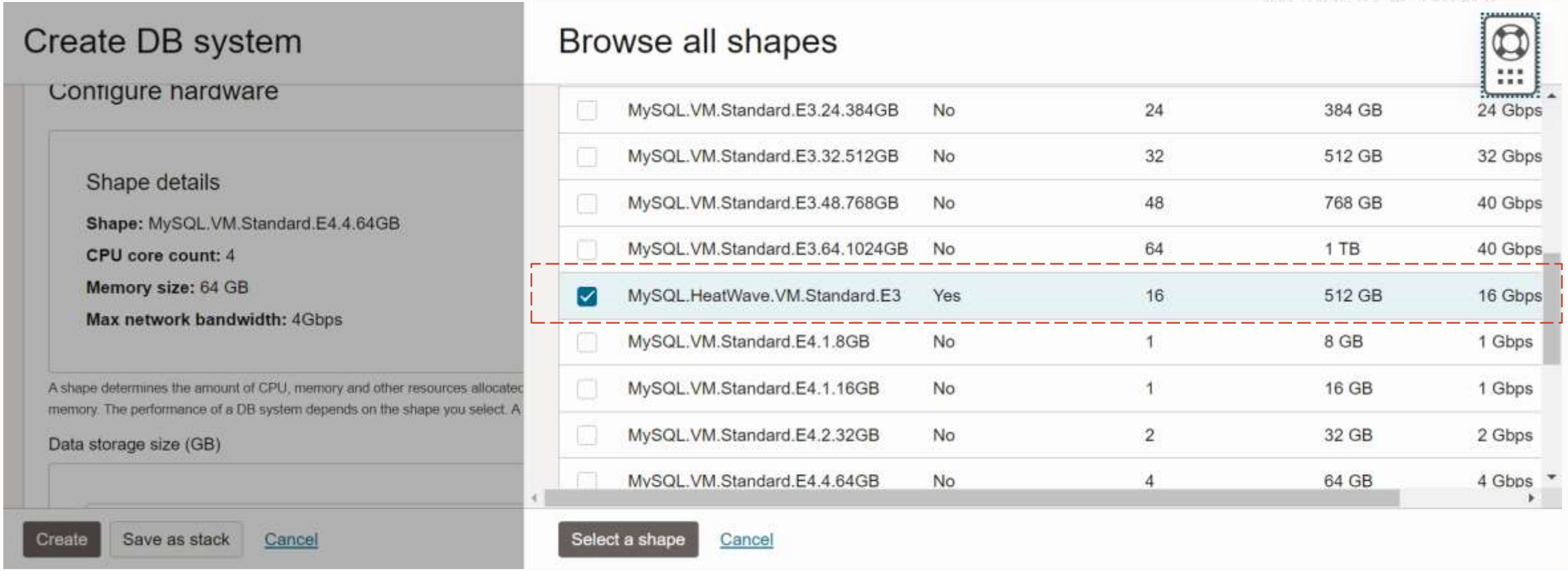
Exadata Cloud at Customer | Control Plane Workflow



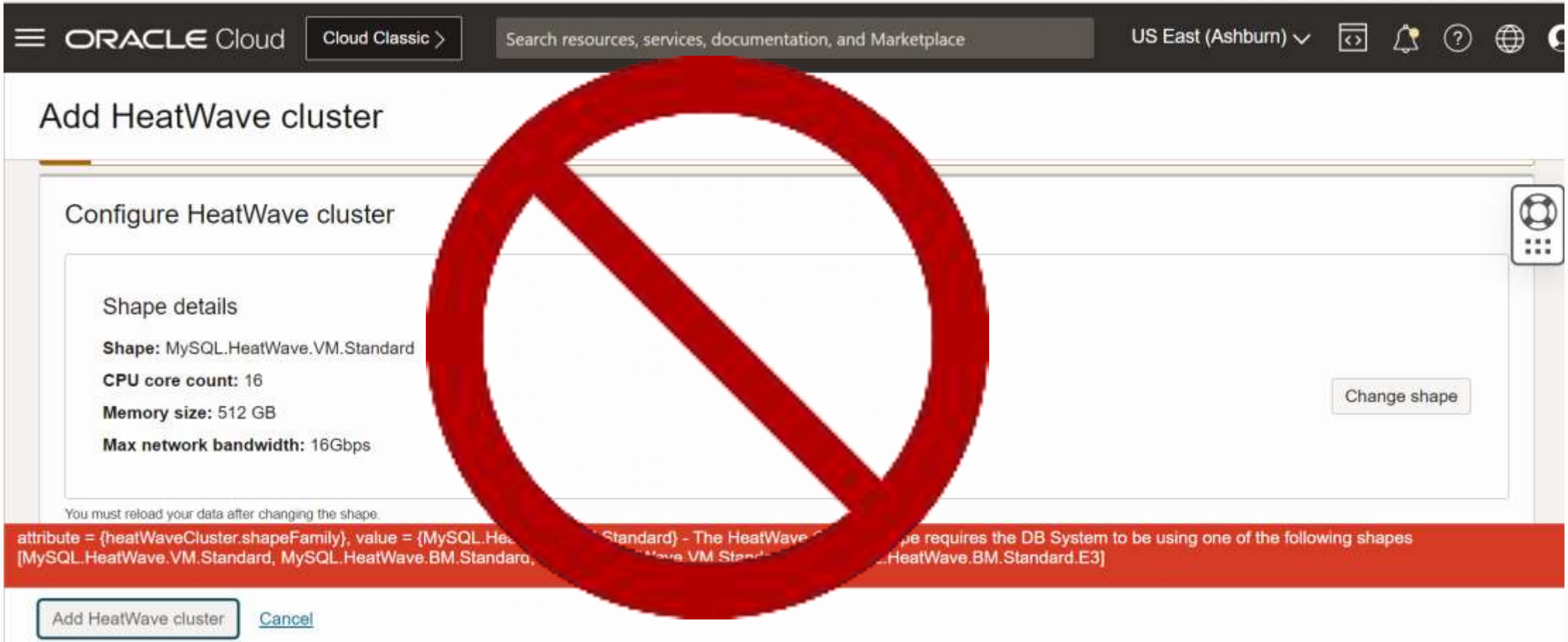
Mysql vcn Ingress Roles port 3006 and 33060

☐	No	0.0.0.0/0	TCP	All	3006	TCP traffic f or ports: 300 6
☐	No	0.0.0.0/0	TCP	All	33060	TCP traffic f or ports: 330 60

You must select a heatwave compatible shape during Mysql provisioning



Incompatible shape error for Heatwave enable



OCI Licensing Manager

What is OCI Licensing Manager ?

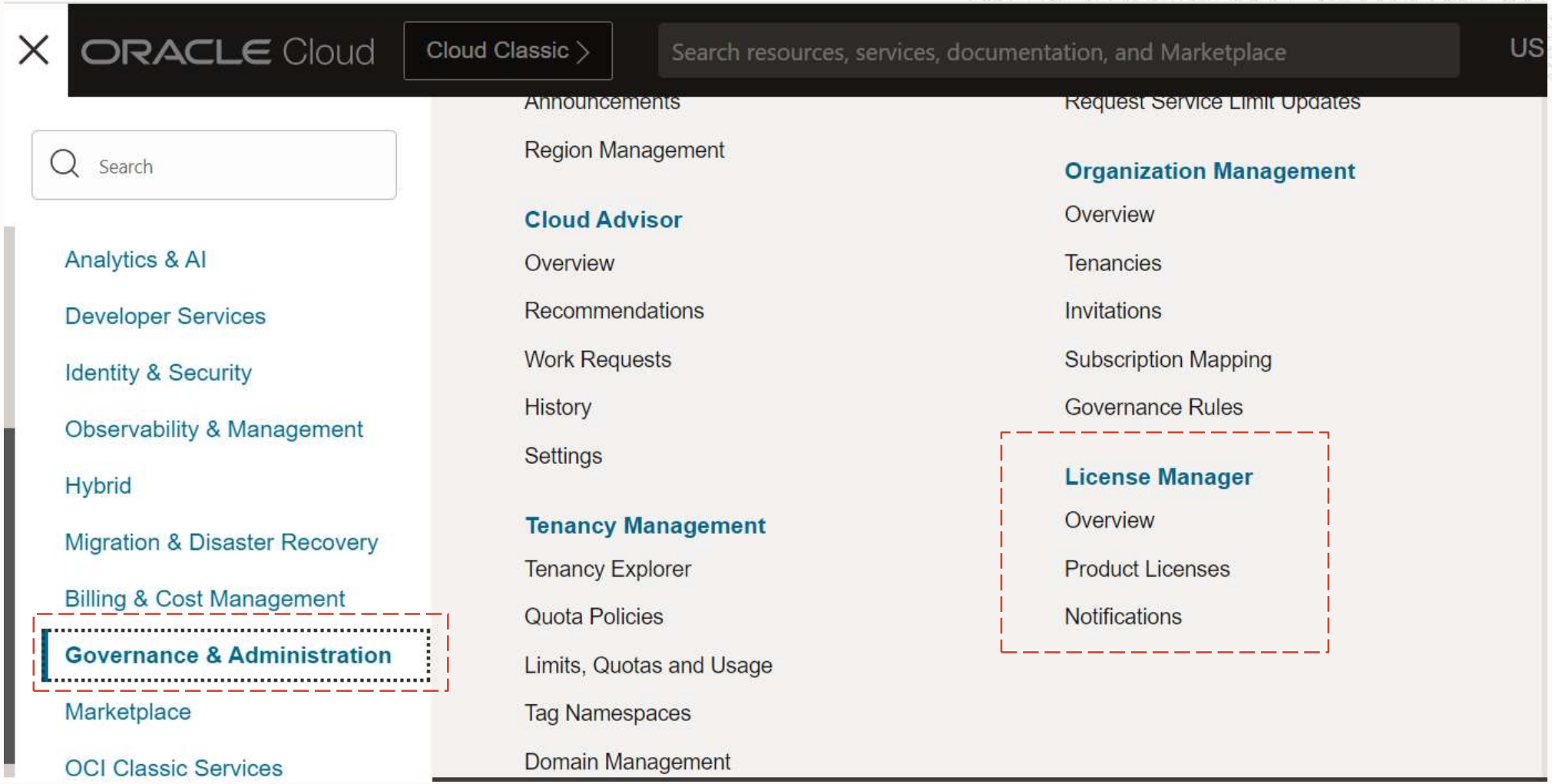
License Manager is a free, opt-in service that makes it easier for you to **Bring Your Own License (BYOL)** on OCI with the following capabilities :

- Automating the license portability rules for Oracle Database products to OCI Database service. **IT eliminates overhead** for individuals responsible for software procurement and licensing.

- Enabling **easy tracking of license utilization** of licenses for Oracle Database products or third-party products by Compute resources. Customers have a single pane of glass to track the utilization of Oracle and third-party licenses on OCI.

- Easy reporting of BYOL resources that have licensing needs. License Manager also offers **proactive monitoring and email notifications** on scenarios, such as oversubscription of licenses and tracking of license expiration dates.

OCI Licensing Manager on OCI Console

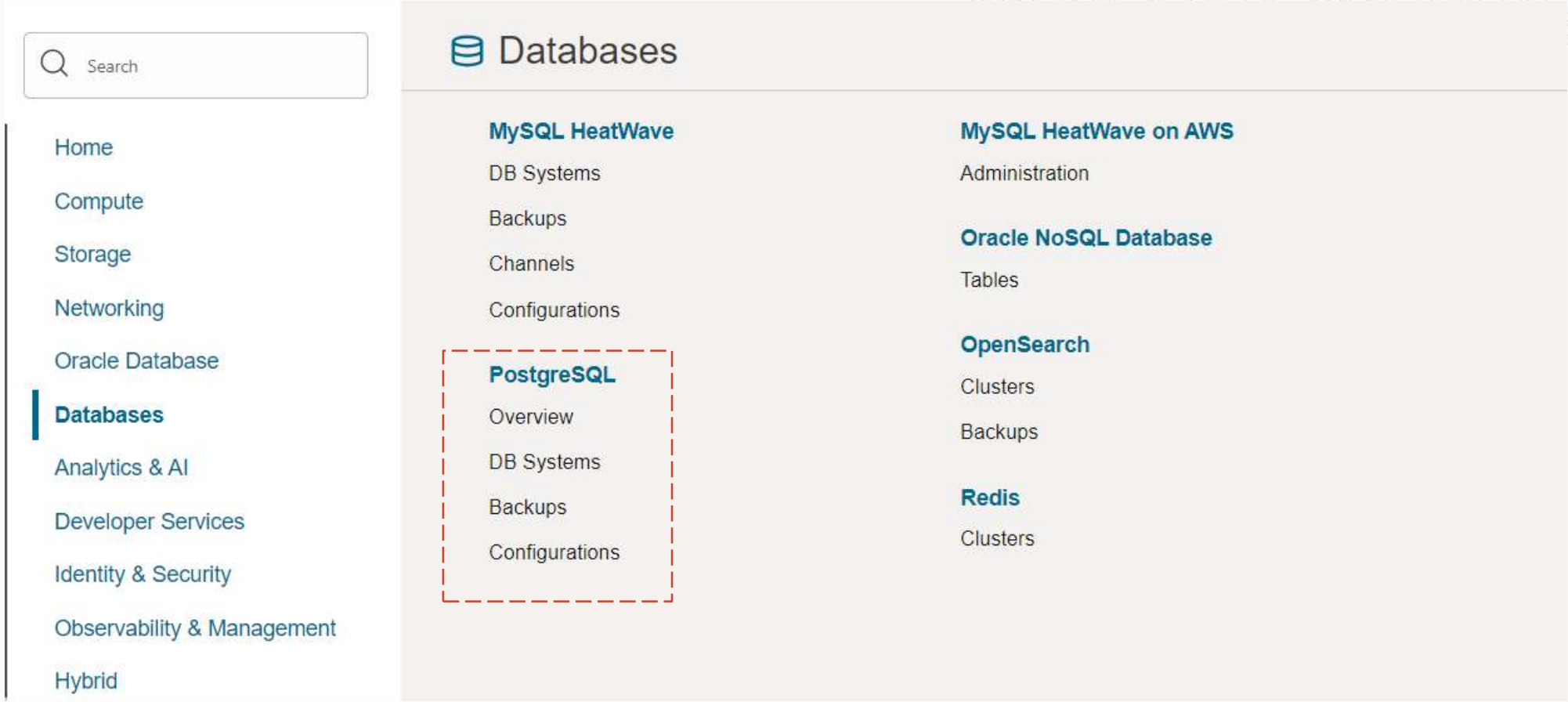


OCI PostgreSQL Database

PostgreSQL - one of the most advanced open source databases

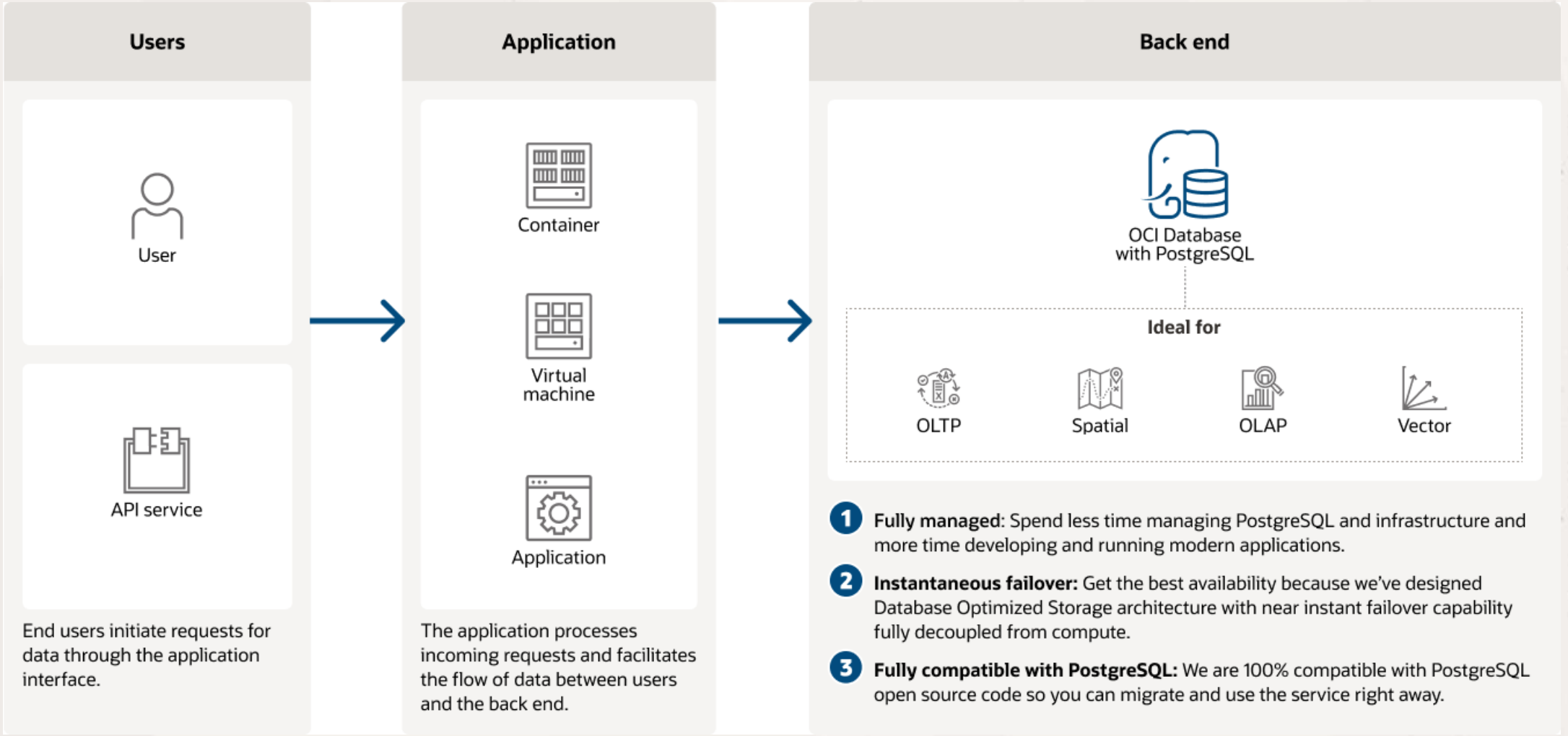
Rank Nov 2023	Rank Oct 2023	Rank Nov 2022	DBMS	Database Model	Score Nov 2023	Score Oct 2023	Score Nov 2022
1.	1.	1.	Oracle	Relational, Multi-model	1277.03	+15.61	+35.34
2.	2.	2.	MySQL	Relational, Multi-model	1115.24	-18.07	-90.30
3.	3.	3.	Microsoft SQL Server	Relational, Multi-model	911.42	+14.54	-1.09
4.	4.	4.	PostgreSQL	Relational, Multi-model	636.86	-1.96	+13.70
5.	5.	5.	MongoDB	Document, Multi-model	428.55	-2.87	-49.35
6.	6.	6.	Redis	Key-value, Multi-model	160.02	-2.95	-22.03
7.	7.	7.	Elasticsearch	Search engine, Multi-model	139.62	+2.48	-10.70
8.	8.	8.	IBM Db2	Relational, Multi-model	136.00	+1.13	-13.56
9.	9.	↑ 10.	SQLite	Relational	124.58	-0.56	-10.05
10.	10.	↓ 9.	Microsoft Access	Relational	124.49	+0.18	-10.53

OCI database Postgres on oci console

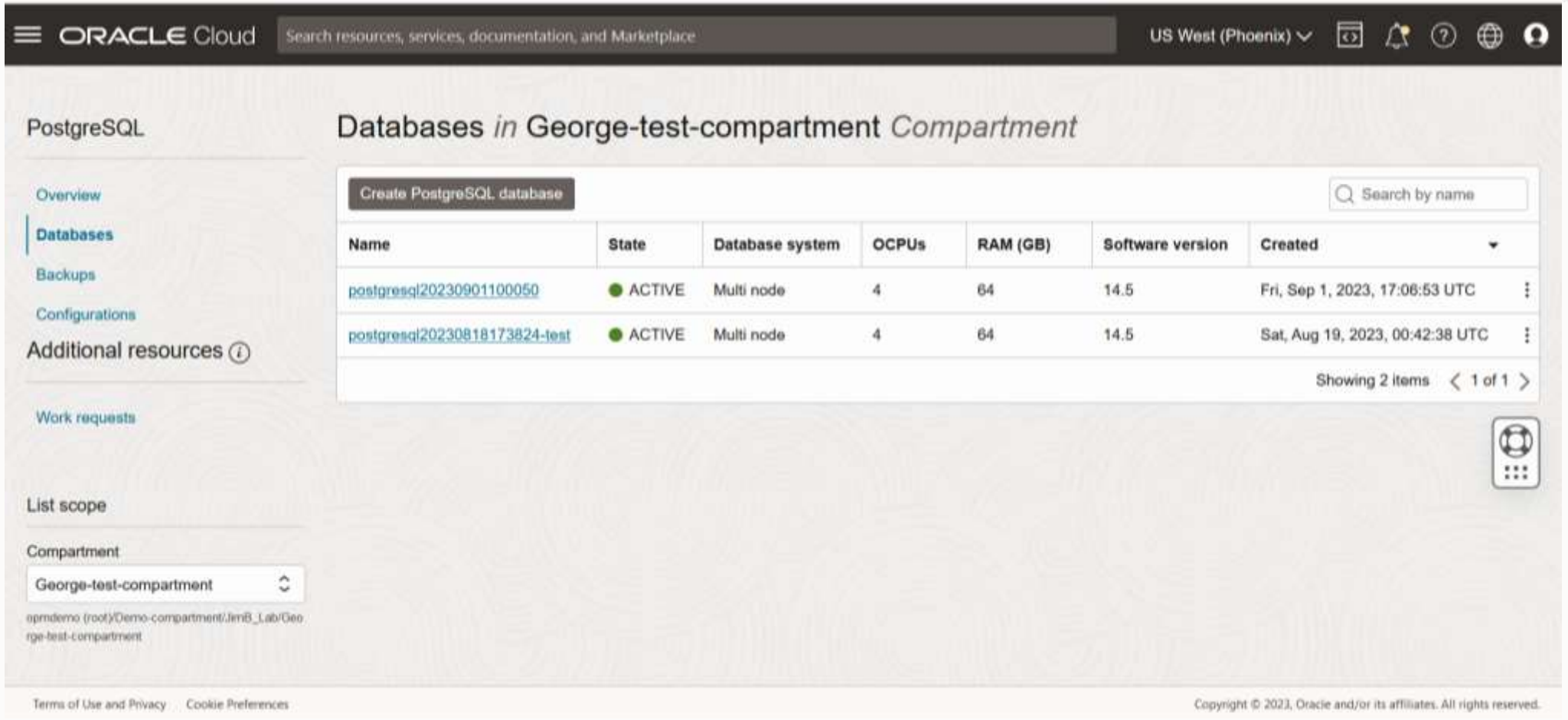


OCI Database with PostgreSQL

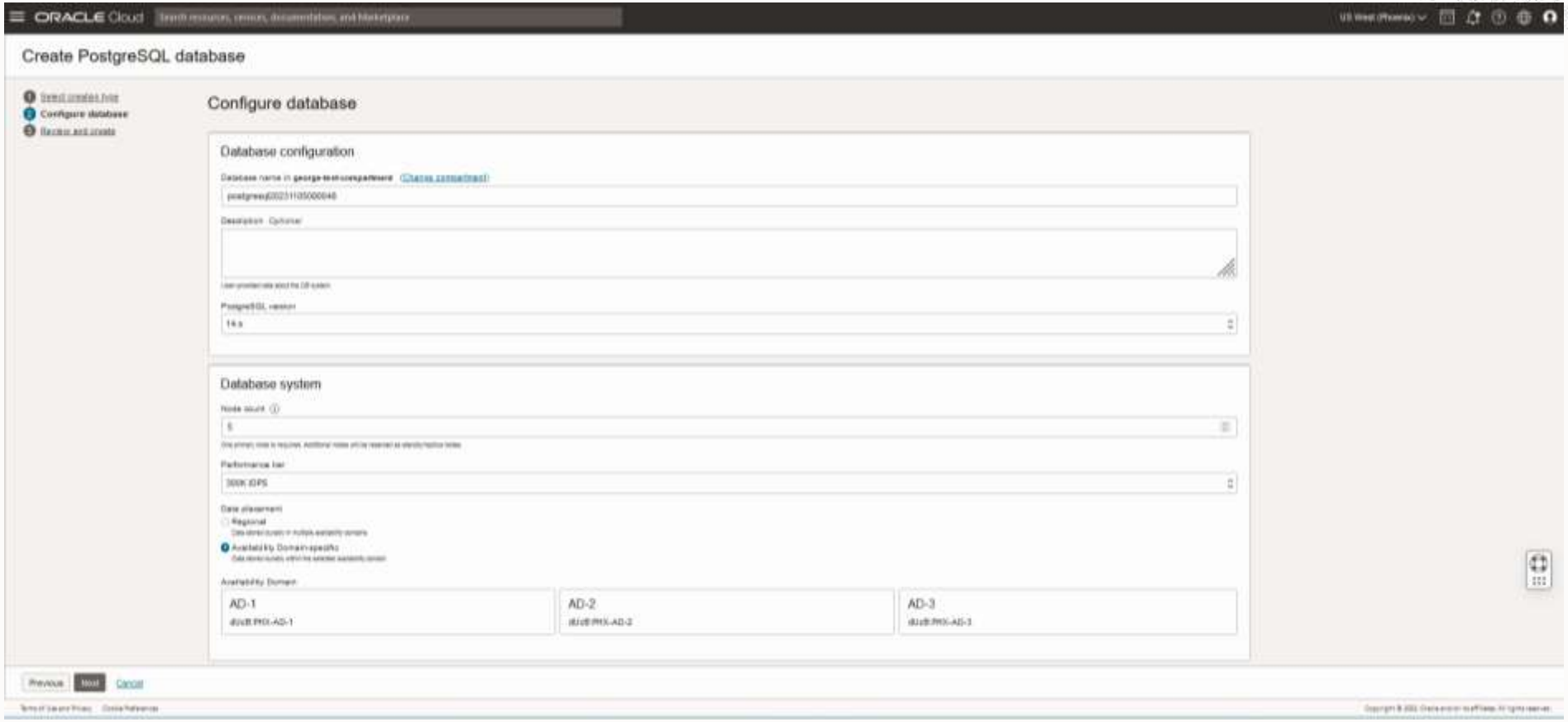
A fully managed service



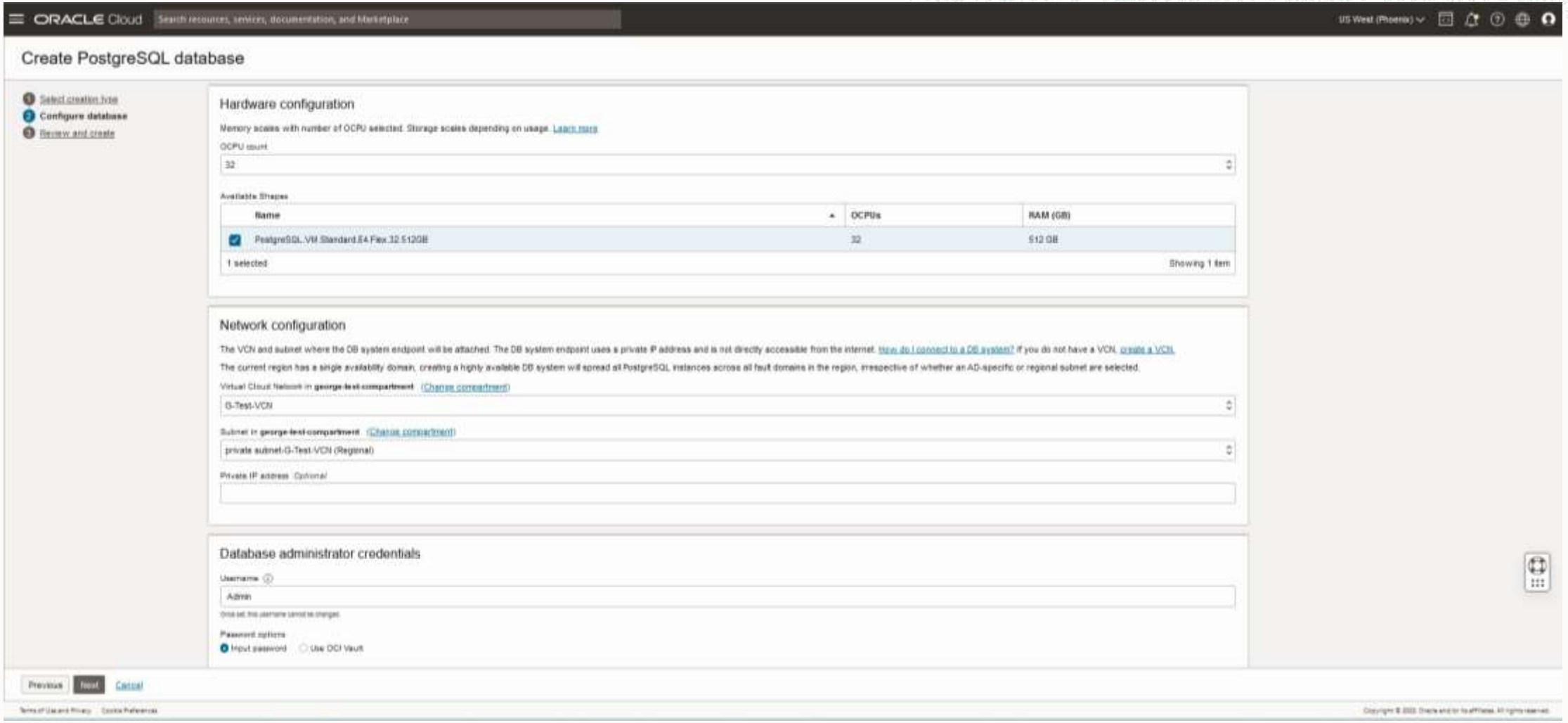
User Experience - PostgreSQL clusters list view



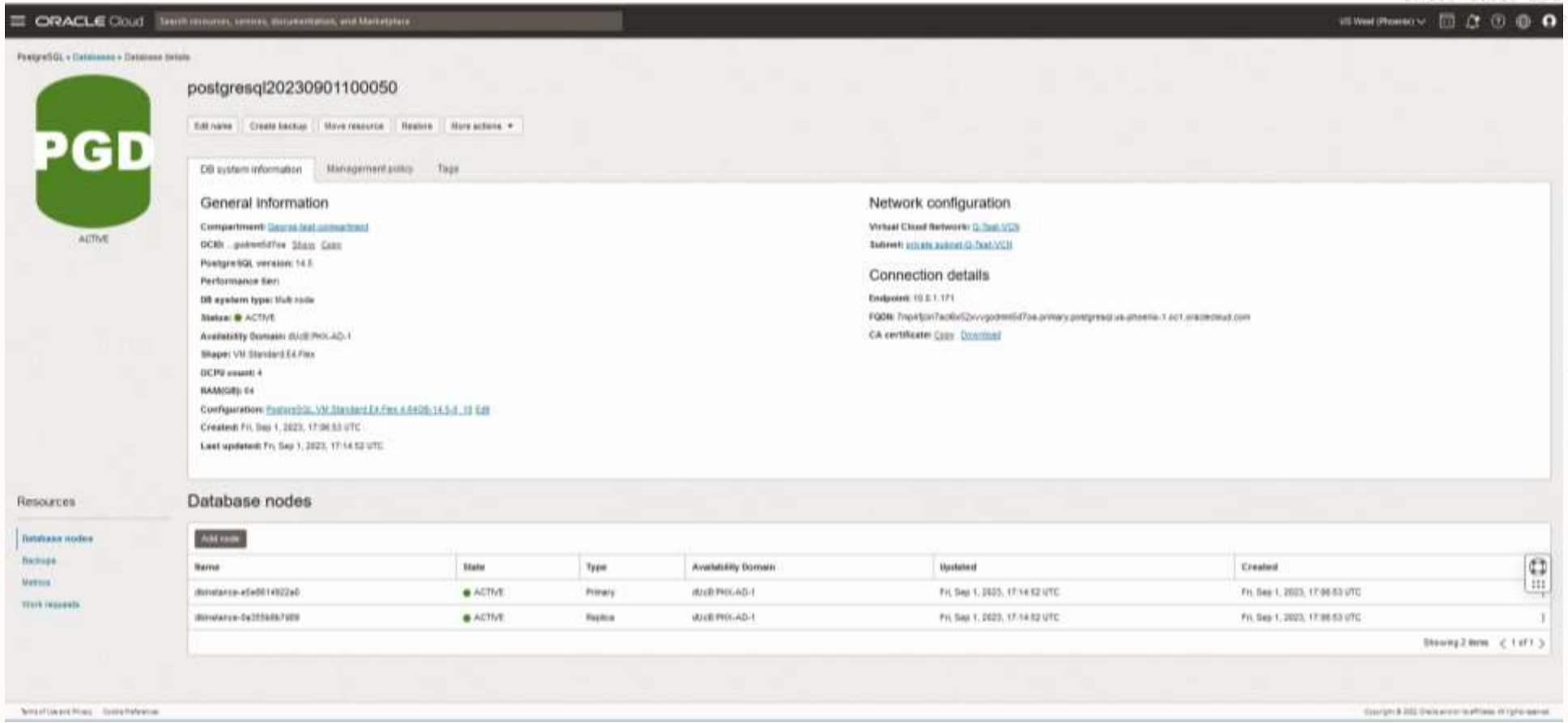
User Experience - Create multi-node PostgreSQL cluster



User Experience - Create multi-node PostgreSQL cluster cont.



User Experience - Detailed view with Read replica



Oracle Exam 1Z0-1093-23

Exam 1Z0-1093-23: Oracle Base Database Services 2023 Professional

- Number of Questions **55**
- Format **Multiple Choice**
- Duration **90 minutes**
- Passing Score **68%**

Oracle Base Database Services 2023 Exam Topics

Oracle Cloud Platform for Database in the Cloud

- Describe Oracle Cloud Platform for Database in the Cloud
- Describe Oracle Cloud Infrastructure Strategy (OCI)

DB Systems BM/VM

- Discuss Database Cloud Services (Overview)
- Provision Database Cloud Service on a Virtual Machine DB System
- Manage Database Cloud Service on a Virtual Machine DB System
- Manage the Database Lifecycle for Database Cloud Services on a Virtual Machine DB System
- Utilize Database Cloud Service Management Interfaces

Exadata Database Service

- Explain the Exadata Database Service
- Provision Exadata
- Manage Exadata Infrastructure and VM Clusters
- Manage the Exadata Database Lifecycle
- Utilize Exadata Cloud Management tools

MySQL Database Service and HeatWave Technical Overview

- Describe the MySQL Database Service
- Manage MySQL Database
- Provision and connect to MySQL Database
- Monitor MySQL Database
- Set up Backup for MySQL Database Service
- Describe performance considerations for the MySQL Database Service
- Create, manage, and use HeatWave

NoSQL Database Cloud Service

- Explain connecting to the NoSQL Database Cloud service
- Explain table security management
- Explain table rate limiting
- Describe NoSQL data models
- Explain provisioned throughput for NoSQL Database Cloud Service
- Describe NoSQL language SDKs

Oracle Cloud Infrastructure Database Management Service

- Describe the Oracle Cloud Infrastructure Database Management Service
- Install and configure Management Agent
- Register External Databases & enable and use Database Management
- View Fleet Summary and Management features
- Use Database Groups and Jobs

Resources

- **MySQL HeatWave Implementation Associate (University Training)**

https://mylearn.oracle.com/ou/learning-path/become-a-mysql-heatwave-implementation-associate/128102

- **MySQL Web Site**

https://mysql.com

- **MySQL Web Site for developers**

https://dev.mysql.com

- **Oracle MySQL web Page**

https://www.oracle.com/mysql

- **MySQL Githup Repository**

https://github.com/mysql

- **Getting Started with MySQL HeatWave on OCI**

https://developer.oracle.com/learn/technical-articles/getting-started-with-mysql-heatwave-on-oci

- **Introducing OCI Database with PostgreSQL**

https://blogs.oracle.com/cloud-infrastructure/post/oci-database-postgres

- **OCI Database with Postgres**

https://www.oracle.com/br/cloud/postgresql

- **OCI Database Postgres documentation**

https://docs.oracle.com/en-us/iaas/Content/postgresql/home.htm

- **Database With Postgres Pricing**

https://www.oracle.com/cloud/postgresql/pricing/

- **First Principles: Optimizing PostgreSQL for the cloud**

https://blogs.oracle.com/cloud-infrastructure/post/first-principles-optimizing-postgresql-for-the-cloud

- **Upgrade your database now (Mike dietriche site)**

https://mikedietrichde.com/

- **Oracle Architecture Center Site**

https://docs.oracle.com/solutions

- **Oracle Live Labs**

https://apexapps.oracle.com/pls/apex/r/dbpm/livelabs/home

- **Oracle Luna Labs**

https://luna.oracle.com

- **Ask Ton Official Site**

https://asktom.oracle.com

- **OCI Licensing Manager Documentation**

https://docs.oracle.com/en-us/iaas/Content/LicenseManager/Concepts/licensemanageroverview.htm

- **OCI PaaS and IaaS Universal Credits Services Descritpion**

https://www.oracle.com/a/ocom/docs/paas-iaas-universal-credits-3940775.pdf

- **Annoucing License Manager for Oracle Cloud Infrastructure**
  https://blogs.oracle.com/cloud-infrastructure/post/announcing-license-manager-for-oracle-cloud-infrastructure

- **Oracle Audit Vault and DB Firewall 20 Get Started**
  https://blogs.oracle.com/cloud-infrastructure/post/announcing-license-manager-for-oracle-cloud-infrastructure

- **Oracle Live labs - DB Security - Audit Vault and DB Firewall**
  https://blogs.oracle.com/cloud-infrastructure/post/announcing-license-manager-for-oracle-cloud-infrastructure

Thank you

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marcel.lamarca@oracle.com


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