



Oracle Cloud DBA

Lear how to stay up to date on this Dbaas era

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July, 2023



Nuestros Valores

Integridad

Compliance

Trabajo en Equipo

Satisfacción del Cliente

Calidad

Ética

Innovación

Respeto Mutuo

Justicia

Comunicación

Como empresa líder en tecnología, aceptamos la **diversidad** en todas sus formas. Realmente creemos que la **innovación** comienza con la **inclusión**. Y esto solo se puede lograr con la cooperación de nuestros **partners**. Afirmamos nuestro **compromiso** de mantener un **ambiente respetuoso** y **libre de discriminación** y esperamos esto de nuestros **socios de negocios**.

Oracle espera que sus **partners** realicen negocios de manera **justa** y **ética**, cumplan con las leyes anticorrupción en todo el mundo, cooperen con las solicitudes de información de Oracle y eviten participar en cualquier actividad que implique incluso la apariencia de ser incorrecta.

Es vital que nuestros partners se adhieran al **Código de Ética y Conducta Comercial de Oracle**, que da los lineamientos sobre los valores que son esenciales para nuestro éxito como empresa. Estos valores son la base de todo lo que hacemos y lo que debemos vivir todos los días.



Utilice el código QR para acceder al Código de Ética y Conducta Comercial de Oracle.

Agenda Day 2

OCI MySQL Database

Autonomous ADB Database

OCI Data Safe and Security

DBCS Bare Metal Vs VM System Database

OCI MAA Data Guard

Demo – MySQL Heatwave Provisioning

Demo – Autonomous Database Provisioning

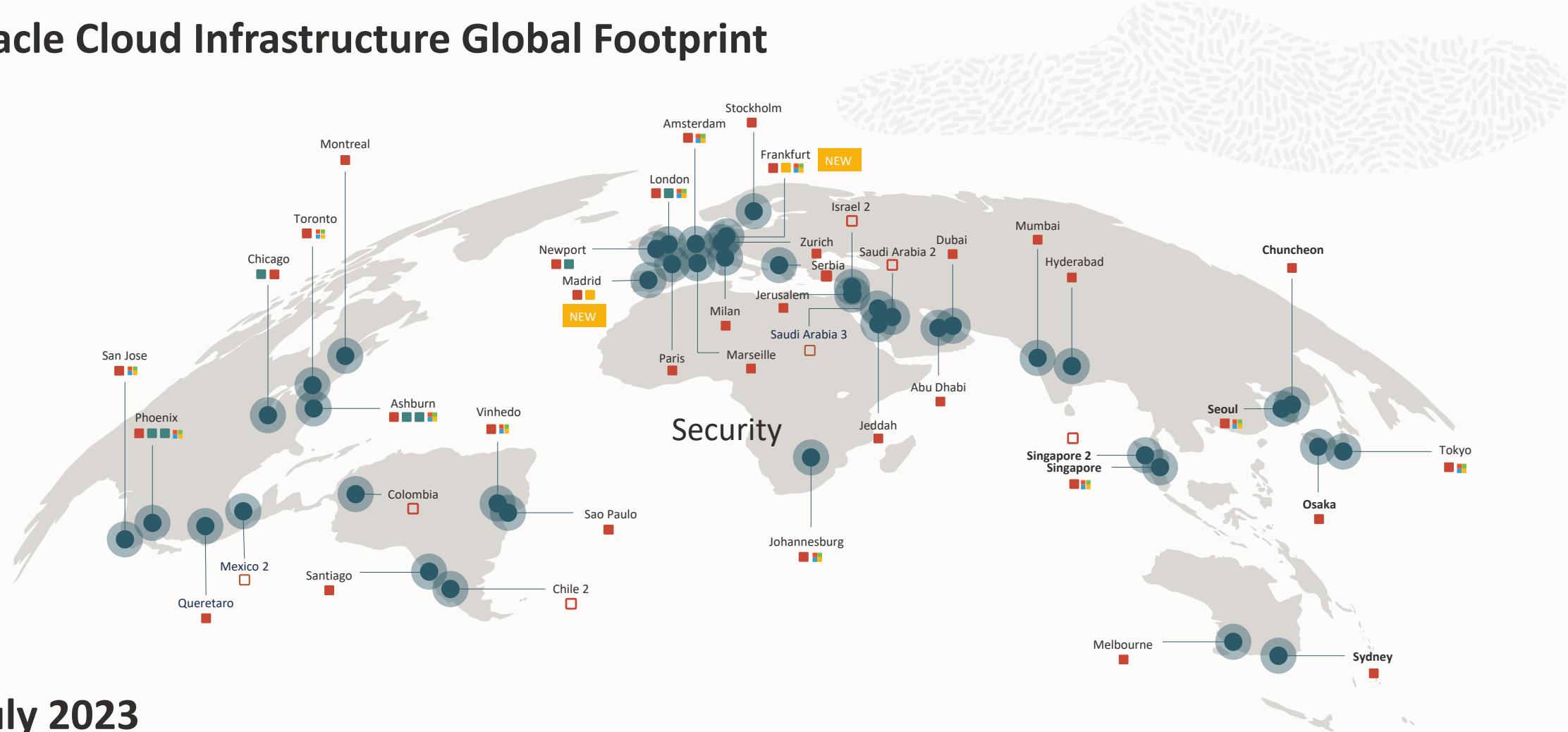
Demo – Data Safe Register

OCI Cloud Region Map

Current Oracle Datacenter and Microsoft around the Word



Oracle Cloud Infrastructure Global Footprint



July 2023

44 regions; 7 more planned

12 Azure Interconnect Regions

MySQL

MySQL and MySQL Heatwave Available for deploy on OCI



Oracle MySQL Database Services on OCI Console



Databases

MySQL

DB Systems

Backups

Channels

Configurations

MySQL HeatWave on AWS

Administration

Oracle NoSQL Database

Tables

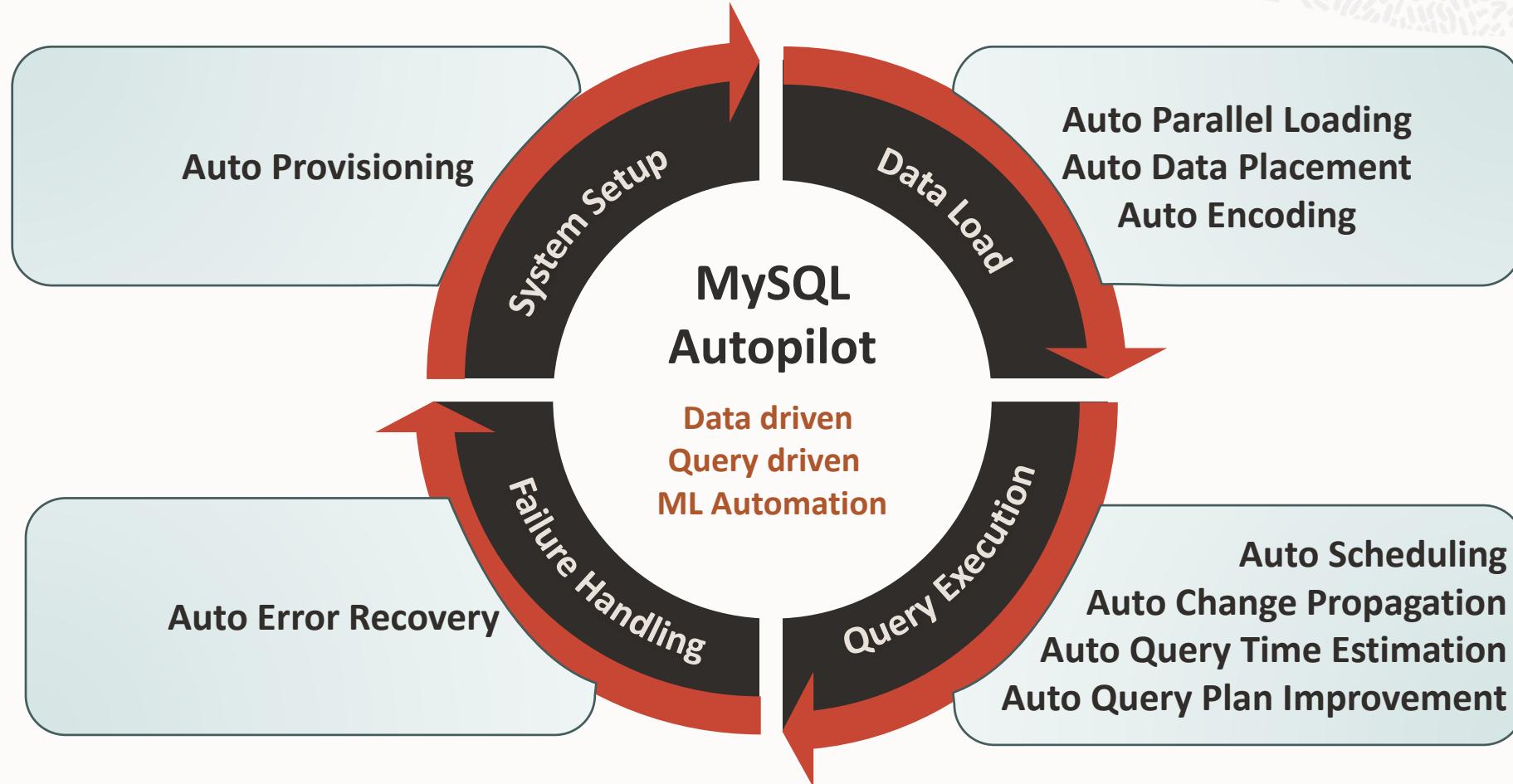
OpenSearch

Clusters

Backups

MySQL Autopilot Features

Machine learning based Automation



MySQL is the most popular database for developers

Most popular databases

MySQL 47%

PostgreSQL 44%

SQLite 32%

MongoDB 28%

MS SQL Server 27%

[Stackoverflow survey](#)

Which databases have you used in the last 12 months?

MySQL 64%

PostgreSQL 48%

Redis 36%

MS SQL Server 32%

SQLite 30%

[Jetbrains survey \(SQL is primary\)](#)



Innovative organizations across many industries run MySQL

Social

facebook



Linkedin



Pinterest

E-Commerce

Booking.com

NETFLIX

U B E R

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
The Bank of America logo, featuring a red and blue swoosh design.

J.P.Morgan

citi

Fidelity
INVESTMENTS

VISA

CA

Manufacturing

T E S L A



TOYOTA

CAT

MySQL powers Open Source applications

Custom Apps Development



django



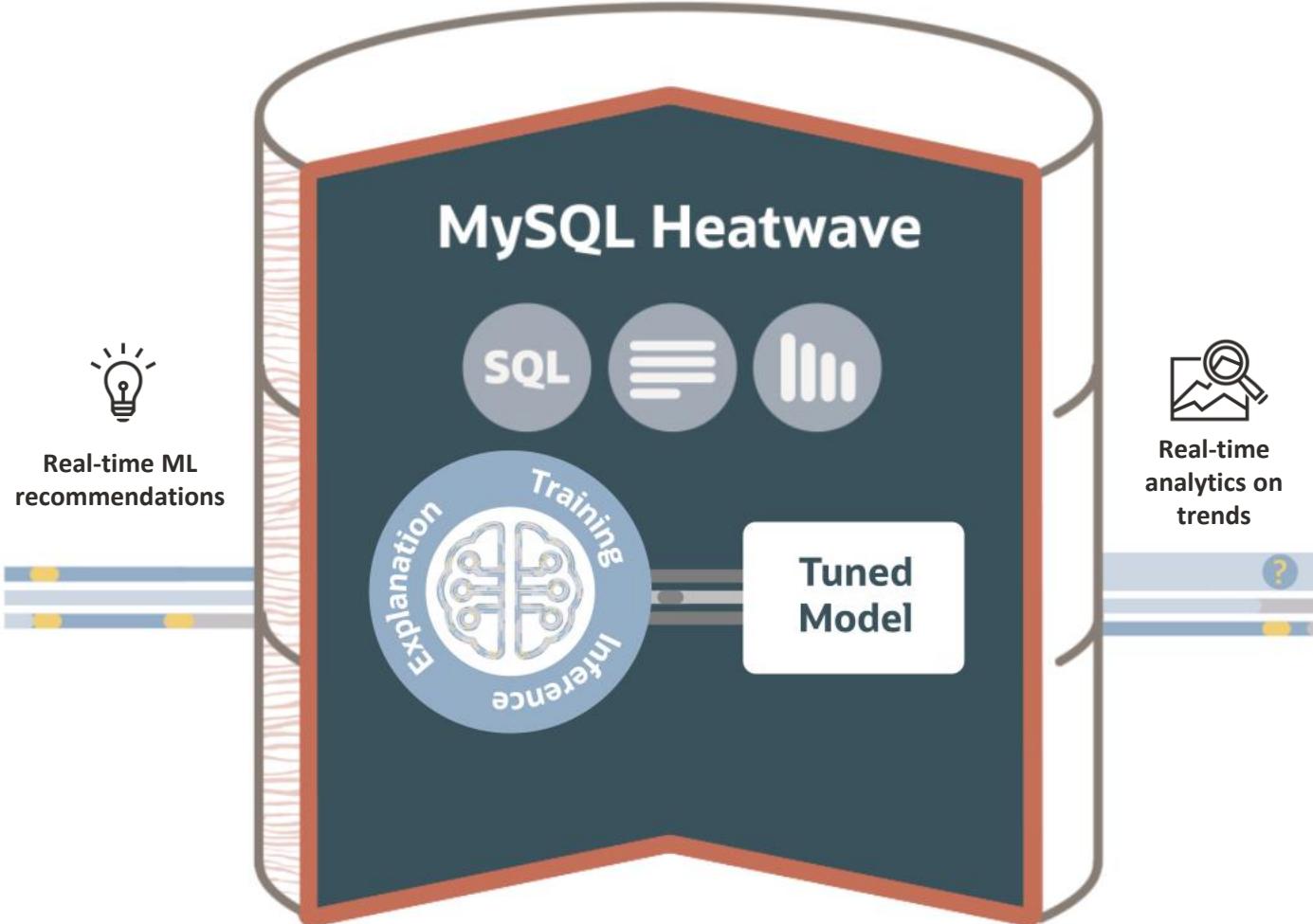
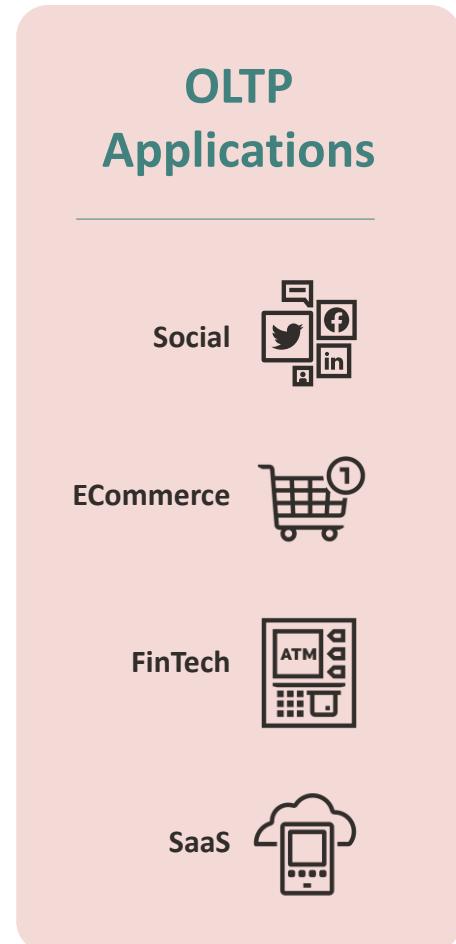
Content management and eCommerce



Learning platforms



Machine learning in action with MySQL HeatWave



Oracle MySQL Console Management

Create DB system

Production
Sets up a high availability DB system with recommended defaults for a production environment.

Development or testing
Sets up a standalone DB system with recommended defaults for a development or testing environment.

Provide DB system information

Create in compartment

marlamar
acteamiad (root)/marlamar
More

MySQL.VM.Standard.E4.4.64GB

CPU core count: 4
Memory size: 64 GB
Max network bandwidth: 4Gbps

A shape determines the number of OCPUs, memory, and other resources allocated to a MySQL instance of a DB system. A high availability DB system contains three MySQL instances and hence has thrice the number of OCPUs and memory. [See supported shapes.](#)

Data storage size (GB)

1024
Storage allocated to each MySQL instance for data and log files. Storage size impacts IOPS and throughput. Data storage size must be an integer between 50 and 131,072.

Total IOPS: 76800
Total throughput: 600 MB

Standalone
Single-instance DB system

High availability
Run a DB system with 3 MySQL instances providing automatic failover and zero data loss

HeatWave
DB system that allows you to enable HeatWave for accelerated query processing, suitable for running both OLTP and OLAP workloads

Create administrator credentials

Username Define the administrator username

Browse all shapes

A shape determines the number of OCPUs, memory, and other resources allocated to a MySQL instance of a DB system. A high availability DB system contains three MySQL instances and hence has thrice the number of OCPUs and memory. [See supported shapes.](#)

All types Virtual machine Bare metal

Available shapes

Name	Supports HeatWave	CPU core count	Memory size	Max network bandwidth
<input type="checkbox"/> MySQL.VM.Standard.E3.1.8GB	No	1	8 GB	1Gbps
<input type="checkbox"/> MySQL.VM.Standard.E3.1.16GB	No	1	16 GB	1Gbps
<input type="checkbox"/> MySQL.VM.Standard.E3.2.32GB	No	2	32 GB	2Gbps
<input type="checkbox"/> MySQL.VM.Standard.E3.4.64GB	No	4	64 GB	4Gbps
<input type="checkbox"/> MySQL.VM.Standard.E3.8.128GB	No	8	128 GB	8Gbps
<input type="checkbox"/> MySQL.VM.Standard.E3.16.256GB	No	16	256 GB	16Gbps
<input type="checkbox"/> MySQL.VM.Standard.E3.24.384GB	No	24	384 GB	24Gbps
<input type="checkbox"/> MySQL.VM.Standard.E3.32.512GB	No	32	512 GB	32Gbps

Select a shape Cancel

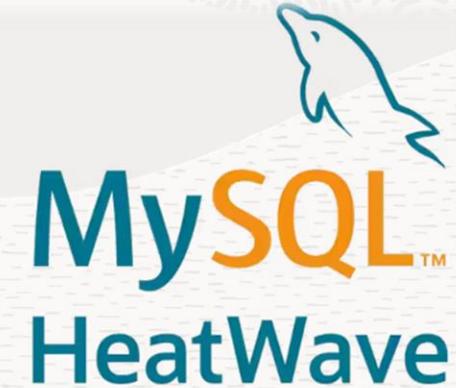


My SQL Available in OCI Free

Get \$300 in credits and try MySQL Database Service free for 30 days

Try MySQL HeatWave for free

- Get US\$300 in cloud credits and try Oracle MySQL HeatWave for 30 days.
- Choose your cloud provider: Oracle Cloud Infrastructure (OCI) or Amazon Web Services (AWS).
- Simplify operations with one MySQL Database service for transactions, analytics, and machine learning (ML)—eliminating the complexity and cost of separate analytics database, ML, and ETL services.
- Get real-time analytics and improve security—eliminating the latency and risks of data movement between data stores.
- Benefit from unmatched price performance and machine learning-powered automation—with changes to current MySQL applications.



<https://www.oracle.com/mysql/free>

Oracle Autonomous Database

Autonomous database on shared or dedicated infrastructure

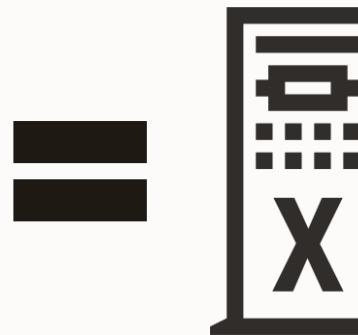


What is Oracle Autonomous Database?

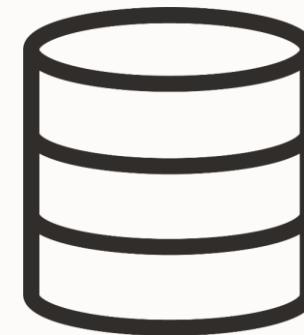
Using the cloud to eliminate all the complexity of mission critical databases



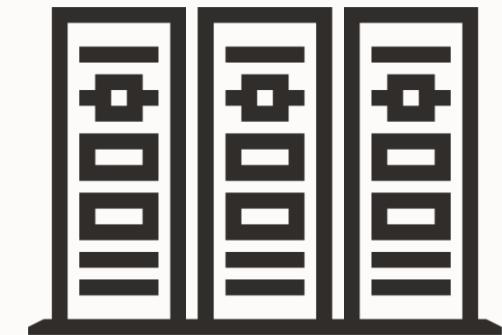
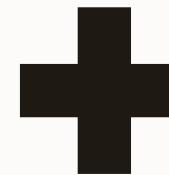
Oracle
Autonomous
Database



Complete
Infrastructure
Automation



Complete
Database
Automation



Automated
Data Center Operations

Autonomous Database | Shared Infrastructure

Oracle Database

Overview

Autonomous Database

Autonomous Data Warehouse

Autonomous JSON Database

Autonomous Transaction Processing

Autonomous Dedicated Infrastructure

Oracle Base Database (VM, BM)

Exadata on Oracle Public Cloud

Exadata Cloud@Customer

External Database

Data Safe - Database Security

Overview

Security Assessment

User Assessment

Data Discovery

Data Masking

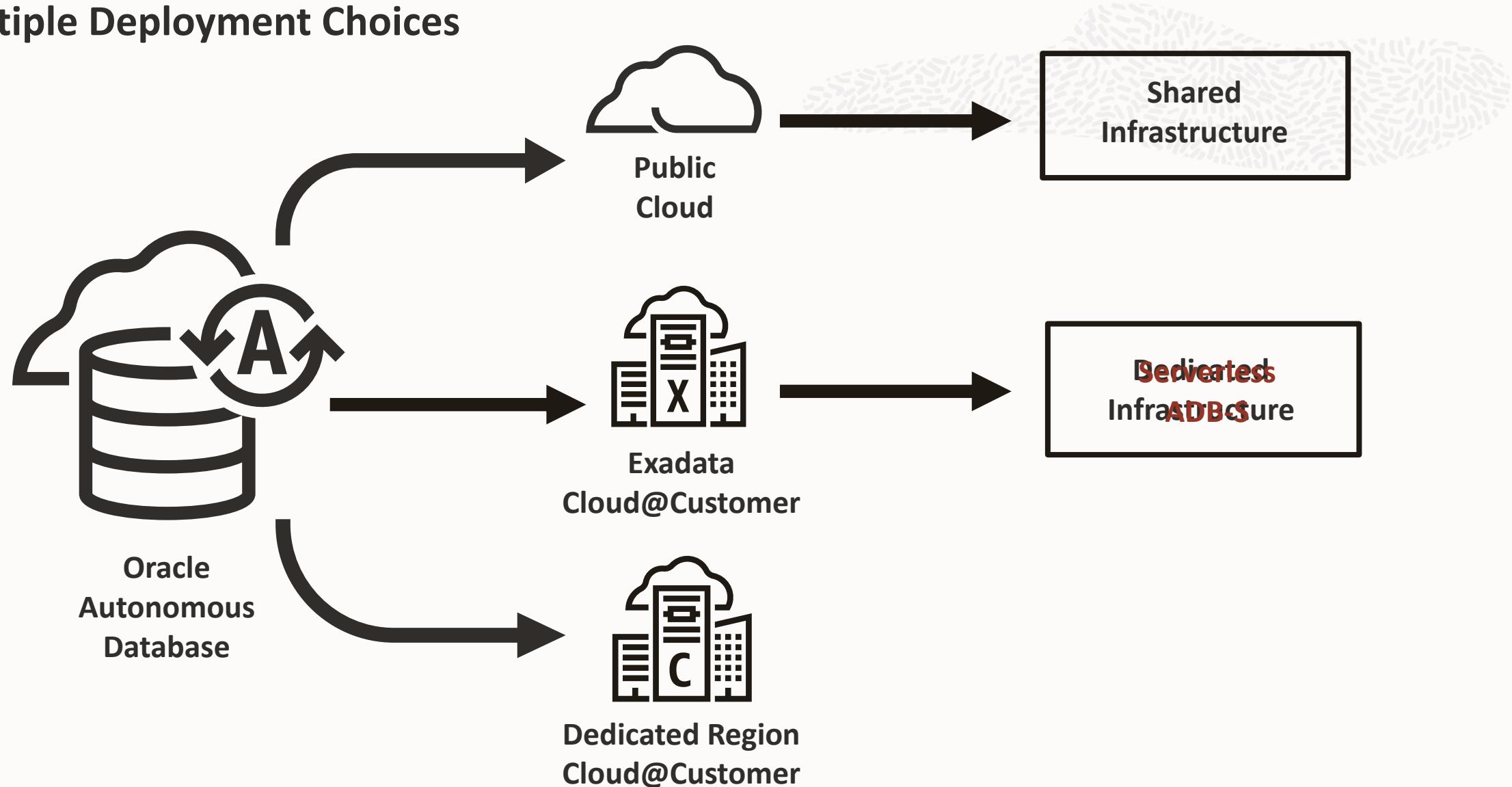
Activity Auditing

Database Backups

GoldenGate

Operator Access Control

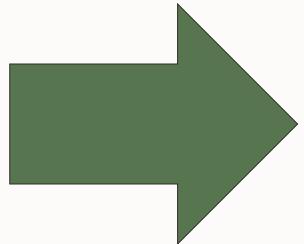
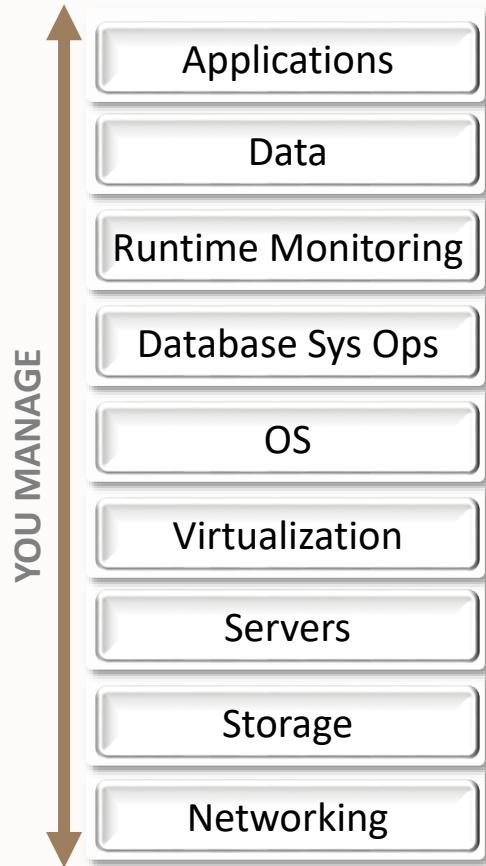
Multiple Deployment Choices



Transfer more responsibility to the service while lowering costs

Same cost per OCPU, greater value with Autonomous

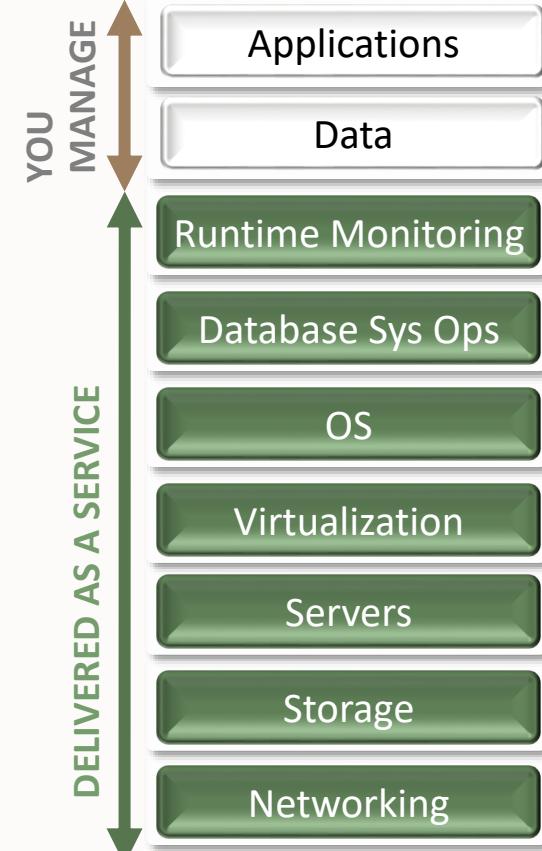
Traditional IT



YOU
MANAGE

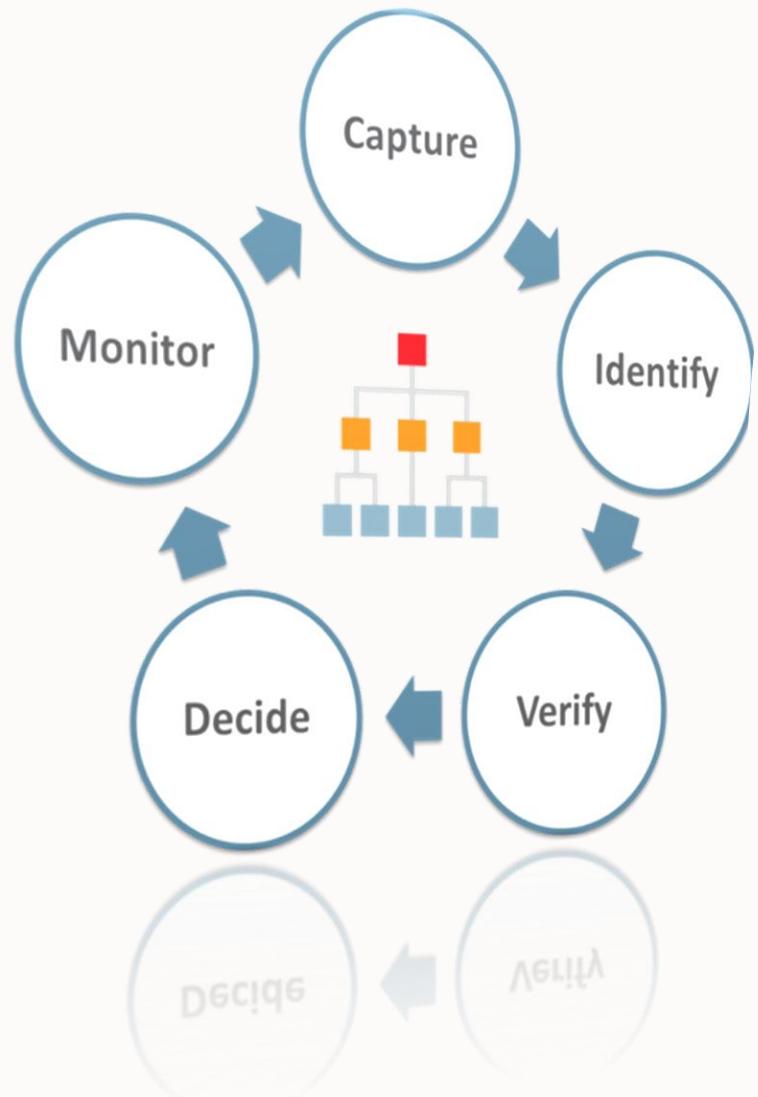
DELIVERED AS
A SERVICE

Exadata Database



Autonomous

Autonomous Database | Automatic Indexing



Indexes implemented using Machine Learning

The entire process is continuous and fully automatic

Index activities are viewable, controllable and auditable

Oracle Autonomous Console Management

Create Autonomous Database

Data Warehouse	Transaction Processing	JSON	APEX
Built for decision support and data warehouse workloads. Fast queries over large volumes of data.	Built for transactional workloads. High concurrency for short-running queries and transactions.	Built for JSON-centric application development. Developer-friendly document APIs and native JSON storage.	Built for Oracle APEX application development. Creation and deployment of low-code applications, with database included.

Choose a deployment type

Shared Infrastructure	Dedicated Infrastructure
Run Autonomous Database on shared Exadata infrastructure.	Run Autonomous Database on dedicated Exadata infrastructure.

Choose Autonomous Container Database

Autonomous Data Guard-enabled Autonomous Container Databases

Autonomous Container Database in **FleetCompartment** ([Change Compartment](#))

FLEET_ACD ([View Autonomous ACD](#))

Configure the database

OCPUs count

0.1

You can enable up to 35 OCPUs. Available cores are subject to compartment quotas and existing core allocation. [Learn more](#).

Auto scaling

Allows system to use up to three times the provisioned number of cores as the workload increases. [Learn more](#).

Storage (GB)

32

The available storage, up to 131072 GB. Available storage is subject to compartment quotas. [Learn more](#).

General Information

Database Name: ATPDevTest1

Workload Type: Transaction Processing

Compartment: [REDACTED] /PM_Compartment

OCID: ...ibmzoq [Show](#) [Copy](#)

Created: Tue, May 25, 2021, 17:34:32 UTC

OCPU Count: 0.1

Auto Scaling: Enabled [\(i\)](#)

Storage: 32 GB

Database Version: 19.11.0.0.0

Lifecycle State: Available

Instance Type: Paid

Scale Up/Down

[Help](#)

OCPUs count

0.6

You can enable up to 74 OCPUs. Available cores are subject to compartment quotas and existing core allocation. [Learn more](#).

Auto Scaling

Allows system to use up to three times the number of cores specified by the OCPU count as the workload increases. [Learn more](#).

Storage (GB)

512

The available storage, up to 131072 GB. Available storage is subject to compartment quotas. [Learn more](#).

[Update](#)

[Cancel](#)

Oracle Autonomous secure connection | Credential Wallet

The screenshot shows the Oracle Cloud interface for an Autonomous Database. The main title is "Autonomous Database » Autonomous Database Details". On the left sidebar, there are sections for Resources, Backups, and Backups (0). The main content area is titled "Database Connection" and contains the following information:

You will need the client credentials and connection information to connect to your database. The client credentials include the wallet, which is required for all types of connections.

Download Client Credentials (Wallet)

To download your client credentials, click Download, and supply a password for the wallet.

[Download](#)

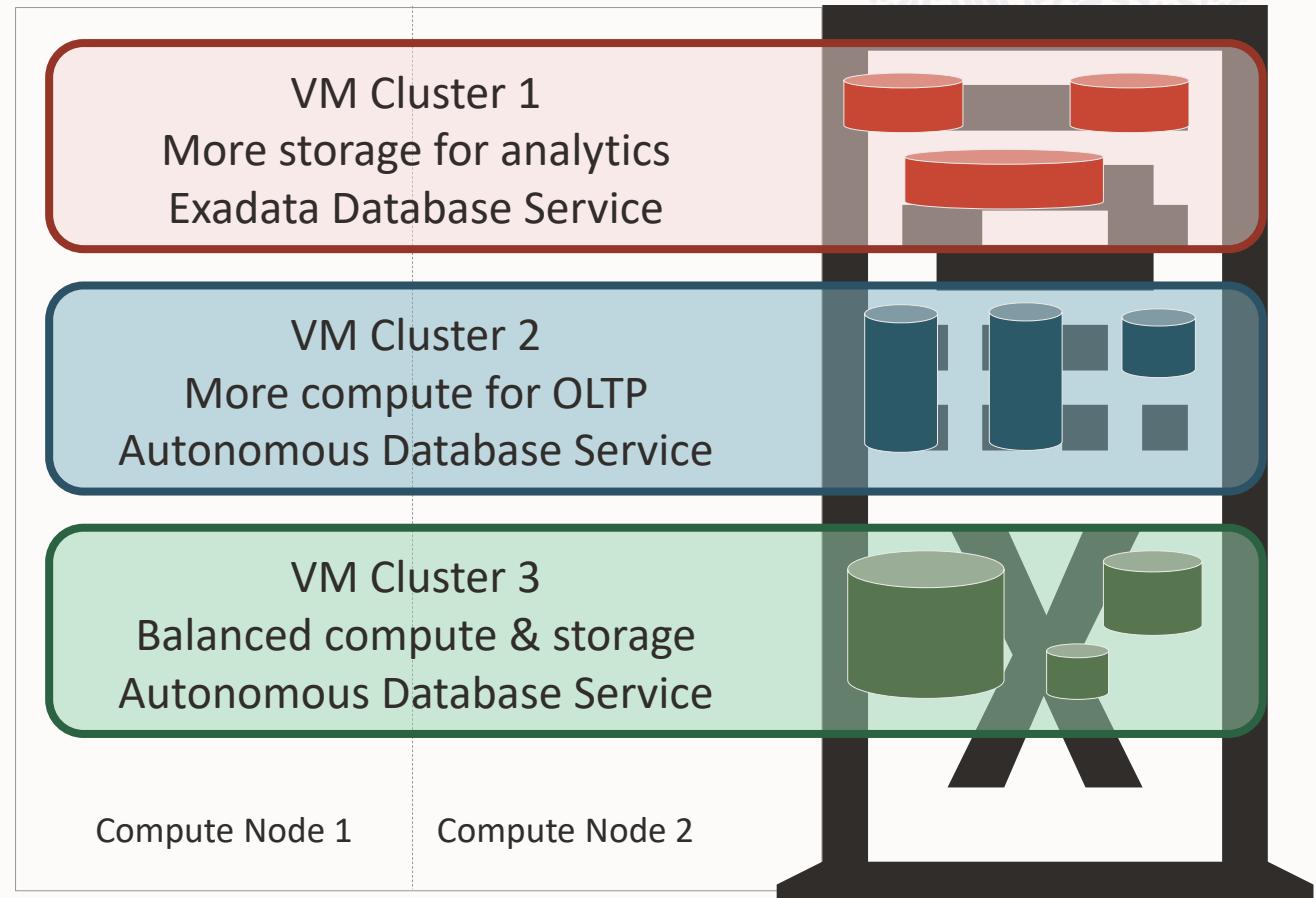
Connection Strings

Use the following connection strings or TNS names for your connections. See the [documentation](#) for details. Oracle recommends using TLS connections to connect to your Autonomous Database.

TNS Name <small>(i)</small>	Connection String <small>(i)</small>
ATPDB2_tp	...ME=ATPDB2_tp.atp.oraclecloud.com))) Show Copy
ATPDB2_medium	...TPDB2_medium.atp.oraclecloud.com))) Show Copy
ATPDB2_tpurgent	...DB2_tpurgent.atp.oraclecloud.com))) Show Copy
ATPDB2_low	...E=ATPDB2_low.atp.oraclecloud.com))) Show Copy
ATPDB2_high	...=ATPDB2_high.atp.oraclecloud.com))) Show Copy
ATPDB2_tp_tls	...ME=ATPDB2_tp.atp.oraclecloud.com))) Show Copy
ATPDB2_medium_tls	...TPDB2_medium.atp.oraclecloud.com))) Show Copy
ATPDB2_tpurgent_tls	...DB2_tpurgent.atp.oraclecloud.com))) Show Copy
ATPDB2_low_tls	...E=ATPDB2_low.atp.oraclecloud.com))) Show Copy

Increasing Resource Utilization Efficiency and Consolidation Savings

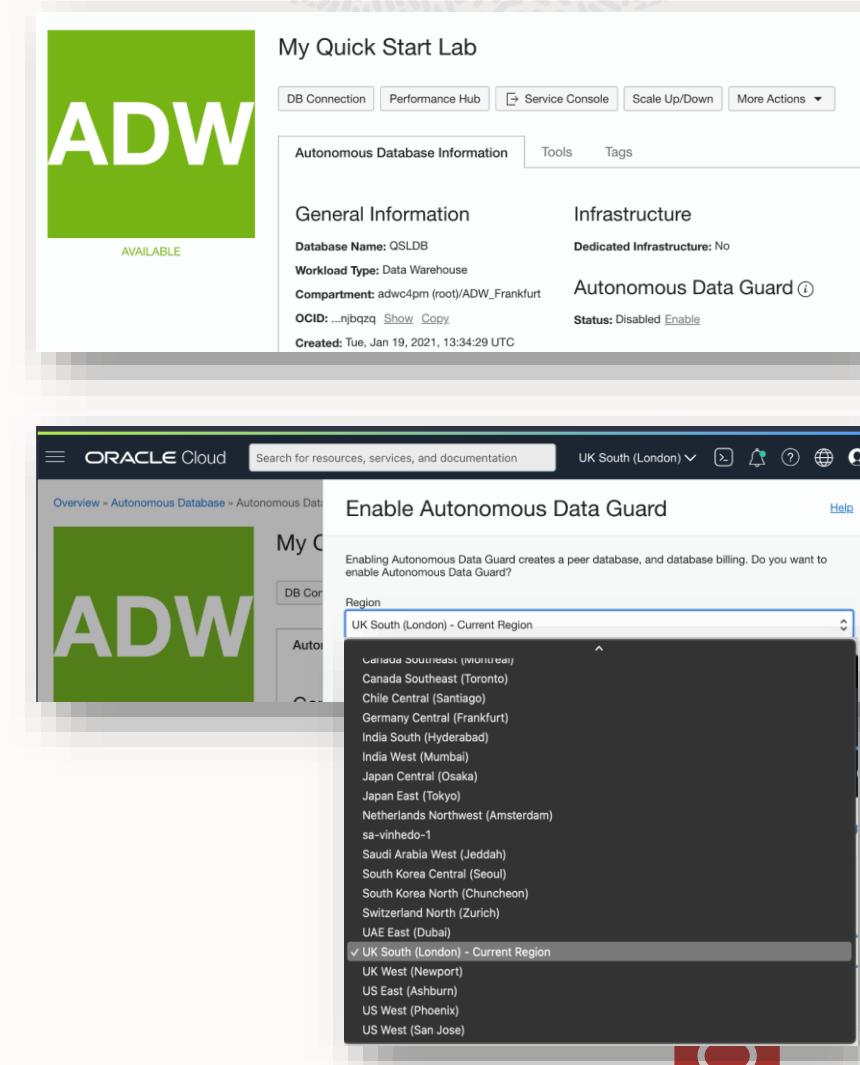
1. Multiple VM clusters can be created on Exadata Cloud@Customer Infrastructure
2. Each VM cluster can be configured to match workload needs (e.g. more storage for analytics or more compute for OLTP)
3. Each VM cluster can be used for either Autonomous or Exadata Database Service
4. Each VM cluster can 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 (and automatically with Autonomous Database)



Available on Exadata Cloud@Customer Infrastructure X7 through X9M

Automated Data Protection – Autonomous Data Guard On ADB

- One-click enable
- Simple and transparent data protection
- Fully-managed standby database
- Completely transparent to customer applications
- Automated failover for zero-data loss scenarios
- User initiated failover for other scenarios
- Seamless reconnection - no new wallet or network configuration required
- RPO: 5 mins, RTO: 2 mins
- Cross Exadata machine or Availability Domain (AD)
- Cross Region



Move Standard Database Workload Autonomous Database



Autonomous Database

Autonomous Operation

- Reduce intensive and manual DBA Tasks
- Auto Database Tuning, Pathing and Securing Capabilities

Lowest cost to adopt Autonomous Database (ADB)

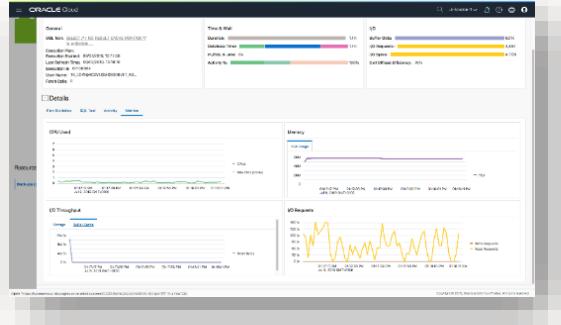
- No additional infrastructure costs, pay only for ADB OCPUs
- Leverage features that drive a true pay-per-use consumption
- Use BYOL to reduce your costs and TCO

Simplest transformation for new and existing workloads

- Autonomous automation and optimized end-to-end
- Developer self-service for new database application development

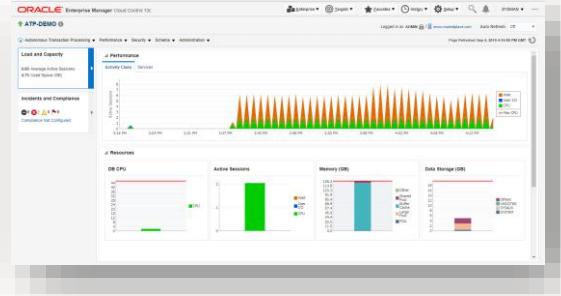
<https://blogs.oracle.com/database/post/migrate-dbse-to-atp>

Autonomous Management Tools | All Tools Bundled with ADB



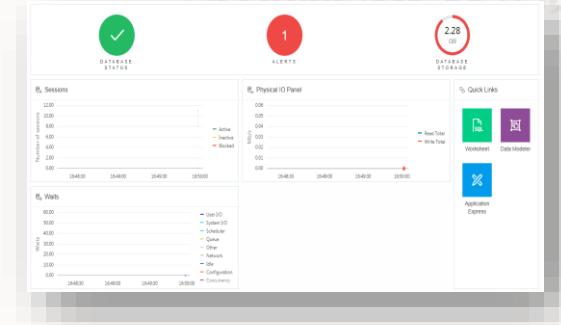
Oracle Management Cloud

Managing multiple DB instances across On-premises and Oracle Cloud - Need a consolidate view



Enterprise Manager

Get rid of time-consuming and resource-intensive weekly full backups on production database services



OCI Console DB Mgmt Services

Working across multiple ADB instances (dev, Test, QA and etc.)
Needs access to SQL performance data

Maximizing Data Privacy and Security

Keeping Data Safe with the Oracle Database



People are after **your** data



Nation States

Criminals

Hacktivists

Insiders

Former Employees

Curiosity Seekers

Customers

Competitors

Personal Data
Financial Data
Trade Secrets
Regulated Data



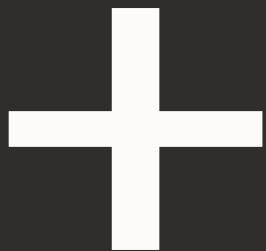
Integrated and Automated Security from Data to Identity



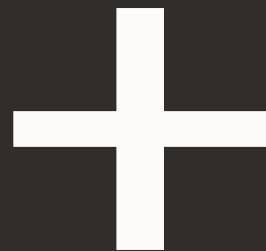
The best security for your data



ORACLE
AUTONOMOUS
DATABASE



ORACLE DATA SAFE



ORACLE CLOUD

Oracle Data Safe available on your OCI Tenancy

Oracle Database

Overview

Autonomous Database

Autonomous Data Warehouse

Autonomous JSON Database

Autonomous Transaction Processing

Autonomous Dedicated Infrastructure

Oracle Base Database (VM, BM)

Exadata on Oracle Public Cloud

External Database

Data Safe - Database Security

Overview

Security Assessment

User Assessment

Data Discovery

Data Masking

Activity Auditing

Database Backups



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

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.



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)

The screenshot shows a security assessment interface with the following key elements:

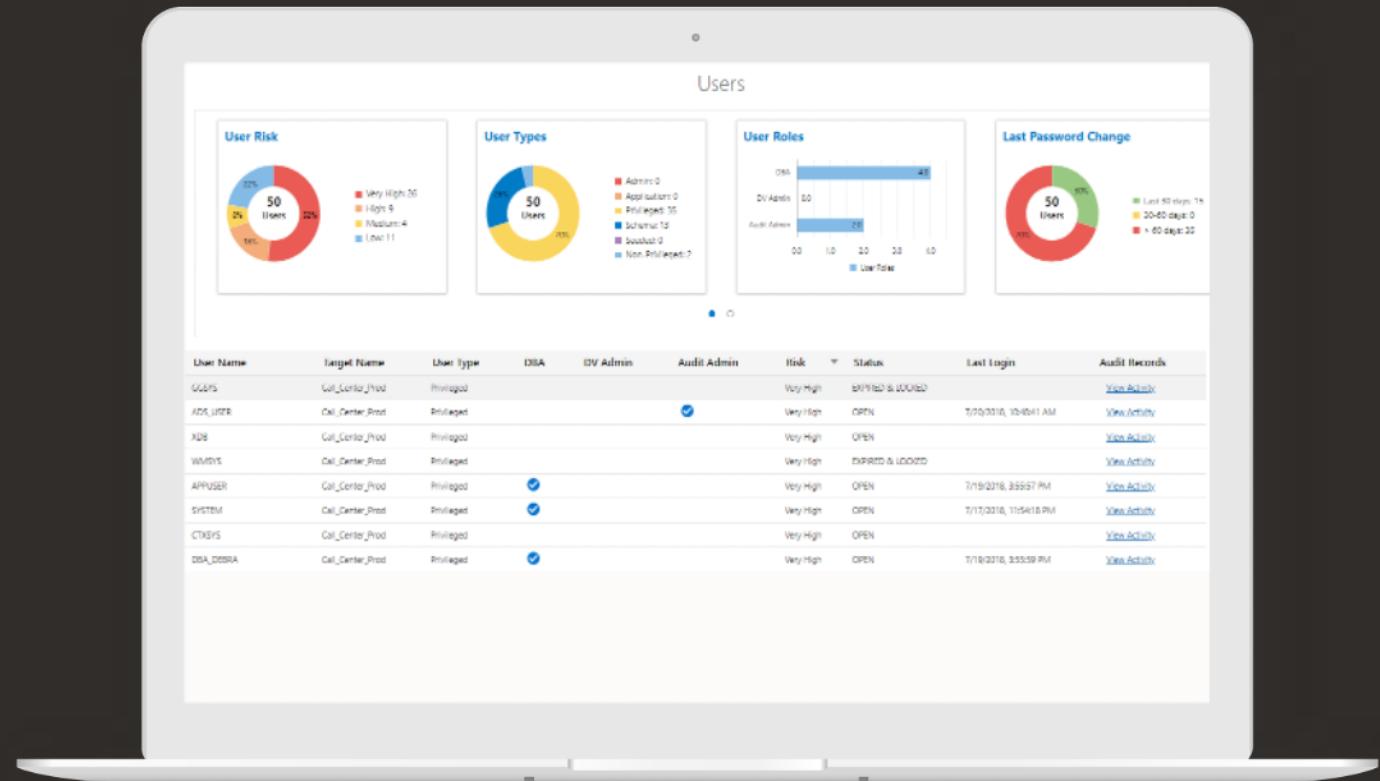
- Summary:** A table showing the count of findings across different categories and risk levels:
 - High Risk: 17
 - Medium Risk: 9
 - Low Risk: 2
 - Advisory: 10
 - Evaluate: 14
 - Pass: 11
 - Total Findings: 20
 - Security Controls: 32
 - User Security: 20
 - System Configuration: 32
- Details:** A detailed view of a specific finding titled "Users with Default Passwords".
 - Status:** High Risk
 - Summary:** Found 10 unlocked user accounts with default password.
 - Details:** Users with default password: ADAMS, BLAKE, CLARK, HR, IX, JONES, OE, PM, SCOTT, SH
 - Remarks:** Default passwords for predefined Oracle accounts are well known and provide a trivial means of entry for attackers. Well-known passwords for locked accounts should be changed as well.
 - References:**
 - dscs-template.cisPrefix
 - dscs-template.stigPrefix
- Remarks:** These PL/SQL packages (DBMS_BACKUP_RESTORE, UTL_DBWS, UTL_ORAMTS) can send data from the database using the network or file system. Access should be granted only to users with a legitimate need for this functionality. Use Privilege Analysis to identify if these privileges were used. If not, consider revoking.
- References:**
 - dscs-template.cisPrefix

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

The screenshot shows a software interface for data masking. On the left, a tree view lists 'Sensitive Columns' under categories like 'Financial Information' and 'Personally Identifiable Information'. On the right, a 'Mask Format' dropdown menu is open, displaying various options for masking credit card numbers. The options listed are:

- User Defined Function
- Regular Expression
- American Express Credit Card Number
- Discover Card Credit Card Number
- MasterCard Credit Card Number
- Visa Credit Card Number
- Generic Credit Card Number

Activity auditing

Track user actions and streamline auditing with policy-based reporting

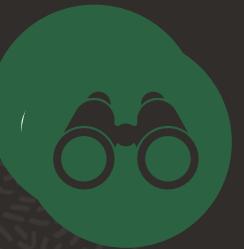


- Collect audit data from databases and track sensitive operations
- Provision audit, compliance, and alert policies
- Generate audit reports
 - Interactive and customizable reports
 - Summary and detailed reports

The screenshot shows a modal dialog titled "Edit Policies" with the target name "Call_Center_Prod". The dialog is divided into sections: "Audit Policies" (selected), "Alert Policies", "Basic Auditing", "Admin Activity Auditing", "User Activity Auditing", "Audit Compliance Standards", and "Additional Audit Policies". Under "Basic Auditing", "Critical Database Activity" and "Login Events" are selected, with "Exclude Users" set to "ALL USERS". Under "User Activity Auditing", "All User Activity" is selected, with "List of Users" set to "Enter Users". Under "Audit Compliance Standards", "Center for Internet Security (CIS) Configuration" is selected. Under "Additional Audit Policies", links to "Custom Policies" and "Oracle Pre-seeded Policies" are shown. At the bottom are "Provision" and "Cancel" buttons.

Data discovery

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



- 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

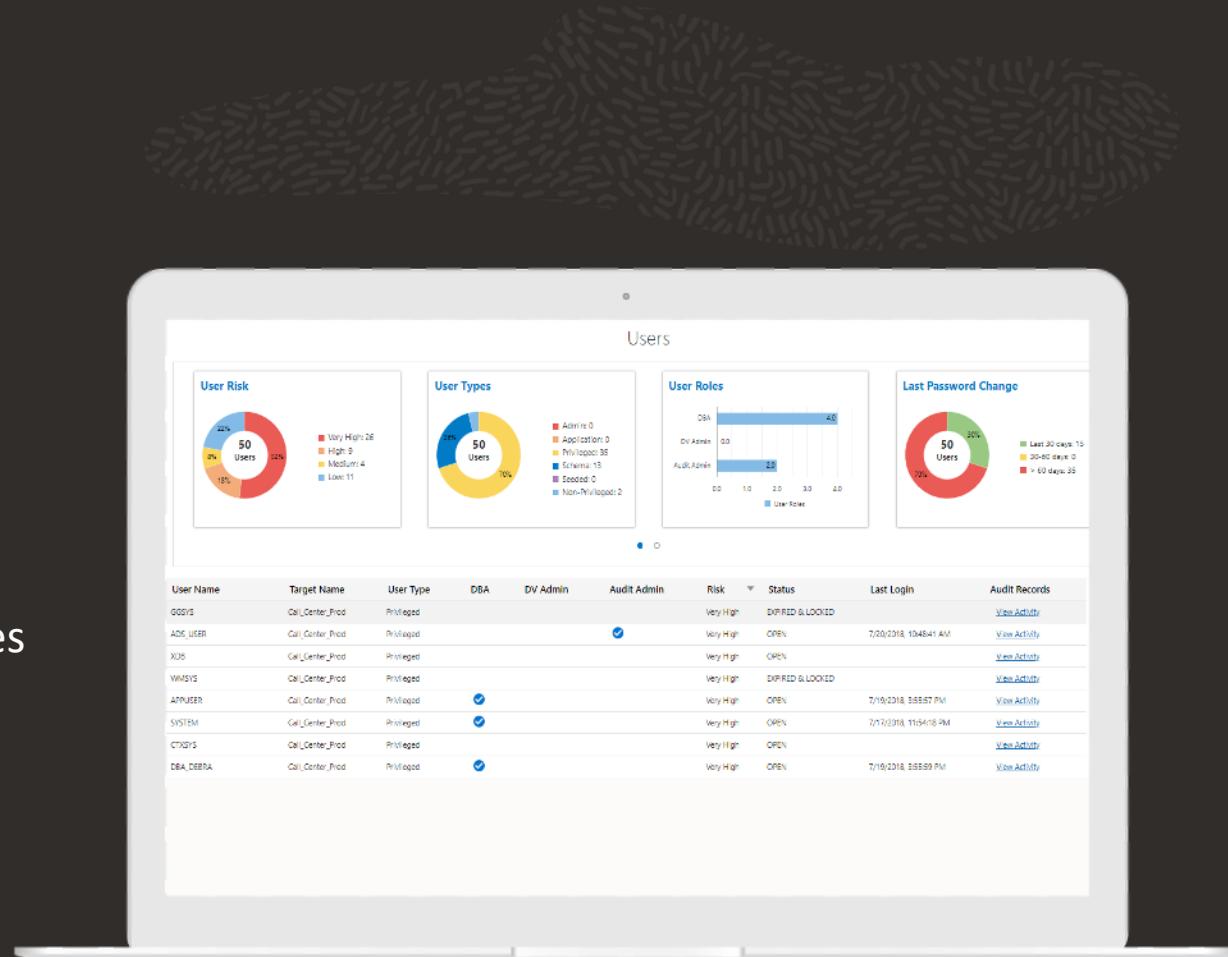


16.6K Sensitive Values	12 Sensitive Types
4 Sensitive Tables	17 Sensitive Columns

Summary: Oracle Data Safe

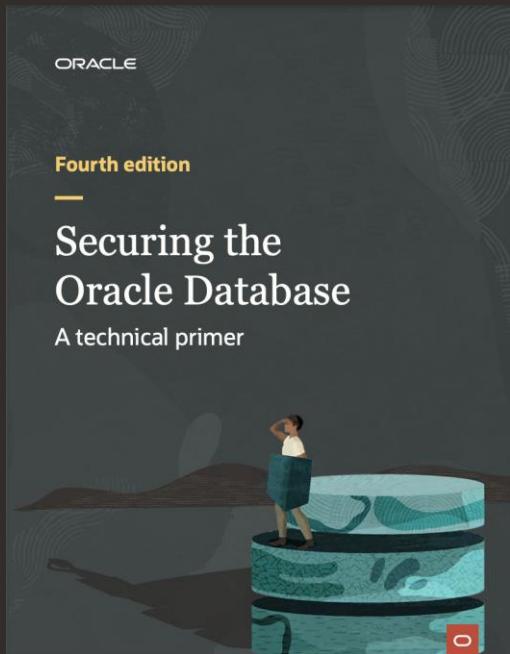
- Unified security control center for cloud and on-premises databases
 - Immediate visibility into risks from data, users, and configurations
 - Click-and-secure: no special expertise required
 - Complete set of proven database security capabilities
- Cuts customer operational cost for securing their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

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

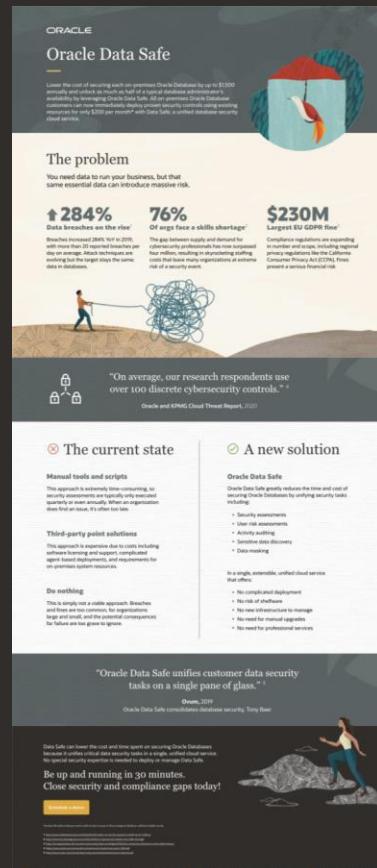


Learn More

[Read the ebook](#)



[Check out the infographic](#)



[Read the IDC report](#)

White Paper
The Security Benefits of a Fully Managed Database Service:
Oracle Autonomous Database

Sponsored by: Oracle Corp.
Carl W. Oldforsen
March 2020

IN THIS WHITE PAPER

In this white paper, we consider the important role of security features such as detection and protection of privacy-related and other sensitive data, detection of improper or suspicious access, and control of database access in a comprehensive way. We also look at timely patching of database management system (DBMS) software, especially where security patches are involved. Patching is done on an infrequent basis in most datacenters, exposing the database to risk in the delay. This white paper discusses that risk and related factors involving database unavailability. It also looks at other security concerns such as data loss prevention and data breach detection.

One might think that moving to a managed database service in the cloud would solve the availability problem, but these services may still require interaction between the customer and the service provider, resulting in database unavailability during the patching process. Handling most security issues remains the user's responsibility, but without proper tools and features, this can be problematic at best. The Oracle Autonomous Database service, by contrast, removes these issues, providing availability without compromise but with maximum security and a range of capabilities that enable users to properly monitor and secure their data.

SITUATION OVERVIEW

The Patching Issue

Computer software is never in a steady state. It requires constant improvement and updating. Some of this effort has to do with shifting usage models or the correction of previously undetected problems, but a great deal has to do with countering vulnerabilities that may be found and exploited by bad actors. This is especially important for databases, where breaches result in significant liability for the enterprise. These updates are applied through patching.

What Is Patching?

A patch is a piece of code that is inserted into existing software to alter its behavior. It may represent a fix to a known problem, a much-requested enhancement, or the removal of a security vulnerability. Applying a patch to a database server normally requires taking it offline to modify the code and then bringing it up again.

March 2020, IDC #US4649719

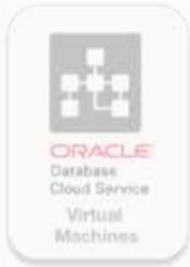
OCI DBCS Bare Metal

Understanding DBCS Bare Metal characteristics



Database Cloud Service | Bare Metal

Understanding Oracle OCI DBCS Bare Metal Roles and Limitations



Bare Metal DB Systems rely on Bare Metal servers running Oracle Linux

- One-node database system
- Two Bare Metal shapes
 - BM DenselBM.01.36 up to 36 Cores, 512 GB Memory and 9 3.2 TB locally attached (28.8 TB total)
 - BM DenselBM.02.52 up to 52 Cores, 768 GB Memory and 8 6.4 TB locally attached (51.2 TB total)
- Start With 2 cores and Scale Up/Down OCPU's based on your requirement
- Data Guard with and across Ads (Requires DB Enterprise Edition)
- No Oracle RAC Allowed, just Single Instance
- It is not possible to create a non-CDB via the console - use dbcli

Oracle DBCS Bare Metal Console Management

Create DB system

- 1 DB system information
- 2 Database information

Select an availability domain

AD-1 wBCz:US-ASHBURN-AD-1 ✓ AD-2 wBCz:US-ASHBURN-AD-2 AD-3 wBCz:US-ASHBURN-AD-3

Select a shape type

Virtual Machine **Bare Metal** ✓

Select a shape

BM.DenseIO1.36 2 Available Core Count Change shape

Configure storage

Data storage percentage

80%

Browse All Shapes

A shape determines the options for resources such as node count, core count, and storage. For information about shapes, see [Shapes for Bare Metal DB Systems](#).

Name	Maximum Core Count	Minimum Core Count
<input checked="" type="checkbox"/> BM.DenseIO1.36	36	2
<input type="checkbox"/> BM.DenseIO2.52	52	2

1 Selected

Showing 2 Items < 1 of 1 >

Configure the DB system

Total node count

1

The node count for the selected shape cannot be changed.

Oracle Database software edition

Enterprise Edition High Performance

Select an Oracle Database Software Edition

Standard Edition

Enterprise Edition

Enterprise Edition High Performance

Enterprise Edition Extreme Performance

<https://docs.oracle.com/en-us/iaas/dbcs/doc/bare-metal-db-systems.html>

OCI DBCS Virtual Machines

Understanding DBCS Virtual Machine characteristics



Database Cloud Service | Virtual Machine

Understanding Oracle OCI DBCS roles and limitations



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

Restrictions:

- 2 DB Systems types on VM
 - One Node – One VB Database System
 - Two Nodes – Two VM Clusters with Oracle RAC Features
- Can have only a Single Database Home and one Database
- Amount of memory allocation depends on VM Shapes
- On A RAC shape, each node is assigned on a different fault domain

Oracle DBCS Virtual Machine Console Management

Create DB system

1 DB system information
2 Database information

Select a shape type

Virtual Machine ✓ Bare Metal

Configure shape

A shape determines the options for resources such as node count, core count, and storage. For information about shapes, see [Shapes for Virtual Machine DB Systems](#).

AMD VM.Standard.E4.Flex
4 core OCPU, 64 GB memory, 4 Gbps Network Bandwidth, 64K IOPS

Change shape

Change shape

AMD AMD
Flexible OCPU count. AMD processors.

Intel Intel
Flexible and fixed OCPU count. Intel processors. ✓

Ampere Ampere
Flexible OCPU count. Arm-based processors.

Intel X9
Flexible OCPU count ✓

Intel X7
Fixed OCPU count

Change shape

Configure OCPU

Name	OCPUs	Memory	Network bandwidth	Theoretical max IOPS
VM.Standard3.Flex	8	128 GB	8 Gbps	128K

You can customize the number of OCPUs. Other resources scale proportionately. [Learn more about flexible shapes](#).

Number of OCPUs per node

8 1 32

1 Selected Showing 1 Item

Configure the DB system

Total node count
2

Oracle Database software edition
Enterprise Edition Extreme Performance

Total storage (GB) Read-only ⓘ
912



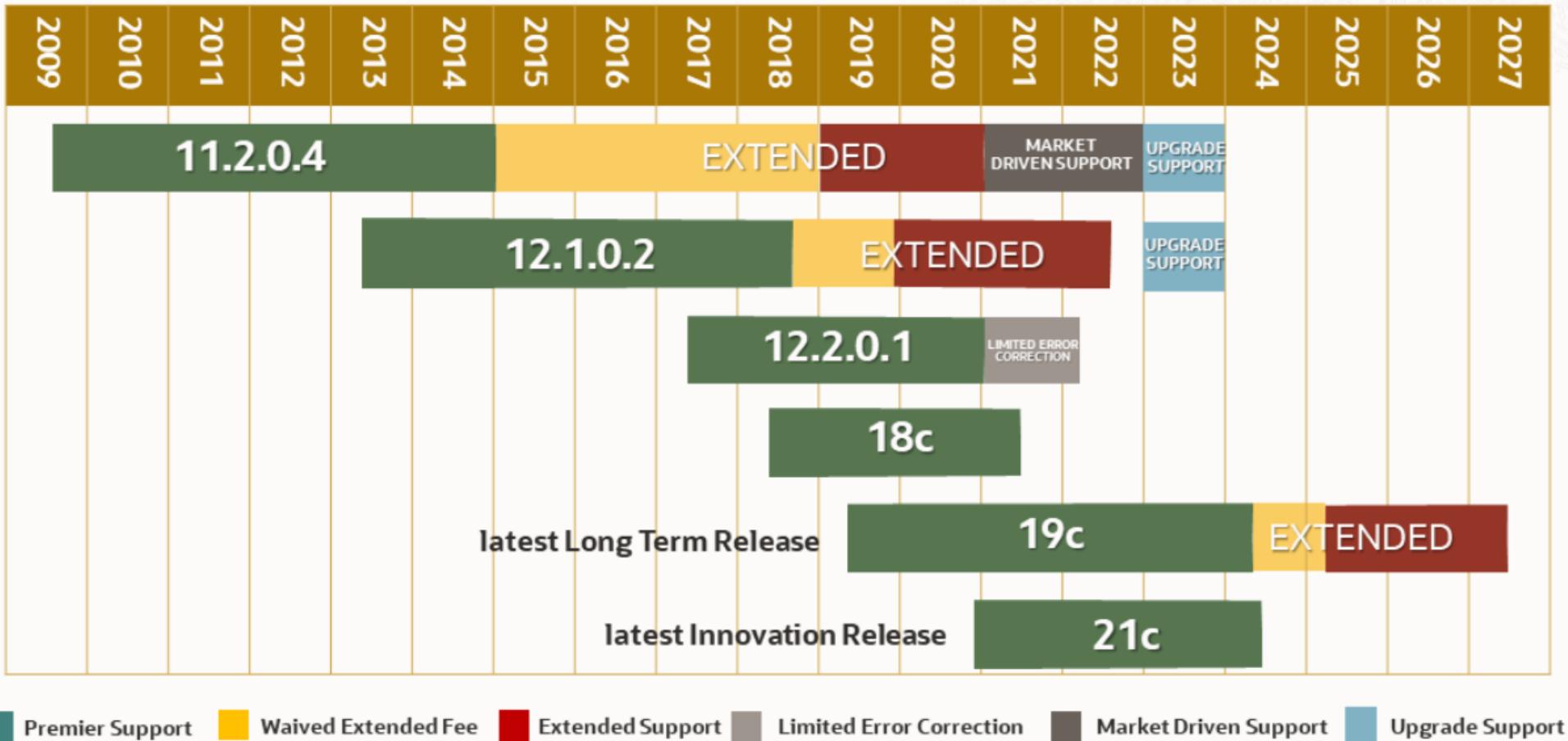
Oracle Database Version and Timeline

Understanding My Oracle Support Limitations



Oracle Database 19c – 8 years of support

My Oracle Support Official Note (Doc ID 742060.1)



OCI DBCS Patching

Keep your OCI DBCS Database Up to Date



OCI DBCS Grid Patching

Pre check through OCI Console before change any bundle patch version



Updates

DB System: [demo12rac](#)

Update description	Type	State	Component	Version	Last successful precheck	Release date	⋮
Jan 2023 19c Db System patch	Patch	Available	GI patch	19.18.0.0.0	—	Tue, Oct 17, 2023, 01:00:00 UTC	⋮
Oct 2022 19c Db System patch	Patch	Available	GI patch	19.17.0.0.0	Wed, Feb 8, 2023, 16:16:34 UTC	Run precheck	⋮

OCI VM System DBCS | Oracle Home Patching Precheck

Pre check through OCI Console



Database: [dem12rac](#)

Oracle Database Software Images

Custom Database Software Images

Patch description	Type	State	Version	Release date	
Jan 2023 12.1.0.2 Database patch	Patch	● Available	12.1.0.2.230117	Wed, Jan 25, 2023 UTC	Precheck Apply Copy OCID ⋮
Oct 2022 12.1.0.2 Database patch	Patch	● Available	12.1.0.2.221018	Thu, Dec 15, 2022 UTC	Precheck Apply Copy OCID ⋮

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/oracle/dcs/commonstore, STABLE
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

Confirm

The action might result in database downtime. Are you sure you want to apply the patch to the database?

If you have manually installed one-off patches on this database, Oracle recommends that you patch using a custom database software image that includes your one-off patches.

[Learn more](#) about OCI custom database software images.

This operation may roll back one-off patches that have been applied manually.

Do you want to continue?

OK

[Cancel](#)

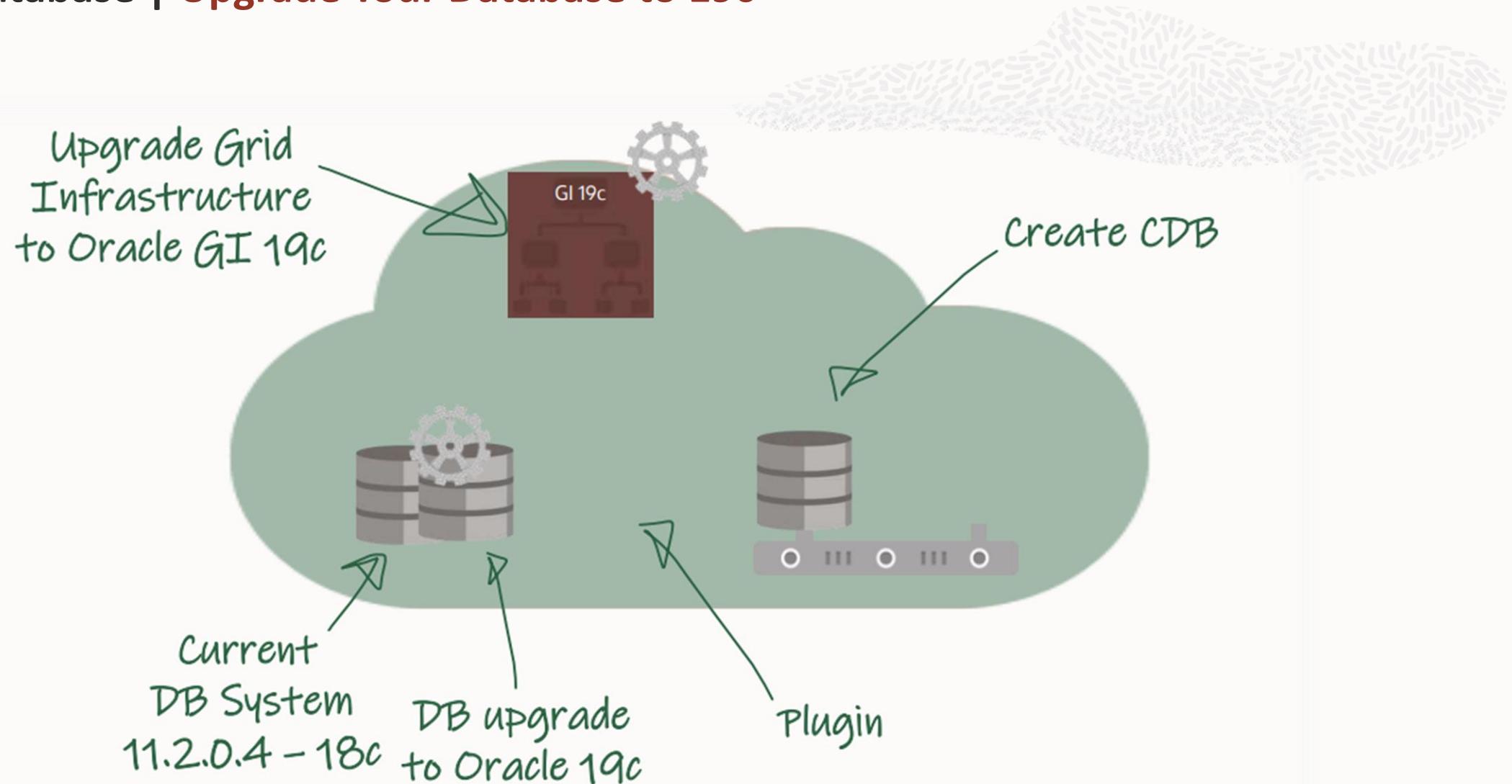


OCI DBCS Upgrade Database Version

Move your Oracle Database to 19c



Oracle Database | Upgrade Your Database to 19c



OCI VM System DBCS Upgrade Precheck

Oracle Database 19c Upgrade pre check using OCI console



Database: [dem12rac](#)

Oracle Database Software Images

Custom Database Software Images

Patch description	Type	State	Version	Release date	Precheck	⋮
Oracle Database 19.15.0.0	Upgrade	● Available	19.15.0.0	-	Precheck	⋮
Oracle Database 19.16.0.0	Upgrade	● Available	19.16.0.0	-	Upgrade	⋮
Oracle Database 19.17.0.0	Upgrade	● Available	19.17.0.0	-		⋮
Showing 3 Items < 1 of 1 >						

OCI VM System DBCS | Upgrade Database

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



Upgrade Database

[Help](#)

i An Oracle Grid Infrastructure (GI) patch is available for your DB system. Oracle recommends patching your GI before upgrading the database.

There are no manual backups of this database. Oracle recommends creating a manual backup of the database before starting an upgrade. [Learn more about creating a manual backup](#)

During the upgrade process, the system performs an automatic precheck. However, Oracle recommends running a manual precheck before upgrading to detect and mitigate any problems before the upgrade to minimize the downtime window. [Learn more](#) about upgrading.

Upgrade Precheck Cancel



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 DBCS Pos Database Upgrade

What we must to check after a susses Database Upgrade Version



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

</

Dbcli Command Line Interface

Using dbcli to manage your entire Oracle DBCS database command



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-dbhomes
- *dbcli* describe-dbhomes
- *dbcli* list-dbhomes
- *dbcli* update-dbhomes



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

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 Guard MAA

Understanding options and Database editions limitations



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

Database information Tags

General information

Lifecycle state: Available
OCID: ...32vonq [Show](#) [Copy](#)
Created: Sat, Oct 22, 2022, 19:54:02 UTC
Database Role: Standby
Database unique name: DB12_iad1r5
Oracle SID Prefix: None
Database Architecture: Container Database
Character Set: AL32UTF8

Backup

Automatic backup: Disabled [i](#)

Data Guard

Status: Enabled

Encryption

Encryption Key: Oracle-managed key

Data Guard Associations							
Enable Data Guard							
Peer database	Peer DB system	Peer role	Protection Mode	Transport type	Apply lag	Data Guard Type	Launched
DB12	DB12STDBY	Standby	Maximum Availability	Sync	0 seconds	Mounted (Data Guard)	Sat, Oct 22, 2022, 19:50:14 UTC

Edit Data Guard Association

Help

Data Guard association details

Data Guard Type

Active Data Guard
Active Data Guard is a licensed option to the Oracle Database Enterprise Edition and enables advanced capabilities that extend the basic Data Guard functionality. These capabilities include Real-Time Query and DML Offload, Automatic Block Repair, Standby Block Change Tracking, Far Sync, Global Data Services, and Application Continuity. [Learn more.](#)

Data Guard
Oracle Data Guard ensures high availability, data protection, and disaster recovery for enterprise data. Data Guard provides a comprehensive set of services that create, maintain, manage, and monitor one or more standby databases to enable production Oracle databases to survive disasters and data corruptions. Data Guard maintains these standby databases as transactionally consistent copies of the production database. [Learn more.](#)

Protection mode

Maximum Availability

Data Guard Associations							
Enable Data Guard							
Peer database	Peer DB system	Peer role	Protection Mode	Transport type	Apply lag	Data Guard Type	Last updated
DB12	single_marcel01	Standby	Maximum Availability	Sync	0 seconds	Mounted (Data Guard)	Sat, Oct 22, 2022, 19:50:14 UTC



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

Enable Data Guard

Provide information for the initial database

1 DB system information 2 Database information

Configure standby database

Database image *Optional*

Click **Change Database Image** to select your software version

Change database image

Database password

.....

Show advanced options

Data Guard Association cannot be created when standard database service port (1521) is used with Subnet: `ocid1.subnet.oc1.iad.aaaaaaaaacx5bqxh24cggprzg7psrf4okvwhboryv6pj63xs`

Instances in Subnet: `ocid1.instance.oc1.iad.aaaaaaaaacx5bqxh24cggprzg7psrf4okvwhboryv6pj63xs435ii5hcwkq` by security rules associated

Previous **Enable Data Guard** Cancel

VM Data Guard Switchover through OCI Console

The screenshot illustrates the process of performing a VM Data Guard switchover through the Oracle Cloud OCI console. It consists of three main panels:

- Top Panel:** Shows the OCI Cloud Classic interface with the navigation path: Overview > Oracle Base Database > DB Systems > DB System Details > Database Home Details > Database Details > Work requests > Work request details. The title "Switchover Data Guard" is displayed.
- Middle Panel:** A modal window titled "Switchover Database". It contains a confirmation message: "Are you sure you want to perform a database switchover? A switchover reverses the primary and standby database roles." Below this is a password input field labeled "Enter the database admin password". At the bottom are "OK" and "Cancel" buttons.
- Bottom Panel:** A detailed view of the work request. The title is "Switchover Data Guard". The status bar shows a large orange "WR" icon with the text "IN PROGRESS". The progress bar is at 0% complete. The operation details are:
 - Operation:** Switchover Data Guard
 - OCID:** ...s3rlha [Show](#) [Copy](#)
 - Compartment:** acteamlad (root)/marlamar
 - Accepted:** Tue, Apr 25, 2023, 22:28:56 UTC
 - Started:** Tue, Apr 25, 2023, 22:29:33 UTC
 - Finished:** —
- Bottom Left Panel:** A smaller view of the same work request details, showing a green "WR" icon with the text "SUCCEEDED".

Studding and costs useful tools

Very good tools to test and



Oracle Cloud Cost Estimator



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Most Popular Services

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Carregar

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https://education.oracle.com/es/learn/oracle-cloud-infrastructure/pPillar_640



Oracle Learning Library Videos on YouTube :

[Oracle Learning – YouTube](#)



OCI training and certification :

www.oracle.com/cloud/iaas/training

www.oracle.com/cloud/iaas/training/certification

www.education.oracle.com/oracle-certification-path

Oracle Cloud always free tier:

www.oracle.com/cloud/free



Upgrade your Database - NOW!



Mike Dietrich's Blog About Oracle Database Upgrades... Mostly



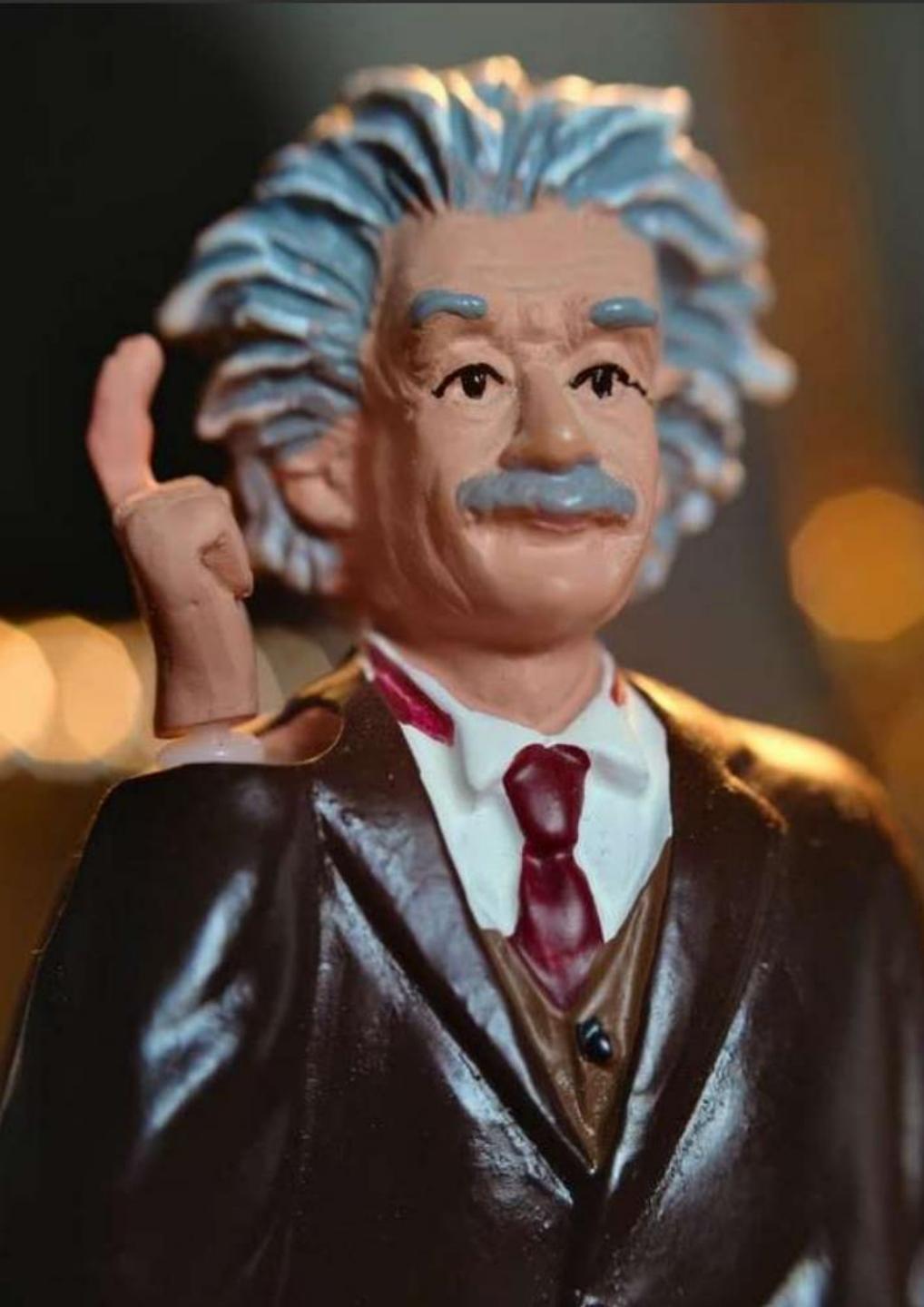
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Patching my environments with
the January 2023 Bundle Patches

Photo by [karokrasinska](#) on [Unsplash](#)

Rolling back or removing
all patch SQL changes

<https://mikedietrichde.com>



Demo 1 - OCI DB System VM

- *dbcli* update
- Grid Prechk Patch using *OCI Console*
- Oracle Home Patch aaply using *dbcli*
- Data Guard check status using Broker
- Dataguard switchover using OCI Console



Demo 2 – OCI Data Safe

- Data Safe Fast provisioning on ADB





Thank You 😊

Questions / Feedback / Training Suggestions

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Ask for help 😊

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