

ORACLE

Oracle Database 23c

Get Started – New Features For Administrators

Marcel Lamarca

Exadata Cloud Specialist

Oracle, Alliances and Channels LAD

April, 2024



SQL> select * from person where name = 'Marcel Lamarca'




MARCEL LAMARCA

Exadata Cloud Specialist

Upgrade, Utilities, Patching, Performance & Migrations

 [marcel-lamarca](https://www.linkedin.com/in/marcel-lamarca)

 marcel.lamarca@oracle.com



About My Career

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

Certifications

Oracle Cloud Specialist (OCS)

- Exadata Database Machine X9M Certified Specialist
- OCI Foundation 2020 / 2023
- Oracle Autonomous Database Administrator Professional 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 database 23c! What is new ?

2

Upgrade to 23c

3

Resources

4

Demos



Oracle Database 23c Benefits to you



- Blockchain Tables
- Database Availability
- Database Architecture
- Performance Improvements
- Database Manageability
- Database Security
- Database Sharding

Oracle Database Timeline Version



Oracle Database Cloud Deploy for database 23c

Oracle Database Service (DBCS)



Support **Enterprise** and **Standard**
Editions for Database version 19c
and 23c

Oracle Exadata Cloud



Supports only **Enterprise Edition**
for Database Versions 19c and 21c

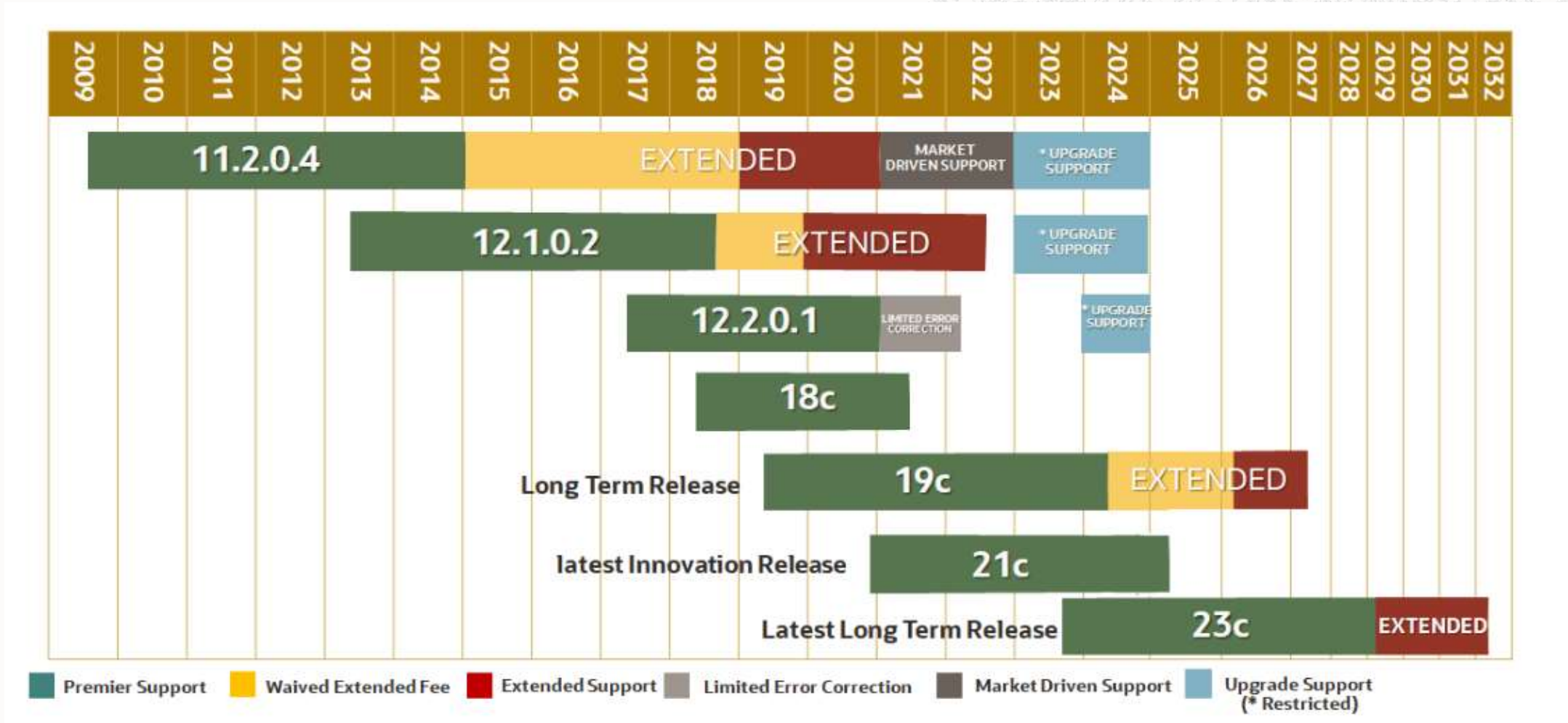
Oracle Autonomous Database



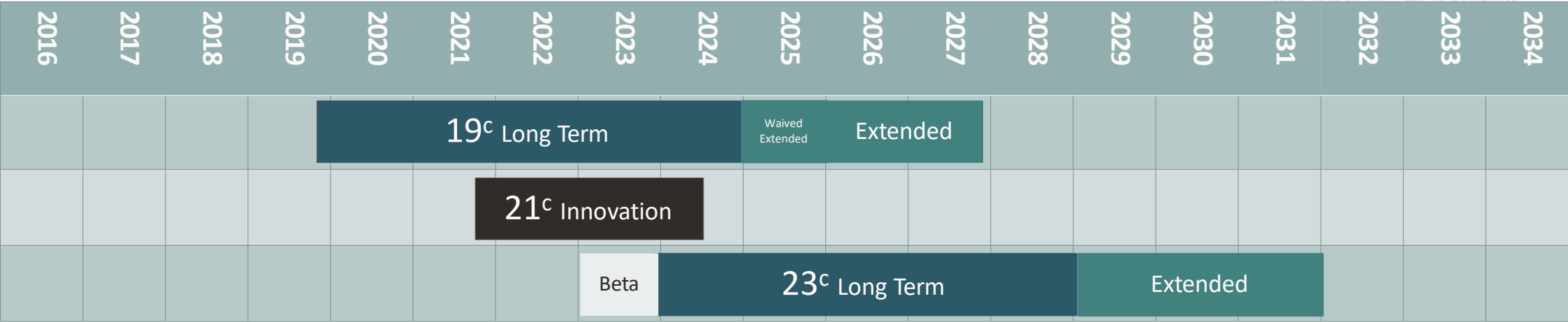
Supports **Enterprise** and **Standard**
Edition for Database Version 19c

Oracle Database Releases and timeline

My Oracle Support Official Note (Doc ID 742060.1)



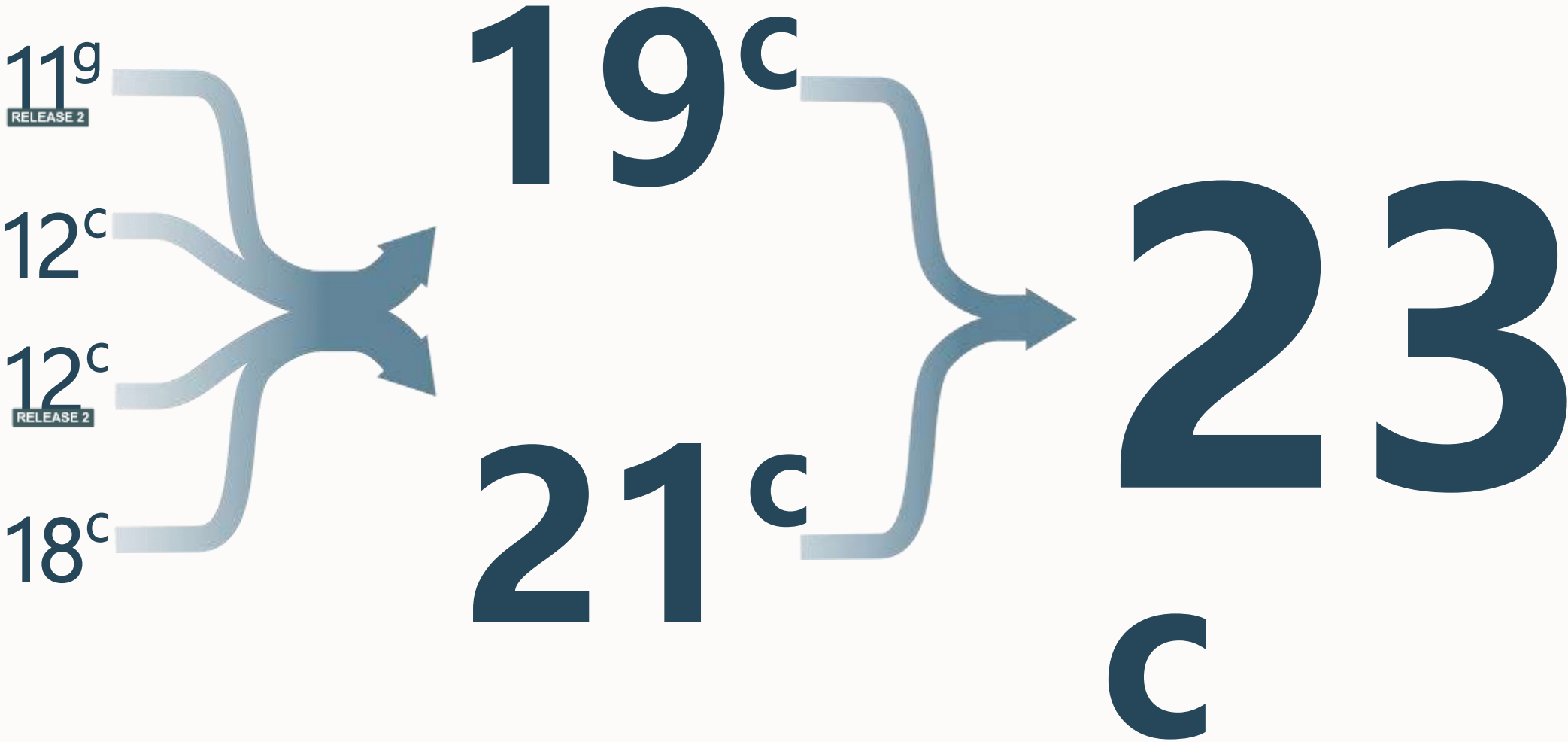
Innovation Release Vs Long Term Release



- Innovation Release - 2 years of Premier Support, and no Extended Support
- Long Term Release - 5 years of Premier Support, and 3 years of Extended Support



Upgrade Path to Oracle Database 23^c



Oracle Database Cloud Service



Oracle DBCS Bare Metal Console Management

The screenshot displays the Oracle Cloud console interface. At the top, the header includes the Oracle Cloud logo, a 'Cloud Classic' link, and a search bar. The left sidebar contains a navigation menu with items like Home, Compute, Storage, Networking, **Oracle Database** (highlighted), Databases, Analytics & AI, Developer Services, Identity & Security, and Observability & Management. The main content area is titled 'Oracle Database' and lists various services. Under the 'Overview' section, there are links for 'Autonomous Database' (with sub-links for Autonomous Data Warehouse, Autonomous JSON Database, and Autonomous Transaction Processing), 'Globally Distributed Autonomous Database', 'Autonomous Dedicated Infrastructure', **Oracle Base Database Service** (highlighted), and 'Oracle Exadata Database Service'. On the right side, there are links for 'Exadata Fleet Update', 'External Database', 'Data Safe - Database Security' (with sub-links for Overview, Security Assessment, User Assessment, Data Discovery, Data Masking, Activity Auditing, and SQL Firewall), and 'Database Backups'.

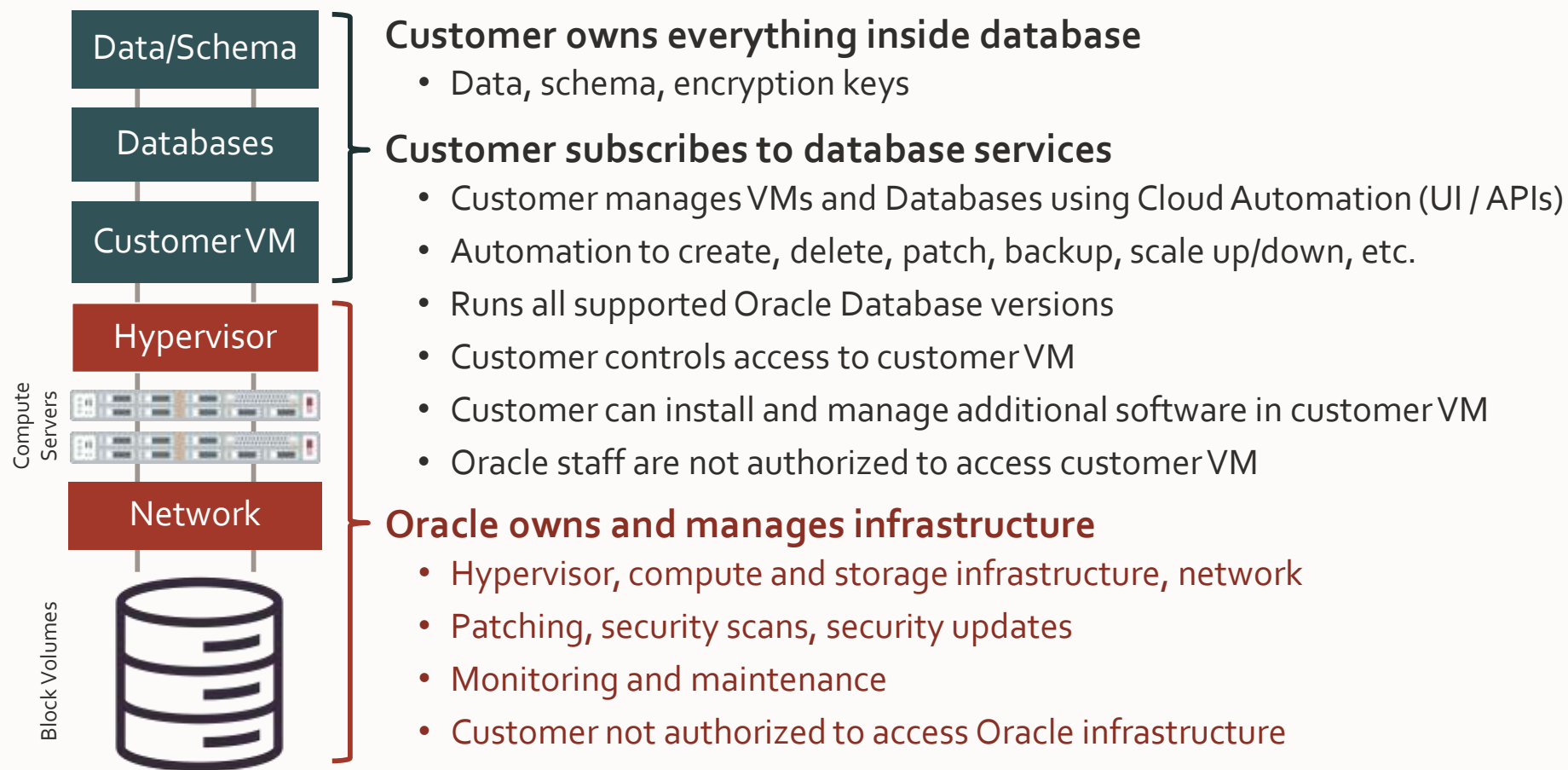


Database Cloud Service | Virtual Machine 23c



- Supports only one node for Oracle Database 23c
- Supports Standard and Enterprise edition
- Does not support Standard Editions BYOL licenses
- Up to **80 TB** of usable higher performance block-volume storage

Customer managed databases with Oracle managed infrastructure





Oracle DBCS Virtual Machine Console provisioning


Change shape

Shape series

A shape determines the options for resources such as node count, core count and storage. [Learn more.](#)

**AMD**
Flexible OCPU count. AMD processors.

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

**Ampere**
Flexible OCPU count. Arm-based processors.

Intel X9
Flexible OCPU count ✓

Intel X7
Fixed OCPU count

Change shape

Configure OCPU

Name	OCPU	Memory	Network bandwidth	Theoretical max IOPS
<input checked="" type="checkbox"/> 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

1 32

1 Selected

Showing 1 Item

Configure storage

You can choose the storage management software type (Grid Infrastructure or Logical Volume Manager), the performance setting and specify how much storage to provision.

Oracle Grid Infrastructure
Block Volume Performance: Higher performance
256 GB available storage, 19.2K IOPS

Change storage

Configure the DB system

Total node count

2

Oracle Database software edition

Enterprise Edition Extreme Performance

Total storage (GB) *Read-only* ⓘ

912



Blockchain Tables

Blockchain table overview



- Each row is chained to the previous row (except first row)
- Rows are linked when the transaction commits

ID	User	Value	Hash
1	Tom	500	ADSJS
2	Carol	176	%SHS
3	Steve	500	SH@1
4	John	176	DHD3
5	Mike	332	*EGG
6	Sarah	632	AH11
7	Eve	25	LIO\$
8	Prisha	850	SHS4

Hash1 = hash (row data 1 and Hash0)
Hash2 = hash (row data 2 and Hash1)
Hash3 = hash (row data 3 and Hash2)
Hash4 = hash (row data 4 and Hash3)

BLOCKCHAIN TABLE



Blockchain table overview

- **Blockchain tables considerations**

- May be partitioned
- Specify Retention
 - Blockchain table
 - Blockchain table rows

- **Restrictions**

- Data Types not supported :


ROWID,
UROWID,
LONG,
object type,
REF,
varray,
nested tables,
TIMESTAMP WITH TIME ZONE
TIMESTAMP
WITH LOCAL TIME ZONE

- Update rows, merge rows, truncate, drop partition



Blockchain table overview

- Must Specify Version :
 - Version "V1" ---→ Oracle Database 21c
 - Version "V2" ---→ Oracle Database 23c
- Reduce column limits
 - Version "V1" ---→ 20 less columns
 - Version "V2" ---→ 40 less columns
- V2 Benefits
 - Add / Drop partitions
 - Add Columns

- 
- Distributed transactions
 - Replication OGG / ADG

Blockchain table overview

- Altering Blockchain Tables
- Modify Retention Period
- Alter Table

--- Cannot drop if newest row is <16 days old ---

```
SQL> ALTER TABLE bank_ledger ON DROP UNTIL 16 DAYS IDLE;
```

--- Cannot be deleted until 20 days after creation -----

LOCKED indicates the setting can never be modified

```
SQL> ALTER TABLE bank_ledger ON DELETE UNTIL 20 DAYS AFTER INSERT LOCKED;
```

Blockchain table overview

```
CREATE BLOCKCHAIN TABLE hcm1.customers
(
  order_num      NUMBER,
  day            DATE,
  cust_id        NUMBER,
  movie_id       NUMBER,
  title          VARCHAR(25))
NO DROP UNTIL 15 days IDLE
NO DELETE UNTIL 16 days AFTER INSERT
LOCKED HASHING USING "SHA2_512" version "v2";
```


Blockchain Table Restrictions



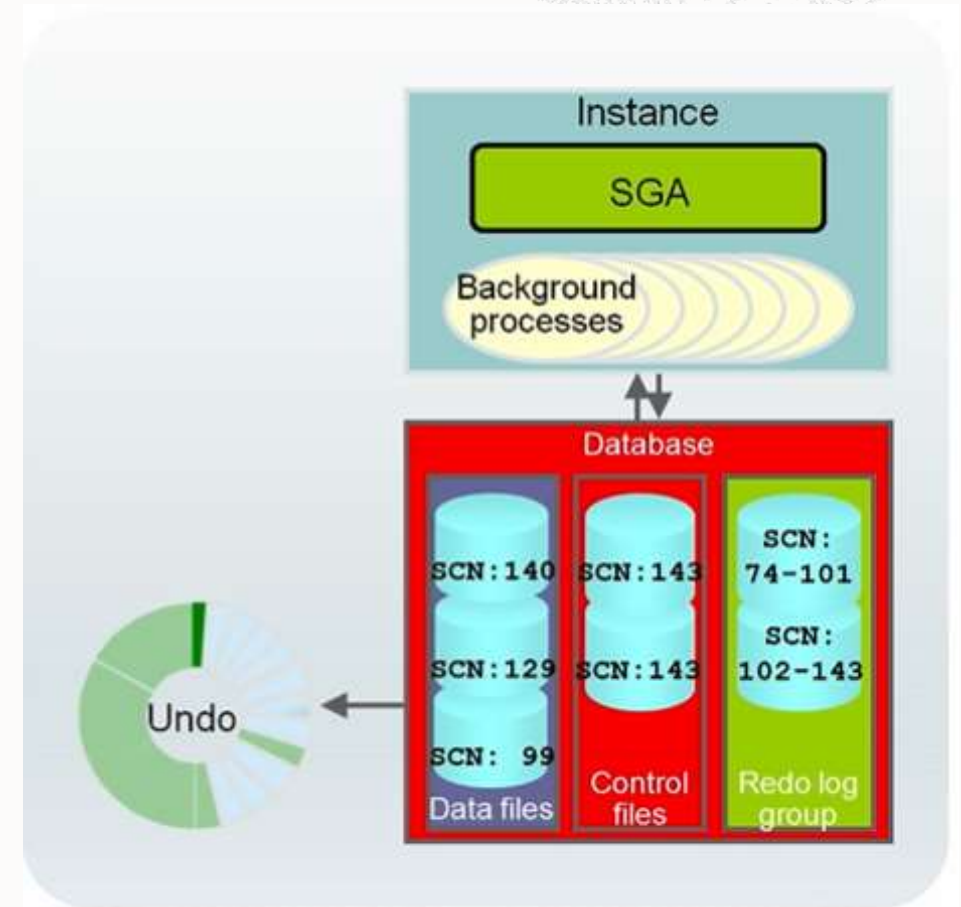
- XMLtype tables are not supported
 - Created in CDB or Application Root
 - Truncating
 - Sharded Tables
 - Flashback Tables
- Creating Automatic Data Optimization (ADO) policies
 - Create Oracle Virtual Private Database (VPD) Policies
 - Create Oracle Label Security (OLS) policies
 - Online Redefinitions using the DBMS_REDEFINITION package

Automatic Transactional Quarantine

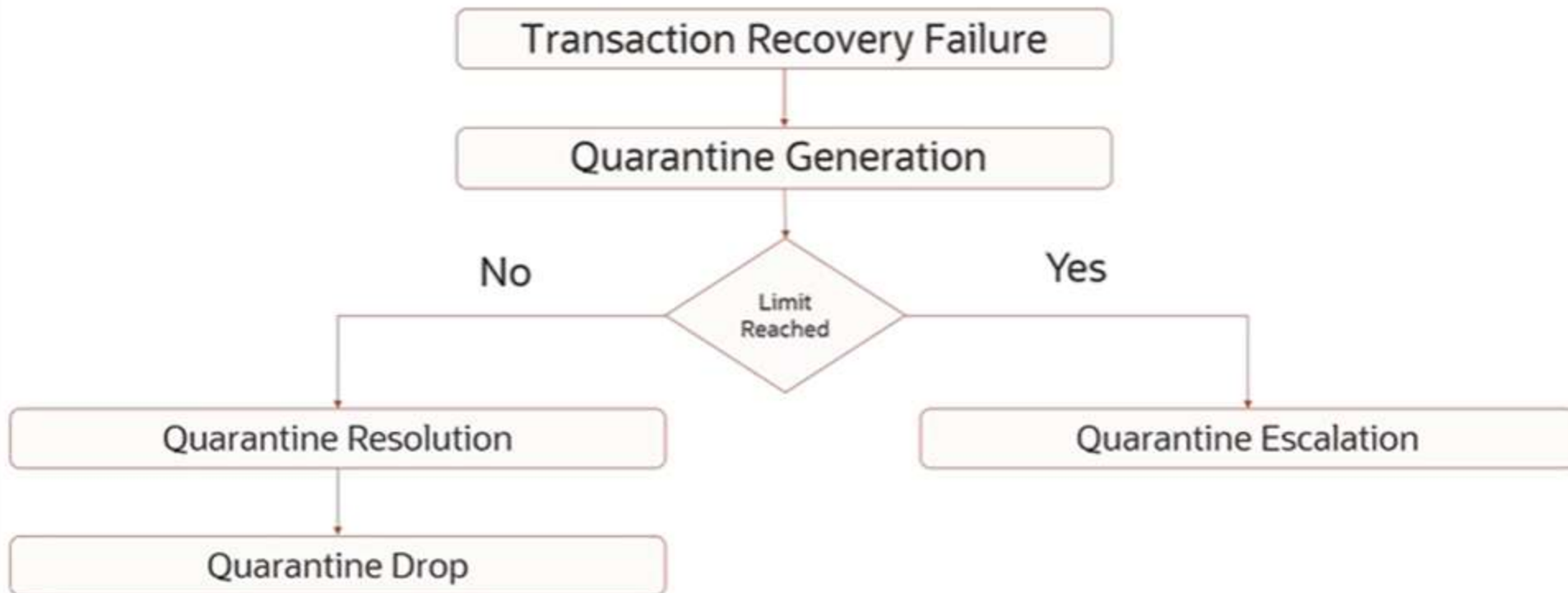


Phases of Oracle Database instance Recovery

1. Instance startup (Data Files are out of sync)
2. Roll forward (redo)
3. Committed and uncommitted data in files
4. Database opened
5. Roll back (Undo)
6. Committed data in files



Automatic Transactional Quarantine : Workflow



Automatic Transactional Quarantine database view

```
SQL> DESC DBA_QUARANTINED_TRANSACTIONS;
```

Name	Description
USN	Undo segment transaction of the quarantined transaction
SLT	Slot Number of the Quarantined transaction
SQN	Txn_start_SCN of the quarantined transaction
REASON	The reason why this transaction failed to recover
TRACE_FILE_NAME	The trace file that contains reason and diagnosability Information
UBA_RDBA	Relative Data block address of the undo block
CON_ID	The ID of the container



Automatic Transactional Quarantine database view

```
SQL> DESC DBA_QUARANTINED_TRANSACTIONS;
```

Name	Description
USN	Undo segment transaction of the quarantined transaction
SLT	Slot Number of the Quarantined transaction
SQN	Txn_start_SCN of the quarantined transaction
REASON	The reason why this transaction failed to recover
TRACE_FILE_NAME	The trace file that contains reason and diagnosability Information
UBA_RDBA	Relative Data block address of the undo block
CON_ID	The ID of the container



Automatic Transactional Quarantine database view

```
SQL> DESC DBA_QUARANTINED_TRANSACTIONS;
```

Name	Description
USN	Undo segment transaction of the quarantined transaction
SLT	Slot Number of the Quarantined transaction
SQN	Txn_start_SCN of the quarantined transaction
REASON	The reason why this transaction failed to recover
TRACE_FILE_NAME	The trace file that contains reason and diagnosability Information
UBA_RDBA	Relative Data block address of the undo block
CON_ID	The ID of the container

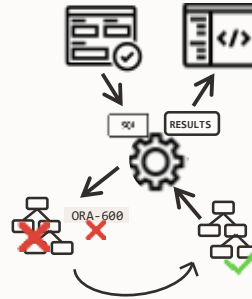


Security

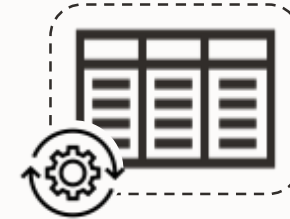
Oracle Database 23c security and automation



ML Augmented Real-time Statistics



Real-time SQL Plan Management



Automatic Materialized Views



SQL Firewall



TLS 1.3 Support

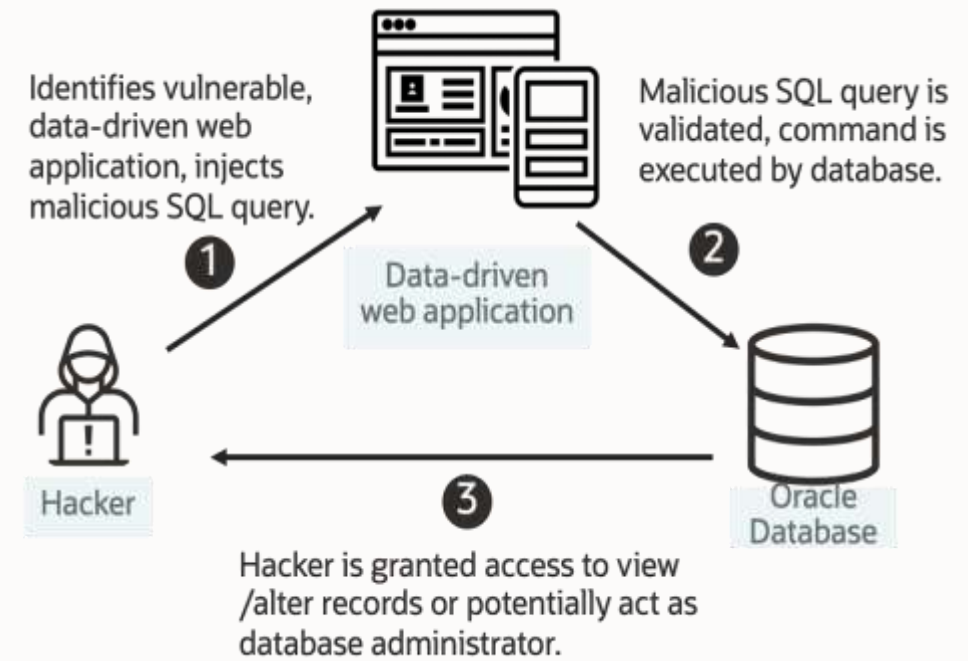


**Azure AD
OAuth2 Integration**

SQL Database Firewall

Sql injection overview

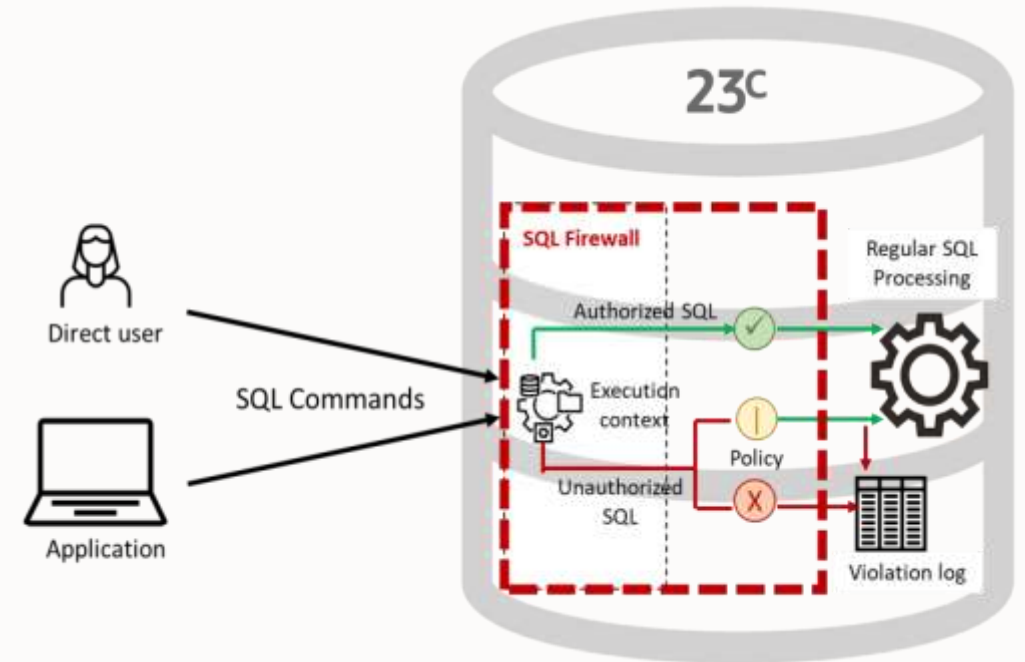
- SQL injection is one of the most popular attack to **application security**
- Attacks target applications and the underlying database by injecting **malicious SQL** into input fields.
- Attackers may try to use SQL injection to add, **modify, and delete records in the database.**



SQL Firewall



- Oracle SQL Firewall is a new feature built into Oracle Database 23c
- It can examine all SQL statements - whether local or over the network, encrypted or clear text.
- Oracle SQL Firewall feature is the only one that inspects ALL incoming SQL statements and allows only authorized SQL statements.



Oracle Data Safe



Available for 23c databases only



Oracle Data Safe on OCI menu

The screenshot displays the Oracle Cloud console interface. At the top, the Oracle Cloud logo is on the left, followed by a 'Cloud Classic' button and a search bar. Below the header, a left-hand navigation menu lists various services: Home, Compute, Storage, Networking, **Oracle Database** (highlighted with a red dashed box), Databases, Analytics & AI, Developer Services, Identity & Security, and Observability & Management. The main content area is titled 'Oracle Database' and contains several sections: Overview, Autonomous Database (with sub-items: Autonomous Data Warehouse, Autonomous JSON Database, Autonomous Transaction Processing), Globally Distributed Autonomous Database, Autonomous Dedicated Infrastructure, Oracle Base Database Service, Oracle Exadata Database Service on Dedicated Infrastructure, Oracle Exadata Database Service on Cloud@Customer, Exadata Fleet Update, and External Database. On the right side, a sub-menu for 'Data Safe - Database Security' is highlighted with a red solid box. This sub-menu includes: Overview, Security Assessment, User Assessment, Data Discovery, Data Masking, Activity Auditing, SQL Firewall, Database Backups, GoldenGate, and Operator Access Control.

Oracle Cloud Cloud Classic > Search resources, services, documentation, and Marketplace

Search

Home

Compute

Storage

Networking

Oracle Database

Databases

Analytics & AI

Developer Services

Identity & Security

Observability & Management

Oracle Database

Overview

Autonomous Database

Autonomous Data Warehouse

Autonomous JSON Database

Autonomous Transaction Processing

Globally Distributed Autonomous Database

Autonomous Dedicated Infrastructure

Oracle Base Database Service

Oracle Exadata Database Service on Dedicated Infrastructure

Oracle Exadata Database Service on Cloud@Customer

Exadata Fleet Update

External Database

Data Safe - Database Security

Overview

Security Assessment

User Assessment

Data Discovery

Data Masking

Activity Auditing

SQL Firewall

Database Backups

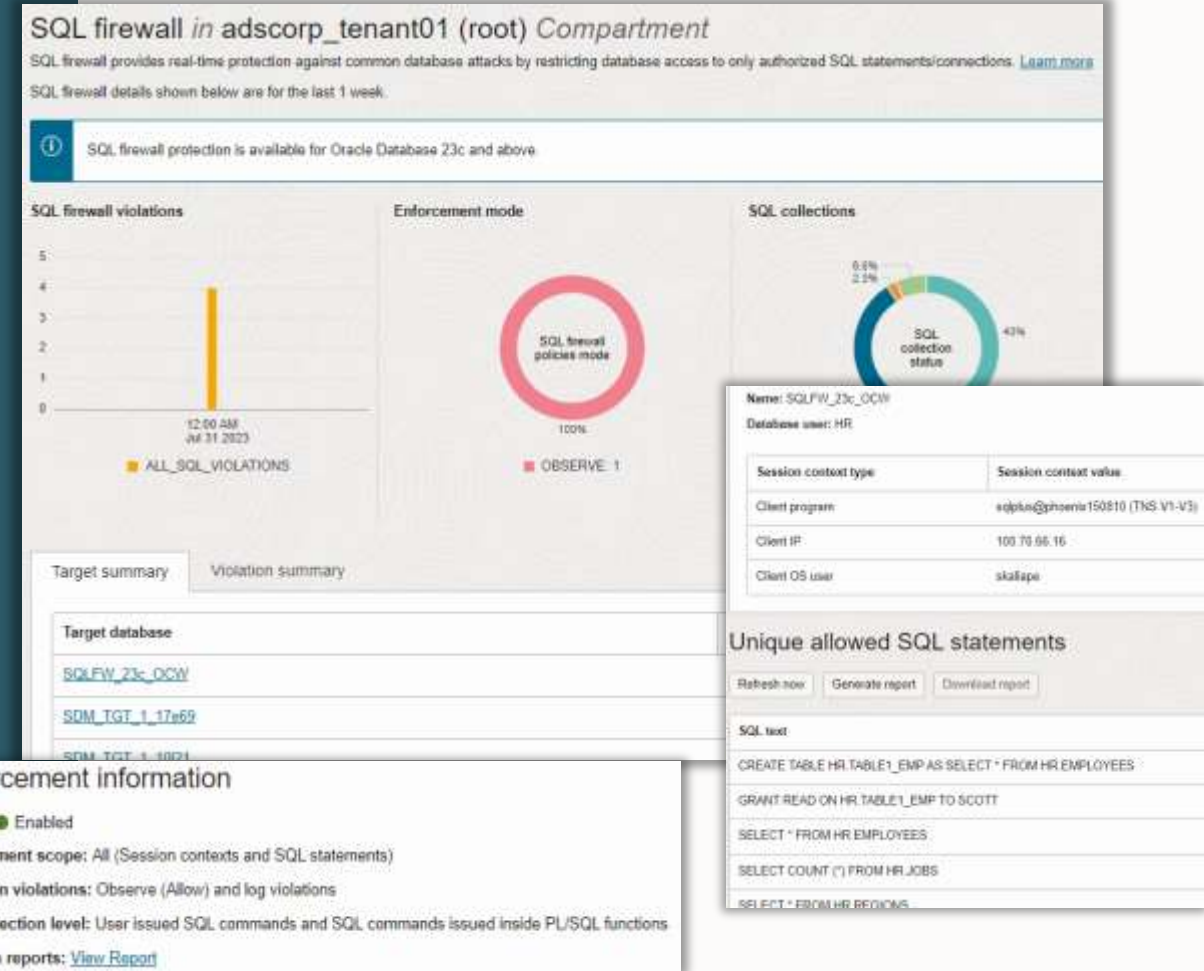
GoldenGate

Operator Access Control

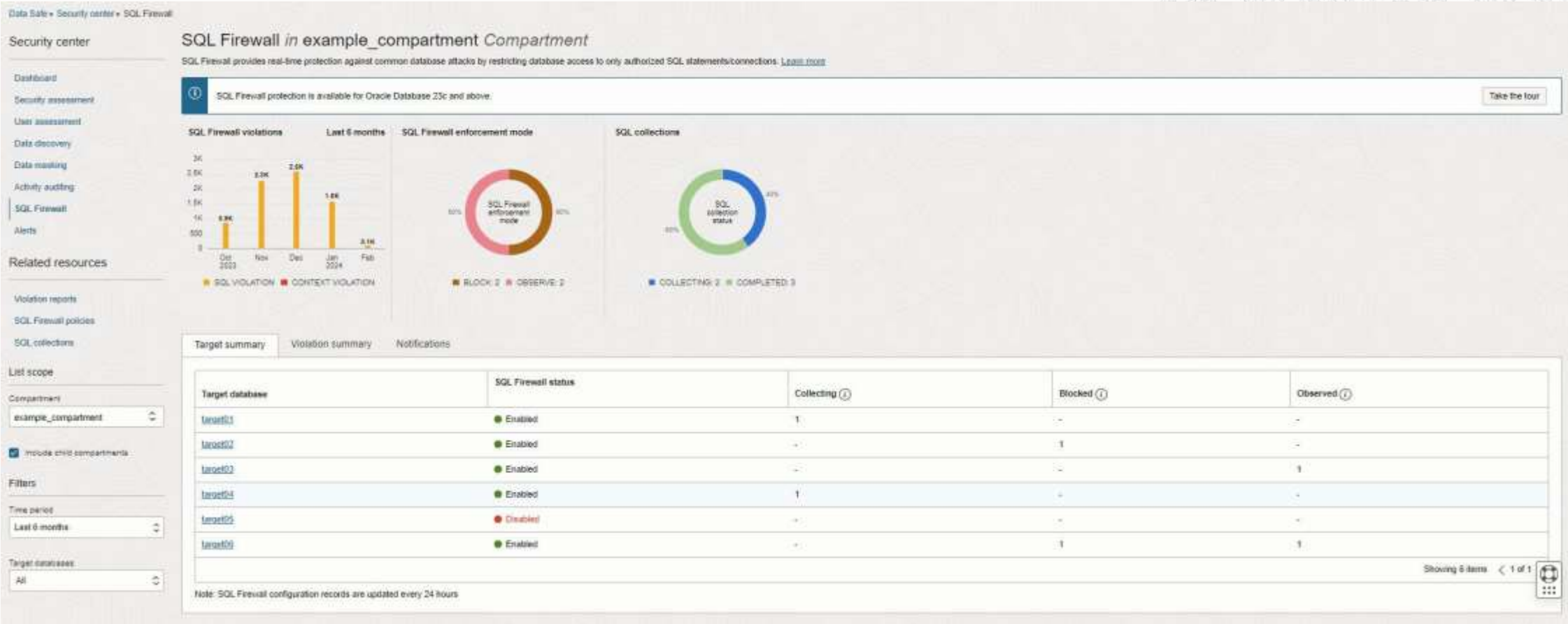


SQL Firewall on Data Safe

- Provides real-time protection against common database attacks by restricting database access to
 - Authorized connections
 - Authorized SQL statements
- Block or monitor any violations
- Mitigates risks from SQL injection attacks, anomalous access, and credential theft/abuse



SQL Firewall Dashboard in Data Safe



SQL Firewall

Easy configuration, management, and monitoring in Data Safe

1

Collect

Turn on the SQL statement
and user connection
collection

2

Review & Modify

Review the SQL collection
Review and modify the
allowed user connections
(as required)

3

Enforce

Block or monitor any
unauthorized SQL
And/or user
connections

4

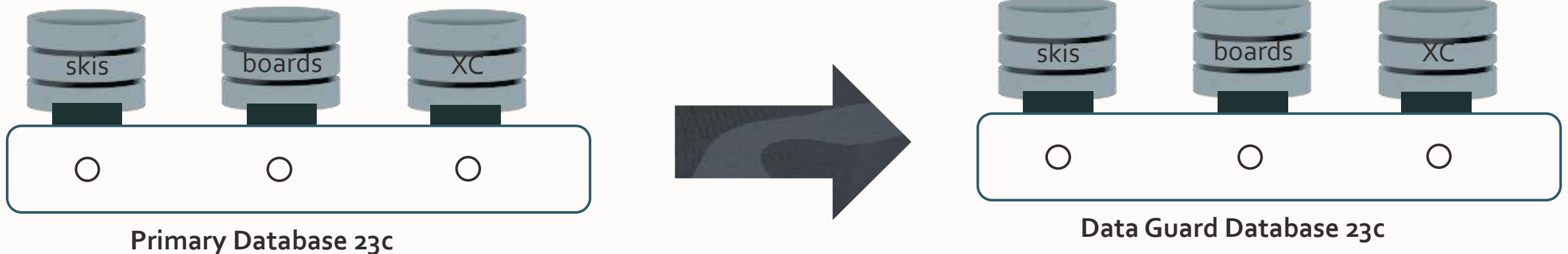
Monitor

Monitor any violations

PDB's and Oracle Dataguard

Database PDB's and physical Data Guard

- Per-PDB Data Guard now supports the standby PDBs being opened in Read-Only mode to allow offloading of reporting to the DGPDB standby
- Customers can balance the workload between two different sites while maintaining the Multitenant consolidation benefits



Resources



- **Oracle Database 23c Product Page**

<https://www.oracle.com/database/23c/>

- **Oracle 23c new features Guide**

<https://docs.oracle.com/en/database/oracle/oracle-database/23/nfcoa/>

- **Oracle Database 23c License User Manual**

<https://docs.oracle.com/en/database/oracle/oracle-database/23/dblic/Licensing-Information.html#GUID-F796455D-C7EF-4836-9F69-2BCCDA49B7BD>

- **Oracle Database 23c Documentation**

<https://docs.oracle.com/en/database/oracle/oracle-database/23/index.html>

- **Oracle Database 23c New Features for Administrators (Oracle University)**

<https://docs.oracle.com/en/database/oracle/oracle-database/23/index.html>

- **Oracle Database 23c New Features for Developers (Oracle University)**

<https://docs.oracle.com/en/database/oracle/oracle-database/23/index.html>



Thank you

Marcel Lamarca

marcel.lamarca@oracle.com



ORACLE