ORACLE

Oracle Database 23c

Get Started – New Features For Administrators

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Exadata Cloud Specialist
Oracle, Alliances and Channels LAD

April, 2024

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

SCAN ME

MARCEL LAMARCA

Exadata Cloud Specialist

Upgrade, Utilities, Patching, Performance & Migrations

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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 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

- Simplified Database Migration Across Plataform Using RMAN
- Flashback Log Placement
- Unrestricted DML After Direct Load
- Lock Free Reservations
- Unrestricted Parallel DML's
- Wide Tables
- Improvement Performance HCC
- Fast Ingest
- Data Storage Improvements

Check Oracle Database 23c documentation on resources

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

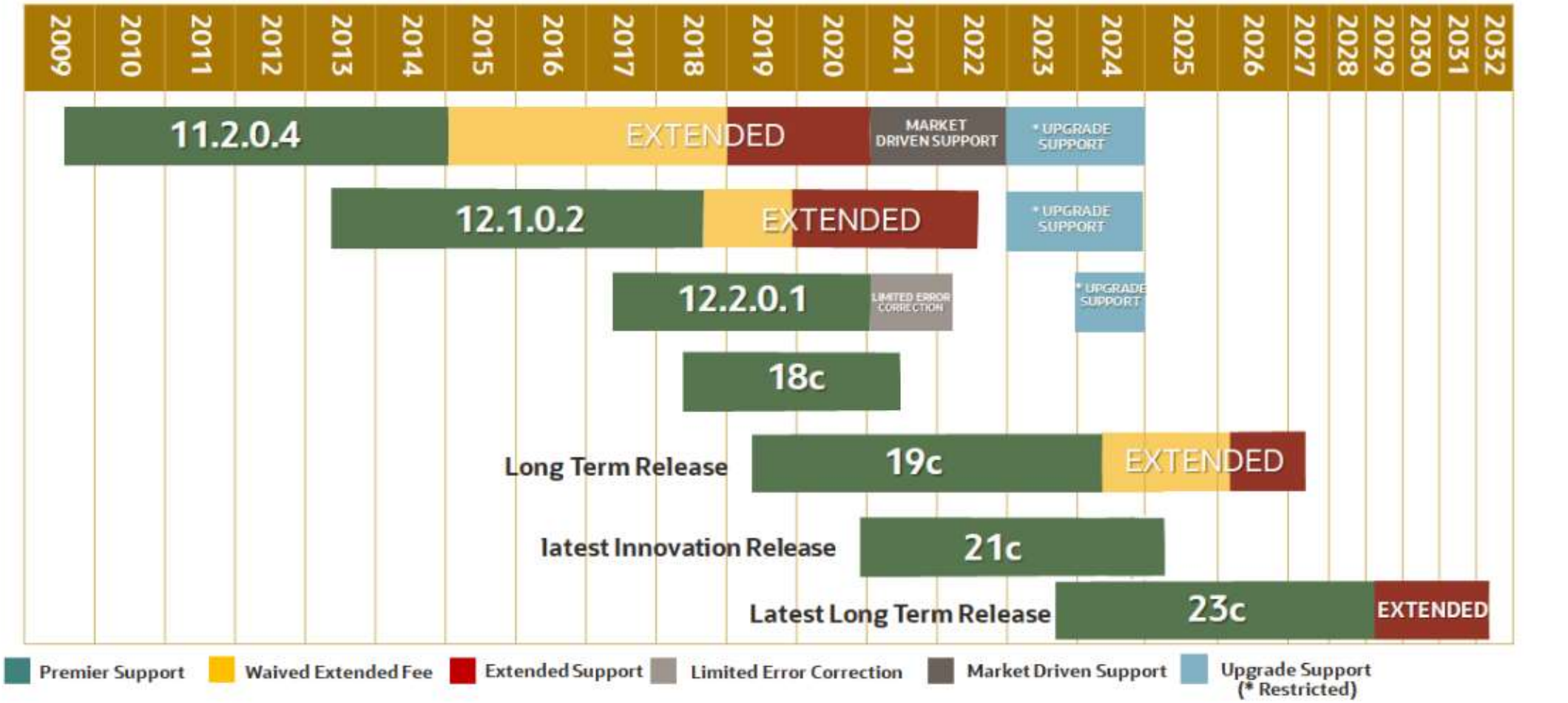
Supports only **Enterprise Edition** for Database Versions 19c and 21c

Oracle Autonomous Database

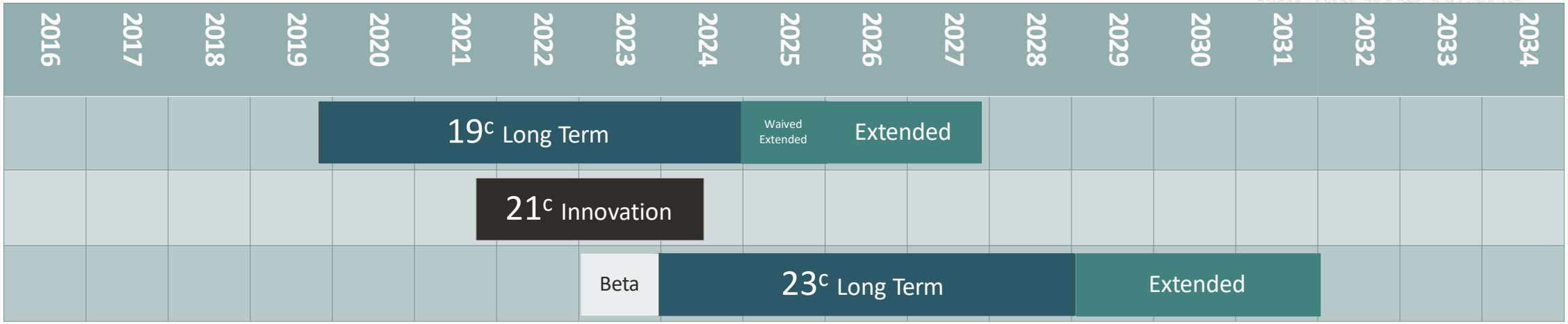
Supports **Enterprise** and **Standard Edition** for Database Version 19c

Oracle Database Releases and timeline

My Oracle Support Official Note (Doc ID 742060.1)

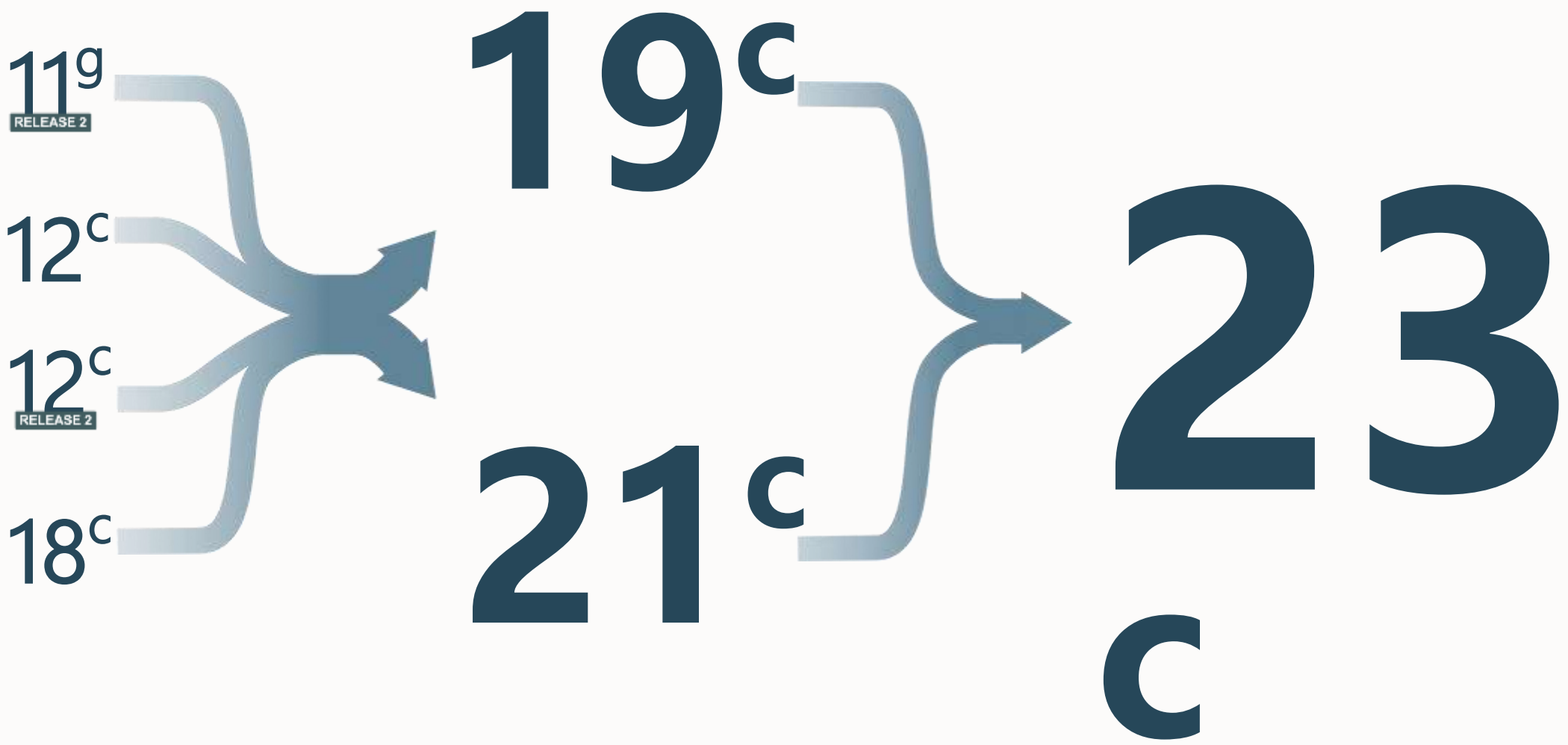


Innovation Release Vs Long Term Release



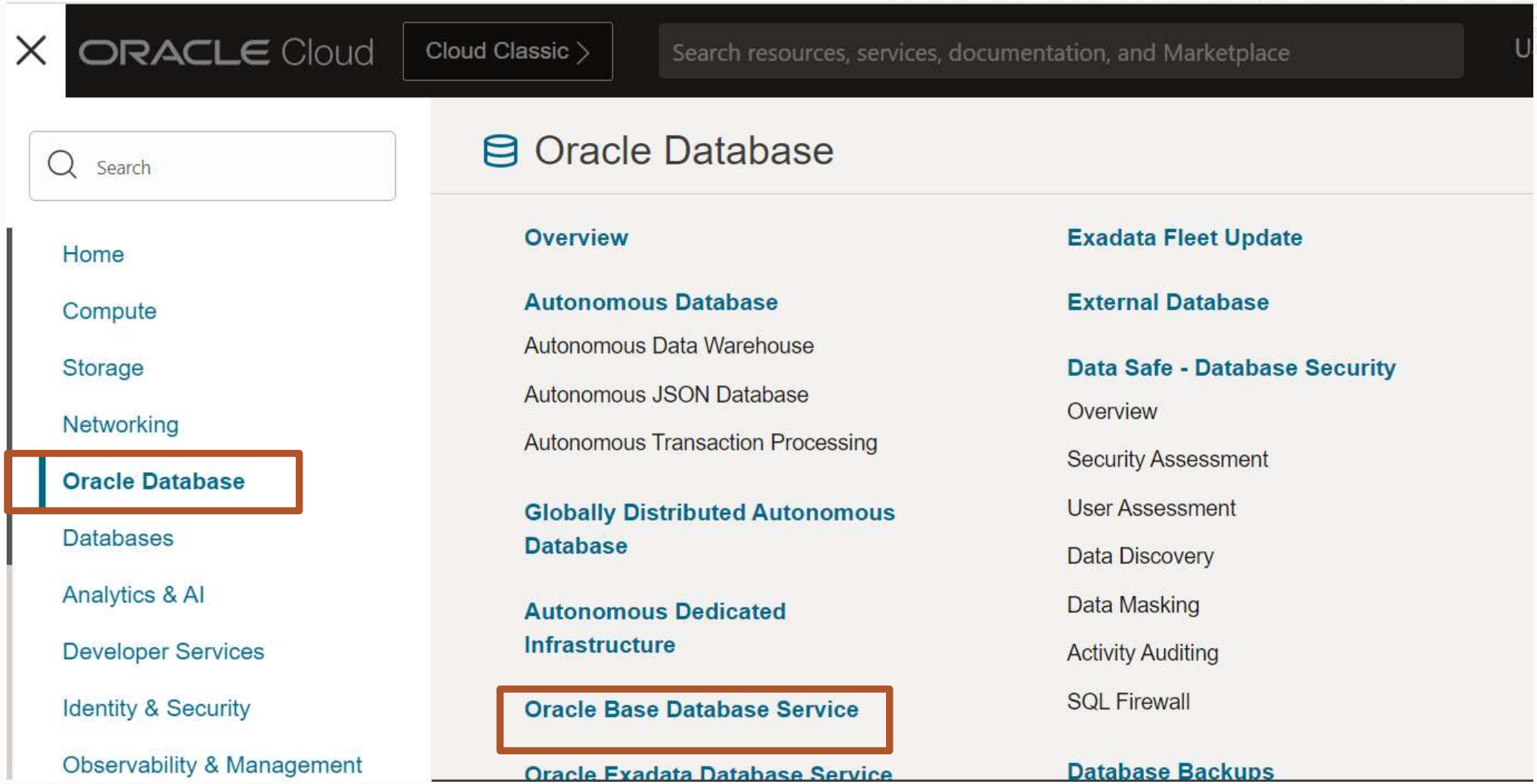
- Innovation Release - 2 years of Premier Support, and no Extended Support
- Long Term Release - 5 years of Premier Support, and 3 years of Extended Support

Upgrade Path to Oracle Database 23c



Oracle Database Cloud Service

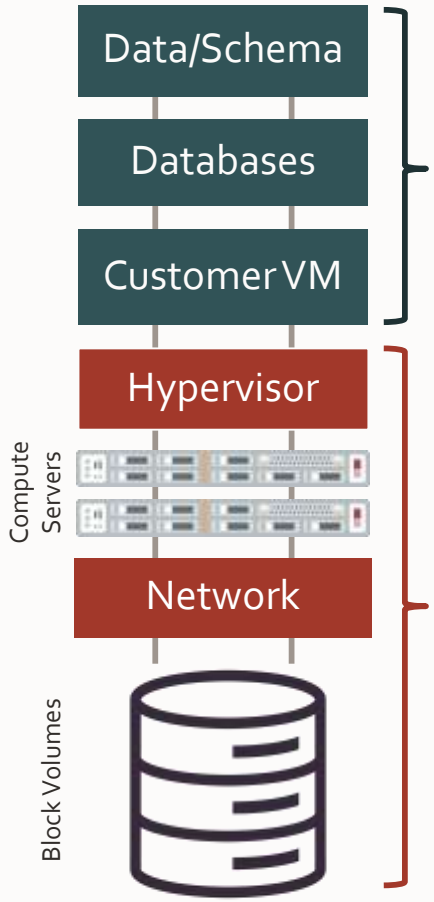
Oracle DBCS Bare Metal Console Management



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



Customer owns everything inside database

- Data, schema, encryption keys

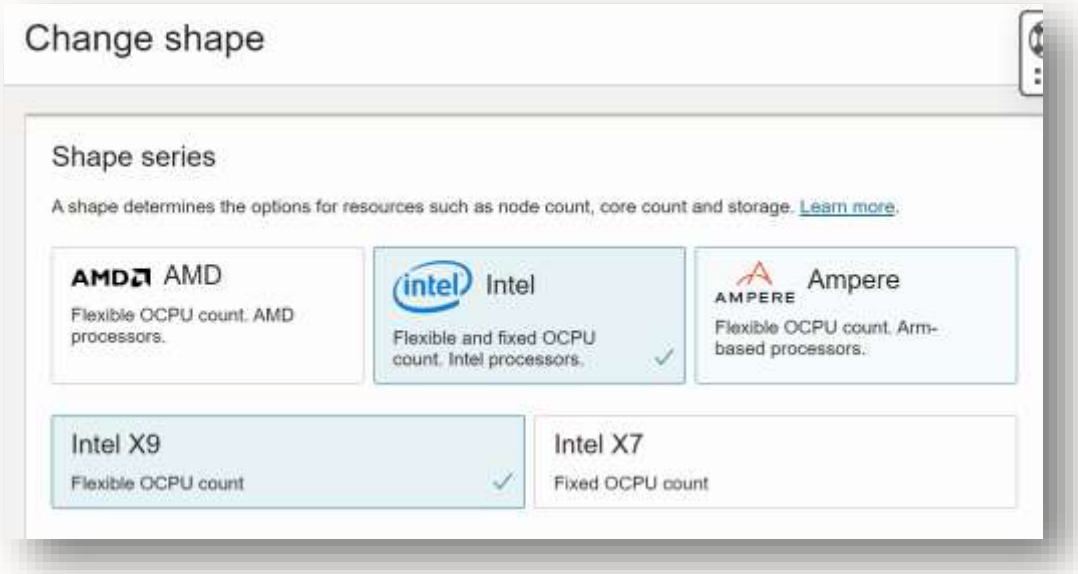
Customer subscribes to database services

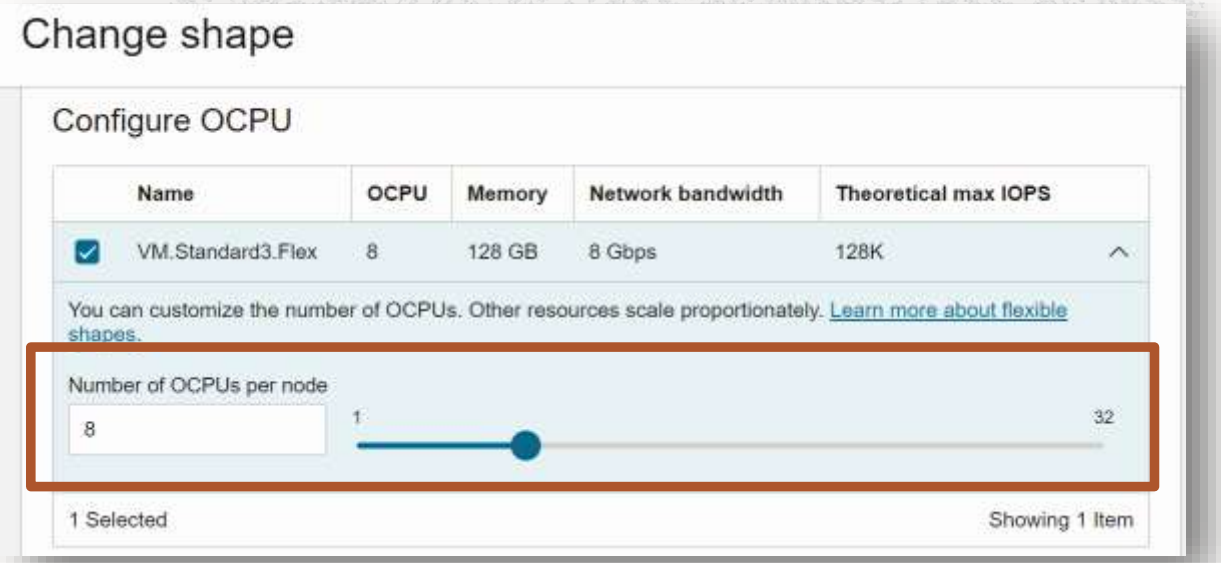
- Customer manages VMs and Databases using Cloud Automation (UI / APIs)
- Automation to create, delete, patch, backup, scale up/down, etc.
- Runs all supported Oracle Database versions
- Customer controls access to customer VM
- Customer can install and manage additional software in customer VM
- Oracle staff are not authorized to access customer VM

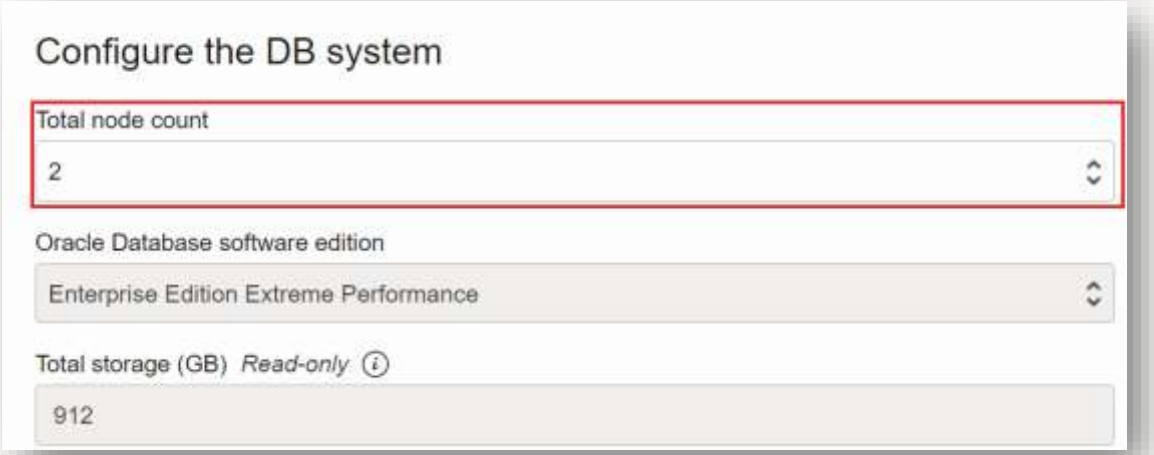
Oracle owns and manages infrastructure

- Hypervisor, compute and storage infrastructure, network
- Patching, security scans, security updates
- Monitoring and maintenance
- Customer not authorized to access Oracle infrastructure

Oracle DBCS Virtual Machine Console provisioning



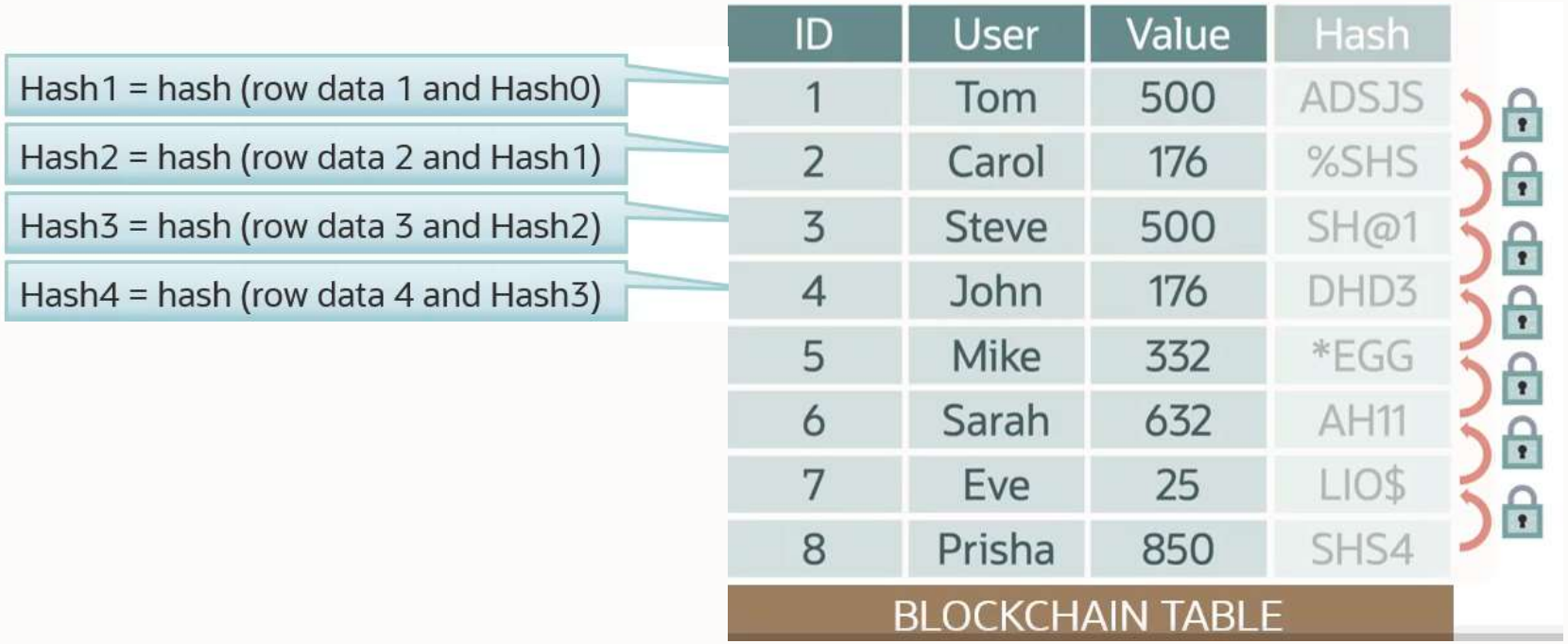




Blockchain Tables

Blockchain table overview

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



Blockchain table overview

- **Blockchain tables considerations**

  - May be partitioned

  - Specify Retention

    - Blockchain table

    - Blockchain table rows

- **Restricitions**

  - Data Types not supported :

ROWID,
UROWID,
LONG,
object type,
REF,
varrary,
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";
```

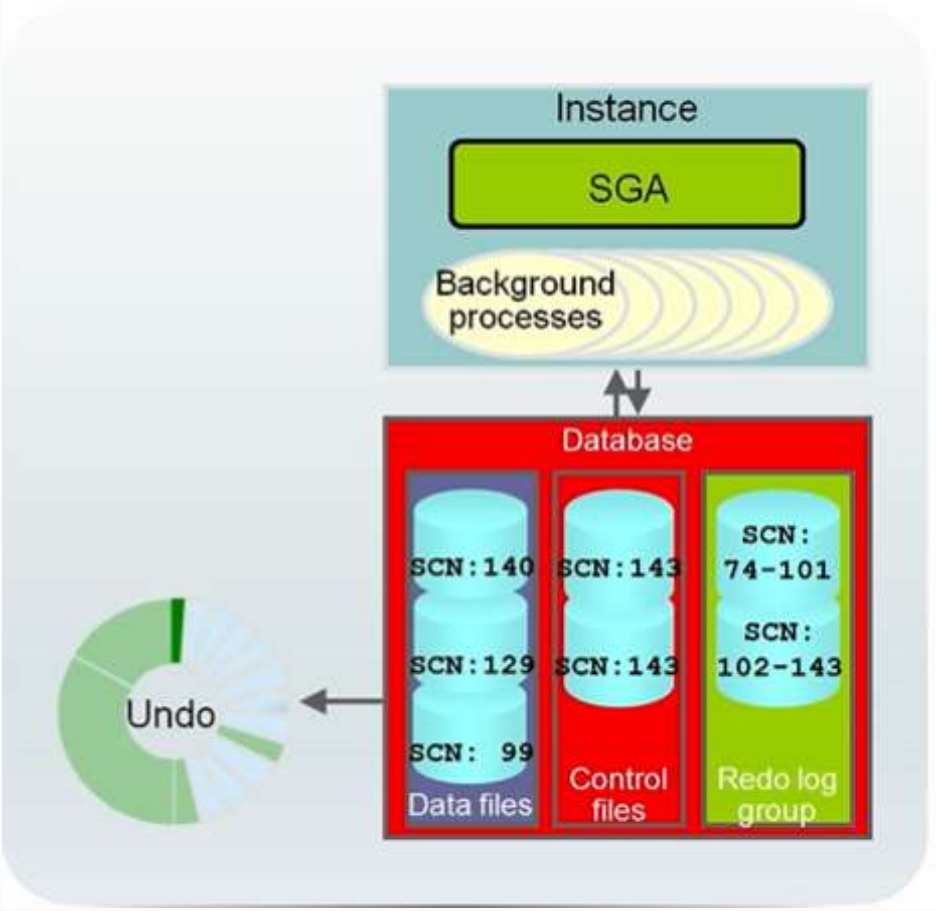
Blockchain Table Restrictions

- 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

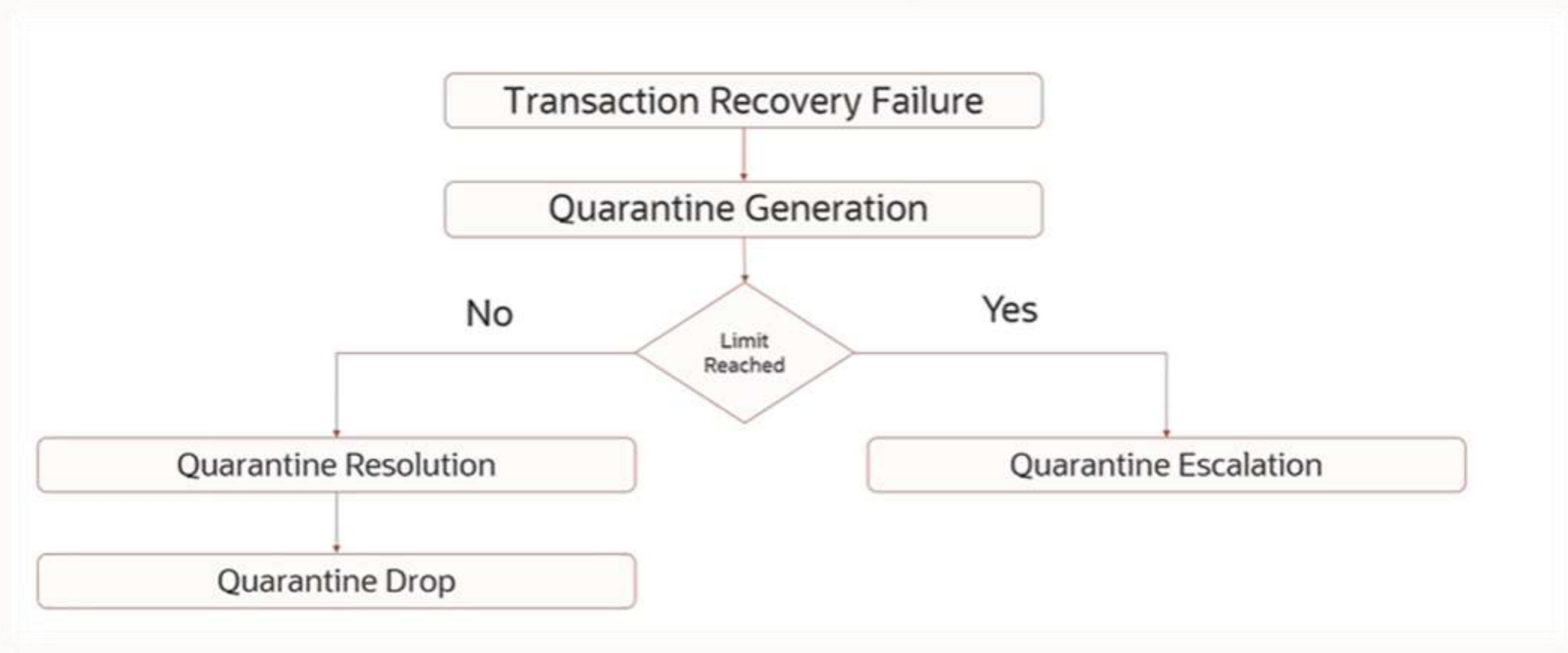
Automatic Transactional Quarentine

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
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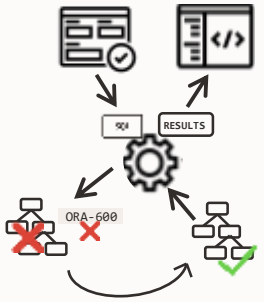
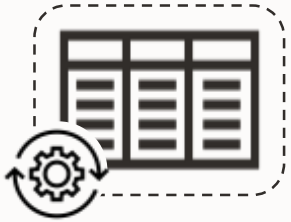
Security

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

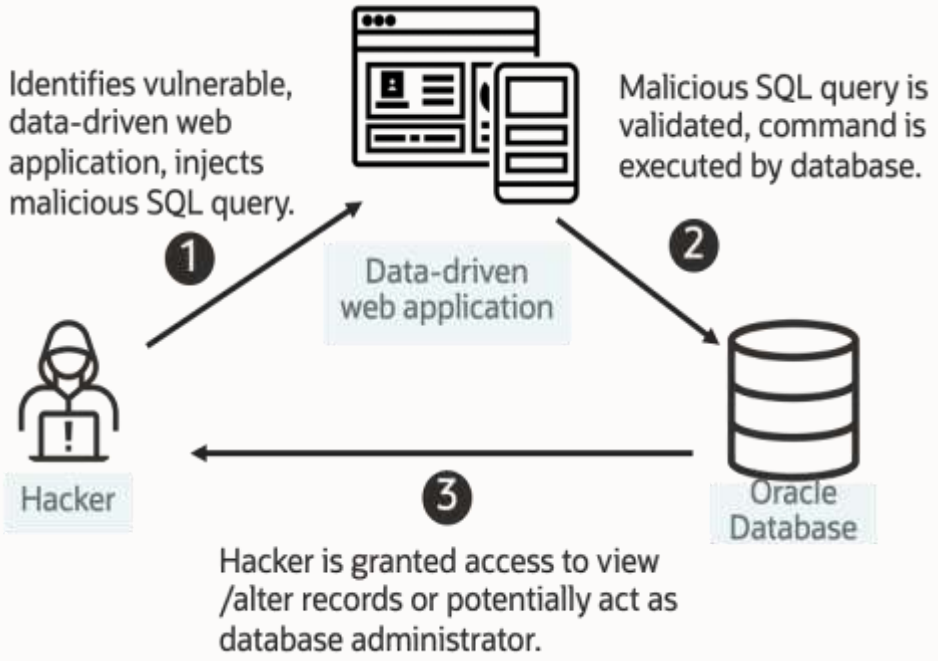
SQL Database Firewall

Sql injection overview

- SQL injection is one of the most popular attack to application security

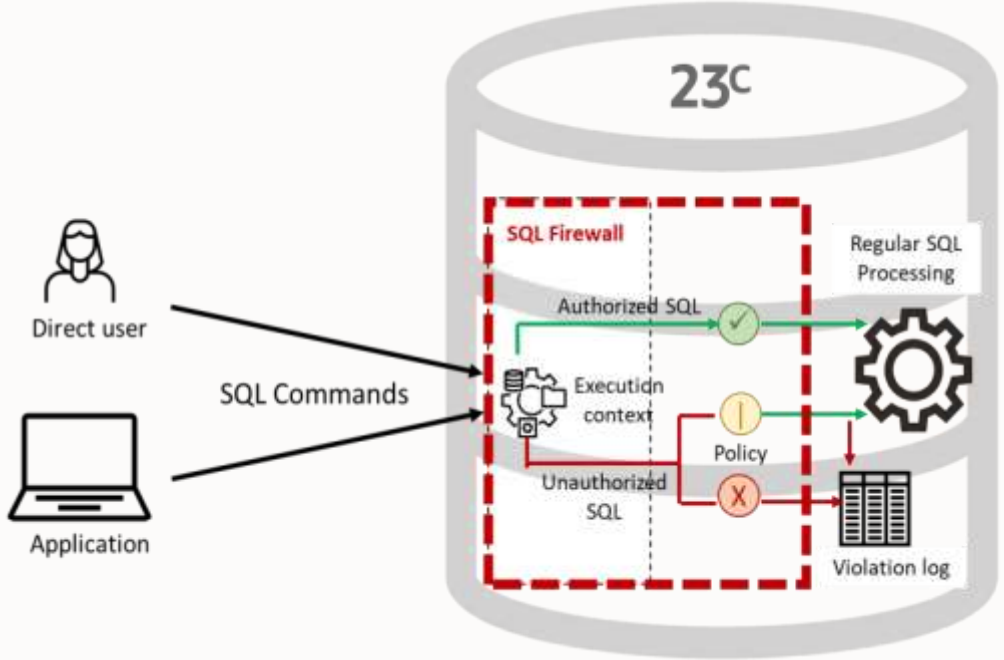
- Attacks target applications and the underlying database by injecting **malicious SQL** into input fields.

- Attackers may try to use SQL injection to add, **modify, and delete records in the database**.



SQL Firewall

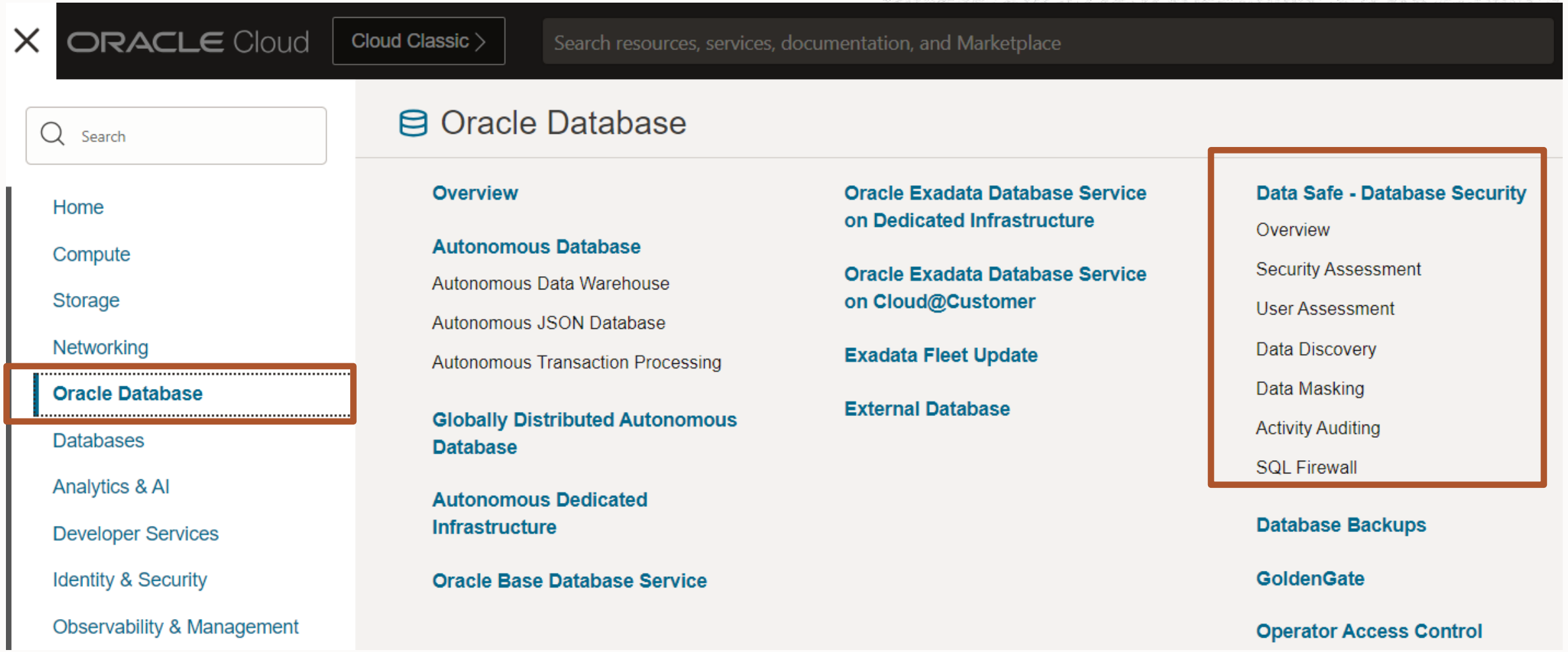
- Oracle SQL Firewall is a new feature built into Oracle Database 23c
- It can examine all SQL statements - whether local or over the network, encrypted or clear text.
- Oracle SQL Firewall feature is the only one that inspects ALL incoming SQL statements and allows only authorized SQL statements.



Oracle Data Safe

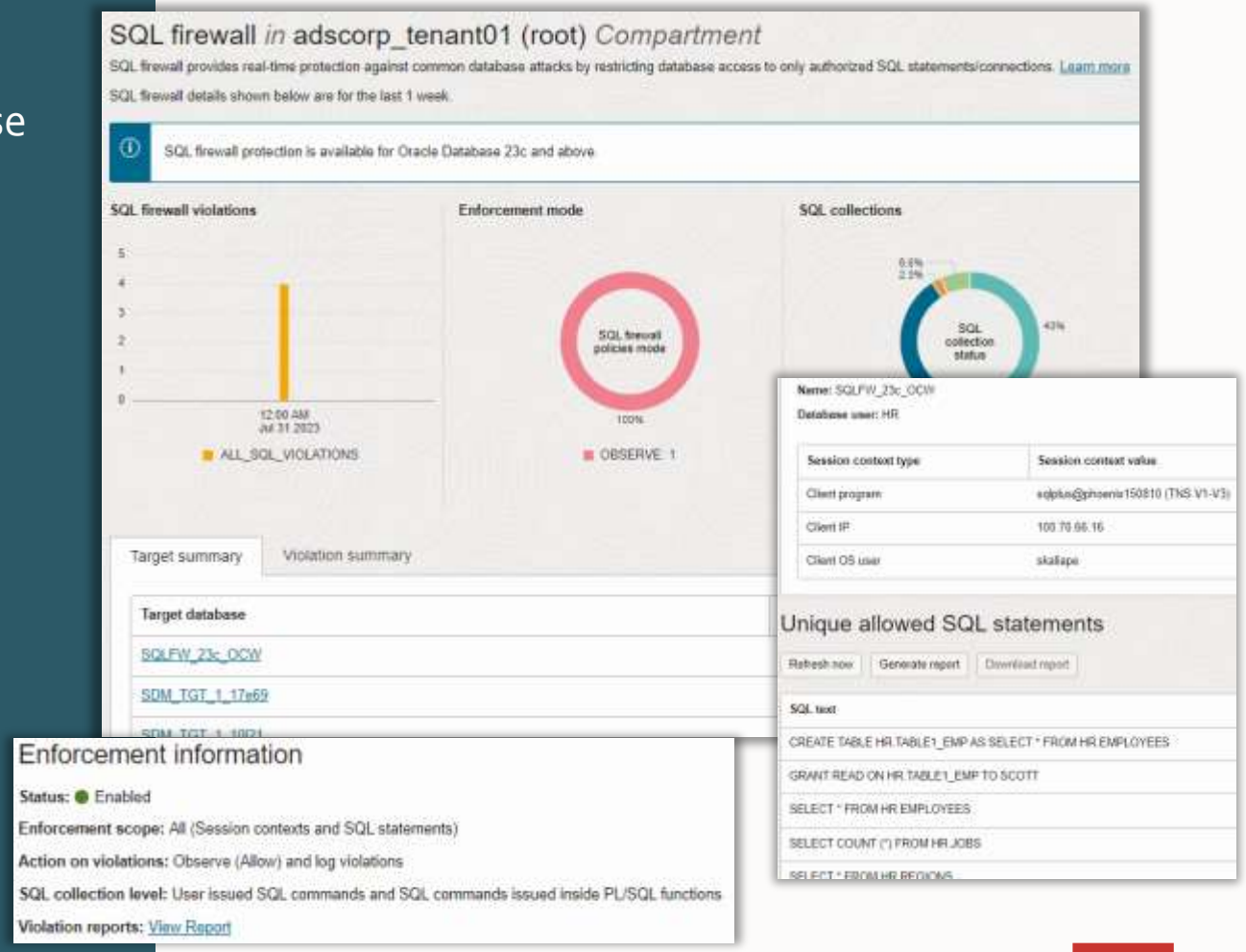
Available for 23c databases only

Oracle Data Safe on OCI menu

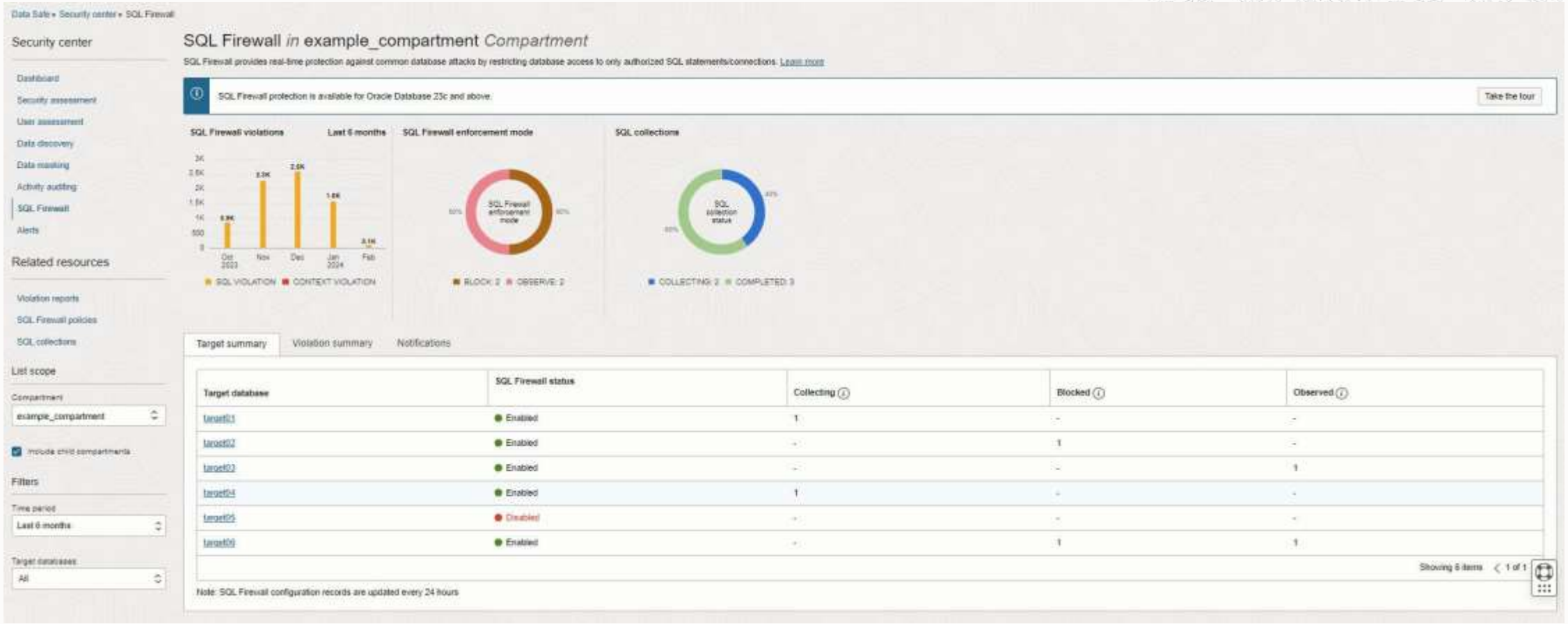


SQL Firewall on Data Safe

- 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

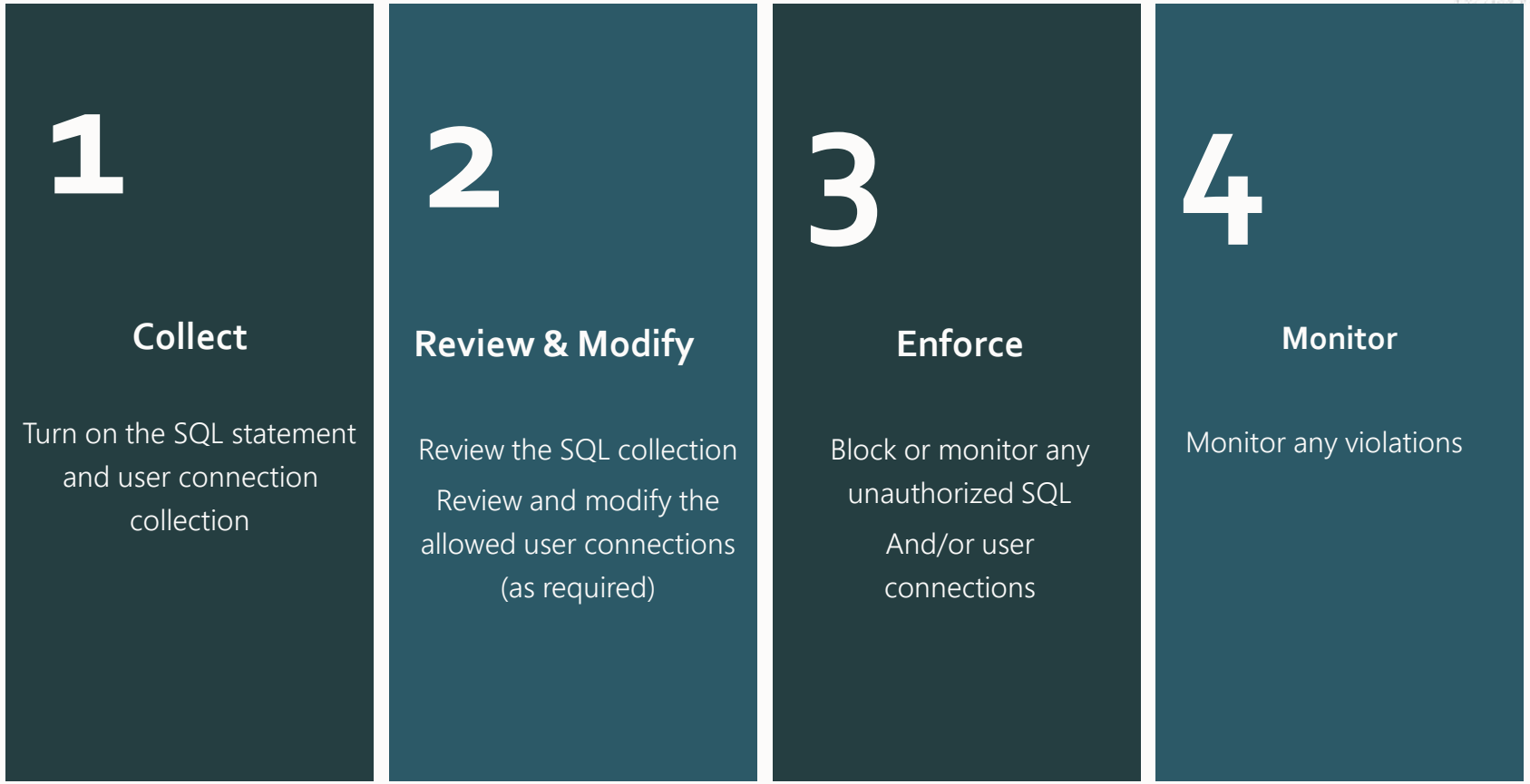


SQL Firewall Dashboard in Data Safe



SQL Firewall

Easy configuration, management, and monitoring in Data Safe

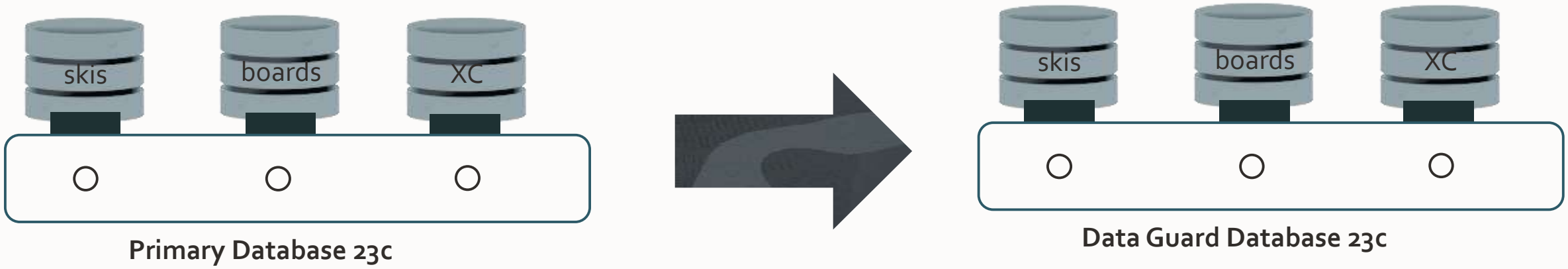


PDB’s and Oracle Dataguard

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



Primary Database 23c

Data Guard Database 23c

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

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