



Oracle Cloud DBA

Lear how to stay up to date on this Dbaas era – Day 1

Marcel Lamarca

Exadata Cloud Specialist

Oracle, Alliances and Channels LAD

February, 2024





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



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 Administrator 2019
- 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 Exadata Cloud

2

OCI Backup database options

3

Oracle NoSQL Database Cloud Service

4

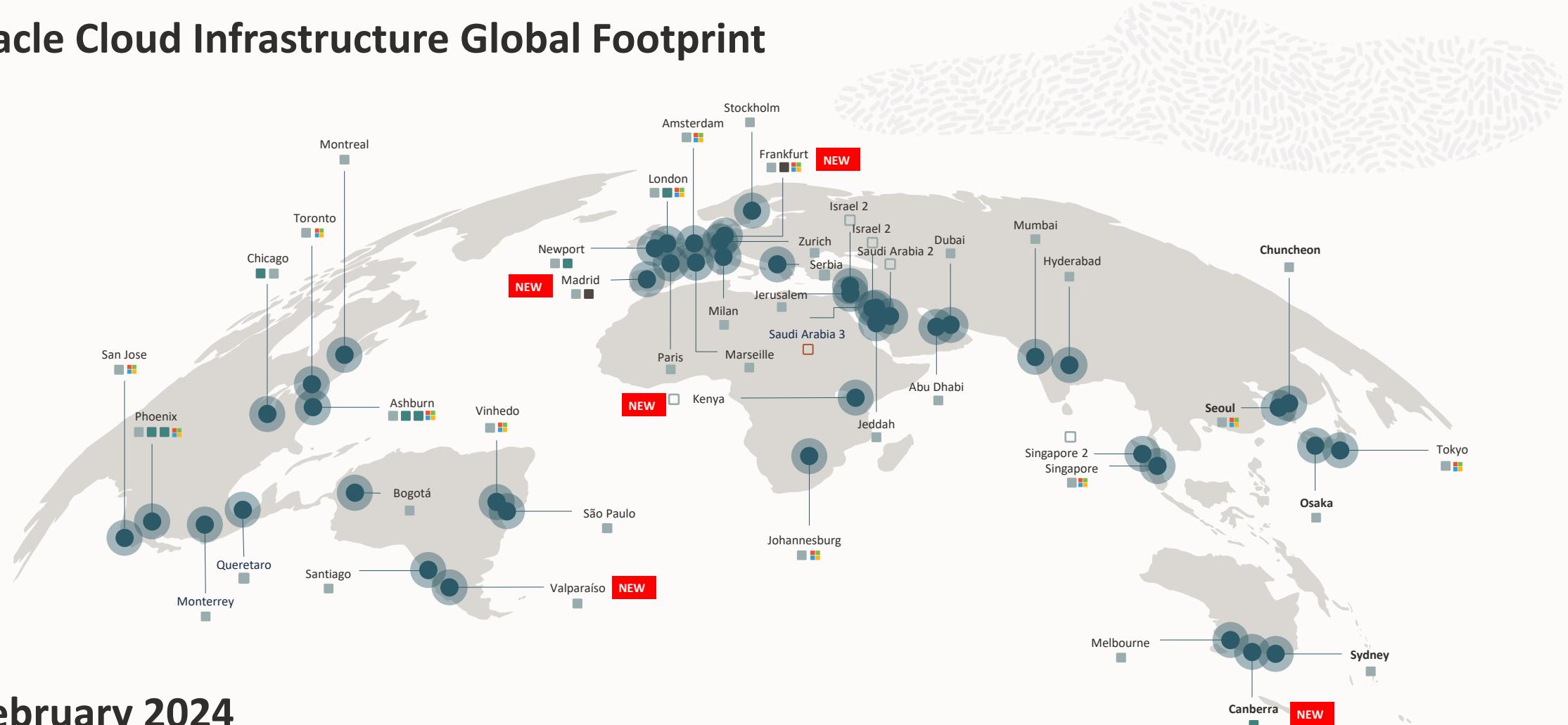
Resources



OCI Cloud Region Maps



Oracle Cloud Infrastructure Global Footprint



February 2024

48 regions; 5 more planned

12 Azure Interconnect Regions



Oracle Database deploy options



Choice of control and hybrid strategies

Use a single database for all deployments



							
Autonomous Database Serverless	Autonomous Database Dedicated	Exadata Cloud@Customer	Oracle Database Service on OCI Compute (BM/VM)	Database Cloud Service (on BM/VM)	Exadata Cloud Service	Oracle Exadata On-Premises	Commodity HW, On-site
Fully automated data management with no human intervention	Fully automated, isolated data management with control	Database control, sovereignty, privacy req. of mission critical workloads managed by Oracle	Customer deployed and managed DB Workloads on OCI compute	DB Workloads running on BM/VM in public cloud	High performance DB workloads on Exadata in public cloud	For sensitive data with higher availability, perf needs	Customer-managed workloads running on commodity h/w

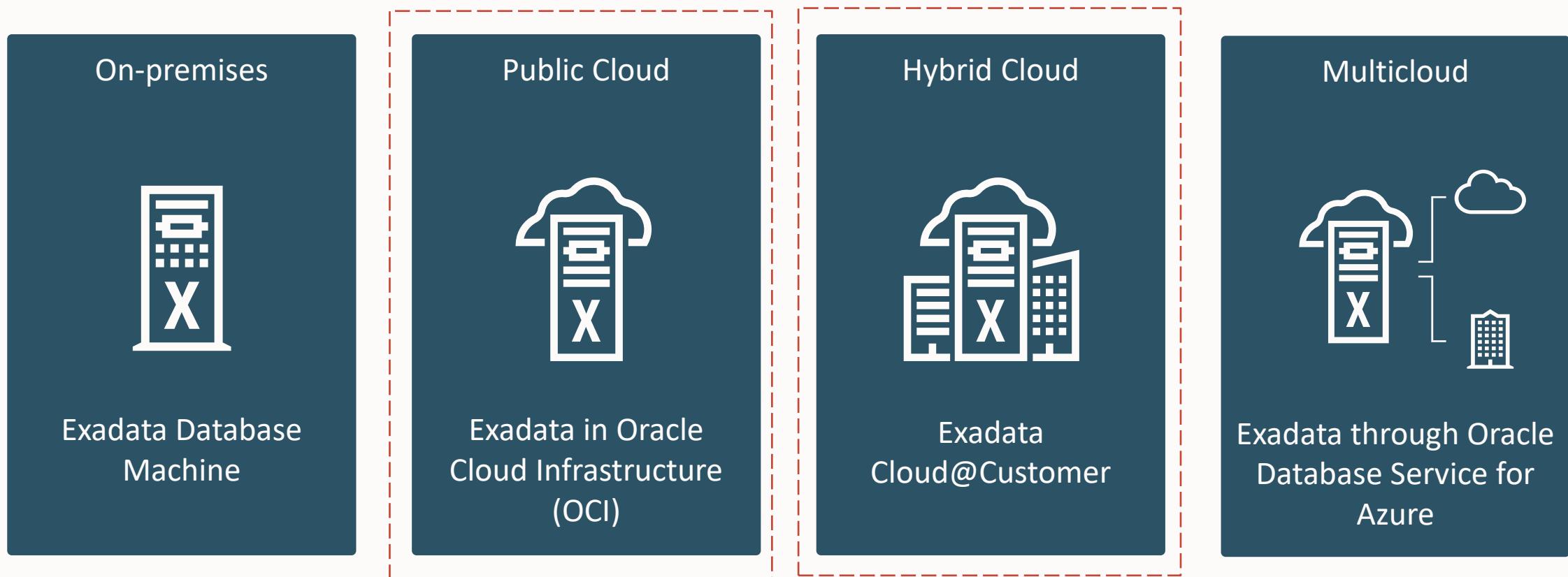


Oracle Exadata Cloud



Exadata runs everywhere

Identicality across deployments improves IT agility and reduces costs



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](#)



Database Cloud Service | Exadata

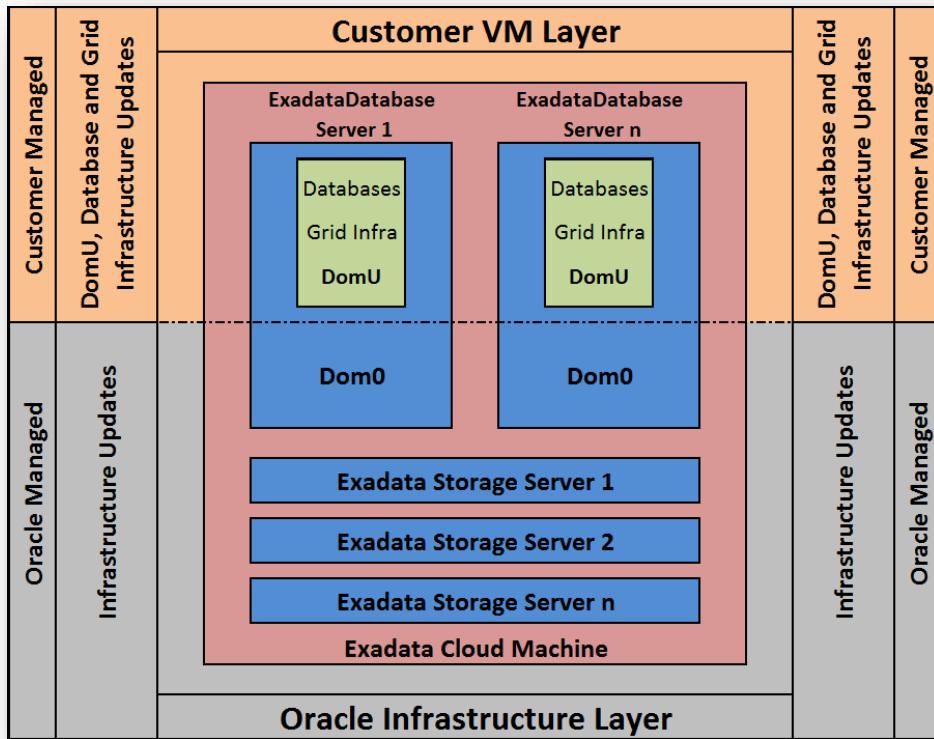
Understanding Oracle Exadata Cloud Service and Cloud at Customer



World's Best database machine, provisioning with GI

- As many databases as you want
- No Single Instance allowed. Just RAC!
- Start With 2 cores and Scale Up/Down OCPU's based on your requirement
- Data Guard with and across Ads
- Only Oracle Database Enterprise Editions allowed
- Works with Autonomous Database on Dedicated Infrastructure

Exadata Cloud | Dom0 vs DomU Roles and Responsibilities



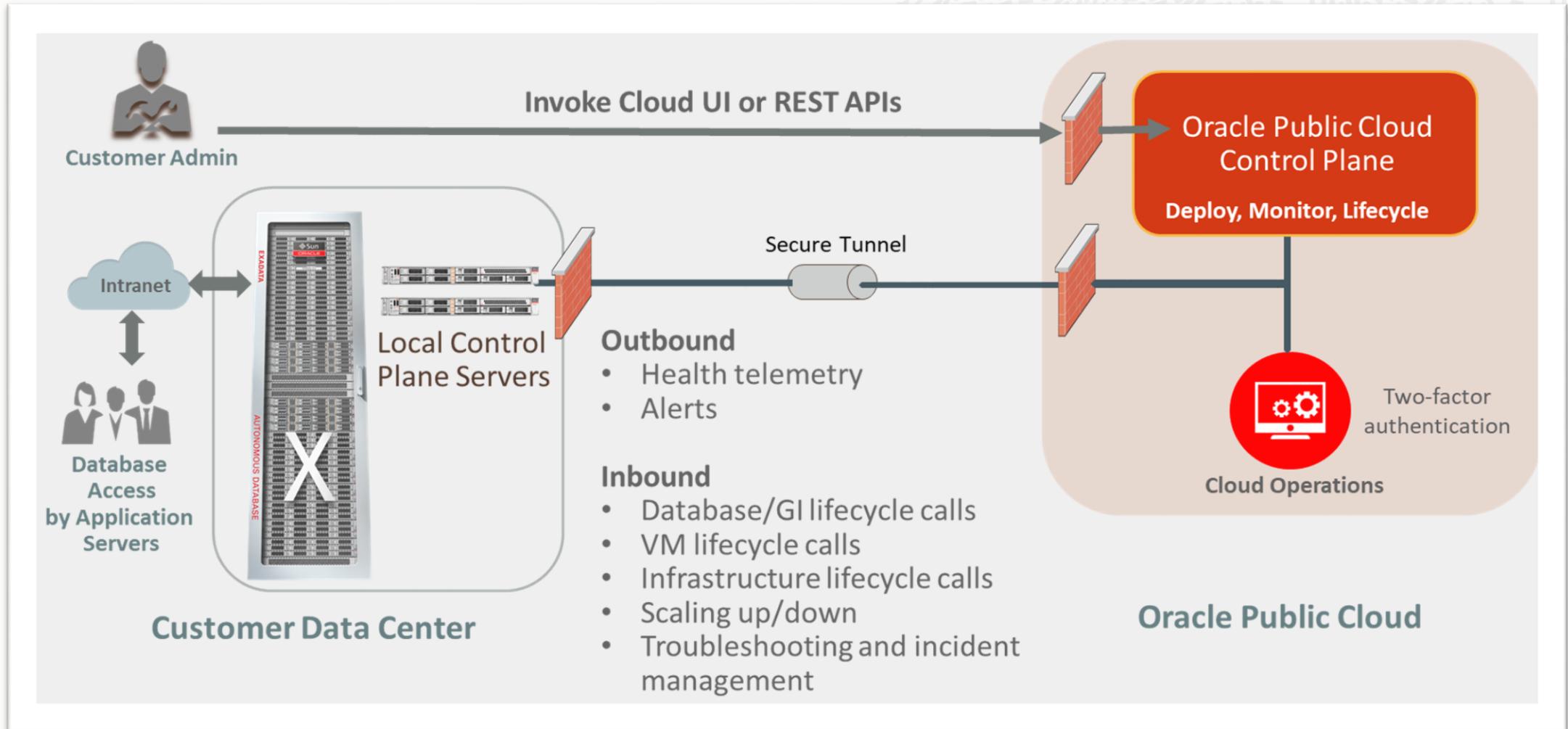
About *Dom0* Oracle Responsibilities

- Oracle Cloud Ops manage Exadata infrastructure (hardware, system software) & hypervisor (dom0);
- Oracle Support is responsible for update any version;
- For ExaCC gen1, Oracle Support open an SR and request customer formal approval;
- For Exacc Gen2, the customer is responsible for scheduling Dom0 maintenance and must provide at least 4 dates per year;

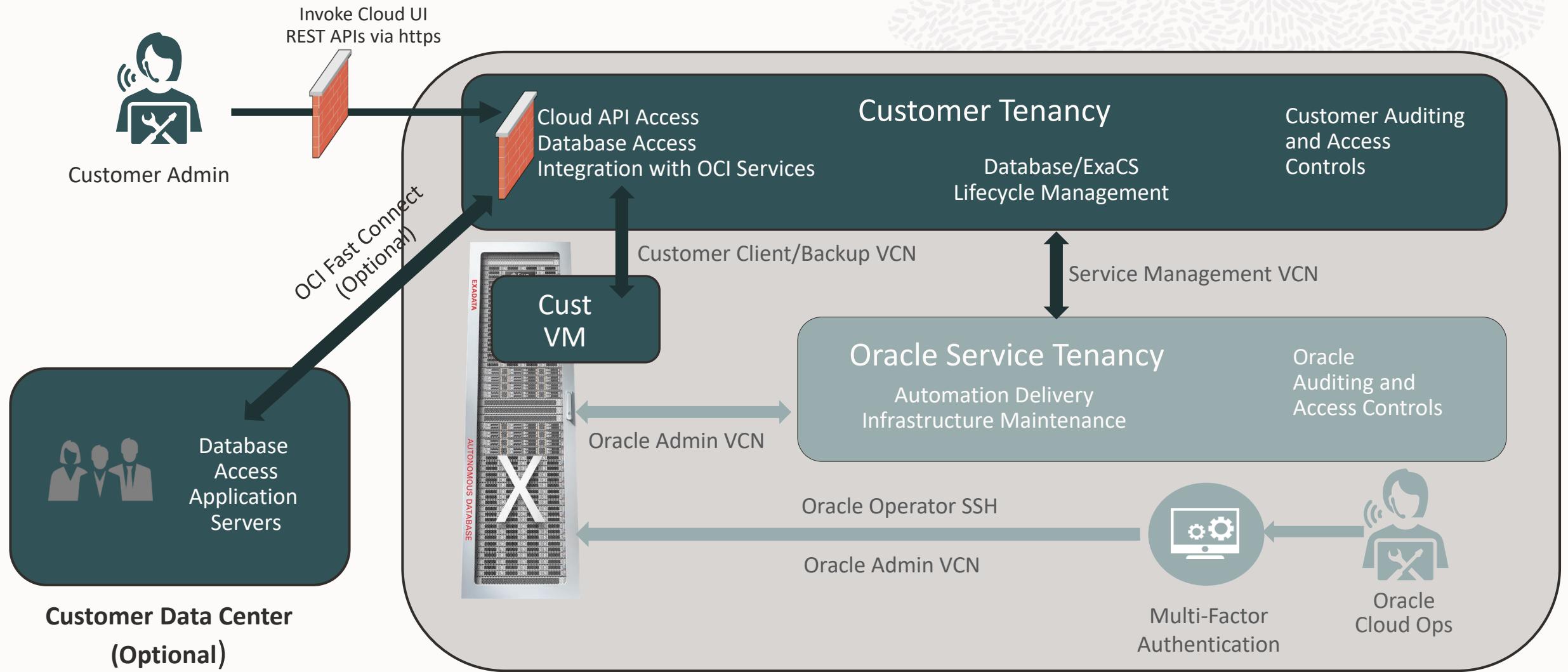
About *DomU* Customer Responsibilities

- Adjust license (BYOL or License included)
- Scale UP/Down resources
- For Exadata C@C Gen 1 DomU uses Xen for virtualization
- For Exadata Cloud at Customer Gen2 DomU uses KVM
- Customer have root access to domU;
- The customer is responsible for any update or configuration change on DomU;

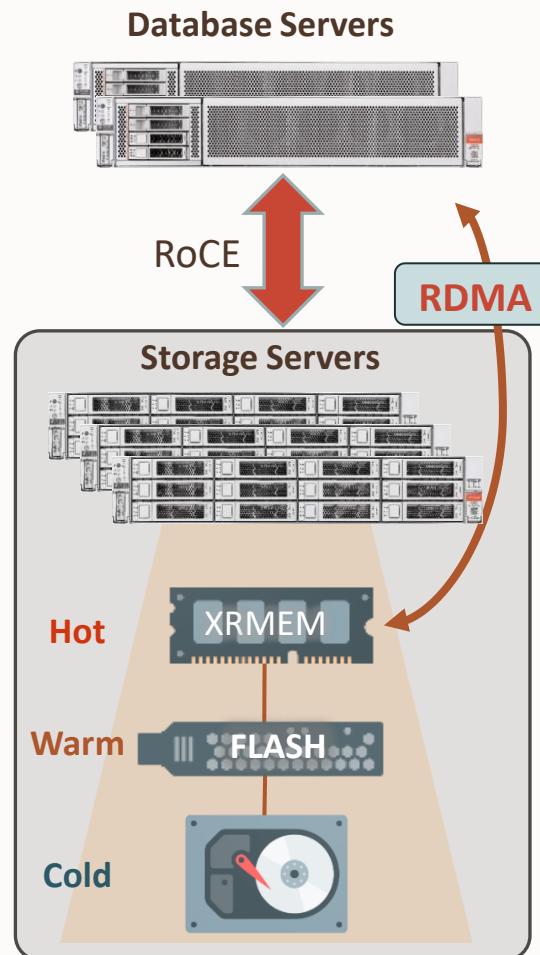
Exadata Cloud at Customer | Control Plane Workflow



Exadata Cloud Service Architecture



Exadata architecture – scale out with intelligent storage



Scale-out system architecture and software

- Independent, online scaling of database and storage servers
- Scales from 2 to 210 Exadata X10M database servers
- Scales from 3 to 264 Exadata X10M storage servers
- Redundancy with fast failover provides high availability

Database uses RDMA instead of I/O to read XRMMEM in Smart Storage

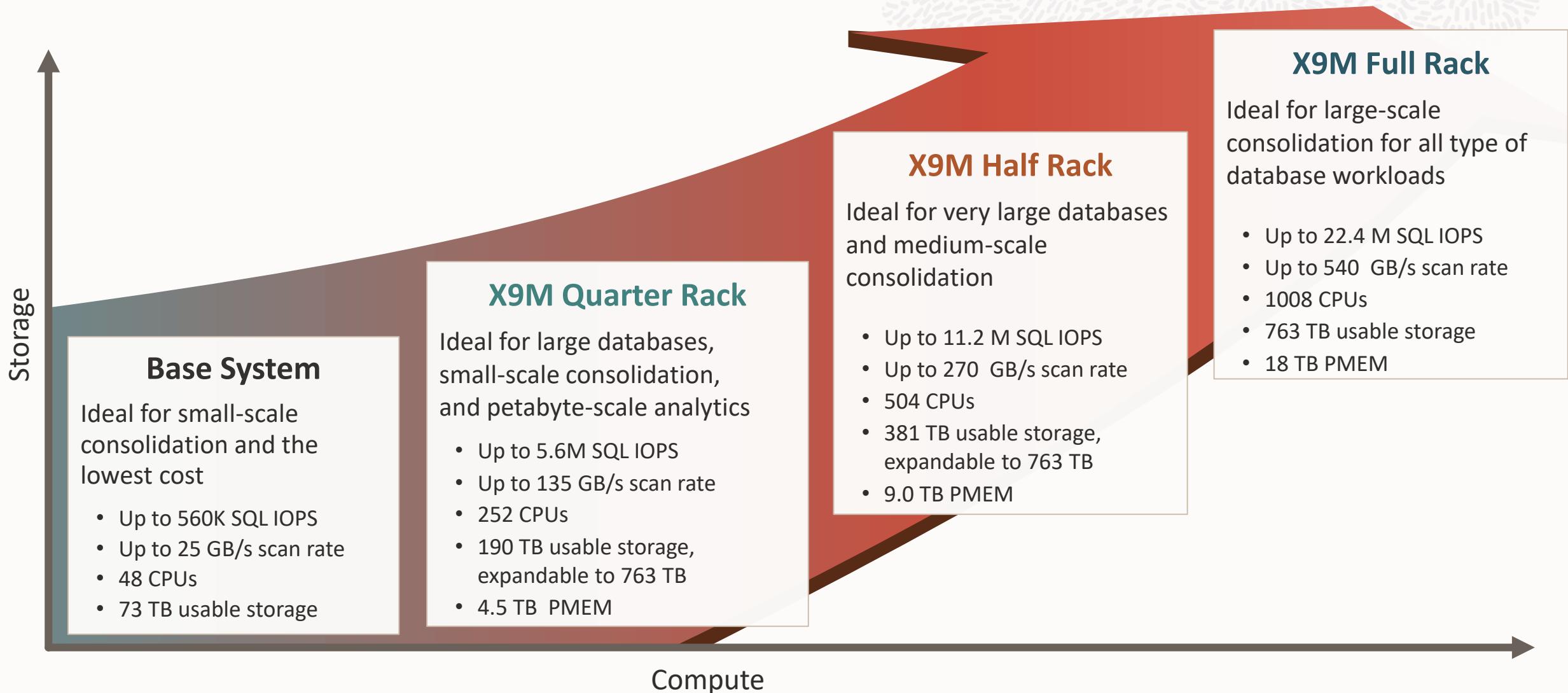
- Bypasses network and I/O software, interrupts, context switches
- Data is transparently managed in multiple storage tiers to minimize latency
- High-performance active-active 100 Gbit/s internal network maximize throughput
- Speeds up both database reads and commits

Database cluster virtualization

- Deploy environments with different needs on the same system
 - Dev-Test, Staging Production, DR
 - OLTP, Analytics, Mixed Workloads
- Share and manage pools of resources to increase efficiency and lower costs
- Isolate resources to meet differing security and predictability requirements

Exadata Cloud X9M Flexible Shapes

Available in high-performance, cost-effective shapes to match enterprise needs



Exadata Cloud at Customer X10M Shapes

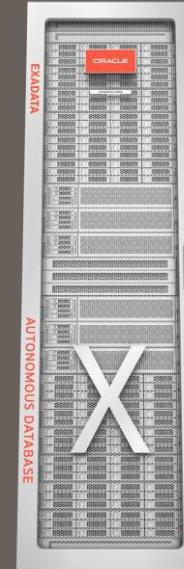


Quarter Rack – X10M

Total Capacity

DB Servers	380 Cores – 1,024 GB Memory
Storage Servers	192 TB Usable DB Storage

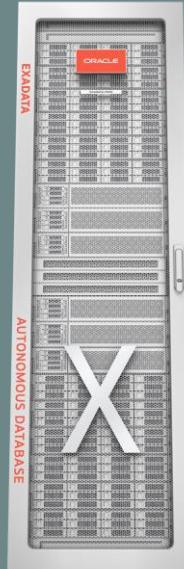
NEW
SHAPE



Quarter Rack – X10M - L

380 Cores – 4,180 GB Memory
192 TB Usable DB Storage

NEW
SHAPE

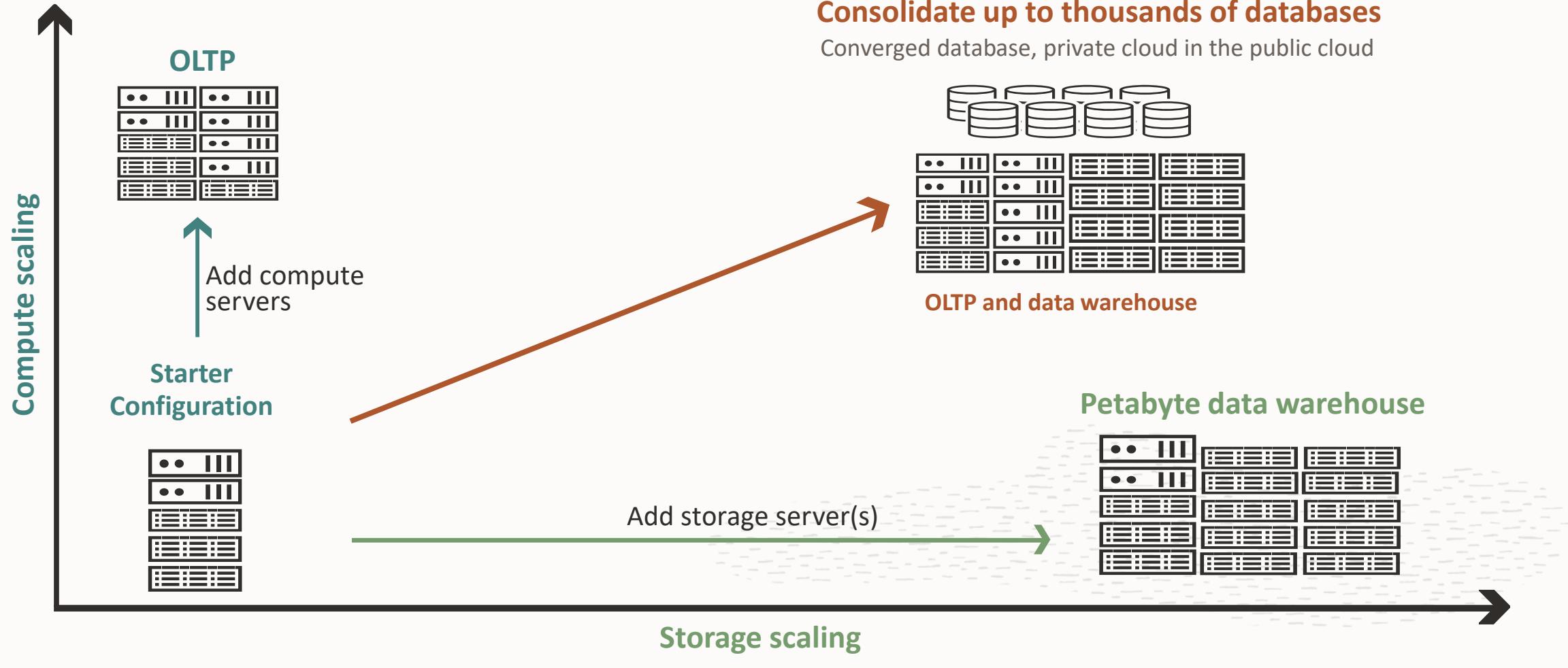


Quarter Rack X10M-XL

380 Cores – 5,600 GB Memory
192 TB Usable DB Storage

There are no Half and Full rack shapes.
Expand Quarter Racks using Expansion Servers.

Easily right-size your service by adding compute and storage as needed

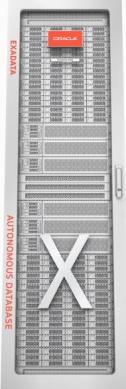


Exadata Cloud@Customer X10M Shapes

All Configurations greater than a Quarter Rack are elastic

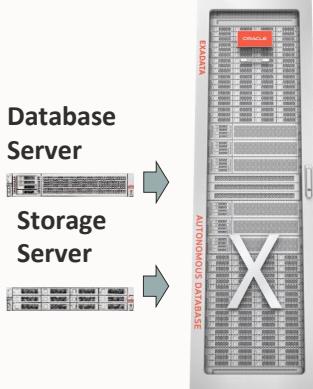


Standard Configuration



Incrementally add
Database and
Storage Servers

Elastic Configuration



Add Racks to
Continue Scaling

Start with a Standard Configuration

- Quarter Rack
- Quarter Rack-L
- Quarter Rack – XL

Elastically Expand Rack with Servers

- Database Server
- Storage Server
- Can NOT mix Database Servers with different memory configurations
 - e.g. X10M cannot be mixed with X10M-XL

Continue to Expand Servers using Expansion Rack(s)

- Up to 6 Racks including primary rack
- Max 32 Database Servers
- Max 64 Storage Servers
- Max 5 Expansion Racks

Exadata Cloud tools



Cloud Automation for Common Lifecycle Tasks

Oracle Cloud Web base UI, REST APIs, SDK, CLI, Terraform

- Scale OCPUs
- Create Database Homes and Databases
- Schedule Infrastructure Maintenance
- Update Operating System, Grid Infrastructure, and Databases
- Backup and recovery
- Enable Data Guard

Create Database

Database name: X8MDB1

Database version: 19c

PDB name Optional:

Database Home:
 Select an existing Database Home Create a new Database Home
This DB system has no Database Homes for your selected database version. A new Database Home will be created.

Database Home display name: X8MDBHome1

Create administrator credentials

Scale VM Cluster

Configure the VM cluster

Specify OCPU count per virtual machine 10 Requested OCPU count for the Exadata VM cluster 40

Current allocation: 10. Minimum allocation: 0. Available OCPUs (including the current allocation): 50.

Current Exadata storage 150.528 TB

Create Backup

Name:

If you previously used RMAN or dbcli to configure backups and then you switch to using the Console or the API for backups, a new backup configuration is created and associated with your database. This means that you can no longer rely on your previously configured unmanaged backups to work.

Enable Data Guard

Data Guard association details

Protection mode: Maximum Performance

Transport type: Read-Only Sync

Select Peer VM Cluster

Peer region: Read-Only US East (Ashburn)



Exadata Cloud Command Line Interface (*dbaascli*)

How to upgrade DBAAS Cloud Tooling using dbaascli (Doc ID 2350471.1)

Database Commands

- *dbaascli* database create
- *dbaascli* pdb create
- *dbaascli* pdb relocate



Backup Commands

- *dbaascli* database backup
- *dbaascli* database recover
- *dbaascli* create-dbstorage



Database Home Patch

- *dbaascli* database upgrade
- *dbaascli* db home patch
- *dbaascli* grid patch
- *dbaascli* update-dbhomedir



Exadata Cloud Pathing



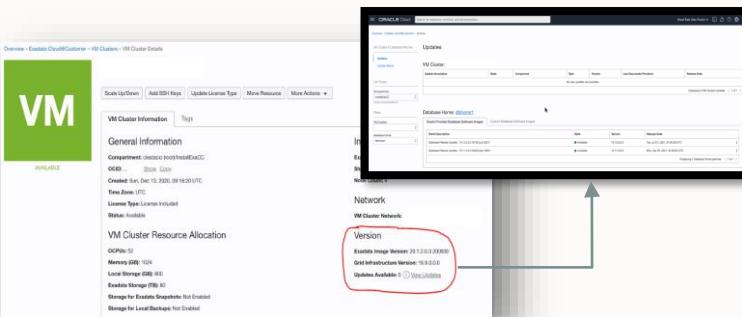
Exadata Cloud Pathing

Pathing dom0, domU, Tooling, Grid and Oracle home, how and how to do

DOMU - CUSTOMER RESPONSIBILITY

Maintaining a secure Exadata Service instance in the best working order requires you to perform the following tasks regularly:

- Patching Grid Infrastructure.
- Patching Database software.
- Patching Exadata Software Image (SO).
- Patching Tooling (dbaascli).
- Patching other components installed on DomU.



DOM0 - ORACLE RESPONSIBILITY

Oracle manages quarterly infrastructure maintenance updates of all other infrastructure components:

- Patching Database Servers (Dom0).
- Patching Storage servers.
- Patching Network switches.
- Patching Control Planes.

Quarterly maintenance updates may require a restart of the customer-managed guest virtual servers.

Quarter 1	Quarter 2	Quarter 3	Quarter 4
<input checked="" type="checkbox"/> JANUARY	<input checked="" type="checkbox"/> APRIL	<input checked="" type="checkbox"/> JULY	<input checked="" type="checkbox"/> OCTOBER
<input checked="" type="checkbox"/> FEBRUARY	<input checked="" type="checkbox"/> MAY	<input checked="" type="checkbox"/> AUGUST	<input checked="" type="checkbox"/> NOVEMBER
<input checked="" type="checkbox"/> MARCH	<input checked="" type="checkbox"/> JUNE	<input checked="" type="checkbox"/> SEPTEMBER	<input checked="" type="checkbox"/> DECEMBER

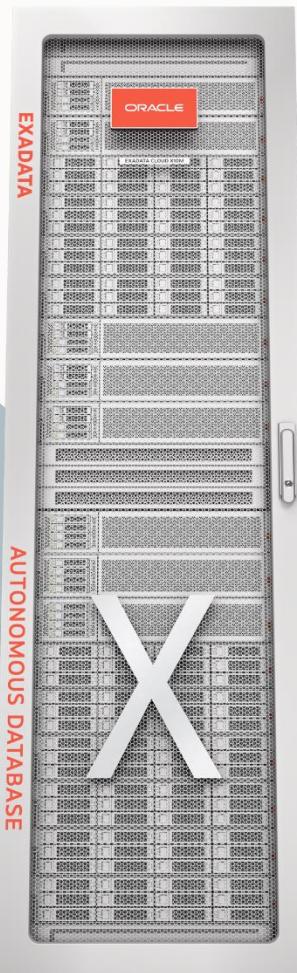
Exadata Cloud Features



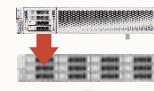
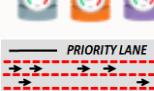
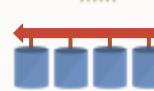
Oracle Database and Exadata Platform Innovations

-  Multitenant
-  In-Memory DB
-  Real Application Clusters
-  Active Data Guard
-  Partitioning
-  Advanced Compression
-  Advanced Security, Label Security, DB Vault
-  Real Application Testing
-  Advanced Analytics, Spatial and Graph
-  Management Packs for Oracle Database

All Oracle Database Innovations



All Exadata DB Machine Innovations

-  Offload SQL to Storage
-  RoCE Fabric
100 Gbps
-  XRMEM Data Accelerator
-  Smart Flash Cache
-  PCI Flash
-  Storage Indexes
-  Columnar Flash Cache
-  Hybrid Columnar Compression
10:1 I/O
-  I/O Resource Management
-  Network Resource Management
-  In-Memory Fault Tolerance
-  Exafusion Direct-to-Wire Protocol

Fastest Cloud In Memory, Smart Scan and HCC

Unique: Smart Scan (SQL Offload)

- Data-intensive processing* runs in Exadata Storage, bypassing network bottlenecks and freeing up DB CPUs

Unique: Tiered Flash Cache

- Active data is automatically cached on PCI NVMe Flash, inactive data on low cost, high-capacity disks

Unique: Storage Indexes

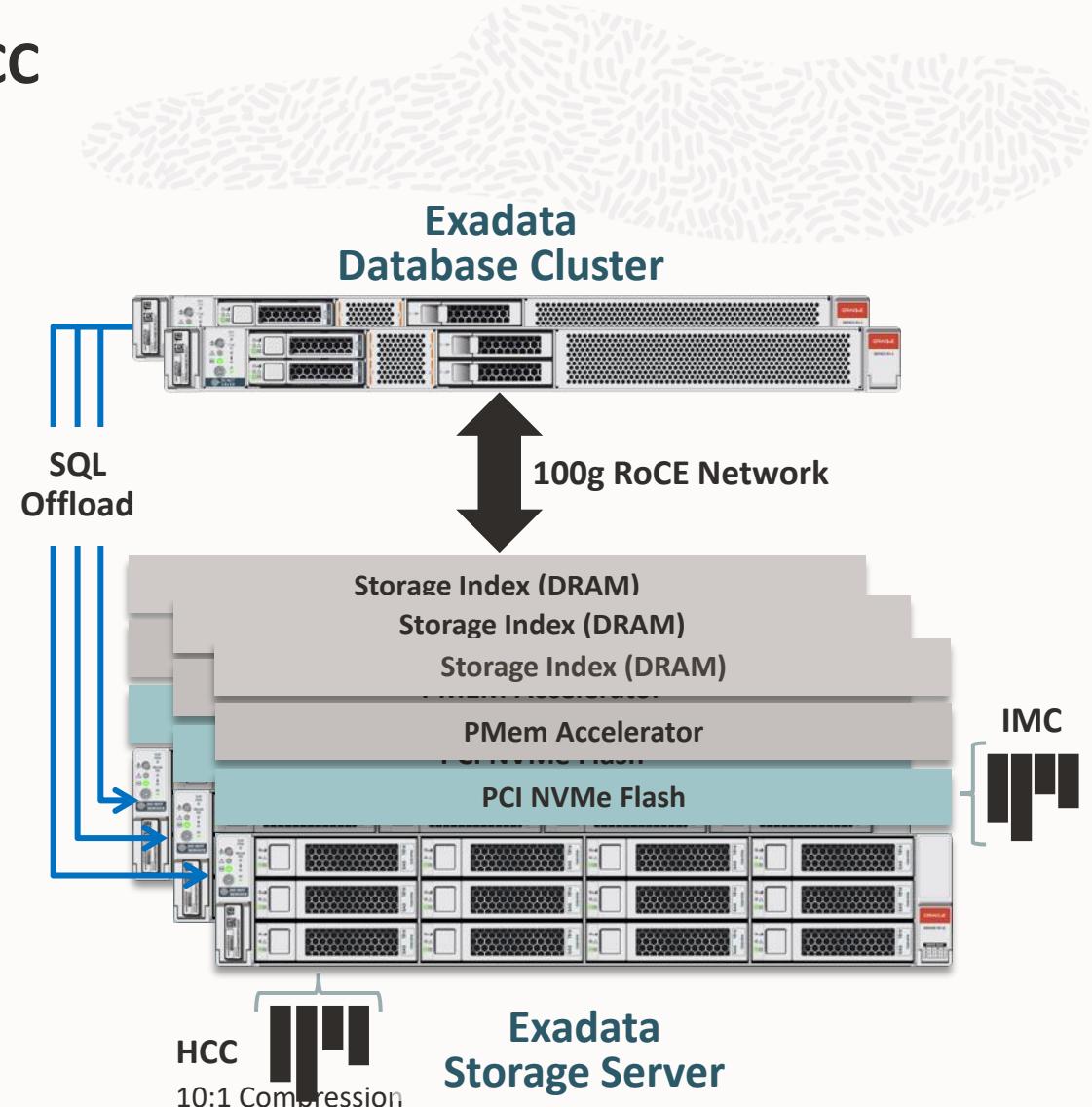
- Eliminates I/O not relevant to a particular query

Unique: Hybrid Columnar Compression (HCC)

- Compressed, columnar format in storage, saving space, reducing I/O, speeding analytic queries

Unique: In-Memory Columnar (IMC)

- Extends In-Memory database performance to higher capacity Flash memory in storage

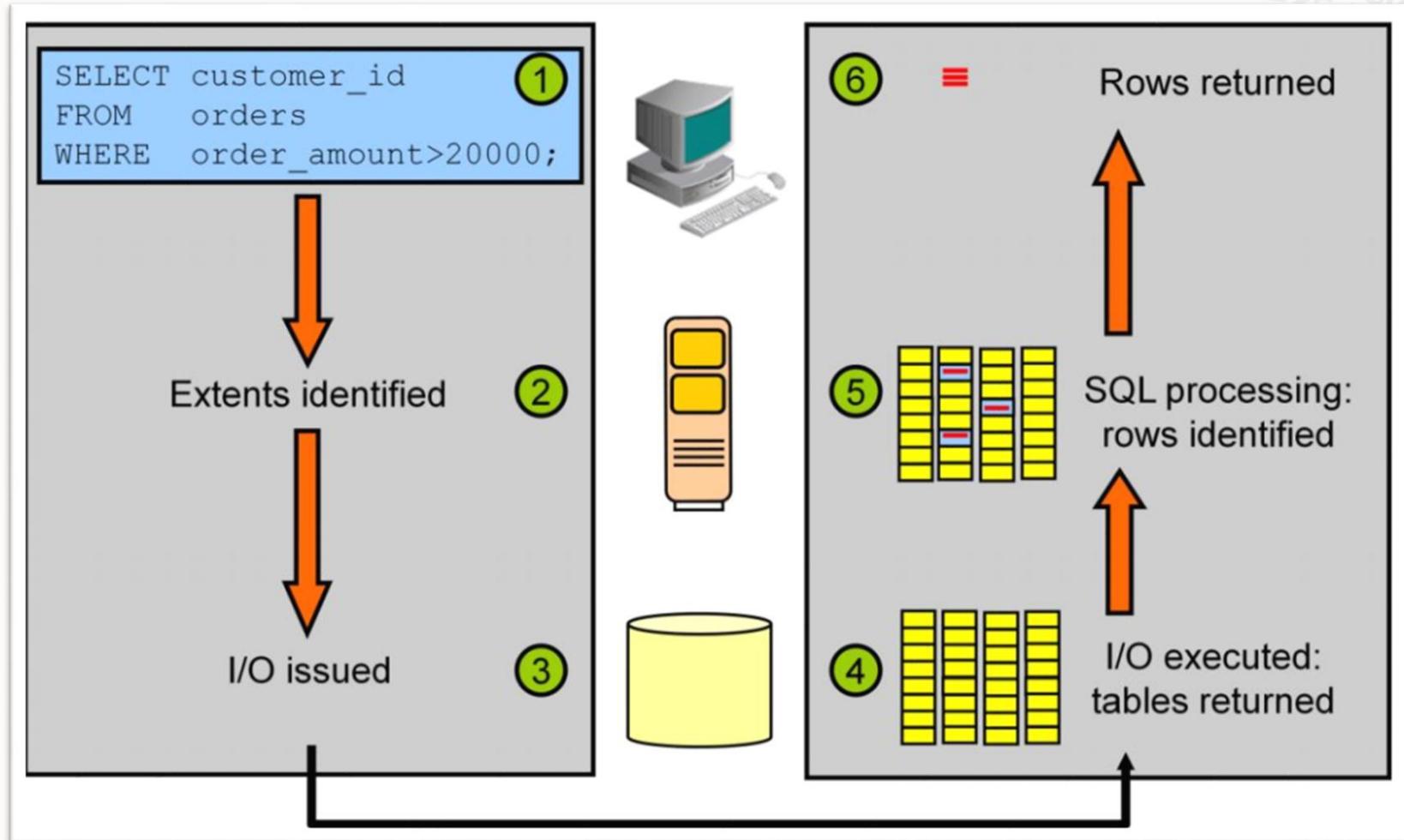


*Includes long-running SQL queries, backups, decryption, aggregation, data mining

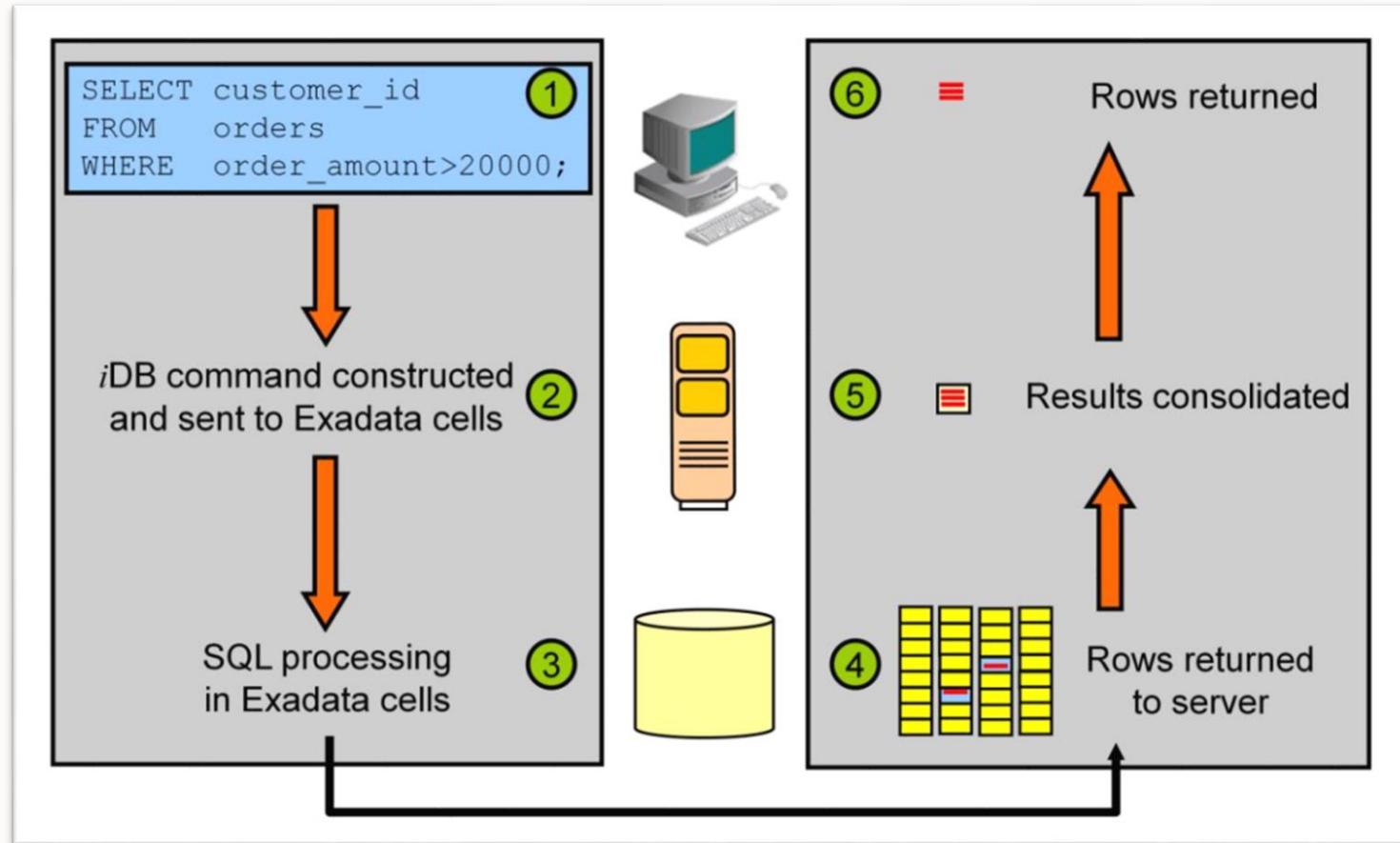
Smart Scan



Oracle Database | No Exadata System



Exadata Cloud a Smart Scan | Off Load Querying



Query Execution plan | Traditional Database Vs Exadata System

```
SQL> select * from table(dbms_xplan.display);
```

```
PLAN_TABLE_OUTPUT
```

```
Plan hash value: 970577077
```

Id Operation	Name	Rows	Bytes	Cost	(%CPU)	Time
0 SELECT STATEMENT		902	23452	10	(0)	00:00:01
1 TABLE ACCESS BY INDEX ROWID BATCHED	CUSTOMERS	902	23452	10	(0)	00:00:01
* 2 INDEX RANGE SCAN	CUSTOMERS_ID_PK	902		6	(0)	00:00:01

```
Predicate Information (identified by operation id):
```



```
PLAN_TABLE_OUTPUT
```

```
Plan hash value: 2008213504
```

Id Operation	Name	Rows	Bytes	Cost	(%CPU)	Time
0 SELECT STATEMENT		902	23452	306K	(1)	00:00:12
* 1 TABLE ACCESS STORAGE FULL	CUSTOMERS	902	23452	306K	(1)	00:00:12

```
Predicate Information (identified by operation id):
```

```
1 - storage("ID"<=1000 AND "ID">>=100)
      filter("ID"<=1000 AND "ID">>=100)
```



Exadata Smart Scan Why it's not working?

- Scan performed on a partitioned table
- A Scan is performed on an index-organized table
- Fast full scan is performed on a compressed index
- Full scan is performed on a reverse key index
- The table has row-level dependency tracking enabled.
- The optimizer wants the scan to return rows in ROWID order
- A LONG or LONG column is being selected or queried
- A select from flashback query is being executed
- A query that has been converted to a materialized view



Oracle Database backup options



Oracle Database automatic backup

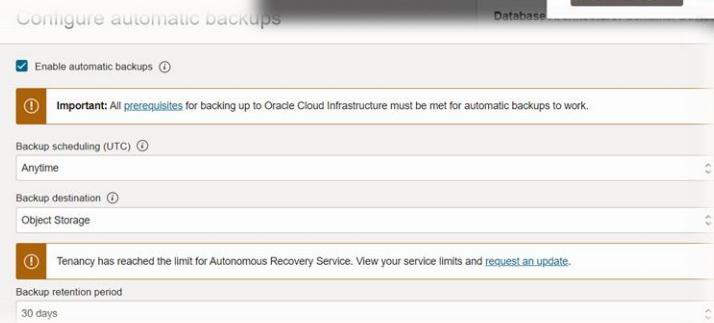
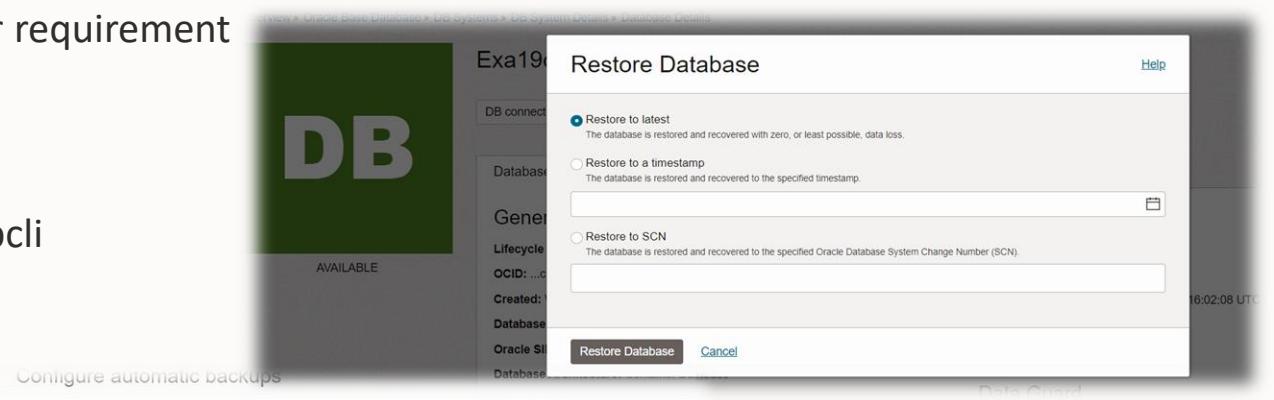
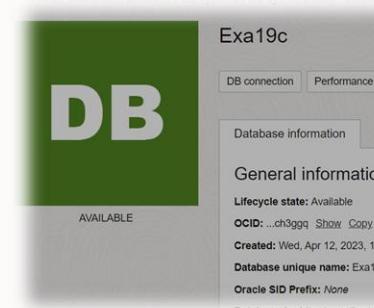


Manage backup and restore feature for VM/BM DB System

- Backup stored in Object or Local storage
- DB System in private subnets can leverage Service Gateway
- Start With 2 cores and Scale Up/Down OCPU's based on your requirement

Backup Options

- It is not possible to create a non-CDB via the console - use dbcli



Terminate Database

[Help](#)

Are you sure you want to terminate the peer database? Once it's terminated, the associated primary database will no longer be in high availability mode. Terminating the database permanently deletes it from its DB System and removes all automatic backups. You cannot recover a terminated database.

Are you sure you want to terminate database **DB12?** **Terminating the database permanently deletes it from its DB System and removes all automatic backups.** You cannot recover a terminated database.

Do you want to back up the database before terminating it?

Yes, back up the database

To confirm termination, enter the name of the database:

Terminate Database [Cancel](#)



Cloud Backup | Oracle Database Backup Cloud Service page



Help Center Database Backup Service Search 

[Get Started](#)

Tasks

Resources

Videos

Books

Topics

Get Started

Learn About Database Backup Cloud Service

Watch an overview video

Related Video

Learn about the service

Learn about the backup module

See the FAQ

Get a Subscription

Manage and monitor services

Set up cloud users, administrators, and SFTP users

See important details about subscriptions

Get Started with Database Backup Cloud Service

Understand the backup workflow

Download and install the backup module

Perform configuration and backup tasks

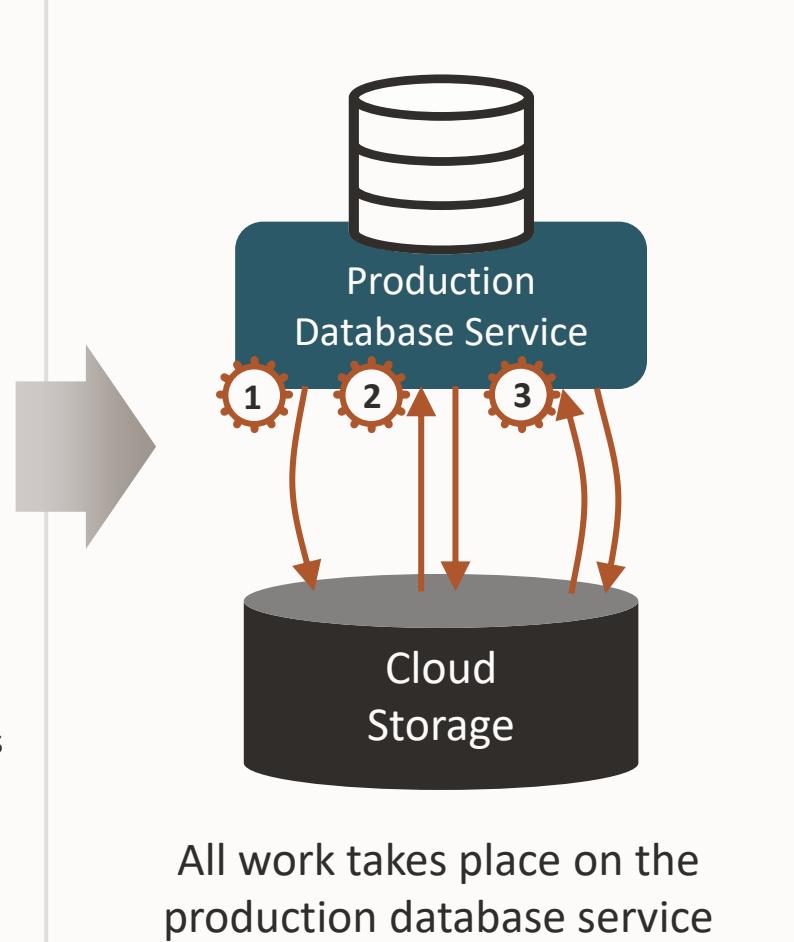


Recovery Service offloads backup validation

All backups are checked for recoverability, reducing database service overhead

Traditional cloud backup

1. Backup (full or incremental) is created on the production database service and stored in object storage
2. Production service reads the backup from object store, validates it, and fixes issues **doubling the impact on production database services**
3. Periodic revalidation **increases production database consumption**
4. Resulting in:
 - a. Lower production performance if resource constrained, or
 - b. Higher consumption costs if resources are unconstrained, or
 - c. Decision to not validate backups or revalidate them, increasing risk



Oracle Database Zero Data Loss Autonomous Recovery Service

A fully managed, automated service for continuously protecting Oracle databases in OCI

Ransomware resiliency

- Automatic and mandatory encryption to help prevent data theft
- Safeguards backups with enforced 14-day retention
- Optimizes backups in the background for fast recovery with zero data loss

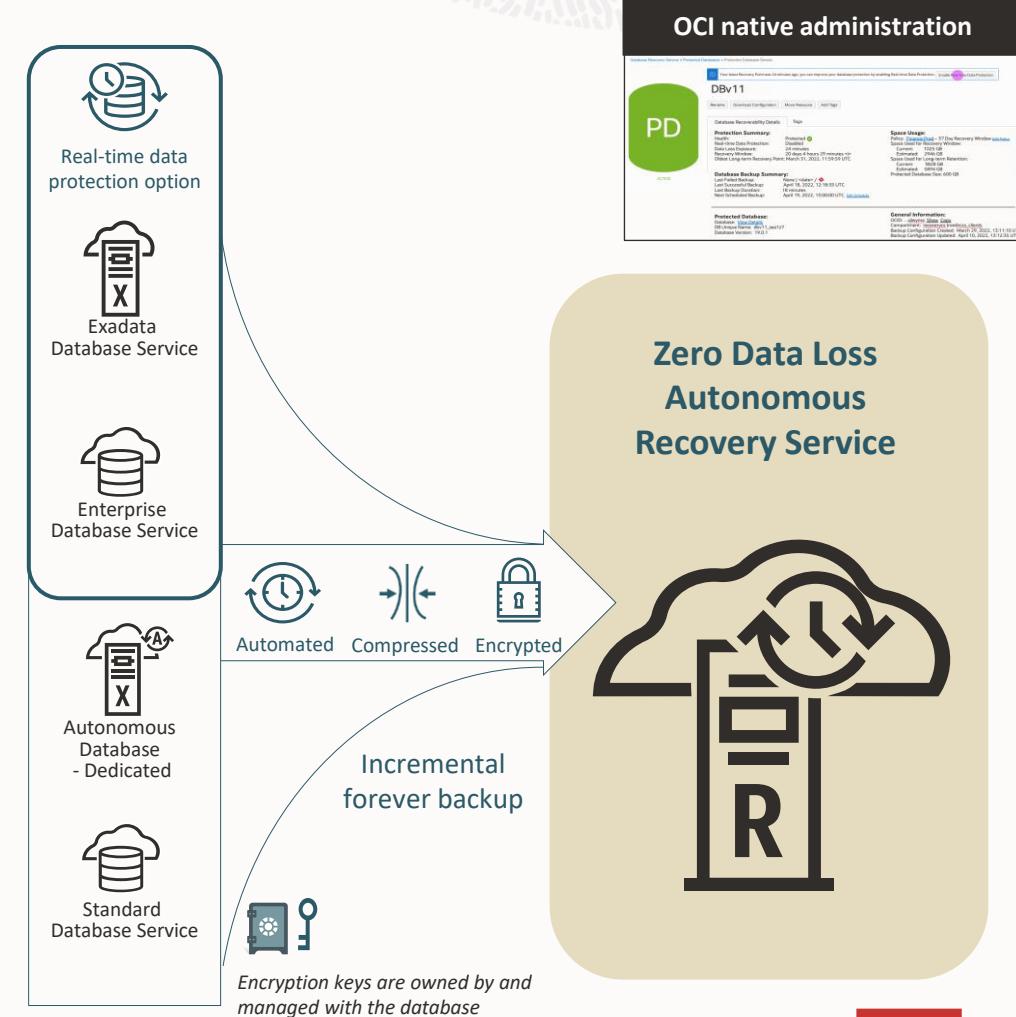
Operational efficiency

- No more weekly full backups – eliminates production database overhead
- Shorter backup windows with incremental forever strategy
- Zero-impact database recovery validation for every backup

Cloud simplicity

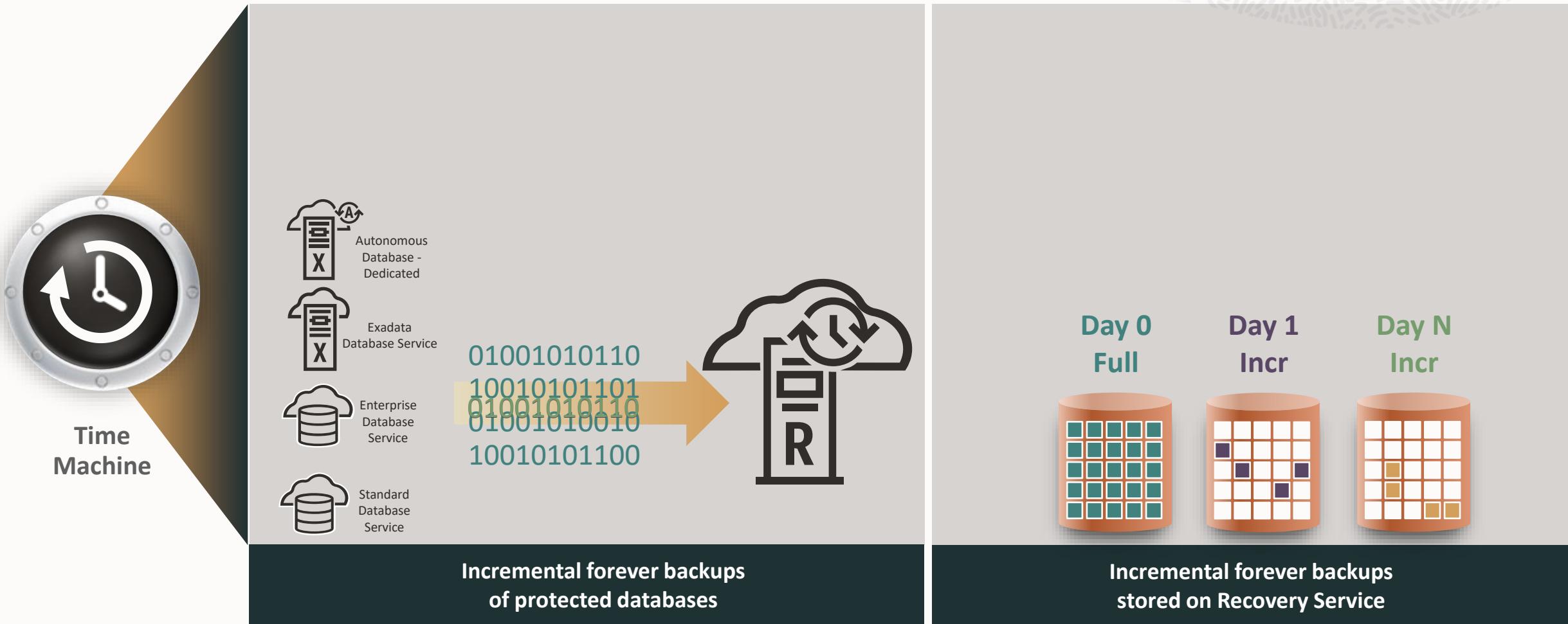
- Quickly configure database protection at scale with zero data loss
- Control costs with database-specific backup consumption metrics
- Gain deep data protection insights with granular recovery health dashboard

Using proven Recovery Appliance technology



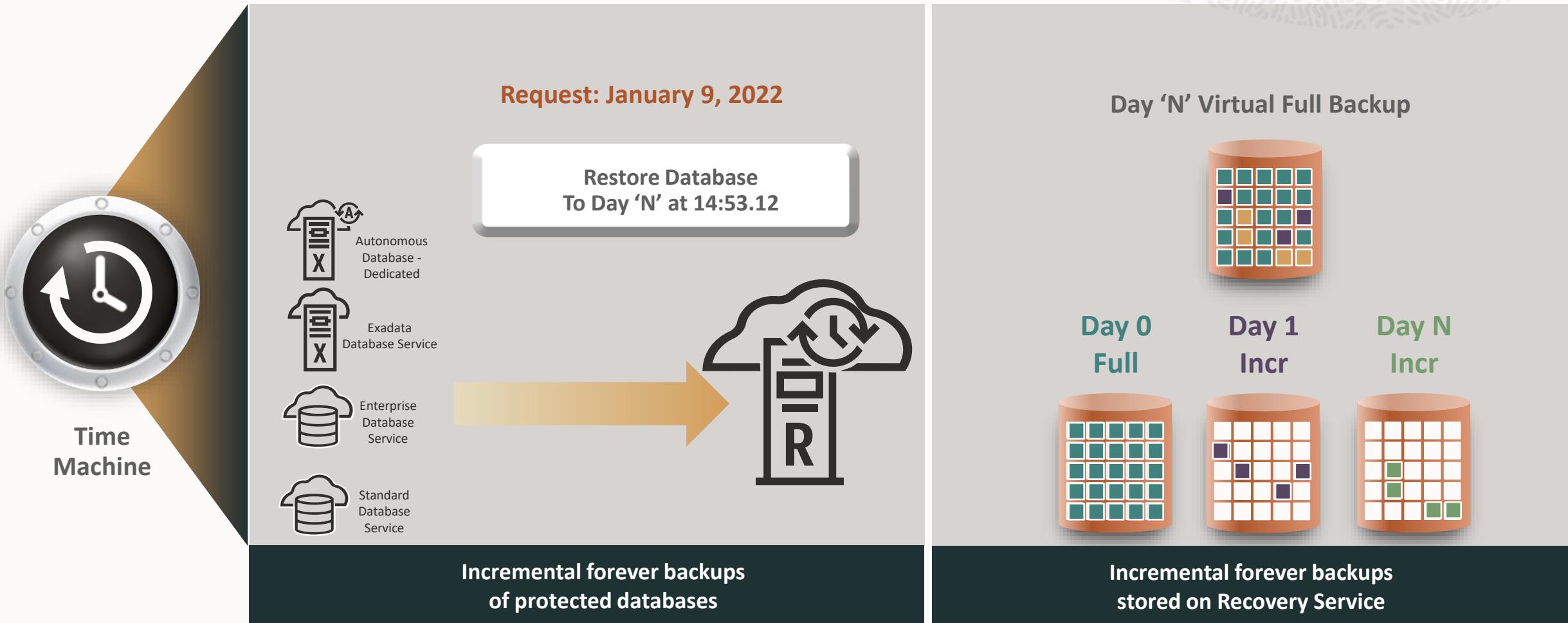
Recovery Service eliminates weekly full backups

Incremental-forever backups reduce backup overhead on production database services



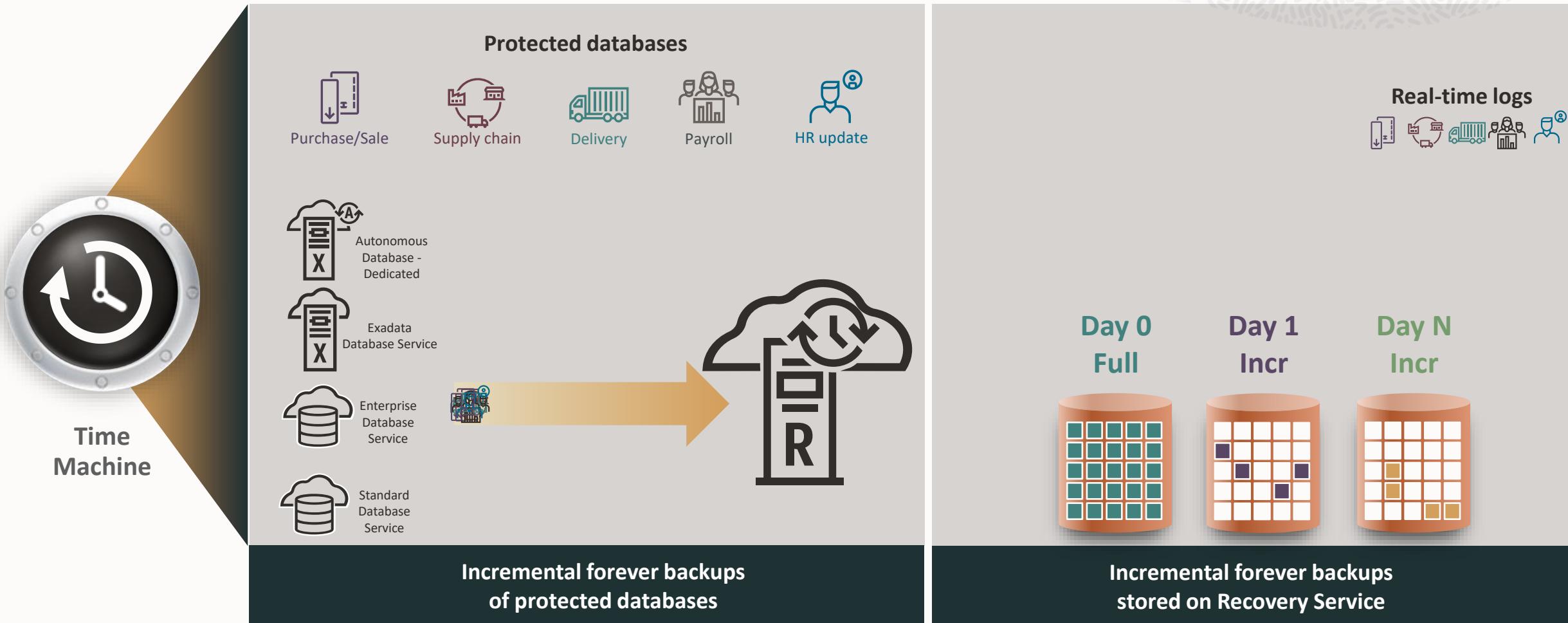
Recovery Service simplifies database restores

Creation of virtual full backups eliminates multiple incremental restore & apply cycles



Recovery Service continuously protects Oracle databases

Real-time protection of database changes increases resiliency with point-in-time recovery

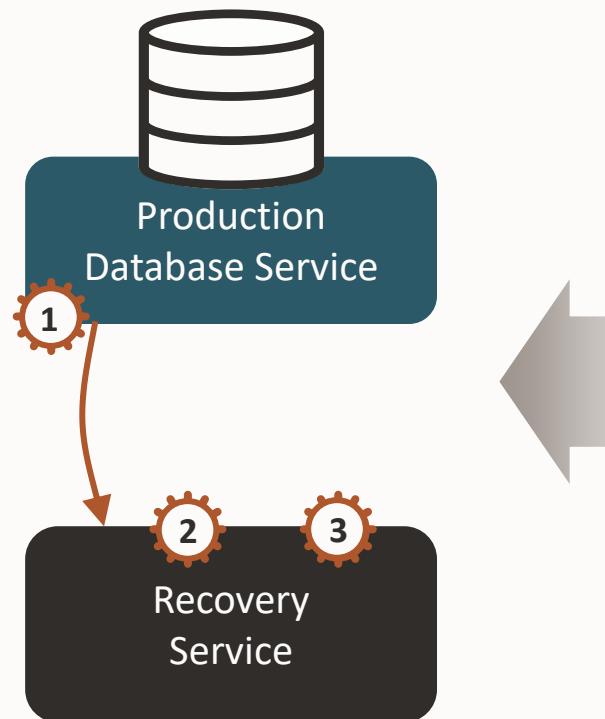


Recovery Service offloads backup validation

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 - a. Lower production performance if resource constrained, or
 - b. Higher consumption costs if resources are unconstrained, or
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Most work takes place on the Recovery Service

Recovery Service backup

1. Incremental forever backup is created on the production database service and stored in the Recovery Service
2. The Recovery Service uses **internal Oracle Database knowledge** to check examine and fix backups when ingested, with **no impact on production databases**
3. The Recovery Service periodically revalidates backups with **no production database consumption**
4. Resulting in:
 - a. **Minimal backup impact on production databases**
 - b. **No additional production database service costs**
 - c. **Higher recoverability & lower risk**



Recovery Service is easy to set up and use

Protect Oracle databases with less than 5 clicks in the OCI console

A fully managed OCI service with a simple UI

1. Enable automatic backups
2. Schedule daily incremental backups to meet your business schedule
3. Select Autonomous Recovery Service
4. Select protection window of 14 to 95 days
5. Enable real-time protection

Configure automatic backups

[Help](#)

Enable automatic backups [i](#)

! **Important:** For automatic backups to function, all [prerequisites](#) must be met.

Backup scheduling (UTC) [i](#)
2:00AM - 4:00AM

Backup destination [i](#)
Autonomous Recovery Service

Protection policy in **ZDLRA** [i](#) ([Change Compartment](#))
Bronze (14-days recovery window)

Enable real-time data protection [i](#)

Deletion options after database termination [i](#)
 Retain backups according to the protection policy retention period
 Retain backups for 72 hours, then delete

[Save changes](#) [Cancel](#)



Recovery Service protects against unauthorized access

Built-in security and resiliency help safeguard mission-critical data

Encryption is mandatory

- Non-encrypted databases are rejected
- Keys are never stored in the Recovery Service

Access and management controls

- No direct user access to storage – backup only
- Access granted per protected database
- 14-day minimum retention enables recovery from human error or malicious internal actors

Resilient operations

- Fault-tolerant across all infrastructure components
- Highly available across Availability Domains and Fault Domain
- Load balanced within a region

The screenshot shows the Oracle Cloud interface for Protected Database details. The main header includes the Oracle Cloud logo, Cloud Classic, a search bar, and navigation links for US East (Ashburn), Help, and Support. Below the header, the breadcrumb navigation shows Database Backups > Protected Databases > Protected database details. The central content area displays a large green circular icon with 'PD' and 'ACTIVE' text, labeled 'FINANCE'. The page is divided into several sections: 'Protected database information' (Health: Protected, Real-time data protection: Disabled, Data loss exposure: 0 seconds, Protection policy: Bronze 14-day recovery window, Current recovery window: 14 d 11 h 45 m), 'Space usage' (Current: 16,231.27 GB, Projected for policy: 16,216.83 GB, Protected database size: 5,790.931 GB), 'Database backup summary' (Last failed backup: —, Last completed backup: Mon, Oct 10, 2022, 02:56:02 UTC, Last backup duration: 4 m 53 s), 'Protected database' (Database details: FINANCE), and 'General information' (OCID: ...4w7dxa, Show, Copy). A small blue square icon with a white question mark is visible in the bottom right corner.



Recovery Service provides insights into backup health and operations

Built-in dashboards and tools simplify reporting and planning

Continuous monitoring of potential business risks

- Data loss exposure
- Recovery window

Critical data for operational planning

- Capacity usage
- Protection policy

Protected databases in ZDLRA Compartment

Protected databases offer an RMAN integrated 'incremental-forever' backup strategy to transfer Oracle Database backups to Oracle Cloud. Built to reduce network consumption and storage utilization, protected databases enable real-time data protection, backup validation and policy driven backup administration for all databases. [Learn more](#).

Name	State	Health	Source database	Real-time data protection	Data loss exposure	Current recovery window	Recovery window space used	Protection policy	Database size	⋮
FINANCE	● Active	Protected ⓘ	FINANCE	Enabled	0	7 d 7 h 54 m	8,121.12 GB	Bronze	5,778 GB	⋮
SALES	● Active	Protected ⓘ	SALES	Disabled	29 m 47 s	7 d 8 h 12 m	9,022.26 GB	Silver	3,944 GB	⋮
HRMS	● Active	Protected ⓘ	HRMS	Disabled	29 m 49 s	7 d 8 h 15 m	5,427.58 GB	Bronze	3,909 GB	⋮

Real-time protection and data loss exposure

Recovery window and capacity used

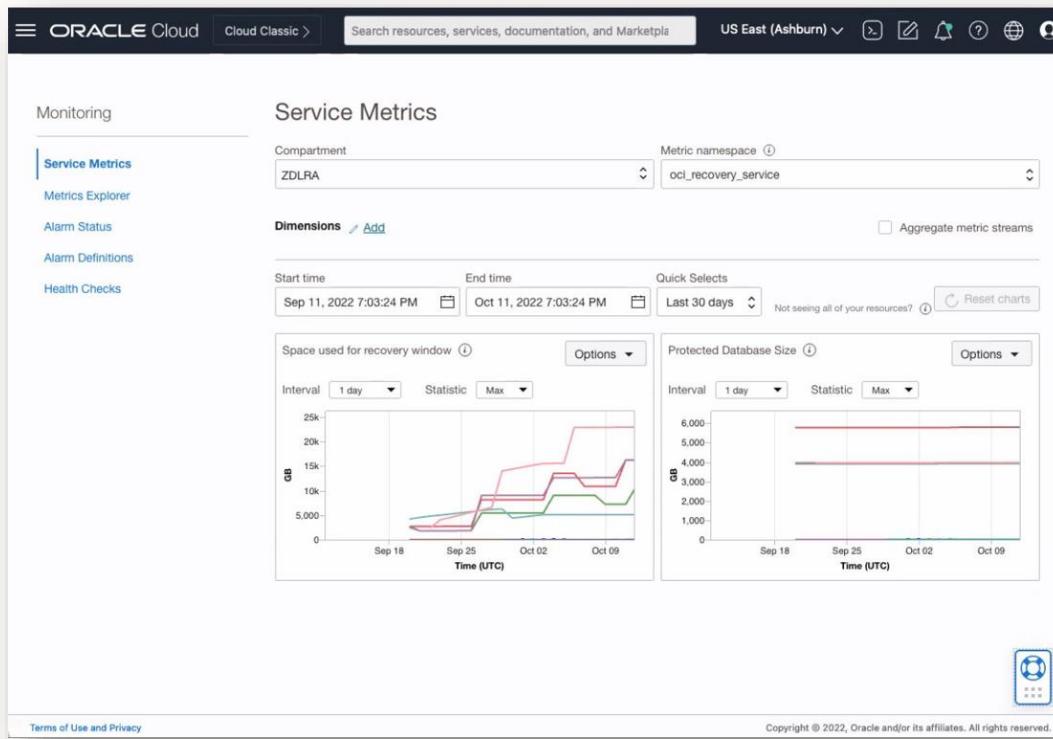
Protection policy



Recovery Service integrates with OCI observability and management

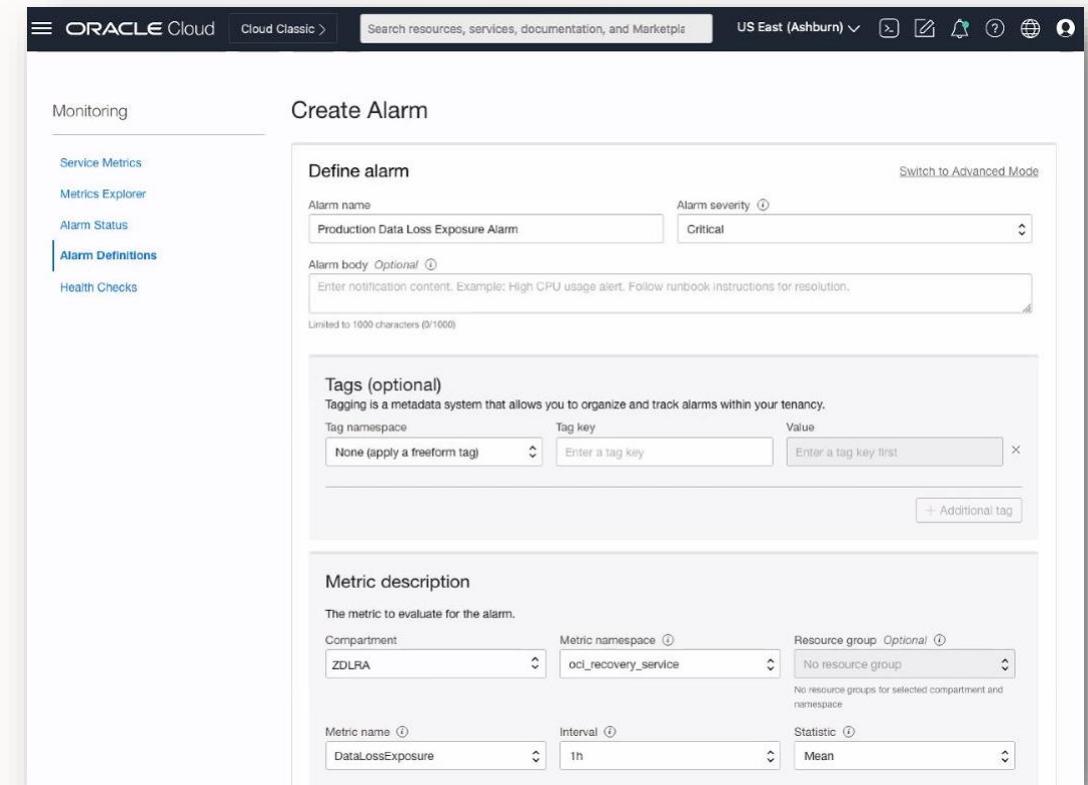
Comprehensive visibility across the full cloud stack

Integration with OCI Metrics Explorer provides common access to critical information



The screenshot shows the Oracle Cloud Metrics Explorer interface. On the left, a sidebar menu includes 'Monitoring', 'Service Metrics' (which is selected), 'Metrics Explorer', 'Alarm Status', 'Alarm Definitions', and 'Health Checks'. The main area is titled 'Service Metrics' and displays two line charts. The top chart, 'Protected Database Size', shows values in GB over time (Sep 18 to Oct 09). The bottom chart, 'Space used for recovery window', also shows values in GB over the same period. Both charts have 'Interval' set to '1 day' and 'Statistic' set to 'Max'. The 'Metric namespace' dropdown is set to 'oci_recovery_service'. The 'Dimensions' section has 'Add' and 'Aggregate metric streams' options. The 'Start time' is Sep 11, 2022, 7:03:24 PM, and the 'End time' is Oct 11, 2022, 7:03:24 PM. A 'Quick Selects' dropdown shows 'Last 30 days'. At the bottom right is a blue circular icon with a white 'O'.

Alarms and notifications are created within OCI for consistent monitoring and management



The screenshot shows the 'Create Alarm' interface in Oracle Cloud. The left sidebar menu is identical to the one in the Metrics Explorer screenshot. The main area is titled 'Create Alarm' and contains several sections. The first section, 'Define alarm', includes fields for 'Alarm name' (set to 'Production Data Loss Exposure Alarm') and 'Alarm severity' (set to 'Critical'). Below this is an 'Alarm body' field with placeholder text: 'Enter notification content. Example: High CPU usage alert. Follow runbook instructions for resolution.' A note says 'Limited to 1000 characters (0/1000)'. The second section, 'Tags (optional)', allows tagging with a 'Tag namespace' (set to 'None (apply a freeform tag)'), 'Tag key' (set to 'Enter a tag key'), and 'Value' (set to 'Enter a tag value first'). There is also a '+ Additional tag' button. The third section, 'Metric description', requires selecting a 'Compartment' (set to 'ZDLRA'), 'Metric namespace' (set to 'oci_recovery_service'), and 'Resource group' (set to 'No resource group'). It also includes fields for 'Metric name' (set to 'DataLossExposure'), 'Interval' (set to '1h'), and 'Statistic' (set to 'Mean').



Oracle NoSQL Database Cloud Service



Oracle NoSQL Database Services on OCI Console

Easy provisioning and Management

Databases

MySQL

- DB Systems
- Backups
- Channels
- Configurations

MySQL HeatWave on AWS

- Administration

Oracle NoSQL Database

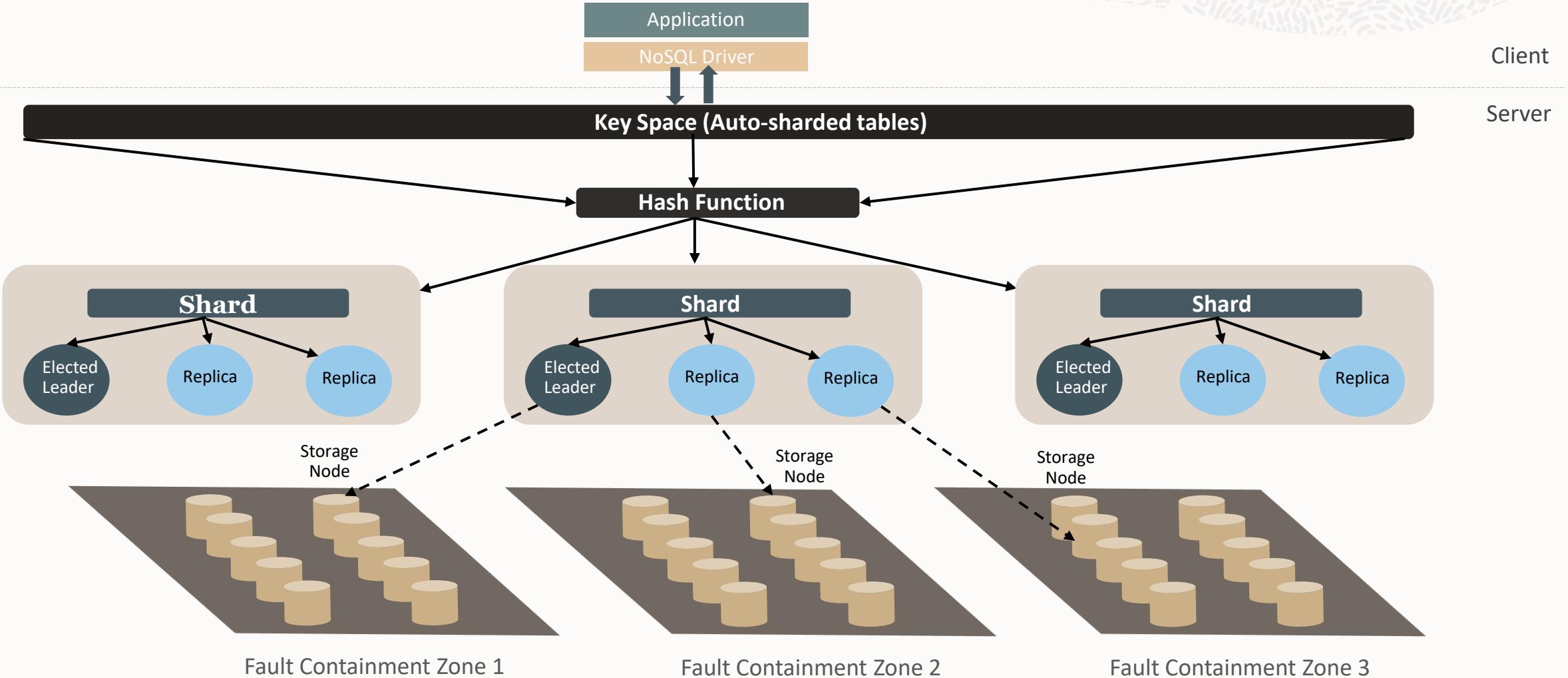
- Tables

OpenSearch

- Clusters
- Backups

Oracle NoSQL Database Architecture Overview

A distributed, shared nothing key/value data store architected for HA



Oracle NoSQL Database Cloud Service

Built for extreme, dynamic workloads of today's modern applications

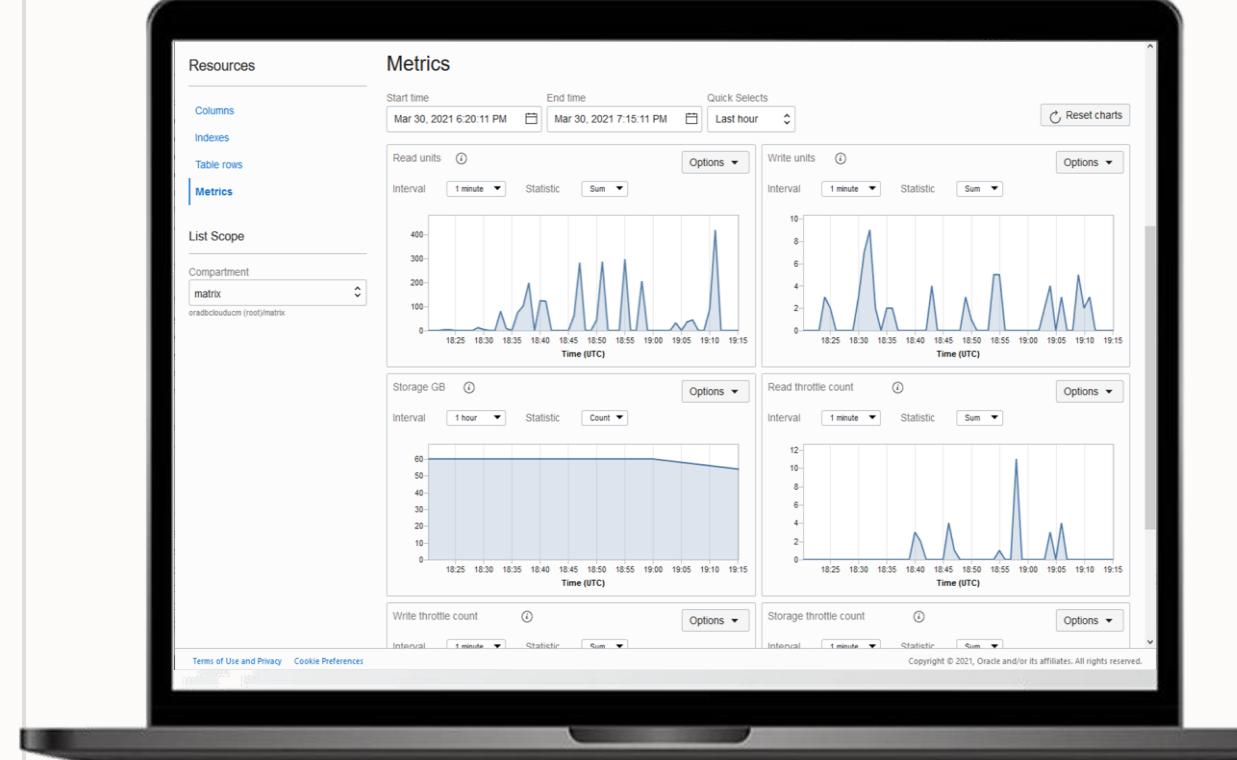


Fast, Flexible NoSQL Database Service at any scale

- **Fully managed, serverless NoSQL database table service**
- **Single digit millisecond and predictable latency** at any scale
- **Linear throughput scaling** for **extreme** workloads
- Multi-model support (document, fixed schema, key/value)
- **Built-in high availability** for business continuity
- Fully **ACID compliant** and **adjustable** read consistency
- Serverless computing through Oracle Functions
- Available in 30 OCI commercial regions worldwide (Mar 2022)

Differentiated Use Cases

- **Request level granularity** for extreme workloads, and handles **spikes and drops optimally**
- Fast, constant, high-volume workloads requiring **predictable low latency** for **highly responsive applications**
- Designed for business applications requiring **scale, performance, and high availability** with flexible consistency



Oracle NoSQL Database Cloud Service - Metrics

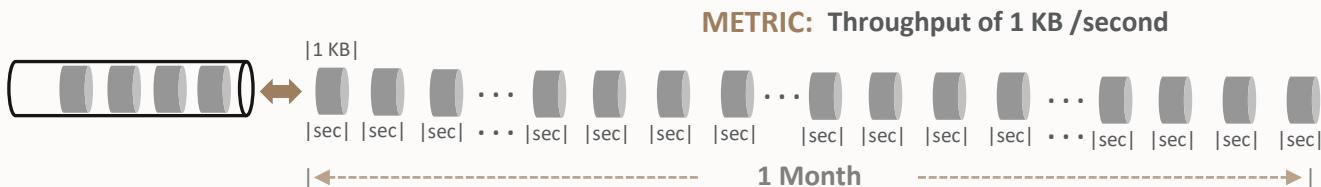
Throughput provisioning

1 Write Unit

- The throughput of up to 1 kilobyte (KB) of data per second for a write operation over a one-month period
- Approximately 2.67 million writes per month

1 Read Unit

- The throughput of up to 1 kilobyte (KB) of data per second for an eventually consistent read operation
- Approximately 2.67 million eventually consistent reads per month
- 2 Read units are needed for an absolute consistent read



Period of a month
 $=3600 \text{ KB/Hr} * 744 \text{ Hr}$
 $=2.67 \text{ million (writes/reads) KBs}$



Oracle NoSQL Database Cloud Service – Capacity

Provisioned capacity vs. on-demand capacity

Provisioned Capacity

- Must determine read/write units in advance
- Adjustments done via API or console
- Increasing unlimited
- Decreases limited to 4 per day
- Pay for what you provision
- Deep understanding of workload needed

On-Demand Capacity

- Automatic scaling
- No rate limiting in your application
- No workload characterization
- Simple to use
- Pay for what consumed



Oracle NoSQL Database Cloud Service – Provisioned Capacity

Provisioned throughput

- Provision reads/sec, writes/sec, GB storage at table creation time
 - Dynamically increase
 - Dynamically decrease

2000 read units | 100 write units | 500 GB Storage

JAVA code sample:

```
TableRequest tableRequest = new TableRequest()
    .setStatement("create table if not exists foo (id integer,
value JSON)")
    .setTableLimits(new TableLimits(2000, 100, 500))
    .setTimeout(1000);
TableResult res = NoSQLHandle.tableRequest(tableRequest);
```

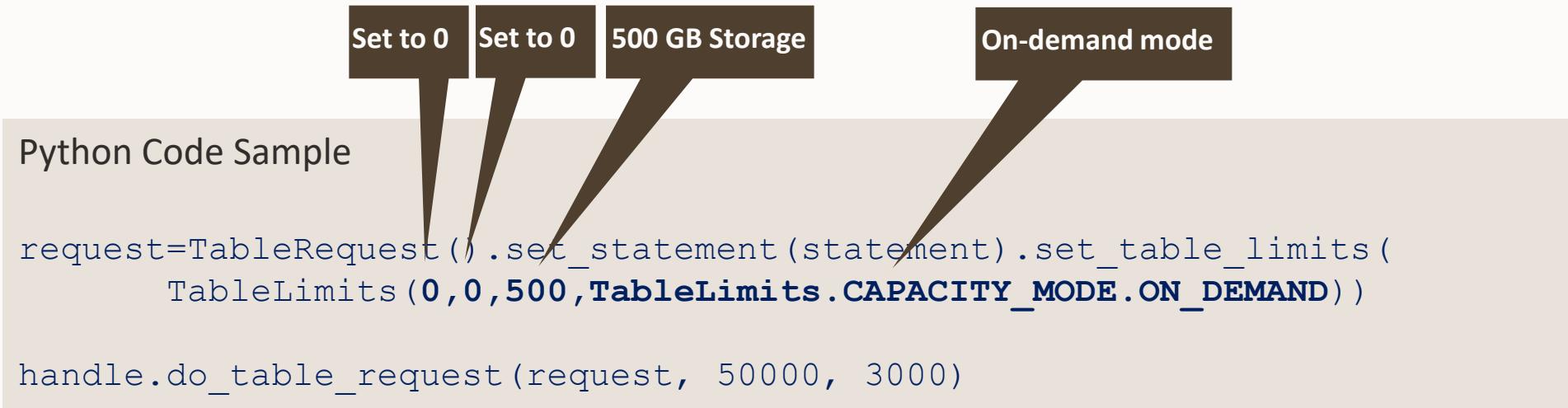
Modify the table lowering the read units to 1000

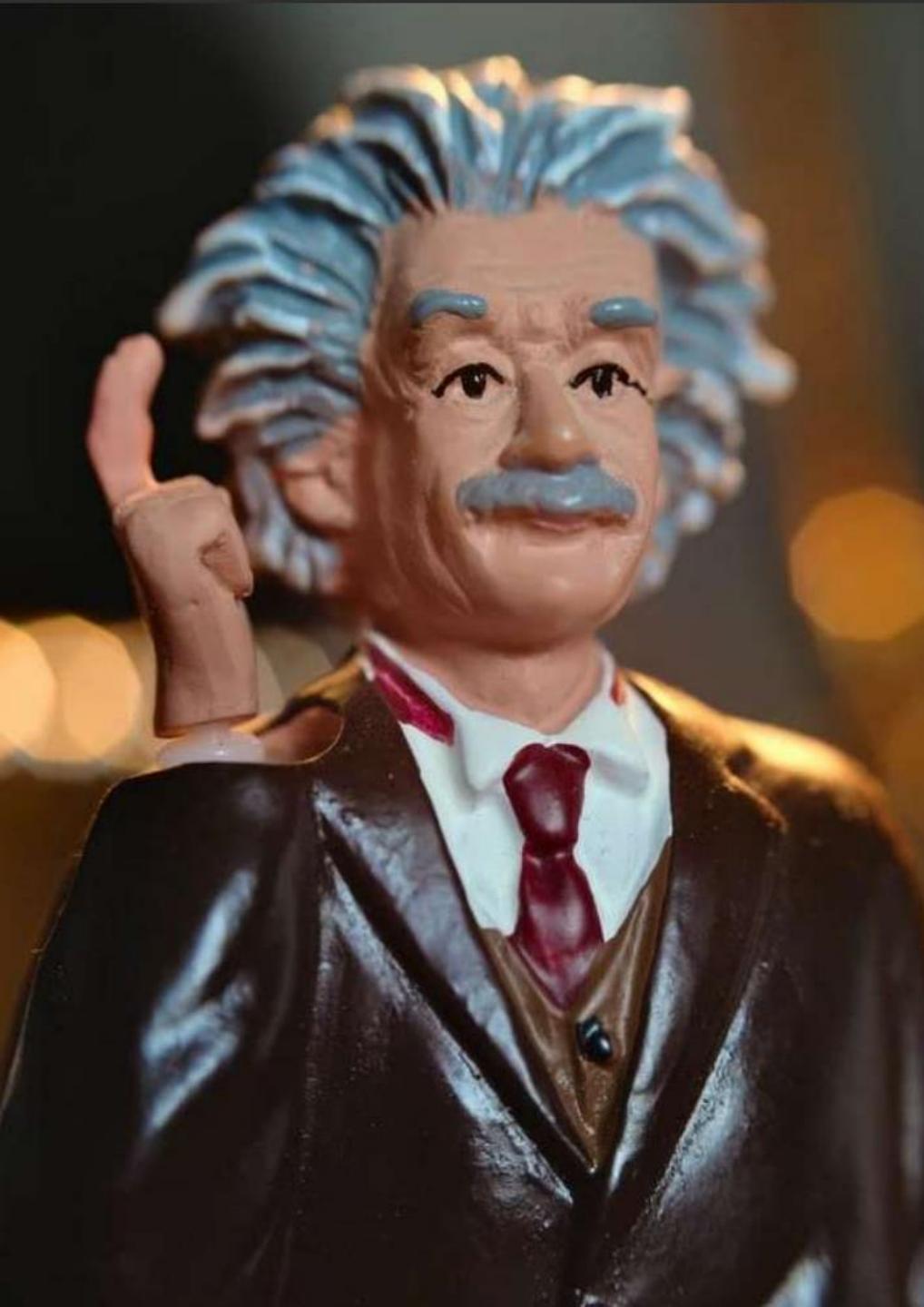
```
tableRequest.setTableLimits(new TableLimits(1000, 100, 500))
```

Note: Every TableRequest is a DDL call to the NoSQL store and may be performed 4 times within a minute.

Oracle NoSQL Database Cloud Service – On-Demand Capacity

Auto-scaling throughput





Demo 1 – OCI NoSQL Services

- NoSQL Table provisioning
- NoSQL Table Insert using OCI Console



Demo 2 – Exadata Smart Scan

- Changing Table execution plan using Index
- Change index to invisible and enable Smart Scan

Demo 3 - OCI Console Tour

- Dom0 Patching scheduling
- Database Provisioning
- Exadata Pathing prechk on Console
- Exadata Cloud Shape and Version



Resources



- **Oracle Database Backup Cloud Services**

<https://docs.oracle.com/en/cloud/paas/db-backup-cloud/>

- **Oracle NoSQL Database Cloud Service**

<https://docs.oracle.com/en/cloud/paas/nosql-cloud/>

- **Exadata X9M Datasheet**

<https://www.oracle.com/a/ocom/docs/engineered-systems/exadata/exadata-cloud-infrastructure-x9m-ds.pdf>

- **Exadata Cloud Dbaascli commande reference**

<https://docs.oracle.com/pt-br/iaas/exadata/doc/ecc-using-dbaascli.html>

- **Exadata X10M Cloud at Customer Datashhet**

<https://www.oracle.com/a/ocom/docs/engineered-systems/exadata/exadb-cc-x10m-ds.pdf>

- **Zero Data Loss Autonomous Recovery Service**

<https://www.oracle.com/database/zero-data-loss-autonomous-recovery-service>

- **Oracle Database Backup Cloud Services**

<https://docs.oracle.com/en/cloud/paas/db-backup-cloud/>

- **Oracle oci License Management Services**

<https://www.oracle.com/corporate/license-management-services/>

- **Exadata Cloud at Customer Documents**

<https://docs.oracle.com/en/engineered-systems/exadata-cloud-at-customer/>