

ORACLE

# Oracle Cloud DBA

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

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**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

 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 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

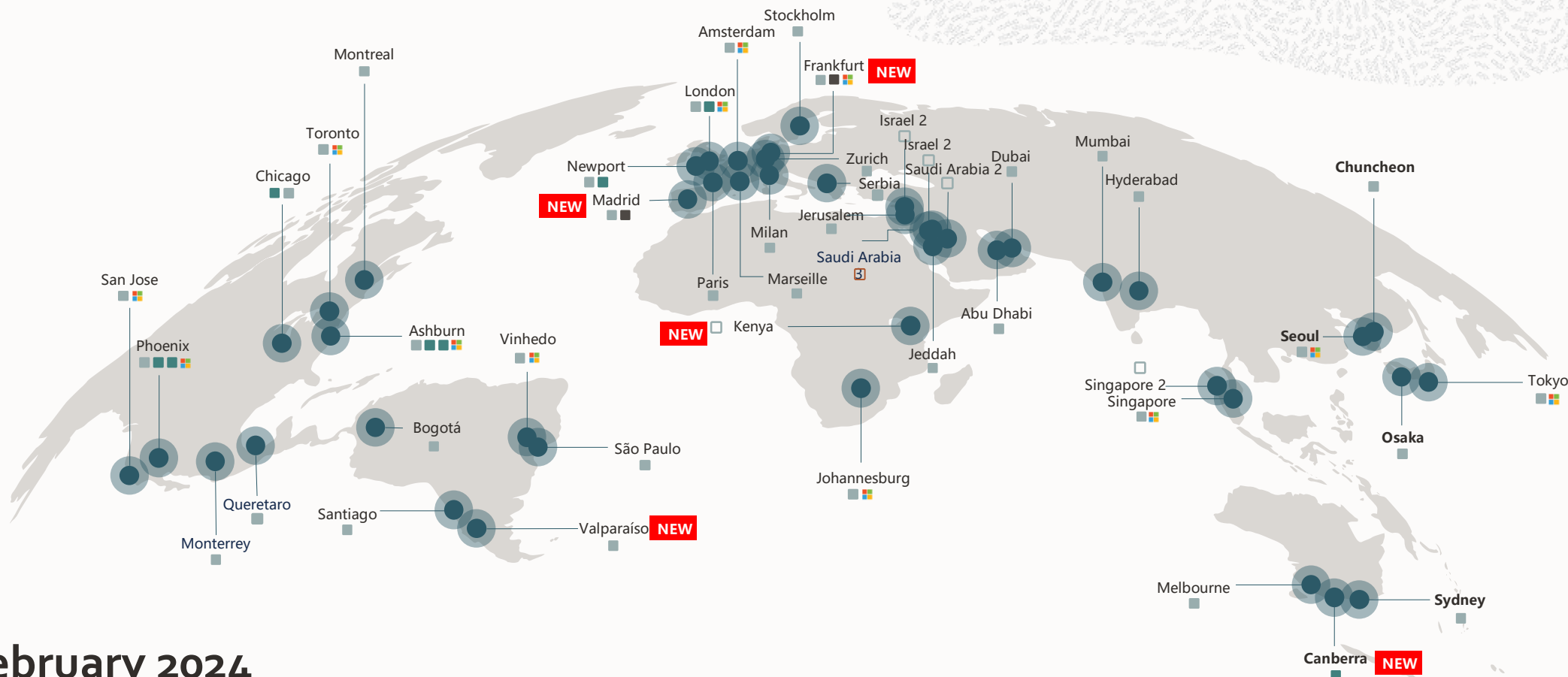
Resources





# 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



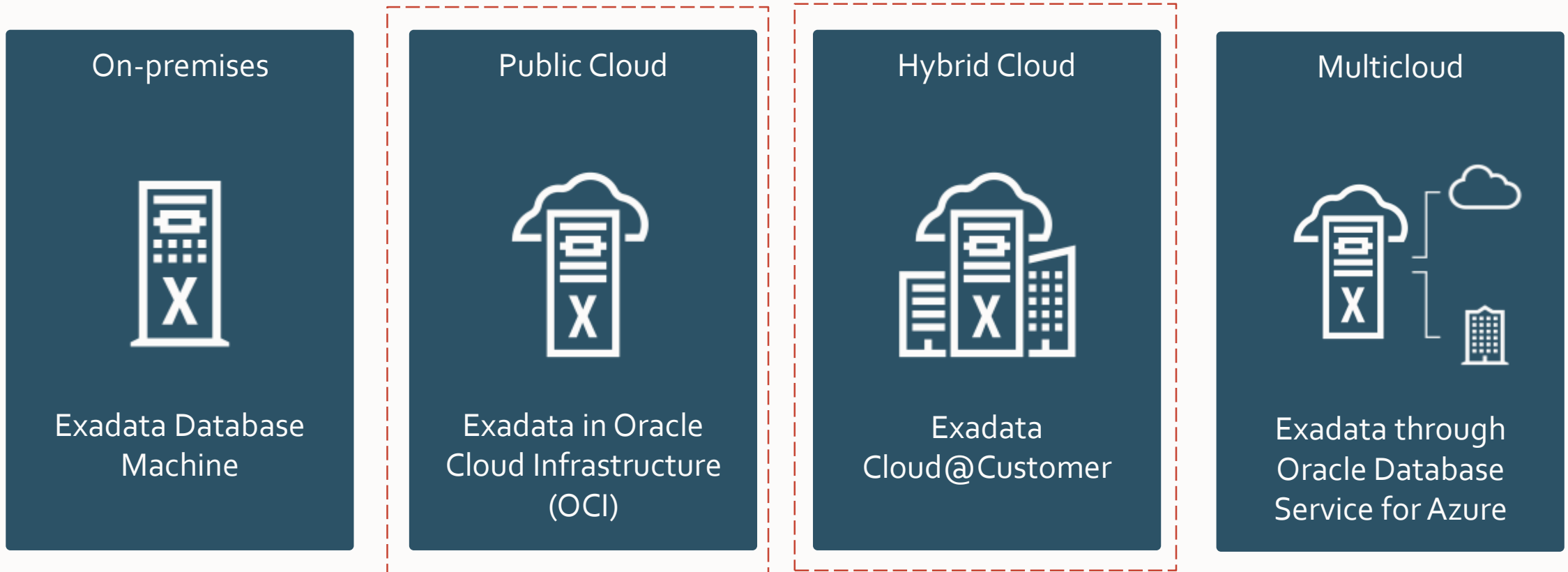


# Oracle Exadata Cloud



# Exadata runs everywhere

Identity across deployments improves IT agility and reduces costs



# Exadata Cloud | OCI Console

## 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

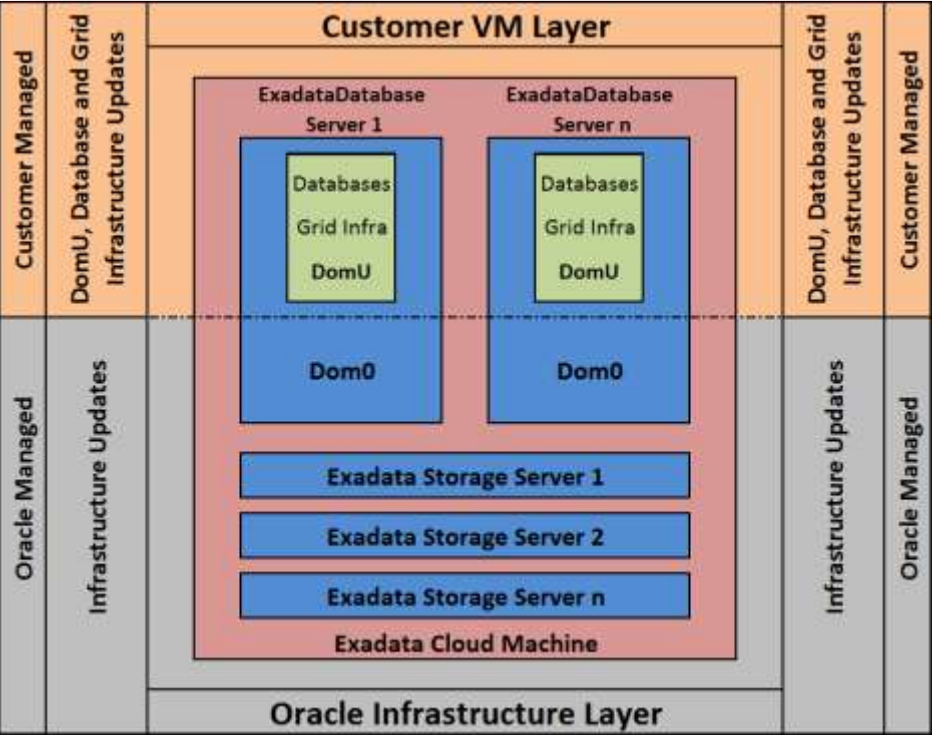
Understanding Oracle Exadata Cloud Service and Cloud at Customer



## 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 *Domo* Oracle Responsibilities

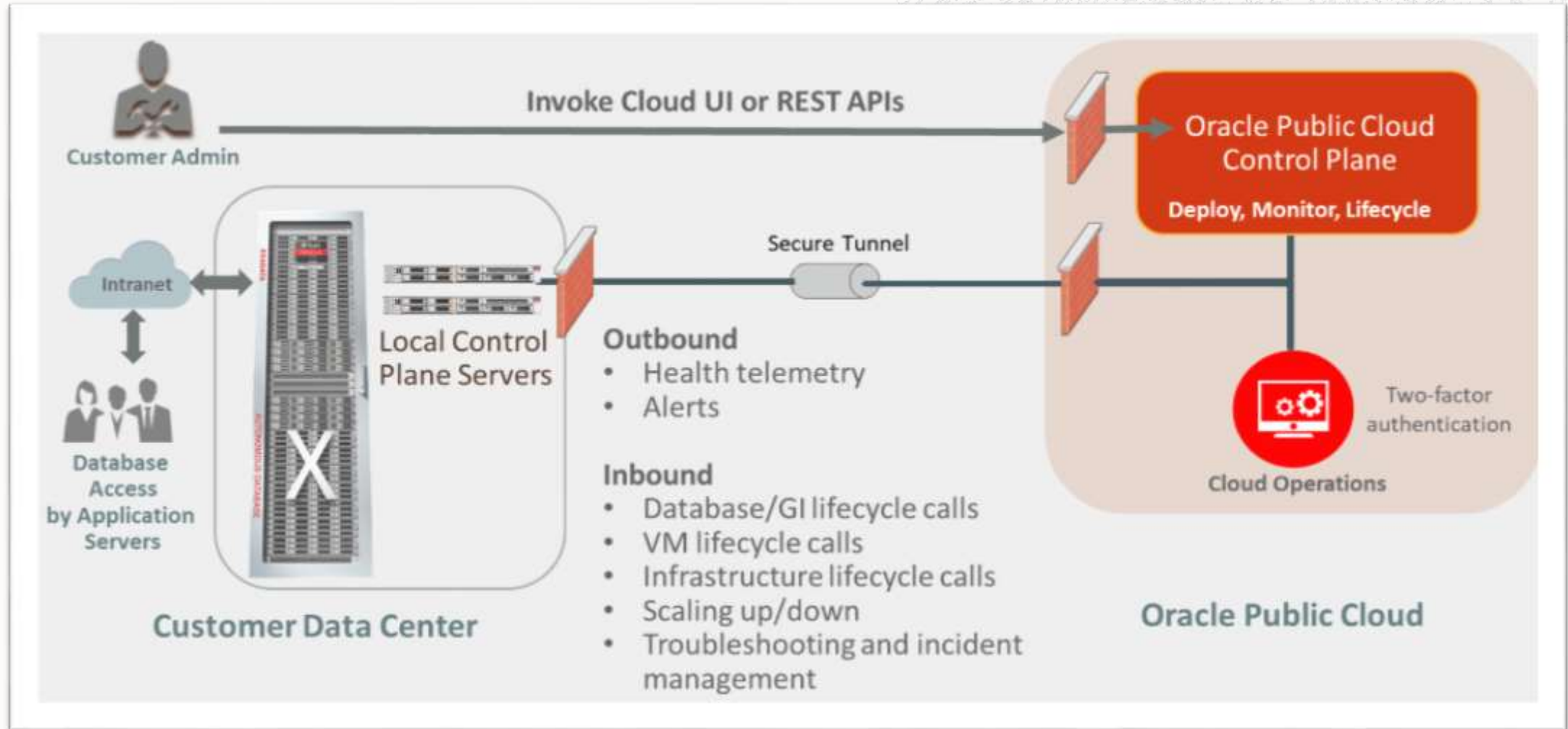
- Oracle Cloud Ops manage Exadata infrastructure (hardware, system software) & hypervisor (domo);
- Oracle Support is responsible for update any version;
- For ExaCC gen1, Oracle Support open an SR and request customer formal approval;
- For Exacc Gen2, the customer is responsible for scheduling Domo 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 Exadatada 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;

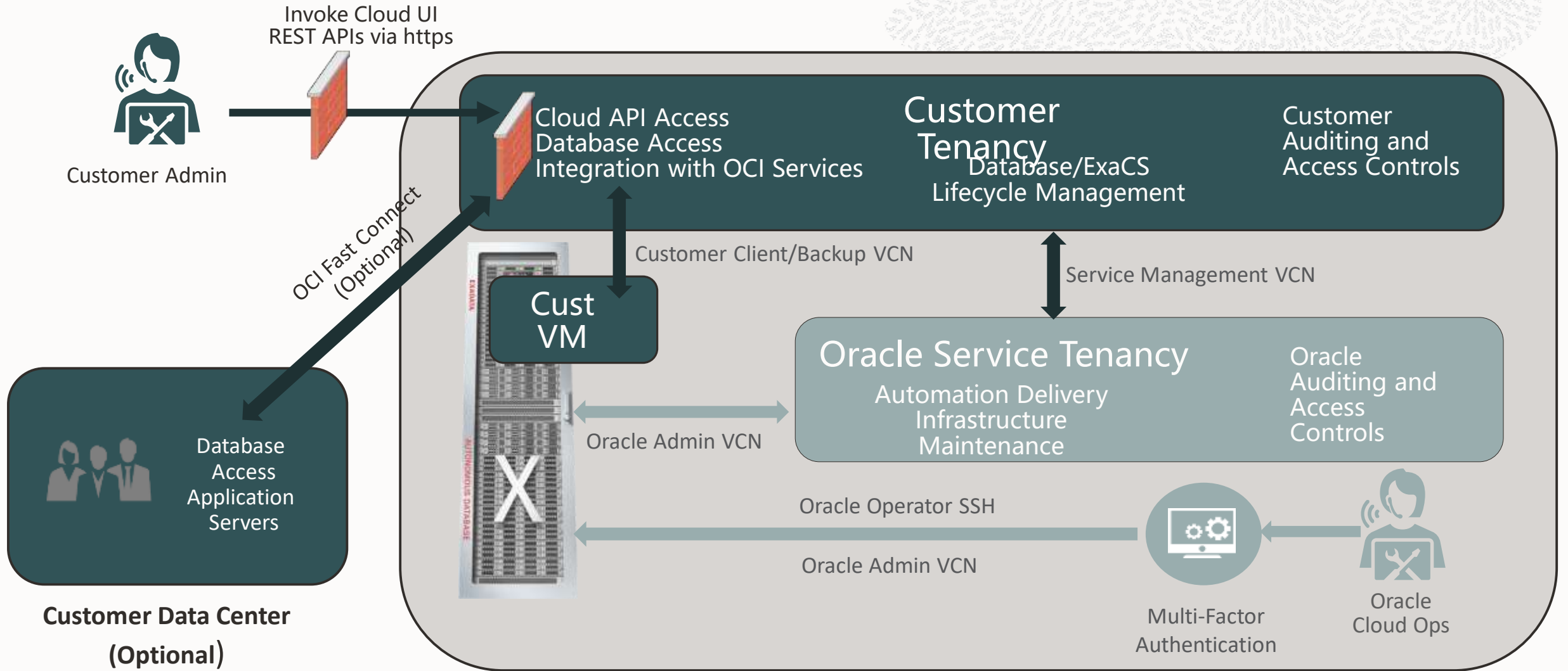


# Exadata Cloud at Customer | Control Plane Workflow





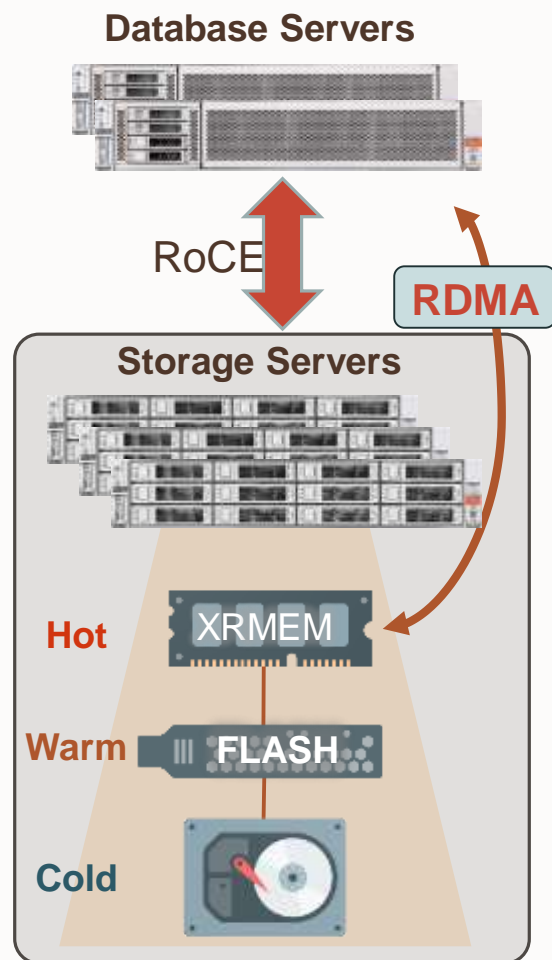
# Exadata Cloud Service Architecture



Oracle Cloud Infrastructure Region



# 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 XRMEM in Smart Storage

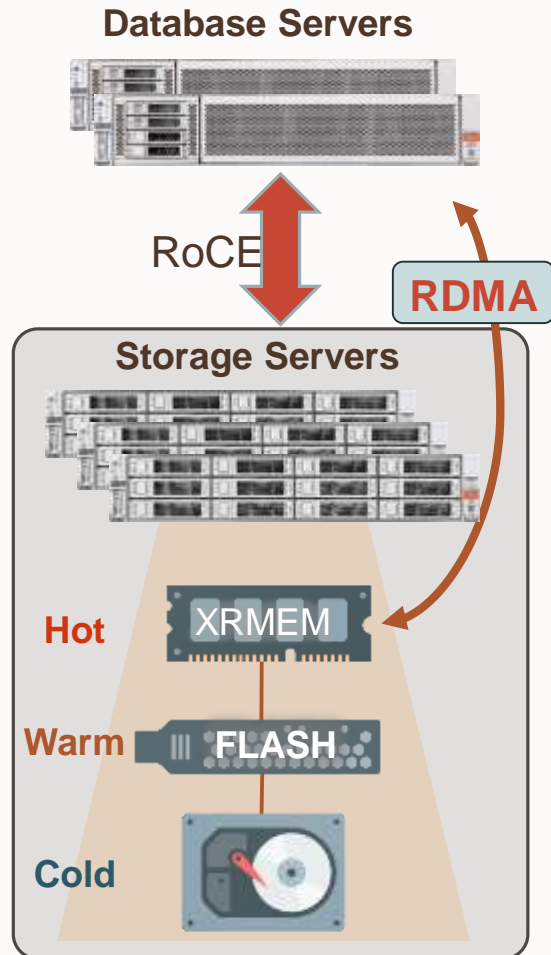
- Bypasses network and I/O software, interrupts, context switches
- Data is transparently managed in multiple storage tiers to minimize latency
- High-performance active-active 100 Gbit/s internal network maximize throughput
- Speeds up both database reads and commits

## Database cluster virtualization

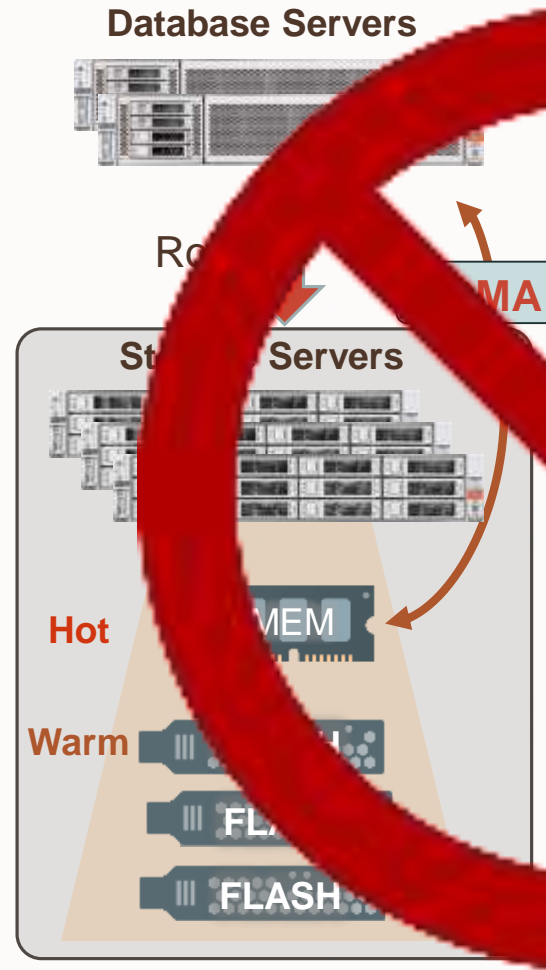
- Deploy environments with different needs on the same system
  - Dev-Test, Staging Production, DR
  - OLTP, Analytics, Mixed Workloads
- Share and manage pools of resources to increase efficiency and lower costs
- Isolate resources to meet differing security and predictability requirements

# There are no EF and XT Storage options for Exadata Cloud

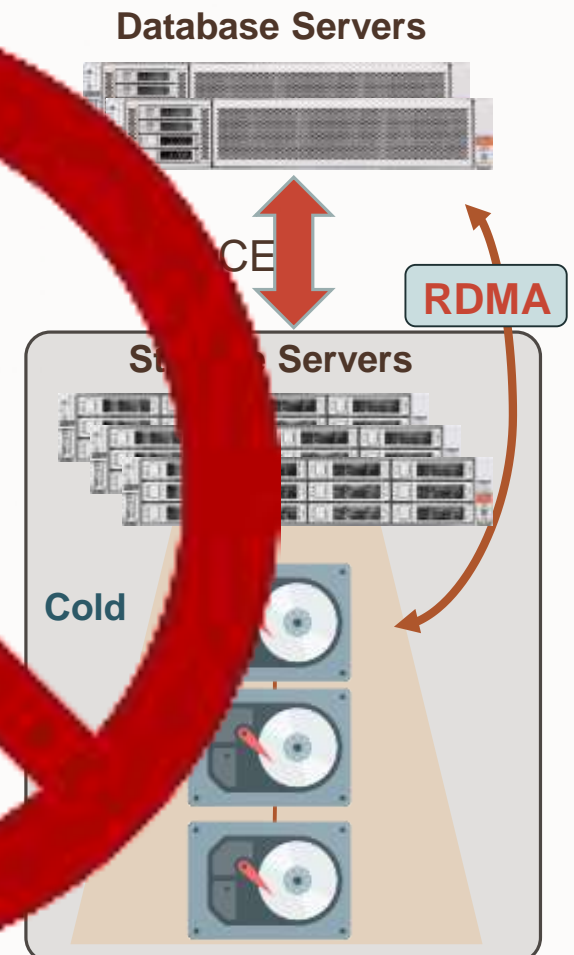
## High-Capacity (HC) Storage



## Extreme Flash (EF) Storage

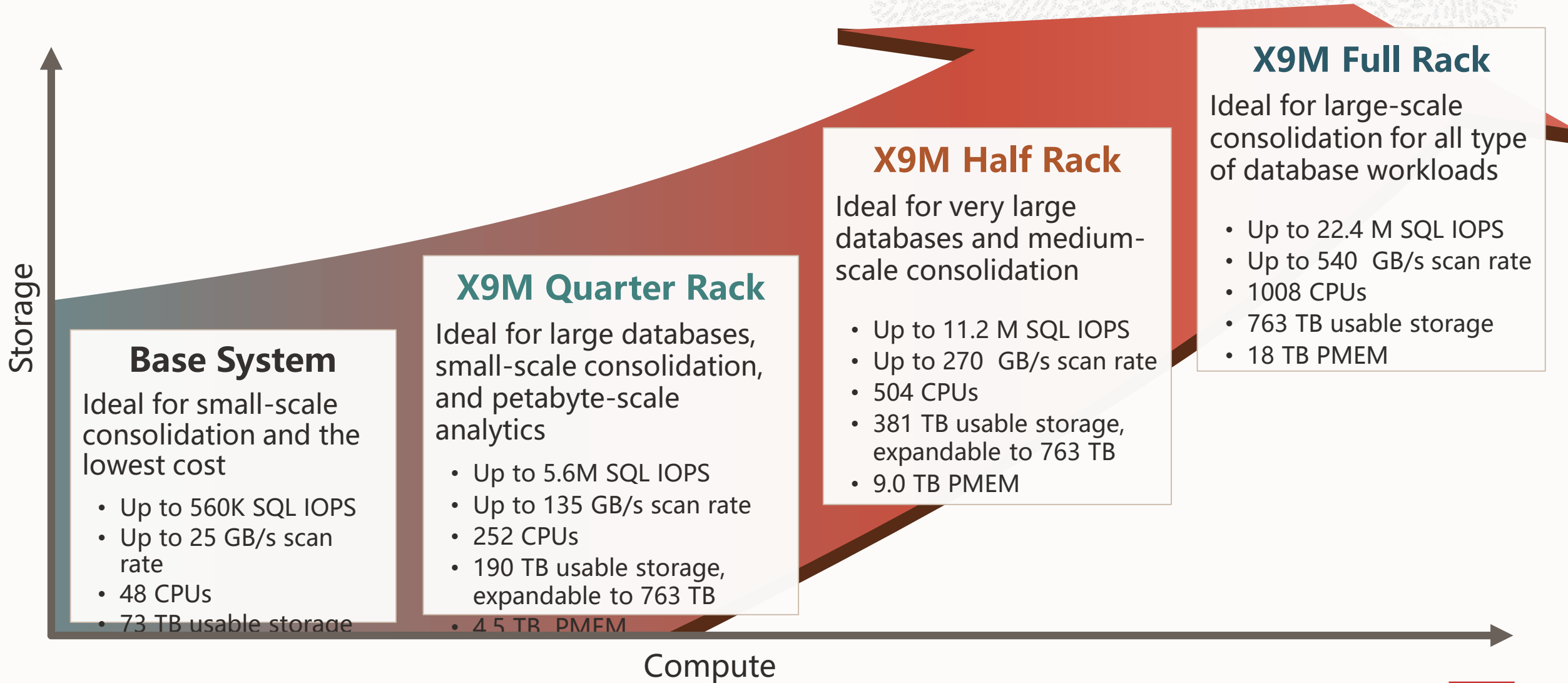


## Extended (XT) Storage



# 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 – 2,780 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**

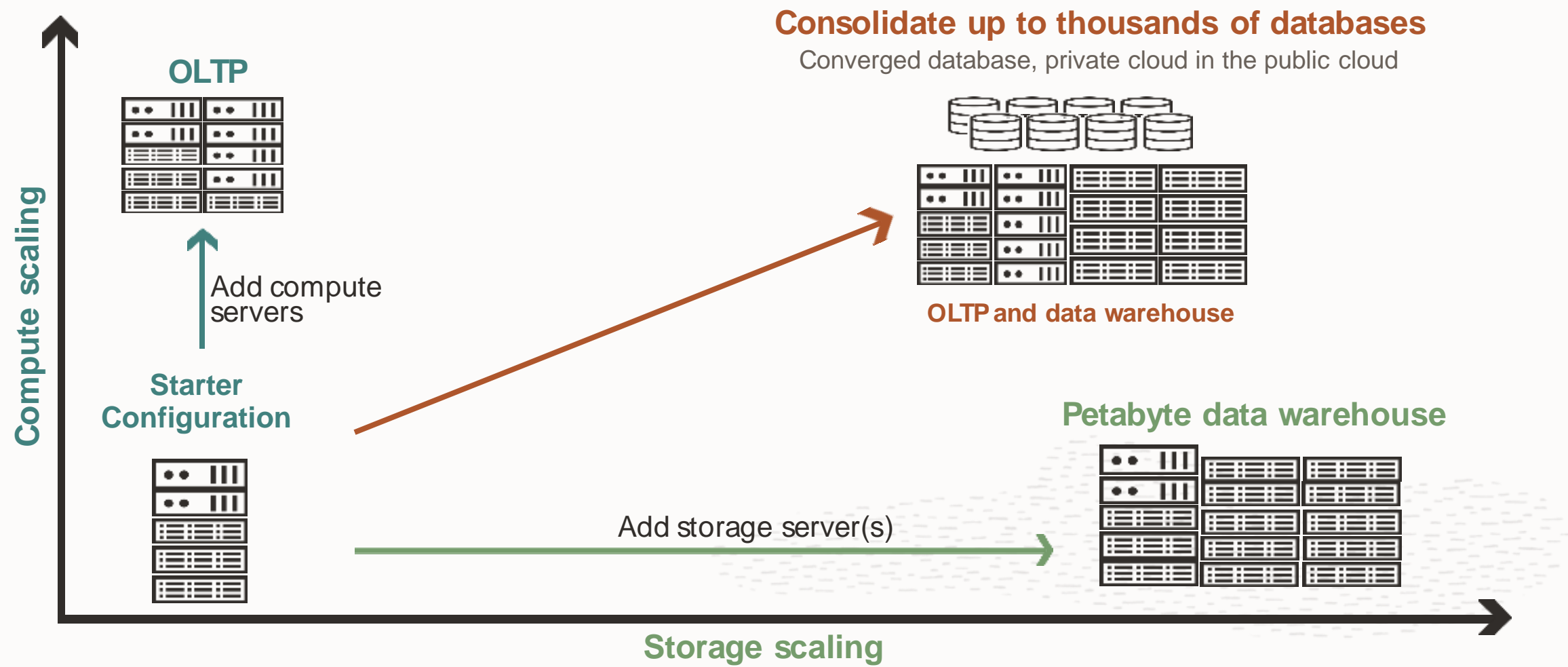
380 Cores – **5,600 GB Memory**  
192 TB Usable DB Storage

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



Online – No downtime scaling



# Exadata Cloud@Customer X10M Shapes

All Configurations greater than a Quarter Rack are elastic

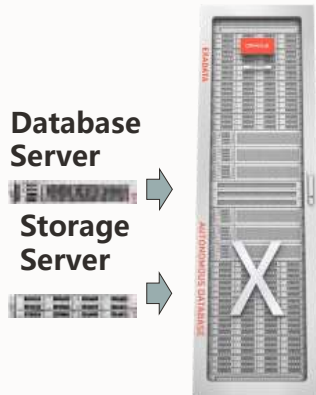
## Standard Configuration



Incrementally  
add Database  
and Storage  
Servers

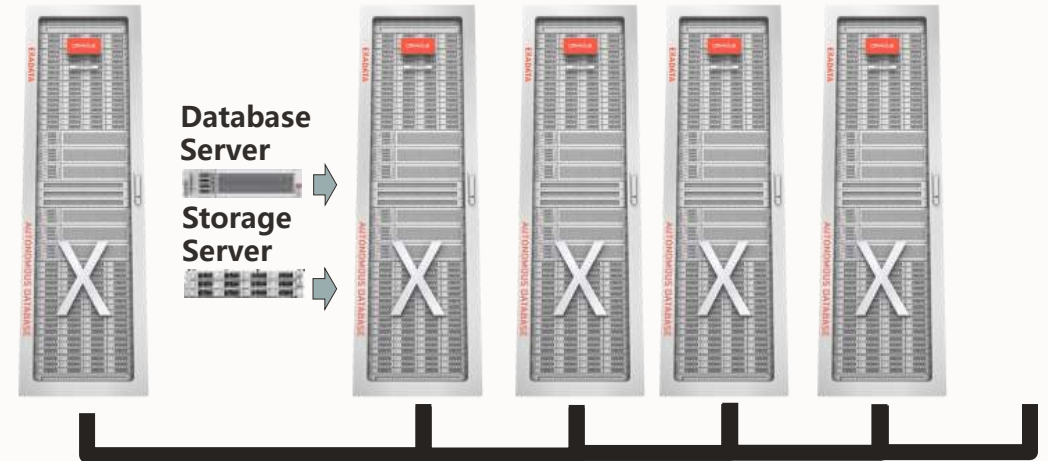
## Elastic Configuration

Database  
Server  
Storage  
Server



Add Racks to  
Continue  
Scaling

Database  
Server  
Storage  
Server



### 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:

Database version:

PDB name:

Database Home:

Create administrator credentials

[Create Database](#) [Cancel](#)

**Scale VM Cluster**

Configure the VM cluster

Specify OCPU count per virtual machine:

Requested OCPU count for the Exadata VM cluster:

Current Exadata storage:

[Scale](#) [Cancel](#)

**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.

[Create Backup](#) [Cancel](#)

**Enable Data Guard**

Data Guard association details

Protection mode:

Transport type:

Async

Select Peer VM Cluster

Peer region:

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-dbhome







# Exadata Cloud Pathing

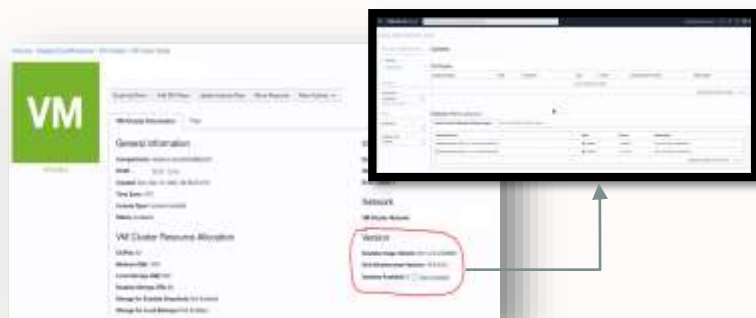
# Exadata Cloud Pathing

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
✓ JANUARY	✓ APRIL	✓ JULY	✓ OCTOBER
✓ FEBRUARY	✓ MAY	✓ AUGUST	✓ NOVEMBER
✓ MARCH	✓ JUNE	✓ SEPTEMBER	✓ DECEMBER



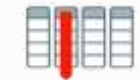


# Exadata Cloud Features

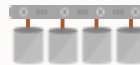
# Oracle Database and Exadata Platform Innovations



**Multitenant**



**In-Memory DB**



**Real Application Clusters**



**Active Data Guard**



**Partitioning**



**Advanced Compression**



**Advanced Security,  
Label Security, DB  
Vault  
Real Application  
Testing**

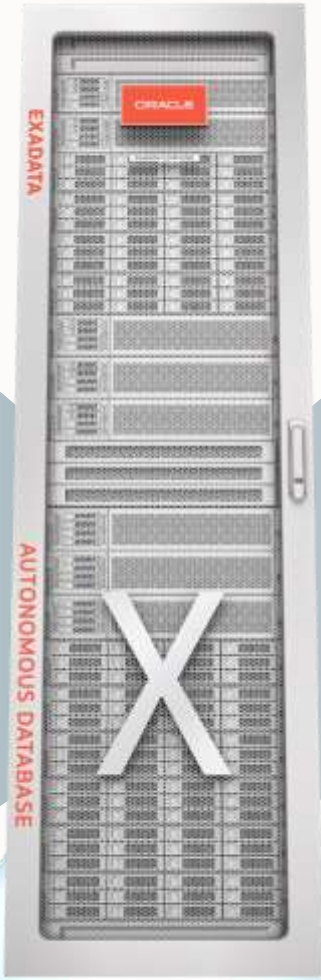


**Advanced Analytics,  
Spatial and Graph**



**Management Packs  
for  
Oracle Database**

**All Oracle  
Database  
Innovations**



**All Exadata  
DB Machine  
Innovations**

**Offload SQL to Storage**



**RoCE Fabric**



**XRMEM  
Data Accelerator**



**Smart Flash Cache**



**Storage  
Indexes**



**Columnar Flash Cache**



**Hybrid Columnar  
Compression**



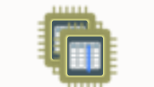
**I/O Resource  
Management**



**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

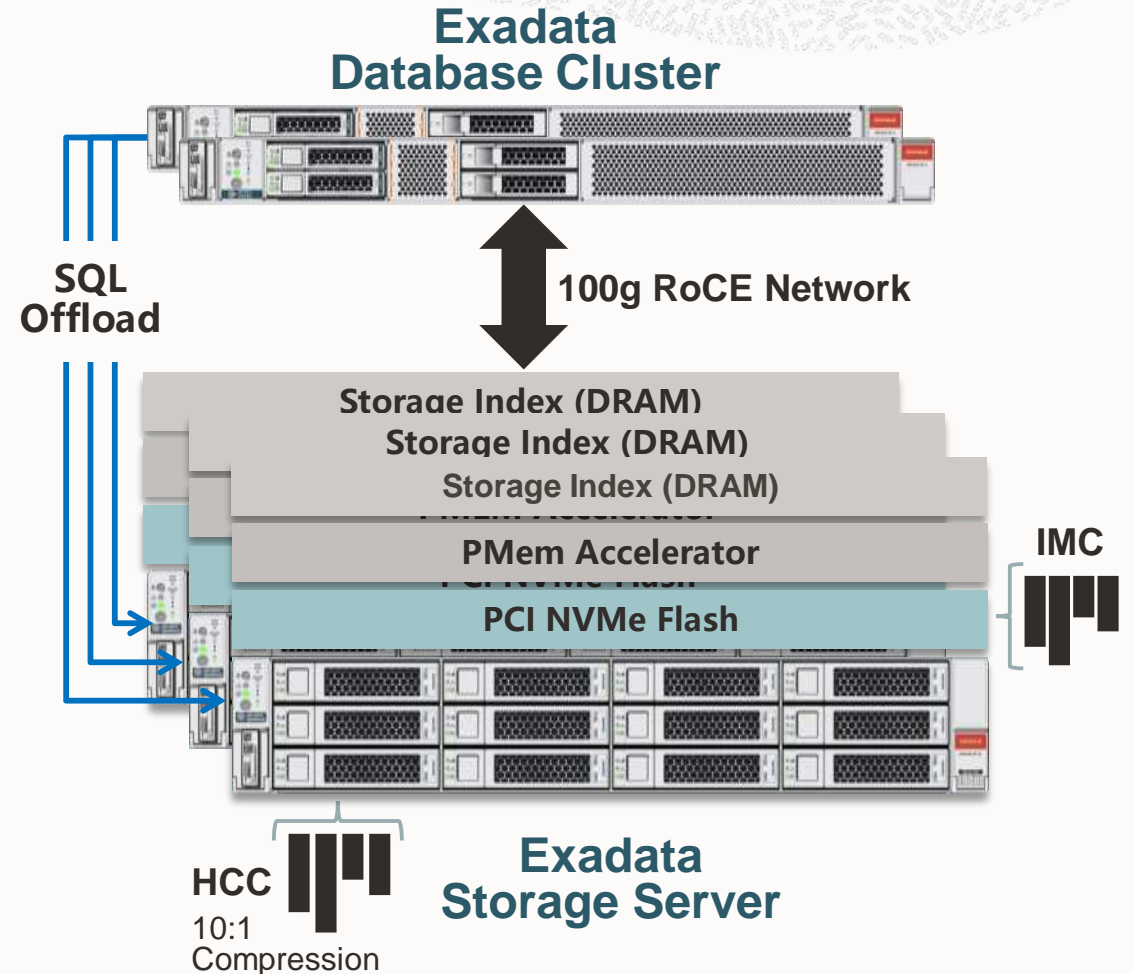
## Unique: Hybrid Columnar Compression (HCC)

- 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



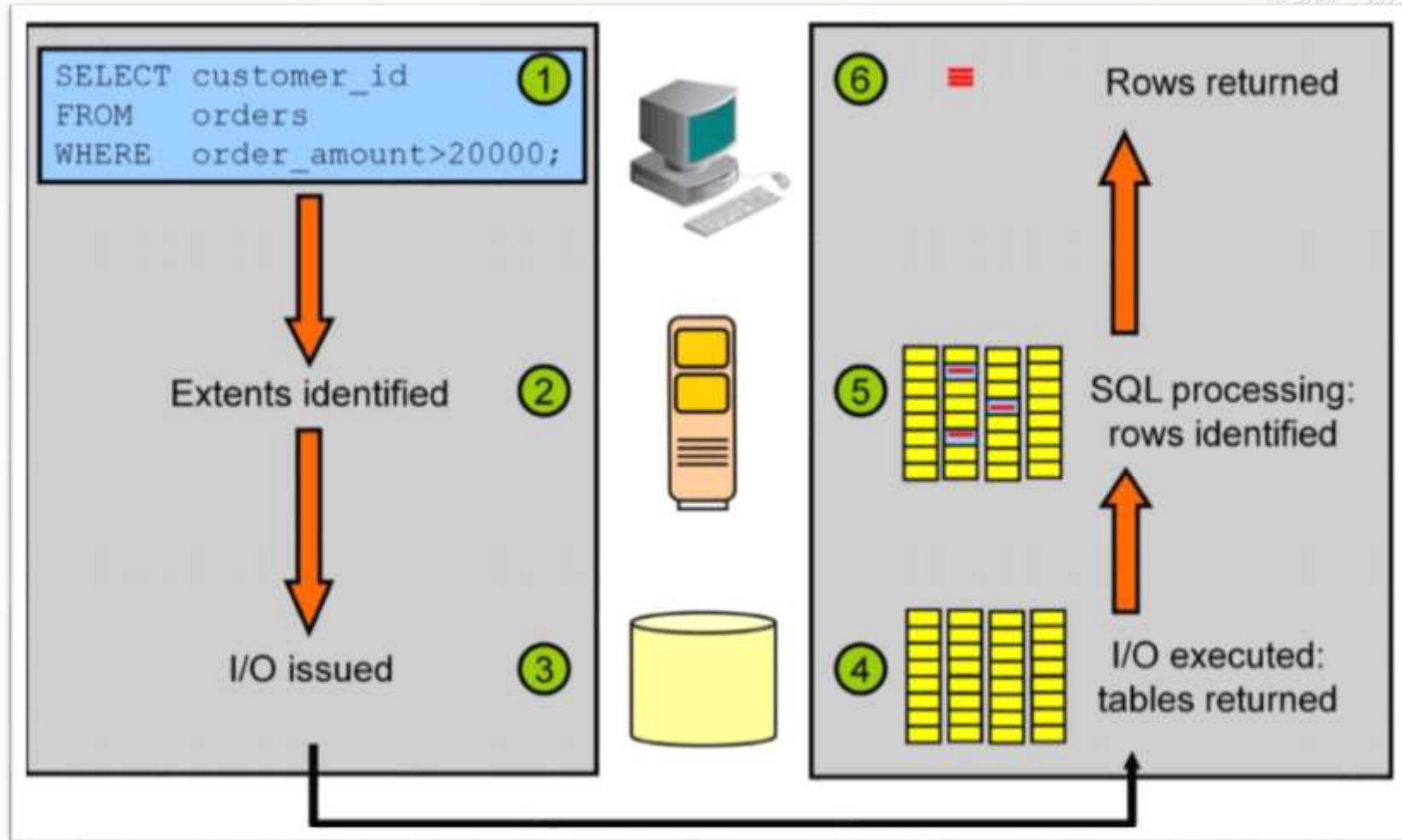




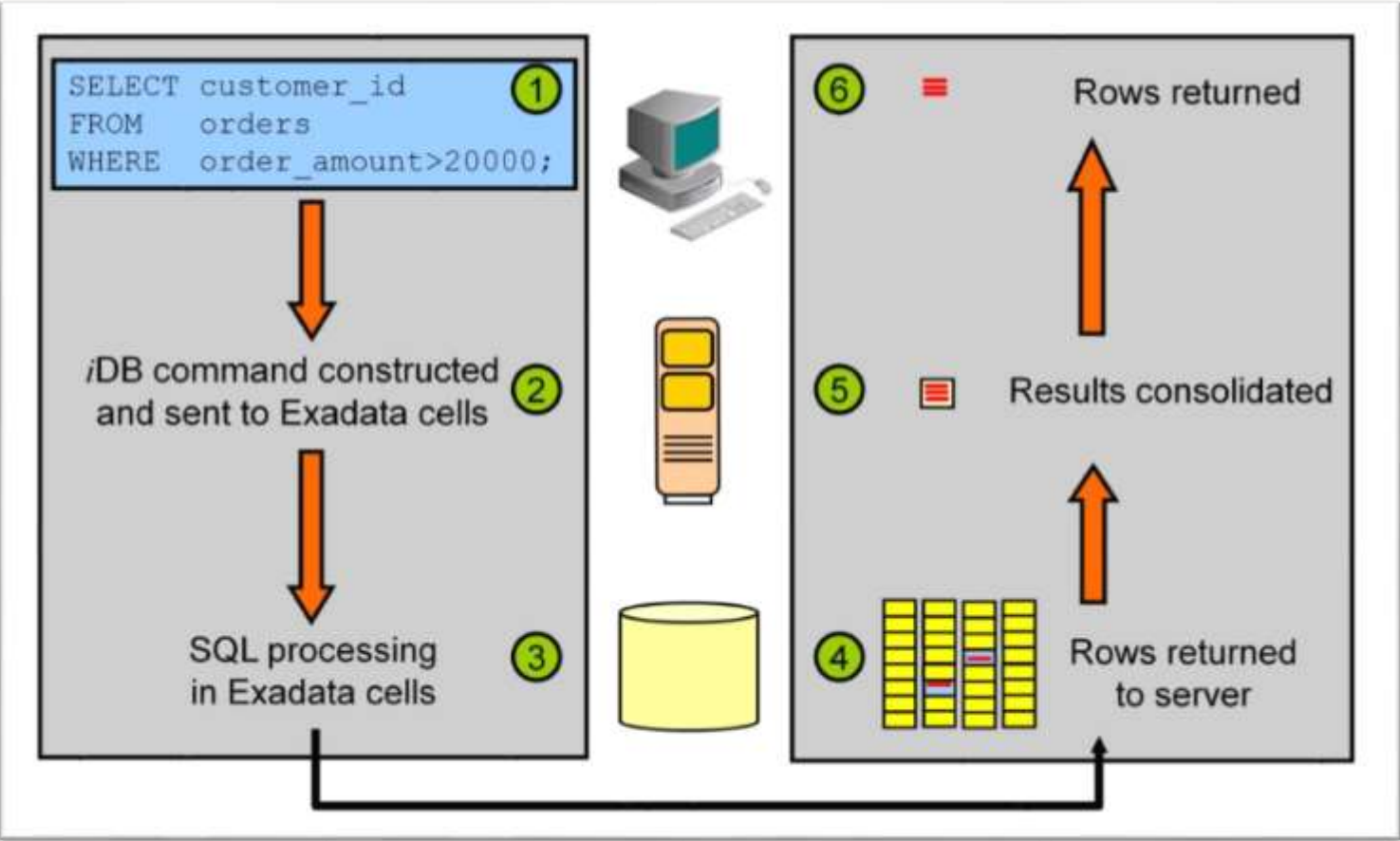
# Smart Scan



# 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 table
- A Scan is performed on an index-organized table
- Fast Full Scan performed on a compressed index
- Full scan is performed on a reverse key index
- Table has row-level dependency tracking enabled.
- Optimizer wants the scan to return rows in ROWID order
- A CLOB or LONG column is being selected or queried
- A selection flashback query is being executed
- A query that references a partition is referenced





# Oracle Database backup options

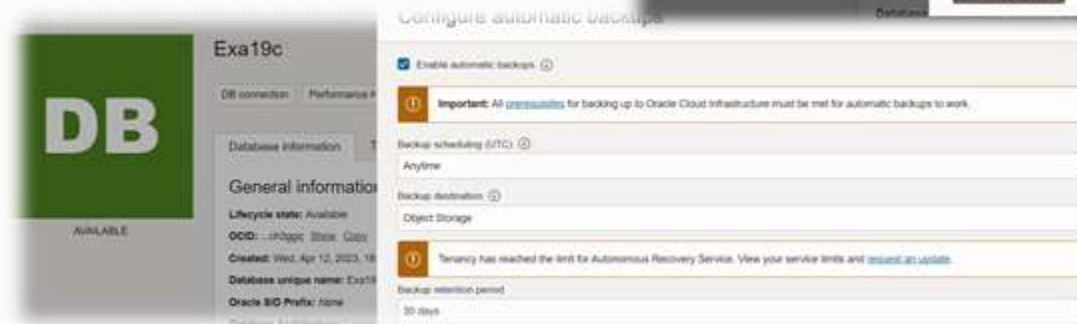
# Oracle Database automatic backup

## 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



# OCI Database Backup | Take Care before delete your Database

## 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.

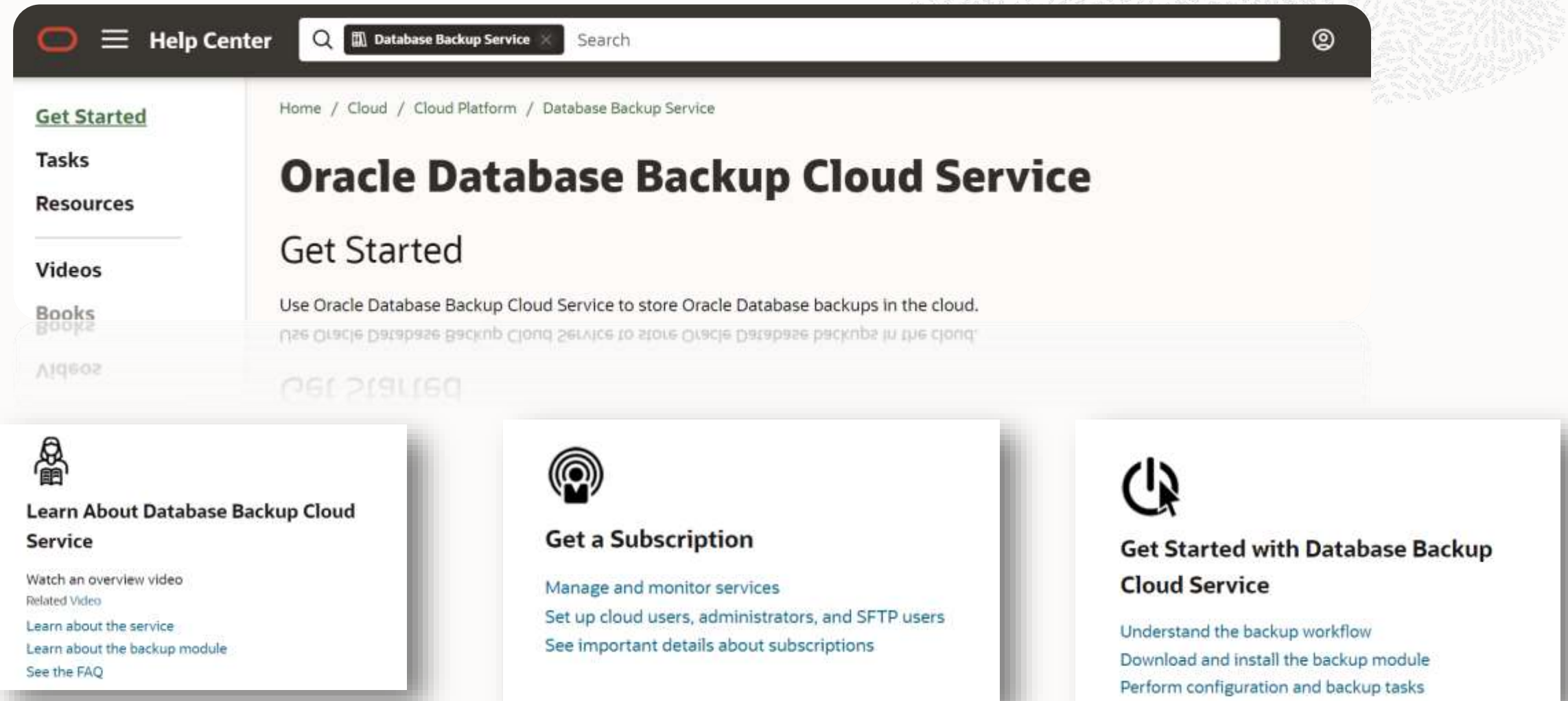
Do you want to back up the database before terminating it?






☐ 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


Home / Cloud / Cloud Platform / Database Backup Service

## Oracle Database Backup Cloud Service

### Get Started

Use Oracle Database Backup Cloud Service to store Oracle Database backups in the cloud.

Use Oracle Database Backup Cloud Service to store Oracle Database backups in the cloud.



#### 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](#)

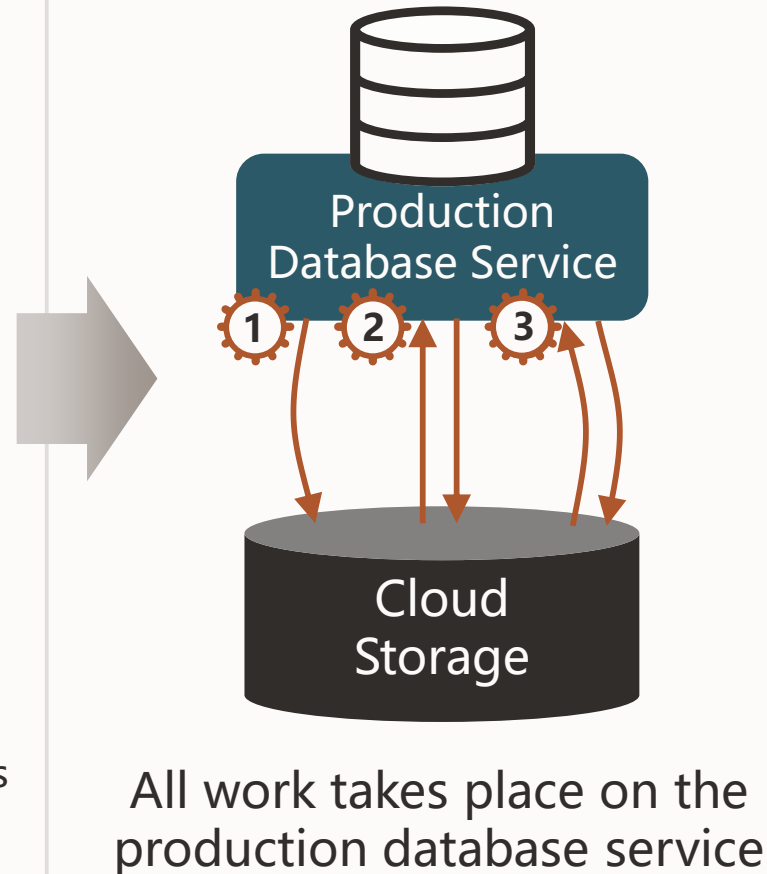
[Perform configuration and backup tasks](#)

# 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

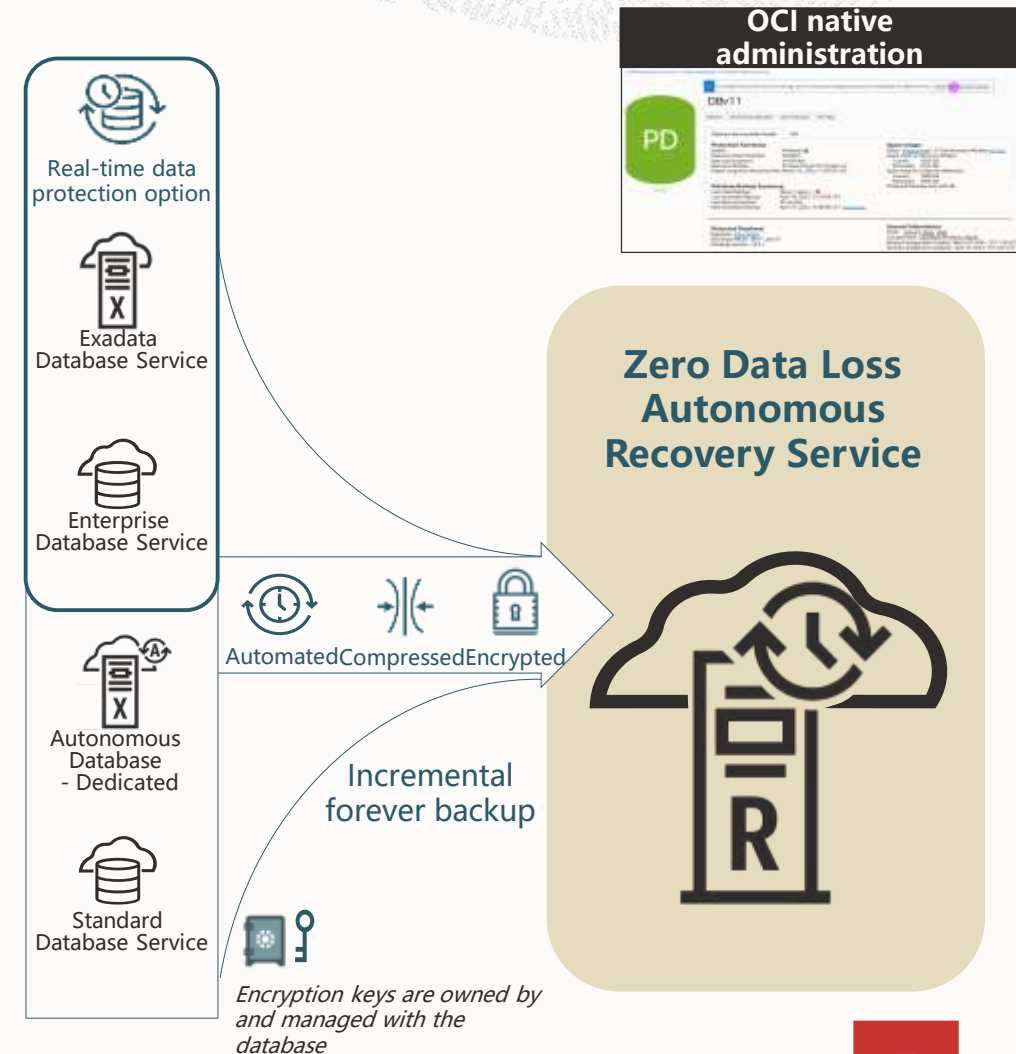
## Operational efficiency

- 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

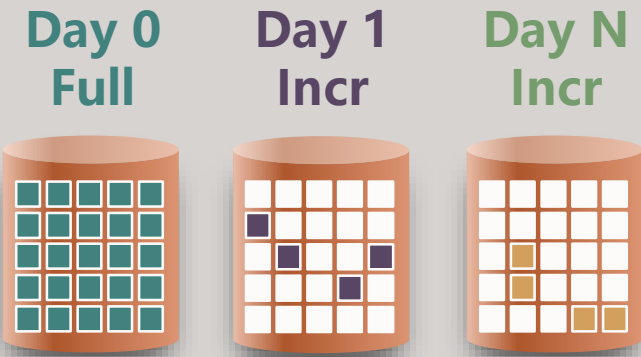
Incremental-forever backups reduce backup overhead on production database services



Time Machine



Incremental forever backups  
of protected databases



Incremental forever backups  
stored on Recovery Service

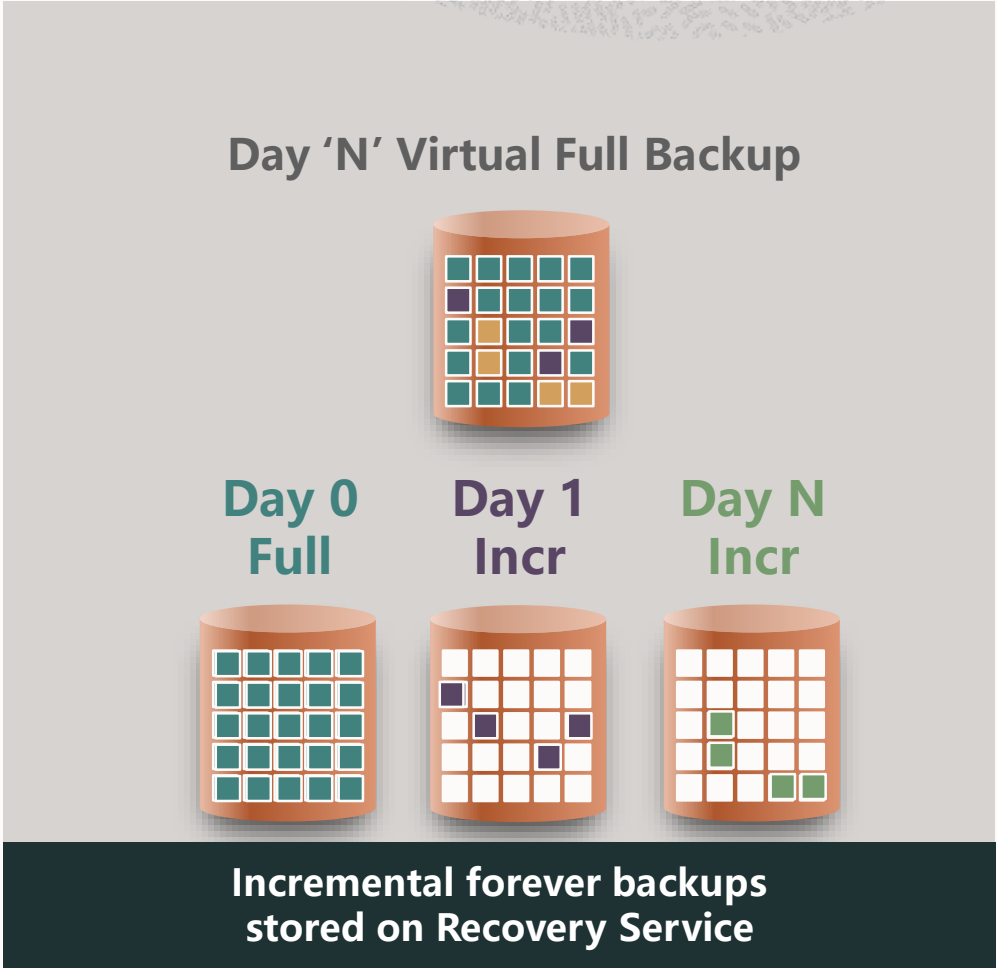
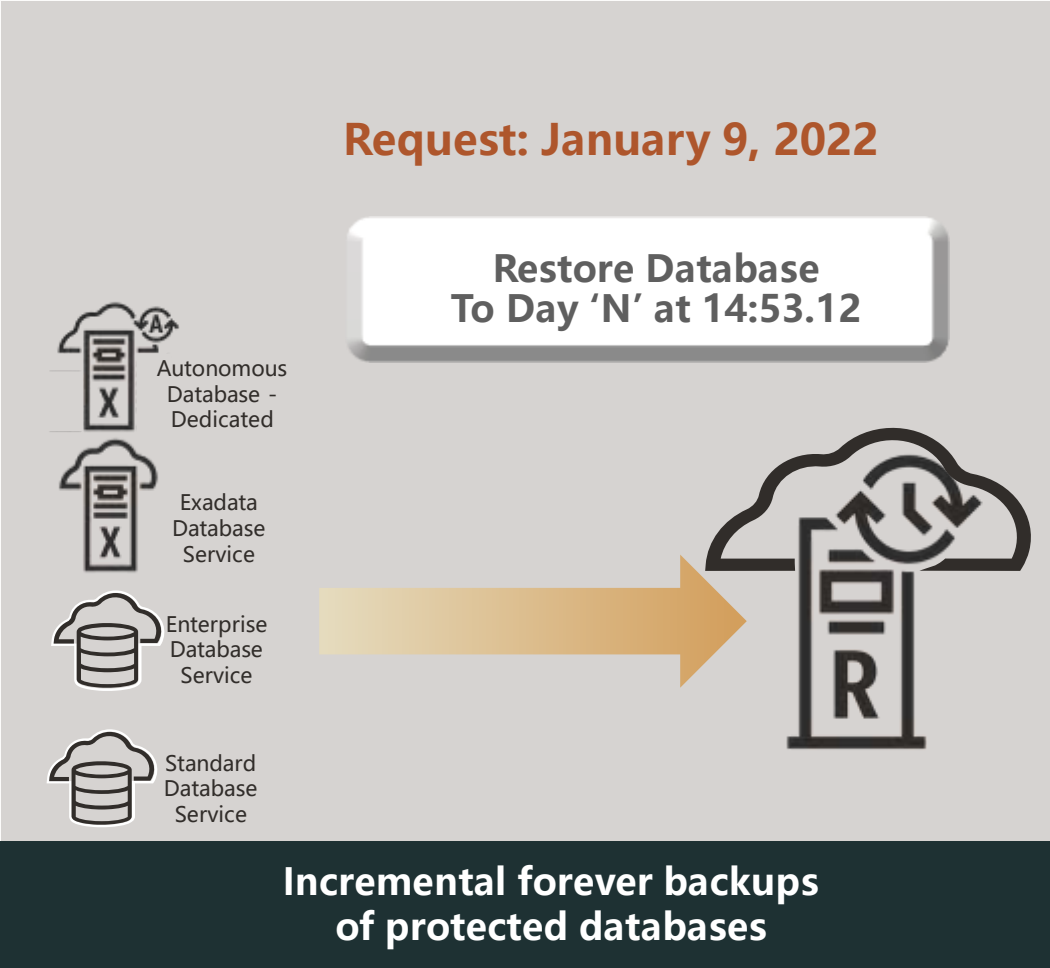


# Recovery Service simplifies database restores

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

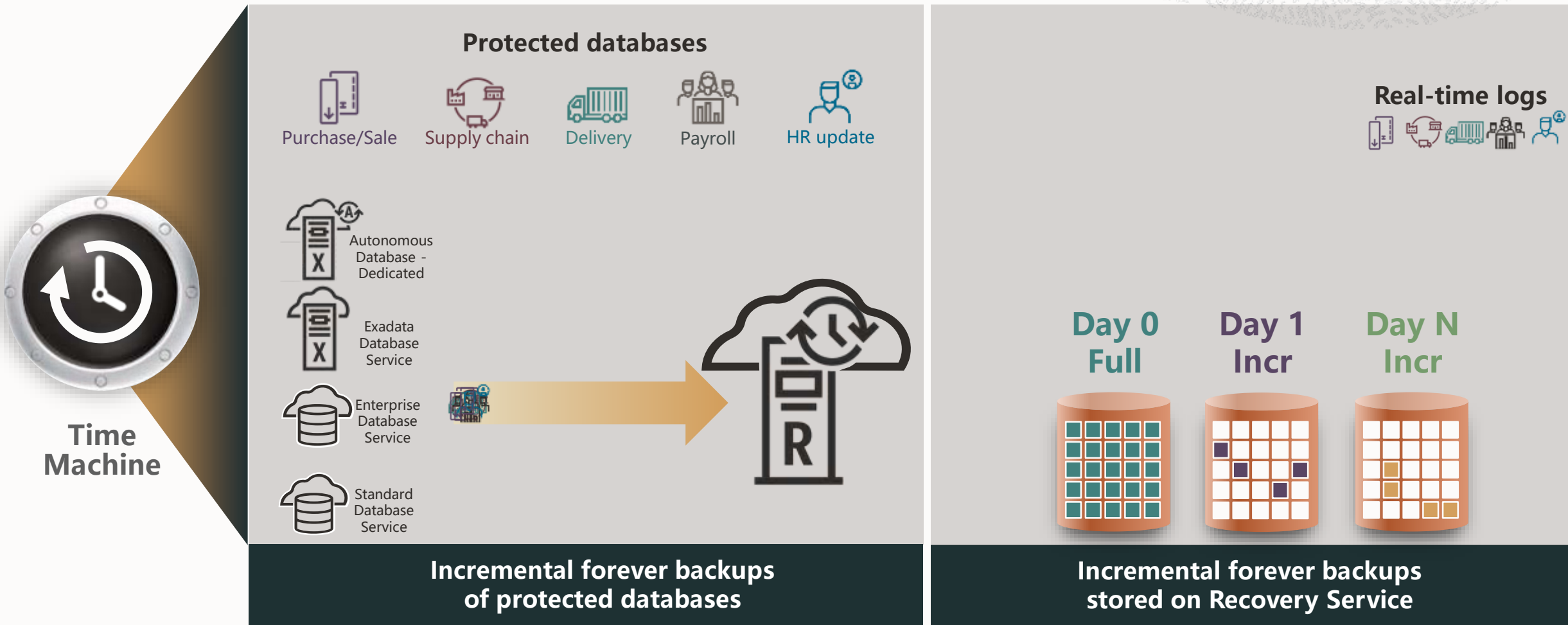


Time Machine



# Recovery Service continuously protects Oracle databases

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

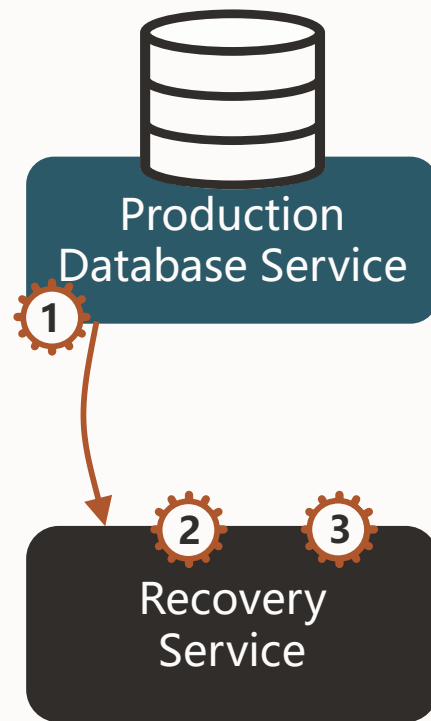


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  - b. Higher consumption costs if resources are unconstrained, or
  - c. Decision to not validate backups or revalidate them, increasing risk



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**



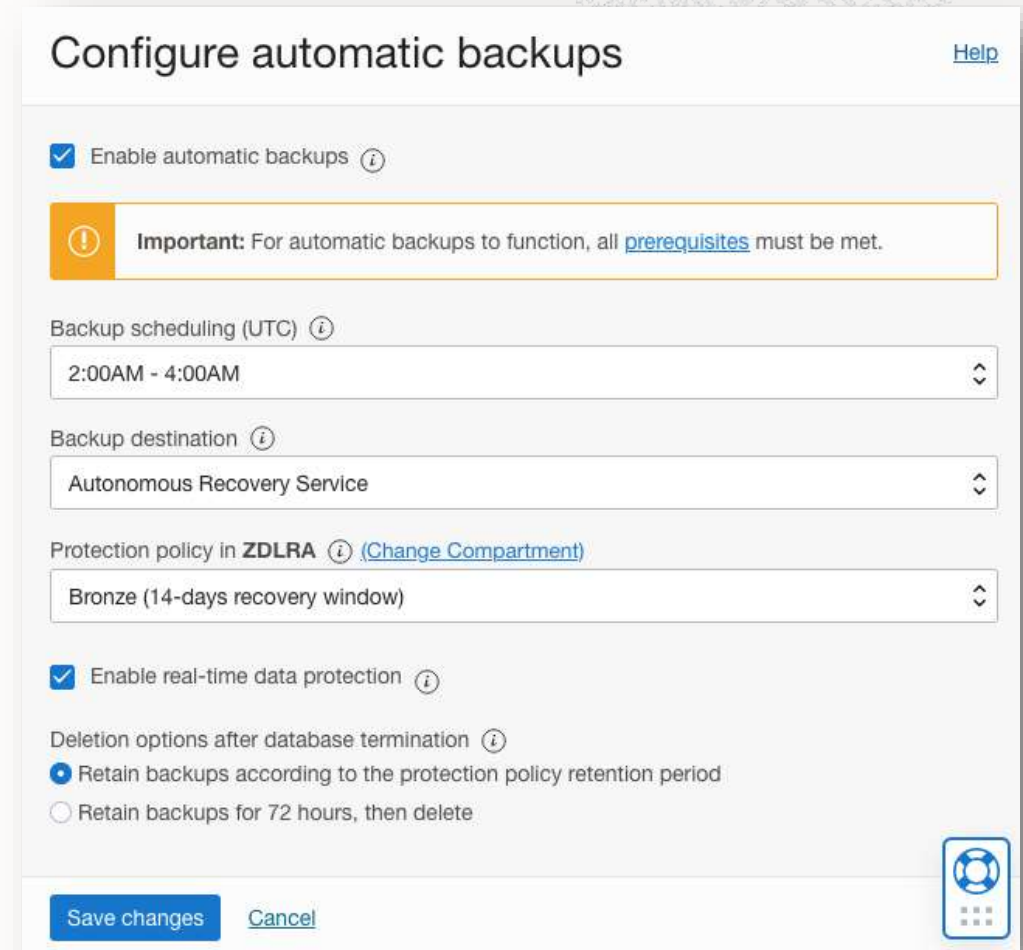


# Recovery Service is easy to set up and use

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



The screenshot shows the 'Configure automatic backups' page in the OCI console. At the top right is a 'Help' link. The first section has a checked checkbox for 'Enable automatic backups' with an information icon. Below this is an orange-bordered box with an exclamation mark icon and the text: 'Important: For automatic backups to function, all prerequisites must be met.' The next section is 'Backup scheduling (UTC)' with an information icon and a dropdown menu showing '2:00AM - 4:00AM'. Below that is 'Backup destination' with an information icon and a dropdown menu showing 'Autonomous Recovery Service'. The next section is 'Protection policy in ZDLRA' with an information icon and a link '(Change Compartment)', with a dropdown menu showing 'Bronze (14-days recovery window)'. The final section has a checked checkbox for 'Enable real-time data protection' with an information icon. Below this is 'Deletion options after database termination' with an information icon and two radio button options: 'Retain backups according to the protection policy retention period' (which is selected) and 'Retain backups for 72 hours, then delete'. At the bottom are 'Save changes' and 'Cancel' buttons, and a small icon of a database with a globe in the bottom right corner.

# 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



# 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
<a href="#">FINANCE</a>	Active	Protected ⓘ	<a href="#">FINANCE</a>	Enabled	0	7 d 7 h 54 m	8,121.12 GB	<a href="#">Bronze</a>	5,778 GB
<a href="#">SALES</a>	Active	Protected ⓘ	<a href="#">SALES</a>	Disabled	29 m 47 s	7 d 8 h 12 m	9,022.26 GB	<a href="#">Silver</a>	3,944 GB
<a href="#">HRMS</a>	Active	Protected ⓘ	<a href="#">HRMS</a>	Disabled	29 m 49 s	7 d 8 h 15 m	5,427.58 GB	<a href="#">Bronze</a>	3,909 GB

Real-time protection and data loss exposure

Recovery window and capacity used

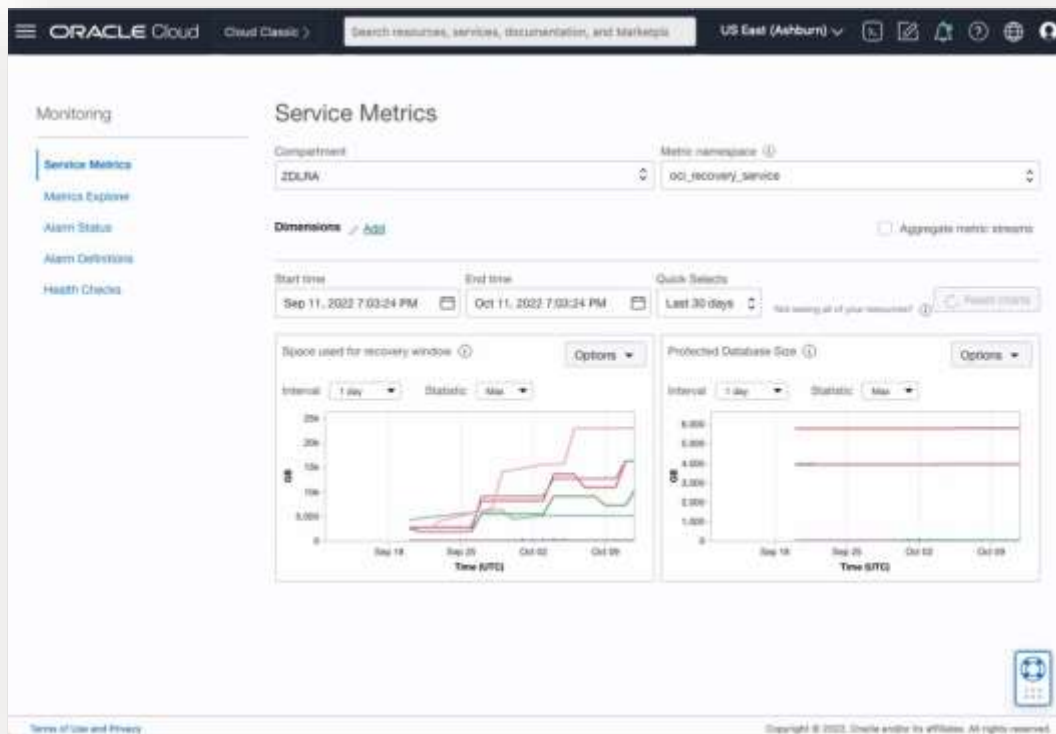
Protection policy



# 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



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

The screenshot shows the Oracle Cloud Monitoring 'Create Alarm' page. The left sidebar contains links for Monitoring, Service Metrics, Metrics Explorer, Alarm Status, Alarm Definitions, and Health Checks. The main content area is titled 'Create Alarm' and includes a 'Define alarm' section with fields for Alarm name, Alarm severity, and Alarm body. Below this is a 'Tags (optional)' section with fields for Tag namespace, Tag key, and Value. The bottom section is 'Metric description', which includes fields for Metric namespace, Resource group, Metric name, Interval, and Statistic. The page also includes a search bar at the top and a 'Create Alarm' button in the bottom right corner.







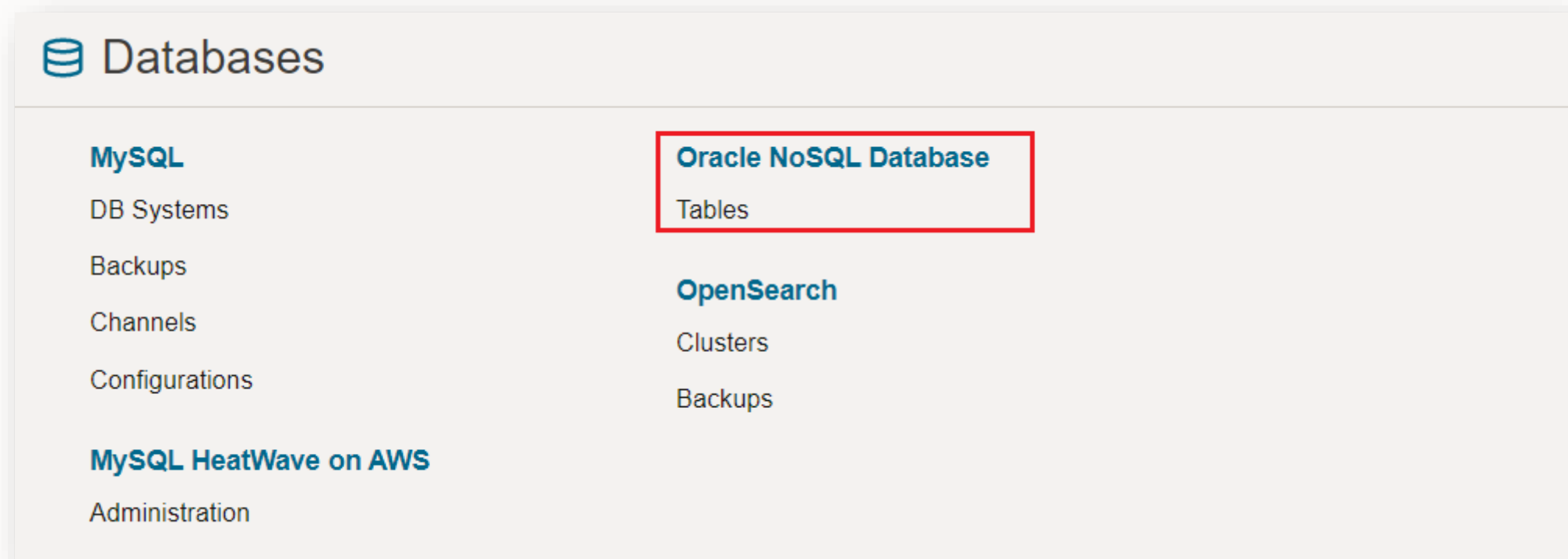
# Oracle NoSQL Database Cloud Service





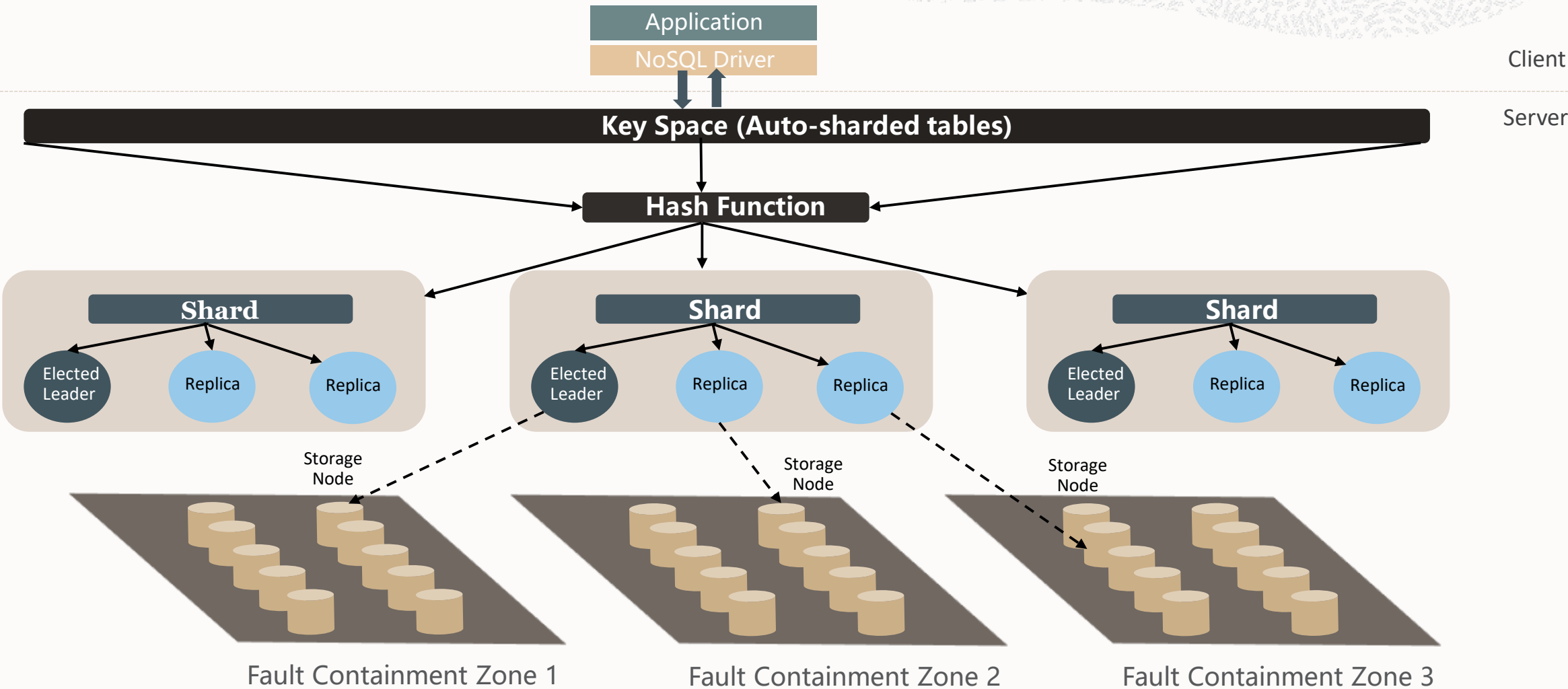
# Oracle NoSQL Database Services on OCI Console

Easy provisioning and Management



# Oracle NoSQL Database Architecture Overview

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



# Oracle NoSQL Database Cloud Service

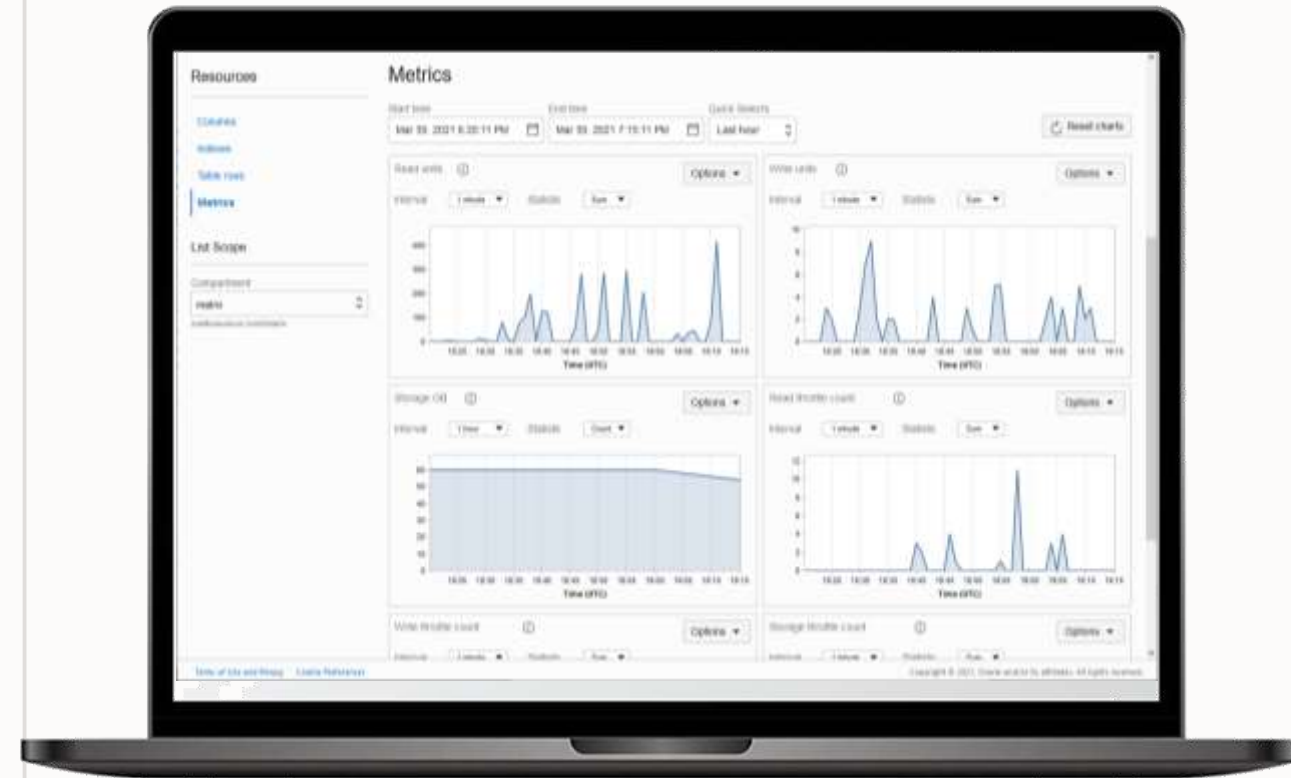
Built for extreme, dynamic workloads of today's modern applications

## 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

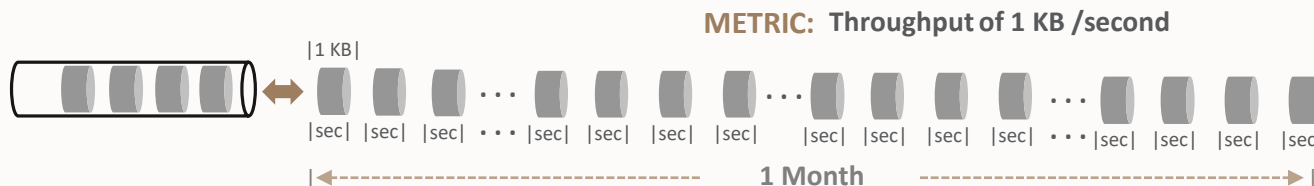
## Throughput provisioning

### 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 KB/Hr \* 744 Hr  
= 2.67 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

Python Code Sample

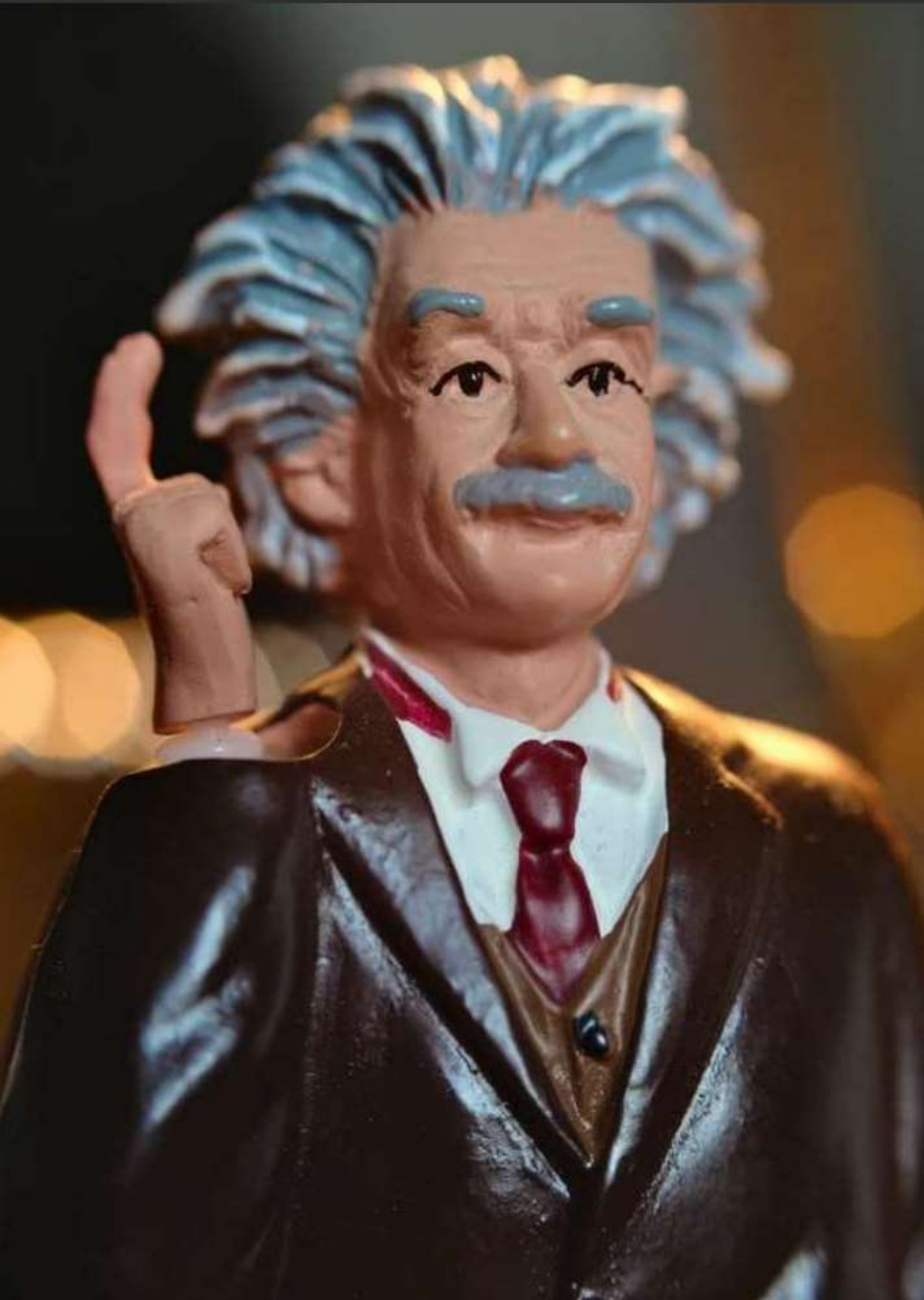
```
request=TableRequest().set_statement(statement).set_table_limits(  
    TableLimits(0,0,500,TableLimits.CAPACITY_MODE.ON_DEMAND))  
  
handle.do_table_request(request, 50000, 3000)
```

Set to 0

Set to 0

500 GB Storage

On-demand mode



## 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





# 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 Dbascli 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/>



# Thank you

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