



Exadata Cloud at Customer

Overview

Alexandre Fagundes

OCI Database & Oracle LAD

André Sousa

ISV Technical Valid Oracle LAD

Marcel Lamarca

Licences & Systems Oracle LAD

August, 2022





Marcel Lamarca

- Father, Caipira , husband, Cooker and Corinthiano!
- Graduated in Business Administration (FMU-SP)
- **Oracle DBA**
 - 18 year dedicated to study and support Oracle Databases.
 - 7 years working with Exadata (On-prem, C@C and Cloud Services) .
 - About to complete 3 years at Oracle helping Customers and partners on the journey to Cloud.
- **Oracle Certified Professional (OCP)**
 - 10g, 11g and 12c.
- **Oracle Certified Specialist (OCE)**
 - 11g Grid/RAC Database Administrator.
 - OCI Foundation 2020 / 2022.
 - Oracle Autonomous Database 2019 Administrator.
 - Oracle Cloud Database Migration and integration 2021.





Alexandre Fagundes





André Sousa



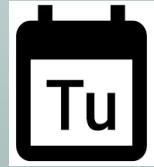
Safe harbor statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, timing, and pricing of any features or functionality described for Oracle's products may change and remains at the sole discretion of Oracle Corporation.



Agenda

For today and what's coming soon...



17th Ago

- C@C Dom0 and domU responsibilities
- C@C Features available
- C@C X9M Shapes
- C@C Control Plane Management
- MOS Free training and certification
- CSM Roles and responsibilities
- MOS Escalation patch
- MOS Breking glass Service Request
- C@C Autonomous on Exac@C Infra



26th Ago

- C@C Dom0 and DomU responsibilities
- C@C Patching dom0
- C@C Patching domU
- C@C How to update dbasscli (Tooling)
- C@C Patching Grid Home
- C@C Patching Oracle Home
- C@C Patching a one-off patch
- C@C Out of place path best practices

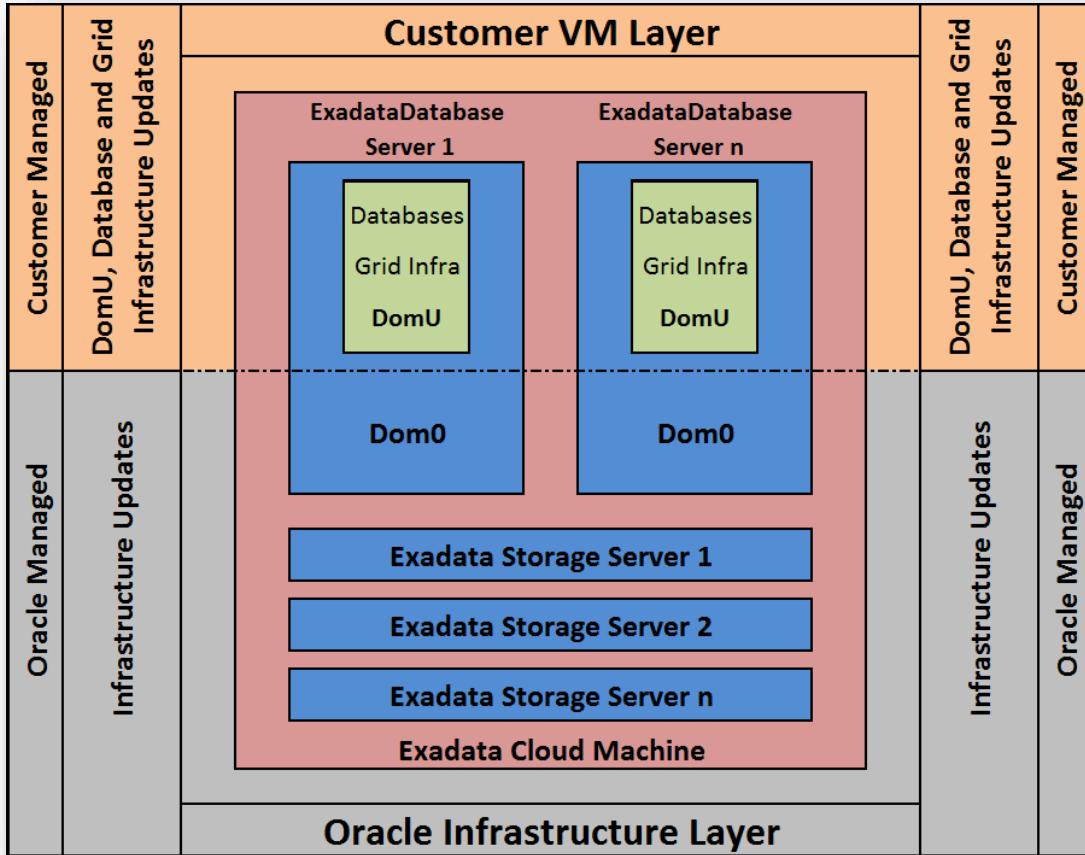
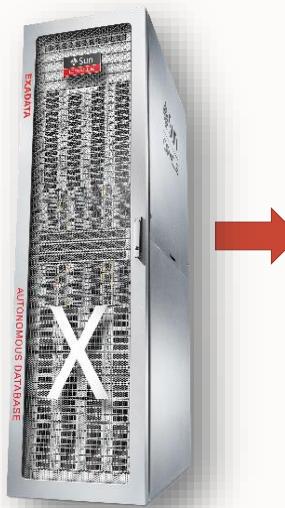


30th Ago

- C@C Backup Database Using rest API
- C@C Backup database using OCI console
- C@C Backup Database To a Object Storage
- Backup Database to a Diskgroup
- Restore Database scenarios

Exadata Cloud at Customer - Dom0 and DomU

Roles and responsibilities



Management

- Customers responsible for Database and OS
- Databases created / managed through Cloud automation (web UI / REST API)
- Oracle Cloud Ops manage Exadata infrastructure (hardware, system software) & hypervisor (dom0)

Virtual Machine (VM)-based Isolation

Every ExaCC system deployed with one VM Cluster (domU), customers have root access to domU, they create / manage databases within the domU

Customer is responsible

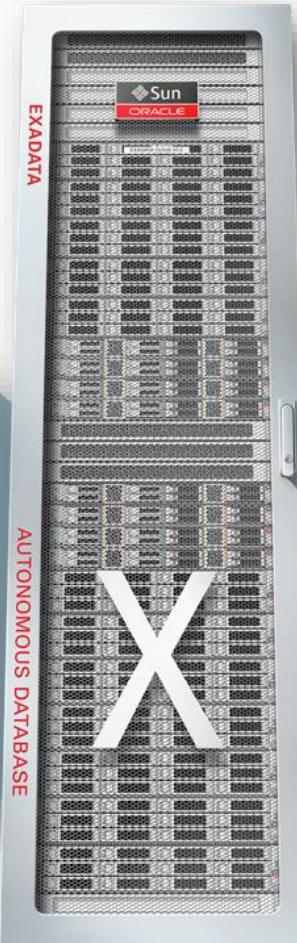
- Adjust license (BYOL or License included)
- Scale UP/Down resources

Exadata Cloud Most Powerful Database + Platform

All Exadata Features available with no extra costs

	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
	InfiniBand Fabric
	Smart Flash Cache, Log
	Storage Indexes
	Columnar Flash Cache
	Hybrid Columnar Compression
	I/O Resource Management
	Network Resource Management
	In-Memory Fault Tolerance
	Exafusion Direct-to-Wire Protocol

Exadata X9M Cloud Shapes

Actual X9M shapes available from base to full

Base System

- 2 Database Servers
- 3 Storage Servers
- 4 Max User VMs
- 562.5K Read IOPs
- 25 GB/s Flash Bandwidth
- 2.7 GB/s Disk Bandwidth

Quarter Rack

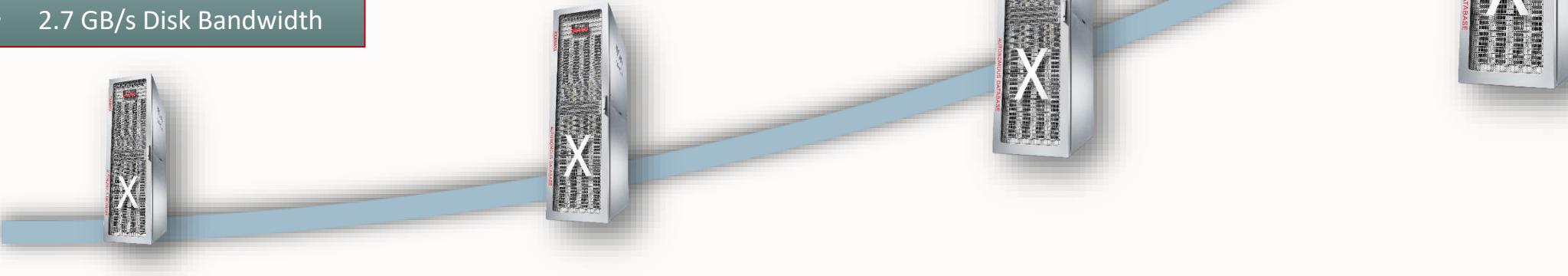
- 2 Database Servers
- 3 Storage Servers
- 8 Max User VMs
- 5.6M Read IOPs
- 135 GB/s Flash Bandwidth
- 5.4 GB/s Disk Bandwidth
- Pmem

Half Rack

- 4 Database Servers
- 6 Storage Servers
- 8 Max User VMs
- 11.2M Read IOPs
- 270 GB/s Flash Bandwidth
- 10.8 GB/s Disk Bandwidth
- Pmem

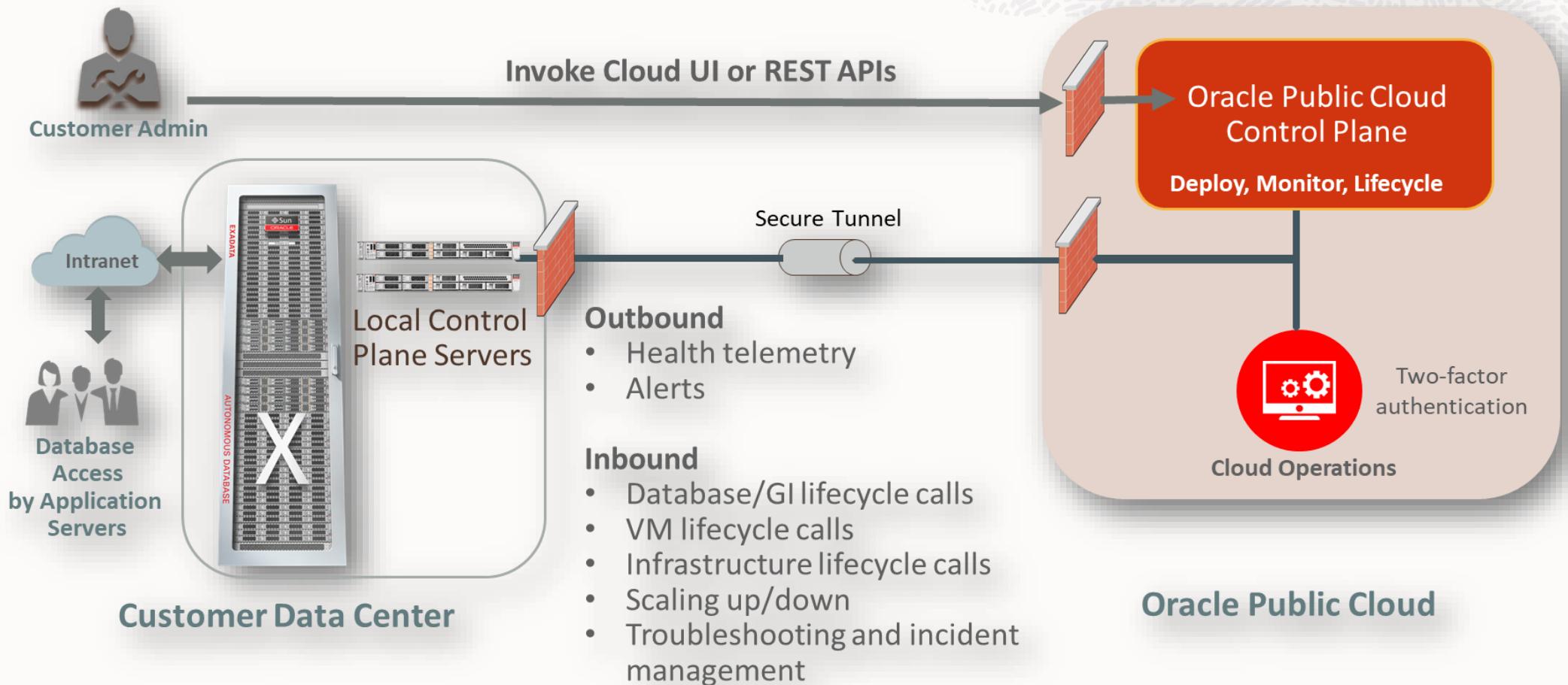
Full Rack

- 8 Database Servers
- 12 Storage Servers
- 8 Max User VMs
- 22.4M Read IOPs
- 540 GB/s Flash Bandwidth
- 21.5 GB/s Disk Bandwidth
- Pmem



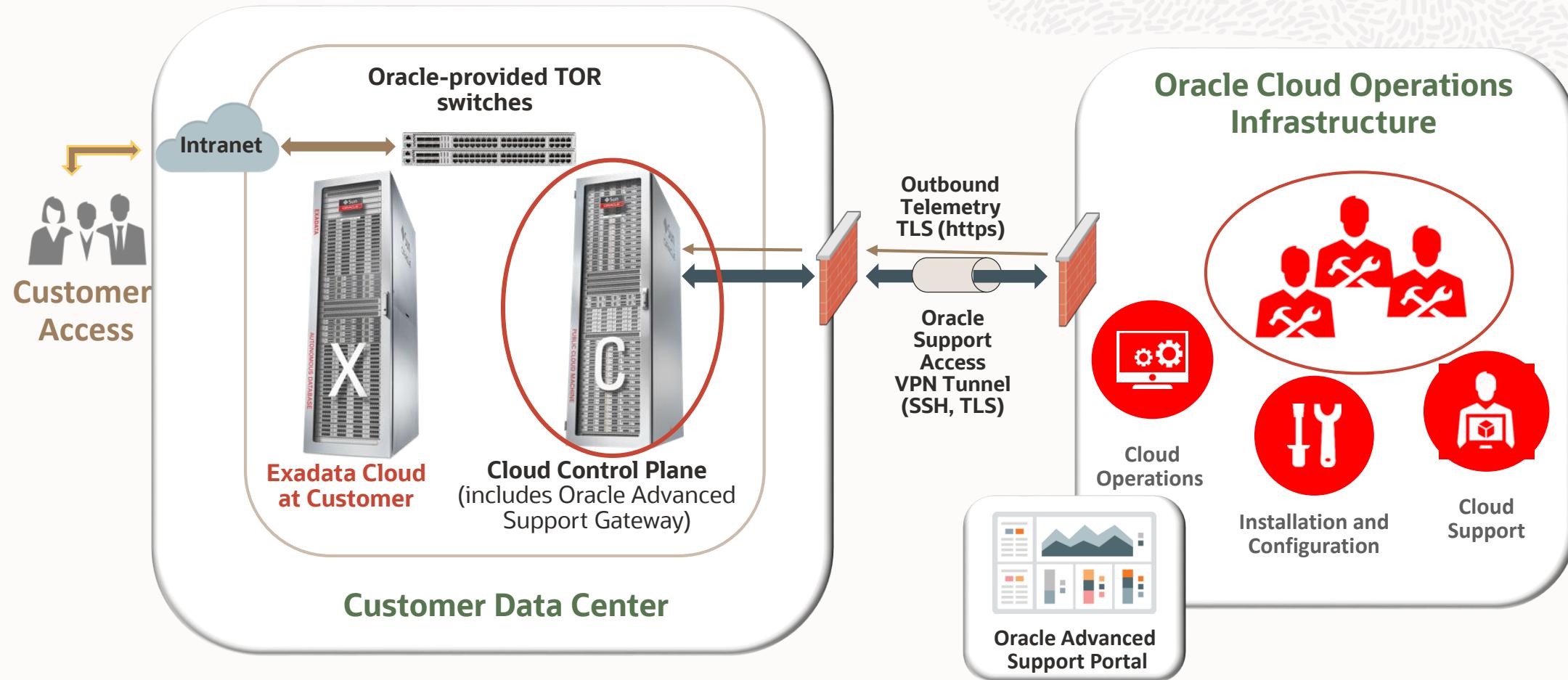
Gen 2 ExaCC - Management Flow

Management console overview and security diagram



Gen 1 ExaCC – Control Plane

Management console overview and security diagram whit two Full control planes



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: XBMDB1

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: XBMDBHome1

Create administrator credentials

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

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

[Update](#) [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: Maximum Performance

Transport type: Read-Only
Asynchronous

Select Peer VM Cluster

Peer region: Read-Only
US East (Ashburn)

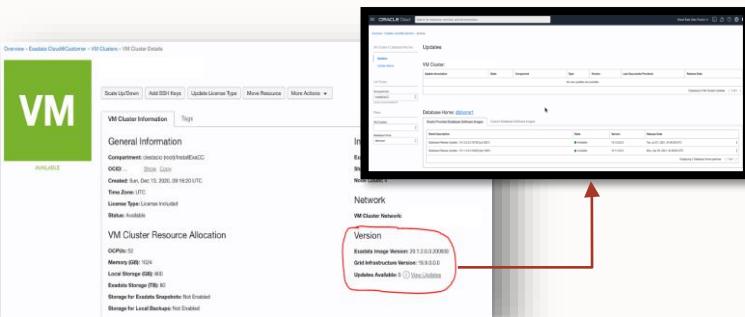
Exadata Cloud at Customer Pathing Overview

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

My Oracle Support and Exadata CSM

Understanding CSM Job descripion's and MOS



MOS Customer Experience

Free MOS training and certifications

The screenshot shows the My Oracle Support homepage. At the top, there's a banner with a video thumbnail and the text "My Oracle Support: Year of Innovation". Below the banner, there are three call-to-action buttons: "New user? Register here", "Watch", and "Explore". The "Watch" button has a subtitle "Learn the basics in minutes". The "Explore" button has a subtitle "Sign in for more quick training videos". The main content area features a large image of the Earth with the text "Welcome to My Oracle Support!". Below the image, it says "The one-stop support solution for Oracle Premier Support Customers." followed by a bulleted list of features: "Search for solutions", "Download patches and updates", "Access proactive support tools", "Collaborate in the My Oracle Support Community", and "Create a Service Request". There's also a link to "Register, sign in, and visit the User Resource Center to learn more.". At the bottom of the page, there's a footer with copyright information, legal notices, and privacy statements.

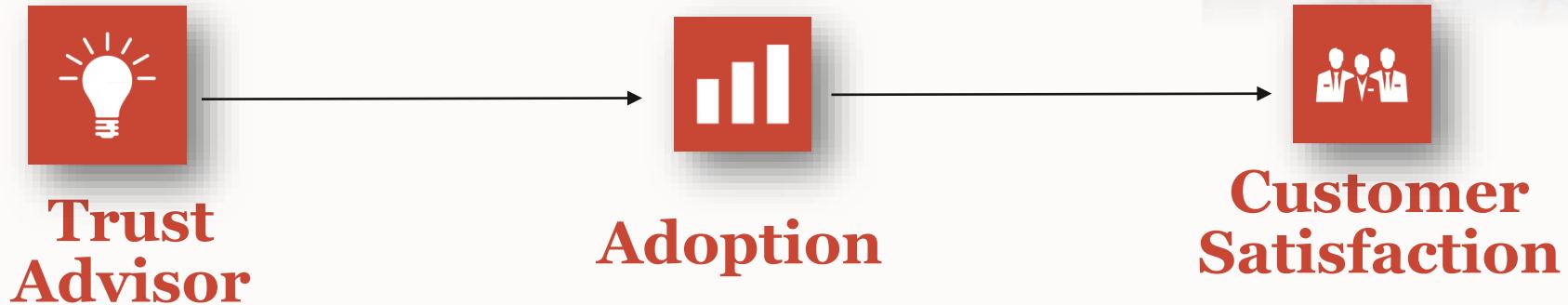
- First contact for resolution, support and technical assistance through Service Request (SR) ticketing system.
- Online Resources via My Oracle Support Portal.
- Knowledge Base
 - Known issues and bugs.
 - Guides and tutorials.
- Updated information on patches, bug fixes, security, alerts, new features
- How to use My Oracle Support -How-to Training Video Series (Doc ID 603505.1)**



What is a Cloud Specialist?

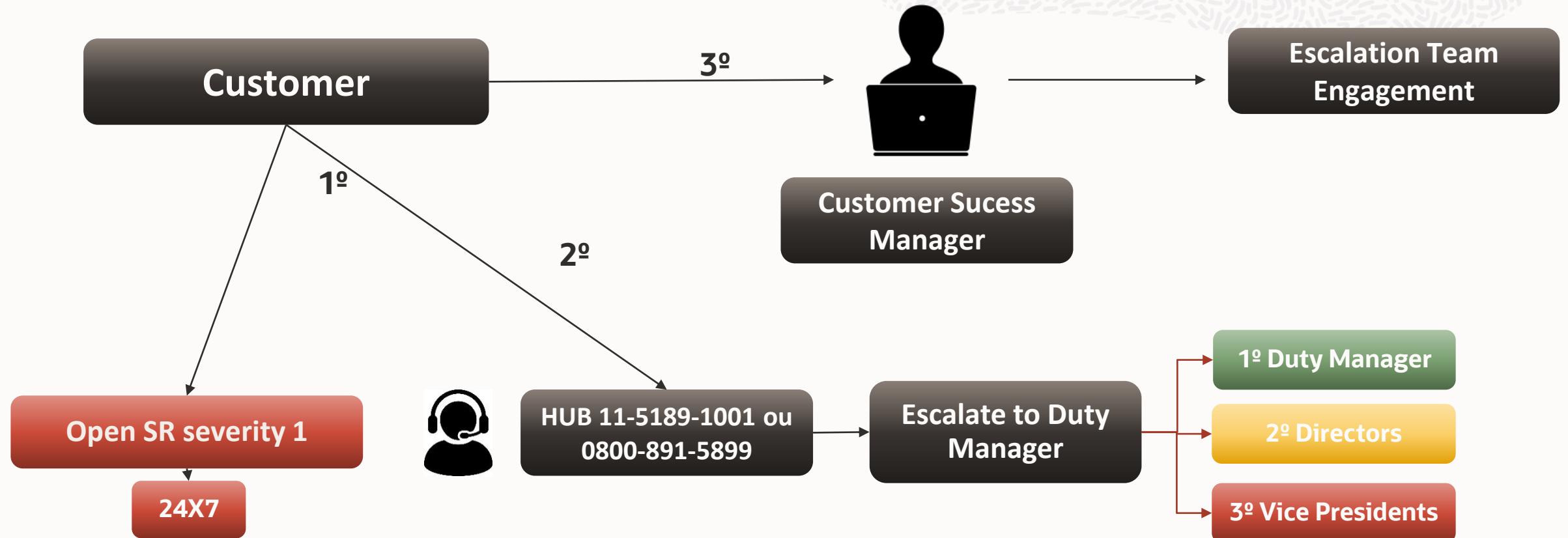
A cloud specialist (CSM) is a technical expert to guide customer about best practices

Oracle Cloud Specialist is an Oracle organization dedicated to pursuing customer satisfaction through the best use of our solutions.



Workflow Maximum Attention on Service Request

MOS escalation roles, responsibilities and golden tips to deal with Oracle Support



How To Request Management Attention on a Service Request (SR) with Oracle Support Services (Doc ID 199389.1)

What is a Breiking Glass Service Request ?

Understanding when it is needed and how to open this SR

A Breaking Glass Service request is a formal process to request and allow Oracle support to get into your Exadata Cloud at Customer Virtual Machines (DomU) and fix the issue customer reported.

The customer must to open this SR and share this SR number on parent SR as soon as possible.

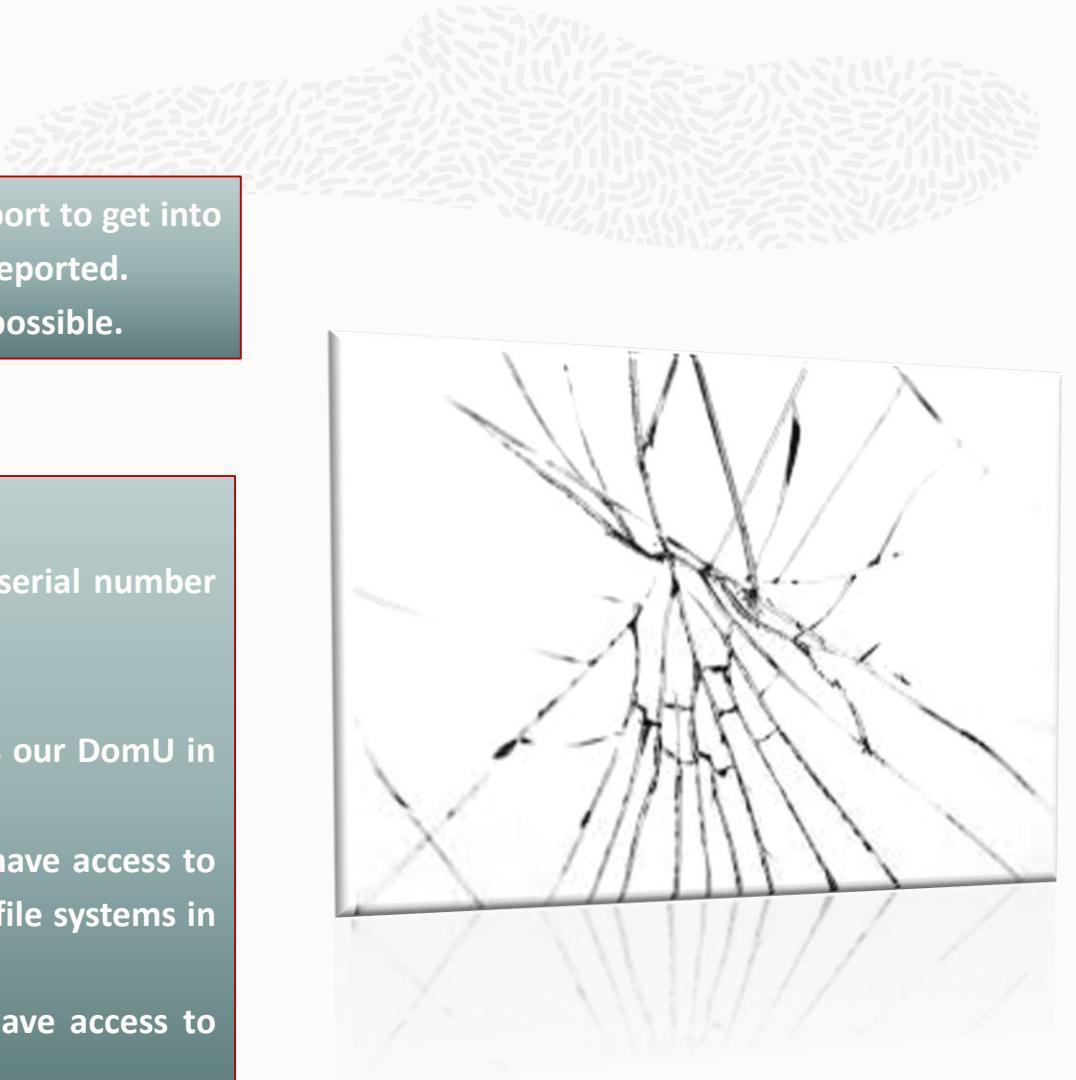
Breaking Glass Text template

SR Title: SR granting Oracle explicit permission to access DomU of ExaCC with AK serial number
AK0000000

SR Content: We are opening this SR to grant explicit permission to Oracle to access our DomU in order for support to help resolve issue described in SR# 3-XXXXXXX

We acknowledge that by providing this permission, we understand that Oracle will have access to ALL FILES in DomU and agree that there are no confidential files stored in any of the file systems in DomU.

In addition, we also agree that customer security team has authorized Oracle to have access to customer DomU in order to resolve the issue described in the above SR."



What is a Root Cause analysis?

Understanding how and when this formal report is needed



A RCA (Root Cause Analysis) Is a formal request that the customer or partner request on parent SR to figure out what caused the issue and avoid future issues.

It must be requested on the same parent SR that the issue be reported and as soon as possible to avoid SR close. Oracle support needs up to 15 days to provide that information and the SR number can be used as an official doc.

It's important to be focused on parent SR and provide any new evidence to help Oracle support identify the root cause.



If the customer or partner didnt agree with Oracle support feedback, it's up to de customer to request another engennier to review.

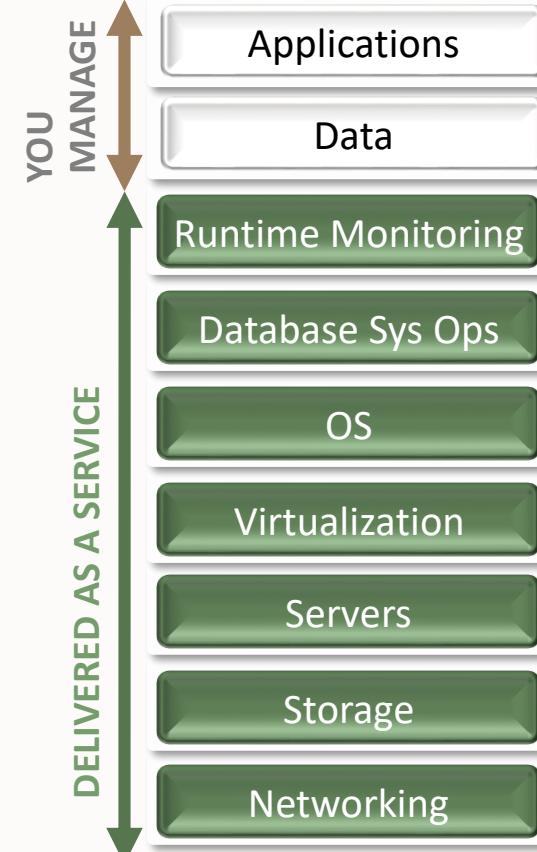
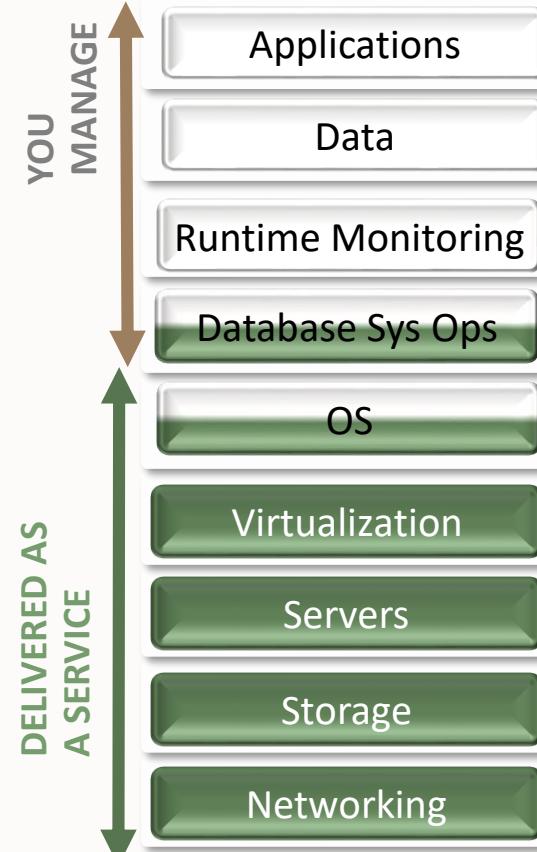
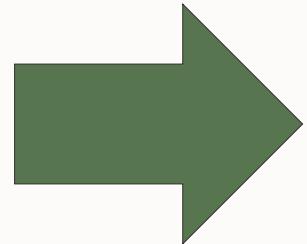
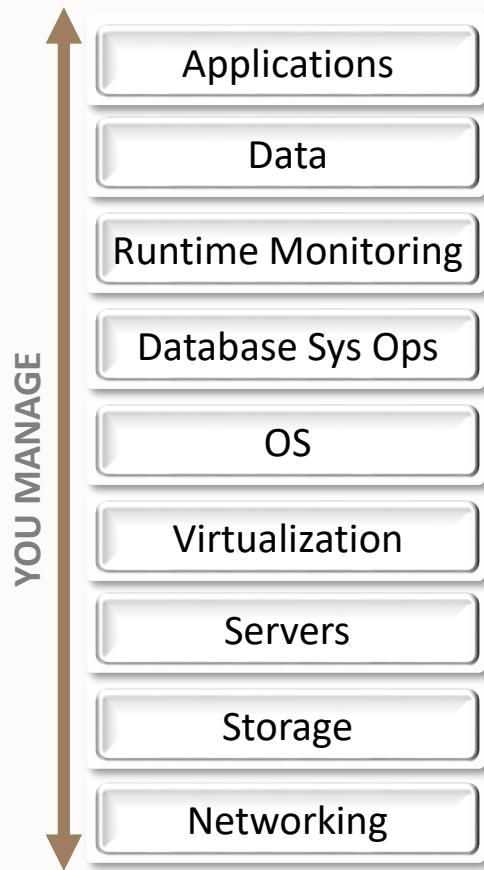
Multiple VM Autonomous Database Dedicated

Overview

Transfer more responsibility to the service while lowering costs

Same cost per OCPU, greater value with Autonomous

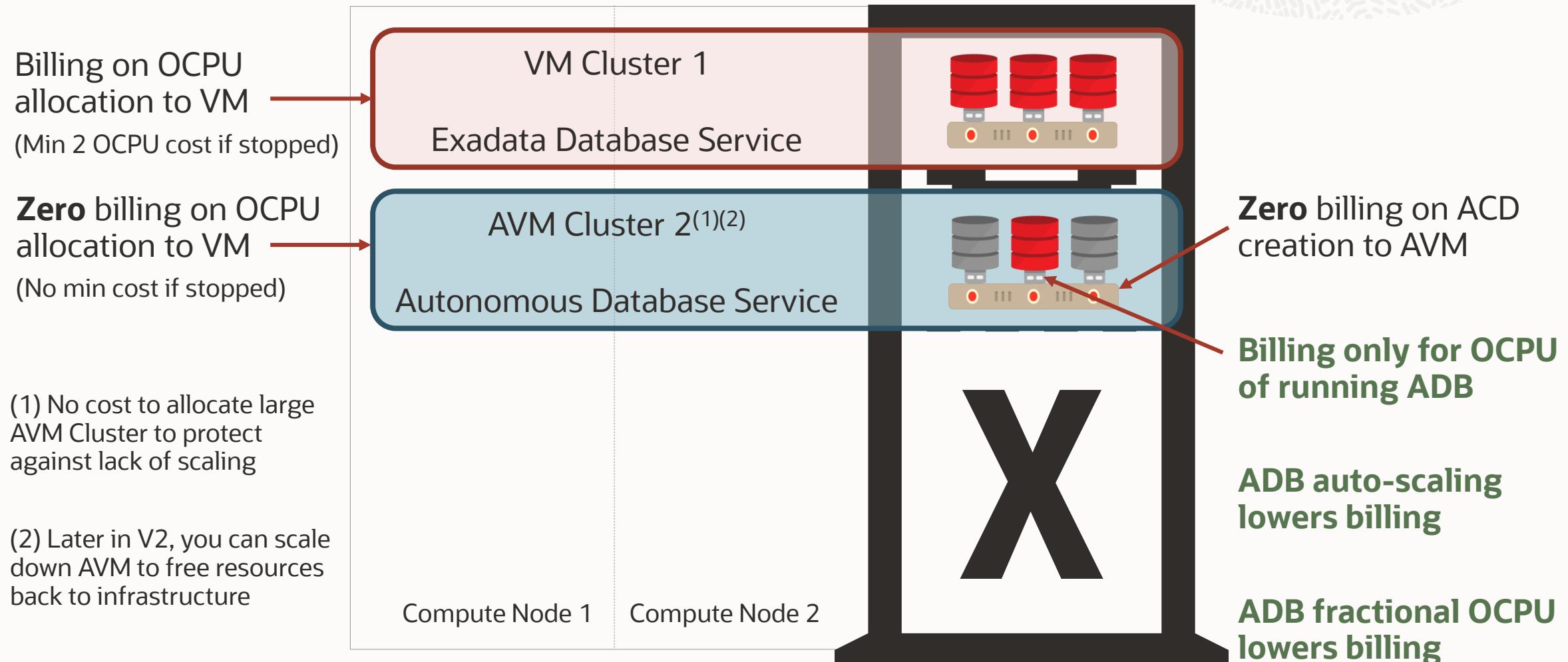
Traditional IT



O

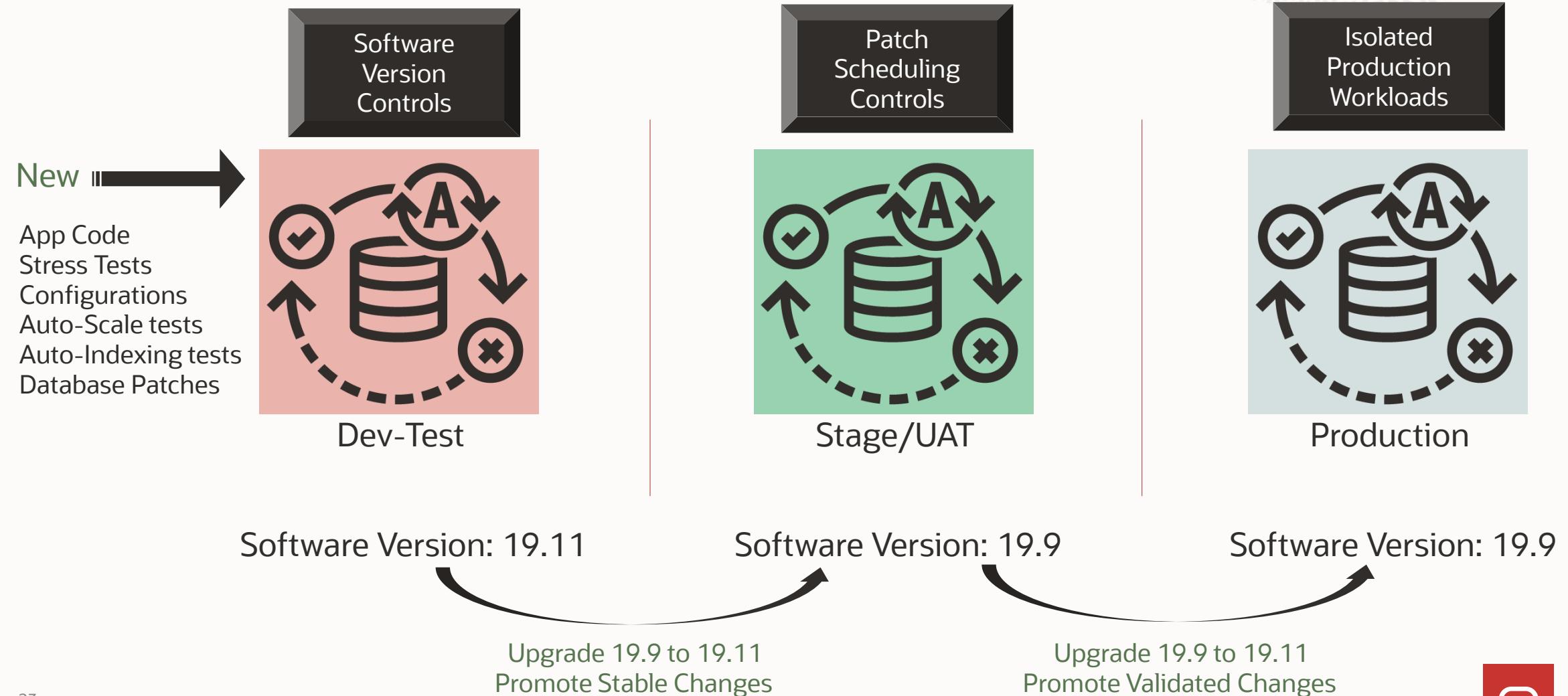
How does Multi-VM Autonomous Database Work?

Cluster creation and billing model – V1



Autonomous Database – Dedicated on Exadata Cloud@Customer

Functional Isolation Guarantees



Multiple VM Autonomous Database

Overview

Multiple VM Autonomous Database

Resource Allocation

- Simplified resource allocation
 - Max # of ACDs customer plans to create in the Autonomous VM cluster
 - OCPU per node
 - Memory per OCPU for the Autonomous Database
 - Total Autonomous Database Storage
- Aggregate resource required on the Exadata Infrastructure displayed on the right

Configure Autonomous VM Cluster Resources

Node Count: 2 *i*

Maximum number of Autonomous Container Databases for the Autonomous VM Cluster
1 1 16

OCPUs count per Node *i*
5 5 50

Database memory per OCPU (GB) *i*
12 12 27

Allocate storage for local backups *i*

Autonomous Database storage for the Autonomous VM Cluster (TB) *i*
1 1 120

Total Resources Requested for Autonomous VM Cluster

OCPUs Count: 10
OCPUs Count per Node x Node Count

Memory: 200 GB
[OCPUs Count per Node x Database Memory per OCPU + Internal Database Service Memory: (40GB)] x Node Count

Local Storage: 300 GB
Internal Local Service Storage: (100GB + 50GB x ACD Count) x Node Count

Exadata Storage: 1.75 TB
[User Data Storage + Internal Database Service Storage: (200GB + 100GB x ACD Count x Node Count)] x 1.25

Autonomous Database - Dedicated Operator Access Control (OpCtl)

Now available for Autonomous Database - Exadata Cloud@Customer

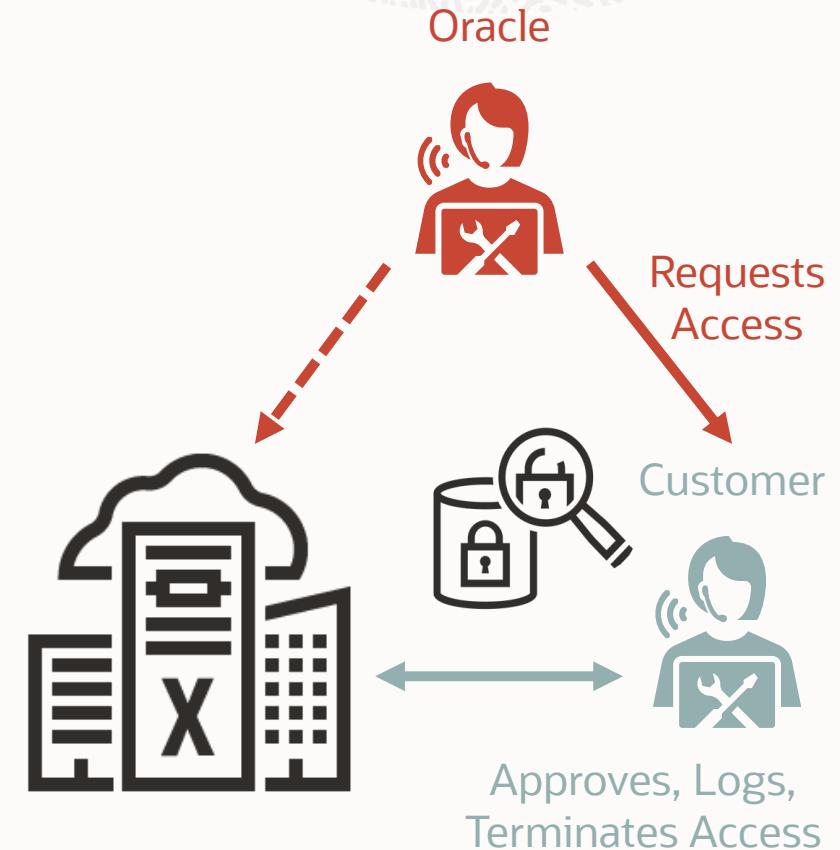
OpCtl enables customers to grant, audit, and revoke access to Exadata Cloud@Customer managed by Oracle

Customers control access to Exadata Infrastructure and Autonomous VM Clusters by Oracle operators to limit:

- when they have access
- components they can access
- commands they can execute

Observe and record Oracle operator commands and keystrokes that Oracle staff execute

Terminate Oracle operator connections at discretion



Enhanced Security for Regulated Industries



Features not supported in Autonomous

Transportable Tablespaces

Oracle Multimedia

XML DB Repository

Clusters (Groups of tables / IoTs)

Common users

DBMS_LDAP , DBMS_DEBUG, DBMS_DEBUG_JDWP, and
DBMS_DEBUG_JDWP_CUSTOM

UTL_TCP

Cloud Management Pack for Oracle Database

Database Lifecycle Management Pack for Oracle Database

Oracle LogMiner

Workspace Manager

Data Models

Root container (CDB\$ROOT) access

Oracle XStream

Oracle R Enterprise - roadmap

Logical Standby - roadmap

RAT: Database Replay – roadmap

Database In-Memory – roadmap

Oracle Native Sharding – roadmap

Application Container – roadmap

Data Masking and Subsetting Pack - roadmap

Autonomous Database | Pre-migration checks

* Features supported in Autonomous with limitations

- Index-organized tables
- Java in Oracle Database
- Data Pump (no TTS)
- Advanced Queuing
- Label Security
- Spatial
- XML DB
- Flashback and Restore Points

Autonomous Database | Pre-migration checks

Legacy features automatically replaced during migration

FEATURE	REPLACEMENT
Basic File LOBS	Secure Files LOBS
Dictionary Managed Tablespaces	Locally Managed Tablespaces
Manual Space Management	Automatic Space Management (ASSM)
Uniform Extent Allocation	Autoallocate
Manual Undo Segments	Undo Tablespace
DBMS_JOB	DBMS_SCHEDULER
Non 8K Blocks	8K Blocks

Autonomous Database | SYS / COMMON USERS Not Supported

- SYS user moves to ADMIN and has the following => SQL restrictions
- Underscores and many other initialization parameters are not supported. Initialization parameters set by Oracle Workload type selection.

```
ALTER LOCKDOWN PROFILE
BACKUP ANY TABLE
BECOME USER
CREATE ANY JOB
CREATE ANY LIBRARY
CREATE LIBRARY
CREATE LOCKDOWN PROFILE
CREATE PLUGGABLE DATABASE
DEQUEUE ANY QUEUE
DROP LOCKDOWN PROFILE
EM EXPRESS CONNECT
ENQUEUE ANY QUEUE
EXPORT FULL DATABASE
FLASHBACK ANY TABLE
FLASHBACK ARCHIVE ADMINISTER
GRANT ANY PRIVILEGE
GRANT ANY ROLE
IMPORT FULL DATABASE
INHERIT ANY PRIVILEGES
LOGMINING
MANAGE ANY FILE GROUP
MANAGE ANY QUEUE
MANAGE FILE GROUP
USE ANY JOB RESOURCE
USE ANY SQL TRANSLATION PROFILE
```

 Copy

Autonomous Database Migration Best Practices

Cloud Pre migration Advisor Tool (CPAT)

- ✓ Java Based – run anywhere
 - ✓ Bundled with ZDM or standalone
 - ✓ Does not install anything in your database
 - ✓ JSON or Text output

Database Details

```
Source Database Container Name: ORCLPDB1  
Source Database Host Name: 4bea9faa8231  
Source Instance Name: ORCLCDB
```

Autonomous Database Migration Best Practices

Cloud Premigration Advisor Tool (CPAT)



[Analyzes Databases for Suitability of Cloud Migration \(Doc ID 2758371.1\)](#) - Successor to the Schema Advisor

Premigration Advisor Check Details List

~~~~~ Check

Name: has\_user\_defined\_objects\_in\_sys

Check Result: BLOCKER

Description: User-defined objects in SYS and SYSTEM schemas will not migrate.

Failure Impact: Any applications relying on user-defined objects in SYS and SYSTEM will fail.

Action: User-defined objects were detected in SYS/SYSTEM schemas. Consider moving them out prior to the migration.

Relevant Objects:

| OWNER  | OBJECT_NAME              | SUBOBJECT_NAME | OBJECT_TYPE |
|--------|--------------------------|----------------|-------------|
| SYS    | MY_VERIFICATION_FUNCTION |                | FUNCTION    |
| SYSTEM | IDXSIZE_UQ2              |                | INDEX       |
| SYSTEM | IDXSIZE_UQ3              |                | INDEX       |
| SYSTEM | ISEQ\$\$_83287           |                | SEQUENCE    |



# Let's Demo ?

# Exadata Cloud at Customer and Cloud Services – Support Useful Links

MOS useful and official doc to help you understand and implement ExaCC best practices

- [Oracle Exadata Best Practices \(Doc ID 757552.1\)](#)
- [Best Practices Blueprints for High Availability](#)
- [Exadata Critical Issues \(Doc ID 1270094.1\)](#)
- [19c Database Self-Guided Upgrade with Best Practices \(Doc ID 1919.2\)](#)
- [Optimizing the Support experience](#)
- [Exadata Cloud Support Information Center \(Doc ID 2522950.2\)](#)
- [Autonomous Health Framework \(AHF\) - Including TFA and ORAchk/EXAchk \(Doc ID 2550798.1\)](#)
- [Oracle 19c - Complete Checklist for upgrading Oracle 12c, 18c Container Database \(CDB\) to Oracle 19c Release using DBUA \(Doc ID 2543981.1\)](#)
- [Getting Started with Oracle E-Business Suite on Oracle Exadata Cloud@Customer Gen 2 \(Doc ID 2774983.1\)](#)
- [Cloud@Customer Gen 2 \(Doc ID 2758998.1\)](#)
- [Cloud Infrastructure or Oracle Cloud at Customer \(Doc ID 2368508.1\)](#)
- [Release Schedule of Current Database Releases \(Doc ID 742060.1\)](#)
- [Upgrading to 19c Oracle Grid Infrastructure on Exadata Cloud Service \(ExaCS\) and Exadata Cloud at Customer Gen2 \(ExaCC\) \(Doc ID 2624992.1\)](#)
- [Exadata Cloud at Customer Gen2 \(ExaCC\) \(Doc ID 2624992.1\)](#)





# Thank You 😊

**Questions / Feedback / Training Suggestions**

[alexandre.af.fagundes@oracle.com](mailto:alexandre.af.fagundes@oracle.com)

[andre.sousa@oracle.com](mailto:andre.sousa@oracle.com)

[marcel.lamarca@oracle.com](mailto:marcel.lamarca@oracle.com)

**Ask for help 😊**

ORACLE

