



DWGL Exadata Update

Barb Lundhild X-Team
barb.lundhild@oracle.com

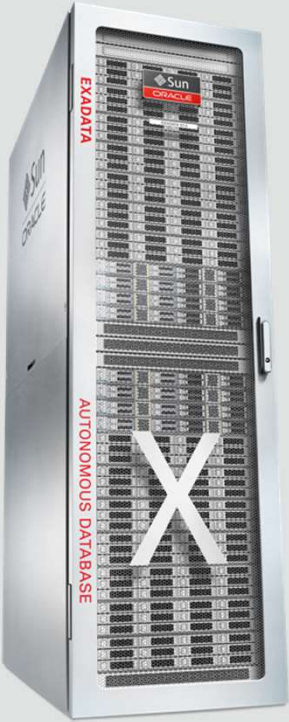
June 2020

Safe Harbor

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.

Statements in this presentation relating to Oracle's future plans, expectations, beliefs, intentions and prospects are "forward-looking statements" and are subject to material risks and uncertainties. A detailed discussion of these factors and other risks that affect our business is contained in Oracle's Securities and Exchange Commission (SEC) filings, including our most recent reports on Form 10-K and Form 10-Q under the heading "Risk Factors." These filings are available on the SEC's website or on Oracle's website at <http://www.oracle.com/investor>. All information in this presentation is current as of September 2019 and Oracle undertakes no duty to update any statement in light of new information or future events.

Oracle Exadata Offerings



Core Exadata Platform



- Flexible Subscription Model
- Database PaaS Services
- Secure Virtual Networks
- Cloud Security and Hardening
- Oracle-Managed Exadata Infrastructure

Exadata Cloud at Customer

In Data Center of Customer's Choice

Exadata Public Cloud Service

In Oracle Public Cloud Data Centers



Oracle Maximum Availability Architecture(MAA) Solution Options



Exadata Deployment Model Comparison

| Category | On-Premises | Cloud at Customer Gen 1 | Cloud at Customer Gen 2 | Cloud Service |
|--------------------|---|--|--|---|
| Data Sheet | Exadata X8 Data Sheet Exadata X8M Data Sheet | ExaCC X7 Data Sheet | Gen 2 ExaCC X8-2 Data Sheet | ExaCS X7 Data Sheet |
| Commercial | | | | |
| Licensing | CAPEX: HW & SW | OPEX Infra: subscription License: BYOL/UCM | OPEX Infra: subscription License: BYOL/UCM | OPEX Infra: UCM License: BYOL/UCM |
| Ownership | Customer | Oracle | Oracle | Oracle |
| Data Center | Customer | Customer | Customer | Oracle |
| Min. Term | None | 4 years, less with fee | 4 years, less with fee | 1 month |
| DB, Exa Software | License separately | Included, DB BYOL | Included, DB BYOL | Included, DB BYOL |
| Premier Support | License separately | Included | Included | Included |
| Lifecycle | | | | |
| DB Versions | 11.2, 12.1, 12.2,18.x,19.x | 11.2, 12.1, 12.2,18.x | 11.2, 12.1, 12.2,18.x,19.x | 11.2, 12.1, 12.2,18.x,19.x |
| Infra Updates | Customer | Oracle | Oracle | Oracle |
| DB Server Updates | Customer/Platinum | Customer | Customer | Customer |
| Deploy Requirement | Advanced Support Gateway reqd with Platinum Services | OCC, Advanced Support Gateway | Open VPN | Recommended: VPN, FastConnect, Compute |
| Oracle Homes | Shareable | Shareable | Non-Shareable (Shareable on roadmap) | Shareable |
| Non-CDB Support | Supported | Yes, for 12c only without UI Support | Yes, for 12c only without UI Support | Yes, for 12c only without UI Support |
| Exa Admin | ExaCLI, CellCLI, EM | Self-service UI , ExaCLI | Self-service UI , ExaCLI | Self-service UI |
| Scale up | Capacity on Demand | Scale OCPU up/down / hr | Scale OCPU up/down / hr | Scale OCPU up/down / hr |
| Elastic Expansion | Supported | Yes – Compute & Storage (X7), Storage Only (X6) | Not yet * | Not yet * |



Exadata Deployment Model Comparison

| Category | On-Premises | Cloud at Customer Gen 1 | Cloud at Customer Gen 2 | Cloud Service |
|--------------------------|--|--|--|--|
| Hardware | | | | |
| Processor | 2-socket & 8-socket | 2-socket | 2-socket | 2-socket |
| Server Generation | X8, X8M | X7 | X8 | X7 |
| Storage Server | HC, EF, XT | HC | HC | HC |
| Default Physical Memory | 384 GB / server (X8) | Base: 256 GB/server, Others: 768 GB/server | Base: 384 GB/server, Others: 768 GB/server | 768 GB/server |
| Memory Expansion | Up to 1.5 TB / server | Not supported | Not supported | Not supported |
| Configuration | | | | |
| RAC / Single Instance * | Sub-clusters & single instance | Sub-clusters & single instance | Rack Size Clusters & Single Instance | Sub-clusters & single instance |
| Configurations | 1/8, 1/4, 1/2, Full, Elastic | Base, 1/4, 1/2, Full; Elastic in roadmap * | Base, 1/4, 1/2, Full; Elastic in roadmap * | Base, 1/4, 1/2, Full; Elastic in roadmap * |
| No. of Storage Servers | 1/4: 3, Half: 7, Full: 14 | Base, 1/4: 3, Half: 6, Full: 12 | Base, 1/4: 3, Half: 6, Full: 12 | 1/4: 3, Half: 6, Full: 12 |
| ASM Redundancy | Normal, High | High | High | High |
| VM | VM (incl. multi VM) | VM (incl. multi VM) | Single VM | Single VM |
| VM Cluster Subsetting | Yes | Yes | n/a | n/a |
| Backup | Customer backup infra, backup to cloud | Customer backup infra, incl. backup to cloud | Customer backup infra, incl. backup to cloud | OCI Object Store |
| Database Encryption | Customer choice | Encrypted by default | Encrypted by default | Encrypted by default |
| Network Isolation | VLANs, Multiple VLAN Per VM | VLANs in TORs, One VLAN per VM | VLANs in Customer TORs, one VLAN per VM | SDN (OCI & OCI-C ADs) |
| External IB connectivity | Supported | Not supported | Not supported | Not supported |
| Re-racking / Addn Equip | Allowed | Exception approval | Exception approval | N/A |



Exadata 20.1

See Utube Video

https://youtu.be/Uf2ee_7C4Yo

Secure Fabric

Virtual machines have a cluster network for RAC traffic and storage network for IO

Virtual machine cluster networks are isolated from each other

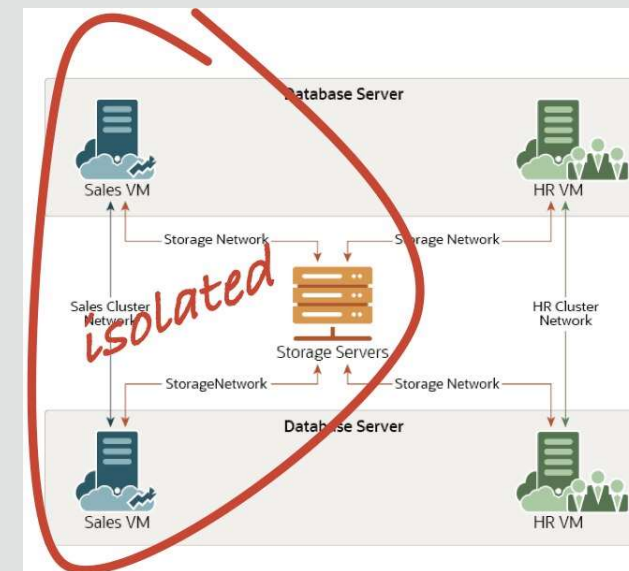
Virtual machines can talk to storage servers **but cannot talk to each other on the storage network**

Enabled with a new switch configuration for secure fabric that turns leaf switch ports to trunk ports, new switch upgrade syntax

OEDA UI and OEDACLI allow user to specify VLAN IDs

Enabled with Exadata System Software 20.1, GI and DB 19.6 with 30676209 and 30613937 and older database releases with same minimums as needed for UEK5 in 19.3

See [Using Exadata Secure RDMA Fabric Isolation](#) in the documentation for more details.



Smart Redo Log Caching

Redo log write latency is addressed by both Smart Flash Logging and Persistent Memory Commit Accelerator

Redo write and read throughput are going up

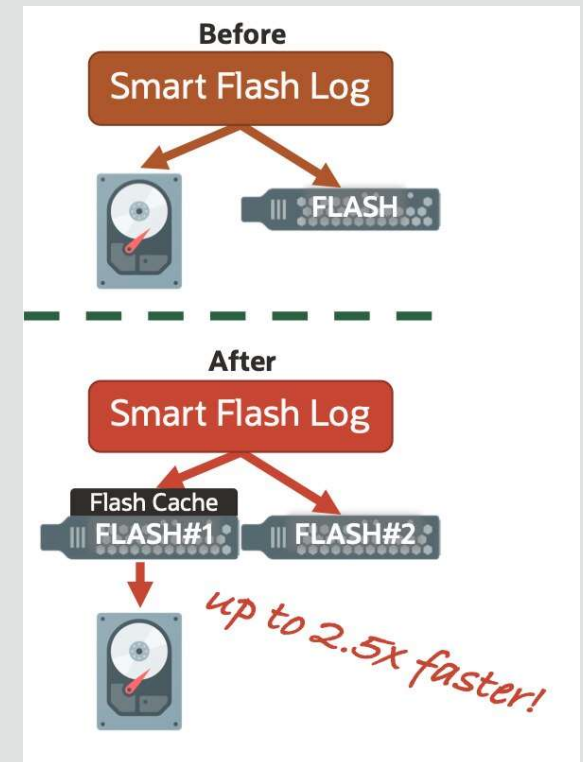
Smart Redo Log Caching writes online logs and standby redo logs to **writeback** flashcache

- Needs entire redo log in flash

- 5% of CDB allocated to root by default in IORM and redo log needs to fit

Reduces latency outliers by choosing different flash disks as part of writes to flash log

Enabled on X7 and X8 storage servers

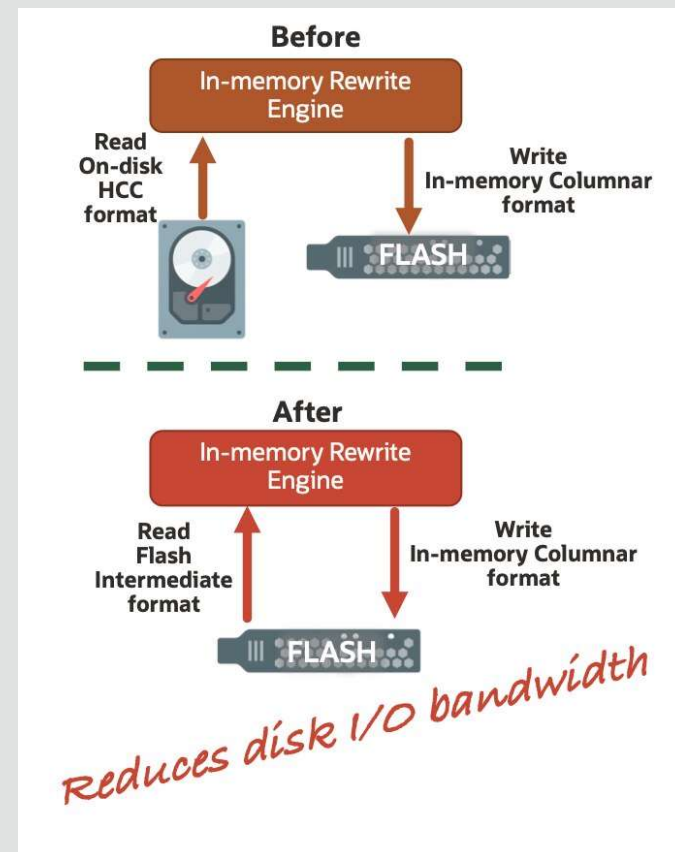


Improved Performance

Faster In Memory Columnar Cache builds

Reads intermediate format from flash for building columnar cache instead of reading from disk

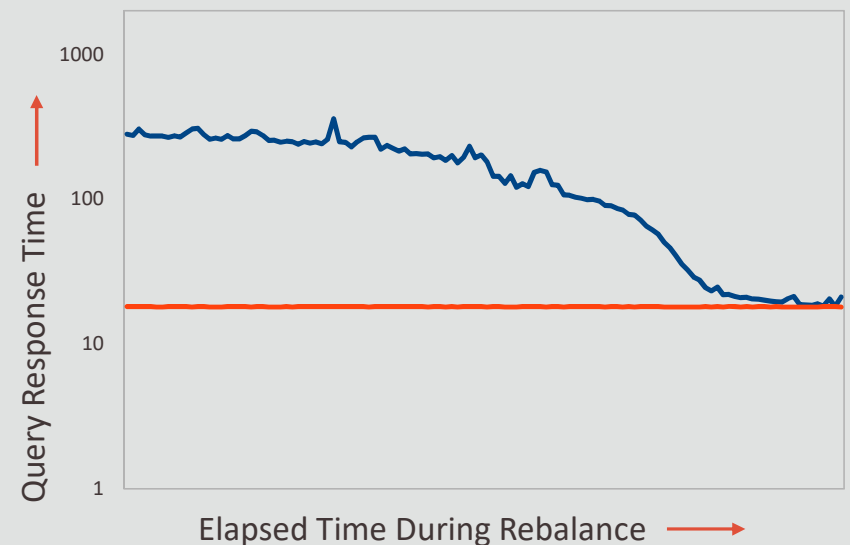
See [In-Memory Columnar Format Support](#) in the Oracle Exadata System Software User's Guide for more information about the in-memory columnar cache format



Improved Performance

Data in persistent memory cache preserved across rebalance

Consistent query response times



- Before - Wait for IO from Flash
- After - Consistent Response from Persistent Memory



Smarter Management

Fine grain control of Persistent Memory Cache and Persistent Memory log at a per database level via inter-database IORM plan

```
alter iormplan dbplan=((name=slowdb, pmemlog=off, pmemcache=off))
```

Shrinking the flash cache reduces the size proactively instead of letting new workload drain the flash cache

Management Server application engine moves to Jetty

- No longer uses pared down Weblogic server

- All the existing management server features continue to work

- Enabled for both the storage server and the database server

- Completely Automatic and Transparent

The logo for Jetty, featuring the word "jetty" in a bold, italicized, orange font, followed by two slashes "://".

Smarter Infrastructure

Oracle Linux distribution updated to 7.8 and UEK5 Update 3

Now includes both python2 and python3 on the database server

Diagnostic ISO and Secure Eraser ISO don't ask for a password

Simplifies the use of the live CD

Instant failure detection for Clusterware

targeting April GI release for 19c, 18c and 12.2



Gen 2 Exadata Cloud at Customer


Gen 2 ExaCC New Features

- GA Features
 - Charset Selection When Creating Database
 - Time zone Selection ability
 - DB/GI Update From Cloud UI
 - Multi-VM
 - Data Guard Automation
 - CPU Offline Scaling
- Sneak Peek Of Upcoming New Features (Expected June 2020)
 - ADB C&C




New GA Features

Charset Selection When Creating Database


 [Hide Advanced Options](#)

Management Backup Tags

Character set

AL32UTF8 

National character set

AL16UTF16 

Time Zone Selection Ability

Select the time zone

Select the time zone

UTC

America/Los_Angeles (browser-detected)

Select another time zone

Region or country ⓘ

America

Time zone

New_York

DB/GI Update From Cloud UI

- Introduces the ability to patch GI and DB Homes from available RUs
- Along with this feature, we will be making Jan 2020 as default RU (currently Apr 2019) for new installs, existing installs will need to use CSWLib
- Ability to run pre—check and apply patch for DB as well as GI RU updates
- Ability to view pre-check outcome and patching history
- Apply function will apply update in rolling manner
- Ability to move a database from current home to a home with higher or lower version. Data patch will be applied where applicable
- Ability to move DB to lower version not supported with 11.2 due to data patch restrictions

Multi-VM

- Multi-VM provides an ability to create multiple VMs in ExaCC Infrastructure
- With minimum of 60GB per /u02 there is a maximum of 5 VMs in X8 and 6 VMs for X7 after accounting for space needed for VM images and Oracle managed DomU backups
- All existing customers will be migrated to Multi-VM prior to feature release via fleet upgrade without needing any downtime
 - Simply means they are Multi-VM capable from day 1 upon feature rollout
- Multi-VM Feature will allow customers to
 - Scale Up/Scale Down Memory (rolling)
 - Scale Up/ Scale Down OCPU (online)
 - Shrink / Grow ASM Storage (online)
 - Shrink / Grow Local Storage (rolling)
- New VM Cluster will span all nodes of the rack. Ability for RAC Node subsetting and DB Instance subsetting will be introduced in a future release

Data Guard

- Provides ability to automate DG creation process in two VMs within the same ExaCC Infrastructure (a.k.a Rack) or two VMs in different ExaCC Infrastructure
- Provides automation for switchover, failover and reinstate
- The two Infrastructure shapes where Primary and Standby is created must be of the same shape (both quarters / both half etc.) – Cross shape DG will be supported in future release
- Infrastructure and Standby Infrastructure must be in the same region. Cross region DG is not yet supported
- Only Max Performance DG protection mode that uses async redo transport is supported. Max Availability and Max Protection will be supported in the future

CPU Offline Scaling

- ExaCC is considered to be in a "Disconnected" mode when there is a loss of connectivity with the DBaaS control plane running on Oracle Cloud Infrastructure (OCI)
- While in disconnected mode, customer must use command-line interface to scale resources or to check the status

```
$ dbaascli cpuscale update --coreCount <coreCount> --message <message>
```

```
$ dbaascli cpuscale get_status
```



Sneak Peek Of Upcoming Features





Thank you for joining!

