Deploying Oracle Database with Exadata

September 18–22, 2016
San Francisco

Brian Spendolini
Product Manager
Oracle Exadata Cloud Services

Copyright © 2017, Oracle and/or its affiliates. All rights reserved. |

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, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Exadata Cloud Service

1. Introduction
2. Service Details
3. Provisioning: Exadata Cloud Instance
4. Provisioning: Database Service
5. Using Exadata Service
6. Summary

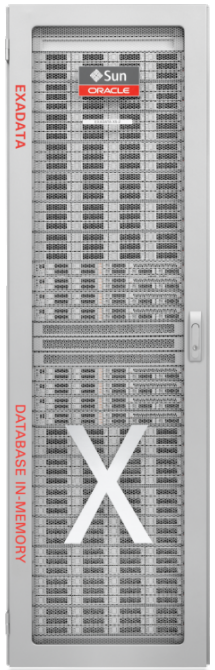
Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

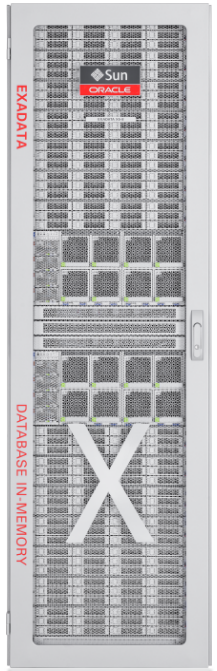
Exadata: Investment Protection Across any Deployment

100% Compatible, No Application Changes

- **Exadata X6**

X6-2

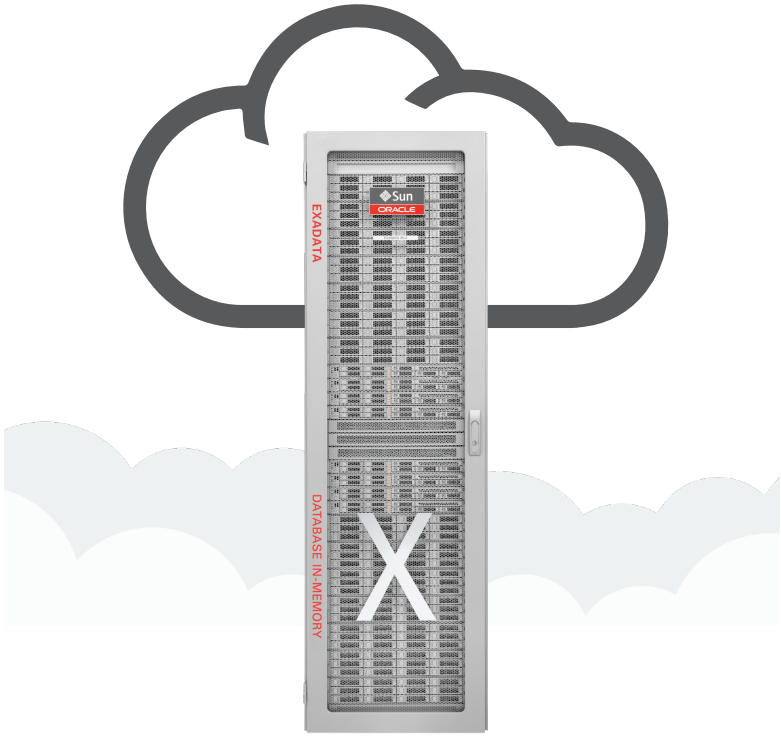




X6-8

On-Premises

- **Exadata Cloud Service**



Exadata Cloud Service @ Oracle

- **Exadata Cloud Machine**

Exadata Cloud Service @ Customer

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. | Oracle Confidential – Internal/Restricted

Exadata Vision

Dramatically Better Platform for All Database Workloads

- Ideal Database Hardware - Scale-out, database optimized compute, networking, and storage for fastest performance and lowest costs
- Smart System Software – specialized algorithms vastly improve all aspects of database processing: **OLTP, Analytics, Consolidation**
- Full-Stack Integration – Database-to-disk optimization, automation, testing, updates, and support to reduce operational costs

Identical On-Premises and Oracle Public Cloud

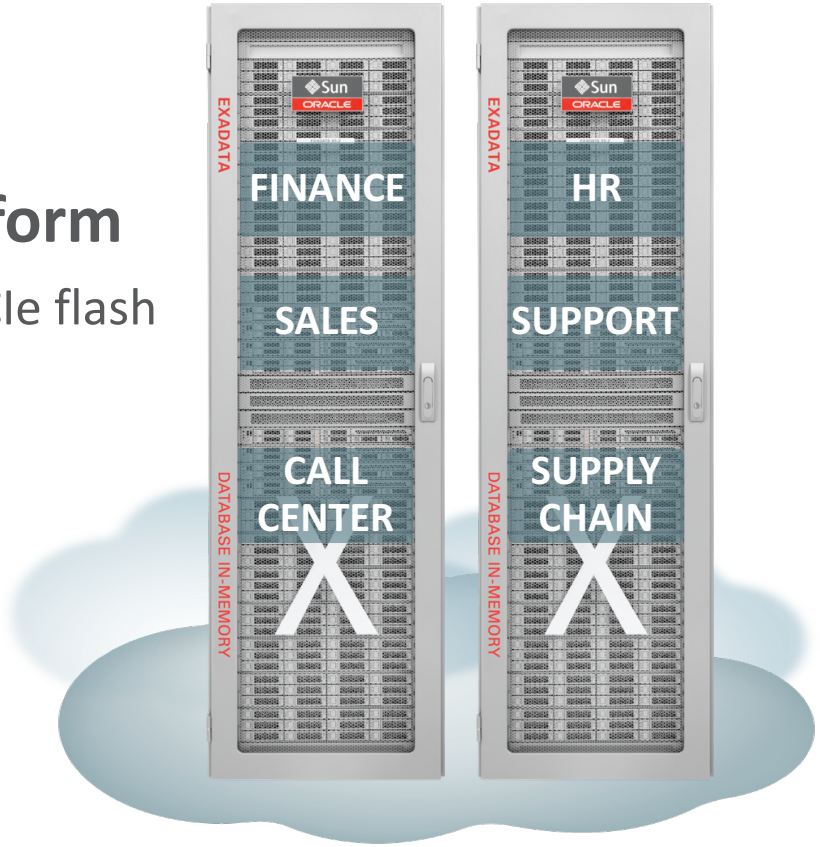
Exadata Cloud Service

ORACLE

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Oracle Database **Exadata Cloud Service**

- **Full Oracle Database with all advanced options**
  - #1 database for mission critical OLTP and DW
- **On fastest and most available database cloud platform**
  - Scale-Out Compute, Scale-Out Intelligent Storage, InfiniBand, PCIe flash
  - **Complete Isolation** of tenants with no overprovisioning
- **All Benefits of Public Cloud**
  - **Fast, Elastic, Web Driven** Provisioning
  - **Oracle Experts Deploy and Manage** Infrastructure
  - **No Capex** Monthly Subscription

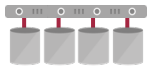


Best of On-Premises with Best of Cloud

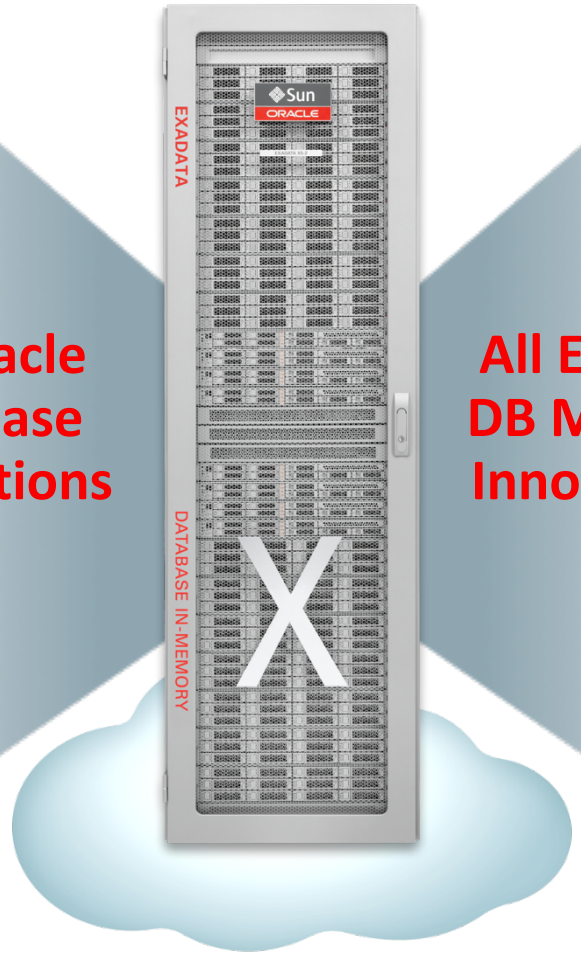
Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Exadata Cloud: Compatible – Scalable – Available – Secure

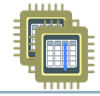
Decades of Database Innovation Proven at Millions of Mission-Critical Deployments

	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



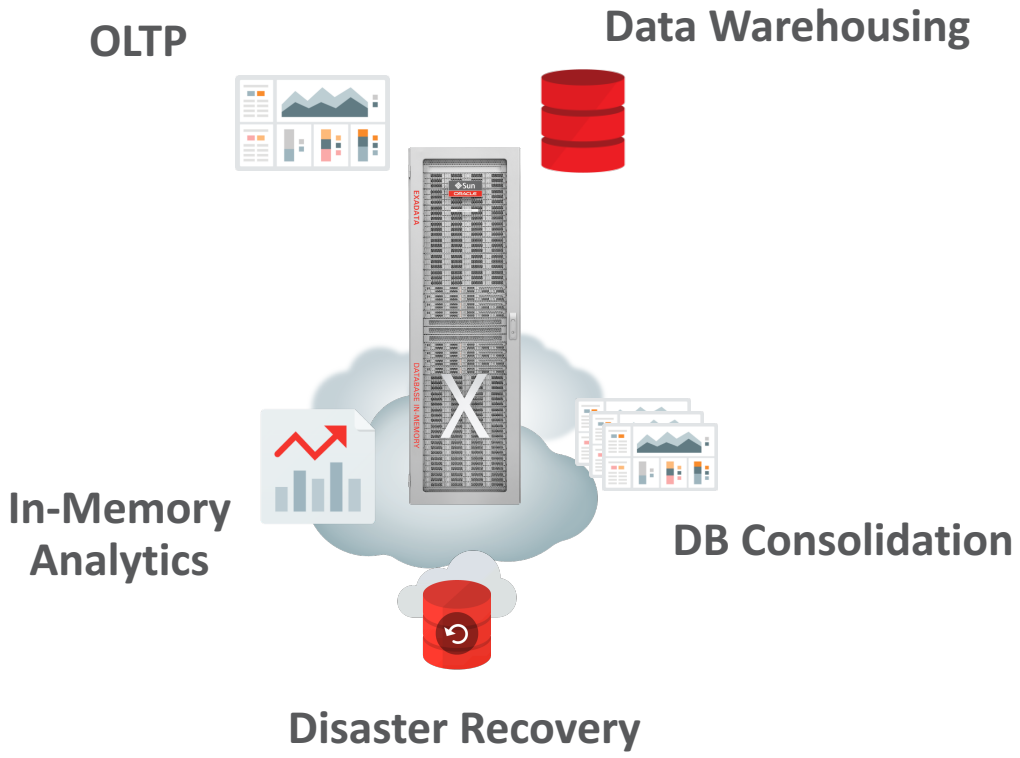
All Exadata DB Machine Innovations

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	

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Use Cases

- Mission Critical Production Databases
  - Single large database or consolidate many
  - OLTP, Data Warehousing, Analytics, …
- Disaster Recovery and Reporting
- Test, Development, Certification, Try before Buy
- Hyper-fast Analytical Reporting



100% Compatible with on-premises databases:
Extend your Data Center beyond the physical boundaries …

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Exadata Cloud Service

1 Introduction

2 Service Details

3 Provisioning: Exadata Cloud Instance

4 Provisioning: Database Service

5 Using Exadata Service

6 Summary

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Service Overview

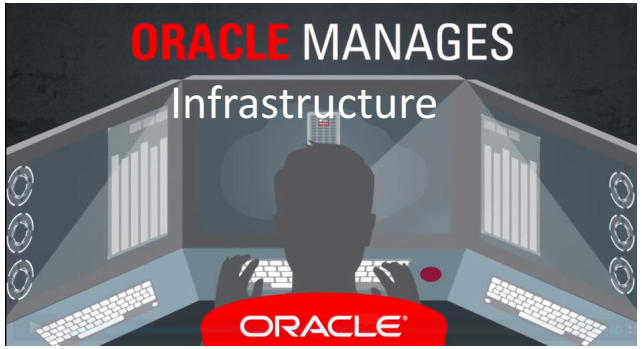
Allocation Unit: Quarter Rack	
OCPUs (min-max) [1]	16 - 68
Total Memory	1/2 TB
PCIe Flash	19.2 TB
Usable Storage[2]	42 TB
Max DB size[3]	16.8 - 33.6TB

- Customer requests Exadata Service on Oracle Cloud Portal
  - Provides system size; Database names, sizes, versions, etc.
  - Pricing is based on Database CPU Cores enabled
- Start with a minimal number of cores within a Quarter Rack
  - Minimum: 16 cores, enable additional cores on demand
  - Access to full 42 TB of storage, 900K IOPs
  - Can expand to 100s of Cores, 100s of TB storage, Millions of IOPs
- Exadata System automatically provisioned for customer
  - Assured hardware resources: no server or storage over-provisioning
- Databases requested by customer prebuilt and ready to run
  - Oracle Database and Exadata software includes all options and features
  - Oracle Database 11.2.0.4 or 12.1.0.2, Grid Infrastructure 12.1.0.2
  - Self-service UI for backup, database updates, upgrade and creation
- Instance Provisioning and Lifecycle Management via UI or REST API

1. *OCPU = Oracle CPU = 1 usable compute core*
2. *After high-redundancy mirroring, but before database compression*
3. *After provisioning DATA and RECO disk groups, actual space depends on space needed for local backups*

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

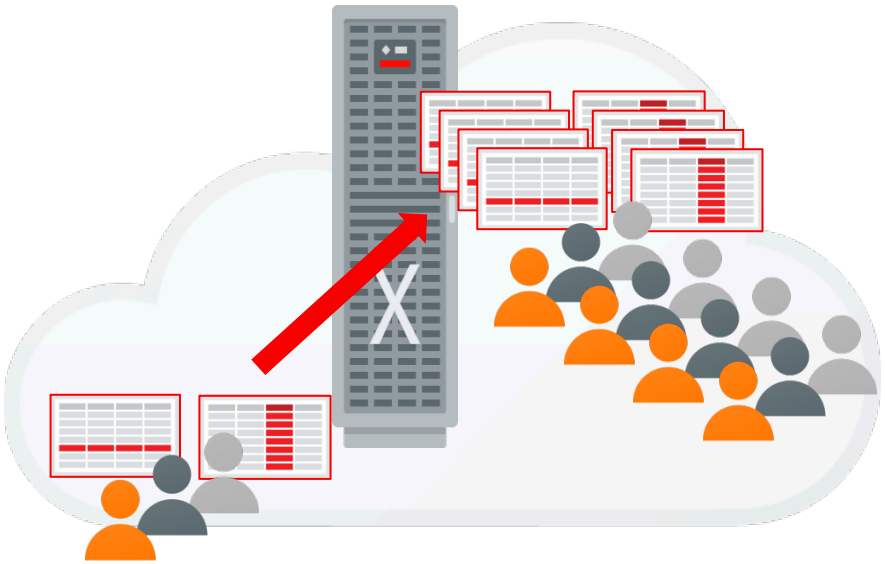
Management & Maintenance



- Customers control and manage software that directly affects their application
  - Database, OS, Clusterware
- Oracle manages underlying infrastructure
  - Facilities, servers, storage, storage software, networking, firmware, hypervisor, etc.
- Customers have administrator privileges for compute VMs and databases so they can configure and run the system as they like
  - Customers initiate automated database update script when it is convenient for them
  - Can be run rolling across nodes to avoid database downtime

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Lifecycle Management



- Self-service to apply Quarterly Updates
  - Database and Grid Infrastructure Updates
- I/O Resource management
  - Prioritize I/O resources among multiple databases
- Elastically scale resources up and down
  - Scale OCPUs up and down dynamically
  - System expansion options: Quarter Rack → Half Rack → Full Rack
  - Elastic Expansion by individual DB or Storage server coming in a future update
- Configure backup policy
  - Weekly full, daily incremental

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Access and Security

- Secure Access from on-premises clients
  - SSH Tunnel, Secure SQL*Net
  - IPSec VPN
  - Source IP Whitelisting
- InfiniBand partition per tenant for complete isolation
- Databases encrypted by default
- VM isolates hardware from tenant
- 3 Physical Networks
  - Client Network – Application Connectivity
  - Admin Network – For Database Admins (SSH enabled)
  - Backup Network – Separate network for DB backup traffic
- Low Latency network connectivity from Mid-Tier/App Tier in Oracle Cloud

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

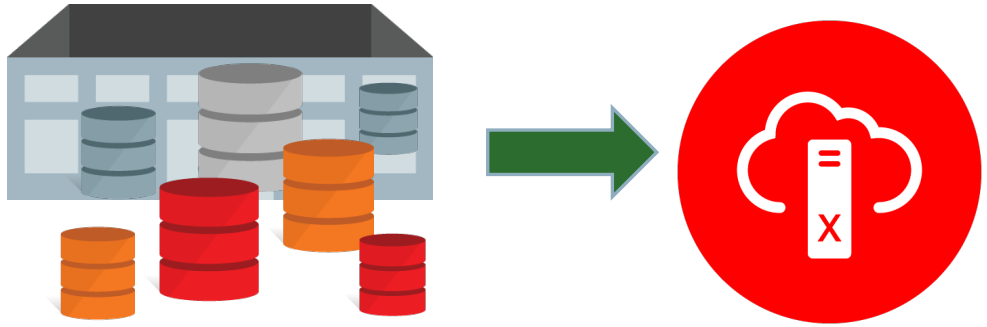
High Availability and Backup & Recovery

- Integrated Exadata Maximum Availability Architecture features and practices
  - Full data protection, consistency, transactional isolation
  - Fully active RAC cluster
  - ASM High Redundancy
  - Redundant InfiniBand and Ethernet networks
  - Data Guard to a standby database in the Cloud
- Cloud backup with Oracle Database Backup Cloud Service
  - Low Cost
  - Default frequency: weekly full, daily incremental,
- Fast Recovery Area (FRA) on Exadata for local on-disk RMAN backups

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Options for Migrating Databases to Cloud

- 100% Oracle Database compatibility makes migration easy and low risk
- Logical Migration: allows reorganization and optimization
  - Data Pump, GoldenGate Replication
- Physical Migration: simplest, byte-to-byte copy
  - RMAN backup, Transportable technologies, Data Guard
  - Restore from backup on Oracle Public Cloud
- Data Movement Options:
  - Use public internet
  - Private high bandwidth virtual network (FastConnect)
  - Data Transfer Services
- MAA Migration Best Practices "Best Practices for Migrating to Exadata Database Machine"



Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Exadata Cloud Service

1. Introduction
2. Service Details
3. Provisioning: Exadata Cloud Instance
4. Provisioning: Database Service
5. Using Exadata Service
6. Summary

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Summary: Oracle Database Exadata Cloud Service

Best Database on Best Cloud Platform

- **100% Compatibility (Hybrid Cloud)**
  - No application & data model changes
  - Data moves back and forth seamlessly
  - Run any infrastructure component in any location
- **All Database Workloads in one Unified Cloud Service**
  - Analytics, data warehousing, OLTP, consolidation, mixed-workloads
  - No need to use distinct cloud platforms for distinct workloads
- **Serious Infrastructure for Serious Databases**
  - Ideal Database hardware, not commodity servers and storage
  - Exadata unique innovations for performance, availability and security
  - Dedicated platform – no over-provisioning, noisy neighbors, etc.

ORACLE

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

For More Information

cloud.oracle.com/database

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |

Integrated Cloud

Applications & Platform Services

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. |


ORACLE®