Deploying Oracle Database with Exadata

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Oracle Exadata Cloud Services
Safe Harbor Statement

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Exadata Cloud Service

1. Introduction
2. Service Details
3. Provisioning: Exadata Cloud Instance
4. Provisioning: Database Service
5. Using Exadata Service
6. Summary
Exadata: Investment Protection Across any Deployment

100% Compatible, No Application Changes

- Exadata X6
- Exadata Cloud Service
- Exadata Cloud Machine

X6-2 X6-8

On-Premises
Exadata Cloud Service @ Oracle
Exadata Cloud Service @ Customer
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
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**
Exadata Cloud: Compatible – Scalable – Available – Secure
Decades of Database Innovation Proven at Millions of Mission-Critical Deployments

<table>
<thead>
<tr>
<th>All Oracle Database Innovations</th>
<th>All Exadata DB Machine Innovations</th>
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<td>Multitenant</td>
<td>Offload SQL to Storage</td>
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<tr>
<td>In-Memory DB</td>
<td>InfiniBand Fabric</td>
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<td>Real Application Clusters</td>
<td>Smart Flash Cache, Log</td>
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<td>Active Data Guard</td>
<td>Storage Indexes</td>
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<tr>
<td>Partitioning</td>
<td>Columnar Flash Cache</td>
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<td>Advanced Compression</td>
<td>Hybrid Columnar Compression</td>
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<td>Real Application Testing</td>
<td>Network Resource Management</td>
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<td>Advanced Analytics, Spatial and Graph</td>
<td>In-Memory Fault Tolerance</td>
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<td>Management Packs for Oracle Database</td>
<td>Exafusion</td>
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<td>Direct-to-Wire Protocol</td>
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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...
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Service Overview

- 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

**Allocation Unit: Quarter Rack**

<table>
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<tbody>
<tr>
<td><strong>OCPUs (min-max)</strong> 1</td>
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<tr>
<td><strong>Total Memory</strong></td>
</tr>
<tr>
<td><strong>PCIe Flash</strong></td>
</tr>
<tr>
<td><strong>Usable Storage</strong> 2</td>
</tr>
<tr>
<td><strong>Max DB size</strong> 3</td>
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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*
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
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
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
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
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”
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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.
For More Information

cloud.oracle.com/database
Integrated Cloud
Applications & Platform Services