ORACLE Platinum Partner
Specialized

Introduction to the Oracle Database Appliance

NYOUG

12/13/2011

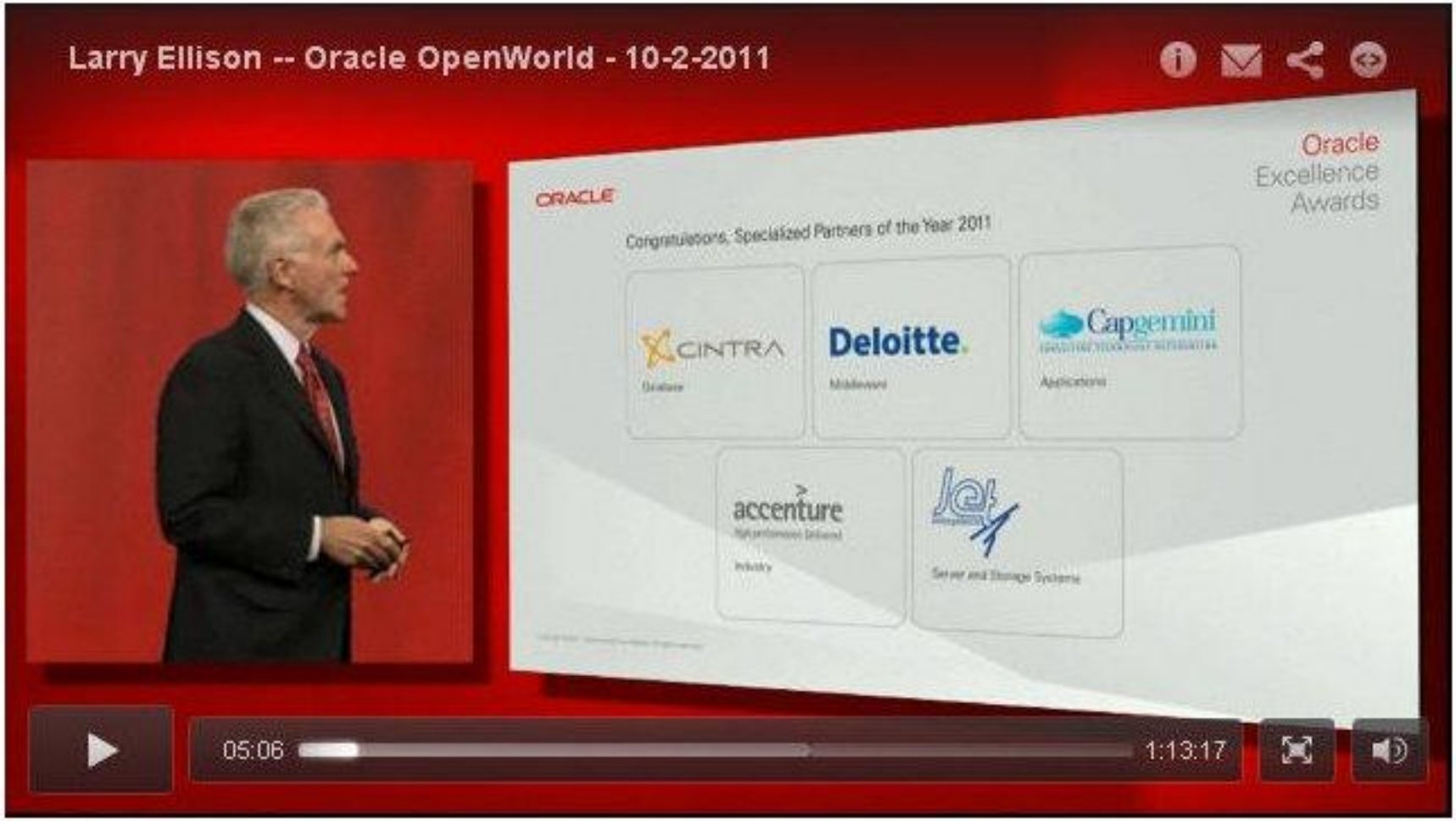
CINTRA

2011 Winner Oracle Excellence Award

ORACLE PARTNERNETWORK
2011 ORACLE TITAN AWARD
NORTH AMERICA

ORACLE

2011 Oracle Global Partner of the Year for Database



Featured Keynote Highlight

Cintra Credentials

- **Oracle Global Database Partner of the Year 2011**
- **Oracle Titan Award Winner Database and Clustering 2011**
- **Oracle Platinum Level Global Partner**
- **Oracle Pillar Partner – Platform and Grid**
- **Oracle Specializations & Certifications**
  - Oracle Database 11g
  - Oracle Performance Tuning
  - Oracle RAC
  - Oracle GoldenGate Replication
  - Oracle Business Intelligence Enterprise Edition
  - Oracle Enterprise Linux

ORACLE Platinum Partner
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Oracle Database

ORACLE Platinum Partner
Specialized
Oracle Database 11g
Performance Tuning

ORACLE Platinum Partner
Specialized
Oracle Real Application
Clusters

ORACLE Platinum Partner
Specialized
Oracle GoldenGate

ORACLE Platinum Partner
Specialized
Oracle Linux

ORACLE Platinum Partner
Specialized
Oracle Business Intelligence
Foundation

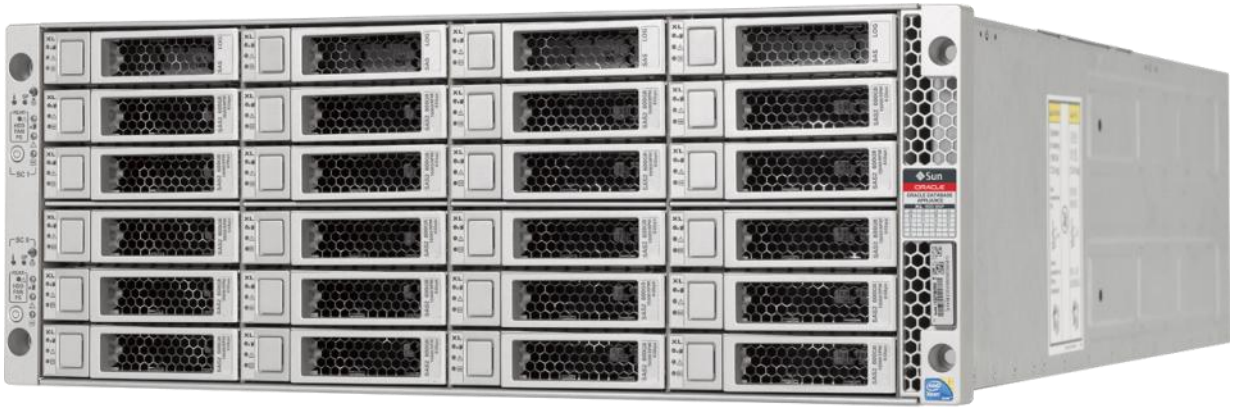
Why Engineered Systems / Appliances ?

- **High Performance**
  - Fastest execution of mission critical transactions
  - Innovation delivered faster
  - Better reliability and security
- **Low Cost**
  - Shorter deployment times
  - More efficient use of HW and SW resources
  - Lower cost of management and upgrade
- **Agility**
  - Quickly adapt to changing business imperatives
  - Reduced change management risk
  - Manage spikes in demand without maintaining excess capacity

Oracle Database Appliance – aka the ODA

Overview

- **Simple, quick, complete, affordable, HA Cluster Database System in a single box**
- Power of Oracle Engineered for Extreme Simplicity



Engineered for Performance

Oracle Database Systems Family

Engineered for Simplicity

Database Appliance

2 to 12 Cores (Single Instance)

4 to 24 Cores (Clustered)

Cores can be disabled

12 TB Storage

292 GB Flash for Redo Logs

One Click Deployment, Patching, and Support

Exadata Quarter Rack

24 Database Cores

3 Exadata Storage Servers

72 TB Storage

1.1 TB Smart Flash Cache

Smart Scan

Hybrid Columnar Compression

Fully Expandable

Database Appliance

24 cores

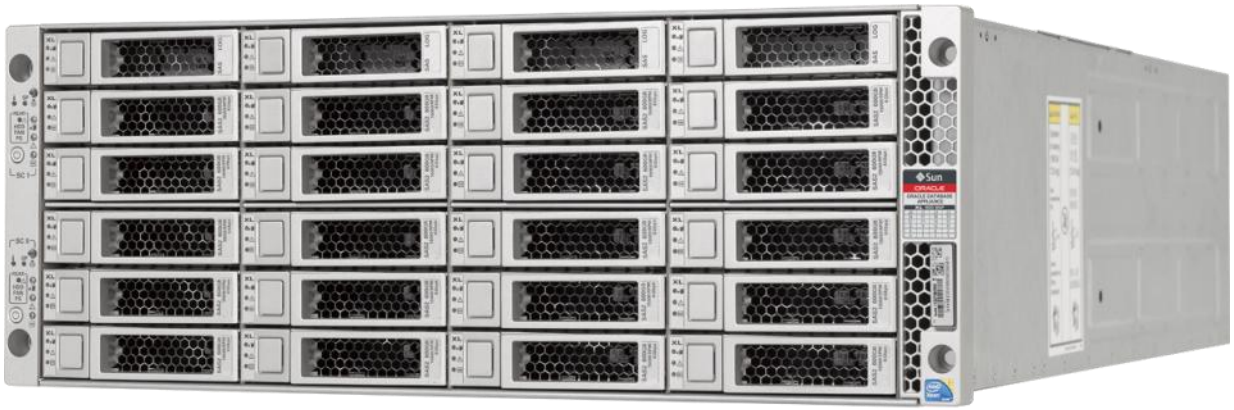
4 cores

PERFORMANCE HIGHER

CAPACITY HIGHER

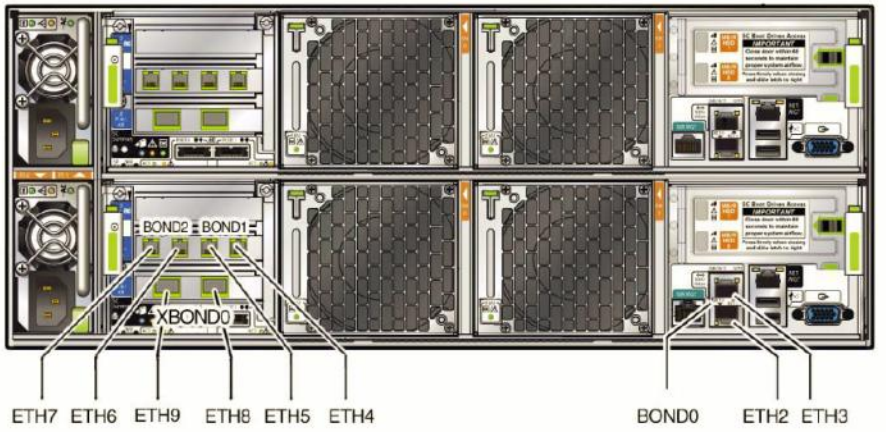
Oracle Database Appliance

- **Extreme simplicity** – one-button implementation & patching
- **Pay-As-You-Grow licensing** – most cost-effective entry point for Oracle Database Enterprise Edition, aligns to budget cycles
- **Complete and integrated** system for Single Instance (Enterprise Edition), RAC One Node, and RAC



Oracle Database Appliance Chassis

FRONT VIEW

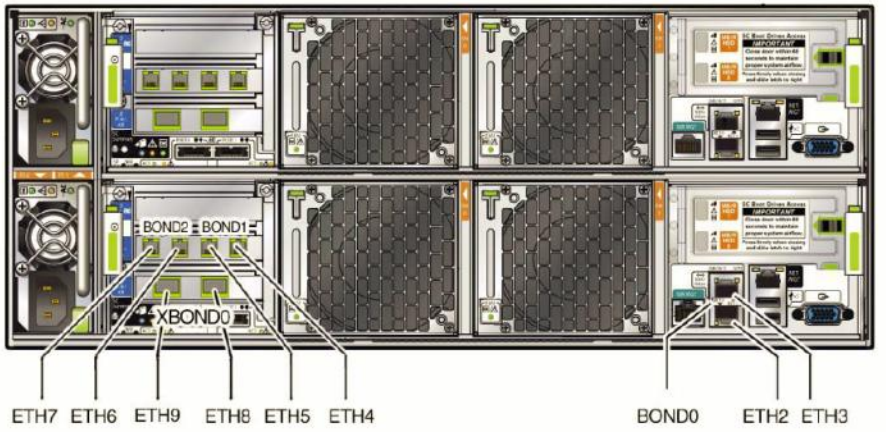


REAR VIEW

- 4U Redundant Storage Server
- 2 System Controllers (SC)
  - 2x Intel Xeon X5675 per SC (6 core, 3.06 GHz) "Pay As You Grow"
  - 96 GB memory per SC
  - 2x 500GB Boot Disks in back of server
  - USB flash port w/ factory image
- Shared Disk
  - 12 TB RAW, 4 TB Usable
  - 24 x 3.5" dual-ported SAS/SATA/SSD disk slots
    - 20x 600GB 15K RPM SAS
    - 4x 73 GB SSD for redo logs
  - SAS disks triple mirrored, SSD double mirrored

Oracle Database Appliance Chassis

FRONT VIEW



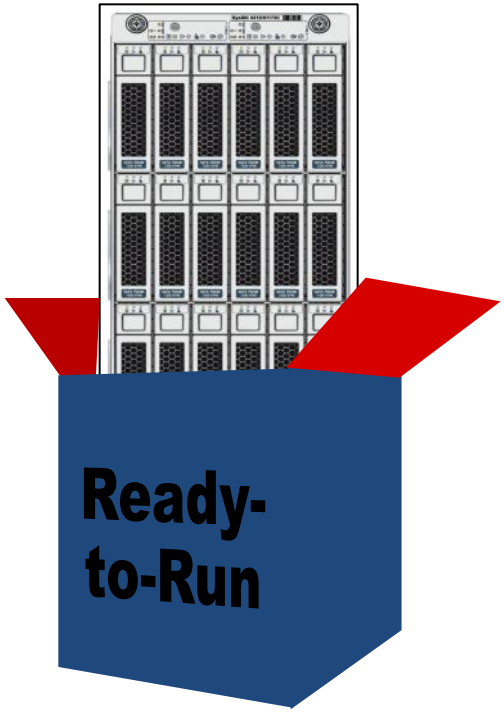
REAR VIEW

- Networking
  - 4x 1GbE (external - public) per SC
  - 2x 1GbE (external – public) per SC
  - 2x 1GbE (internal - interconnect) for SC-to-SC
  - 2x 10GbE (external - public) per SC
  - All public ports bonded into dual pairs for aggregated bandwidth and failover
  - Service Processor:
    - 1x serial, 1x 1GbE, 1x VGA per SC
- RAS Features
  - Triple Mirroring on disks
  - Redundant backplane power
  - Hot swap SN modules, fans, disks, power supplies

ODA Hardware – Why this configuration

- Westmere 6 Core 3.06 Ghz Processors per node
  - Good balance of CPU power and core count
  - Able to configure 2 cores all the way up to 24 cores
- Triple Redundant Storage Configuration on 600GB SAS drives
  - Drives are typically delivered from the same batch which tend to fail at the same time, therefore disk failures are typically correlated
- Double Redundancy on 72GB SSD Drives
  - Less likely to fail due to no moving parts

Extreme Simplicity



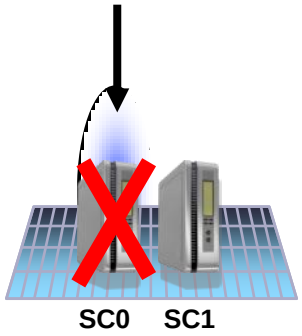
- **Easy to Implement**
  - One box: server, storage, networking
  - One button installation of software
- **Easy to manage & maintain**
  - One button patching
  - Self-managing storage
  - Auto-detects and auto-corrects
- **Easy to diagnose and support**
  - Automated Service Request filing *(phone home)*
  - Relevant logs gathered and packaged for support

The Full Oracle Software Stack

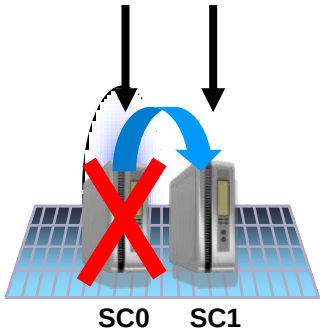
- Oracle Linux 5.5 running the standard kernel
- Choice of Oracle Database EE, RAC or RAC One Node (11.2.0.2)
- Oracle Grid Infrastructure 11g Release 2 (11.2.0.2)
  - Oracle Clusterware
  - Oracle Automatic Storage Manager
- Oracle Enterprise Manager Database Control

- Oracle Automatic Service Requests (Phone home)
- **Oracle Appliance Manager**
  - **One Button Automation for Provisioning, Patching, Diagnostics, and Storage Management**

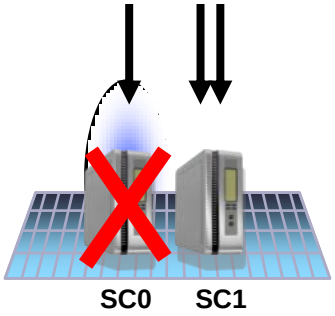
Deployment Scenarios



- Single Instance
  (Oracle Database Enterprise Edition)
- Runs on one node
- Automatic restart



- Single Instance
  (RAC One Node)
- Runs on one node
- Passive failover on failure



- Cluster database
  (RAC)
- Active failover on failure

Oracle Appliance Manager

The Secret Sauce For Simplicity

- Provides One Button functionality to easily install, manage, maintain & validate the system.
- Performs discovery of the storage subsystem.
- Monitors disks for hard & soft failures.
- Recovers ASM disk groups on shared disk failure.
- Automates procedures after remove/replace disks

Oracle Appliance Manager

The Modules

- Configurator Module
- Deployment Module
- Storage Management Module
- Patching Module
- Validation & Diagnostic Tools Module

OAM simplifies and automates much of the administration !!

Oracle Appliance Manager

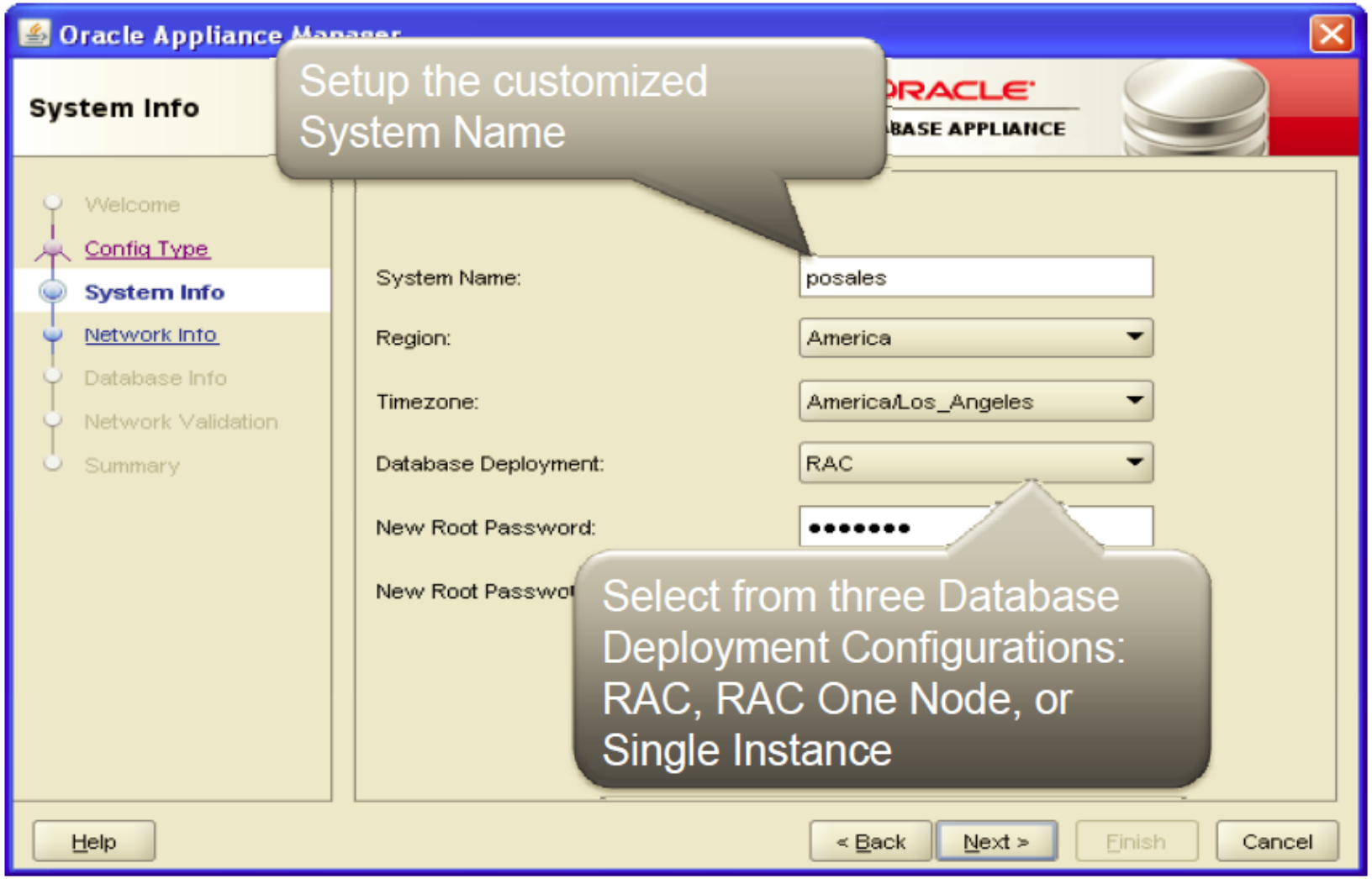
Configurator Overview

- Hides the complexity of setting up the cluster
- GUI-based enquiry to collect configuration information
  - Cluster Name
  - Domain
  - Networking Information
  - Database Size
- Validates gathered information
- Configures OS & Networks
- Deploys the Grid Infrastructure & Database

OAM simplifies and automates much of the administration !!

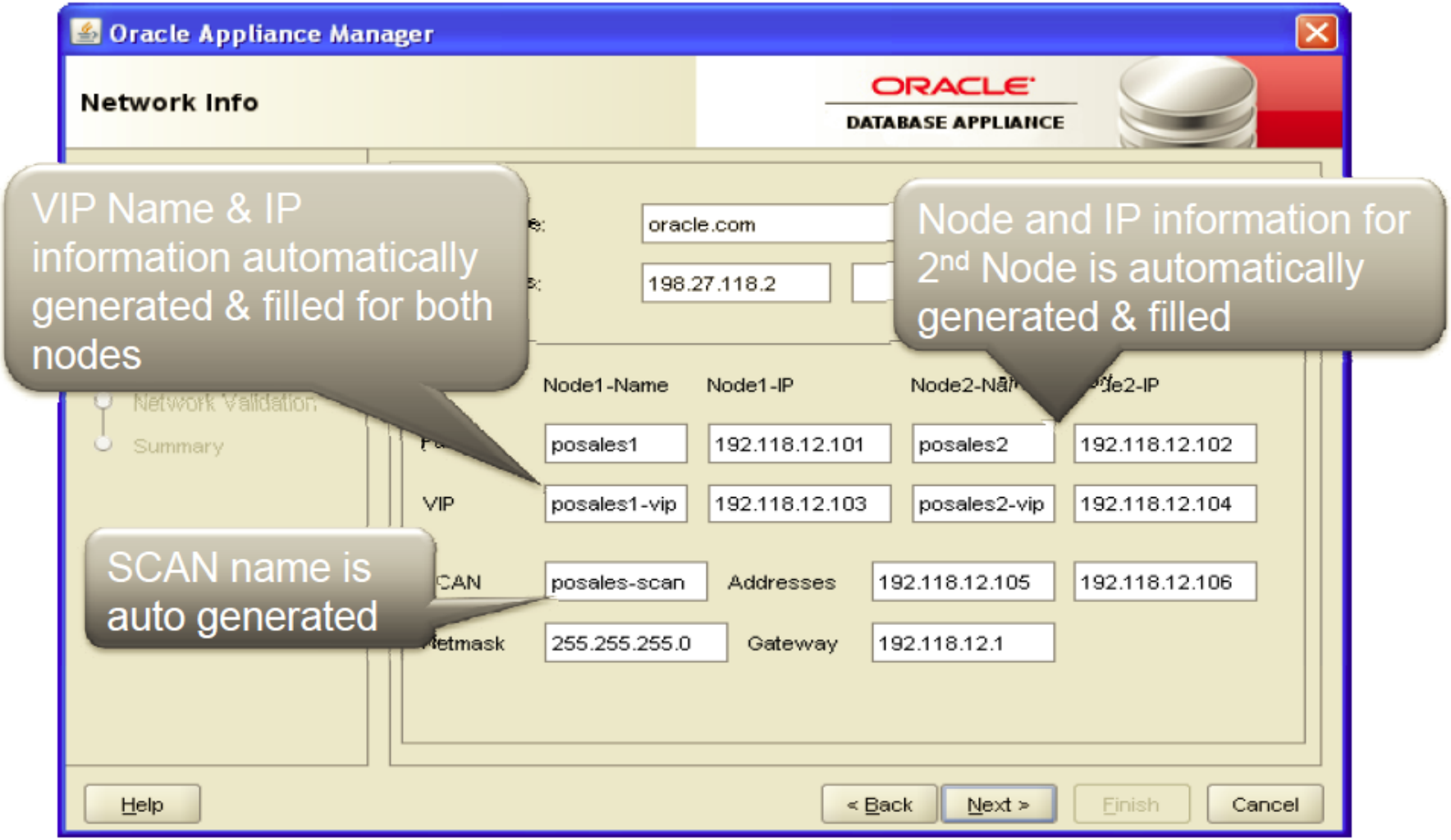
Oracle Appliance Manager

Configurator Sample Screen 1



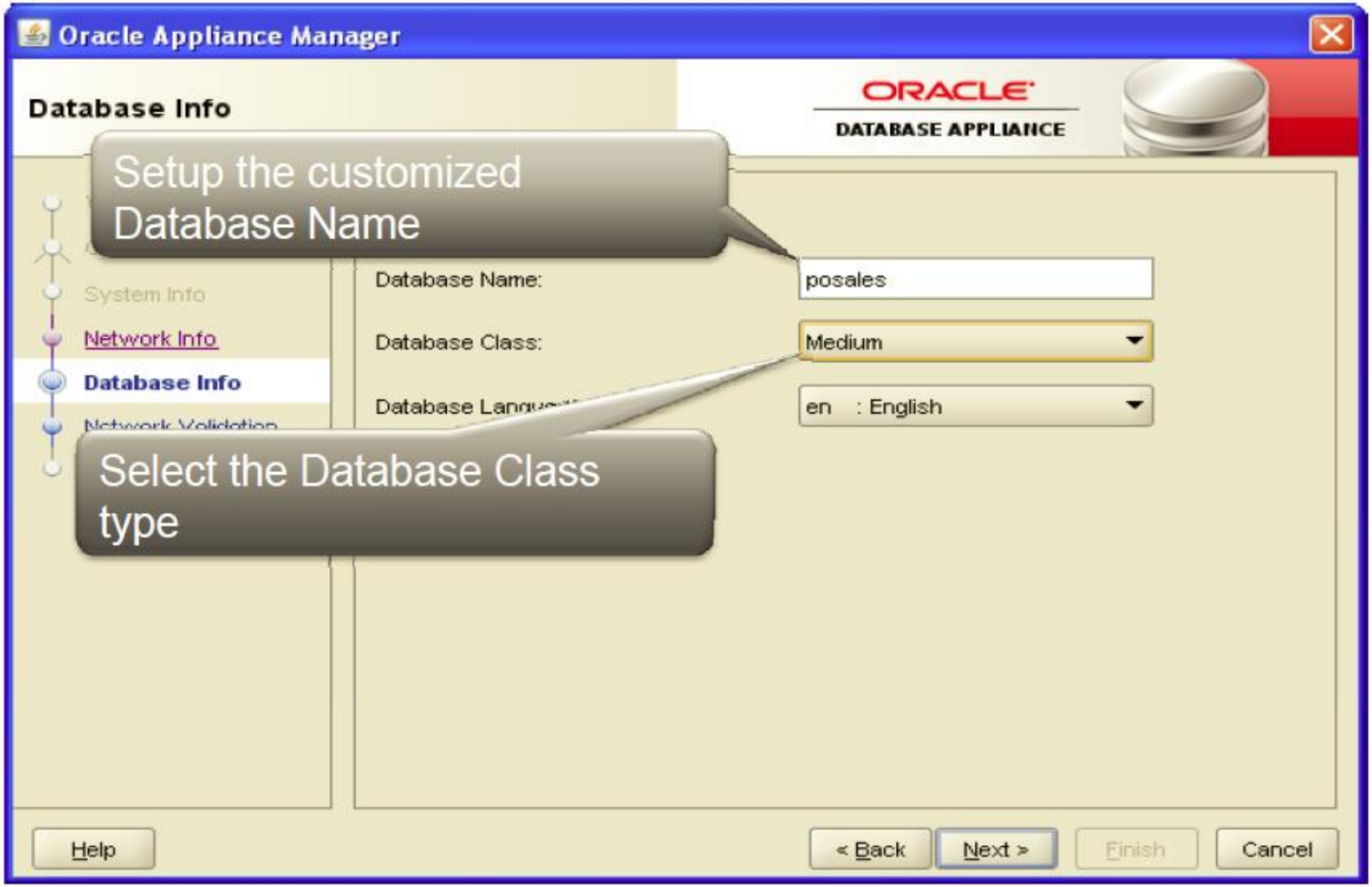
Oracle Appliance Manager

Configurator Sample Screen 2



Oracle Appliance Manager

Configurator Sample Screen 3



Oracle Appliance Manager

Deployment Module

- Deploys OS, Oracle Appliance Manager, Grid Infrastructure & Database
- Configures GI & RDBMS (Oracle Database)
- Ensures correct configuration of disks & networks
- Consistent implementation of known Best Practices
- Configures optimal disk layout for ASM
- Performs initial configuration of disks & ASM DG(s)

OAM simplifies and automates much of the administration !!

Oracle Appliance Manager

Storage Management Module

- Oracle Appliance Manager Daemon (oakd) is started during boot
- Discovers storage subsystems
- Tracks configuration by storing metadata
- Monitors status of disks
- Generates alerts on failures
- Takes corrective action on appropriate events
- Interacts with ASM for complete automation

OAM simplifies and automates much of the administration !!

Oracle Appliance Manager

Patching Module

- Patching Module provides tools to patch OS, Oracle Application Manager Modules, Grid Infrastructure (GI), RDBMS
- Provides a single interface and command to patch all the components including OS, firmware, BIOS, GI, and RDBMS
- Patching Module will update the repository to reflect the newly installed patches and firmware's
- Bundle Patches for all components that is to be patched.

OAM simplifies and automates much of the administration !!

Oracle Appliance Manager

Validation & Diagnostic Tools Module

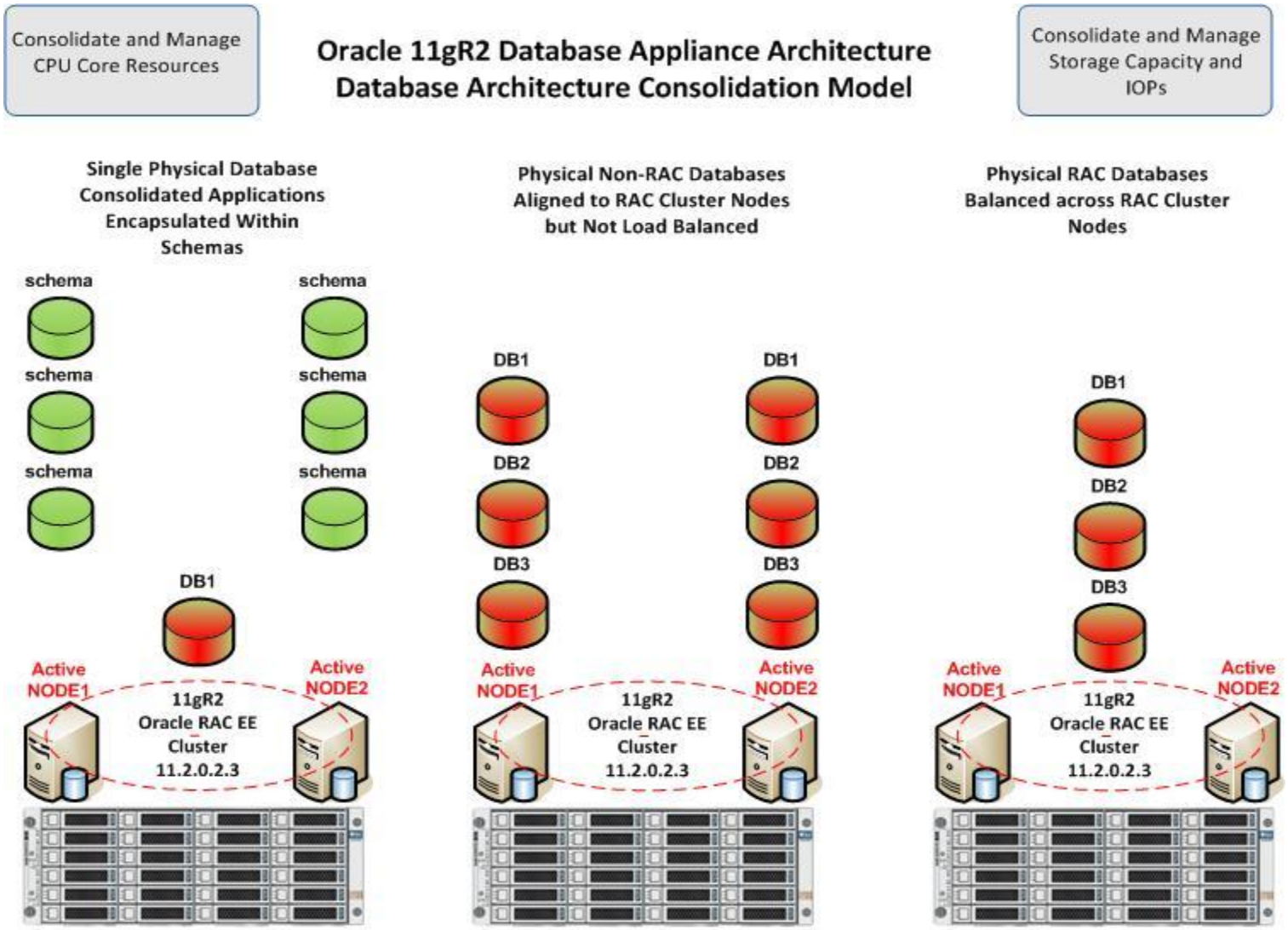
- A set of tools for validation & diagnostics
- Validation tool provides detailed information about the components – both HW & SW
- Diagget tool collects all the diagnostic information and can be used when experiencing problems.
- Healthcheck can be used to check the health of OS, DB, Clusterware, and other Oracle Database Appliance components to ensure they are health and functional optimally.

OAM simplifies and automates much of the administration !!

Oracle Database Appliance Benefits

- **Rapid Deployment**
  - Deploy a highly available platform in days not weeks or months
- **High Availability**
  - Increase overall availability for applications that previously couldn't justify a costly enterprise architecture
  - Provide ZERO downtime redundancy and SLA
- **Performance**
  - Benefit from RAW device storage performance with ASM
  - Benefit from Redo Log SSD Optimization providing measurable performance increases in write heavy transactions
- **Consolidation**
  - Upgrade and consolidate any Oracle version to the ODA 11gR2
  - Consolidate to a single instance database or many independent instances.

Oracle Database Appliance Consolidation



Migration to the Oracle Database Appliance

- **Non Oracle Database Sources**
  - Traditional logical migration path from non-Oracle RDBMS to Oracle 11gR2
  - Using GoldenGate, Data Load or ETL tools
- **Logical Migration from older Oracle Versions**
  - Traditional Export and Import or Datapump Export and Import
- **Physical Migration paths to the ODA**
  - RMAN backup and restore for compatible platforms and Oracle Versions
- **Minimal or near zero downtime migrations**
  - RMAN & Standby Database for minimal downtime migrations
  - GoldenGate for Zero Downtime migrations

Integrating to the real world data center

- **Backups**
  - RMAN Backups to an internal FRA
  - RMAN Backups to network location via NFS
  - RMAN Backups using Approved RMAN Agents to external tape media
  - Oracle will be publishing a WHITE LIST of approved backup agents
- **Oracle Enterprise Manager 11g or 12c**
  - Enable management and monitoring for the complete stack with Oracle Enterprise Manager
- **System Monitoring**
  - Enable Linux SNMP for external monitors such as PRTG
  - Oracle will be publishing a WHITE LIST of approved monitoring agents

What you cannot do with the Appliance

- Hardware configuration cannot be modified other than core count
- Cannot attach directly to another SAN using Fiber
  - Therefore internal storage cannot be extended for more capacity
  - However, Advanced compression can extend usable capacity to 10Tb
- Cannot change ASM level triple redundancy
- Cannot support any older version of Oracle other than 11gR2

Oracle Appliance Manager: Core Sub Capacity

Pay-As-You-Grow: CPU Cores on Demand Providing License Cost Control

- ***A FEATURE ONLY AVAILABLE FROM ORACLE***
- CPU cores on demand allows users to enable only the cores they need from as few as 4 cores to as many as all 24 cores (in increments of 4)
- Both system controllers must have the same number of enabled cores (Each SC has 2, 4, 6, 8, 10, or 12 cores enabled)
- System ships with all 24 cores enabled – there is no need to do anything if running at full capacity
- To configure for sub-capacity
  - Log onto MyOracleSupport
  - Declare configuration for servers
  - Download encrypted key to reconfigure servers
  - Run CLI to reconfigure server in BIOS and system will reboot
- Once configured for sub-capacity, core count can only increase in subsequent reconfigurations
- Customer responsible to ensure proper number of licenses owned

Pay As You Grow for High Availability

Performance HIGHER

Small – 4 Cores

4 Cores Active

High Availability

DB + RAC License $141K
Hardware $50K

Installation & Setup

Medium – 16 Cores

ACTIVATE 12 Additional Cores
High Availability

Total DB + RAC License $ 564K

No Additional Hardware or Services Required

High – 24 Cores

ACTIVATE 12 Additional Cores
With High Availability

Total DB + RAC License $846K

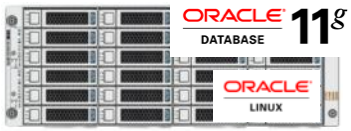
No Additional Hardware or Services Required

Automated License Expansion

Capacity HIGHER

Pay As You Grow for High Availability

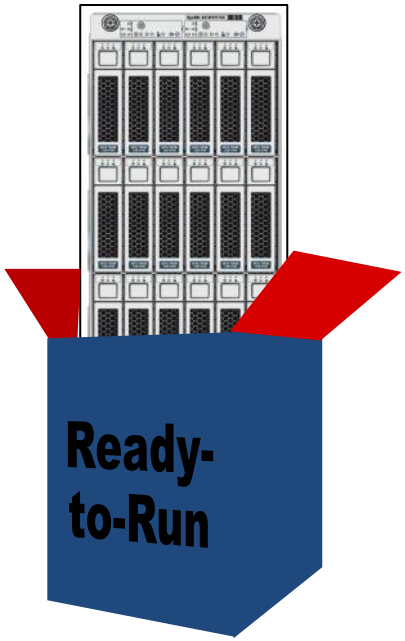
Start Small HA – Pay As You Grow

	HP	DELL	ORACLE
			
System Configuration	2 x DL380 G7 & P2000 storage (6+6 cores)	2 x R710, MD3200 & MD1200 storage (6+6 cores)	Oracle Appliance (24 cores total, 2+2 cores active)
HW Price	~$50K	~$50K	$50K
DB EE + RAC License	$423K	$423K	$141K
Total Cost	**$473K**	**$473K**	**$191K**

Oracle Database Appliance Use Cases

- Requirement for immediate deployments – from order to delivery in less than one week
- Consolidation of databases
- Standardization across Dev/Test, Prod and DR
- Data Warehousing and Data Marts
- Branch offices and Remote Data Centers
- To control Oracle costs for multi-core deployments

Oracle Database Appliance



EXTREME SIMPLICITY

Best Machine For

- Reducing Complexity
- Reducing Cost
- Reducing Risk

Cintra Services for Oracle Database Appliance

- ODA Architecture Assessment for Oracle Database Appliance Adoption
- ODA Quick Start Deployment
- ODA Database Upgrades to 11gR2 and Migration Services
- ODA Database Backups using RMAN
- ODA Grid Control Monitoring with Diagnostics and Tuning Packs
- ODA Disaster Site Replication using Data Guard
- ODA Advanced Compression for more data storage and performance
- ODA GoldenGate Integration and Zero Downtime Migrations

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