Engineered Solutions from Oracle – the new era of IT

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Engineered Systems
Discussion points

- The future according to IDC
- Datacenter Transformation Trends
- Oracle’s (R)Evolutionary Approach
  - Best of Breed System Elements
  - Optimized Solutions
  - Engineered Systems and Appliances
Third Platform for Industry Growth

Intelligent Economy

Trillions of "Things"
Billions of Users
Hundreds of Millions of Users
Tens of Thousands of Apps
Millions of Apps

PC
LAN/Internet
Client-Server

Mobile Devices
Mobile Broadband
Social Business
Big Data/Analytics
Cloud Services

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New Realities & New Paths

Next-Gen Solutions

most new solutions will be “Vertical”
Major Datacenter Trends

**Goals:**
- Specialized Datacenter Design
- Public Cloud Services
- Private Cloud

**Considerations:**
- Security and Availability
- Feature Sets
- Integration with On-premise

**Goals:**
- Public Cloud Services
- Private Cloud

**Considerations:**
- Legacy infrastructure
- New SW and support
- Organization impact
- Management tools
- New Processes

**Goals:**
- Pooled resources
- Faster deployment
- Improved Service
- Increase Performance, Security, and RAS

**Considerations:**
- CapEx
- Deployment Risk
- Large “sunk cost”

**Goals:**
- Large OpEx Reduction
- Extreme Performance
- Extreme Efficiency

**Considerations:**
- Rapid Deployment
- Pay as You Go
- Minimal Capex
Datacenter Today

Enormous complexity

Management Tools

Management Tools

Management Tools

Management Tools

Management Tools

Oracle

Red Hat Enterprise Linux

VMware

HP

Brocade

EMC/NetApp

Custom Integrated
Transforming the Datacenter

- Best-of-Breed System Elements
- Optimized Solutions
- Engineered Systems

- Value Added Custom Deployment
- Predictable, Lower Risk Guided Deployments
- Massively Simplified Turn-key Deployments
Unique Advantage of Oracle on Oracle
Engineered Systems & Appliances

Purpose Built

Exadata
Exalogic
Big Data Appliance

Database Appliance
Exalytics

General Purpose

SPARC SuperCluster

Oracle 11g
Oracle Solaris
Oracle Fusion Middleware
Oracle Optimized Solutions
Oracle’s Engineered Systems
Oracle Exadata Database Machine
Transaction Processing, Data Warehousing, Consolidation

- **Fastest** Data Warehouse & OLTP
- **Best Cost/Performance** Data Warehouse & OLTP
- Optimized Hardware (per rack)
  - Processor: up to 128 Intel Cores and 2 TB DRAM
  - Network: 880 Gb/Sec Throughput
  - Storage: 5 TB Flash and up to 336 TB Disk
- Software Breakthroughs
  - Exadata Smart Storage Grid
  - Smart Flash Cache
  - Hybrid Columnar Compression
  - Parallel Scale-Out Database and Storage
- Scales from ¼ Rack to 8 Full Racks
Oracle Exadata
Extreme Performance at Lowest Cost

- Lower data center costs through consolidation
- Store up to ten times more data
- Search data up to ten times faster
- Make more-informed business decisions in real time
- Speed time-to-market for new products and services
- Mitigate deployment risks
EXADATA
powered a passenger jet
it would fly from New York to Paris IN 42 MINUTES
CARRYING 5,000 PASSENGERS
Oracle Exalogic
Transaction Processing, Consolidation

- **Fastest** Java, C, C++ Applications
- **Best Cost/Performance** Java, C, C++ Applications
- Optimized Hardware
  - Processor: 96-360 Intel Cores; 2.8 Terabyte DRAM
  - Network: 880 GB/Sec IO Throughput
  - Storage: 4TB Flash; 40 TB Disk
- Software Breakthroughs
  - Exa-Bus High Performance Messaging
  - Parallel Workload Scheduling
  - Dynamic Workload Balancing
  - Transaction Affinity with Database
  - Built in Application & Network Isolation
Oracle Exalogic Elastic Cloud
Maximum Application Performance and Efficiency

- Extreme performance for JAVA Applications
- Extreme performance for Oracle Applications
- Best foundation for Cloud
- Mitigate deployment risks and costs
Oracle Exalogic
Exalogic and Exadata together

- High speed Infiniband communication
- 4X better throughput; 3X better latency
- **Transaction affinity** with Oracle Database
- Parallel scheduling and dynamic prioritization
New | Oracle Database Appliance

• Simple to implement
• Designed and priced to scale
• Performance improves as you scale
• Highest levels of serviceability
• Highest availability for this class of machine
New Oracle Database Appliance

- **Simple**
  - Complete, plug-and-go hardware and software
- **Reliable**
  - Highly available database cluster configured in minutes
  - Advanced management features and single vendor support
- **Affordable**
  - Capacity on pay-as-you-grow basis
  - Consolidation platform for small databases
Oracle Database Appliance
Fully Redundant Hardware, Highly Reliable Software

- 2 x dual-socket Oracle Linux servers
  - 24 Intel Xeon processor X5675 cores
  - 192 GB main memory
- 12 TB raw disk storage
- 292 GB solid state storage
- Built-in redundancy
  - Server, storage, network, power and cooling
- Oracle Database 11g Enterprise Edition
- Oracle Real Application Clusters
- Oracle Appliance Manager software
  - Phone home automatic service requests
New | Exalytics

BI Foundation Suite: OBIEE
In-Memory Parallel Analytics
In-Memory Parallel Essbase
In-Memory Parallel TimesTen

- BI Query reporting:
  Exalytics on Oracle Database: 18X response time improvements
- BI Query reporting:
  Exalytics on Exadata Database: 23X response time improvements
- OLAP Planning:
  Exalytics on Essbase running EPM Application: 16X improvements in Essbase response times
New Oracle Exalytics Business Intelligence Machine

Extreme Analytics

• World’s First Business Intelligence Machine
  – Optimized BI Foundation Suite
  – In-memory analytics software
  – In-memory hardware
  – Proven technology

• Extreme Performance
  – 20x faster analysis
  – 16x faster what-if and forecasting
  – 23x faster with Exadata

• Real-Time Visualization

• Works with Existing Data Sources, Exadata and Hyperion EPM Apps
Oracle Exalytics BI Machine Hardware

RAM Machine

• Memory
  – 1 TB RAM, 1033 MHz

• Compute
  – 4 Intel® Xeon® E7-4870, 40 cores total

• Networking
  – 40 Gbps InfiniBand – 2 ports
  – 10 Gbps Ethernet – 2 ports
  – 1 Gbps Ethernet – 4 ports

• Storage
  – 3.6 TB HDD Capacity
Analyze Any and All Data Sources
Relational, Multidimensional, Unstructured in any Combination
New Oracle Big Data Appliance
Big Data for the Enterprise

- Engineered System to Acquire, Organize, Analyze “Big Data”
- Super-Fast – Massively Parallel Processing & Loading into Oracle
- Complete – Software engineered with Hardware
Oracle Big Data Appliance Hardware
Super-Fast Data Processing & Loading into Oracle Database

• Compute
  – 2 CPUs (6-core Intel) per node, up to 216 cores total
• Storage
  – 12 x 3 TB HDD capacity, up to 648 TB raw disk total
• Memory
  – 48 GB memory per node; up to 864 GB memory total
• Networking
  – 40 Gbps InfiniBand – x ports
  – 10 Gbps Ethernet – x ports
New | SPARC SuperCluster

SPARC T4 Compute Pool
10 World Records over IBM and HP across every tier

Exadata Storage Cells
1M IOPS, 32 GB/s query throughput

Exalogic Elastic Cloud
10x Java performance

Integrated ZFS Storage
2x faster and ½ the price of NetApp

Solaris 11
Cloud provisioning in seconds
Unmatched Scalability

Cloud Built-In
Zero virtualization overhead

InfiniBand
5-8x the speed of current networks

Enterprise Manager
Up to 90% reduction of downtime
Oracle’s SPARC SuperCluster

Exadata
- Intelligent Storage Grid
- Hybrid Columnar Compression
- Smart Cache Flash

Exalogic
- Active GridLink for RAC
- Extreme Java Performance
- JDBC over SDP

Solaris 11
- OVM Live Migration
- Oracle Solaris Cluster
- Image Packaging System

SPARC T4
- Smarter, Faster Threads
- Built-in Crypto

ZFS Storage Appliance
- Hybrid Storage Pools
- DTrace Analytics
- Built-in Data Services

Integrated Management
- Enterprise Manager (opt.)
- EM Ops Center (opt.)
- ILOM
Mixed Workload | SPARC Supercluster

1.2M IOPS

- 1,200 CPU threads
- 4 TB DRAM
- 97 to 198 TB Hard Disk
- 8.66 TB Flash
- 42 GB/sec Storage Bandwidth
- 896 Gb/sec Infiniband Interconnect
Exalogic Elastic Cloud Software Vision: Runtime
Improved Consolidation, Management, Performance

Exalogic Elastic Cloud X2-2 Hardware
Virtual Assembly Builder
Oracle VM = Coming Soon

Middleware and Business Applications
- WebLogic (Exabus SDP API)
- Coherence (Exabus Java API)
- Tuxedo (Exabus RDMA API)

Exalogic Elastic Cloud Software
- Exabus
- Exalogic Control

Enterprise Manager
Other Custom Configurations

- Runs Oracle software
- Customer integrates hardware and software
- Error prone and time consuming to deploy
- Support from multiple vendors
  - Hardware
  - Software
  - Operating System

Engineered Systems

- Runs Oracle software
- Oracle integrates hardware and software
- Risk free and quick to deploy
- Support from one vendor
  - Hardware
  - Software
  - Operating System
Business Value of Engineered Systems

- Faster performance
- Higher availability
- Tighter security
- Capital costs
  - Management costs
  - Downtime costs
- Resource management
- Dynamic services
- Shared resources
- Fewer configurations
- Standardize applications
- Standardize Operating System
Systems Architecture Matters

- Standard Materials
- Different Results
Hardware and Software
Engineered to Work Together