Mellanox InfiniBand Solutions Accelerate Oracle’s Data Center and Cloud Solutions

Providing Superior Server and Storage Performance, Efficiency and Return on Investment

As Announced and Demonstrated at Oracle OpenWorld, October 2012
Mellanox Provides the Interconnect Foundation For Oracle

Accelerated and Connected by Mellanox End-to-End InfiniBand Solutions

- Mellanox interconnect solutions provide the foundation for Oracle
  - Clouds, database and Big Data analytics solutions

- Oracle utilizes Mellanox InfiniBand for complete server/storage interconnect
  - To deliver highest performance and efficiency, high-availability and lowest cost of ownership
Oracle Announcing Oracle Cloud

“Interconnected with world fastest network – InfiniBand”
“What we are offering is our OS, our VM, our Compute and Storage services running over Exadata, Exalogic, SuperCluster all connected together with the most modern network, InfiniBand”
Oracle Announcing Exadata Database Machine X3

The Infrastructure of Oracle Public and Private Clouds

Announcing Exadata X3

Database In-Memory Machine

- 26 Terabytes of DRAM and Flash in one Rack
  - Multiple Databases Stored in Memory
  - Ultra High Performance
- 10X Database Compression
  - Store 220 Terabytes Database in Memory
  - Reduce Storage Costs by 10X
- Infrastructure of the Oracle Cloud and Private Clouds
  - High Performance, Redundancy, Reliability
  - Only Pay for What You Use

Accelerated by Mellanox InfiniBand Solutions

- 4X larger Flash Memory
- 20X More Write Performance
- 33% More Data Throughput
- 10% to 40% Lower power
Oracle’s Big Data Solution

Interconnected by Mellanox InfiniBand Solutions
Delivering Performance Interconnect to Oracle Products

- **Exadata (database in-memory machine)**
  - Fault-tolerant storage and server I/O network
  - Linear scalability to multiple compute racks and hundreds of storage servers
  - For enterprise database, cloud database and Big Data analytics solutions

- **Exalogic (cloud computing appliance)**
  - Application performance up to 10X (vs. 10GbE), all I/O over one InfiniBand wire
  - SLA oriented Cloud infrastructure, reliable and secure multi-tenant environment
  - Best support for elastic capacity on demand

- **ZFS (storage over InfiniBand)**
  - 4X to 15X higher performance vs. Fibre-Channel
  - Cuts critical application backup windows in half

- **Exalytics (In Memory Compute)**
  - Business Intelligence Appliance, scalable, high-frequency trading

- **SuperCluster (Data Center in a box)**
  - SPARC T4-4 Servers, Exadata and InfiniBand ZFS Storage
  - 11gR2 & middleware acceleration with virtualization

Mellanox Technology and Solutions are the Competitive Advantage!
THANK YOU
Engineered Systems & Appliances

Cloud Built-in

**Purpose Built**
- Exadata
- Exalogic
- Big Data

**General Purpose**
- SPARC SuperCluster

Oracle Database 11g
Oracle Fusion Middleware
Oracle Exadata

- Best for OLTP
  - Smart Flash Cache
  - 1 Million I/Os per Second
- Best for Warehousing
  - Intelligent Scale-Out storage
  - 10x faster queries
  - 10x Data Compression
- Best for Consolidation
  - Terabytes of Memory
  - Mix OLTP, DW, batch, reporting in single machine

- Complete Ready-to-Run System
- Full database encryption with near zero overhead
- Runs all Oracle Applications unchanged

InfiniBand minimizes latency, maximizes throughput
- 40 Gigabit fault-tolerant storage and server network
- Advanced InfiniBand capabilities for application communication
- Eliminates SAN data bandwidth bottlenecks
Scale Performance and Capacity

- **Scalable**
  - Scales to 8 rack database machine by just adding wires
    - More with external InfiniBand switches
  - Scales to hundreds of storage servers
    - Multi-petabyte databases

- **Redundant and Fault Tolerant**
  - Failure of any component is tolerated
  - Data is mirrored across storage servers
Oracle Exalogic Elastic Cloud

• Fastest Java Performance
  – Application performance improved up to 10X

• Foundation for Mission Critical Cloud
  – Best for application consolidation
  – Best for elastic capacity on demand

• Engineered System
  – Lowest cost to deploy and operate
  – Fastest path to production

InfiniBand provides extreme scale, application isolation and flexibility
  – Lossless server and storage connectivity
  – Provides QoS, isolation, and security
  – RDMA-enabled protocols improve application performance and responsiveness
### Memory
- 1 TB RAM, 1033 MHz

### Compute
- 4 Intel® Xeon® E7-4870 w/ 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
SPARC SuperCluster

Half Rack Configuration

• Networking
  – 3 Sun Network QDR InfiniBand Switches
    (1 spine + 2 leaf)
  – Gigabit Management Switch

• Storage
  – 3 Oracle Exadata Storage Servers with 21 TB High Performance Storage or 72 TB High Capacity Storage
  – Sun ZFS Storage 7320 appliance
    Dual-Controller + 1 Disk Shelf

• Compute
  – 2 Oracle SPARC T4-4 servers
ZFS Storage Appliances
Uniquely Engineered for Exadata Data Protection

- Only system with native end-to-end Infiniband
- Up to 4x faster than using EMC or NetApp for NDMP backups
- Up to 15x more scalable than IBM tape alternative
- Cut critical application backup windows in half
- Only Oracle offers an end-to-end native InfiniBand solution
Why is InfiniBand Useful to Oracle?

- Extremely low latency
  - 10X better than Ethernet
- Much higher bandwidth
  - At least 4X better than Ethernet
- Multiple steps ahead of Ethernet on certain features
  - Lossless nature, resiliency, error recovery, RDMA
- Lower cost/bit compared to Ethernet
- Open standard
- Unified wire and network stack optimization
  - Network, Storage, and Inter-processor communication

Combined with Oracle’s Application-to-Disc optimizations, enables Oracle’s Engineered Systems (Exadata, Exalogic, SPARC SuperCluster)
THANK YOU