Mellanox for Big Data

March 2013

Mellanox TECHNOLOGIES

Connect. Accelerate. Outperform.™

Company Overview

Ticker: MLNX

- Leading provider of high-throughput, low-latency server and storage interconnect
  - FDR 56Gb/s InfiniBand and 10/40/56GbE
  - Reduces application wait-time for data
  - Dramatically increases ROI on data center infrastructure

- Company headquarters:
  - Yokneam, Israel; Sunnyvale, California
  - ~1,160 employees* worldwide

- Solid financial position
  - Record revenue in FY12; $500.8M
  - Q1’13 guidance ~$78M to $83M
  - Cash + investments @ 12/31/12 = $426.3M

* As of December 2012

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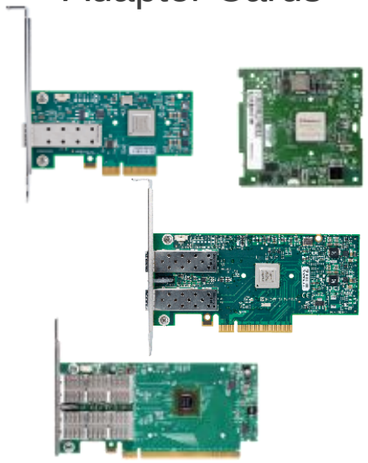
Leading Supplier of End-to-End Interconnect Solutions

Comprehensive End-to-End InfiniBand and Ethernet Portfolio

ICs

Adapter Cards



Switches/Gateways

Host/Fabric Software

Cables

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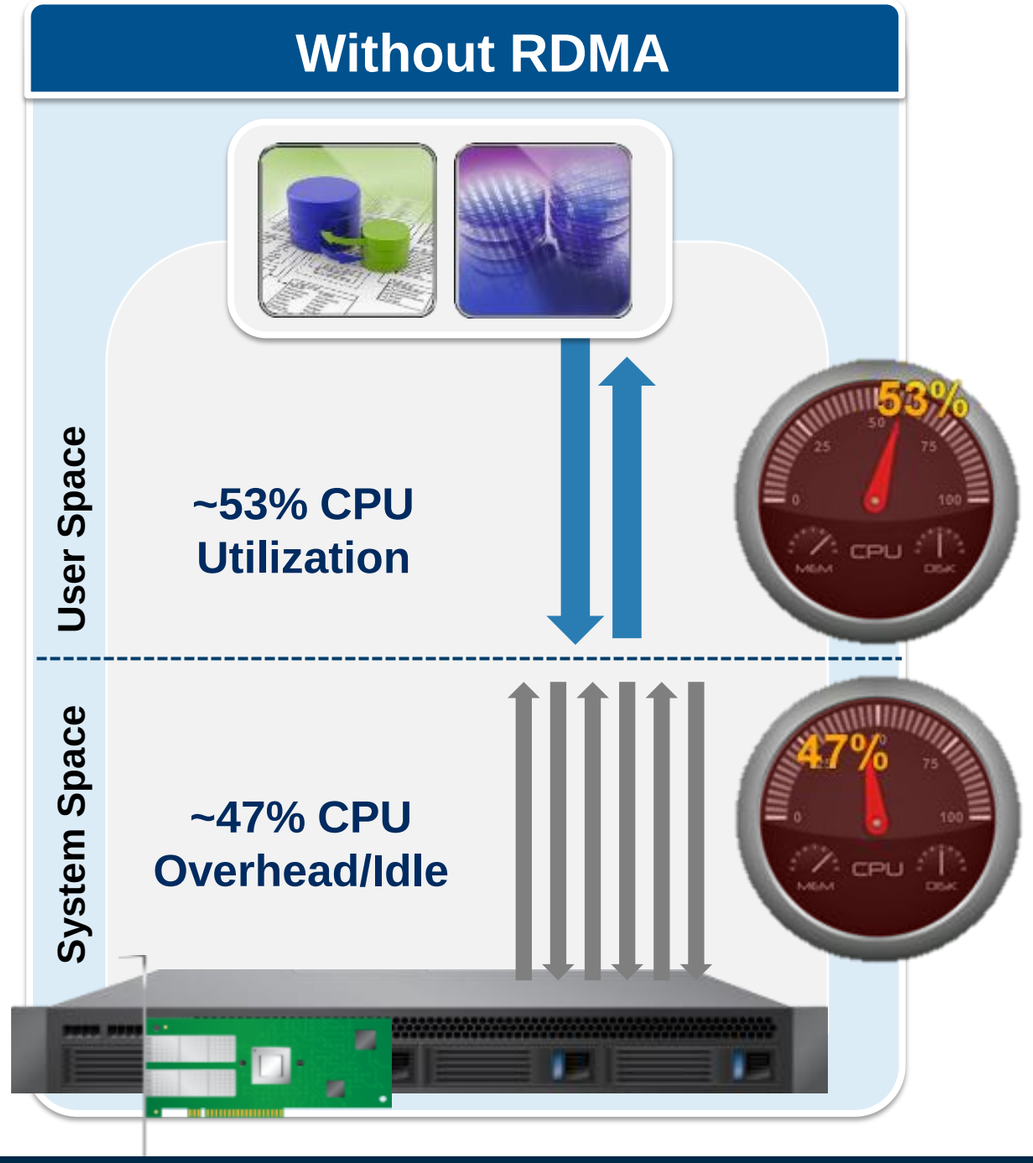
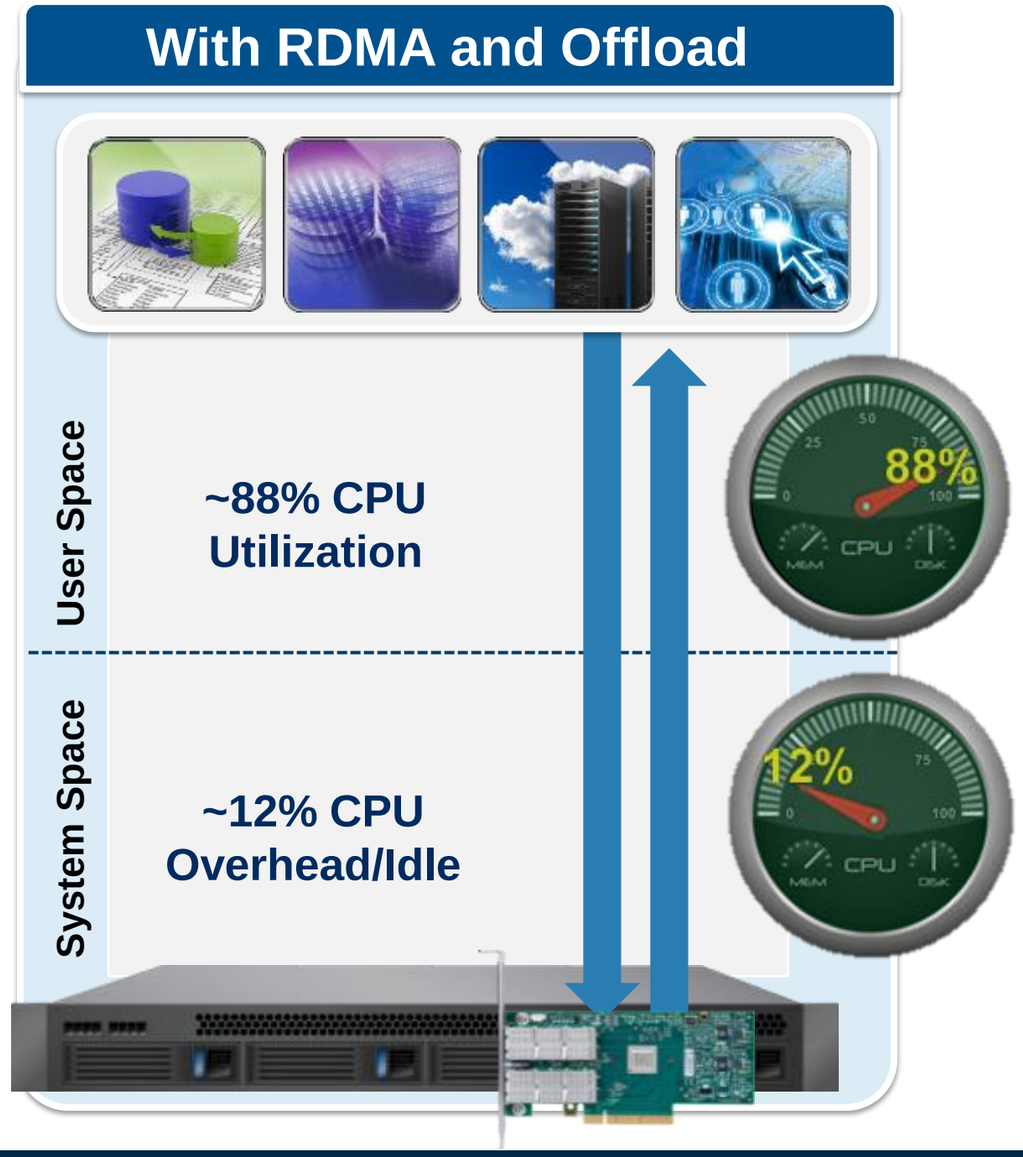
RDMA | Efficiency, Latency, & Application Performance





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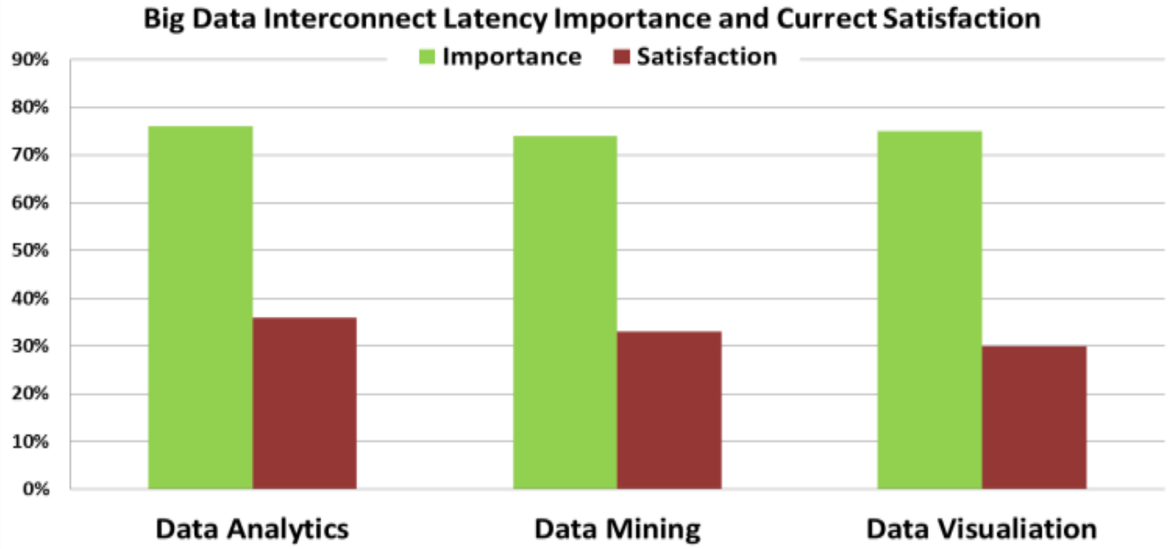
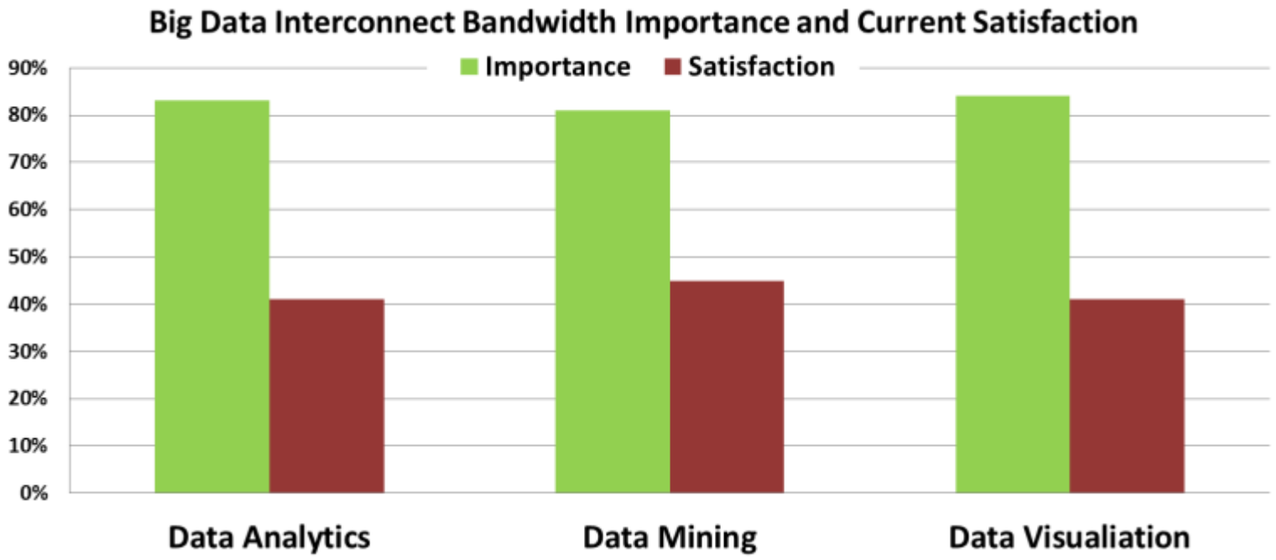
Big Data Solutions

Big Data Needs Big Pipes

- Capabilities are Determined by the weakest component in the system

- Different approaches in Big Data marketplace – Same needs
  - Better Throughput and Latency
  - Scalable, Faster data Movement





Big Data Applications Require High Bandwidth and Low Latency Interconnect

* Data Source**: Intersect360 Research, 2012, IT and Data scientists survey**

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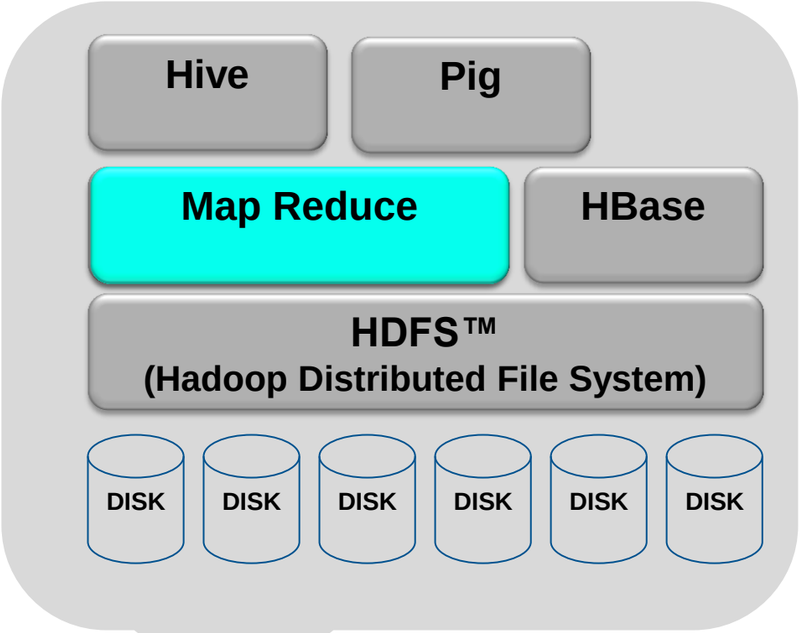
Unstructured Data Accelerator - UDA

- Plug-in architecture
  - Open-source
    - https://code.google.com/p/uda-plugin/
- Accelerates Map Reduce Jobs
  - Accelerated merge sort
- Efficient Shuffle Provider
  - Data transfer over RDMA
  - Supports InfiniBand and Ethernet
- Supported Hadoop Distributions
  - Apache 3.0 and 2.0.3 support in the main trunk
  - Apache Hadoop 1.0.x ; 1.1.x
  - Cloudera Distribution Hadoop 3.x and 4.x
  - Hortonworks HDP 1.1
- Supported Hardware
  - ConnectX®-3 VPI
  - SwitchX-2 based systems



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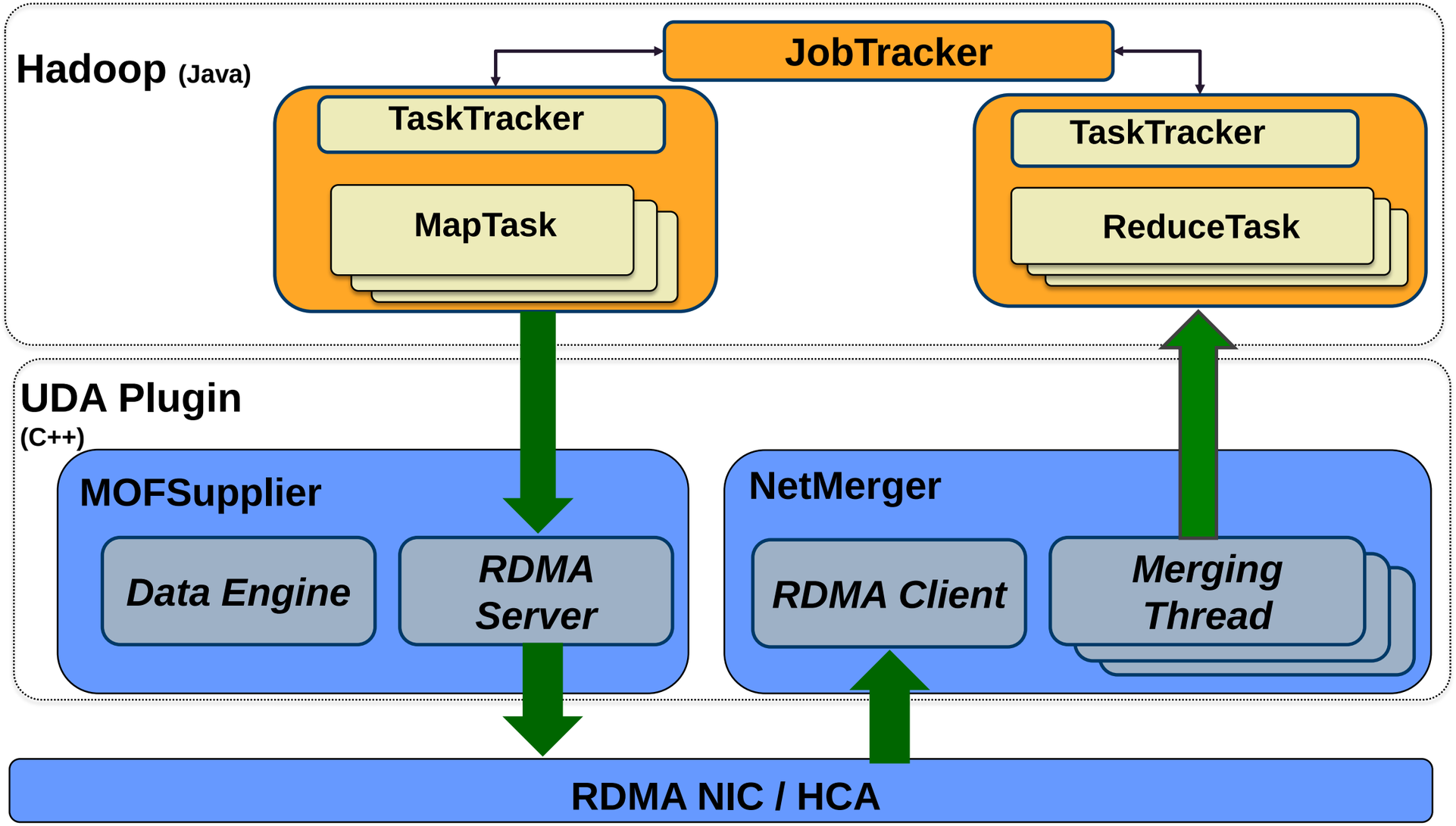
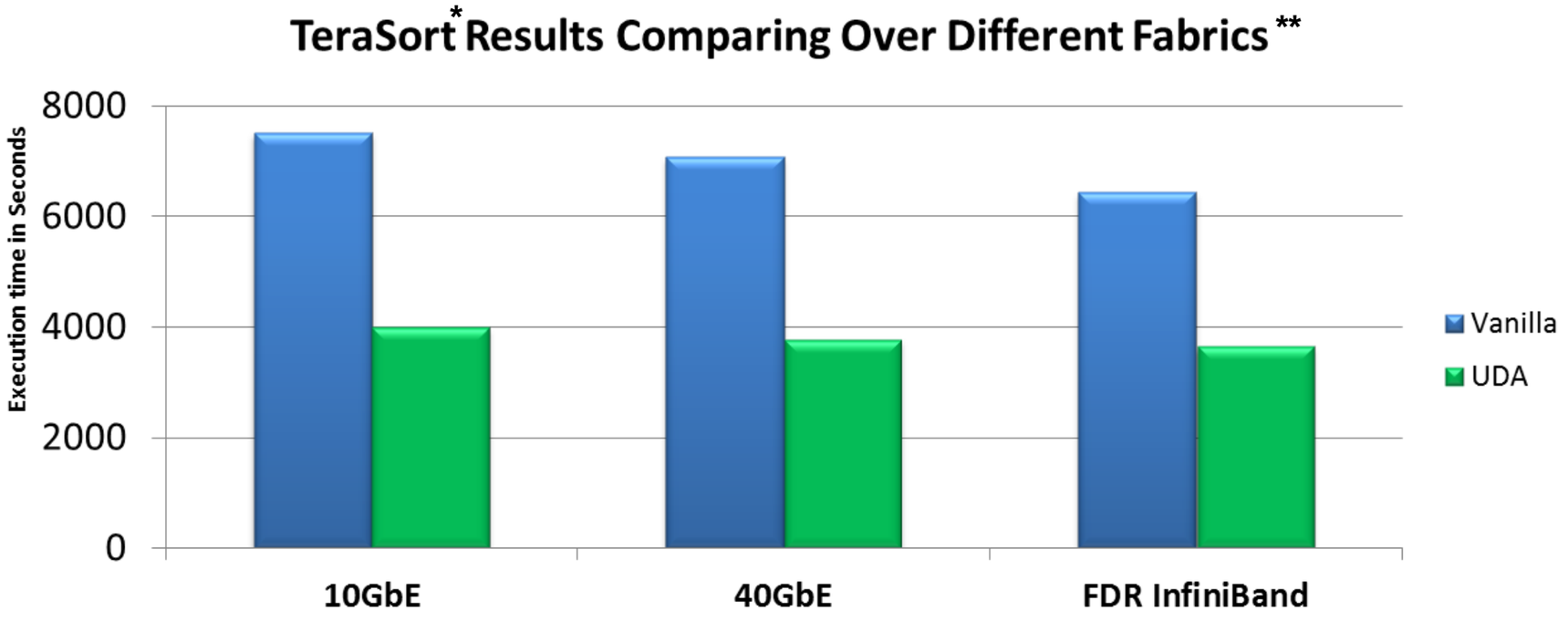
UDA - Software Architecture



Double Hadoop Performance with UDA



Disk Writes 40%

Disk Reads 15%

CPU Efficiency 2.5X

*TeraSort is a popular benchmark used to measure the performance of Hadoop cluster

**1TB Data Set, 5x E5-2680 Machines, 4x HDD Base; Vanilla→ Apache Hadoop 1.0.3; UDA → Apache Hadoop 1.0.3+UDA

~2X Faster Job Completion! Increase the Value of Data!

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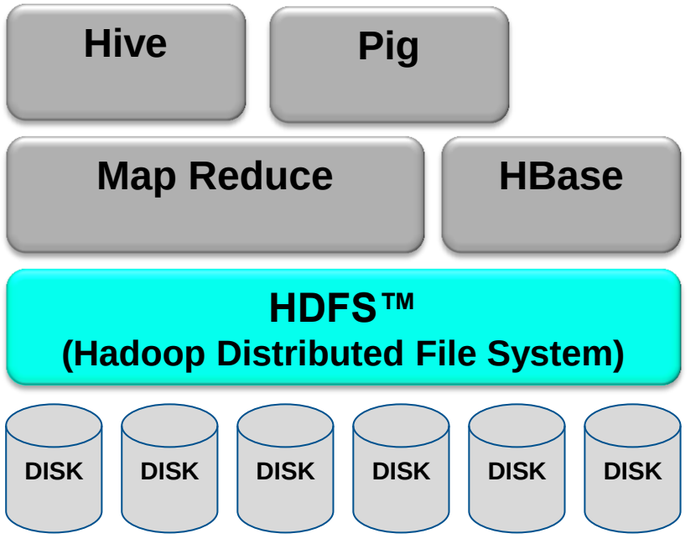
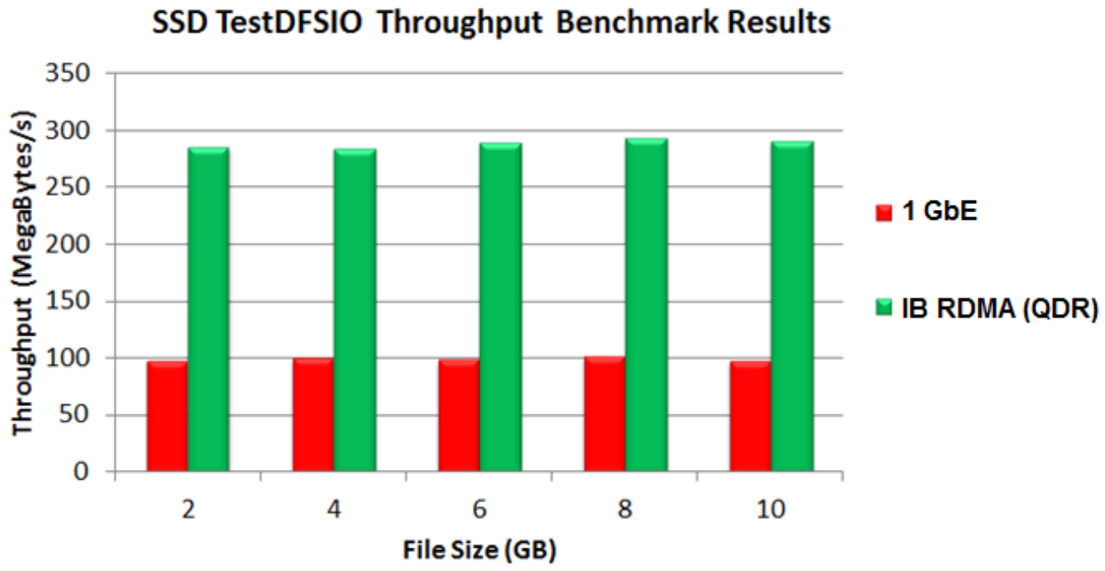
HDFS Acceleration; Joint Project With Ohio State University

- HDFS is the Hadoop File System
  - The underlying File system for HBase and other NoSQL Data Bases
- More Drives, Higher Throughput is Needed
- SSDs Solutions Must use Higher Throughput
  - Bounded by 1GbE and 10GbE





Cloudera Certified – CDH3 and CDH4

- Mellanox VPI Card
  - MCX354A-FCBT
- Mellanox Edge Switches
  - MSX10xx; MSX60xx

ConnectX®-3

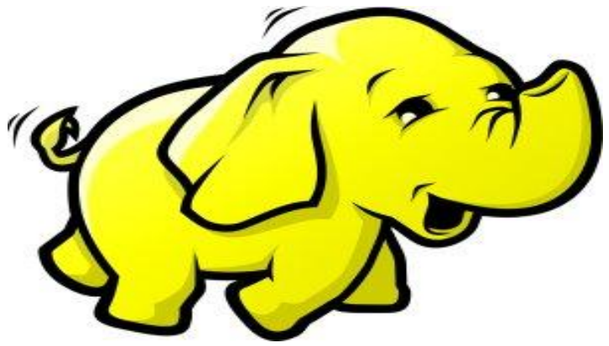
SwitchX®

Hadoop Solutions, Using RDMA Based Interconnect

PHAT-DATA 40G

Invite Your Customer to Test Drive Their Application

- EMC 1000-Node Analytic Platform
- Accelerates Industry's Hadoop Development
- 24 PetaByte of physical storage
  - Half of every written word since inception of mankind
- Mellanox VPI Solutions



EMC²

GREENPLUM
A DIVISION OF EMC

vmware

ConnectX®-3

SwitchX®

Hadoop Acceleration | ***2X Faster Hadoop Job Run-Time***

High Throughput, Low Latency, RDMA Critical for ROI

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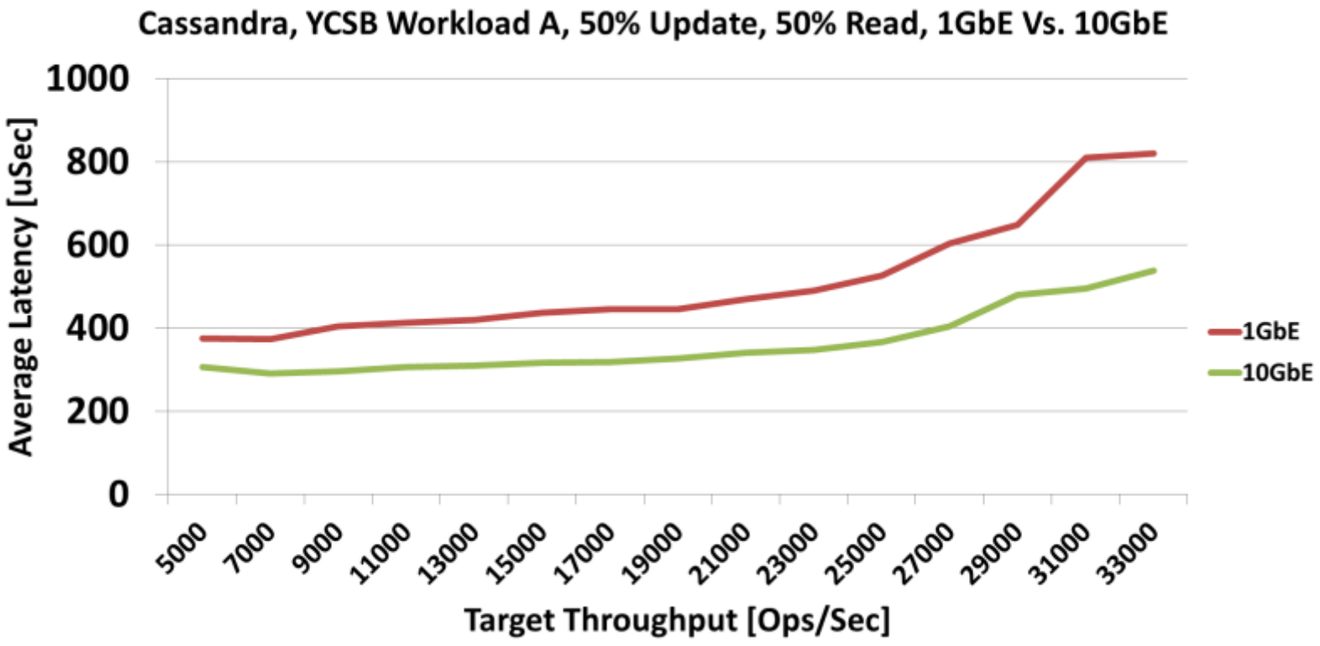
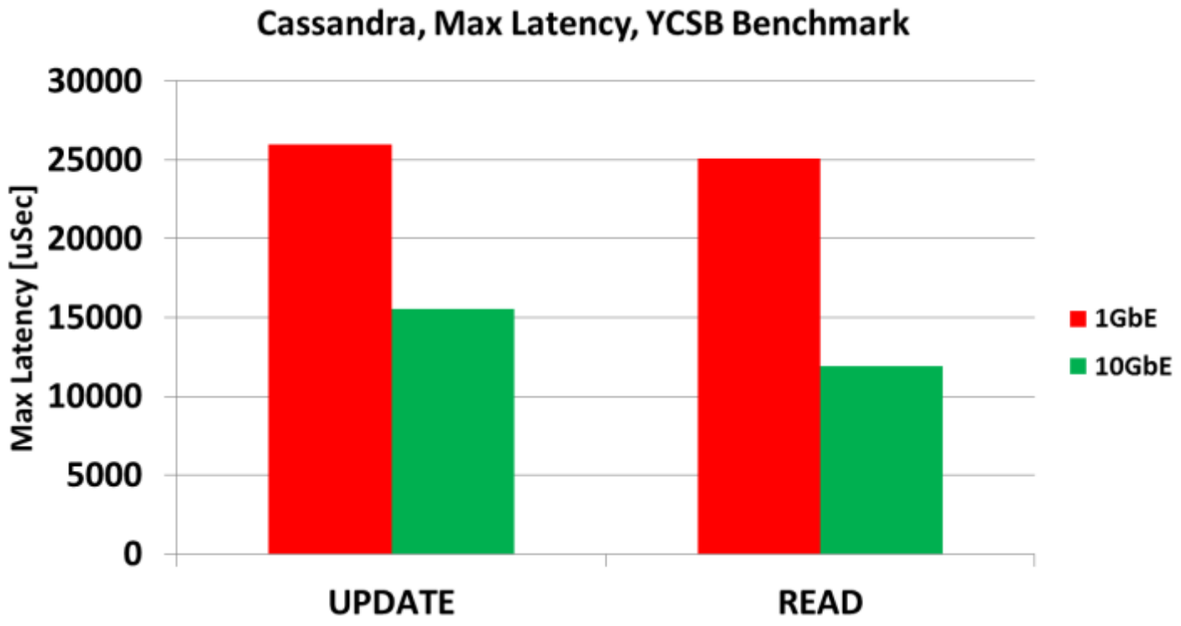
Cassandra

- Linearly scalable, column index database
- Enable 30% more queries
- Cut latency gaps by 50%





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Unmatched ROI for Big Data and Web 2.0

Big Data Analytics (e.g. Hadoop)

- Run more jobs in parallel
- Faster rebalancing after node/link failure
- Faster data load into HDFS
- Ready for major increase in disks per node

2X

In-Memory Caching (e.g. Memcached)

- More transactions per second
- Faster response/retrieval time
- More users/clients per server

13X

Price-Performance

- More bandwidth at the same price
- Lower price per Gb/s
- Lower power per Gb/s

4X

Source: Company testing for order of magnitude improvement data

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Thank You

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