Vendor Presentation:
Xyratex

LUG 2013

Michael K. Connolly
Partner and Alliances Development

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Applications Require Petascale Solutions

- Scientific research
- Life sciences
- Digital media
- Energy exploration
- Data analytics
- Digital manufacturing
- Weather and climate

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High Performance Applications

- Massively parallel globally concurrent access
  - Thousands application clients - billions of files
- Highest performance scalability, reliability, availability and serviceability
  - Single file system namespace in 10s petabytes usable capacity
  - Linear file system scale-out performance in 100s of GB/s
- Integrated solution management
  - End-to-end system visibility, provisioning, manageability and diagnostics

HELP WANTED — Need More Clients

Need More Files

Need More Capacity

HELP WANTED — Need More Performance

HELP WANTED — Need More Visibility and Management

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Leading OEM Provider of Data Storage Solutions

Enterprise Data Storage Solutions

- **18%** of w/w external storage capacity shipped in 2011

- **> 4,000** Petabytes of storage shipped in 2011
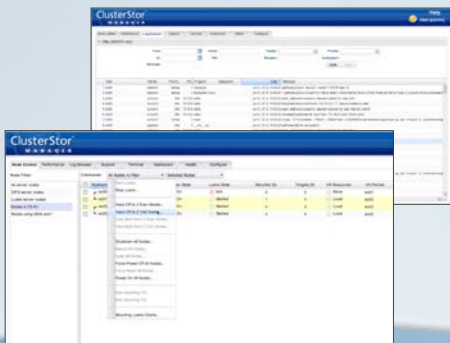
- **Largest OEM** Disk Storage System provider

HDD Capital Equipment Solutions

- **~ 50%** of w/w disk drives are produced utilizing Xyratex Technology*

- **Largest independent** supplier of Disk Drive Capital Equipment

ClusterStor HPC Storage Solutions

- **1.1 TB/s** sustained file system performance achieved

- **~ 90PB** ClusterStor capacity shipped in 2012

- **150+** ClusterStor S/W engineers

ClusterStor™ MANAGER

ClusterStor™

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Cornerstone for Storage

- Successful and accomplished history
  - Over twenty five years experience - multiple storage platform generations
  - Span entire storage market - entry, midrange, enterprise, HPC, Big Data and Cloud
  - Largest manufacturer for storage OEMs

- Strategic investments
  - Next generation storage platforms, embedded storage and compute servers, solution software
  - Deep and extensive Lustre® file system expertise
  - Community Involvement
  - Lustre asset(s) acquisition
  - Long term commitment to HPC and Big Data

2013 Cloud Storage Excellence Award

**January 15, 2013
Cloud Computing Magazine**

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Leading Roles in Lustre® Global Community

OpenSFS Board Member & EOFS Member	**Active Contributor to Lustre Source & Roadmap**	**Integration of Lustre into ClusterStor™**	**Exascale I/O Workgroup (EIOW)**
Direct Funding of Lustre Tree & Roadmap Development	*World Class Lustre Development Team on Staff*	*Industry leading HPC Storage Solutions*	*Defining Next Generation Capabilities*

OpenSFS
Open Scalable File Systems, Inc.

EOFS
European Open File System

Storage Systems, Solutions and Innovations

OneStor™ Storage Enclosures	OneStor™ Integrated Application Platforms	ClusterStor™ File System Solutions
Modular Enclosures	**Embedded Storage Platforms**	**Integrated File System Solutions**

+

(intel)

Storage Application Platform

(intel)

Xyratex Storage Innovations

OneStor™ Software (USM)	Reliability, Availability & Serviceability	Integrated System Testing	Metis™ Power Protection
Common Mgmt SW & Deep System Diagnostics	*Enterprise Redundancy & Resiliency*	*Proprietary Pre-Ship Testing Methods & Automation*	*UPS Alternative for Data Protection*

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ClusterStor™ 6000
Industry Leading Performance at Massive Scale

Delivering Ultimate Scale-Out Storage for HPC and Big Data

Optimized time to productivity

Efficiency, application availability, results

Unmatched file system performance – Delivered!

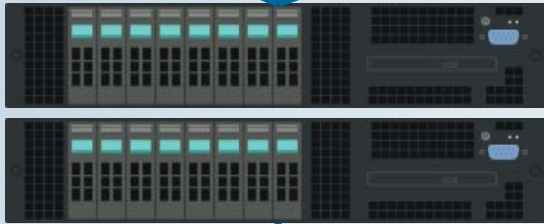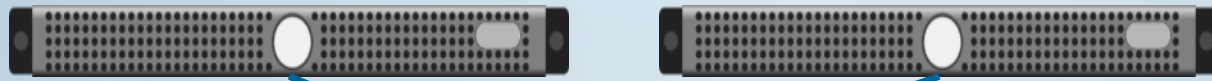*Industry's fastest just got two times faster*

Highest reliability, availability and serviceability

Enterprise level resiliency

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Traditional Lustre File System Design
Separate Piece Parts - Processing, Networks, and Storage
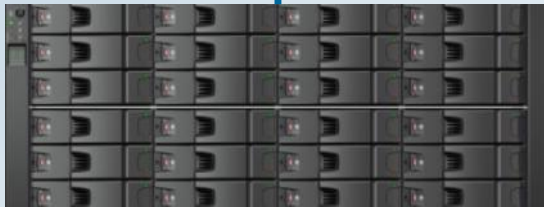
Network I/O Ports:
Compute & RAM:
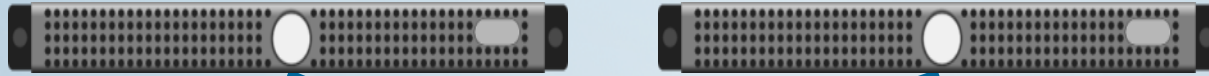Total Spindles:

Traditional Lustre Design

Separate Vendor Hardware for Server, Networks, and Storage

Increased Hardware and Management Complexity, Problematic to Scale

Increased Latencies, Increased Cables, Increased Interoperability Issues

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ClusterStor Consolidates Resources
Seamless Embedded Lustre Solution

ClusterStor
Solution Integration

ClusterStor Integration

Consolidates Embedded File System
Processing, Networks and Storage

Co-Locates File System Resources
Promotes Optimum Seamless Efficiency

Reduces Latencies, Reduces Cables,
Eliminates Separate Piece Parts

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Predictable Linear Performance and Capacity Scale

ClusterStor Scalable Storage Unit

Network I/O Ports:	████████
Compute & RAM:	████████
Total Spindles:	████████

Rack Scale
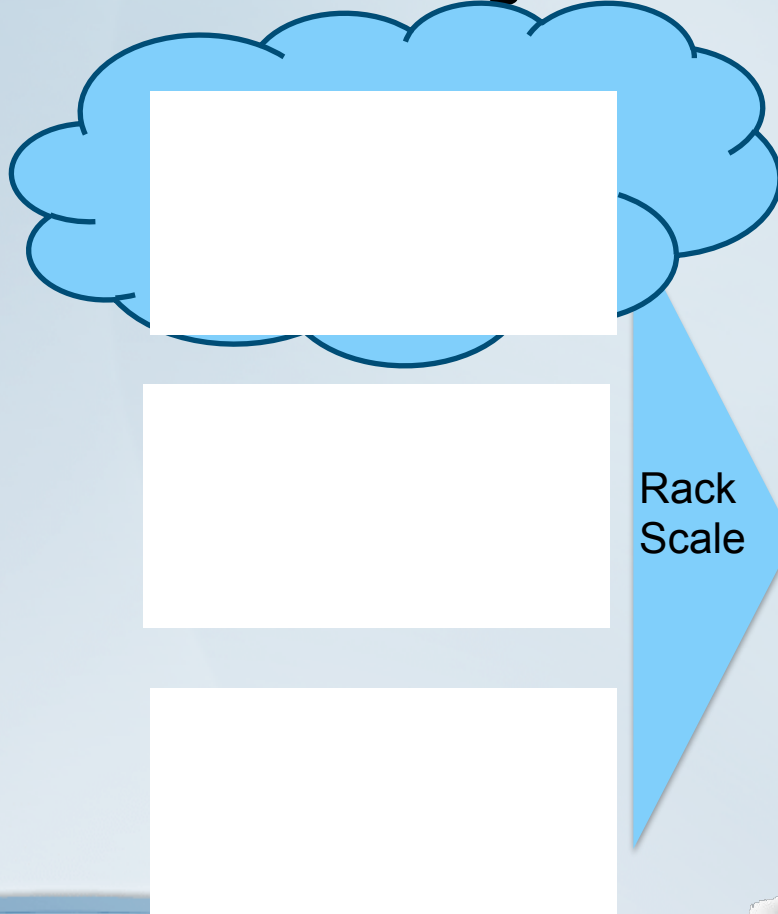
ClusterStor Consolidates:

- Lustre File System
- Management Servers
- File System Servers
- Operating System
- Management Networks
- Data Networks
- Storage Controllers
- RAID Storage

Fully Realized Optimal Scale-Out Storage Solution

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ClusterStor Manager

- Fully Integrated Solution Visibility and Management
  - Low level diagnostics, embedded monitoring, proactive alerts

Easy to Manage

Real Time Monitoring

High Performance Applications

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  - Thousands application clients - billions of files
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- Integrated solution management
  - End-to-end system visibility, provisioning, manageability and diagnostics

Tens of Thousand Clients

Multiple Billion Files

Over 90 PB Usable Capacity

Over 1TB/s Performance

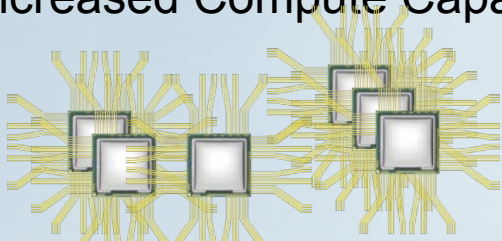Fully Integrated Solution Visibility and Management

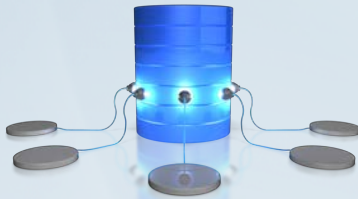xyratex

ClusterStor Benefits

Faster Data Throughput & Capacity

Increased Compute Capacity

Higher Levels of System Availability

Efficient Deployment & Management

- Fundamentally overcomes the well known "Storage I/O Bottleneck"

- Satisfies HPC and Big Data accelerated pace for more compute and capacity

- Resolves legacy "cobbled together systems" reliability and availability issues

- Delivers fastest time to productivity

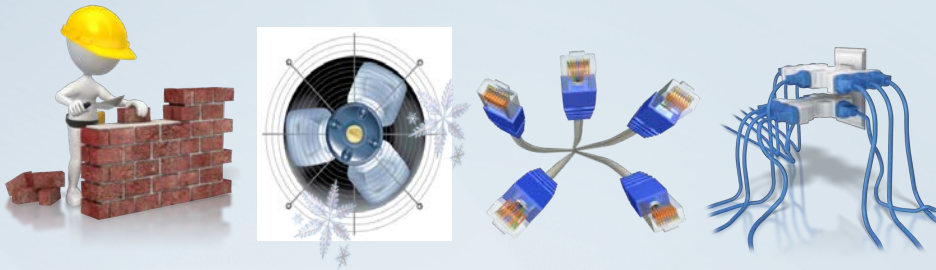xyratex

ClusterStor Benefits

Shrinking Budgets

Limited Power Resources

Datacenter Infrastructures

- Collapses and consolidates solution into modular, easy to use building blocks

- Savings in storage hardware resulting in lower latencies, higher reliability and reduced power and cooling costs

- Reclaims resources for more compute, performance and storage capacity

- Eliminates waste

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Some ClusterStor Solution Success
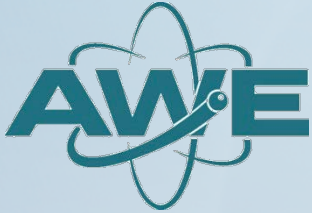
Ken Atkinson
High Performance Computing, AWE

"All of the performance testing met or exceeded expectations."

Jacques-Charles Lafoucriere
Department Leader, CEA

"The software stack provided with the system enabled us to install a working Lustre environment within hours."

Paul Calleja
Director of High Performance Computing, University of Cambridge

"With Lustre and the comprehensive storage management framework we were able to easily configure and manage our cluster"

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Thank You

Michael_Connolly@xyratex.com