Unified Storage and FCoE

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Agenda

- Market Dynamics
- Why Unified Ethernet Storage
- Customer Success Stories
Data Center Design Is Evolving

Support multiple workloads and customer groups from a single IT infrastructure
### Data Center Challenges

- **Infrastructure efficiency**
  - Multiple network interfaces increase capital expenses

- **People and skill consolidation**
  - Disparate expertise and manual processes increase operational costs

- **Technology advances**
  - Server virtualization and multicore processors increase bandwidth needs
Ethernet Storage Can Help

- Benefits: ubiquitous, cost-effective network; pervasive skill set; simplified interoperability; virtualization optimized

- Customer examples
  - Sensis reduced operational expenses by 50%
  - Lenzing AG realized a 40% faster backup process
  - SAP-Co Innovation Lab reduced time required to provision SAP® landscapes from days to hours
  - AutoTrader.com supported annual business growth of 30–40%

“… IP storage solution enabled us to deliver capacity on demand. We’ve been able to shrink new-project storage activation from 8 weeks down to days.”

Andrew Crabb, Group Manager, Data and Storage Solution Center, Telstra
ExamWorks Saves Money with 10GbE Ethernet Storage

Business Benefits
- Scale seamlessly to support tripling business growth
- Slash IT costs
- Highly adaptable infrastructure to deliver services via internal cloud

Business Impact
- Avoid >$1M IT staffing costs
- Achieve nearly $500K capex/opex savings
- Deploy 3-rack data center for business with more than 2,000 employees
- Eliminate high-cost PC refreshes
- Eliminate helpdesk

Headquartered in Atlanta, Georgia, ExamWorks is a fast-growing independent medical examination (IME) and review company.
Ethernet Enhancements Benefit FCoE, iSCSI, and NAS

- **IEEE Ethernet enhancements*:**
  - Lossless transport
  - Priority flow control
  - Congestion notification
  - Enhanced transmission selection

- **Benefits:**
  - Consolidation (LAN, storage) reduces capital and operational costs
  - Higher performance (10GbE followed by 40GbE, 100GbE) improves unified fabric design, multicore computing, and virtualization bandwidth

*Known as Data Center Bridging (DCB)
Ethernet Unifies Data Center Storage

Solve All Your Use Cases

- Increased asset and storage utilization
- Simplified storage and data management
- Reduced costs through consolidation
- Improved storage and network efficiencies
Traditional Data Center

- Dual Ethernet Switches
- Ethernet Core Switch
- Fibre Channel Director
- Dual Fibre Channel Switches
- Ethernet IP
- Fibre Channel
- LAN
- Storage
- FC Storage
- Tape Library
Transition to DCB / FCoE at the Edge

Dual FCoE/DCB Ethernet Switches

Fibre Channel Director

Ethernet Core Switch

Storage

FC Storage

Tape Library

Fibre Channel

Ethernet IP

FCoE

/Ethernet IP

LAN
Transition to DCB / FCoE at the Core

Dual FCoE/DCB Ethernet Switches

LAN

FCoE/DCB Ethernet Core Switch

Storage

FC Storage

Tape Library

Fibre Channel

Ethernet IP

FCoE/Ethernet IP
Unified Test Environment Overview

For more information on this solution:
• Technical Report: 3800 - Fibre Channel over Ethernet (FCoE) End-to-End Deployment Guide
FCoE Results

- Sequential and random read tests, server achieved near line rate performance of 10Gb with request size of 8KB and greater
- Sequential and random write tests, server achieved near line rate performance of 10Gb with request size of 32KB and greater

FCoE and iSCSI results similar
Unified Connect

- Wire once for all your workload needs
- All protocols— FCoE, iSCSI, CIFS and NFS on one cable/port
- Increased efficiency and simplified management
  - Reduced cabling and management points
  - Improved expansion slot efficiency
  - Enhanced port and bandwidth utilization
Unified Connect (FCoE and CIFS) Results

- Sequential and random read tests, server achieved near line rate performance of 10Gb with request size of 8KB and greater
- Sequential and random write tests, server achieved near line rate performance of 10Gb with request size of 32KB and greater

- Simultaneous block and file access to same port, no drop in performance
- Per best practice, mapped drive and LUN were not contained by same FlexVol on storage system
- CoS dedicated 80% of line capacity to FC traffic and 20% to Ethernet
Unified Test Conclusions

- iSCSI, FCoE, and FCoE+CIFS performed very well, with throughput approaching 10Gbps line rate.
- Throughput peaked at ~2,200 MB/sec in 50% read/50% write tests for FCoE.
- No difference in performance for random vs. sequential access patterns.
- A 10GbE unified networking and storage solution can reduce the footprint, price and complexity of deploying a Cloud computing environment.
Databasement FCoE Success Story

Industry:
- Cloud services

Challenge:
- Provide enterprise-class data protection and other services at an affordable price

Solution:
- Safeguard client data with a cloud-based, service-oriented infrastructure built on unified storage systems that support FCoE and FC, as well as IP based protocol

“The option to deploy FCoE provides our customers with a strong performing protocol, as well as consolidation of network interfaces.”
- Rob Christ, Founder and Director, Databasement

Benefits of Implementing FCoE:

- Moved from 4U servers to 2U servers with fewer PCI-E slots
- Replaced dual NICs and FC HBAs per server with a single dual port CNA per server
- Halved its rack-space consumption and reduced power and cooling bill by ~45%
- Reduced networking equipment and cabling by using an DCB/FCoE switch in place of separate FC and 10GbE switches for storage connectivity
- Utilized QoS capabilities of DCB to bump-up storage protocol bandwidth on demand, whether it be FCoE, iSCSI, NFS or CIFS
  - Proved a useful capability that can help deal with bandwidth spikes caused by services such as backup
- Databasement SAN management tools worked with FCoE with no issues
Payformance FCoE Success Story

Industry:
- Application service provider for healthcare industry

Challenge:
- Upgrade storage infrastructure to handle 12-fold increase in customer data and cut costs

Solution:
- Upgrade to a converged network with FCoE storage

“With the switch to a converged network and FCoE, we’re now able to manage one large, converged infrastructure, rather than two different fabrics.”
- Jason Beckham, Director of I.T. Operations, Payformance
Benefits of Implementing FCoE:

- Moving to a converged network has saved between 30% and 50% of the costs of buying separate adapters and switches.
- Manage on large, converged infrastructure, rather than two different fabrics
- Simplified troubleshooting, zoning and management

“From a total investment perspective, it made sense to consolidate at the same time as we upgraded.”
- Jason Beckham, Director of I.T. Operations, Payformance
Recommended Next Steps

- Implement FCoE for new FC deployments
  - Consider timing, ecosystem of FCoE/DCB
  - Implement in phases
  - Begin transition with tier 2 or 3 applications
- The future of Fibre Channel is over Ethernet
- Investment protection with unified approaches