

# Unified Storage and FCoE

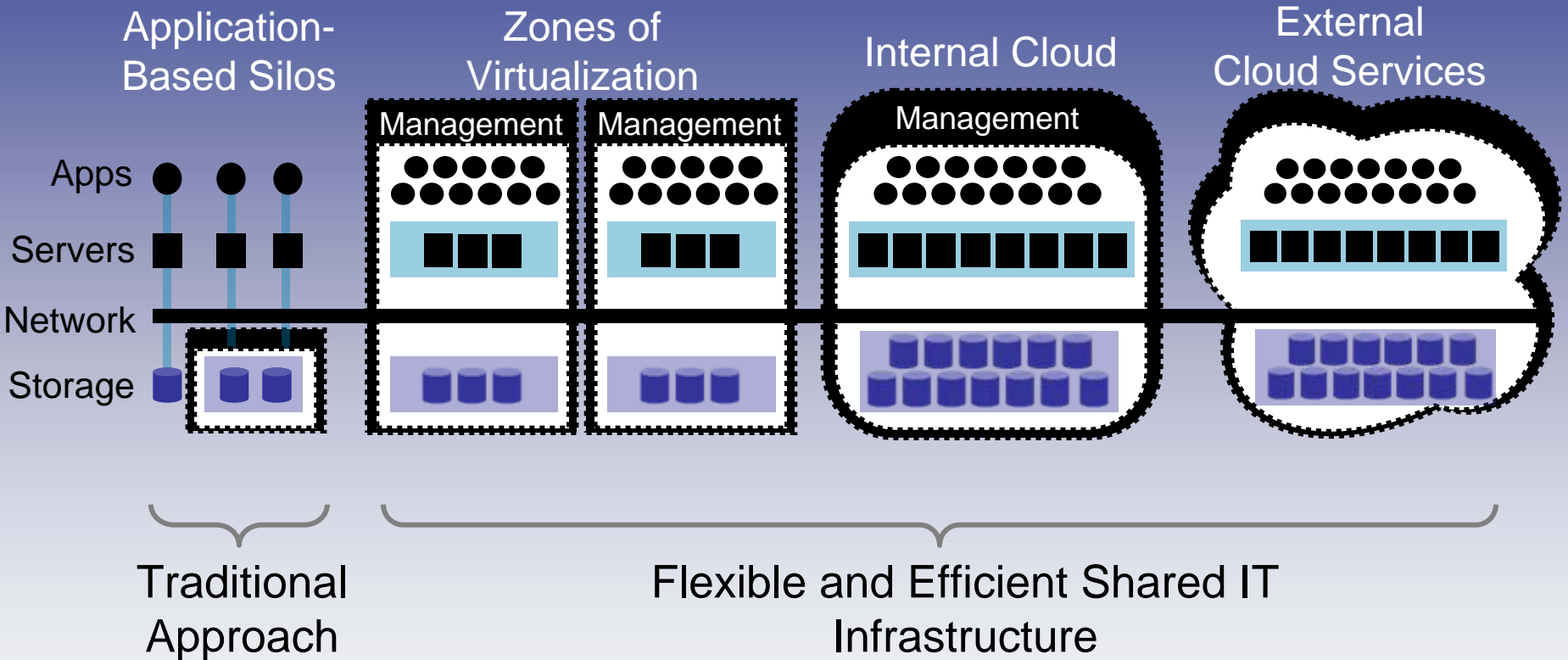
Mike McNamara, NetApp

February 24, 2011

# Agenda

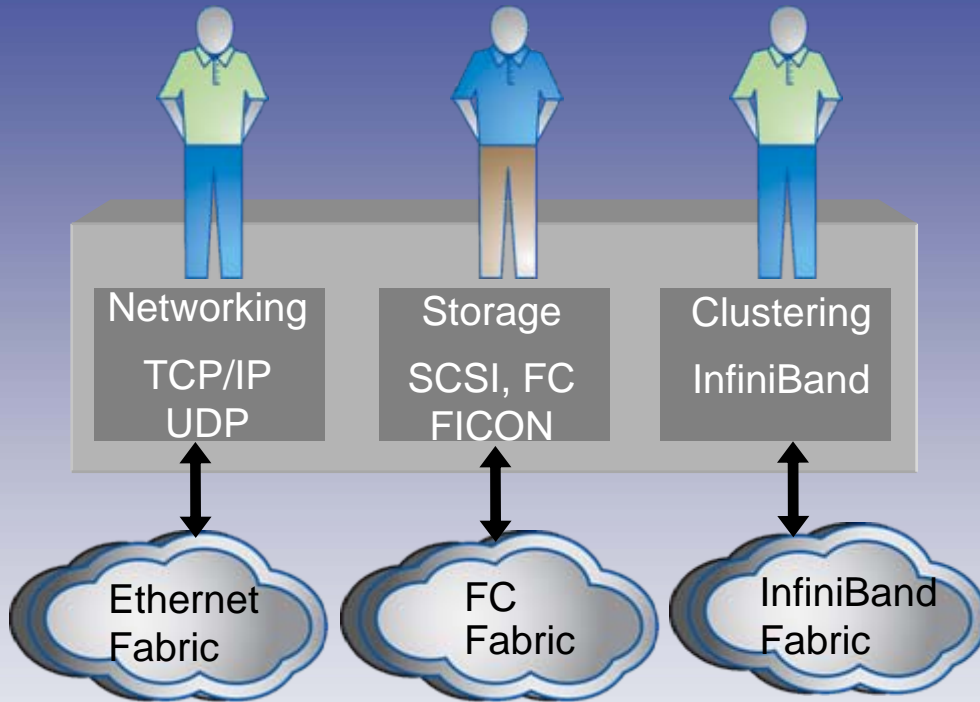
- Market Dynamics
- Why Unified Ethernet Storage
- Customer Success Stories

# 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



Headquartered in Atlanta, Georgia, ExamWorks is a fast-growing independent medical examination (IME) and review company.

## Business Benefits

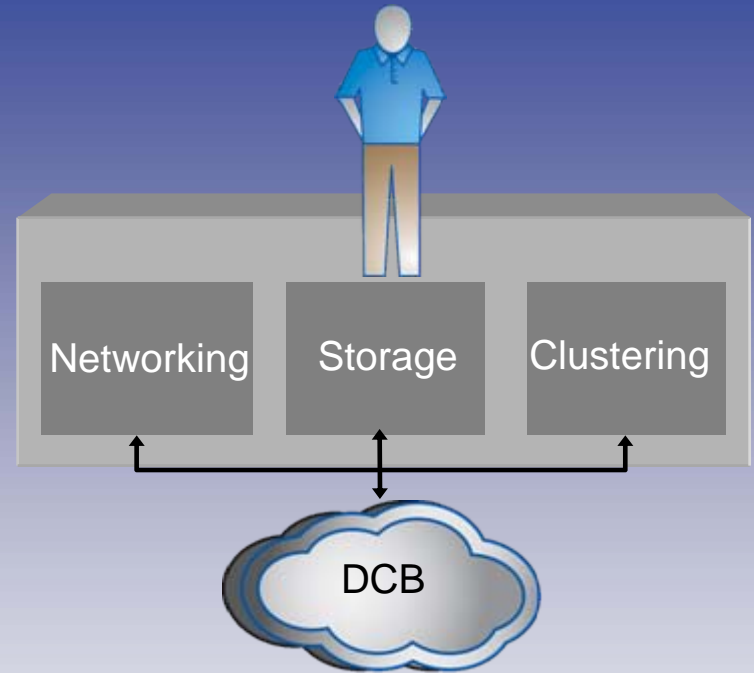
- Scale seamlessly to support tripling business growth
- Slash IT costs
- Highly adaptable infrastructure to deliver services via internal cloud

## 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

# Ethernet Enhancements Benefit FCoE, iSCSI, and NAS

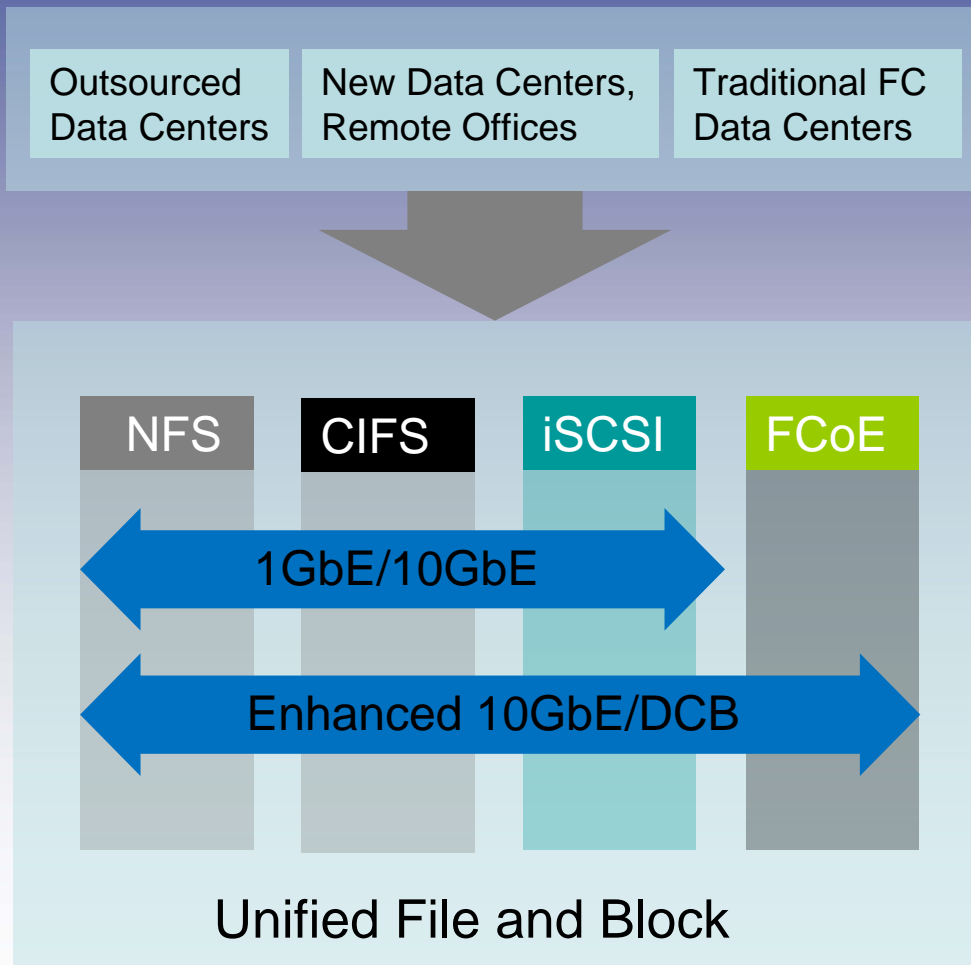
- IEEE Ethernet enhancements\*:
  - Lossless transport
  - Priority flow control
  - Congestion notification
  - Enhanced transmission selection



- 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

# Ethernet Unifies Data Center Storage

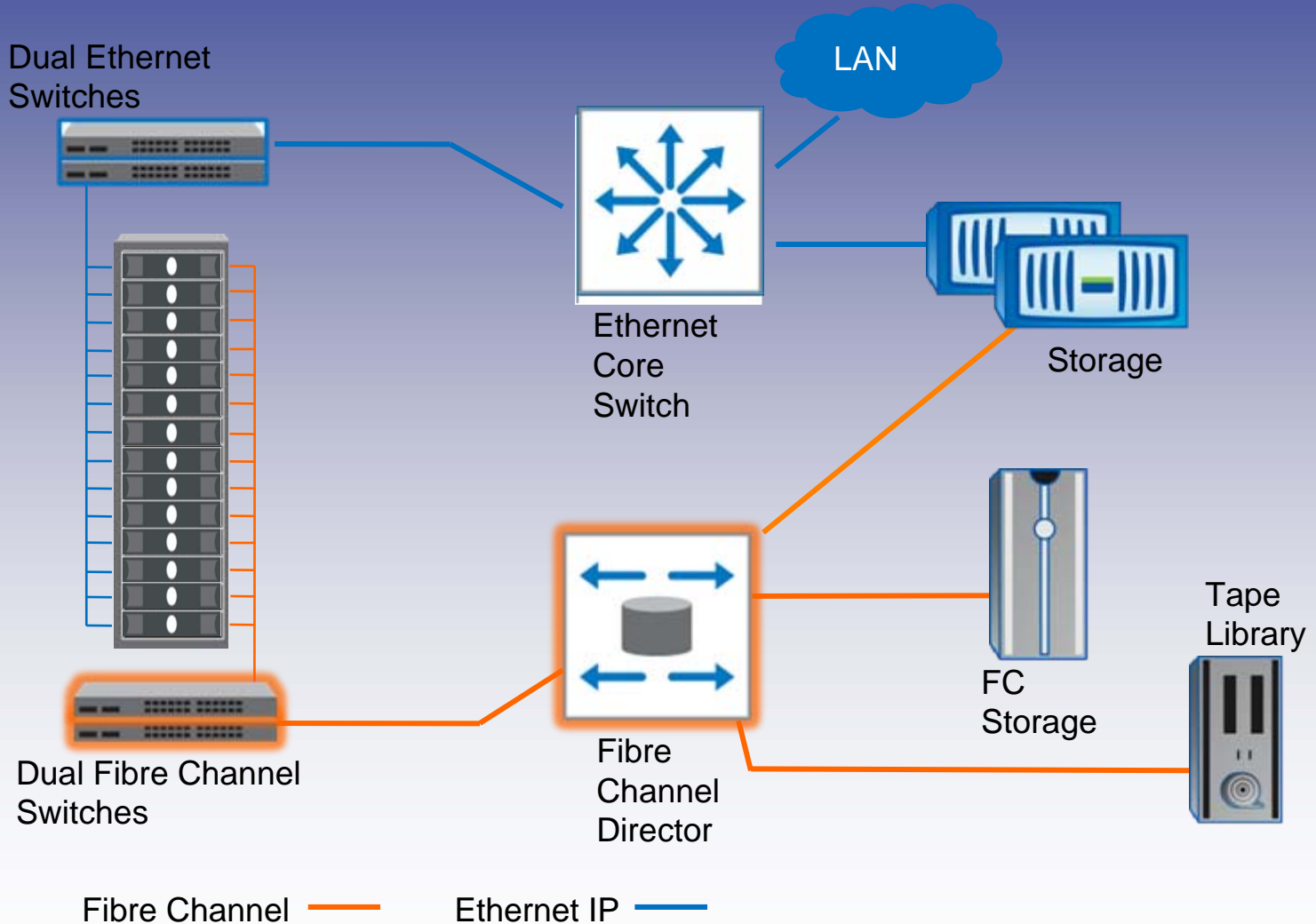
## Solve All Your Use Cases



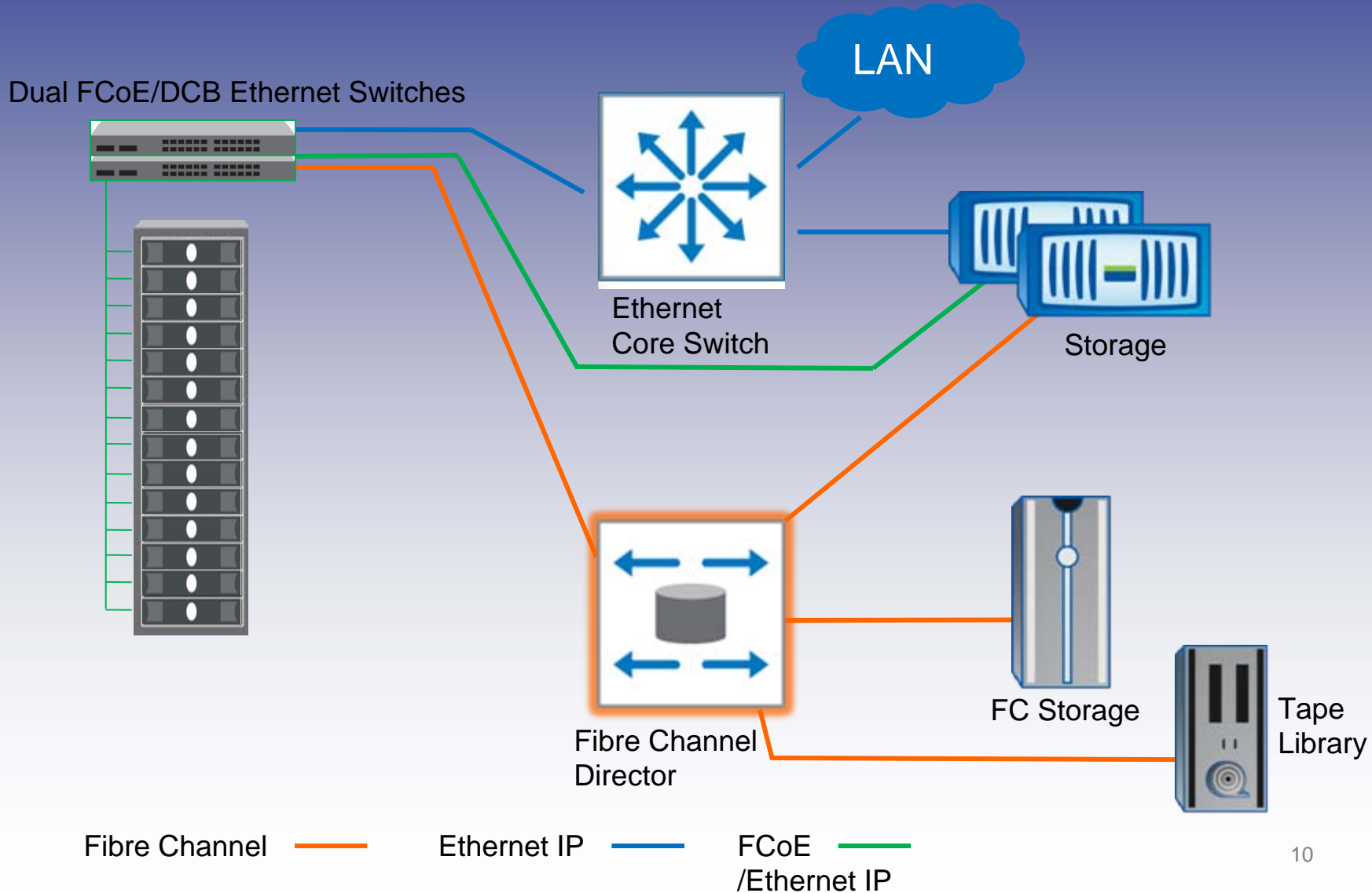
- Increased asset and storage utilization
- Simplified storage and data management
- Reduced costs through consolidation
- Improved storage and network efficiencies



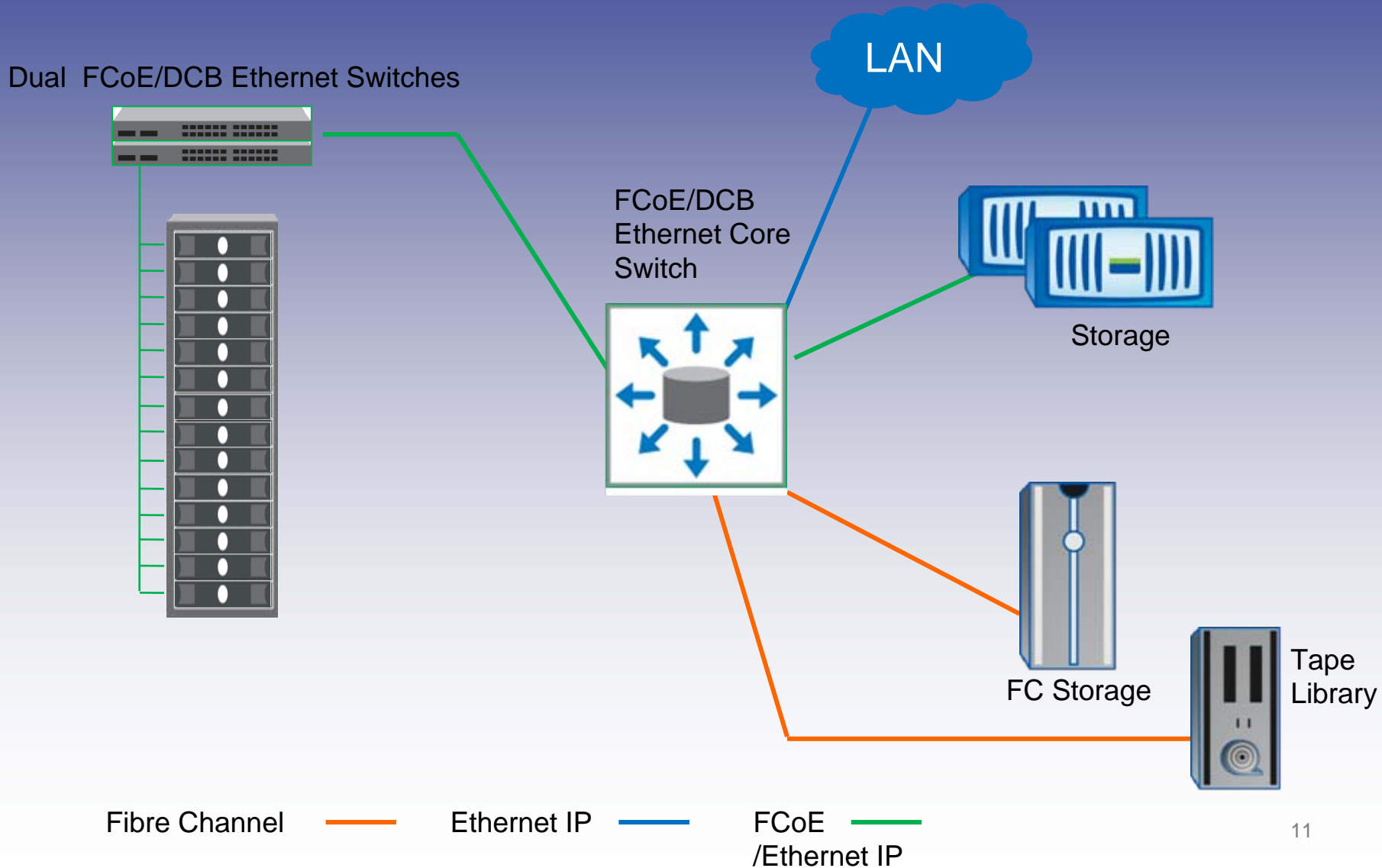
# Traditional Data Center



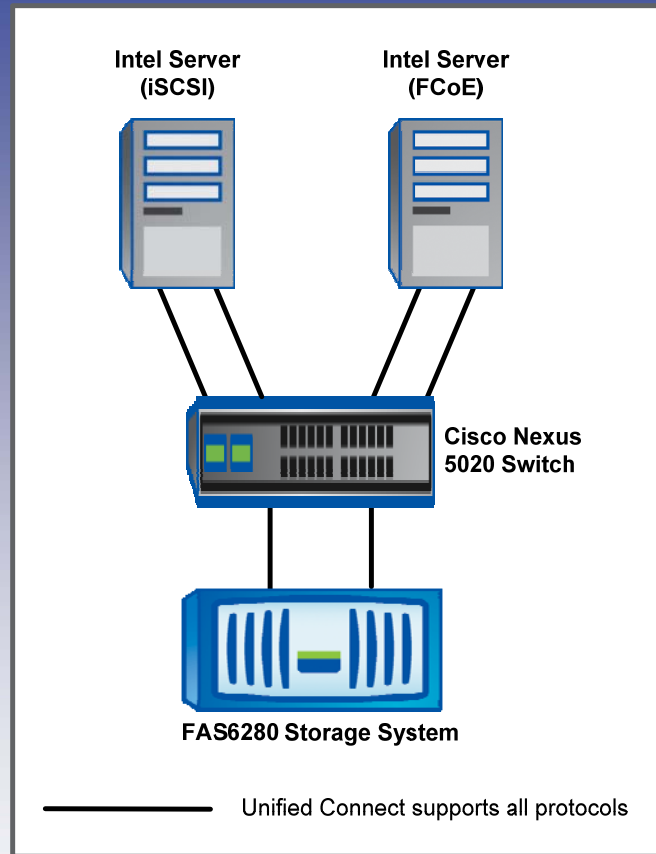
# Transition to DCB / FCoE at the Edge



# Transition to DCB / FCoE at the Core



# Unified Test Environment Overview

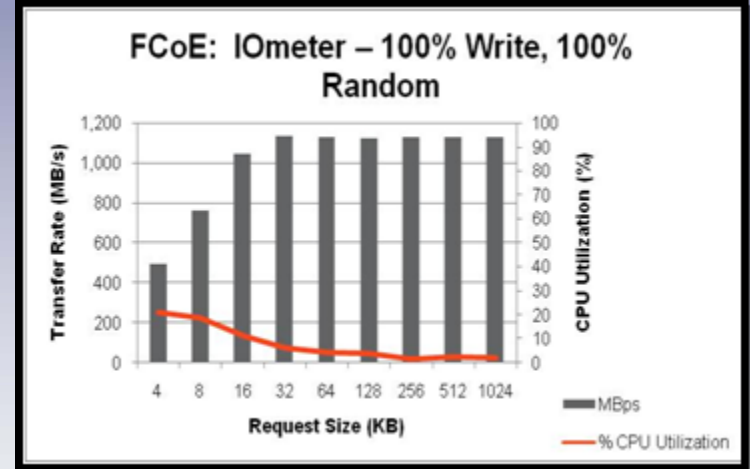
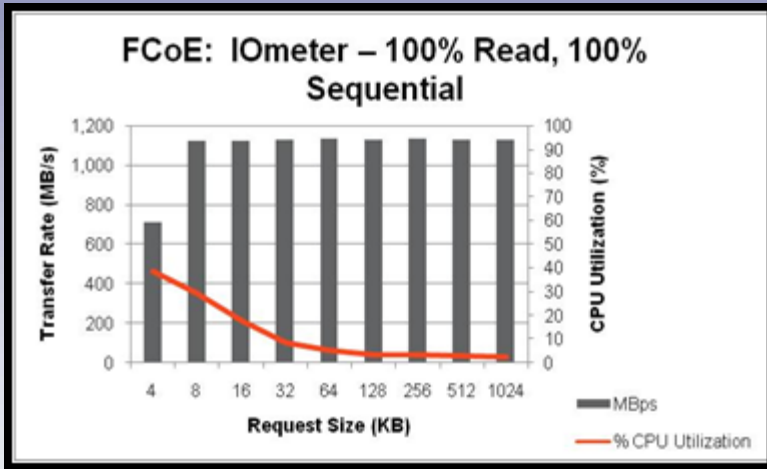


For more information on this solution:

- [Technical Report: 3894 - The Benefits of Converged Networking with NetApp FAS6280 and Intel Xeon Servers](#)
- [Technical Report: 3800 - Fibre Channel over Ethernet \(FCoE\) End-to-End Deployment Guide](#)

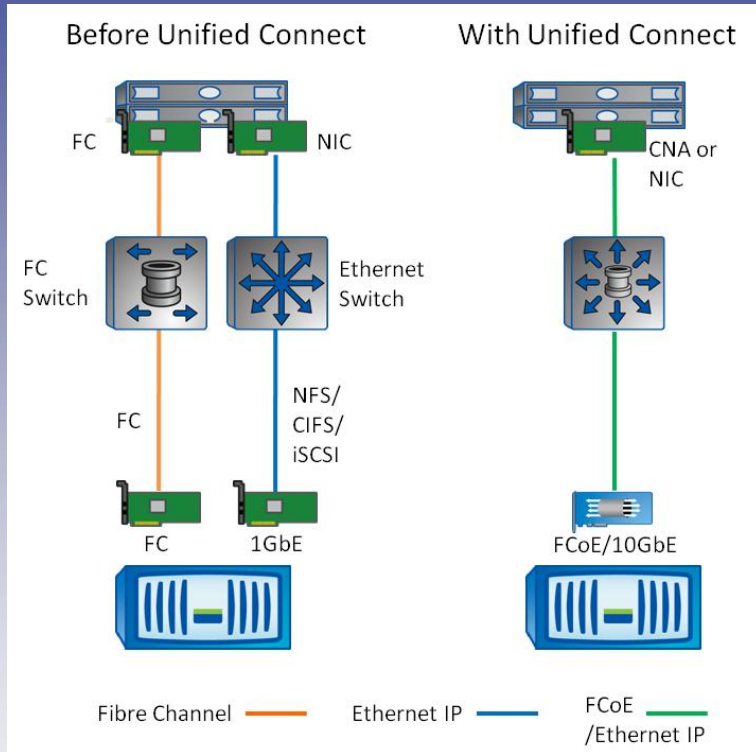
# FCoE Results

- 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

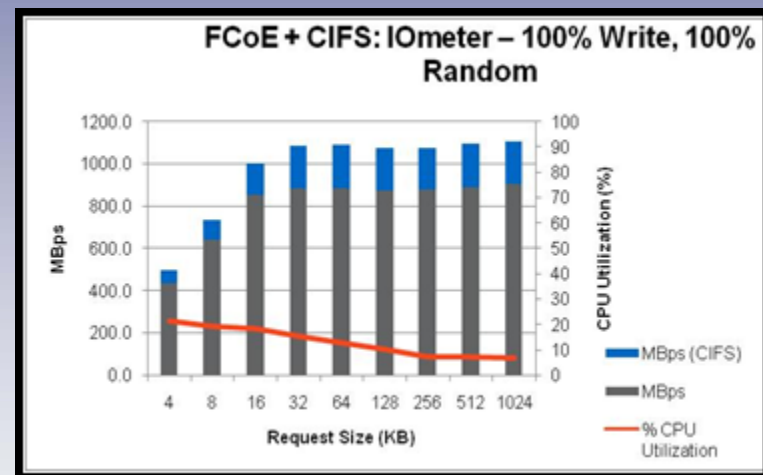
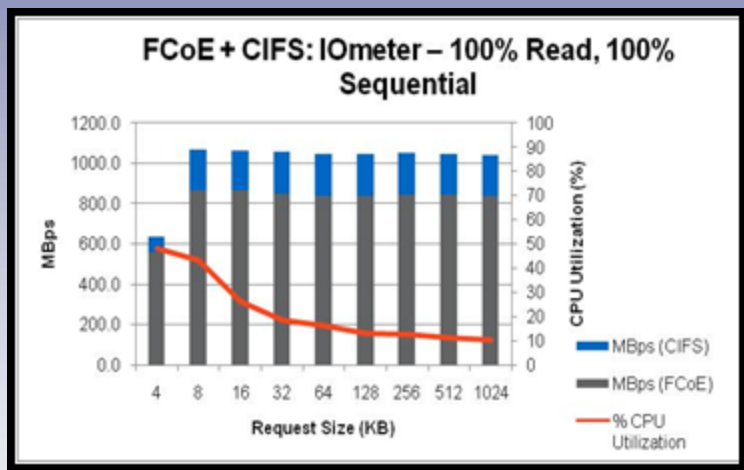
# Unified Connect



- 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



Headquartered in the Netherlands, founded in 2002 and a top provider of data protection services

## Databasement (cont.)

### 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



Since 1985, business have turned to Payformance for payment solutions. An application service provider.

## Payformance (cont.)

### 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