Data Management for Financial Services: Solutions for Achieving Compliance Without Sacrificing Your Sanity

An InformationWeek Webcast
Sponsored by CDW
Webcast Logistics

**Participate in the webinar:** Ask questions, share feedback via the survey, and access the Information panel.

**Personalize your experience:** Click the buttons at the bottom of your screen to open supporting content and user tools at your own convenience.

**Technical Issues:** Ask the support team for live assistance in the ask-a-question window.
NetApp Storage
The #1 Choice for Virtualized IT

Christopher Costanzo
NetApp System Engineer
Agenda

• Who is NetApp?

• Management, Virtualization and vSphere Integration

• Efficiency, Performance, Flexibility

• FlexPod
NetApp is a global data & storage management company known for innovative technologies that drive customer success.

- 12,000 employees, 135 countries, based in Sunnyvale, CA
- NTAP = NASDAQ 100, IPO in 1995
- NetApp is the storage behind many familiar brands. You are already a NetApp customer if:
  - You sell something on Ebay or buy it with PayPal
  - You fly Southwest Airlines
  - You use the iTunes Store
  - You tag a friend in a photo

* Non-GAAP Revenue
Gartner Magic Quadrant, Industry Leading SAN and NAS Solutions

Modular Enterprise SAN Arrays

Midrange & High End NAS

As of March 2011

As of November 2011
FAS Market Share Trend – Revenue

FAS equals the combined NAS and SAN markets

Source: IDC, June 2011
The Acknowledged Leader

- Initial product quality
- Product features
- Technical support
- Knowledgeable sales
- Overall ranking

NetApp ranked #1 in overall rankings for Enterprise Arrays:

- NetApp: 6.69
- IBM: 6.61
- Hitachi: 6.46
- EMC: 6.3
- HP: 6.25

NetApp tops enterprise array field again.

If it hasn’t done so already, NetApp is shaking off that “only NAS” label with yet another big win in the Quality Awards for Enterprise Arrays.

Storage Magazine: Vol. 11 No 1, March 2012, “Quality Awards: Enterprise Storage”
NetApp Key Partnerships

- All NetApp FAS and V-Series products are VMware certified
- NetApp storage used throughout VMware development
- **Virtualization Escalation Team (VET)** in place for joint customer support

---

**Cisco**

- NetApp IT runs on Cisco; Cisco development runs on NetApp
- **Virtualization Escalation Team (VET)** in place for joint customer support
- **imaginevirtuallyanything.com**: FlexPod ITaaS solution by Cisco + NetApp + VMware

---

- 2009 Storage Partner of the Year
- Extensive support and integration with Hyper-V, Exchange, SQL, and MOSS that allows customers to reduce storage spend and increase agility in their environment
Unified Architecture

- CIFS
- iSCSI
- NFS
- FCoE
- FC
- Compliance
NetApp Unified Storage
With the Data ONTAP storage operating system

Competitors
- Incompatible silos

NetApp
- Compatible family

Platforms

Software & Processes
- Incompatible software; different processes
- Unified software; Same processes

Experts & Integration Services
- Lots of experts and integration services
- Reduced training & service requirements
FAS Family of Enterprise Storage Systems

- Single Storage Architecture with FC SAN, NAS, and iSCSI connectivity
- Single code base (Data Ontap)
- Single Achieve / Compliance (WORM)
- Single Replication method
- Single Snapshot technology
- Single Dedup
- Single Backup

Data ONTAP + One Family of Management Software
NetApp® V-Series Systems

- FC/FCoE
- iSCSI
- CIFS
- NFS

LAN

Vol
Aggregate

NetApp®
Comprehensive Storage-Saving Features
Built-in to Data ONTAP to maximize Storage Efficiency

**Data Deduplication**
Saves up to 95% for full backups; 25% to 55% for most data sets.

**RAID 6 (RAID-DP™)**
Saves up to 46% versus mirrored data or RAID 10.

**Thin Provisioning (FlexVol®)**
20% to 33% typical savings.

**Writable Snapshot (FlexClone®) Copies**
Savings equal size of original data set minus blocks subsequently changed in clone.

**Snapshot™ Copies**
Savings equal the portion of data set not changed since last copy was made.

*Savings compound when using multiple features!*
Agenda

- Who is NetApp?
- Management, Virtualization and vSphere Integration
- Efficiency, Performance, Flexibility
- vSphere Integration
VSC 4.0 Overview

• VMware vCenter™ plug-in provides centralized management of VMware virtual server and desktop environments running on NetApp storage

• Key Feature:
  – NetApp Cluster-Mode Enablement

• VSC 4.0 now provides 4 capabilities:
  – Monitoring & Host Configuration
  – Provisioning & Cloning
  – Backup & Recovery
  – Optimization & Migration (new & cool)
NetApp Software

VMware vCenter

VMware ESX
NetApp Software

VSC 4.0

- Virtual Storage Console (VSC)
- Rapid Cloning Utility (RCU)
- SnapManager for Virtual Infrastructure (SMVI)

VMware vCenter

VMware ESX

SME

SMSQL

SMMOSS

SnapDrive

SnapDrive

SnapDrive
Virtual Storage Console 4.0
Storage Console – Overview, SAN and NAS

Inventory storage and ESX hosts

Address, Capacity, Version information

MPIO and NFS settings
Virtual Storage Console 4.0
Provisioning and Cloning - VM Provision

- Provisions datastores
  - Without Storage Admin intervention
  - At various levels: Data Center, Cluster & Host

- Manages storage paths
  - Selects paths
  - Load balances paths
  - Applies multi-pathing policies

- Secures storage access
  - Masks LUNs
  - Creates NFS exports
• Instant cloning at file and volume granularity

• Flexclone technology minimizes storage use to a single copy
Manages storage options
  - Enables dedupe
  - Enables thin provisioning

Resizes datastores

Provides instant cloning of VMs
  - Virtual servers
  - Virtual desktops

Supports native storage efficiency
  - I/O offload
  - Pre-deduplicated clones
Virtual Storage Console 4.0

Backup and Recovery Overview

Per-Job Backup Options:
– Triggering of VMware® snapshots for application consistency
– Triggering of pre/post backup scripts
– Exclusion of selected datastores
– Inclusion of independent disks
– SnapMirror update
– Time-based or number-of-copies–based retention period
– Customized alert notification

Other Features:
– Immediate or scheduled application, or crash-consistent backups of VMs or datastores
– Flexible recovery at any level of granularity
– Updating of existing SnapMirror relationship at backup completion for integrated DR
– Mounting of backups for prerestore content verification
– Protocol support: FCP, iSCSI, and NFS
Optimization and Migration Highlights

• This is a NetApp “exclusive”

• Review the alignment of VMs and migrate misaligned VMs to new/existing Datastores

• Perform online alignment of VMs without taking the VM down

• Can migrate from any other storage platform

• Interface fully integrated into VMware vCenter
Agenda

- Who is NetApp?
- Management, Virtualization and vSphere Integration
- Efficiency, Performance, Flexibility
- FlexPod
Deduplication on NetApp

Apply NetApp Dedup technology
Virtualization gives rise data increase

Traditional RAID deployment

Highly redundant data footprint

Not ‘virtual’

Raises costs
Deduplication for Virtualization

NetApp FAS Array

VM
VM
VM
VM

Datastore

FlexVol

Do not buy this space

Lower CAPEX
For new deployments
For existing deployments
Even for 3rd party arrays
Lowered TCO
NetApp Zero Cost Cloning - Volumes

Zero Cost Clone

NetApp FAS

Datastore with 84 VM’s

4 original deduped VM’s

Cloned 20 times for 80 VM’s

50 GB of data amplified to
4000 GB of data at no cost

8000% efficient space Utilization

Saving 4TB from purchase

Clones are created in seconds with zero space required

Do not buy this space
Zero Cost Cloning – For single VM’s

Cloning one VM at a time

File Level *FlexClone* clones the individual VM – in storage

No server CPU impact
Zero Cost Cloning – For single VM’s

These file clones cost zero and are created in seconds. Dedup in future to maintain space efficiency over time.

Save 100’s of TB’s from purchase with virtual desktops.
Dedup and Clones – do they matter?

- 85% NetApp Virtualization customers use Dedupe
- NetApp Virtualization Guarantee* Program
  – [www.netapp.com/Guarantee](http://www.netapp.com/Guarantee)
TYPICAL MARKET DATA STORAGE ARCHITECTURE

Common Problem Areas:

1. Local DAS storage is fast and cost effective, but lacks enterprise class reliability, scalability, and management features.

2. CAS compliance archive is obsolete, expensive, and too slow to be useful for analytics.

3. High-Performance storage provided by boutique vendors lacks enterprise class features and is too expensive to store the entire archive.

4. Tier-ing Appliance responsible for policies that migrate older data off of high-performance storage down to archive storage. Adds complexity and performance bottlenecks.

5. Archive storage for the bulk of the data. Cost effective but too slow for analytics.

! Multiple proprietary storage solutions increase future expenses when it is time to replicate to a DR site, or upgrade to new hardware, or migrate data to a new solution...
PRODUCTION SITE

INCOMING RAW MARKET DATA

Broadcast Servers
Feed Loggers

Columnar IMDB Servers

Analytics Servers

Queries

Traders & Analysts

Infiniband Network

10GbE / FCoE Network

FlexCache High Performance NFS

Data Ontap

SAS

SAS or SSD

Historical Archive DB

2TB SATA Drives
Dedupe
RAID-DP
SnapShots
Lost-Write Protection
Parity Scrubbing

SAS or SSD

Scratch Space

Auto Data Tiering

SnapLock

Archived data can WORM protected with configurable retention periods per flexvol for regulatory compliance.

Market Data Archive Reference Architecture

Trading firms require two storage components for their market data analytics. First, high throughput (GBs/sec) to the “Analytics Servers” or “IMDB Servers” for data processing and modeling. Second, cost-effective archival storage to retain this data for years and potentially lock it down for regulatory compliance. Traditionally, these two components required separate, proprietary storage solutions with complex tiering appliances and policies to manage data migration between the tiers.

NetApp FAS storage arrays combine these components into a unified solution, driving efficiency while providing the massive bandwidth required by high-frequency trading operations. FAS storage arrays support both NAS (NFS, CIFS) and SAN (iSCSI, FCP, FCoE) protocols. Performance is achieved through the use of auto-tiering Flash Cache within the controllers and scale-out NAS Flex Cache between the controllers. Cost savings are realized through the use of dense SATA drives along with built-in deduplication and compression. Snaplock can be used to lock down the data for SEC compliance. Patented data protection technologies such as SnapShots, SnapRestore, RAID-DP, Lost-Write Protection, Parity Scrubbing, and SnapMirror are built-in. Data Motion can be used to migrate data between controller-pairs for load balancing and to avoid hardware obsolescence. The foundation for this solution is Data Ontap, the operating system running on all NetApp storage controllers worldwide.

DR SITE

Gigabit Ethernet

SnapMirror replicates flexvols to DR site

Data Motion uses Snapmirror to migrate MultiStore Virtual Partitions between physical controllers for load balancing or technology-refresh purposes—with no disruption to NFS clients.
Introducing FlexPod
Agile, Proven Data Center Solution

Complete data center in one rack cabinet

- Standard, pre-validated, best-in-class infrastructure building blocks
- Flexible: One platform scales to fit many environments and mixed workloads
  - Add applications and workload
  - Scale up and out
- Simplified management and repeatable deployments
- Design and sizing guides
- Services: Facilitate deployment of different environments
Secure Multi-tenancy for ITaaS
Three Companies, One Architecture

Project Overview:
• NetApp, Cisco, VMware jointly testing an end-to-end secure multi-tenancy solution
• Data is securely partitioned from vFiler, UCS, to vShield Zones

Customer Benefits:
• The only solution in the industry to support end to end multi-tenancy across application and data
• To result in significant economies of scale, higher utilization, better SLAs
FlexPod for VMware

**VMware vSphere**
VMware vSphere Enterprise Plus
VMware vCenter Standard

**Cisco® Unified Fabric**
2 Cisco Nexus® 5548 with fabric services
(per 3 FlexPod configurations)
2 Cisco Nexus 1010 and 1000V

**Cisco UCS Platform**
2 Cisco UCS 6120XP Fabric Interconnect
3 Cisco UCS 5108 Blade Server Chassis
9 Cisco UCS B-250 M2 plus VIC
6 Cisco UCS B-200 M2 plus VIC

**NetApp FAS3210A**
4 NetApp DS2246 450-GB SAS shelves
2 256-GB flash cache
2 10-Gbps IP interfaces
4 4-Gbps Fibre Channel interfaces
NetApp complete bundle

**1 Rack Data Center Solution**
- 30 Westmere CPUs (180 cores)
- 2 TB server memory (up to 4 TB)
- 40-Gbps interconnect (4x 10 GE)
- 512-GB SSD storage cache
- 42 TB storage

**1 Enterprise IT Infrastructure**
For an organization of 1500 users with a mixed workload of:
- VMware View 4.5 (MS Windows 7)
- MS Exchange 2010
- MS SharePoint 2010
- MS SQL Server 2008 R2
- Plus headroom for more applications

Scale-out your infrastructure by connecting more FlexPods to support 3000 and 4500 users

1500 3000 4500
#1 Storage for Virtualized Environments

NetApp™
Thank you

Chris Costanzo
CDW FINANCIAL SERVICES TEAM

Scott Hiemstra
Sales Manager, Financial Services
120 S. Riverside Plaza FL 7 | Chicago, IL 60606
Phone: 312.705.8187 | Mobile: 312.218.4574
scothie@cdw.com
CDW Overview

» Industry-leading provider of hardware, software and services for client, networking, communication and data center systems

» Founded in 1984 by Michael Krasny
  - Acquired Berbee Information Networks in 2006

» 6,200+ coworkers, 23 locations

» 1000+ partners

» Privately held since October 2007

» Ranked no. 38 by Forbes on America’s Largest Private Companies list in 2011

» Sales of $9.6 billion in 2011
DEDICATED ACCOUNT TEAM

Financial Services Team

- Dedicated Account Managers supporting the Financial Services Industry
- Team focuses on a national account base
- Superior customer service through experience and industry focus
- Co-Sponsored technology events with industry specific vendors
- Team participation in many of the major trade shows (FIA, SIFMA, HPC Wall Street, etc.)
HOW WE DO IT

Knowledge of your IT environment
- Guide you through the stages of assessment, design, and implementation
  - Maximize your existing technology
  - Refresh or new solution opportunity
- Prepare for new and Emerging Technologies
- Partner with our Solution Architects and the industry leading manufactures

Wide array of products and services across the IT lifecycle
- Presales Assessments
- Configuration
- Installation
- Managed Services
- System and Application Design Workshops

UNMATCHED.
Our expertise, experience, and resources allow CDW to offer a solution portfolio that is unmatched in the industry.
HOW WE DO IT
Technology Experts and Solution Architects

- Storage & Server Architecture
- Configuration Solutions
- Power & Cooling
- Networking
- Security
- Telecommunications
- Unified Communications
- Mobility
- Software
- Document & Print Management Solutions
THANK YOU.
Q&A Session

Chris Costanzo
Pre-Sales Engineer, CDW

Scott Heimstra
Securities & Investments Sales Manager, CDW