SIMPLE AND EFFICIENT STORAGE FOR IT PRODUCTION
LEVERAGING EMC’s UNIFIED PLATFORMS

EMC Forum
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Unified Storage Specialist
The Journey to The Private Cloud

- **IT PRODUCTION**
  - 15% Virtualized
  - Lower costs

- **BUSINESS PRODUCTION**
  - 30% Virtualized
  - Improve quality of service
  - 50% Virtualized

- **IT-AS-A-SERVICE**
  - 85% Virtualized
  - Improve agility
  - Run IT as a Business
  - 95% Virtualized

Companies like Microsoft, Oracle, and SAP support virtualization for higher efficiency.
The Journey to The Private Cloud

Simple & Efficient

IT PRODUCTION

Percent Virtualized

Development, Test, and IT-Owned Applications

15%

30%

Lower costs
EMC Unified Storage

- Multi-protocol
- Flash and SATA
- FAST
- Virtual Provisioning
- Deduplication
- Compression
- Spin Down
- Five-9’s reliability
- Self serviceable

EMC’s Fastest Growing Storage Platform
EMC Unified Storage

EMC UNIFIED STORAGE IS 20% MORE EFFICIENT. GUARANTEED.
20% More Storage Efficiency Out of the Box

EMC Unified

"Other"

RAID Parity
File Sys Format
Snapshot Reserve
Core Dump Reserve
System Reserve

Usable Capacity

Capacities based on documented out-of-the-box best practices for set up
20% More Storage Efficiency Out of the Box

Guarantee:
At least 20% More Efficiency
or EMC will make up the difference at no additional cost

Capacities based on documented out-of-the-box best practices for setup
20% More Storage Efficiency Out of the Box

* Disclaimers: NONE

Capacities based on documented out-of-the-box best practices for set up.
20% More Storage Efficiency Out of the Box

Access the capacity calculator at emc.com

Capacities based on documented out-of-the-box best practices for set up
Any Protocol

- iSCSI
- NAS
- Fibre Channel & FCoE

- Ethernet
- iSCSI SAN
- CIFS & NFS
- FC/FCoE SAN
UltraFlex

- Flexibility to mix Fibre Channel and iSCSI
- Online expansion via hot pluggable IO modules
- Upgrade to support future I/O technologies

Future Connectivity
i.e. FCoE

Designed for flexibility and future expansion
Flash Drives

+30x IOPS improvement
10x faster response time
38% less power per drive
98% less power per IO
58% less weight per TB
Better availability & reliability
Flash Drives and ROI

Oracle Database

150 FC  6 EFD

35% More Transactions/Minute
300%+ More IOPS
25% Lower Response Time
96% Fewer Disk Drives
73% Lower Storage Costs
Energy Efficiency

• Policy-based drive Spin Down
  – Reduce energy for inactive drives

• 2TB Low-power SATA drives
  – 32 percent less energy versus SATA drives

• Adaptive Cooling
  – Dynamic cooling based on activity

• Enterprise Flash drive technology
  – 98 percent better energy efficiency per I/O

• High Density Packaging Option
  – 2X the capacity in ½ the footprint
High Density Configs

Twice the Capacity with Half the Foot Print

- New packaging offers up to 390 SATA Disks in a single rack
- Available for all NSG-2 & 8, CX4 480 & 960 models
- No change to system model maximum drive counts
- Includes supports for 1TB & 2TB LP SATA drives

Standard CX-4 960 with 1TB SATA

6 Frames = 945 TB

Dense CX4-960 with 2TB SATA

3 Frames = 1,890 TB
Data Deduplication

- Built in deduplication of primary filesystems
- Up to 50% storage savings for typical unstructured file share datasets

Based on integration of key EMC technologies:
Avamar deduplication + RecoverPoint compression
Data Deduplication

• Dedupe Enhancements
  – Large file & active file deduplication
  – Compression-aware NDMP backups
  – Tunable deduplication by filesystem
  – File level compression for CIFS

• New VMware dedupe support
  – Adds support for deduplication and compression of VMDK images

• vCenter integration
  – New plug-in enables VMware File-level snaps and clones
  – Provides more granular replication and recovery
New Capabilities: Simple & Efficient

Unisphere Manager
Simple, unified control point for block and file data types

Virtual Storage Integrator
View, provision, manage storage services via vSphere

vSphere VAAI-Ready
VMware integration to accelerate storage operations

Sub-LUN FAST
Policy based data movement across tiers based on activity

FASTCache
Flash Drives as cache to improve array response time

LUN Compression
Space efficiency feature for both block and file data

Available now for CX4 and NS Series
Unisphere: Simple, Unified Management

- Common experience for SAN and NAS
- Single sign-on for multiple arrays
- Built in access to support community
- Supports CLARiiON CX4 & Celerra NS

No Charge Upgrade
EMC Virtual Storage Integrator

Integrated point of control to improve storage efficiency

vCenter

- Create file system
- Enlarge file system
- FullClone
- FastClone
- Deduplicate VMs
- Compress VMs

Now Available on Powerlink
VMware Array API Integration (VAAi) Ready

- **Write Same/Zero**
  10x less IO for common tasks

- **Hardware Offloaded Locking**
  10x more VMs per datastore

- **Thin Provisioning Stun**
  Avoid “out-of-space” issues

- **Fast/Full Copy**
  10x faster VM deployment, clone, snapshot, and Storage VMotion
Sub LUN FAST and FASTCache

Efficient & Granular Sub LUN Tiering

Automated policies for performance and/or cost optimization

Extend Array Cache via Flash Drives

Increase cache efficiency for large capacity arrays to optimize response time
FAST: Efficiency Made Simple

- Similar performance
- Similar capacity
- Less power
- Less footprint

15% Lower Cost
Fully Automated
The FAST Cache Effect

2X more users
2X more transactions

Baseline

25,000 TPS
1,228 Users

w/ FAST Cache

50,000 TPS
2,445 Users
Increased Space Efficiency via Compression

LUNs within a Pool  
Reclaimed Capacity

Compression

50% (Data type dependent)

User enabled or disabled at the LUN Level

Minimal overhead – Compression run in background

Application independent – supports all data types
Putting it All Together

FAST

Flash
Fibre Channel
SATA

FAST Cache

Compression

More performance for lower cost
FAST for File-based and Unstructured Data

- Flash + SATA
- FAST
- Virtual Provisioning
- Deduplication
- Compression
- Cloud Federation

Store More with Less

Public Cloud
File Archiving – FAST with FMA and Atmos

FAST integration with cloud storage

Automated file tiering via policy with transparent application and user access

New operational model to deliver storage services via internal or external providers
Use Cases for EMC Atmos Cloud Storage

**Content-rich Web Apps**
- App integration in a week through Web services
- Solves global content access challenges
- Gives developers control and IT easier management

**Infrastructure-as-a-Service**
- Scales to multiple PBs elastically
- Makes protection and distribution easy
- Supports multiple tenants natively

**Archiving to the Cloud**
- Makes protection across sites easy
- Extends to Atmos-based clouds
- Can separate archives into isolated tenants
EMC Atmos Family

**Atmos Platform**
- Software with integrated server and storage
- Factory configured, racked & cabled
- Flexible, service model with user-serviceable

**Atmos Software**
- Open solution for policy-driven object storage
- Support for industry standard HW platforms
- Easy integration (~1 week, 1 engineer)

**Atmos Virtual Ed.**
- Runs on VMware ESX and starts at 10TB
- Supports third party servers and storage
- Certified with EMC Arrays (NFS and FC)
EMC Unified Storage Strategy

File Services
- NFS
- CIFS
- iSCSI
- FC
- Unified Storage Platform
- FCoE
- MPFS
- SOAP
- REST

Atmos Cloud
- App OS
- Microsoft SQL Server
- SQL Server
- SQL Server
- VMware
- Oracle Database

Power Path & FMA
- Atmos
- Cloud
- PowerPath
- FMA

Virtualization
- Atmos
- Cloud
- PowerPath
- FMA

Unified Storage Platform
- Flash
- FC
- SATA
- Snaps
- B2D
- Archive

Five 9’s Availability
- Virtual Provisioning
- Deduplication & Compression

LAN/WAN
- NAS
- iSCSI
- FC

DR/COOP
- Flash
- FC
- SATA
- Snaps
- B2D
- Archive

1 to n Replication

Purpose Built Platforms
- Integration & Extension
- DLm
- Atmos
- Centera
- CLARiiON
- Recover Point
- Rainfinity
- Avamar
- V-Max
- Data Domain

Unisphere
The Journey to The Private Cloud

- 15% or more savings with enhanced FAST
- 2x performance with FAST Cache
- 50% capacity reduction with compression
- Single pane of glass management
- Industry’s best VMware integration

Get Started Now
Getting Started with the Help of EMC U

Featured EMC Education & Certification Courses

- Unified Storage Implementation and Management
- Maximizing VMware & EMC Array Integration Workshop
- Cloud Computing Foundations via e-Learning

Why Users Invest in EMC Training and Certification

- 45% demonstrate increased competence and expertise
- 26% increased credibility & respect from peers & managers
- 29% play a more strategic role in their team and organization
- 85% exploit more EMC product features and functions

Source: Voice of the Customer (Q3-09); 30/60 day customer feedback; EMC Proven Survey w/IDC Dec’09

Learn more ➔ http://education.EMC.com
Please evaluate this session:
Simple and Efficient Storage for IT Production

• Text to **32075**

• In the message body, type: **EMC2 space 05** then letters from the table below to indicate each response

• Provide additional comments after an * on what you learned in the session

• Example: **EMC2 05a*I learned a lot**

<table>
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<th>Overall rating of this session</th>
<th>Highly Valuable</th>
<th>Valuable</th>
<th>Neutral</th>
<th>Somewhat Valuable</th>
<th>No Value</th>
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<td>Please indicate how valuable you found this session.</td>
<td>a</td>
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THANK YOU