Driving Innovation Through the Information Infrastructure

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Integrating a Multi-tiered Deduplication Approach to Simplify Enterprise-wide Backup & Recovery

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EMC IT At a Glance

User Profiles  48,000 “internal” users

IT Environment  400,000+ customers and partners
                5 data centers, 7 PB storage

Business Applications  ~500 applications and tools

Virtualization  ~ 6,000 OS images (worldwide)
                75% of all servers virtualized

Global Support  80+ countries and 20 languages
EMC IT Backup and Recovery Challenges

Challenges impacting backup and recovery:
- Rapid Storage Growth
- Globalization
- Application explosion
- Service Expectations
- Cost of ownership
- Complexity
- Security
- Acquisitions
Backup and Recovery Guiding Principles

✓ Centralize & standardize Backup and Recovery initiatives across EMC
  • Easy troubleshooting
  • Reducing management costs

✓ Ensure data protection while reducing backup infrastructure

✓ Meet and improve recovery time and recovery point objectives

✓ Refine data protection and archiving policies and strategies for optimized backup service

✓ Increase reliability by phasing out older tape technologies

✓ Automate alerting, monitoring, reporting for more effective proactive incident management

✓ Never backup same data twice
Global Backup Strategy

Non IT-supported Assets

End User Systems

Lab Equip, Shadow Apps

Remote Office, File/Print, Apps, Other

IT Supported Assets

IT Partially-Supported Assets

Desktop/Laptop

Data Centers

Remote Environments

Out of Scope
Deduplication Backup Options

- Leverage deduplication to solve backup challenges
- Utilize each technology across differentiated use cases

### Avamar
- Use cases: ROBO, desktop/laptop, file system, VMware, NAS
- Shortened backup window
- Unstructured data, high commonality and low change rate
- Network bandwidth constraints
- IP based only

### Data Domain
- Use cases: data center, structured data (Oracle, SQL, Exchange, SAP), large ROBO
- Multiple protocols
- Seamless integration with existing backup infrastructure
- High performance & high capacity
- Global deduplication
EMC IT Next Gen Backup Timeline

Tape Challenges:
- High Restore Failure Rates
- Administration Time
- Unexpected downtime
- Growing backup windows
- Not unified across platforms, applications and geos
Phase 1: Remote Office Backup Consolidation

Approach:
- Leverage deduplication to centralize remote office deployment and monitoring
- Consolidate backups across geos:
  - 72 sites in Americas
  - 49 sites in Europe
  - 28 sites in Asia Pacific

Benefits:
- Backup volume decreased by 95%
- Backup times cut by 90%
- Using only 40% of storage space previously needed
- Backup failures eliminated
- Trouble tickets down from >6,000 to nearly zero
- 100% restore success rate
- Savings of $1M
- 8 FTEs re-directed to other tasks
Phase 2: VM Backups Within the Data Center

**Situation:**
- Currently at 75% virtualization of server environment
  - Goal of reaching 100% by 2012
- Supporting backups of over 2,000 VMs
- Increase backup success rates
- Decrease backup times
- Reduce the number of trouble tickets into IT

**Approach:**
- Deduplicate and minimize backup data transmitted across the network
- Centrally manage deduplicated backups
Phase 2: Results & Benefits

Results:

**Before Deduplication**
- Primary Data Storage: 183 TB
- Monthly Full Backups: 183 TB
- Daily Incremental: 7.6 TB
- **90 Day Retention:** 1232 TB
- Growth Rate: 34%

**After Deduplication**
- Primary Data Storage: 183 TB
- Monthly Full Backups: N/A
- Daily Incremental: 371 GB
- **90 Day Retention:** 64 TB
- Growth Rate: 6%

Benefits:
- Deduplication ratio of 95%
- Removed all physical tape libraries for VM backups
- Decreased FTE support by 50%
- Increased client run time by 75%
- Backup success rate improved by 50%
- Decreased power consumption requirement by 50%
Phase 3: Desktop / Laptop Protection Strategy

Approach:
• Centralized deployment and monitoring across EMC locations leveraging deduplication to reduce amount of data stored
• Time zone based categorization of clients and configurations
• Simple end user interface for on demand backup and self service recovery

Benefits:
• Complete end-user client system protection strategy
• Data reduction average 96% per backup
• Consistently faster backups
• Negligible performance and network impact
• Allows end user to self-restore files reducing Help Desk involvement
Phase 4: Mission Critical Data Center Applications

Situation:
- Mission critical applications: Oracle, SQL and Exchange
- Very large databases, highly transactional
- Huge growth in the amount of data stored
- Large (PB) backup capacity requirements
- Increasing power costs

Approach:
- Optimized deduplication to provide performance and scalability to handle heavy data center workloads
- Leverage network-efficient replication for DR
- Centrally manage deduplicated backups through integration with NetWorker
Phase 4: Results & Benefits

Results*:

Before Deduplication
- Monthly Full Backups: 568 TB
- Daily Incremental: 18 TB
- 90 Day Retention – Space Consumed: 3270 TB

After Deduplication
- 90 Day Retention – Space Consumed: 68 TB
- Compression Rate 48x

*Sampling of SQL, Oracle and SourceOne workloads over 90 day retention

Benefits:
- Deduplication enables efficient replication for DR processes
- Dramatically reduces backup storage growth
- Cost avoidance savings
- Reduction in power costs
- 100% tapeless operational backups
Implementation Overview

Design criteria:

• 100% tapeless for operational backups
• 100% disk backup utilizing deduplication
• Bi-directional replication
• Off site vaulting for compliance
Combined Benefits of Deduplication

- 49% Decrease in Required Enterprise-wide Backup Capacity
- 85% Increase in Protected Data
EMC IT Next Gen Backup Timeline

Tape Challenges:
- High Restore Failure Rates
- Administration Time
- Unexpected downtime
- Growing backup windows
- No unified management across platforms, applications and geos

Next Gen Backup Results:
- Remote office protection
- Desktop/laptop protection
- Journey to the Cloud
- Reduced backup volumes
- Measurable cost savings
Summary

• Deduplication has transformed EMC’s data protection environment:
  – Measurable benefits in backup performance, recovery time, and storage optimization
  – Significant improvements in operational and capital costs
• Utilizing each technology for its specific differentiating function
Q&A

Thank You!

For Additional Information:
Visit EMC at SNW Booth #209

IDC Analyst White Paper:
“EMC IT Increasing Efficiency, Reducing Costs, and Optimizing IT with Data Deduplication”

www.emc.com/collateral/analyst-reports/11147-idc-buyer-case-study-emc-it-ar.pdf