



# **Driving Innovation Through the Information Infrastructure**

**SPRING 2011**

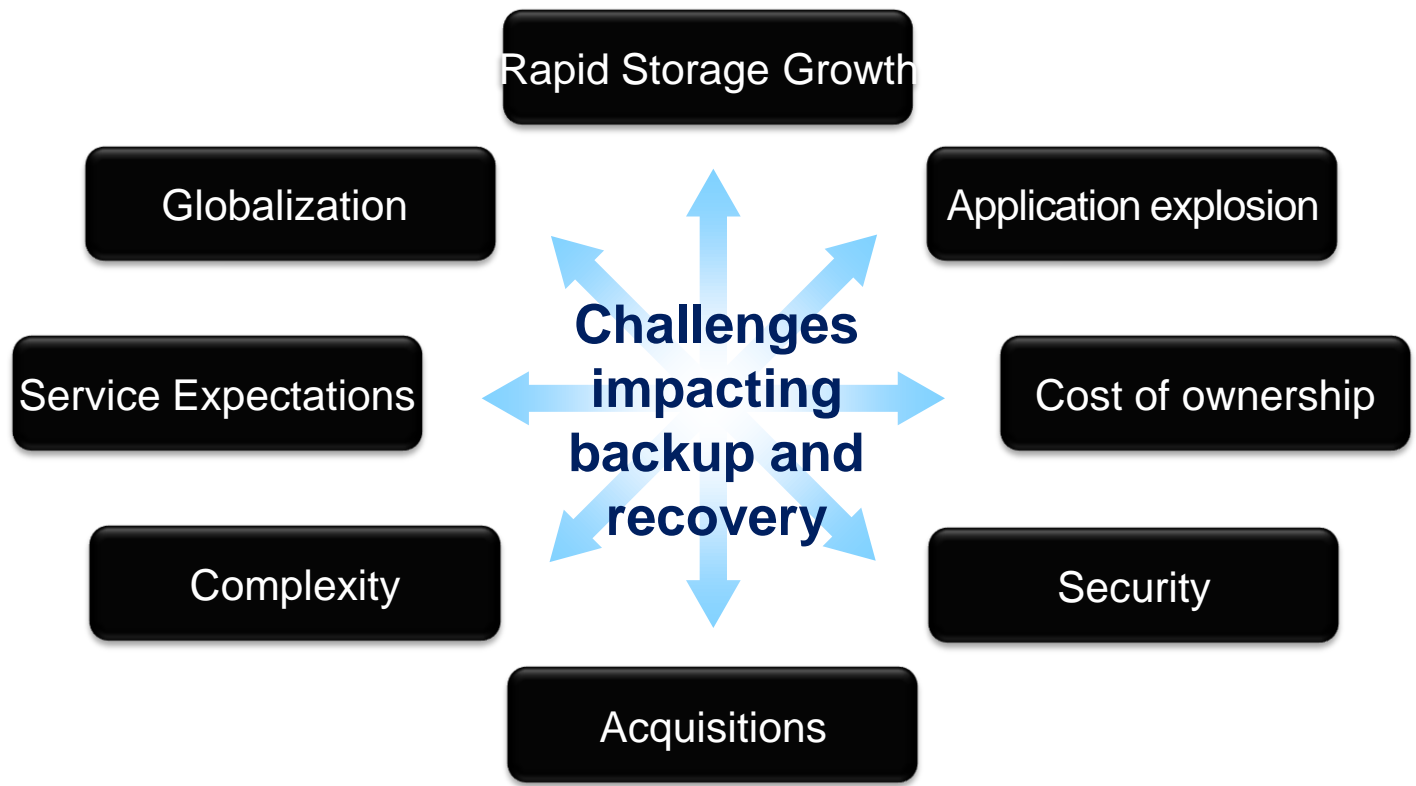
# **Integrating a Multi-tiered Deduplication Approach to Simplify Enterprise-wide Backup & Recovery**

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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

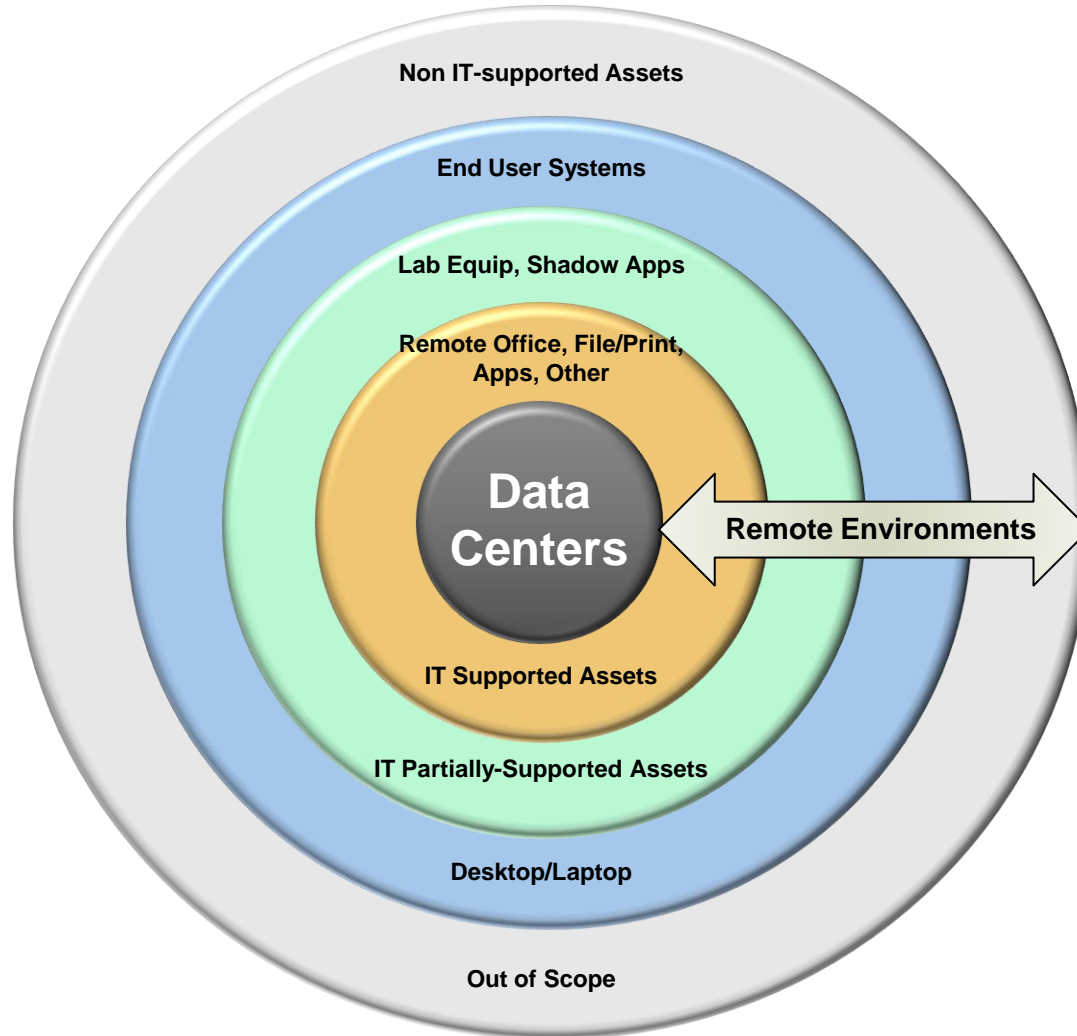


## **Backup and Recovery Guiding Principles**

- ✓ 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



# Deduplication Backup Options

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



## Avamar

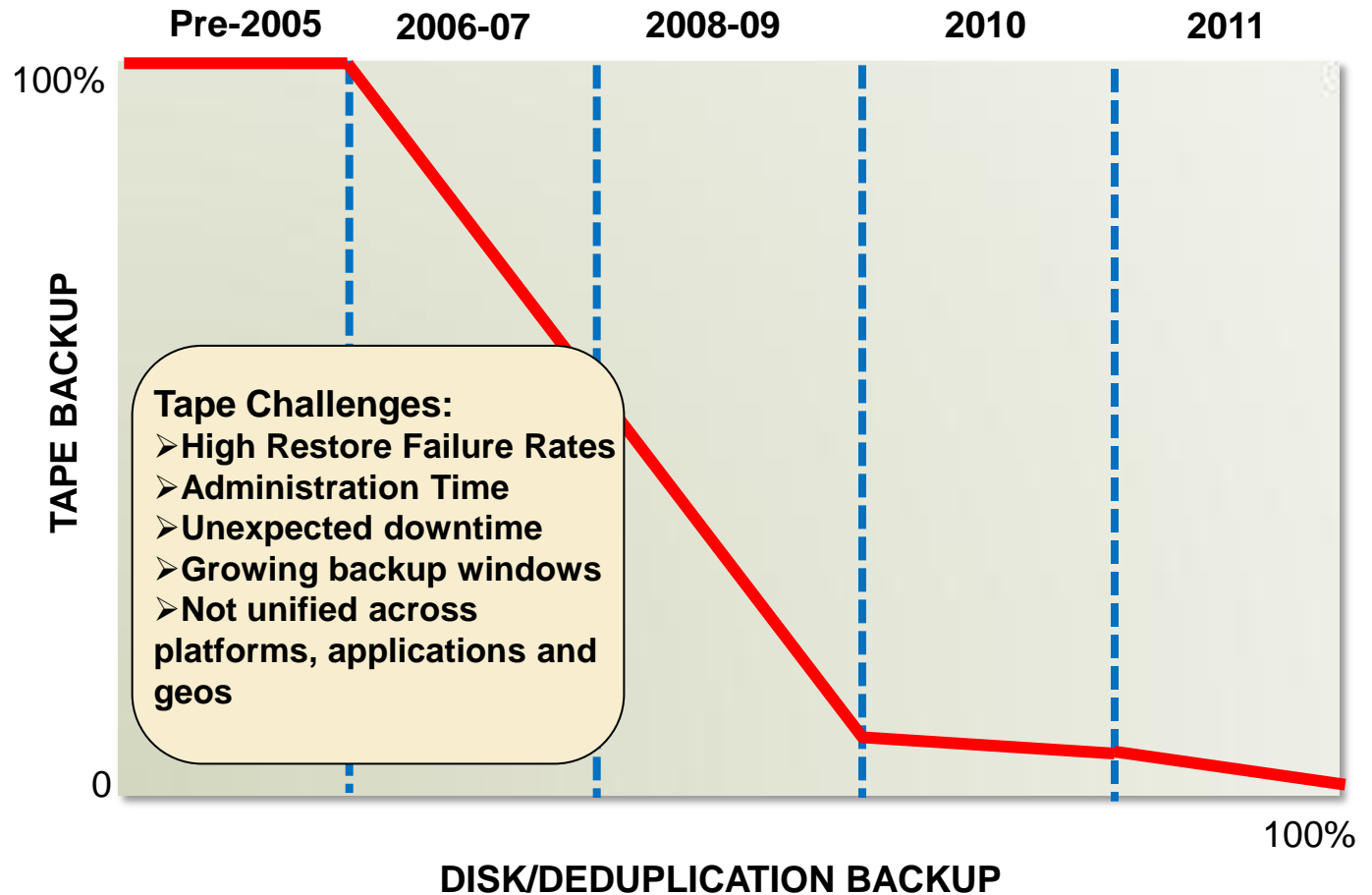
- Use cases: ROBO, desktop/laptop, file system, VMware, NAS
- Shortened backup window
- Unstructured data, high commonality and low change rate
- Network bandwidth constraints
- IP based only



## 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





# 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

## Remote Office Backups

Remote Offices  
Eastern Seaboard



Remote Offices  
West/Central USA



# 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

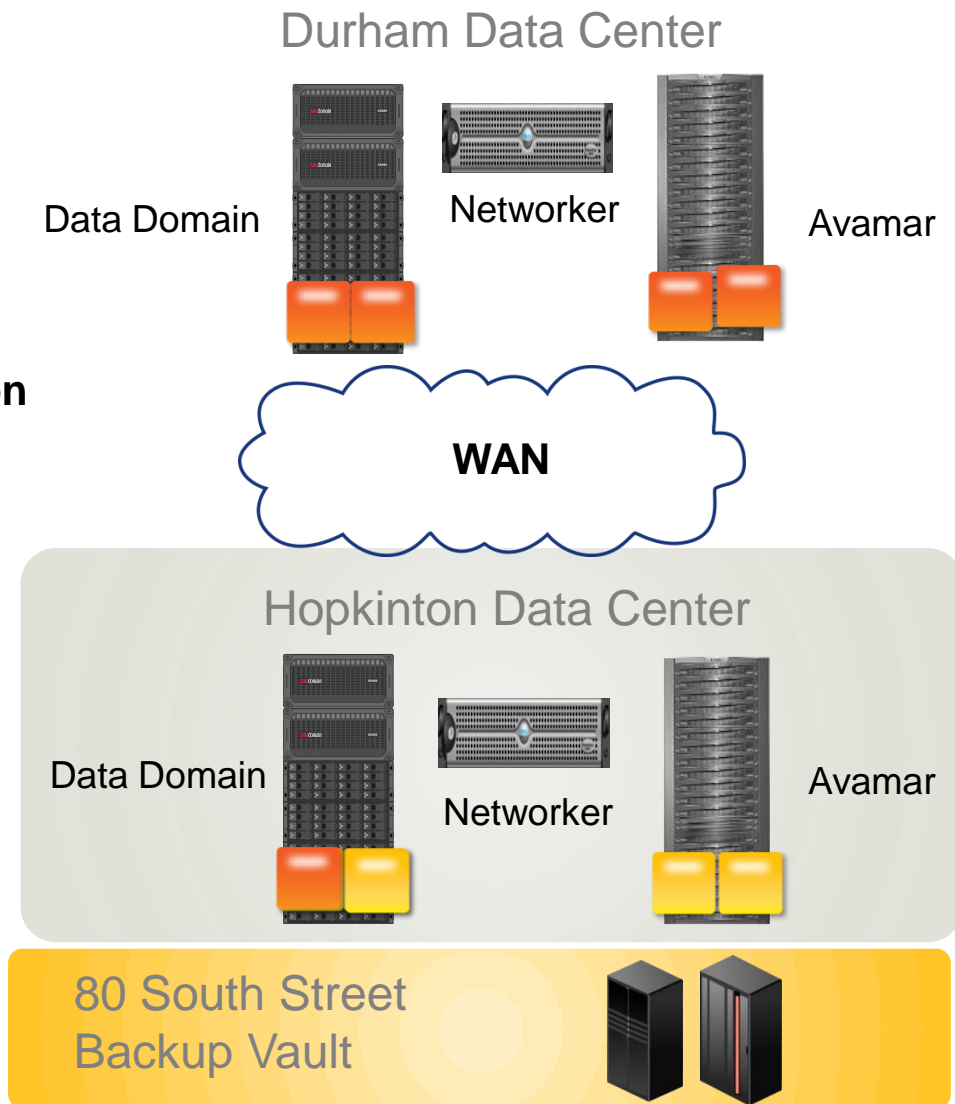
## Benefits:

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

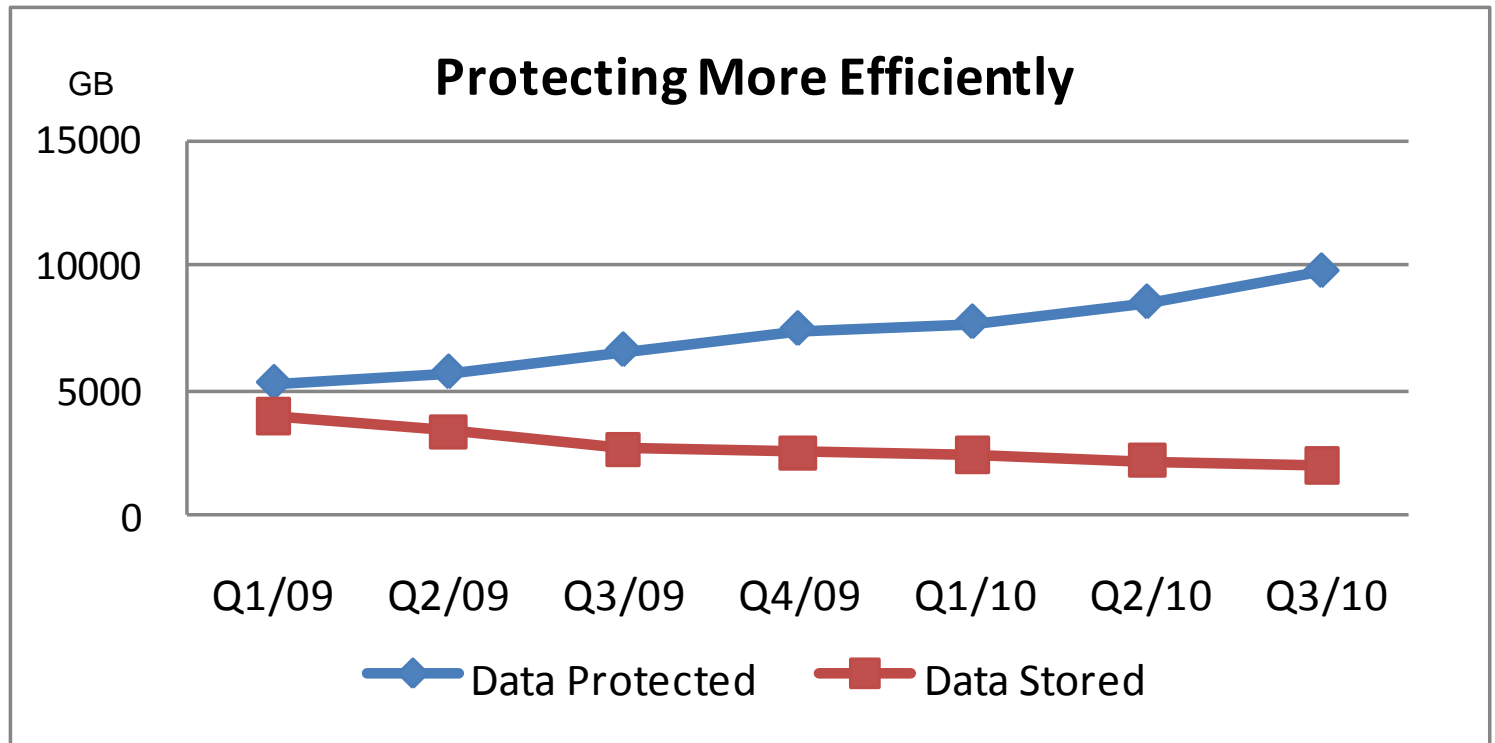
# Implementation Overview

## Design criteria:

- 100% tapeless for operational backups
- 100% disk backup utilizing deduplication
- Bi-directional replication
- Off site vaulting for compliance

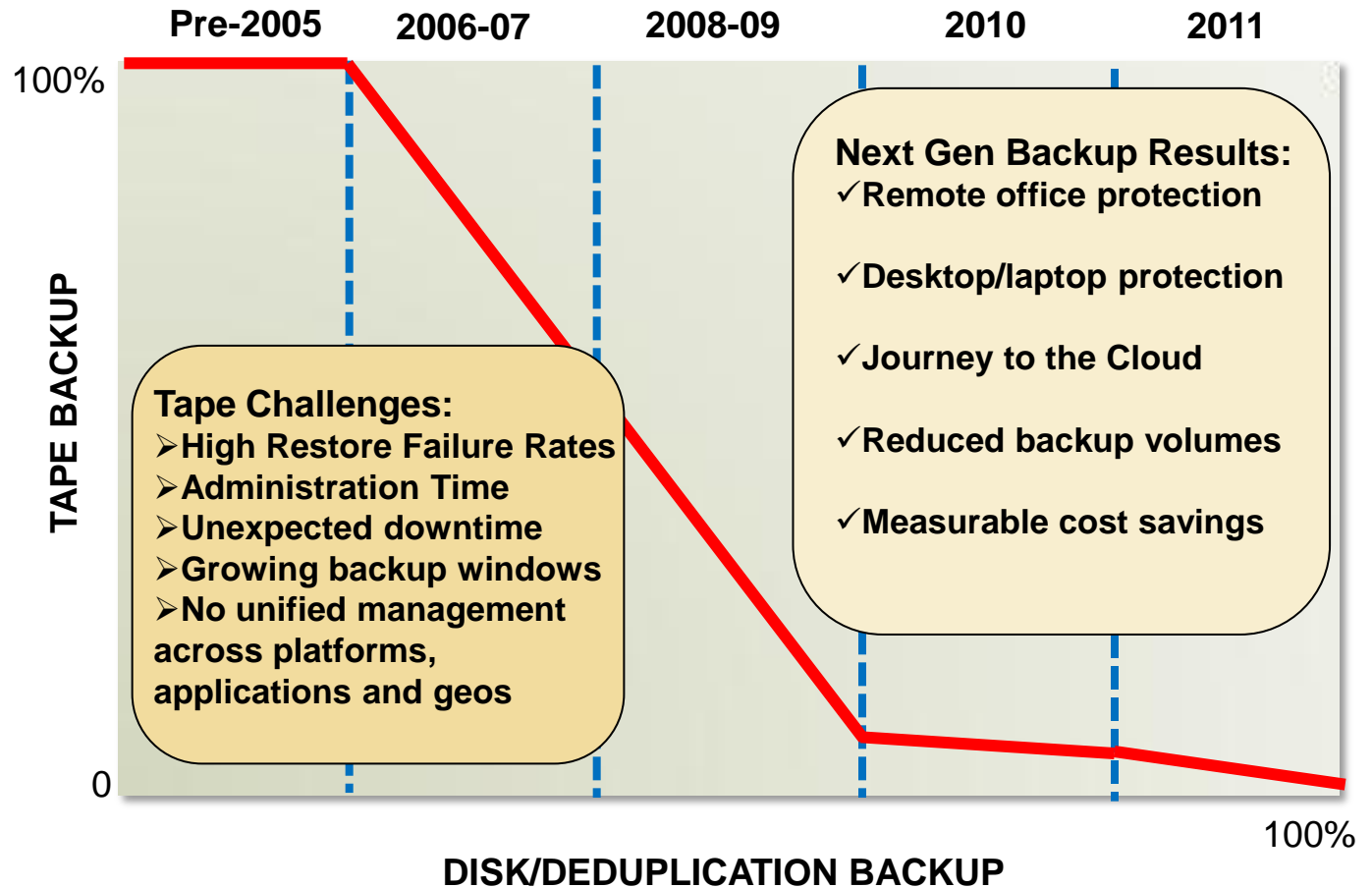


# Combined Benefits of Deduplication



- 49% Decrease in Required Enterprise-wide Backup Capacity
- 85% Increase in Protected Data

# EMC IT Next Gen Backup Timeline



# 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](http://www.emc.com/collateral/analyst-reports/11147-idc-buyer-case-study-emc-it-ar.pdf)