

Efficient Backup with Data Deduplication: Which Strategy is Right for You?

Mike Salins

Principal Technical Consultant

Backup and Recovery Systems (BRS)

Optimization Technologies Take Center Stage



Server



Optimization



**Server
Virtualization**

Network



Optimization



**WAN
Optimization**

**Backup &
Recovery**



Optimization



**Deduplication
Storage**

Where is Deduplication Applied Today?



Deduplication Across Use Cases Provides Additive Savings and Readily Co-exist

Backup

Session Focus

- To address major inefficiencies and costs due to redundant data
- Offered at both source/target depending upon use case
- Delivered as integrated backup solution or as hw target for incumbent backup software

Archive

- To provide single instancing for long-term retention
- Reduces long-term storage costs
- Ability to guarantee single instance of data for compliance

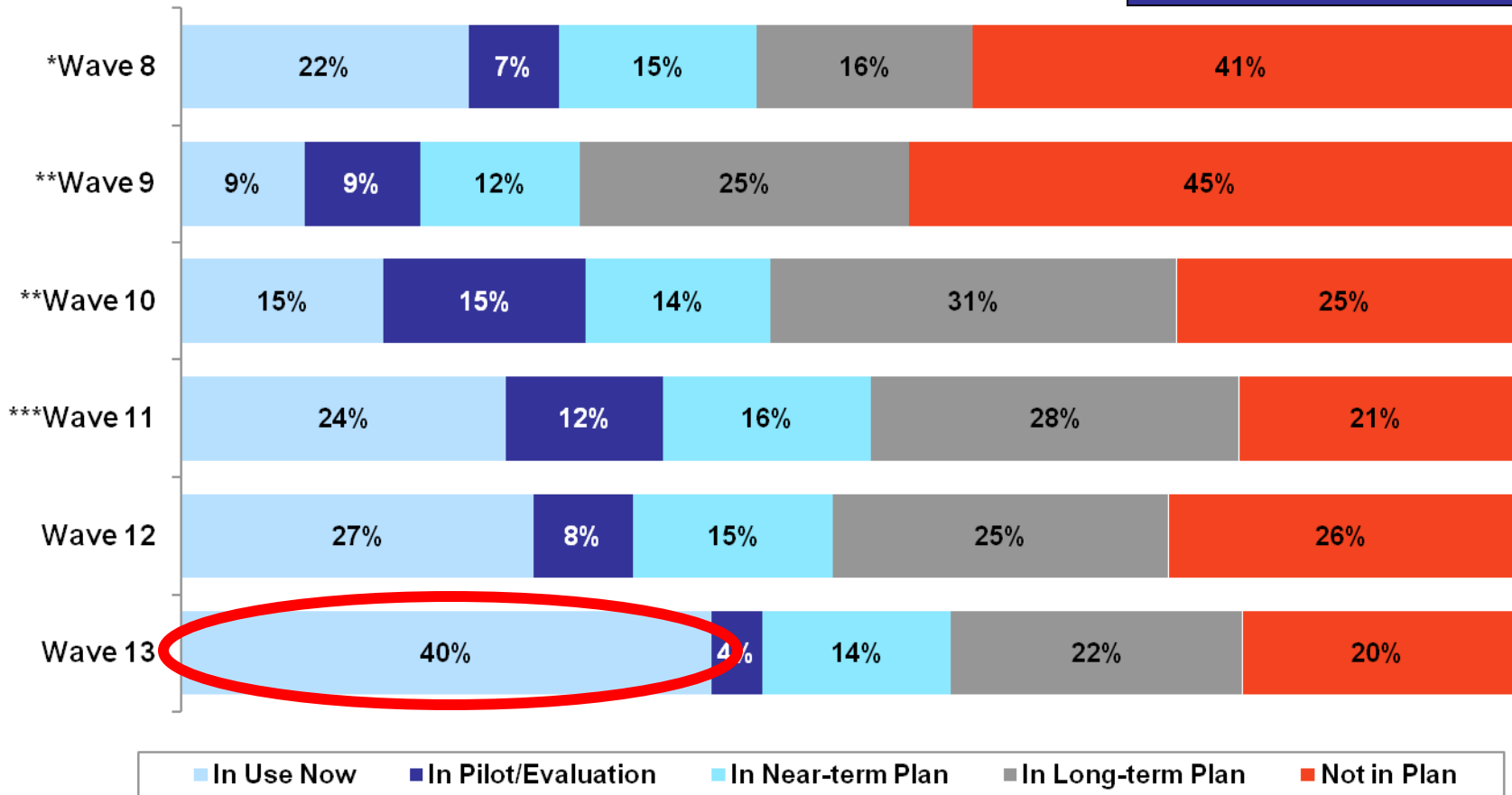
Primary storage

- To provide increased primary storage efficiency; store more data, retain data longer
- Non-disruptive; maintain performance with significantly reduced capacity requirements
- Reduced storage acquisition cost; longer intervals between storage capacity upgrades

The Move is On!

F1000 Backup Deduplication Implementation

Heat Index Rank: 1
Storage Networking Wave 13

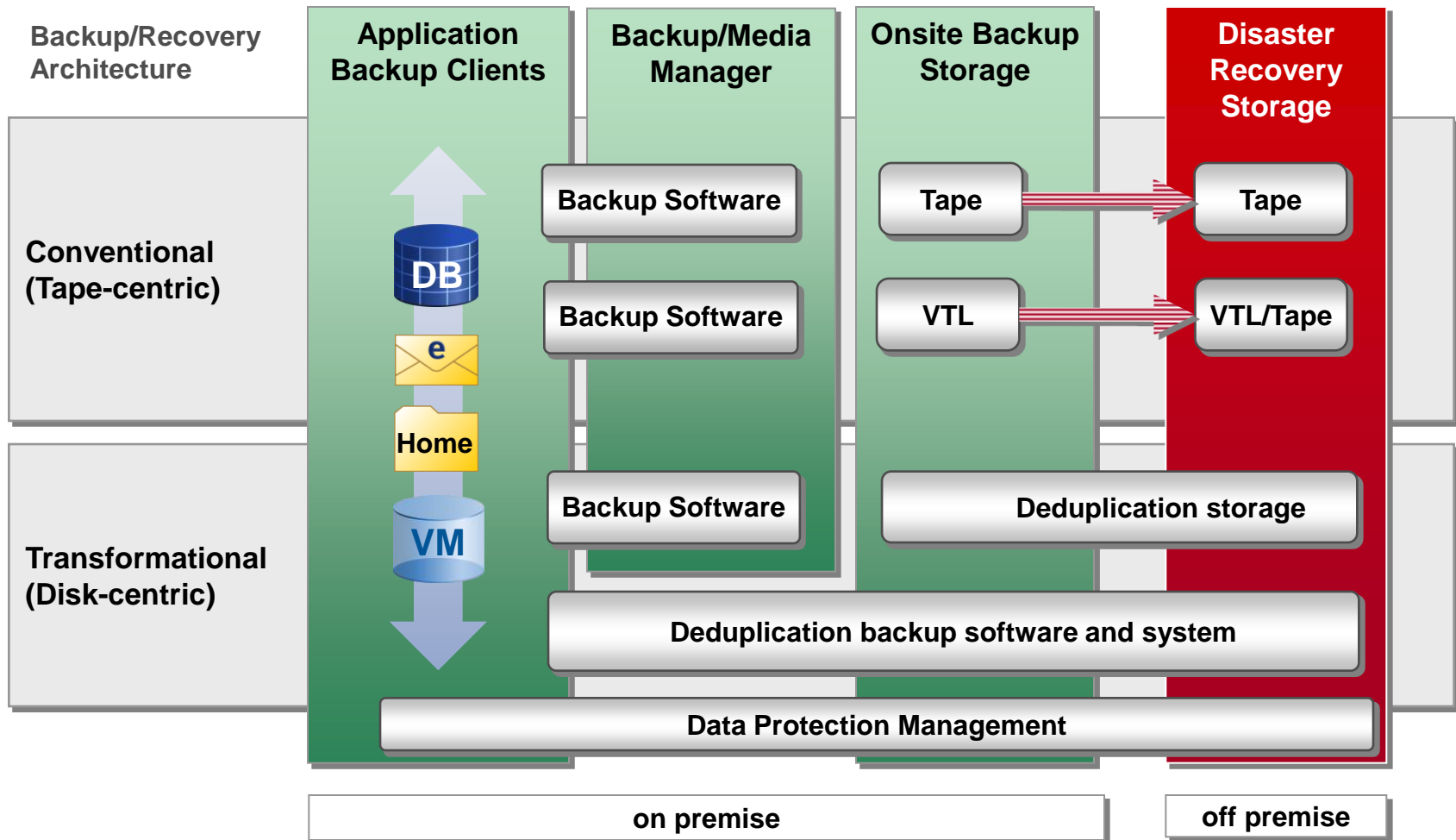


(11/18/09): F1000 Sample. Wave 8, n=148; Wave 9, n=150; Wave 10, n=151; Wave 11, n=127; Wave 12, n=147; Wave 13, n=183.

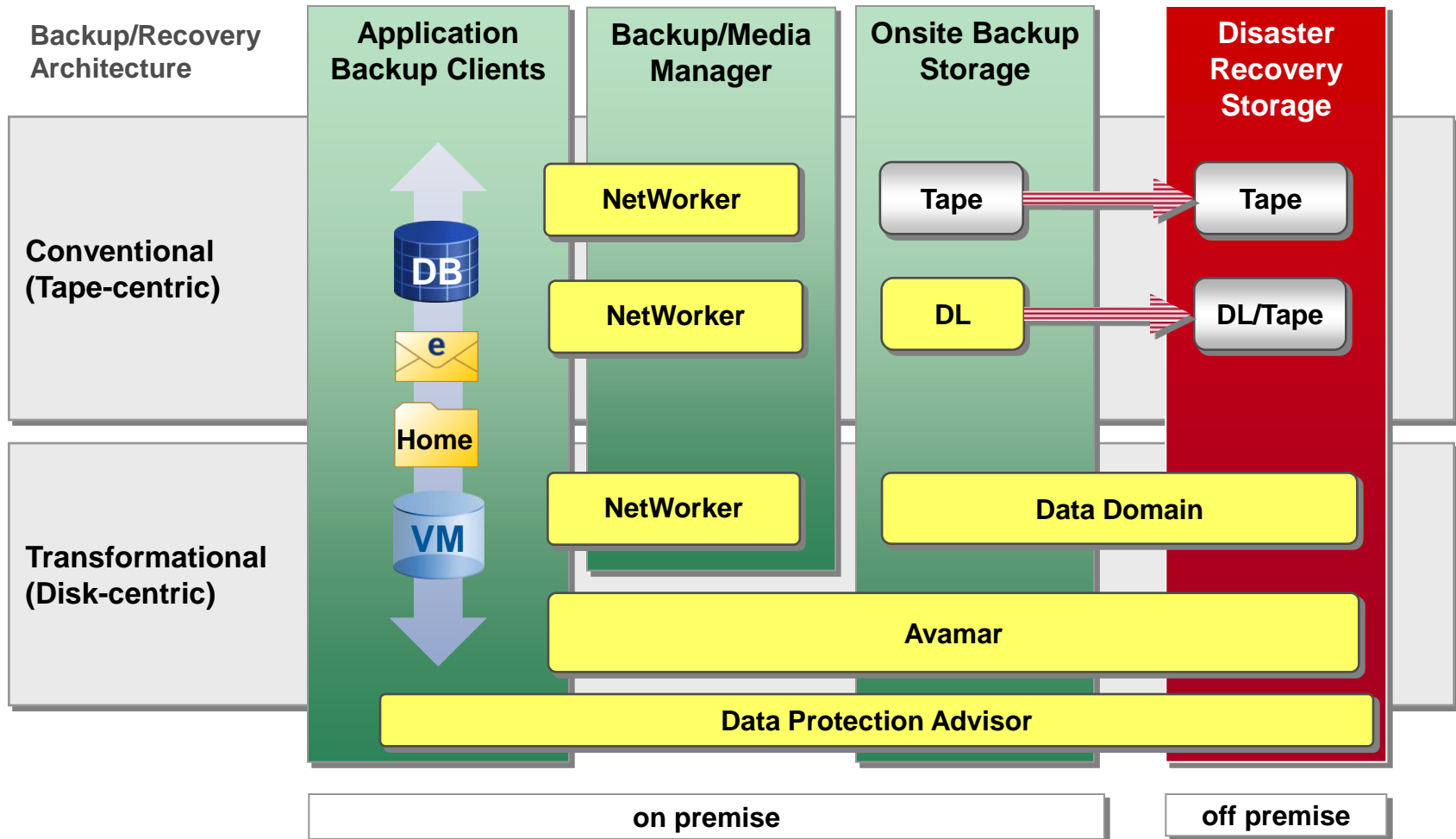
*Technology was previously categorized as Deduplication. **Technology was previously categorized as Deduplication/ Capacity Optimized Storage/Single Backup Instance Store.

***Technology was previously categorized as Single Backup Instance Store Software.

Deduplication is Driving the Evolution of Backup and Recovery



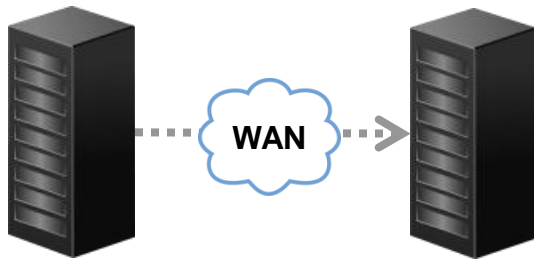
Deduplication is Driving the Evolution of Backup and Recovery





Retain longer

Keep backups onsite longer with less disk for fast, reliable restores, and eliminate the use of tape for operational recovery.



Replicate smarter

Move only deduplicated data over existing networks for up to 99% bandwidth efficiency and cost-effective DR.



Recover reliably

Continuous fault-detection and self-healing ensure data recoverability to meet SLAs.

Retain. Replicate. Recover.

Dedupe everything without changing anything

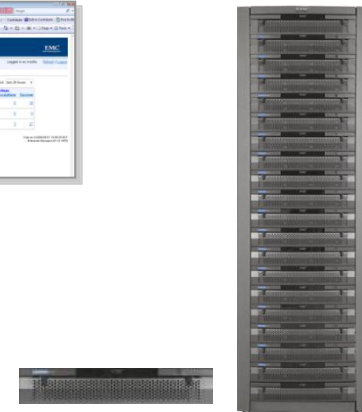
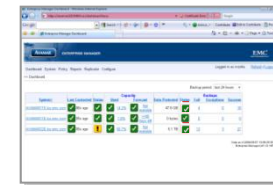
Simplify backup, archiving, and DR with easy integration across workloads, infrastructures, and backup software



Data Domain
Deduplication Storage Systems

Never backup the same data twice

Revolutionize your backup by moving less data to solve your toughest VMware, NAS, and remote office backup challenges



Avamar
Deduplication Backup Software

Inline deduplication storage systems

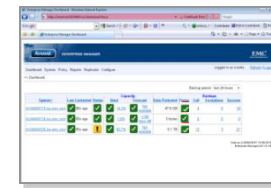
- Supports backup and archive software
 - Backup Software: NetWorker, Symantec, CommVault, IBM TSM, ...
 - Application utilities: Oracle RMAN, SQL Server, ...
 - F5 ARX file virtualization
 - Archive: SourceOne, Symantec Enterprise Vault, Mimosa, ...
 - Data Domain Retention Lock software option
- Supports any protocol
 - SAN: VTL software option
 - NAS: NFS, CIFS
 - Custom: NetBackup OpenStorage software option
- Scalable for Local and Distributed Recovery
 - Up to 5.4 TB/hour
 - Up to 71 TB addressable capacity per system
 - Data Domain Replicator software option
- Advanced dedupe architecture for high speed & resilience
 - Stream Informed Segment Layout (SISL) scaling architecture
 - Data Invulnerability Architecture



Data Domain
Deduplication Storage Systems

Deduplication backup software

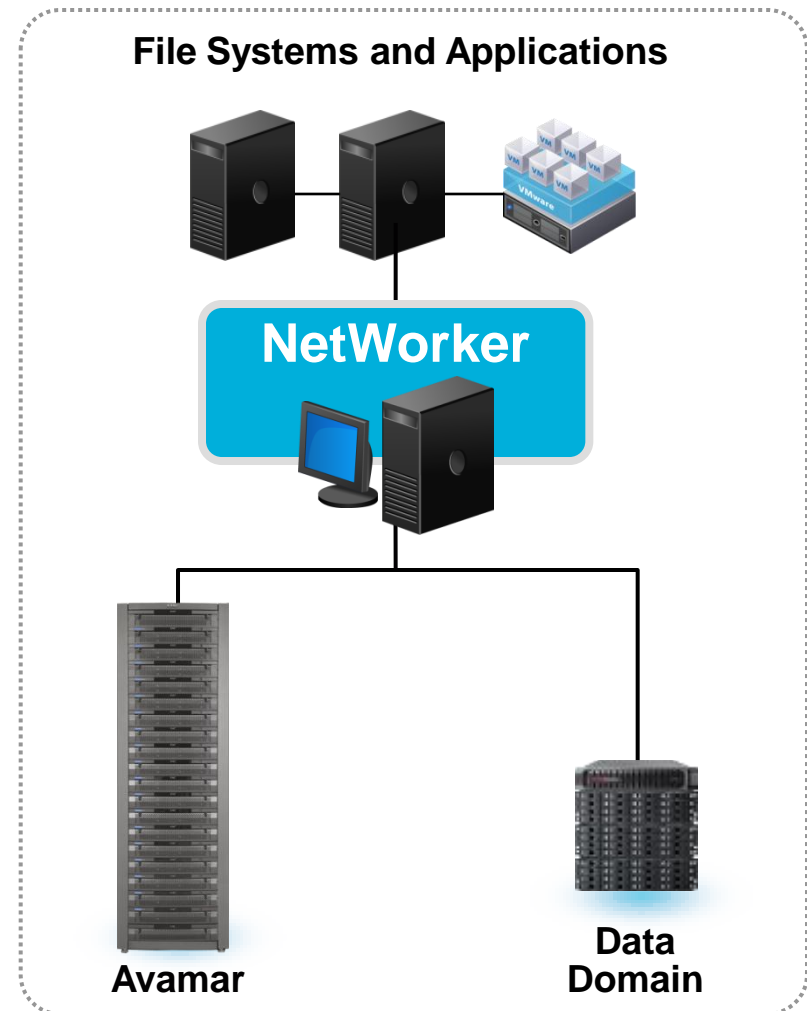
- Integrated software & hardware solution with global source-based deduplication
 - Deduplicates across sites and servers globally
 - Effective full backup every time
 - Single step recovery
 - Backup process reduces data sent over the network and stored
 - Variable-length sub-file segments for optimal deduplication
- Integrated high availability and reliability
 - RAIN for high availability and fault tolerance
 - Avamar server and data recoverability verified daily
 - Replication between servers
- Flexible deployment options
 - Avamar software
 - Avamar Data Store
 - Avamar Virtual Edition for VMware environments



Avamar
Deduplication Backup Software

Manage from a single pane of glass

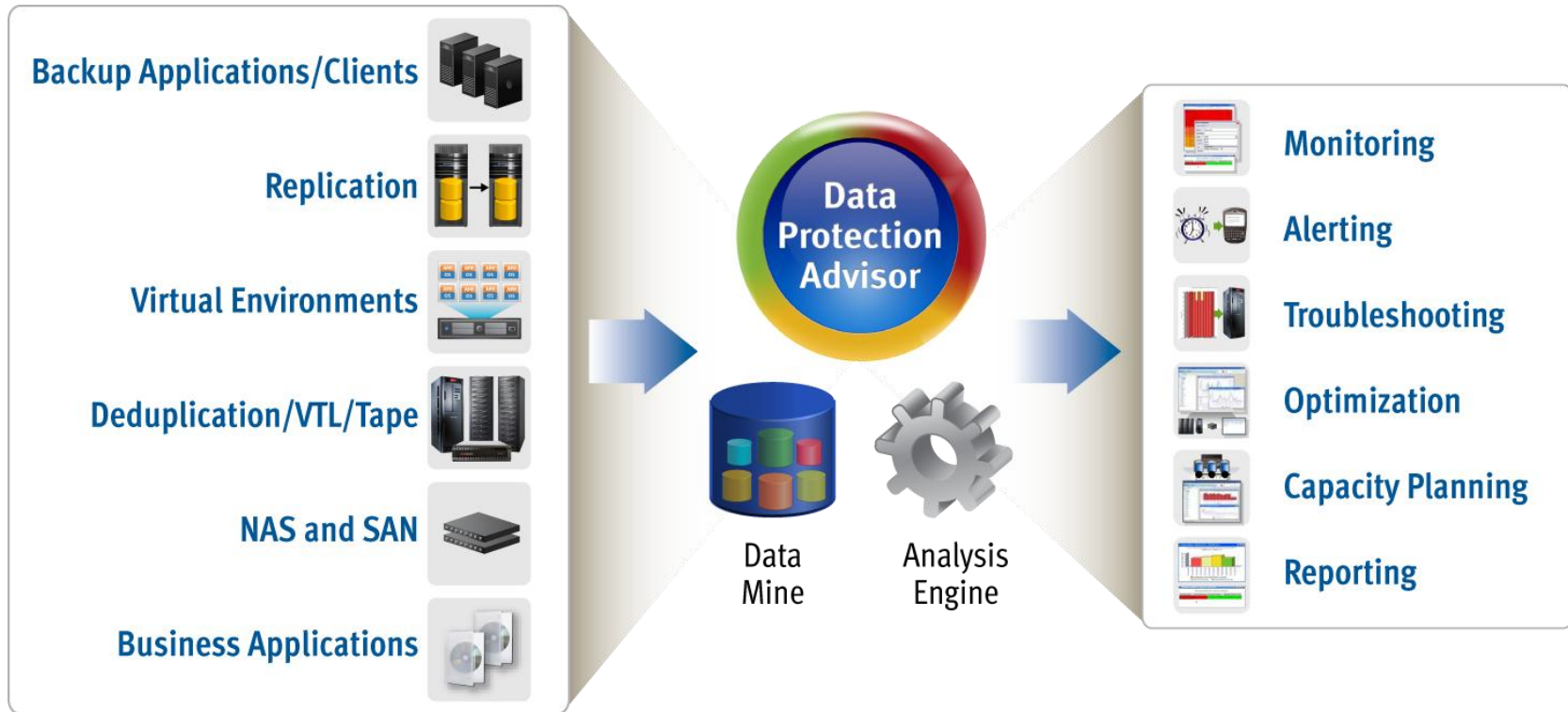
- Integrated deduplication
- Optimize deduplication for the greatest benefit
- Single pane of glass



EMC Data Protection Advisor



Single view across EMC backup and recovery solutions



Payback typical in 12 months or less

Lowers risk—manage to service level agreements

Reduces costs—insight drives efficiency

Minimizes complexity—single, integrated view

Use Case:

Deduplication with Existing Backup Software

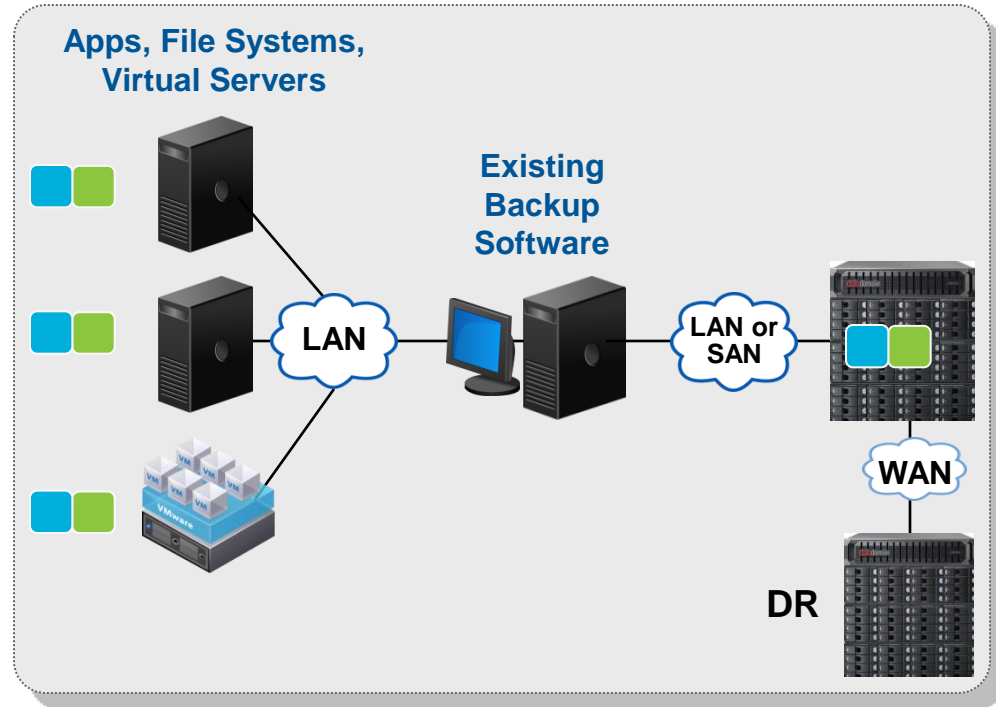


Challenges

- ✗ Backup storage growth and costs
- ✗ Pressures on datacenter space and energy
- ✗ Committed to current backup software

Why Dedupe Storage Systems

- ✓ Easy integration across workloads, infrastructures, and backup software
- ✓ Address storage inefficiencies due to redundant data
- ✓ Efficient replication – reduces or eliminates associated tape costs



Use Case:

Large, high-change rate database backup



Challenges

- ✗ Backup speed critical to stay within tight backup windows
- ✗ High change rate database generally have less redundant data

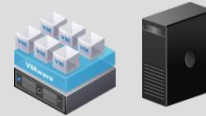
Why Dedupe Storage Systems

- ✓ Meet backup windows with high-throughput while eliminating redundant data
- ✓ Physical and Virtual Servers
- ✓ Efficiently scale for enterprise environments
- ✓ SAN VTL or LAN options
- ✓ “Plug and Play” – leverage existing backup software

Fast, scalable, efficient large database backup

ORACLE

Microsoft
SQL Server



SAP

IBM DB2
Informix

SYBASE



WAN



DR

Use Case:

Limited Bandwidth LAN and NDMP Backup

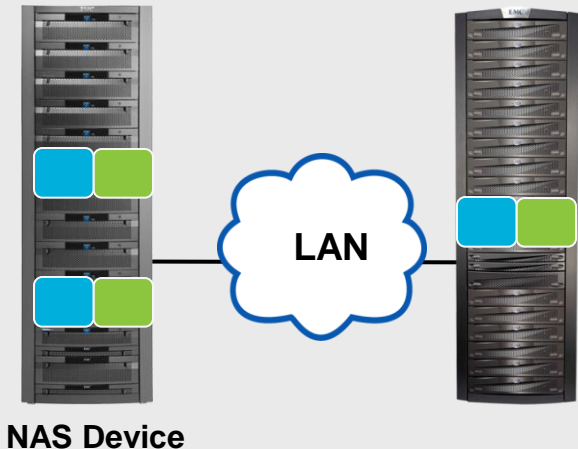
Challenges

- ✗ Full NDMP backups slow and consume significant network, filer and storage resources
- ✗ Limited Bandwidth LAN backups face backup window challenges

Why Dedupe Backup Software

- ✓ **NDMP Backup:** Eliminates time-consuming, full backups by only moving new data
- ✓ **Limited Bandwidth LAN:** Speeds backup by deduplicating data at source before moving across LAN
- ✓ Single-step restore from full backup image
- ✓ Reduces/eliminates associated tape costs

Dedupe at source for faster NDMP and LAN backups with less network resources used



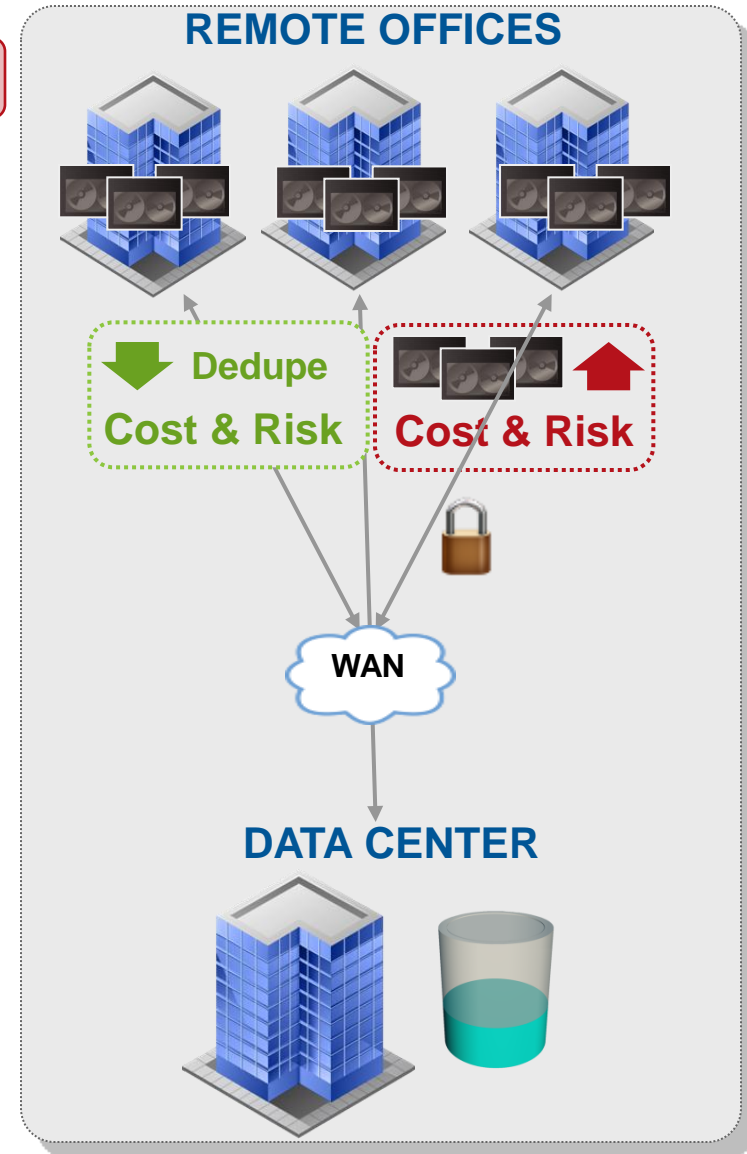
Use Case: Remote Offices

Challenges

- ✗ Remote office backups cost and risk
- ✗ Cost of people and equipment at each location
- ✗ Bandwidth too costly for centralized backup
- ✗ Risk that backups not happening at all

Why Backup to Data Center with Dedupe

- ✓ Reduces data moved by up to 500x for efficient back up over existing bandwidth
- ✓ Eliminate local tape backup, equipment and shipment
- ✓ Remove risk that data is unprotected



Use Case: VMware environments

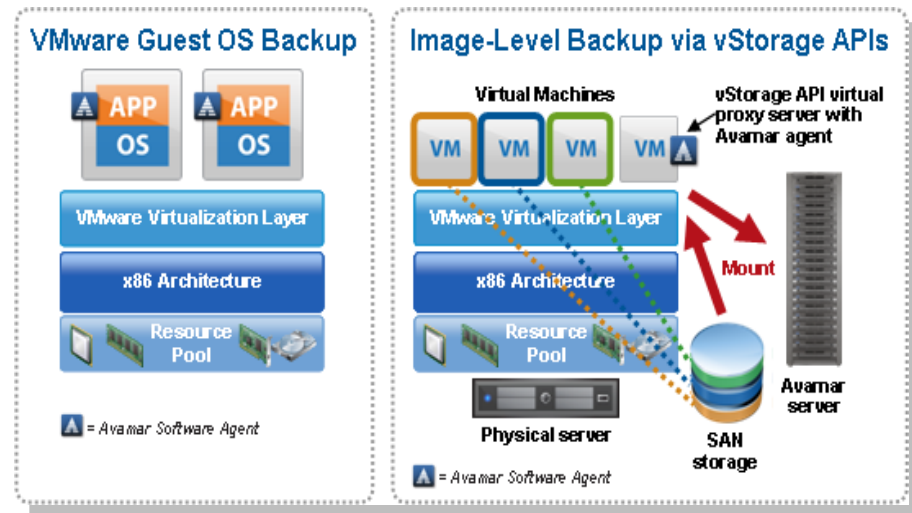
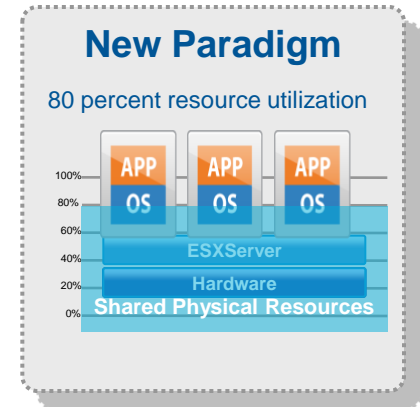
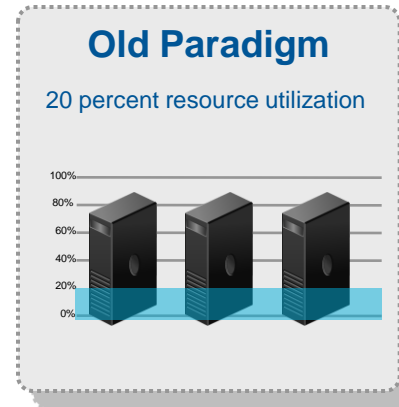


Challenges

- ✗ Higher server utilization leaves resource contention issues during backup
- ✗ Not meeting SLAs
- ✗ Limits server consolidation goals, increases costs

Why Dedupe Backup Software

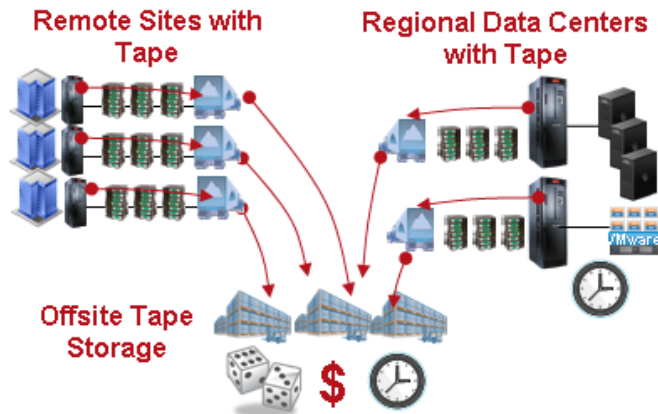
- ✓ Never backup the same data twice
- ✓ Guest, Image level via vStorage APIs, VCB and snap backups
- ✓ Support vStorage API change block backup
- ✓ Up to 90% faster backups
- ✓ Up to 95% less data moved
- ✓ Removes a barrier to greater server consolidation



Worldwide Financial Institution

Before

- ✗ Main data center, regional data centers and over 200 remote offices
- ✗ VMware and TSM backup and recovery bottlenecks limiting consolidation
- ✗ Tape used in all locations and shipped offsite
- ✗ Tapes containing data on 12 million customers lost in transport to offsite storage



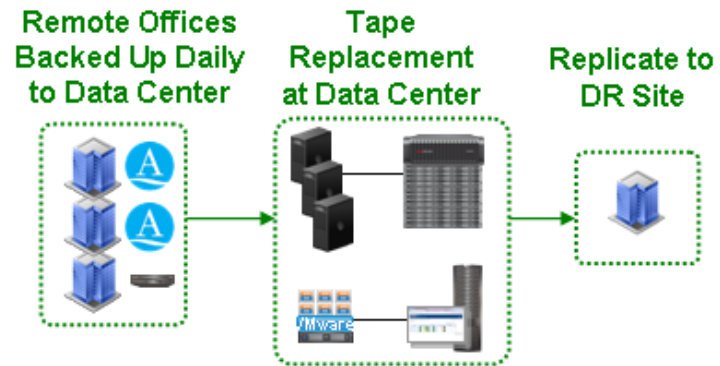
After








Data Domain

- ✓ Covers entire environment, works with existing backup software and infrastructure
- ✓ Replicates offsite for fast and safe DR
- ✓ **7 PB protected**

Avamar

- ✓ Solved VMware backup challenge in data centers
- ✓ Backs up 200+ remote sites daily
- ✓ **Avamar \$3.5M TCO savings over 3 years (VMware use Case)**

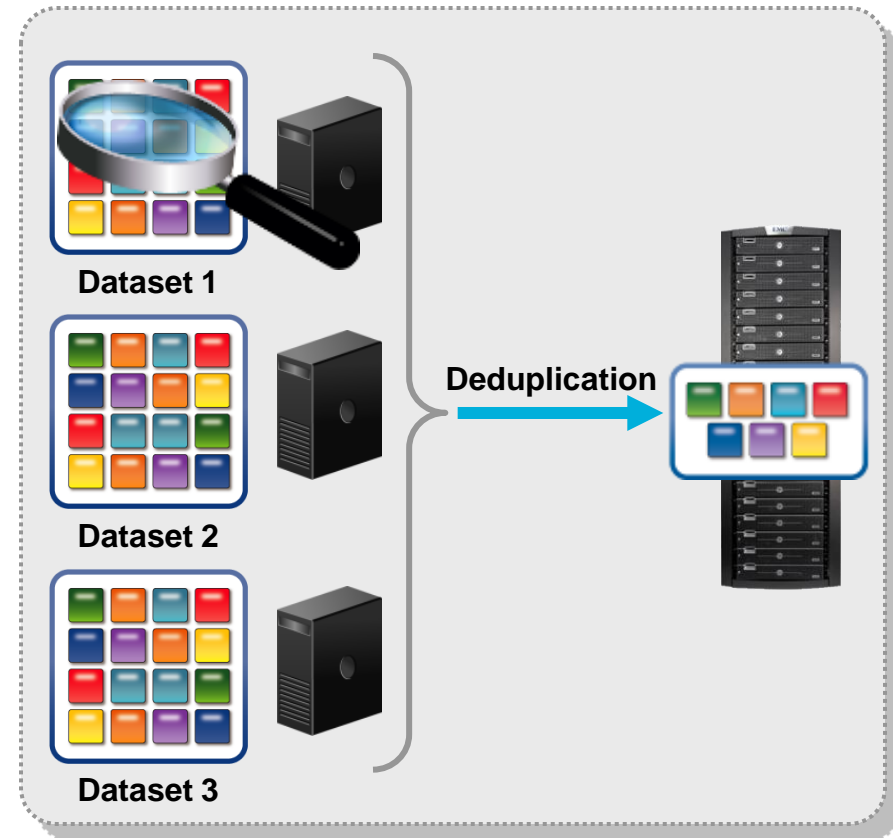


-  ↓ Tape Minimized
-  ↓ Less Management
-  ↓ Less Risk
-  ↓ **3.5M** Less \$\$\$
-  ↓ Less Network
-  ↑ More Performance
-  ↑ More Secure

Which deduplication solution is right for you?

Let us help you determine the right solution

- Depends on:
 - Current backup challenges and environment
 - Application and data type
 - Service level requirements
- Backup, e-mail, and file system assessments, TCO tools
- EMC Assessment for Deduplication Service



Develop and validate your Deduplication and Backup Recovery expertise



1. Information Storage Technology 'Open' Curriculum
2. EMC Technology-Specific Learning Paths
3. EMC Proven Professional Certification Program

Enhance your Deduplication and Backup Recovery capabilities

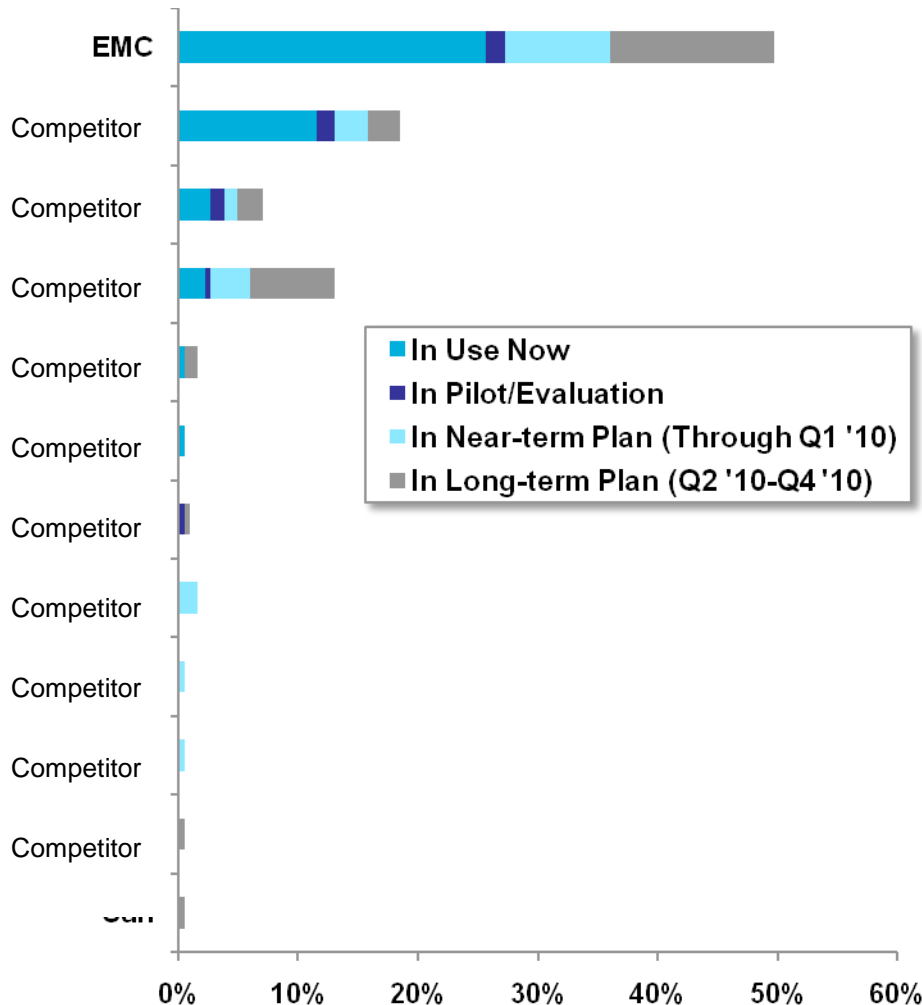
Featured Learning Paths

- Avamar (deduplication) Administration
- Backup and Recovery – NetWorker
- EMC Disk Library
- EMC RecoverPoint
- Replication Manager

Take the next step

Visit <http://education.EMC.com/BackupRecovery>

Why EMC for Backup and Recovery with Deduplication



- Data protection landscape is shifting
 - Virtual servers
 - Data growth
 - New technology: data deduplication
- The evolution of data protection surfaces unique new requirements
- EMC is best positioned to address these new requirements
 - Most recoveries will be from disk, not tape
 - EMC leadership in storage + backup software optimization

Source: TheInfoPro Storage Study (Q4 2009) | (11/12/09): F1000 Sample. Left and Top Right Charts: n=183. Lower Right Chart: n=76. Lower Bottom Right Chart: n=37.

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