

EMC Avamar

Izdelava varnostnih kopij podatkov z vključeno deduplikacijo podatkov



Agenda

Predstavitev Avamar produkta

Avamar – uporaba v praksi

Avamar – rezultati iz prakse

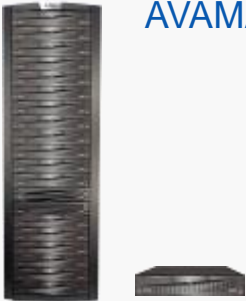


AVAMAR SOFTWARE



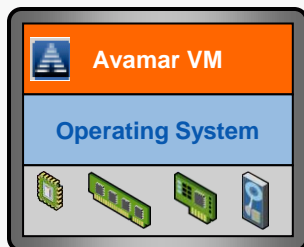
Agent-only or deployed
on qualified, industry
standard servers

AVAMAR DATA STORE



Fully integrated software/
hardware solution

AVAMAR VIRTUAL EDITION FOR VMware



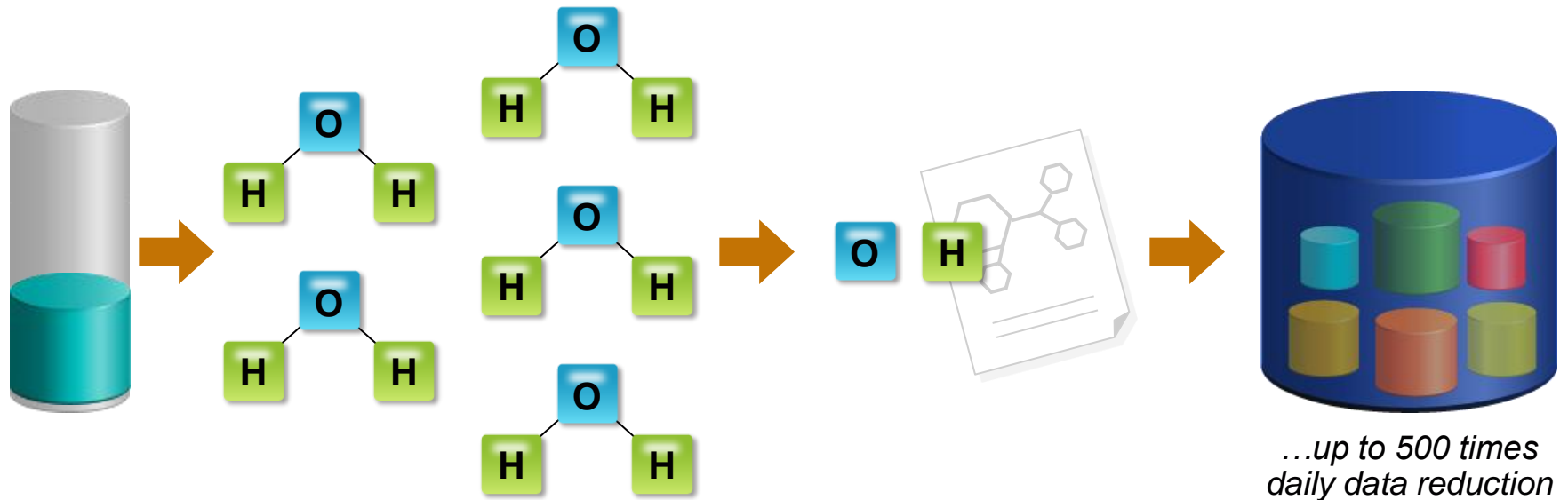
Avamar server deployed
as a virtual appliance

Revolutionizes backup with global, source data de-duplication

- Reduces the size of backup data at the source, enabling fast, daily full backups across existing physical and virtual infrastructure
 - Reduces daily backup times by up to 10x reduction
 - Reduces daily network bandwidth impact by up to 500x
- De-duplicates across sites and servers for maximum efficiency
 - Reduces total disk backup storage by up to 50x
- Cost-effectively store full backups on disk for extended period of time – reducing/ eliminating reliance on tape
- Ideal for protecting VMware environments, remote offices, and data centers constrained backup windows or limited bandwidth

Global, Source Data De-duplication

- 1 Break data into atom (sub-file, variable-length segments of data)
- 2 Send and store each atom only once
- 3 EMC Avamar backup repository



At the source—De-duplication before data is transported across the network

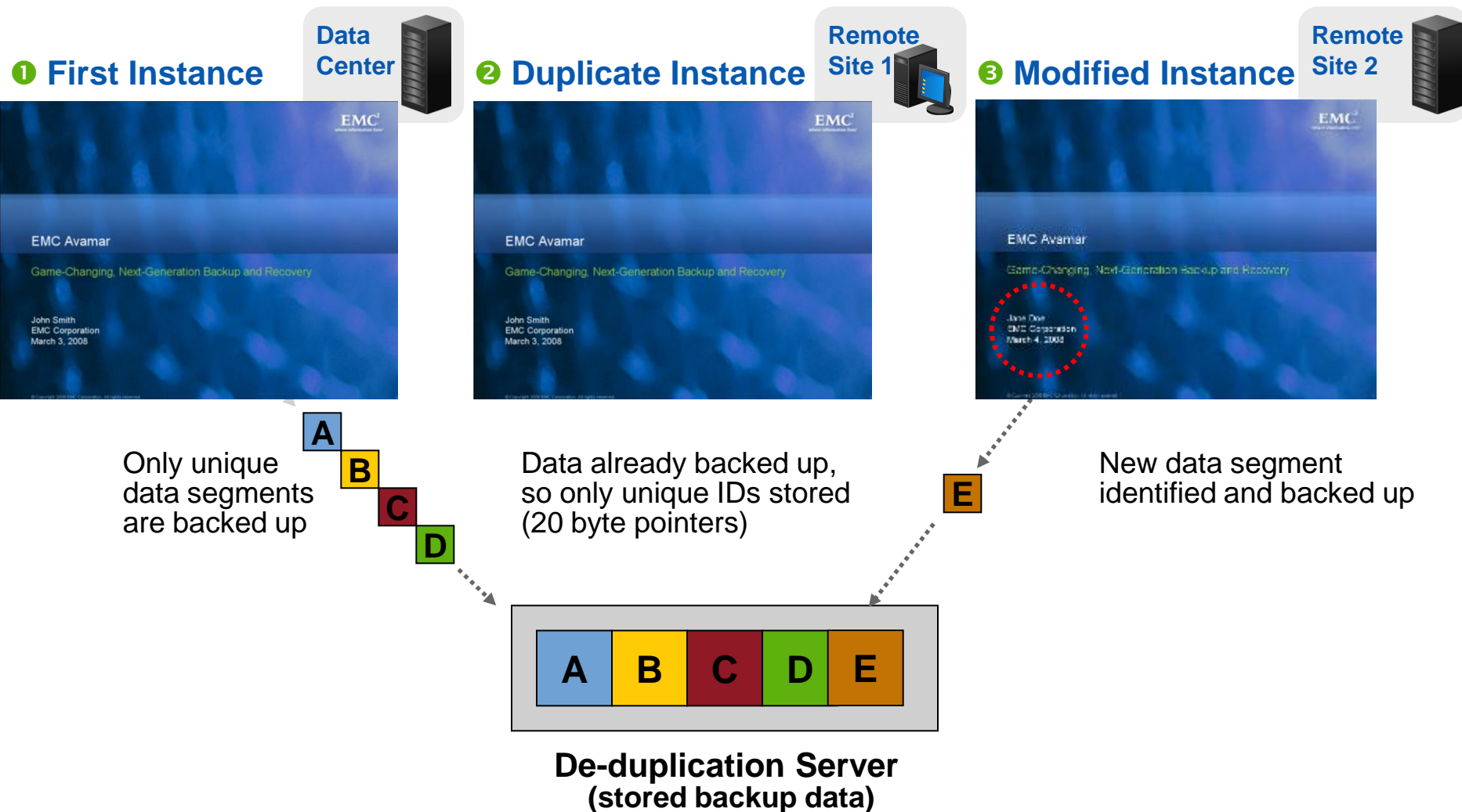
At the target—Assures coordinated de-duplication across sites, servers, and over time

Granular—Small, variable-length sub-file segments guarantee most effective de-duplication

Avamar: How it Works



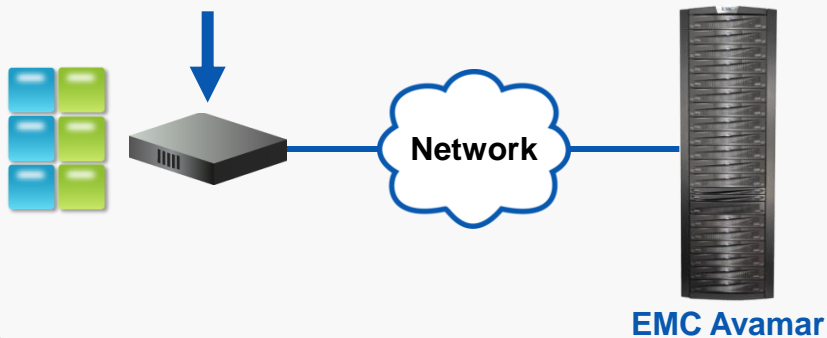
Simple Example of Global, Source Data De-duplication



There are strong use cases for both technologies...but only source-based de-duplication reduces daily network bandwidth requirements and decreases client resource utilization during backups.

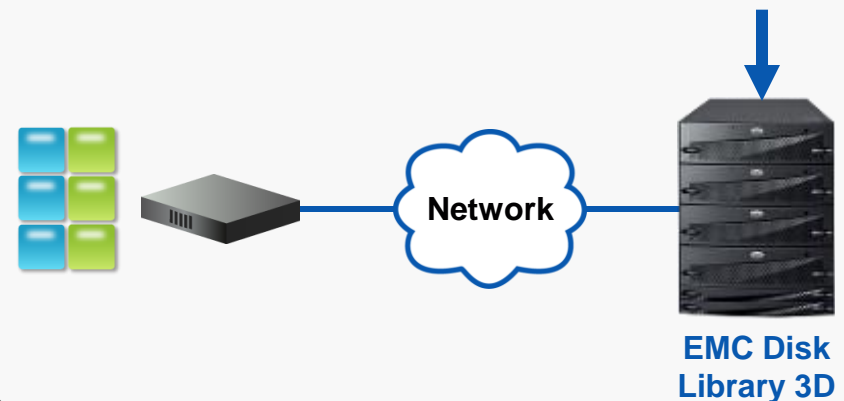
DE-DUPLICATION AT SOURCE

- Moves ~ 2 percent of primary data weekly
- Up to 50 times reduction in backup storage
- Up to 500 times less daily network impact
- Up to 10 times faster daily full backups
- Fast, daily full backups, single-step recovery
- Next-generation backup and recovery



DE-DUPLICATION AT TARGET

- Moves ~ 200 percent of primary data weekly
- Up to 50 times reduction backup storage
- Backups are typically restored from full and incremental images
- De-dupe device viewed as file system and/or virtual tape library target for traditional backup software

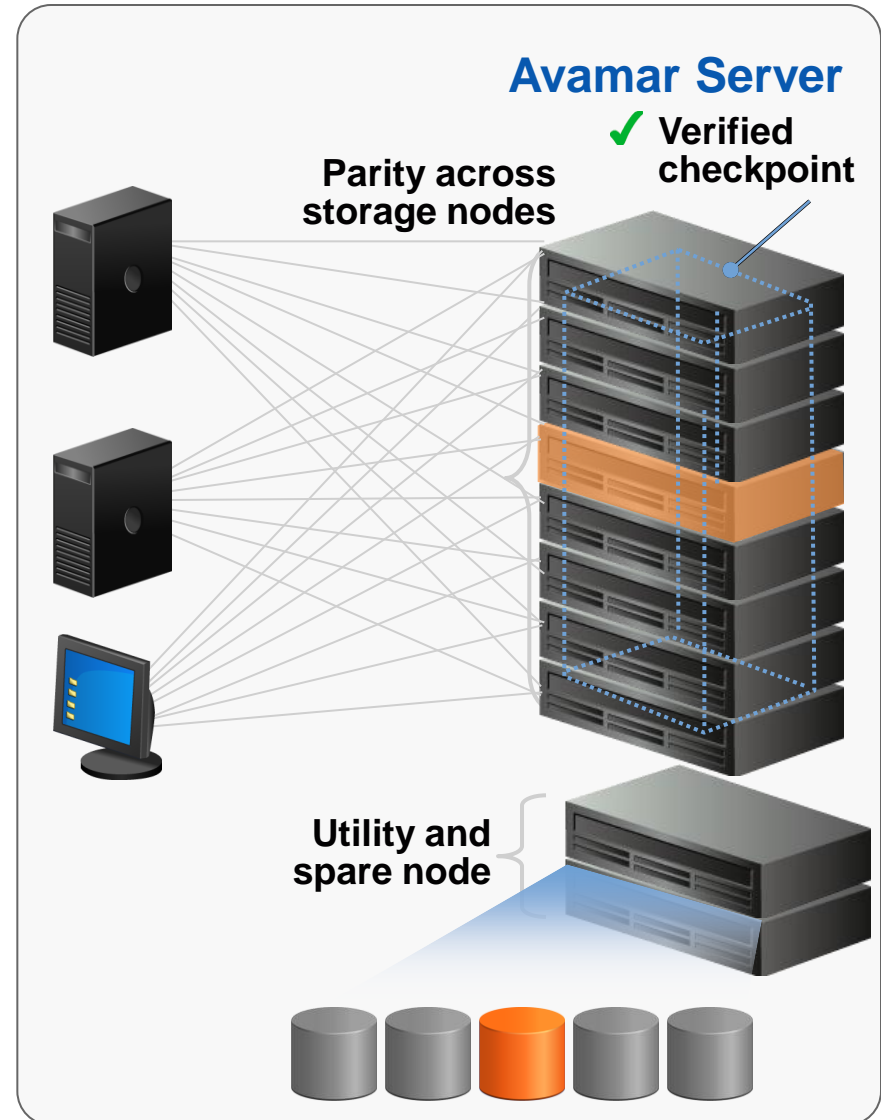


Avamar's Innovative Architecture



U.S. Patent No. 6,826,711

- Redundant Array of Independent Nodes (RAIN) architecture
 - Each server node with internal disk storage and CPU
 - Provides high availability and fault tolerance across nodes
- Grid architecture for online scalability and performance
- Daily integrity checks for Avamar server and data recoverability
- RAID protection from disk failures
- Available for Avamar software and Avamar Data Store



Client operating systems supported

- Microsoft Windows 7 Professional, Enterprise, Ultimate
- Microsoft Windows Server 2003 Standard and Enterprise
- Microsoft Windows Server 2008 R2
- Microsoft Windows Vista and XP
- Red Hat Enterprise Linux (RHEL) 3.0, 4.0, 5.0
- Red Hat Enterprise Linux (RHEL) 5.4 on zLinux
- Red Hat Linux 7.2, 7.3, 9.0
- Solaris 8, 9, 10, 10 x86
- SUSE Linux Enterprise Server (SLES) 8, 9, 10, 11
- SUSE Linux Enterprise Server (SLES) 10SP3 on zLinux
- Apple Macintosh OS X 10.4.x, 10.5.x, 10.6.x
- CentOS 4.x, 5.x
- Debian 4, 5
- Free BSD 6.2
- HP-UX 11.0, 11iV1, 11iV2, 11iV3
- IBM AIX 5.2, 5.3, 6.1
- NetWare 6.5
- Novell Open Enterprise Server OES SP2
- Oracle Enterprise Linux R5
- SCO OpenServer 5.0.5, 5.0.6, 5.0.7
- SCO UnixWare 7.1.3

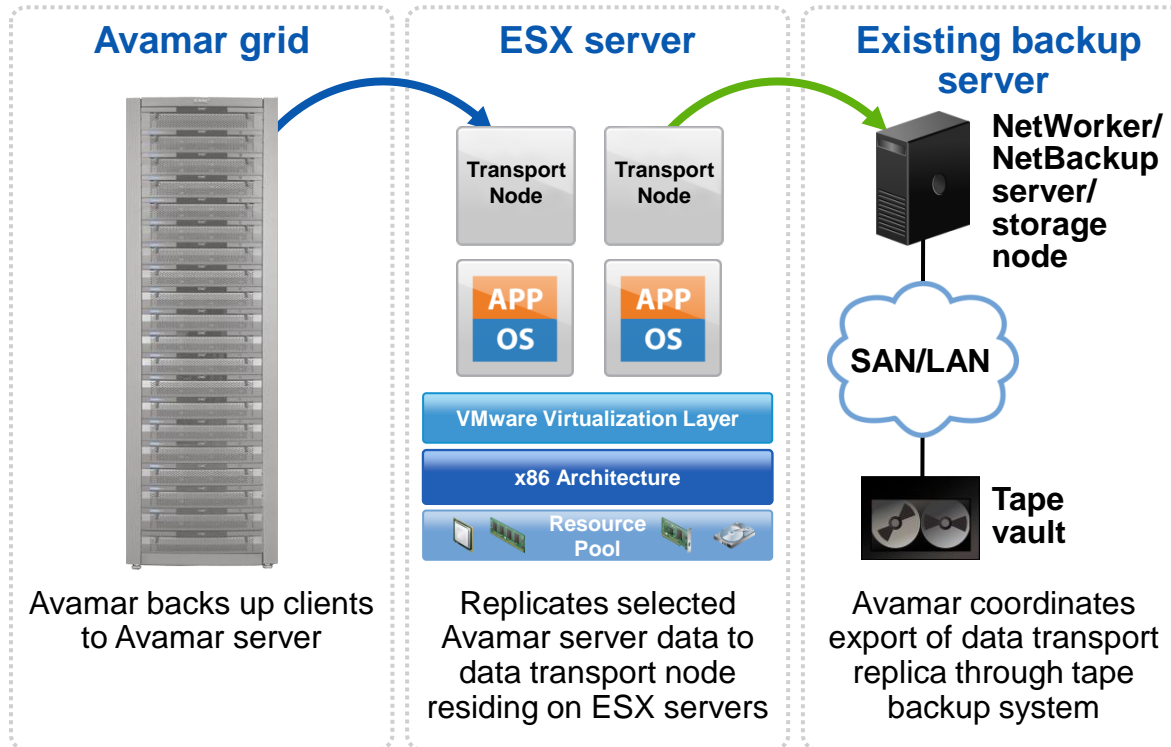
Application modules

- IBM DB2 9.1, 9.5, 9.7
- IBM Lotus Domino 6, 7, 8
- Microsoft Exchange 2003, 2007, 2010
- Microsoft Office SharePoint Server 2007
- Microsoft SQL Server 7.0, 2000, 2005, 2008
- NDMP (EMC Celerra with DART 5.5, 5.6)
- NDMP (NetApp Data ONTAP 6.5, 7.0.4, 7.0.5, 7.0.6, 7.1x. 7.2, 7.3.x)
- Oracle 9i, 9.2, 10, 10g, 10gR2, 11g, 11gR2

VMware infrastructure

- ESX 3.0.x, 3.5, 3i
- vSphere 4, 4i

No charge for client agents or application modules



Export deduplicated data to tape for long-term storage

- Policy-driven process exports and restores Avamar deduplicated data to and from tape
- Searchable file-level catalog eases and speeds restoration
- Leverages existing backup software (e.g., EMC NetWorker)

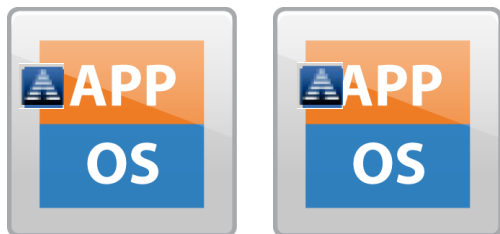
**Fewer tapes for lower costs—
up to 50 times reduction in long-term storage costs**

EMC Avamar – uporaba v praksi

- VMware environments
- Remote office/branch office (ROBO)
- Applications, File System
- Desktop/laptop



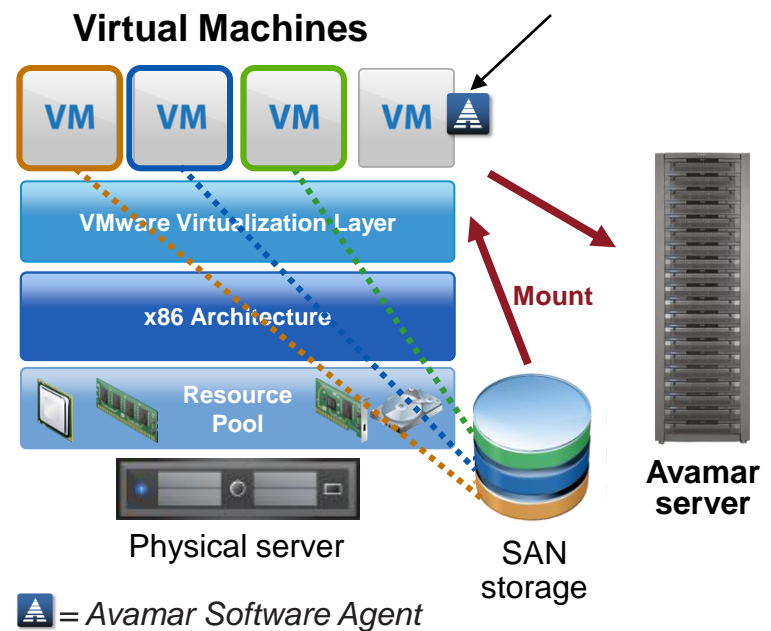
VMware Guest OS Backup



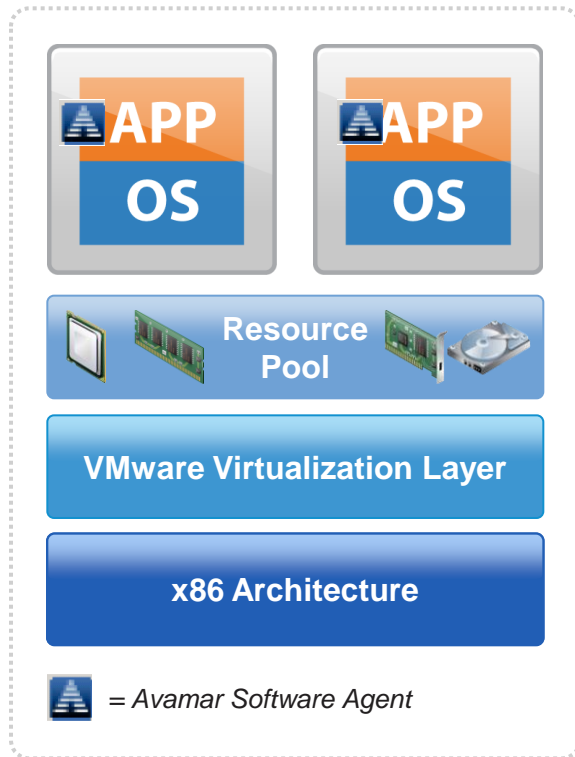
 = Avamar Software Agent

Avamar client software runs directly on each virtual machine

Image level - vStorageAPI

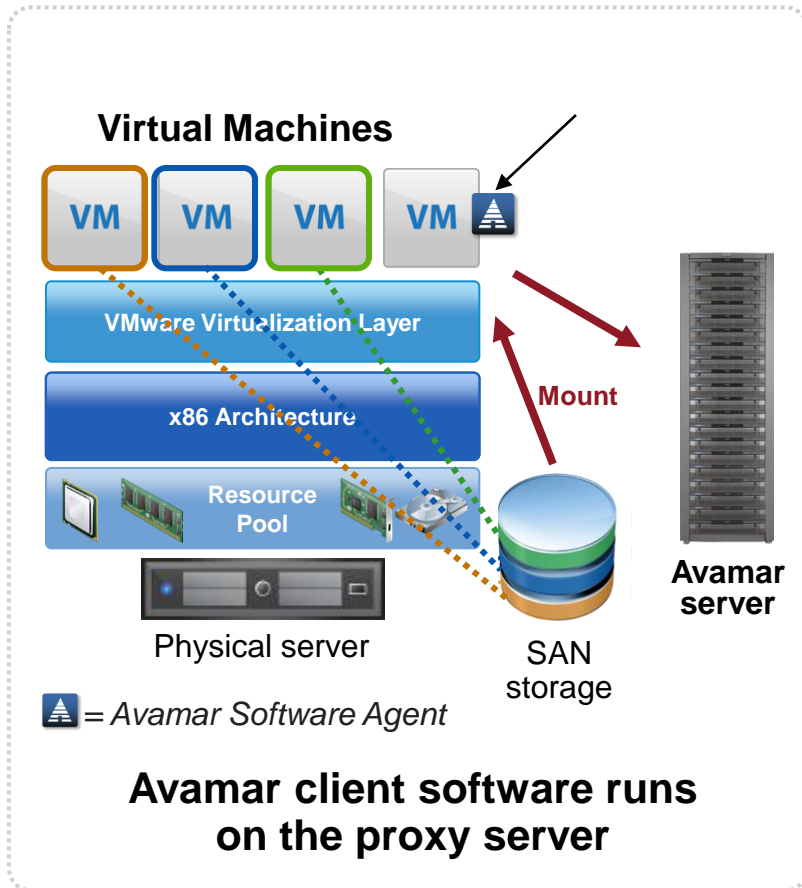


Avamar client software runs on the proxy server



- Avamar agent resides inside each virtual machine
- Deduplicates data within the virtual machine, as if they were physical servers
- Moves minimal backup data
 - Reduces resource contention and accelerates backups
- Provides file-level restore for Windows, Linux, and Solaris
- Optimizes consolidation ratios


Avamar and vStorage APIs for Data Protection

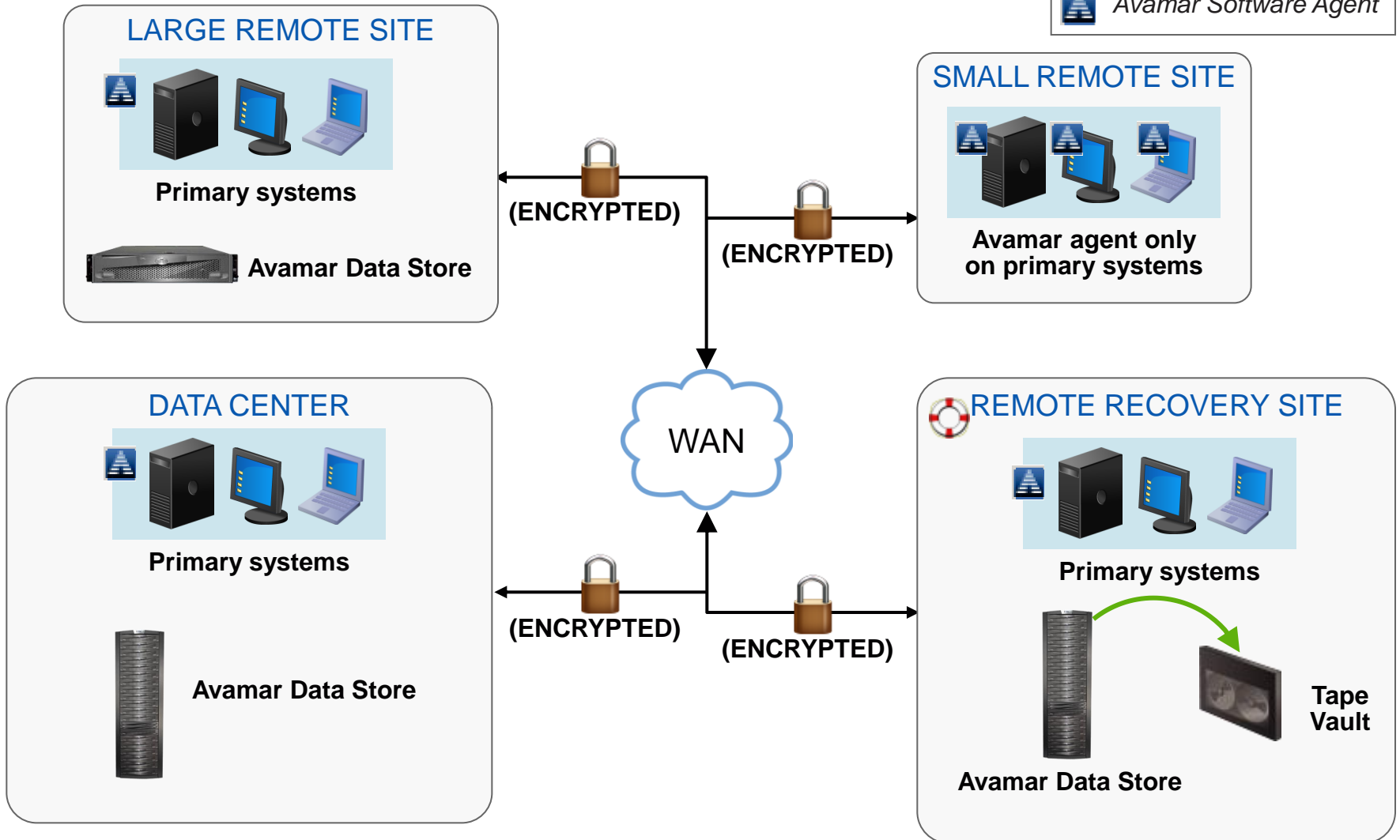


- Avamar agent resides on the proxy server
- Deduplicates within and across VMDK files
- Supports both file (Windows only) and image-level backup
- Avamar replication provides disaster recovery for backed up VMDKs
- Increases consolidation ratios of virtual machines to proxy server

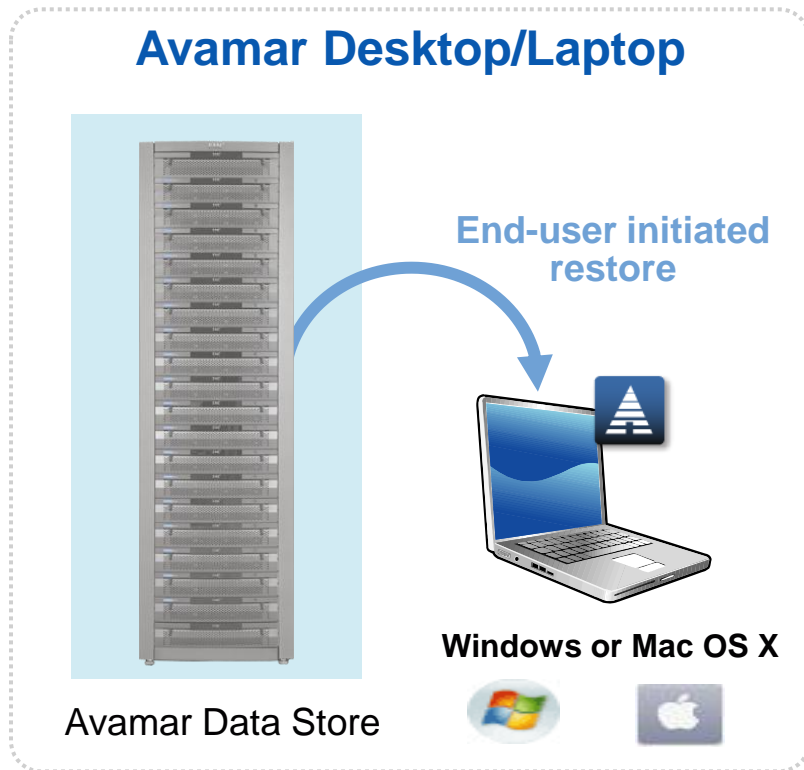
Avamar's Flexible Remote office/branch office (ROBO) Deployment



 Avamar Software Agent



Desktop/Laptop Backup Challenges and Avamar Solution



- Puts power in end-users hands
 - Eliminates Help Desk for restoring data to desktop or laptop
 - End users restore their data anytime, anywhere
 - Self-managed restores
 - Document-level search engine
 - Multiple language support
- All the benefits of Avamar backup
 - Data deduplicated at the source
 - Daily full backups—up to 10-times faster
 - Minimal impact on PC and network resources during backup

EMC Avamar – rezultati iz prakse



Real results



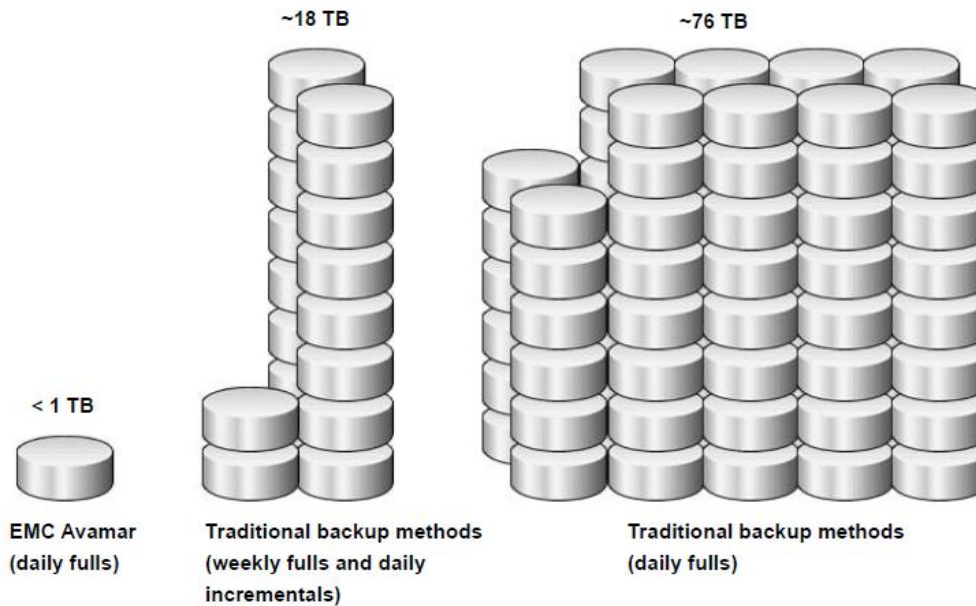
- File system:
- Backup = 1TB of data
- Available disk capacity = 670 GB

Session								Client				
Status	Error Code	Start Time (CEST)	Elapsed	End Time (CEST)	Type	Progress Bytes	New Bytes	Client	Domain	OS	Client Release	Proxy
✓		2010-08-24 13:10	00h:00m:52s	2010-08-24 13:10	On-Demand Backup	73,1 MB	44%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A
✓		2010-08-24 13:48	00h:00m:56s	2010-08-24 13:49	On-Demand Backup	13,9 MB	97,5%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A
✗	10020	2010-08-24 13:52	36h:11m:17s	2010-08-26 02:04	On-Demand Backup	1,0 TB	31,9%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A
✓		2010-08-26 10:00	03h:55m:01s	2010-08-26 13:55	Scheduled Backup	1,0 TB	0,1%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A
Ⓜ		2010-08-27 10:00	00h:32m:13s	2010-08-28 02:00	Scheduled Backup	163,3 GB	0,1%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A

Session								Client				
Status	Error Code	Start Time (CEST)	Elapsed	End Time (CEST)	Type	Progress Bytes	New Bytes	Client	Domain	OS	Client Release	Proxy
✓		2010-08-29 10:00	03h:28m:32s	2010-08-29 13:28	Scheduled Backup	1,0 TB	<0.05%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A
✓		2010-08-28 10:00	03h:44m:06s	2010-08-28 13:44	Scheduled Backup	1,0 TB	0,1%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A
✓		2010-08-27 10:00	03h:36m:09s	2010-08-27 13:36	Scheduled Backup	1,0 TB	0,1%	srvfile2.skb.l...	/clients	Windows Se...	v5.0.105-1...	N/A

- 31,9% of 1TB = 319 GB first full backup
- 0,1% of 1TB = 1 GB daily full backup

Total Backup Storage Consumed Over 13 Months



For 13-months we performed daily full backups with EMC Avamar and used less than 1 TB of total disk storage. Traditional backup methods would have required over 76 times more disk storage to perform the same number of daily full backups. (mix of database and MS Office file data)