

A DESKTOP és SERVER virtualizáció storage oldali kezelése.

2010 február 12.

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improve
IT**

Célok:

- Újdonságok bemutatása
- Elfelejtett funkciók felidézése
- Felhasználói kérdések és gondolatok megismerése megválaszolása
- Tapasztalatok megismerése

Eszközök:

- Gyártói prezentációk mint vezérfonal
- Kötetlen forma
- Kérdések
- Rajzok
- Bekiabálások

Tervezett témák a virtualizáció szemszögéből



NetApp orientáció

Thin provisioning

Teljesítményt befolyásoló tényezők

Deduplikáció

Snapshot hatás

Részletek

Blokk alignment, VmWare, VM, partíció.

Space reclaim. Mikor, hova.

NFS előnyök

Deszktop vagy alkalmazás virtualizáció

Unified Multiprotocol Storage Connectivity Layer

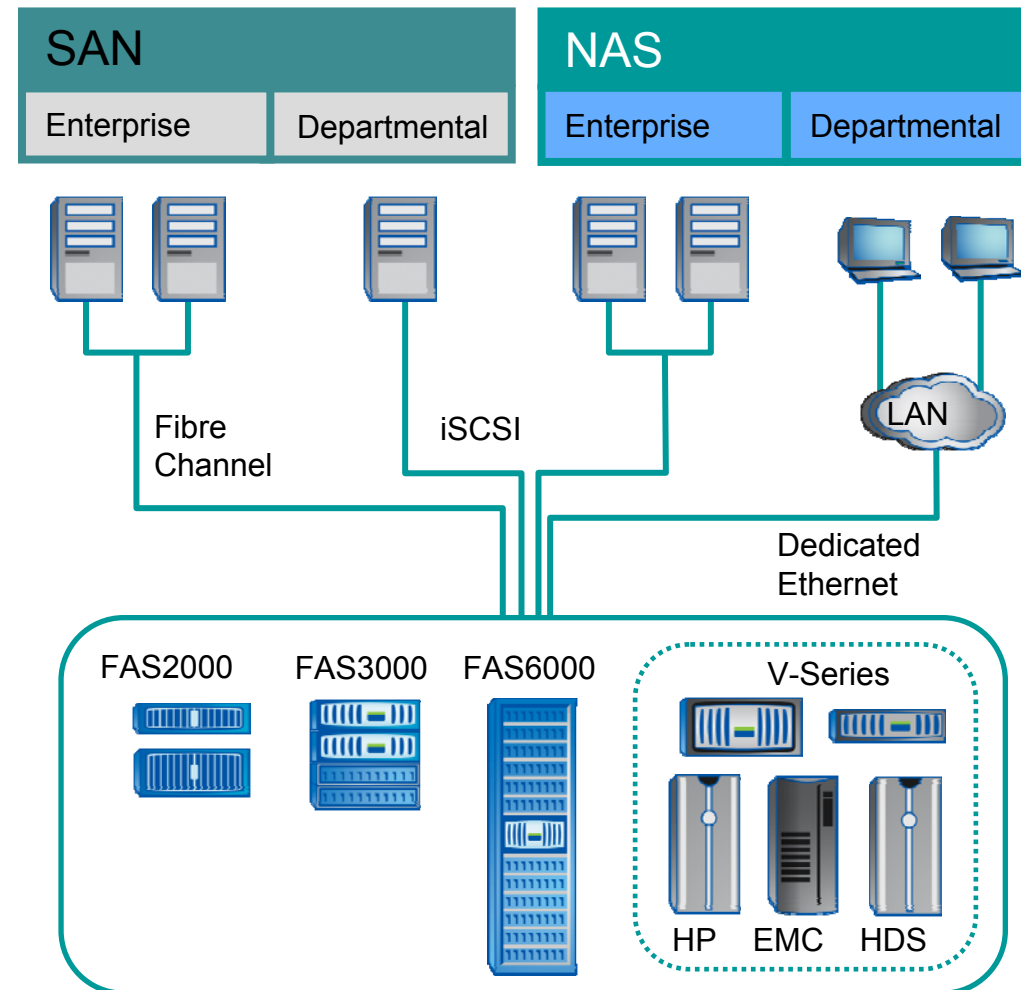


Consolidate file and block workloads into a single system

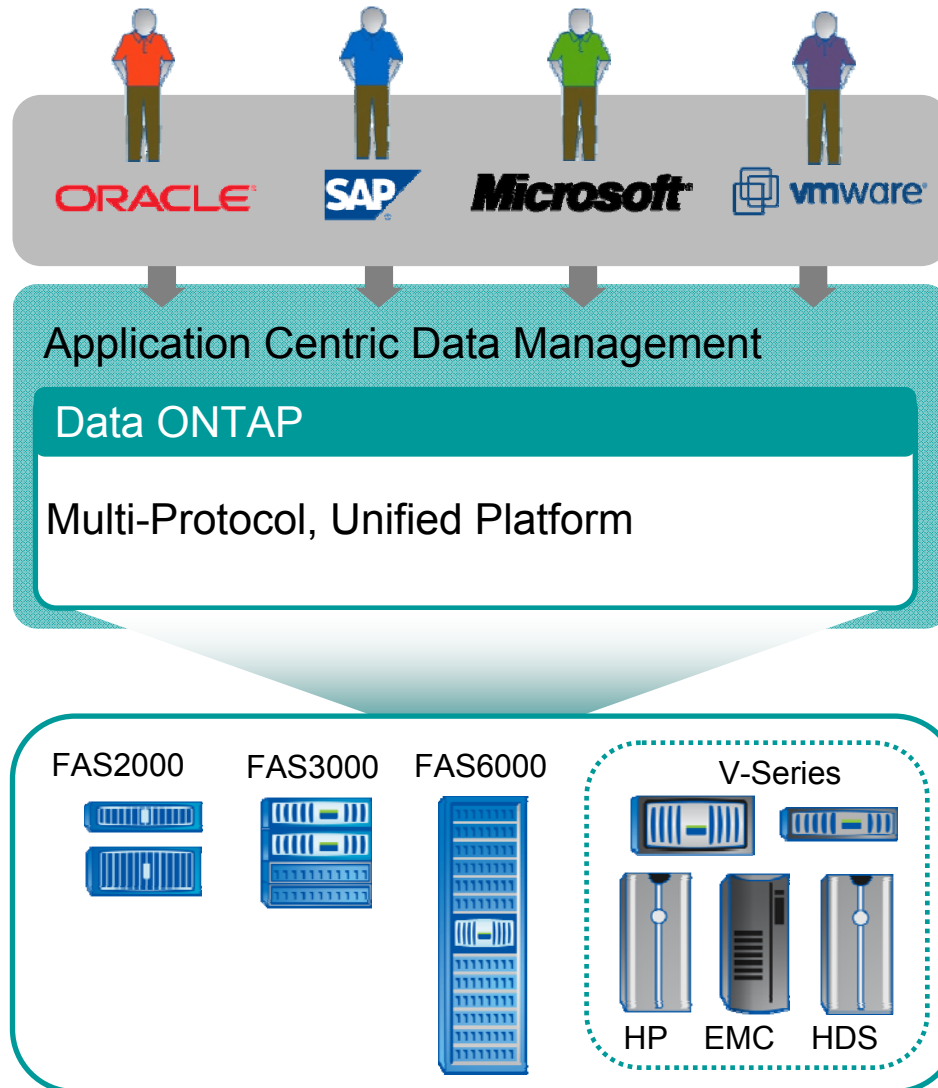
NFS, CIFS
iSCSI, FCP

Adapt dynamically to changing performance and capacity needs

Support for multivendor storage arrays



Data ONTAP® Application-centric Storage



Manage data from applications:

- Application administrators self-manage within established storage policy
- Application synchronization

Single storage virtualization engine:

- Manage storage pools instead of hardware
- The heart of virtualized data management

Simplify elements to be managed:

- Select capacity, performance and cost
- Supports: SAN and NAS protocols
- Architected for availability and simplicity

NetApp Data Protection Portfolio



High Availability

Continuous availability to protect against internal data center and environmental failures

Disaster Recovery

Thin replication of any data at any frequency to protect against regional outages

Backup & Recovery

Snapshot-replication or VTL to speed backups, improve reliability and reduce backup costs

Archive & Compliance

Active archival and data retention for major enterprise applications and files

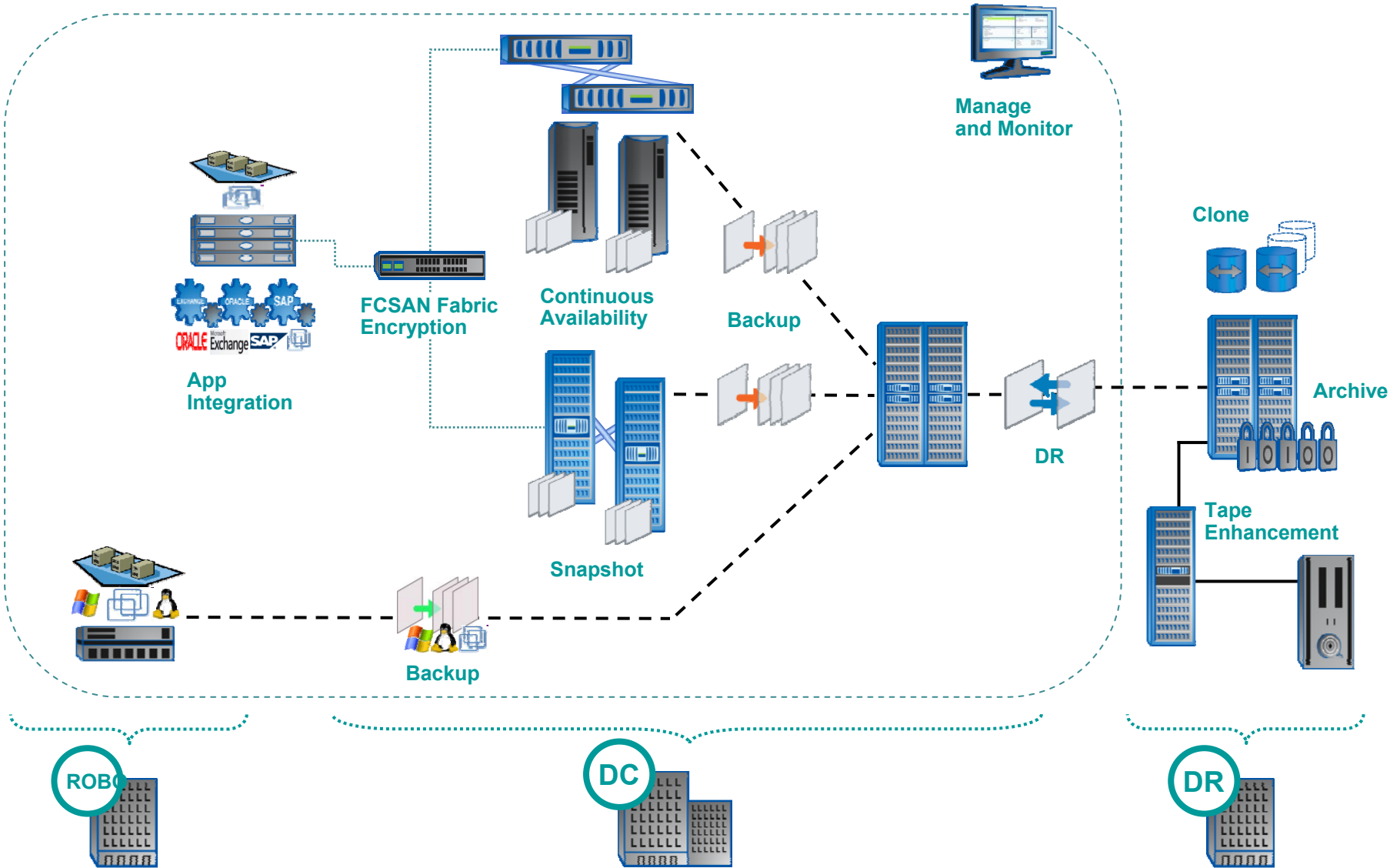
Security

Encryption for data in motion and data at rest, integrated with the data center fabric

Data Protection Portfolio in Action



Platinum Partner
Support Certified



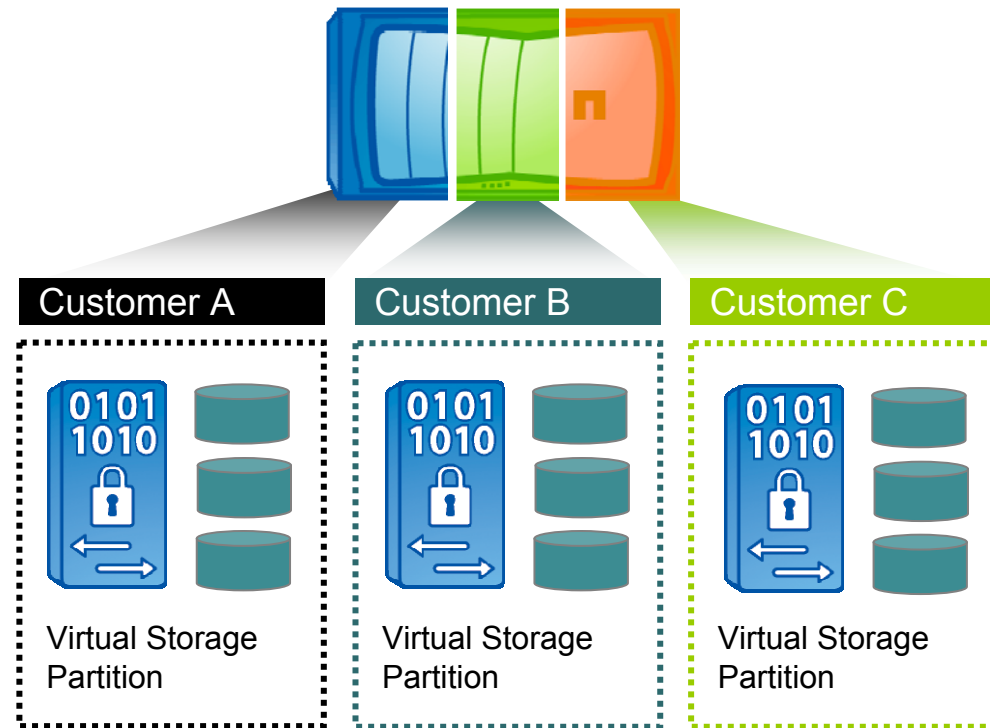
Secure Multi-Tenancy with MultiStore[®]



Host multiple customers on shared storage infrastructure

Based on proven MultiStore technology

Virtual storage partitions



NetApp Deduplication



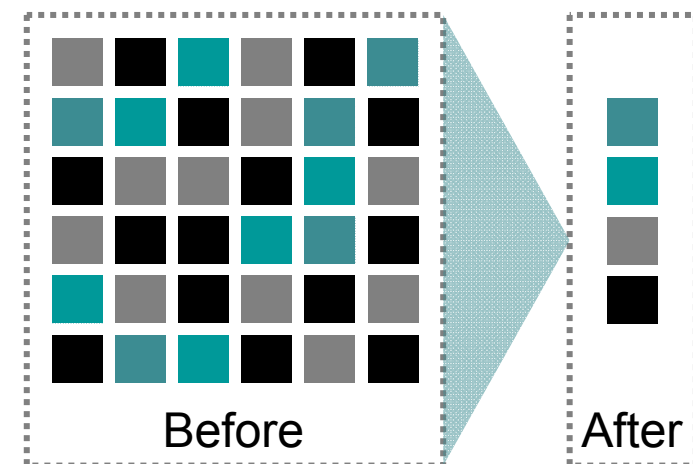
Examines newly stored data blocks

Each block has a digital “fingerprint” which is compared to all other fingerprints in the volume

If an exact block match exists, the duplicate block is discarded and instead referenced to the original, identical block

Can be implemented across a wide variety of applications and file types, including data backup, data archiving, and primary data volumes

Customers can reclaim up to 95% of their storage space

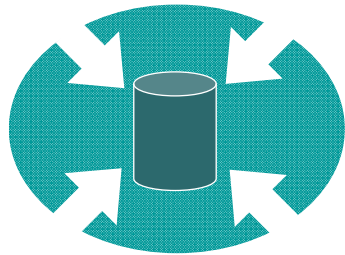


Deduplikációs nyereségek



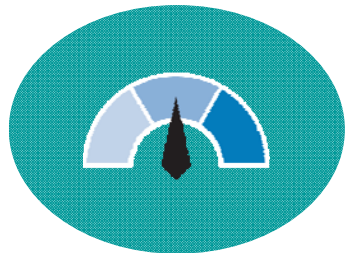
- Mindegy mi van a volume-on
- Transzparens a SAN és NAS felhasználók számára
- Átviszi a SnapMirror
- A tárnyereséget a thin provisioning szerint adja vissza

Video Surveillance	1%
PACS	5%
Movies	7%
Email Archive	8%
ISOs and PSTs	16%
Oil & Gas	30%
Web & MS Office	30 - 45%
Home Dirs	30 - 50%
Software Archives	48%
Tech Pubs archive	52%
SQL	70%
Virtualizáció	90%



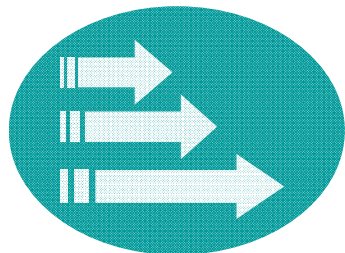
Multiple, disparate workloads can share a single storage system

Enables increased storage consolidation



Business-critical applications receive I/O priority

Latency sensitive workloads do not suffer



Control of system and client workloads

On-the-fly adjustments for dynamic service levels

Creating a Logical Pool of Storage



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Data ONTAP® 7G Technology

FlexVol®

Thin provisioning

Deduplication

Multiprotocol access

Multivendor array support

Quality of service
(FlexShare™)

Key Benefits

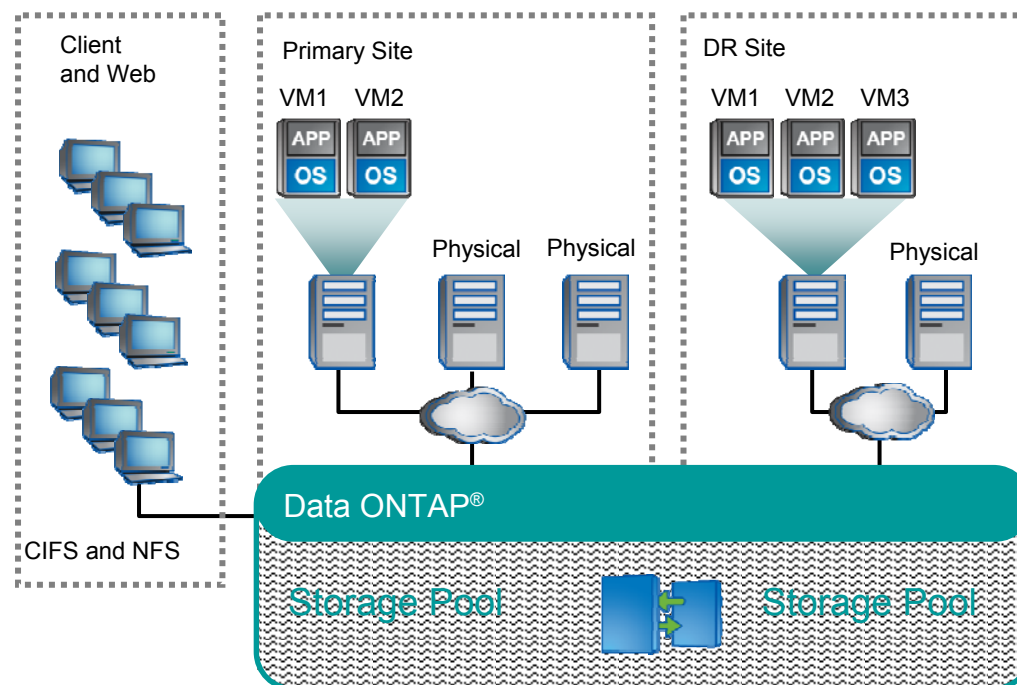
Improve storage utilization by 2X

Manage 2 to 3X more storage per admin

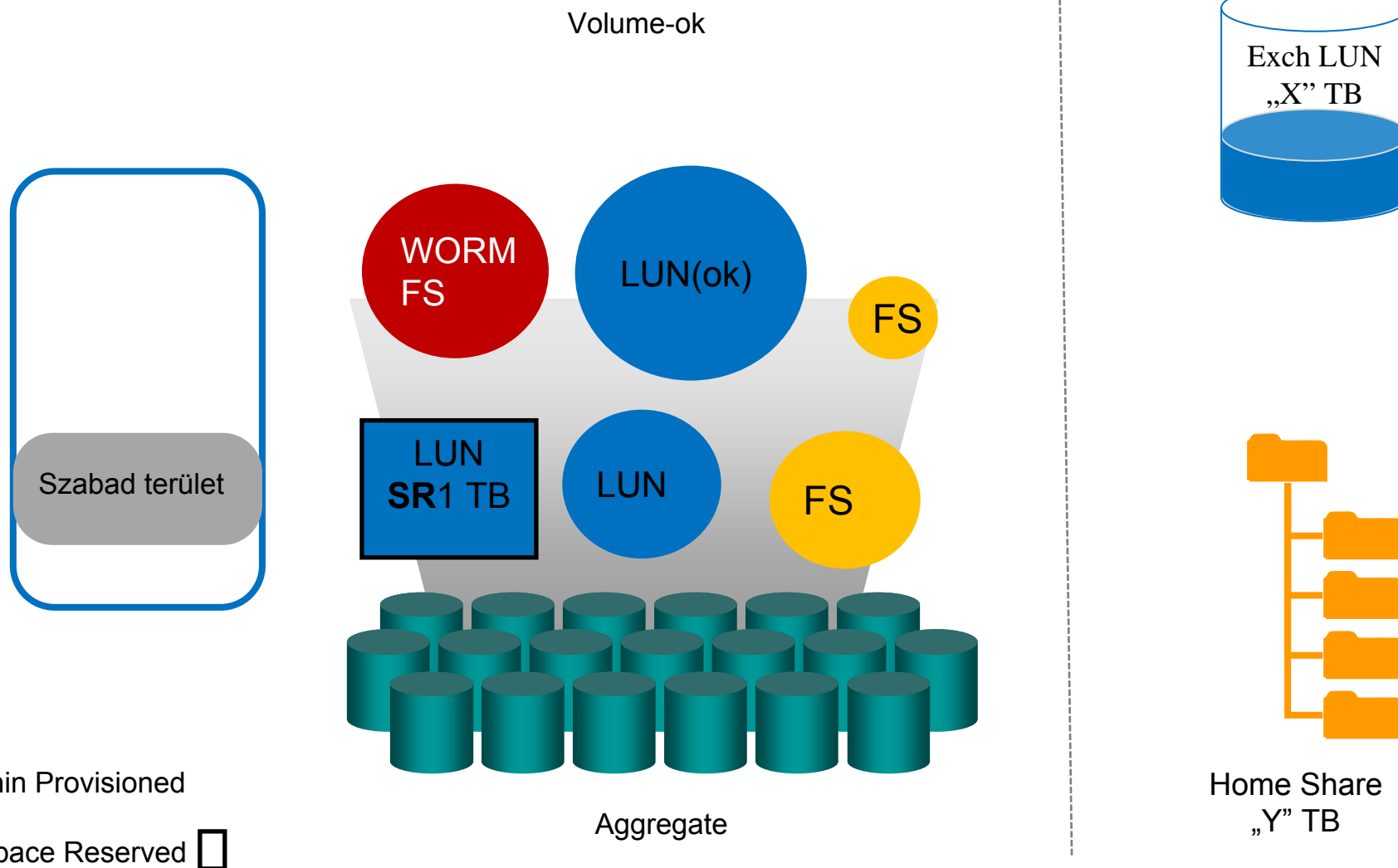
Cut provisioning time by 90%

Choice of storage array technology

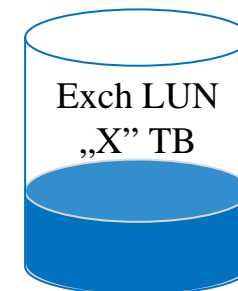
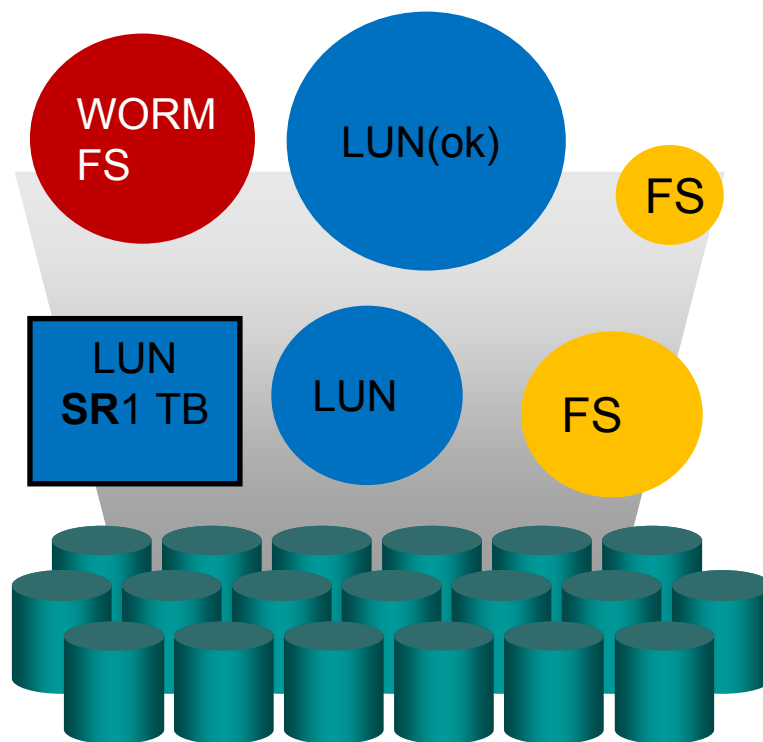
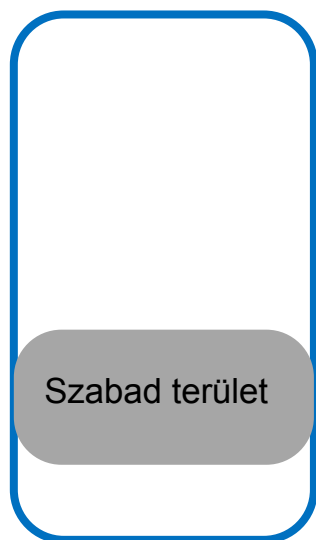
Consolidation of multiple workloads



Thin provisioning



Thin provisioning



TP=Thin Provisioned

SR=Space Reserved

Aggregate

Home Share
„Y” TB

A tárterület sturktúrája



•Aggregate:

- Koszolidált, homogén diszk terület és erőforrás

•Volume:

- Operatív tárolási egység
- a Snap- Flex- Dedup és egyéb művelek alapegysége
- Helyfoglalása az aggregate-ben dinamikusan történik
- A NAS hozzáférés (NFS, CIFS) területi egysége

•LUN:

- A blokk alapú hozzáférés (FC és iSCSI) egysége
- Helyfoglalása az volume-ban dinamikusan történik

Terület visszafoglalás



Az OS-ben futó agent (SnapDrive) visszaszól a NetApp-nak, hogy mely blokkokat lehet felszabadítani a LUN-ról.

NFS és CIFS területen törölt fájlok blokkjai automatikusan felszabadulnak (Sanpshot !)

A felszabadult blokkokat a LUN, volume vagy aggregate kapja beállítás szerint

Másolatok tesztre és fejlesztésre



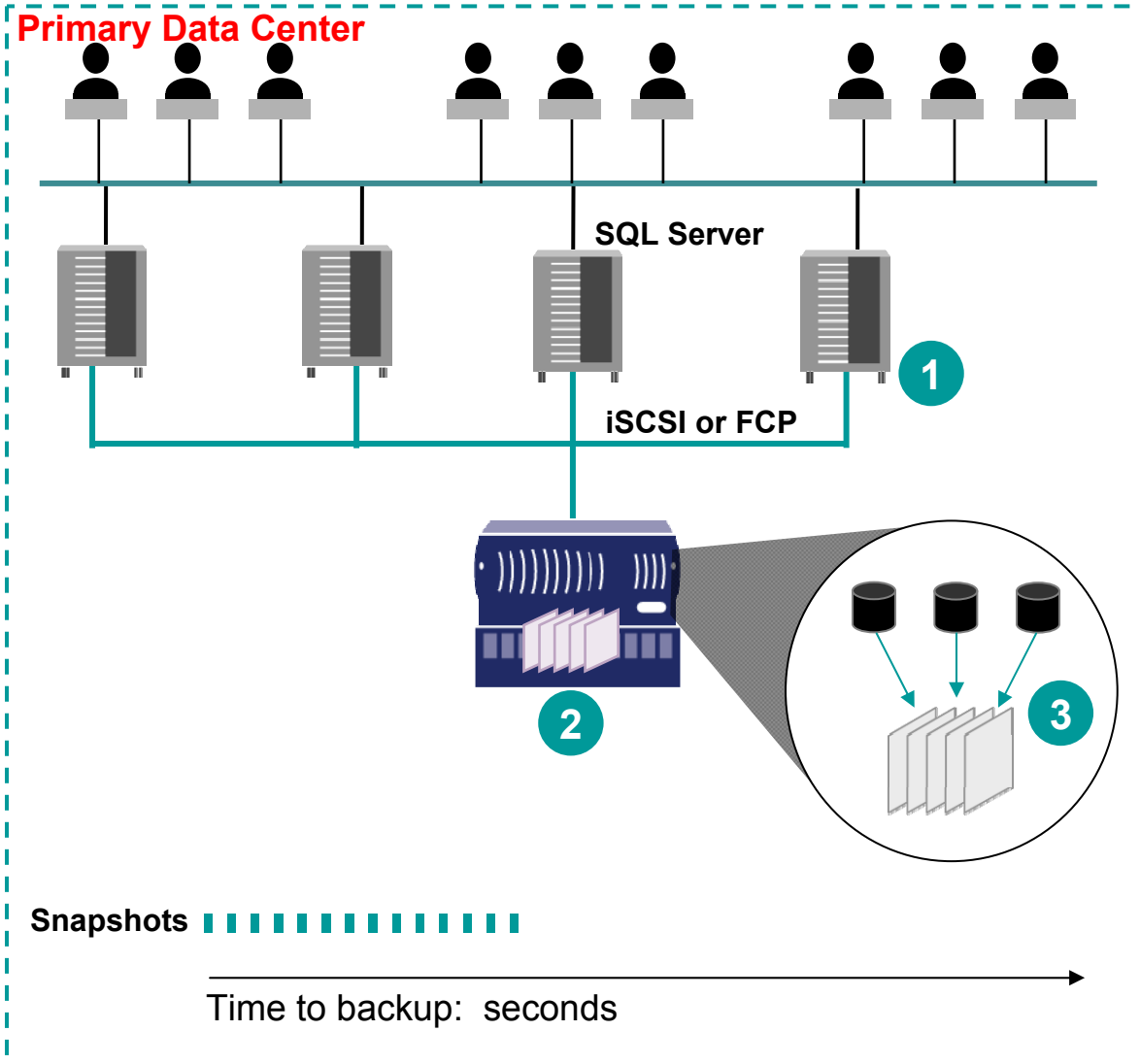
Ad-hoc vagy mentésre készült snapshot-ból azonnal lehet klónozni

Sok teszt verzió gyorsan és kevés helyigénnyel

Snapmirror nélkül: klón, snapshot és éles rendszer szabályozottan osztozik az aggregate-en

Snapmirror-ral: kiléphetünk egy másik aggregate-re vagy NetApp-ra

SQL mentés



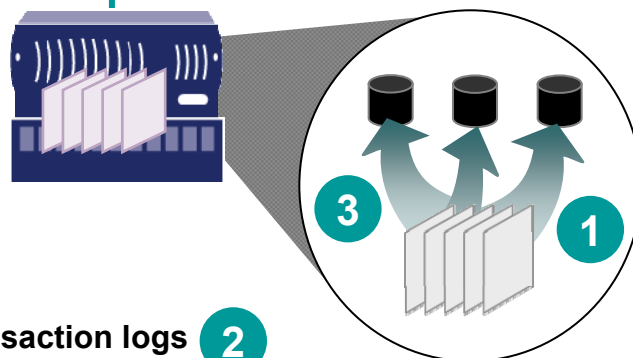
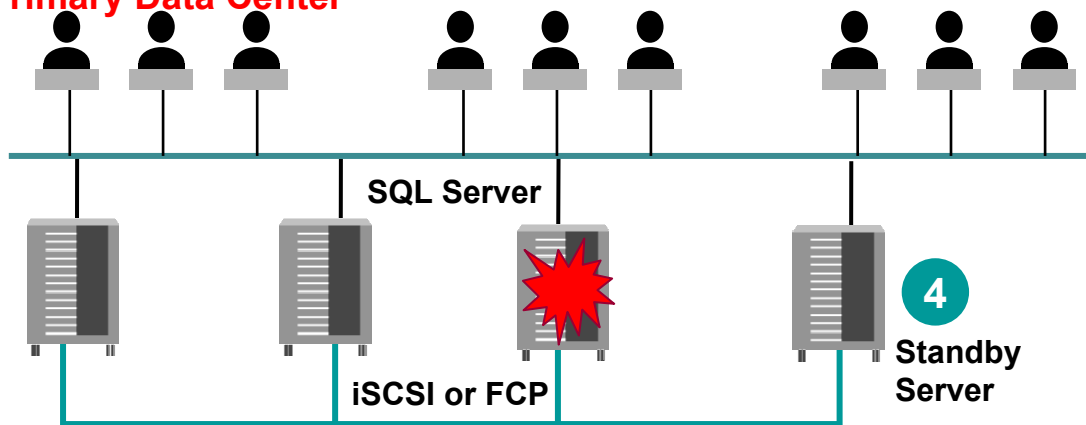
- 1 SnapManager automates data management for SQL Server
- 2 Snapshots for near-instantaneous backups
- 3 Backup multiple databases simultaneously

Benefits:

- ▶ Eliminate backup windows
- ▶ Automation reduces manual errors
- ▶ More frequent backups reduce data loss
- ▶ No performance degradations

SQL helyreállítás

Primary Data Center



■ Snapshot

— Roll transaction logs

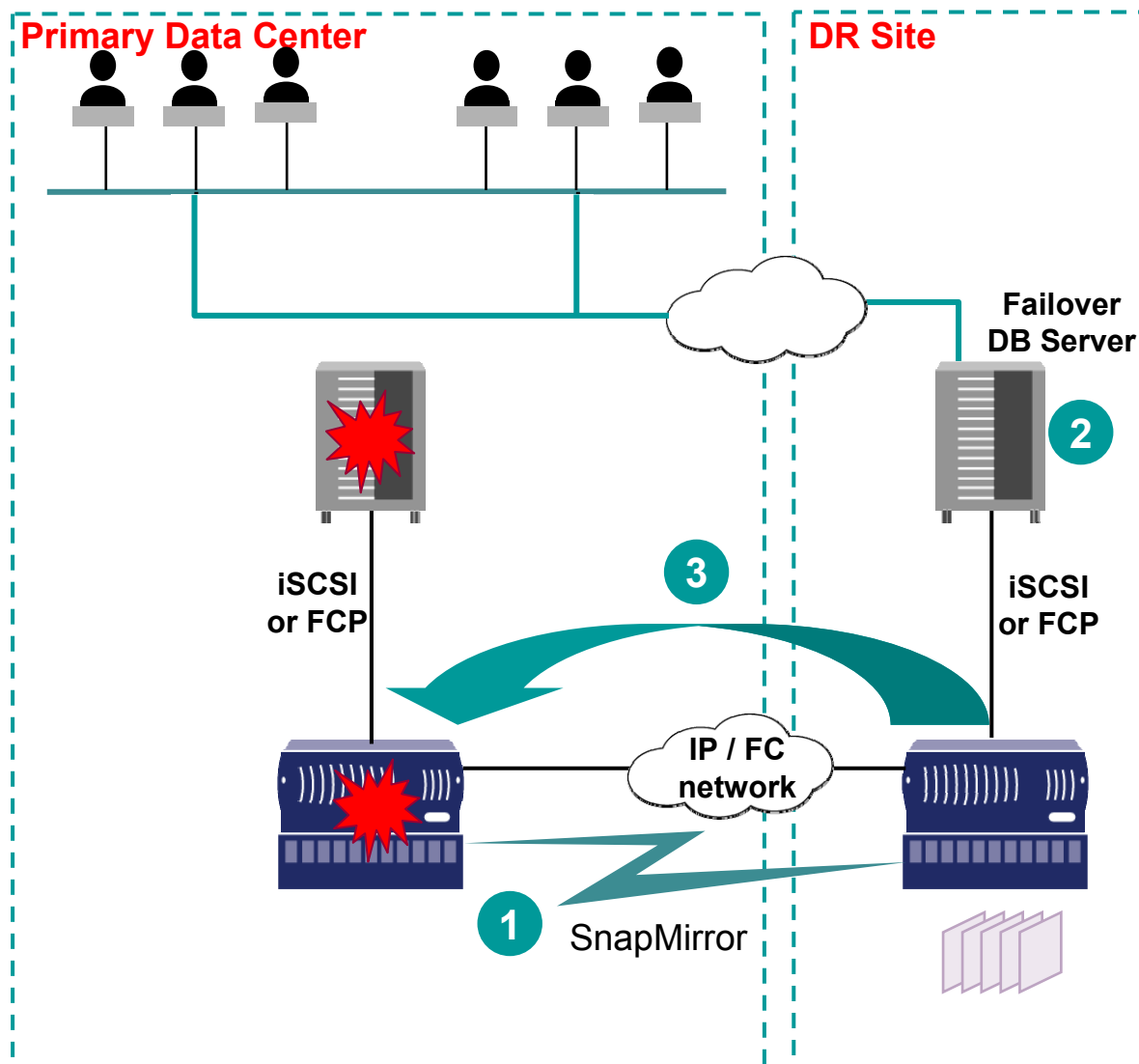
Time to restore: minutes

- 1 Near-instant restore from online snapshot
- 2 Automated log replay for current image
- 3 Restore single or multiple databases
- 4 Rapid failover to standby server

Benefits:

- ▶ Fast and accurate restoration of SQL Server
- ▶ Reduce downtime from outages
- ▶ Automation saves administrative time

DR védett mentések



- 1 SnapMirror® replicates SQL Server data to remote location

Replicate over existing IP networks

After Failure

- 2 Failover to DR site
- 3 Rebuild primary site from DR site

Benefits:

- ▶ Ensures business continuance
- ▶ Minimizes length of outages
- ▶ Cost effective – efficient use of existing IP network

Görcsmentes online bővítés

The screenshot shows the Windows Computer Management console. The left pane displays a tree view of system tools, with 'Storage' expanded to show 'SnapDrive', 'VirtualDisk[4,0,15,0] (H)', 'VirtualDisk[4,0,15,1] (E)', 'VirtualDisk[4,0,15,2] (F)', 'Path Management', 'Snapshots', 'Disk Management', 'Disk Defragmenter', 'Logical Drives', 'Removable Storage', and 'Services and Applications'. The right pane shows a table of storage configurations.

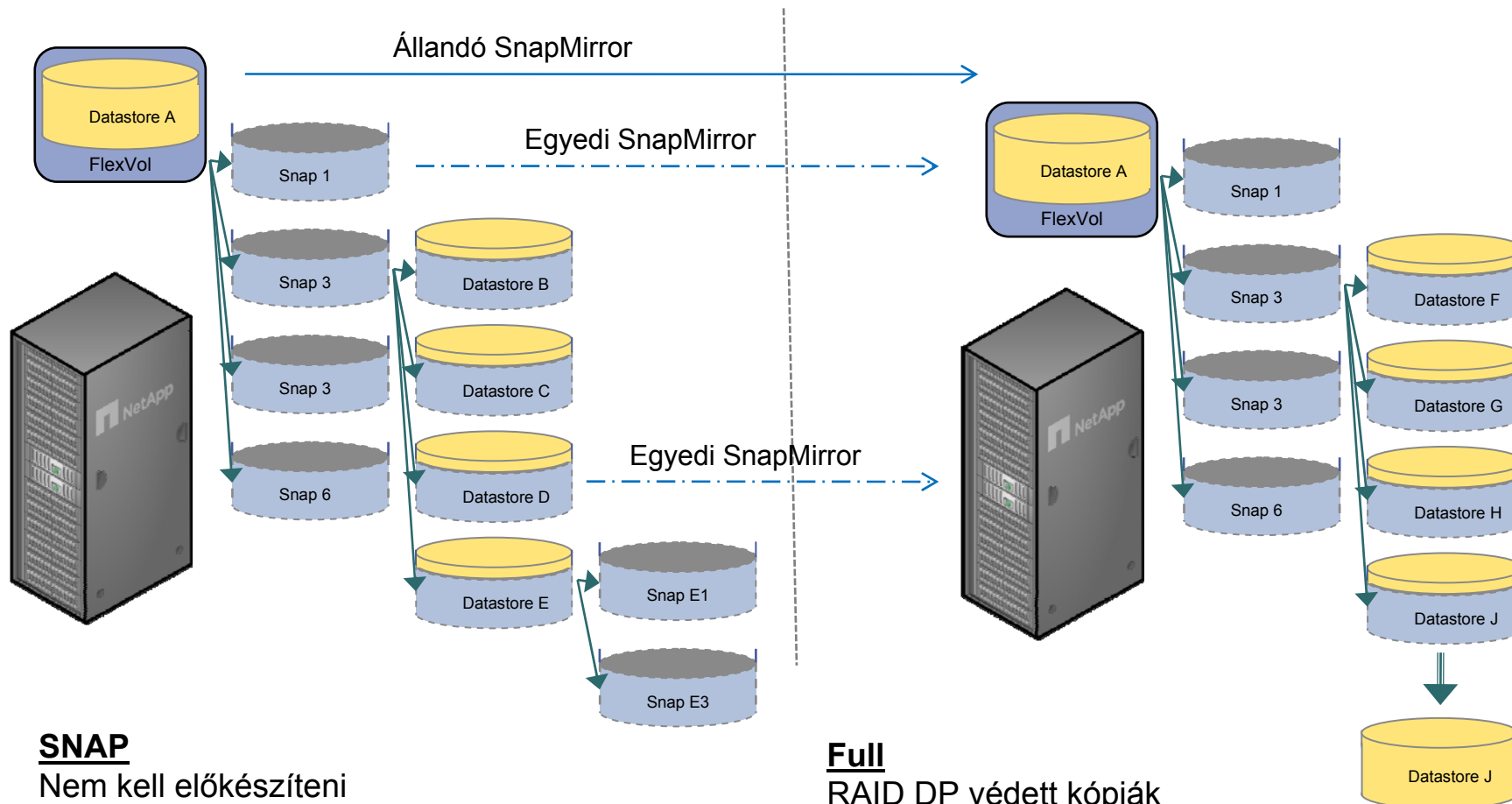
State	Target Slot/Port	Initiator WWPN	Target WWPN
Active	4a	10:00:00:00:c9:2d:60:de	50:a9:80:01:02:00:00:00
Passive	4b	10:00:00:00:c9:2b:fe:50	50:a9:80:01:02:00:00:00

Annotations with red arrows point to the following elements:

- Virtuális diszk a NetApp-ról** (Virtual disk from NetApp) - points to the VirtualDisk entries.
- MPIO Path management** - points to the Path Management icon.
- Snapshot és snapmirror kezelés** (Snapshot and snapmirror management) - points to the Snapshots icon.

Másolatok tesztre és fejlesztésre

DR oldal



SNAP

- Nem kell előkészíteni
- Nem kell várni a szinkronizációra
- Nem lassít sem a szinkronizálás sem a snapshot
- RAID DP védett kópiák
- Mindig van terület
- iSCSI –n is elérhetők

Full

- RAID DP védett kópiák
- iSCSI –n is elérhetők
- Teljes szeparáció
- Tovább SNAP-olható

Virtualizáció

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Increased efficiency

- 3,103 physical servers to 134 (23:1)
- 25% Storage utilization to 70%
- Power savings of 2MW (\$2.25M per year)
- Space savings of 660 racks
- More than 8,500 ports saved
- ROI in 8 months

Increased capabilities

- Activation time from 6 weeks to same day
- Backup from 96 hours to <30 minutes
- Enabled “capacity-on-demand” business model

NetApp Partners with Key VDI Vendors



- VMware View (formerly VDI)
- Building on virtual server mindshare

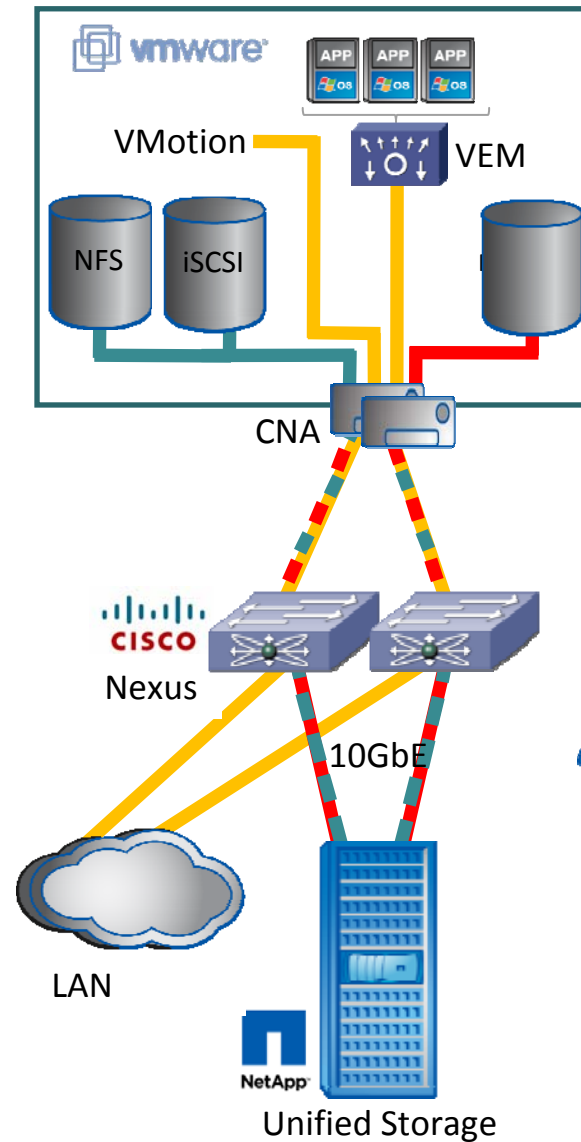
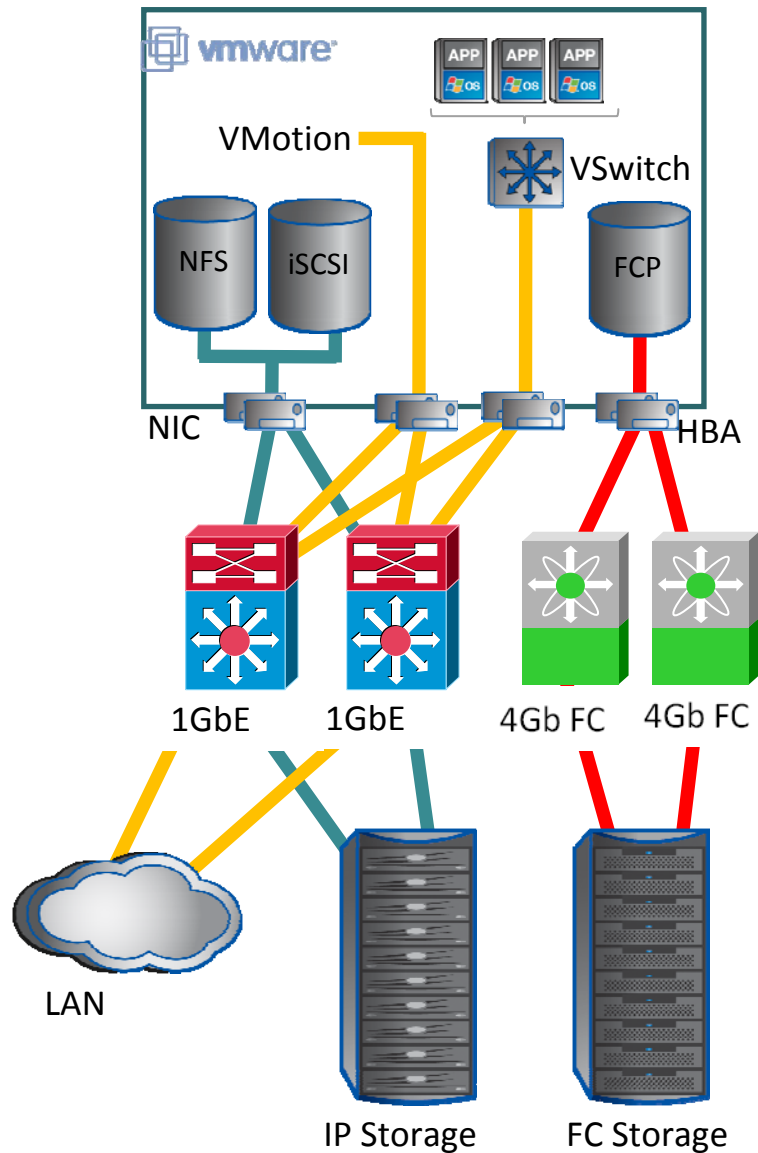


- Citrix XenDesktop
- Well known in desktop environment



- Partnering with Citrix XenDesktop
- Close partnership between NetApp and MSFT

NetApp Legacy



- One wire
- One fabric
- One storage



Efficiency



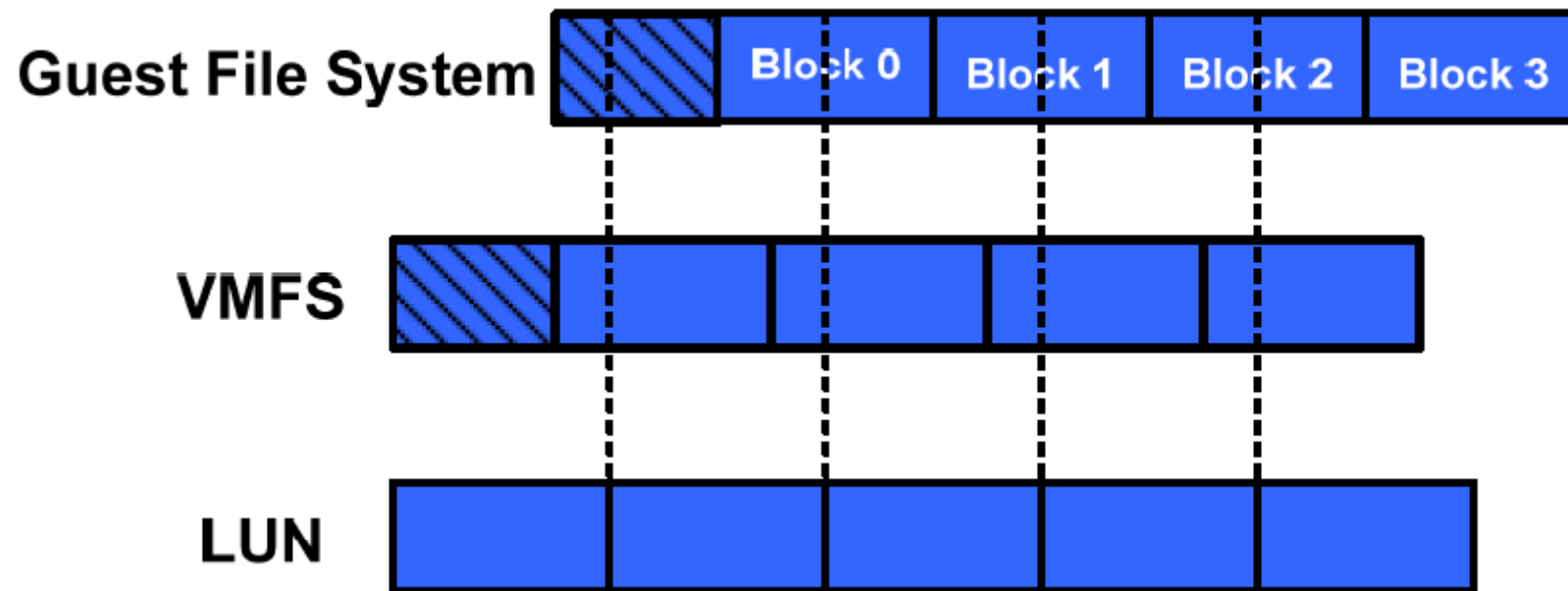
Simplicity

Gyári prezentációk

- SecureMultiTenancy
- SMVI20
- RapidCloningUtility21
- SnapDriveforWindows62
- ApplianceWatchPRO20
- VDI***

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Blokk alignment



NFS

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When you treat storage as files a SAN complicates everything



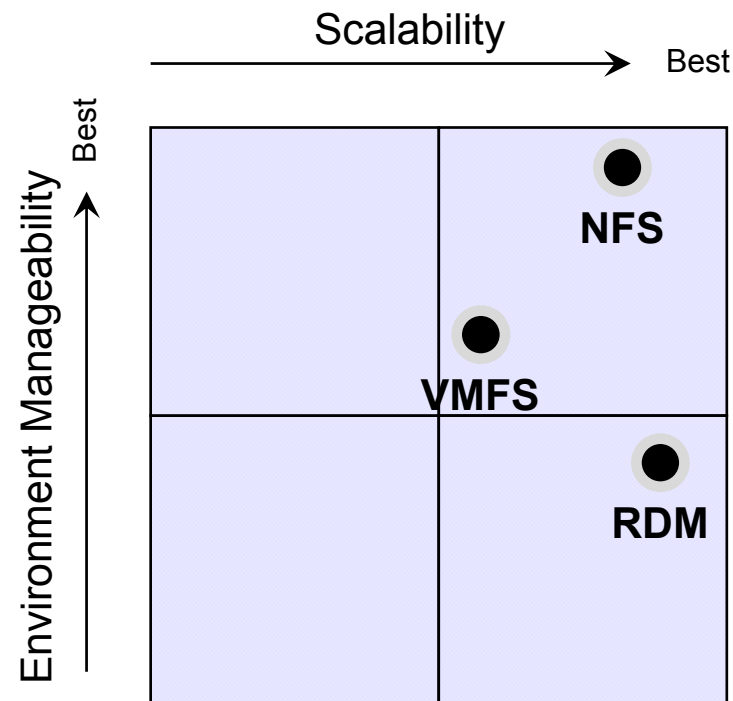
- ▶ **Grow a Datastore**
 - ▶ **SAN – 45 steps executed over 20 servers (or more with more servers)**
 - ▶ **NAS – 1 step on the array**
- ▶ **Shrink a Datastore**
 - ▶ **SAN – Not Available – leaves orphaned storage**
 - ▶ **NAS – 1 step on array**
- ▶ **Restore a VM from a snapshot**
 - ▶ **SAN – 6 steps, several minutes, and a lengthy IO impact**
 - ▶ **NAS – 1 step – SnapRestore**
- ▶ **Restore a file from a snapshot (like SMBR)**
 - ▶ **SAN – Not Available**
 - ▶ **NAS – UFS Explorer, MAC, or Linux**
- ▶ **Run Deduplication**
 - ▶ **SAN – VMware admin unaware; new storage must be provisioned from savings**
 - ▶ **NAS – VMware admin aware; deploys new VMs with confidence**

Scaling and Manageability Quadrants



VMFS

- 90% of the market
- Server admin mgmt of storage
- Easy, common
- VMFS limits scaling
- With Thin prov A-SIS ready



NFS

- NFS is always thin provisioned
- Zero administrator management
- No VMFS bottleneck
- Scales to limit of array or network
- A-SIS ready

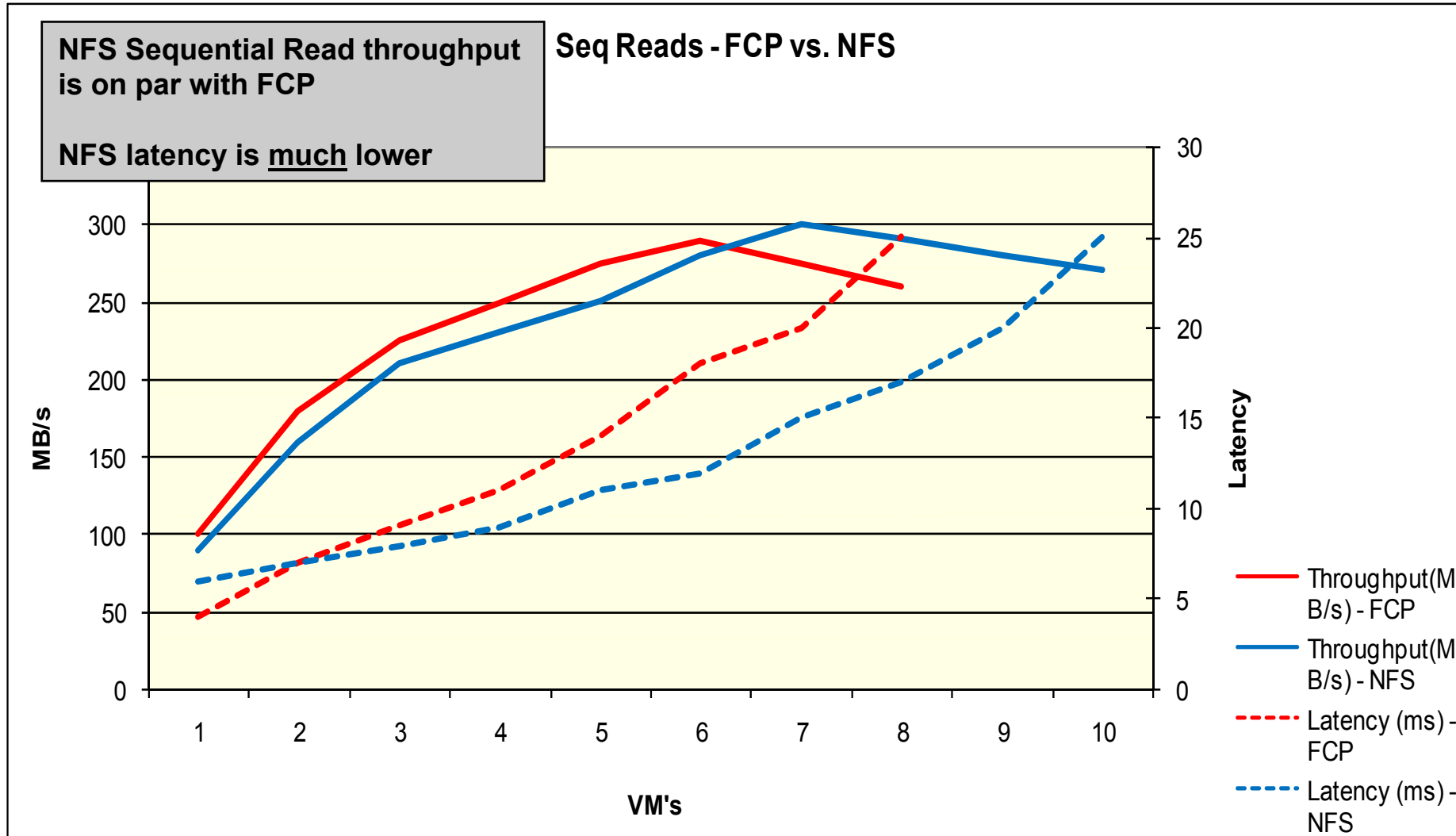
RDM (Raw Device Mapping)

- iSCSI or FCP
- Storage Admin manages all luns
- Fastest single VM perf (FCP)
- Scales to limit of array or network
- Most labor intensive
- Must thin prov LUNs to be A-SIS ready
- NetApp tools will move this up

The choice is yours, NetApp supports them all

Sequential Tests – FCP vs. NFS

NFS is on par or slightly better!



What About Storage Protocol?



To NetApp, protocols simply do not matter

NetApp value holds true for all protocols

RAID-DP

NetApp Dedupe

SnapManager for VMware Infrastructure

Common deployment trends

Small installations tend to use iSCSI

Large installations prefer FCP or NFS

FCP is most commonly deployed protocol

NFS allows direct NetApp data management in VMware®
by providing object based storage

Majority of VDI customers use NFS

Why are so many NetApp customers using NFS for VDI?



More VMs per datastore - >125 VMs for NFS vs. <20 VMs for blocks

Fewer objects to manage: 40 objects vs. 250 objects for a 5,000-seat VDI deployment

More VMs per datastore enables FlexClone to clone more VMs at a time

More VMs per datastore increases overall deduplication savings (dedupe works at volume level)

NFS is thin-provisioned by default

Dynamic datastore resizing allows easy grow or shrink of the storage as needed

Without having to migrate VMs from the datastore

Eliminates the need to add extents

Savings or increases in storage can be reflected immediately in ESX hosts by refreshing datastores

Less overall management complexity

Removes need for FC switches, HBAs, zones across ESX servers

Clone and restore individual VMs

Comparing Terminologies



Feature	VMware® ESX	Microsoft Hyper-V	Citrix XenServer
Hypervisor	VMware® ESX Server	Hyper-V Server	Citrix Xen Server
Virtual Machine (VM)	Guest OS	Child OS	Guest OS
Storage containers	Datastore	Physical disk	Storage Repository
File representing VM hard disk	vmdk	vhd	vhd
Disk directly mapped to the VM	RDM	Pass-Through Disk	RDM
Centralized Management Software	vCenter	System Center Virtual Machine Manager	Xen Center Console
Migration of VMs across hosts	VMotion™	Live Migration	Xen Motion
High Availability of VMs between hosts	High Availability (HA)	Host Clustering/Quick Migration	High Availability (HA)
Software installed on VMs for fastest/best user experience	VMware Tools	Integration Services	Xen Tools
Clustered Filesystem to store VMs	VMFS	Cluster Shared Volumes (CSV)	N/A

Virtualization Guarantee* Program



Use NetApp for your virtual environments, and we guarantee* you will use less storage

50% less with NetApp systems

35% less on your existing systems

“During the research phase of our next storage purchasing cycle, ask each vendor if it offers a capacity savings or utilization guarantee.”

- Jonathan Davis, Duke Institute for Genome Sciences and Policy
Gartner Inc. Nov 2008 April Adams Capacity Savings and Storage Utilization Guarantees: What's Included, and Are They Worth Considering?

How To Participate

- Implement our standard best practices
- Use our industry-leading features
 - Thin provisioning
 - Deduplication
 - RAID-DP® (not required for V-Series)
 - NetApp Snapshot™ copies
- Use NetApp V-Series for your existing systems
- Have us help you install
- If you don't use less storage, get the capacity shortfall at no additional charge

*For terms and conditions, go to netapp.com/guarantee