



Simplifying Data Management

An Introduction to Network Appliance

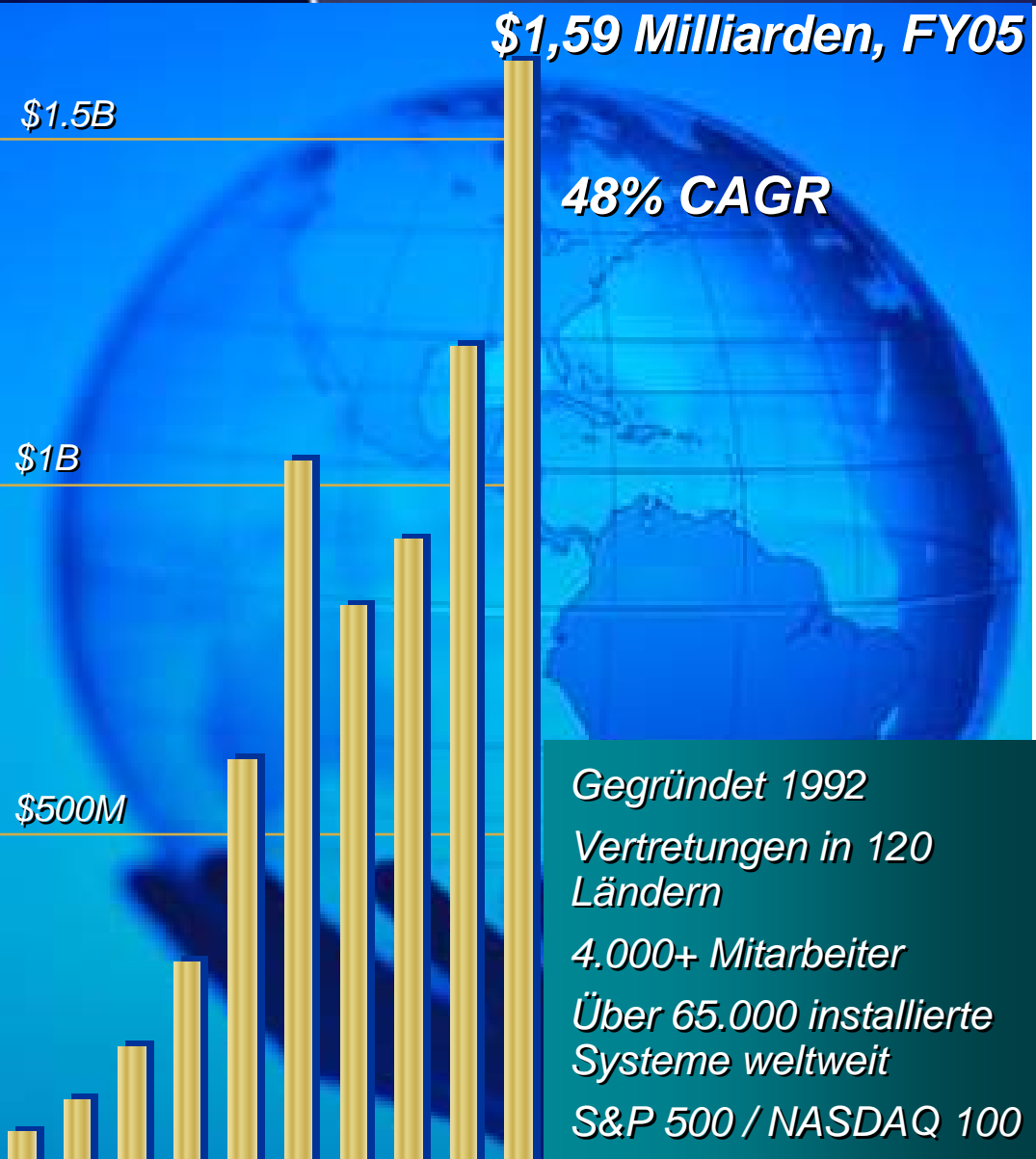
Joe Braun Partner Account Manager
Michael Treutel System Engineer



**Network Appliance bringt
unmatched simplicity
für die komplexe Welt im
Enterprise Data Management.**

- Reduce cost & complexity
- Minimize risk
- Control change

Unser Anspruch: Kundenzufriedenheit



- ▶ **Schnellst** wachsendes Storage Business
- ▶ **Umfassendes** Lösungsportfolio für Datenmanagement
- ▶ **Weltklasse** Service & Support
- ▶ **Führende** Partnerschaften
- ▶ **Weltweite Enterprise-**Kundenbasis

Heutige Herausforderungen

- ✓ Extremer Datenwachstum
- ✓ Einfaches Management
- ✓ Hohe Skalierbarkeit
- ✓ 24x7 Zugriff
- ✓ Data security & compliance



Consolidate
storage

Operate
everywhere

Protect
your business

NetApp Produktübersicht

Primary Storage



FAS900 and FAS3000 Series

Unified Enterprise-class Storage

Nearline Storage



NearStore®

Economical Secondary Storage

Virtualization Solutions



V-Series

Intelligent Gateway for Heterogeneous Storage

Content Delivery



NetCache®

Accelerated and Secure Access to Web Content

Remote/ Small Office



FAS200 Series

Remote and Small Office Storage

Data ONTAP™ Operating System—SAN, NAS, iSCSI, Caching

Management and Automation

- DataFabric® Manager
- SnapManager®
- SnapDrive™
- SecureAdmin™
- ApplianceWatch™

Storage Resource Management

- DataFabric Manager
- FilerView®
- MultiStore®
- VFM™ (Virtual File Manager)
- SnapMover®
- FlexClone™

Information Availability

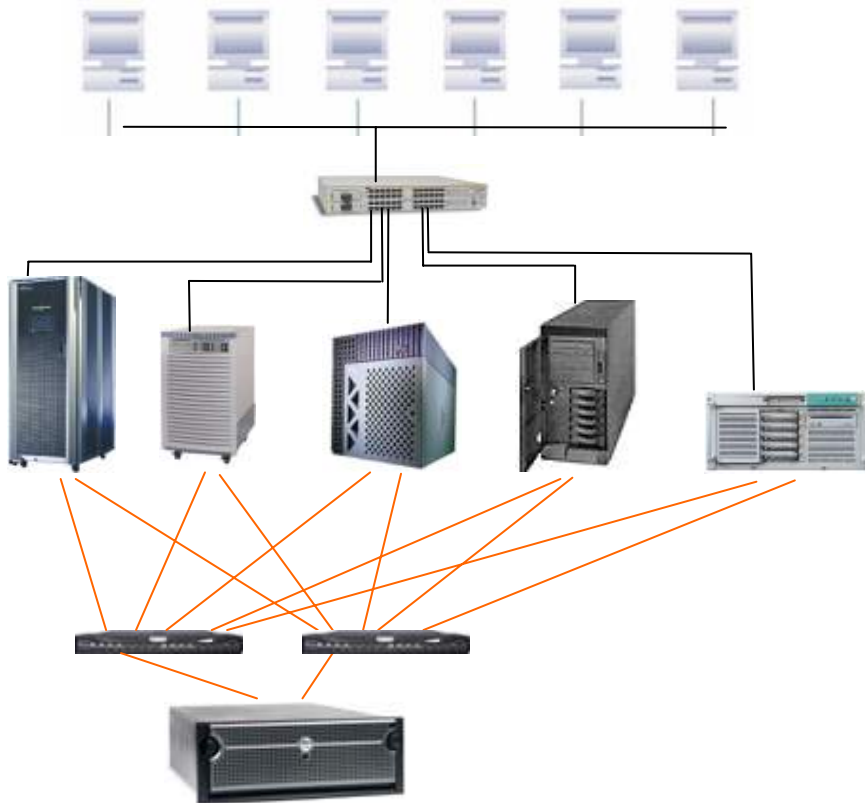
- Snapshot™
- SnapRestore®
- SnapMirror®
- SnapVault®
- SnapLock™
- Clustered Failover
- SyncMirror®
- MetroCluster
- LockVault™



iSCSI

Wer kennt iSCSI?
Wer setzt iSCSI ein?

Kosten FC-SAN



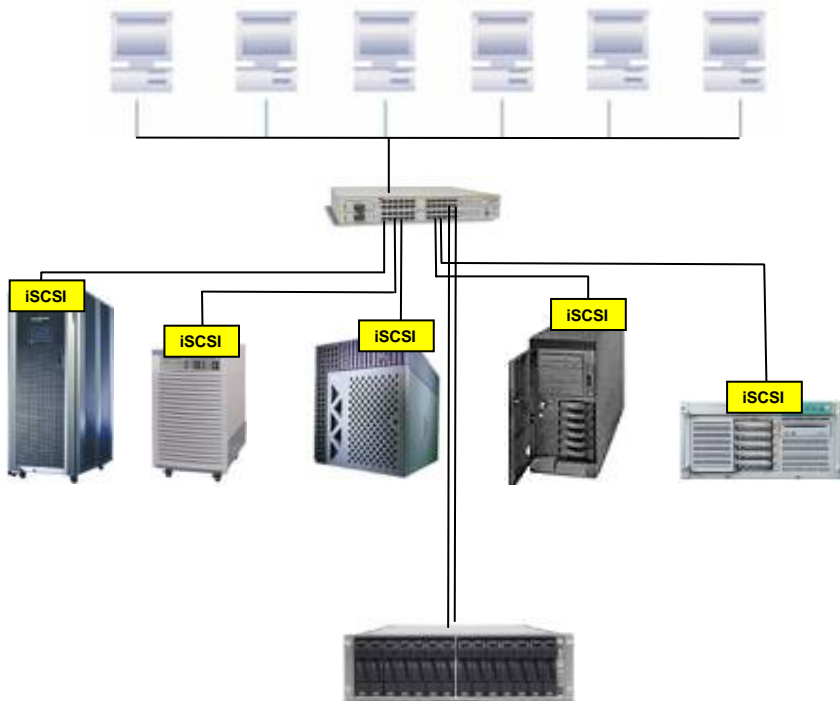
Investition:

10 x FC-HBA	10.000 €
2 x FC-Switch	10.000 €
1 x 2 TB FC-RAID	30.000 €
Lizenzen	10.000 €
	=====
	55.000 €

Nicht kalkulierbare Kosten

FC-Know How
 FC Verkabelung
 Pflege (Treiber, Pathfailover....)

Kosten iSCSI SAN



Investition:

10 x SW-Teiber	0 €
2 x IP-Switch	500 €
1 x 2 TB FAS270	30.000 €
Lizenzen =====	
	30.500 €

kalkulierbare Kosten

IP-KnowHow ist vorhanden
 IP Verkabelung
 Pflege, (Treiber.....) KOSTENLOS
 CIFS/NFS/FC Optional

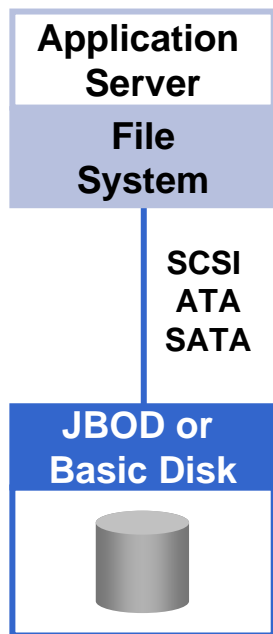


iSCSI

mtreutel@netapp.com

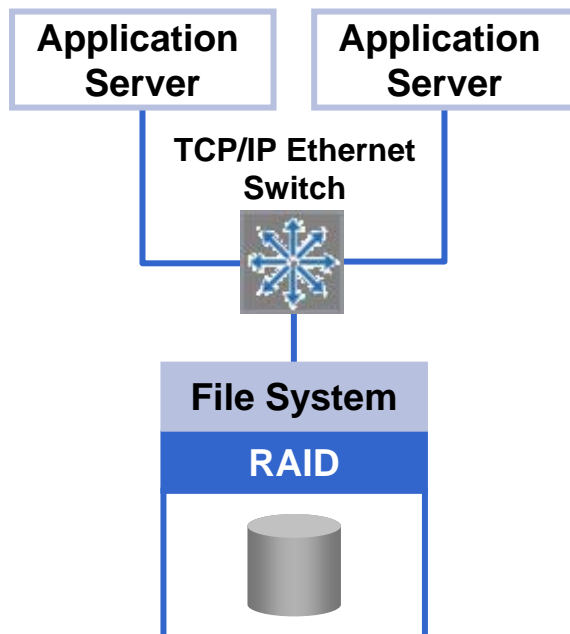
Storage Technology Choices

DAS



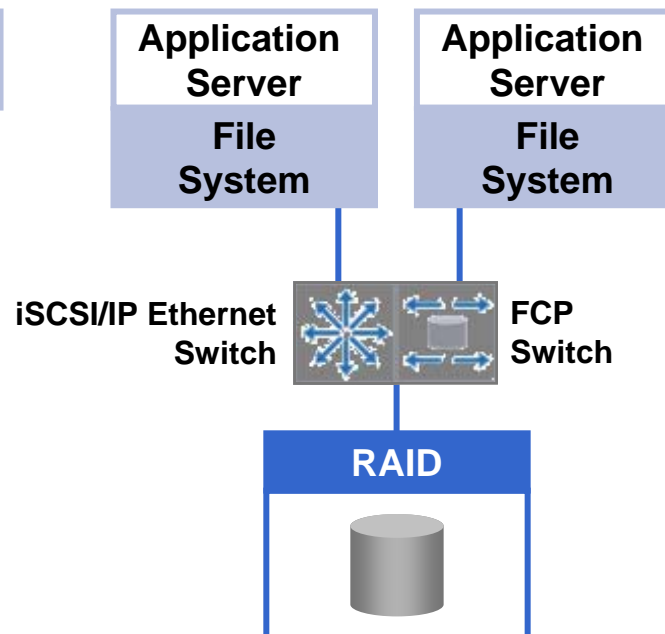
- ▶ High cost-of-ownership related to management
- ▶ Inflexible

NAS



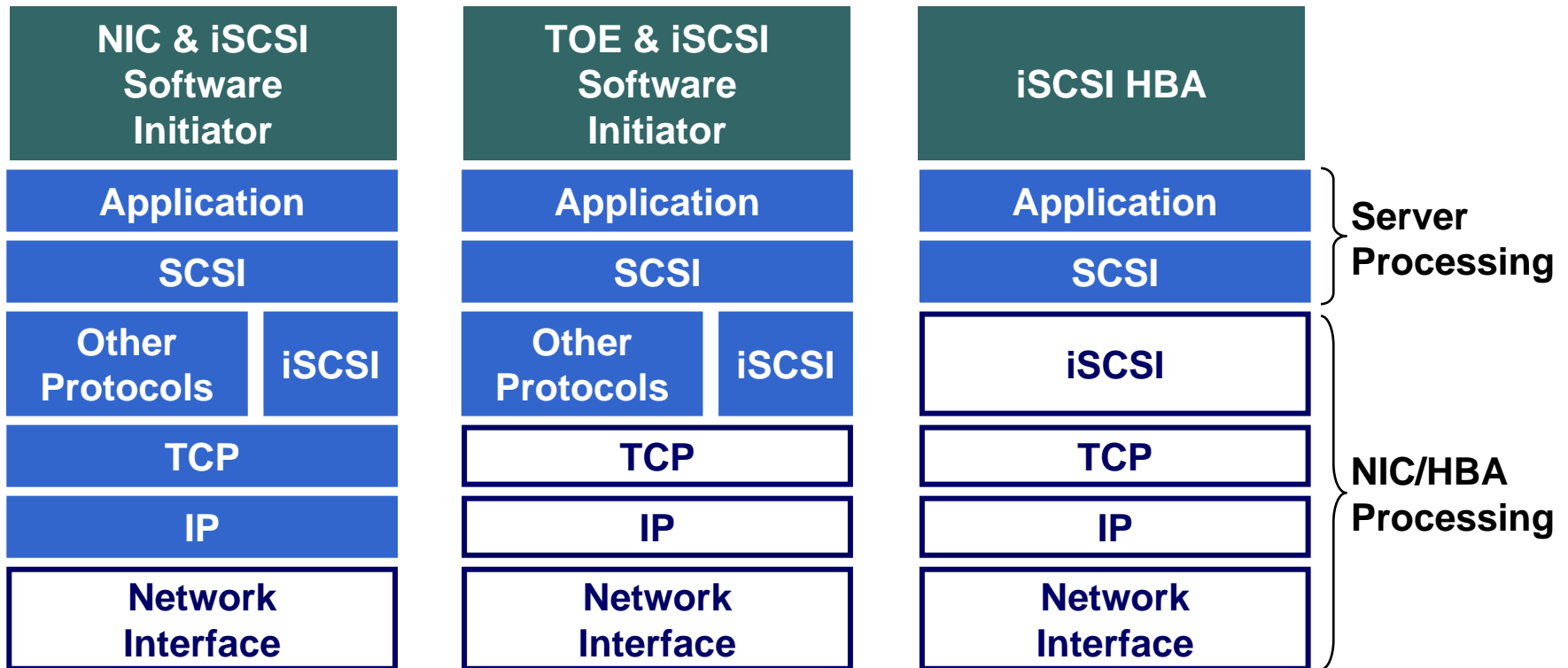
- ▶ Transmission optimized for file transactions
- ▶ File storage traffic travels over Ethernet

SAN



- ▶ Transmission optimized for I/O block data movement
- ▶ Separates LAN and SAN

NIC, TOE, iSCSI HBA: Why All of the Choices?



- ▶ **TOE and iSCSI HBA goals:**
Offload IP and iSCSI activities from the host processor
- ▶ **Additionally, some iSCSI HBAs offer remote boot capabilities**







iSCSI

(**i**nternet **S**mall **C**omputer **S**ystem **I**nterface)
is a standard protocol, see RFC 3720,
since 2003

FCP-Interoperabilität ??

<http://www.snia.org/ipstorage/home>

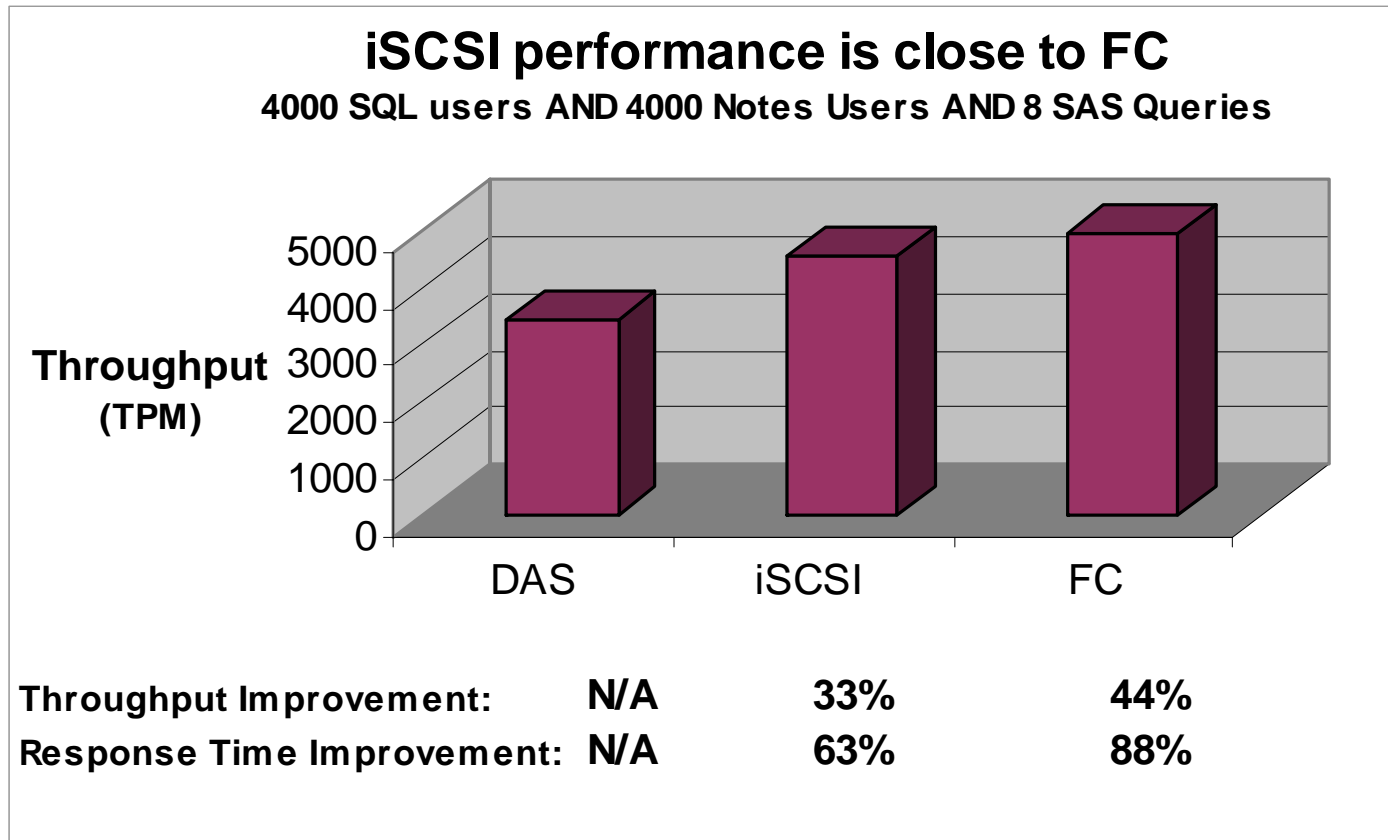
IP SAN Host Support

OS	Initiator	Certified Solution	Multi-pathing	Host Cluster
	Hardware (several), software initiator	<input checked="" type="checkbox"/>	Microsoft MPIO	MSCS
	Qlogic	<input checked="" type="checkbox"/>	TBD	TBD
	Software Initiator	<input checked="" type="checkbox"/>	PV Links	TBD
	Software Initiator	<input checked="" type="checkbox"/>	Trunking	TBD
	Hardware (several), software initiator	<input checked="" type="checkbox"/>	Trunking	Oracle
	Hardware (several), software initiator	<input checked="" type="checkbox"/>	Trunking	Oracle
Novell. NetWare.	Software	<input checked="" type="checkbox"/>	Trunking	Netware

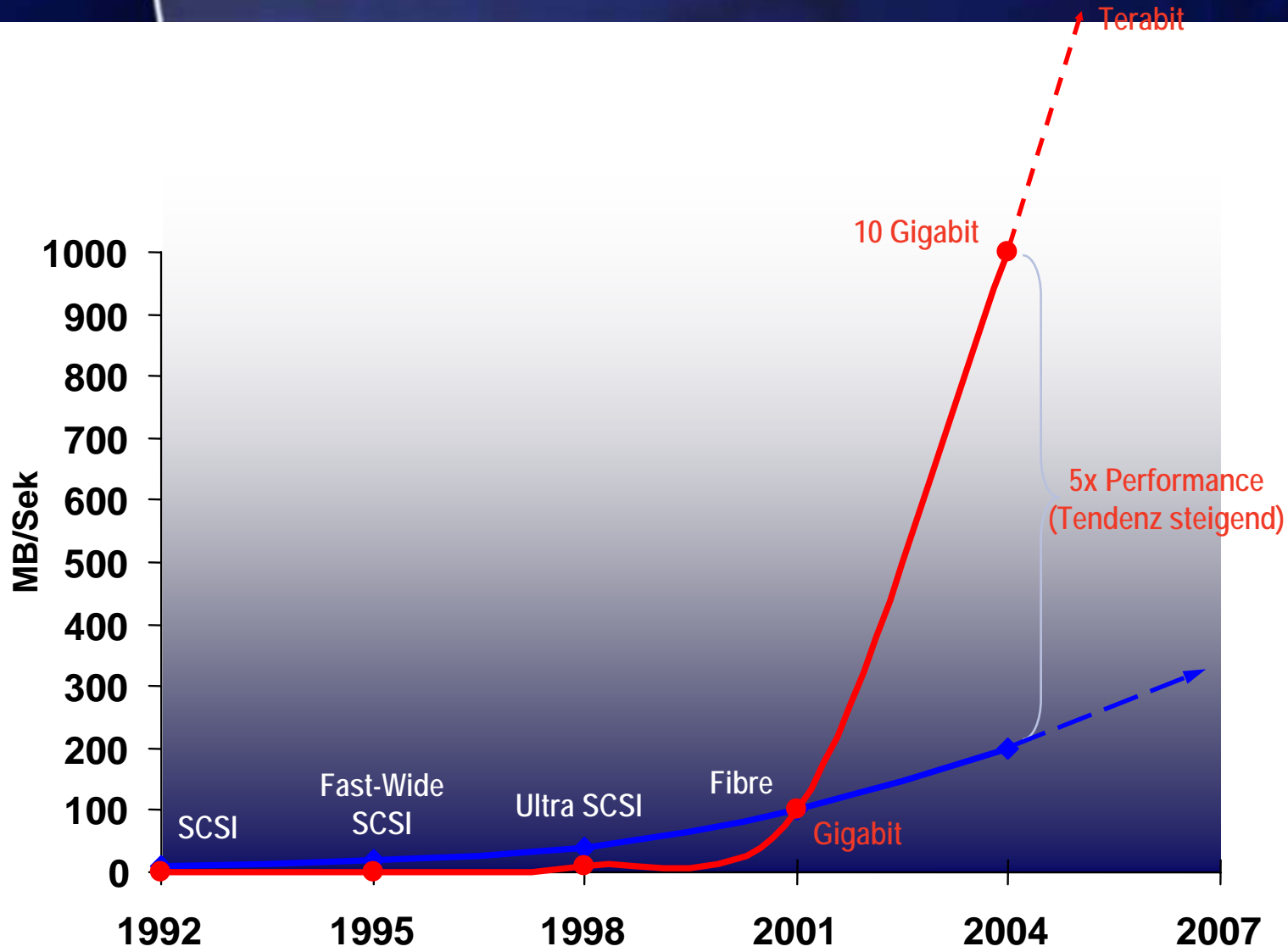
<http://now.netapp.com/NOW/knowledge/docs/san/>

Proof Points - Performance

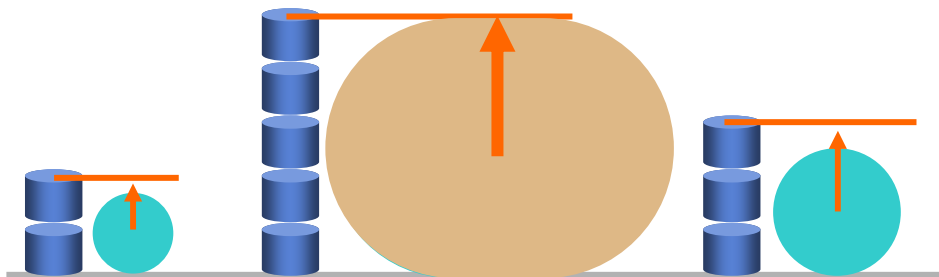
- ▶ **Enterprise Strategy Group Validation study (4/04)**
 - http://www.netapp.com/tech_library/ftp/analyst/ar1023.pdf



What is coming next?

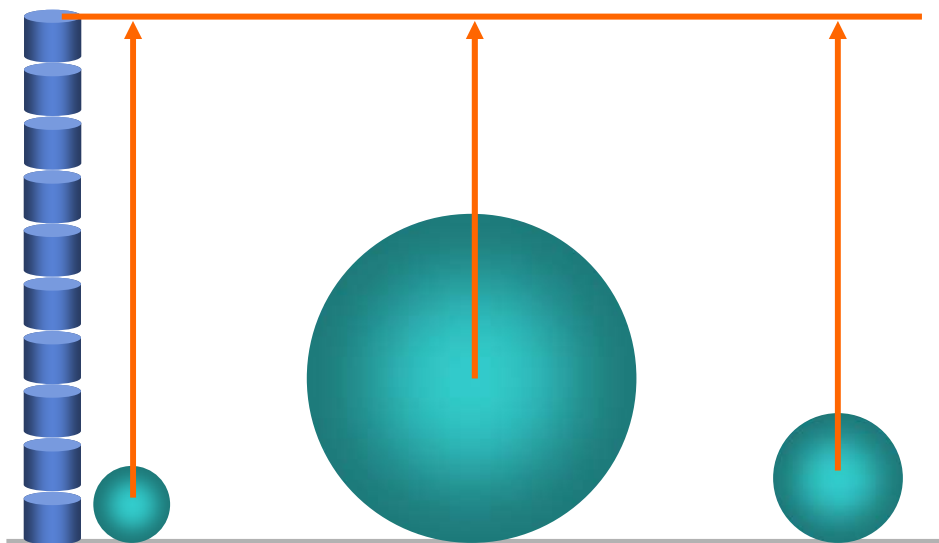


FlexVol™ Volumes: Increasing I/O Performance



Regular volumes

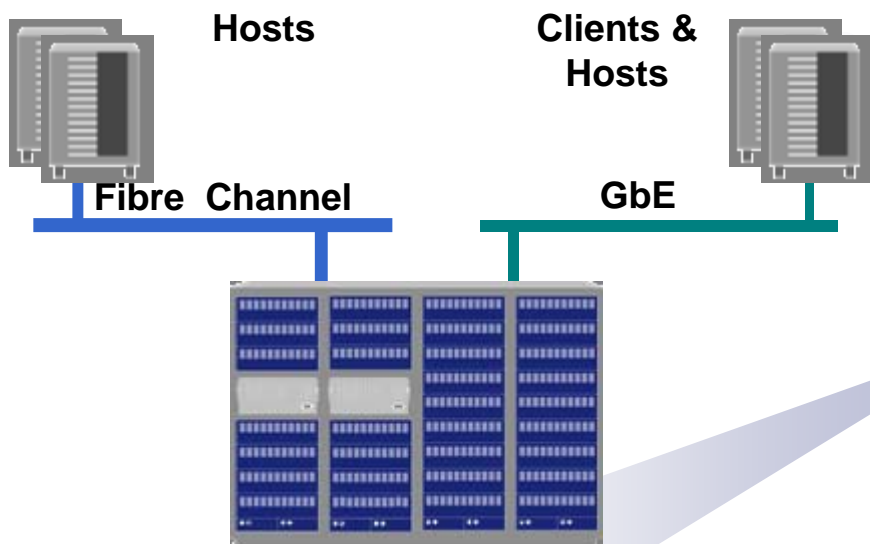
- ▶ Volume performance limited by number of disks it has
- ▶ “Hot” volumes can’t be helped by disks on other volumes



FlexVol volumes

- ▶ Spindle sharing makes total aggregate performance available to all volumes

Unified Storage



- ▶ Heterogeneous host OS support
- ▶ Redundant fabric-attached SAN

- ▶ SCSI protocol over FC and IP
- ▶ Virtualized port access
- ▶ Simultaneous SAN and NAS

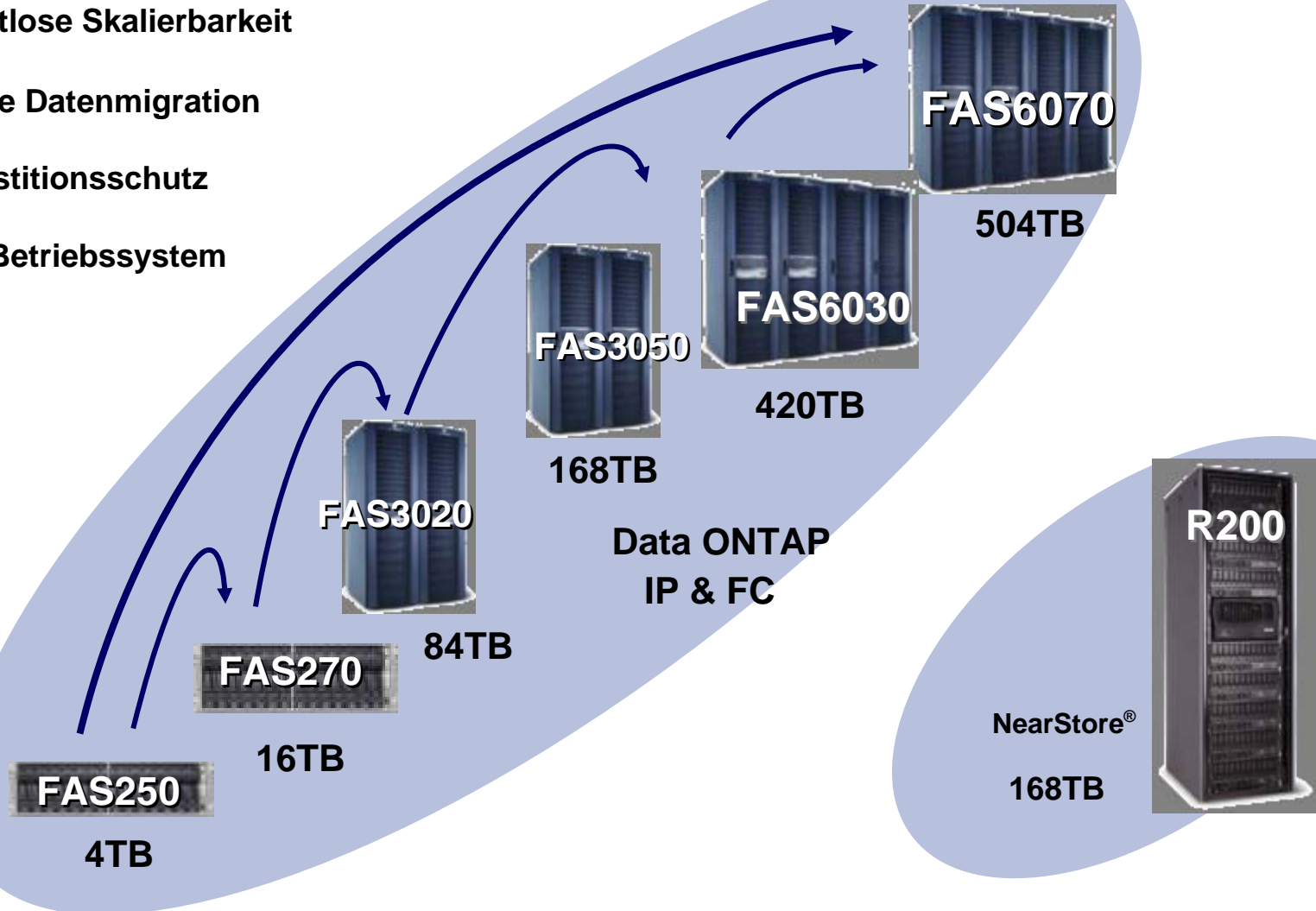
- ▶ Transport-independent LUNs
- ▶ Integrated LUN masking/mapping & host groupings for SAN security

Data Management	iSCSI	FCP	NFS	CIFS	HTTP	DAFS
Data Recovery Data Availability Data Integrity	LUN Semantics		File Semantics			
	Performance Acceleration					
	Block Management					

- ▶ Leverages WAFL optimizations
- ▶ Wizard-based LUN setup
- ▶ Dynamic LUN expansion
- ▶ Writable Snapshot™ LUN

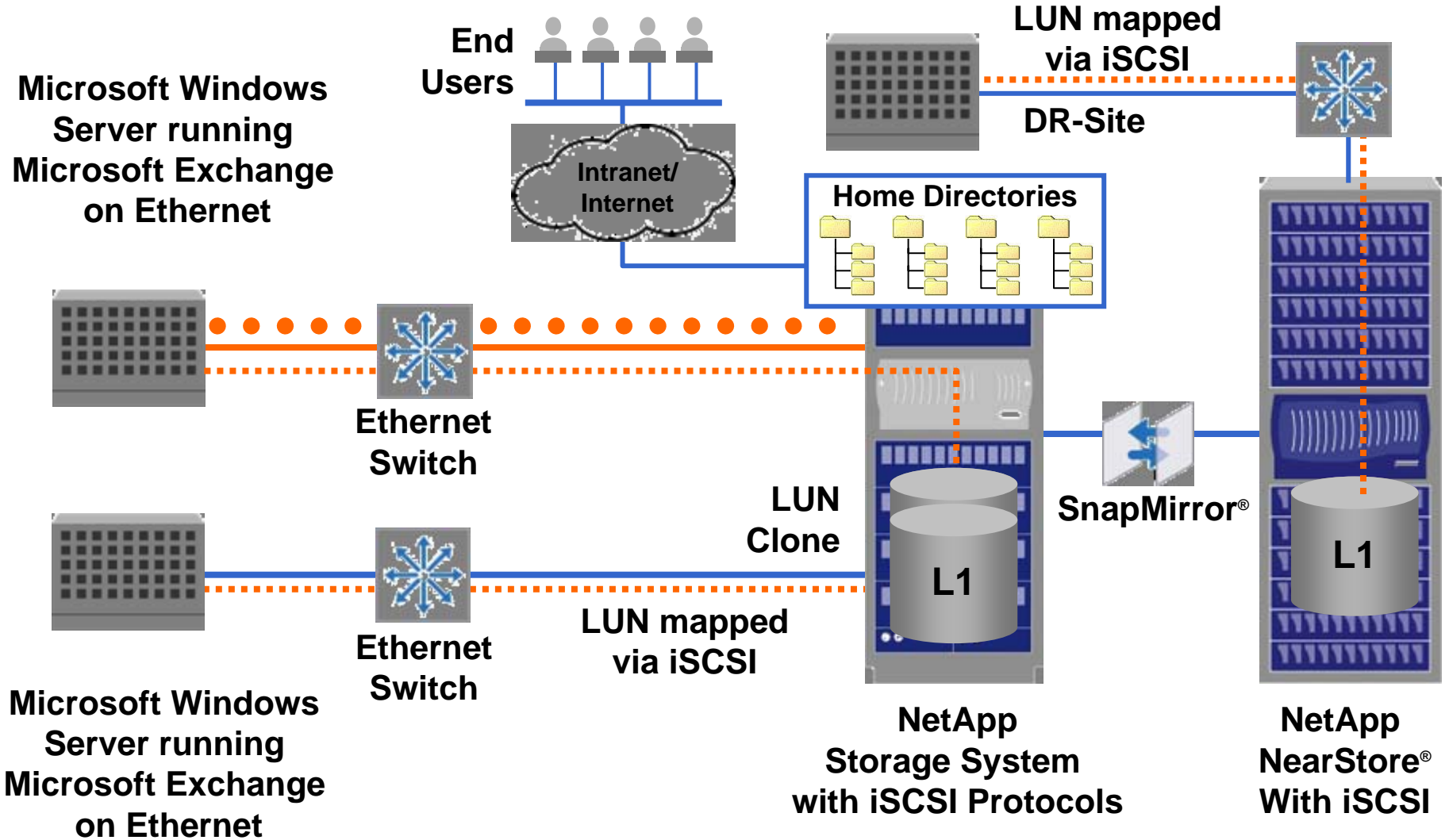
Unified Architecture, Nahtlose Skalierung

- Nahtlose Skalierbarkeit
- Keine Datenmigration
- Investitionsschutz
- Ein Betriebssystem



	Feature	Benefit
SnapManager®	Safe, automated backup and restore for target applications	Streamlined, simplified data management
SnapDrive™	Automated storage provisioning and virtualization	Greatly improved storage provisioning flexibility & efficiency
SnapMirror®	Affordable remote replication for DR and disk-disk-tape backup	Integrated global data infrastructure with centralized backup
SnapRestore®	Data recovery in minutes, not hours, without tape	Significant admin and end-user productivity improvements
Snapshot™	Space-efficient point-in-time copies	Simplified backup Backup cost savings
iSCSI Protocol	SAN using ubiquitous Gigabit infrastructure	Lower costs, easy admin

Unified Storage Solution Example



NetApp IP SAN Advantages

- ▶ **NetApp the iSCSI Expert**
 - Market leader with >40% market share (IDC)
 - 6000+ deployments in production environments
 - 12+ years IP storage expertise
- ▶ **Increase Data Availability**
 - Non-disruptive backups
 - Recover in minutes
 - Advanced mirroring and DR
- ▶ **Minimize Costs**
 - Increased capacity utilization
 - Leverage IP infrastructure and expertise
 - Multi-protocol storage
 - Lower component costs
- ▶ **Accelerate IT Project Completion**
 - Provision storage in minutes
 - Increased admin productivity



**Network Appliance bringt
unmatched simplicity
für die komplexe Welt im
Enterprise Data Management.**

- Reduce cost & complexity
- Minimize risk
- Control change