



## IBM N Series

*Store the maximum amount of  
data for the lowest possible cost*



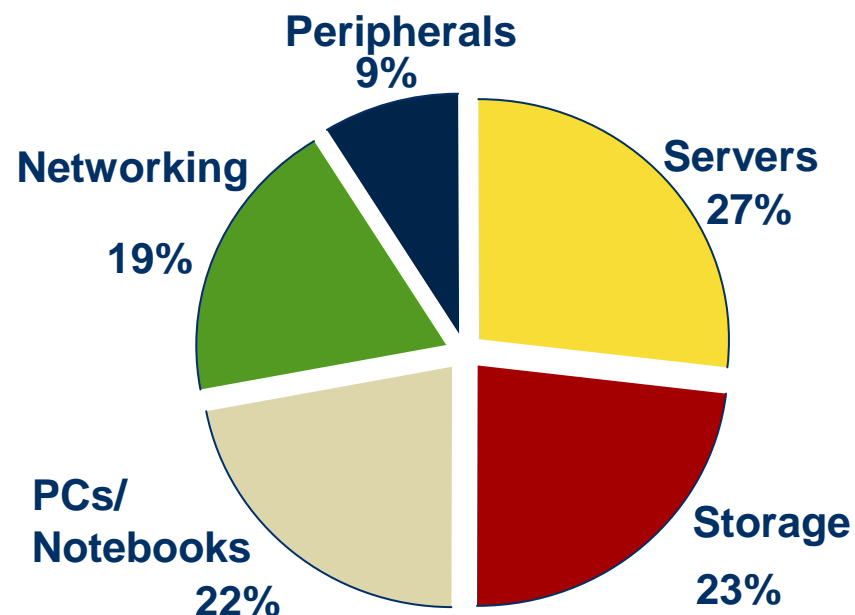
**Matthias Rettl**  
**Systems Engineer**  
**NetApp Austria GmbH.**

## Agenda

- Challenges and Concerns
- Increasing Efficiency - How We Do It
- The Net Effect
- Getting Started

## Storage Is A Major Component of IT Spend

- Data Storage is 2<sup>nd</sup> highest cost in IT
- Storage costs are growing 50% per year, but budgets are not...



N series Storage Efficiency  
Solves This Problem

Sources: IDC Perspectives Study, 2008 "Storage is the 2nd highest percentage of IT spend"  
The InfoPro, Wave 11: "Storage spend growth is over 50% per year in average Fortune 1000 companies"

## Storage Consumes Power

- Data Centers are huge consumers of power  
*(1.5% of total electricity consumption)*
- Left unchecked, they will double in five years
- Storage plays a major role

Data Center Power Consumption (Billion kWh)			
	2006	% of Total	Growth
Volume Servers	20.9	67.9%	161%
<b>Data Storage Devices</b>	<b>3.2</b>	<b>10.4%</b>	<b>191%</b>
Network Equipment	3.0	9.7%	114%
Mid Range Servers	2.2	7.1%	-12%
High End Servers	1.5	4.9%	36%
<b>Total</b>	<b>30.8</b>	<b>100%</b>	<b>118%</b>



Source: U.S. Environmental Protection Agency "Report to Congress on Server and Data Center Energy Efficiency" – Figure 2.2

## How the Industry Is Responding

### Three basic strategies have emerged

- Optimize what you have now and going forward
  - *Consolidate*
- Deploy new technologies to optimize space and power
  - *Virtualize*
- Relocate facilities to lower cost geographies
  - *Re-engineer*

Lowest Risk  
Lowest Cost

Moderate Risk  
Moderate Cost

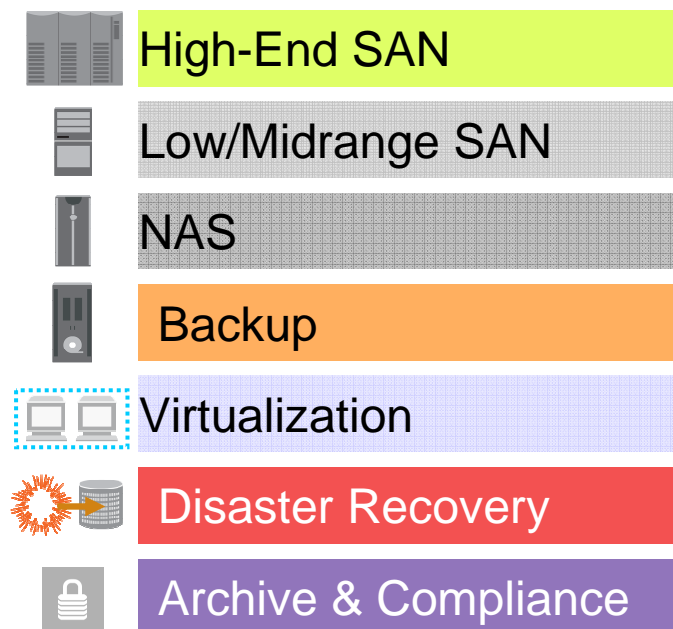
Highest Risk  
Highest Cost

## Increasing Efficiency: How We Do It



# Benefits of Unified Storage: Efficiency Starts Here

## Industry Approach



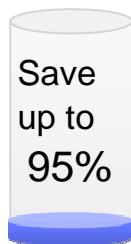
Different hardware  
 Different software  
 Different people  
 Different processes

## N series®



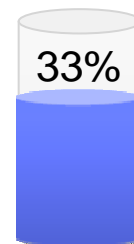
Same hardware  
 Same software  
 Same people  
 Same processes

# Software Efficiencies: *Dramatic Reductions in Storage Space*



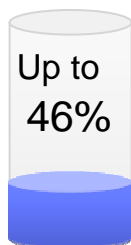
## Deduplication

Saves up to 95% for full backups;  
25% to 55% for most data sets.



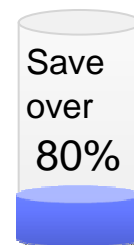
## Thin Provisioning (FlexVol®)

20% to 33% typical savings.



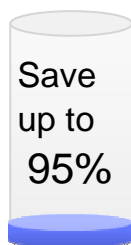
## Double Parity RAID (RAID-DP™)

Saves up to 46% versus  
mirrored data or RAID 10.



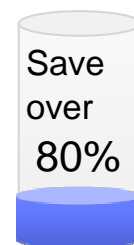
## Snapshot™ Copies

N series Snapshots do not  
require “copy” space, serve  
local backup purposes,  
delivers savings of up to 80%.



## Thin Replication

Disk-to-disk data protection®  
saves up to 95%.



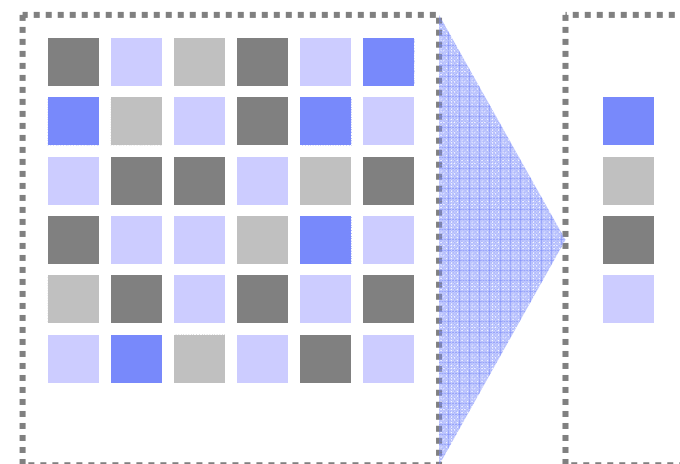
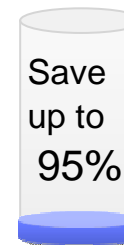
## Writable Snapshot (FlexClone®) Copies

Savings equal size of the  
original data set minus blocks  
subsequently changed in clone.

## N series Deduplication

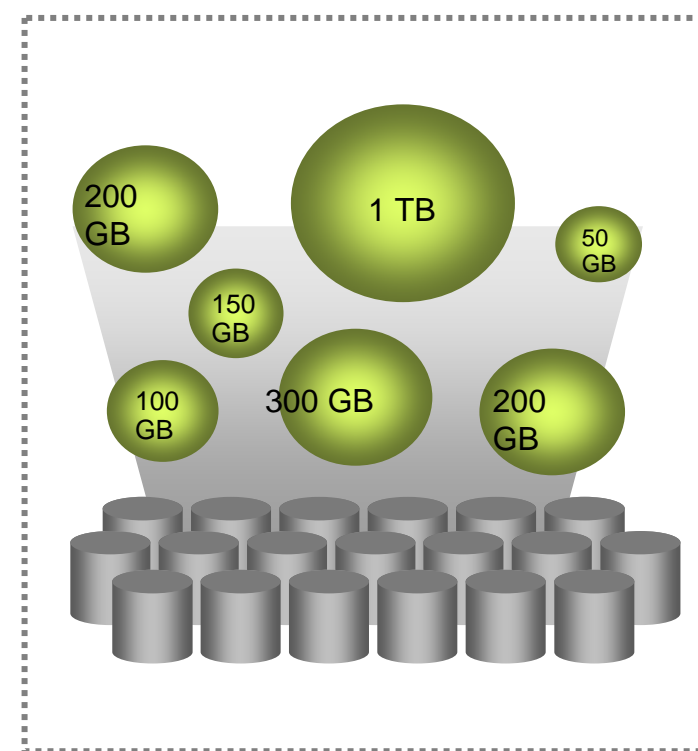
### *Industry's Only De-Dupe for Primary Storage*

- 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
- Application - agnostic
- Customers can reclaim up to 95% of their storage space



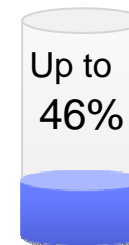
## N series FlexVol® Thin Provisioning

- Enables users to create flexible volumes that appear to be a certain size, but are actually much smaller physically
- Provides substantial improvements in storage provisioning, utilization, and volume sizing
- Data volumes can be sized and resized quickly and dynamically as application requirements change
- Reduction in physically allocated storage up to 33%



## N series RAID-DP™

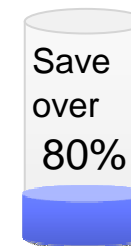
### *Performance Optimized RAID 6*



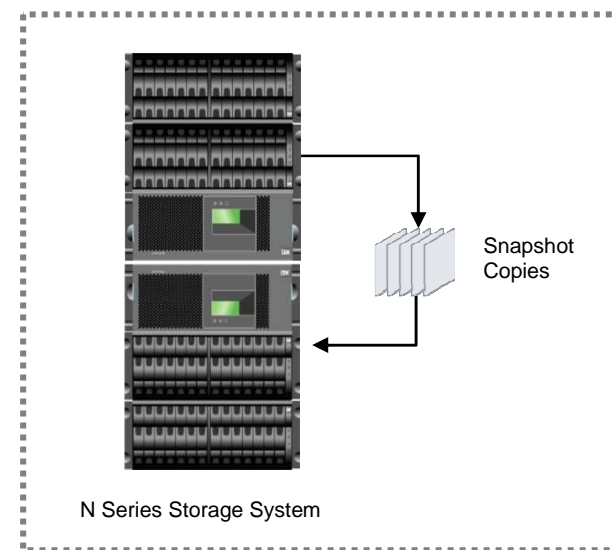
- As disk drives are utilized for larger amounts of storage, care must be taken to insure reliability is not compromised
- Standard feature of Data ONTAP® , delivering 46% savings over RAID -10
- Superior fault tolerance by recovering from the simultaneous failure of two drives, unlike other RAID levels that can only tolerate a single drive failure
- Use lower-cost SATA disks without worry for enterprise applications



## N series Efficient Snapshot™ Copies

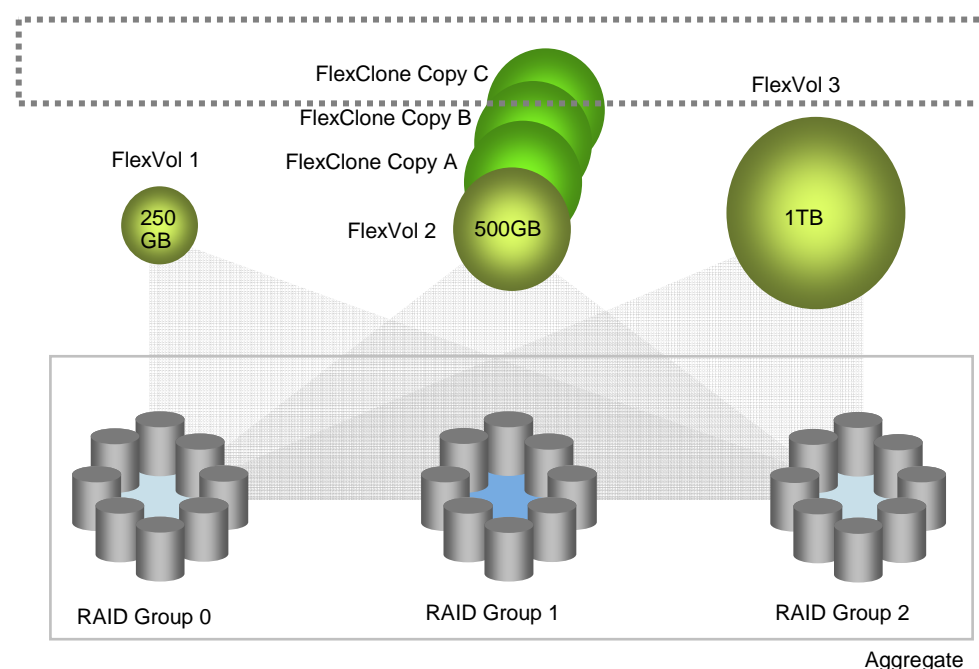
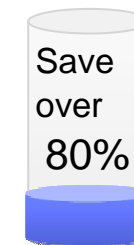


- A Snapshot copy is a frozen, read-only view of a data volume that provides for easy recovery of files and directories
- Snapshot copies consume minimal storage space, since only changes to the active file system are written
- Other approaches require at least double the storage space for snapshots of the entire file system
- Bottom line: data is protected without the requirement to purchase excessive amounts of disk storage



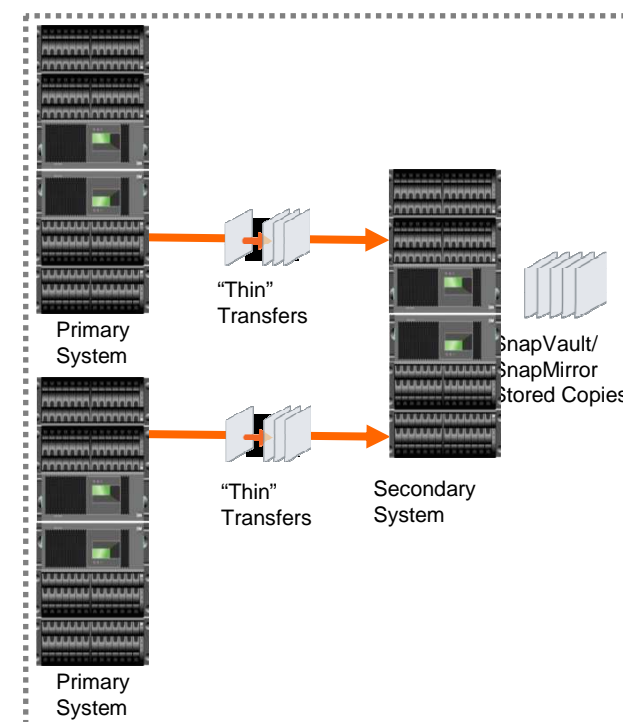
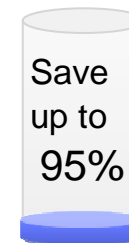
## N series FlexClone® Writable Copies

- Application development often requires substantial primary storage space for essential test operations such as platform and upgrade rollouts
- FlexClone improves storage efficiency for applications that need temporary, writable copies of data volumes
- Creates a virtual “clone” copy of the primary dataset and stores only the data changes between parent volume and clone
- Multiple clones are easily created
- Resulting space savings of 80% or more



## N series Thin Replication

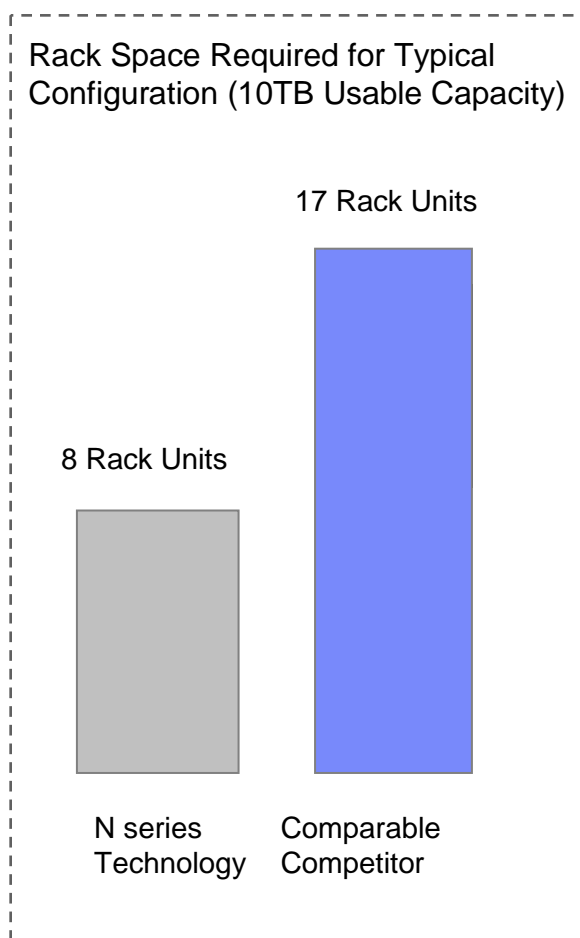
- SnapMirror and SnapVault takes the pain out of disk-based data protection
- Once a complete copy of primary data is stored on the backup system, each subsequent backup only transfers data blocks that have changed
- Results in a dramatic reduction in the physical storage requirements for disk-to-disk protection
- Provides fast and easy restoration of files from disk
- Up to 95% space savings when compared to traditional storage replication technologies



## The Net Effect



## Use 50% Less Storage and Space



### Oliver Wyman Study\*

- N series technology
  - requires 50% less raw storage (11.2TB versus 22.9TB for 10TB usable capacity)
  - requires 50% less rack space
- Conclusions based on best practices followed by customers in the study
- Storage savings in the study came from RAID-DP™, FlexVol®, and Snapshot™

\*Study sponsored by NetApp based on NetApp FAS users

## It All Adds Up to Savings



### Application Environments

- 39% lower TCO for Oracle®
- 55% lower TCO for SAP®
- 30% lower TCO for Exchange
- 44% lower TCO for file services
- 35% lower TCO for archive
- 38% lower TCO for VMware®

### Operational Efficiency

- 50% less rack space
- 52% less power
- 51% lower heat

Source: Mercer and Oliver Wyman TCO studies, 2006-2008 provided by NetApp



# Getting started



# \*\*New\*\* N3300/N3600 - Included Software

More software now standard - at no cost

Feature	Benefit	
NetApp Snapshot™	Point-in-time copy enabling rapid restore	Already Included
Thin Provisioning	Applications share common pool of free space (FlexVol®)	
Storage Pooling	Increase capacity utilization up to 2x (FlexVol)	
RAID-DP®	Protect against multiple failures in a RAID group	
Workload Prioritization	More resources for high-priority workloads (FlexShare®)	
Deduplication	Store only one copy of each unique data object	Licensable & free!
Disk Mirroring	Storage resiliency (SyncMirror®)	
Tiered storage	Move infrequently accessed data to lower-cost disk (NearStore®)	
Storage Management	Monitor and manage system performance and health (Operations Manager)	New! \$0 Additional Cost
System Management	Administer N series system via Windows server (System Manager)	
SAN protocols	FCP and iSCSI for FC SAN and/or IP SAN	

# Where Can We Help You?

## Application Integration:



Business Apps  
& Database

Messaging  
& Collaboration

Technical Apps  
& File Services

## Infrastructure:



Consolidation & Virtualization

Data Protection & Retention

Flexibility and  
efficiency



New  
capabilities



Deploy with  
confidence

Go further, faster™

## Summary: The N series Space Eff. Advantage

Store The Maximum Amount of Data for Lowest Cost

- Store 7 times more data per rack with SATA
- 2x or more storage over-provisioning
- Up to 95% data reduction through de-duplication
- Near-zero incremental storage for test and development
- 50% savings in power, cooling, and floor space

- ✓ Dramatically Reduce Storage Costs
- ✓ Lower Energy Bills
- ✓ Delay / Eliminate New Data Center Builds





**Thank  
you!**

