

I S I T

THE STORAGE COMPANY



Optimise your infrastructure

with State of the art Storage Technologies

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The challenges you face....+++

The unused terabyte
Virtualisation/Consolidation
Semi-structured data
Where do I get storage experts
Tape is dead
Tape is cool
SMI-S
Storage tiers
1/2/4/8 Gb cc
Fibre
SAS better than SATA

Plug & play
OAIS
€ Cost savings
Virtual tape
Regulations
MAID
SOX
Who is SNIA
More agility
What do I need to archive
Too much money spent on maintenance

What are I'm allowed to archive
Too many tools
Security
No more data center
Should I be
ROI of storage/ROI of IT
No money for innovation
Support the business
Increased productivity
FCoE
ILM/Long term archiving

MISSION IMPOSSIBLE???

SNIA At A Glance

- ◆ Voice of the storage industry representing approximately \$50-60B in worldwide revenue for hardware and software
- ◆ Founded in 1997 as a 501(c)(6) non-profit trade association
- ◆ Yearly budget \$5-6 Million
- ◆ Worldwide headquarters in San Francisco
 - ◆ Global presence in A/NZ, Canada, EMEA, India, Japan, South-Asia, and China
 - ◆ 17 full-time staff members (US)
- ◆ Technology Center activities in Colorado, Beijing, Tokyo, and Bangalore
- ◆ Focus on education, conferences, specifications/standards, industry alliances, best practices, plugfests, and conformance testing for SNIA specifications
- ◆ Co-owner of Storage Networking World (SNW) conference with Computerworld
 - ◆ SNW brand used in A/NZ, China, and Europe



Current Market Conditions

- Dramatic reduction in IT budgets
- IT spend being postponed
- Reduction in work force

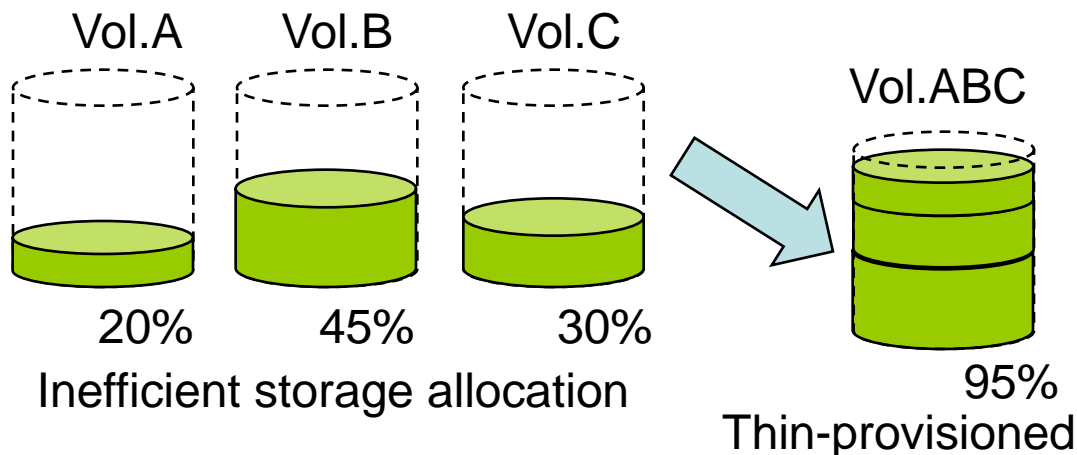
Increasing Business requirements

- Data is still growing exponentially
- Store and protect more data
- Improve Performance
- Improve RTO and RPO

Storage Technologies can help

- Thin Provisioning
- De-duplication
- Solid State Disks
- Storage Virtualisation
- ILM
- DB archiving
- Storage Resource Management
- Wide Area Data Services
- Storage as a Service
- Server Virtualisation

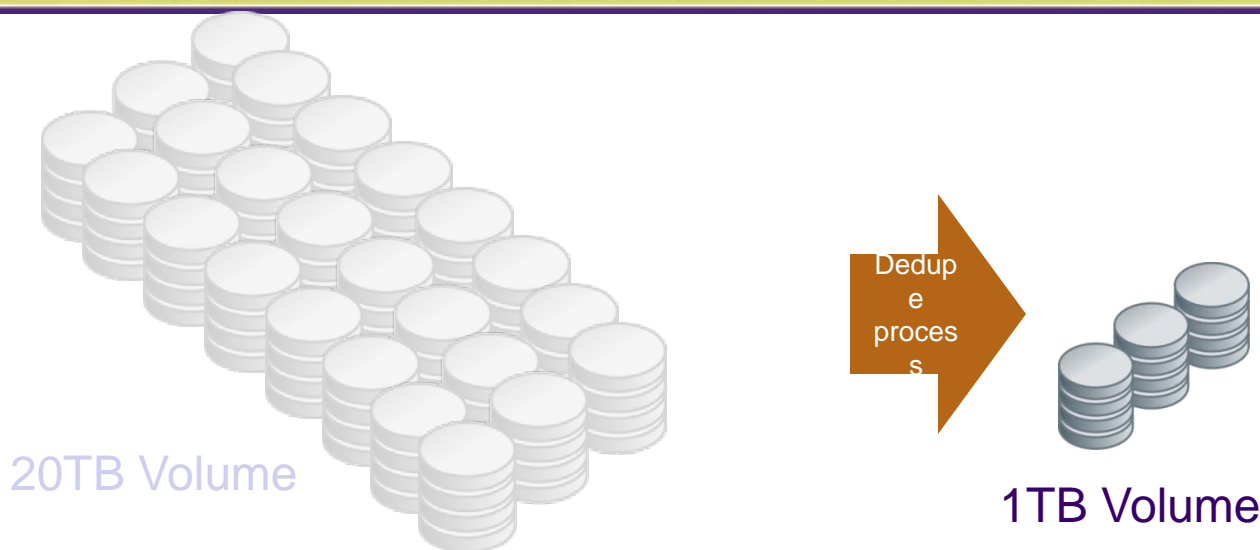
Thin Provisioning



- user demands vary over time
- over-allocation anticipates future needs
 - low capacity utilization
 - low performance utilization

- Consolidate storage space to
 - ◆ improve utilization efficiency
 - ◆ reduce overall data center footprint
- Helpful to have good forecast of workloads
- Need dynamic provisioning to achieve best results

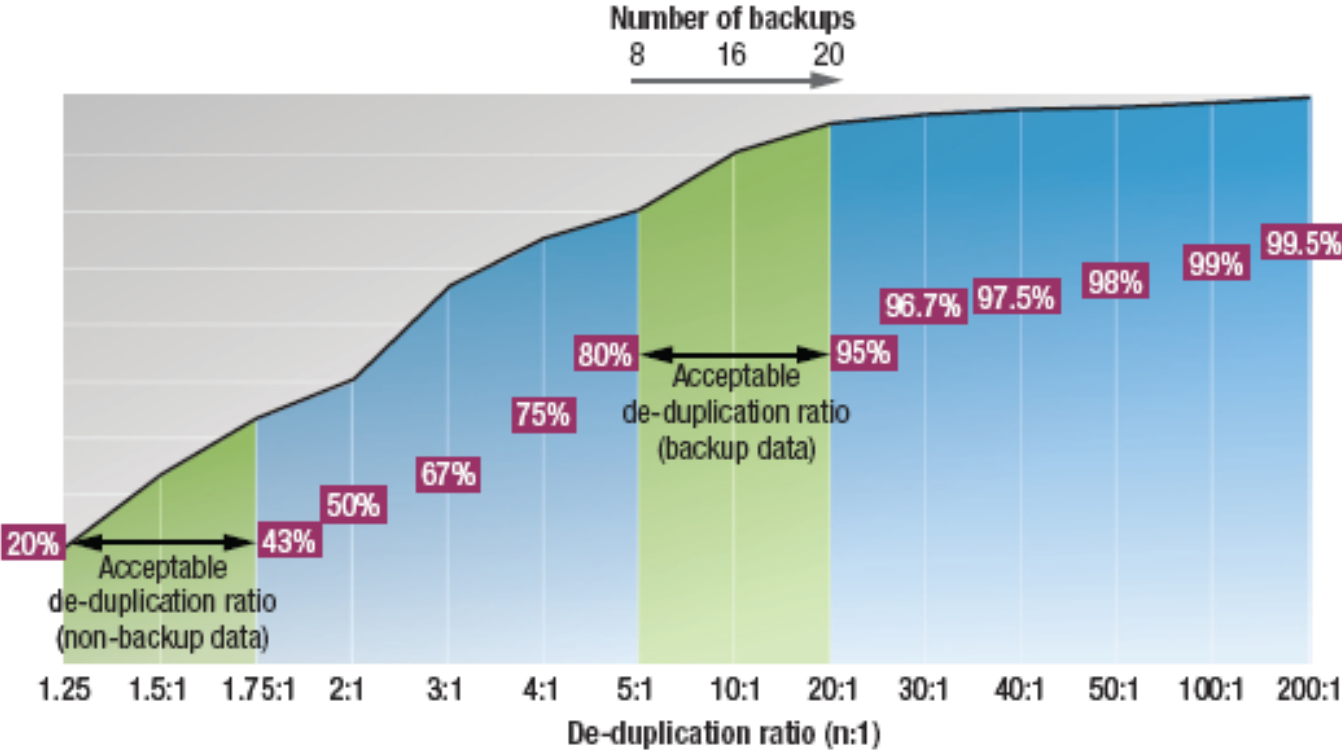
Deduplication



- Store (& transmit) new and unique data only (at sub-file level); update tracking information; further compression is possible
- Applicable to backup, some primary storage, disaster recovery, archive and wide area optimizations
- Must consider restore speeds (latency, bandwidth, data type); results will be application and data type dependent

Deduplication

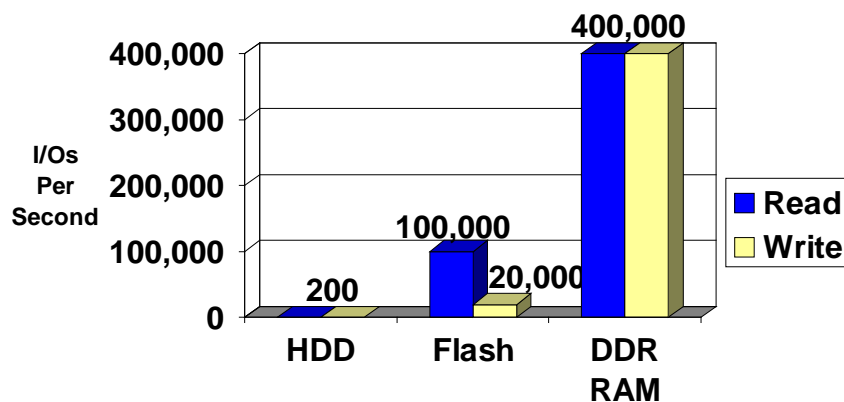
De-duplication ratio and storage savings



Ref: http://www.snia.org/forums/dmf/news/articles/DMF_DeDupe.PDF

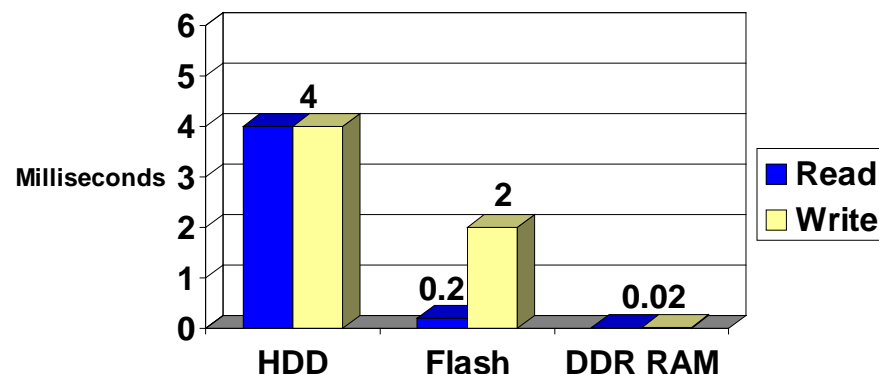
Random I/O's Per Second

(assumes a cache-miss)

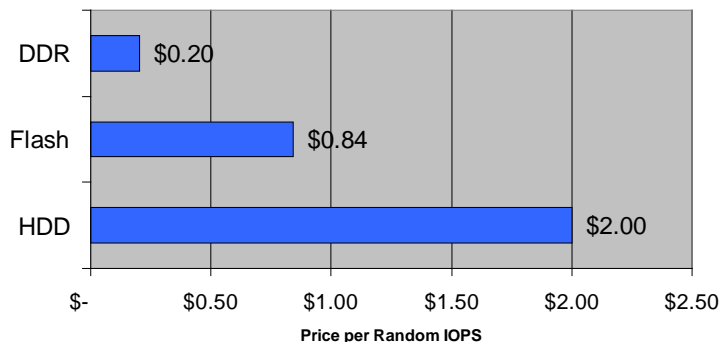


Data Access Times

(assumes a cache-miss)



Price / IOPS



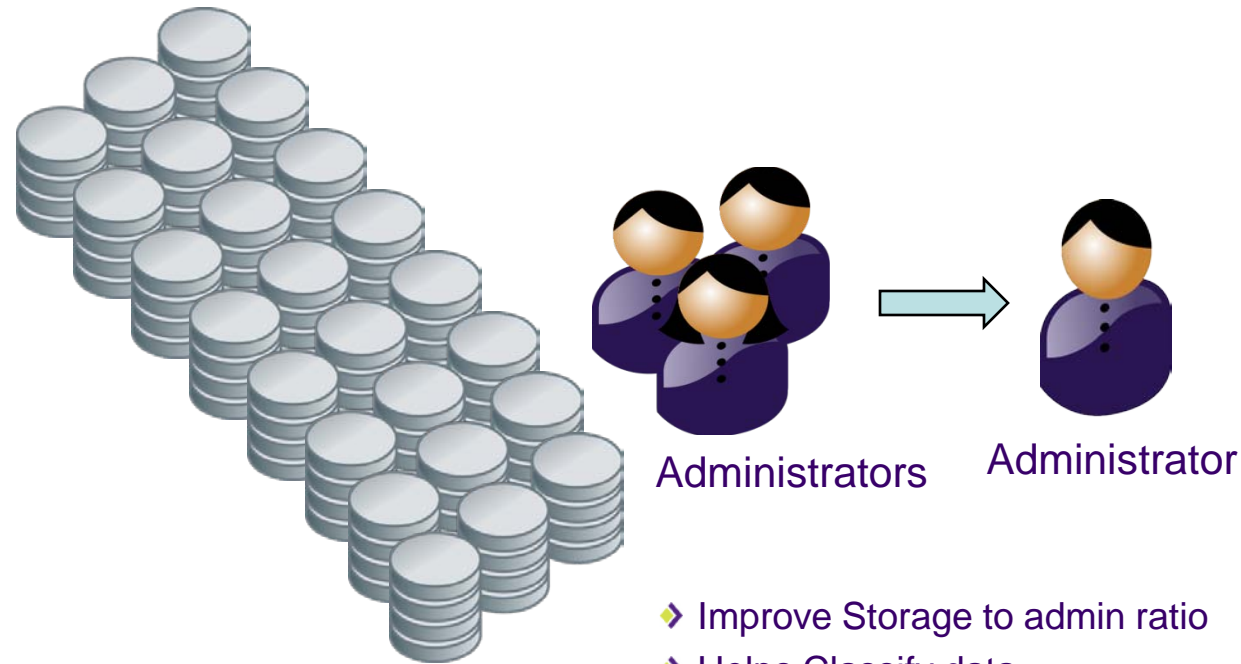
➤ Flash Memory Based

- ◆ Same class of memory used in consumer electronics
- ◆ Inherently non-volatile
- ◆ Best known for ruggedness and good random read performance

➤ DDR Memory Based

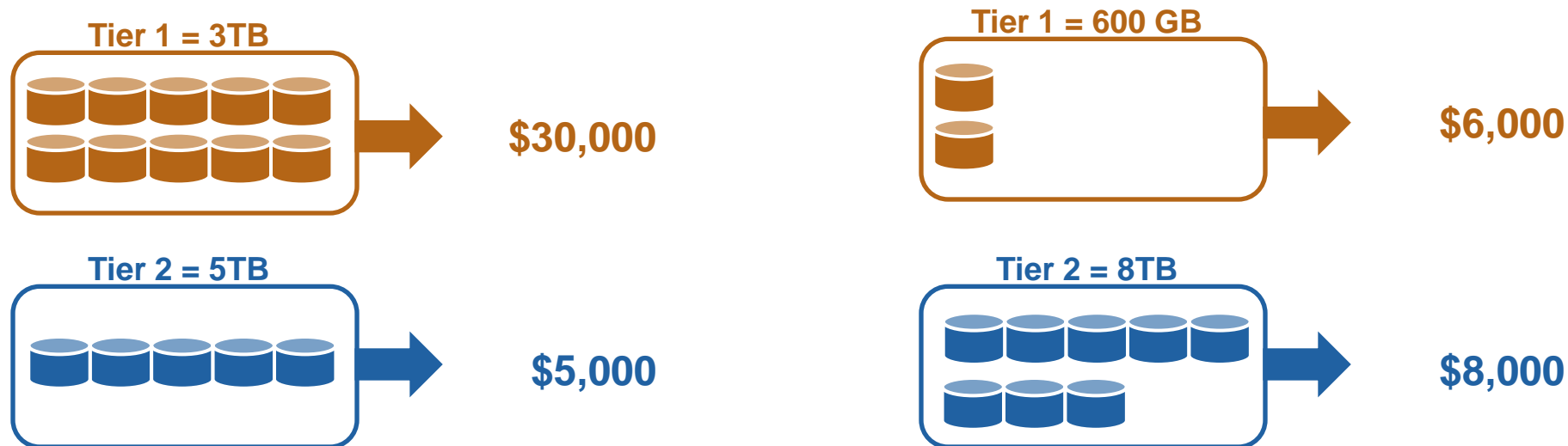
- ◆ Same memory used in enterprise servers
- ◆ Requires batteries and backup hard disks for non-volatility
- ◆ Best known for outstanding performance and high cost.

Storage Resource Management



- ◆ Improve Storage to admin ratio
- ◆ Helps Classify data
- ◆ Eliminate redundant data
- ◆ Reclaim unused capacity
- ◆ Simplified administrative tasks reduce time spent managing storage
- ◆ Intuitive GUI interfaces reduce training requirements
- ◆ SRM reduces time spent performing capacity planning and management tasks




Information Life Cycle Management









- ◆ Lower capacity requirements and reduce acquisition cost
- ◆ Reduces Tier 1 storage needs
- ◆ Grow with cost effective disk
- ◆ Concentrate storage on cost effective storage
- ◆ Concentrate storage on energy efficient disk

Information Life Cycle Management

Case study: Tiered data protection – Large manufacturing company (Deferring purchases of Tier-1 storage for two years)

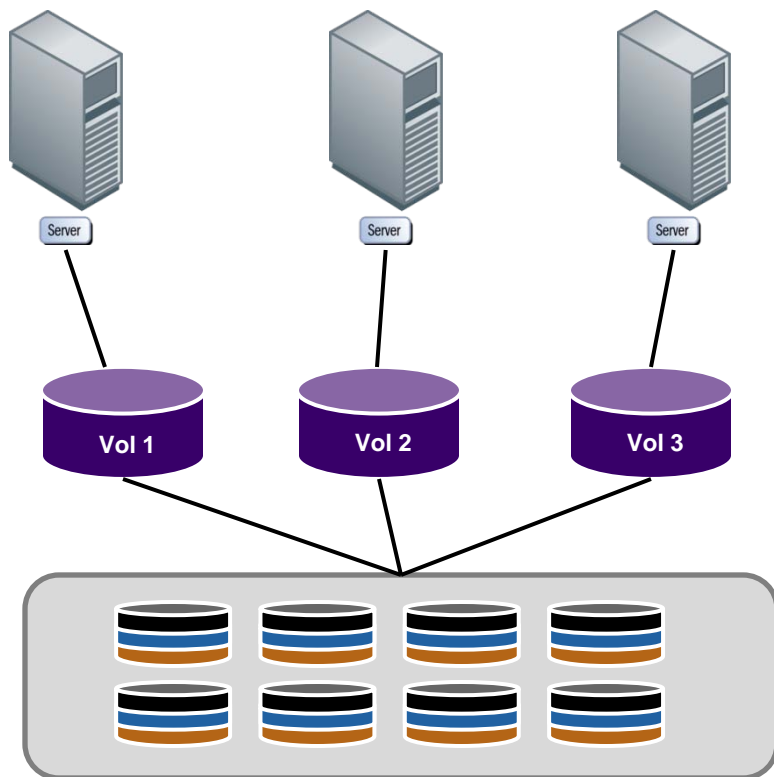
		Before						
		Total cost of acquisition (3-year model)						
				Tier	Data	Storage	\$/GB	Total
High tier		120TB	High-end SAN RAID, local and remote replicated	1	120TB	360TB	\$45/GB	\$16,200,000
		40TB	Midrange SAN RAID, local replicated	2	40TB	80TB	\$29/GB	\$2,320,000
Low tier		20TB	DASD	3	20TB	20TB	\$10/GB	\$200,000
		Total:			180TB	460TB		\$18.7M

		After						
				Tier	Data	Storage	\$/GB	Total
Highest tiers		40TB	High-end SAN RAID, local and remote replicated	1	40TB	120TB	\$45/GB	\$5,400,000
		30TB	High-end SAN RAID, local replicated	2	30TB	60TB	\$35/GB	\$2,100,000
Lowest tiers		20TB	Midrange SAN RAID, local replicated	3	20TB	40TB	\$29/GB	\$1,160,000
		40TB	Midrange SAN RAID, not replicated	4	40TB	40TB	\$20/GB	\$800,000
		40TB	Slow disk SAN RAID, not replicated	5	40TB	40TB	\$14/GB	\$560,000
		10TB	DASD	6	10TB	40TB	\$10/GB	\$400,000
		Total:			180TB	340TB		\$10.5M

Source: Contoural

Storage Virtualisation

Aggregate multiple physical storage resources into a single storage pool enabling storage to appear as a single storage device.

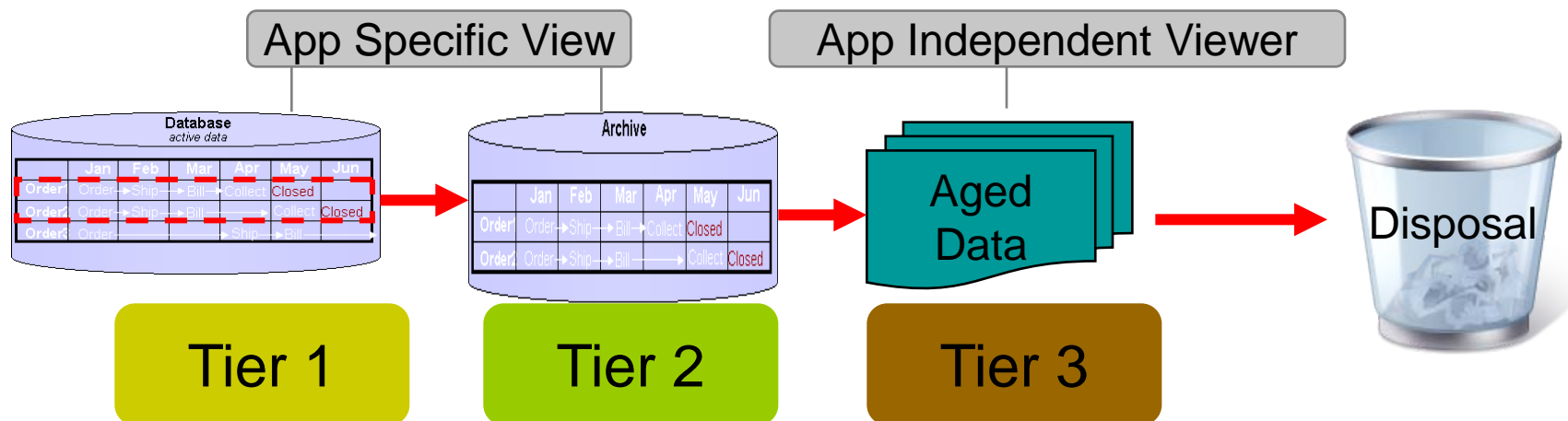


- Simplify Management
- Increased Storage Utilization with Heterogeneous Storage pooling
- Tiered Storage and ILM
- Non disruptive Data migration across Disk Arrays
- Improved Business continuance with Snapshots or clones

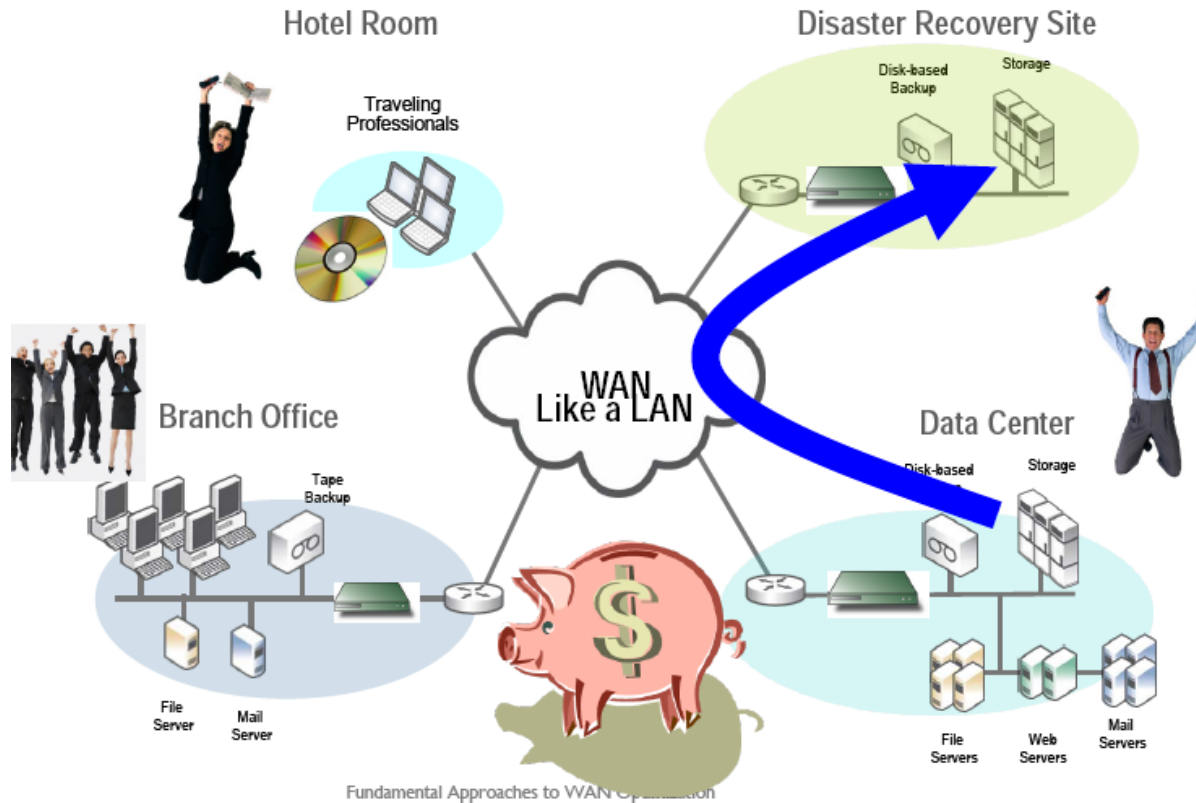
Database Archiving

- Classify data into “Active”, “Inactive” and “Aged” categories based on business processes and value to the business
- Relocate archive eligible transactions to online/offline archive
- Maintain appropriate levels of access to archived data

Sample Database Archiving Configuration



Wide Area Data Services



➤ Benefits

- ◆ Reduce Investment in Branch offices
- ◆ Branch office users access data at LAN speeds over the WAN
- ◆ Reduce Bandwidth requirement for DR by more than 90%

➤ Benefits

- ◆ Reduce Storage Capex and Opex

➤ SAAS Use Cases

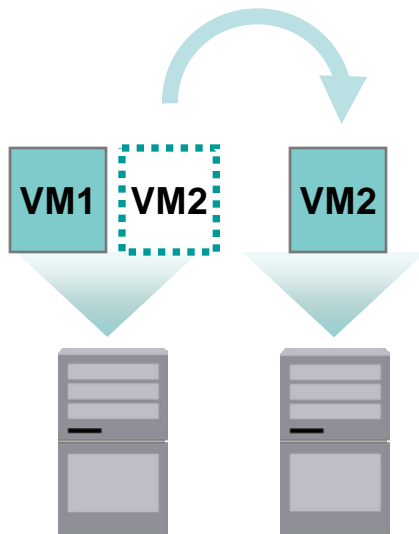
- ◆ Backup
- ◆ Archive
- ◆ File Storage

- **Server Consolidation**
 - ◆ Reduced number of servers and Dramatically improved CPU utilization
- **Physical Infrastructure Cost Reduction**
 - ◆ Reduced hardware cost and complexity
 - ◆ Reduced data center footprint, power and cooling
- **Improved Operational Flexibility & Efficiency**
 - ◆ Reduced administrative overhead
 - ◆ Greatly simplified server and application provisioning:
- **Increased Application Availability**
 - ◆ Elimination of planned downtime and Fast recovery from unplanned outages
- **Improved Business Continuity:**
 - ◆ Consolidated backup and restore
 - ◆ Simplified disaster recovery

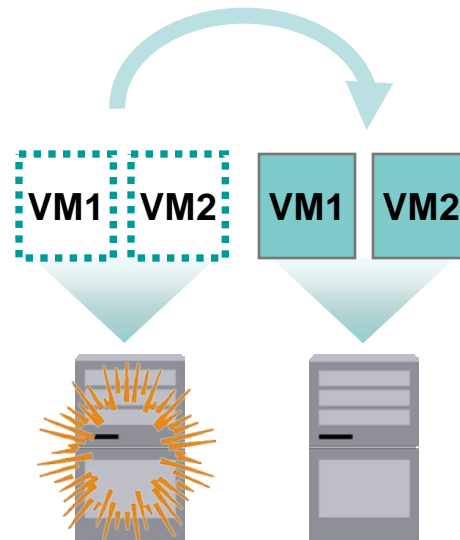
The Requirement for Networked Storage

The full benefits of virtual server features are only enabled through the use of networked storage

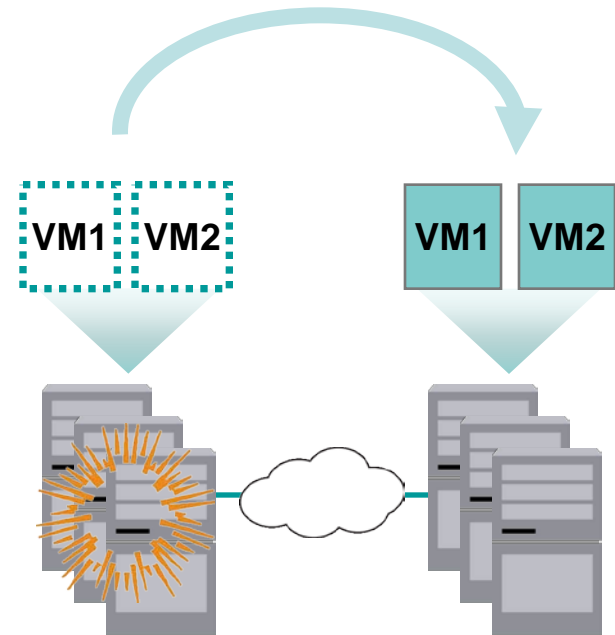
Move VMs on the Fly



Simple VM Failover



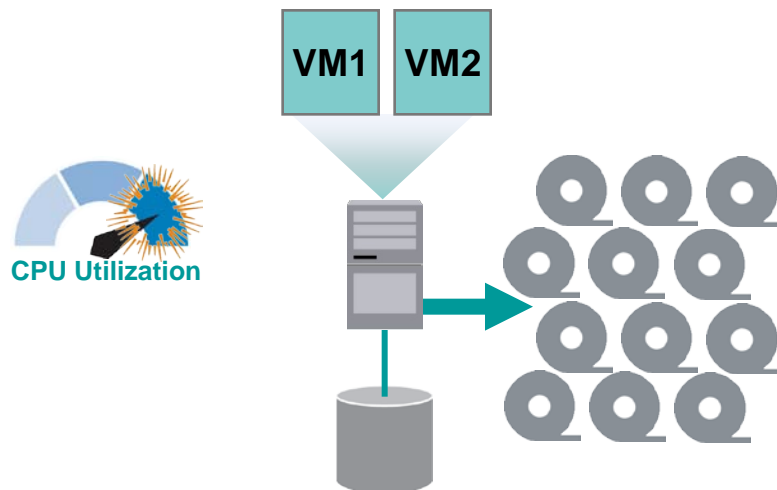
VM Failover upon Site Failure



Instantaneous Backup, Zero Server Impact

The Problem

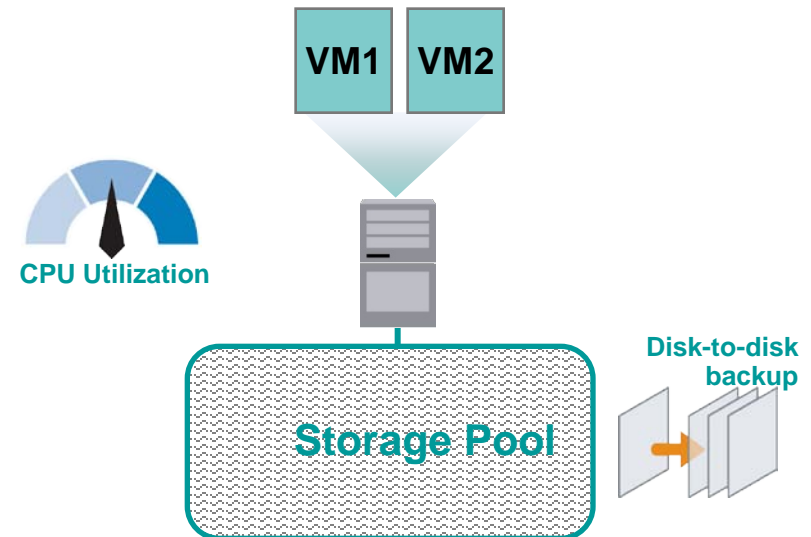
- ▶ High server utilization
- ▶ No spare cycles for backups
- ▶ Tape is slow, complex, & expensive
- ▶ Disaster recovery is very difficult



**Traditional Backup Is
NOT Practical**

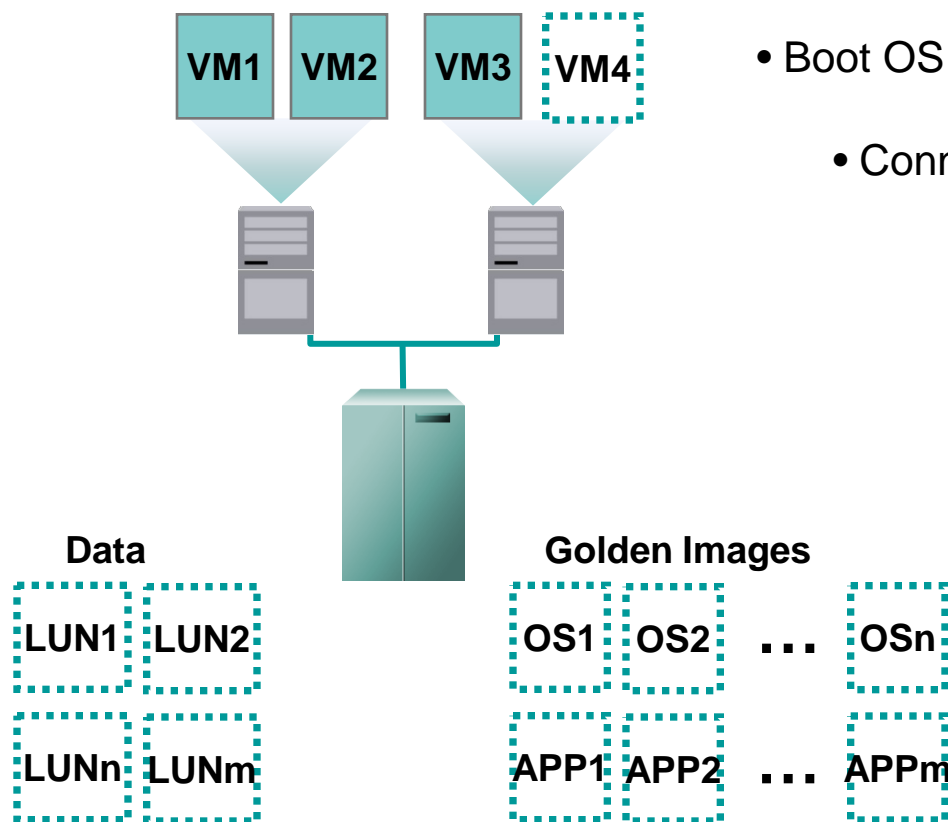
Disk-to-disk Backup

- ▶ Servers run apps, not background processes
- ▶ Instantaneous backup (snapshot)
- ▶ Fast recovery
- ▶ Low storage overhead
- ▶ Application consistent



**Fast, Affordable, and Simple
Backup and Restores**

Server and Application Provisioning



- Boot OS image from golden image store
 - Load apps and config files
- Connect to appropriate data store(s)

Conclusion

- Storage technologies can help you dramatically Improve ROI of your existing infrastructure

- $1 + 1 > 2$ Combine multiple technologies for better ROI

THANK YOU

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