Education

Consolidating Primary & Secondary Storage

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Abstract

Tiered storage is the allocation of different classes of data to various types of storage media with the goal of improving storage efficiency and reducing total cost of ownership.

- This presentation covers “tierless" iSCSI storage. We are examining the traditional primary & secondary storage applications and how they are served in a consolidated storage environment on a tierless iSCSI array. We also provide a view at the enabling technologies for tierless storage arrays.
- We will review RAID levels, including the fit for RAID 5, RAID 51, RAID6 and RAID 61. D2D backup deployment and the need for encrypting data at rest.
- Also covered will be the benefits of consolidated storage and servers deployed as virtual machines and why it makes sense for Microsoft servers to use the iSCSI array to boot from the SAN.

Outline

- Traditional tiered storage and its challenges
- Storage & Server Consolidation – Virtualization
- iSCSI IP SAN – Enables Storage Consolidation
- iSCSI SAN's the "Tierless" Storage Architecture
- SAS Infrastructure - SAS and SATA in a Tierless Approach
- Primary Storage
  - Virtualization & "Tierless" iSCSI
  - Microsoft migration from DAS to "Tierless" iSCSI
- Secondary Storage
  - VTL, D2D and CDP to "Tierless" iSCSI

Learning Objectives

- Examine the traditional primary and secondary storage applications
- Learn about iSCSI and Virtualization in a “tierless” approach
- Explore cutting operational expenses by increasing storage and server asset utilization
- Examine maximizing iSCSI SAN technology for storage consolidation
- Discover "tierless" iSCSI storage

Traditional tiered storage

- Different types of storage arrays at different price points that are designated to hold different classes of data.
- In the below approach, different technologies are used at each tier. Equipment costs are low, but moving data between tiers can be problematic.

Tier	Description	Technology
1	Primary Storage	Fibre Channel, SAS, SCSI
2	Secondary Storage	VTL, SATA Array's
3	Archival Storage	Tape Libaries

Storage & Server Consolidation – Virtualization

- Storage and server consolidation has emerged as a core strategy for organizations to bring IT expenses under control.
- Centralizing operations through consolidation enables IT mangers to minimize operational expenses by increasing utilization of storage and server assets.
  - Virtualization is the key driver for Servers.
- iSCSI is a major enabler for storage consolidation
  - Resulting in a tremendous technology growth forecast to **$6B** over the **next 5 years**
- SAS infrastructure enables a tiered "in the box" SAS and SATA approach
  - Driven by data access needs of applications and users

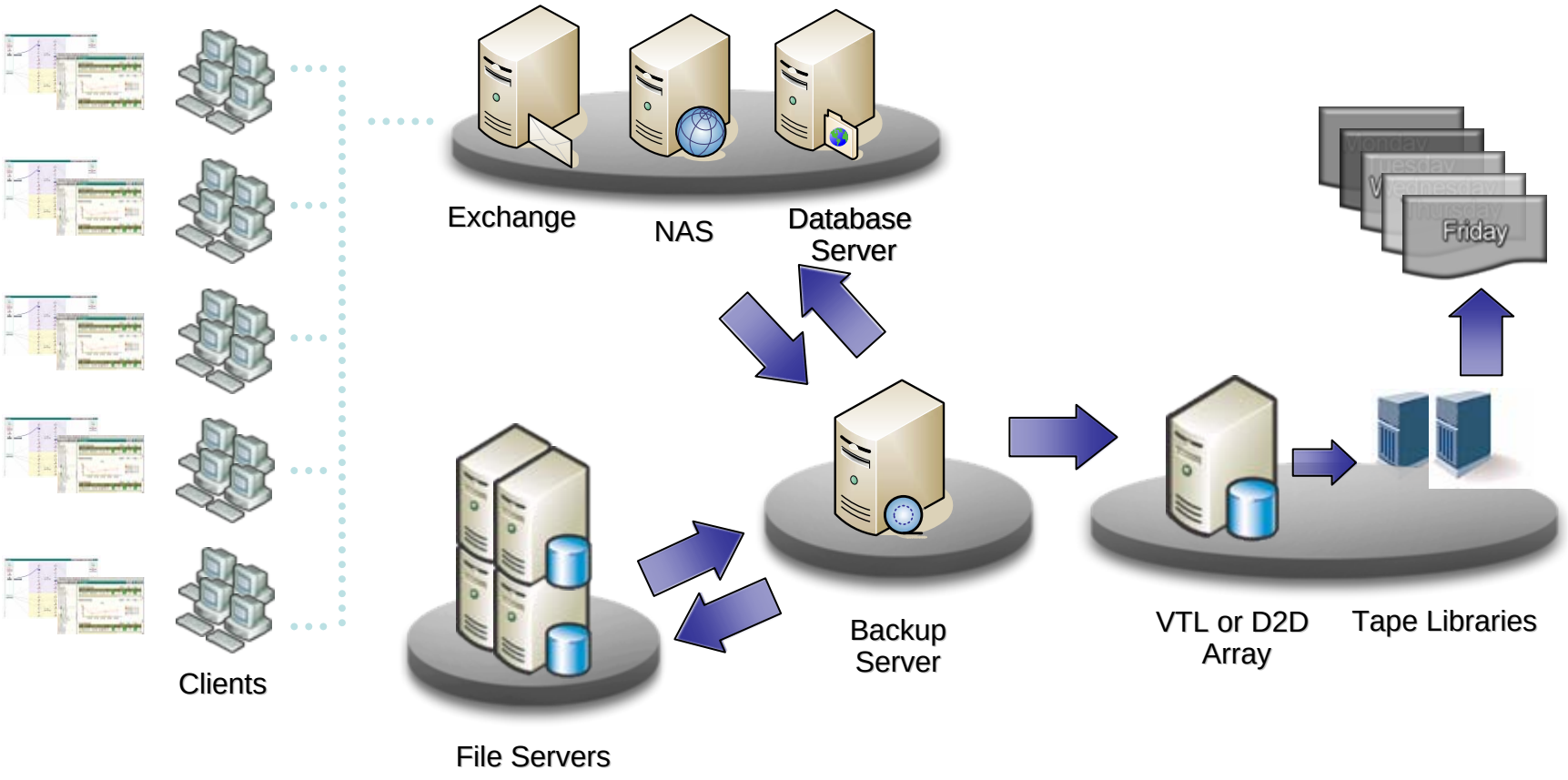
IP SAN driven by iSCSI – Enables Storage Consolidation

- On the storage side, iSCSI SAN technology has rapidly gained acceptance as the ideal storage consolidation platform.
- iSCSI – the cost efficient SAN solution
  - Simplified Management
  - Low cost infrastructure
  - Use of existing TCP/IP
- iSCSI in a Virtual and Blade Server Environment
  - Up to 50% reduction in the number of servers required
  - Associated savings in power, cooling, floor space and administrative overhead
  - 60 – 80% server utilization rates compared to typical 15% or less
  - Application provisioning time measured in seconds, not days
  - Zero-downtime hardware maintenance

Consolidated approach to tiered storage

- Primary Storage
  - RAID 5
  - High performing disks
  - Low capacity
  - Many spindles
  - Very expensive
  - Low latency
- Secondary Storage
  - Relatively new
  - D2D
  - D2D2T
  - VTL
- Triciary Storage
  - Tape Libraries

Consolidated approach to tiered storage

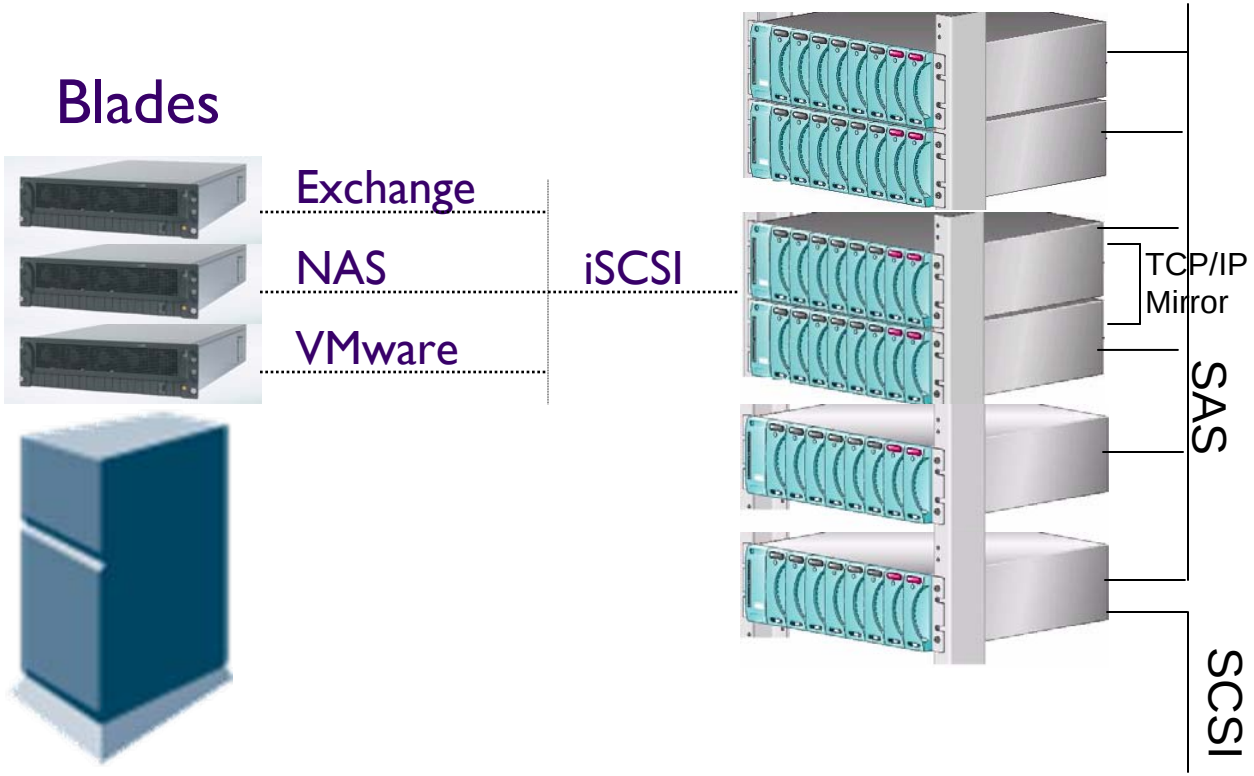


SAS Infrastructure – Tierless "In the Box" Storage with SAS and SATA Drives

- SAS Infrastructure – Enabler for data movement between SAS, SATA and VTL
- Block level or File level data movement
- Storage Resource Management
- Creating an effective and "automatable" policy-based categorization system

"Tierless" iSCSI Storage Arrays

- Consolidation practices are about to enter the next phase with the new generation of iSCSI storage arrays, virtualization and blade technology



Primary Storage:
- Heads or Heads with Storage

Secondary Storage:
- Mirrored Storage with RAID61
- SAS – D2D
- SATA – D2D

Triciary Storage:
Tape

Virtualization & "Tierless" IP SANs

- Single Management Point
- Mixed SAS and SATA in the same chassis
- Mixed RAID levels
- Primary and Secondary Storage Pools
- D2D backup in a tierless storage platform
- Automatic moving of data between pools
- Automatic archiving to tape

The Next Generation MS Environment

- Primary Storage
  - Benefits of deploying consolidated tierless storage along with consolidated servers deployed as virtual machines
  - Dedicated Microsoft server using the iSCSI array to boot from the SAN.
- Secondary Storage
  - MS DPM
  - MS DPM and S-CDP integrated into an Appliance
  - Encryption for off-site archiving
  - Data migration from disk to removable tape
- Triciary Storage
  - SCSI traffic to offload data to tape

Consolidating Primary & Secondary Storage

Thank you!

Questions?

Q&A / Feedback

- Please send any questions or comments on this presentation to SNIA: trackstorage@snia.org

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