

LAN Technology

Other Networks

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July 2010

Other Networks

Outlines:

- WAN: Wide Area Network
- MAN: Metropolitan Area Network
- PAN: Personal Area Network
- **SAN: Storage Area Network**

Overview

How do we take what we know about storage processor performance and apply it to emerging SAN technology?

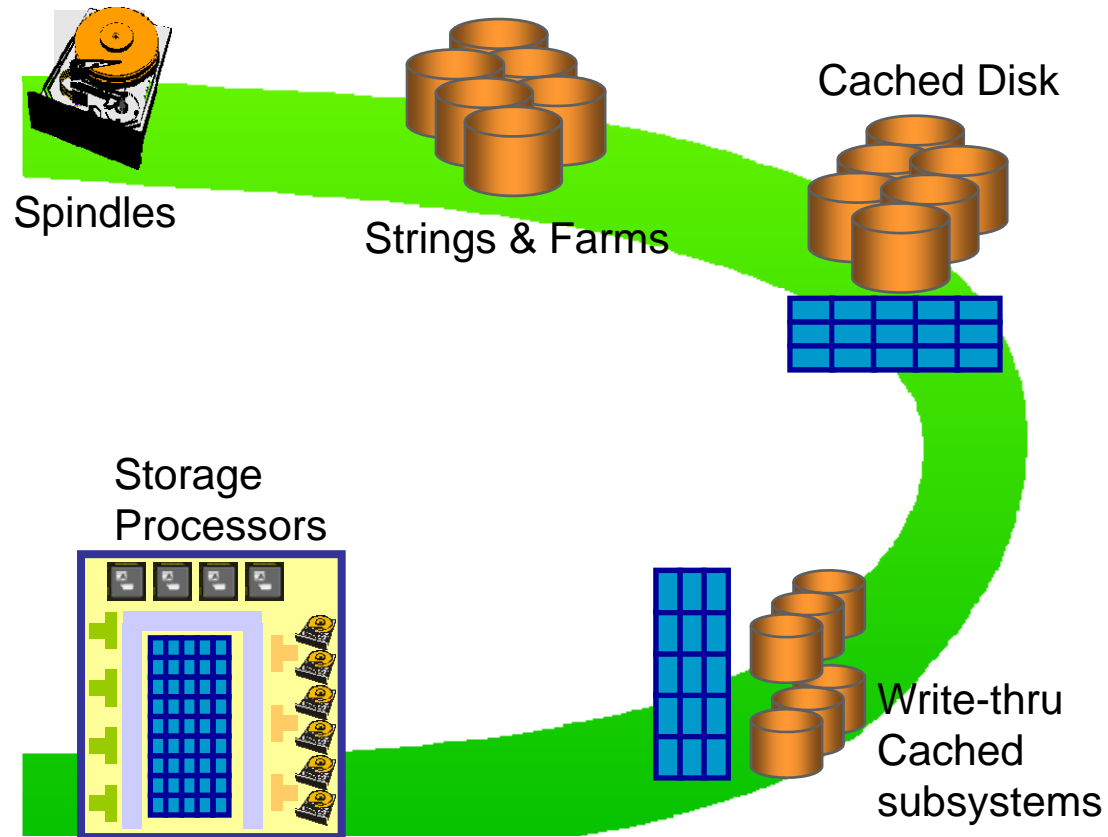
What is a *SAN*?

Planning for SANs:

SAN performance characteristics

Backup and replication performance

Evolution Of Disk Storage Subsystems



What Is A SAN?

Storage Area Networks are designed to exploit Fiber Channel plumbing

Approaches to simplified networked storage:

- SAN appliances

- SAN Metadata Controllers (“out of band”)

- SAN storage managers (“in band”)

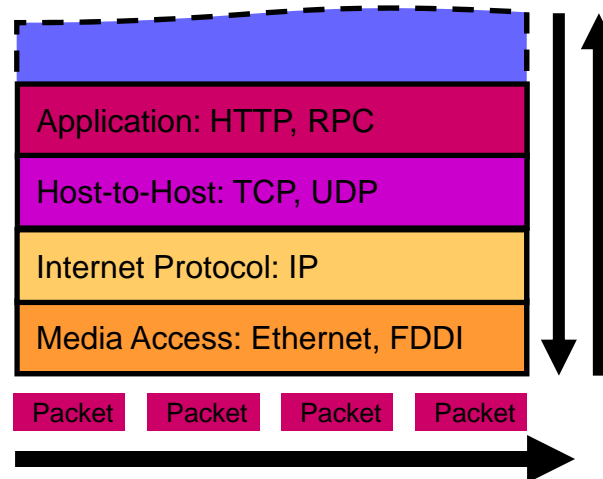
The Difference Between NAS and SAN

Storage Area Network (SAN) designed to exploit Fiber Channel plumbing require a new infrastructure.

Network Attached Storage (NAS) devices plug into the existing networking infrastructure.

Networked file access protocols (NFS, SMB, CIFS)

TCP/IP stack



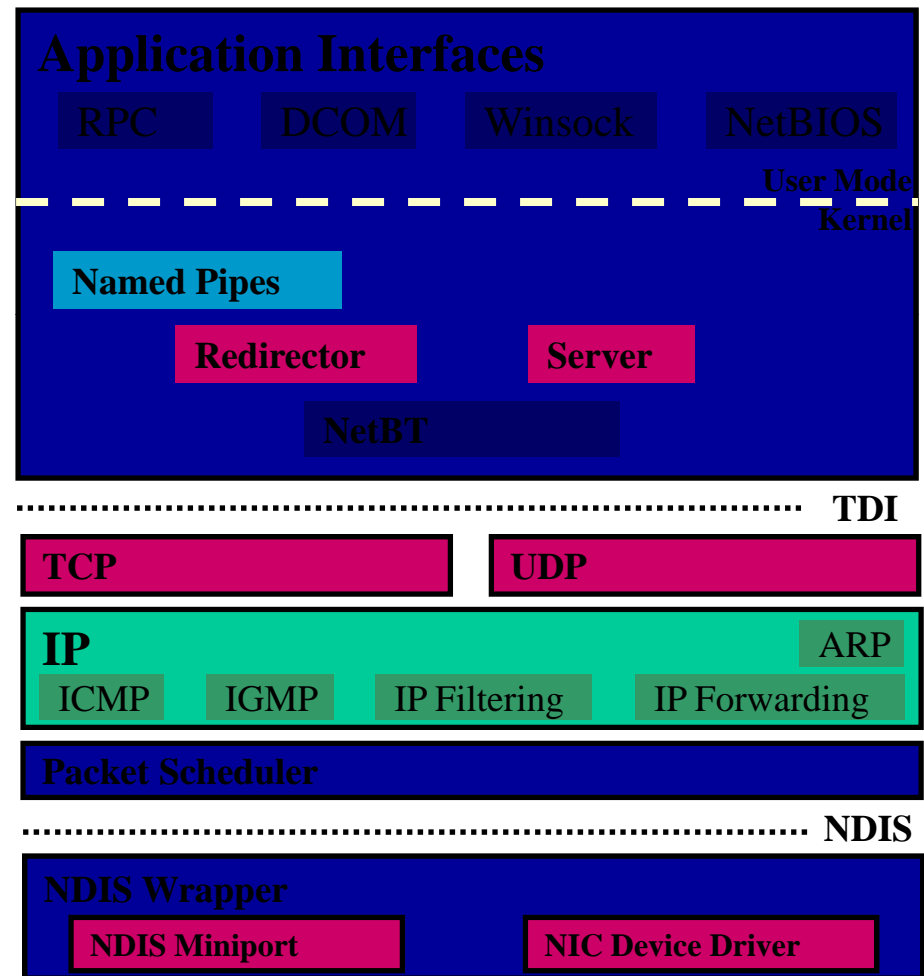
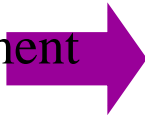
The Difference Between NAS and SAN

NAS devices plug into existing TCP/IP networking support.

Performance considerations:

1500 byte Ethernet MTU

TCP requires acknowledgement of each packet, limiting performance.



SAN appliances

Conventional storage processors
with

Fiber Channel interfaces

Fiber Channel support

FC Fabric

Zoning

LUN virtualization

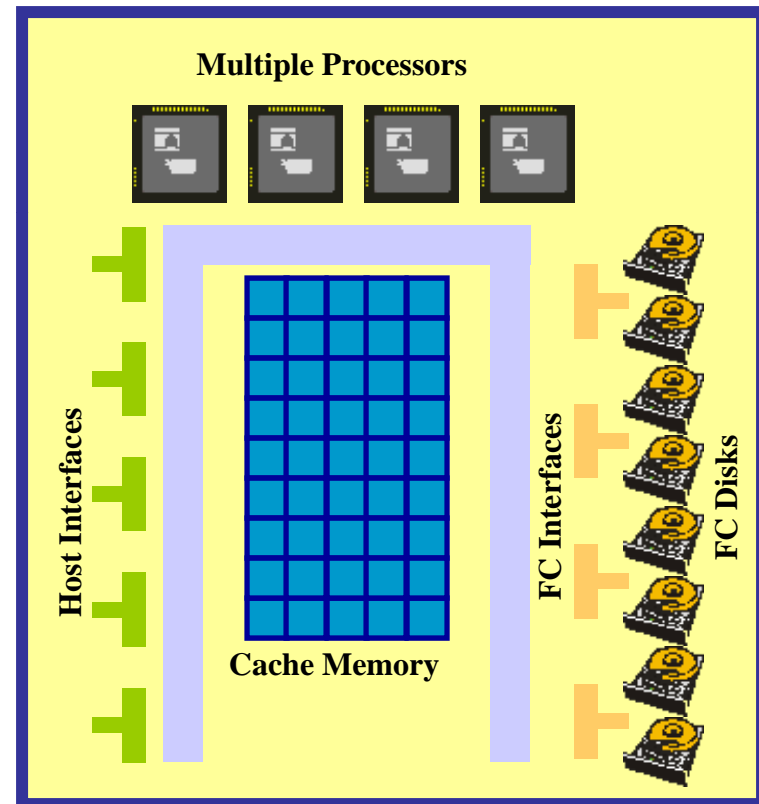


SAN Appliance Performance

Same as before, except faster
Fiber Channel interfaces

Commodity processors,
internal buses, disks, front-
end and back-end interfaces

Proprietary storage processor
architecture considerations



SAN appliances

SAN and NAS convergence?

Adding Fiber Channel interfaces and Fiber Channel support to a NAS box

SAN-NAS hybrids when SAN appliances are connected via TCP/IP.

Current Issues:

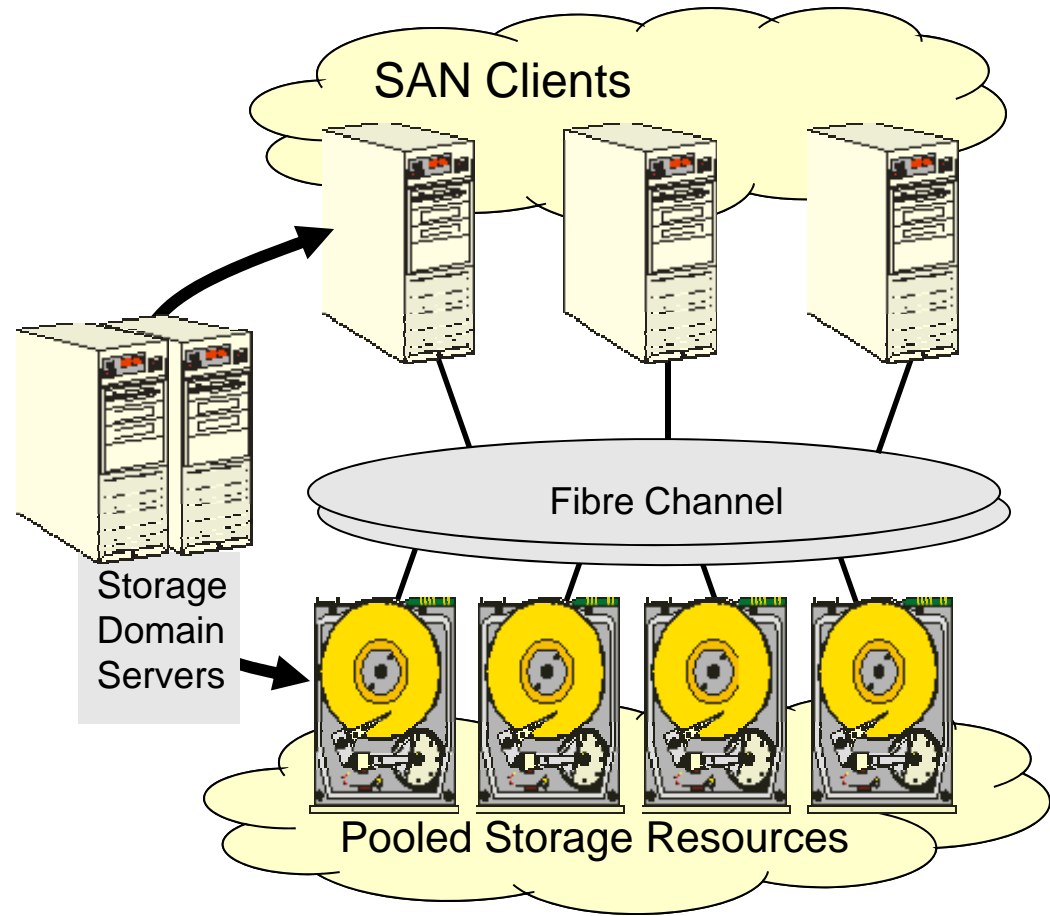
Managing multiple boxes

Proprietary management platforms



SAN Storage Manager

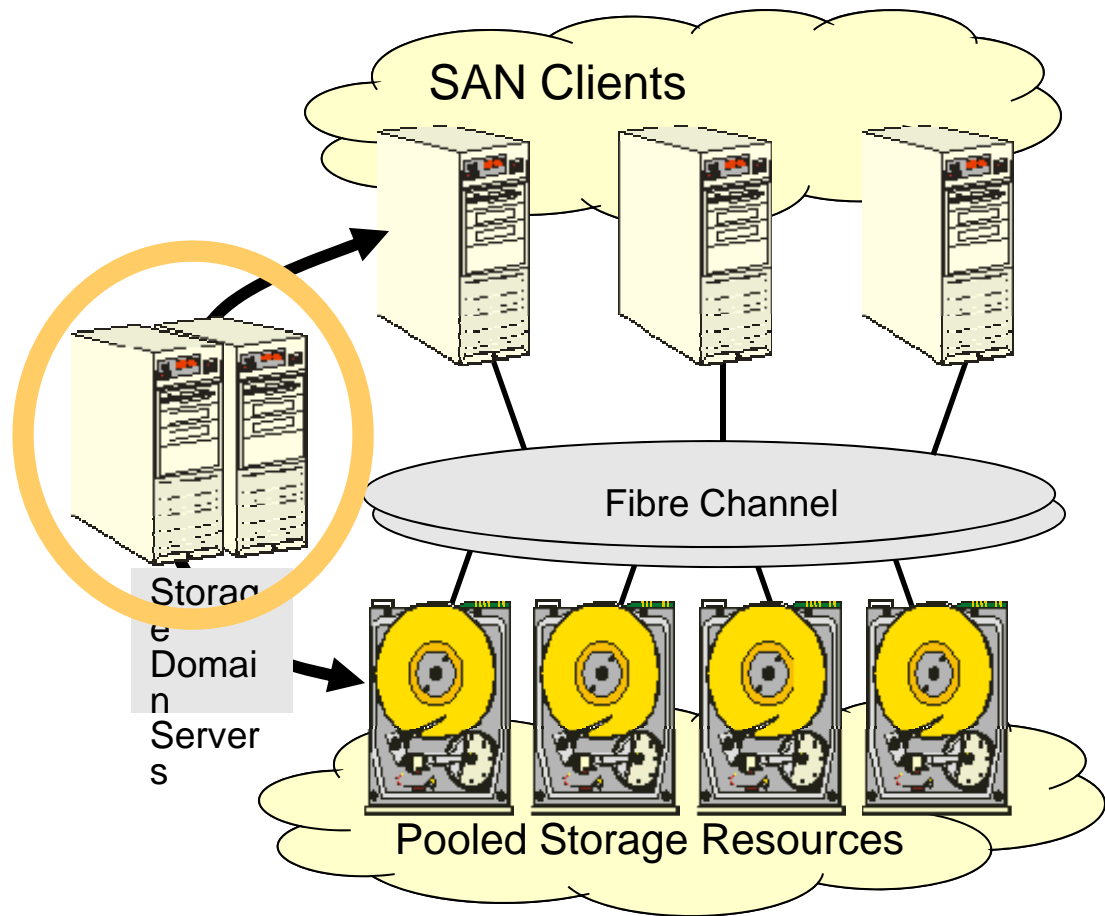
Requires all access to pooled disks through the SAN Storage Manager (in-band)!



SAN Storage Manager

SAN Storage Manager adds *latency* to every I/O request
How much latency is involved?

Can this latency be reduced using traditional disk caching strategies?



Questions

