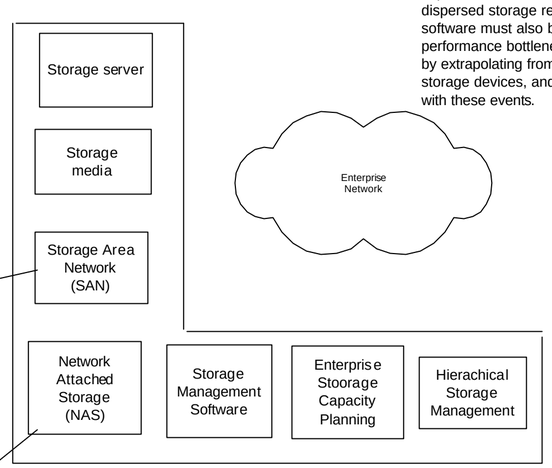
Enterprise Storage Management Architecture

Technology Components

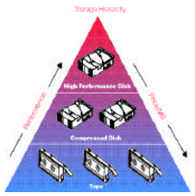
A SAN is a specialized high-speed network that enables fast, reliable access among servers and external or independent storage resources. In a SAN, all networked servers share storage devices as peer resources; they are not the exclusive property of any one server. You can use a SAN to connect servers to storage, servers to each other, and storage to storage through hubs, switches, and routers. A SAN carries only I/O traffic between servers and storage devices; it doesn't carry general-purpose traffic such as email or other end-user applications. Thus, it avoids the difficult tradeoffs inherent in using a single network for all applications.

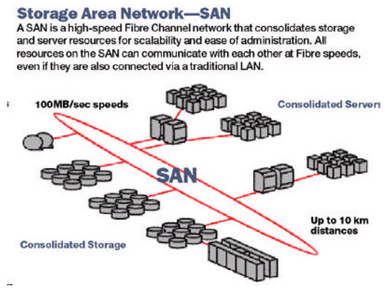
Building an enterprise storage area networking (SAN) infrastructure involves a great deal of relatively complex technology. A SAN has three major components: the interconnecting fabric, the management software, and the storage system. To ensure optimal utilization and flawless application support, planning and integration are paramount.

Technology Components



Managing a large storage network requires robust configuration management. Strong monitoring capabilities are necessary to centrally manage widely dispersed storage resources. SAN management software must also be able to detect imminent failures, performance bottlenecks, and out-of-bound conditions by extrapolating from data provided by the network and storage devices, and to take predefined actions to deal with these events.



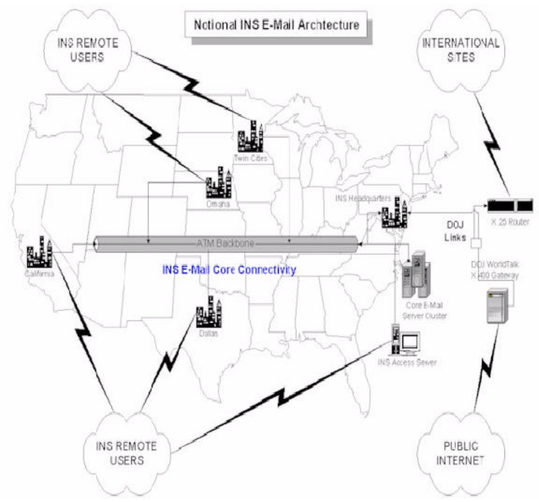


Network-attached storage (NAS) is hard disk storage that is set up with its own network address rather than being attached to the department computer that is serving applications to a network's workstation users. By removing storage access and its management from the department server, both application programming and files can be served faster because they are not competing for the same processor resources. The network-attached storage device is attached to a local area network (typically, an Ethernet network) and assigned an IP address. File requests are mapped by the main server to the NAS file server.
Network-attached storage consists of hard disk storage, including multi-disk RAID systems, and software for configuring and mapping file locations to the network-attached device. Network-attached storage can be a step toward and included as part of a more sophisticated storage system known as a storage area network (SAN).

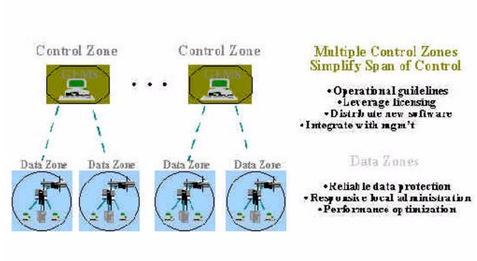
Fibre Channel Topology: Two Fibre Channel topologies support a SAN infrastructure. The first is an arbitrated loop (FC-AL) in which data is passed from node to node, and all nodes share the same bandwidth. Up to 126 physical host or storage devices can theoretically be connected to the loop, but the response time sags noticeably when a loop exceeds 6 to 8 arrays (in fact, as additional devices are added to an arbitrated loop, some throughput is lost simply to arbitration overhead).

The second topology, "switched topology," uses switches to establish many concurrent connections between different nodes, each connection having its own dedicated bandwidth. A switched fabric enables the movement of large blocks of data, is scalable from small to very large enterprise environments, and can support high levels of availability. A switched fabric is more costly to purchase, but generally has a lower cost of ownership than hubs in any mission-critical environment. Switched fabrics require some infrastructure implementation and management software, and have suffered until now from interoperability problems.

Enterprise Architecture



Storagement management architecture



The second concept is called a control zone. A control zone is a collection of data zones. Control zones are put in place for the purpose of centralized administration and policy management. The number of data zones within a control zone can be arbitrarily large or small (Figure 7).

The first concept introduces the term data zone. Simply stated, a data zone is the boundary of storage servers, and desktop equipment managed by a single NetWorker server. In other words, the data zone ingredients consist of customer data, associated Metadata, tape devices, and a built in administrative function. The concept is one of compactness and reliability.

Standards

Products

Technology Components (Products)

Table 1 Enterprise Systems Mangement Product Standards

	Status Category			
Product Existing or Proposed	Obsolete	Transitional	Strategic	Research
Help Desk problem ticketing, tracking etc.				
Impact	✍	✍✍		✍
NMS9300 (Notes Based)	✍✍	✍	✍	✍
Help Star 2000		✍✍	✍	✍
Track-IT	✍	✍	✍	✍✍
Help Trac	✍	✍	✍	✍✍
Royal Blue	✍	✍	✍	✍✍
Asset Management				
Impact	✍	✍✍		✍
Track-IT	✍	✍	✍	✍✍
LanDesk	✍	✍✍	✍	✍
Royal Blue	✍	✍	✍	✍✍
Remote Monitoring Desktop/Server systems management ✍				
NetView	SAN topology	✍		✍✍
OpenView	✍	✍✍	✍	✍
Managewise		✍✍	✍	✍
Remote Monitoring Desktop/Server systems management (cont.) ✍				
Zenworks	✍	✍✍	✍	✍
Control-IT (was Remotely Possible)		✍✍	✍	✍
Performance Works		✍✍	✍	✍
What's Up Gold		✍	✍✍	✍
WebTrends	✍	✍	✍✍	✍
Site Scope	✍	✍✍	✍	✍
MS-Zac	✍	✍✍	✍	✍
MS-SMS	✍	✍✍	✍	✍
Next Point	✍	✍✍	✍	✍
Network Systems Management				
NetView 6000	✍	✍	✍✍	✍
OpenView	✍	✍✍	✍	✍
Managewise		✍✍	✍	✍
Zenworks	✍	✍✍	✍	✍
Control-IT (was Remotely Possible)		✍✍	✍	✍

Enterprise Service Architecture

Technology Architecture

Storage management Architecture

SIZE	FSCM NO	DWGNO	REV
	John Wu	SHEET	OF 13