



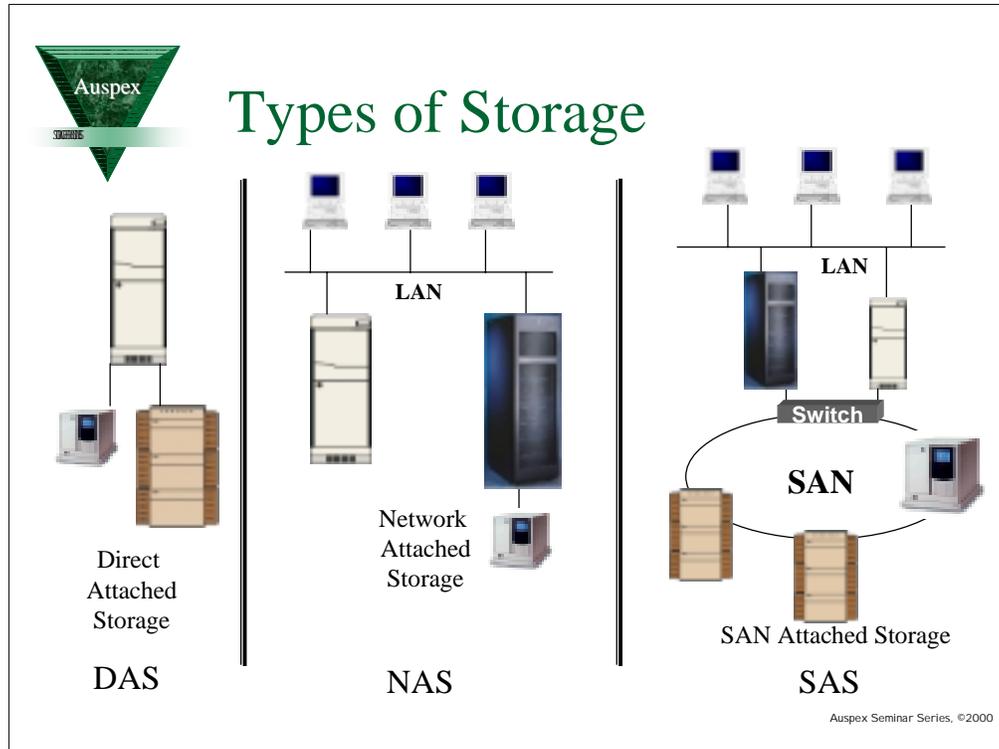
## NAS/SAN Integration

Eighth NASA/Goddard Space Flight Center  
Conference on Mass Storage Systems and Technology  
March 30, 2000



# Agenda

- ▼ Introduction
- ▼ The types and roles of storage
- ▼ Integrating storage as a business advantage
- ▼ Conclusion



Let's talk about the evolution of storage.

First came direct attached storage (DAS) where disks of a few hundred MB to a few GB could be easily handled by a single server or workstation. You might even have a small tape drive or library attached. The downside was: the server needed to touch every piece of data going to and from disk.

Next came network attached storage (NAS) invented by Auspex. In this scenario, the major storage is offloaded from the, let's say, application server and stored on a new device that will serve up the files faster over the LAN, in most cases, than locally attached disk. This is due to some proprietary technology developed by Auspex that defines specific tasks in thin kernels vs a large, general purpose operating system that must do everything from draw graphics to serve files. Now, the expensive application server can devote its cycles to running the application and not waste cycles serving up data.

Lastly, is the emerging technology of storage area networks (SAN) and SAN attached storage. This architecture has a dedicated network, usually based on fibre channel technology, for handling high speed data movement off the LAN.



## Best fits for storage

- ▼ DAS
  - Low initial cost for local storage & applications
- ▼ NAS
  - Storage consolidation of UNIX and NT files
  - Client access of large files, even on the internet
- ▼ SAS
  - High volume movement of data off the LAN

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This slide summarizes the benefits of the different types of storage in their singular forms. Most networks will probably have varying flavors of all three types, depending on the application.



## Storage is your business

- ▼ Holds the crown jewels
  - Intellectual property
  - Customer information
- ▼ Revenue generating center
- ▼ Disaster prevention
- ▼ Replication of data to remote locations



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Storage is becoming an increasingly important consideration because it contains the essence of your business: intellectual property of what it is your company does and the customers it does it for.

Storage can be used as a revenue generating center by providing a mechanism to distribute, for a fee, both raw data as well as processed information.

It is also essential for keeping your business in business. The companies that went bust after the World Trade Center bombing went out of business not because their offices were destroyed but because they were located in a crime scene and they couldn't retrieve any of their data. The companies that had remote copies of their information were able to continue on.



## Benefits of NAS today

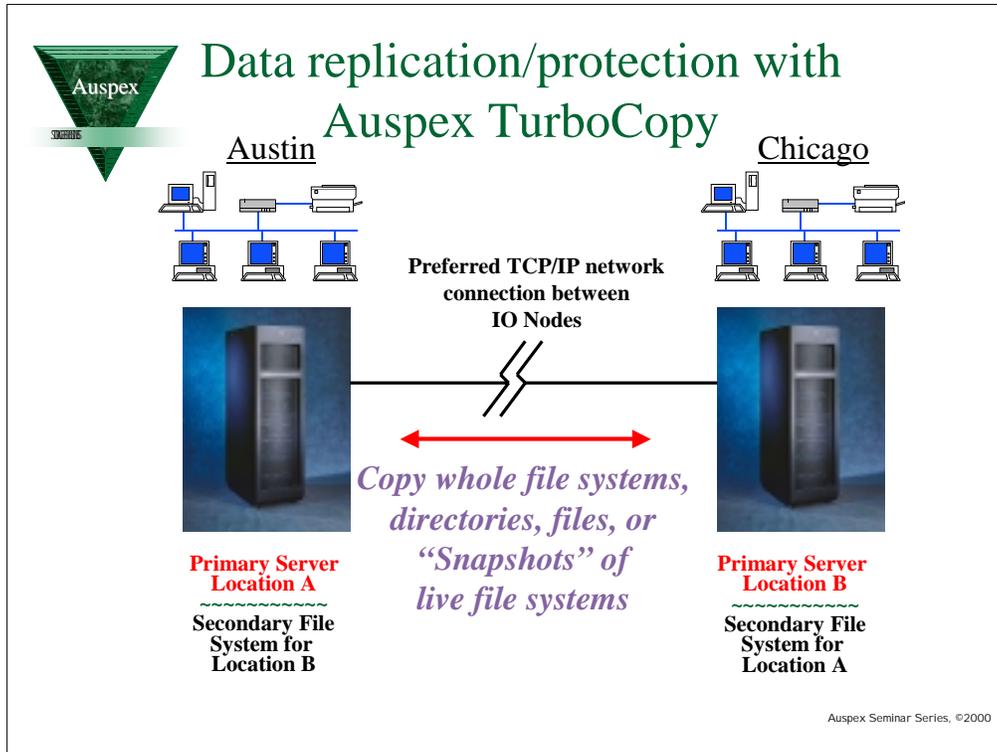
- ▼ Storage consolidation
- ▼ True data sharing for UNIX and NT
- ▼ Scalability and connectivity
- ▼ Reduced management costs
- ▼ Increased productivity
- ▼ Reduce risk
- ▼ Cut time to market



**Auspex NAS is the intelligent gateway to the SAN**

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Obvious and supported by the IDC white paper available from [www.auspex.com](http://www.auspex.com)



A new product from Auspex, TurboCopy, allows you to create a high speed data transfer conduit between two NS2000 for replicating whole file systems, directories, files, or snapshots of live file systems. The transfer takes place over any TCP/IP connection between I/O Nodes. It can be a two way process replicating data on matched pairs of servers so each can have an asynchronous backup copy of data, or used for blasting data on a worldwide basis to remote servers.



## Remote Data Replication

- ▼ Reduce data loss with remote replicas
- ▼ Effective e-Business content distribution
- ▼ Increase decision support capability
- ▼ Reach new markets faster
- ▼ Use data resources better



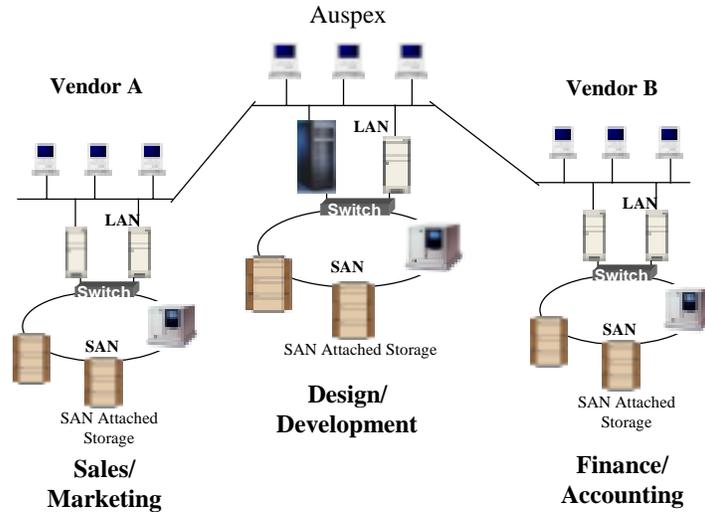
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Remote data replication offers many new opportunities for companies to communicate more effectively on a global basis, reduce data loss and become more productive in ways undreamed of before.

With increased decision support coming from the ability to analyze critical data close to the geography where it was generated, decisions can be made faster on new trends and future planning and deployment of appropriate resources to meet new opportunities.



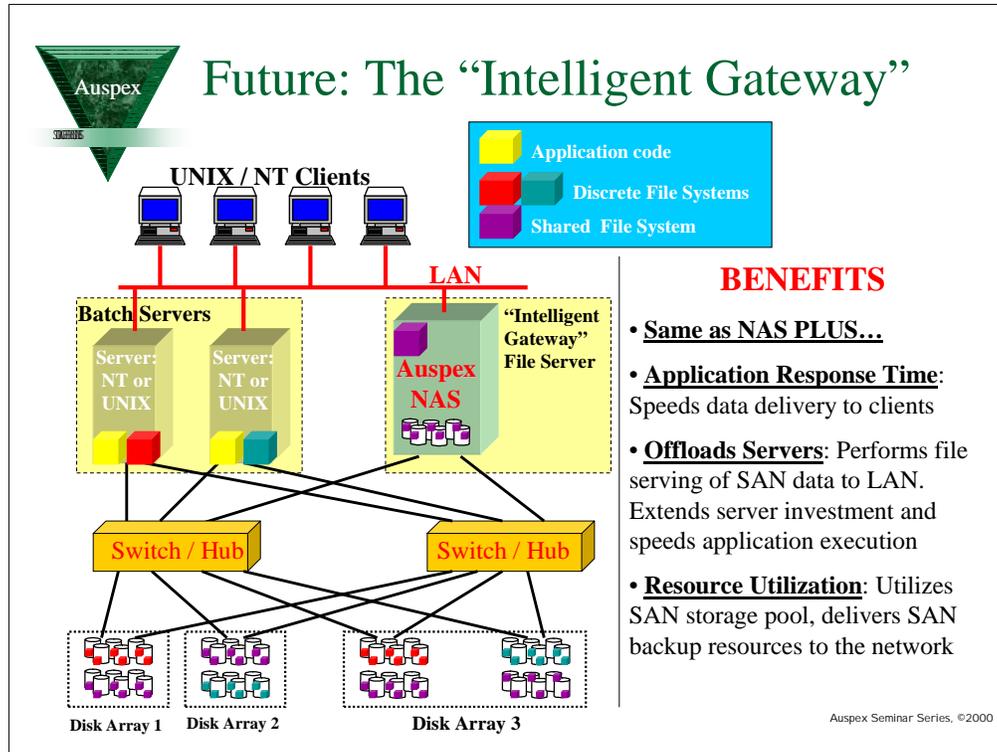
## Present: Islands of SAN



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The present deployment of heterogeneous SANs from different vendors creates an island of SAN environment. Each SAN requires its own file system, components, like switches and hubs, do not interoperate cleanly, and storage hardware has vendor specific proprietary technologies associated with it. The only common thread is the LAN that connects all of the clients together.

This is okay if you need to deploy a specific SAN-let for a specific function tied to a specific hardware vendors expertise. Auspex, for example, provides a superior mechanism for delivering files to clients and servers on the network due to the inherent nature of an Auspex NAS server, but what everyone is searching for is in the next slide...



In this slide, there are major pools of storage that can be made available, dynamically. Auspex still has the major advantage as the “Intelligent Gateway to the SAN” because of its rich selection of network connections and back-end benefits of storage consolidation, true data sharing, and thin kernel for high speed data serving.

Other platforms can share in the mass storage that will be available at the right price point to serve the requirements of the environment.

The benefits that would be derived are clearly spelled out.



# Benefits of SAN

## The Current Benefits of SAN

- ▼ Performance improvements on the LAN
- ▼ LAN-free, Serverless backup - the “Killer App”
- ▼ Larger networks over larger distances

## The Future Benefits of SAN

- ▼ Shared storage pools
  - Assign storage where needed
- ▼ Multi-vendor interoperability
  - Switches, storage, management utilities

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This slide summarizes the state of the art of SAN. The future benefits are dependant on standards that are in the works. The commercial outcome of these standards may not be realized for 3 to 5 years.



## Conclusion

- ▼ Storage in a corporate environment is a powerful tool for corporate competitiveness
- ▼ NAS provides several advantages for storage consolidation, increased productivity, and cost reduction

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