

From Local to a Global Storage Network

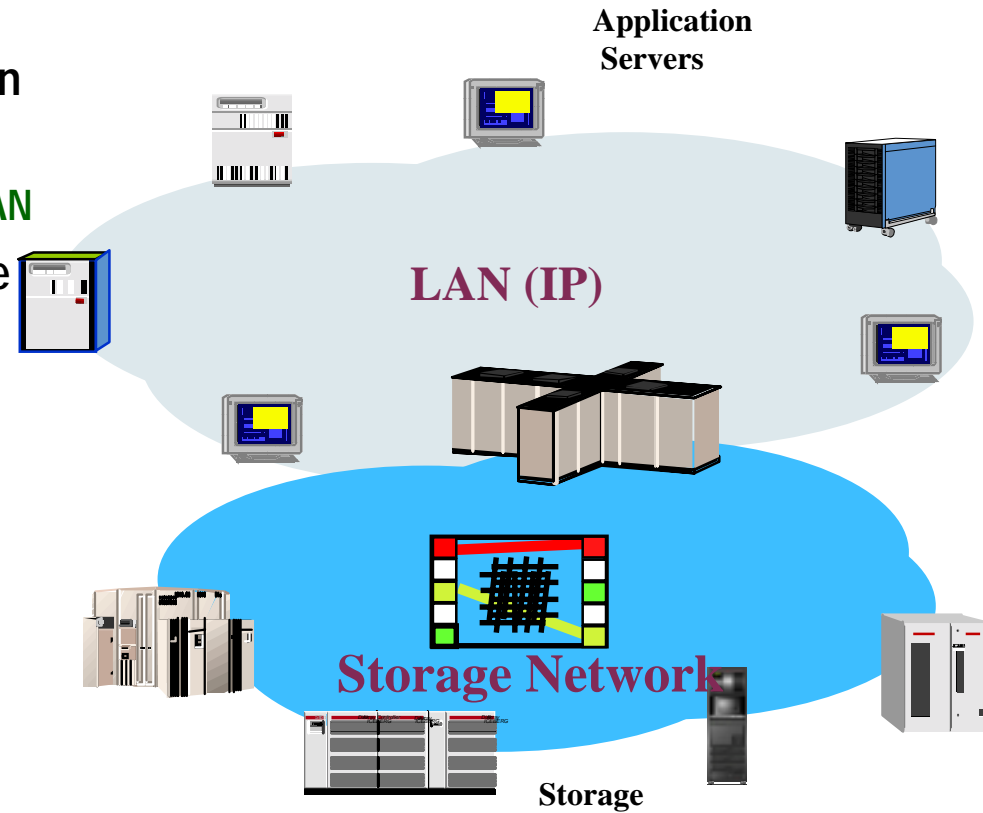
Aloke Guha
StorageTek

guha@network.com; aloke_guha@StorageTek.com

NetStore'99
October 14, 1999

Trend 1: Local Storage Area Network (SAN)

- SAN provides network connectivity between storage devices and apps
 - Trend: 4% ('98) to 59% ('01) of new disk in SAN
- Creates a common storage pool that can be shared and managed at lower admin cost
- Increases overall storage I/O
- Enables more flexible storage mgmt.
 - E.g., 3rd party data transfer, failover
- SAN + Intelligence = NG Controller



Trend 2: Data/Storage Utility

- Level3 agreement: potential revenue ~\$400M over next two to three years
- Frontier Corp: backup and recovery
- Atrieva file backup over web: 50% growth per month
- RedDotNet, a Digital On-Demand Inc. subsidiary: to protect and distribute more than 200,000 hours of digitized music—on a pay-as-you-use basis

THE WALL STREET JOURNAL

June 28th 1999

Storage Technology to Begin Selling Data Storage on Pay-as-You-Go Basis

By WILLIAM M. BULKELEY
Staff Reporter of THE WALL STREET JOURNAL

Storage Technology Corp. plans to begin selling computer storage on a pay-as-you-go basis, a novel approach aimed at spurring revenue growth.

StorageTek is expected to announce Monday that telecommunications company Frontier Corp. has signed up for the service. Frontier, Rochester, N.Y., plans to use StorageTek equipment to offer data backup and recovery services for its big Internet customers.

Under the StorageTek plan, customers will pay for storage by the megabyte, much like customers buy electricity or natural gas. The company calls the approach a "storage utility." Traditionally, outfits have had to purchase an entire storage system for their data-storage needs.

StorageTek, of Louisville, Colo., predicts the strategy could generate revenue of \$200 million by 2002. David Weiss, StorageTek's chairman and chief executive, said the pay-as-you-go approach is especially appealing for fast-growing Internet companies with heavy data-storage needs.

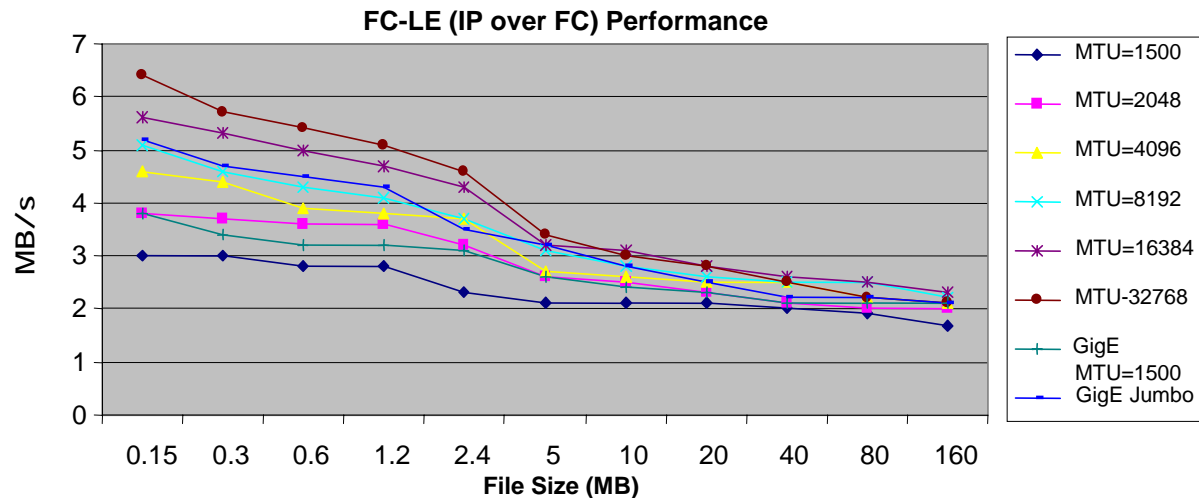
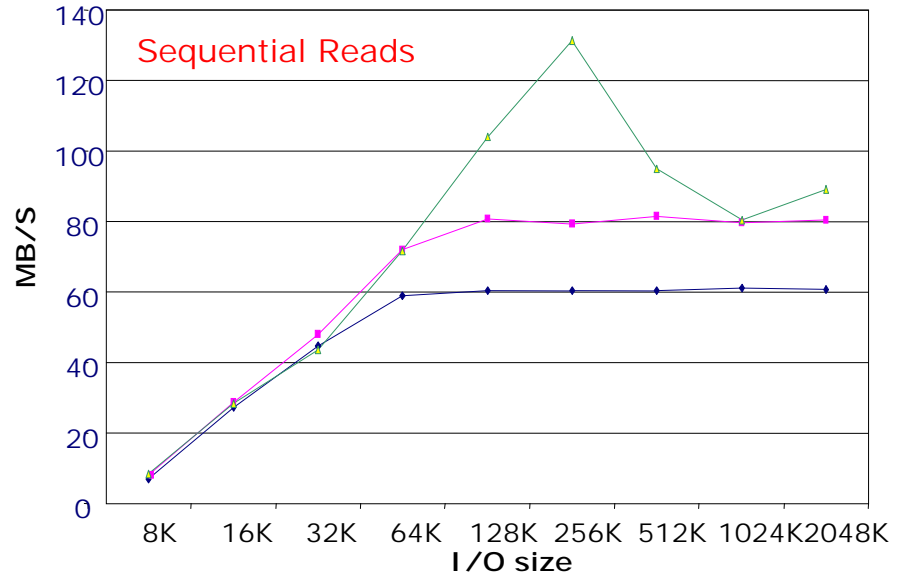
Extending SANs: Bandwidth Issues

- Native server-storage (FC) can have high throughput
- Server based extensions requires tuning to improve throughput

■ SAN extension offloads application server load: channel extension déjà vu?

■ Refs.

- Guha, IEEE Gigabit Workshop, March '99
- Pekar and Guha, IEEE LANMAN Workshop, Nov. '99



Key Technical Areas to Work on

- Fast replication/extension: GB/loc $\uparrow\uparrow$ vs GB/s/loc \uparrow
- Time to do small grain object replication: #obj/disk $\uparrow\uparrow$
- Coherency/Access Control: distribution of metadata
- Setting up Service Level Agreements: control/configuration
 - Access time and Data transfer rate
 - Degree of consistency
 - Access rights
 - Availability/Fault-tolerance