

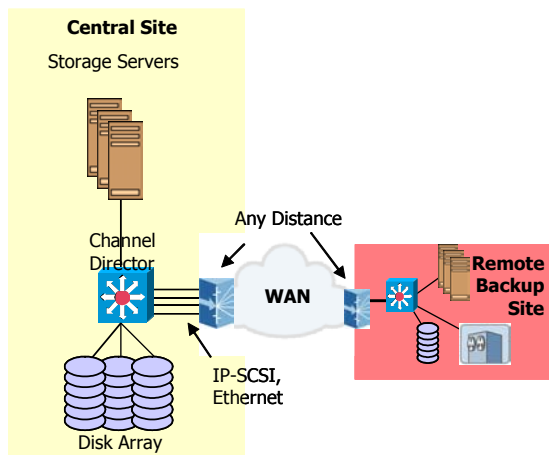
Enterprise Application Note: **Remote Data Back-up & Business Continuance Services**

Introduction

As data storage continues to grow in importance to government institutions and large multi-national enterprises, the value of backing up data and ensuring availability will continue to grow. Storage networking application requirements can be strenuous, but the right transport architecture can make the difference between an effective and an ineffective back-up and/or business continuance plan. IP based Storage Area Networking (SAN) and Network Attached Storage (NAS) applications can be transported most effectively over an Optical Ethernet infrastructure, since it provides the simplest low latency form of high-speed transport for metro or regional networks. Ethernet-Line services are ideal for supporting back-up and business continuance applications. This overview focuses on back-up and business continuance service requirements when transporting information between data center sites.

Application Description

Remote data back-up services use asynchronous storage transfer between two or more sites. Copies of the stored data are periodically pushed from the primary sites to the back-up center for potential recovery or for other applications, such as regulatory compliance. The link must be high-speed and must reliably deliver the traffic without loss.

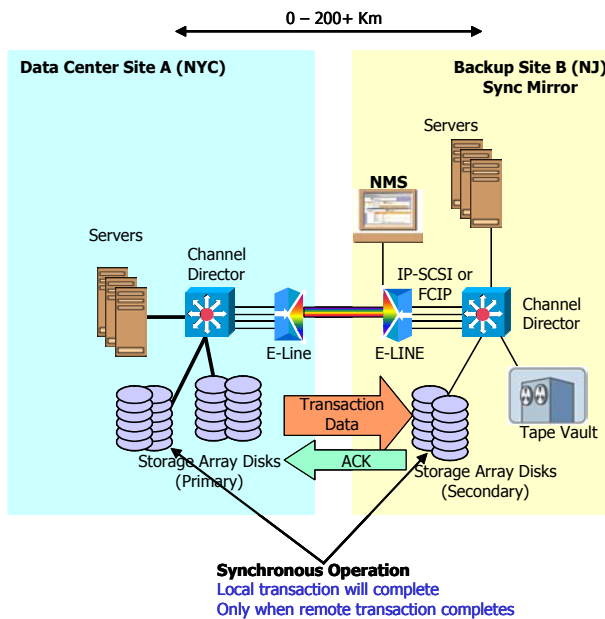


Summary of Key Points

- Requires asynchronous operation
- Transactions or files are periodically batch transferred to a back-up location
- Requires high-capacity, low-cost network service that ensures no loss of data
- Uses IP-SCSI/NAS connections over optical Ethernet to meet cost, capacity, reliability, requirements
- Distance is unlimited
- High-speed Ethernet hand-offs provides lowest upfront an on going (upgrade) cost model

Business continuance services use mirrored or synchronized storage transfer between two sites this means that as data is created and stored at the primary location, it is simultaneously recorded at the backup facility. For example, a local transaction such as the processing of a securities order in New York City cannot be completed until the entry also is completed at the backup facility in New Jersey and the local host server receives an acknowledgement.

Business continuance services require synchronous operation between sites so that no data is lost. In synchronous operation, block data continues to be sent to the mirror site as long as it is continually receiving acknowledgements that the previous block was received to ensure that the data is exactly the same at both sites.



Synchronous operation uses either IP-SCSI or FCIP protocols for reliable transfer. Both protocols can be used over long distances when deployed over an optical Ethernet transport because of the underlying service's ability to deliver low consistent latency and a low loss. NOTE: real-time synchronized storage arrays are end-end delay sensitive and require low loss and low transit latency to avoid synchronization delay at the application layer. Ethernet-Line services with their lower transit latencies rather than traditional routing allow transit distances to be greatly extended.

Summary of Key Points

- Requires synchronous operation
- Transactions are simultaneously recorded in two locations
- Local transaction cannot complete until remote transaction receipt is acknowledged to ensure no loss of data
- Uses IP-SCSI, or FCIP over Ethernet for low delay, reliability
- Allows distances to a few hundred 100 Km for real time storage array synchronization

Service Implementation

Optical Ethernet services can solve both back-up and mirrored business continuance storage needs for any kind of stored data. This simplifies the job of enterprise network architectures by allowing them to pick the SAN, NAS, and LAN wide area connectivity architectures that meet their business needs. The ability to hand-off from the enterprise owned device using reliable standardized low cost Ethernet interfaces not only minimizes services costs, but ensures interoperability. All of today's major storage array vendors support specifications that back Ethernet as a certified means of storage connectivity over the wide area.

In any application, optical Ethernet technology provides the reliability to support Ethernet-Lined based storage services in real-time, side-by-side with other data services. Optical Ethernet service based solutions can offer superior protection and SLA monitoring capabilities, which allow an operator the tools to offer an enterprise both the confidence in the service level provided, and in its ability to offer a sustainable service through its scalable and reliable architecture.