

**BROCADE**



# SAN Extension Options for Business Continuity Solutions

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# Agenda

30 Quick Minutes to cover:

- Overview of BC solutions for SAN
- Examination of available options for SAN extension
  - When to use each extension technology
  - Tips when designing SAN extension solutions
    - Focus on SAN Extension over IP
- Time for your questions



# Industry Trends and Implications

## Business Reasons for SAN Extension

Business continuity relies on recovering from disasters

- Many applications have tough RTO / RPO requirements
- Replication between datacenters or remote tape vaulting

Regulations drive business requirements for applications

- Virtually all data must be protected and managed
- Mistakes don't cost you time, they GET you time.







Service model of IT

- Focus on efficiency through standard services
- Demand for speed and flexibility



# Replication Requires SAN Extension

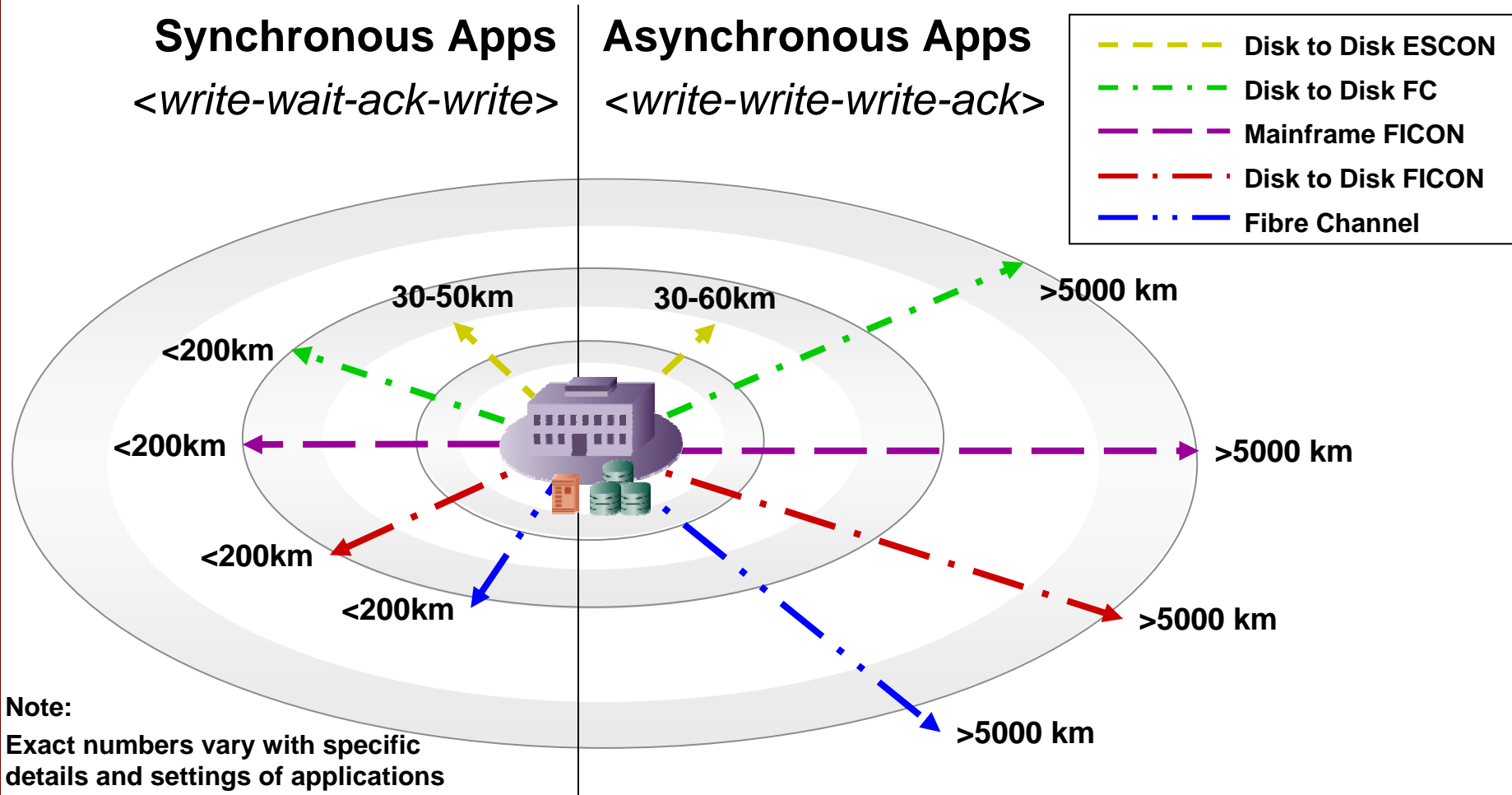
## Examples of commonly used DR applications

Partner	Product	Solution	Server
	<ul style="list-style-type: none"> <li>• SRDF</li> <li>• MirrorView</li> <li>• Recoverpoint</li> </ul>	<ul style="list-style-type: none"> <li>• Data replication</li> <li>• Data mirroring</li> </ul>	<ul style="list-style-type: none"> <li>• S/390</li> <li>• Unix</li> <li>• Microsoft</li> </ul>
	<ul style="list-style-type: none"> <li>• XRC</li> <li>• MetroMirror</li> <li>• GlobalMirror</li> <li>• VTS Peer-to-Peer</li> </ul>	<ul style="list-style-type: none"> <li>• Data replication</li> <li>• Data mirroring</li> </ul>	<ul style="list-style-type: none"> <li>• S/390</li> <li>• Unix</li> <li>• Microsoft</li> </ul>
	<ul style="list-style-type: none"> <li>• TrueCopy</li> <li>• HXRC</li> </ul>	<ul style="list-style-type: none"> <li>• Data replication</li> <li>• Data mirroring</li> </ul>	<ul style="list-style-type: none"> <li>• S/390</li> <li>• Unix</li> <li>• Microsoft</li> </ul>
	<ul style="list-style-type: none"> <li>• CA</li> <li>• DRM</li> </ul>	<ul style="list-style-type: none"> <li>• Backup and recovery</li> <li>• Data replication</li> <li>• Data mirroring</li> </ul>	<ul style="list-style-type: none"> <li>• Unix</li> <li>• Microsoft</li> </ul>
	<ul style="list-style-type: none"> <li>• VSM</li> <li>• VSMRL</li> <li>• D-Series</li> <li>• Tape Pipelining</li> </ul>	<ul style="list-style-type: none"> <li>• Backup and recovery</li> <li>• Data replication</li> <li>• Data mirroring</li> </ul>	<ul style="list-style-type: none"> <li>• S/390</li> <li>• UNIX</li> <li>• Microsoft</li> </ul>
	<ul style="list-style-type: none"> <li>• TSM</li> </ul>	<ul style="list-style-type: none"> <li>• Backup and recovery</li> </ul>	<ul style="list-style-type: none"> <li>• Unix</li> <li>• Microsoft</li> </ul>



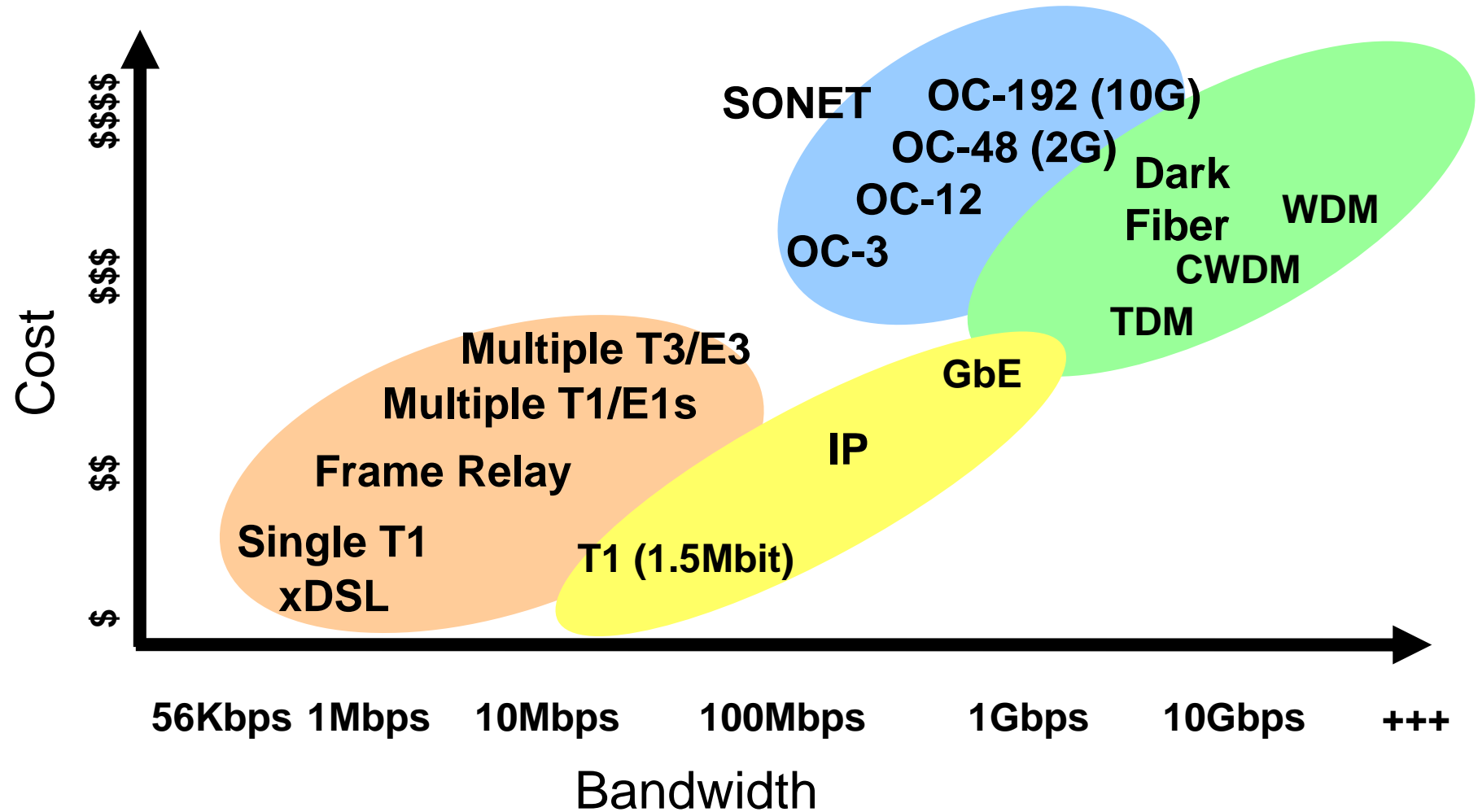
# Replication Objectives & SAN Extension

## Synchronous vs. Asynchronous Replication



# Transport Options for SAN Extension

Many technologies can be used



# Relevant Factors in SAN Extension

- Distance, throughput, and cost are factors in transport choice
- Transport latency characteristics impact application performance
- Dark fibre & xWDM historically popular, used in larger shops
- FCIP also popular as IP is commonly available between sites

Characteristics:

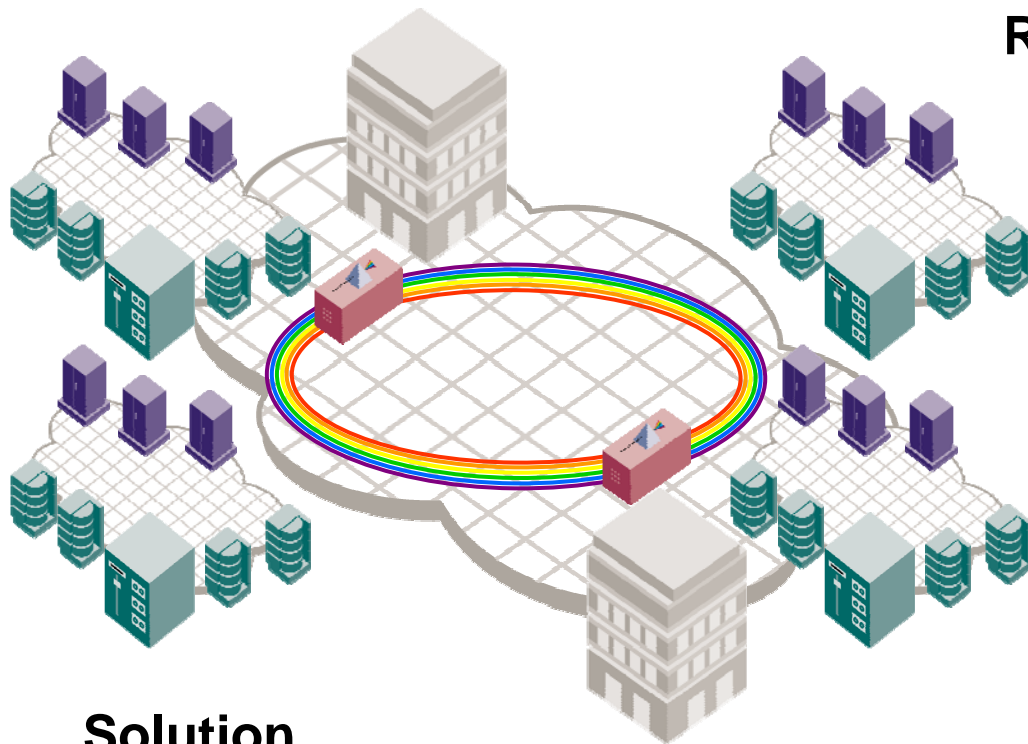
Distance	10km and lower	10km to 50km	50km to 100km	100km to 500km	500km and higher	Latency	Low (fast)	Medium	High (slow)	Throughput	Full FC Speed	Constrained	Very Constrained	Cost	High	Medium	Low
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Technology:

Standard FC (SWL)	✓						✓				✓						✓
Extended FC (LWL)	✓	✓					✓				✓					✓	
Extended FC (ELWL)	✓	✓	✓				✓				✓				✓		
Extended FC (passive WDM)	✓	✓	✓	✓			✓				✓				✓		
Extended FC (active WDM)	✓	✓	✓	✓	✓		✓				✓				✓		
FC over SONET/SDH			✓	✓	✓	✓		✓				✓				✓	
FC over IP (FCIP)				✓	✓	✓			✓				✓				✓



# Customer Use Case Example - DwDM



## Solution

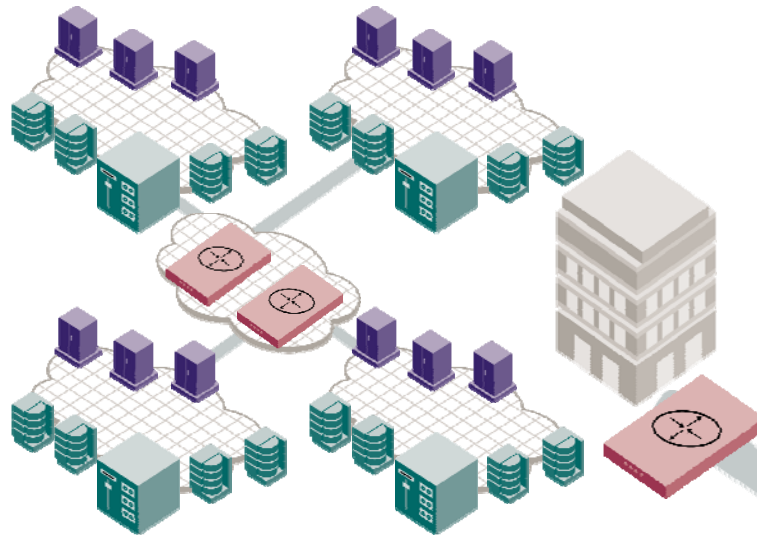
- Customer selected Nortel DWDM w/ SAN Routing over leased lines
- Synchronous replication for low RTO

## Business Continuity Requirement

- Replicate transaction processing data between datacenter sites
- Very large data set with high change rate require high throughput
- Recovery point objective close to “real-time” requires very low latency
- Recovery time objective as fast as possible, budget funded to meet RTO/RPO



# Customer Use Case Example – IP WAN

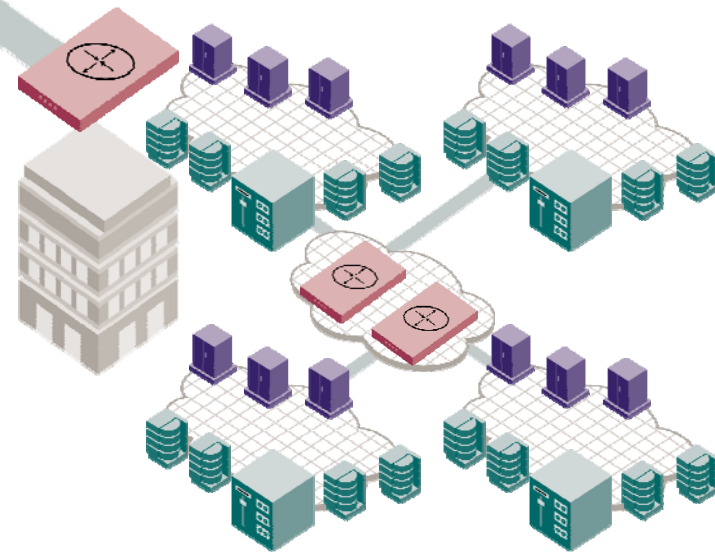


## Business Continuity Requirement

- Replicate application data between datacenter sites
- Large data sets but with low change rate
- Recovery point objective

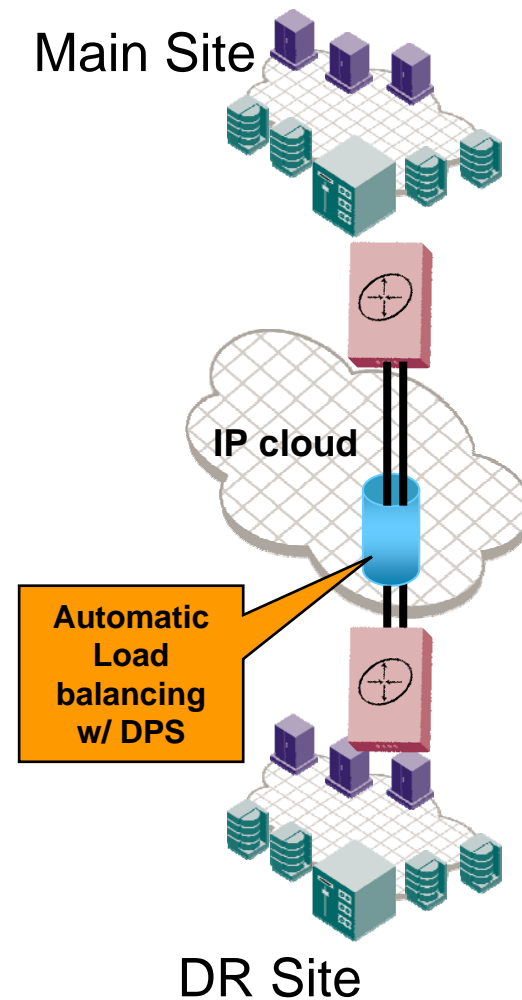
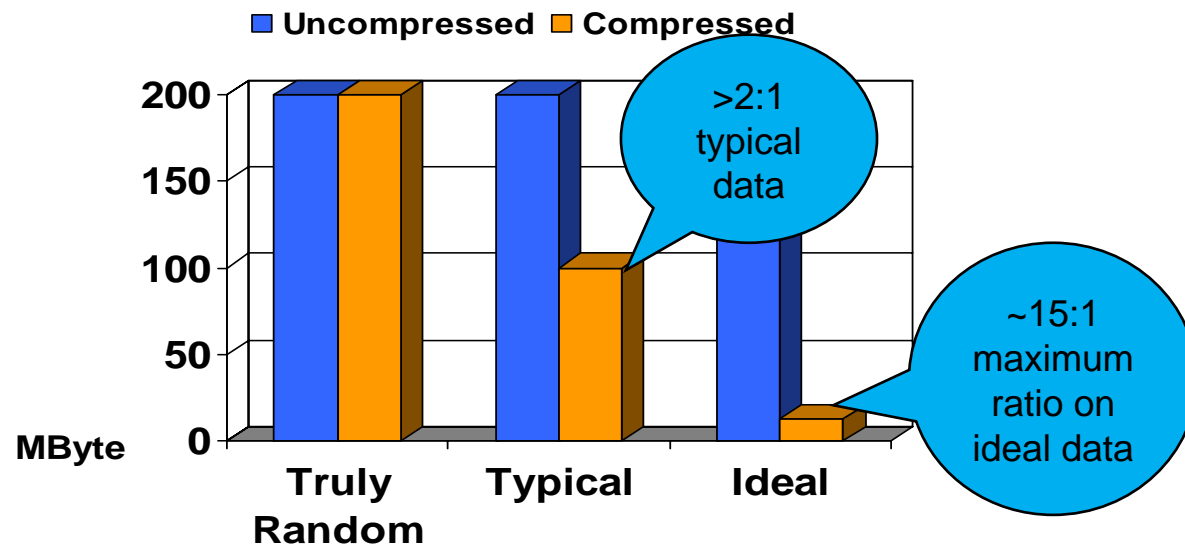
## Solution

- Customer selected Brocade Routing & FCIP over IP connectivity already in place
- Asynchronous replication meets RTO & RPO objectives



# Design Tips for SAN Extension over IP Intergraded Compression

- Payload compression within FCIP
- Additional data replicated without additional WAN bandwidth cost
- For use when WAN Routers are not already compressing

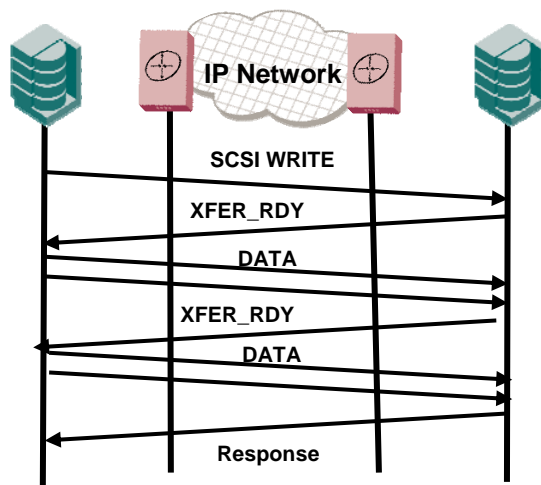


# Design Tips for SAN Extension over IP

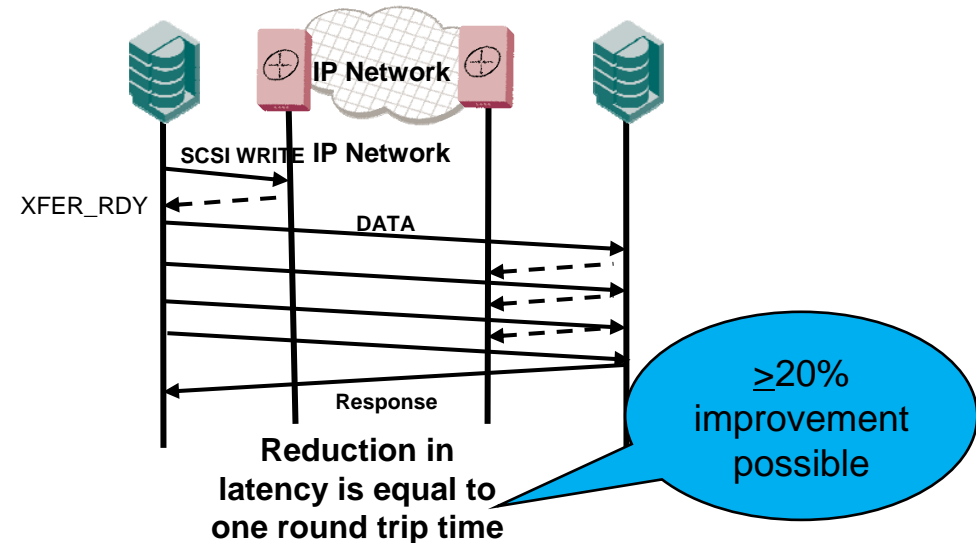
## Fastwrite for Synchronous Applications

- Latency over IP WAN is often an issue
- Fastwrite improves performance by eliminating some round-trip responses (acts like a local cache)
- For use only with synchronous apps

FCIP without Fastwrite



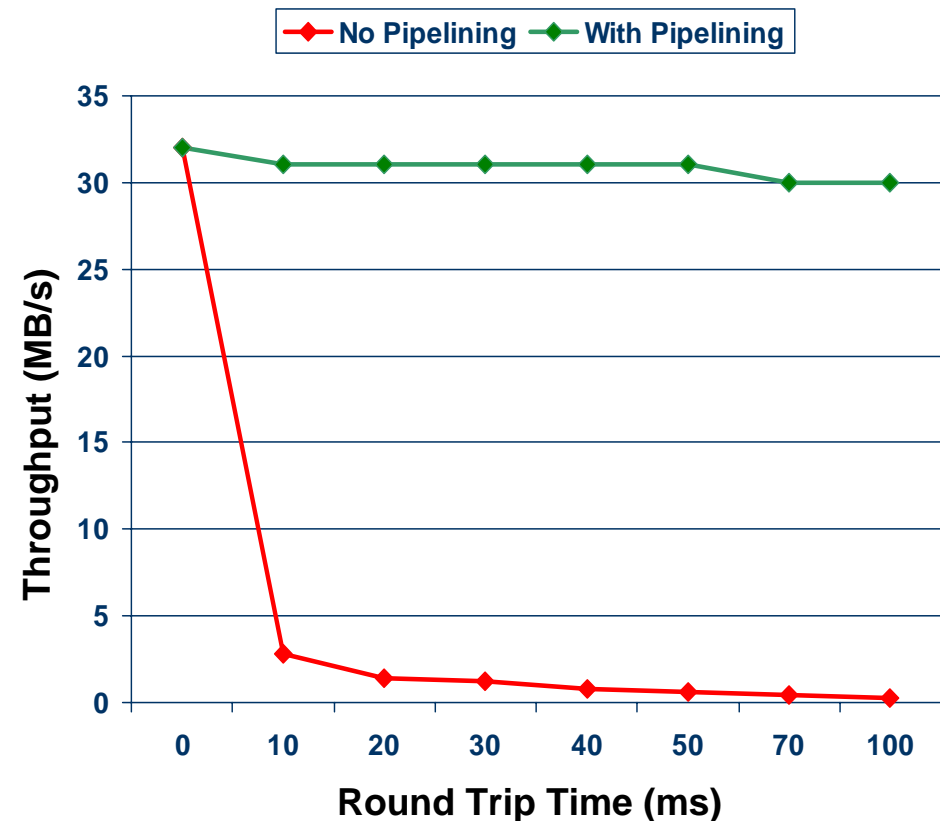
FCIP with Fastwrite



# Design Tips for SAN Extension over IP

## Tape Pipelining for Remote Tape Vaulting

- Local acknowledgement of tape operation (write or read)
- Tape Pipelining improves throughput for sequential data, reduces “shoe-shine” effect
- Forces the sender (host) to transmit multiple outstanding commands to make full use of WAN and target storage



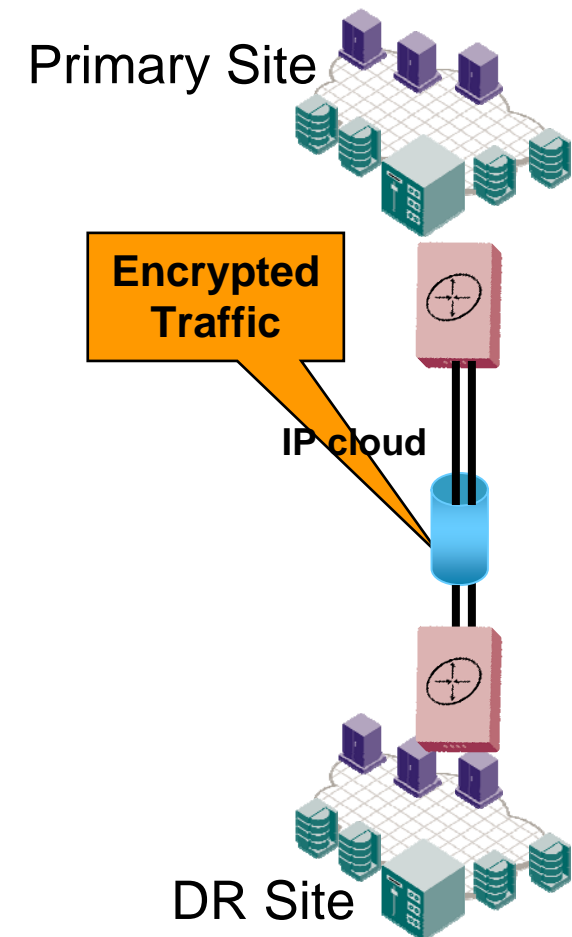
(a) Legato Networker 7.0 (b) Windows Advanced Server 2000. Dual Xeon CPUs © IBM Ultrium TD2 LT0-2 Tape Drive



# Design Tips for SAN Extension over IP

## FCIP Encryption w/ IPsec for Additional Security

- IPsec Encryption for FCIP
  - AES w/ 256 bit encryption
  - 3DES w/ 192-bit encryption
  - Support for SHA-1 and MD5 hashing
- Additional security over IP WAN
- Hardware-based feature available on FR4-18i Blade and SilkWorm 7500
  - Compression done before encryption
- For use when WAN Routers are not already encrypting



# SAN Extension Options Summary

- There are many technology options for SAN extension
- Distance, throughput, & cost are transport choice factors
- Each option has trade-offs between price and performance
- Latency characteristics of IP as a transport impacts application performance
- FCIP is popular and relevant in Asia
  - IP is commonly available between sites
  - IP can be acquired within project budgets
- No matter which option best fits your requirements, Brocade has a tested & certified solution to meet your needs



# Brocade's Portfolio for Routing & Extension

## Leading solutions for SAN Extension

- Open Systems and Mainframe
- Variety of transport options
- Professional Services

## Key Differentiators

- Breadth and Depth of Solutions
- Superior Performance
- Resource Efficiency
- Highest Availability
- Successful Customer Base
- Full Life-Cycle Services

Over 16,000  
systems  
deployed



48000 Blade  
FR4-18i



7500 SAN Router



Edge M3000



USD-X



M2640



M1620



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Questions?

Thank You!