

Where is Our Data? & Money??

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Asia Pacific IP+Optical Networking**

Agenda

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- 
- **Tornado in Storage**
 - **Business impact & Challenges**
 - **How to Keep the Storage**

Data Density

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Traditional data types:

Real numbers

Integers

Boolean

Character

New data types:

Static images

Audio

Video

Program fixes

Software updates

Bidirectionality

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- **Remote medical facilities sending Data to regional specialists**
- **B2B applications moving data between companies and suppliers**
- **B2C applications moving data between companies and individuals**
- **Collaborative applications supporting technical workgroups**

Mobility

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- **PDAs and 2/2.5G/3G phones equipped with digital cameras**
- **Mobile medical laboratories for medical imaging (radiology, ultrasound, scanning) and cardiology**
- **GPS technology**
 - **Increased commoditization**
 - **Relaxed regulation**



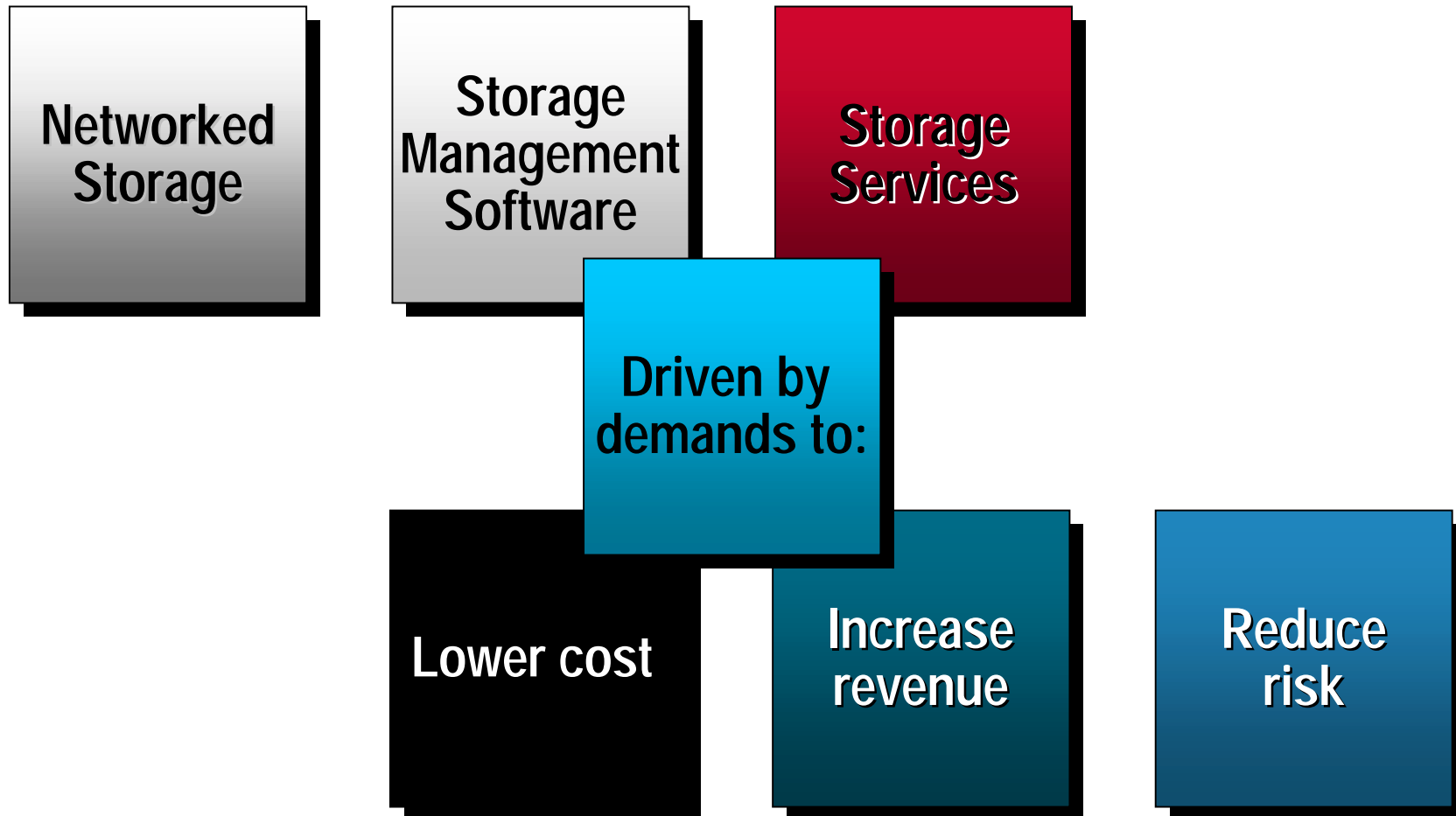
Business Issues

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- **The era of the “Fast Company”**
 - Internet
 - E-commerce
 - Strategic value of knowledge
- **Information-centric organizations**
 - Velocity of change
 - Differentiation based on knowledge
 - Knowledge is everywhere
 - Huge growth in volume of information

It's a Good Time to Be in Storage:

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Agenda

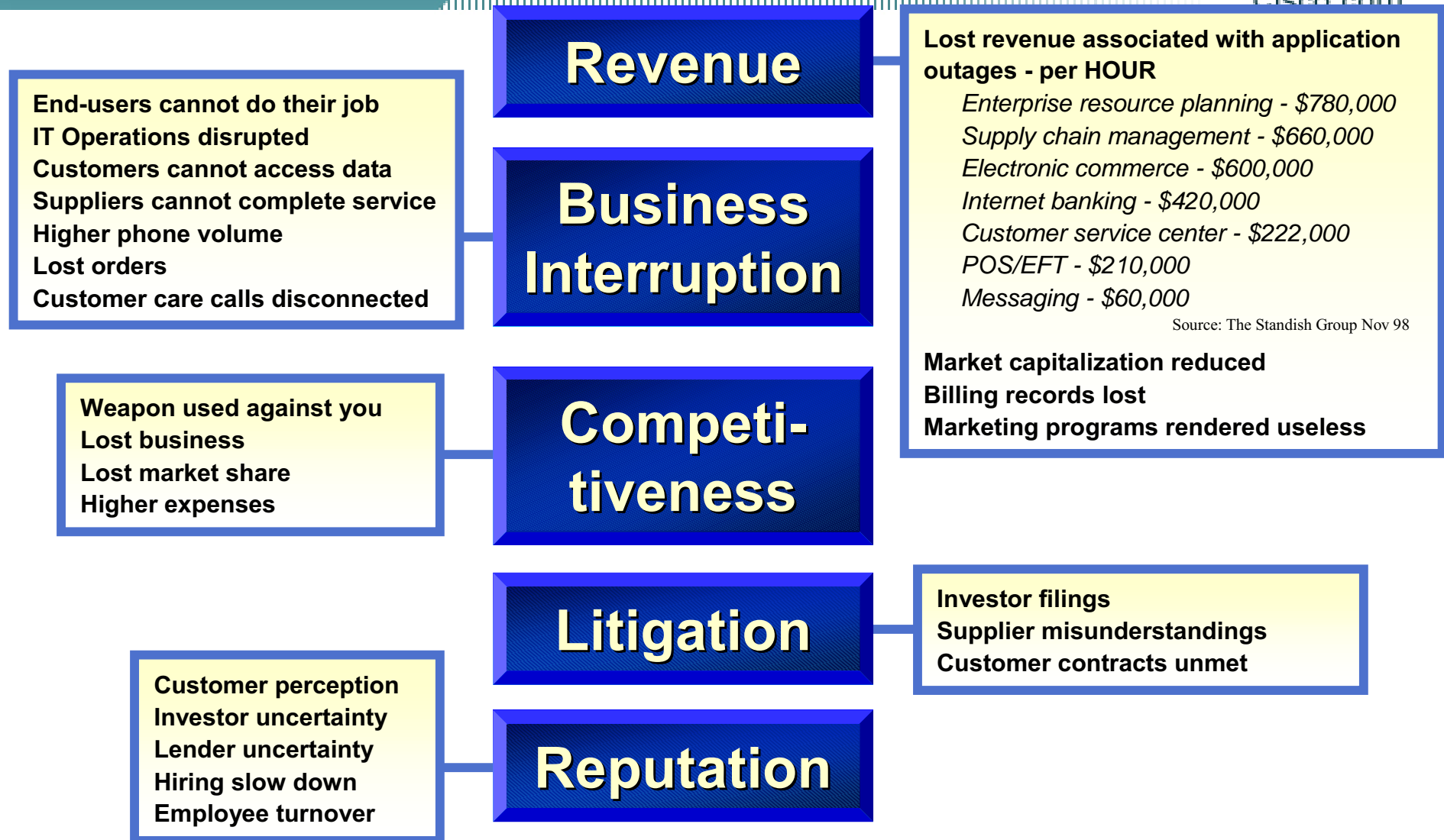
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- **Tornado in Storage**
- **Business impact & Challenges**
- **How to Keep the Storage**



Impact of Downtime

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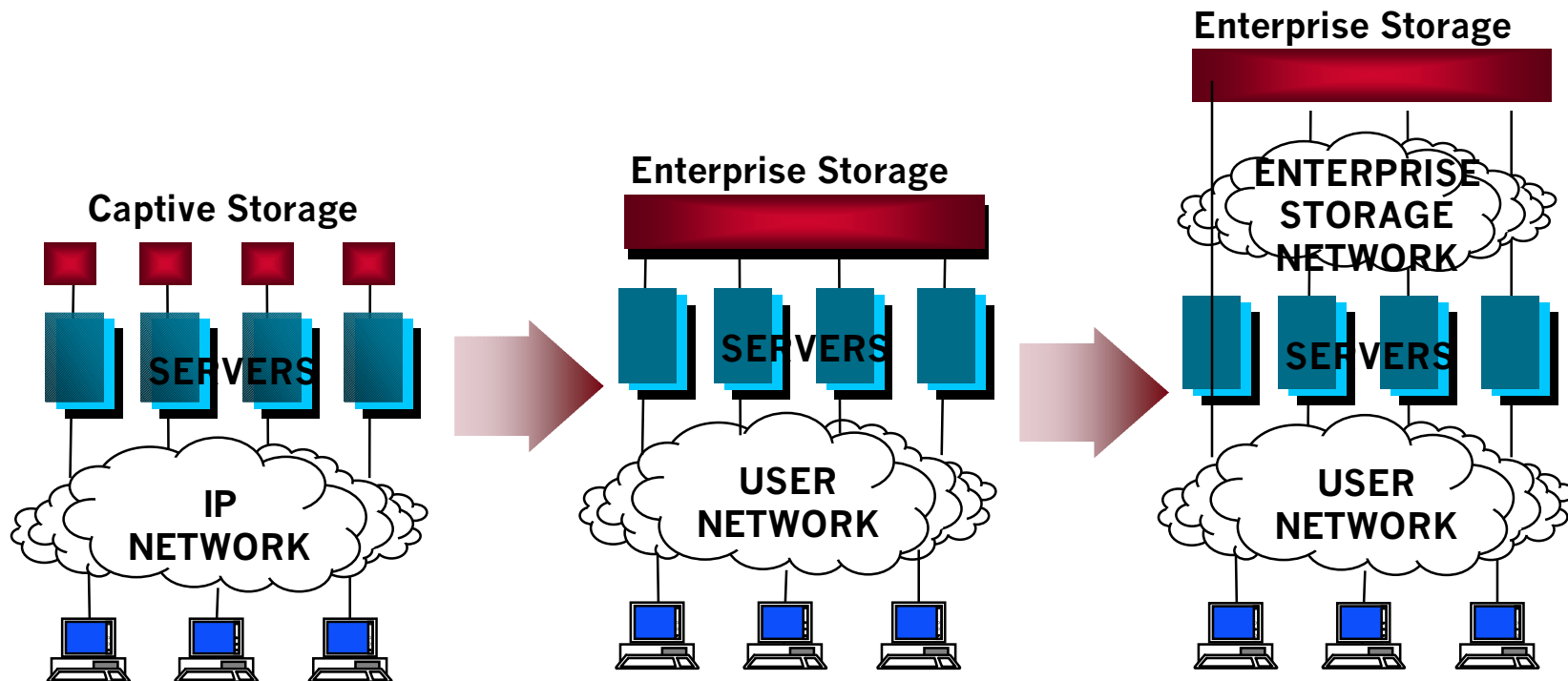
The Evolution of Information Management

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Manage with
disparate Server-
specific tools

Consolidated
Storage
Management

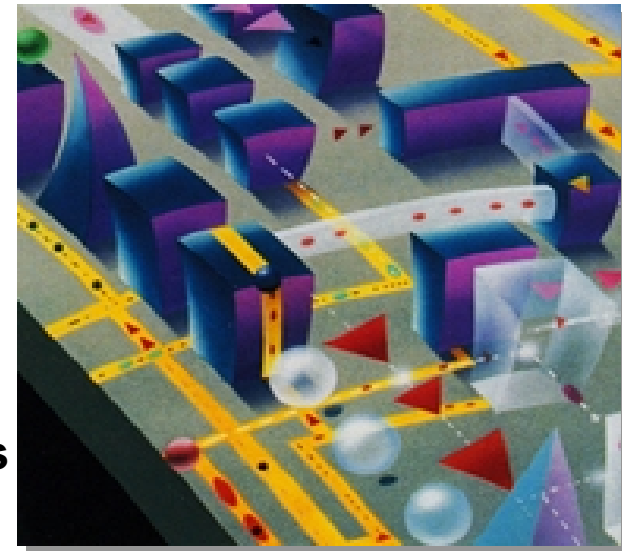
Managed ESN



Technology Challenges

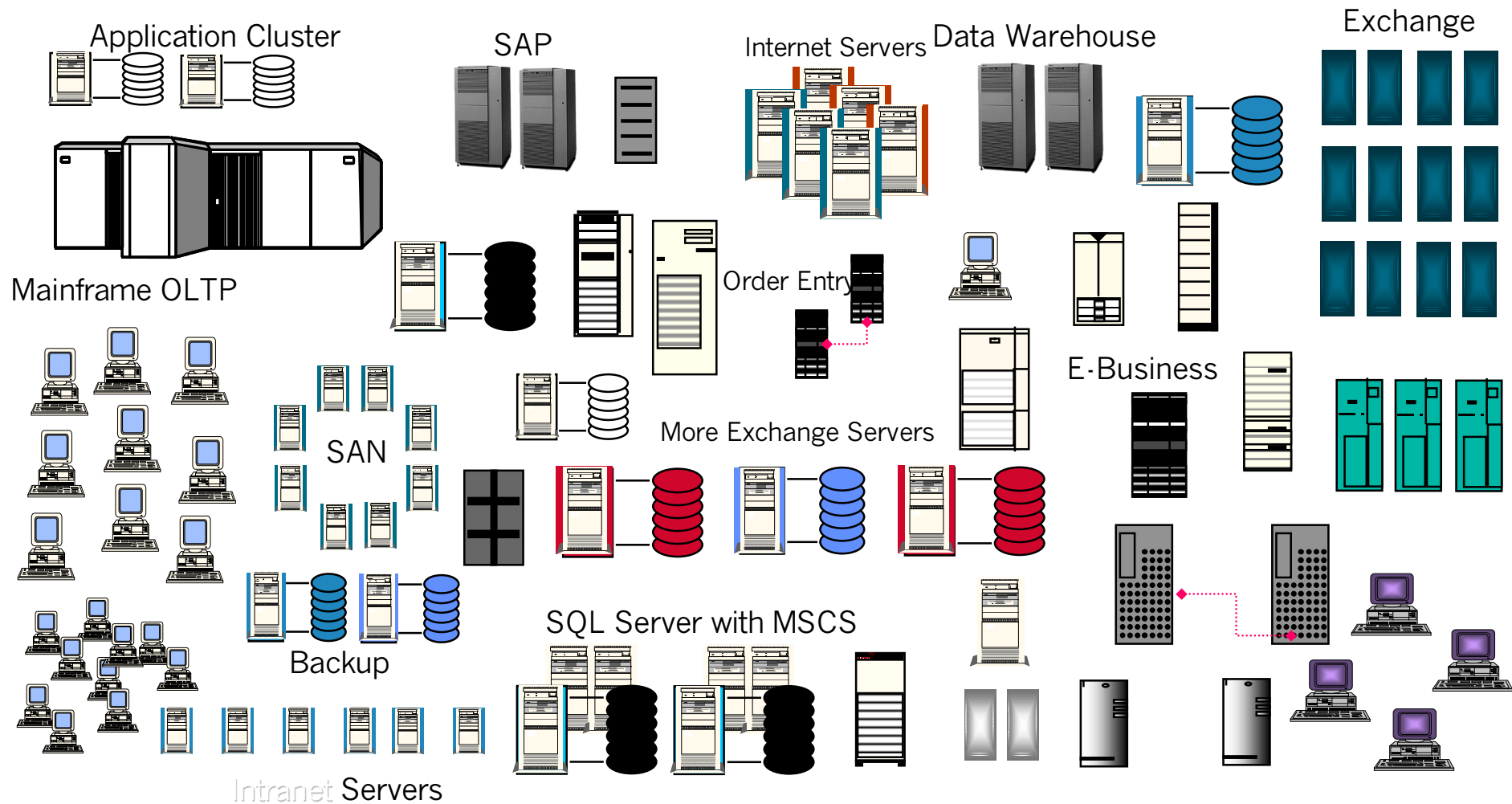
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- **Information when and where the business user needs it**
 - Mission critical data NOT just in the data center
 - 365 x 7 x 24 availability
- **Integrate technology infrastructure with business processes**
 - Eliminate “stovepiped” application environments
 - Secure operational environments
- **Flexible, resilient architecture**
 - Respond quickly to business requirements
 - Reduce the cost of managing information



Storage Management Challenges

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Storage Management

Business Challenges

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- **Shortage of Qualified Staff**
- **Meeting Service Level Agreements**
 - **Availability & Performance**
- **Managing Business Continuance**
 - **Shortening Backup/Restore Window Testing Disaster Recovery Plans**
 - **Maintaining Flexible Storage Infrastructure**
 - **Dynamically Reallocating Resources**
- **Capacity Planning**

Agenda

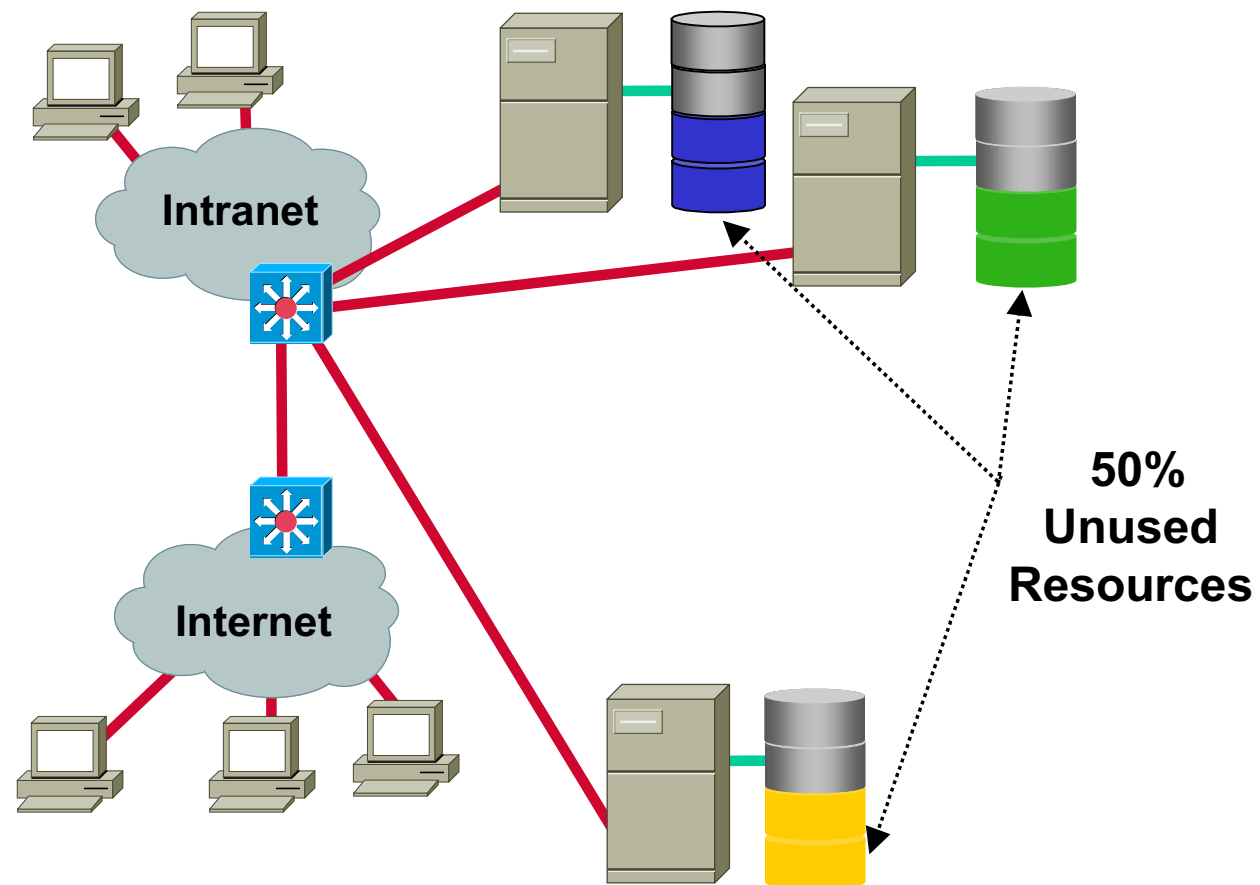
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- 
- **Tornado in Storage**
 - **Business impact from Data**
 - **How to Keep the Storage**

Storage Inefficiency

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Server Attached Storage

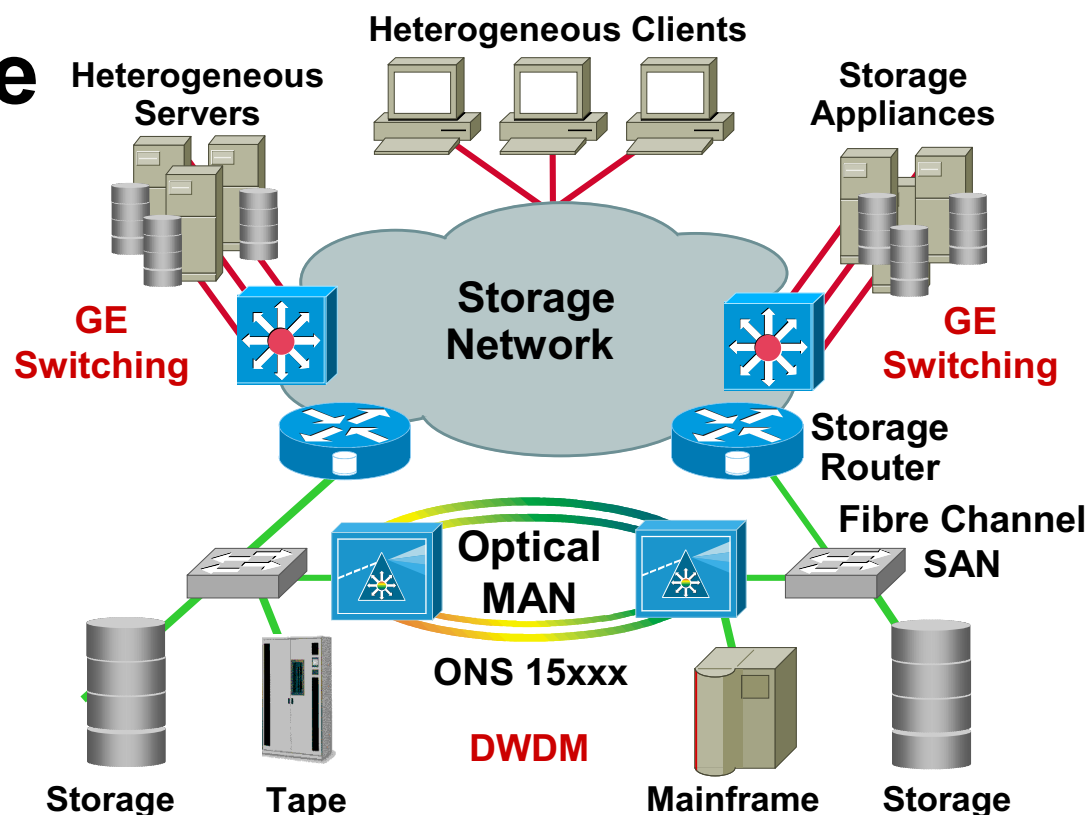


Customer Benefits

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IP + Gigabit Ethernet + FC + Optical

- **Reduced storage costs**
- **Improved scalability**
- **Leverages IP investment**
- **Secure storage networks**



Storage Networking Solutions

Business Continuance

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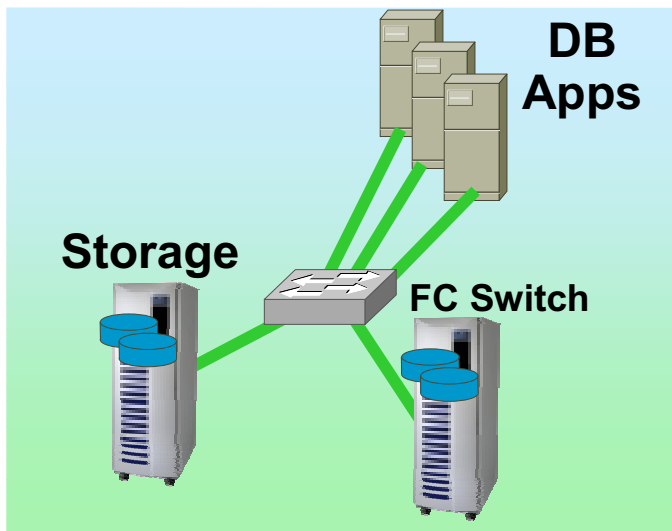
Customer Solution	Networking Technologies
Business Continuance - Replication - sync/async - Backup	•Optical (FC or GE) •Storage over WAN
Storage Consolidation - heterogeneous access to/mgmt shared storage, virtual storage	•Optical (FC or GE) •NAS,NFS,VI •IP Access to Storage
Content Distribution (SP) - Optimized Internet performance	•Storage over WAN •Caching/Storage integration •New Data Center
Hosted Storage(SP) - Small/medium, Datawarehousing/ backup	•Optical (FC or GE) •Storage over WAN •NAS, SCSI over IP

SAN or NAS You Choose

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SAN

- typically simple „SCSI-like“
blocklevel operations
- large datablocks efficiently moved
- limited sharing of information
- *more difficult to extend over data Networks due to strict timing & protocols*



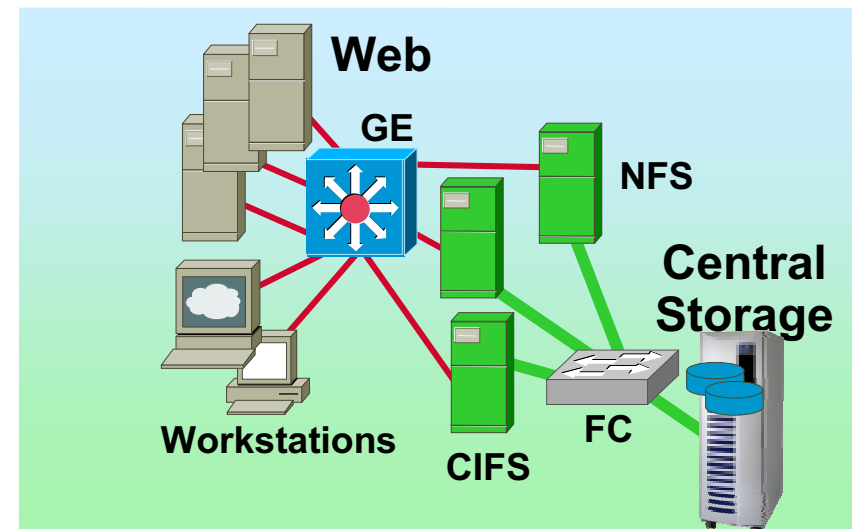
SAN forecast: \$14B market by 2003 (IDC)

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NAS

- Clients & Servers, multiple OS
- more complex **file level operations**
- more & higher layers
intelligence required
- Authentication, File locking
- *easy extension over data networks*

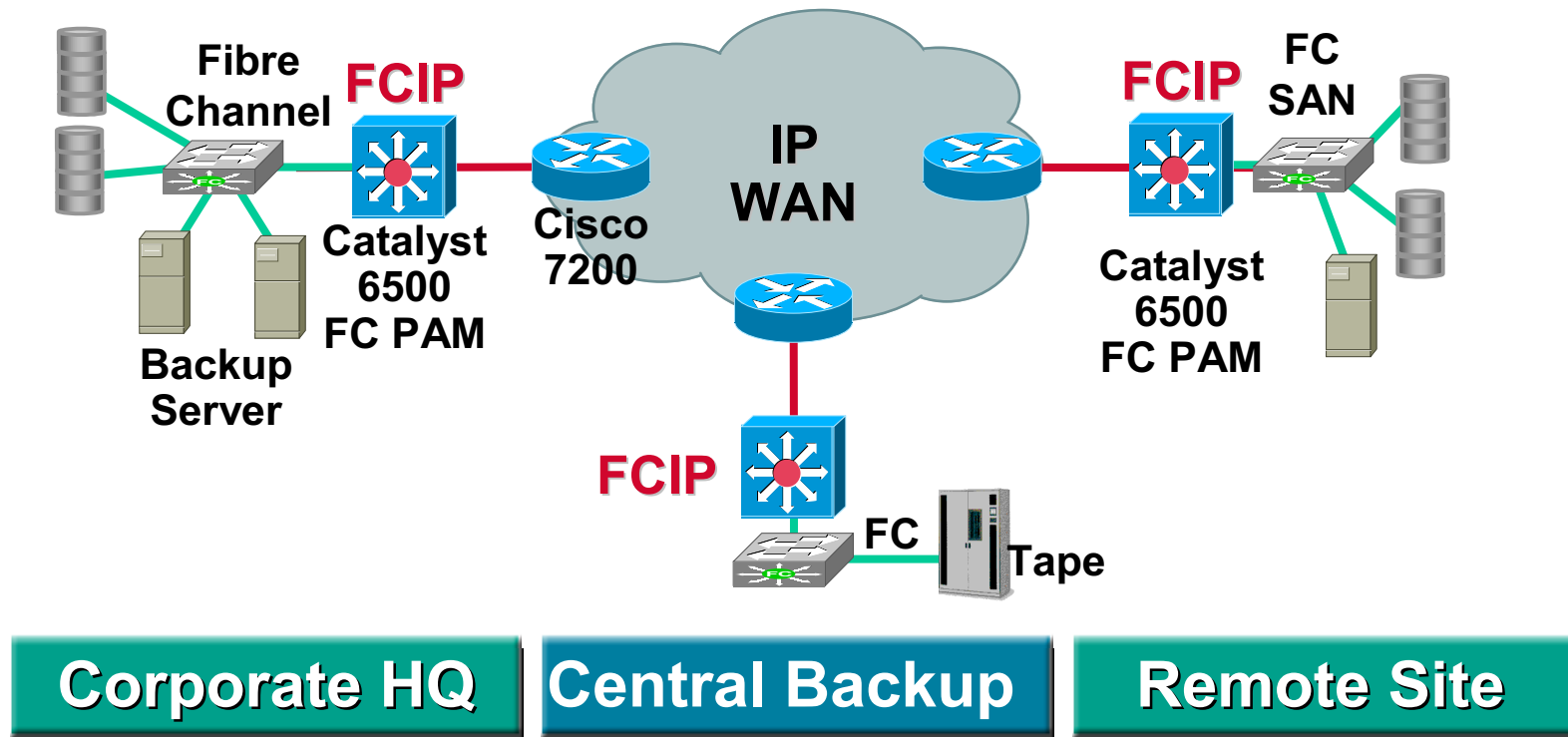


NAS forecast: \$6.5B market by 2003 (IDC)

Fibre Channel Over TCP/IP (FCIP)

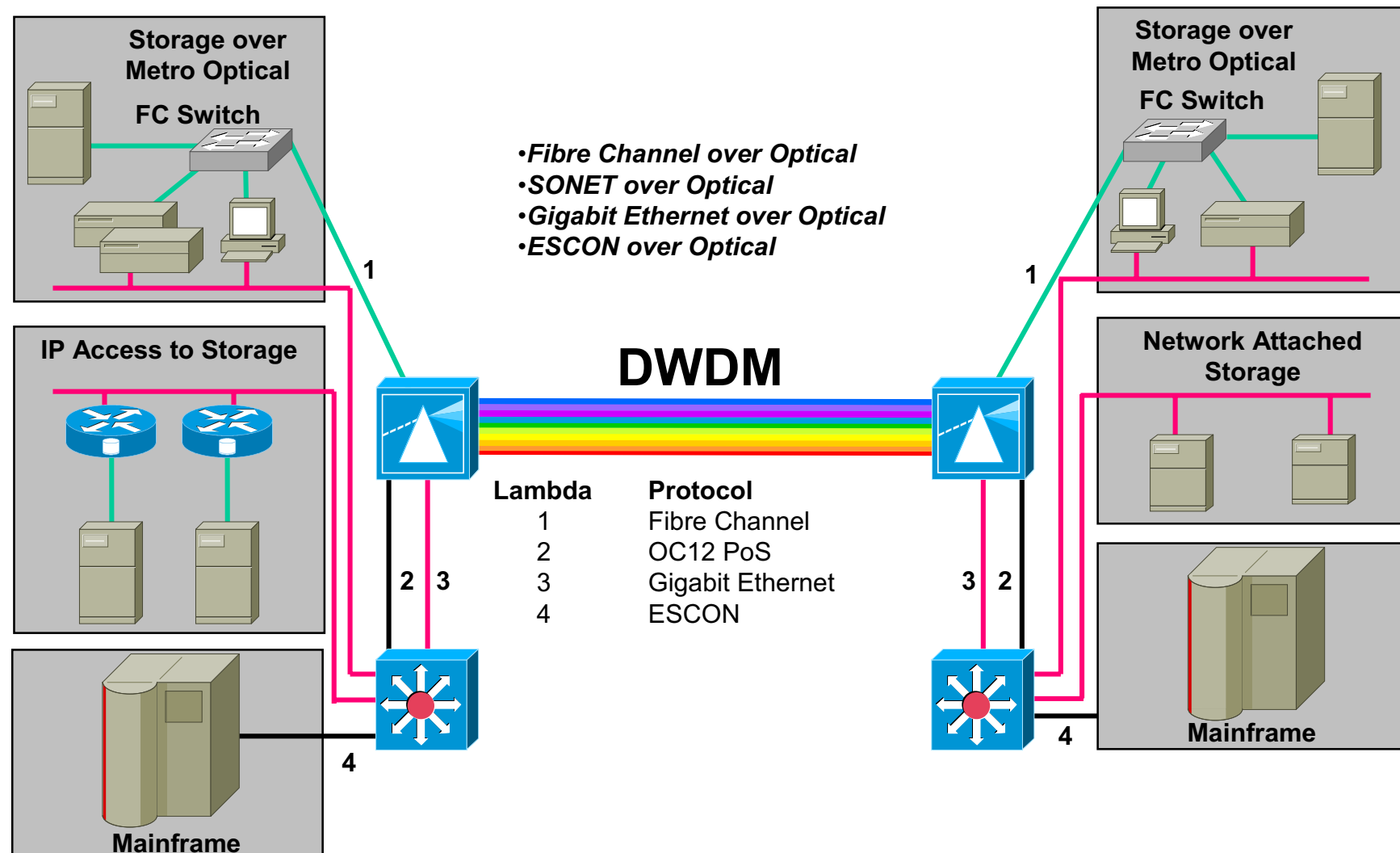
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- Interconnect Fibre Channel islands
- Business Continuance
- **Future** Catalyst 6000 FC PAM



Physical Interface over Optical

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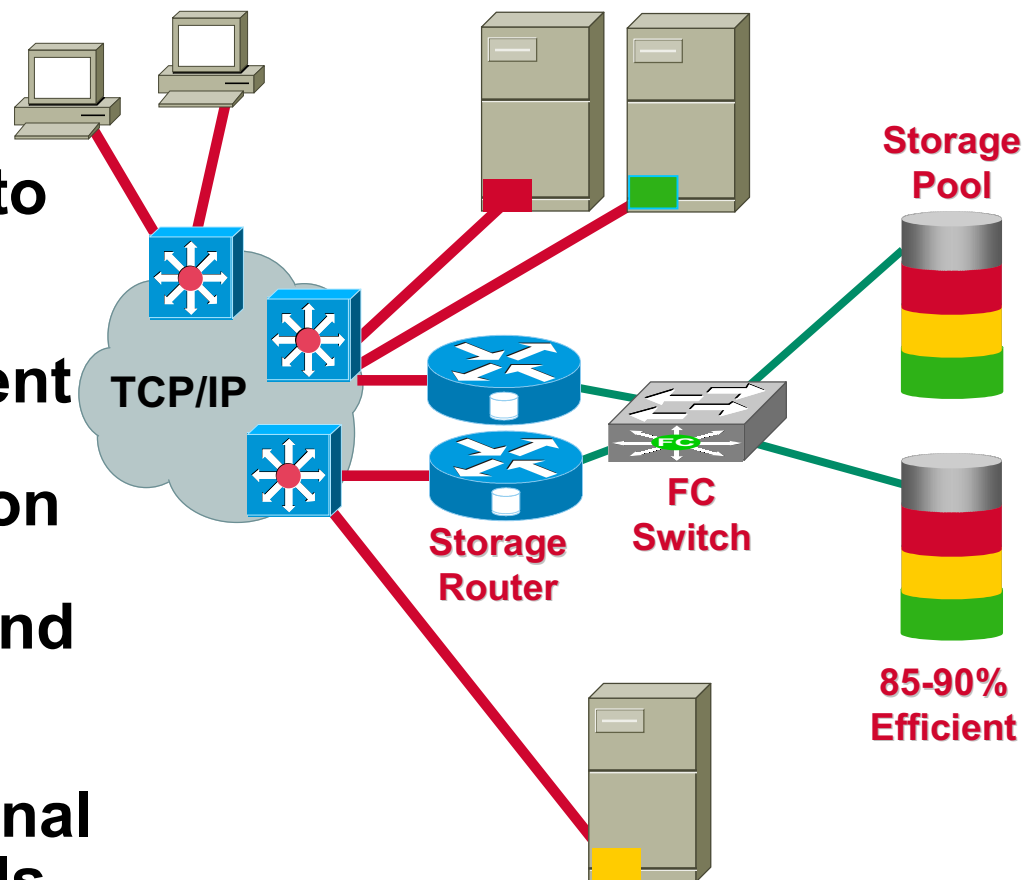


Storage Consolidation

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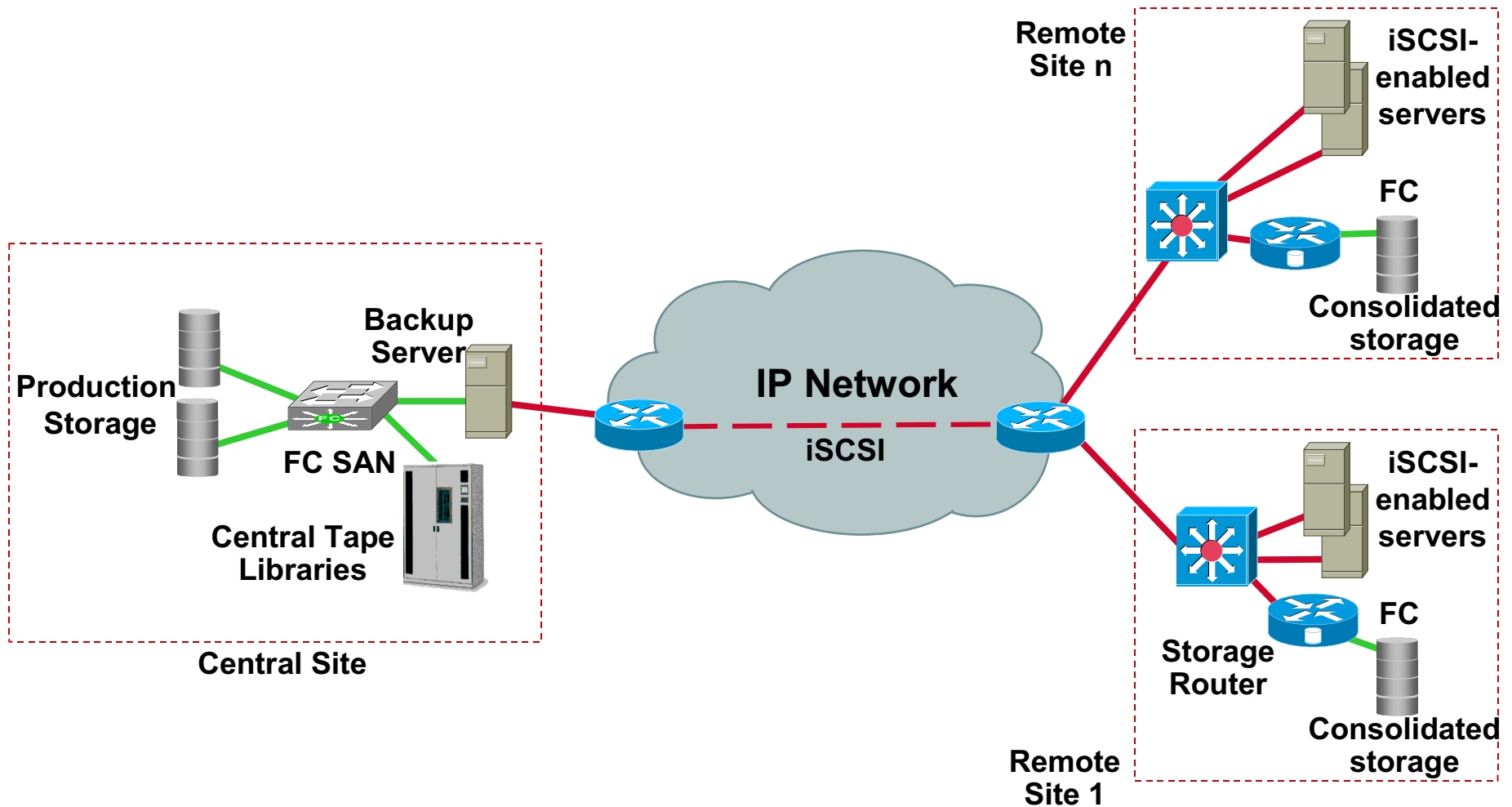
Block Access over TCP/IP to Storage Pool

- More scalable access to storage pool
- Centralized management
- Improves disk utilization
- Improves availability and performance
- Flexibly assign additional storage and RAID levels



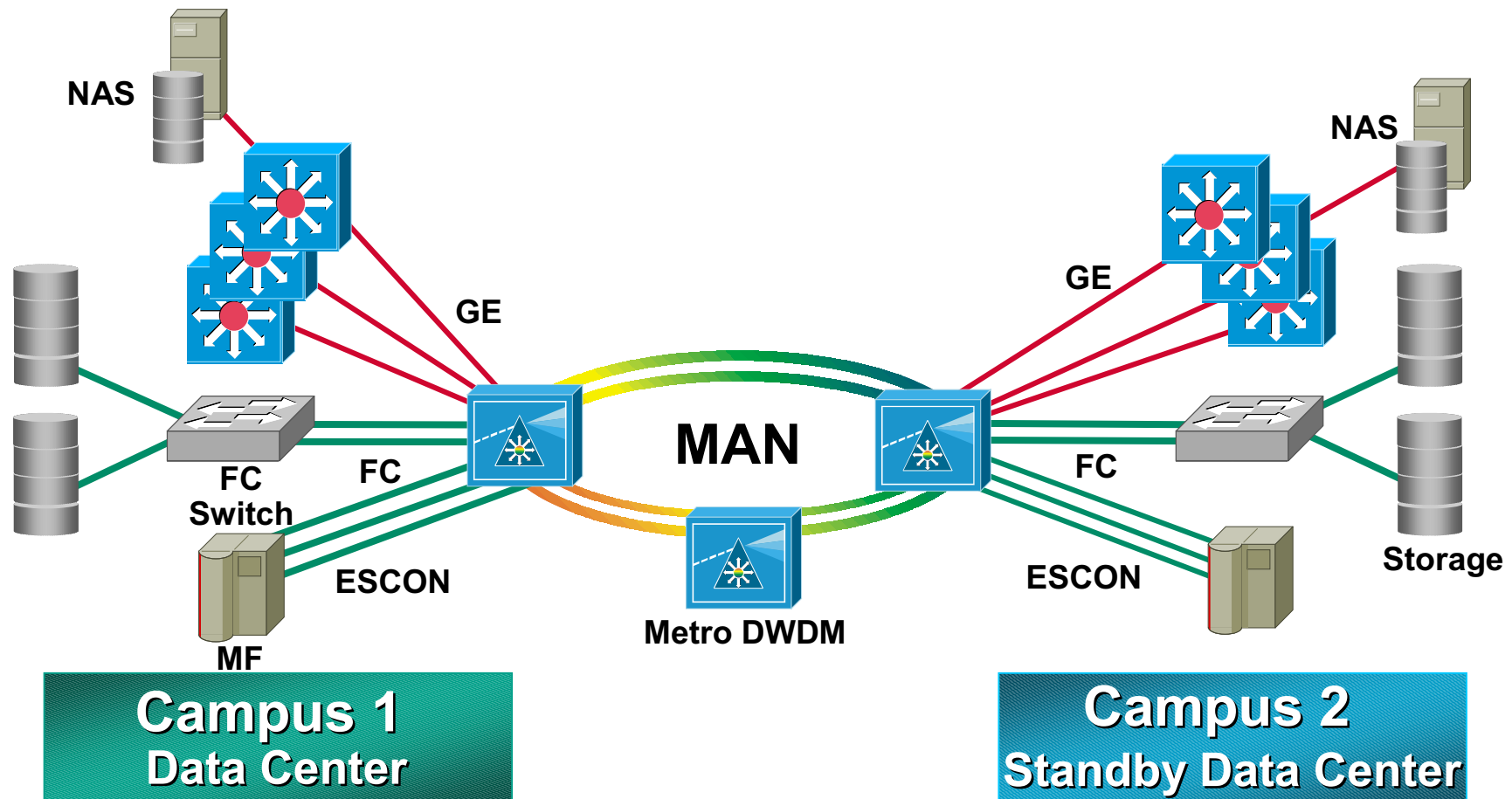
Remote Backup for Tape Consolidation

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Disaster Recovery Across MAN (DWDM)

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Storage Networking Solutions

Storage Consolidation

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Cisco Metro Optical

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SERVICES

Data (IP, FR, ATM, PL)
Storage (FC, ESCON, iSCSI, outsourcing)
Legacy and IP voice
Ethernet Provisioning (MDU, MTU)

Switching and Aggregation

Next Gen Metro
Optical
Transport
(SONET/SDH)

Resilient
Packet
Ring (DPT)

IP/
Ethernet
Switching

Metro Dense Wavelength Division Multiplexing
(Metro DWDM)

Fiber Infrastructure

Cisco Product Portfolio

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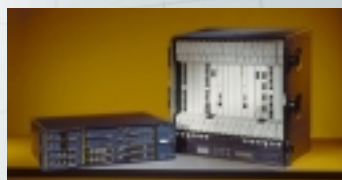
ONS 15201 + 15252

- lowest first cost λ to building solution
- OC/STM-n, GE, bit-rate independent

λ
To The Building



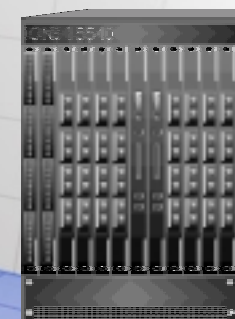
ONS 15216 + 15454/15327



- 500+ customers
- #1 Ethernet over SONET (CIR)
- #1 OC48 (RHK)

ONS 15540 ESP

- Dense ESCON, FC, GE
- EMC, IBM
- Transparent, bit-rate independent interfaces



New

Summary

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- **Storage networking is a tornado requirements for Business Continuance**
 - **Storage drives significant network infrastructure**
 - **Cisco's Complete resources and team to assist SAN**
 - **Cisco's Strong product portfolio & Solutions**
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CISCO SYSTEMS



EMPOWERING THE INTERNET GENERATIONSM