Satellite, Broadcast & Broadband Networks Powered with Storage Area Networks

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LSI LOGIC

The Communications Company ™

Agenda

- **LSI Logic Overview**
- **Entertainment & Media Market Business Challenges**
- **Enterprise Storage Demands**
- **Broadcast Services Architecture**
- **Satellite, Broadcast, Broadband Networks: Content over the Edge**
- **What is the SAN? Performance.....**
- **Enterprise Storage Architecture**
- **SAN Infrastructure: Platforms, Switches, HBA**
- **Business Impact: Storage Consolidation and Hot Scale Technology**
- **Customer Testimonials**
- **Conclusion**

LSI Logic Inc. Semiconductors to Fibre Channel Storage

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Telephones Voice Over IP
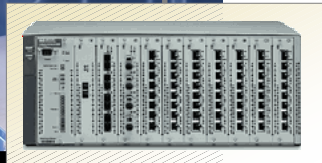
Digital Cameras

Data Servers

Video Games

PDAs

Workstations

Internet

LANs
WANs
Routers
Hubs
Switches

Digital Copiers

Scanners

DVD

Storage Systems

PCs

Internet Browsers

Set-Top Decoders

3

Entertainment & Media Market Business Challenges

INTERNET

Managing Growth/Complexity
Ability to adapt rapidly to changing business conditions within the broadcast environments

Business Intelligence
Information access, data availability at all times with no barriers to access

Containing Costs
Lower total cost of ownership and investment protection
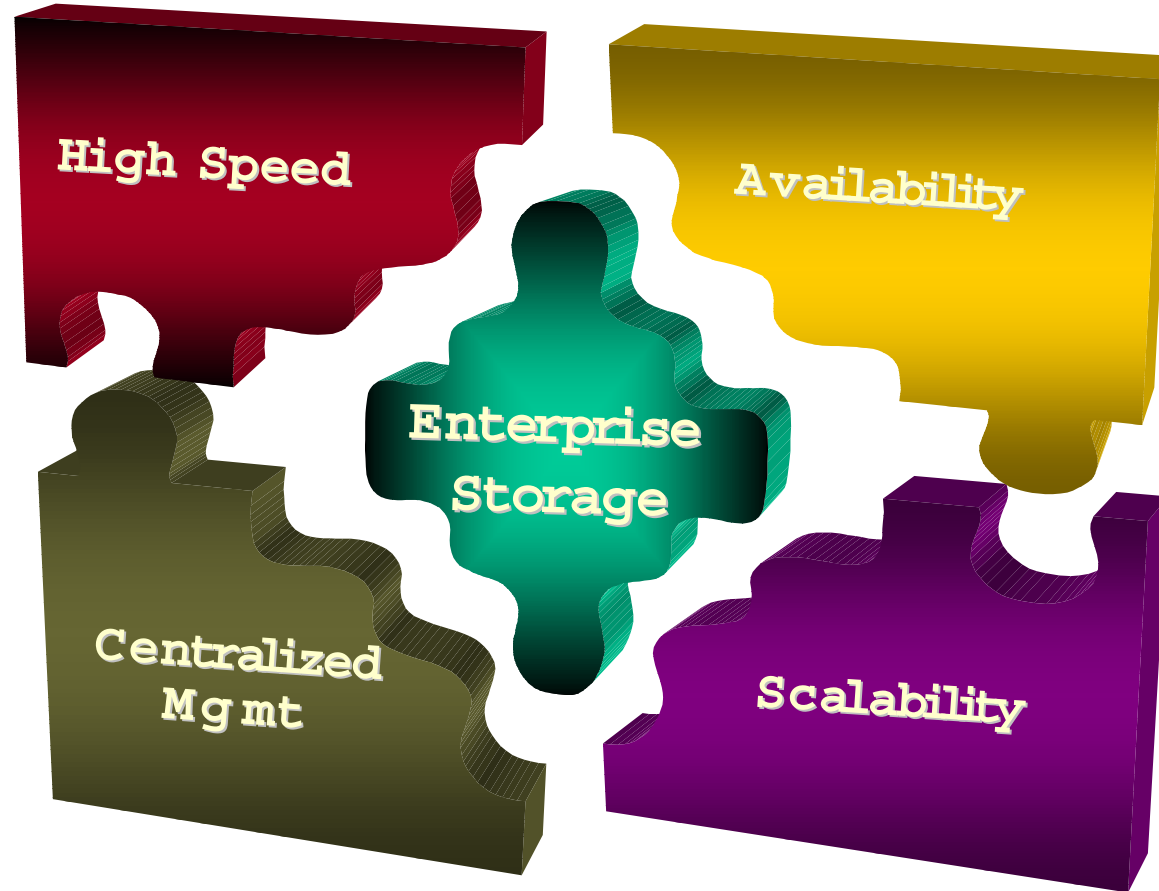
Increasing Productivity
Speed of access must keep pace with ever accelerating and new technological demands on the enterprise

Mission Critical Computing
Service Level Agreements
24 X 7 X 365

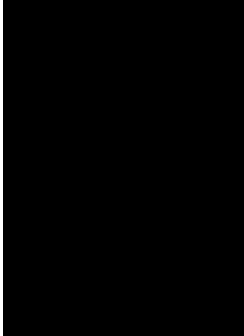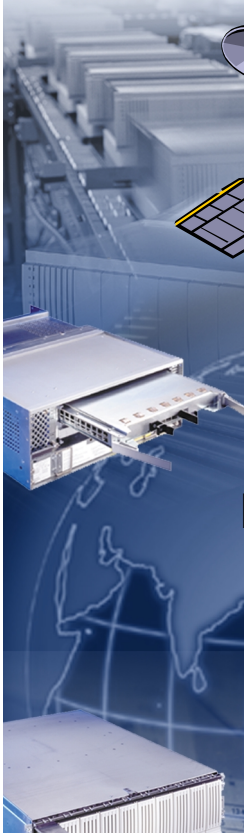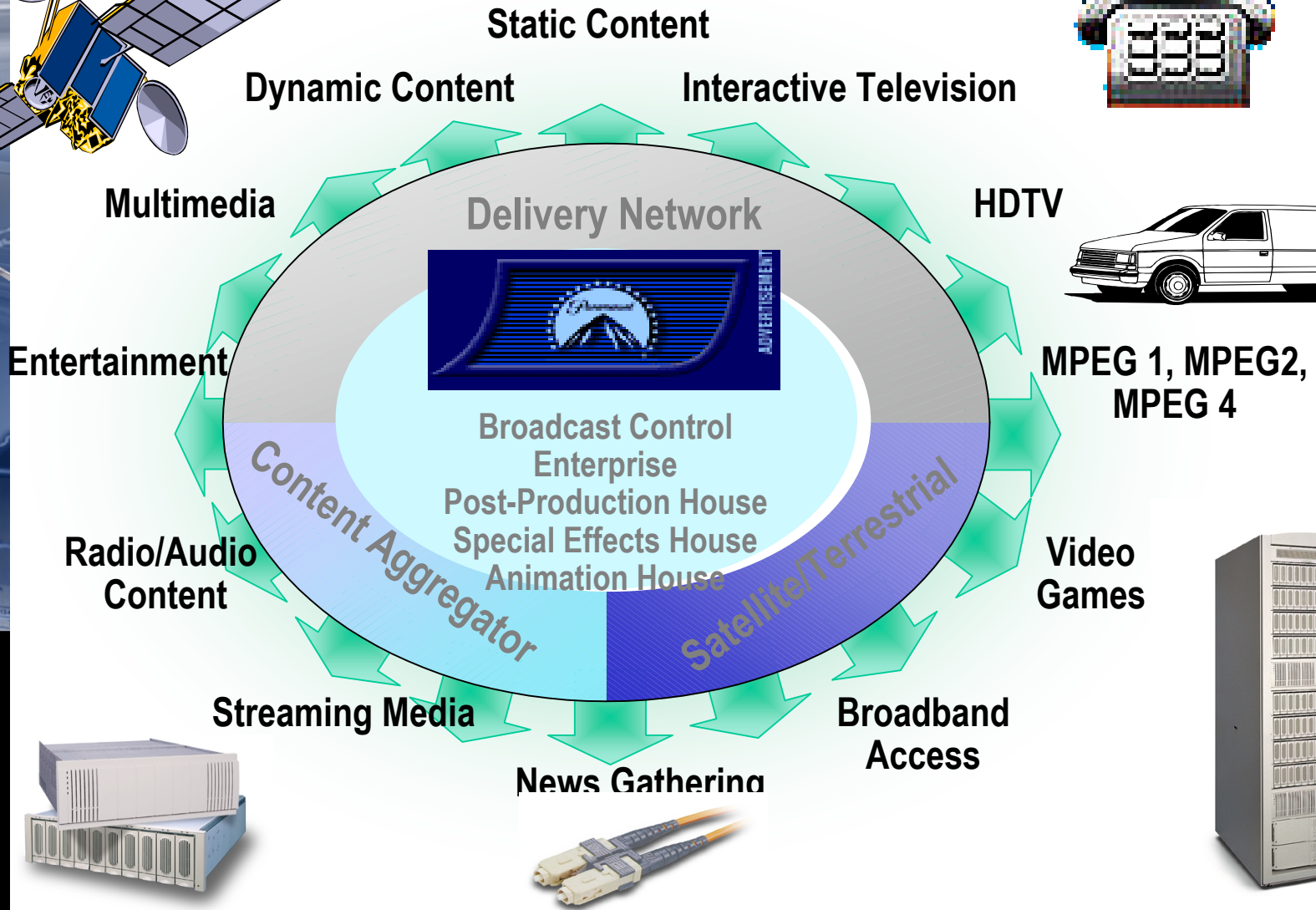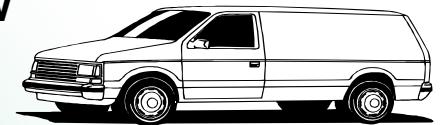# *Enterprise Storage Demands within the Broadcast/Network Operations Center*

High Speed

Availability

Enterprise Storage

Centralized Mgmt

Scalability
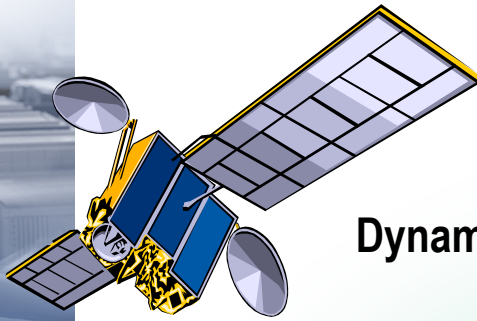
Open Storage Management Strategy

CONTENT delivered to "THE EDGE" via SATELLITE, BROADCAST OR BROADBAND SERVICE PROVIDERS

Static Content

Dynamic Content

Interactive Television

Multimedia

Delivery Network

HDTV

Entertainment

Broadcast Control
Enterprise
Post-Production House
Special Effects House
Animation House

MPEG 1, MPEG2, MPEG 4

Content Aggregator

Satellite/Terrestrial

Radio/Audio Content

Video Games

Streaming Media

Broadband Access

News Gathering

Enterprise Storage
Broadcast/Network Services
Architecture

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Management
Sales, Trafficking, Billing, DataWarehousing, Personalization

Raw Content

Content Production
- Service Creation
- Content Management
- Encoding
- Editing
- Storage

Program Packaging
- Scheduling
- Program Guide
- Channel Management
- Storage

Distribution
- Transport Mixing
- Conditional Access
- Local Insertion
- Playout

Consumption

Application Services

Delivery Services

Backchannel

Applications Running in a Broadcast Environment
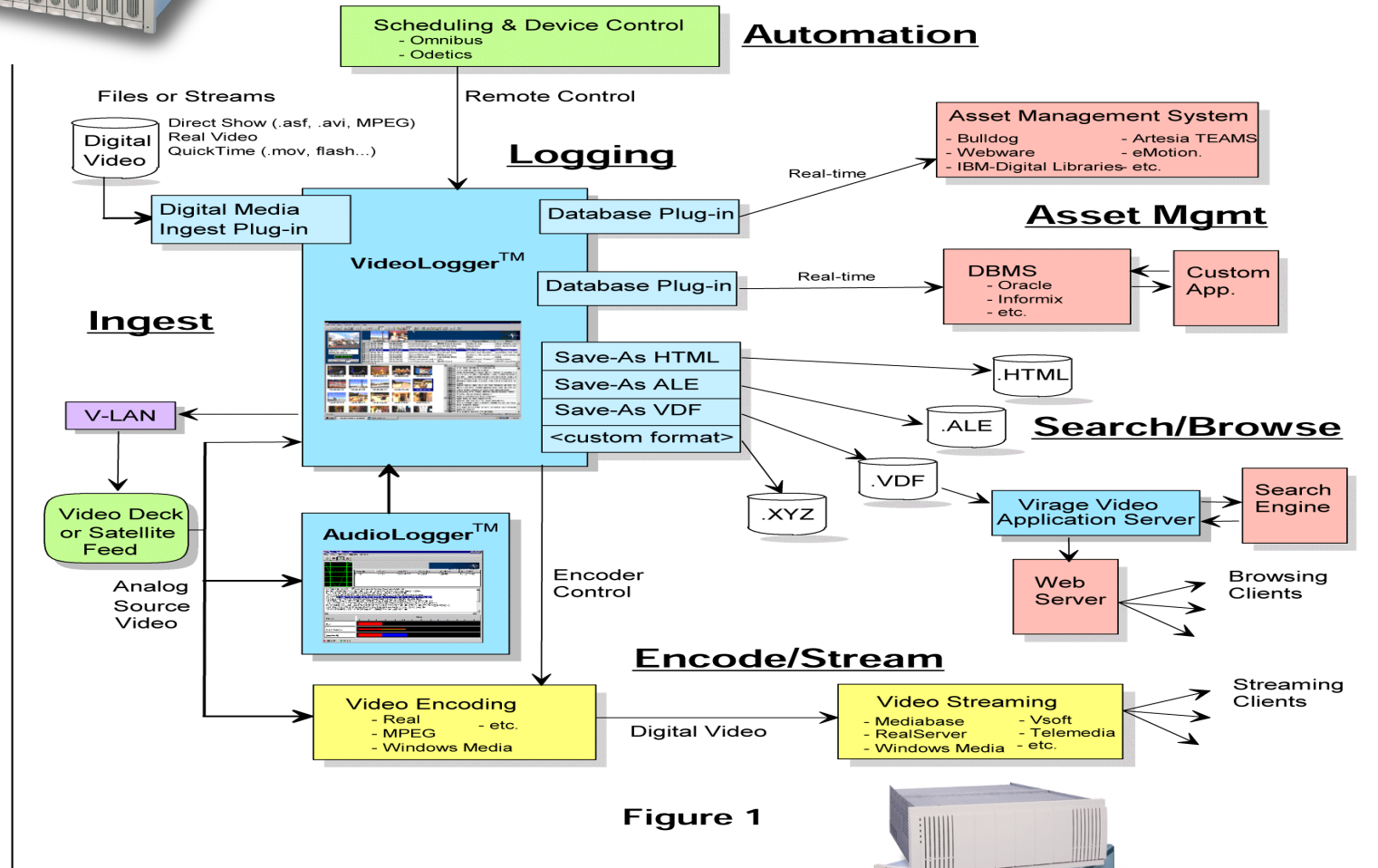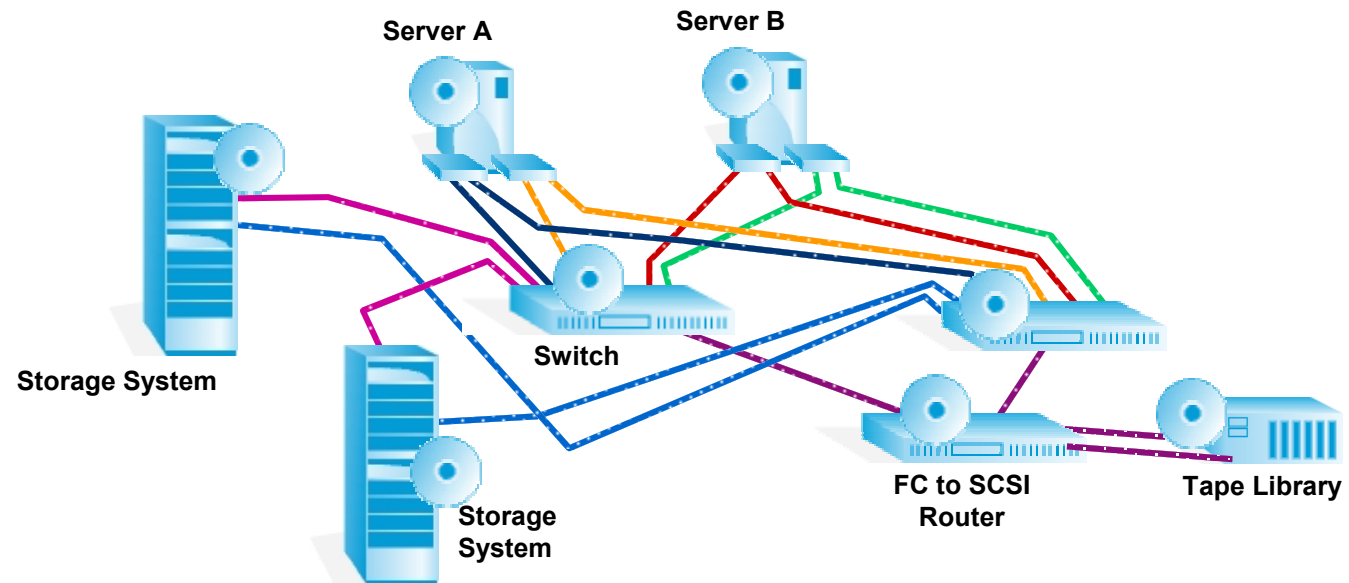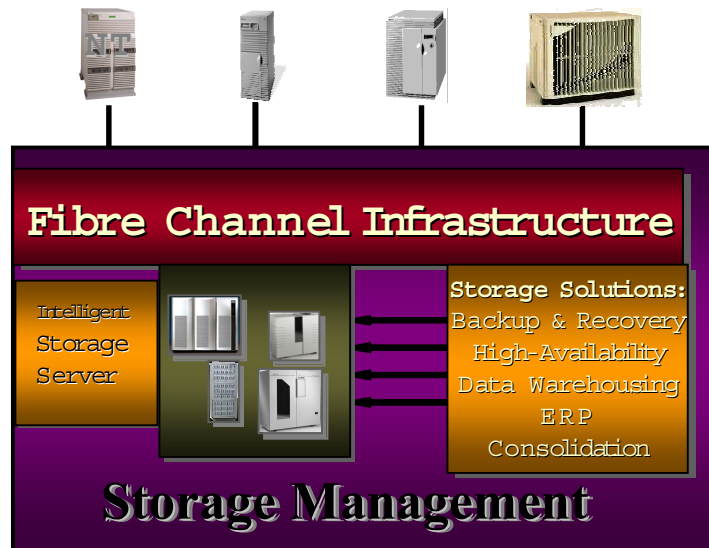

Figure 1

What is a Storage Area Network (SAN)?

- **A SAN is a dedicated network connecting storage devices and computers**

  - All data and control information is transferred between computing elements and storage devices over the high speed SAN infrastructure

  - Storage devices communicate with each other to accomplish storage-related tasks

Server A

Server B

Storage System

Switch

Storage System

FC to SCSI Router

Tape Library

Enterprise Storage Architecture

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Storage Area Networks

Fibre Channel Infrastructure

Fibre Channel Infrastructure

Intelligent Storage Server

Storage Solutions:
Backup & Recovery
High-Availability
Data Warehousing
ERP
Consolidation

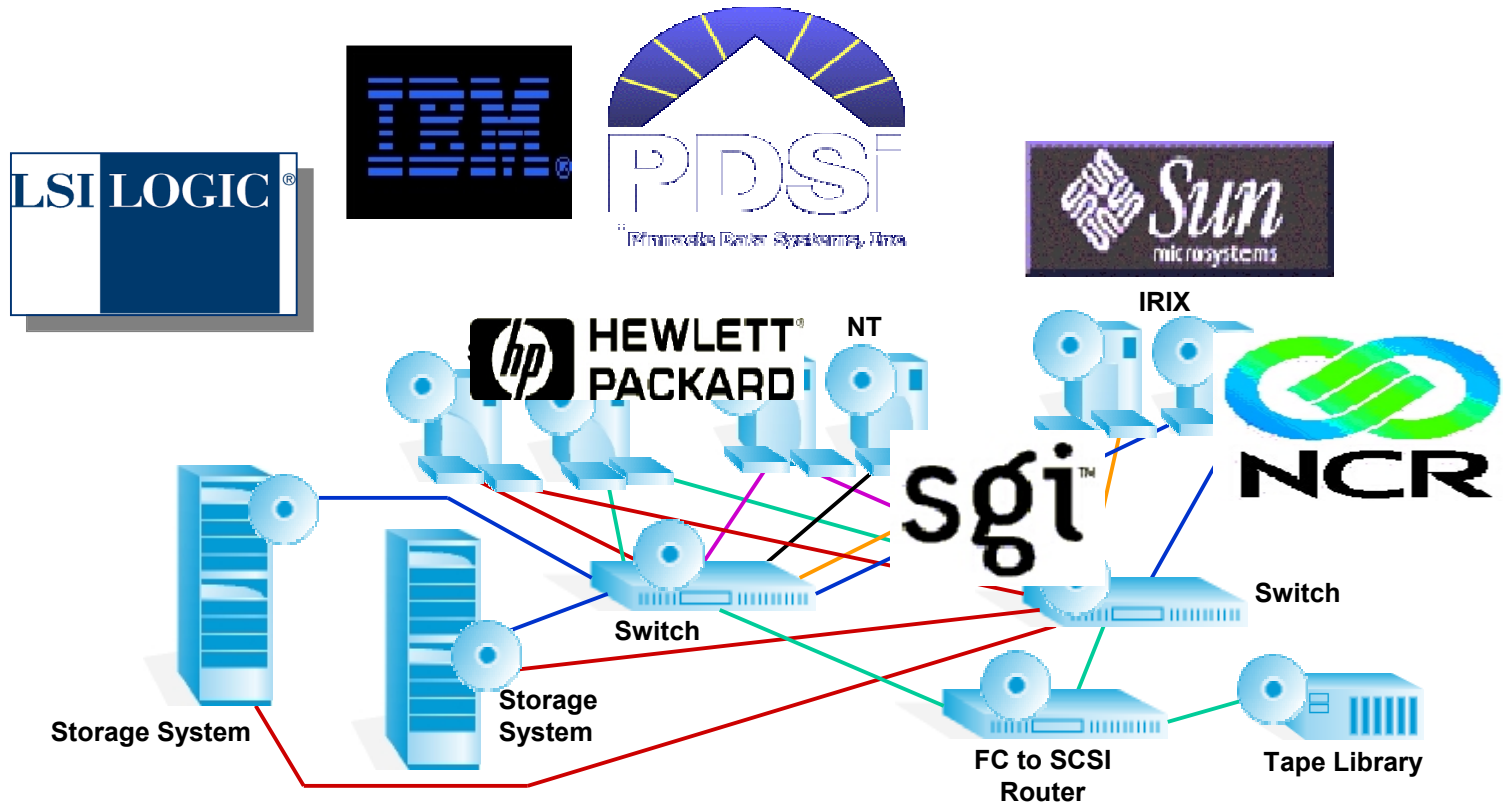**Storage Management**

Storage Hardware Devices

Storage Management

**Storage Sales & Service Support**

SAN Hardware Servers

- ## Video Server Platforms
  - **HBA must be available for all major and min-major platforms**
  - **SNIA, jointly develop, test and market and service new technologies**
  - **provide quick time to market solutions**
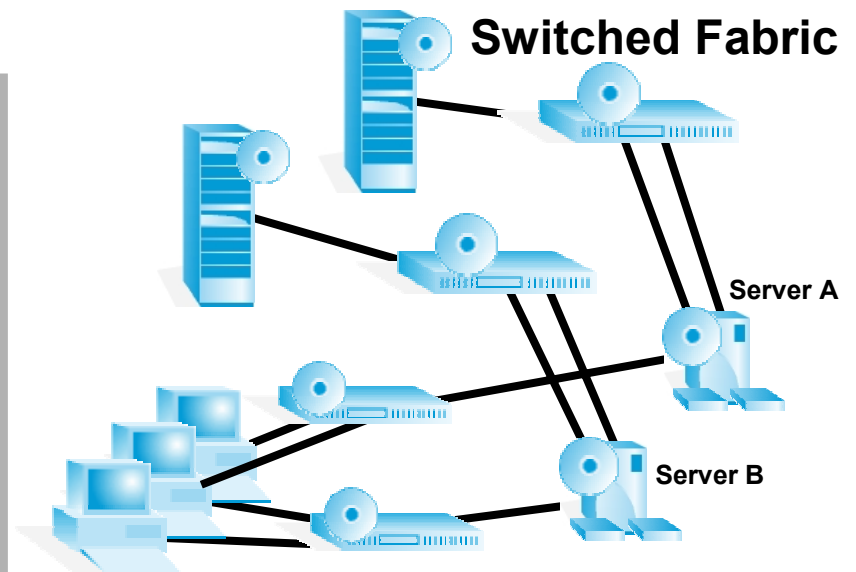   - NT, SGI/IRIX, Sun/Solaris, Apple/Mac and others

SAN Infrastructure

- **Hubs and switches provide the any-to-any connections between computing elements and storage devices**
  - Many choices in cost, performance, extensibility, availability and management

Hub

Server B

Server A
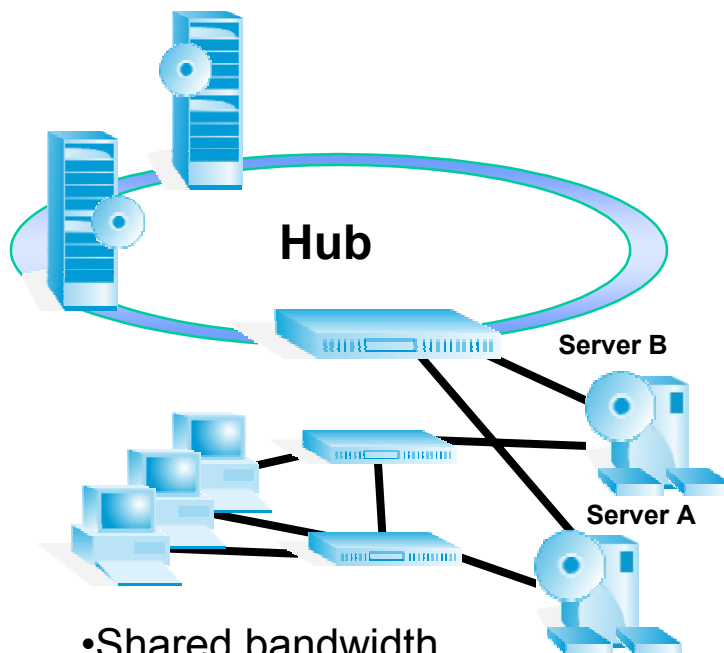
- •Shared bandwidth
- •Lower cost
  - Emulex, Gadzoox, Vixel

Switched Fabric

Server A

Server B

- •Full bandwidth for all connections
- •Higher cost
- •Scalable
 - Brocade, Ancor, Gadzoox, McData, Vixel

SAN Hardware Devices

- **Fibre Channel Host Bus Adapters**
- **Not all adapters available for all platforms**
- **Widely available for many popular platforms**
  - NT, SGI/IRIX, Sun/Solaris, Apple/Mac and others
  - LSI Logic, Qlogic, Emulex, Prisa, JNI, Agilent

Storage System

Storage System

Switch

Switch

FC to SCSI Router

Tape Library
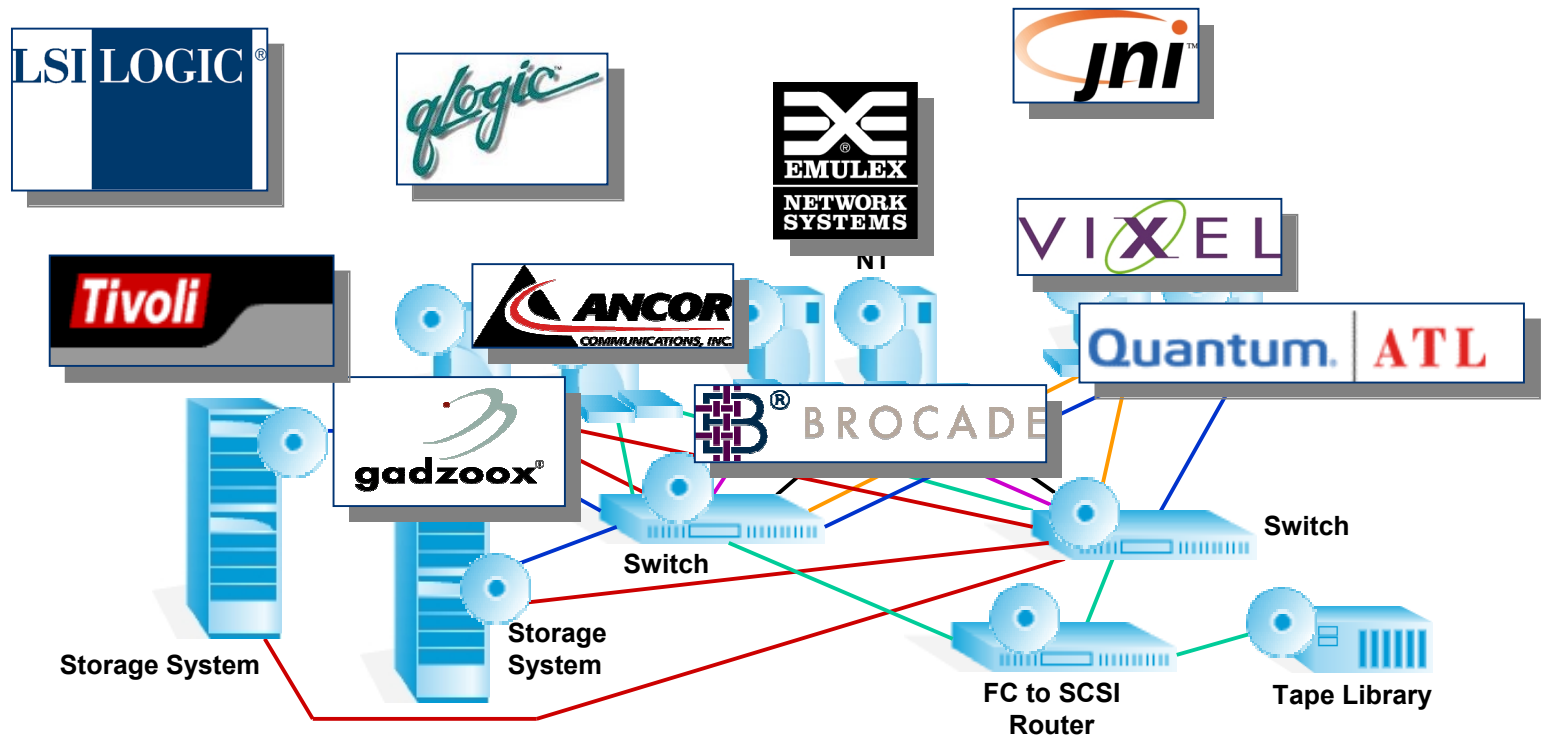
Fibre Channel Infrastructure

- **Fibre Channel Data Transfer Rates**
  - ◆ 1 Gigabit/sec. transfer rate
    - ● 2 Gigabit/sec. Protype Technology
  - ◆ Up to 100KM point-to-point distances possible over IP
    - ● Optical media characteristics
      - ■ Single-mode LWL to 10KM
      - ■ Multi-mode SWL to 500M
      - ■ DWDM Fibre Transport -Metropolitan Area Networks

Server A   Server B

Switch

Storage System

FC to SCSI   Tape Library
Router
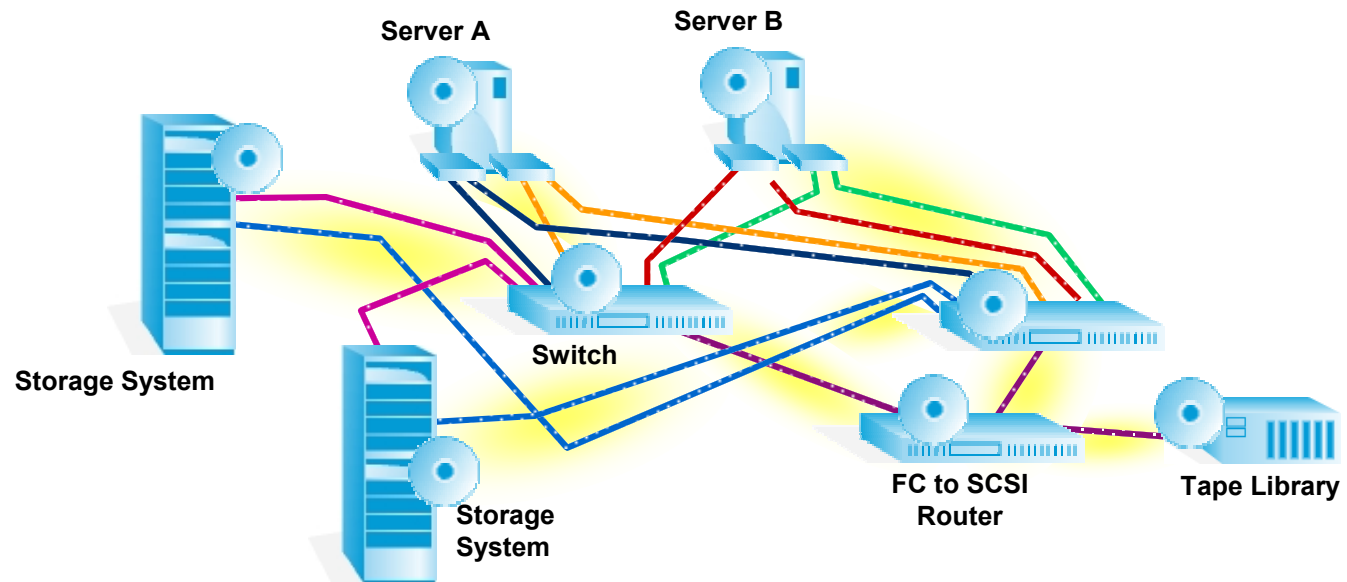
Storage
System

Storage Area Networks Studio to Post-Production

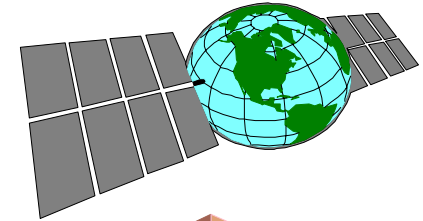**LSI LOGIC**
STORAGE SYSTEMS

- Information Core

- High Speed Connectivity

- Studio, Metro, & Post-Production

- Remote Mirroring & Failover

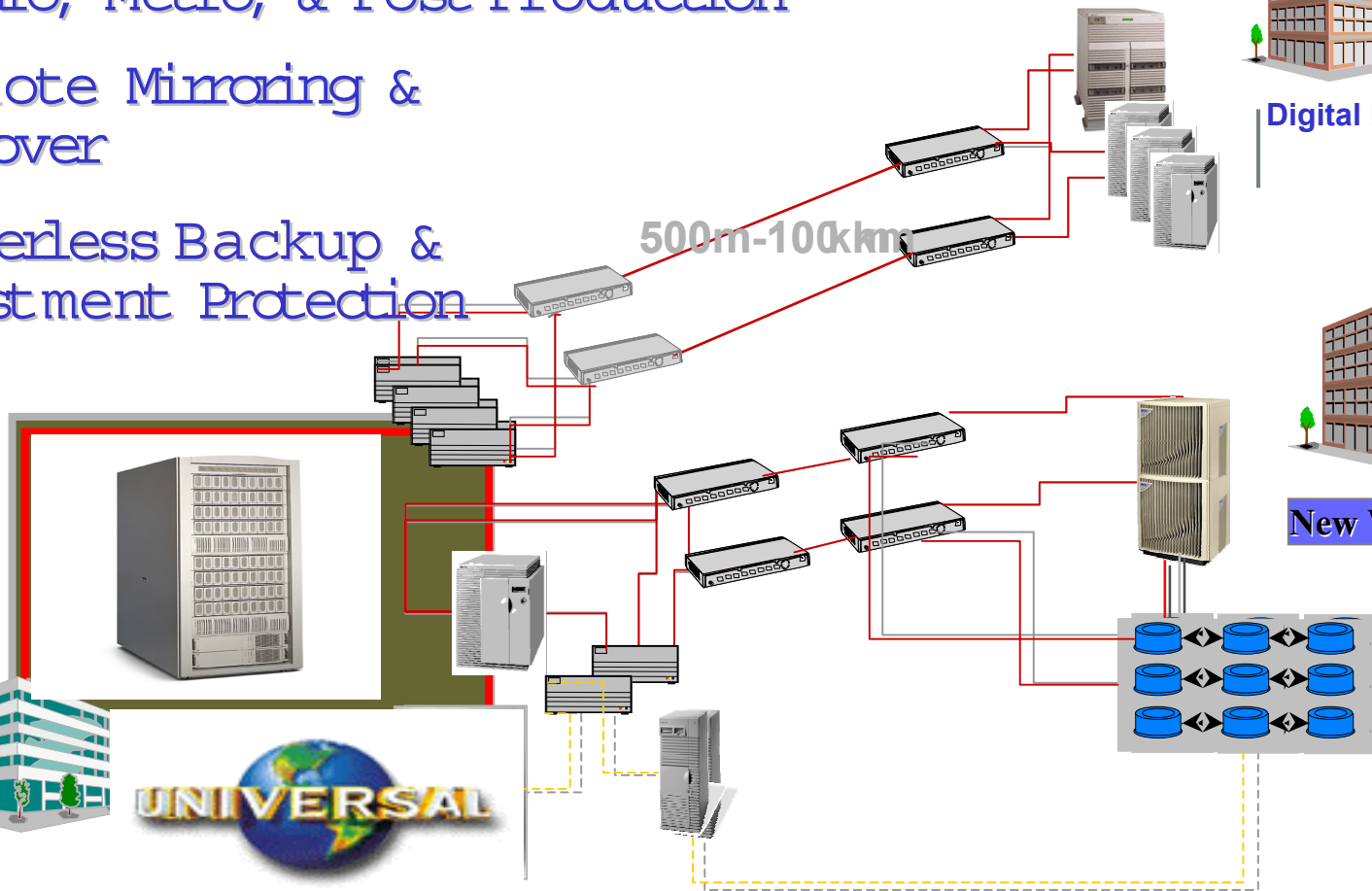- Serverless Backup & Investment Protection

500m-100km

Digital Domain

New Wave Entertain

UNIVERSAL

E4400's HotScale Keeps Data Available

- **HotScale technology maintains Fibre loop integrity when components are added or removed**

- **HotScale host-side components with no system downtime**

  - Servers can be connected or re-deployed

  - SANs can be reconfigured

  - Existing host-side components (servers, switches, hubs) unaffected

- **HotScale drive modules with no interruption to data access**

  - Scale capacity as demands grow

  - Re-deploy capacity as requirements change
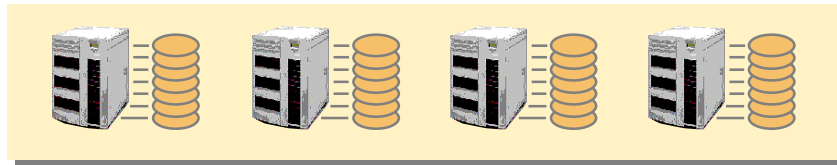
Drive loop A

Drive loop B

E4400 CM

DM 1

DM 2
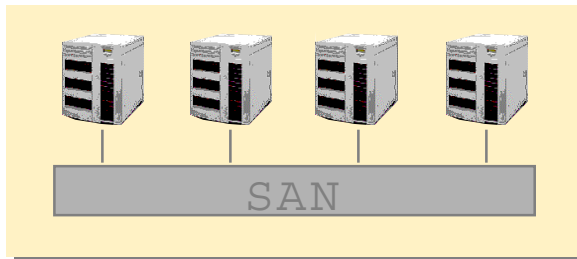
DM 3

❶ ❸ ❷
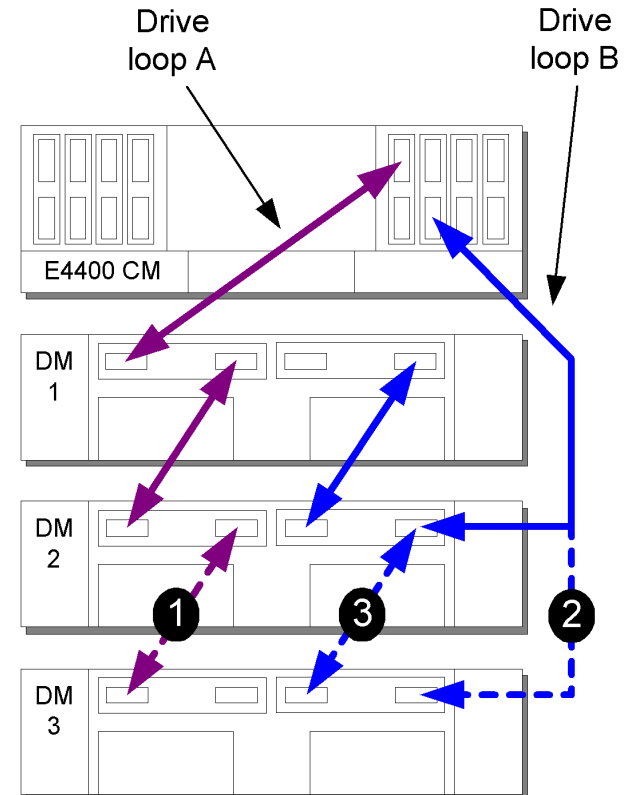
Storage Consolidation

Decentralized
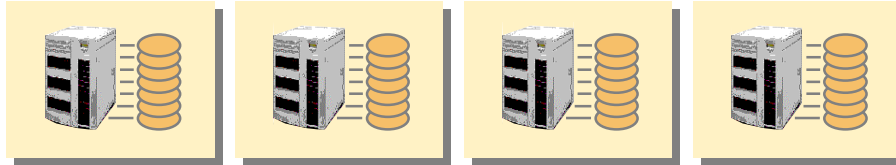
100GB per manager

Management costs = 55% of storage budget

Co-located—Server Dependent

200GB per manager

Management costs = 35% of storage budget

Consolidated Storage

SAN

750GB per manager

40% REDUCTION

Management costs = 15% of storage budget

Streaming Audio & Video Content
Digital Island

- **Business challenge**

  - Access to audio and video assets of Digital Island onto the web in multiple B to B and B to C Businesses

  - Maintain control, quality, and visibility over their assets and integrate leading edge technology

- **Solution**

  - Dell Power Edge 1300 Servers WIN 2000
  - Storage capacity: LSI Logic Storage E4400 2.0TB

- **Enterprise Storage Impact:**

  - Faster accessibility to their assets increased productivity
  - Better performance time, better customer satisfaction allowing them to maintain market share

Storage Consolidation:
MTV Networks

- ● **Business Challenge**
  - ◆ Storage Consolidation with Animated Television Shows
  - ◆ Business Continuance with increased performance with a fair total cost of ownership
  - ◆ Manage their own network environment

- ● **Solution**
  - ◆ 1 E2400 Enterprise Storage Systems
  - ◆ Advanced Intelligence Tape (AIT) Library

- ● **Business Impact**
  - ◆ Cost savings across the enterprise
  - ◆ 18 Editing Workstations (AVID) consolidated to one storage subsystems
  - ◆ Increased productivity with less resources

Business Continuance:
Digital Domain

- **Business Challenge**
  - C/S system availability and performance intensive
  - C/S system 24/7
  - I/O intensive
  - Slow rich media file rendering
- **Solution**
  - Sun Servers, SGI Servers, LSI E4400
  - Storage capacity 4.0 TB
- **Business Impact**
  - 35% - 70% improved performance
  - Improved productivity and accessibility for 400 special effects artists

  no down time - 24/7 365 days a year

Bottom Line

- **Business Efficiency**
  - ◆ Reliable, First in Class partnerships
  - ◆ Adaptive Architecture: Open SAN vs. Proprietary SAN
  - ◆ No Vendor Lock limits choice and pricing, assures best of breed components and pricing
  - ◆ Business & Storage

- **Increase Revenue Stream**
  - ◆ Uptime/Availability
  - ◆ Business Continuance

- **Cost Reduction**
  - ◆ Operational Support-end to end interoperability certified?
    - ● Applications and infrastructure
  - ◆ Cost Of Ownership
  - ◆ Investment Protection

LSI Logic Storage Systems
Delivering Solutions

Drive To Success
with LSI Storage!