Prepare your Data Center for Business Continuance

Benny Chan
Product Marketing Manager – Data Center
Cisco Systems APAC
Agenda

- Business Resilience Challenges and Trends
- Solutions for the Resilient Business:
  - Data Resilience
  - Application Resilience
  - User Access Resilience
- Summary
The Answer…..

- 75% of IT decision-makers are altering Disaster Recovery/Business Continuance programs as a result of September 11.
- Following a disaster, 43% of directly affected businesses do not reopen and 29% fails with 24 months as a result.
- Only 15% of Global 2000 enterprises have a full-fledged business continuity plan.
What Would You Do If Your…

- Headquarters and data center were destroyed?
- Network that supported 5000 desktops and servers was ruined?
- Corporate employees were displaced?
- PBX phone communications were disrupted?
- 45 Branch offices were unable to access mission-critical applications?
The Makings of a Resilient Business

Lehman Bros. Reopened for Business the Next Day

- **Recovering Applications and Data**
  Synchronized data centers across a metro network ensured fast recovery of data and applications

- **Continuous Communications**
  IP telephony network enabled continuous voice communications
  Voice traffic rerouted over IP to alternate PSTN gateways in Europe, enabled communications with customers

- **Ensuring Continuous Access**
  Data and communications secured over public networks using VPN technology provided continued access
  Instant offices in hotel rooms, using wireless and VPN technologies allowed key personnel to get back to work
Business Resilience is a Business Strategy

- Regulatory / Current Affairs
  - Customer Expectations
  - Regulations
  - Contractual Obligations

- Operational
  - Business Operations
  - Budget

Enterprise Policy and Operational Process

- User Access
- Application Availability
- Data Integrity

Pervasive Security

Current Affairs

Business

Regulations

Operational

Contractual

Budget

Customer

Expectations

Obligations
Agenda

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Business Continuance

Data Resilience

User Access Resilience

Ensuring Uninterrupted Anywhere Access to Applications and Services

Technology Enablers

VPN’s; Mobility
Global Load Balancing; Multi-channel Communications

Application Resilience

Ensuring Availability and Protection of Applications and Communications Services

Server Load Balancing; Infiniband Clusters; HA Clustering; Geo-Clustering

Data Resilience

Ensuring Data Protection, Accuracy, Availability and Integrity

SAN Extension; High Speed DC Inter-Connect; Platform for Storage BC/DR Applications; Virtualization

Business Need
Key Data Resilience Technology Challenges

Designing Technology Solutions That Balance:

- Application / Process Recovery Objectives (RPO and RTO)

- Distance
- Storage Capacity
- Application Performance
- Risk
- Cost
Defining the Window of Unavailability

- **Last backup or point where data in usable state**
- **Disaster strikes**
- **How far back?**
- **Data loss**
- **How long to recover?**
- **Systems recovered and operational**

**Recovery Point Objective (RPO)**
What is the cost and impact of data loss? How much data loss is tolerable in event of disaster or failure?

**Recovery Time Objective (RTO)**
What’s the maximum tolerable outage? When must operations resume after a disaster?
Identifying Requirements

Enterprise Policy and Requirements

Value of the Data
- Cost of Downtime
- Risk
  - Enterprise RPO and RTO policy

Applications and Process to Meet Policy and Requirements
- Backup and archive process
- Cold/hot standby servers
- Cold/hot standby data centers
- Synchronous or asynchronous replication

Transport to Meet Application Level Requirements
- Optical (DWDM, CWDM, SONET/SDH)
- IP (FCIP for Storage)
- Redundant paths for high availability

Application Level

Transport Level
E-Commerce: Downtime and recovery time equal lost revenue

Patient Records: Regulatory requirements demand dependable data

Strategies to Meet RPO and RTO Requirements

- High
- Immediate
- Low
- Delayed

- Tape Backup Off-site
- Tape Backup On-site
- Data Center Mirroring
- Synchronous Disk Mirroring
- Remote Data Replication
- Application-Layer Replication
- Local Data Replication
- Electronic Vaulting
- Application-Layer Replication

Business Impact of Application Downtime or Data Loss
Cisco Advantage: Enhancing Data Resilience

Meet Required Application / Process Recovery Objectives (RPO and RTO)

• Enhanced Asynch / Synch Replication, Backup, Point in Time Copy
• Multi-vendor Support: EMC, HP, HDS, IBM, Appliances
• 3rd Party Application Support: SANTap
• Network Accelerated Server-less Backup
• Enhanced Remote Backup

Cisco Technologies, Services

• Unlimited Distance Interconnect: FCIP, DWDM, SONET/SDH, Buffer Credits, TCP/IP Tuning
• Improved Application Performance: Write, local and Remote Tape Backup Acceleration
• Lower Risk: Tested and Validated Solutions and Services
• Lower Cost: Compression and WAN Consolidation

Enhanced Distances, Storage Capacity, Application Performance

Lower Cost and Risk
Business Continuance with Integrated SAN Extension

**FCIP**
- Description
  - Unlimited Distance between Data Centers
  - Can utilize Cost Effective IP MAN/WAN
  - Supports Asynchronous Replication
  - Supports Remote Tape Backup
- Cisco Solution Benefits
  - FCIP Integrated in MDS Switch
  - Large Buffer Credits, Tuning for WAN Optimization
  - Integrated Encryption and Compression
  - Write and Tape Acceleration

**Production Data Center**
- Fibre Channel over IP (FCIP)
- Fibre Channel over DWDM
- Replication Software
- Enterprise Storage Arrays

**Disaster Recovery Data Center**
- IP WAN
- Optical MAN
- DWDM
- Cisco MDS
- Cisco ONS
- Replication Software
- Enterprise Storage Arrays

**DWDM**
- Description
  - Distances 5-320 km
  - Synch / Asynch Mirroring and Backup
  - Higher b/w for Faster Tape Recovery
  - Low Latency for Minimal App Impact
- Cisco Solution Benefits
  - Optical and SAN Platforms to Meet all Needs
  - Integrated DWDM and SONET/SDH Platform
  - High Density FC, GE, 10GE, FICON, ESCON
  - Buffer Credit Management at the optical layer
Comprehensive SAN Extension Solution

Primary Data Center

Backup Data Center

WAN/MAN

MDS 9216i

Application Performance
Tape & Write Acceleration

Application Availability
Inter-VSAN Routing

New

WAN Utilization
Hardware Compression

Application Tuning
SAN Extension Toolkit (SET)

New

Security
FCIP Encrypt and Auth.

Cost Reduction
VSAN-Enabled Consolidation

Traffic Management
QoS, TCP Tuning

Solution Management
Multiprotocol Fabric Manager

New

New

New
Cisco MDS Advantage: 
Network Accelerated Serverless Backup

<table>
<thead>
<tr>
<th>Customer Benefit</th>
<th>Proof Points</th>
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<tbody>
<tr>
<td>Lower TCO</td>
<td>▪ Offload I/O &amp; CPU work from Media Servers to SSM</td>
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<td></td>
<td>▪ Reduce server administration &amp; management tasks</td>
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<tr>
<td>Higher Performance &amp; Reliability</td>
<td>▪ Each SSM delivers up to 16 Gbps throughput</td>
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<td>▪ SSM integrated into a high availability MDS platform</td>
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<tr>
<td>Investment Protection</td>
<td>▪ No changes to existing backup environment</td>
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<td>▪ SSM Data Movement can be enabled with software</td>
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Cisco MDS Advantage: SANTap

**Customer Benefit**

**Proof Points**

<table>
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<tr>
<th>Increased Agility</th>
<th>Insert new appliance-based applications seamlessly</th>
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<tr>
<td>High Availability Solution</td>
<td>Preserves integrity, availability and performance of primary I/O</td>
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<td>Improved Business Continuance</td>
<td>Supports replication, point-in-time copy, and continuous data protection applications</td>
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Cisco MDS Advantage: Network-Hosted Storage Virtualization

Dynamic Volume Migration

- Non-disruptive movement of production data across storage
  - Lease Roll-over
  - Seamlessly upgrade storage
  - Reconfigure storage to meet SLA objectives
  - Data Center migration/ additions

Production System

Backup System

Application

Migrate back
Choosing the Appropriate Metro Technology

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<th>Campus 1</th>
<th>Campus 2</th>
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<tr>
<td><strong>Enterprise Applications</strong></td>
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<td><strong>Cisco Metro Products</strong></td>
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<td><strong>Provided Service</strong></td>
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<tr>
<td>Dark Fiber</td>
<td>DWDM</td>
<td>Ethernet or SONET/SDH</td>
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<td><strong>Enterprise Interconnect Technologies</strong></td>
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<tr>
<td>GE/DPT</td>
<td>DWDM</td>
<td>SONET/SDH</td>
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<tr>
<td><strong>“Do-It-Yourself” Dark Fiber</strong></td>
<td><strong>Lease Wavelengths or Managed Services from a Provider</strong></td>
<td><strong>Purchase Services from a Provider</strong></td>
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Business Continuance
Application Resilience

User Access Resilience
- Ensuring protection and availability of applications and communications services

Application Resilience
- User Access Resilience
- Ensuring protection and availability of applications and communications services

Data Resilience

Business Need

Technology Enablers
- Server Load Balancing; InfiniBand Clusters; HA Clustering; Geo-Clustering
Key Application Resilience Technology Challenges

- Reducing or Eliminating Points of Server Failure
- Support Server Scale Up and Scale Out Strategies
- Support for Web, Application, Database Tiers
- Ensure Resilience for Communications Applications
Removing Points of Failure At All Tiers

- Load Balance Across Web Servers
- Cluster Scale Out Application and Communication Servers
- Cluster Between Data Centers
- HA Cluster Between SMP DB Servers
- Cluster Between Data Centers
- CallManager Interconnect
- CallManager Cluster
- CallManager Cluster
Communications Server Clustering for Availability and Scalability

- Enables call processing redundancy for fast failover
- Yields scalability up to 10,000 IP Phones per cluster
- Assures consistent device configuration and optimal call routing
- Local and distributed clusters
High Availability Clusters

- Active – passive failover
- Heartbeats, status, control synchronized through private and public networks
- Client reconnection transparent - shared IP address
- Failure transfers ownership of storage
- Microsoft Cluster-aware applications include:
  MS SQL Server
  MS Exchange
What is a GeoCluster?

- Protect against even catastrophic site-level failures
- GeoCluster software enhances HA Clusters
e.g. Microsoft Cluster Server, HP ServiceGuard, and IBM HACMP
- Each node maintains its own storage with an independent, synchronized copy of the cluster data
- Requires multiple high-speed low latency interconnects
Geo Clustering For Mainframe Environments

- IBM Geographically Dispersed Parallel Sysplex (GDPS) synchronizes mainframe computing resources
- Load balancing across computing resources and instantaneous failover to alternate site
- Requires high bandwidth, low latency, low jitter network
Server Farm Network Resiliency Design Goal – Application Transparency

- Failover time is the combination of convergence at L2, L3, L4
- Stateful Devices typically failover within 3s
- Etherchannels << 1s
- STP converges in <1s
- HSRP can be tuned to < 1s
- Fallback converges in ~4-5s
Business Continuance

User Access Resilience

User Access Resilience

Business Need
Ensuring Uninterrupted Anywhere Access to Applications and Services

Technology Enablers
VPNs, Mobility Global Load Balancing, Multi-channel Communications

Application Resilience

Data Resilience

Ensuring Uninterrupted Anywhere Access to Applications and Services

Blade Servers UNIX/NT Servers Mainframes

MDS 9500

Storage & Tape Arrays

VPNs, Mobility Global Load Balancing, Multi-channel Communications
Key Access Resilience Technology Challenges

- Ensuring Continuous Access to Applications and Communications Services
- Ensuring Ability of Applications to be Served from Multiple Locations
Ensuring Continuous Access
Global Site Selector – GSS 4491

- Load balance across multiple sites
- Redirects users to most available Site
- Unique proximity features

Branch Worker or Online Customer

Application Servers Fail

Data Center 1

Server & Comms
Cluster

Catalyst

GSS 4491

Redirect to Secondary Data Center

Data Center 2

Access Network

Server & Comms Cluster

Catalyst

Application Servers Fail

Redirect to Secondary Data Center

Access Network

Server & Comms Cluster

Catalyst

Internet or Intranet or Campus Net

GSS 4491
Ensuring Continuous Access
Reconnect Branches with VPNs

- Use Internet-Based VPN for Rapid Connection of Branches and Mobile Offices
Ensuring Continuous Access
Rapid Deployment of Emergency Branches

- Wireless for Rapid LAN Deployment
- IP Communications for Internal and External Communications
- VPN for Anywhere Location

Internet-based VPN

Branch or Campus Disrupted

Data Center 1

Temporary Branch

Deploy Mobile Offices

Branch
Agenda

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Business Continuance Action Plan

1. Carry out a business impact assessment on all enterprise applications

2. Develop a business continuance and security plan between business, IT and network stake-holders

3. Engage with Cisco and partners to deploy appropriate business continuance and security solutions:
   - Data Resilience
   - Application Resilience
   - User Access Resilience

4. Continue to revise and test plans/solutions to meet changing needs
Overview of Network-Accelerated Serverless Backup (NASB)

- **SAN**
  - Application Server
  - Master Server
  - Media Server
  - Catalog
  - Backup Schedules
  - Backup Policies
  - File Catalog

- **LAN**
  - Backup Agent
  - Disk
  - Tape

- **SCSI XCOPY**
  - SCSI Read
  - SCSI Write

- **MDS XCOPY Engine**

**Key Features**

- **No changes to the existing backup environment**
  - Continue to use Backup Agents on Application Servers, Master/Media Servers and Catalogs

- **Offloads I/O and CPU work from expensive Media Servers**
  - Reduces the backup window if Media Servers are a bottleneck
  - Reduces the number of high-end expensive Media Servers

- **Increased reliability, low maintenance**
  - XCOPY Engine integrated in Highly-Available (HA) MDS platform
  - Reduces the server administration/management tasks

- **Investment protection**
  - Standards based API based on SCSI Extended Copy Command