



Storage Decisions


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Internal Recovery: Is It Right For You?

April 27, 2004
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Abstract

As IT infrastructures grow in size and complexity, many organizations are struggling to keep their continuity programs current with their business recovery requirements. This session presents a methodology for examining your existing continuity capability and its requirements, developing economic models of internal vs. external recovery, and identifying the leveragability of test & development, as well as dedicated resources for use in a disaster.




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Agenda

- Requirements for the Post 9-11 Environment
- Traditional Approaches for New Requirements
- Alternate Approaches to Contain / Reduce Overall Continuity Cost
- Some Economics



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Requirements For The Post 9-11 Environment

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The Feds "New" Business Continuity "Objectives" for Money Center Banks

- **Rapid recovery and timely resumption** of critical operations following a **wide-scale disruption**;
- **Rapid recovery and timely resumption** of critical operations following the loss or inaccessibility of staff in at least one major operating location; and
- A high level of confidence, through **ongoing use or robust testing**, that critical internal and external **continuity arrangements are effective and compatible**.

<http://www.sec.gov/news/studies/34-47638.htm>

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The Feds "New" Business Continuity "Sound Practices" for Money Center Banks

- Identify clearing and settlement activities in support of critical financial markets.
- Determine appropriate recovery and resumption objectives for clearing and settlement activities in support of critical markets.
- **Maintain sufficient geographically dispersed resources** to meet recovery and resumption objectives.
- **Routinely use or test** recovery and resumption arrangements.

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Requirements In DR Industry Terms

1. Small RTO (minutes to hours)
Is Fail-Over Required?
2. Need Coverage for Loss of:
 - a. Site
 - b. Region
3. Use the Solution; or Test, Test, Test
4. Business Continuity Arrangements must be:
 - a. **Effective**
 - b. **Compatible**

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Do The New Fed Requirements Apply to Me?

- Yes, if you are a "major money center" organization.
- Maybe, if you are a financial organization. *(The final paper stated draft reviewers suggested that the requirements should apply to all financial firms. It may be a matter of time before other regulatory agencies pick up the requirements)*
- Yes, by in large, the recommendations are sound BC practices. *Who can argue with the Testing requirements?*
- Maybe, your auditors may pick up these practices and incorporate them into their SOX audit checklists.

Just Do It!!!

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Okay

Now What???

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Emerging Continuity Practices

- Technology Recovery Center:
 - "Out of Region"
 - Within Driving Distance
- Remote Command & Control Center:
 - In Region
 - Typically Co-Located with Work Force Recovery Center
- Work Force Recovery Center:
 - In Region, but separate from current assets
 - Within Commute Distance
- Combine HA & DR Disciplines and View as Complete Continuity of Services

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Need More?

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Business Continuity Strategy Approaches

- Traditional
- Tiered
- Leveraged / Dual Data Center
- Divide & Conquer

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First, Some BC Industry Terms & Metrics

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Industry Standard Metrics: Recovery Point & Recovery Time

Hours of Lost Transactions (RP) Hours Required to Resume Business (RT)

Trans. Not Captured Declaration Data Retrieval Transist BU Tapes System Restore & App. Rest. Filesystem Restore Database Restore Dig Verification App Verification ID Lost Trans. Transaction Recreation

Recoveries Designed Around:

- **RTO** - Recovery Time Objective:
 - A measure of downtime
- **RPO** - Recovery Point Objective:
 - A measure of data loss

Recoveries Measured By:

- **RTA** - Recovery Time Achieved in Testing
- **RPA** - Recovery Point Achieved in Testing

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Typical Continuity/Recovery Times By Tiers

Tier	Recovery Time
0	Seconds/Minutes (Emerging Requirement)
1	< Half Day
2	< 1 Day
3	< 3 Days
4	As Time & Resources Permits

Critical Requirements

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Traditional BC Planning Approach

- Perform BIA
 - Collect & Verify RTOs/RPOs for all Business Units
 - Stratify Recovery Times into Recovery Tiers
- Develop Recovery Plans
 - Choose Recovery Strategies
 - Design Recovery
 - Implement / Develop Detailed Recovery Plans
- Test, Fix, Test,

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Tiered Approach

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Develop A Contingency For Each Type of Loss

- Loss of Equipment
 - Technology Failure
- Loss of Facility
 - Facility is not accessible or usable
- Loss of the Region
 - Widespread outage

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Types of Disasters / Frequency / Likelihood of Occurrence

Disaster/Loss Type	Relative Duration of Recovery	Relative Frequency of Occurrence
Loss of Equipment	Shortest	Frequent
Loss of Facility & Equipment	Long	Occasionally
Loss of Region – Facility Intact	Short to Medium	Seldom
Loss of Region & Facility	Very Long	Very Rare

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Rules of Thumb for Tiered Strategies

1. Invest the most in things that are more likely to occur.
2. It will cost you more for things that last for longer durations.
3. Try to develop Recovery Strategies that can be shared between outage types.
4. Extend RTO for things that rarely occur.
5. Extend RTO for things that also affect your customers/vendors.
6. Have other contingencies for things that rarely occur.

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Question:

Can One Solution Solve for Every Scenario?

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Leveraged / Dual Data Center Approach

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Question:

How Many Server Images Do You Have
That Are For The Same Function?

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How Many Different Server Images Do You Have?

- Production
- Standby/Failover
- Disaster Recovery
- Development
- QA/Test
- -1 Production

DO ALL OF THESE IMAGES NEED TO BE ONLINE ALL OF THE TIME?

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What's The Cost Of A Server Image*?

Typical DL380 (incl. box, taxes, shipping, installation)	\$4500
Share of Infrastructure Costs	\$1000
Share of Tape Backup Infrastructure Costs	\$2500
Windows Server 2003 SE	\$799
Application Software	???
AV Software	\$55
SQL Server	\$1400
Backup Software w/SQL Agent	\$895
Floor Space, Utilities, etc. (\$30 mo. * 36 months)	\$1080
Other Costs (direct / indirect)	???
Total Estimated Cost	\$12,229

*List Prices, HP, CDW, Cost Study

OUCH!!! $\$12,229 \times 6 = \$73,374$

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Leveraged Dual-Data Center Approach

- Philosophy:**
 - Reuse Servers for Different Images
 - Personality is determined by OS, Application and Data
- Approach:**
 - Get Current Inventory of all Physical Servers
 - Classify Each by Role (Production/Development, etc.)
 - Look for Re-Leveragability of Server Images
 - Split Similar Function Servers Between Data Centers
 - Create Your Own Internal Hotsite
 - Future Application Roll-outs Should Fund Both Production and Development/Test Servers

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Question:

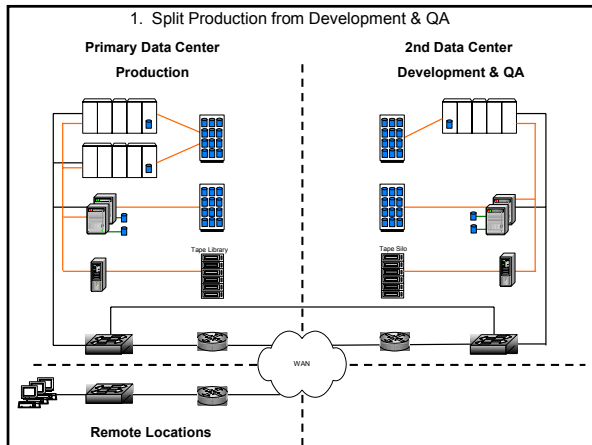
What Are Your Development & Q/A Servers Doing in a Disaster?

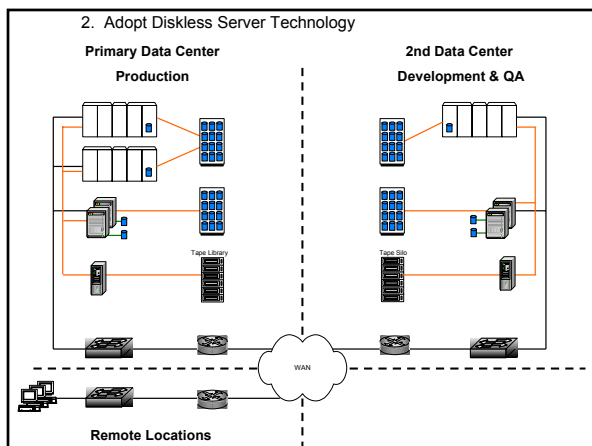
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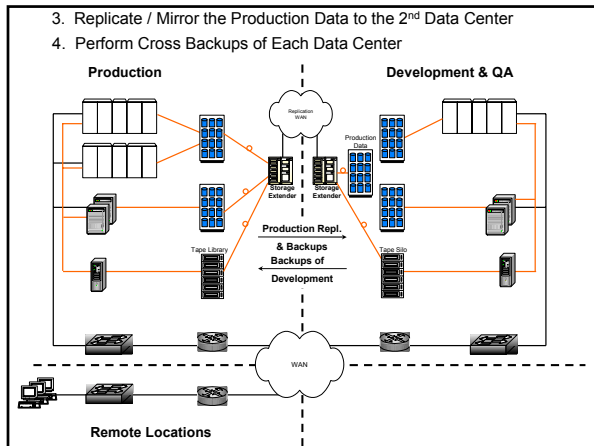
Steps to Implement an Internal Hotsite

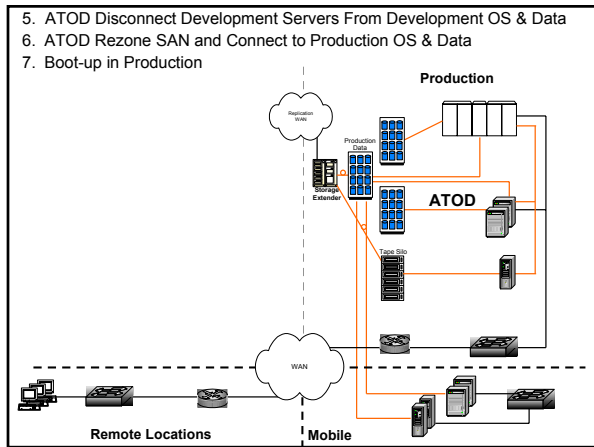
1. Split Production & Development Between Two Data Centers
2. Employ Diskless Servers (Boot and Data)
 - Variation - Local JBOD for page & swap
3. Replicate / Mirror Production Data to the 2nd Data Center
4. Perform Cross Backups of Each Data Center
5. ATOD Disconnect Development From Development OS & Data
6. ATOD Rezone SAN and Connect to Production OS & Data
7. Boot-up in Production

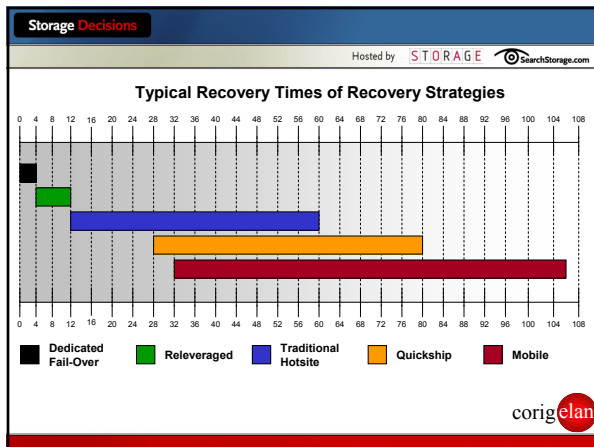













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Approach Variations

1. Create Geo-Clusters from Local HA Clusters
2. Use Mobil Recovery Units at the 2nd Data Center for Non-critical Tiers

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Side Benefits

1. Production Releases More Successful
2. Can Do More Frequent Smaller DR Tests
3. DR Testing More Successful
4. With Properly Architected Network, Business Systems that might have not been cost justified for HA, can have near HA recovery times

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Divide & Conquer Approach

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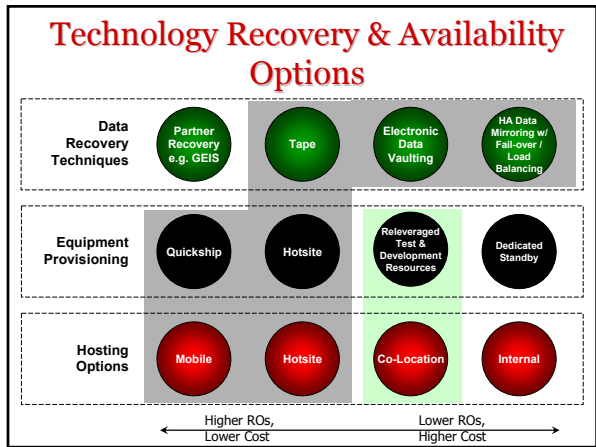
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Chunk It Up

- Separate:
 - Data Recovery from,
 - Equipment Provisioning from,
 - Hosting Options
- Match Requirements to Solutions.

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Some Economics

Build vs. Outsource

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Large Data Center Build Costs*


Facility Type	Uptime %	Cost / Sq. Ft.	Cost / Cabinet (14 sq. ft. + 50%)	Mo. Cost / Cabinet (60 mo. @ 7%)**
Level 1	99 – 99.9%	\$150	\$3150	\$63
Level 2	99.9 – 99.99%	\$250	\$5250	\$104
Level 3 (Mission Critical)	99.99 – 99.999%	\$400	\$8400	\$167
Level 4 (Mission Critical)	99.999 – 99.9999%	\$550	\$11,550	\$229

*Build Costs Source: Morgan Stanley Dean Witter for a Large (50K sq. ft. +) Data Center, Trilliant Technology Group Endorsed

**60 months @ 7% used for Capital or Alternative Use Opportunity Costs



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Smaller Data Center Build Costs*


Facility Type	Uptime %	Cost / Sq. Ft.	Cost / Cabinet (14 sq. ft. + 50%)	Mo. Cost / Cabinet (60 mo. @ 7%)**
Remodel / Rebuild Existing Data Center	99.9% (no redundancy)	\$833	\$17,493	\$347
Complete Construction (excluding land)	99.99%	\$1143	\$24,003	\$476
Complete Construction (excluding land)	99.999%	\$1628	\$34,188	\$677

*Build Costs Source: Nexgen II, LLC Cost Study for Houston Based Hospital 3000 sq. ft. Data Center; est. 2000 sq. ft. usable


**60 months @ 7% used for Capital or Alternative Use Opportunity Costs



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Meeting The Feds' Requirements



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Meeting the Feds Requirements Economically

1. Small RTO (minutes to hours)
 - Releveraged Equipment
2. Coverage for Loss of: Site & Region
 - Internal 2nd Data Center / Co-Lo Recovery Center
3. Use the Solution; or Test, Test, Test
 - Releveraged Development/QA Equipment
 - Continuous / Ongoing DR Test Program
4. Business Continuity Arrangements Must Be: Effective & Compatible
 - Continuous / Ongoing DR Test Program
 - Releveraged Development/QA Equipment

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Some
Fun...

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Thank you.

Questions?

Mr. Edborg will be available at the
Ask-the-Experts booth in the Exhibit Hall:

Monday 4-5 PM
Tuesday 4-5 PM