

Trends and Directions in Disaster Recovery Management for Midsize Businesses

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Midsize Enterprise
Summit. 2007



Disaster Recovery Management Is Maturing

**Survey Results
from 12/2006
(100 respondents)**

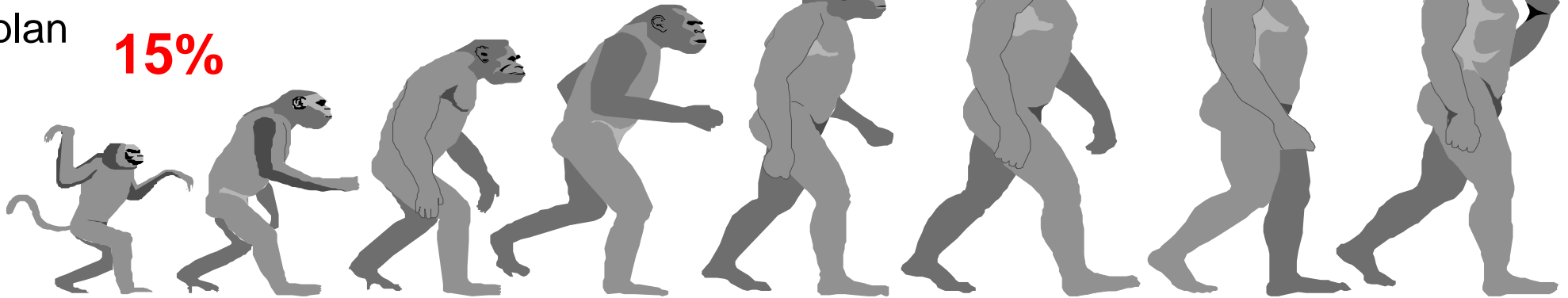
- Stage 2**
- Disaster recovery as a process, component of business continuity management
 - Link DR to business process requirements
 - Defined organization
 - Plan regularly tested
 - Formalized reporting

35%

Stage 0

No DR or shelfware plan

15%



- Stage 1**
- DR as an IT project
 - Platform-based
 - Plan occasionally tested
 - Ad hoc project status reporting

32%

- Stage 3**
- Business integration
 - Partner integration
 - Process integration
 - Continuous improvement culture
 - Frequent, diverse testing
 - Formalized reporting to BCM, executives and board

15%

Strategic Planning Assumption

Through 2010, fewer than 20% of enterprises will operate at Stage 3 – the highest level of disaster recovery management process maturity (0.8 probability).

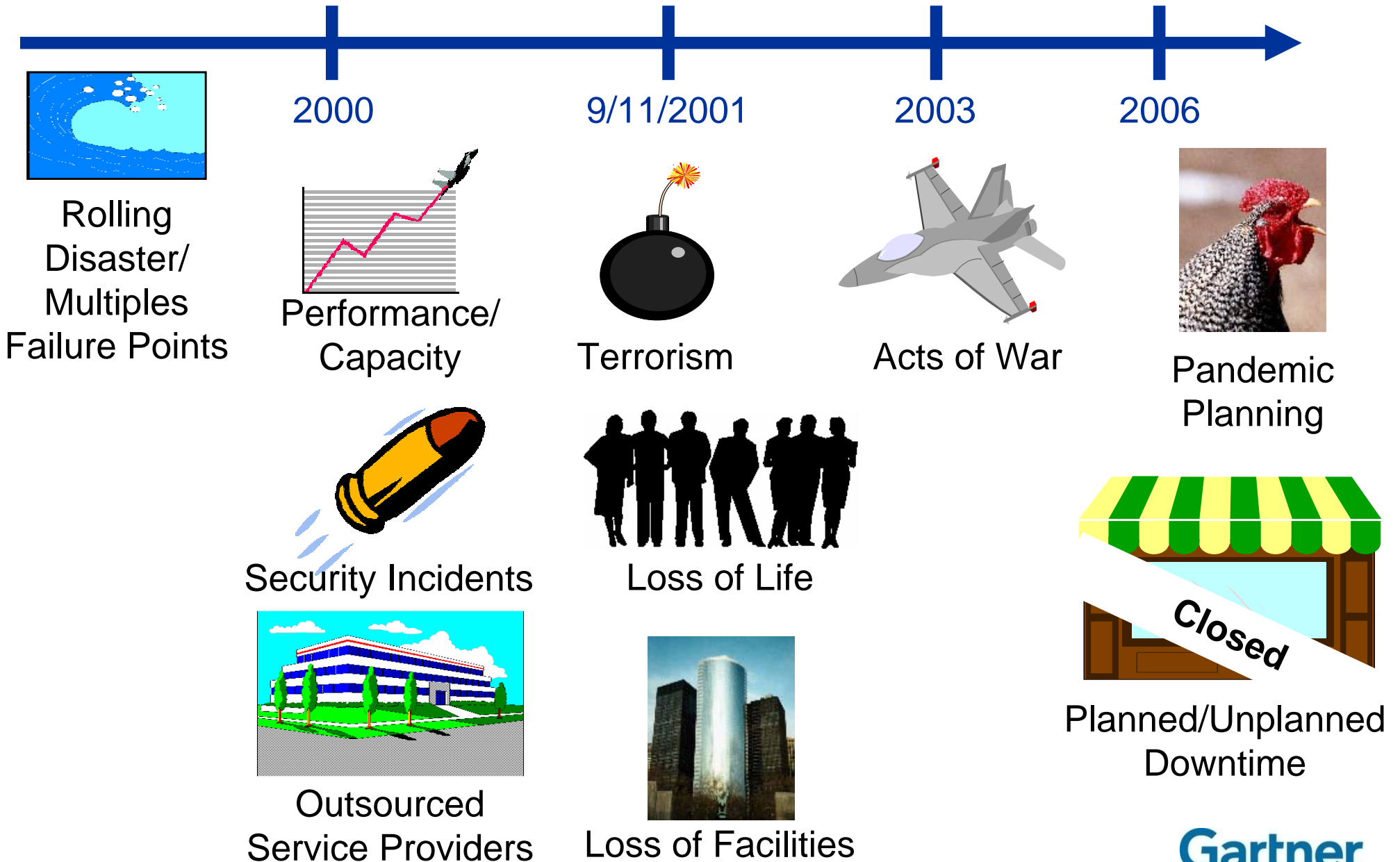
Key Issues

1. What trends are affecting the disaster recovery management strategies for midsize enterprises?
2. How will midsize enterprises justify investments in disaster recovery management, and what strategies will they pursue?
3. What architectures and best practices will enable enterprises to achieve 24/7 availability and disaster protection, as required by the business?

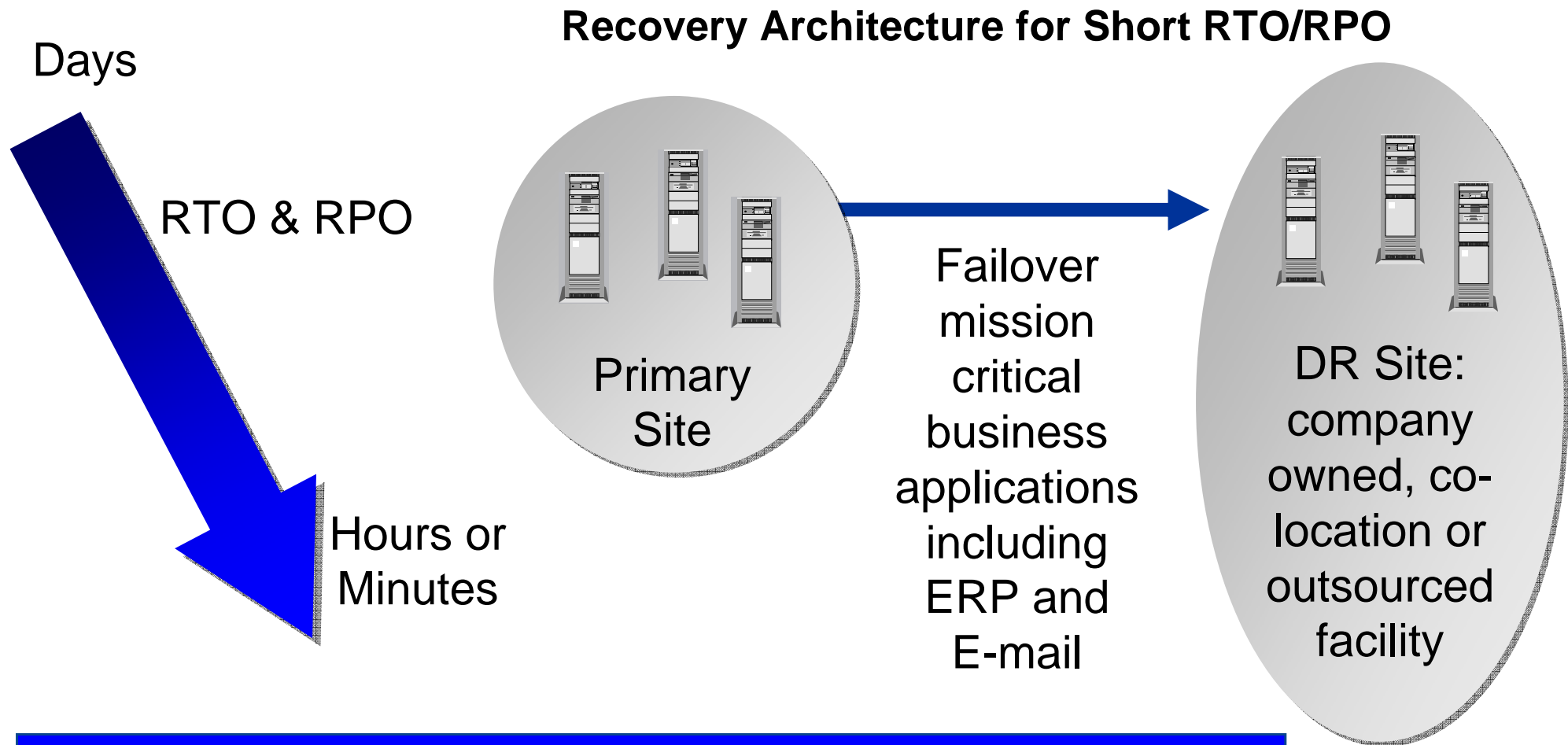
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Trend: Increased Awareness and Planning for Ever-Increasing Risks



Trend-Major Reduction in RTO and RPO Driven by Business Requirements



Failover for planned downtime, as well to increase overall application availability – the DR plan is no longer an "all or nothing" failover, but instead is more granular and flexible for those applications with architectures enabling short RTO

Strategic Planning Assumption

By 2008, the number of midsize enterprises that have granular application-based DR strategy will double (0.8 probability).

Trend – Toward Insourcing and Multisourcing

Factors Driving Insourcing

- Outsourcing costs for dedicated solutions
- Relatively low cost internal solutions available
- Location of outsourcing sites
- Inflexible and long-term outsourcing contracts
- Inflexible outsourcing test time and desire to test more frequently
- Control including more granular recovery options



Multi-sourcing
Combines the
Best of Both

Factors Driving Outsourcing

- Single site
- Shared solutions for lower pricing (but longer RTO/RPO)
- Architectural redundancy
- Workspace
- Staffing and skills
- Test time not interrupting other company work

Trend: Virtualization Is a Key Enabling Tool

Resource
User

Interposing technology that masks the physical nature and boundaries of resources from resource users.

- ✓ Isolation from change
- ✓ Removes barriers
- ✓ Improvements in utilization and flexibility

Layer of Abstraction
(Virtualization)

Real Resources

Server

Network

Management

Storage

Strategic Planning Assumption

By year-end 2008, Windows disaster recovery will be dominated by virtualization solutions (0.8 probability).

Trend: Backup and Replication Markets Merging Into a Recovery Market (Suite)

Tape Backup

- Cataloged
- Block or file
- Local or remote
- Starts at \$300/server

Snapshot

- Time-based
- Block or file
- Local or remote
- Typically add-on price to disk arrays, (approximately \$15,000)

Replication

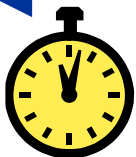
- No sense of time
- Sync or async
- Local or remote
- Starts at \$2,500/server for non DBMS products

Disk Backup

- Cataloged
- Block or file
- Local or remote
- Starts at \$995/server

CDP

- Time-aware
- Sync or async
- Local or remote
- Starts between \$0 (if bundled) and \$2,500/server



Days



Hours



Minutes



Seconds

Strategic Planning Assumption

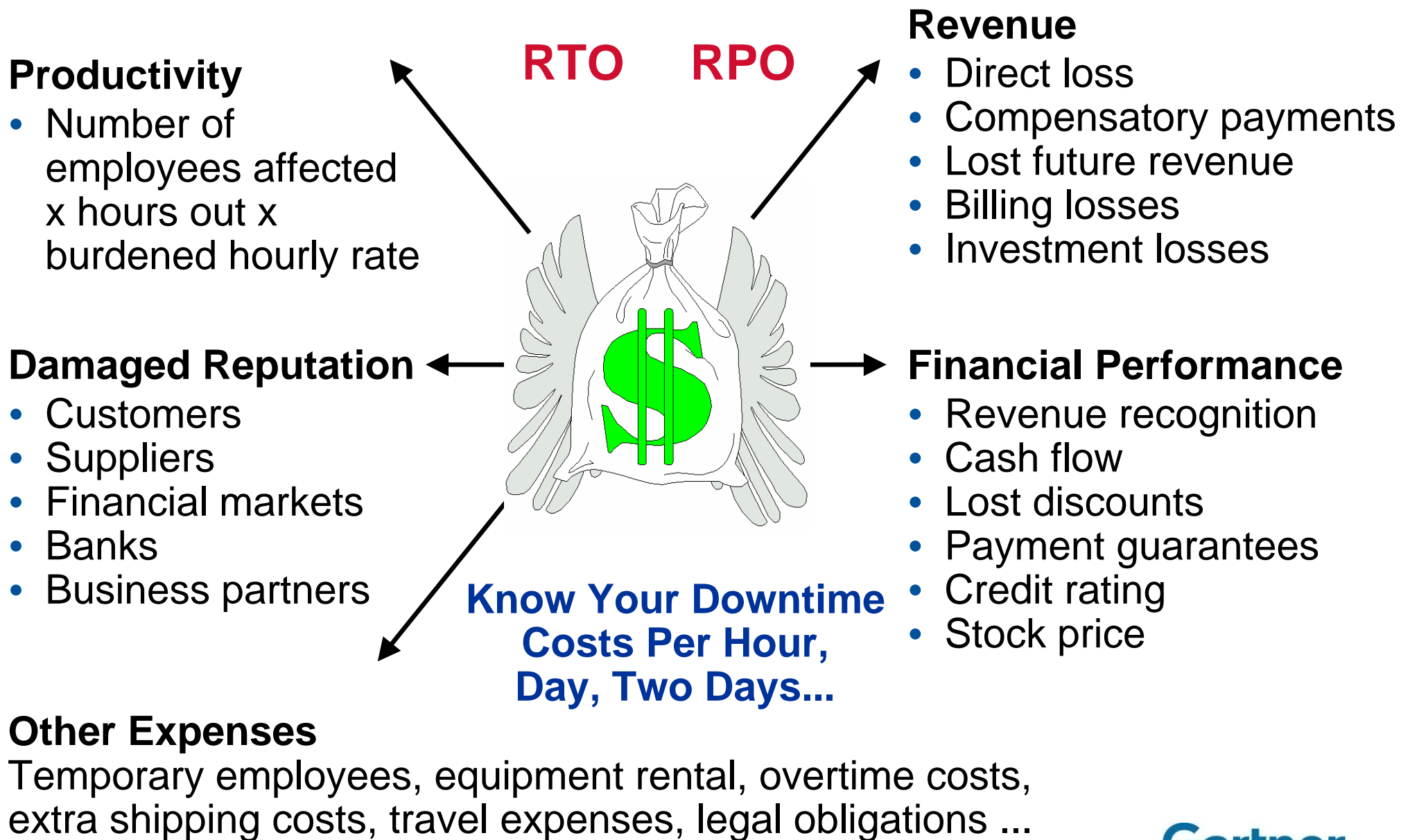
Through 2009, CDP will be part of the replication and backup markets (0.8 probability).

By 2011, CDP will be a function of backup and/or replication products and not exist on its own (0.8 probability).

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Justification Vehicle: The Business Impact Assessment



Criticality Ratings/Classification Systems

Class	Business Process Services	DR Service Levels/Strategy	Cost Considerations
Class 1 (RTE)	<ul style="list-style-type: none"> • Customer-/partner-facing • Functions significantly affecting revenue or brand image 	<ul style="list-style-type: none"> • RTO = 0-4 hrs.; RPO = 0-4 hrs. • Dedicated architecture • Architecture may include automated failover 	<ul style="list-style-type: none"> • 2x Capx • Network • Replication • Management
Class 2	<ul style="list-style-type: none"> • Less-critical revenue-producing functions • Supply chain 	<ul style="list-style-type: none"> • RTO = 8 to 24 hrs.; • RPO = four hrs. • Dedicated or shared recovery environment 	<ul style="list-style-type: none"> • Same as above except shared
Class 3	<ul style="list-style-type: none"> • Enterprise back-office functions 	<ul style="list-style-type: none"> • RTO = three days; • RPO = one day • Shared recovery environment • May include quick-ship programs 	<ul style="list-style-type: none"> • Tape-based • Labor-intensive
Class 4	<ul style="list-style-type: none"> • Departmental functions 	<ul style="list-style-type: none"> • RTO = five+ days; RPO = one day • Quick ship contracts typical • Sourcing at time of disaster where RTOs are lengthy 	<ul style="list-style-type: none"> • Low-cost contracts, but not testable

Strategic Planning Assumption

The proportion of applications residing in Class 1 (most critical) will rise from about 10% today to 25% by 2010 (0.8 probability).

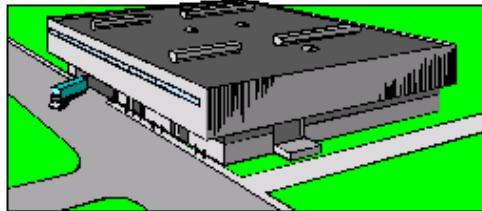
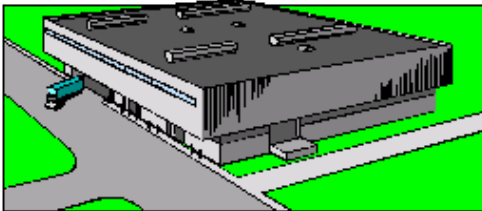
Disaster Recovery Strategies

Client Questions:

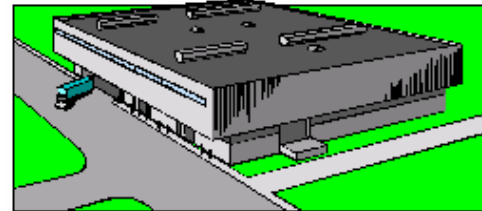
Trade-Off Costs, Risks, Complexity

- How many data centers should I have? One or many?
- Where should they be located? Is close better than far?
- Should I reduce the cost of DR by using idle assets for other purposes?

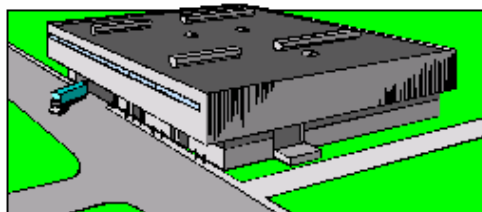
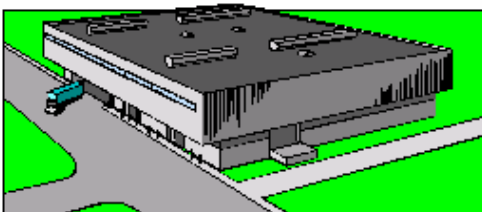
Common Strategies



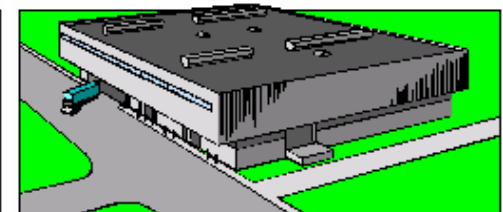
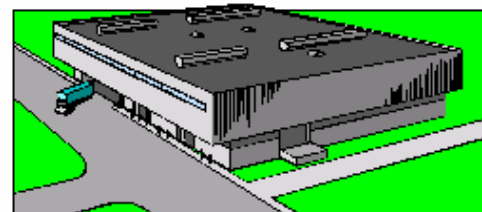
Production/Load Sharing



Production/Outsourcing/DR



**Production/Development
and Test DR**



Production/Standby DR

Strategies to Reduce Cost of DR

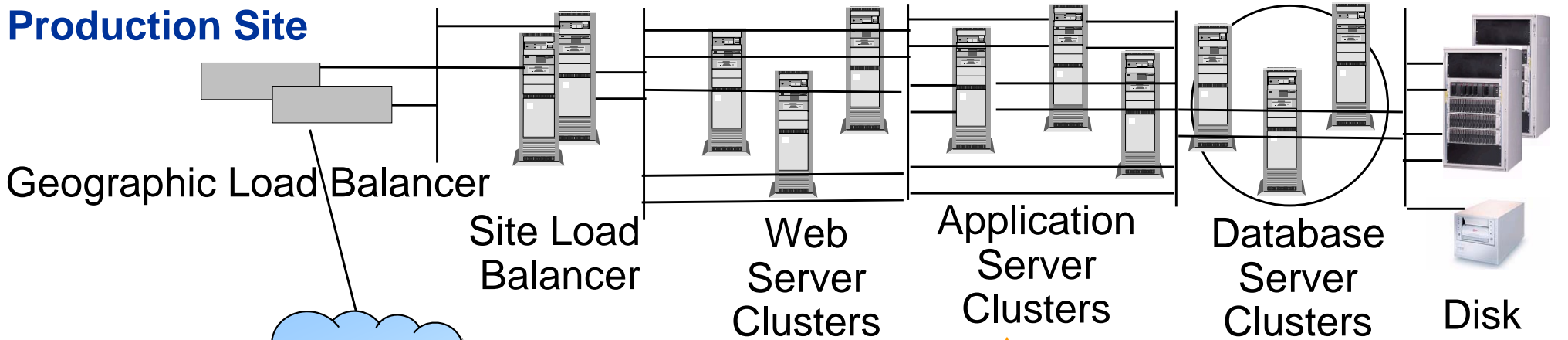
- Focus on the most mission-critical business processes and associated applications/infrastructure
- Shared service at ESP, trading off reduced cost and lack of guarantee for longer recovery times
- DR architecture becomes the HA architecture by eliminating redundant resources in primary site; note that this increases risks and complexities associated with component failures and may elongate recovery times for component failures
- Shared resources at recovery site, that is, for development, test, staging; reconfigure on disaster and for testing
- Lower-capacity resources at recovery site; increases risk, but can be managed if work with the business on prioritization
- Use of lower-performing disk at recovery site; disaster recovery replication implications
- Use of virtualization at recovery site can drastically cut labor resources associated with recovery of servers

Key Issues

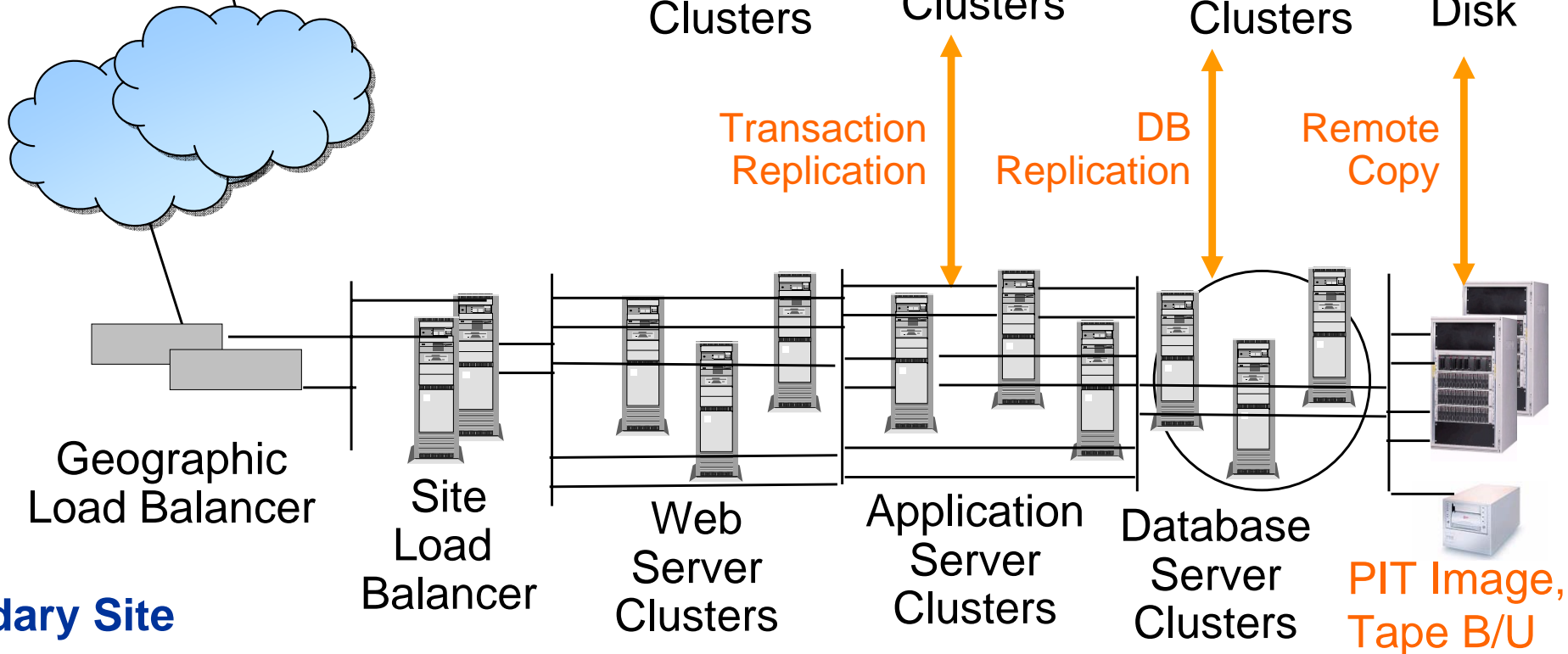
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Data Recovery Architectures: Redundant Everything

Production Site



Secondary Site



Virtualization for Fast Recovery of Servers – Both Internal and External

Server Recovery Method

RTO

Cost Considerations

Server Standby (dedicated, hot)	Minutes to less than one hour; must have strong change management	Idle resources for standby systems
Re-installation (attended or unattended)	Two to more than 12 hours/server, if attended; one to two hours/server, if unattended and automated, but requires standard software configurations, but no special customizations	If standardized this option is less people intensive than disk-image
Disk-image (snapshot) based recovery	One to two hours/server; requires manual customization for each server	people intensive-every server requires customization
Tape-image (snapshot) based recovery	One to three days/server	people intensive-every server requires customization
Virtualization (P to V; V to V)	Minutes (just start VM); longer if VM is located on tape	VM software costs, but less people cost and more agility

Technology Best Practices: Hardware, Software and Data

Hardware

- DR equipment isn't always the same as production
 - Less-expensive DR equipment: performance vs. cost vs. risk
 - Decide what will run on what box (capacity issue)
 - Capacity on demand
 - Must test this if different
- More granularity of plans: most firms chose to cutover based on all-or-nothing
 - Decide what will fail together or what fails separately, for example, application server vs. database
- Separate network for DR, testing, Q&A and so forth are not uncommon

Software

- Software licensing in DR
- Application Interdependencies
- Complicated systems, such as SAP, are likely to have different resources in DR site
- Virtualization – VM for recovery of dislike systems

Data

- Backup Restoration Testing
- Corrupt tapes or tapes that cannot be retrieved can result in data loss and/or delayed recovery
- Use a data backup quality assurance function to regularly test to restore and verify the data integrity of backed up data

Microsoft Replication Strategies

- Microsoft adds database mirroring to SQL Server 2005
 - Early customer experiences have been positive in terms of ease of implementation and use
 - Mirroring ensures no committed transaction losses
 - Requires same-subnet failover
 - Failover in one to two minutes in most cases
 - No backward compatibility
 - No requirement for Microsoft clustering
 - No ability to "evaluate" prior to failover; however witness is in place
 - No ability to read the mirror when primary is operational
- Exchange 2007 CCR
 - Log-based replication
 - Requires Microsoft clustering between sites; however failover is automatic, and can not be "evaluated" prior to failover (risk, cost)
 - Sites must be on same subnet
 - No backward compatibility

Strategic Planning Assumption

Through 2010, Microsoft will not be the dominant replication provider for Windows applications (0.8 probability).

Midsize Enterprises Commonly Used Replication Strategies

	Pros	Cons
<p>DBMS Log-Based</p> <p>Oracle DataGuard Microsoft SQL Server Mirroring</p>	<ul style="list-style-type: none"> • Often included with DBMS • Hardware-independent; supports heterogeneous disk • Generally low bandwidth requirement; lower network costs • Can be used for short RPO, with longer RTO, potentially reducing software license costs 	<ul style="list-style-type: none"> • DBMS-specific solution; typically requires database license for recovery site • More operational complexity than storage replication • Does not replicate configuration data in files • Requires active duplication
<p>Host-File-Based</p> <p>CA XOSoft Doubletake EMC Neverfail Symantec</p>	<ul style="list-style-type: none"> • Low cost for software • Storage hardware independent • One solution for all applications/data on a server • Failover/failback may be integrated and automated • Most enable "moving back in time" 	<ul style="list-style-type: none"> • File system dependent • More operational complexity than storage replication • Requires active duplication of server resources • File but not application aware

Midsize Enterprises Commonly Used Replication Strategies

	Pros	Cons
<p>Storage Controller Unit-Based</p> <p>Dell HP IBM NetApp</p>	<ul style="list-style-type: none"> • Infrastructure-based solution provides platform and data type independence (including mainframe) • Operational simplicity • Minimal host resource consumption 	<ul style="list-style-type: none"> • Homogeneous SAN required • Short RTO, but typically longer than file or database replication • High cost for small volumes • Less storage pricing leverage • Failover typically not packaged • High connectivity costs • Not application aware
<p>Host Volume-Based and Emerging Network-Based</p> <p>EMC NetApp Symantec</p>	<ul style="list-style-type: none"> • Storage hardware independent • One solution for all server applications/data • Failover/failback may be integrated and automated • May not require host agents • Price often based on amount replicated 	<ul style="list-style-type: none"> • More operational complexity than storage controller-based replication • Host-based relies on host agent; emerging network-based replication has relatively few customer implementations • Not application-aware

Disaster Recovery Service Providers – Expanding Their Services

Full-Service Providers



- Traditional shared service recovery
- High-availability/dedicated service recovery
- Co-location services
- Hot OS and virtualization
- Drop ship programs
- Mobile recovery

Other Providers and Examples of Their Focus

- MessageOne (e-mail recovery)
- Iron Mountain (backup/tape storage)
- Strohl (software)
- Agility (specializes in mobile recovery)
- Hosting/co-location service providers

Services

- Cold sites
- BC/DR program management
- Crisis/emergency management
- Alternative work/office space
- Consulting services

Process Best Practice: Disaster Recovery Test Plan Framework

Pre-Test

1. What: LOB, applications
2. When
3. Where
4. Who
5. Scenario
6. RTO and RPO
7. Objectives
8. Expectations
9. Current Capabilities
10. Exclusions
11. Applications

Test Evaluation

12. Success Evaluation Criteria
13. Scoring

Post Test

14. Test Results
15. Test Issues and Gaps in Recovery Capability
16. Recommendations, Responsibilities and Timeframes

Strategic Planning Assumption

By 2010, DR testing will occur on average every six months for SMBs (0.8 probability).

Recommendations

- ✓ Consider disaster recovery requirements in the new project design phase and annually thereafter
- ✓ Testing, testing, testing
 - End-to-end test where possible; partial where not
 - Tabletop tests can be advantageous to assess capabilities to address scenarios as well as procedures
 - Fast follow-up/response to test findings
 - Test scenarios that you didn't plan for
- ✓ Incident/problem/crisis process
 - Where IT incident could result in invocation of DR plan, leverage problem management process, which should already be in place
 - Damage assessment: must assess costs of failing over to an alternative location vs. time to recover in primary location
- ✓ Use automation to reduce errors in failover/failback and for planned downtime
- ✓ Effectiveness with DR is directly tied to maturity in managing IT (that is, IT service management effectiveness)

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