



Planning for the Worst:

Disaster Recovery
Strategies

INTEROP[®]

BUSINESS. TECHNOLOGY.
ONE WEEK. ONE PLACE.



TOP 10 WAYS TO LOSE A DATA CENTER



Top 10 ways to lose a data center: Number 10

**RUNNING ALL CRAC UNITS AT
100% CONTINUOUSLY**



Top 10 ways to lose a data center: Number 9

VIRUS OUTBREAK WITH MAIL & FILE SYSTEMS



Top 10 ways to lose a data center: Number 8

IGNORING VESDA ALARMS DUE TO LACK OF SMOKE




Top 10 ways to lose a data center: Number 7

DELETING INTERNAL DNS ZONE RECORDS



Top 10 ways to lose a data center: Number 6

DATA CORRUPTION OF PRODUCTION SAN INFRASTRUCTURE



Top 10 ways to lose a data center: Number 5

ALL DATA CIRCUITS USING SIMILAR LOCAL LOOP PATHS



Top 10 ways to lose a data center: Number 4

NOT SAVING RUNNING CONFIGURATION OF NETWORK GEAR




Top 10 ways to lose a data center: Number 3

SPRINKLER TESTING ABOVE THE DATA CENTER



Top 10 ways to lose a data center: Number 2

FORGOING PHYSICAL DATA CENTER MAINTENANCE



Top 10 ways to lose a data center: Number 1

LACK OF EVENT MONITORING OF THE UPS SYSTEM

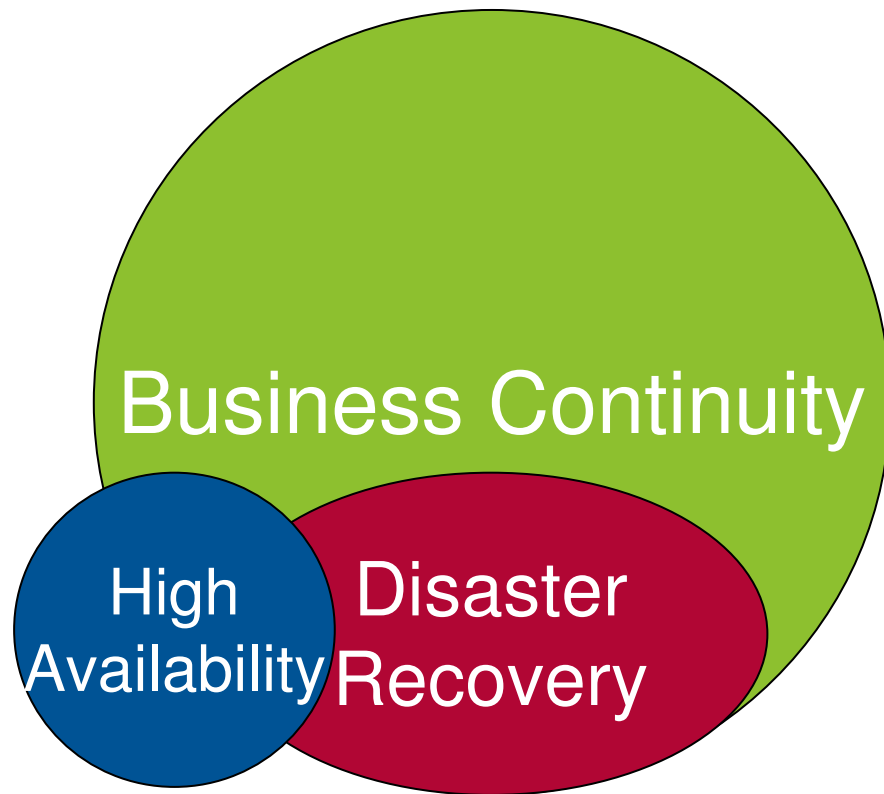
Relative Risk of IT Disasters

| Disaster Category | Relative Risk (in thousands) |
|-------------------|---------------------------------|
| Natural Event | 79.1 |
| IT Failure | 69.7 |
| Disruptive Act | 32.9 |
| Power Outage | 14.2 |
| Fire | 4.5 |
| IT Move/Upgrade | 2.1 |
| Water Leakage | 0.22 |
| Miscellaneous | 2.8 |
| Environmental | 2.4 |
| Theft | 0.0 |
| Flood | 0.0 |
| IT Capacity | 0.0 |
| IT User Error | 0.0 |

- Data from disaster recovery events experienced by clients from 1988 to 1999
- Declared incident lasted an average of 11 days

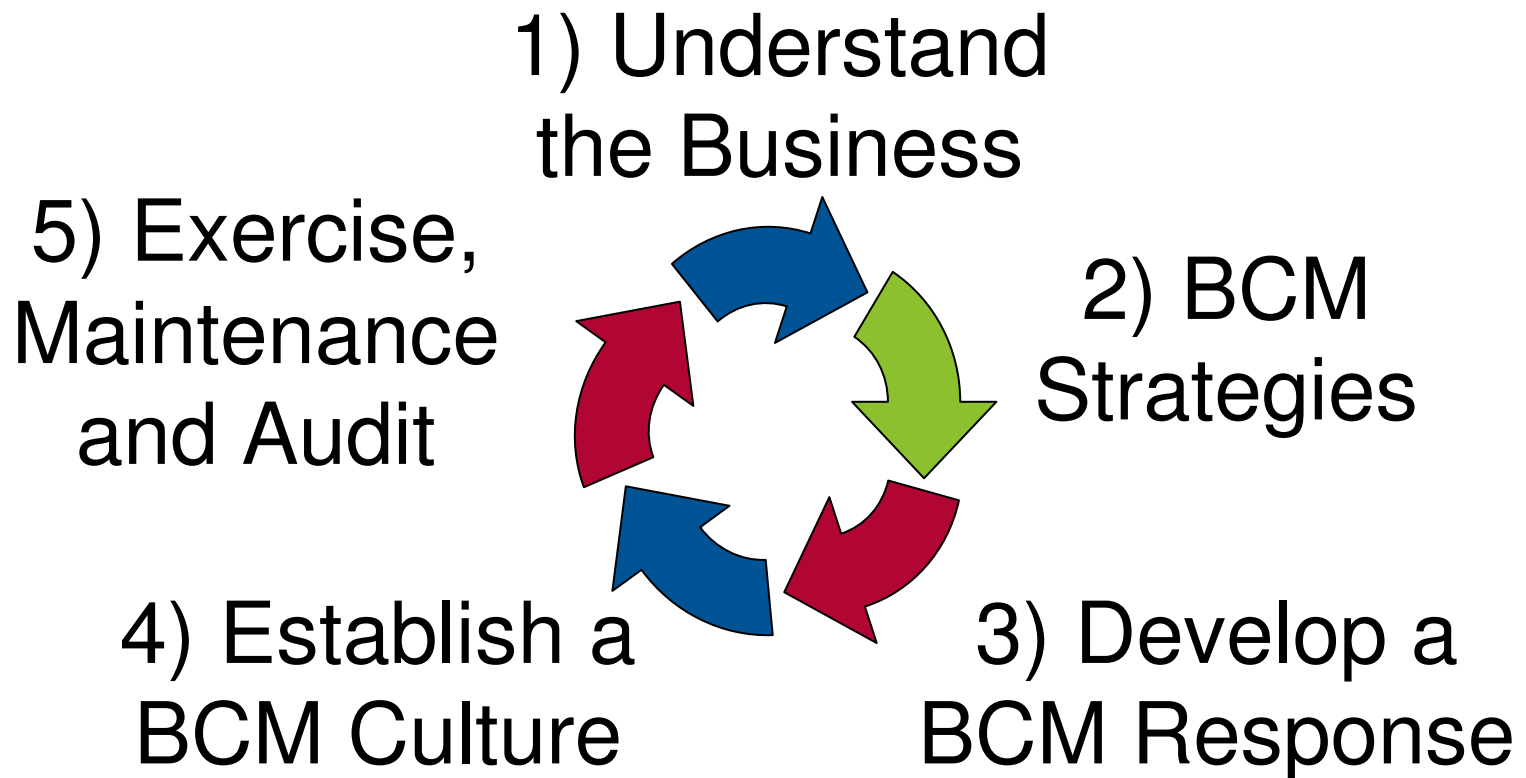
Source: William Lewis, Jr. , Richard T. Watson , Ann Pickren, An empirical assessment of IT disaster risk, **Communications of the ACM**, v.46 n.9, September 2003

Business Continuity



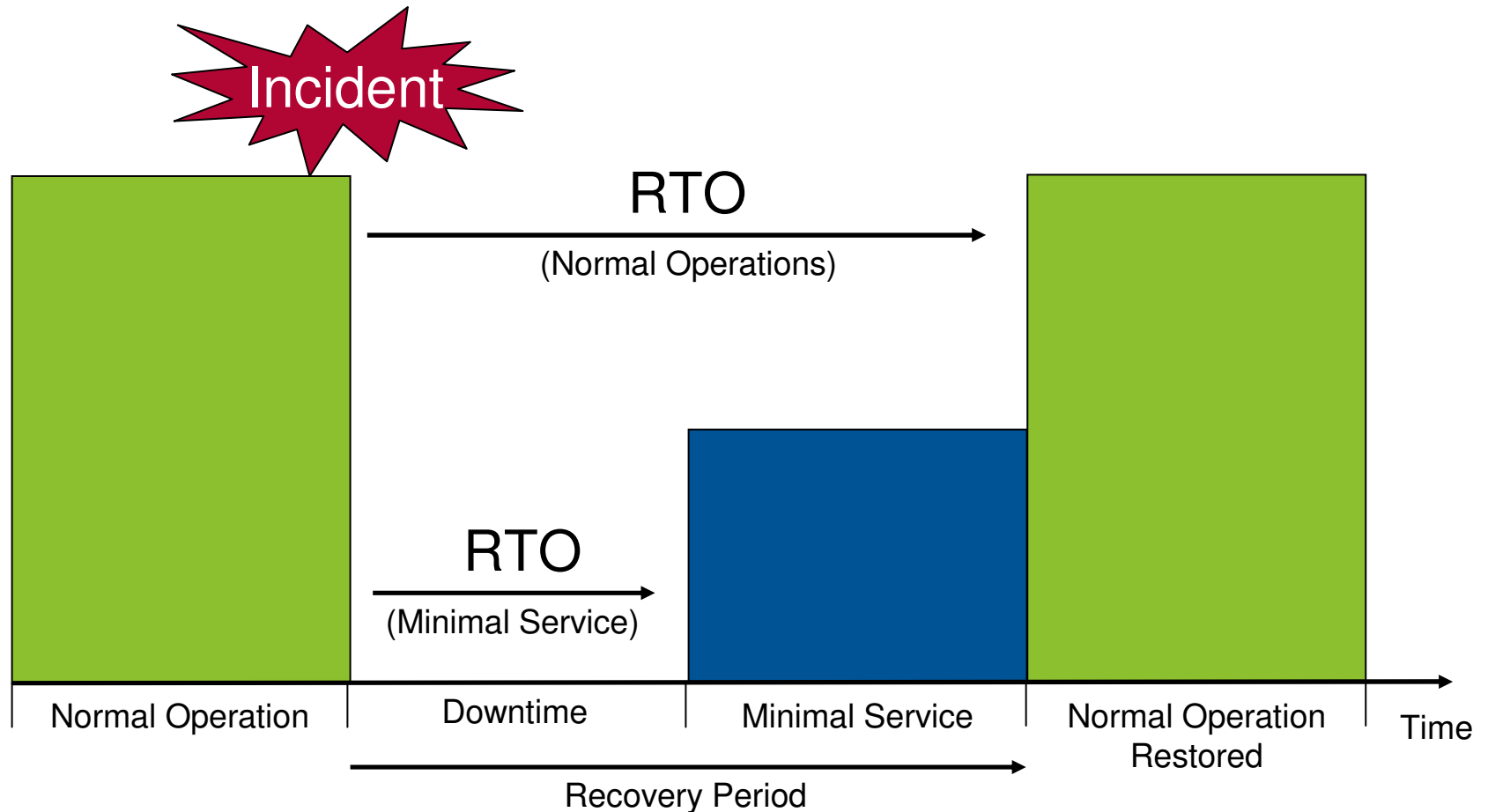
- Providing service and support to its customers
- Maintaining viability before, during, and after a business continuity event

Business Continuity Management (BCM) Process

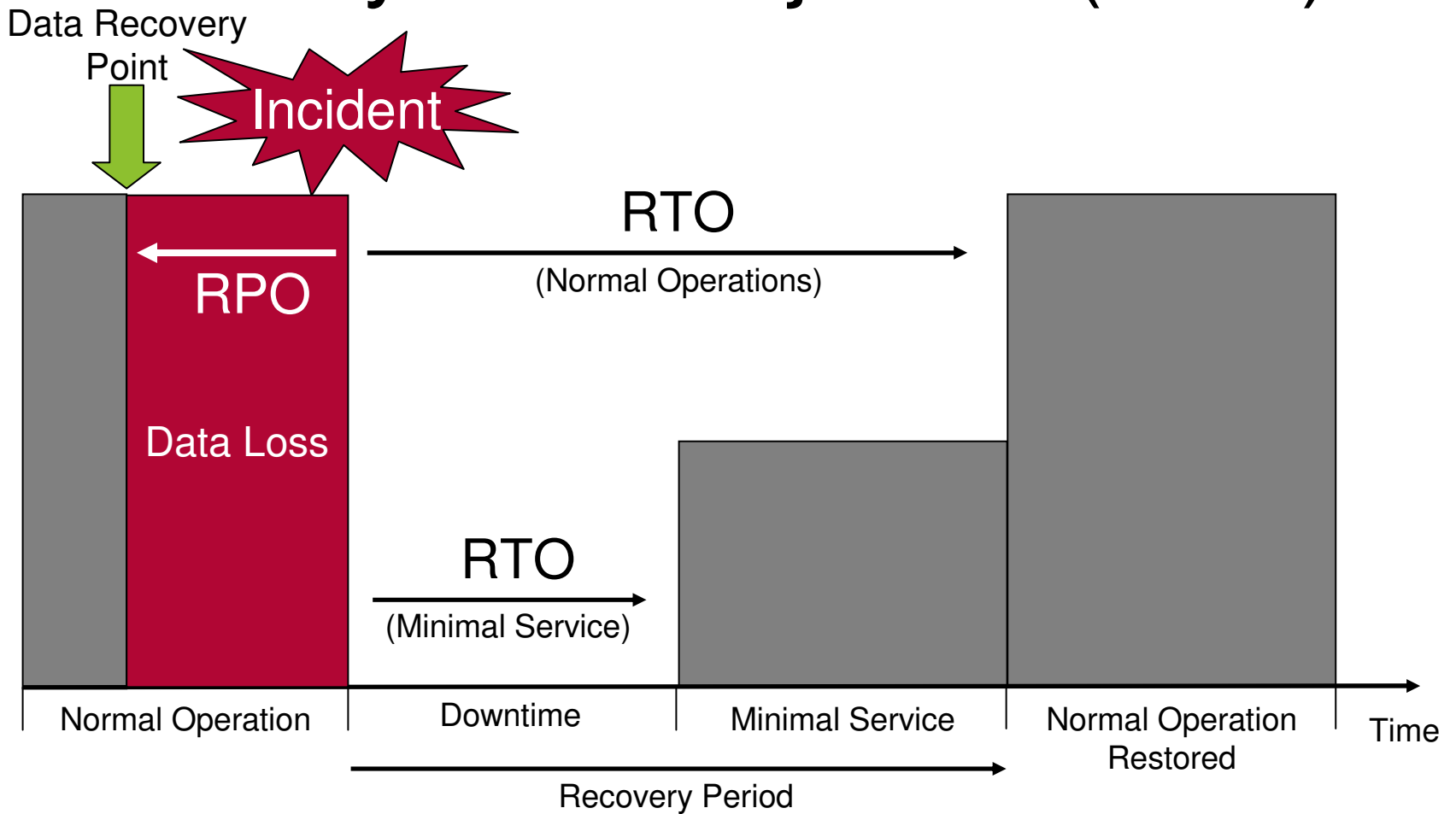


Source: DRI: The Institute of Continuity Management

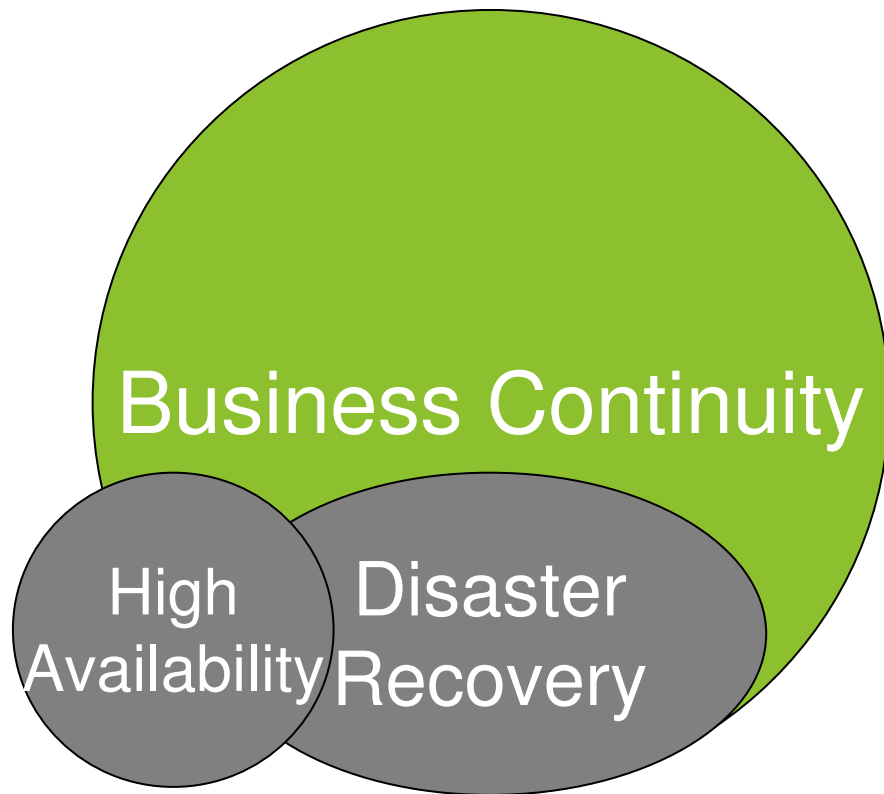
Recovery Time Objective (RTO)



Recovery Point Objective (RPO)



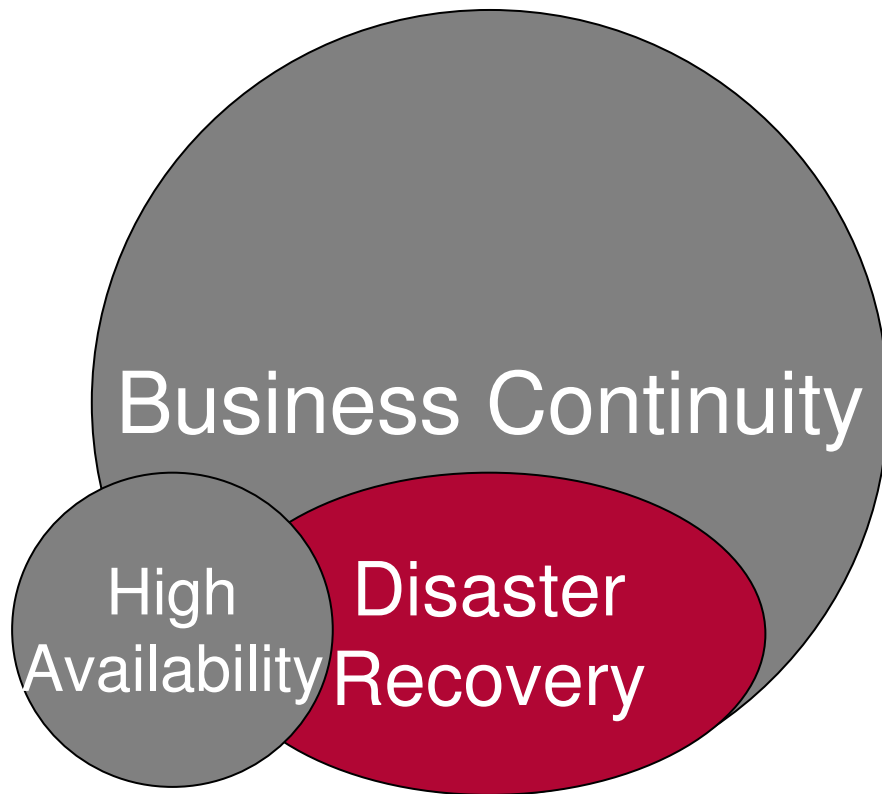
Business Impact Analysis



Process to Prioritize
Business Functions:

- Financial Impact
Quantitative
- Non-Financial Impact
Qualitative
- Identify Supporting IT
Applications & Infrastructure
- Establish RTO and RPO

Disaster Recovery



- Responding to a disaster or an interruption in services
- Implementing a disaster recovery plan
- Stabilizing & restoring the organization's critical functions

What is Disaster Recovery?

- An Enterprise Wide Responsibility
 - Not Simply an IT Problem
- An ongoing IT process not just a project
 - ITIL Service Support (Release Management)
 - ITIL Service Delivery (Capacity Planning)
- Disaster Recovery Readiness needs to be part of overall IT Operations Strategy

Disaster Recovery Exercise

Can you “reboot” your data center?

1. Shutdown sequence of applications and infrastructure
2. Startup sequence of infrastructure and applications
3. Validation steps to confirm normal operations

Establishing a DR Strategy

- Corporate Governance
 - Create an Enterprise BC/DR Policy
 - Establish Business Stakeholders
- Business Priorities
 - Business Impact Analysis
- IT Asset Inventory (HW, SW, Services)
 - Documentation

Infrastructure Recovery Strategies

| Option | RTO | Hardware | Cost | Technology | Complexity |
|--------------|---------|---------------------------|--------|--|------------|
| Hot Standby | Minutes | Dedicated | High | Stretched Cluster, Global Load Balancing | High |
| Warm Standby | Hours | Dedicated | High | Preconfigured Platform | Low |
| Cold Standby | Days | Shared (Dev, Test, QA) | Medium | Install Software and Restore Data | Medium |
| None | Weeks | None | Low | Corporate Credit Card | Low |

Data Recovery Strategies

| Data Option | RPO | Cost | Technology | Complexity |
|--------------------------|-------------------|-------------|---|-------------------|
| Synchronous Data Writes | No Loss | High | Dark Fiber, Limited Distance | High |
| Asynchronous Data Writes | Seconds / Minutes | Medium | Continuous Data Protection, Time Lag based on I/O | Medium |
| Data Snapshots | Hours | Medium | Point in Time Copy, Delayed Write Issues | Low |
| Backup Tape | Days | Low | Point in Time Copy, Offsite Media | Low |

Creating the DR Strategy

| Application | Priority | RTO | RPO | IT Strategy |
|--------------------|-----------------|------------|------------|--------------------|
| App #1 | 4 | Minutes | Minutes | Plan A |
| App #2 | 1 | Seconds | No Loss | Plan B |
| App #3 | 9 | Hours | Minutes | Plan C |
| App #4 | 10 | Days | No Loss | Plan B |
| | | | | |

Data Center Architecture

- Reduce disaster recovery complexity by simplifying the data center architecture
 - N-Tier Network Architecture
 - Server Virtualization Technology
 - Centralized Data Storage (SAN/NAS/iSCSI)
 - Tiered Data Storage (FC, SATA, Tape)
 - Data Center Rationalization
 - Application Rationalization

DR Planning Considerations

- Contracts & Agreements
 - “Force Majeure” Clauses
 - Third Party Vendor Escalation Process
 - Best Effort versus Service Level Agreement
 - Licensing Terms

Typical DR Challenges

- TCP/IP Centric Infrastructure
 - Network Team uses IP addresses
 - Platform Team uses DNS hostname
 - Application Team uses both IP and DNS
- Release Management
 - When a release is implemented, is the disaster recovery plan updated after acceptance?
 - Rollback strategy?

Internet DR Strategies

- Always On Business Applications require Third Party Sourcing Selection
 - Akamai EdgeComputing & Caching
 - Amazon Web Services
 - Sun Grid Compute Utility
 - IBM On Demand

References

- Uptime Institute
<http://www.uptimeinstitute.org/>
- Data Center Journal
<http://www.datacenterjournal.com/>
- Disaster Recovery Journal
<http://www.drj.com/>
- Disaster Recovery Institute
<http://www.drii.org/>

Questions?