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Business Continuity

(Mission Delivery Day In and Day Out)

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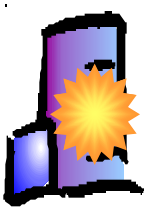
Business Mission is Critical

Today, information is the axis on which your agency revolves. When information is unavailable to an organization, it is at risk of losing its competitive edge.

Technology disruption . . . **Leads to lost . . .**



- **Decision Capability**
- **Constituency Data**
- **Productivity**
- **Service**
- **Credibility**

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Business Continuity

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Drivers for Business Continuity

- Seventy-two percent (72%) of companies do not have a business continuity plan.
- Fifty percent (50%) of companies who experience a major disruption are no longer in business 1 to 2 years later.
- Business interruptions cost billions of dollars in lost revenue and penalties. System outages and downtime have an especially large effect on e-businesses:
  - ***For example, eBay lost 28% of its market capitalization following a 22-hour outage, a decrease of over $3B.***
  - ***Forrester Research estimates that Amazon.com would lose $4.5M in revenue in 24 hours of downtime. Yahoo would lose $1.6M for 3 hours; companies as large as Intel and Cisco would lose $35M, $33M, and $30M in 24 hours, respectively.***
- Most downtime is not attributable to a “disaster”:
  - ***40 percent of downtime is caused by application failures (e.g., performance issues or "bugs")***
  - ***40 percent by operator error or lack of procedures***
  - ***20 percent by system or environmental failures.***
  - ***Overall, less than 5 percent of application downtime is attributable to disasters.***

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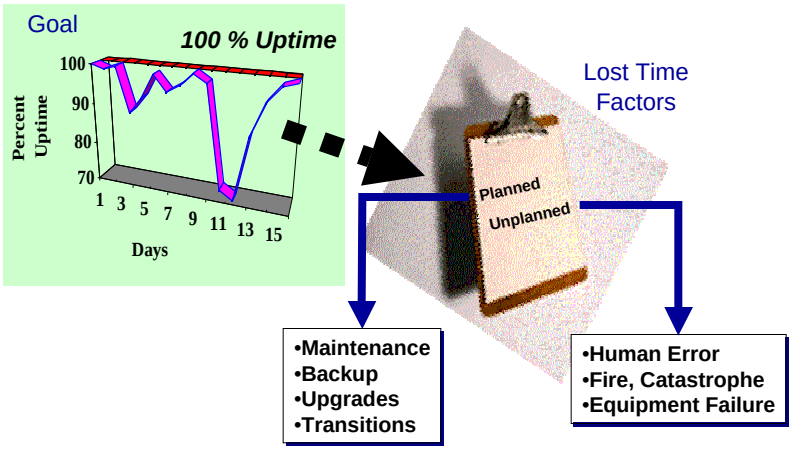
Downtime - Planned & Unplanned



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Transportation	**Package Shipping**	**$24,000 – 32,000**	**$28,000**

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Causes of Failure

Foundations for Business Continuity

Business Continuity means…

Recovering from unplanned, catastrophic events or disasters in an orderly, timely, appropriate manner based on the risk, costs and importance of the business system…

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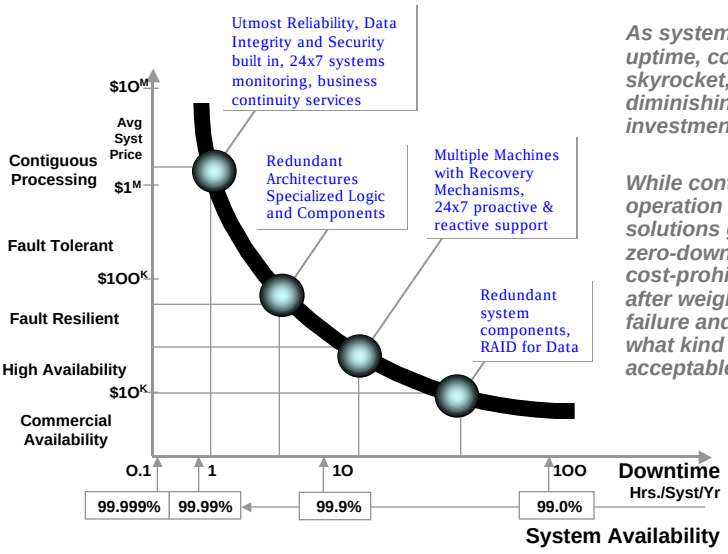
Traditional Definitions of Availability



As systems approach 100% uptime, costs begin to skyrocket, demonstrating diminishing returns on your investment.

While continuous business operation is often desired, solutions guaranteeing zero-downtime are often cost-prohibitive, especially after weighing all risks of failure and determining what kind of downtime is acceptable for your needs.

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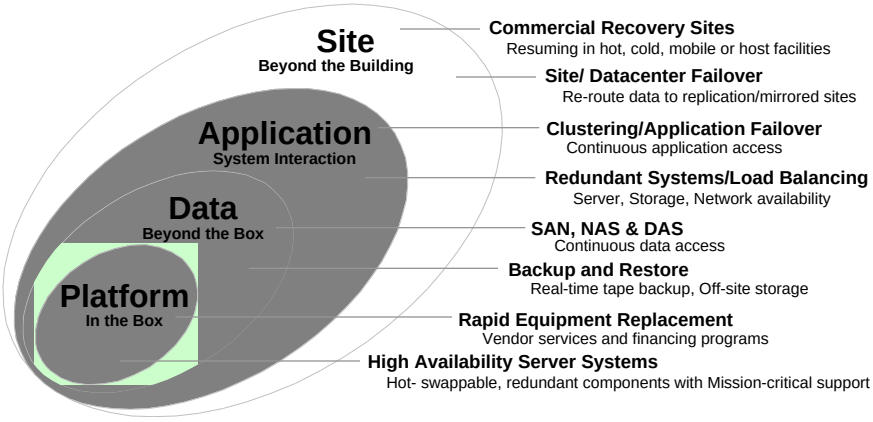
Reality Check on Availability

- **Goal of availability planning is to balance cost, complexity, and flexibility in delivering the desired fault tolerance/recovery solution**
- **Majority of agency requirements are not at the highest levels of availability**
- **Assessment typically shows a varying level of availability requirements within an agencies IT infrastructure**
- **Implementing and guaranteeing higher end/ multiple 9's availability**
  - is usually cost prohibitive to agencies
  - is unrealistic in majority of environments due to complexity of implementation
  - can be marred/ruined by simple human error or delay



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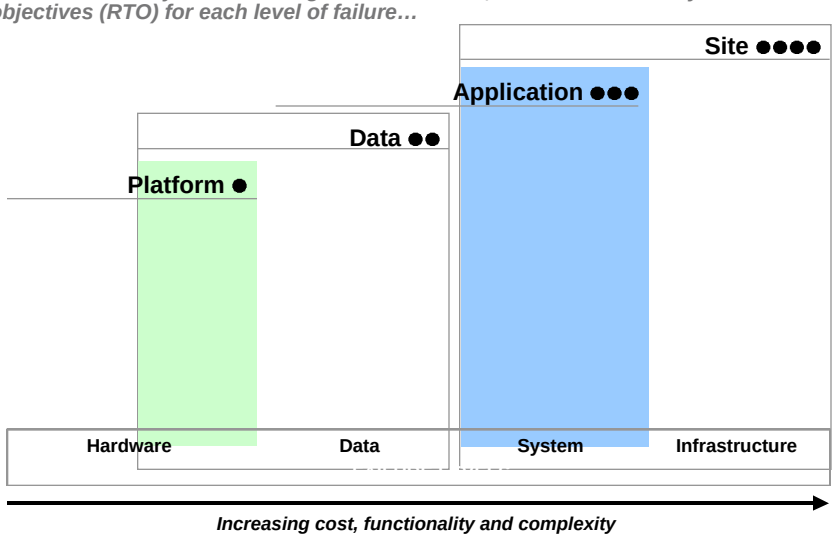
Building Blocks of Disaster Recovery

Disaster Recovery scales through the continuum, to address recovery time objectives (RTO) for each level of failure…



Small Organization Continuity Scenario

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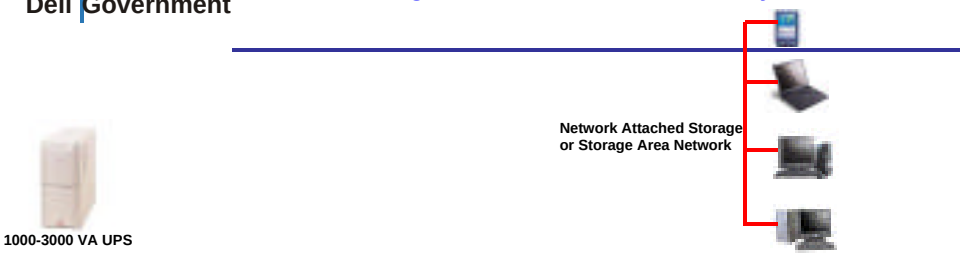
Mid-Sized Organization Continuity Scenario



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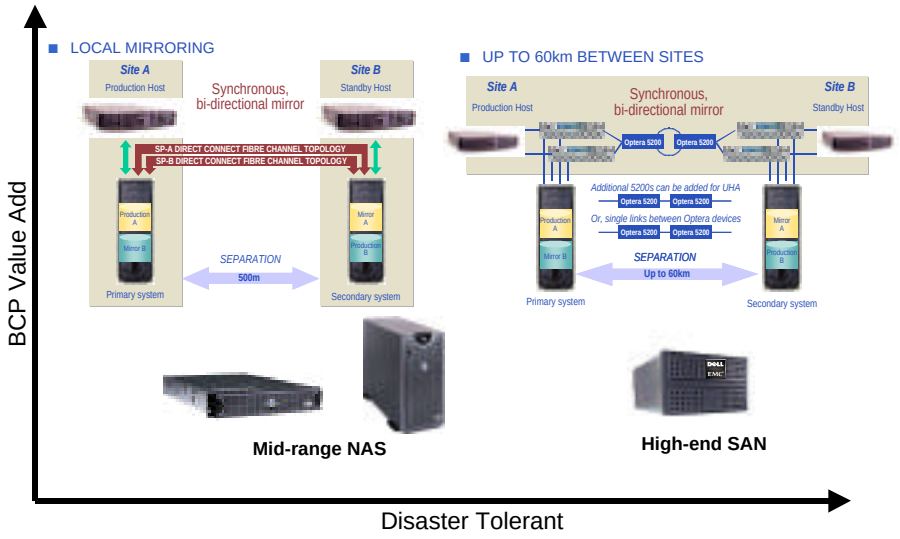
Enterprise Continuity Scenario



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DAS / NAS / SAN Comparison

DAS

Direct Attached Storage

- Storage directly connected to server
- Independent tape backup or backup through network
- Limited Scalability
- Increased management costs
- Low cost solutions

SAN

Storage Area Network

- Consolidated storage for two or more servers
- Lower management costs, enables centralized management
- Faster backups at lower cost
- Optimized for application storage
- Centralized and remote backup
- Investment protection
- Greatest scalability
- Higher availability

NAS

Network Attached Storage

- Storage independent from server functions
- High speed file sharing
- Optimized for sharing files with clients directly
- Investment protection
- Can scale up to over a 7TB of storage
- Snap shots of data

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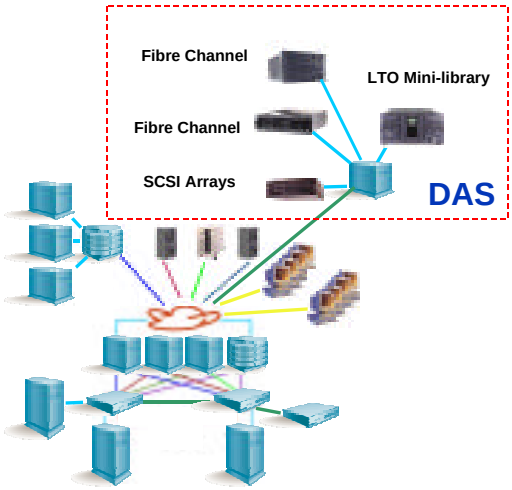
Traditional Storage Connectivity



Direct Attached Storage

- Well understood installation and configuration
- Storage connects to server via HBA or RAID controller
- SCSI based, block-level data transfers
- Dedicated storage for single server

BUT…

- High management costs
- Sub-optimal disk utilization
- Installation may impact server uptime

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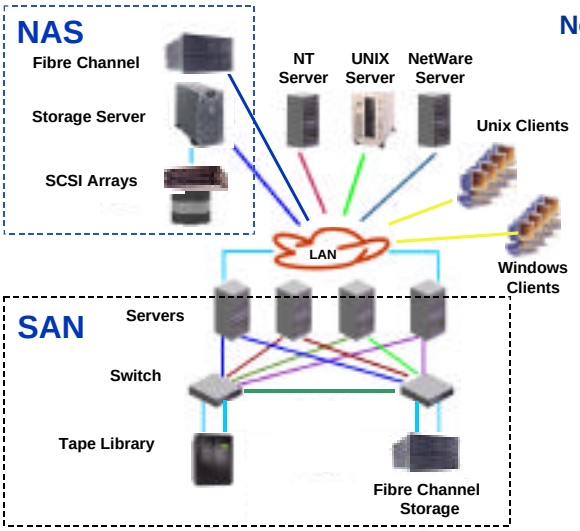
New Networked Storage Connectivity



Network Attached Storage

- Client storage consolidation
- Connects to existing Ethernet
- Easy to install and manage
- TCP/IP-based file-level data transfers
- Multi-OS file sharing

Storage Area Network

- Server storage consolidation
- Connects to trusted FC network
- More complex installation
- SCSI-based block-level data transfers
- Application enabled data sharing

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How Direct Attached Storage Helps You

Optimize information availability

- Full component redundancy, hot plug fans, power, drives
- RAID configurations keep data online if a hard drive fails
- High performance, spindle density for applications
- Industry leading, highly reliable, high MTBF hard drives
- Management software allows dynamic volume expansion
- Clustering kits provide fail-over capabilities

Reduce costs through simplicity

- Well understood, so no special training required
- Installs on server, no dedicated network needed
- PowerVault acquisition costs low due to commoditization
- Dell | EMC investment protection for SAN migration

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How Network Attached Storage Helps You

Improve utilization and accessibility of storage

- Mixed clients – Windows, Mac, Unix – can share files
- Multi-protocol services automatically configured
- Data share immediately accessible upon installation
- High speed large file data transfers beat general servers
- Consolidation provides single resource for serving files
- Storage can be added without effecting ongoing operations

Manage resources with greater efficiency

- Storage consolidation lowers management costs
- Browser-based console provides management anywhere

Reduce costs through simplicity

- Ease of use lowers learning curve, management costs
- Unlimited clients are able to access at no cost

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How Storage Area Networks Help You

Protect information from loss or disaster

- Ideal storage infrastructure for low-impact backup
- Snapshot, mirroring capabilities provide data redundancy
- Enables remote site protection/recovery from catastrophe

Improve utilization and accessibility of storage

- Optimal utilization of storage capacity when consolidated
- Storage is independent, free from server outages
- LUNs can be concatenated when more storage is needed
- Fewer tape devices needed when storage is centralized

Optimize information availability

- Storage external to application, alternate paths to data
- Storage systems can be upgraded without disruption

Manage resources with greater efficiency

- Management is centralized, storage is pooled
- Serviceability easier for non-complex configurations

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How Tape Backup Helps You

Protect information from loss or disaster

- Low cost offerings and media allow more frequent backup
- Multiple copies for off-site storage mitigates risk of data loss

Improve utilization and accessibility of storage

- SAN-based LAN-free backup eliminates data flow via LAN
- Tape libraries can be shared by multiple SAN hosts
- Higher capacity means more servers can be backed up
- Performance provides fast restore times in an emergency

Manage resources with greater efficiency

- Higher capacity media means higher backup density
- High speed requires less time to create off-site copies
- Fast data streaming reduces risk of missing backup window
- Hot backup during access eliminates window for some apps

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Thank You

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Steps for Building a Business Continuity Plan

Step 1 – Establish the Foundation

- Rapid assessment for identifying the people, processes and technologies most critical to continuous operations

Step 2 – Address Critical Exposures

- Direct deployment of systems and services for protecting, maintaining and recovering from high-impact, high-probability events

Step 3 – Develop and Implement a Comprehensive Plan

- In-depth plan for preparing an organization to manage expected and unexpected events, based on vulnerabilities, risks, impacts and costs.

Step 4 – Maintain the Plan

- The plan must be tested and maintained on a regular basis

Service Mapping to Availability Continuum

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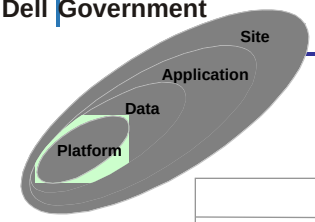

Platform ●

Key Services:
- Installation of Server
- Gold Support (7x24, 3-year, 4 -hour response, Technical Account Manager (TAM) team, remote software support)

Other Services:
- Training – server
- Custom Factory Integration

Data ●●

Key Services:
- SAN Production Readiness:
  - SAN design
  - Project implementation planning
- Storage installation
- Gold Support

Other Services:
- Training – storage systems
- Backup & Recovery Planning
- Dell Technology Solution Center proof-of-concept
- Platinum Support (with Availability Guarantee option)
- Business Continuity (referral)

Application ●●●

Key Services:
- MS-SQL or Exchange Design & Implementation
- Cluster kit installation
- Gold Support (software coverage included in Gold on servers)

Other Services:
- Training – Cluster, Appl.
- Migration Services
- Proof-of-Concept or tuning
- Platinum Support (with Availability Guarantee option)

Site ●●●●

- Custom Dell Premier Enterprise Services:
  - Assessment
  - Planning & Design
  - Implementation
  - Platinum Support with remote monitoring, 2-hour response, dedicated TAM, on-site parts, optional on-site engineer, and optional Availability Guarantee)
- Business Continuity/ Disaster Recovery (referral)

Components | Data | System | Infrastructure

Increasing cost, service resources, and complexity

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