

# Hennepin County

## Business Continuity & Disaster Recovery Planning Efforts



Information Technology Dept.  
Hennepin County, MN

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## Introduction

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Business Continuity / Disaster Recovery Planner  
Information Security Group, Hennepin County

- ◆ 14 years in the IT field
- ◆ 8 years varied IT Security responsibilities, including mainframe disaster recovery
- ◆ Dedicated to BCDR planning since March, 2005
- ◆ Board of Directors, ISSA - MN Chapter
- ◆ Member BCPA

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# Agenda

- ◆ Brief History
- ◆ Environment
- ◆ Current Large BCDR Efforts
  - Continuity of Operations Planning (COOP)
  - Backup Data Center
  - IT Continuity and Recovery Planning
- ◆ Directions
- ◆ Summary

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# History

- ◆ Large investment in legacy mainframe systems (z/OS, IMS, CICS, DB2, etc)
- ◆ Mature mainframe recovery effort (nearly 20 years)
  - Full recovery plans
  - Tape backups to alternate offsite tape library
  - Recovery at offsite vendor (Sungard, Comdisco, IBM)
  - Control from Local Area Suite
  - Exercised 3-4 times per year
- ◆ Some scattered business process and workspace recovery planning by operational units, but solutions are incoherent

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# History

- ◆ Client server systems consolidated into data center mid/late 90's
- ◆ Backup to mainframe via Harbor, then to tape stored in offsite library; restoration speeds across network slow (<1.5 Gb per hr)
- ◆ Full LAN recovery options discussed, but
  - Offsite vendors expensive (projected \$1.6M/yr by 2007)
  - Sufficient County owned space not available
  - Network radiated from single point of presence in same building as Data Center
  - Funding a challenge
- ◆ Some clustering or mirroring of critical applications and platforms, but within data center
- ◆ Acquiring space, shipping/setup of equipment/servers, ophys and app install, then data recovery from tape backup = weeks to months to recover applications

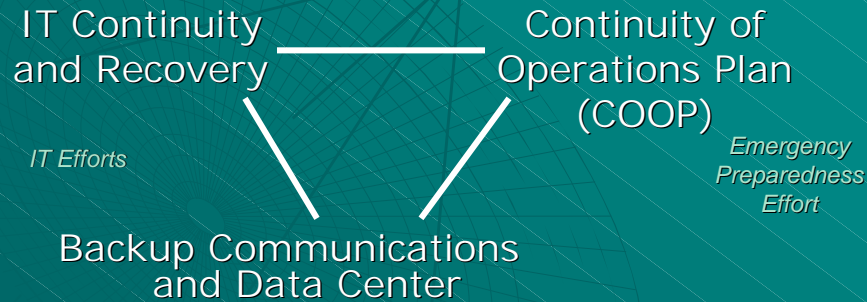
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# Environment Today

- ◆ 10,000 – 12,000 users depending on platform
- ◆ 400+ servers, 95% in central data center; growing at nearly 100 new servers per year
- ◆ Primarily a Microsoft and Cisco shop, a few other OpSys/databases
- ◆ Veritas backup direct to tape in alternate tape library
- ◆ zSeries 900/800 mainframes running z/OS, z/VM, z/Linux
- ◆ 25 TB storage on SAN; expanding at 5 TB per year
- ◆ Applications transitioning from mainframe to LAN platforms
- ◆ Increasing reliance on portable/remote networking and internet-based interactions/data exchange with key partners
- ◆ Hennepin County Medical Center and the Sheriff's Office maintain own data centers but obtain some enterprise services from central data center (email, mainframe, internet, DNS/WINS, etc)

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# Continuity Projects at HC



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# COOP Planning

- ◆ Continuity of Operations Planning effort chartered out of Hennepin County Emergency Preparedness group
- ◆ Focusing on business processes of county
- ◆ **First phase** - focused on analysis
  - Risk Assessment and Business Impact Analysis through facilitated meetings and personal interviews
  - Summary Reports and Recommendations
    - ◆ Business operations of the County broke down into 47 core services, 300 processes, and several thousand functions (doesn't include support services such as IT and HR)
    - ◆ Recommendations were to:
      - Create structured group of continuity planners
      - Incorporate planning work already being done
      - Establish strategy and priority for planning efforts
      - Create phased project plan to achieve fully documented plans within 2-3 years

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# COOP Planning

- ◆ **Second phase – structured planning**
  - With insufficient internal resources, County will retain outside consultant by 2Q 2006
  - Focused on processes and services in Government Center and City Hall
  - Will include all aspects of process/service, such as workspace, records, public interfaces, and support services such as IT, HR, Finance, etc.
- ◆ Follow-on phases will address COOP plans for other County locations
- ◆ Final phase will address maintenance and exercising of plans

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# Backup Data Center Project

## Setting the Stage

- ◆ External studies in 2002/2003 looked at options for alternative data center and main point of presence (MPOP)
- ◆ County sites, reciprocal agreements and leased facilities considered, in downtown, with State of MN, and remote
- ◆ **Recommendations:** build a remote data center facility in case catastrophic event incapacitates downtown
- ◆ Further analysis showed estimated facility related costs would be \$300,000 for leased space vs. \$4,000,000 to build space
- ◆ **Executive direction:** initially plan just for incapacitation of data center, MPOP, or Government Center
- ◆ In response, planning is broken into two strategies:
  - **Short term:** establish data center in downtown area adjacent to in-street fiber optics, mitigating localized risks until permanent data center can be made available
  - **Long term:** build new remote facility for data center operations in five to seven year timeframe

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# Backup Data Center Project

## Prep Work

- ◆ Network redesign and additional provisioning in 2004/2005 provided routes around single point of failure, single MPOP
- ◆ Many sites reviewed for space, environmental, necessary redesign, proximity to campus network, power, etc.

## Leased Space

- ◆ ING Bldg, 111 Washington St, Minneapolis
  - Acquired Jan 1, 2006, 5 year lease with extensions
  - 9,000 sq ft leased data center space being prepared
  - Planning as 'lights out' unmanned facility, remotely monitored
  - On fiber campus network, allows high-speed data mirroring
  - Planning for co-location of other County and local entities
- ◆ Will initially contain alternate:
  - Network/comm. equipment for fault-tolerance, alternate core and MPOP
  - SAN, VMware system, domain services, other critical LAN components
  - VoIP, Email, other critical communication and voice components
  - Alternate mainframe tape library

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# Backup Data Center Project

## Next Steps (funding allowing)

- ◆ Duplicate Internet/Intranet presence
- ◆ Duplicate other core infrastructure services
- ◆ Replicate critical customer applications
  - Applications/systems already clustered or mirrored will be first candidates

## Investments

- ◆ \$1.2 million capital funding in 2005/06 used for fiber, consulting, and new equipment; additional funding will be required to build redundancy for applications and services
- ◆ \$240,000+ estimated operating expenses per year
- ◆ Additional equipment purchases for leased site seen as reusable in long term solution
- ◆ Future funding methods will need to be determined – capital budgeting, charge-back, operating department funds

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# IT Continuity/Recovery

## Creating IT BCDR Program

- ◆ Full time position dedicated to IT BCDR planning established March 2005
- ◆ Initial work involved:
  - Creation of mission, vision, strategic goals
  - Updating existing recovery manual and processes
  - Reassessing criticality of mainframe applications and systems
  - Improving rigorousness of existing mainframe recovery planning and processes - all critical/high priority apps now tested once per year
  - Establishing better connectivity between campus network and offsite mainframe recovery vendor
- ◆ Consulting with centralized/departmental IT staff and customers, interfacing with other continuity/recovery efforts, reporting to governance bodies

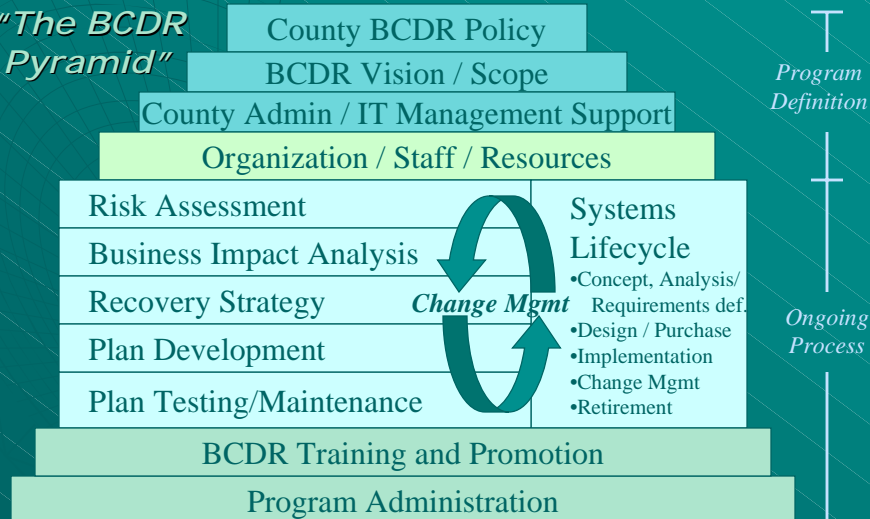
## Current Focuses

- ◆ Initiated LAN application recovery planning process
- ◆ Expanding recovery teams and processes
- ◆ Researching BCDR Planning software/tools

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# IT Continuity/Recovery

"The BCDR Pyramid"



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# IT Continuity/Recovery

## LAN App Recovery Planning Process:



# IT Continuity/Recovery

## Business Impact Analysis

- ◆ LAN applications doing new assessment 4Q 2005 - 1Q 2006
- ◆ Information requested:
  - Application detail, process timelines, user base
  - Server platform, database, connectivity, environment, dependencies, etc.
  - Current backup/recovery process, if any
  - Priority and maximum acceptable outage, costs of outages
- ◆ Estimated 2-4 hours per app, one app per survey
- ◆ Information to be maintained in database for query/reporting

## Detailed Interviews

- ◆ Will pull out details, discuss RPO/RTO, integrate with BIA info obtained from COOP assessment of business processes

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## Directions – Mainframe Recovery

### Program maintenance

- ◆ Maintain/exercise current plans, teams, processes
- ◆ Continue to outsource, due to uncertain future of platform
- ◆ Ship tapes to vendor and control recovery from local suite
  - Vendor provides systems within 24 hours of declaration
  - Operating systems and application platforms recovered within 36 hours of declaration
  - Production applications and databases recovered within 48-72 hours of declaration
- ◆ Connect to backup data center via 2 T-1 lines managed by recovery vendor
- ◆ Determine methods to exercise concurrent with LAN recovery at backup data center

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## Directions – LAN Recovery

### Mirrored SAN

- ◆ 25 TB SAN in production data center; 15 TB in backup site
- ◆ Need data criticality definition, based on app criticality or other categorization, to determine replication priorities

### Tape Backup

- ◆ Veritas allows direct access to tape library, removing mainframe
- ◆ With mirrored SAN, tape backup role reduced to file restores, archiving, and restoring non-critical or non-SAN attached servers

### Remote Site Servers (non-data center)

- ◆ LiveState utilized to 'snapshot' server opsys and application with all settings, image is backed up to tape
- ◆ Data backed up to tape via Veritas
- ◆ Replacement hardware drop-shipped to data center, image and data restored on high-speed network, then restored server is moved to site

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## Directions – LAN Recovery

### Virtual Server Environments

- ◆ VMWare piloting in production data center
  - Provides better operational capacity, allocation, provisioning
  - Will provide increased fault-tolerance in production environment
  - OpSys and application backed up as single file, stored on SAN
- ◆ VMWare key solution in backup data center
  - VM environment may be initially populated with depreciated hardware to quickly/cheaply build capacity
  - Allows 'drag-n-drop' of images of critical servers/applications, which are then pointed to mirrored SAN and 'booted up'
  - Removes traditional dependency on exact hardware
  - Reduces recovery times to minutes to hours, depending on prioritization
  - Other possible solutions still under investigation may allow automated failover from primary VM to backup (IP subnetting and other challenges exist)

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## Directions – LAN Recovery

### Fault-tolerant / Redundant Systems

- ◆ Systems/applications with high-availability requirements shorter than VM recovery provides will need to follow traditional paths for clustering and/or other failover/mirroring technologies
- ◆ Systems/applications that can not be virtualized ('heavy-hitters' or app incompatibility) will also need to follow traditional paths

### Low Priority Systems

- ◆ Systems with very long RTO can utilize more cost effective drop-ship agreements or wait as VM environment is augmented

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## Directions – LAN Recovery

### LAN Recovery Solution Breakdown \*\*

- ◆ Top 10% of systems
  - High-availability solutions
  - Non-virtualized systems
- ◆ Middle 70-80% of systems
  - Virtualized systems/recovery
- ◆ Bottom 5-10%
  - Drop ship or off-the-shelf solutions
  - A few "don't bother" systems never recovered

\*\* *Guesstimates*

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## Summary

- ◆ The County is focusing many efforts on continuity and recovery, from the business and IT ends; good coordination/direction is needed to meet in the middle
- ◆ Resources are a challenge, both in managing continuity efforts and in customer groups supplying key information
- ◆ Years of studies and slow preparation are starting to pay off by having foundations for backup data center and other redundancy in networks and systems
- ◆ Many converging projects and technologies now allow better continuity/recovery, even if only as ancillary benefit
- ◆ SAN and server virtualization efforts are seen as key enablers for quick recovery of our large LAN environment but traditional solutions will still figure in

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Questions??

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