Disaster Recovery and Business Continuity for GIS

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Presentation Overview

- Who is Bowne?
- Overview of disaster recovery and business continuity
- Three case studies:
  - NYC government post 9/11/2011
  - NYC Economic Development Corporation today
  - City of Newburgh today
Who We Are

• Bowne Management Systems, Incorporated
• Part of the Bowne AE&T Group
• Founded in 1986
• Specialize in GIS and IT services and consulting
• Our focus is local government
• Headquartered in the NYC area
• We have approximately 30 F/T staff
A Disaster is:

Any unplanned event that threatens an organization’s ability to function effectively
Disaster Management Phases

- Planning / preparedness
- Response
- Recovery
- Mitigation
RPO and RTO

- The Recovery Time Objective (RTO) is the goal for how quickly an application and its data need to be back online.
- The Recovery Point Objective (RPO) defines to what point in time the data must be restored to be considered successful.
How Much Can You Tolerate?

- RPO and RTO represent the balance between maximum acceptable data loss and the cost of achieving that objective.
Audience Participation Time

• How much confidence do you have in your disaster management plan?
  – No plan
  – Never tested
  – Failed
  – Passed
In a VERITAS survey of over 3,000 IT professionals, 72 percent had no disaster plan, never tested their plan, or had a plan that failed.
Many Solutions

• RAID, other mirroring
• Backup using tape, disk, other media
• Replication
• Server and storage virtualization
• Disk and server imaging
Server Imaging

Original server with imaging backup software

Server backup to image file

Server is restored from image file as an exact replica of the original server when backed up

Physical server

Virtual server
Storage Management
Three Case Studies

- NYC government post 9/11
- NYC Economic Development Corporation today
- City of Newburgh today
NYC 9/11

• Suddenness caught NYC GIS off guard
• Primary offices were 1 ½ blocks north of WTC7
• We left at 9:15 AM and did not return for months
NYC Post 9/11

• Immediate focus: finding staff and ensuring their safety

• That evening we went to the NYPD’s EOC and started doing GIS

• The “Emergency Mapping Center“ grew quickly in size and capabilities, but didn’t have an enterprise geodatabase
NYC Post 9/11

- Within a few days we moved to OEM’s EOC
- We were renamed the “Emergency Mapping and Data Center”
- Several of our key resources were “grabbed” by others
Post 9/11, NYC

- The EMDC operated 24/7 through Nov and closed late Jan 2002
- Over 5,000 job requests were processed
- Over 100 professionals and volunteers gave their time
Lessons Learned

• Get busy, supporting first responders and stay close to them – adjust your products and services quickly

• Have an enterprise geodatabase, many copies of it and remote access

• Have a web hosting platform and ftp capabilities

• Document simple things – e.g. contact info, dataset names and locations, key URLs, usernames and passwords
NYCEDC GIS Business Continuity Project

- Over 2 TBs of GIS data hosted
- About 10 GIS web applications
- Variety of geographic web services, web map services and SharePoint Web Parts
- Widespread integration by non-GIS apps/systems
- Seven GIS servers
- 3 full-time GIS staff, 1 part-timer, 2 interns
### NYCEDC’s GIS RTO and RPO

<table>
<thead>
<tr>
<th>GIS Resource</th>
<th>Recovery Time Objective (RTO)</th>
<th>Recovery Point Objective (RPO)</th>
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<tbody>
<tr>
<td>PropertyInfo (application)</td>
<td>One business day</td>
<td>One week</td>
</tr>
<tr>
<td>PoliticalInfo (a)</td>
<td>Two business days</td>
<td>One month</td>
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<tr>
<td>AMmap (a)</td>
<td>Two business days</td>
<td>One week</td>
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<tr>
<td>CAPmap (a)</td>
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<td>One week</td>
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<tr>
<td>DEVmap (a)</td>
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<td>IncentiveMap (a)</td>
<td>Two business days</td>
<td>One week</td>
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<td>WFMMS (a)</td>
<td>Two business days</td>
<td>One business day</td>
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<td>geoEDC (a)</td>
<td>Two business days</td>
<td>One business day</td>
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<tr>
<td>ArcGIS Desktop users (software)</td>
<td>Two business days</td>
<td>One business day</td>
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<td>PropertyCentral services (web services)</td>
<td>One business day</td>
<td>One business day</td>
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<td>Enterprise geocoder (web services)</td>
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<td>Geosupport (web services)</td>
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<td>ProjectCentral map services (web map services)</td>
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<td>Standard map services (web map services)</td>
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<td>Two business days</td>
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<td>WFMMS map services (web map services)</td>
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</table>
NYCEDC GIS Business Continuity Project

- Goal: specify, procure, install, configure and test remote GIS hosting of data, services and applications
- Esri and Microsoft-based architecture
- Existing GIS infrastructure all downtown Manhattan
- New remote site offered
Brooklyn Army Terminal

- 6.6 miles by road from corporate headquarters
- Offered both server room capacity and GIS staff work areas
NYCEDC GIS Business Continuity Project

- Implementing with NYCEDC’s GIS and MIS
- Next step: test and adjust, re-test (iteratively)
- Plan and infrastructure will need to be kept up-to-date over time
NYCEDC GIS Business Continuity Project

• Configuration:
  – Servers are imaged and left off by default
  – GIS data is replicated using SAN-to-SAN replication and SQL Server replication

• Synchronization:
  – Server images are refreshed weekly
  – Replication uses real-time transactional updates
City of Newburgh

- Over 100 GBs of GIS data and Esri desktop software
- Some GIS web applications
- GIS data is hosted at 22 Grand Street
- GIS data is backed up at 83 Broadway
City of Newburgh

• Cons:
  – The two sites are across the street from each other
  – No remote site is ready now
  – No coverage for GIS web sites and Esri licensing

• Pros:
  – GIS data is being backed up
  – The City recently authored a data-centric Disaster Management Plan
Any Questions?

Thank you!