Cloud Computing

Brad Harris
Louisiana
ITS Technology Survey results

22 responses from 21 jurisdictions

3 ITS, 1 ITS/STS, 4 STS, 2 BOS, 3 STS/BOS

Utilizing CLOUD based services

6 Used by jurisdictions

SurveyMonkey, HostedTest, GovDelivery, Email
Virtual servers, Redundant storage

1 Created by jurisdictions

Comments: Not for sensitive data; Contract signed, not implemented; Servers are virtual
ITS Technology Survey
ITS Technology Survey results

Reasons not used

4 No obvious use or available solutions not right fit
3 Never considered
3 Technology, security, privacy, or other non-financial concerns
1 Financial concerns

Other: Not there yet; Being investigated; Ownership & retention of records
Case Studies

Explore Issues of Security, Integration, Backup, Building Applications, Government Entities

Graphical Election Results
State Archives Multimedia Assessment
Public Facing Website Assessment
Graphical Election Results

Statewide elections after polls close
Even ½ hour outage unacceptable in 4-5 hour window
Have had issues related to load and just bad luck
Not sensitive data
Azure chosen
  Had developer who was familiar
  Simple to deploy
  Highly available
  Only pay for what you need
  Can be scaled up for election night
Graphical Election Results
Graphical Election Results

Azure SDK add-in to Visual Studio
Parent project stores configuration
Web Role project
Publish process
  - Zip file uploaded, web role instance update/create
Has built in test environment that simulates cloud

Must code to get site metrics and performance
Graphical Election Results
Graphical Election Results

Management tools offer diagnostics
  Memory use, available bytes, processor time

Production environment
  1 extra small web role scaled to 2

Staging environment
  1 extra small web role
### Graphical Election Results

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Status</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Louisiana Secretary of State</td>
<td>Subscription</td>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>Hosted Service</td>
<td>Created</td>
<td></td>
</tr>
<tr>
<td>ERIN.Azure - 2012.05.10 9:31:54 AM</td>
<td>Deployment</td>
<td>Ready</td>
<td>Production</td>
</tr>
<tr>
<td>SOSWebRole</td>
<td>Role</td>
<td>Ready</td>
<td>Production</td>
</tr>
<tr>
<td>SOSWebRole_IN_0</td>
<td>Instance</td>
<td>Ready</td>
<td>Production</td>
</tr>
<tr>
<td>Staging</td>
<td>Hosted Service</td>
<td>Created</td>
<td></td>
</tr>
<tr>
<td>Certificates</td>
<td>Service Certificate</td>
<td>Created</td>
<td></td>
</tr>
<tr>
<td>ERIN.Azure - 2012.05.08 11:52:15 AM</td>
<td>Deployment</td>
<td>Ready</td>
<td>Production</td>
</tr>
<tr>
<td>SOSWebRole</td>
<td>Role</td>
<td>Ready</td>
<td>Production</td>
</tr>
<tr>
<td>SOSWebRole_IN_0</td>
<td>Instance</td>
<td>Ready</td>
<td>Production</td>
</tr>
</tbody>
</table>

**Properties**

- **Environment**: Production
- **Name**: SOSWebRole_IN_0
- **Start result**: Started
- **Start time**: 5/10/2012 2:37:45 PM UTC
- **Size**: Extra Small
- **Status**: Ready
- **Update domain**: 0
- **Type**: Instance
Graphical Election Results

Adobe Flash application

client side application swf file

election results in json file

download only information needed for current page
domain windows service updates results every 2 min.
timestamp on file determines cache refresh
Graphical Election Results
State Archives Multimedia Assessment

Last major application still on mainframe
Application co-developed by another state entity
Options to store video at other state agency, in cloud or internally

AWS S3

    supported natively by enterprise backup products
GovCloud

    Keeps data segregated from public
Screening to confirm US governmental agency
FIPS 140-2 compliant
State Archives Multimedia Assessment

AWS S3 (con’t)
  - can choose 1 or multiple datacenters
  - can make snapshots and choose location for storage
  - can be scripted
  - pay for download and monthly prorated use only

Azure BLOB
  - not supported by as many vendors
  - newer at this than Amazon
State Archives Multimedia Assessment

Buy storage ourselves
  High upfront cost
  Not fully utilized for several years
  Must have backup capability
  Have to support it

Leaning towards AWS S3
  Pay as they create content
  Third party tools to upload content
  A little cheaper
**State Archives Multimedia Assessment**

<table>
<thead>
<tr>
<th>Cloud Storage</th>
<th>Storage Cost</th>
<th>Cloud Bandwidth (250GB)</th>
<th>Total Monthly Cost</th>
<th>Total Annual Cost</th>
<th>Hours of HQ Video*</th>
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</thead>
<tbody>
<tr>
<td>1TB</td>
<td>$110.00</td>
<td>$30.00</td>
<td>$140.00</td>
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<tr>
<td>2TB</td>
<td>$220.00</td>
<td>$30.00</td>
<td>$250.00</td>
<td>$3,000.00</td>
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<tr>
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<td>$30.00</td>
<td>$9,630.00</td>
<td>$115,560.00</td>
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<table>
<thead>
<tr>
<th>Storage</th>
<th>Storage Cost</th>
<th>Bandwidth (N/A)</th>
<th>Total Monthly Cost</th>
<th>Total Annual Cost</th>
<th>Hours of HQ Video*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1TB</td>
<td>$250.00</td>
<td>-</td>
<td>$250.00</td>
<td>$3,000.00</td>
<td>500</td>
</tr>
<tr>
<td>2TB</td>
<td>$500.00</td>
<td>-</td>
<td>$500.00</td>
<td>$6,000.00</td>
<td>1,000</td>
</tr>
<tr>
<td>10TB</td>
<td>$2,500.00</td>
<td>-</td>
<td>$2,500.00</td>
<td>$30,000.00</td>
<td>5,000</td>
</tr>
<tr>
<td>51TB</td>
<td>$12,750.00</td>
<td>-</td>
<td>$12,750.00</td>
<td>$153,000.00</td>
<td>25,500</td>
</tr>
<tr>
<td>100TB</td>
<td>$25,000.00</td>
<td>-</td>
<td>$25,000.00</td>
<td>$300,000.00</td>
<td>50,000</td>
</tr>
</tbody>
</table>

**LASOS Hosted Storage Example**

<table>
<thead>
<tr>
<th>RAW Storage</th>
<th>Usable Storage</th>
<th>Type of Storage</th>
<th>Purchase Cost</th>
<th>DR Cost*</th>
<th>Total Purchase Cost</th>
<th>Estimated Annual Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>36TB</td>
<td>27TB</td>
<td>Direct Attached</td>
<td>$8,000.00</td>
<td>$8,000.00</td>
<td>$16,000.00</td>
<td>$2,000.00</td>
</tr>
<tr>
<td>36TB</td>
<td>26TB</td>
<td>SAN</td>
<td>$18,000.00</td>
<td>$8,000.00</td>
<td>$26,000.00</td>
<td>$3,500.00</td>
</tr>
</tbody>
</table>

*DR Cost does not include traditional backup. This cost is for a one way replication of the data to our Disaster Recovery site.*
Public Facing Website Assessment

DNN site 7 years old
Not upgradable due to open source modules used
SharePoint to be used
Cloud would allow availability in outage
Cloud would allow scaling for election night

Public Facing website designed with Iframes
  Separate web applications in DMZ
  Access to databases that may contain sensitive information
  Sensitive information not kept in DMZ
Public Facing Website Assessment

Considered AWS but were concerned about state procurement
Azure not quite there yet for SharePoint
Target for presidential election
Not sensitive data
Will probably use local datacenter as public cloud
   On state contract