Project Description

- The project was to replace all the production system components located at the Department’s HQS due to their age, variation in vendors, and lack of providing an efficient, scalable, secure and reliable platform to operate our business operations.

- The components at the Department’s HQS were duplicated and placed at the Department of Information Technology’s (DoIT) Simms building data center for redundancy.

- With the use of load balancers the two sites were split into an active-active cluster and allowed for continue operations when there is a failure at the Department’s HQS.
Parts of the Project

- Replaced physical servers with VMWare and Cisco UCS with Blade Servers allowing for scalability of resources.
- Replaced local server storage with a Dell NAS allowing for scalability, increase of performance, and ease of backup and recovery. Implemented a 10GB fiber channel connection between the NAS and UCS chassis for performance.
- Replaced HQS switches and routers with the same vendor and model in order to simplify O&M and configuration.
- Moved SSL Certificates from servers to the load balancers.
- Replaced the obsolete firewalls with an ASA device with advanced security features and services.
- Reviewing the replacement of VPN (juniper) with Cisco Anyconnect VPN option.
- Duplicated hardware at HQS and placed it at DoIT for reliability and performance.
# Expenditures

<table>
<thead>
<tr>
<th>Service</th>
<th>Actual Cost</th>
<th>Approved Funds</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Services</td>
<td>$20,000</td>
<td>$20,000</td>
<td>$0</td>
</tr>
<tr>
<td>IT Equipment – Software</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$0</td>
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<tr>
<td>IT Equipment - Hardware</td>
<td>$277,353</td>
<td>$280,000</td>
<td>$2,647</td>
</tr>
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<td><strong>Actual Total Spent:</strong></td>
<td><strong>$347,353</strong></td>
<td><strong>$350,000</strong></td>
<td><strong>$2,647</strong></td>
</tr>
</tbody>
</table>
Accomplishments

- Initial funds appropriated June 2015
- Phase 1 at DoIT completed November 2015
  - Move existing redundant servers and load balancers from NMDGF Hqs Data Site to DoIT Data Site
  - Rack is leased to house the equipment at DoIT Data Site
  - Establishes an alternate data center with manual failover capabilities
- Phase 1 at DGF completed February 2016
  - Establish DoIT as the primary data site for operations
  - Replace end of life network switches with Cisco 3750 switches
  - Convert application physical servers to virtual servers on blades to one physical server
  - Validate performance and functionality of virtual servers
Accomplishments

Phase 2 at DGF completed March 2016
- Replace the servers at NMDGF Hqs with Cisco Blade Servers using the virtual versions
- Move the server with the virtual servers to the test domain
- Connect the servers to a Storage Area Network device
- Validate performance and functionality

Phase 3 at DoIT completed March 2016
- Establish NMDGF Hqs as the primary site
- Replace the servers at DoIT with Cisco Blade Servers using copies of the NMDGF virtual versions
- Connect the servers to a Storage Area Network device
- Validate performance and functionality
Accomplishments

- Validated Completion March 2016
  - Validate failover and performance
Lessons Learned

- Allow more time to anticipate shifts in the project schedule to address periods of critical business operations and unplanned production issues.
- Schedule subject matter experts further in the future and allow more scheduled time with them due to their availability.
Questions?