ENTERPRISE ARCHITECTURE

Enterprise Data Center Strategy Study

A Vision Technologies whitepaper providing an overview of the assessment and design of data center architecture for the Department of State.

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Enterprise Architecture

ENTERPRISE DATA CENTER STRATEGY STUDY

DEPARTMENT OF STATE DATA CENTER DESIGN

The Information Resource Management (IRM) organization is the Department of State's corporate IT organization. While IRM is the corporate business unit, IT functions are scattered across 37 bureaus with multiple systems, locations, and processes. Consequently, a significant number of IRM functions and services can be proposed or considered for consolidation, Shared Services, or reengineering to reduce redundancies.

The Department of State (DoS) contracted (through the prime contractor Grant Thornton) with Vision Technologies (Vision) to conduct an enterprise-wide business case analysis to support the development of a data center consolidation strategy. The purpose was to collect data in support of the development of high level solutions to consolidate DoS Enterprise Data Centers and the ancillary supporting activities enterprise-wide.

The data collection effort supported the immediate tactical goals to:

- Establish a plan for data centers to be moved out of current data centers
- Resolve the future of non-targeted data centers
- Establish a plan for the new data center

In addition, the data collection effort supported the longer term strategic goals to:

- Validate data center requirements
- Elaborate a data center vision
- Establish longer term direction

Assessment Goals

Vision developed an analysis that provides DoS with a clear assessment of their data center's building systems infrastructure, application directions and provided a 5 to 10 year strategy on the direction for their data centers. During the process, Vision reviewed the DoS data center facilities via questionnaires, interviews, observations, market research, and the review of best practices. The results of this study relied heavily upon the feedback provided by business application and data center owners. They were asked to respond to questionnaires and interviews designed to profile of the applications that are critical to the business goals of the organization. The study also relied on current market forces in the data center industry. Market forces are an integral part in the decision making process as DoS must compete for vital resources such as funding, staff and space.

A data center consolidation, virtualization and migration strategy was needed due to the unscheduled infrastructure outages, limited environmental infrastructure capacity and aging electrical and mechanical systems of the data centers. As a consequence, critical business applications hosted by these centers were at risk. In addition, the increasing demand for access to business applications on a 24x7 basis has intensified. Some of the data centers also occupy valuable office space. A forward-looking strategy was needed to meet the demands of the current business environment and to position DoS to meet the new business requirements of the future.

When these data centers were created, they were not designed to handle the intense computing requirements of today's applications. Many of these centers are converted office space or repurposed mainframe facilities. Neither is capable of providing a sufficient environmental infrastructure that is flexible, scalable, secure and efficient. The business landscape is evolving, the data centers have not. The following is a summary of the current data center environments, options to address the issues and a future vision.

Consolidation

Data center consolidation is not just about consolidating equipment, services and staff. It is also about relocating critical business applications. It was fundamental that the performance of these applications either remain intact or be improved after the consolidation. The investment in time, money and energy of such an endeavor without improving application performance is futile. The current DoS enterprise-wide data centers consist of 19 data centers spread across geographically dispense areas within the United States. Vision's scope of work was to gather, evaluate, and analyze information from end user systems and support services, communications services, datacenter services, IT security services and current business services/enterprise applications. As a result of this data gathering, evaluation and analysis Vision provided recommendations for the consolidation and virtualization strategy necessary to combine multiple data centers and their applications services into fully meshed, high availability data center architecture capable of providing business continuity and disaster recovery.

Analysis and Recommendations

Based on our analysis Vision formulated and proposed a recommendation based on two Tier 3 primary data processing centers and a Tier 2 backup data center. The two Tier 3 primary data processing centers would provide the daily operational support for the DoS production systems. They would be load balanced and support real time failover capabilities to each other. The Tier 2 backup facility would provide recovery support should one of the primary processing facilities experience a catastrophic failure. In this scheme there will always be at least two data centers. To address the immediate needs of specific data center, Vision recommended that production applications should be relocated to a new leased Tier 3 commercially owned facility.

At the same time, all backup applications should be relocated to a new leased Tier 2 commercially owned facility. Vision Technologies estimated this process will take 2 to 3 years to complete. To complete the BCDR scenario, Vision recommended the DoS to establish a second primary data processing center. This will provide the load balancing and real time failover capability for the first primary processing facility. Other considerations taken in to account were:

Before DoS engages in the transformation of their data centers to a new vision, the following was suggested:

- An Enterprise Changes Management process that (1) centralizes and controls all decisions in the relocation of applications to the new data centers and (2) forms the foundation for a new centralized data center management structure.
- A comprehensive transition plan that aligns its activities with the Enterprise Change Management process, business application and data center owners, IT infrastructure and network personnel.
- Develop a simulated environment to test application performance in the new data center before the relocation.