



ADOA-ASET

Project Investment Justification

Version 03.31.15

A Statewide Standard Document for Information Technology Projects

Project Title:

ASLD Refresh Project

Agency Name:	Arizona State Land Department (ASLD)	
Date:	May 7, 2015	
Agency Contact Name:	Carolyn M. Brown	
Agency Contact Phone:		
Agency Contact Email:		

I. Project Investment Justification (PIJ) Type*

Yes No Is this document being provided for a Pre-PIJ / Assessment phase?

If Yes,

Identify any cost to be incurred during the Assessment phase.	\$
Based on research done to date, provide a high-level estimate or range of development costs anticipated for the full PIJ.	\$

Explain:

[Click here to enter text.](#)

Yes No Will a Request for Proposal (RFP) be issued as part of the Pre-PIJ or PIJ?

II. Business Case

A. Business Problem*

Budget constraints in previous fiscal years have prevented ASLD from refreshing components of our IT infrastructure. These components include IBM Blade System application servers, IBM X3850 Hypervisor Citrix XenServer VDI hosting servers and the BNT 10Gbe network infrastructure backbone providing infrastructure access between all compute and storage devices.

This refresh process is critical in order to ensure continued high availability and efficient functioning of the Department’s central network services. Any potential downtime would prove costly and have significant business impacts including, but not limited to, substantial lost revenues for the State Trust. The infrastructure in place has become obsolete and no longer fulfils all business requirements; a refresh is required for ASLD staff to perform their duties as efficiently as possible. Since the last refresh server in 2003 technology has become more powerful and efficient. Capacity requirements are being overburdened resulting in stressed performance. Land is not currently out of storage space but is approaching capacity with a very low available reserve left. This is negatively impacting the Compellant SAN infrastructure performance as it must utilize more processing power to move data around an increasingly smaller allotment of available disks.

The stability of new and supported equipment provides savings through less downtime and lower maintenance and increased efficiency. Current equipment is no longer being supported and ASLD is experiencing an accelerating number of hardware failures and finding it increasingly difficult repairing or replacing them since they are nearing end-of-life support.

B. Proposed Business Solution*

In order to ensure the continued reliable functioning of the Department’s critical IT applications and data management functions ASLD proposes procurement of new servers and Storage Area Network (SAN). These servers perform a variety of critical tasks such as provision of business system services, GIS data services, email services, directory services, configuration control and other functions. These servers will be installed in ASLD’s data center located at 1616 W. Adams, Phoenix, Arizona 85007. These new servers would have higher performance and capacity specifications providing enhanced throughput for the Department’s server based IT applications. Because of the consistency in form and architecture the servers would be easier to manage and administer from both a maintenance contract perspective and

from an IT staff perspective. The newer servers will be more reliable, parts and support will be easier to obtain and they would use significantly less energy than the current old servers.

Cisco UCS B200 M4 Blade Server provides enterprise-class performance in a compact form and is optimized for use in the data centers or cloud environment. As well this technology offers high performing CPU and memory options without constraints in configuration power or cooling.

The proposed storage system is an IBM FlashSystem V9000 providing an all-flash enterprise storage solution including a rich set of storage virtualization features. This system is an economical high performance solution.

C. Quantified Benefits*

<input checked="" type="checkbox"/>	Service enhancement
<input type="checkbox"/>	Increased revenue
<input checked="" type="checkbox"/>	Cost reduction
<input checked="" type="checkbox"/>	Problem avoidance
<input checked="" type="checkbox"/>	Risk avoidance

Explain:

Service Enhancement – The Department servers provide application and data services for the Department’s enterprise business system (OASIS) which is not slated to be replaced by BREAZ, and GIS systems (ARIS, PALMS), its directory services system, email system and other user applications. A number of other servers provide network security services or network management services or act as development environments for the Department’s enterprise user applications. An upgraded infrastructure provides enhanced service to the user community. The new converged network architecture will increase throughput to 40Gbe up from 10Gbe currently and provide increased network reliability and redundancy through the dual-redundant Cisco switching architecture. The additional capacity will deliver significantly more data to the department’s ESRI mapping and Oracle server infrastructure applications (PALMS and OASIS).

Problem and Risk Avoidance - As the Department continues to rely more and more on information systems to carry out its daily operations and planning activities the need to ensure quality and reliability of services is of paramount importance. Failures of these major components leading to outages of services would prove very costly to the Arizona State Trust. Without reliable core IT infrastructure components such as servers the Department will be unable to guarantee reliable and efficient IT services to the Department staff, management and customers. This could have dramatic consequences for the Department’s ability to carry out its mission of managing Arizona’s valuable state trust lands and producing large revenue streams for the Trust beneficiaries.

Cost Reduction – If the Department does not refresh its aged server base risk of catastrophic failure greatly increases in addition performance problems that hinder productivity will increase as the Department’s use of information technology continues to grow. The stability of having new equipment provides savings through less downtime and lower maintenance. ASLD has experienced an increasingly number of service outages and downtime through the failure of our older equipment. These unplanned outages negatively impact our productivity while systems are unavailable to our users. A refresh of our

older equipment would provide a significantly higher degree of reliability and availability to our user community increasing their productivity. Additionally, IT staff would see increased productivity as well with a more reliable infrastructure.

New servers will provide benefits of increased performance and throughput enabling better performing IT applications. Cost reduction and ROI is also achieved with increased efficiency and less maintenance. Improved Server technology is more powerful and efficient providing increased workload while consuming less power.

Risk Avoidance - The proposed solution helps to eliminate risk associated with potential failure associated with maintaining an aged infrastructure, this does not have an impact on Disaster Recovery updated and is fully compatible as ASLD will continue utilizing its existing tape storage infrastructure.

III. Technology Approach

A. Proposed Technology Solution*

The project proposes to refresh the Department's core IT infrastructure. This proposed refresh of these infrastructure components will replace equipment purchased during the Department's last IT infrastructure refresh cycle in 2009/2010. As a result of this proposed project the Department will have refreshed and modernized the critical server components in its overall IT infrastructure.

ASLD will be utilizing VSC to virtualize our onsite storage infrastructure behind the new FlashSystem SAN. This includes the existing Compellent SAN infrastructure, additional NAS devices, and the AZGEO projects SAN infrastructure when it comes online.

This software will allow us to virtualize our storage area networks and other storage architecture through a single orchestration pane of software behind the proposed FlashSystem SAN. This will increase performance of these older technologies by utilizing Flash technology as a cache buffer to contain frequently requested data for fast read and write handoff's, as well as provide a central point of access across all storage architectures for our clients and end devices.

IBM FlashSystem Storage Enclosure:

- High capacity and fully integrated management.
- Storage Enclosure expansion units for large scale enterprise storage system capability.
- Currently amount of storage is 24TB before compression with 36TB to 42TB expected after real-time compression judging from a Proof of Concept analysis conducted during the 1st quarter of this year.

IBM® Virtual Storage Center:

- Data and storage management software is a storage virtualization platform and a storage management solution for cloud-based and software-defined storage.

- Automate storage provisioning, capacity management, availability monitoring and reporting.

FlashSystem® V9000 Software:

- Fully integrated management capabilities.
- Single management experience.
- Clustered and externally virtualized set of resources, delivering ease of use and management consistency throughout.

ThinkCentre M93P:

- The current units will not meet our GIS graphical requirements. As well, they are no longer in production and are experiencing an increasingly high failure rate.
- The M93p desktop features 15-month platform stability with no planned hardware changes that affect the preloaded software image.
- Image stability for long-term deployments.
- Supports up to three monitors.
- Security tools including USB ports disablement assists in data theft prevention.
- Trusted Platform Module (TPM) encrypts data and key information.

UCS B200 M4 Blade Server:

- Delivers performance, flexibility and optimization for data centers.
- Enterprise-class providing exceptional levels of performance, flexibility, and I/O throughput.
- Quickly deploys physical and virtual workloads.
- Provides uncompromised expandability and capabilities.

Cisco UCS B460 M4 Blade Server:

- Single converged system that simplifies server management and delivers greater cost efficiency and agility.
- Uncompromised expandability, versatility, and performance.
- Offers advances in fabric-centric computing, open APIs, and application-centric management, and uses service profiles to automate all aspects of server deployment and provisioning.
- NVIDIA Grid Technology delivers rich graphics on virtual desktops (multiple users can share a single GPU)
 - Cloud server efficiency by offloading the CPU from encoding functions
 - Power efficiency.
 - 24/7 reliability.

B. Existing Technology Environment

This project proposes to replace the Department’s current capacity Network Appliance networked attached storage system. The existing SAN capacity is 28TB and it will be repurposed as additional storage to the proposed Flash SAN. Some servers may be repurposed with older units surplus. ASLD experienced no issues during Proof of Concept testing earlier this year and as such do not anticipate any compatibility concerns with DR as well.

Existing technology as follows:

- Enterprise Server rack for blade server equipment.
- IBM Blade Center H Chassis (3) for housing the blade servers.
- Rack monitor, keyboard and mouse for server management console.
- Server management console device for management of blade servers through a management console.
- Transceivers for connecting blade center switch modules to the network infrastructure
- IBM N6040 SAN (Storage Area Network).

C. Selection Process

Products were reviewed and tested to ensure computability with ASLD infrastructure and provide optimum performance. Quotes were obtained to ensure all proposed technology is in compliance with State contracts and purchasing policies.

IV. Project Approach

A. Project Schedule*

Project Start Date: 5/20/2015 **Project End Date:** 12/31/2015

B. Project Milestones

Major Milestones (Please note that these milestones are fluid and details cannot be determined until PIJ approval and receipt of equipment)	Start Date	Finish Date
• Design the installation and migration process	5-20-2015	
• Order project hardware and software	5-20-2015	5-20-2015
• Receive Hardware and software	6/26/2015	6/26/2015
• Install, configure and test backend server		
• Install configure and test client side hardware		
Documentation	11-1-2015	12-31-2015

C. Project Roles and Responsibilities

ASLD engineering staff will be installing FlashSystem SAN themselves utilizing the experience they gained from installing and configuring this SAN during the Proof of Concept evaluation earlier this year

William Reed, the Department's Chief Technology Officer, will have the overall responsibility for the design and implementation of this project and will supervise staff and consultants for the project. Mr. Reed was responsible for the development of the Department's current network and communications systems and is familiar with the technical design and operations of the Department's current IT infrastructure and its current server components including its ORACLE based business system. All of existing server components were successfully developed and deployed under his supervision. He has extensive experience in managing and designing multi-server, multi-application networks. He also has significant previous experience in the design and operations of centralized storage, backup and recovery, network architecture design and deployment as well as user access control and network security. He also has significant experience in designing user access control, network security controls and policies and procedures to ensure system security. He currently functions as the Department's information security officer.

Arthur Sarumov, ITS 4 EDP Tech Sup Spec II will perform installation and configuration work associated with the blade center and blade servers. He currently manages the existing servers for the Department and is thoroughly familiar with their current configurations and requirements for expanded capabilities. He has extensive experience in computer systems operations and network administration.

Ken Hankish, ITS 4 Network Spec II will perform installation and configuration work associated with the directory services and other IT management servers. He currently manages the Departments NOVELL directory services and user work space provisioning functions for the Department. He has extensive experience in computer systems operations and network administration.

V. Risk Matrix, Areas of Impact, Itemized List, PIJ Financials

VI. Project Approvals

A. Agency CIO/ISO Review and Initials Required*

Key Management Information	Yes	No	Initials
1. Is this project for a mission-critical application system?		N	
2. Is this project referenced in your agency's Strategic IT Plan?	Y		
3. Have you reviewed and is this project in compliance with all applicable Statewide policies and standards for network, security, platform, software/application, and/or data/information located at https://aset.az.gov/resources/psp ? If NO , explain in detail in section "VIII. Additional Information" below.	Y		
4. Will any PII, PHI, or other Protected Information as defined in the 8110 Statewide Data Classification Policy located at https://aset.az.gov/resources/psp be transmitted, stored, or processed with this project? If YES , the Protected Data section under "VII. Security Controls" below will need to be completed.		N	
5. Will this project migrate, transmit, or store data outside of the agency's in-house environment or the State Data Center? If YES , the Hosted Data section under "VII. Security Controls" below will need to be completed.		N	
6. Is this project in compliance with the Arizona Revised Statutes and GRRC rules?	Y		
7. Is this project in compliance with the Statewide policy regarding the accessibility to equipment and information technology for citizens with disabilities?	Y		

B. Project Values*

The following table should be populated with summary information from other sections of the PIJ.

Description	Section	Number or Cost
Assessment Cost (if applicable for Pre-PIJ)	I. PIJ Type - Pre-PIJ Assessment Cost	\$
Total Development Cost	V. PIJ Financials tab	\$578,502.73
Total Project Cost	V. PIJ Financials tab	\$688,801.16
FTE Hours	1000	

C. Agency Approvals*

Approver	Printed Name	Signature	Email and Phone
Project Manager:	William Reed		
Agency Information Security Officer:	William Reed		
Agency CIO:	Evan Brom		
Project Sponsor:	Evan Brom		
Agency Director:			

VII. Security Controls

Collaboration with the ADOA-ASET Security, Privacy and Risk (SPR) team may be needed to complete this section, which is only required for those projects that involve data that is Protected or Hosted outside of the Agency or State Data Center. Additional information can be found in the NIST FRAMEWORK section under RESOURCES at <https://aset.az.gov/resources/psp> or you may wish to contact ASET-SPR directly at secadm@azdoa.gov for assistance.

A. Protected Data

N/A

B. Hosted Data

Check here if the <https://aset.az.gov/arizona-baseline-security-controls-excel> Spreadsheet is attached. Otherwise explain below what information/ support is needed to complete the spreadsheet and/or why no sheet is attached:

N/A

Check here if a Conceptual Design / Network Diagram is attached. Otherwise explain below what information/support is needed to complete the diagram and/or why no diagram is attached:

N/A

VIII. Additional Information

IX. Attachments

The following are examples of supporting documents that should be sent as email attachments when required:

A. *Vendor Quotes*

X. Glossary

Other Links:

[ADOA-ASET Website](#)

[ADOA-ASET Project Investment Justification Information Templates and Contacts](#)

Email Addresses:

[Strategic Oversight](#)

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