ADOA-ASET

Arizona Strategic Enterprise Technology

Project Investment Justification

Version 01.01

A Statewide Standard Document for Information Technology Projects

Project Title:

ADC Prison Complex Server Virtualization Pilot Project

Agency Name:	**Arizona Department of Corrections**
Date:	**12/20/2013**
Agency Contact Name:	***Laura Boden***
Agency Contact Phone:	
Agency Contact Email:	

Hover for Instructions

I. Management Summary*

The Arizona Department of Corrections (ADC) State run and controlled facilities currently consist of several Central Office sites in Phoenix, 10 prison sites and parole offices throughout the state. ADC's aging infrastructure and legacy systems at our various facilities are in serious need of updating to support current and future agency growth. Many servers are nearing the end of life and a large number of them are older than five years. Many of the servers out in the field no longer have the required processor speeds, disk storage and capacity.

In addition, ADC has benefitted greatly by migrating outdated and end of life physical servers to a VMWare based virtual infrastructure in its central office data centers. Reduction of cooling concerns, server redundancy, and the ability to provide adequate amounts of data storage play heavily in the decision to fully embrace a VMWare environment, primarily housed on HP rack mount servers and Nimble SAN Storage.

The ADC replacement for servers, storage, setup, and maintenance are part of the replacement/upgrade at ADC. The replacement/upgrade of IT equipment is based on available funding. ADC will replace outdated, incompatible, and non-supported IT equipment with current ASET and Industry standard practices. Two HP Proliant DL360p Gen8 Servers will support ADC's virtual infrastructure in each prison complex data centers. Two Brocade VDX 6720 24P switches to support ISCSI traffic from the HP servers, to the two Nimble Storage CS240G SANs. UPS power would be supplied via two Eaton 9130 UPS with EBMs.

II. 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?

III. Business Case

A. *Business Problem**

ADC's Network Team supports a fleet of over 60 servers across the state. We have been able to defer some replacements through the means of purchasing HP Care Packs or upgrading the server hardware to increase the life span.

Aging equipment cannot keep up with the demands of contemporary productivity software, which in turn hinders the productivity and efficiency of ADC's workforce. Average annual server hardware failure rates continue to rise and HP Care Pack costs on existing servers continues to rise as the server ages.

Although failed equipment is replaced with new, this approach perpetuates the distributed computing model and its inherent shortcomings.

Due to the complexity and administrative privilege needed to replace a failed server with a new unit, technician intervention is required using the current process. With computers dispersed throughout the state and very few technicians to cover a broad geography, there is often a wait time of hours to several days before a failure incident can be resolved. Furthermore, technicians must perform the high cost/low value work of driving equipment to and from customer duty posts.

Maintaining operating system and software instances distributed to thousands of computers across the state is inefficient, expensive, and often requires technician drive and computer touch time.

B. *Proposed Business Solution**

Initially, ADC will install the listed hardware/Software in this PIJ at one of the LARGE PRISONS as a pilot project whose location is to-be-determined (this single location pilot project will form the basis for future prison site deployments).

Using VMware prescribed best-practices approach, ADC Network Team will leverage several complementary technologies to build a modern, high-available, and efficiently managed virtualized server environment. This new virtualized server ecosystem will form the foundation to enable the conversion of 60+ aging physical servers into the virtual environment.

The primary purpose of this approach is to reduce ADC's overhead cost associated with keeping its HP Servers current with HP Care Packs and online. In addition, a move to the virtualized ecosystem will increase performance and reliability, afford efficiency gains associated with maintenance and management of legacy servers, and enhance data security, while maintaining or exceeding current service levels.

This solution will accomplish the following:

- This would allow us to test the viability of virtualizing all of our field servers onto two ESXI hosts, providing failover and redundancy within each prison complex.
- This will provide a solution to evaluate storage needs for our growing agency (ie, IP cameras and Education for inmates), and provides failover and redundancy.
- It provides multiple ISCSI paths from the HP Servers to our SAN appliance, eliminating a single point a failure.
- It also provides two separate UPS power, one of which should be connected to generator power to maximize uptime.

*C. Quantified Benefits**

X	Service enhancement
	Increased revenue
X	Cost reduction
X	Problem avoidance
X	Risk avoidance

Explain:

Service enhancement

By replacing all physical servers with two virtual hosts within the pilot complex, we decrease the amount of time that it currently takes to procure a new server, configure it, and install it onsite. In some cases this is a replacement to an existing server and requires a downtime to complete the upgrade. With the aid of virtualization, we reduce the amount of time it takes to accomplish the same task, via server templates and cloning.

Cost reduction

Over the five-year project lifecycle, ADC will spend $10,000 per server replacement, with an additional $3,909 in HP Care Packs. By virtualizing all the physical servers onto two virtual hosts, we will save $300,000 on server replacements and $154,796.40 in HP Care Packs.

We use $504,000 of electricity over the same 5 year period in each of our complex datacenters, this number will be reduced to $252,000 with the aid of server virtualization. A total cost savings of $669,270.

Problem avoidance

In deploying multiple hosts, SANs, and ISCSI switches per complex, we reduce the single point of failure that exists at each complex. We increase our uptime at

each complex by providing multiple paths to the storage, SANs, VMware Hosts, and battery backups.

Risk avoidance
By deploying software and hardware from reputable vendors, ADC is not running the risk of this project failing because of new and unproven technology.

IV. Technology Approach

*A. Proposed Technology Solution**

The ADC replacement of servers, storage, setup and maintenance are part of the replacement/upgrade at ADC and based on available funding. ADC will replace outdated, incompatible and non-supported IT equipment with current ASET and industry practices.

The technology and quantities proposed in this pilot project will be for one large prison and shall consist of two HP Proliant DL360p Gen8 Servers to support ADC's virtual infrastructure in the pilot prison complex data centers. Two Brocade VDX 6720 24P switches will be acquired to support ISCSI traffic from the HP servers, to the two Nimble Storage CS240G SANs. UPS power would be supplied via two Eaton 9130 UPS with EBMs.

ADC adheres to the ASET standard P710-S710 Rev 3.0**;** Network Infrastructure and, P730-S730 Rev 3.0; Applications and Related Software, for guidelines on the purchase/upgrade/replacement of equipment and software. Attached quotes section provides a description of the equipment that will be included in the Agency's replacement orders.

Development costs for professional and outside services are listed as installation costs on the attached quotes. Maintenance fees are listed as support and five year HP Care Pack paid once on attached quotes.

B. Technology Environment

We currently deploy VMware ESXI hosts at both our central office and ANNEX1 locations. No additional hardware is required for the proposed solution of integrating into the existing virtual infrastructure, with the deployment of VMware vCenter Server linked mode. This will give us a single pane of glass to manage the virtual infrastructure.

C. Selection Process

ADC's Network Team main goal is to provide each complex with the ability to remain up and running, even if we suffer a hardware failure and to maintain a

high level of customer service to each one of our clients in the complexes. We wanted to address the needs of new technology deployments with a quicker response time. We have prior experience and considerable man hours working with Nimble Storage, Brocade, and VMware. We know this will be a great fit for ADC going forward.

V. Project Approach

*A. Project Schedule**

Project Start Date: 1/6/2014 **Project End Date**: 6/30/2014

B. Project Milestones

Major Milestones	Start Date	Finish Date
Place order	1/06/14	1/10/14
Receive order	1/13/14	2/07/14
Configure and lab testing	2/10/14	3/21/14
Deliver hardware to final site	3/24/14	4/25/14
Backup existing data at site	4/28/14	5/30/14
Install hardware/software and data configuration	6/02/14	6/30/14
Go live	6/30/14	6/30/14

VI. Roles and Responsibilities

A. Project Roles and Responsibilities

Project Role	Name	Responsibilities
Project Manager	Laura Boden	Project oversight, management and reporting.
Budget Manager	Karen Osmond	Purchase and Delivery
Infrastructure and Field Services Network Manager	Joseph Nicoletti	Infrastructure and Field Service Manager
Network Infrastructure	Robert Dinkel	Equipment testing and configuration
Project Lead	Robert Dinkel	Network Management

B. Project Manager Certification

- [ ] Project Management Professional (PMP) Certified
- [x] State of Arizona Certified
- [ ] Project Management Certification not required

C. Full-Time Employee (FTE) Project Hours

Total Full-Time Employee Hours	720
Total Full-Time Employee Cost	$18,720.

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

VIII. Project Approvals

A. *Agency CIO Review**

Key Management Information	Yes	No
1. Is this project for a mission-critical application system?	X	
2. Is this project referenced in your agency's Strategic IT Plan?	X	
3. Is this project in compliance with all agency and State standards and policies for network, security, platform, software/application, and/or data/information as defined in http://aset.azdoa.gov/security/policies-standards-and-procedures, and applicable to this project? If **NO**, explain in detail in the "XI. Additional Information" section below.	X	
4. Will this project transmit, store, or process sensitive, confidential or Personally Identifiable Information (PII) data? If **YES,** in the "XI. Additional Information" section below, describe what security controls are being put in place to protect the data.		X
5. Is this project in compliance with the Arizona Revised Statutes (A.R.S.) and GRRC rules?	X	
6. Is this project in compliance with the statewide policy regarding the accessibility to equipment and information technology for citizens with disabilities?	X	

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)	II. PIJ Type - Pre-PIJ Assessment Cost	**$0.00**
Total Development Cost	VII. PIJ Financials tab	**$192,315.00**
Total Project Cost	VII. PIJ Financials tab	**$192,315.00**
FTE Hours	VI. Roles and Responsibilities	**720**

C. *Agency Approvals**

Contact	Printed Name	Signature	Email and Phone
Project Manager:	Laura Boden		
Agency Information Security Officer:	Stephen Welsh		
Agency CIO:	Stephen Welsh		
Project Sponsor:	Michael Kearns, Administrative Services Division Director		

Agency Director:	Charles L. Ryan		

IX. Optional Attachments

A. Vendor Quotes

X. Glossary

XI. Additional Information

Links:

ADOA-ASET Website

ADOA-ASET Project Investment Justification Information Templates and Contacts

Email Addresses:

Strategic Oversight

ADOA-ASET_Webmaster@azdoa.gov