ADOA–ASET
Arizona Strategic Enterprise Technology

Project Investment Justification

Version 01.01

A Statewide Standard Document for Information Technology Projects

Project Title:

Application Performance Management Implementation

Agency Name:	**Arizona Department of Health Services**
Date:	**October 4, 2013**
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Agency Contact Phone:	
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Hover for Instructions

I. Management Summary*

ADHS has several applications that are used statewide and some of these have experienced performance issues which have caused business/revenue impact and customer relationship problems with our partners. Our current monitoring systems deliver component level visibility; however infrastructure monitoring alone is inadequate for tracking end-to-end performance, availability, and user experience for modern applications. In addition, modern integrated applications have far more potential failure points than legacy applications. This project is to implement an Application Performance Management (APM) solution to bring together the people, process, and technology aspects and to provide an end-to-end perspective on critical services and applications. We have selected ExtraHop's APM solution. We see the initial area of concentration for APM within our vital records applications; however this solution will be able to be utilized across our enterprise. We will be able to greatly improve our current applications and will be able to proactively test our applications prior to production rollouts for performance and security.

II. Project Investment Justification (PIJ) Type*

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

III. Business Case

A. *Business Problem**

ADHS has several applications that are used statewide and some of these have experienced performance issues which have caused business impact and customer relationship problems with our partners. At the beginning of this year we launched a new customer service module and fetal death module as a part of our statewide vital records death registration/certification application. The users of this system experienced very slow application performance in several of the common workflows making it difficult and sometimes impossible to carry out these functions. Performance was extremely poor in Maricopa County, the largest and highest volume county in our state, impacting their ability to provide good customer service and impacting their revenues.   We have spent months analyzing our multi-tier infrastructure, Maricopa's infrastructure, and the application and resolved issues as they were identified; however we still experience intermittent performance problems. In addition, a security assessment identified security issues with this application. We don't have adequate end-to-end tools to effectively troubleshoot and we have been unable to be proactive in testing for load and security prior to implementing applications. Any potential performance issue encountered must be addressed and resolved in a timely manner.

B.   *Proposed Business Solution**

To effectively address key challenges for managing application performance, we need to implement a single platform with a common language that all of operations can use to communicate and collaborate. An APM (Application Performance Management) solution needs to be open, extensible and provide analytics and reporting capabilities to improve usability of APM data. Once developed, these capabilities enable IT staff to address key APM challenges and be better able to identify and resolve anomalies before end-users are impacted.

Application Performance Management (APM) brings together the people, process, and technology aspects and provides an end-to-end perspective on critical services and applications. Even with the best people and the most rock-solid processes in place, people and process alone are simply no longer "agile" enough to ensure high levels of service quality. Traditional monitoring systems deliver component level visibility; however infrastructure monitoring alone is inadequate for tracking end-to-end performance, availability, and user experience for modern applications. In addition, modern integrated applications have far more potential failure points than legacy applications. Leading-edge technology requires leading-edge management tools, and APM solutions can reduce administrative spend while ensuring application quality.

The rate at which we are implementing complex integrated multi-tier web applications has been growing exponentially and we have tried to continue using old tools and methods which are not adequate in this new environment. The business drivers are demanding that we keep up with a growing demand for services and we need to find ways to improve efficiencies. We conducted two proof-of-concepts and within a short time period were able to identify many application-related issues. We chose ExtraHop for three major reasons, 1) the cost is approximately a quarter of the cost of the other product, and 2) the product was a lot less complex to implement and configure to interpret information across network and 3) the learning of the product for internal systems administration is much easier and quick.

We see the initial area of concentration for APM within our vital records applications; however this solution will be able to be utilized across our enterprise. We will be able to greatly improve our current applications and will be able to proactively test our applications prior to production rollouts for performance and security.

The ExtraHop platform enables IT teams to view application servers, databases, storage systems, and the network together as one integral delivery system. The ExtraHop platform equips all IT teams with correlated, cross-tier visibility so they can answer the question, "What is happening in my environment right now?" With this operational intelligence, the IT organization at ADHS will be able to not only troubleshoot performance problems faster, but be able to proactively fix problems before users even notice. Benefits of the ExtraHop platform include:

- **Faster Troubleshooting –** With the ability to correlate performance across tiers, the IT team will be able to rapidly triage and troubleshoot performance problems. They help bridge operational silos enabling cross-functional teams to work together more efficiently to solve application-related problems.
- **Continual Improvement –** ExtraHop will enable us to establish performance baselines and track improvements with dashboards and push-button reports.

- **Increased IT Agility –** They maximize the utilization of personnel by reducing time spent in "all hands on deck" troubleshooting exercises. We will be able to respond faster to changing requirements and requests for new services.
- **Make Informed IT Decisions –** ExtraHop provides the before-and-after performance measurements that we need to make IT decisions, such as determining the impact of migrating applications from physical to virtual infrastructure and optimizing network and storage configurations and settings.

Extrahop's solution is a managed deployment including data feed management, appliance configuration for maximum data fidelity & legibility, and a set of operational dashboards covering KPIs for key applications. They will create a custom training curriculum based on ADHS specific apps/environment in addition to ad hoc training while they are onsite. This offering also includes transactional analysis visualizations (i.e. performance by application/business transaction), heavy onsite targeted training, and analysis of the current health of ADHS applications (with recommendations for remediation).

C.   *Quantified Benefits**

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

Explain:

The rate at which we are implementing complex integrated multi-tier web applications has been growing exponentially and we have tried to continue using old tools and methods which are not adequate in this new environment. The business drivers are demanding that we keep up with a growing demand for services and we need to find ways to improve efficiencies. We conducted a proof of concept and within a short time period were able to identify many application-related issues. We see the initial area of concentration for APM within our vital records applications; however this solution will be able to be utilized across our enterprise. We will be able to greatly improve our current applications and will be able to proactively test our applications prior to production rollouts for performance and security.

Proactive end user application management and deep dive diagnostics minimizes business cost by reducing the incidence of performance degradation and the number and duration of business critical application outages, thereby reducing end user minutes lost. IT resources and priorities will more closely align with business needs, which better supports the business' ability to improve customer satisfaction. The APM solution is expected to provide ADHS IT support staff a 360 degree view of application performance and availability and being able to trace real user transactions across application tiers to speed resolution times. In addition, the APM enables us to measure end-user experience using repeatable transactions from multiple locations and gain deep application insights for fast problem isolation and issue resolution.

We expect the greatest quantifiable results from the ExtraHop platform to come from a reduced number of service tickets and related time-savings.

- **60% reduction in application performance-related service tickets –** According to TRAC Research, organizations that apply analytic capabilities for managing application performance are nearly two times more likely to be able to prevent performance issues compared to their peers without this capability.[1] With wire data analytics from ExtraHop, the Arizona Department of Health Services IT organization expects to reduce the number of performance-related service tickets by 60%, resulting in savings of $40,000 in the first year and $160,000 over four years.
- **50% reduction in time spent troubleshooting issues –** This is a conservative estimate based on the current time spent correlating data from disparate monitoring tools used by specialist teams. ExtraHop provides a holistic view of application performance with the ability to quickly drill down into the performance of each tier and identify critical details, such as error messages, file names, and database queries. By reducing the time spent troubleshooting issues, we expect to save $80,000 in the first year and $320,000 over four years, based on number of employees involved in these situations and average salary of these employees. In addition, the significant savings in time spent troubleshooting will allow our team of experts to spend that time optimizing their specific environments to continually improve performance and prevent future outages or issues.

IV. Technology Approach

A. Proposed Technology Solution*

ADHS proposes procuring and implementing the Extrahop's APM solution which focuses on providing the visibility into real user behavior for fast, targeted problem resolution and passive real-user monitoring to improve end-user experience. The solution will passively monitor application performance and availability for all users at all locations all the time. It automatically discovers underlying infrastructure and classifies user actions—giving instant visibility into session health. It provides the ability to trace user experience across tiers to quickly isolate application issues, capture live sessions, see where customers clicked, measure response times and see pages that caused problems.
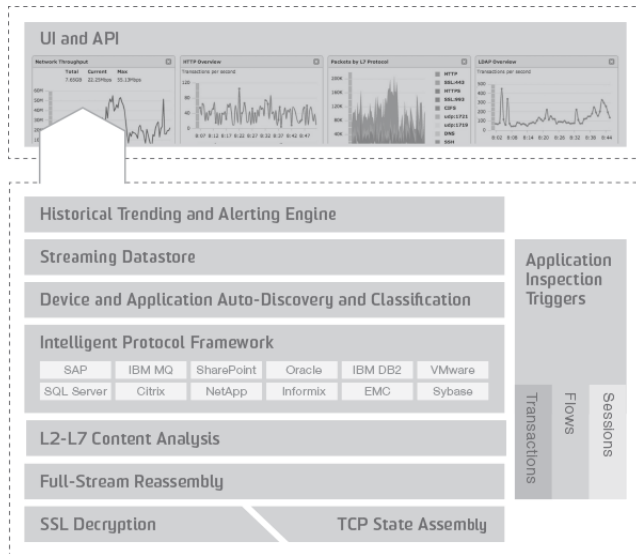
The ExtraHop platform is a hardware appliance and software which is sized by the number of devices (listed this in the hardware section of the Financials section). We are also purchasing implementation and training services.

The ExtraHop platform performs full-stream reassembly and full-content analysis of network traffic to extract IT and business insights. ExtraHop analyzes application transactions continuously and in real time, at speeds up to a sustained 20Gbps. An open and extensible platform, ExtraHop enables IT teams to define and implement new metrics within minutes, and integrates seamlessly with manager of managers (MOM) systems and other next-generation monitoring products such as Keynote, New Relic, SevOne, and Splunk. Through full-stream reassembly, the ExtraHop Context and Correlation Engine can analyze the full content of transaction payloads (not to be confused with packet payloads) and extract crucial details such as the specific URI included in a HTTP 500 Error, slow stored procedures in a database, or the location of a corrupt file in network-attached storage. ExtraHop offers protocol modules for web applications, NoSQL and relational databases, network-attached storage (NAS) and storage-area

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[1] *Improving the Usability of APM Data, TRAC Research, June 2011* http://www.extrahop.com/wp-content/uploads/TRAC-Market-Insight-Usability-of-APM-Data.pdf

networks (SANs), and directory services.

The ExtraHop Context and Correlation Engine is built for massively scalable transaction analysis—up to a sustained 20Gbps.

The ExtraHop platform is a completely passive, out-of-line network appliance that is easy to deploy and manage. As soon as traffic is detected by the platform, ExtraHop's Context and Correlation Engine automatically discovers and classifies devices, both physical and virtual, and determines relationships between devices based on MAC addresses, IP addresses, naming protocols, and other heuristic elements. As the IT environment changes—with new software builds and upgraded infrastructure components, for example—ExtraHop automatically detects and adjusts to those changes.

B.   Technology Environment

This will integrate easily into our environment. The ExtraHop appliance will be installed on our network and work in a passive manner. The product will support up to 500 devices and it will be installed onsite at ADOA Data Center. The solution include ExtraHop 6000-for 500 devices, 10 Gbps continuous traffic analysis. QTY 500 Extrahop - Part#: EH6000P-SVR-500; includes all base system software including HTTP, TCP, DNS, LDAP, SMTP, FTP, Network Analysis Modules, Oracle Analysis Modules and SAN Analysis Modules.

C.   Selection Process

We initially looked at a vendor that provided APM and load testing capabilities as an integrated product because we were looking for both functions. We found the product to be complex and expensive because of the various modules needed to purchase and deploy. We then looked at ExtraHop because it was an appliance that was easy to implement and more affordable. We conducted proof-of-concept projects with both products and found they provided similar information but the ExtraHop product was much easier to implement and use.

V.   Project Approach

A.   Project Schedule*

Project Start Date: 1/13/2014   **Project End Date**: 3/31/2014

B.   Project Milestones

Major Milestones	Start Date	Finish Date
Procure ExtraHop Appliance / Implementation & Training Services	1/13/14	1/17/14
Engage ExtraHop for Implementation & Training Services	1/20/14	1/22/14
Design APM Architecture (what is to be monitored)	1/23/14	1/27/14
Create & Deploy Infrastructure Monitoring (OS, Application, Database Tiers) in Preproduction and then Production Environment	1/28/14	2/7/14
Create & Deploy .NET/JVM Application Diagnostic Monitoring in Preproduction and then Production Environment	2/10/14	2/14/14
Create & Deploy Real User Monitoring in Preproduction and then Production Environment	2/17/14	2/21/14
Create Dashboard Views in Preproduction and then Production	2/24/14	2/28/14
Deploy ExtraHop	3/5/14	
Train Staff (schedule TBD)	3/1/14	3/31/14

VI.   Roles and Responsibilities

A.   Project Roles and Responsibilities

1.0 Project Sponsor – Janet Mullen, PhD, Deputy Director Operations & Planning – This position will provide approval for project scope. Specific responsibilities will include (but not be limited to):
- Project champion, provides direction and support to the team
- Approves project scope and funding and sets the priority.

2.0 Information Technology Executive – Paula Mattingly, Assistant Director / Chief Information Officer - This position will be accountable to place the necessary Information Technology at the Enterprise level and to meet the goals within the budget and timeline. Specific responsibilities will include (but not be limited to):
- Project champion, provides direction and support to ITS team
- Implement necessary Infrastructure and meet the immediate business needs
- Monitoring business value
- Management of IT staff or other resources.

3.0 Information Technology Project Manager – Raghu Ramaswamy, ITS Application Services Manager - This position will provide leadership and overall project management and efforts described in this document and for the future technology needs of the Department.
- Coordinating resources assigned to the project
- Allocating resources to ensure project completion on schedule, within scope, and within budget
- Providing status reports to the Executive Management and GITA as required
- Coordinating the operational needs and performance troubleshooting and resolution.

4.0 Information Technology Services Manager – Dave Gilbert – This position will provide oversight for installation and configuration of the APM solution on agency's server for monitoring and administering the network performances.

5.0 Network Engineer – Eric Hill -- This position will provide technical analysis, configuration, testing and deployment support.

6.0 Database, System Administrators, Applications lead– This team will provide technical analysis, software configuration, development/mapping, testing and deployment support. Specific responsibilities will include (but not be limited to):

- Configure the Operating System, assign storage space, and connect to the Enterprise SAN
- Migrate database and establish connectivity
- Development, mapping, application end-to-end testing
- Produce user reports.

6.0 Professional Services – ExtraHop rovides design, build, installation, configuration, and testing.

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	160
Total Full-Time Employee Cost	$8,000

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	$
Total Development Cost	VII. PIJ Financials tab	$149,401
Total Project Cost	VII. PIJ Financials tab	$259,668
FTE Hours	VI. Roles and Responsibilities	160

C. Agency Approvals*

Contact	Printed Name	Signature	Email and Phone
Project Manager:	**Raghu Ramaswamy**		
Technical Services Manager	**David Gilbert**		
Agency CIO:	**Paula Mattingly**		
Project Sponsor:	**Janet Mullen**		
Agency CFO:	**Jim Humble**		

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](#)

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