FOOTHILL-DE ANZA COMMUNITY COLLEGE DISTRICT

Board of Trustees Agenda Item

Board Meeting Date: January 05, 2010

Title of Item: Agreement with AppLabs to Load Test the Banner Student System

Background and Analysis:

Prior to the Banner Financial System's going live on July 1, 2009, the District engaged Sungard Higher Education Consulting Services to conduct load testing of the Finance module. The test was limited in scope (5,000 simultaneous access) and only exercised the sign-on process of the <u>Financial</u> system in an effort to determine how many simultaneous users our new Banner system can sustain. The test was successfully conducted and our system passed the Sungard certification process.

The Banner <u>Student</u> system is scheduled to go live in Summer 2010. There will be a heavy demand on system resources and network bandwidth when the Banner student registration system is opened to student access. Therefore, it is critical to run simulation load testing prior to the real go-live event. This test will be larger in scope (10,000 simultaneous users) and will exercise the critical functionalities of the registration process.

To meet required deadlines (e.g. to have Banner system installation completed before the start of Summer 2010 term), we need to hire a vendor that has experience with conducting this type of testing with other Banner schools.

Based upon careful research including consultation with other colleges and universities who have conducted this type of load testing, ETS plans to engage the services of AppLabs, Inc. to assist the ETS staff in developing the testing scenarios and in conducting the actual testing. The proposed agreement with AppLabs, Inc. will be for the amount of $22,745; the test will last approximately 18 working days. AppLabs, Inc.'s Statement of Work is attached as backup.

Recommendation: Authorize Vice Chancellor of Technology, Fred Sherman to execute a contract with AppLabs in the amount of $22,745 for load testing.

Submitted by:	Fred Sherman, Vice Chancellor of Technology, 6120
Additional contact names:	Chien Shih, Director of IT and Operations, 6139
Is backup provided?	Yes

Performance Testing Services

Proposal and Statement of Work for Performance Testing

Submitted To:

FOOTHILL-DE ANZA
Community College District

AppLabs

December 2009

AppLabs Contact Details	FHDA Contact Details
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Introduction

Headquartered in Philadelphia, PA, and with test labs in U.S., UK, and India, AppLabs Technologies Pvt. Ltd. has provided twelve years of consistent performance testing services on a multitude of applications ranging from eCommerce platforms, ERP, CRM, eLearning, and SaaS to some of the top U.S. companies in their respective market segment as exampled below. References are available upon request:

Retail: BedBath&Beyond, BlueFly, Build-a-Bear Workshop, Chico's, Eastern Mt. Sports, Franklin Covey, Kohl's, Lowes

Finance: American Express, American Stock Exchange, GE Money, Inter-American Development Bank, Triad Financial

Enterprise: Comcast Cable, ESPN, Farmers Insurance, Fox Interactive Media, MSNBC.com, Reed Elsevier Group

Higher Education/Government/Non-Profit: Big Brothers-Big Sisters, Focus on the Family, YMCA, USA.gov, Bureau Engraving & Printing, Brown University, University of San Francisco, National University, Alamo Community College District

Regardless of the industry or business-specific type of application, the key to successful performance testing requires the generation of accurate anticipated volumes of end-user and/or other application traffic while investigating the impact of that traffic on the systems under test. AppLabs is pleased to offer a full range of performance testing services. The following information has been prepared for **FOOTHILL-DE'ANZA COMMUNITY COLLEGE DISTRICT (Here forward called FOOTHILL)** to provide information about these performance testing services for web application.

Project Overview

Applabs and **FOOTHILL** working together to performance test their Banner web application. The key business driver for **FOOTHILL** is to Performance test its Banner application via public internet in a scaled approach. The Banner/Prod instance(Oracle 10g database) will have default populated data supplied by SunGard, production tables, files and forms which were loaded in May 2009 and also a wide variety of Banner/Finance transactions that have been stored in the Banner/PROD instance since July 1, 2009. An iterative testing approach will be recommended for testing during a 4 peak processing periods (Dec-Jan, Mar-Apr, Jun-Jul, Aug-Sept) when class registration occurs and students can add or drop classes, in order to populate the Oracle database with relevant course information over time.

The testing would likely be conducted off-hours in the production environment, and the Infrastructure is based upon Banner web/app server with Oracle 10g DB behind a load balancer. Since FOOTHILL does not own a testing tool, Applabs will provide a tool rental utilizing *Radview Software: WebLOAD 8.3* of 5,000 virtual users (VU). AppLabs will employ our Accelerated Load Testing Methodology to utilize the 5,000 VU licenses such that the FOOTHILL backend is stressed to a level of 10,000 concurrent users. This Accelerated Methodology will be successful based on FOOTHILL's infrastructure's ability to handle such traffic. AppLabs offers no guarantee that the FOOTHILL infrastructure can support traffic simulated to 10,000 concurrent users and therefore makes no guarantee user level of 10,000 users will be successfully simulated. AppLabs does have the ability to provide traffic and per test plan, will do so.

The scope and effort estimation for the project in this proposal is based on the phone conversation provided by **FOOTHILL**. This proposal is preliminary, and may be subject to change as more information becomes available.

*Load/Visitors over Time – Accelerated Load Test approach

The suggested Performance Load Target is **up to10,000 concurrent users emulated under Accelerated Load via 5000 VU**.

FOOTHILL requested for a 10,000 user load on the application under test with a standard sleep time of 30 seconds. The 10,000 virtual users with a standard sleep time of 30 seconds might generate X page views per second (workload on the application). Due to the reason that there is a substantial difference in the pricing between 10,000 and 5000 user licenses, AppLabs recommends an **accelerated load test** approach which implements a reduced sleep time (15 seconds) so as to bring down the concurrent user load to 5,000 while generating the same workload of X page views per second as 10,000 users could hit the application with a 30 second sleep time between the pages

Example:

10,000 users with 30 seconds sleep time might generate 200 page views per second
5,000 users with 30 seconds sleep time might generate 100 page views per second
5,000 users with 15 seconds sleep time might generate 200 page views per second, which is equivalent to the 10,000 user test explained above – Accelerated load test approach

The accelerated load test is a proven way of reducing the number of virtual clients but sill maintaining the same workload. This is a recommended option to cut down the cost for tool licensing and reduce the project budget.

Automation

The effort for the automation effort for this performance engagement is calculated by determining the total number of actions that need to be scripted. Automation will be done by AppLabs using the *WebLOAD 8.3* tool. The automation effort for this engagement below is *an assumptive estimate*, given the absence of specific scripts provided by **FOOTHILL** at this time:

User Scenarios	Steps per Scenario	Total Action to be Automated
2	5	10

The *assumed scripts* will be further defined in the AppLabs Test Plan but below are the sample use-cases:

- Student Registration
- Course Search

Testing Objectives

The objectives of this performance testing engagement are as follows:

- Evaluate the business transactions (end-user or other activity) conducted within the application.

- Develop automation scripts to generate virtual/simulated traffic

- Generate realistic load ramping up to the target load under Accelerated Load Testing approach

- Analyze client side and server side performance counters.

- Provide a performance report describing the capabilities and limitations of the system

Scope

The following activities are defined as the scope of this performance testing activity:

- **Discovery:** gain an understanding of the application and environment under test

- **Test Plan**: document the testing methodology, activities, schedule and deliverables

- **Setup**: Setup the test environment with required load generators, controllers and bandwidth.

- **Automation**: automation scripts will be developed to replicate end-user or other transactions against the application. A smoke test will be conducted to verify the automation is functionally able to run against the application for 5 simultaneous users, to validate basic automation functionality & to generate the data required for test.

- **Testing: Execute three (3) test iterations <u>up to10,000 concurrent users emulated under Accelerated Load via 5000 VU</u>**

  - Ramp up 2 use cases combined to target load in 90 minutes and sustain the same load for next 30 minutes, and End Test. Distribute the targeted load across the use-cases.

  - Provide detail report on both client side and server side performance. Banner and Oracle backend will be monitored as part of the test execution and AppLabs will be providing the all OS counters for all the servers comparing with Load.

Out of Scope

The following activities are out of scope for this performance testing activity:

- Code review, analysis, and/or modifications

- Server/Application/Appliance configuration updates and/or changes

- Performance Tuning

Methodology

Browser Based Testing Methodology

The browser based testing is completed using a virtual user testing model, meaning the targeted number of concurrent users will be generated from a smaller number of load generating servers. All these virtual users will simulate protocol level requests (ex: HTTP GET/POST). The estimation for the testing has been prepared estimating a specific number of roles/scenarios with a specific number of steps for each scenario. The automation will be developed with a **15 second** sleep or delay between each page request during the transaction to simulate realistic usage patterns.

Automation

Automation scripts will be created to generate HTTP(s) GETs and POSTs normally generated by a browser which will be issued from a load generating agents simulating these same requests. AppLabs will make every effort to replicate the end-user actions using simulated virtual user load generators. In the event an activity is discovered that cannot be economically automated within a virtual load agent, AppLabs reserves the right to propose alternative methods for generating the load or requesting that such actions be omitted from the load testing automation effort.

Test Environment

Hardware

Equipment	Specifications
Server	Load Console and Report Server located at AppLabs.
Clients	Load Generators at AppLabs.
Load Locations	☒ **Pacific (CA)** ☒ **Mountain (UT)** ☐ Central (TX) ☐ Eastern (PA) ☐ UK ☐ India ☐ Customer location

Software

Software	Specifications
Virtual User License	Number of Virtual Users 5000
Enterprise Class Tool	☒ **WebLoad** ☐ Silk Performer ☐ QA Load ☐ LoadRunner ☐ Other

Bandwidth

Item	Description	Count	Hours
Bandwidth	Dedicated bandwidth for this testing (sustained load for up to 2 hours)	**279 Mbps**	**2**

Assumptions

AppLabs has made the following assumptions to arrive at the effort estimation, and build the proposal for this performance testing engagement:

- It is expected that the application will be fully functional before the automation and testing efforts begin and that the application interface will not be changed after the automation has started.

- The customer will provide support and subject matter expertise for any questions on the functionality of the application or questions about automation of the end-user activity. Detailed information will be provided to AppLabs about web service calls that interact with the application such as Java script, Java Swing, AJAX, Flash or other imbedded browser-side technologies.

- The customer will provide adequate access to the systems to be monitored to allow AppLabs to gather server-side performance counters.

- All user-load will be driven from AppLabs default load generating locations and the application to be tested will be located at the customer's location or Hosting Provider and is accessible over the Internet.

- If during the course of the project, any of these assumptions change, a change in the timeline and/or the nature & size of the team assigned to the project may result. This may also result in a change in the proposed cost of the project. AppLabs will escalate all such changes and will develop a plan jointly with Customer on how to deal with the issue.

- Any application defects, undisclosed elements, anomalies, or other issues which arise that increase the estimated effort and/or cause the work to extend beyond the original agreed deadlines which are not caused by AppLabs will require a new SOW/Change Order and additional fees.

- Any plug-inns or Add-ons required other than standard web protocol supported by *Radview Webload 8.3* will be purchased to support the successful automation and load testing and the same tool charges will be charged to the customer in actual.

Effort Estimation

Script Automation Segment

Service	Description	Engineers	Days
Discovery	In-depth analysis of the application, transaction, data, systems under test	**2**	**2**
Test Plan	Document the proposed methodology, user transaction, and test deliverables	**2**	**1**
Setup	Setup hardware, install OS, provide customer access for app install and configuration	2	1
Automation	Develop data and automation scripts to replicate end-user activities for testing	**2**	**3**
	Effort for Phase 1 : Man Days		15
	Effort for Phase 1: BUSINESS DAYS		**6**

* In the event smoke testing reveals that automation scripts become invalid between test iterations 1, 2, or 3 a Change Order may apply in order to re-automate scripts.

Performance Testing Segment

Service	Description	Engineers	Days
Accelerated Load Testing: Ramp load <u>up to10,000 concurrent users emulated under Accelerated Load via 5000 VU</u> **over 2 hour as described under scope of testing.**			
Testing	Testing (setup generators, deploy scripts/data, retrieve data) 2 hours sustained load per test run	**2**	**1**
Monitoring	Access, Setup, and Monitor servers during testing.	2	1
Analysis / Report	Analyze performance counters, formulate recommendations, prepare report	**2**	**3**
	Effort Days per Test Iteration: Man Days		10
	Effort Days per Test Iteration: BUSINESS DAYS		**4**

* Irrespective of budget, please be advised that as per Industry Best Practices AppLabs recommends that performance testing should be conducted in at least three (3) test iterations with Test #1 benchmarking the app/system, Test #2 tuning the app/system, and Test #3 validating the app/system.

Deliverables

Item	Comments
Test Plan	To Be Provided By AppLabs Team Lead at Conclusion of Discovery Phase
Web load Test Scripts	Scritps to be provided to FOOTHILL's with technical conference call to explain scripts at completion of Smoke Test
Snapshot Test Report	Email report provided 5 hrs after each test run. Report will include: ➢ Number of Users Reached (via licenses) ➢ Number of Users Reached (via accelerated load calculation) ➢ List of major errors viewed by client ➢ Maximum response time at conclusion of test ➢ Duration of tess
Test Report	A full, detailed report listing all benchmarks and observations will be provided 3 days after test run

Pricing Information

Total price estimated for this **18-business day** engagement is **$22,745.00**. The following table describes the HIGHER EDUCATION preferred pricing for the automation and testing services presented in this proposal:

Item	Cost (USD)	Comments
Phase I – Automation		
Project Initiation	$1,275	Discovery, Set-Up, Test Planning
Test Case Automation	$765	Automate up to 10 scripted steps/pages.
Phase II - Load Testing		
Banner Performance Test Run #1: 2-Hour Test. Infrastructure - $3,960.00 Engineering - $1,275.00	$5,235.00	Benchmarking focus. Infrastructure, Setup, Bandwidth, Testing / Monitoring/Detail Reporting on both client and servers.
Banner Performance Test Run #2: 2-Hour Test. Infrastructure - $3,960.00 Engineering - $1,275.00	$5,235.00	Tuning focus. Infrastructure, Setup, Bandwidth, Testing / Monitoring/Detail Reporting on both client and servers.
Banner Performance Test Run #3: 2-Hour Test. Infrastructure - $3,960.00 Engineering - $1,275.00	$5,235.00	Tuning/ROI Validation focus. Infrastructure, Setup, Bandwidth, Testing / Monitoring/Detail Reporting on both client and servers.
Testing Tool Licenses		
Radview Software: WebLOAD 8.3	$5,000.00	5000 Virtual User Tier – 60-Day Term License
TOTAL FIXED BID BUDGET	**$22,745.00**	

Postponement or Cancellation

Postponement Policy: If for any reason the customer decides to postpone the test run(s) within two business days prior to the planned and scheduled testing period, the customer will be responsible for a rescheduling fee equal to 30% of the "Testing / Monitoring / Reporting" costs listed above. If tool licensing expires because of the postponement, the customer will be responsible for additional licensing costs for the rescheduled test run.

Engagement Day Cancellation Policy: If for any reason the customer decides to terminate the test run(s) on the day of or during the planned testing period, the customer will be responsible for payment of all charges for all of the test run(s). AppLabs will schedule and make available all infrastructure, resources, and personnel to the customer for the planned duration of a test run (even if the test run is terminated). The customer can return for testing anytime during the remainder of the scheduled test period.

Billing Information

The terms for invoicing and payment that would apply to this engagement are listed below:

- **Fixed Bid Project:** This project constitutes a fixed bid versus time & materials. Customer signature will agree to be responsible for payment of these fees in its entirety.

- **Invoicing for professional fees:** AppLabs will invoice the tool licensing and Phase I of these fees at the time of signing the SOW/PO due Net-30 terms, and the remainder will be invoiced on the first working day of the month following work that has been done I the previous month.

- **Invoicing for expenses:** AppLabs will invoice for any additional expenses within 7 days of when such expenses are incurred.

- **Payment for professional fees:** Payment terms will be NET 30; with any expenses being due upon receipt.

Signatures

Please confirm acceptance of this Statement of Work with signature/date, and send .PDF to Aaron Hooley via email at aaron.hooley@applabs.com or to Fax 801-852-9501. This SoW must be received prior to AppLabs beginning work for this project.

FOOTHILL-DE'ANZA COMMUNITY COLLEGE DISTRICT	APPLABS, INC.
Signature:_____	Signature:_____
Name:_____	Name:_____
Title:_____	Title:_____
Date:_____	Date:_____

Invoicing/Procurement

Please assist us in doing business by providing all pertinent information for invoicing and billing purposes.

PO# (If applicable)	
Accounts Payable (Contact Name/Phone)	
Invoicing Address	

Please remit payment to: AppLabs Inc. – Dept. CH 17471, Palatine IL, 60066-7471