



# Software Test Laboratory Proposal

*Xerox Connect, Inc.*

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## Purpose and Scope

This document makes recommendations for the establishment of a software test laboratory at Xerox Connect, Inc. (Atlanta office). The information includes project objectives, lab requirements (software, hardware, and personnel), approximations of expected expenditures, and a summary of expected return on investment (ROI).

## Project Assumptions

- These recommendations are associated wholly with the creation of a QA test environment (including software configuration management and issue tracking/change management). Environments associated with development and production are considered to be separate initiatives.
- The QA test laboratory is a standalone environment, consisting of dedicated hardware and software, and separated from development and production (with some noted hardware exceptions).
- Costs listed in this document as associated with the creation/maintenance of the QA test lab reflect fluctuating, negotiable prices. Prices may increase with market rates, or decrease with planned purchasing and vendor management.
- The expected ROI and success of the QA test laboratory initiative in general is closely tied to the development and implementation of a meaningful QA methodology in the Atlanta office and the hiring/training of qualified test developers.
- The QA test laboratory is intended to support Xerox Connect development projects only. For support of customer QA test requests (should Xerox Connect decide to market services intended to meet the outsourced test needs of customers), the laboratory and associated budget must be planned for scalability.
- As changes in development resource needs are evaluated, QA test laboratory resources should be evaluated to ensure testing requirements can be reasonably met.
- The purpose of the QA test laboratory is intended to grow in scale as the quality assurance methodology becomes more established and matures; automation of tasks associated with configuration management, requirements management, and issue tracking/change management should be integrated with the test process.
- Estimated expenses do not include costs associated with networking, environment (ventilation, racking, etc.), or laboratory accessories (office equipment, furniture, etc.).

## Project Objectives

### Identify and Maintain Static QA/Configuration Management Resources

Hardware, software, and personnel dedicated to QA testing are recommended ensuring that adequate resources are available to support development projects.

### Provide a Mechanism for Test Process Improvement

Automated tools, when utilized by properly trained software test engineers, can enable Xerox Connect to:

- Reduce the time spent on redundant testing
- Increase test coverage
- Increase defect reproducibility
- Provide a history of scalable test scripts
- Allow for customized testing which is either not possible or practical in a manual test process.

Automated tools also provide an avenue for implementing improvement in test planning, script production, and general script management.

### Develop Marketable, Value-Added Customer Services

The functional/regression test automation process can be expected to enable Xerox Connect to provide a higher quality test to the customer. The scripts developed will constitute reusable building blocks for testing of future revisions, a recorded history of product testing, and a product in and of itself should the customer make a request for offsite usage. Load/stress testing of systems is becoming recognized as integral to companies depending on the web for retail sales, advertising, B2B, or internal business activities; additionally, e-commerce companies are increasingly concerned with performance as internet-savvy customers become more demanding. Tools associated with this type of testing are comparatively expensive to purchase and support, and therefore companies have incentive to look to vendors to provide services to meet this type of need. This market niche should be evaluated if customers begin to request that load/stress requirements be included in development projects, as there is not a practical way to perform load/stress tests manually.

### Promote and Support Testing as a Viable, Important Part of the Software Development Life Cycle

Test process success is dependent on management and project team support. Because the earliest possible identification of defects reduces the cost of corrective action, test engineers should be recognized as a part of the entire software development life cycle. Results associated with unstructured or unplanned testing yield a low confidence level. Test automation and dedicated test resources can be leveraged to promote the ideas that test activities should be planned, test engineers are respected technical specialists, and that the company supports the test process as an integral part of the development life cycle.

## Lab Requirements and Approximate Expenditures

### Automated Test Tools

<u>Software</u>	<u>Purpose</u>	<u>Price</u>
<i>TestDirector</i> (Mercury)	Test management, defect tracking	\$6K/user license

Interactive)	(requirements management available as an add on in April, 2000)	
<i>WinRunner</i> (Mercury Interactive)	Functional/regression testing (Visual Basic and Web add ins included in price)	\$6K/user license
<i>LoadRunner</i> (Mercury Interactive)	Load/Stress Testing	\$80K/500 virtual users <i>or</i> testing can be purchased as a vendor service (priced by project)
Recommended total software license fees, (5) TestDirector, (5) WinRunner, and (1) LoadRunner		\$140,000.00
Maintenance fee (18% license fee)		<u>\$ 25,200.00</u>
<b>Total</b>		<b>\$165,200.00</b>

**Hardware- Microsoft System Under Test (SUT)**

<u>Machine</u>	<u>Purpose</u>	<u>Price</u>
Server, Pentium III 768 MBRDRAM 27 GB hard drive CDROM floppy	IIS	\$5,202.00
Server, Pentium III 768 MBRDRAM (2) 27 GB hard drives (1) 18 GB hard drive CDROM floppy	SQL Server	\$5,130.00
(2) Monitors	Individual server use	<u>\$498.00</u>
<b>Total</b>		<b>\$10,830.00</b>

**Hardware- Lotus Notes System Under Test (SUT)**

<u>Machine</u>	<u>Purpose</u>	<u>Price</u>
Server, Pentium III * 768 MBRDRAM 27 GB hard drive CDROM Floppy	Domino 4.6 projects	\$5,202.00
Server, Pentium III * 768 MBRDRAM 27 GB hard drive CDROM Floppy	Domino R5 projects	\$5,202.00

Server, Pentium III 768 MBRDRAM 27 GB hard drive CDROM Floppy	Sametime	\$5,202.00
Server, Pentium III 768 MBRDRAM 27 GB hard drive CDROM Floppy	Websphere	\$5,202.00
(3) Monitors	Independent and shared server use	<u>\$747.00</u>
<b>Total</b>		<b>\$21,555.00</b>

*Note: Hardware denoted by \* may be upgraded and partitioned to share.*

**Hardware- Test**

<u>Machine</u>	<u>Purpose</u>	<u>Price</u>
(1) PC , Pentium III 128 MG RAM 10 GB hard drive CDROM Floppy	NT Workstation Functional/regression testing, Load test scenario development	\$1,729.00
(4) PC, Pentium III 128 MG RAM 13.5 GB hard drive SCSI CDROM Floppy Ethernet	NT Workstation Functional/regression testing, Load test hosting (small scale)	\$6,916.00
Server, Pentium III 256 MBRDRAM 27 GB hard drive CDROM Floppy	NT, System Supplying Load (SSL, for up to 500 virtual users)	\$5,202.00
(5) Monitor	Individual PC use	\$1,245.00
Server, web *	TestDirector Defect Manager	N/A
Server, database *	TestDirector repository	<u>N/A</u>
<b>Total</b>		<b>15,092.00</b>

*Note: Hardware denoted by \* may be currently existing production servers.*

**Personnel \***

<u>Title</u>	<u>Required Skills</u>	<u>Salary Range</u>
(2) Test Developer	Manual and automated functional test script proficiency; Microsoft development exposure.	\$60-\$75K annually
(2) Test Developer	Manual and automated functional test script proficiency; Lotus Notes development exposure.	\$60-\$75K annually
Senior Test Developer	Extensive experience in automated functional/regression and load/stress testing. Knowledgeable in test environment configuration and support. Communication and supervisory skills.	\$75K+ annually

**Total (Projected) Annual** **\$315,000.00**

*\* Test staff number (5) based on support of 20 developers.*

All Microsoft licensing is associated with MSDN subscriptions for individual employees. The cost associated with laboratory set up and use for the first year is estimated to be **\$527,677.00**.

### **Expected Return on Investment (ROI)**

Once the laboratory is established and test developers are considered tool/methodology proficient, the establishment of a quarterly report is recommended. The report should include metrics for the purpose of monitoring the following expected results:

**Expected ROI**

More test-cycle iterations possible within the same period of time reserved for testing (useful for testing of phased releases).

**Estimated Hours Saved/Process Improved**

The industry accepted “rule of thumb” is that it takes approximately 3X longer to produced an automated script than one manual script execution; however, once the script is produced, each test cycle run after the third should yield a time savings approximately equivalent to the time of a manual test (minus minimal script maintenance for changes).

Improved regression testing.

Changes necessary to the automated script due to defect fixes, enhancements, etc., and test setup would constitute the time invested to run a full regression test (a savings of up to 90% of time spent in manual testing).

Performance testing is simplified and scalable.

Automated production of test and defect reports/tracking

The company can offer clients load/stress testing, simulating up to 500 users through one test developer and minimum hardware (value-added, marketable service). Experienced Atlanta area consultants performing this type service bill at a rate of \$1,500.00 to \$2,500.00 per day. Defect/issue reporting and accounting are completely automated. Reports can be customized at management discretion.

Questions associated with the software test laboratory proposal may be addressed to Scott Rowls (scott.rowls@xeroxconnect.com).