LiquidOffice Form Server Performance Data

White Paper

Overview

This white paper is intended to provide information regarding performance testing that has been performed with a single LiquidOffice Form Server. All performance data provided in this document was determined using LiquidOffice 2.0. Ongoing testing continues and this white paper document will be updated as new information becomes available.

LiquidOffice Form Server Performance Testing

With each release of LiquidOffice, Cardiff Engineering and Quality Assurance Departments spend a significant amount of time performing stress tests. These tests involve real world forms that stress all aspects of the product including form submissions, routing, signatures, lookups, validations, calculations, and the use of custom script in various client & server-side LiquidOffice events. In some test cases, a combination of real users along with using a web stress tool to simulate requests to the server is used in determining performance.

The form used for collecting the data in this document was the 1040A Federal Tax form. This form was selected because it is well known and therefore helps to establish a baseline of common understanding regarding performance. Using the 1040A Federal Tax form along with a test script and a web application stress tool from Microsoft called Application Center Test (ACT), server requests were simulated to the LiquidOffice Server for an eight-hour period. The form contained no profile fields, no database lookups, no dynamic lists, and no server script. The first type of test (Five Step Submission Test) simulated users logging in, opening a form, submitting the form, and logging out. The second type of test (Three Step Submission Test) simulates anonymous users who do not log in or out, they only open and submit the form or pre-authenticated users simply filling out another form.

Each test opened up 10 simultaneous connections between the browser and server. Once a connection was opened, a delay between requests was set to random ranging from 0.10 to 0.50 seconds. By limiting the number of client connections to 10 with a small delay between requests, the test setup itself is the gating factor for system throughput. As a result, this test does not demonstrate the maximum throughput of the LiquidOffice Server configuration tested.

One data export was set for a SQL Server 2000 table. The export table was located on the same Database Server as the LiquidOffice Form Server backend database. Each form submission added one record to the export table, which was comprised of 116 columns (one per form field).

The performance testing conducted by Cardiff tracked several important data points on the server including processor usage and memory usage.

Hardware Used:

LiquidOffice Server	
Processor Type	Dual Intel Pentium III Processors
Processor Clock Speed	866 MHz
Physical Memory	1 GB
Software	Microsoft Windows 2000 Server LiquidOffice Forms Server 2.0 --No LDAP

Database Server	
Processor Type	Single Pentium III Processor
Processor Clock Speed	866 MHz
Physical Memory	512 MB
Software	Microsoft Windows 2000 Server Microsoft SQL Server 2000

Web Stress Tool: Microsoft Application Center Test (ACT) Tool

Five Step Test

Simulates users logging in, opening a form, submitting the form, and logging out.

Request Breakdown		
1.	**Login**	POST LoginID and Password to the Server.
2.	**Open Form**	GET Form using Friendly URL.
3.	**Submit Form**	POST Form Data.
4.		GET Redirect URL encoded in server response to submission.
5.	**Logout**	GET Logout URL.

RESULTS	
Total Submissions	**Run Time**
70,437	8 hours
Test Notes: Default server installation without LDAP. SQL Backend server running on separate server from LiquidOffice	
Total Server Requests	353,046
Avg. Requests Per Second	12.26
Avg. Submissions Per Second	2.45
Avg. Submissions Per Minute	147
Avg. Submissions Per Hour	8,804
Avg. LO Server Processor Usage	49.28%

Avg. Available Physical Memory	703.40 Mb
Avg. LO Server Network Throughput	420,713.4 bytes per second (12,500,000 Bandwidth)
Avg. DB Server Processor Usage	33.58%
Avg. DB Server Network Throughput	276,819.2 bytes per second (12,500,000 Bandwidth)

Three Step Test

This test script simulates anonymous users who do not log in or out, they only open and submit the form by way of a URL embedded in an email or other web page.

Request Breakdown		
1.	**Open Form**	GET Form using Friendly URL.
2.	**Submit Form**	POST Form Data.
3.		GET Redirect URL encoded in server response to submission.

RESULTS	
Submissions	**Run Time**
130,164	8 hours

Notes:

- Default server installation without LDAP.
- ACT Client threads at 20.
- Modified Tomcat server.xml file. Changed max_threads from 60 to 90 and max_spare_threads from 30 to 60.
- Modified LiquidOffice dfserver.properties file. Changed MaxPoolSize setting from 40 to 90.

Total Requests	391,662
Avg. Requests Per Second	13.60
Avg. Submissions Per Second	4.52
Avg. Submissions Per Minute	271
Avg. Submissions Per Hour	16,270
Avg. LO Server Processor Usage	85.08%
Avg. Available Physical Memory	660.34 Mb
Avg. LO Server Network Throughput	600,488 bytes per second (12,500,000 Bandwidth)
Avg. DB Server Processor Usage	56.12%
Avg. DB Server Network Throughput	449,112 bytes per second (12,500,000 Bandwidth)

Summary

These results provide an initial sampling of form submission quantities that are easily achievable with the tested configurations. While more form submissions are most certainly possible over the same period of time, more requests translate to more resource usage on the server.

As with any performance data, consider that other user activity within the LiquidOffice Web Desktop will result in additional server requests. This will also impact CPU and RAM usage on the server. These requests could include activity like clicking on the Inbox, viewing trace history, or downloading data using My Data Client. Future tests will likely consider other activity outside of opening and submitting a form as well as pushing the LiquidOffice server to maximum capabilities. The test conducted for this paper does not demonstrate the maximum throughput of LiquidOffice – even on the configuration tested.

Cardiff continues to conduct performance testing on the LiquidOffice Server platform and this document will be updated as more data becomes available.