The Client

A Chicago-based company and rival Quebecor Printing are neck-and-neck in the race for the #2 spot among the world's commercial printers (both firms trail leader Dai Nippon Printing). Catalogs, retail inserts, and magazines account for more than half of the company's sales. Other activities include book publishing, telephone directory publishing, and financial services (annual reports, mutual funds) publishing. The company has long-term telephone directory printing contracts with four of the five Regional Bell Operating Companies in the US. Internationally, this company has interests in Asia, Europe, and South America.

Client's Objectives

This Chicago-based leader in the commercial printing industry commissioned CTI to provide systems testing for their Financial Systems Replacement Program (FSRP). They were looking for answers that would help them determine the optimum way to run the PeopleSoft Financial Applications for large-scale implementations.

CTI's Role

A key element leading to the successful deployment of FSRP for our client was determining the optimal infrastructure configuration for today and the future. An infrastructure stress test running the PeopleSoft Financials application was conducted at the client's lab to address the four main system areas:

¨ Citrix Winframe/Application Server
- Identified the limits of the application servers giving the number and size of servers needed to support the entire rollout.
- Determined the number of concurrent users per application server.
- Identified bottlenecks and limits of application server: CPU, memory, file handles, and disk capacity.

¨ Network Backbone
- Determined if the network infrastructure is sufficient to support user requests between the application server and database server. The data was then used to project the growth needs for the future.
- Projected the Local Area Network bandwidth utilization between the database server and the application servers for a load of 900 concurrent users (based on 4:1 ratio - 3600 user database to concurrent users). Data transactions were simulated for the most popular PeopleSoft activities in the field.

¨ ICA Application Network Footprint
- Identified the network traffic generated when running the Winframe ICA software. Information will also be noted on the clients system requirements used when running the test.
- Obtained and documented the Winframe client footprint statistics (Network bandwidth, memory, and response times). These tests helped cover all areas of communication between the client/server application and also project FSRP WAN requirements for all of the Donnelley divisions.

¨ Fat/Thin Client
- Compared and contrasted the use of three different client configurations running the FSRP application. The clients are: Winframe 1.7 running on a Windows PC; Winframe 1.7 running on a Network PC; and a "fat client" Windows PC running the application directly connected to the database server.
- Identified the response times and network traffic between the Fat Client and the data base server.
- Compared the results with Thin Clients.

Real Results
As a direct result of CTI's efforts, our client able to determine Citrix Winframe technology is the optimum way to run the PeopleSoft Financial Applications for a system of their magnitude.   This client went on to present the stress testing report at "Thinergy 98", the world's first global conference on thin client/server computing. Our detailed deliverables from this report included recommendations for the following:

¨ Citrix Winframe/Application Server - During each of the user tests, it was found that the system functioned within acceptable levels. The CPU, memory and disks were adequately stressed during this test to challenge bottleneck situations through a broad range of anticipated transactions. The test configuration afforded realistic simulations of users concurrently taxing the system in a manner beyond what is expected in production. The test verified the reasonable limits of each server to be 45 simultaneous users with ample overload margin for disk space and application server memory. Processor Utilization was found to be the limiting bottleneck. A final test was conducted that showed the system would experience unpredictable slowness and performance due to processor utilization when greater than 51 users were active executing the PeopleSoft application. To remain within acceptable comfort levels the technical team recommended not exceeding 45 users per server.

¨ Network Backbone - By studying the network backbone during the various tests, it was shown 1 Application Server (45 concurrent) connected to the database to utilize approximately 500Kbs (5% of 10M). Over 20 Citrix application servers running 45 concurrent users each was determined to be required for the complete FSRP rollout. At 500Kbs per server, a 10M network would be maintaining bandwidth of greater than 90% of full utilization. We believe this to be a totally unacceptable figure for network utilization that would cause a great deal of collisions and unpredictable network situations including bursts of traffic well over the 10M high water mark. Hence, we recommended moving to a switched 100M backbone.

¨ ICA Application Network Footprint – Our technical team was able to determine measurements for bandwidth traffic for the ICA client at 8Kbs. At this level, a partial T1 was found to be acceptable at most client divisions for supporting the PeopleSoft rollout. A detailed study was recommended to document each site and validate that their WAN connection is sufficient based on an 8Kbs per customer requirement.

¨ Fat/Thin Client - The FSRP client testing was able to determine measurements for bandwidth traffic, duration, and memory utilized. Regarding the network traffic, the Citrix client proved to use an average of 8Kbs bandwidth where the fat client required 25Kbs per user bandwidth.   Response times for the fat client were much higher compared to that of the Citrix client due to the transferring of the required cache files. Once the cache files were loaded on the fat client the response times of the tests were similar, however, it must be noted that there is no way to administer these cache files or optimally configure the fat client. Optimal configuration requires-loaded cache files, which is impossible with the fat client. This is not the case for the Citrix client. Finally, it was found the memory requirements to run the fat client requires 16M while the Citrix client runs on less t