DESCRIPTION

GENERAL INFO

JOB Server Benchmarks

DATES Report - 3/26/2001 Test Date 3/2/2001-3/25/2001

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ANALYSIS

PURPOSE **The goal of the tests was twofold:**
1-Establish an on-going procedure to verify performance of systems used for serving tasks.
2-Verify if the HP Netserver 6000 series systems are a good choice for Simon Marketing needs.

LOCATION/DATE/TIME The tests were performed at two locations: Downers Grove IL and Alienconcepts Mount Prospect IL from March 2 2001 through March 25 2001. Two sets of test equipment were used. The first set located Downers Grove included 6 NT clients ,1 NT Controller and 1 HP Netserver 6000 with 4 CPU. The comparison set included up to 8 NT/W98 clients, 1 NT Controller and 1 Tyan2510 ServerWorks LE system with 2 CPUs.

EQUIPMENT LAYOUT **Common:**
1-Each client and server was connected to an INTEL 460T 24 port 10/100 switch on there own segment to aid in minimizing traffic.
2-All tests were performed at "off hours" from 9AM to 9PM on Saturday and Sunday
3-All systems used a 100mbit Ethernet connection with the adaptors and switch ports set to FULL DUPLEX for the entire channel. (Note: Site 2 set 1 "webbench" tests had one system running a wireless connection which reduced performance on that client an "hp6000" portable)

Site 1: Downers Grove IL *Included:*
6 NT Server or Workstation clients including: "ftp.smi-ch.com", "pilotras", "smichcad2", "smi-chdownload", "replicator" and "smi-chlogon"
1 NT Terminal server controller "ch_sw"
1 HP Netserver 6000 "ch-sql02" **with 4 -700mhz Xeon CPUs**, 1.5gb of ram Intel Pro100 dual server nic, embedded HP 100 server nic, 1 SCSI Raid for boot drive ,temp and pagefile and 1 SCSI raid for data . The motherboard used the Intel BX series chipset allowing a 100mhz bus speed. Operating system was Windows 2000 Advanced Server on SP1.

Site 2: Alienconcepts Mount Prospect IL *Included:*
8 NT Server, workstation or W98 clients including: "hp6000", "call", "lv-426", "auriga" ,"ripley", "sil", "nostromo" and "betty"
1 NT workstation controller "sulaco"
1 Tyan2510 server "tyan2510" **with 2 -800mhz P3 CPUs**, 512mb of ram Intel Pro100 dual server nic, 1 IDE boot drive , 1 Promise ATA100 IDE Raid for temp, pagefile and some test data and 1 SCSI LSI raid (software based) for data . The motherboard used the ServerWorks LE series chipset allowing a 133mhz bus speed. Operating system was Windows NT4 Server on SP6.

TEST PROCEDURES

ZDLabs test suites were chosen because of there wide spread use. I was able to find hundreds of references to these test suites on the internet.

Overview of tests

Serverbench 4.1

ServerBench 4.1 is eTesting Labs' synthetic benchmark program for testing application servers in a client/server environment. ServerBench tests up to 60 clients to initiate test mixes on the server, designed to stress its various subsystems: disk, CPU/memory, and network. The test clients report back how long they waited for the server to complete their transactions, generating a mean score expressed in transactions per second. We set the test program's performance option to background services, with file and print sharing optimized for file sharing. (Note: As of 1/1/2001 ZDLabs or eTesting no longer supports ServerBench however, it was included because of the large amount of reference data available on the internet relating to it.)

WebBench 4.01

WebBench lets you measure Web server software performance by running different Web server packages on the same server hardware or by running a given Web server package on different hardware platforms. WebBench's standard test suites produce two overall scores for the server: requests per second and throughput as measured in bytes per second. WebBench provides both static standard test suites and dynamic standard test suites (which execute applications that actually run on the server)

NetBench 7.01

NetBench is a portable benchmark program that measures how well a file server handles file I/O requests from 32-bit Windows clients, which pelt the server with requests for network file operations. NetBench reports throughput and client response time measurements.

Procedures

Because of the limited number of clients that are available for testing I had to use the method that ZD recommends to simulate large client connections . This can be done by stressing the clients with additional sessions and editing the following parameters in the server test suite:

•Reduce the Think time parameter. (this floods the server with requests without any wait)
• *Increase the number of clients in the test .<< could not do*
•Use a large value for the data range parameters (data segment size, segment access ratio)
•Increase the total size of the disk tests.

I then monitored the clients as well as the server with performance monitor and kept increasing values until I got both the test server and the clients to run the tests at a 70% CPU and Ethernet load. (wirespeed: 12.5 megabytes/sec or 100mbit)

ZDLabs specifies:
"To get a valid measure of your server's performance, make sure you reach a knee in the benchmark results curve. The knee indicates that the transactions per second are no longer increasing." (this can be seen on the accompanying graphs)

I found that as I increased the WebBench load from 4 to 8 clients and the session count from 6 to 10 sessions per client there was little difference at which point the maximum performance was achieved. I choose 6 clients and 10 sessions per client as my test load and proceeded.

I performed a similar routine to setup ServerBench and again choose 6 clients with an increased value of times 2 for data segment size, segment access ratio and total size of the disk tests. I than compared my results to results available from the internet and found that everything was as expected.

NetBench presented additional problems. This is one test that I could not get meaningful results out of because of limited clients. No matter what I did I could not get more then 25% of available through-put, as a result I abandoned this test for now.

All tests were ran a minimum of 2 times after the load guidelines had been established.

ANALYSIS RESULTS

FINDINGS **Several issues were derived from the tests.**

1) In EVERY client/server test that was performed the 2 CPU Tyan 2510 out performed the **4 CPU** HP Netserver 6000.

2) The only tests that the HP excelled in were the CPU and Network load tests which was to be expected. I had two network channels operational on HP

Recommendations:

From all indications the HP 6000 Netservers can not keep up with the newer ServerWorks based systems. This may come from the fact that even though the HP is a good design it is using old technology. The HP appears to work well in very CPU intensive tasks as can be seen by the performance monitor that was run in sync with benchmarks however, it was not able to keep up on the transaction load (with twice as much CPU).

This could be attributed to several issues:

1-Poor OS installation and tuning (according to ZDnet Windows 2000 server outperforms NT4 (see attached review)

2-Bottleneck in network channel (however, the PMON graphs indicate that both system were running at the same throughput with different cpu loads) Tyan 2.8mb/sec at 93%CPU HP 2.2mb at 28% CPU when running ServerBench which is only 20% of maximum for the network channel. This is disputed by the fact that when WebBench was running the PMON indicated that both systems were running within 15% of each other in all loads. (see WebBench graphs at end of report)

I would recommend that we setup one more set of tests next weekend with 12 clients running 10 sessions each. The problem is I need six more clients in server room or somewhere on network running Remotely Possible so I can configure. (I could get 6 more clients if I use "notesint" "smich2" "smibackup" "smtpmta" "chiis02" and one more however all services would need to be shut off for 12 hours.)

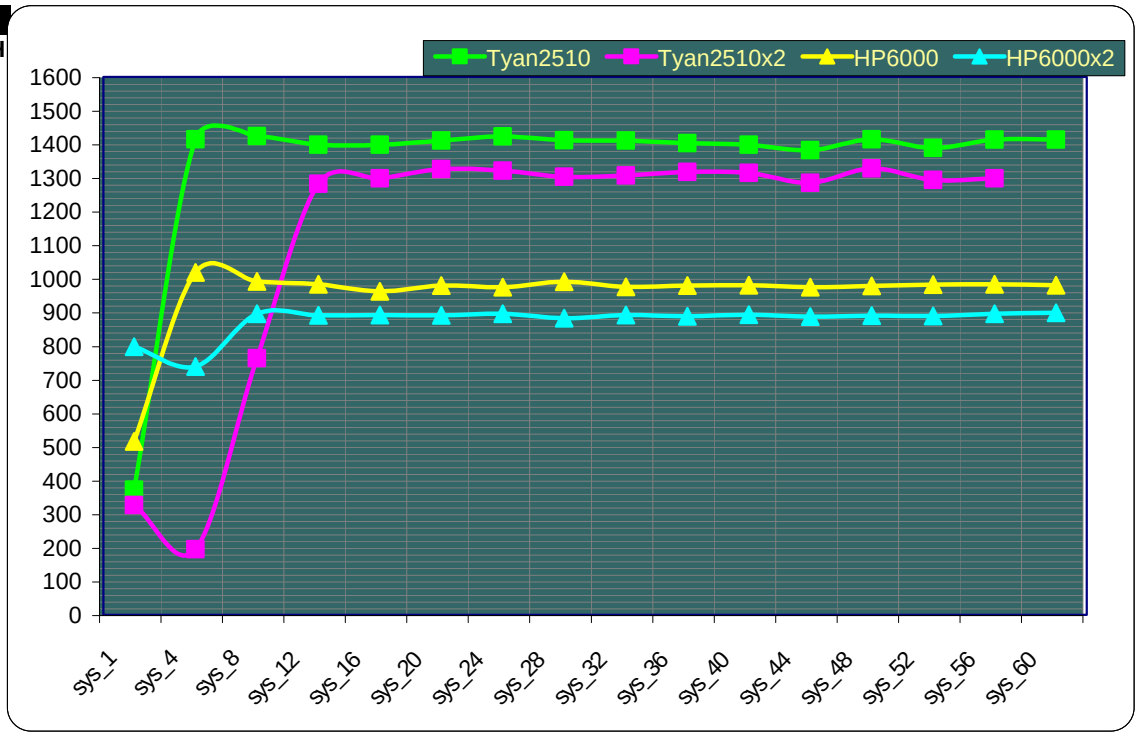
GRAPHS

SERVERBENCH

The small graphs represent the following:

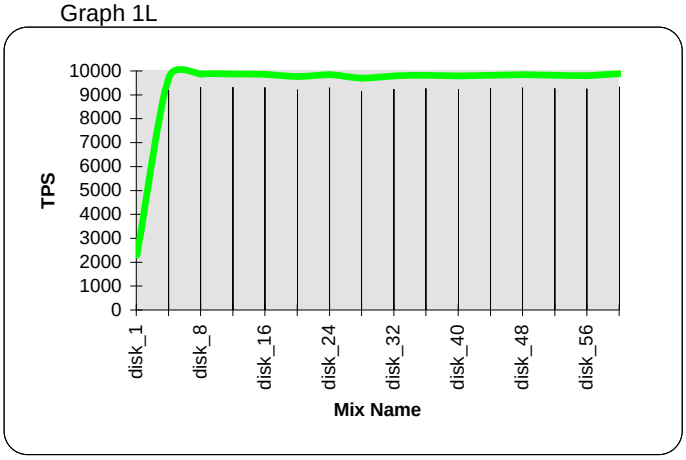
1L-DiskMix Tyan
1R-DiskMix HP
2L-NetMix Tyan
2R-NetMix HP
3L-CpuMix Tyan
3R-CpuMix HP
4L-PMon Tyan
4R-Pmon HP
5L-IdeRaid Tyan
5R-BootRaid HP
6L-ScsiRaid Tyan
6R-DataRaid HP

Note: There appears to be something wrong with DiskMix HP. It looks as if the values got inverted. However , the test master does indicate what is noted.

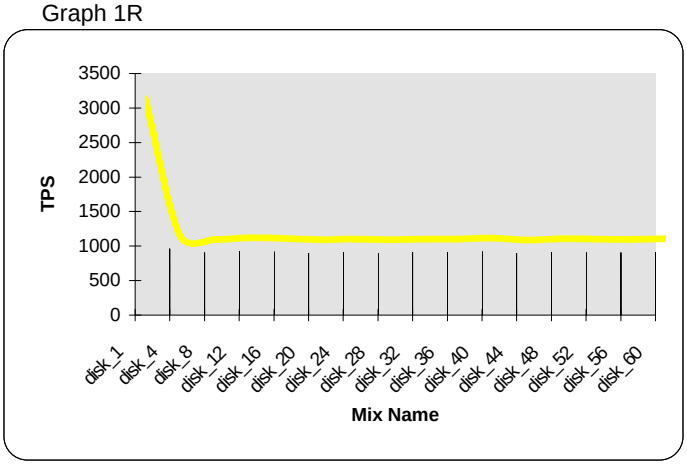


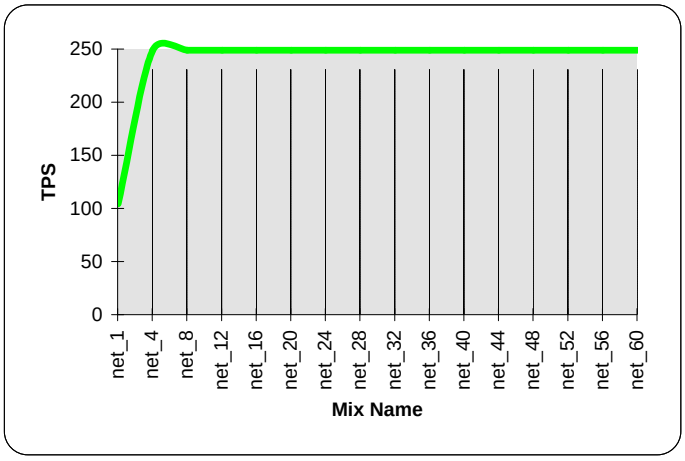
This composite graph shows indicates TPS for both the Tyan2510 and HP 6000 under two test conditions. The higher values on each is a client load of 6 with all parameters set to stress server. The lower value is the same with all test values multiplied by 2 (X2).

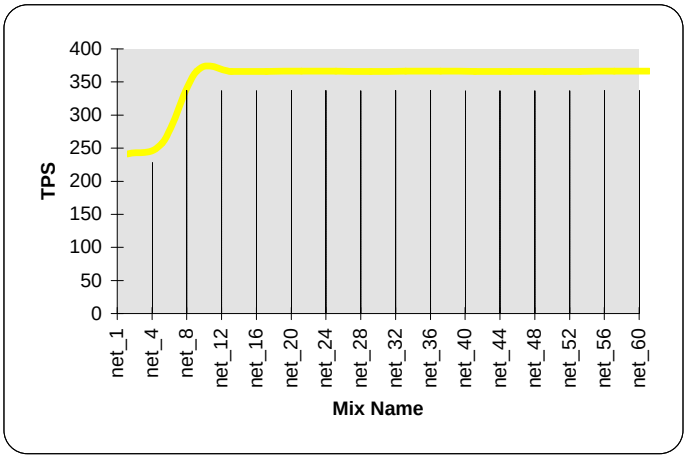
Graph 1L

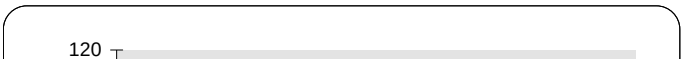


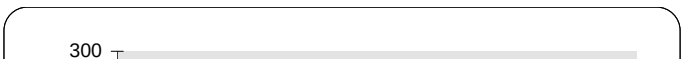
Graph 1R

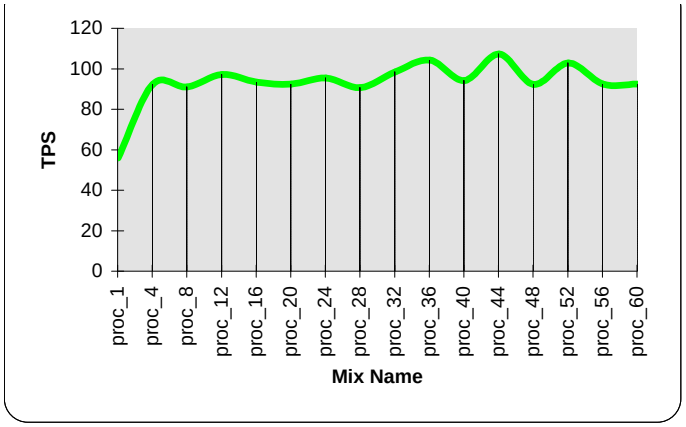




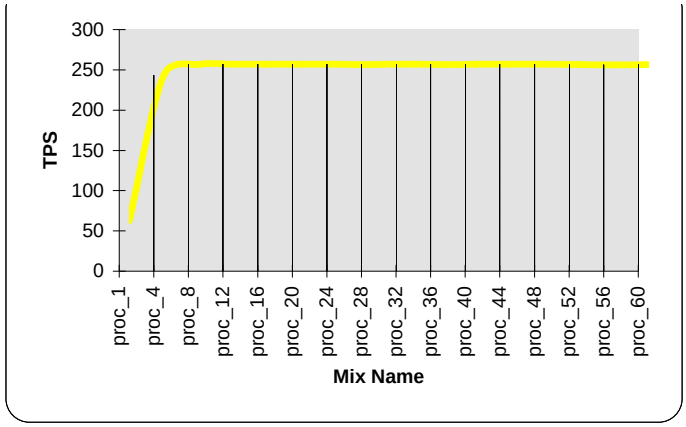




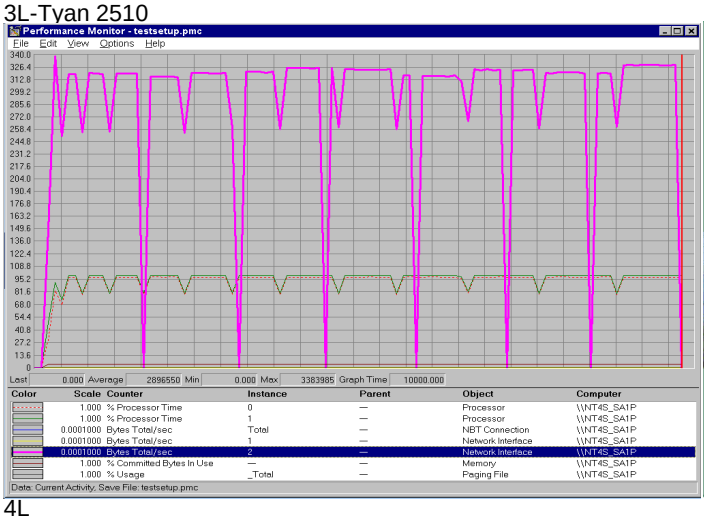




3L-Tyan 2510

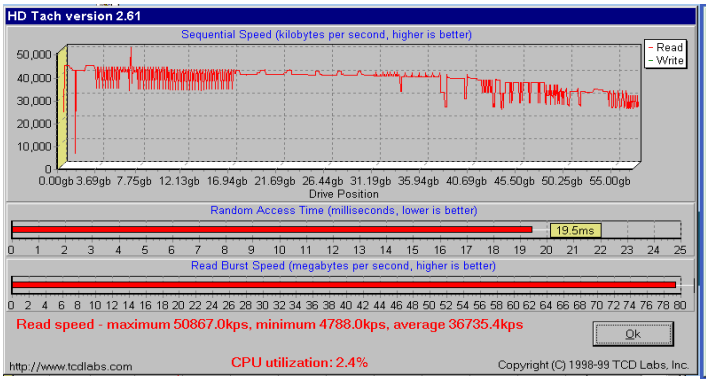


3R-HP 6000

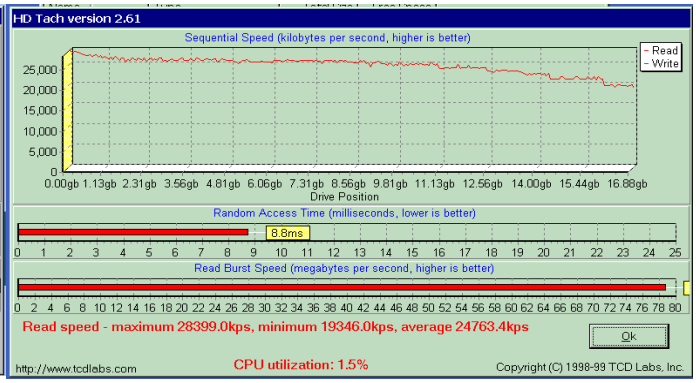


4L

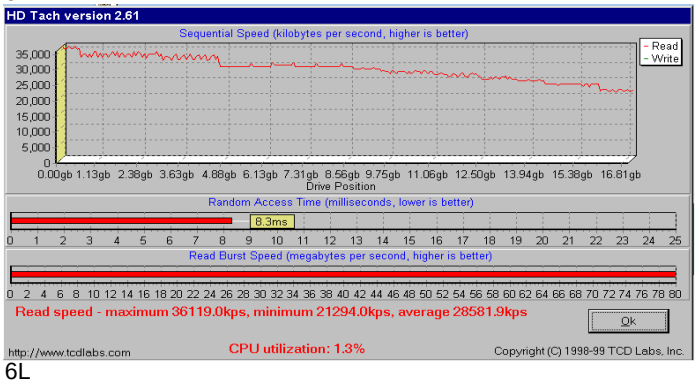
4R



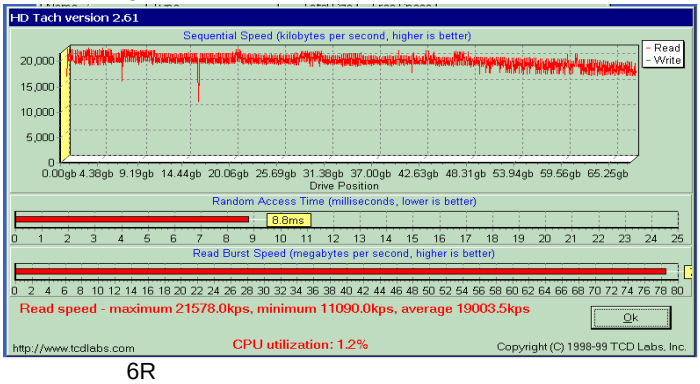
5L



5R



6L



6R

WebBENCH Graph Wb1

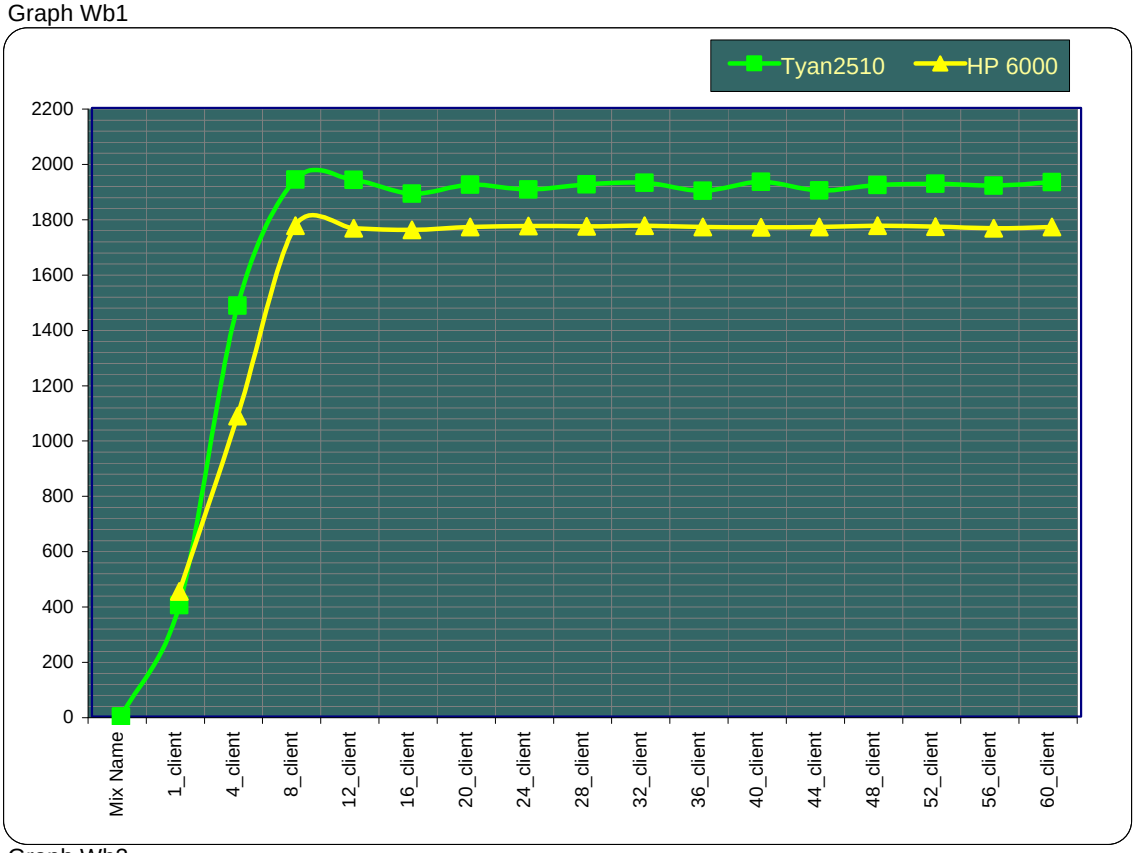
The following graphs indicate as noted below:

Wb1- Requests/sec

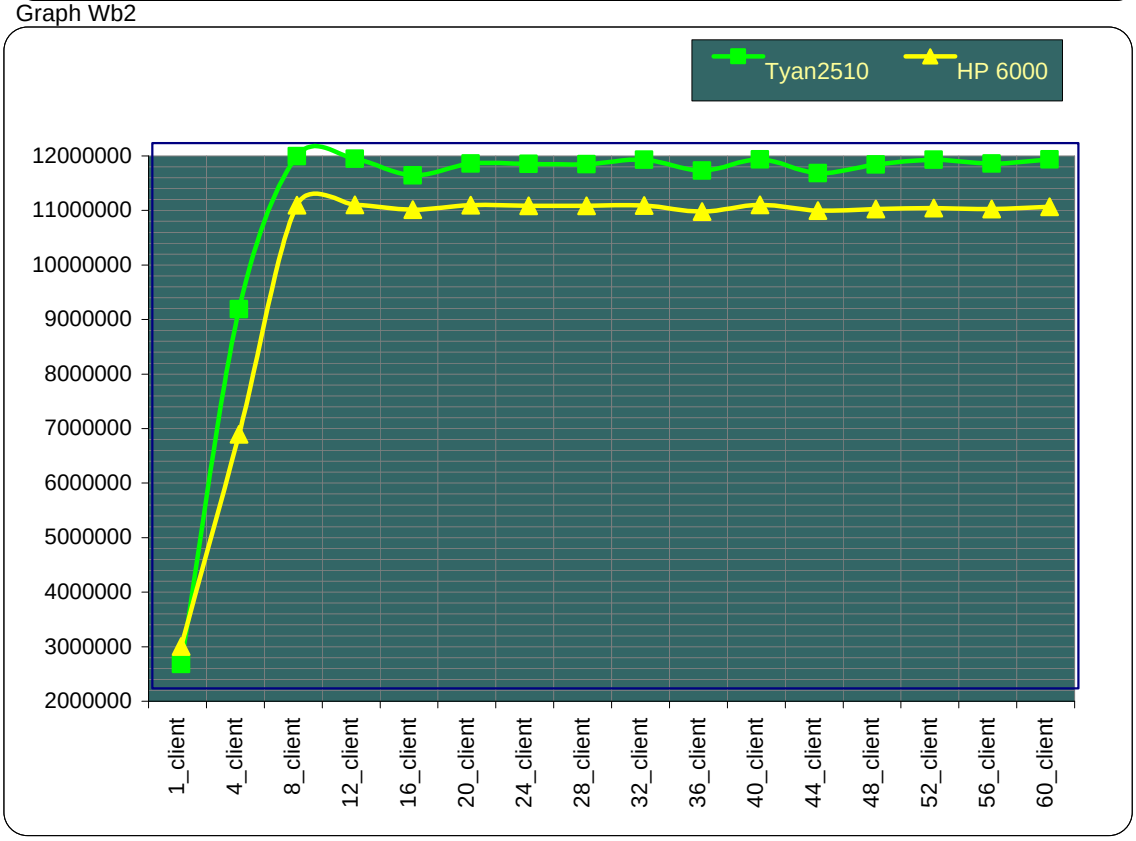
Wb2- Throughput/sec

Wb3- Pmon Tyan2510

Wb4-Pmon HP 6000 Netserver



Graph Wb2



Graph Wb3

Graph Wb4