PC MAGAZINE
ZIFF DAVIS MEDIA
www.pcmag.com
THE INDEPENDENT GUIDE TO TECHNOLOGY
MAY 21, 2002

Capable of Heavy Lifting

Jack of all trades, master of none: That's how general-purpose servers have been described in the past. By contrast, as our tests show, the latest generation are versatile enough to excel as e-mail, database, file/print, and application servers—or even as Web servers.

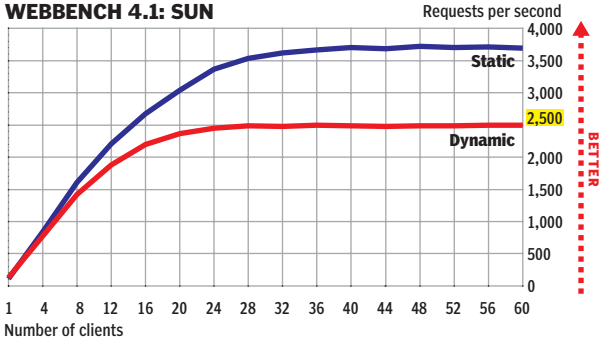
Although the Linux-based HP and Penguin units lagged in WebBench performance compared with the servers running Windows, they performed just as well on our NetBench test, where the network operating system is much less important than the RAID controller and hard drives. Just as the HP server had similar NetBench scores under both Linux and Windows 2000, the other Windows-based machines would presumably have yielded much the same results using Linux.

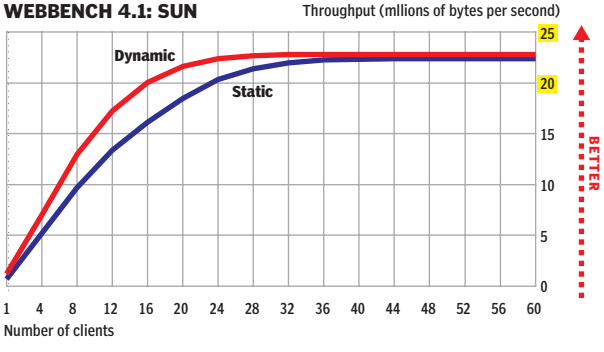
As shown in a separate pair of charts, the Sun Fire 280R outperformed the other servers on the dynamic WebBench test, thanks to its off-chip memory controller, which frees up processor cycles by off-loading some of the work its CPU has to do to move blocks of data from the system memory to the network interface (the Quad Fast Ethernet adapter). The CPU can then concentrate on processing dynamic Web data.

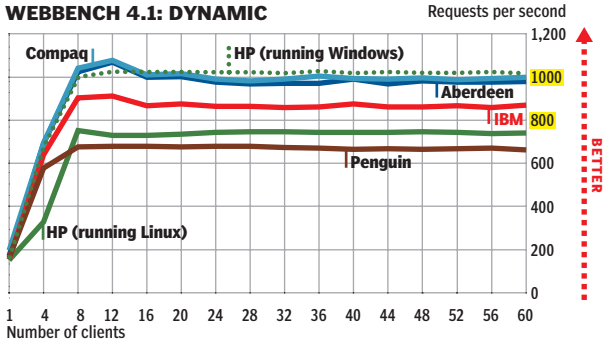
We checked for factors that could explain the Aberdeen's inferior NetBench throughput with more than 20 clients.

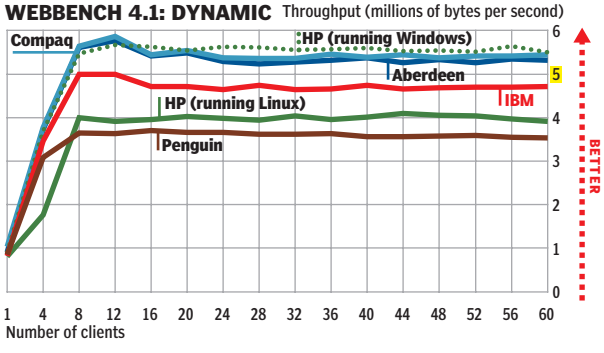
All the servers have opportunistic locking enabled by default. This setting lets a client reserve a file on the server for that client's exclusive use. It allows all clients to work using cached files, resulting in a throughput that can exceed the theoretical maximum of the network adapters.

Moreover, the Aberdeen's RAID cache size is in line with the other servers here; the drive speed is 15,000 rpm (as on the Compaq server), and all servers' NICs were set to 100 Mbps and full duplex. We even reseated the Aberdeen's









memory, CPU, and RAID card (this server's NICs are integrated). We found that its Adaptec 2005S RAID adapter, with 48MB of cache, reserves 16MB of memory for IOP (I/O parity). Perhaps the parity checking caused some overhead that hurt performance.

Otherwise, we can only surmise that one or more of the Aberdeen's components were not operating correctly. With this one exception, all of the Windows servers showed comparable performance. Those who use Linux for scalability, configurability, and affordability may have to sacrifice some amount of Web server performance as well as protection from Windows-based viruses.

HOW WE TESTED

All Windows servers came preloaded with Windows 2000 Server and IIS 5.0. The Compaq ProLiant DL380 G2 came with Windows 2000 Advanced Server installed, but since we did not invoke the specialized extras of Advanced Server (such as server clustering or 32-CPU support), the test results should be the same as if we had used Windows 2000 Server. The Penguin Relion 225 had Red Hat Linux 7.2 and Apache installed, and we tested the HP Netserver LP 200r with the same configuration.

For the Linux servers, we used Samba for Windows file sharing. The Sun Fire did not come loaded with Sun's Solaris PC NetLink software, so we could not run the NetBench tests on this unit.

Each server came with 1GB of SDRAM, and we asked that the data partitions for each be installed on a three-disk, Level 5 RAID array. (The Sun Fire included an external disk array, as it has only two disk bays in the server chassis.) We also requested that each server come with two identical 100Base-T Ethernet NICs or a NIC with at least two ports. Though all of the servers were dual-processor–capable, we asked that each server come with one processor installed.

We arranged the clients into two identical 30-node subnets, attached over 100-Mbps Ethernet to each NIC. We used two Extreme Networks Summit48 10/100 Ethernet switches in two virtual LANs to connect the clients, server NICs, and controller machine. For the networking protocol, we used the TCP/IP stack in either Windows 2000 or Linux. Thus, each server was connected to a 60-node private LAN, with a mix of Windows 98 SE clients. The clients included various Pentium II and Pentium III PCs.

WebBench 4.1 measures the performance of Web servers as they handle requests from clients (measured in terms of both requests per second and millions of bytes per second). We tested using the static and dynamic (simple CGI, or Common Gateway Interface) tests. CGI lets the Web server software interface with external programs, such as database engines, e-mail programs, and more. We set the performance option and file/print sharing to be optimized for applications. We turned off the IIS logging and visit logs and set performance to 100,000-plus hits a day. The site was not indexed; there was no application protection on the static-content directory, and the CGI-BIN directory was set as a virtual directory for dynamic content.

The **static** test serves static HTML Web sites, including HTML code and GIF files. During a **dynamic** request, the client asks each server to run a CGI application that lives on that server. This application creates HTML response data, which the server returns to the client. Because the executable runs on the server, it uses processing resources there.

NetBench 7.0.2 replicates the network traffic associated with file and print server use and measures how well a file server handles file I/O requests from 32-bit Windows systems.—*Analysis written by Joel Santo Domingo*