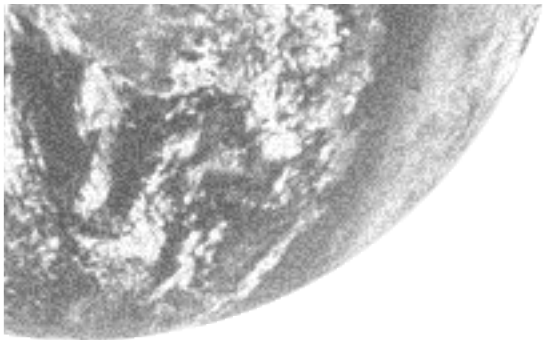

Publishing on the World Wide Web:
The Mac OS Advantage

Abstract: We describe why a Workgroup Server from Apple running the Mac™ OS and MacHTTP is the preferred hardware and software platform on which to build a World Wide Web site. We do this by contrasting the Mac OS–based Workgroup Servers from Apple with the alternatives (workstations running UNIX® and PCs running Microsoft Windows). Our preference is founded on an analysis of each platform's price/performance value, security, reliability, flexibility, and ability to provide custom solutions.

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What Is the World Wide Web?

The World Wide Web (WWW) is a low-cost, low-overhead technology that enables people to publish electronically almost any information on the Internet—today's forerunner to the information superhighway. Catalogs, research papers, order forms, databases, discussion forums, multimedia demos, software archives, books, and periodicals—all can be published electronically and made available immediately to anyone, anywhere in the world. All it takes is a single computer, connected to the Internet—the possibilities are endless.

Organizations of any size can use the WWW to project a global presence by publishing their contact information, background, and product information. Businesses can rapidly publish catalogs and price lists without the costs and time required for paper publishing. They can even take orders and perform credit card transactions on line. Large corporations can use the WWW to securely connect the data resources of their various sites at a fraction of the conventional cost. Schools and universities can post curriculum information, research findings, campus activities, and resources to their campus community or to the world at large.

Electronic publishing via the WWW has been called the 1990s equivalent of the desktop publishing revolution, and now is the time to get onboard. Why? Because the Internet has a global audience consisting of more than 25,000 connected networks, and more than 31 million users (and potential customers). The WWW is the fastest-growing segment of the Internet, with a 5 to 10 percent monthly growth rate. The tools and infrastructure are in place and mature. Costs are low and the potential return is high, and growing.

Client and Server Programs

Two kinds of software are needed to make the WWW work: client programs and server programs. A client program provides you with access to the published content of the WWW, while a server program allows you to do the publishing.

A number of client programs (or browsers) are available today, and new ones are always under development. Many client programs are free to the public (such as Mosaic, MacWeb, and Netscape), and they will run on multiple hardware platforms. Just about anyone with access to a computer can tap into the WWW.

On the server side, however, the ability to publish information is limited by the availability of software. Relatively few server programs exist, and each is designed specifically for one of three hardware platforms: UNIX-based workstations, Windows software–based PCs, and Mac OS–based systems.

Server Programs for UNIX-based Workstations

UNIX-based workstations are typically high-performance, high-cost machines. Because of the complexity of the UNIX operating system, these workstations require a significant amount of time to set up, and they need to be configured by a qualified UNIX system administrator. Usually this administrator is a full-time staff member whose sole job is to maintain—and modify—the system.

UNIX-based workstations range in price from $10,000 to $30,000 (U.S.). When the cost of a full-time administrator is added, these workstations become quite expensive.

The first WWW server programs were developed for UNIX-based workstations, and many commercial UNIX server programs are available today. Like the workstations on which they run, these WWW server programs typically require a great deal of effort to set up and maintain. In addition, they can only interact directly with text stream–based applications (such as UNIX shell scripts). The server program cannot interact with other applications (such as an SQL database, Lotus 1-2-3, and so on) running on the same workstation unless a custom C program is written to perform each requested interaction.

Server Programs for PCs Running Windows

Server programs for PCs running Windows suffer from all of the afflictions of server programs for UNIX-based workstations, because that is what they are: UNIX server programs that have been ported to Windows. However, because they do not have access to the capabilities provided by UNIX, these server programs are even more limited than the UNIX server programs.

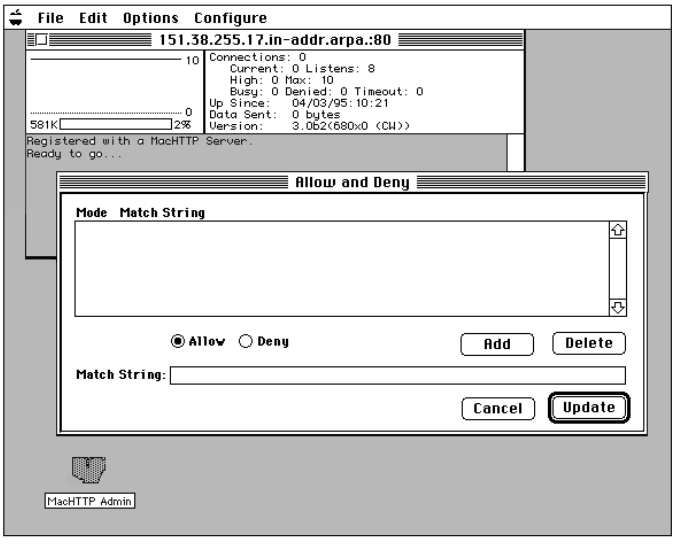
Server programs for PCs running Windows severely limit the number of simultaneous client connections, making them unsuitable for high-volume WWW sites. They have only a vestigial ability—via Perl scripts—to interact with most applications for Windows. And they have only minimal security support.

Worst of all, because of known memory allocation problems, none of these server programs can remain in continuous use for more than a few days before crashing the host machine. They are not recommended for production use, and therefore we do not consider them further in this article.

MacHTTP, the Server Program for the Mac OS Platform

MacHTTP, the WWW server program for the Mac OS platform, provides the full functionality of commercial UNIX server programs and more, without any of the disadvantages. MacHTTP was designed to work in the Mac OS–based server environment, and is completely integrated with Macintosh® System 7.5; it is not a ported product. The software places a relatively small load on your computer, in terms of memory and processor requirements. MacHTTP runs in native mode on both 680x0-based Apple® Macintosh systems and PowerPC™ processor–based systems.

Like most applications for Macintosh systems, MacHTTP can be installed, configured, and running in about five minutes by anyone; no system administration experience is required. MacHTTP can even be installed and set up remotely, over a network.



MacHTTP is easy to use and set up, even from a remote Macintosh system. It also provides an easy-to-understand interface for controlling access to your WWW server, as shown in the screen above.

MacHTTP version 2.0, the most recent version, offers many new features, including:

- Common Gateway Interface (CGI) support for integration with external applications, such as databases or e-mail applications.
- Security enhancements that support user name and password security for all files it serves, in addition to MacHTTP access controls by domain name and IP address.
- User interface enhancements, such as improved statistics reporting and saved preferences for window settings and menu selections.
- Increased Apple event support to allow complete remote administration of MacHTTP from another Macintosh or any authorized WWW client.

MacHTTP Specifications

- **Native versions are available for both 680x0-based Macintosh computers and PowerPC processor–based systems**
- **Requires less than 1 megabyte of RAM**
- **Implements the HTTP/1.0 Standard**
- **Multithreaded transfers**
- **Compatible with other MacTCP® applications**
- **Completely scriptable and recordable**

The Mac OS Advantage Over the UNIX Platform

Once you have decided to publish information on the WWW, the next decision you need to make is which hardware and software to use. This decision should be based on performance, reliability, cost, security, customer support, and flexibility.

Performance

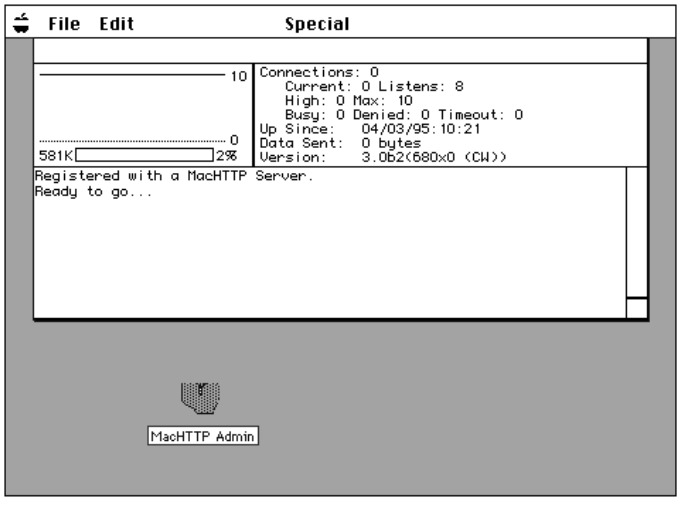
At first glance, you might think that UNIX-based workstations would be the clear winners in the performance arena over any Mac OS–based system. After all, a single UNIX workstation can outperform a Workgroup Server from Apple, in terms of simultaneous connections supported. However, comparing the performance of a Workgroup Server and a UNIX-based workstation is like comparing apples and oranges. To compare apples to apples, you must compare price and performance together. For example, compare an $11,000 (U.S.) investment in Workgroup Servers with the same investment in UNIX-based workstations. For that amount today, you can buy either three Workgroup Servers or one low-end UNIX-based workstation. The multiple Workgroup Servers, working together, will outperform the single workstation every time. A single Workgroup Server can serve 3,000 to 5,000 (or more) connections per hour, depending on the data being served and the network bandwidth. This number of connections is far greater than the number that the average WWW site receives in an entire day.

Reliability

For many potential WWW applications (such as on-line catalogs) downtime is not just an inconvenience—it costs money. While a Workgroup Server is, in general, as reliable as the typical UNIX-based workstation, you can buy several Workgroup Servers for less than the cost of a single UNIX-based workstation. If your one and only UNIX-based workstation bites the dust, you're off the air until it gets fixed. But if one of your several Workgroup Servers goes down, the rest are unaffected. The others can continue to publish your information and service your customers. Mac OS–based systems running as dedicated WWW servers have demonstrated the ability to run unattended for months at a time, while UNIX-based workstations performing the same functions are forced into periodic reboots by operating system bugs, kernel panics, and administrative downtime. A list of some of the most persistently available Mac OS–based servers on the Internet is available at the WWW address http://www.ape.com/. Many of these servers have been running since September 1994 with no downtime.

Cost

Workgroup Servers from Apple start at less than half the price of the lowest-cost UNIX-based workstations, and they're easy to use and maintain. When you compare the price of a UNIX-based workstation plus the additional cost of a full-time UNIX system administrator with the price of a Workgroup Server, the Apple solution clearly provides more "bang for the buck."



With MacHTTP and a Workgroup Server from Apple, configuring your WWW server is simply a matter of double-clicking the MacHTTP icon, as shown here. There's no need for a full-time system administrator to wade through complex installation requirements.

Security

A Workgroup Server running MacHTTP is much more secure than any UNIX-based workstation, because of the many documented security holes in the UNIX operating system. To provide even minimal security for a UNIX-based workstation often requires expensive or proprietary firewall software, in addition to an experienced UNIX system administrator.

On the other hand, a Workgroup Server connected to the Internet is not subject to unauthorized access (a big UNIX security problem). Furthermore, MacHTTP does not allow random access to the entire document tree. Only those files and documents that you want to publicize are available to the Internet community.

Support

Customer support for most UNIX-based WWW server programs is limited to a few on-line documentation files. With some commercial server programs, you can ask questions by e-mail, and they might be answered a few days later. In addition, a few Internet newsgroups are devoted to the topic, so other users can commiserate.

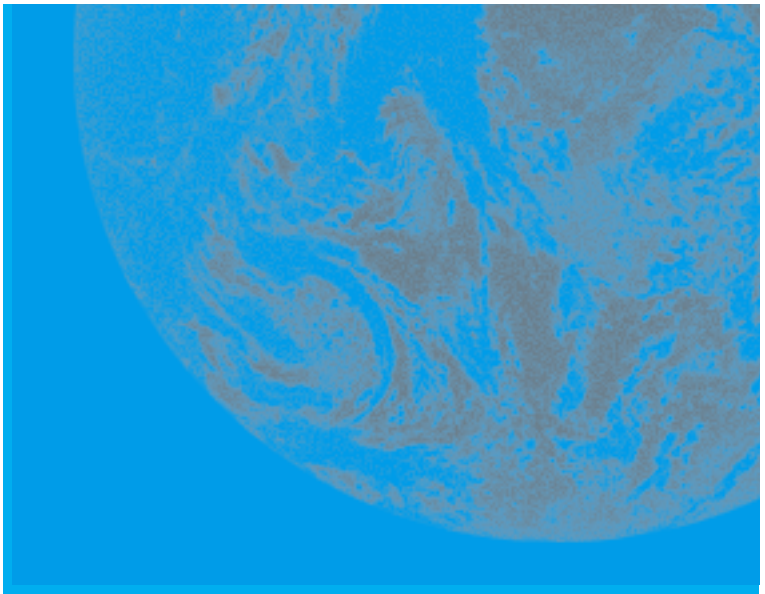
In contrast, complete on-line support is provided for MacHTTP by BIAP Systems, including on-line documentation, answers to frequently asked questions, examples, tutorials, and personal support to registered users and clients. E-mail questions are usually answered within an hour, and always within 24 hours. And there's a large on-line community of MacHTTP users who share tips and information in a dedicated e-mail forum.

Flexibility

While UNIX-based server programs can interact only with text stream–based applications, MacHTTP has no such limitation. A number of interface utilities already exist to link MacHTTP to databases and text search engines, and to process credit card sales through the First Virtual Holdings system. In addition, MacHTTP can use AppleScript® (the built-in scripting language of the Mac OS) to interact with any other application designed for Macintosh systems (such as spreadsheets, word processors, and databases), including custom applications. No formal C programming experience is required to take advantage of these capabilities.

Conclusion

Now is the time to become a part of the World Wide Web, and the best way to do so is with Apple's Workgroup Servers and MacHTTP software. The desktop publishing revolution that started with the Macintosh computer will continue to evolve on the WWW, and Workgroup Servers from Apple provide the platform of choice.



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