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Inexpensive options simplify connectivity

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Connectivity among different kinds of computers — exchanging files between IBM Personal Computers, Apple Computer, Inc. Macintoshes and Unix workstations, for instance — has become much more affordable and less complicated in recent years. From the standpoint of information systems managers, there are more options and a broader market of products to select from. We haven't reached connectivity nirvana, however. Different PCs and workstations from different vendors still store information on floppy disks and magnetic tapes in fundamentally incompatible formats. But when properly configured, all of the leading brands of computers — and many more — can transparently access one another's files over a network.

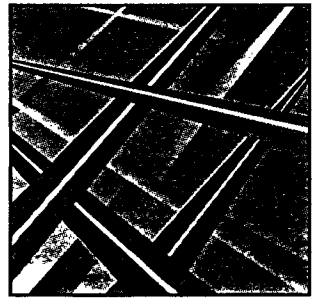
There are two levels to interconnecting disparate workstations: physical and logical. Two workstations are physically connected if they share the same local-area network — which is not hard to arrange, given that third-party vendors now provide Ethernet and token-ring cards for Macintoshes, PCs and a variety of Unix workstations.

The cost of the hardware depends on how quickly users need to transfer information. Every Macintosh comes standard with a Localtalk interface, but Localtalk only transfers 230K bit/sec. If a user wants high-speed transfer, he'll have to buy an Ethernet or token-ring interface card for each computer he wants on the network. Most of these cards cost between $400 and $600.

However, physical connectivity is only the first phase. The second, or logical connection, is more complicated, because it can involve reconciling incompatible disk storage, network server software and application software formats.

Network software comes in two parts. Server programs make the files stored on servers available over the network. Client programs run on local computers and make the files stored on the server available to the operating system.

On MS-DOS computers, Novell, Inc.'s proprietary Netware is the most popular networking protocol. Netware runs with Ethernet. Software clients are also available for the Macintosh and OS/2, which means these computers can access files stored on a Netware server. But Netware is expensive: The server software costs between $3,000 and $8,000, depending on options. This may seem steep, but 250 users can share a single Intel Corp. 80386 server using the $7,995 Netware 386. Netware clients cost approximately $200 per workstation.



If an office is mostly using Macintosh computers, users will probably choose Apple's Appleshare remote file system. To use Appleshare, users must dedicate one Macintosh computer to be a file server, and only files stored on the server can be shared among users. While any Macintosh can be a server, the faster ones, such as the Macintosh IIFX, give better performance to all users. Of course, the faster Macintoshes are also more expensive. The server costs $790.

Next year, however, Apple's long-awaited Version 7.0 operating system "will allow [users] to set up part of [their] individual Macintosh as a nondedicated server," says Doug McLean, Apple's product line manager for network integration.

In the Unix world, Sun Microsystems, Inc.'s Network File System (NFS) is undisputedly the most popular network file system. Although NFS was originally a proprietary protocol, it is now a standard. The free software is available from the University of California at Berkeley. Also, NFS is highly portable, because it is based on the industry-standard Transmission Control Protocol/Internet Protocol. As a result, it is available for practically any computer for which a network interface can be purchased, anything from PCs and Macintoshes to supercomputers.

Unfortunately, NFS pays a price for this portability. "The performance of most NFS solutions with DOS does not really compare with Netware," says James Van Bokkelen, president of FTP Software, which sells NFS for the IBM PC.

However, the advantage of NFS is its adherence to an open and well-thought-out standard, Van Bokkelen says. Since NFS is a standard, it is available on far more platforms than any other network file system. And NFS software is a good investment, because it is likely to be supported by any computers users buy in the future.

Unfortunately, merely being able to access files stored on the server is often not enough. If a user uses his PC to access data written by a Macintosh, he must be sure that the application programs on the two computers can interchange files in a mutually compatible format.

For example, the Macintosh version of Microsoft Corp.'s Microsoft Word can read and write data files in a variety of formats, including the format used by Microsoft Word running under Windows 3.0. If a user wishes to use a specific application on a variety of platforms, he should be sure that the various versions can all exchange data files.

Sharing plain text files between operating systems can often be more complicated than sharing data files from application programs. This is because DOS, Apple and Unix use different series of control characters to indicate the end of a line and the end of a paragraph. Conversion between the formats often requires nothing more than search-and-replace inside a word processor, but on a daily basis, the need to convert is annoying.

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