THE NEED FOR SPEED

Upgrading DTP Networks for Faster Throughput

By Suzanne Kimball

By now you're used to the scenario ...you've sent a 150 MB file to RIP, so you figure now's a good time to read all your e-mail, answer your phone messages, and take a bathroom break. You know other desktop publishers and pre-press service bureaus are moving toward greater networking bandwidth, and you long for speed, but you're not sure how to sort through all the possibilities. Here's some information that should help.

If you're like other desktop publishing professionals, you need more speed from your network than you're currently getting. Industry vendors are developing a variety of solutions to increase networking bandwidth, but it's not always easy to decide which is the best technology for you. No one solution may be the fantasy answer to all your problems, but a combination of technologies and products can help you set up an efficient network that will increase your productivity and improve your bottom line.

Naturally you've probably been tempted by claims that 100 Mbit technologies can increase network performance by ten times. Before you run out and buy a proprietary high-speed networking solution, however, consider first what you can do to beef up your existing 10 Mbit Ethernet network. While high-speed solutions do offer increased bandwidth over today's 10 Mbit Ethernet solutions, completely abandoning 10BASE-T Ethernet is not necessary. Software and cabling alternatives can help increase 10 Mbit Ethernet performance today and save you money.

Getting the Most Out of Your Current Network

Many desktop publishers and pre-press service bureaus are improving speed on their existing 10BASE-T networks through acceleration software packages. RunShare software by Run Inc. is a popular bandwidth maximization program used by many pre-press professionals.

WHN, a pre-press service bureau in Salt Lake City, uses RunShare on its nine Macintosh, peer-to-peer Ethernet network. Time spent to transfer a 32 MByte file from a PowerMac 8100 desktop CPU to a PowerMac RIP station is cut from 15 minutes to approximately 59 seconds using RunShare. "We don't notice the difference in speed until we aren't using RunShare," said Rick Noyes, president of WHN, 'but when it's not active, you can really feel the difference."

RunShare is fully compatible with the Mac OS but is also available in a version for PCs, working with Helios EtherShare for IBM RS/6000 and Sun Solaris computers. A 5-user package sells for $749 and a 25-user version for $2,499.

In addition to software acceleration, you can boost network performance by eliminating peer-to-peer connection and adding a server to your network. This helps reduce network collisions between individual stations and adds management and routing capa-

bilities to the network.

An easy way to connect Macs to the server in a mixed environment is through NetWare 4.1 which comes with an AppleTalk client. A NetWare file server is probably more stable than a Windows NT server and it provides better file access and storage. If your shop is primarily Mac-based, and you want to connect one or two PC's to the server, Personal MacLAN from Miramar for Windows 95 and Windows 3.1 will do the trick, or you can use AppleShare PC client by Apple Computer.

After you've added a server to the network, you can gain additional performance through network segmentation. Demanding users can be isolated from the rest of the network with their own direct connection to the server. Ken Maki, president of a computer consulting firm based in Portland, Ore., suggests the easiest way to segment users on a server: "Install multiple network interface cards (NICs) on the server for both Mac and PC users. Then attach Ethernet hubs to each of the cards. This is easier than cascading all Ethernet hubs for all users into one card; route users based on the platform they're using, either Mac or PC, and on how demanding they are on the network."

This kind of segmentation is inexpensive, but it should be noted, however, that Apple Macintosh servers do not support it. UNIX, Netware, and Windows NT servers can be set up in such a way with low-cost NICs, which sell for under $200.

Another way to increase network speed is through switched Ethernet. Many pre-press and desktop publishing shops are using switched 10 Mbit Ethernet to avoid collisions. Switching is a form of segmentation, but rather than isolate certain users at the server level, an Ethernet switch provides dedicated bandwidth directly to an individual port on the hub, so the traffic on one port is separated from traffic on another.

Switched Ethernet is easy to implement. It's also fairly inexpensive because it doesn't require replacement of NICs or cabling on your network. However, you will need to replace your existing shared Ethernet hubs with a switched hub. Interwest Graphics Inc., the largest pre-press house in the state of Utah, is using switched Ethernet technology. The 40 workstation service bureau uses a Cisco (formerly Grand Junction) Fast Switch 10/100 AG which includes internal bridging and routing capabilities and an uplink to 100 Mbit Ethernet. Switching hubs let Interwest give

demanding users all the pipeline they need to produce large graphic files.

The Need for Speed

Okay, so maybe you've squeezed every bit of performance you can out of your existing 10 Mbit network. Now what can you do? If you need even more speed, you'll want to know about 100 Mbit networking technologies that are beginning to emerge like Fast Ethernet, FDDI (Fiber Distributed Data Interface), and ATM (Asynchronous Transfer Mode).

Fast Ethernet (or 100BASE-T) is similar to the 10BASE-T Ethernet standard, using the same collision detection method as 10 Mbit Ethernet. Its similarity with 10 Mbps Ethernet makes it easy to set up and maintain because if you're using 10BASE-T Ethernet, you're already familiar with cabling and topology methods for 100BASE-T.

Because Fast Ethernet is so much like 10 Mbit Ethernet, it offers a flexible upgrade path so you can update the network at your own pace. If you're on a 10Mbit Ethernet network, chances are you're using either Category 3 or Category 5 twisted pair cabling. If you're considering a Fast Ethernet solution you will want to upgrade from Category 3 to Category 5. To do so, simply change the RJ-45 jacks, the cabling itself, and the punchdown blocks.

Upgrading your network to Fast Ethernet also requires that you install a 100 Mbit NIC in each computer. Fast Ethernet vendors like Dayna Communications Inc. offer NICS in a 10/100 configuration, letting you install a card into an existing 10 Mbps network and use it with a 10BASE-T hub. Dayna's line of BlueStreak 10/100 cards can auto-negotiate between 10 and 100 speeds and are compatible with PCI, NuBus, and PDS buses. Prices for these cards range from $194 to $399 depending on the bus. Other companies like Asante Technologies and Farallon Computing also offer PCI and NuBus cards ranging in price from $198 to $344.

After you have installed Fast Ethernet cards in each computer, you will need to connect a 100 Mbit shared hub or switched hub to the network. The D-Link ProFAST 10/100 hub has 12 ports and is available for about $1,750. Dayna also offers a 12-port 100BASE-T hub for $1,800.

You'll also want to consider how to connect other 10 Mbit devices, such as printers, to a Fast Ethernet network. To do this, you can u use a 10/100

bridge from vendors like D-Link, Farallon, and Asante. The most inexpensive solution for bridging 10 Mbit printers to your Fast Ethernet network, however, is Dayna's newly announced BlueStreak Fast EtherPrint. This single address bridge lets you connect a printer or other device to a 100 Mbit network for less than $500.

The overall industry acceptance of Fast Ethernet is favorable, however, it isn't the Holy Grail of high-speed networking. It does have its limitations. Although inexpensive compared to FDDI or ATM, it does not handle collisions as well as these technologies, and is limited to 100 meters between the computer on the desktop and a hub. Fast Ethernet is the perfect solution for smaller networks or 100 Mbit workgroup segments on a large network, but is not well suited as an enterprise-wide backbone. Other technologies such as FDDI and ATM may be better backbone solutions for large, mixed platform sites.

FDDI is a fiber optic cabling technology that offers 100 Mbps speeds over a maximum distance of 60 miles. FDDI provides built-in network management capabilities and is being well accepted in prepress environments as a strong backbone solution. It uses timed token-passing management so it handles collisions better than Fast Ethernet and supports up to 500 nodes.

FDDI solutions include NuBus and PCI cards from Spectra Systems, PCI cards from Rockwell Network Systems, and Sonic Solutions' MediaNet for both Macintosh and UNIX servers. Most FDDI NICs sell for around $1,000 so the technology isn't cheap. If your budget is tight, you might want to consider setting up Fast Ethernet workgroup segments using 100BASE-T cards rather than FDDI cards and link these segments to a switched hub with an FDDI uplink port.

Another high-speed networking solution which promises to offer phenomenal speed is ATM or Asynchronous Transfer Mode. ATM is basically a switching technology and runs from speeds of 25 Mbps to 155 Mbps with potential speeds of 600 Mbps. It uses cells of 53 bytes to transmit data through an uninterruptible link, so traffic on one node is not affected by traffic on another. Though powerful, ATM can be quite expensive. Fore System's Power Hub 7000 with an FDDI and ATM uplink and both 10 and 100 Mbit switched Ethernet ports sells for about $40,000. Currently there are no established ATM standards, so upgrading is difficult, and it requires LAN

emulation software to work with current UNIX, Macintosh, or Windows software.

Other high-speed networking solutions include 100VG AnyLAN, developed by Hewlett Packard Co., and Transoft Corp.'s SCSI-Net III for Macintosh users that solves the speed problem by transporting data over shared hard drives. Both are proprietary solutions that should be carefully evaluated due to their lack of general acceptance in the market, and their inflexibility in upgrading from current Ethernet standards.

Living in the Real World

With all this talk of speed you may be a little high, so now it's time to come down and face some harsh realities. Although PC and UNIX workstations can take full advantage of 100 Mbps speeds, Mac users should not expect to see ten times the speed they currently get with 10 Mbit Ethernet due to limitations in the Mac OS. Limitations in the Macintosh NuBus and problems with Apple's Open Transport for PCI Macs also keeps Mac users from realizing full 100 Mbit bandwidth performance. The newest release of Open Transport, version 1.1, has fixed some of the speed limitation on the Macintosh PCI bus, but it still needs improvement. Until Apple resolves these problems, Mac users should only expect to see a 20 to 30 percent increase in performance using 100 Mbit technology.

That doesn't mean you shouldn't begin taking advantage of the speed available to you today. Vendors are offering products that let you migrate from 10 to 100 Mbit speeds as improvements in the technology are made. Several Mac-centric pre-press service bureaus are already mixing Fast Ethernet, FDDI, and switched 10 Mbit Ethernet to get around the networking bandwidth issue.

Selecting the right combination of products and solutions that will work in a mixed Macintosh, Netware, Windows, and UNIX environment is still your best bet for today's networking needs. An efficient and productive network is available once you know your limitations, and ultimately how to best put together a combination of products and technologies which will meet your network's need for speed.

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