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New Ways to Access the Net, Part I: Faster Modems

By Michael Devitt

A few years ago, the only way the average computer user could gain high-speed access to the Internet on a consistent basis was by way of an ISDN (integrated services digital network) line. While ISDN lines offered a significant advantage in terms of the speed at which one could send and receive information, they were more expensive than a regular connection to the Internet, often costing three or more times the average Internet account. In addition, there was the issue of having the telephone company set up and install a separate ISDN line, and the technology wasn't available on a universal basis.

Although ISDN is still one of the most widely used means of high-speed access, it is no longer the only one available. In the past year, a handful of competitors have sprung up, each attempting to gain a share of the high-speed access pie. From 56K connections and cable modems to more exotic forms of technology such as satellite modems and microwave transmissions, users have more options than ever in deciding how they want to send and receive data on the Internet.

Of course, each new technology has its advantages and drawbacks, so before plunking down as much as \$500 or more to upgrade your computer system, it pays to know how each product functions and just what a user gets for their money. In part one of this series on new methods of accessing the Internet, we'll review two of the more conventional communication devices currently in use -- 56K modems and cable modems -- and provide our readers with some basic facts and figures on the speed at which some of these technologies function.

How Fast Is Fast? An Internet Access Chart

The transmission of data across the Internet is measured in bits per second (bps). Most modems today transmit information at several thousand bits, or kilobits, per second (Kbps). As noted in Table I below, some forms of high-speed access now allow users to send and receive data in terms of megabits, or millions of bits, per second (Mbps). Many experts believe that within 25 years, the average computer user will be

able to send and receive information at a speed of several gigabits (a billion bits) per second.

Table I: Conventional and alternative forms of Internet access.

Type of Access	Maximum Download Speed	Maximum Upload Speed
Analog modem	14.4-33.6 Kbps	33.6 Kbps
56K modem	53 Kbps	33.6 Kbps
Aggregated 56K modems	Up to 112 Kbps	67 Kbps
ISDN	64-128 Kbps	64-128 Kbps
Direct Broadcast		
Satellite	200-400 Kbps	Depends on modem speed
MMDS	Up to 800 Kbps	Depends on modem speed
xDSL	Up to 1.5 Mbps	16-640 Kbps
Cable Modems	1.5-10 Mbps	1.5-3.0 Mbps

56K Modems: Going Alone or Pairing Up

The most common type of fast Internet connection is the 56K modem, which has been around for more than a year now. Like most modems currently in existence, 56K modems use a regular telephone line (also known as an analog line). They are also the least expensive type of high-speed access available, with some 56K modems selling for as little as \$59.

Until recently, there were two types of standards for 56K modems -- X2 and K56Flex -- which were incompatible with each other. This incompatibility issue raised a number of problems between computer users and their Internet service providers. For example, if a user had a K56Flex modem but dialed into an ISP using X2 technology, they wouldn't be able to take advantage of their modem's full capabilities. The user would still be able to send and receive data, but at a greatly reduced rate.

Fortunately, the issue of incompatible modems was resolved this past February, when a new modem standard -- V90 -- was announced by the International Telecommunication Union. The V90 standard should receive final approval in September, and some companies have already begun shipping modems with V90 technology. However, some problems remain with the reliability of today's 56K modems and their ability to send and receive information at high speeds.

For instance, a 56K modem doesn't really deliver data at speeds of 56 kilobits per second. Current FCC regulations limit a 56K modem's maximum download speed to 53 Kbps, so the name is somewhat misleading. And attaining a speed of 53 Kbps is possible only if there is just one switch between the user's computer and the phone company. Connecting through more than one switch drops the modem's data transfer rate to 33.6 Kbps, a speed that can already be attained by most analog modems currently in use.

A new concept currently being considered is called aggregated modems. Under this process, a user can arrange two modems, two analog phone lines and two ISP connections into one data transfer stream. In theory, aggregating (or bonding) modems would double the download rate of a 56K modem, resulting in a maximum download rate of 112 Kbps and a maximum upload rate of 67 Kbps.

As one can see, though, the fees involved with aggregating modems could be the technology's own worst enemy. While buying an extra modem is a one-time cost, having to pay for a second phone line still carries a monthly charge, as would a second Internet connection. At this time, none of the major ISPs support aggregated modems. And as ISDN rates continue to drop and become more competitive, the monthly cost of bonded modems could actually be more expensive than an ISDN line in some parts of the country.

Cable Modems: The Wave of the Future?

Another method of high-speed access that has been in existence for more than a year now is the cable modem. Cable modem systems utilize the same lines that cable television companies use. Since using cable lines for sending and receiving data requires a digital system, only those locations with fiber optic structures in place can offer cable modem service.

If you decide to have cable modem service installed on your PC, technicians will come to your home to determine whether your existing cable wiring meets data standards. If the wiring is adequate, the company will install an adapter card in your computer. A cable modem will be attached to the card and to your cable service via coaxial cable. If you do not have cable service in your home, fear not; you can still have a cable modem installed for a modest fee.

Once the cable modem and adapter card have been installed, your PC will actually become part of a larger network with a fixed address. It is crucial that options such as file sharing be turned off on your computer and that your hard drives become password-protected upon joining a network. Taking these steps will prevent your intrusion from hackers and potentially deadly computer viruses.

There are several advantages to having a cable modem installed, the primary one being the speed of data transmission. Although cable modems are designed to reach a maximum speed of 10 megabits per second (Mbps), the typical transfer rate is between 1.5-3 Mbps, which is still more than 40 times faster than the average Internet connection.

There are other advantages to using a cable modem as well. For instance, cable modem service is symmetrical in terms of data transmission. This means that users can send and receive data at equal speeds to and from the Internet, giving cable modems a huge advantage over other forms of high-speed access. And because cable modem service is always "on," there are no delays in connection or dialing into an ISP.

Perhaps the biggest advantage that cable modems have over competing technologies is the cost. At present, installing a cable modem costs from \$100 to \$175, with unlimited access fees ranging from \$35 to \$50 a month. Considering that the monthly fees for most ISPs are between \$20-\$25 a month, and that a dedicated phone line costs an additional \$20 a month or so, having a cable modem installed is a viable alternative to using a conventional modem on a dedicated phone line.

One disadvantage to cable modems is that they are unavailable in most parts of the country. This is due to the fact that many communications companies still need to upgrade their digital cabling systems in order to provide cable modem access to their subscribers. However, many larger cable companies such as Cox Cable, Intermedia, Marcus, MediaOne, Rogers, Shaw and Time-Warner all have either begun offering service on a limited basis or plan to offer cable modems to their customers by the first half of 1999. If you are a subscriber to one of these companies mentioned above, you may want to contact them to see what their plans are for providing cable modem service.

If you are not a subscriber to one of the aforementioned providers, or if cable service is unavailable in your area, there are still a variety of options available for obtaining a faster Internet connection. Among them are direct broadcast satellite modems, digital subscriber lines and multichannel multipoint distribution services. These technologies will be discussed in the second part of this series on high-speed access to the Internet.

As always, we welcome your comments. If you have any questions about the types of Internet access mentioned in this article, feel free to contact me by phone or e-mail at the address listed below.

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