Web Mountain Technologies

High-Speed Internet Access

A Tutorial Offered by Web Mountain Technologies
For Residential Internet Users

The Internet and the World Wide Web have taken the world by storm. You cannot pick up a newspaper or magazine, or listen to a radio or TV news broadcast without, at some point, being referred to the Internet. Company advertisements now list web addresses right along with their telephone numbers and sports teams advertise web addresses on the walls of their stadiums.

Approximately 40% of Americans have Internet access with many being able to access the Internet from home. The majority will use a dial-up modem installed in their personal computer to access their Internet Service Provider (ISP).

Dial-Up Internet Access

The term "dial up" refers to the process performed when placing a call in the typical manner, like a call to Grandma on Sunday evening. Here's an inside look at how a call is made:

- You pick up the handset.
- The telephone company equipment senses that you have gone "off-hook" and sends you "dial tone".
- When you hear "dial tone", you dial a phone number.
- The telephone company equipment recognizes the phone number.
- A "ringing" signal is sent down the circuit of the dialed phone number alerting the called party.
- The called party lifts the handset.
- The telephone company equipment detects that the called party has gone "off-hook".
- The telephone company equipment connects the calling party and called party circuits.
- The call is now established.

This is also what happens on a computer modem-generated call, except that the service provider's modem is the called party. Once the call is connected, your modem takes over and sends data over that circuit.

The Advantages of Dial-Up Access

The main advantage of dial up access is the economy. If you already have a phone, you can easily get connected to the Internet and only pay a monthly access charge, which is typically $20. The phone wiring is already in place. No additional facilities are required and no additional wiring must be put into your home.

The Problems of Dial-Up Access

Several problems exist using a dial up modem to access your Internet Service Provider.

1. Modems are limited in speed due to their technology. 56,000 bits per second (bps) is the current upper limit. This table gives an idea of data transmission speeds and times while downloading a 1 Mb file from the Internet. (1 Mb

stands for 1 million bits).

Modem speed	Time for download
2400 bps	7 minutes
9600 bps	1.8 minutes
28800 bps	34 seconds
56000 bps	18 seconds
128,000 bps (ISDN)	8 seconds
256,000 bps (DSL)	4 seconds
1,544,000 bps (T1)	0.6 seconds

If you are using a slower speed modem, it is no wonder that the "World Wide Web" is known as the "World Wide Wait". ISDN, DSL, and T1 are typically phone circuits for commercial use and are discussed more fully in a later paragraph.

2. The telephone company does not have enough circuits to allow everyone to make calls simultaneously. They have assumed that only a certain percentage of phones will be in use at one time thereby allowing them to "make do" with fewer circuits. This has been the historical design of telephone company circuits for many years. These circuits were designed for an average voice call of 5 minutes. Now, calls on the Internet can last hours. When using a modem, you are tying up a circuit that could be used for a voice call. If enough people in a given geographical area connect to their ISP at the same time, voice calls will be blocked. Before the Internet came along, our voice network was satisfactory. Now, we are seeing tremendous demands being placed on our telecommunication networks.

3. Modems are susceptible to noise on the telephone line or to another phone being picked up in the home. These noise spikes or "glitches" cause the modem to "hiccup" and lose its connection momentarily, thereby dropping the call. Now you must go through the hassle of reconnecting to your ISP. This is especially annoying if you were in the middle of a large download, since you will now have to start all over again.

4. Just like the telephone company, your Internet Service Provider assumes that not everyone will want to access the Internet at the same time. The ISP will therefore provide a limited number of modems at their location. This leads to the problem of connecting to the Internet during peak hours. This is what caused the problem for America Online when they switched to unlimited usage. All of their users were trying to access a very limited number of modems. Since that time AOL has spent millions of dollars in adding modems to improve access.

5. When you’re online, your telephone line is tied up. You cannot take incoming calls or make outgoing calls. This means that urgent calls to reach you will get busy signals for as long as you’re online. One solution to this problem is to acquire a second phone line from your local telephone company.

6. If you run a small business from your home or "telecommute", dial up access can be extremely frustrating. Working at home, the slowness of the "World Wide Wait", using dial up modems rather than your corporate network with a T1 connection (1.544 Mbps) will cause you to lose your humor very quickly.

The Solution

There are many capabilities that the Internet makes available to us, including lower cost long distance phone calls and video-conferencing. However, these services will not become mainstream without high speed Internet access.

There are several high speed Internet access methods in use today. These include: cable modems from your cable service provider (if available in your area); WantWeb (a wireless broadcast access method); WebTV (Internet access over your cable system that uses your TV as the display device), and several different transport technologies from your local telephone company such as ISDN (Integrated Services Digital Network), T1 (1.544 Mbps), and DSL (Digital Subscriber Line). An ISP has all of these options available to send information to you and will use a high-speed method to deliver it to you. However, they provide a dial-up modem option for the path from your home to the ISP. The reason for this is that large downloads and web browsing are mostly one-way transmissions from the ISP to your home. Data transmission from your home to the ISP tends to be very small. Therefore, dial-up access works for this application.

Cable modem service providers tout their method as having extremely high speed. Typically, these devices operate at several million bps. However, cable television networks will require upgrades to "two way" transmission to operate in a high-speed manner in both directions - your home to the ISP and the ISP to your home. Currently, Denver’s cable service providers do not offer two-way operation, but have plans to do this in the future.

WantWeb is a wireless broadcast system using a small antenna on the roof of your home and your Internet access is beamed to you from the ISP's antenna. WebTV is similar but utilizes your cable facilities to transmit information. Both of these services are high-speed downstream technologies also, but have dial-up upstream access.

ISDN is a service offered by USWest and, while it has the advantage of higher speed (128,000 bps), it also has the disadvantage of only being a more sophisticated "dial-up" access. You must still set up a call and are only connected to the Internet while the call is active. This can still lead to congestion on circuits since this service uses up one of the telephone company shared circuits.

T1 is a high-speed data service offered by the local telephone company. Typically, this service is used by larger corporations for the transmission of data, including Internet access. The cost for this service can be several hundred dollars per month and, with few exceptions, tends to be too expensive for residential applications.

USWest is introducing a new high-speed access method called Megabit service. This technology uses standard phone lines to transmit and receive 256,000 bps to your home using a technology known as Digital Subscriber Line. This service is ideal for small home-based businesses or small offices that don’t require and can’t afford T1 or ISDN service, but still desire a faster, more efficient method of accessing the Internet. In addition, this service interfaces to your computer using Ethernet, which is a technology that allows multiple computers to be connected to each other over a local area network to exchange files and share peripherals for more efficient operation.

All of these access alternatives, with the exception of ISDN, are "always on" connections to the Internet. You do not have to dial-up to access the Internet. You merely go to your personal computer, click on an icon, enter a URL such as www.webmtn.com, and you’re immediately connected. You will no longer have to worry about your ISP logging you off due to inactivity because they want to keep their modems available for other users.

Most of the services listed above will cost $50 to $75 per month, with the exception of ISDN and T1, which are more expensive.

Summary

In summary, high speed Internet access technologies are becoming desirable to individuals who are heavy users of the Internet. Several different alternatives have been discussed; you need only choose the right one for your needs. For individuals who operate a small business or telecommute, these alternatives should be explored today. The improvement in efficiency and the decrease in frustration will probably outweigh the additional cost of these services. For those users who are casual users, dial up access will probably be acceptable for the near term. But, as the Internet becomes more pervasive in our lives, high-speed access will be not only desired, but also almost required.

This information has been presented by Web Mountain Technologies. For more information, contact us at info@webmtn.com.

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