WHAT IS DSL, AND HOW DO I MAKE IT WORK?

What is DSL anyhow?

DSL is short for a Digital Subscriber Line. In fact, it is really called ADSL, which stands for asymmetrical digital subscriber line. DSL telephone lines allow the user to simultaneously talk on the telephone and be connected to the Internet while on the same line. Further, DSL lines provide substantially faster data transfer speeds than do regular dial-up modems over a typical phone line.

DSL was preceded by a service called ISDN, which stands for Integrated Systems Digital Network. People often referred to ISDN as “it’s some dumb notion”. ISDN allowed a user to transmit data simultaneously with a voice conversation on the same telephone line, with data transfer speeds up to 384Kbps. However, the user was required to purchase an expensive ISDN telephone unit, along with an ISDN terminal adapter for connection to the computer, in order for this system to work. For most businesses this notion was unacceptable, and virtually all residential customers rejected the idea of such an expensive proposition. Customers wanted higher speeds than dial-up modems could provide, without having to buy expensive or proprietary equipment.

DSL is an adaptation of the original ISDN idea. Current DSL systems allow for download speeds of 1.5Mbps, with upload speeds of 384Kbps. The reason for differing speeds is simple: people download more than they upload, and the speed difference will benefit the typical online consumer. To provide this service to the consumer, the phone companies have significantly upgraded their telephone switching equipment at the central offices to make this product available. All that is needed at the consumer’s end is a “DSL modem”, which strips off the data portion of the phone signal to the computer, DSL telephone filters that prevent voice telephone conversations from interfering with the data signals, and a network interface card, which most computers are equipped with as standard equipment. Most DSL providers give their subscribers the DSL modem and/or a network card, as well as a router to allow multiple computers access to the DSL service, at no charge to the customer. Package deals from the various telecommunications companies have caused the price of DSL lines to drop to nearly the same price as that for monthly dial-up service with national services such as AOL or MSN.

How do I make it work?

The process begins with the phone company. They have to certify that your line is capable of supporting clean (noise-free) communications from your home to the central office. Next, the central office has to have upgraded their switching equipment to support DSL, and have enough capacity in that equipment to support you and potentially several hundred other subscribers in your immediate area.

Then, the consumer contacts the DSL provider and orders the service. The provider sends out to the customer a DSL modem, which strips off the data portion of the telephone signal and transfers it to the network interface card in the computer. Some DSL providers also give to their customers a wired or wireless router, which allows the consumer to split the bandwidth between several computers within the home or business. There usually is no extra charge for this service.
To install a DSL-based system in a home or business, use these step-by-step procedures:

1) Connect the DSL modem directly to the telephone jack nearest to the PC; do NOT install a DSL line filter on this connection. Also, connect the AC adapter to the DSL modem and to the AC wall plug (or surge suppressor).

2) Install DSL line filters on ALL other phones (including wall phones) in the house. Any unfiltered phones will affect the DSL connection to the PC and cause the DSL modem to drop the signal. These filters attach to the wall jacks, and then you will attach the phone cord to the filter’s connection jack.

3) Connect an Ethernet cable (RJ-45 Cat 5 cable) directly to the DSL modem, and then connect the other cable end to either:
   a. the NIC on the back of your PC; or
   b. the “DSL” jack on the back of your wired/wireless router. Then, connect another Ethernet cable from the router to the NIC on the back of your PC. If you have a wireless NIC in a PC or laptop, make sure it is on and the drivers are installed properly.

4) Run the installation software that came with the DSL package to load the drivers for your DSL modem, and to configure your system to use the DSL connection. The installation software should do the following things on your PC:
   a. Load the driver for your DSL modem, so that if it is connected directly to your PC, it will recognize it and interface properly.
   b. Set your networking properties in Windows (any version) to either accept the IP address from the DSL provider, or to pass that IP address to your router. In turn, your router will pass to your PC via DHCP a “local IP address” such as 192.168.1.100.
   c. Install any third-party software such as MSN Premium, or email client software like Eudora Light or Outlook Express. This software will come pre-configured to recognize the DSL provider’s servers and IP address ranges.

The DSL equipment and software is generally well-documented, with color-coded cables that plug into color-coded jacks. The installation software will terminate if the minimum hardware resources needed to run the DSL system are not present, and it will check the network card, DSL modem and phone line to ensure that good connections are in place. Lights on the DSL modem will indicate if there is a good DSL signal coming from the phone jack, and if there is a good connection from the network card to the DSL modem. If those lights are not ALL lit, re-check the cable connections, and call the DSL provider if necessary for assistance. It is possible that the DSL service is not enabled yet, or that there are unfiltered phones still connected in the home that are interfering with the DSL signal.

On a DSL-enabled phone line, the frequency range of the phone line is increased from the standard (2000 - 11,000 Hz audio) to a range that allows higher-frequency signals to be received at the home or business location. The DSL modem “strips off” the higher frequency digital signals and converts them into a form that the network card will use. The lower-frequency analog audio signals still are transmitted on the phone line at the same time as the digital signals, and the DSL filters on the telephones ensure that no cross-talk between the two signal streams will occur. Without the filters, analog audio signals will interfere with the digital data signal, causing a loss of connection.
DSL data lines are far superior to traditional dial-up connections to the Internet, and since the cost of obtaining a DSL connection has dropped so dramatically, there really is no reason for customers to use a dial-up modem. The only reason would be if DSL service (or cable modem service, which is quite similar) was not available in the person’s area. Also, the level of customer service that the local DSL providers give to their customers is quite satisfactory. Most users will call in a professional to install their DSL equipment and service software, when in fact the equipment is easily installed and the software installation is fairly routine.

Let me know if you have any questions concerning this discussion.

Thanks.

Uncle Bill