# How ISDN Works:

## A Beginner's Guide To Digital Communication

*by Scott Holstad*

Now you know the big secret—EarthLink is bringing ISDN Net access to its customers across the nation, and doing so in an easy, affordable manner. Great news, but what does this mean for you?

### What is ISDN?

Integrated Services Digital Network. It's the name for a digital telephone service that allows a single phone wire to carry voice, digital network services, and video at the same time.

### How can ISDN *do* that multiple function thing?

Because ISDN uses digital technology, an ISDN line can be divided into three "channels" two "B" channels and one "D" channel. With two 64Kbps B channels, you can surf the Internet with one, and have the other standing by to act as a regular voice line (so you can be on the phone with your best buddy *while* you surf). EarthLink will also support dual channel connectivity, so you can combine the B channels together to create one 128Kbps line. The D channel is reserved to communicate with the phone network.

Not only does ISDN support multiple simultaneous functions, but you'll be surfing the Net at speeds up to more than four times that of current analog modems!

ISDN has existed for over a decade, but it's taken a while to reach us. Why? Phone companies have had to convert to digital, and this took time and money.

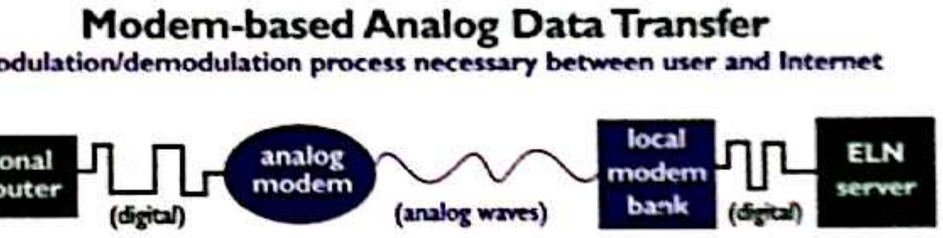
### Why is ISDN faster than regular modems?

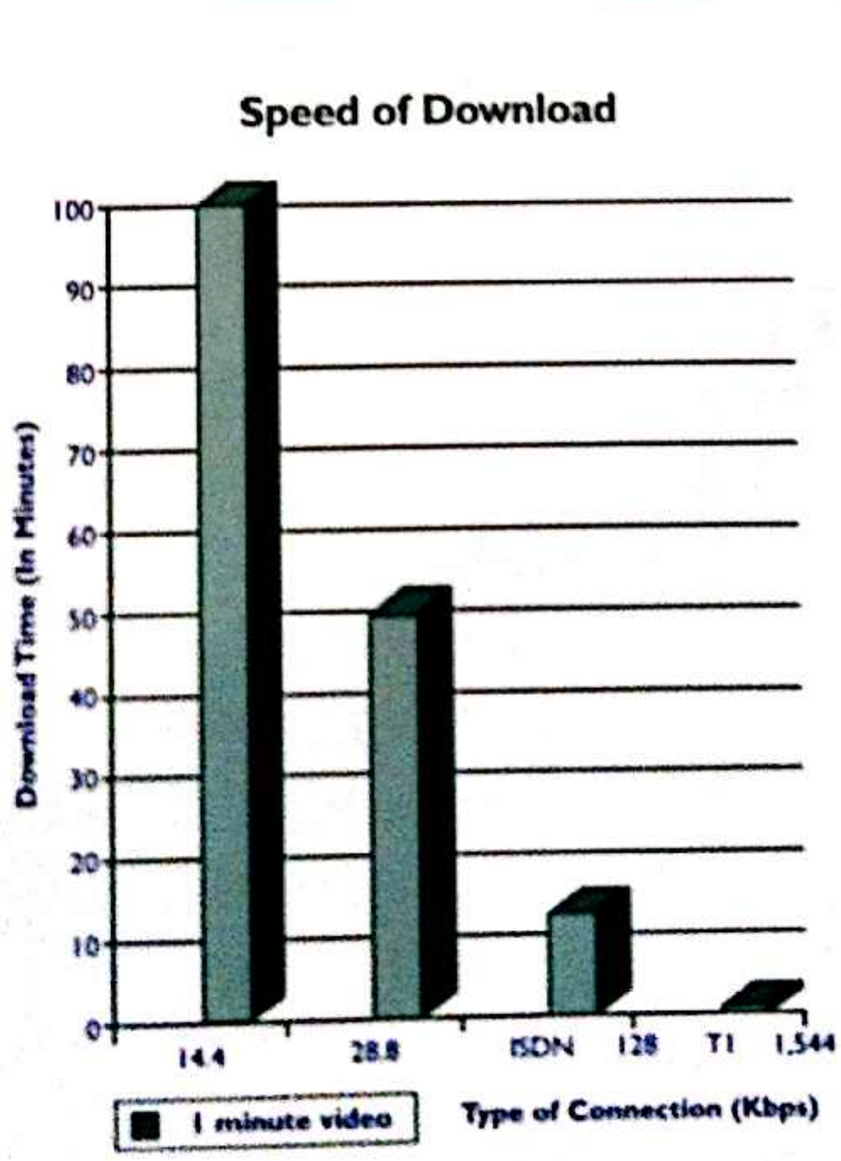
Regular analog phone lines were designed only for carrying human voices. (Phone line technology has changed little since the 19th century.) Consequently, today only ⅛ of the data carrying capacity (about 4Kbps) of the line is utilized. ISDN technology, on the other hand, utilizes the full capacity of the digital lines, thus allowing the entire 64Kbps capability to be reached. This means that ISDN is certainly the faster way to go.

### What is bandwidth?

Think of bandwidth as a pipe. The smaller the "pipe" carrying your data, the slower the data is transferred. ISDN is a bigger pipe. It can be nearly five times faster than standard analog transmissions, so it's fair to say that ISDN users have greater bandwidth. Bandwidth is measured in kilobits per second (kbps). See the accompanying graphs.

High bandwidth speeds up your system when you're downloading big files (such as images). However, there are still factors on the Internet—usually out of your control—which will influence your transmission speed. The actual speed or transmission time of any data from origin to destination depends on a number of variables. Although most Web transmissions travel at high speed on optic lines much of the way, router switching, lower bandwidths at the *other* end of the line, and overloaded servers can create bottlenecks and slow down your Internet experience.




### What equipment is necessary for using ISDN?

To **use** an ISDN line, certain equipment is necessary. One such piece of hardware is the "terminal adapter" (similar to a modem) through which your computer connects to the ISDN line.

For those who want to achieve maximum performance with an ISDN line, a high-speed serial card may be helpful. Serial ports on the current generation of PCs are limited to 115Kbps (older PCs are much slower). Such a card not only permits you to reach the full 128Kbps, it allows you to take advantage of ISDN compression which can provide up to twice the speed.

You'll also need special phone jacks for your ISDN line (typically, an RJ-45).

Finally, you'll need some information from the phone company, such as a SPID. A SPID is a unique identifying number assigned to your ISDN line, so it can determine where to send calls and signals (similar to your computer's IP number).

ISDN can be complex, but part of the beauty of EarthLink's new one-stop ISDN shop is that we'll handle all of these details for you and make things easier!