

meetings

Modem blues got you down? Sick of those lousy speeds your old analog voice connection is producing? With the deluge of new internet connection technologies onto the market, there are several alternatives to your pokey analog line, and some are even entering the range of affordability!

In this month's column, I am going to discuss three different types of technologies that will get you connected to the Internet: [cable modems](#), [ISDN](#), and [xDSL](#).

[Cable, It isn't just for your TV Anymore](#)

That coaxial cable that plugs into the back of your TV can actually provide data access at an incredible speed. The actual [Cable Modem](#) itself is better described as a network adapter rather than a traditional modem.

The cable provider has a Cable Modem Termination System or [CMTS](#), which is connected to the end user's Cable Modem via the actual cable. The cable length can be 100 km (~62 miles) and unlimited amount of cable modems can be on the line. The CMTS can talk to each of Cable Modems individually but each Cable Modem is limited only to talking to the CMTS. If one Cable Modem has to send a packet to another Cable Modem located on the same cable, then the packet

will first have to go to the CMTS which will then send the packet to the receiving Cable Modem.

Downstream rates (how fast you can download) are generally much faster than **Upstream** rates (how fast you upload). From system to system, speeds can vary greatly but generally upstream rates will be about 3 Mbit/s while downstream rates will be at a much faster 27-56 Mbit/s.

Beware though, some providers won't provide upstream access at all, forcing the user to connect via a modem for upstream access leaving the Cable Modem for downstream access only. Another bottleneck is the system provider; some providers only have an Internet connection of a T1, which only runs at 1.5 Mbit/s.

he downfall of cable modems is that you share the bandwidth with all the other users on the system. If you are an early adopter, your speeds will be good, but as cable modems catch on there is nowhere to go but down. ISPs can combat this by increasing their available bandwidth, but as with modems or ethernet connections, odds are it will be a losing battle.

SDN

ntegrated Services Digital Network, **ISDN**, is a system in which regular copper telephone lines carry digital transmissions. ISDN requires an adapter installed at the phone company and also at the user's end.

The type of ISDN that would be installed into a typical user's household includes two 64 Kbit/s B channels and one 16 Kbit/s D channel. ISDN is the combination of analog and digital transmissions on the same network.

ISDN is expensive though. An ISDN line can run as high as \$300! Installation is only around \$100-150 and it's about \$40 a month for unlimited usage.

SL

A long awaited technology that is finally starting to catch on, even

though it remains somewhat expensive, is a Digital Subscriber Line or **DSL**. Instead of having a traditional analog phone line, the data between the phone company and the user is transmitted digitally without the analog bottleneck.

"But wait!" you say, "What about my regular old analog telephone?!" The user can have some of the digital signal separated so that the bandwidth can be devoted to transmit an analog signal so you can use your computer and telephone on the same line at the same time.

Speeds will vary greatly depending on who your provider is, but you will generally get speeds up to 6.1 Mbits/s. Unfortunately, because the wiring is old copperwire, the farther away from the phone company you live, the worse the rates will get. The maximum range for DSL is about 5 km (~3 miles) from the phone company. Those who live beyond the 5 km barrier need not worry too much — some phone companies have upgraded their networks with fiber optics which will allow transmissions at much greater distances.

Asymmetric Digital Subscriber Line (ADSL) is a form of DSL that has most of the bandwidth devoted to the downstream direction. Most users don't need high speed upstream access, so ADSL is expected to be the technology that will be more popular with home users. ADSL is also much better than cable modems because you won't be competing with your neighbors for bandwidth.

Other variations of DSL include:

CDSL - Consumer DSL, Rockwell, the owner of the technology (and the only people who make the chipset for this technology) designed it so the user doesn't need to have a splitter installed in their home. A splitter is a device installed at the phone company that allows you to hook your computer up to the DSL line without the need for a DSL modem.

DSL Lite - Based off of ADSL, it doesn't require a splitter but the speeds are slower, weighing in at only 1.5 Mbit/s.

HDSL - High bit-rate DSL, a symmetric data rate that can carry as much data on as a T1. HDSL is one of the first variations of DSL. HDSL is only one-way — you would need a pair of lines to achieve upstream and downstream access.

RADSL - Rate Adaptive DSL, developed by Westell and based off of ADSL, RADSL can deliver speeds that are adaptive to what the user needs. Downstream speeds start at 640 Kbits/s up to 2.2 Mbits/s and upstream access starting at 272 Kbits/s up to 1 Mbit/s.

SDSL - Single-line DSL is very similar to HDSL. The single line carries 1.5 Mbit's on a full duplex line.

UDSL - A European proposed standard known as Unidirectional DSL, its very similar to HDSL except that it is unidirectional.

VDSL - Another technology that is still being developed, Very high data rate DSL, is expected to have speeds over 50 Mbit/s.

IDSL (integrated DSL), yet another derivative of DSL, is basically ISDN. IDSL weighs in at only 128 Kbit/s.

TM - Automated teller machine? Well, yes, ATM does stand for that but it also stands for Asynchronous Transfer Mode. It is a dedicated networking technology that organizes data into 53 byte (not bit!) packets and transmits them over a medium (usually fiber). The packets (sometimes referred to as cells) are processed in an asynchronous manner that allows for a very efficient use of the line.

Designed to be implemented by hardware devices, ATM can transfer 155.5 Mbit/s or 622 Mbit/s. ATM is expected to expand over the 10 Gigabits/s range in the near future.

If you have a couple extra grand just laying around and you want large bandwidth, ATM is your friend.

would like to know what Apple DVD RAM/ROM means. Is there 1 DVD standard? Can I rent a DVD movie at the video store and play it on my Mac (hopefully to be ordered soon) or is this another "Sorry this will only run on Windows computers?"
- Les Stauffer

VD, otherwise known as Digital Versatile Disk, is the successor to the CD. A single, one-sided DVD can hold up to 4.7 Gbytes of data (about enough information for a movie that is 133 minutes long). A double sided DVD holds double the amount, or 9.4 Gbytes. DVDs also have the unique feature of being **dual-layered**. A double-sided, dual-layered DVDs hold 17.5 Gbytes of data.

There is only one standard of DVD, so you can go buy any DVD movie and it will work in your Mac (if it is equipped with a DVD player).

[DVD RAM](#) is a little different from DVD ROM. DVD RAM is a rewriteable form of DVD. There are two competing standards at the moment for rewriteable DVDs, DVD RAM and [DVD RW](#), while it is still very earlier in the race, DVD RAM seems to be the more popular standard.

Aaron Linville
aaron@applewizards.net

<http://applewizards.net/>