

# DSL and Other Last Mile Solutions

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It seems like everyone is talking about it—a high-speed, always-on connection to the internet. In less than two years, the cost of such a connection has gone from over \$1,000 to under \$100 a month. It is not yet available to every home, but in one form or another, it soon will be. It is a high-speed internet connection via DSL, cable, or satellite.

## DSL

The most common connectivity route at this time seems to be Digital Subscriber Line (DSL). DSL is a method to simultaneously deliver an always-on, high-speed internet connection and one line of normal telephone service using your existing single telephone line. All DSL is not created equal, however. DSL comes in two basic types—aDSL and sDSL. The more expensive type of DSL is sDSL or symmetric DSL. This is often marketed as business DSL. In sDSL, the download (from the internet) data rate is equal to the upload (to the internet) data rate. The data rate can be as high as two megabits per second (Mbps) or as low as 500 kilobits per second (kbps). All DSL is distance-dependent. You must be within a three-mile telephone wire length of the location where the internet signal is added by your Internet Service Provider (ISP) to the telephone signal. The longer the wire length, the slower your DSL service will be. Within these technology constraints, the more you are willing to pay, the faster your service will be. Costs vary greatly from ISP to ISP and from area to area. Expect to pay from \$75 to \$300 per month.

## sDSL

Most sDSL connections also include a dedicated or static IP address. Every computer on the internet must have an IP address, which is like a telephone number. That IP address does not have to be assigned permanently, however. Most computers on the internet have a name. The name is usually suggested by the user and registered by the ISP after the ISP checks the registry of internet names to be sure that the name isn't already in use. In the simple case, the name is assigned an IP address. When the user enters a computer name, which is part of the URL or e-mail address, the ISP looks up the IP address in a registry called Data Name Server (DNS), and the connection is made. There are not enough IP addresses for every computer that needs one, however. To get around this problem, each ISP reserves a block of IP addresses. One of these addresses is temporarily assigned to a computer only when that computer is actually online. The DNS is continuously updated, and connections are seamlessly completed. The lack of a permanent IP address has a major effect on the ability to enable security protection to a computer connected to the internet; therefore, it is almost a necessity for business computers.

## aDSL

The less expensive type of DSL is aDSL or asymmetric DSL. This is often marketed as home DSL. In aDSL, the download data rate is different and faster than the upload data rate. The download data rate can be as high as 500 kbps, approximately ten times faster than the usual home 56k telephone modem. The upload data rate is usually fixed at 128 kbps, approximately three times faster than a home modem. For home use, this arrangement is quite adequate as most home users download image-filled web pages (many bits) from the internet while uploading a few words or mouse clicks (few bits) to the internet. Expect to pay approximately \$50 per month without a permanently assigned IP address. A permanent address is \$10 to \$15 per month more.

## INSTALLATION

What about installation? Most DSL service providers suggest that the user can do the installation themselves and provide the necessary DSL modem, cables, computer software, and telephone line connector, worth approximately \$100. The modem is an external modem and does not require the computer to be opened. An Ethernet port on the computer, however, is usually required. This port is built into most new computers or can be added to almost any other computer for approximately \$20. It does require the installation of a card inside the computer, however. Most DSL service providers will perform an in-house or in-office installation for about \$150.

DSL technology is relatively new and rapidly changing. Most DSL providers currently claim approximately 97% reliability. A pessimist would point out that this translates to not being available approximately one day each month. Most DSL providers will provide you with a local telephone number and a generous monthly allocation of free minutes to access the internet via a standard 56k modem.

## CABLE

An alternative to DSL in many areas is internet connectivity via cable, the same cable that provides cable television. This service is asymmetrical, an upload top speed of 128 kbps, and downloads as fast as 2 Mbps. The service speed is not distant-dependent, but it is user-dependent, i.e., the more people in your neighborhood that are using the cable internet service at a given time, the slower your service speed will be. A permanent IP address is generally not available.

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The cost of internet service via cable appears to be much more complicated than with DSL. The monthly charge varies with how much service you already are buying from your cable company. For example, with one cable company, the monthly charge was an additional \$15 if you subscribed to premium cable, \$40 additional if you were a basic cable subscriber, and \$65 if you only wanted high-speed internet service. The cable modem required an additional \$5 rental fee and was not available for purchase. There was a \$150 installation fee independent of whether you were a current cable subscriber. Just like with DSL, your computer needs an Ethernet port. Unlike DSL, however, cable connectivity is as reliable as your ability to receive cable-TV.

## SATELLITE

And then there is satellite for internet connectivity. Satellite comes in two modes: the older hybrid mode and the newer satellite mode. In the hybrid mode, download is via the satellite but upload is by way of a standard 56k telephone connection to a local telephone number. This means that the telephone will be in use while you are using the hybrid connection. Although the upload is limited to 56 kbps because of the telephone line, the download can be as high as 1 Mbps. The download uses the normal satellite-TV dish antenna with a special antenna wire splitter/modem. Costs assume an add-on to an existing satellite-TV contract and are quite variable.

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In the true satellite mode, both upload and download is via the satellite leaving the telephone free for its normal use. Download speeds may be as high as 1 Mbps, but upload speeds are limited to 128 kbps. Accessing the internet via satellite requires a different antenna than normal satellite-TV. The cost for this antenna is approximately \$300. Depending on your local ISP, there may also be installation charges and a monthly fee for the modem/satellite-TV box. The pricing usually assumes that internet via satellite is an add-on feature to a satellite-TV contract.

In summary, many modes are available for Internet connectivity. The choice depends on needs for speed of connection and download, as well as budgetary considerations.

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