

ADSL vs Cable

- Cable subscribers are connected directly to high speed lines while ADSL subscribers are connected directly to medium speed lines
- Cable subscribers share the line connecting them to neighbourhood servers; ADSL subscribers share the line connecting them from the regional telephone office to the main telephone office
- The capacity on the cable high speed line from subscriber to neighbourhood server is more than sufficient to deal with the traffic from subscribers; this traffic is controlled by subscriber modem

The types of DSL and the speed of the connection available to you depends on the physical distance between your business and the CO. Most types of DSL have a distance limitation of 12,000-18,000 feet or 2.27 to 3.4 miles from the customer's premises to the central office. The distance limitations affect the higher frequencies used by DSL to enable higher data speeds.

The argument that cable modem connections are inferior to DSL connections because the bandwidth on a cable link is "shared" is disingenuous as best. The entire Internet is based upon shared bandwidth. The bandwidth on an individual subscriber's DSL connection may not be shared; the DSL connection ultimately terminates at an Internet router, at which point the multiple streams are merged together into one or more shared upstream connections. Likewise, cross-country Internet links are shared between thousands of ISPs and millions of users. Even DSL circuits can be shared: Bell Atlantic's DSL deployment shares a single pair of copper wires that both voice and data can use simultaneously. The issue isn't whether or not a link is shared. The issue is whether or not there is enough bandwidth on the shared link to satisfy all of the users at a particular time.

To gauge Bell Atlantic's DSL Internet service, I called up the company and had its InfoSpeed service installed at my house in August. The company sent me a DSL modem in the mail, and added the DSL service to my existing phone line. Bell Atlantic also sent me a dozen "microfilters" that I needed to install on the other telephones in my house. Without the microfilters in place, the DSL connection's high-speed data stream sounds like a loud hiss in every phone. (Truth be told, though, even with the microfilters in place I could still hear the DSL on some of my phones.)

Meet the DSL family

DSL is actually a generic term used for a family of related technologies: SDSL, IDSL, ADSL and uADSL. Each type of DSL has it's own distinct characteristics that make it better suited for different applications. The leading types of DSL for small to mid-sized businesses and consumers are:

- **SDSL (Symmetrical DSL)** as the name implies, is a symmetric (equal upstream and downstream speeds) DSL service that delivers variable high-speed data communication speeds up to 1.5 Mbps. SDSL is packaged in a range of bandwidth configurations that include 144 Kbps, 160 Kbps, 200 Kbps, 416 Kbps, 748 Kbps, 1.04 Mbps, and 1.5 Mbps. As always, the closer to the CO, the faster the connection. SDSL is the most reliable of the DSL family, because it's based on proven technology the telephone companies use for T1 internet access.

- **IDSL (ISDN DSL).** This DSL family member is the always-on cousin of dial-up ISDN. IDSL delivers symmetric 144 Kbps capacity. Unlike other kinds of DSL, you can't upgrade beyond the 144 Kbps. IDSL is offered primarily because it has a much further range from the CO than other forms of DSL, reaching 26,000 feet (5 miles) or more. IDSL is a more affordable alternative for many dial-up ISDN users with high usage costs.
- **ADSL (Asymmetrical DSL).** This form of DSL delivers asymmetric (better download than upload capability) data communication speeds up to 8Mbps downstream and up to 1 Mbps upstream. ADSL is distance sensitive and performs better when 12,000 feet (2.5 miles) or closer to the CO. ADSL allows you to use the same telephone line for standard telephone service as high-speed data connectivity.
- **uADSL (Universal ADSL).** The newest member of the DSL family is based on the new G.Lite standard and is intended primarily for home consumers. Like ADSL, it's asymmetric and allows you to use the same telephone line for standard telephone service as high-speed data connectivity. uADSL can deliver up to 1.5 Mbps downstream and 512 Kbps upstream.

Types of High Speed Internet Access

There are many different types of high speed internet access services including dsl, adsl, sdsl, cable and satellite.

DSL

Digital Subscriber Line (DSL) is a broadband internet service that is delivered right through your regular phone line and is often supplied by your local telephone company. Although it uses your phone lines, it does not interfere in anyway with you telephone, caller id, answering machine, or other telephone equipment. It is typically available in speeds from 144Kb to 3Mb, but even faster speeds are available from some providers.

aDSL

A type of DSL common for residential use is Asymmetric Digital Subscriber Line (ADSL). It is asymmetrical in the sense that it can download (receive) data much faster than it can upload (send) data. Typical internet surfing mainly involves downloading data from web servers, so this asymmetry works out fine for home use. Plus this asymmetry often allows for large cost savings.

sDSL

A type of DSL that is common for business use is Symmetric Digital Subscriber Line (SDSL). With SDSL you get the same bandwidth (speed) in each direction. Although it is typically much more expensive than ADSL, it is better if you are running a web server or conducting other activities which would require a lot of data to be sent.

Cable

Cable internet access is generally offered by the same companies that provide cable TV. It works on the same coaxial cable that the TV signal comes in on, but doesn't effect your TV signal. Therefore you can use the internet and watch TV at the same time. Typically, cable internet access provide a maximum of 1.5 - 6MB of bandwidth on the system. However, everyone on your network segment is sharing that bandwidth, so performance can be much lower, especially if a lot of people in your neighborhood use the service. They may also limit your individual bandwidth, so that you will never see the peak bandwidth even when your network segment is clear. Since you are sharing the network segment with other users, there can be security risks with cable modems.

Satellite

With satellite internet access, data is sent between a small satellite dish at your home and the satellite in space. This data is then relayed to a base station that has a direct connection to the internet and acts as a hub. Especially for those in rural areas that cannot get DSL or Cable internet access, a satellite ISP can be a good way to get broadband service.

Internet Connection Speed Comparison Chart

Carrier Technology	Description	Speed	Physical Medium	Comments
Dial-up Access	On demand access using a modem and regular telephone line.	2400 bps to 56 Kbps	Twisted pair (regular phone lines)	<ul style="list-style-type: none"> • Available throughout most of province. • Cheap but slow compared with other technologies. • Speed may degrade due to the amount of line noise.
ISDN	Dedicated telephone line and router required.	64 Kbps to 128 Kbps	Twisted pair	<ul style="list-style-type: none"> • Not available throughout province but becoming more widespread. • An ISDN line costs slightly more than a regular telephone line.
Cable	Special cable modem and cable line required.	512 Kbps to 52 Kbps	Coaxial cable; in some cases telephone lines used for upstream requests.	<ul style="list-style-type: none"> • Must have existing cable access in area. • Cost of bring service into an area and trenching cable can be prohibitive. • Networkable

<p>ADSL</p> <p>Asymmetric Digital Subscriber Line</p>	<p>This new technology uses the unused digital portion of a regular copper telephone line to transmit and receive information. ADSL is asymmetric since it <i>receives</i> at 6 to 8 Mbps per second but can only <i>send</i> data at 64 Kbps.</p> <p>A special modem and adapter card are required.</p>	<p>512 Kbps to 8 Mbps</p>	<p>Twisted pair (used as a digital, broadband medium)</p>	<ul style="list-style-type: none"> • Doesn't interfere with normal telephone use. • Bandwidth is dedicated not shared like with cable. • Bandwidth is affected by the distance from the network hubs. Must be within 5 km (3.1 miles) of telephone company switch. • Limited availability across Ontario. Only available at a few urban regions at present. • Not networkable
<p>Wireless (LMCS)</p>	<p>Access is gained by connection to a high speed cellular like local multi-point communications system (LMCS) network via wireless transmitter/receiver.</p>	<p>2 Mbps or more</p>	<p>Airwaves</p> <p>Requires outside antenna.</p>	<ul style="list-style-type: none"> • Still in the early test stages. • In theory its capable of super speeds of 10 mbps or more. • Can be used for high speed data, broadcast TV and wireless telephone service.

Satellite	<p>The computer sends request for information to an ISP via normal phone dial-up communications and data is returned via high speed satellite to rooftop dish, which relays it to the computer via a decoder box.</p>	400 Kbps	Airwaves Requires outside antenna.	<ul style="list-style-type: none"> • Bandwidth is not shared. • Satellite companies are set to join the fray soon which could lead to integrated TV and Internet service using the same equipment and WebTV like integrated services • Service is one way with a slow uplink speed. • Requires an Internet service account. • Phone line is busy while online.
Frame Relay	<p>Provides a type of "party line" connection to the Internet.</p> <p>Requires a FRAD (Frame Relay Access Device) similar to a modem, or a DSU/CSU.</p>	56 Kbps to 1.544 Mbps	Various	<ul style="list-style-type: none"> • May cost less than ISDN in some locations. • Limited availability across Ontario.
Fractional T1 (Flexible DS1)	Only a portion of the 23 channels available in a T1 line is actually used.	64 Kbps to 1.544 Mbps	Twisted-pair or coaxial cable	<ul style="list-style-type: none"> • Cheaper than a full T1 line with growth options of 56 Kbps or 64 Kbps increments as required.
T1	Special lines and equipment (DSU/CSU and router) required.	1.544 Mbps	Twisted-pair, coaxial cable, or optical fiber	<ul style="list-style-type: none"> • Typically used for high bandwidth demands such as videoconferencing and heavy graphic file transfers. Many large businesses and ISP use T1. • Expensive

T3	Typically used for ISP to Internet infrastructure.	44.736 Mbps	Optical fiber	<ul style="list-style-type: none"> • Very large bandwidth • Extremely expensive and complex
OC-1	Typically used for ISP to Internet infrastructure within Internet infrastructure.	51.84 Mbps	Optical fiber	
OC-3	Typically used for large company backbone or Internet backbone.	155.52 Mbps	Optical fiber	

About Bandwidth

Bandwidth, or capacity, refers to the amount of data a given technology or infrastructure can transmit over time. It is usually expressed in kilobits per second (Kbps) or megabits per second (Mbps).

Since one kilobit is equal to about 1,000 bits, a 28.8 modem can transmit 28.8 kilobits - or 28,800 bits - per second. A one megabit modem can handle 1 million bits, or 1,000 kilobits, per second.