



Broadband Delivery Technology Options

Digital Subscriber Line (DSL)

DSL is an older wireline (transmitted over physical lines) transmission technology that transmits data over traditional copper telephone lines installed to homes and businesses. DSL-based broadband provides transmission speeds ranging from several hundred Kbps to megabits per second (Mbps). The availability and speed of your DSL service may depend on the distance from your home or business to the closest telephone company facility. In addition, the age and condition of the copper in your neighborhood and/or home as well as the number of subscribers using these lines for Internet access will impact your DSL quality of service. DSL is being phased out by some providers.

Cable (TV)

Cable is another wireline Internet service that enables cable TV operators to provide broadband using the same infrastructure that delivers pictures and sound to your TV set. Cable Internet provides transmission speeds of 1.5 Mbps and higher. Transmission speeds vary depending on the type of cable service, the cable network, and traffic load – cable uses shared available bandwidth. Most cable operators restrict upload and download rates, but provide customizable limits. Cable operators are not inclined to expand their services beyond their current franchise obligations which only requires service to the more populated areas.

Fiber Optic

Fiber is the ultimate wireline Internet service and transmits data at speeds far exceeding current DSL or cable speeds, typically by tens or even hundreds of megabits per second (Mbps). A few residential fiber operators are offering connection speeds up to 1,000 Mbps, or 1 gigabit per second (Gbps.) The actual speed you experience will vary depending on a variety of factors, such as how close to your computer the service provider brings the fiber and how the service provider configures the service, including the amount of bandwidth used. The same fiber providing your broadband can also simultaneously deliver voice (VoIP) and video services, including video-on-demand. Fiber is extremely expensive to deploy and as such telecommunications providers usually only provide fiber-to-the-home (FTTH) Internet in a few very densely populated areas of the country.

Fixed Wireless

Wireless broadband connects a home or business to the Internet using a radio link between the customer's location and the service provider's facility. Wireless broadband can be mobile or fixed. Wireless technologies using longer-range directional equipment provide broadband service in remote or sparsely populated areas where DSL, cable or fiber service would be too costly to provide. Speeds are generally comparable to DSL and cable and improving yearly. Wireless Internet services offered over fixed networks allow consumers to access the Internet from a fixed point; for example, thousands of Wireless Internet Services Providers (WISPs) provide wireless broadband services in rural areas not



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served by cable or DSL services. Wireless Internet can be faster and less expensive to deploy thus providing cost effective services to customers.

Satellite

Satellite technology has advanced in the past few years to improve quality and speed for Internet access. However, there still exists 'data caps' (limits on the amount of data that can be used during a month) associated with satellite service which puts limits on the usage of the Internet and can increase the total monthly cost of the service if the data cap is exceeded. Satellite technology also suffers from high latency (delays in communication) as the signals must travel a great distance to and from the satellite and these delays can impact the quality of service (QoS.) QoS is particularly impacted when connected to virtual private networks (for example, connecting to the business's network), online meetings and streaming videos. Satellite technology is often slower and more expensive than terrestrial based technologies that can provide faster connections with less latency and are prone to weather related disruptions.