

FINDING DISCOVERING PLAYING

TRADING DOWNLOADING CONNECTING

SENDING TELECOMMUTING GAMING

SHOPPING SELLING RESEARCHING

SURFING LISTENING CONFERENCING

LIVING & WORKING BROADBAND WITH DSL

Your guide
to experiencing
the Internet
like never before

By David Angell,
Author of DSL For Dummies

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DSL is Broadband.


With it, the Internet springs to life.

Web pages appear in less than a blink. Streaming video and music play without interruption. Files upload and download in a snap. Without it, the full promise of the Internet is an empty promise.

Broadband is all about soaring above the confines of slow, dial-up Internet access to **change how we live, work and play.**

Look at these statistics:

The installed base of broadband subscribers is expected to reach almost 9 million worldwide in 2000, and 49 million by 2003.



9 million
in 2000
49 million
by 2003

(Source: Cahners In-Stat, February 2000)

DSL is short for digital subscriber line.

What is DSL, anyway?

It's a technology that uses ordinary phone lines to deliver broadband — resulting in fast Web surfing, quick file downloads, dynamic video conferencing, telecommuting and all the other advantages the Internet promises.

The telephone system that you use to connect your computer to the Internet was designed for voice communications, not digital data. But DSL is able to transform ordinary telephone lines into high-speed broadband networks.

DSL's availability and affordability now make it possible for most homes and offices to enjoy the benefits of broadband.

BROADBAND CHANGES THE WAY WE LIVE AND WORK.

Broadband is more than just a faster Internet connection. It dramatically changes how we live, work and play. Just a few examples:

Finding and gathering information

Instant access makes surfing the Web for information, getting news, researching, and downloading software second nature. No more frustrating waits.

Running the household

Full-powered, instant access to online shopping, investing, bill paying, banking and many other tasks, replaces an afternoon of errands or time spent sending and receiving information by snail mail.

Telecommuting

All the capabilities of the office are available at home. With DSL and VPN (virtual private networking), telecommuters can access the company network from home just as securely as if they were sitting at their desk in the office.

Playing

Enjoy all the multimedia entertainment that the Internet has to offer. Play online games, listen to music or broadcasts, make your own music CDs, or watch videos. Now, nothing is too big or too complex to do online.

Connecting

Keep in touch with people near and far. Broadband enables you to send photos – even a baby's first steps captured on home video. You can easily video-conference friends, family and clients over the Internet.

Downloading software

Lightning speed enables you to get the latest updates and programs fast. A DSL connection lets you quickly grab programs from any Internet site. No more long walks in the park while you wait for files to download. Now a 40 MB file (about the size of

Sending and receiving large attachment e-mails

Send and receive anything, including video clips, photos and programs as normal e-mail attachments. Even home videos can be shared instantly.

Saving time for other things

In a typical day, you spend 10 minutes waiting for your dial-up connection to go through, for a file to download or a Web site to load. For 10 minutes each day you do nothing but stare at a frozen screen, an activity as useless and frustrating as sitting in a traffic jam during your morning commute. After a year, those daily 10 minutes add up to an entire workweek spent staring at a screen. Time saved using DSL is the extra week of vacation that you need!

This guide is designed to tell you more about how DSL can deliver the broadband promise to homes and businesses across the country and, increasingly, throughout the world.

The Rolling Stones' greatest hits) will download in just minutes with a DSL line, as opposed to hours using a 28.8 Kbps modem.



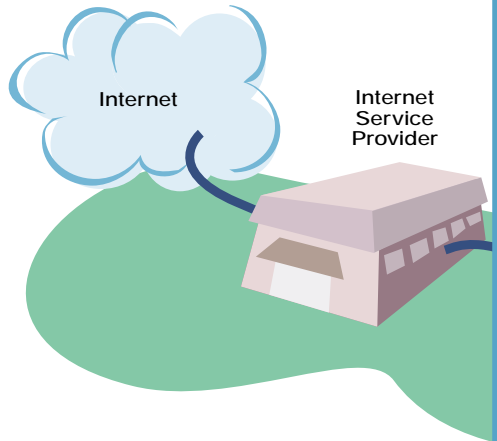
Basically, DSL works like this:

Data gets routed from the Internet through the ISP (Internet Service Provider). The ISP is connected to the DSL provider's facility, also called the Network Node.

The data then flows from the Network Node through the DSL provider's Digital Subscriber Line Access Multiplexer (DSLAM), located within the telephone company's Central Office (CO).

From here, the data travels over copper phone lines and into the user's home or office through a DSL modem (for a single PC) or a router (for multiple computers). When data flows in this direction, it's traveling downstream.

When data flows in the other direction (from the user's computer to the Internet), it's traveling upstream. DSL subscribers enjoy high speeds in both directions.



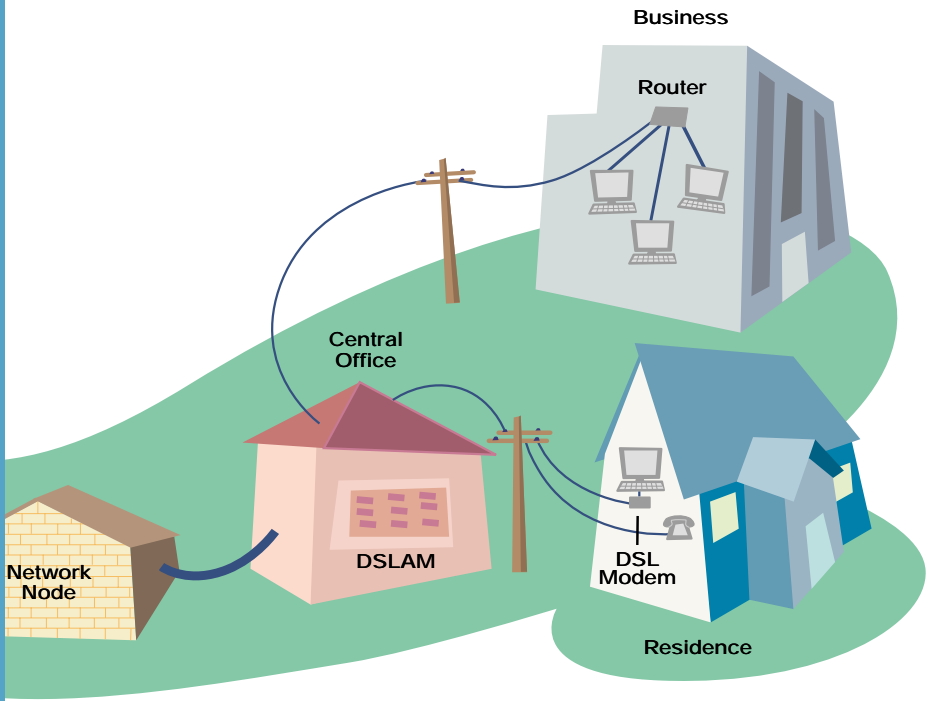
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DSL IS A FAMILY OF TECHNOLOGIES

But they all do the same thing: deliver broadband access to the Internet over a telephone line. The main difference is the speed at which they deliver the information to and from the computer. To most subscribers, these variations mean little more than the different types of gasoline they put into their cars. Customers make their choices based on

individual needs and applications. Some kinds of DSL are right for homes, others are right for businesses or telecommuters. Here is a quick overview of the DSL family members. You'll find additional details in the glossary at the end of this guide.

ADSL - Asymmetric DSL. Offers more speed for downloading (receiving) data and less speed for uploading (sending)



data. Ideal for residential users who generally download bigger files than they upload.

SDSL - Symmetric DSL. Transmits at the same fast speed downloading or uploading. Ideal for telecommuters, home-offices or businesses who frequently send and receive large files.

IDSL - ISDN DSL. The always-on, DSL cousin of ISDN that provides symmetric speeds up to 144 Kbps. IDSL is available where other types of DSL are not.

G.lite - Recently developed “lite” version of ADSL designed especially for residential users who don’t need all the power of ADSL.

What DSL delivers

What does DSL give you? It's a long list. And it's growing with each new application that broadband availability makes possible.

Always-on access

No more busy signals, no dropped connections, no time limits, no waiting.

The line that brings you DSL is yours alone. If your computer is on, you're already connected.

Double-click your Web browser and you're instantly at your home page.

Talk and surf simultaneously

Use the Net or the phone? For most of us, it's one or the other because our Internet connection and voice connection use the same line. Since DSL is a dedicated line, you can surf and talk at the same time. Some flavors of DSL also let you share the same line for both activities.

Affordability

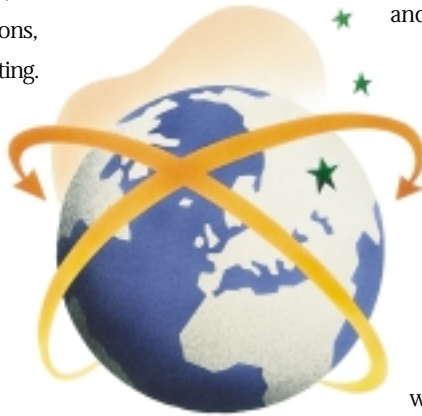
Until recently, broadband Internet access was only available to those companies that could afford a T-1 connection, which costs approximately \$1,000 per month. DSL breaks through the barrier of cost-prohibitive broadband access, with prices starting as low as \$39.95 a month for consumers

and \$99.95 a month for businesses.

Freedom of choice

DSL is the only broadband technology where you have a choice of providers.

Chances are your telephone company isn't the only company offering DSL in your area. New competitors called data CLECs (Competitive Local Exchange Carriers), like NorthPoint Communications, also offer DSL service nationwide through their own telecommunications networks. These DSL providers are developing innovative new products and services and offering them at competitive prices.



Living Broadband

The change that fast, affordable bandwidth brings is so vast and so dramatic that we will stop thinking about individual applications, and start thinking instead about a broadband lifestyle. This change that broadband brings will make the Internet essential to our lives.

WHAT DO WE MEAN BY THE BROADBAND LIFESTYLE? WELL, PICTURE THIS.

You wake up and scan the personalized electronic newspaper which is delivered straight to your laptop.

A little later, you use the notebook computer in your kitchen to order groceries online and select a convenient delivery time. You remember a favorite nephew is turning four in a few days, so you shop for the latest toy in just a few minutes and off it goes.

Then it's time to go to work. Warm up the car? Catch the train? Not today. Instead, you instantly connect to your

company's network and get the day's updates, assignments, insights, problems and everything else you need. It's just like sitting in your office. Only the coffee is better.

Next, there's a meeting with a client across the country via videoconference. Broadband's speed and capacity turn what was once an expensive, often low-quality exception into an everyday tool. Within a few years, it will be as routine as a phone call. But you might want to lose the pajamas.

Dinner? A recipe you picked off your favorite Italian cooking site. The wine? Ordered from an online merchant who helped you select it to go with tonight's meal.

After dinner, you check the stock market. Your portfolio, customized by you, is available at the click of a mouse. You download 60 pages of research at amazing speeds and make some after-hours trades. You also review the day's electronic bills, write a few electronic checks and move some money to a different account to cover the margin

call on that stock that the kid at the gas station told you was a can't miss. Hey, some things never change.

Ready for some games and entertainment? They're some of the many specialties of the Net enhanced by Broadband. You can:

Listen to online music or create your own music soundtracks

The Internet is becoming a prime channel for music distribution. You can listen to CD-quality music broadcasts right on your computer.



Watch videos You can view real-time video broadcasts directly from the Internet, or instantly download video files and play them on your computer.

Play multi-player online games

The power of a high-speed DSL connection takes graphic-intensive online games to a whole new realm. You can even compete against other players who are using different computers in different locations. No need to drive two hours to the online gaming tournament. You play from home.

Working Broadband

For businesses, broadband not only lets you do more work in less time, it changes the rules of competition by allowing you to do your work differently.

First, think about the sheer gains in productivity. Downloading a complex file, say a PowerPoint presentation, might take as long as an hour with a conventional modem. With a high-speed connection like DSL, you can do it in a few minutes. Sending a complex engineering drawing? What once took hours now takes minutes. Job by job, the time saved adds up.

Productivity also means time not spent on trains and highways as telecommuting made possible by high-speed, always-on bandwidth becomes a routine work style. In fact, there are an estimated 9.8 million telecommuters in the United States today, and this number is expected to reach 13.5 million by 2003.

Not only is DSL faster, but it can dramatically cut your Internet connection costs.

Even moderate use of dial-up Internet connections can run more than \$100 a month for the telephone line, business telephone usage costs and Internet access. So a small office with five computers and dial-up access can easily incur costs of \$500 a month. Converting to DSL can cut that cost by as much as

half while greatly increasing the access speed enjoyed by each end-user.

You can get software fast. Downloading and updating software online is the new standard. Shrink-wrapped software will

soon seem as archaic as carbon paper. A new crop of companies

called Applications Service

Providers (ASPs)

will even rent

software to you,

meaning you

never have to

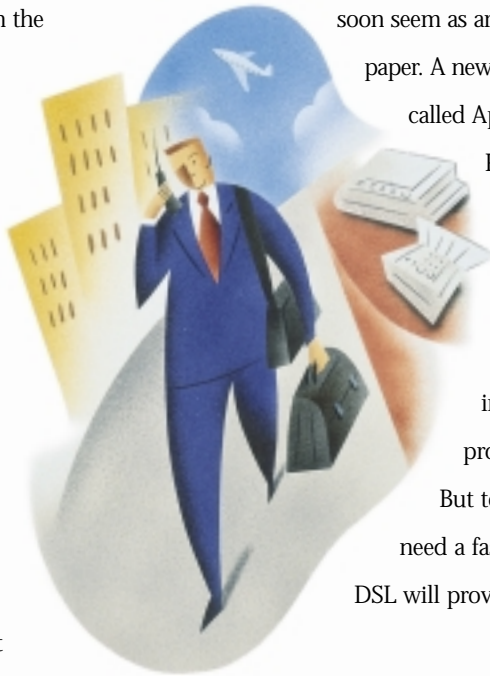
invest in obsolete

programs again.

But to get all this you

need a fast connection.

DSL will provide it.



Broadband and the affordability of DSL gives the smallest businesses a whole new way to do business.

Your business can now tap into the Internet for a cornucopia of timesaving and money-saving online business-to-business services.

A ticket to the future

The Internet is just getting warmed up. DSL is your connection to all that the Internet has to offer today – and in the future. The word is scalability, tech talk for compatibility with any new service or application that comes along. If you can get it, you can use it. DSL will not become obsolete.



That's the way it's going to work. Step by step, application by application, the availability of unlimited, instant, feature-rich broadband is going to change everything.

The DSL-wired computer is becoming a multi-functional Internet appliance that is central to the home. Multiple Internet appliances will all connect to a single DSL line. That will lead, in turn, to home networks, groups of computers or “smart” appliances that can talk and interact with one another.

Wireless networks will deliver cordless broadband Internet to every room in your home, giving you the freedom to place computers and Internet appliances where people need them – the living room, the kitchen, the bedroom. And any appliance could turn into an Internet appliance.

Broadband access enables you to unlock the unlimited potential of the Internet, letting you do things you never dreamed possible. So whether you're exploring, trading, downloading, communicating or just having fun, you'll be doing it without boundaries. You'll be experiencing the Internet like never before.

Questions?

If I want DSL, how do I get it?

DSL service is sold through Internet service providers (ISPs). Check your local ISPs and compare services and prices. Since there are many different companies that offer DSL, it should be easy for you to find a DSL package that best suits your needs.

How do I find out if DSL is available in my area?

Checking to see if DSL service is available in your area is easy. The Web is the number-one resource for information. Most DSL providers list their ISP partners on their Web sites, so you can compare the different DSL packages being offered. For example, NorthPoint Communications' Web site at www.northpoint.net lets you instantly check service availability and ISP specials for their nationwide DSL network. If you already know of an ISP in your area, you can also check their Web site or call them to find out if they're offering DSL.

DSL isn't my only broadband option. What are my other choices?

Cable Internet service is broadband delivered by your cable TV operator. It's widely available and competitively priced at around \$39.95 a month. Cable service suffers from being a "party-line" Internet connection. So the more neighbors that connect up to cable Internet service, the slower the Internet connection becomes for everyone using the Internet in that area. Also, because only one company in a particular area delivers cable, your speed and Internet service choices are limited.

ISDN (Integrated Services Digital Network) delivers data at speeds up to 128 Kbps. The telephone companies have offered ISDN for years, and it is widely available. Because ISDN is a premium service based on usage, you're charged for each minute spent online. It doesn't take long for the costs to add up. ISDN service typically costs up to \$300 for installation and anywhere between \$50 to \$200 per month for service, and that's just for the connection! You also have to pay for Internet access service on top of what you're paying for the ISDN line.

If you're already using ISDN, you're a prime candidate for DSL. Moving up to DSL is a cost-effective improvement. Not only will you dramatically speed up your connection to the Internet, you'll also save money.

Is my telephone company the only place I can get DSL?

DSL services are available from two types of companies: the telephone companies and CLECs (Competitive Local Exchange Carriers). CLECs are data communication companies that compete with the telephone companies and offer DSL service on a national and regional basis. Because CLECs only provide DSL, they have built better networks and provide a wider range of services than the telephone companies. NorthPoint Communications is an example of a CLEC.

I've heard not everyone can get DSL. Why?

Your ability to get DSL depends on how far you are from the local phone company's central office, or CO. That's where the DSL equipment that sends the signal to your home is located. One of the current limitations of most types of DSL, which is changing with new technologies, is that the signal can only travel up to 3.4 miles.

The good news is, 80% of the general population lives within this distance. If the nearest CO with DSL equipment is farther than that, it's still possible to get IDSL, with speeds of 144 Kbps.

I get DSL from an ISP but who installs my DSL service?

The ISPs usually don't own the equipment that makes DSL service possible. Instead, they buy DSL service wholesale from a DSL service provider. The ISP then packages Internet services, customer care and other services. When you order DSL service, the telephone wiring and equipment is handled by the DSL service provider.

How much does DSL service cost?

The total price you pay to get DSL service will depend on what service package you choose and the ISP. Consumer DSL service starts as low as \$39.99 a month, which includes the high-speed DSL line and Internet service. Business DSL service starts as low as \$99.99 a month.

The Language of Broadband

a Glossary

ADSL Asymmetric Digital

Subscriber Line A member of the DSL family that supports downstream data speeds up to 8 Mbps and 1 Mbps upstream. ADSL delivers voice and data communications over the same telephone line.

always-on Refers to a DSL Internet connection as a dedicated connection.

This means there is no dial-up process for Internet access because the computer is always connected. When the computer is on, so is the connection.

bandwidth The capacity of a data communication link. The greater the bandwidth, the more data that can travel through the connection. Bandwidth is typically measured in Kilobits (Kbps) and Megabits (Mbps).

broadband A term used to describe a high-capacity network that can carry several services on the same line, such as data, voice and video. DSL, cable modems and T-1 lines are all forms of broadband.

CLEC Competitive Local

Exchange Carrier A telecommunications company competing with a local telephone company to deliver voice or data communications services. NorthPoint is a CLEC offering DSL services to homes and businesses.

CO Central Office The place where DSL lines are linked to the DSL network. These are telephone company facilities that are the termination point for all telephone lines within a given geographical area.

CPE Customer Premise

Equipment The DSL hardware (either a modem or a router) that connects a computer to the DSL service and the Internet by converting and transmitting data. A DSL modem, also known as a DSL bridge, connects a single user to the Internet. A DSL router is commonly used in a business networking environment.

dial-up Using the telephone network to connect computers to the Internet using modems.

downstream The direction that data flows when it moves from the Internet to the computer. Some DSL flavors, such as ADSL and G.lite, deliver data faster downstream than upstream. Businesses

usually need equal downstream and upstream speeds.

DSL Digital Subscriber Line

The generic term that refers to the underlying technology that transforms standard telephone lines into high-speed data communications links. Refers to all flavors of DSL, such as SDSL, ADSL, IDSL, etc.

DSLAM Digital Subscriber Line Access Multiplexer

The device typically housed at the CO that consolidates all of the data traffic coming in from the individual DSL lines, and passes it to a backbone network for distribution to the network node and on to ISPs.

FCC Federal Communications Commission

The federal agency responsible for regulating the telecommunications industry, including the delivery of DSL services.

G.lite This new member of the DSL family is based on the international standard dubbed G.lite. It supports speeds up to 1.54 Mbps downstream and 512 Kbps upstream. G.lite is intended primarily for the consumer market.

IDSL ISDN Digital Subscriber Line

The always-on cousin of ISDN. IDSL delivers a symmetric 144 Kbps connection without the dial-up and usage charges of ISDN service. IDSL is available at greater distances than other types of DSL, so it is often an alternative broadband solution for those who are further away from the CO.

ILEC Incumbent Local Exchange Carrier

A term derived from the lexicon of the Telecommunications Act of 1996, used to describe the local telephone companies that controlled local telephone service. Pacific Bell, US West and Bell Atlantic are examples of ILECs.

ISP Internet Service Provider

A company that sells Internet access services.

Kbps Kilobits per second

A measurement for data communications, 1 Kbps equals 1,000 bits per second.

Mbps Megabits per second

Another measurement for data communications. Megabits means million bits per second. For example, a 1.5 Mbps DSL connection can transmit 1.5 million bits per second.

narrowband A term used to describe a data connection under 56 Kbps.

SDSL Symmetrical DSL

A symmetrical (equal upstream and downstream speeds) DSL service that allows for two-way business communications.

TCP/IP Transmission Control Protocol/Internet Protocol

The suite of protocols that defines the basis of the Internet. It provides for data communications across interconnected networks and applications.

Telecommunications Act

of 1996 A landmark piece of legislation passed by U.S. Congress that allowed competition in the delivery of telecommunication services, including DSL.

This act allowed CLECs to offer voice and data services to compete with local telephone companies, which previously had a monopoly on these services.

upstream The direction that data flows from the computer to the Internet. Some DSL flavors, such as ADSL and G.lite, deliver data more slowly upstream than downstream. Businesses usually need symmetrical services that allow for two-way business applications.

VPN Virtual Private Network

A way to deliver private data securely over a public network, such as the Internet. The data traveling between two different hosts is encrypted for privacy using hardware and software solutions.

About NorthPoint

NorthPoint Communications

Group, Inc., a leading broadband provider based in San Francisco, is building a global network designed to deliver affordable, dedicated, high-speed Internet access, streaming content, and other value-added services to consumers and businesses around the world.

The company currently operates DSL-based local networks in major cities across the U.S. By the end of 2000, NorthPoint plans to make DSL available to half of all homes and businesses in the U.S.

Through strategic global partnerships with Call-Net in Canada and VersaTel in Europe, NorthPoint has embarked on the industry's most ambitious global broadband deployment to date.

NorthPoint provides DSL-based Internet access service—at speeds up to 1.5Mbps, more than 50 times faster than common dial-up modems—through national and regional Internet Service Providers, global partnerships, competitive local exchange carriers, long-distance carriers, retailers, value-added resellers and other partners.

Experience the Internet like never before.



For additional information, visit www.northpoint.net
or call 1-877-836-7375.



ABOUT THE AUTHOR

David Angell is a recognized industry expert in DSL implementation for small business and consumer communities and author of the best-selling book, *DSL For Dummies*. David, a 15-year computer and telecommunications industry veteran, has written 20 books and numerous articles on a wide range of computing, Internet and telecommunications topics.

In May 1999, David joined NorthPoint Communications. His charter as “DSL Evangelist” is to champion the needs of DSL subscribers and educate DSL subscriber communities - small businesses, teleworkers and consumers - to understand the options and opportunities of broadband.