

Determining Which Broadband Is Right for You

This is going to be great fun. I know computers all too often have the opposite effect on people, but not this time. You don't have to be serious at your computer all day, and probably the best way to have more fun with your computer is over a fast broadband connection.

But there is more than one way to get broadband to your computer. You might think you don't have a choice, but you do. Everyone in the continental United States has at least one broadband service provider available. If you live near a city, you may have a half-dozen broadband service provider options.

By the time you read this first part of the book, you'll know your options, and you'll have gone through checklists to help you decide which service provider delivers what you need. Then your new broadband connection will help you stop frowning when you sit down at the computer and start grinning.

P A R T



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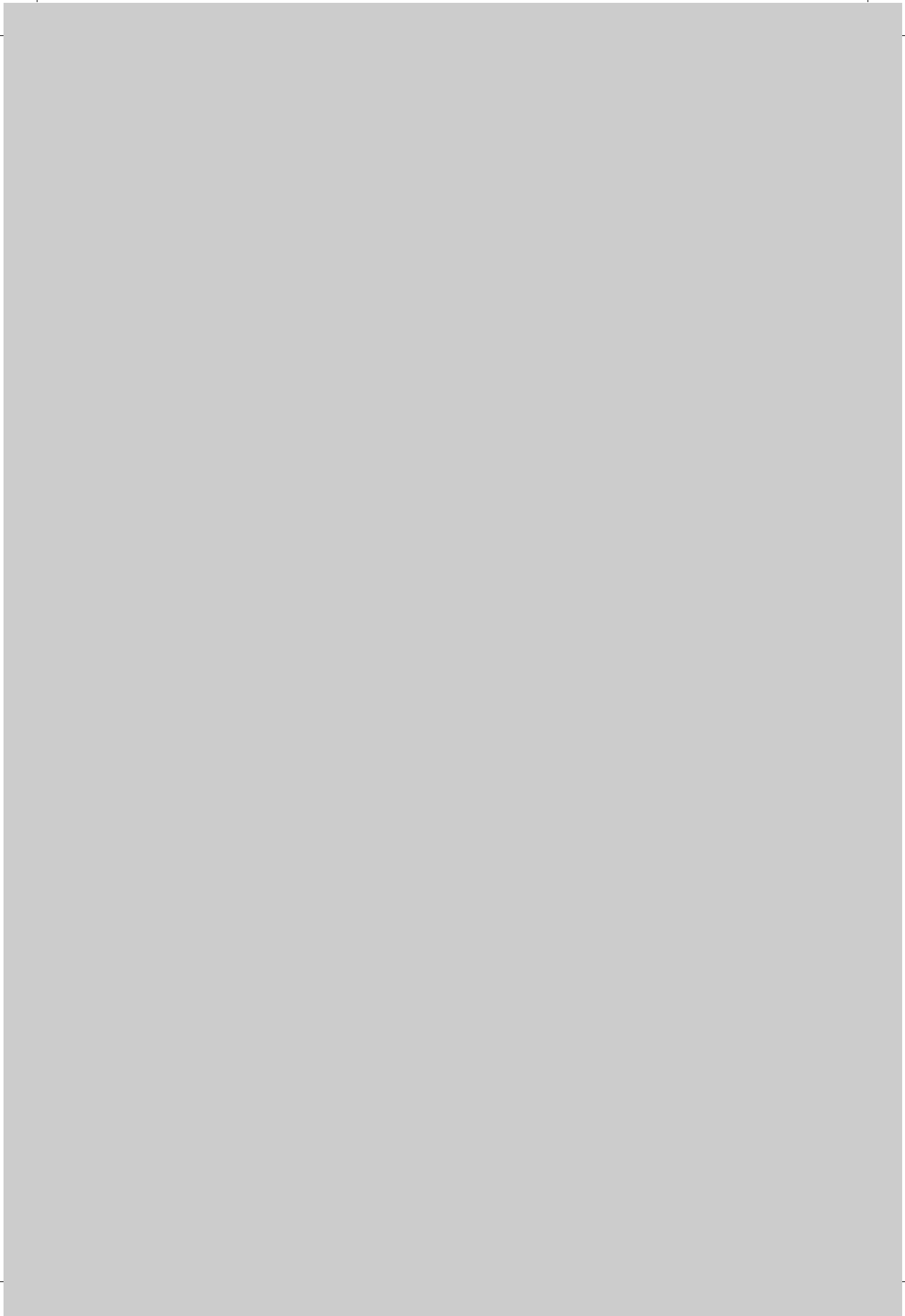
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Why You Need Broadband Internet Access

Back when sneakers were shoes kids wore to play in rather than \$200 foot-borne status symbols, one company distilled its advantages into the clearest advertising slogan ever. If you wore its shoes, you could “run faster and jump higher.” Doesn’t that capture the dreams of every kid lacing up sneakers?

Broadband makes your computer run faster and jump higher. Doesn’t that capture your desires every time you sit down at the keyboard?

To be honest, broadband Internet access doesn’t make the computer sitting on your desk process bits faster or start bouncing around. Computer speed ratings are derived from a set of variables including processor speed, the amount and type of computer memory, and the access ratings of your hard disk.

Broadband does, however, make the Internet and World Wide Web run faster and jump higher for you and your computer. Web pages appear in a snap rather than at a snail’s pace. E-mail’s with photos or other images drop into your inbox rather than drip forever down your phone line. With broadband, you will finally realize why people get excited about Internet radio.

The world of computing will get so much faster, you may need a seatbelt for your chair. So strap yourself in and hang on tight.

1 C H A P T E R



In This Chapter

Diving into computing

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Computing Without Interruption

A friend of mine helped a taskforce at Texas Instruments (TI) in the mid-1980s to study the balance between system response time and user productivity. The taskforce studied mainframe applications, but the idea remains the same. The study results showed that after a half second, the user's concentration broke, and it took mental effort and time to refocus on the task when the system finally presented the updated information on the screen.

If you're the same type of person TI studied nearly 20 years ago, after a half second of waiting for a Web page to update, you probably lose patience and your train of thought. The way everything in life has sped up during the last 20 years, the time now could be less than a half second.

Involved computing sessions demand that screens change as fast as possible. If they take longer than half a second, as far as your train of thought being disrupted they can be 4 seconds or 2 minutes. But life on the computer really runs faster and jumps higher when screens update in a half second or less.

Typical Web Page Download Speeds

An interesting note from broadband provider NTL.com in England shows how long it takes to download a typical Web page (50 Kbps in the example). Here's how they break it down:

- ♦ **56 Kbps modem:** 7.9 seconds
- ♦ **128 Kbps broadband:** 3.5 seconds
- ♦ **600 Kbps broadband:** 0.7 seconds
- ♦ **1024 Kbps broadband:** 0.4 seconds

Nice dovetail with our TI study conclusions, isn't it? If you get broadband download speeds of at least 1 Mbps, most pages update in less than a half second.

Now you can justify the cost of broadband to your spouse by saying that faster speeds mean fewer breaks in concentration, which means you'll finish on the computer faster than ever before. (Let me know if your spouse falls for that rationalization.)

Support files download in a flash

Nothing interrupts your time on the computer more than a pop-up window demanding you stop what you're doing to download a file, update, virus definition, or browser plug-in. Windows users see these computing roadblocks

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constantly, but Microsoft can't be blamed for all the interruptions. Here's a quick list of interruption requests on my systems recently:

- ♦ Windows automatic update files (okay, I can blame Microsoft for this one)
- ♦ QuickTime browser plug-in update (from Apple for equal time)
- ♦ Mozilla plug-in update for Macromedia Flash Player
- ♦ Real Player update
- ♦ Norton virus definition files

Each interruption demands that you stop and download a file or files. Sometimes, for example with a browser plug-in, it takes just a minute or two. With Microsoft and other operating system files, it can take hours to download a weekly update package. The same can happen if you download an update to your browser or one of your multimedia players.

I get more aggravated by the 3-minute interruption and download than the half-hour ones. When you know it will be 30 minutes, you can start the download and go do something else. You can take advantage of being forced from your seat at the computer by wandering around for a few minutes and grabbing a snack. But when I'm searching for something on the Web and one of those file download boxes appears and makes me slam to a stop, I curse and glare at the monitor until I can escape from the trap and go back to my search.

With broadband, however, the downloads arrive in a fraction of the time that they do with a dial-up connection. What used to be a 3-minute distraction is now a 30-second annoyance.

Of course, when downloads, such as patches for your operating system estimate they will take 30 minutes to download over a dial-up line, the broadband user can laugh. Table 1-1 lists file download times, and you can see that downloading a file that takes 30 minutes to dribble down a dial-up line takes 5 minutes over a broadband connection.

Vendors now like you to download a small (under 1MB) file that triggers an update download of the other 99MBs or whatever. The first time or two I got fooled by this it really steamed me. I downloaded the 1MB file and installed that, only to see the newly installed application begin the real work of downloading for what seemed like 24 hours. With broadband, I get up and start looking for a snack because the download and installation will probably take 15–20 minutes. With dialup, my computer is hosed for the evening and I want to threaten the computer with a baseball bat.

As more companies move toward constant updates for security and operating system patches, these interruptions will increase. Vendors want users to get broadband service because it makes it easier on them and because they can keep stuffing those large updates down the pipe to users.

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If you get one of those annoying “download this update now” windows when you have broadband, it’s no big deal. It will never be pleasant, but with broadband the aggravation speeds by quickly.

Applications arrive in a blink

Patches and updates arrive on their schedule and not yours, but the applications you find and download also take time. Waiting for a file you want, such as a new spam filter or digital music player, can be as frustrating as waiting for a complete virus definition file.

Unlike patch and upgrade vendors, developers offering files for download want your download experience to be quick and painless. Files are often zipped (compressed) to save time during downloading. You may not even know when you receive a compressed file because it will often have an .exe extension and decompress itself automatically when you install it.

Searching for handy utilities, such as those shown in Figure 1-1, changes from burden to delight when files download quickly. In fact, broadband connections download files so fast that most of the time you don’t have to save the file and run it later because you can download and install at the same time.



Figure 1-1: DownLoad.com is one source for new applications that you can download quickly over broadband.

Table 1-1 contrasts download times for large files using broadband and dial-up connections.

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Table 1-1
Size and Download Times

<i>Size of file</i>	<i>Time for dial-up (minutes)</i>	<i>Time for broadband (minutes)</i>
1MB	2:40	:09
3MB	8:00	:27
5MB	13:30	:45
32MB	85:45	4:45

Do not take these numbers as absolutes or performance guarantees. Many variables across the Internet influence download times, just like congested roads influence drive times (yes, the Internet has rush hours). This table shows estimates based on real-world tests done by the nice folks at NTL.com in the United Kingdom. But now you see where broadband marketing companies get their justification for touting broadband as being up to 20 times faster than regular dialup, don't you?

The application vendors really, really want to persuade customers to download their programs rather than look for boxes on the store shelves. Offering applications online is much cheaper for the vendors because they don't need to pay for packaging and shipping, and they cut the retailer out of the equation to save even more money. The vendors say the move provides fresher programs that include the latest fixes and updates. You will soon get almost all your programs via the Internet. Transfer speeds and reliability become even more important when you're downloading a 150MB office suite.

How I Will Write Speeds

Different people use different acronyms for speeds, and it can get confusing. Just when you think you have it right, a typo will mess you up.

Here's what I will use:

- ♦ **Kbps**: Kilobits per second.
- ♦ **KBps**: Kilobytes per second

(K for Kilo isn't an even 1,000. it's 1,024 because that's what you get from 2 to the power of 10.)

- ♦ **Mbps**: Megabits per second
- ♦ **MBps**: Megabytes per second

(M for Mega isn't an even 1,000,000, but rather 1,048,576 because that's what you get from 2 to the power of 20.)

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Know how you almost never use your floppy drive for anything anymore? Before long, you may use your CD-ROM drive to play music CDs rather than load new applications. That means downloading rather than installing off a local drive, and that means you need faster downloading.

Immersive Experiences

Computing without interruption enables you to get more work done. The next step, for relaxation, is to immerse yourself in some type of entertainment.

Watching a movie in a modern theater moves beyond the uninterrupted experience into an immersive experience. Sounds come from all around you. The screen takes up most of your field of sight. Darkness diminishes distractions from other audience members. When someone in the audience gets and takes a cell phone call, the movie world is destroyed and you are dropped back into the modern world where fools and their phones are never parted.

Broadband access transforms using your computer into something at least closer to an immersive experience, even though you can't duplicate a theater. The screen fills most of your vision. Lower prices make a surround speaker system affordable. And you control whether every cell phone in the area is on or off.

Modem fans may take exception to this. Wait, they cry, can't you do everything listed in the previous paragraph over dialup? Yes and no. You can get the surround sound speakers, lean close to the monitor, and turn off your cell phone.

What you can't do, however, is maintain your immersive entertainment world when the video jerks, stutters, and stops. You can't immerse yourself in music recorded at painfully low quality to enable transmission at dial-up speeds. You can't convince yourself that ground steak with ketchup is a filet mignon with béarnaise sauce.

Beyond entertainment, informational and educational programs take advantage of computer-based video regularly. Although a short video clip illustrating snake locomotion would be better on a big screen TV, it provides more valuable information moving on the computer screen than just a static picture.

Broadband performance can change your computer from something to work on to a speedy research assistant, from a maker of odd noises to a high-end music entertainment center, and from a display of still pictures to a streaming video treasure chest. Let me give you some examples.

Streaming audio

Today, finding and listening to interesting music outside the mainstream has become a do-it-yourself project. If you live in a rural area, you have few radio stations to choose from. If you live in or near a major city, you have more

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stations but not more choices because corporate radio conglomerates now own multiple stations in every metropolitan area. One owner and one program manager means mainstream radio plays the same few tunes over and over.

Internet radio and online music sites will change your world if you're a music fanatic. If you just like music, you'll find more sources for more tunes from more groups than you'll ever hear on radio. In fact, depending on your music preferences, you'll find more music online than you'll find in the largest music store in the largest cities. BeSonic, shown in Figure 1-2, will thrill music fans and particularly fans of European musicians.



Figure 1-2: One of my favorite Internet music tools for finding new groups.

Before I talk about some of the Web sites you should visit to explore the world of music outside corporate mainstream control, let me give you an idea of what will appear in the next year or two. Computers will drive the audio entertainment for many households. This will occur whether you get a broadband connection or not, but it will be much more fun if you have the fast Internet connection broadband provides.

Consumer product companies (think Sony, Motorola, Phillips, and the like) now race to include computers inside their equipment. Computer companies (think Dell, HP, and Gateway) now race to include consumer products in their catalogs, all of which connect to their computers. Which side will win? I bet those consumers interested in linking the Internet into their stereo systems will win

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first; then the benefits will slow down for a couple of years until broadband speeds make downloaded video streams (as in movies) worthwhile. Although video fans have a strong push underway to liberate the TiVO and make it a broadband downloading tool rather than a second generation VCR. That will be interesting to come home to a downloaded movie you ordered from work via a Web site and had it sent to your home.

Before that happens, however, Hollywood will aggravate almost as many people as the music industry has by trying ill-considered security measures to keep honest people from enjoying their movies although doing nothing to stop large-scale pirating operations. For the next couple of years, spend your money and attention on the constantly improving world of streaming audio, and you'll have plenty of fun.

Lamented Music Site: RIP, MP3.com

The most popular Web music site for 4 years, MP3.com deserves a word of thanks and a lament for its passing. No site did as much for unknown bands than MP3.com did. I found many bands playing my favorite type of pop music (ska/punk bands with horns) by listening to play lists assembled by music fans and posted on MP3.com. Imagine good friends sitting you down and going through their favorite cuts of their favorite CDs, and you have the idea.

In 2001, Vivendi Universal, one of the world's major record companies, bought MP3.com. Fans worried, but the independent music stayed online. Mainstream artists from Vivendi and their partners blanketed the front page and much of the interior advertising, but you could still find great songs, for example: the funniest rock song I've ever heard, "*A Slut Named Rachel*," from Skasmopolitan.

At the end of 2003, however, Vivendi sold MP3.com to CNET.com to use in some future music venture. The pleadings of fans worldwide fell on deaf ears as CNET.com shut down MP3.com and took all music offline despite the offer of several other Web sites ready to host the music files. A sad day indeed.

Quick hit: Example sites

Listing every streaming audio site on the Internet would take the rest of the book, and I would still miss some. Here are a few places to go to get started in your search for new and interesting music, or, if you prefer, old and interesting music.

Although GarageBand.com doesn't generate the most traffic of all music sites, I show it in Figure 1-3 because of Apple Computer. Apple released a new music software package in early 2004 called Garageband and I doubt they worried about overlapping the established Web site of the same name. The two have nothing to do with each other except the name confusion.

Streaming music sites with downloads

www.GarageBand.com

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Figure 1-3: One of the best sites to find new groups and their music.

GarageBand.com does a good job showing the most popular tracks in each main genre with its Charts pages. For many songs, you can download an MP3 file for personal use. GarageBand also makes it easy to find CDs for sale by groups; it shows whether they have live gigs planned (although those don't seem to be up to date), and you can leave messages for the artist or group. The site also helps you find groups that sound like another band.

Music File Formats

Here's a quick rundown of the most common music file formats. The format type is usually indicated by the file extension.

- ♦ **.wav:** Music file format developed by Microsoft and IBM. Since Windows 95, Microsoft made .wav files the standard for all PC sounds. But the high fidelity file format requires nearly 10MBs per minute of music.
- ♦ **.aiff:** Audio Interchange File Format, the Apple Macintosh version of .wav files, including the high fidelity and large file size.
- ♦ **.mp3:** mp3 is short for MPEG version 3, from the Motion Picture Experts Group. MP3 is the third generation of a compressed file format that requires about 1MB per minute of music at nearly the same fidelity as WAV files.

Continued

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Continued

- ♦ **Ogg Vorbis:** An open source, royalty free file format similar to MP3 but not as popular for downloadable music files.
- ♦ **.wma:** Windows Media Audio file format, the default to Windows Media Player. Often used by music services because of embedded digital rights controls in the file format.

www.SoundClick.com

Perhaps the most popular of the music sites after the unfortunate demise of MP3.com, SoundClick appears to be chasing that market full tilt. They promise to create play lists so people can string together their favorite tunes, like MP3.com did, and they now show the number of plays a tune has gotten.

www.CDBaby.com

Built by a working musician trying to market his own music, CD Baby now showcases nearly 55,000 CDs, all straight from the artists. You can listen to tracks CDs, search genres you like, and crank up your PC speakers.

www.IUMA.com

The Internet Underground Music Archive (IUMA) started in 1993 and was one of the first music sites on the infant WWW. It includes a streaming radio station and offers multiple tracks from every artist. It offers free MP3 downloads, streams in MP3 or Real formats, links to CD sales and the like.

www.Vitaminic.com

Connected to IUMA, Vitaminic offers much more international exposure and song protection by using Windows Media format files.

www.Ampcast.com

Another artist-oriented site, Ampcast started in 1998 and already includes play lists for gathering your favorites together. The site streams plenty of tracks, provides downloads, and sells CDs directly to you or recommends other sites.

www.AcidPlanet.com

One of many sites sponsored by music tool vendors, this Sony-owned site showcases artists using their products. In this case, Sony now owns Acid Pro and Sound Forge, among others, and the music posted has almost all been created or modified by Acid Pro or Sound Forge software.

www.BeSonic.com

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Not just another music product vendor, BeSonic offers a ton of European groups. (TerraTec is a German company.) Its excellent Mood Radio page, shown in Figure 1-2, is at the beginning of this section. The site also provides a visually cool artists “cube” to help locate groups playing the type of music you want. Many artists provide a play list of their favorite BeSonic artists, offering another way to get some interesting connections to different artists.

www.ArtistLaunch.com

This site is pretty self-explanatory, but adds some nice touches with a CD catalog that lists CDs for sale by genre. The graphics are large enough so you can actually see the CD cover, an unusual idea for many sites.

www.DMusic.com

This artist promotion site provides an icon beside its songs so you can send a friend a link to that song. Clever marketing.

Streaming radio Web sites

Internet radio stations may be the only place left to hear interesting new music. Small groups who self-publish their own CDs or sign with one of the many small labels need distribution to reach new ears, and corporate-owned radio certainly won't give it to them. Next time you complain when hearing the pop vixen de jour again and again during the day, look to the Internet.

When I searched Google.com for “streaming radio stations,” I received 2,810 listings. Internet radio stations come and go, so there's no guarantee which of the 2,810 stations will be up and running if you check them out.

However, here are a few you should give an ear to as you start your own journey:

- ♦ www.Shoutcast.com
- ♦ www.GrooveRadio.com
- ♦ www.RantRadio.com
- ♦ www.ThePavedEarth.com
- ♦ www.SomaFM.com
- ♦ www.DI.fm
- ♦ www.AccuRadio.com
- ♦ www.RadioIO.com
- ♦ www.NetRadio.com

Streaming video

Obviously you need enough bandwidth to stream the video fast enough to keep your display going at full speed. Your computer, whether running an operating

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system from Microsoft (Windows), Apple (OS X), or Linux needs certain minimum requirements to support streaming video. These aren't absolutes, but good guidelines.

Streaming video over the Internet suffers terribly when compared to the streaming video appliance everyone watches for several hours per day: the TV. Just about every major corporate content provider (TV networks, movie studios, music video producers, and infomercial hucksters) wants to make the Internet, and your computer, a broadcast receiver much like a television.

The world doesn't really need a new form of TV. And sitting at my desk watching a video window of maybe 4.5 inches wide by 2.5 inches high when a 37-inch Toshiba TV sits in the next room strikes me as stupid. So I hope the corporate content providers don't manage to turn the Web into more TV stations.

But the race for eyeballs will not stop for me or you. Look for new products over the next 3 years to link your computer, your broadband connection, and your HDTV set-top box. Look for appliances that act as the go-betweens for your wireless home network and your HDTV, including storing video streams for later viewing. I wonder what the TiVO developers are really up to?

The many geniuses, artists, humorists, and just plain nuts on the Internet provide enough videos to keep a person mesmerized for years. Any users with a few dollars a month for a hosting service can offer their own videos to the world. Be glad they do, because you'll see some things online you'll never see on TV, even if you have full access cable or satellite.

An example of all that's good and bad about corporate content providers is AOL. AOL broadband puts streaming video right up front for users. (Its streaming audio includes a wide range of interesting artists in 175 CD-quality radio stations as well.) Advertisements abound, of course, but music videos and movie trailers work well through AOL when you have a broadband connection. Using AOL broadband also allows multiple members of your family to be online at the same time. You can enforce parental guidelines that restrict your children's access to mature sites as long as you ensure that your children surf the Web through AOL rather than with Internet Explorer or another browser.

The faster your CPU and the larger your memory, the better. A faster hard disk always beats a slower one. Most computers built since 1998 include an Ethernet networking connection that supports 100 Mbps, so you'll be fine there. Specification minimums are shown in the following list:



Chapter 11 covers networking in depth.

- ♦ **CPU:** Intel Pentium III or AMD Athlon (faster is better)
- ♦ **RAM:** 128MB (more is better)

(The information about the previous two items can be found by clicking Control Panel ⇨ System.)

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- ♦ **Video:** 800 × 600, at least 16-bit depth (more is better)
- ♦ **Sound:** Two powered speakers (the ones that came with your PC aren't worth much)
- ♦ **Broadband:** At least 200 Kbps (faster is better)

Of course, the fastest new computer in the world won't give you decent streaming video if you use a dial-up connection. Broadband service on an older computer beats the streaming audio and video performance of a newer computer without broadband every time.

Many of the Web sites offering streaming video give warnings about mature themes. Although the short films usually equate to a movie rated R, some may go further, so keep an eye on your children. Some sites with movies go much, much further.

Yes, there are adult movies and pictures on the Internet. In Part III, I'll explain how to control who in your home or office sees what, and what the legal ramifications are for business owners who provide Internet access to their employees but don't monitor those same employees when they pipe "entertainment" videos into the company network.

If you become a big fan of streaming videos on your computer, you might look for one more accessory to enhance your enjoyment. Go to the bookstore and get one of those full-page magnifying sheets or at least a big magnifying glass. You'll get tired of leaning toward the screen and squinting, I promise.

Quick hit: Example sites

There may be more streaming video sites than streaming radio stations, believe it or not. But the number includes hundreds or thousands of sites using streaming video to teach you something. Remote education often includes streaming video, and there are educational sites for every career or hobby you can imagine. Figure 1-4 shows the AOL 9.0 Enhanced video section.

In Figure 1-4, I mixed education (a National Geographic clip about volcanoes) with entertainment (AOL). Few people consider AOL an educational site, although I used it with my children to take advantage of its parental controls. Hiding Internet Explorer and forcing the kids to use AOL made it possible for me to relax when they were on the Internet.

I'm not sure how AOL does it, but the same music videos look better through AOL than on MTV.com. Perhaps there is something to all AOLs talk about broadband. And the extra speed makes it easier for my teenaged daughter to keep a dozen IM windows open while playing Solitaire, watching TV, and talking on the phone.

Mainstream and advertising supported sites

www.AtomFilms.com

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Figure 1-4: Broadband greatly improves AOL's video performance.

Originally independent and pushing the Internet bubble, AtomFilms.com is now owned by Macromedia, the people who make Shockwave and Flash. Still edgy, because Macromedia appeals to many creative people, AtomFilms.com is a fun place to visit.

www.iFilm.com

Another edgy entry, iFilm.com includes more adult short films than you may want your children to view. But the R-rated ones are often funny or thought provoking, or both. Some of the famous short films that have been e-mailed around the Internet started here.

www.Movies.com

Not edgy, unless you think movie trailers for R-rated movies push the boundaries of good taste. But when you hear about a new movie through the grapevine, the trailer is usually here waiting for you.

www.MTV.com

This used to be edgy, but is now alternately mainstream, corporate, tired, greedy, or historical. But there are a ton of music videos here, and few things on the Web benefit more from a broadband connection than music videos.

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All major network television Web sites

ABC, CBS, NBC, CNN, and even Fox offer plenty of streaming videos, although most are from the TV rerun closet. The news sides of the major networks often include video from other parts of the world not shown on network television often.

Corporate sites

www.Apple.com/Quicktime

Apple computers didn't invent multimedia computing, but don't say that to a Macintosh fan unless you want to fight. The QuickTime player is a must-have, even when you already have Windows Media Player and Real Player on your system.

Video Players

Just like with audio players, you have some default video players (Windows Media Player and Apple's QuickTime depending on your platform) and some third-party players. Here are some of the most popular third-party players and Web sites for download:

- ♦ RealPlayer (multiple versions): www.real.com
- ♦ Winamp: www.winamp.com
- ♦ Rosoft Media Player: www.rosoftengineering.com
- ♦ Sigma Player: www.ngksoft.com
- ♦ BSplayer: www.bsplayer.com

www.Edmunds.com

Yes, a car magazine site. Look to the bottom of the home page for the Video section, and enjoy car videos almost never shown on TV or anywhere except a dealership. Enjoy them at home without a salesperson bugging you to sign on the line.

Odd and thrilling (and funny) independent

www.WebbyAwards.com

This group picks the best of the Web each year and shows the winners and runners-up. Not all of these are videos, obviously, but the ones they have will amaze you. They are all actual award-winning sites and the level of quality rises far above any other site collection.

www.Sputnik7.com

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This site offers music videos you won't see on MTV.com, and short films you won't see on the other film sites.

www.Spongi.com

Cable access meets the Web. No clue who is behind this, or what the site hosts are thinking (or smoking). That's a joke, because some of these videos are hysterical.

www.alldaybreakfast.ca/

Sketch humor translated successfully to the Internet. Canadian humor loosed upon the world.

Communicating Over Broadband

This may seem an odd heading, because broadband is all about sending information. But information isn't always communication, and when I think "communication" I think of a two-way conversation. Many of the broadband sites listed in the previous section are as two-way as radio and TV.

Some people believe the power of broadband, that of fast communications across the public network, should be more than just "they broadcast and we watch." The beauty of getting a fast Internet connection is that it frees you to do all sorts of things you couldn't do before.

Here we hit upon one of the disruptive technologies you hear about sometimes, when a new technology disrupts established businesses and no one saw it coming. In the past, voice was analog and data was digital. The two didn't mix. But that was the old world, when all telephones had wires attached and all music played from vinyl records. (Kids, ask your parents to show you a record.)

Voice over broadband

Today, voice conversations can be turned into data streams, just like music can be turned into digital data on a CD. The process works much like capturing music for the CD, in fact, because the sounds of the voice are captured, sampled by the new Internet Protocol (IP) phone, and sent onto the network as digital data. On the receiving end, the digital data packets are converted from bits back into sound, just like your CD player does for the music it carries.

The technical term for all this is Voice over IP and the shorthand is VoIP. You pronounce it just as funny as it looks: vo-eep.



Here's where things get all tangled up. As I'll explain in Chapter 3, there are two primary types of broadband services: over telephone lines owned and controlled by the telephone companies, and over cable lines owned and controlled by the cable companies. There are other broadband service options, but they don't get into the VoIP world yet.

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If you're the cable company, adding VoIP services gives you a wonderful new feature to sell. Data networking companies like VoIP as well, since it gives them a wonderful new feature to sell.

Guess who doesn't like VoIP? The telephone companies. Does VoIP give them a new product? No, it replaces their most important product. The great value in Digital Subscriber Line (DSL), the broadband product sold by the telephone companies, is that it runs over existing telephone wires. The telephone companies want customers to keep using telephone services running over telephone lines, not to replace them by running VoIP over cable.

In the long term, VoIP will become more important and more common. The underlying network technology supporting VoIP makes it much cheaper to carry voice conversations across data networks than across a pair of telephone wires. VoIP quality goes up with each new product, and large companies save millions of dollars by replacing dedicated telephone circuits with VoIP over data networks for internal calls. One data network connection can carry as many telephone conversations as a hundred pair of telephone wires, and the tools used to manage the data network also manage telephone calls running over those data networks.

The telephone companies, especially the large national carriers with huge investments in data networks as well as telephone systems, are joining the VoIP bandwagon. If you can't beat 'em, join 'em, and it's better for the telephone companies to keep their customers than it is for them to keep protecting their investment in telephone wires.

Individuals and small businesses now have options to buy VoIP telephones and bypass the telephone companies if they believe the marketing from the cable companies. Quality keeps going up and the cost keeps going down.

Most small businesses won't get into VoIP for another year or two. The greatest value so far is for large companies where the majority of long-distance calling costs are generated by calls from one employee to another employee. Using VoIP over existing data networks allows such companies to avoid the long distance charges from their telecom providers and justify the new VoIP equipment.

Webcams

News flash: Webcams can be pointed at more than just friendly college girls asking for your credit card number. Some of the earliest Web entrepreneurs made a fortune with a cheap camera and a marketing list of voyeurs hiding behind their monitors. The prurient news value of those webcams overshadowed all the other ways people used a remote eye.

A few years ago, I interviewed the network manager of a check-cashing service with branches across several states. This smart guy put a webcam in every check cashing office. Whenever a security alarm went off in any office, he checked the webcam before calling the police. It saved him a bundle in false alarm charges.

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If I remember correctly, the first networked webcam watched a coffee pot in a university in England. People got tired of walking upstairs to find an empty pot, so they rigged the camera.

Some daycare providers advertise the placement of webcams in every classroom. Parents use these cameras to check on their children during the day. Figure 1-5 shows a playpen of a different sort.



Figure 1-5: Good camera, bad subject.

Check your local TV station's news Web site and check out their traffic and weather webcams. If your local station doesn't have a good one, check out the thousands of options at www.earthcam.com/.

Anywhere you have electrical power, you can have a webcam. Every security camera you see is a webcam, but not viewable by the public. Every traffic monitoring camera you see watching your downtown streets is a webcam, but again not open to the public.

Prices for webcams are down to, well, free in some cases. I've seen major stores offer no-name webcams for \$25 with a \$25 rebate, which is pretty close to free.

Videophones and video IM

First shown to the public at the World's Fair in 1964, videophones captured the public's imagination (and funny faces) from the beginning. Long a staple of every

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futuristic movie and television show, videophones have yet to fulfill even a small portion of their exciting promise.

But once again, the availability of broadband will make videophones work much better because their big problem in the past has been the limited bandwidth over telephone lines. The only way to make a videophone at all was to keep the picture small and the frame rate low, which made no one happy.

Large companies started buying videophones and videoconferencing equipment years ago to help cut down travel costs. But the costs were high, special network protocols had to be supported, and only the executives got to play with them.

Those days when only the rich could afford small, jerky images of the person on the other end of the phone line are gone. Now normal folks can afford videophones and systems that offer better images than all but the most expensive equipment a few years ago.

Unlike most competing products, the D-Link i2eye DVC-1100 hooks to your television via standard video cables and connects to your computer wirelessly. This makes sense to me. If you want more than one person to be involved on each end, the TV offers a much better gathering point than a personal computer (especially if your desk looks like mine).

Prices for electronics like this are tricky to put in a book because prices change much faster than a book gets reprinted. But the unit shown in Figure 1-6 from



Figure 1-6: New consumer-priced videophone.

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D-Link.com, one of the cost-leaders on the low end, priced this unit not much more than a video game console. For the first time, a usable videoconferencing product (I call it more than a videophone because several people can use it) costs far less than the computer it uses.

Quick hit: Example sites

For just the webcam but not the videophone feature, the Linksys folks have a nice new product, shown in Figure 1-7. It also bypasses the need for a wire to reach your network. Any place you have electrical power, you can have a webcam.

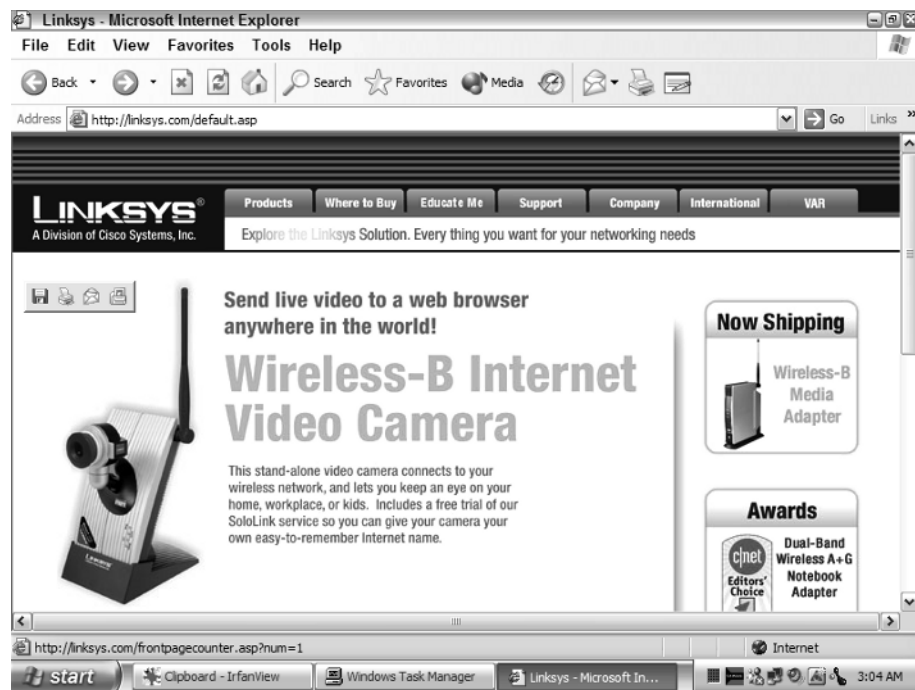


Figure 1-7: Webcam with wired and wireless network connections (used in Figure 1-5).

www.earthcam.com

This site shows some interesting webcam sites, including an office in Tehran and antcam.com.

www.tvweather.com/tv_cams.htm

Weather cams galore.

www.axis.com/

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This is the company that made the cameras for the check-cashing monitoring project. It also sells many of the traffic cameras and cameras used in other public places.

www.vonage.com

One of the first companies to offer VoIP products to the consumer and small business market.

Broadband Gaming

I remember Pong with great fondness. Two lines and a blip ate many of my quarters. Comparing Pong to modern games gives me the same feeling of amazement as looking at the first Volkswagen Beetle and a new Ferrari. Yes, they're the same thing, more or less, but they're a long, long way apart.

Today I no longer need to stand next to my gaming partner, each of us holding the knob on the Pong arcade game unit, to have a shared game experience. Today I can sit at home and be mercilessly slaughtered by a trigger-happy 10-year-old in Cleveland over the Internet.

If you are a gamer, or are the long-suffering parent of a gamer, you are familiar with the excitement and addiction awaiting those new to the world of modern gaming. Gamers push the boundaries of computer technology constantly and buy the newest, fastest, and most expensive hardware on the market. In a time where a complete corporate workstation costs less than \$2,000, gamers might spend \$3,000 and more on their systems.

Gamers love broadband connections for two primary reasons. First, downloading takes a fraction of the time it takes with a dial-up connection. Gamers download new games, new modules for older games, and demos of upcoming games constantly. Second, a faster network connection means faster interactive game playing online.

If you have a child gamer and you have broadband, you'll always know where he (perhaps a stereotype, but the gamer is usually male) is. He will be at home, playing over the Internet.

Game play requirements

Besides the most expensive PC systems on the market, what do game players need? More speed, always more speed. Latency, the technical term for the time lag between when a command is given and the results take effect, is the enemy of gamers everywhere.

The Internet, as you will learn later, consists of networks linked to networks linked to networks. It is, technically, a network of networks.

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Every connection between networks is a potential bottleneck. The good thing about broadband service providers is that they tend to be the large companies and their customer networks have direct connections to other large customer networks. The *Internet backbone* is the highest level of network where all the largest networks connect.

Some service providers offer a special package for game players. This includes an extra IP network address so gamers can be online playing without blocking another family member on another computer from an Internet connection. This type of arrangement used to be special, but now many service providers automatically provide a network router for connecting more than one computer in the home or office to the Internet. But check with your service provider to ensure it supports a game console connection if that's the platform of choice for your gamer.

Using a network router between your computer and the modem provided by the service provider offers a great troubleshooting option: resetting the cable/DSL modem. When the going gets gummy, resetting the broadband modem (unplug it, wait for 60 seconds, then plug it in again) forces a new connection. Just like a telephone call sometimes has static, a network connection can get the digital equivalent of static. Resetting the broadband modem helps clear that problem, making a separate broadband modem an important piece of gear for gamers.



More detailed information on game-specific configuration of routers, firewalls, and proxies await you in Chapter 11. If you don't know what routers, firewalls, or proxies are, but fear you need them, don't worry, I've got your back.

Wrapping yourself in the game world

Few technologies are more engrossing and exclusionary than a good game. When I first saw the groundbreaking *Wolfenstein 3D* in 1992, the parts that scared me the most were the sound effects. The large steel doors that opened and closed in *Castle Wolfenstein* echoed with a surround sound that made it sound like they were opening behind me. That they managed that effect with the cheap PC soundcards and speakers at the time still surprises me.

Gamers spend hundreds of dollars on video cards to replace the ones you and I happily use, in order to get the highest resolution and the fastest screen-drawing times. Check out some of the game sites listed in the next section, and you will be amazed at the realism and depth of the game environment. You don't have to sign up for a paid service just to view screenshots and movies taken from actual game play, and those will be enough to show you that game effects now equal movie special effects.

Developers work with hardware designers to try and get physical impact into games. Even inexpensive handheld controllers vibrate to warn the players. Over the years, companies sold packs to strap on the players' backs with speakers inside to shake them up and special chairs with surround sound and quaking

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cushions to reflect driving over rough ground. These expensive options don't tend to stay on the market for long, but new ones always appear.

Parents who are afraid that their gamer children exercise only their thumbs may check into some of the new interactive game additions. A few companies are selling cameras that mount on the TV and capture physical player movements and translate those into character moves in the game. Let your child physically flail around fighting some demons and they'll get into shape again. Somehow, I doubt the chance for physical workout will attract too many gamers.

For me, ever since the first time I saw (and heard those steel doors in Castle Wolfenstein), sound provides the best immersion tool. Broadband offers higher quality music than dialup by a considerable margin. The difference in music is about the same as the difference between a cheap AM transistor radio and a modern FM home stereo.

Get a better sound card, and get better speakers. You can spend as much on surround-sound speakers for your computer as you can for your home theater. Although I don't advocate that outlay, moving up to a five-speaker system for at least \$100 will make a huge sonic difference. Even the game consoles like PlayStation and X-Box support surround-sound speaker systems.

Are games intruding into everyday life? Radio@AOL has a channel with nothing but the music from the Final Fantasy game series. Even when gamers can't play, they can keep their ears in the game.

The most popular games

Warning, if you're new to the gaming world, popular online games take money. You must subscribe to play. And you thought only pornography made money on the Internet.

The choice of broadband type and other connection details will have no effect on your choice of games. Gamers play certain games for a variety of reasons, some of them innocent and some no doubt based in horrible neuroses foisted upon them by bad parenting. When your kids tell you that, explain to them all the violence in the game world has rotted their brains and they need to take up tennis to get fresh air and exercise. Don't let them tell you Topspin on the X-Box is the same as real tennis.

Your gamer will, when you hook up to broadband, begin playing multiplayer games across the Internet. These go by a variety of acronyms made from some set of the words Massive Online Player Universe and the like. Entire worlds exist for the big games, including people, places, weapons, and monsters never seen in real life (thank goodness, if you've seen some of those weapons and monsters).

There are too many games to list them all. Understand that even a relatively unpopular game may have a hundred thousand fans playing the game online now and then.

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Quick hit: Example sites

ID Software, the group that started it all, comes back with another winner in its long string of winners. You've heard of Doom and Quake, its two other big hit series of games, and now you can get into Castle Wolfenstein at <http://games.activision.com/games/wolfenstein/>. I just hope you get out alive.

If you are familiar with these game worlds, you won't need the following list of sites to visit. If you're not familiar, my descriptions in two or three sentences won't begin to explain them. Go see for yourself. Most of these sites include streaming video movies of game play, so you can get a pretty good taste of what happens. Turn your speakers up to get their full impact.

- ♦ everquest.station.sony.com/
- ♦ www.blizzard.com/
- ♦ www.unrealtournament.com/
- ♦ www.ubi.com/US/
- ♦ www.gamespot.com/index.html?reflash=1

Ah, for a gentler set of games, you can visit games.yahoo.com/.

Summary

You know you want more from your computer. You know you want more from the Internet and Web. You know you want broadband, you just have to make that leap.

As I'll explain in this book, broadband is no longer outrageously expensive, and it's no longer a technical nightmare. Cheap and easy may be going a little too far, but that's the trend.

Besides, your computer will be much more fun on broadband than on dial-up connection. And don't you deserve some more fun in your life?