



THE BROADBAND HOME

NOW, A COUPLE OF words about those broadband people: They're busy.

Like the widespread availability of electrical power did to communities in the early 1900s, the infiltration of broadband into the home is starting to change the way people live and behave. Electricity gave us home washing machines, refrigeration, and the ability to sustain light long into the night. Broadband provides millions of residential users with the tools to learn, work, interact, and communicate in new ways.

Kevin Brinks is one of these residential users. A work-at-home sales representative who sells high-technology image scanners, Brinks is a member of the broadband revolution. Armed with a high-speed DSL connection that's fed through a home network to four PCs within his house, he routinely transmits large data files to clients from his basement office in a matter of seconds. "With dialup, that was taking me 25 minutes each time," Brinks says.

What's equally notable is the influence of the broadband "always-on" connection on his family. From a downstairs bedroom, Brinks' teenage son plays video games on the Internet with opponents who live miles—or even continents—away. His wife, Kati, has become accustomed to checking a PC perched in the living room several times a day to read e-mails and surf the Internet for everyday information (such as weather reports, movie listings, and more). "Any time she wants to research anything—local information or whatever—she just pops on there, types a couple of keywords, and moves on," says Brinks.

Although they might not realize it, the Brinks family of suburban Denver is part of a revolution changing the way people work, learn, and communicate. Broadband connectivity inspires changes in the way millions of worldwide users conduct their daily affairs.

It's also encouraging them to spend more time roaming the world of interactive media at large. Compared with people who connect to the Internet in the old-fashioned narrowband way, broadband users are online more, and when they are online, they do more. For one thing, broadband users are big consumers of entertainment and information that's streamed over the Internet. A growing bounty of this material is available, ranging from breaking news reports to hundreds of live radio feeds from stations around the world. Studies show that broadband users are far more apt than dialup users to tune in. Also, broadband users are fast becoming notorious for the

pendant of downloads—music, software, and more—that can be captured more quickly, thanks to broadband’s faster data rates.

A taste for streaming audio and file downloads is just one characteristic that defines the growing broadband community. Another striking finding of one research effort into broadband behaviors is that people who have broadband at home spend nearly as much time on the Internet as they do watching television or listening to the radio (about 21 percent of their total daily “electronic media time”). That’s a big departure from households with narrowband Internet access, who typically spend just 11 percent of their electronic media usage on the Internet, according to a 2000 study by the media research firm Arbitron. The survey of 3,283 people, called “The Broadband Revolution: How Superfast Internet Access Changes Media Habits in American Households,” found that people in broadband households spent an average of 134 minutes daily on the Internet. That’s 61 percent more time than the 83 minutes per day spent by people in dialup households.

Before we draw any breathless conclusions about the broadband user revolution, note that broadband users tend to be younger, better educated, and earn higher incomes than people with dialup. Those factors might have some bearing on the behaviors exhibited by the broadband community. But, let’s not quibble too much. Anyone who has been liberated from long file-download times and poor playback of streaming audio or video can readily understand why broadband users would want to partake of these features more frequently. Over broadband, downloads actually work well.

The disparities between broadband users and dialup Internet users are even more dramatic when viewed by age. The most prolific broadband users are 18 to 24 year-olds, who report that they spend three hours a day on the Internet, according to a 2001 follow-up study from Arbitron.

As you’d imagine, the notion that broadband compels people to spend more time on the Internet and relatively less time with television has sent many a television-programming executive into panic mode. Television networks and programmers have scurried to develop business models that might allow them to retain their traditional presence in the daily lives of consumers, whether that happens to occur through television or through broadband. A similar search for presence on the new broadband platform has occurred in the movie and music industries, with no one yet having claimed the perfect business model. (One comforting fact for captains of the television industry, perhaps, is the finding that broadband users tend to be incorrigible multitaskers: Twenty-five percent of the respondents to the Arbitron 2002 study reported that they frequently watch television while using the Internet.)

But driving people from the tube isn’t the only thing broadband seems to accomplish. With fast access to Internet content and—importantly—easier ways to contribute their own content to others, broadband users have truly become a unique breed. Compared to “average” Internet users, they tend to do more activities with the

Internet, do them more frequently, and do them for longer periods of time. As Table 5-1 shows, a substantially higher percentage of broadband users engage in virtually every type of online activity when compared to dialup users.

Table 5-1 *An Average Day for Internet Users*

Activity	Broadband Users*	Dialup Users*
Communications		
E-mail	67%	52%
Instant messaging	21%	14%
Chat rooms	10%	5%
Information seeking		
News	46%	24%
Job-related research	36%	14%
Look for product information	32%	18%
For school or training	24%	9%
Look for travel information	23%	6%
Look for medical information	21%	8%
Information producing		
Share computer files with others	17%	4%
Create content (such as web pages or post to bulletin boards)	16%	3%
Display/develop photos	14%	1%
Store files on Internet	8%	N/A
Download		
Download games, videos, pictures	22%	4%
Download music	17%	6%
Download movies	5%	N/A
Media streaming		
Watch video clips	21%	6%
Listen to music/radio stations	19%	4%
Watch movies	4%	N/A

continues

Table 5-1 *An Average Day for Internet Users (Continued)*

Transactions		
Bank online /pay bills online	22%	6%
Buy a product	21%	3%
Buy a travel service	14%	2%
Participate in auctions	10%	3%
Buy groceries/household goods	6%	1%
Buy/sell stocks	5%	1%
Gamble	2%	N/A
Entertainment activities		
Hobby information	41%	18%
Browse just for fun	39%	21%
Play a game	22%	10%
Visit adult websites	6%	1%

* % of each group who engage in various Internet activities on a typical day online.

Source: Home Broadband Users, Pew Internet & American Life Project. February 2002 Survey.

The Pew Internet & American Life Project, which is based on telephone interviews with 507 adult Internet users in early 2002, represents one of the most penetrating looks into the way broadband users interact with the network. Authors John Horrigan and Lee Rainie identified three primary features of home broadband users:

- **They create and manage their own content**—One of the positively inspiring aspects of broadband is its ability to encourage users not only to consume content, but to create it.

About 40 percent of broadband users have been creating their own content for publication over the Internet (in the form of personal or family websites and online diaries), according to Pew's study. On an average day, 17 percent of broadband users share data files (photos, documents, and music) with others. In each instance, these behaviors occur more frequently with broadband users than dialup users. "People are not passive recipients of media," noted Rainie, director of the Pew Internet study on broadband users, "They are creators and distributors, too."

Broadband's capability to make it easier to distribute large and small files might be inspiring a rebirth of the Internet's original promise: to provide a peer-to-peer network that enables users to easily share information. With a rising corporate and organizational influence, the Internet has become largely a client/server model, wherein large numbers of users extract data from centralized web servers (think Amazon.com). Broadband won't do away with the client/server model by a long stretch, but it does present a platform that makes it more likely that users will increasingly stamp their individual imprint over the network. The rise of sophisticated classification systems that make it easy to search for and download music recordings from user communities is living proof that broadband and related new applications have facilitated this migration from client/server to peer-to-peer computing.

- **They use their always-on connections to satisfy their queries**—The Pew Internet authors found that the persistent connection offered by broadband enables users to turn to the Internet for all sorts of information needs. Sixty-eight percent of broadband users say that they do more information searching online because of their always-on, high-speed connection.

About 90 percent of users said the Internet has improved their ability to learn new things, and nearly 50 percent said that the Internet has improved their ability to get health-care information. In each instance, when compared to dialup users, broadband users are more apt to credit the Internet with helping them get information that's relevant to their lives. Lots of broadband users credit the always-on nature of broadband with making it easier to find information. There's something elegant and powerful about the ability to turn to the Internet on a whim, conduct a brief search, and find something out without having to endure the delay of initiating a new dialup session.

- **They do many activities online in a typical day**—The high-speed connection enables broadband users to perform multiple tasks throughout the day.

Broadband users are online at least once a day, which is more than narrowband users. More than 80 percent of broadband users said they're online on a given day; only 58 percent of dialup users said the same.

When contrasting broadband users and dialup users, the downloading and file-sharing disparity is particularly acute.

For every one narrowband Internet user who downloads music or swaps files with others, there are approximately three broadband users who snatch music, movies, and other online content, or make files available to others. That's no surprise. At a broadband

connection rate of 1 Mbps, downloading a three- or four-minute music “single” can be accomplished in 20 seconds or less. The same song would take four agonizing minutes to capture over a 56-kbps connection. It’s as if broadband data rates have expanded the range of media and information we share and exchange—from simple text e-mails to peer-to-peer delivery of voice, video, and more.

The possibilities for even more enthusiastic usage rates for music become easy to contemplate as connection speeds rise over time. A broadband network operating at a super-fast data rate of 64 Mbps could deliver to you the entire contents of a 72-minute music album in about the same amount of time it would take to start your car’s engine for a trip to the local record store—about five seconds. (Today, while music is feasible, downloaded movies are another story. Even with broadband connections of 1 Mbps, movies and long-form video can require hours to download, and remain more of a novelty than anything else.)

Broadband introduces a similar upswing in the use of so-called streaming content, which is material that comes across the network in real-time, just as a live television or radio broadcast does. Nearly one of every five broadband users in the Pew Internet study say that they routinely listen to streaming music or radio stations over the Internet. Just four percent of narrowband customers say the same.

What’s apparent across all major studies of the broadband user is the sheer diversity of activities conducted online. The Pew survey shows that the average broadband user does seven things online daily, such as fetching news reports or sending photos to family members. The average dialup Internet user completes only three tasks on an average day.

But doing more activities online isn’t the only attribute of merit for broadband users. Internet users with broadband connections say broadband improves their ability to do many things they’re already familiar with in the online world. Table 5-2 shows how broadband users are more apt than slow-connection users to credit the Internet with improving various aspects of their lives.

Table 5-2 *Making Life Better*

How Much, If at All, Has the Internet Improved...	Broadband (Percentage Who Say “A Lot,” or “Somewhat”)	Dialup (Percentage Who Say “A Lot” or “Somewhat”)
Your ability to learn new things	86%	73%
The way you pursue your hobby or other interests	65%	48%
Your ability to do your job	65%	42%
The way you get health-care information	47%	41%
The way you manage your personal finances	42%	25%
Your ability to connect organizations in your local community	31%	23%

Source: Home Broadband Users, Pew Internet & American Life Project. February 2002 Survey.

Those with a big economic stake in the future of the Internet have watched with keen interest the emerging portrait of the broadband user. Executives from America Online (AOL), which operates the single largest connection between the Internet and consumers, observes that, among other things, broadband users tend to grab bits and snippets of content and information from the network throughout the day, a behavior that the company’s president, Jonathan Miller, labeled “information snacking” in a 2002 presentation to securities analysts. He’s got a point. According to the Pew Internet study, 43 percent of broadband users go online several times a day; only 19 percent of dialup users log on more than once a day. Not only do the number of sessions increase with broadband, but the amount of time spent online and the number of web pages viewed also increases. Sean Kaldor, an executive with the measurement firm Nielsen//NetRatings, studied the behavior of a sample panel of Internet users who had upgraded from narrowband to broadband between December 2000 and May 2001. As Table 5-3 shows, the group’s time spent on the Internet rose 70 percent—from a collective 26,000 hours to 44,000 hours.

Table 5-3 *Upgrading to Broadband (Monthly Comparison)*

	Before Upgrade	After Upgrade	Difference (In Percentage)
Time spent online per person (Hours:Minutes)	9:28	12:50	36%
Number of sessions	17.94	25.73	43%
Number of pages	615	1039	69%
Total hours online	26,000	44,000	70%

Source: Nielsen/NetRatings

To be sure, some habits and customs of the broadband household cannot be attributed purely to the availability of broadband. Broadband users in general, or at least the first and earliest adopters, tend to come from homes with higher annual incomes and with larger families than the prevailing norm. Even so, researchers believe that these demographic differences are less important in influencing online behavior than the presence of broadband. “The availability of a broadband connection is the largest single factor that explains the intensity of an online American’s Internet use,” the Pew study states.

A close look at the broadband user base, and what sorts of activities broadband users do online, supports a recent theory that is popular among analysts of the medium: No single “killer application” drives the use of broadband. In other words, combinations of a multitude of activities, ranging from consuming entertainment to communicating by e-mail or instant messages to buying goods online, are the byproducts of broadband access. Pew’s study found that 61 percent of broadband users say they’re spending more time online since discarding the old dialup modem and installing a broadband connection. Various applications are responsible for driving this increase in time spent on the Internet:

- Thirty-one percent said the extra time comes from more information searching.
- Nineteen percent said additional e-mailing soaked up their increased Internet time.
- Fourteen percent said they were downloading more movies or music.
- Thirteen percent said online shopping was the reason why they were on the network longer.

There is also a growing sense that broadband users are more apt than dialup users to be willing to spend money on online content. A January 2003 survey of Internet users in Britain, Germany, France, Spain, Italy, and Sweden found that 18 percent of broadband users are willing to pay for video content compared to 11 percent of narrowband users. Broadband users also showed a greater willingness to pay for music and gaming content (reported the survey from Jupitermedia Corp).

Broadband's Liberation from the PC

As the data spin out before us, keep in mind the understanding that a substantial change in online-user behavior is occurring even under the current prevailing constraints on the broadband medium. From its inception to the current time, broadband has been provided almost exclusively as a personal-computer service. Nearly every residential broadband connection today is fed directly to a computer, and whether the application is a movie or an online shopping experience, it's rendered through the lens of a computer monitor.

The emerging broadband models look to the day when the broadband data gets liberated from the confines of the PC and roams freely throughout the household. This vision is encapsulated by the movement to something called the *home network*. It supposes that broadband ultimately finds its way into numerous information and communications appliances, and that broadband becomes not just a PC network, but a home-premises network, wherein a central-receiving device might distribute broadband throughout the home in the way that an electrical junction box distributes electricity to every room.

NOTE The analogy with electricity only goes so far. Some broadband users have expressed dissatisfaction with the speed and reliability of their connections, which suggests that broadband isn't yet on par with telephone services and electrical power regarding "forget-about-it" reliability.

Already, 69 percent of United States broadband users have multiple computers in the home, according to the Pew Internet study, and more than half of those households have some form of network that connects multiple computers.

More interesting is the notion, albeit further down the road, of allowing broadband to find its way into a broader array of appliances than just home computers, printers, and peripheral devices. A recent television commercial from the appliance-maker Whirlpool made the point clear. In it, a homeowner is surprised to find a refrigerator repairman at the doorstep. The refrigerator, linked to a broadband network, placed its own trouble call, prompting the onsite visit. Just idle speculation about a futuristic product? Nope. Magazine publisher *Forbes* reported the European appliance manufacturer Merloni Elettrodomestici of Fabriano has sold more than one million networked appliances (mostly washing machines) that can be controlled through the Internet.

Work is also progressing on the front lines of the much vaunted “convergence” movement, a place where a melding of functionality exists among computer-like devices and entertainment appliances, such as TV sets. For example, Software titan Microsoft and the PC maker Hewlett-Packard have collaborated on a computer called the Media Center PC that can act as a central repository for television and music content that can then be parceled out to networked devices in the home.

The point is, even given the fact that broadband is today imprisoned somewhat through the control of a single device—the PC—users have found a tremendous assortment of things to do with it, and are making meaningful changes in their daily media lives as a result. In fact, after it’s in the house, broadband seems highly likely to remain. An April 2001 survey of DSL users by the telephone company SBC Communications found that 63 percent of customers claimed they’d give up their ritual morning coffee before yanking out the DSL line.

The Kitchen PC

The fully rendered home broadband network might not be here yet, but one of the fascinating early byproducts of broadband availability seems to be a redefinition of where the PC fits within the household or within the context of family.

If you own a PC, chances are it’s perched comfortably on a desk somewhere in your home. After all, much of what we do over the computer is work. We review e-mail, manage budgets, type letters, and manage schedules. When we’re done, we’re done. We leave the PC and turn to more interesting and entertaining places in our homes.

The marriage of computers with desks, offices, and places where we typically work testifies to the fact that the PC is mainly associated with jobs and tasks. Even the growing popularity of streaming media and entertainment-oriented websites hasn’t done much to move the computer from the office to the living room in most households.

The true information revolution will come when the PC, or some other device that accepts a broadband connection, migrates *en masse* to the most lived-in spaces of the household: the kitchen, den, living room, and bedroom. We spend most of our time in those places. Already, many first-generation broadband families enjoy broadband connectivity in these places, where you'll often find a desktop computer, laptop, a new wireless devices known as a web-pad (think of an electronic Etch-a-Sketch) or a detached laptop screen with touch-screen controls that connects wirelessly to a broadband network.

Having a computer in the kitchen hugely contrasts the typical PC-in-the-office scenario. But, remember that broadband doesn't merely replace a dialup, or narrowband, Internet connection. As we're starting to understand from the anthropology of the broadband household, broadband connections change the way people interact. In some ways, broadband seems to prompt entirely new behaviors and ways of responding to the myriad data streams that now ricochet about the home.

Suddenly, with broadband, PCs can drift from the office or den and mingle in all the right places. This mainstream emergence is more than symbolic. No longer imprisoned in spaces and rooms that are cut off from the remainder of the home, computing devices find new ways to flourish when they're integrated into spaces that are more fundamentally relevant to daily life.

The kitchen, a place where so much daily activity revolves, is particularly prominent in the new world of broadband communications. Outfitted with a broadband connection, a surprising number of users have seen fit to plop their computing devices in the center of the action, at a kitchen desk or makeshift workstation located somewhere between the toaster and the electric can-opener. There, a steady diet of brief encounters and on-the-fly grazing replaces, or at least supplements, the elongated sessions familiar to those of us who have known the Internet as a narrowband creature. For many families, locating the family PC in the kitchen has more to do with safeguarding their children from Internet ne'er do wells, certainly. But nonetheless, a PC in the kitchen, or in a centrally accessible room, is not a PC in a closed-off, remote room used for "work" computing.

Within broadband households, it's common to find users integrating the Internet in their lives in seamless, instinctive ways. We see adults, for example, casually checking over the morning's e-mail while they go about normal tasks to prepare for the day. While the toaster browns the bread, they get an early read on messages from the home office. Teens glance at local weather reports and (hoped-for) news of school closings on snowy winter mornings while searching for their lost pair of socks. In studies contrasting dialup Internet households with broadband households, a pronounced tendency is for the PC to become a more frequently used and widely shared resource.

This is hardly a puzzling phenomenon, of course. Dialup, narrowband users are accustomed to sitting before the computer, attempting to accomplish multiple tasks all in a single session that's bound by two identifiable events: signing on and signing off. There is a defined "start" and an equally apparent "finish" to the typical 40-minute dialup session. Between these two invisible bookends, we attempt to complete our online to-do list.

With broadband, you don't have any sign-on and sign-off periods. The concept of a "session" doesn't exist. The persistent broadband connection means that the network is available whenever you want it. New devices beginning to proliferate in the world of wireless networks illustrate this feature well. They don't need to boot up or go through a four-minute ritual of "coming to life." When you need them, they're there, connected to the network, and ready for you to use. Hand-held devices that gather your e-mail messages are a great example of this concept. They don't boot. They just respond to what you need, instantly.

Again, let's use a television analogy. The programs and channels available on television are, effectively, always available; they swirl invisibly around you as part of the radio frequency of a broadcast or satellite TV network (or tucked within the coaxial wiring of cable television). When you turn your television's "power" button on, images and sounds instantly greet you: The nightly news report. The rock concert. The laugh-track on a syndicated sitcom. The close-up of a flying lizard in a South American jungle. You don't wait for your television to muster a connection. You don't hear the electronic shriek of two modems engaging in a cyber-handshake to establish a dialogue.

In homes with broadband connectivity, you don't wait for the electronic handshake, and no noise signals the initiation of a connection. Silently, the network is ever-present, and so long as your broadband device is turned on, it's available to summon web pages, e-mails, instant messages, and more in the mere fraction of a second that it takes you to press a key or to move a mouse. As one SBC Communications consumer-survey respondent said, "My computer is on 24 hours a day, seven days a week."

Broadband users seem willing to discard the idea that the web is a place full of destinations. Rather, it's a treasure of content that's already here—right now. Again, think of the television model. There's no need to consider television programs as resources that must be fetched from distant places. The fact is that they're right here in the living room, and the mere pressing of a button summons tonight's hockey game obligingly onto the screen. Similarly, broadband users seem to consider their favorite web pages and content providers as resources that are literally already resident in the home, just as common PC applications already reside in the computer.

Here's how one broadband user, interviewed for a study published by the former cable television company MediaOne, described the experience:

When I first got this service, I couldn't believe this was the Internet. I was in Netscape but it wasn't acting like it usually did.... Now, it just seemed too simple. Switching between (Microsoft) Word and the Internet was like changing channels on the television.

The Anthropology of Always-On

MediaOne, since purchased twice (once by AT&T, and subsequently by Comcast Corp.), was a pioneering provider of broadband, high-speed data services to the home. It began its cable-modem deployments in 1994. In a fascinating study of broadband culture funded by its technology research division, MediaOne Labs, the company conducted what it called an ethnographic investigation of how its broadband customers were using their new service. The idea was to chronicle the changing patterns of online behavior, and, more importantly, how these changes affected the fabric and routine of daily life. MediaOne Labs dispatched researchers (with permission, of course) into the homes of some of the first broadband communications customers in the United States, in eastern Massachusetts, during 1998. There, they observed first-hand, and for the first time, some of the striking differences between narrowband and broadband Internet users, and, by extension, began to glean some of the first ideas about how broadband might change the way people work, play, and interact.

Here are some key findings:

- **Always-on connectivity helped weave the broadband service into the daily lives of broadband users**—By observing users in their homes and studying the tracking logs that showed what web features were used, and when, MediaOne Labs uncovered a striking feature among broadband customers: They seemed to be more casual about the way they used their broadband connections. Study participants might glance for new e-mails as they walked past the PC, chat with a youth sport coach on the phone while simultaneously looking up a weather forecast, or dispatch a quick e-mail message between TV commercials. The constant connectivity of broadband seemed to beckon a level of multitasking absent from narrowband Internet homes. “They bought it for speed,” said the MediaOne researchers, “but used it for living.”

- **Broadband households used the Internet more**—Not just a modest amount more, but four times as much as the average narrowband, dialup household, according to the report.

For example, one household studied by MediaOne rang up 17 separate Internet sessions in a single day. The 22.5 hours a week? Simple. Lots of short- and medium-sized bursts of Internet activity added together. Again, the presence of a constant, high-speed data connection invites usage that fits more easily into our busy schedules. The temptation to multitask, or use the Internet at the same time we talk on the phone, pay the bills, or watch the kids, is much more pronounced when we don't have to wait on computers.

- **Prime time is all the time**—Well-established trends exist for residential Internet use by times of day. Narrowband users tend to use the Internet more during the evening, roughly from 6 P.M. to midnight. In part, this pattern reflects a dominant-user arrangement in which one household member, often an adult who works outside the home during the day, is guilty of monopolizing the Internet connection within the home during the evening.

Broadband's usage time is different. The heaviest concentration of usage occurs in the morning, although usage is generally dispersed more evenly throughout the day. Typical users tended to integrate the Internet into their morning routine, accounting for the heavy use. Family members checked their e-mail, read news headlines, and scanned weather forecasts. Women that remained home during some or all of the day undoubtedly contributed to the early-riser phenomenon. A telling example: A stay-at-home mom who routinely answered e-mail and scanned sweepstakes entries online while her young child ate breakfast.

- **The PC is the center of attention**—The majority of computers attached to the MediaOne broadband service were placed in so-called "public spaces" within the home—family rooms and kitchens instead of bedrooms and dens. Again, this coming-out is hardly an artifice of savvy marketing. It appears to be a grass-roots dynamic that occurs naturally as more family members, smitten by the ease-of-use and new possibilities allowed by broadband connections, demand equal access to the newly empowered PC. The fact that a device originally conceived as a toy of enthusiasts, then a tool of industrialists, could wind up as a common household appliance is a testament to the tremendous innovation in computing technology, economics, and applications. But, it takes a new sort of force to move the device from the desktop to the countertop. That force is broadband.

What else do we know about broadband users and how they behave over the network? Nielsen/NetRatings, the audience and media measurement company, tells us that even though broadband users represent only a minority of the total Internet-connected households, the people connected to high-speed broadband networks account for the majority of all online time, at least in the United States (and probably globally, too, one suspects). Broadband users spent a cumulative total of 1.19 billion hours online in the month of January 2002, representing 51 percent of the total of 2.3 billion hours spent online. In other words, 21 percent of total online users (the broadband segment) racked up 51 percent of total time online. Without a doubt, broadband seems to be inspiring more use of the digital network.

Here are some more numbers for you: At the time Nielsen/NetRatings made its astounding conclusion about broadband's dominance of total Internet time, an estimated 21.9 million broadband users in the United States had broadband connections at home, and 25.5 million people had broadband access at work. (Of course, many of them are the same people, counted once in each category.) But, it's worth noting that the broadband experience for many people is introduced first in the workplace, where a great number of companies and organizations deliver broadband connectivity to individual computers and devices. Most of us know the common lament of the individual who spends the workday humming across the network at very satisfying speeds and cannot bear to suffer the indignity of a 56-kbps connection at home. Tasting the broadband experience does seem to spoil us all, and after we've seen even a glimmer of the possibilities available through a high-speed data connection, it's difficult to go back to dialup again.

Not surprisingly, there's also good news from broadband for those who hope to sell things over the digital network. Broadband users are more likely than those who connect at narrowband data rates to respond to offers and make e-commerce purchases. In fact, one survey of 1046 broadband network users from early 2002 found that nearly half had spent \$500 or more online in the last year, and 63 percent made six or more online purchases in the last year. The survey, commissioned by a Texas company, Broadjump, found that more than one-third of broadband users make at least 11 separate online purchases a year.

Summary

The broadband lifestyle involves new opportunities and capabilities for families whose homes will be outfitted both with services that flow over broadband and with a multitude of devices that interact with these services. Already, we're seeing the effect

broadband has on individuals and families, with studies showing broadband users are online more often, and accomplish many more things while online, than dialup Internet users. Education, medical care, energy management, and family interactions are just some of the features of daily life that will be improved by broadband networks in the forthcoming "smart" home. Personalized for each household and able to bring a wealth of global knowledge directly to the home, broadband's impact is enormous. Like electricity before it, broadband will bring an enormous wealth of possibility to individuals and families alike.