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Welcome to the Broadband Home of the Future

By Chris Anderson

"Retard!" bellowed the punk kid, his sneering voice careering across the Internet into my living room. I hadn't been called that since junior high. But I suppose I shouldn't have been surprised. I was playing MechAssault on Xbox Live and getting my bot kicked. If life is a series of harsh tests of one's talents, then the world of twitch gaming against real people, especially jobless game-playing freaks who spend every waking moment practicing button combos, is among the harshest.

Still, having a nameless teenager hurl insults at me, right into my ears while I slouched on my couch, made me sit up straight. See, Xbox Live is a broadband online gaming network where the players can wear headsets and discuss team strategy, which is to say they trash-talk lamers in real time as they play against each other. It's one thing to do this on a PC, where a generation of email and chat has accustomed us to meeting strangers via text-based communications. It's quite another to have this happen on your TV, live and in stereo, in your living room.

SPECIAL PROMOTION:

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The MechAssault encounter felt like a final barrier had fallen: a private space had become public (with my permission), a passive medium had become interactive, and a portal had opened to a new world whose outlines are only now taking shape. Never mind that for me the first manifestation of this was getting insulted - Watson probably didn't like the first phone call being a bossy order, either - this was something entirely different, and rich with implication.

Welcome to the broadband home. My experience of bringing the Internet into the living room is now shared by millions of people, in nearly as many different ways, as the natural consequence of the DSL and cable-modem revolutions. More than a fifth of American homes have high-speed, always-on Internet access - almost 23 million households, according to the Yankee Group. An increasing number of them are using wired or wireless networking to spread that broadband connection throughout their homes - from the last mile to the last room.

There, they are starting to connect strange new devices, part computer, part consumer electronics: digital video recorders with hard drives and Ethernet ports, networked MP3 players, online game consoles, media servers, even connected digital picture frames. And by connect, I don't mean RCA jacks in the back. I mean TCP/IP. The native language of the Internet is now taking over the entire home.

Driving this is a combination of three trends, each of which is cresting at the same time. The first is the rise of digital media. What started with the audio CD has suddenly become a clean sweep: DVD players now outsell VHS players, digital camcorders outsell analog versions, digital cameras outsell film cameras, and both digital cable and digital TV are poised to pass their analog counterparts in the next few years. Except for radio (Sirius or XM users notwithstanding), odds are increasing that the entertainment media you consume is 100 percent digital.

The second trend is a natural outgrowth of digital media: the home theater phenomenon. With the arrival of

the DVD and its high-quality video and sound, consumers finally had good reasons to upgrade the rest of their home entertainment system. The result is a tsunami of wide-screen TVs, surround sound audio systems, and digital media devices. Today, 30 percent of US homes have a home theater, defined by the Consumer Electronics Association as at least four-speaker surround sound and a 27-inch or bigger screen. More than 2 million projection TVs with screen sizes ranging from 40 to 80 inches (6.5 feet!) were sold in the US last year. Nearly half of American homes now have DVD players. And sales of all-in-one surround-sound systems are about to surpass even stereo audio systems.

Finally, broadband has reached critical mass in the home. With a high-speed, always-on connection came a fundamental change in the way people listen to music, play games, and watch the news. Broadcast TV viewership is in decline; young people - the all-important 18 to 34 demographic - are looking to the Internet for their entertainment. What they first consumed on their PCs in a home office or bedroom they increasingly want everywhere, from the living room to the front pocket.

Which means the wired home is emerging in any number of ways. In one house, it might be a connection from the computer to the stereo - and suddenly all those MP3 files have rendered your CD collection obsolete. In another, perhaps a PlayStation 2 or Xbox in the living room holds the lure for online play; in comes the Cat-6 Ethernet cable or the Wi-Fi network, and the foundations of a broadband entertainment center are suddenly in place. Or in a third home, TiVo passion poses an obvious question: Why can't I watch what I've recorded on any TV in the house? Install a home network and you can.

This impulse, played out in millions of homes, is creating a brand-new market unlike any other. For once, consumers are leading business in technology adoption. Wi-Fi, which was designed as a corporate wireless networking standard, has surprised everyone by selling twice as many units to individual consumers, mostly for home use. Companies can't think of good reasons to upgrade their networks to gigabit Ethernet, but consumers can: It's great for zipping video from the living room PC to the bedroom. Even open source operating systems are benefiting from the digital-home boom: From TiVo to the Philips iPronto, the OS of choice in the connected den is Linux.

To the consumer electronics leviathans that supplied our entertainment gear for decades, this shift is nothing short of an earthquake. The Sonys and Toshibas of the world grew huge by mastering the skills of the analog age: mechanical VHS tape drives, cathode-ray tubes, little motorized trays, and loads of proprietary features that drive brand loyalty. But once music and video make the leap to the computer, they tend to stay there - whether it be on the desktop PC or in the sleek white objet d'art that you carry in your pocket from that newest of consumer electronics companies, Apple.

Yes, Apple. Or HP, or Gateway, or Dell. The incumbent kings of the living room are now being threatened by the giants of computing, expanding to colonize new territory. And why not? The technology of digital media is the technology of computers: memory, processors, hard drives, and flat-screen monitors. Nobody knows them better - or can assemble them cheaper - than a PC maker. Which is why your next home theater may come from Dell, with a Microsoft OS. As if Japan didn't have enough to worry about.

William Gibson's observation that "the future is already here, it's just unevenly distributed" has never been more true than it is now, in the home. We know, for instance, what tomorrow's entertainment technology will bring. It's the ultimate jukebox: every song ever recorded, every movie ever made, every game created, and infinite television, all available wherever you want. If that sounds silly, consider that one of the early adopters described in the following pages has a library of 50 gigabytes of music and 250 gigabytes of other media. That's 12,500 songs and 125 hours of video, ready for instant enjoyment. Granted, this individual is a millionaire, but his personalized setup soon will be mimicked by DIY middle-class consumers using off-the-shelf products.

Most broadband homes already have access to 500,000 songs (RealNetworks' Rhapsody streaming audio service), all the television you can stomach (TiVo), and unlimited online gaming (Xbox Live). All that costs less than \$30 a month. For another \$1.95 to \$3.95 each, you can pick from 500 movie titles (Time Warner's video-on-demand). A few hundred dollars of networking equipment will extend most of that to every room in the house.

The wired home of 2010 will have a centralized media server that will store music, video, and games. Screens and speakers will be networked and the A/V streams that drive them will be digital. Wireless tablets, or simple wireless remote controls, will send the streams to any room with the equipment to handle them. They will all talk to one another using standard Internet protocols, each one a node on a domestic intranet.

Plugging into this home network will be a host of handheld devices. Cell phones will sync over the network to any PC. Cordless phones will tap into the same network, extending the cell phone's number to a host of cheap, comfortable slave devices in each room. Digital cameras and camcorders will feed the media server - with or without wires. And slices of the server's riches will hit the road in iPod-like personal entertainment players.

Some homeowners will extend this network to security cams and alarm systems. Others will connect appliances, starting with coffeemakers and ovens and eventually - for the impressively well-organized - lights and air-conditioning systems. The networked alarm clock and wireless Internet watch are already available; it may not be long before they actually become useful.

If you're determined enough, you can do almost all of this today. It's not easy, however, which is why this future is still so unevenly distributed. Anyone who has successfully managed to operate a security cam remotely and who can really claim to be running a media server is a brave soul indeed. Sure, TiVo may be hackable, yet it takes nerves of steel to do it. But it's obvious that the digital house is rapidly entering the mainstream, quickly fulfilling its promise. We're all beta-testing the home of the near future, riding the fastest technology adoption train in history.

This is one armchair revolution worthy of its name.

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Friends from High School



Roosevelt
High (427)



Fairmont
High (661)



YOUR High
School (820)

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