

# FTTH: The Next Great Household Amenity

## Introduction

Many enlightening articles have been written to date on the amazing technology surrounding fiber-to-the-home (FTTH) networks, and many of these articles have done an admirable job of educating the telecommunications industry about this highly capable broadband system. Most articles have thus far focused on the technical, financial and regulatory aspects of these systems, such as the network architecture, active and passive optical components, deployment case studies and the overall business case, to name a few topics. An important subject that is often overlooked, however, is the education of the general population about FTTH as the next great household amenity. Although those of us that deal with FTTH in one form or another through our career fields have done a respectable job to date (a humble pat on the back is appropriate here) of educating the vendor, consultant and service provider communities on this exciting, new technology, we have collectively neglected a very important piece of the puzzle that is ultimately crucial to making FTTH a true home run. That formidable piece is the developers and homeowners.

With FTTH technology maturing rapidly, it is now more important than ever that the education and awareness of these ultra-broadband systems be effectively conveyed to this critical audience. Developers and homeowners alike must be introduced to the significant life-enhancing benefits afforded by FTTH networks and realize that this attractive home amenity can be enjoyed today. Instead of leading the educational front with topics such as network technology and transmission protocols to this group, however, the focus really should be on the consumer experience. Most people would agree that developers and homeowners today are far less concerned with what type of network or system architecture or protocol is delivering their broadband services. Rather, this crowd wants to understand what FTTH technology can bring to their lives, and of equal importance, how different it is from what they have been living with thus far. Ironically, understanding the details behind FTTH technology is low on the priority list.

We'll take a somewhat different approach to promoting FTTH technology by focusing on the consumer experience. A portion of this passage will feature a brief interview with a homeowner currently serviced by an FTTH network, who will describe how their own broadband experience has changed as a result of subscribing to this technology. Additionally, we'll highlight some of the new "game-changing" services and applications coming into play today that are likely to stress copper-based broadband networks in the very near future. Ultimately, the article aims to whet the appetite of developers and homeowners alike for the wide range of services that FTTH is ideally suited to deliver. For now, let's forget about that convenient, little four-letter acronym that those of us tied to the industry toss around all too often. Instead, let's talk about the good stuff that it can bring to everyday life.

## The Trend in Household Amenities

So what do you look for in a home these days? Whether considering an existing residence or venturing off into the exciting world of building a new home, there is undoubtedly a must-have set of amenities that remain at the top of your list. Some of the more popular considerations may be floor plan layouts, kitchens, baths and landscaping design, among others. But what is becoming increasingly popular is the hype surrounding the “invisible” infrastructure of the home itself. Centralized audio systems, residential media centers, environmental control and security systems and advanced video systems have all ratcheted their way to the top of the hot amenity list. Consider this: the most-sought after “toys” in homes these days rely heavily upon what is located behind the walls, not what is within view of the homeowner.

It is becoming evident that features once viewed as “neat to have” are evolving into downright hard and fast requirements for the increasingly technology-savvy American homeowner. More homeowners these days are looking to further differentiate their greatest financial asset from the rest of the pack with technology features that turn homes into all-encompassing entertainment zones. Developers have also joined this movement, offering “smart” models featuring media centers with many of these applications.

With the prospect of a tight market in the coming years, home builders are increasingly seeking out new technologies, especially in home networking and audio distribution, to differentiate their offerings and boost sales, according to Parks Associates. The leading market research firm recently launched its 2006 Builder Insights project and reports that nearly 30 percent of builders are actively evaluating new technologies in order to improve their business in home sales, which is up from 25 percent in 2005.

“Interest rates are up, unsold inventories are high, and competition among home builders is heating up,” said Bill Ablondi, director of home systems research for Parks Associates. “For years, builders have emphasized amenities like larger kitchens, bigger closets and elegant master baths. But in this digital era, lures are expected to include multiroom audio, home theater, security systems, and structured wiring, all of which appeal to the new ‘iPod Generation’ of home buyers.” (Parks Associates, 2006).

In Figure 1, the results of a recent survey reflect the increasing trend of builders thinking outside of the box, focusing on technology amenities to differentiate and win in their markets.

But what would motivate a developer to request or specify FTTH over a legacy copper-based broadband system for their particular development? Up until now, many developers have not even known that there was an option available to them. And among the few who have even heard of the technology, skepticism about the actual costs, true capabilities and standardization of components made the selection of “what has always worked” a logical choice. The hope is that every developer whose eyes cross this article, not just the technically-inclined, will at least ask the right questions and consider FTTH technology to enhance and differentiate their next project.

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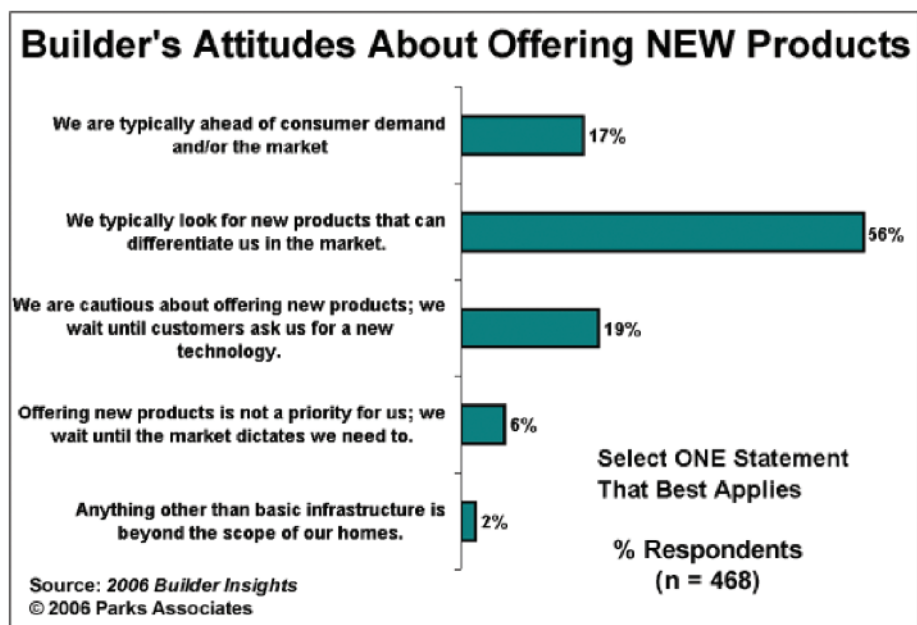


Figure 1 – Survey of Builders on New Technology Considerations (Parks Associates, 2006)

Before moving on, an important point to highlight when considering any technology is that its performance is only as good as the weakest link in the system. An inadequate broadband connection will degrade state-of-the-art home networks and advanced video systems, leaving the homeowner to ponder why they ever made such an investment. Perhaps the most exciting aspect of FTTH technology is that it enables effortless delivery of not only the most bandwidth-demanding applications today, but it also provides a medium that can just as easily service the increasingly intensive applications of tomorrow, many of which have yet to be conceived.

### Who Cares if it's Copper or Fiber to the Home ... Broadband is Broadband, Right?

Let's see, well ... wrong. Although, given the manner in which consumer education on network technologies has transpired thus far, that's not an entirely bad assumption. In actuality, there are as many flavors of broadband as one can imagine. Herein lies the challenge when educating homeowners on the various levels of broadband services that are available to them.

Rather than use the layout of this piece as another technical specification battlefield, pitting copper and fiber technologies against one another in a vicious quest to rule the broadband world, a more preferable avenue would be to lay out the general capabilities of each solution, and most importantly, convey what that really means to a homeowner. While technically laced articles are attractive to certain audiences, developers, builders,



and the average homeowner aren't generally drawn to discussions on EPON vs. GPON, ATM vs. IP, or dynamic bandwidth allocation. This audience would rather understand why it is that they should care about the type of broadband network that serves their home, and ultimately, how their lives are improved by it.

Let's get back to the question of why a developer would give more than two seconds of consideration to the type of communications infrastructure that is placed into their neighborhood. When you think about it, there is a myriad of critical decisions that must be made when planning for a new home development. Influential factors such as entrance and street design, lot sizes, the inclusion of recreational areas, utility placement, curbs, sidewalks, and lighting can all boost the value and return on investment to a developer. Quite frankly, the type of communication infrastructure has been little more than an afterthought. The simple reason for this is that until now, this piece of the puzzle was never a selling point to potential homeowners. That is, until now.

Developers are now in an enviable position because they have a new weapon at their disposal, whether they realize it or not. Though there have been some innovative ideas to increase the attractiveness and amenities associated with new developments in recent years, it has been some time since a utility or service could actually be leveraged as a valuable, differentiable option to homeowners. When polling those who have included FTTH networks in their new developments, one is likely to encounter statistics that reflect faster selling, higher valued lots than those located within comparable developments served with legacy, copper-based broadband systems.

To put it quite simply in today's terms, placing a copper communications cable to a home in a new development versus an optical fiber cable is analogous to a builder specifying 5-year rated roofing shingles in lieu of 50-year rated shingles, when both solutions can be had for about the same cost. To use another illustration, offering copper over fiber is akin to a developer giving away a free black-and-white television with the purchase of every new lot or home. Sure, it does the job, but is the consumer excited by it? I would speculate that most of us would chuckle at the notion, and would likely contribute such a "prize" to charity upon move-in.

## Today's Networks ... Running out of Gas

Focusing in on the consumer broadband experience, it is helpful to identify some key comparative metrics that will help differentiate the technologies under consideration. Table 1 illustrates several parameters that would be noteworthy to a homeowner.

\*Today's standard video, voice, and data package consists of 1 HDTV IP video signal (8 Mb/s, MPEG-4), 1 SDTV IP video signal (2 Mb/s, MPEG-4), 1 phone line (64 kb/s), and high speed Internet (5 Mb/s)  
Total bandwidth consumption - 15 Mb/s

\*\*In 5 years, the standard video, voice, and data package is likely to consist of 1 Super HDTV IP video signal (32 Mb/s, MPEG-4), 1 HDTV IP video signal (8 Mb/s, MPEG-4), 1 phone line (64 kb/s) and high speed Internet (20 Mb/s)  
Total bandwidth consumption - 60 Mb/s

Technology Consideration	Copper	Fiber
Initial Bandwidth Capacity to Home (Based on Today's Network End Equipment)	25 Mb/s	1,000 Mb/s
Maximum Bandwidth Capacity to Home (Based on Physical Transmission Limitations of Network Infrastructure)	100 Mb/s <i>Requires upgrade of initially installed copper network</i>	>1,000,000 Mb/s Achievable with initially installed fiber network
Initial Bandwidth Capacity Consumed to Deliver Standard Video, Voice, and Data Service Package Today*	60%	2%
Initial Bandwidth Capacity Consumed to Deliver Standard Video, Voice, and Data Service Package in 5 Years**	240% <i>Network upgrade required – unable to deliver standard service offering</i>	6%
Technology Likely to Increase Residential Lot Value?	No	Yes
Technology Likely to Increase Home Value?	No	Yes

Figure 2 – Survey of Builders on New Technology Considerations (Parks Associates, 2006)

From the technology consideration table, it is easy to see why a home connected with fiber can offer the best consumer broadband experience and overall investment for developers and homeowners today.

### Straight from the Horse’s Mouth

In the dialogue below, an FTTH subscriber from the state of Texas offers his thoughts on his own personal service experience with this technology:

**1. How long have you been an FTTH subscriber and what type of broadband network previously served your residence?**

I’ve been an FTTH subscriber for about 18 months now. Prior to that, we had DSL service through the local phone company.

**2. What services do you receive over the network?**

For the entire 18 months we’ve had voice and data over fiber, and for the last four months, we’ve also received video.

**3. What was the most noticeable enhancement to your broadband experience after switching to FTTH?**

SPEED – lots and lots of Internet speed! With the wireless router and laptop, working from home is very close to an extension of being in the office. Getting subscribed to video has also been a huge hit with the family. We dropped cable years ago after the local cable provider couldn’t provide us with the quality of service we expected (received ghost images on all local network channels) after repeated service calls to correct the problem. So, we had been getting TV channels via an antenna in our attic prior to picking up the FTTH video package.

**4. Were there any drawbacks to your subscription to FTTH service and would you ever transition back to broadband service from a copper-based network in your current home?**

The video package is pretty extensive with lots of service tiers to choose from. I'd still prefer to get video channels à la carte with the ability to choose each and every channel that I subscribe to. There are too many channels that I receive in the basic plan that nobody in the family will ever watch. There is absolutely no chance that we would ever go back to the dark side having been shown the light and speed of fiber!

**5. How highly would you rank FTTH network services on your home amenity list and would access to an FTTH service provider be a consideration that would influence your next home purchase?**

Moving to a community without fiber would be a HUGE negative. After getting used to the speed of fiber, going back to DSL would be equivalent to only being able to purchase a Model T Ford as a new car and dial-up would be like getting a horse and buggy for transportation. We'd really struggle to take a step back in time. Unfortunately, there are too many places where fiber is still not available, so the likelihood of being relocated to a community is high. The U.S. needs to get its act together to remain a world leader in technology and a true superpower. We're losing ground to Japan and many other countries where fiber is the dominant telecommunications offering.

## The Technology Frenzy: From Home Theaters to Ultra-Gaming Systems

There are a host of bandwidth-consuming applications that we could discuss here, but we will highlight a couple of the more eye-catching topics in the interest of time. High-tech home theater systems today are relying upon quality content that is transmitted to the home just as much as the content that originates from internal line-ups, such as DVDs. As anyone who has purchased an HDTV can tell you, a high-definition viewing experience is only as good as the quality of signal that reaches the television.

More focus than ever must be given to the signal quality and reduction in unwanted noise in video signals that are delivered to homes to ensure the most crisp and enjoyable viewing experience possible. Equally important, with a growing number of televisions per household in the United States, is the ability of the broadband connection to support multiple, simultaneous transmissions of high-definition video. No transmission medium accomplishes this better than fiber. This particular area is where copper-based broadband systems come up short, greatly limiting the number and type of video transmissions to the home and often times "stealing" available bandwidth that is normally allocated to high-speed data services to make up for shortcomings.

On to ultra-gaming systems, who doesn't want the new system to round out that entertainment system line-up? It's alright, adults, we know it's all just for the kids (wink, wink). But with high-definition game titles boasting theater-grade sound, where the slightest whispers can be heard from behind and even the shadows have shadows, who among us can possibly resist? With the advent of these new ultra-gaming systems, the dependence on lightning fast connectivity in the opposite direction, upstream from the home, has never been higher. This upstream bandwidth capability has been an Achilles heel for even the most advanced copper-based broadband systems. These networks will be tested to the limits by applications such as online gaming, telecommuting, and other services demanding significant 2-way bandwidth.

And remember all, your draw is only as fast as the broadband pipe that feeds your home. That FTTH connection will secure your bragging rights at the water cooler the next morning, guaranteed.

## Summary

Five years ago, I would have said that consideration of next-generation broadband capability should not influence the purchase decision of a home. As long as you had an option other than dial-up, go ahead and sign the contract. Being a first-hand witness to the broadband revolution now in motion, however, I can not give that same advice today. Homeowners, whether seasoned or not, should now give serious consideration to the life-enhancing benefits that are afforded by homes connected with optical fiber.

So remember: FTTH is not just another four-letter acronym; it's the next great household amenity. Better yet, this is one four-letter acronym that is OK to teach to the kids. Go on, spread the good news.



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