

FiOS vs. U-verse

Verizon and AT&T have taken very different approaches to building and marketing their next-generation access networks. A noted industry analyst shares his insights about the two telco giants and their competition with the cable companies – and each other.

By Clifford R. Holliday ■ *B & C Consulting Services*

On May 29, 2003, the three largest Regional Bell Operating Companies (RBOCs) – BellSouth, AT&T and Verizon – announced that they had adopted a common set of technical specifications for the delivery of fiber to the premises. In other times, such an announcement would have been viewed by most as another technical standardization and elicited a big yawn. However, at that time it was the biggest news in the telecommunications world – perhaps the biggest in years – and it continues to be big news today.

The initial announcement was followed by a joint RFP issued in June 2003 to select vendors for the FTTP equipment. Responses and vendor selections were scheduled for the third quarter of 2003, with initial deployments to begin in 2004. This schedule was not completely met, but the RBOCs were close. Then in late 2005, the RBOCs issued an RFP for GPON approaches to FTTP. In mid-2006, Verizon announced awards under that RFP. AT&T announced its GPON vendors in mid-2007.

In 2003, the biggest news was that three RBOCs actually agreed on a direction and issued an RFP. At the time, the RBOCs didn't agree on much of anything else. In 2004, the main story was the technology and the fact that the RBOCs (at least Verizon) were serious about an FTTP program and had begun deployment. By 2005, the main story was that the RBOCs (at least Verizon) were going into residential video delivery in a big way. After a lot of tests, learning curves, false starts and failures, the RBOCs were really committing to a

With 3 million and 2 million video subscribers, Verizon and AT&T now rank number eight and number 10 among U.S. video providers. That's impressive, considering that they're newcomers.

massive effort to compete on a network basis in residential video delivery. Those of us who had been in the industry for a long time remembered the RBOCs' 1985–1987 video trials in Cerritos, Calif.; Orlando, Fla.; and elsewhere, and we wondered whether they had learned enough to be successful in this very difficult business.

The reason for the excitement about their entry into the video business was that these RBOCs (now down to two since AT&T's acquisition of BellSouth) serve about 80 million of the approximately 150 million access lines in the United States. They also control the largest interexchange carriers and the largest cellular phone companies. The companies are the powerhouses of the telecom world. In a recent year, their capital expenditures were 76 percent of the total by major telephone companies and more

than 46 percent of all capital spent by all telecommunications carriers. Clearly, these companies have the financial power to rule the equipment markets.

When the equipment vendors looked at the potential size of a project to bring fiber near these companies' customers, they visualized a return to the go-go days of the late 1990s telecom market. At \$1,000 to \$1,500 capital cost per installed fiber line, a program that involves more than 100 million lines could easily drive a return to profitability for many equipment vendors.

FIOS AND U-VERSE TODAY: MAJOR VIDEO PROVIDERS

The "new" AT&T and Verizon have moved into the video business in a massive way. These two RBOCs are now major providers in the residential TV delivery business. As of the end of 2009,

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Verizon had nearly 3 million video subscribers and AT&T had slightly more than 2 million. These numbers put them in the ranks of the top 10 video providers in the United States – Verizon at number eight and AT&T at number 10 – which was impressive, considering that many of the others on the list have been in the video business for decades. In addition, they both rank consistently at the top of customer-satisfaction polls of video customers. By the end of 2010, we expect Verizon to exceed 3.5 million FiOS TV subscriptions and AT&T to reach about 3 million U-verse Video subscriptions.

Both companies have deployed several relatively new technologies in their entries into the video business, including IPTV, FTTP, VDSL, fiber to the node (FTTN) and residential gateways. The RBOCs use just about every imaginable combination of those technologies to achieve their objectives.

FIOS AND U-VERSE DEPLOYMENTS SLOW

The 2008–2009 recession had the expected effect of slowing down capital expenditures for FiOS and U-verse. AT&T reported in its 2009 annual report that wireline capital expenditures decreased by 21 percent, due in part to a reduction in expenditures on U-verse. Similarly, the number of high-speed Internet customers added by FiOS dropped by about 40 percent from the second quarter of 2008 to the second half of 2009.

The recession has definitively put a damper on the growth of advanced-access architecture (AAA) services, for FiOS much more than for U-verse. As of mid-2010, it is not at all clear that FiOS will ever resume the robust gains it was making before the recession.

The recession is not the only factor slowing AAA growth. In public announcements, Verizon executives have said they will not expand the FiOS network beyond the originally planned 18 million homes passed. The company will reach that goal by the end of 2010 and now says that it will curtail construction growth activities and focus on marketing to the 18-million-home footprint.

Verizon is in the process of selling off a number of its wireline services (most

of them formerly GTE properties) to Frontier. This sale will reduce Verizon's wireline footprint from approximately 32 million to 27 million customers. This sale will also reduce the number of FiOS homes passed by about 750,000 of the 18 million. (Frontier will continue to serve those customers.)

However, although curtailing construction may seem like an end to FiOS growth, that interpretation would be very misleading. Verizon reports that it is achieving an average penetration rate of about 25 percent with FiOS. That leaves 75 percent of the footprint to market. The company could easily double and may even triple the number of FiOS customers without adding any more construction.

THE NET NEUTRALITY ISSUE

Net neutrality is another reason given for the slowing of construction. The issue heated up a few years ago when one cable company limited transmission of an extremely high-byte-rate usage service on its Internet service. It is now entangled with the issue of whether the Federal Communications Commission (FCC) should regulate broadband offerings under Title 1 or Title 2 of the Communications Act. Title 1 is for information services and involves much lighter regulation than Title 2, which is for telecommunications common carriers. A third scheme being considered by some of the FCC commissioners, denoted as the “third way,” offers a compromise between Title 1 and Title 2 regulation.

The major carriers, including AT&T and Verizon, are opposing any change from Title 1, and AT&T has rather pointedly stated that changing to Title 2 regulation would result in a curtailment of its investment in U-verse.

The FCC will make a decision on this in 2010. Many writers (this one included) think AT&T may already have made a decision to slow construction spending on U-verse, and is using this regulatory issue as a scapegoat.

OVERBUILDING

This leaves a question about Verizon's experiment with overbuilding adjacent AT&T territories in Texas. (Full dis-

closure: The author lives in such a territory and has just purchased a FiOS installation.)

The advantages for Verizon of overbuilding are as follows:

- First, and most obviously, overbuilding gives Verizon access to more customers – and not just any customers. Normally, a telephone company's customer base is limited by the historical accidents that led to the creation of its franchise boundaries. There is no process for selecting customers. With an overbuild, Verizon has the ability to select its new customers. Of course, it will select high demographics or highly mobile demographics – both very good markets for new technologies that may be relatively expensive.
- By adding addressable customers, Verizon broadens its base for video programming. Programming is sold to a network based on the number of eyes that network may bring to the programming. By being able to selectively broaden its customer base, Verizon has the opportunity to lower its programming costs.
- By growing out of franchise, Verizon also has the option of expanding its footprint for businesses. This same architecture could be selectively expanded to pick off prime technology parks, corporate offices and so forth.
- This expansion could be done within current capital budget commitments by delaying planned additions of FiOS in franchise and instead using the funds to serve what it calls “near out of franchise” (NOOF), or areas close to its incumbent footprint. Verizon can always serve the in-franchise customers later.
- A NOOF overbuild can use existing higher-level infrastructure (that is, higher than the access plant), including central-office buildings, and take advantage of trained technical personnel already in the area.
- Because Verizon can select areas where demand for FiOS services will be high, overbuilding should achieve a higher rate of growth for FiOS and improve bottom-line results.

INDUSTRY ANALYSIS

This is a very impressive list of advantages, and it makes me think Verizon must have more in mind than just northeast Texas.

POSSIBLE LOCATIONS FOR VERIZON OVERBUILDS

GTE, which was merged into Verizon, was known as the “suburban telephone company.” GTE did not have many large cities in its service area, but it was well located in the suburbs of some of the nation’s largest cities. In northeast Texas, Verizon is using exactly these suburban cities around the Dallas-Fort Worth Metroplex for overbuilding into AT&T areas.

Other former GTE areas that are currently part of Verizon include suburbs surrounding Los Angeles, Houston, Seattle, Portland and Chicago, among others. Many of these are being sold by Verizon to Frontier, but the California territories are not. California is the obvious next target for Verizon. The market is huge, and the company has many old GTE franchises that surround the entirety of Los Angeles, which is AT&T territory. This area would be a perfect target of opportunity for Verizon, and AT&T could suddenly be subjected to some very strenuous competition in very large, lucrative markets.

ARCHITECTURES OF FIOS AND U-VERSE

The architectures of FiOS and U-verse are very different and represent very different design philosophies. FiOS is primarily an FTTP approach, while U-verse is primarily FTTN.

FiOS is an effort to future-proof the

installation. The design approach of placing fiber all the way to the end customer attempts to put in place a facility that will never have to be changed. Advances will be accommodated by changing the equipment on the ends of the fiber, but the facility itself is a lifetime facility. This philosophy is very well illustrated by the following quote from Paul Lacouture, then Verizon’s executive vice president for network and technology, explaining the company’s announcement that it would switch from BPON to GPON technology:

“GPON is the next step in the evolution of the all-fiber-access network. When we first launched the nation’s only large-scale FTTP program in 2004, we said that one of the most important competitive and cost-effective features is that we could increase speed and capabilities by evolving to more advanced electronics and without having to change the fiber we had already deployed or are deploying. Today’s announcement begins to fulfill that promise.

“In addition to the ability to boost our broadband Internet speeds on fiber, this new technology will enhance the video-on-demand capabilities of our existing FiOS TV product on fiber and sets the stage for an all-IP TV offering in the future. This new technology also brings us substantial cost benefits, allowing us to reduce costs of the electronics portion of the FTTP platform by about 25 percent. The bottom line is that this is an access network at the local level that is without peer in this industry.”

By contrast, U-verse seeks to achieve a relatively high-bandwidth delivery to

the customer while minimizing the capital costs of new fiber. It places fiber only to neighborhood nodes that are as much as 5,000 feet from the end customer. The remainder of the route is composed of existing copper wire plant. This approach results in placing much less fiber and consequently requires far less capital.

Three predominant AAAs are in use by telcos today, and those used by the cable companies are generally similar except for having coax on the last leg. These are the AT&T approach of fiber to the node, the Verizon approach of fiber to the premises and the BellSouth (now AT&T) approach of fiber to the curb (Figure 1).

Since Alexander Bell first decided to build outside plant, telephone engineers have debated the best way to extend service to the final mile. The debate continues now with the various FTTx schemes for bringing fiber close to the customer. In some ways, the debate has not changed much – it is still about the economics of each approach – but in one very real way, it is different now.

In the past, this debate was always about plain old telephone service (POTS) and the economics of various way of providing it. Now, although the debate is still about economics, it is also, maybe even more, about alternative ways to meet requirements for the bandwidth needed for some very exotic services.

The question is not just “Which is cheaper?” but “What services will I provide? “How many of each service will the customer need?” “How much bandwidth do I provide for these requirements?” and “How will compression

Service	Architecture	Name	Description	Distance of Last Leg
Now defunct	FTTC	Fiber to the Curb	Very near the home – used primarily by BellSouth. Can be used with VDSL to deliver HDTV, high-speed data and voice.	500 feet
U-verse	FTTN	Fiber to the Node	Serves a subdivision – AT&T and Qwest current primary plan. Can be used with VDSL2 or ADSL2+ to deliver HDTV, high-speed data and voice.	3,000–5,000 feet
FiOS	FTTH/P	Fiber to the Home/Premises	Fiber all the way to the house – Verizon’s current plan.	N/A

Figure 1: Predominant Advanced-Access Architectures

INDUSTRY ANALYSIS

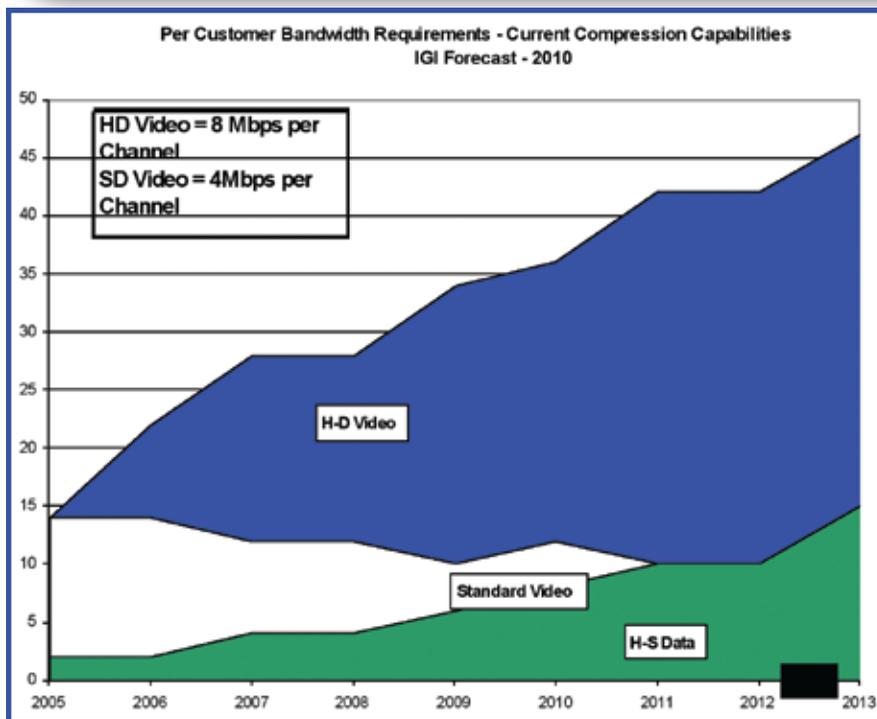


Figure 2: Bandwidth Needs Through 2013

advances impact my choices?” The answers to these questions now guide the technology choices for the last mile at least as much as economics does.

While the debate was never simple, the addition of new unknowns about service requirements makes it much more complex. To see how complex, one just needs to note that the three (now two) major telcos – Verizon, AT&T and BellSouth – studied this issue with all their great resources and came up with three completely different answers!

In earlier years, the bandwidth capacity of access networks was a moot issue because the bandwidth needed was only what was necessary for a voice call. Now the local loop is carrying data and, most recently, television. With the desire for high-speed data driving ever-higher-bandwidth data services, and with video now in the equation, the need for bandwidth is much more complex. The answer to the question of bandwidth requirements drives multiple billions of dollars of capital investment

on the part of the local telephone and cable companies. (See Figure 2.)

This chart shows that, by 2013, the need for bandwidth to the home will be driven by the delivery of multiple high-definition television (HDTV) channels, which will account for 80 percent of the total requirement. This requirement will far exceed any other driver of bandwidth. Traditional voice is so small as to barely be visible on the graph. Even high-speed data is only a minor percentage of the requirement.

The chart also forecasts the virtual end of standard-bandwidth video by the end of the period. By then, we expect virtually all telecasts from the major networks and local stations in the top 50 markets to be in high definition. Standard-definition television will be limited to specialty networks, local feeds and small-market stations. Although standard TV sets will certainly receive HD signals, having so much high-definition programming available will certainly drive customers to upgrade.

Remembering that AAA deployment is, at least initially, going into areas with high marketability (also known as higher income), we should understand that AAA bandwidth demand is not national average bandwidth demand. To meet the needs of high-marketability areas, more bandwidth than the national average will be required. Figure 3 addresses this type of area.

The bandwidth requirements shown

2013 BANDWIDTH REQUIREMENT SCENARIO

Item	Channels	Bandwidth (Incremental) Mbps	Per Customer, Watching Video Mbps
HD Channels @ 8 Mbps each High-Speed Data Channels at 8 Mbps each			
68% watching one HD set	22x.68=15	120	8
68% watching two HD sets	22x.68=15 additional	120	8
68% recording two HD channels on a DVR	2x22x.68=30	240	16
68% using high-speed Internet access.	22x.68=15 high-speed channels	120	8
Total		600	40

Figure 3: 2013 Bandwidth Requirements

Bandwidth Item	Amount of Bandwidth Required
Four HD Video Streams	4x8=32 Mbps
Data Channel	Minimum = 5 Mbps, but more likely at least 8 Mbps to be competitive
Voice	1 @ 64 Kbps
Total Requirement	40 Mbps

Figure 4: Forecast Access Bandwidth Requirements 2013

in Figure 3 reflect the need for four simultaneous HD streams per household in 2013 and a simultaneous high-speed data channel. This represents only two HDTV sets and a single DVR or multiple HDTV sets with two DVRs. We actually feel this is a very modest requirement given the above statistics. It is competitive only with what is now offered by satellite TV services.

By comparison, AT&T started to offer two HD streams with U-verse in some markets in mid-2008. Verizon has had multiple streams available with FiOS almost from the beginning. FiOS also offers multiple additional HD streams from its RF overlay.

In Figure 4, taking the four HD streams and the voice and data require-

ments, we forecast a need for 40 Mbps in 2013.

This is clearly above the capabilities of VDSL2 except at much shorter distances than are planned in U-verse. Note that the 5 Mbps for data is very conservative. Verizon's current lowest-speed offering is twice this – 10 Mbps. AT&T has recently begun to offer data speeds of 24 Mbps but not with four streams of high-definition video.

WHY IS U-VERSE OUTSELLING FIOS?

Verizon started selling and marketing its FiOS service earlier than AT&T started selling U-verse, and because of that head start, Verizon remains the leader in terms of customers served. But in recent quarters, U-verse has begun to catch up, and it has outsold FiOS substantially.

In spite of technical shortcomings, U-verse manages to play up its positive features while Verizon seems to hide some of its.

Verizon has what is arguably a superior product, at least in terms of bandwidth delivery, and Verizon has achieved a 3:2 dominance in the market over AT&T. However, in the last three quarters, AT&T has been outselling FiOS by substantial (35 to 40 percent) margins. As Figure 5 illustrates, this author forecasts that U-verse will nearly catch up with FiOS in the next few years. Why?

One reason is certainly that AT&T is doing a much better job of marketing its service. In spite of technical shortcomings, U-verse manages to play up its positive features while Verizon seems to hide some of its. A clear example of this is in the number of channels that a user can record simultaneously. AT&T makes a major point of telling users they can record four simultaneous programs with the U-verse DVR. It doesn't mention that the service is capable of delivering only two HD streams to the home because of bandwidth limitations. FiOS, on the other hand, has plenty of bandwidth but fails to utilize it because it provides an outmoded DVR that is capable of recording only two programs.

In addition, AT&T does much more to promote U-verse. Living in one of the few areas that can receive both services, I see the marketing materials from both companies. AT&T sends out much more material, and it has much better offers (incentives.) Maybe we just throw most of the marketing materials away, but advertising does work. **BBP**

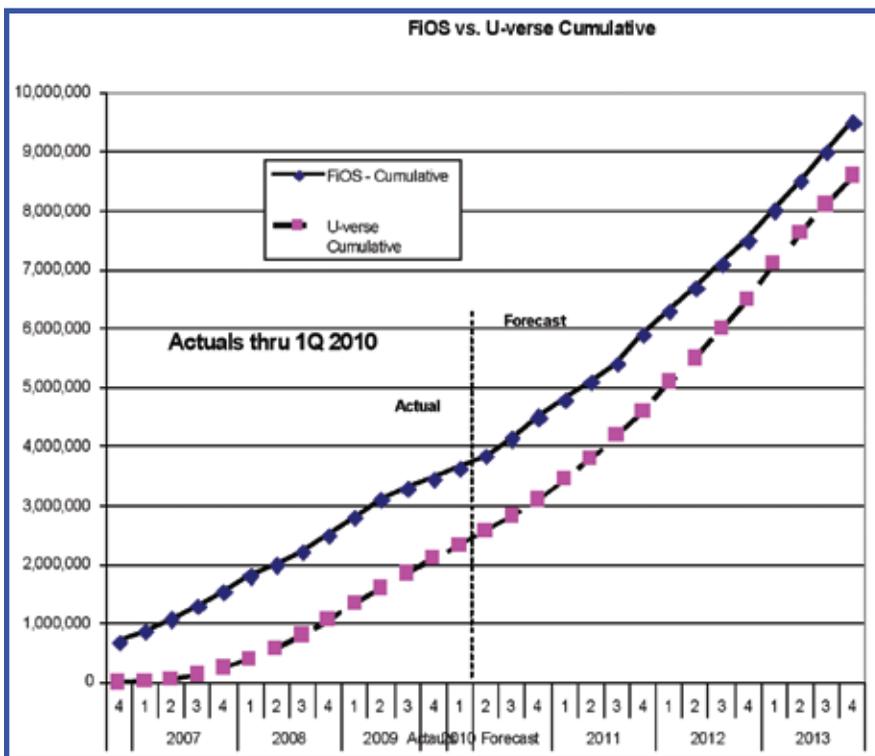


Figure 5: Cumulative Subscribers for FiOS and U-verse