Fiber-to-the-Home Means Never Having to Say You're Sorry

FTTH doesn't force providers into adversarial relationships with their customers – could that be part of the secret of low churn rates?

By Masha Zager ■ *Broadband Properties*

This month's report on the adoption of Verizon's FiOS TV points out that cable companies are beginning to feel the heat from fiber-based telco competition. An executive of the largest cableco, Comcast, said recently that his company expects to lose video customers and market share this year, a remark that immediately sent Comcast's stock plunging by 10 percent. And Comcast isn't alone – not by a long shot.

Why is this happening? There's no lack of creativity in the cable industry, which is brimming with new bandwidth-stretching technology, some of it discussed in this month's "Why We Need More Fiber." The core product is proven, and it meets the needs of the majority of consumers today. Speaking personally, I've been a reasonably satisfied cable customer for years. Yet Verizon bases much of its FiOS advertising on the premise that consumers would love to tell their cable companies to get lost – and the strategy seems to be working.

Much anti-cable sentiment is surely a response to years of indifferent service by cable providers with secure local monopolies. (I was lucky enough to live in a building served by two competing cable providers.) But there's more to it than that.

The deeper issue is that cable technology is nearing the end of its life. That's not to say that it will end tomorrow, or that the industry doesn't have several more aces up its collective sleeve. But it's hard to escape the feeling of watching an endgame being played out.

And endgames generate anxiety. Cable companies know they probably can't meet consumer demand indefinitely, so in addition to finding new ways to squeeze more bits down the pipe (switched video, MPEG-4 compression, channel bonding, spectrum overlays) they must also seek new ways to tamp down demand. They institute bandwidth limits and then cut off customers who exceed them. They interfere with legitimate services that threaten to use unknown amounts of bandwidth. They tell communities they have plenty of cable channels already and don't need any more. Many of them have done a re-markably poor job of explaining all of this to their customers.

Even worse, the need to restrict demand puts cable companies into a strange – one could even say unnatural – relationship with their customers. In most industries, companies value customers who are heavy users of their product. They call them their best customers; they encourage and reward them. But a customer who uses a lot of cable connectivity is called a bandwidth hog who is abusing the system.

Fiber network providers, on the other hand, are free to behave like normal businesses. Because they know there's an upgrade path for fiber as far ahead as the eye can see, they can promote their systems to power users – as Verizon has done with video gamers and Paxio has done with telecommuters – and even seek out new applications that would enable users to fully exploit their systems.

It's just a guess, but could customers' perceptions that providers actually want them to use their products be a factor in the low churn rates that many fiber providers are experiencing? **BBP**

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Verizon's FiOS Deployment as of January 2008

- ■ FiOS Internet and TV services
- ■ FiOS Internet services only

Thirteen States Ratify FiOS TV – Can Verizon Declare Independence?

Launching video services in Oregon last month, **Verizon Communications** said it had reached the 13-state mark for FiOS TV. During the same month, the company also brought video services to new communities in Virginia and New York, and obtained several new video franchises in New York, Rhode Island and Massachusetts.

Verizon says consumers are signing up for FiOS TV at a rate of 3,200 each business day, with several large cable companies admitting that they are feeling the pressure of competition. Wall Street analysts have recently downgraded the outlook for many cable TV companies.

FiOS high-speed Internet services, which are available in 16 states, are also well received by consumers; readers of PC World and Computerworld magazines recently gave FiOS Internet top scores in overall satisfaction, connection reliability, download and upload speeds, customer service and technical support.

Verizon isn't the only telco trying to enhance the appeal of its fiber network with high-definition TV channels. **EATEL**, an independent telco in Louisiana with a large fiber-to-the-home network, recently announced that it had added 12 new HD channels, for a total of 34. The new channels were selected based on customer feedback. Toby DuBois, EATEL product manager, says, "The viewers voted and EATEL listened…. We included the most requested channels in our new lineup."

EATEL also recently partnered with 1st Co Inc. to launch *EATEL 4 News*, a daily news show that features local news, sports and weather, guest interviews, local business updates, cooking demonstrations, community events and health reports. EATEL and 1st Co have built a production studio at EATEL's headquarters where the news show, as well as future TV shows and commer-

cials, will be produced and edited. The studio will allow EATEL to air live broadcasts, which the company says can be useful in emergencies. *EATEL 4 News* will provide more news and content about Ascension and Livingston parishes than any other broadcast source in the region, says Trae Russell, EATEL's communications manager.

Halfway around the world, in the US territory of Guam, an island in the western Pacific, fiber is being rolled out by another incumbent telecom provider. **GTA TeleGuam** selected Occam Networks as the lead access equipment provider for a major upgrade of the telco's network. The first project includes upgrading 10,000 of its 70,000 access lines. The company is pulling fiber directly to the home in some areas and to the curb in other areas, while other areas are remaining with copper for the time being. GTA TeleGuam offers local, long distance and cellular phone service, as well as broadband services.

GTA TeleGuam has purchased Occam's Broadband Loop Carrier (BLC) 6252 ADSL2Plus and POTS Blade, the BLC 6640 Subscriber Trunk Gateway for GR303 signaling, and the BLC 6312 Optical Line Termination Blade and BLC 6450 Access Aggregation Blade for 10 Gigabit Ethernet rings.

"We wanted an all-IP network, including 10 Gigabit Ethernet rings," says Nelson Tanaka, GTA TeleGuam's Chief Operating Officer. "That Occam could offer us both Active Ethernet and GPON solutions was an important selling point. It's helpful for us to work with just one equipment provider for both access technologies." GTA TeleGuam will also be deploying IPTV.

And in North Carolina, independent telco and cable provider **Lexcom** is using Wave7 Optics' Trident7 Platform to provide RF and IP video, voice and data services to homes and businesses. Lexcom is deploying the Trident7 as an "overlay" of existing telephony and HFC

Independent telcos GTA TeleGuam and Lexcom both chose solutions that supported multiple FTTH technologies.

Battle of the Giants:
Verizon FiOS vs. AT&T U-verse

The two largest North American RBOCs are both rapidly building advanced telecommunications networks across large portions of their footprints. Both offer the standard triple play (voice, video, data) along with a variety of ancillary services. And both have undertaken intensive marketing campaigns. That's where the similarities stop, however.

Verizon has staked everything on a fiber-to-the-premises solution; AT&T is using primarily fiber to the node and copper to the home, though it has a small number of FTTP connections in large greenfield developments. (FTTP subscribers are offered the same packages as FTTN subscribers, so they're no better off.) Originally AT&T expected to pass about 1 million homes with FTTP, out of 30 million, but some analysts believe the company will shift to FTTP on a larger scale beginning in 2008, when it starts deploying GPON.

A second major difference: AT&T sees its advanced network primarily as a way to deliver video. Verizon takes a broader view, promoting Internet access and broadband-based applications as much as video.

Here's a detailed comparison of the two projects, based on information publicly released by the two companies. A note of caution: While FiOS take rates appear much higher than U-verse's, the difference isn't as great as it seems. FiOS markets are more mature on average, and take rates tend to improve over time. Second, because AT&T defines U-verse in terms of video, there may be broadband-only customers on the FTTN network who aren't counted as U-verse subscribers.

	Verizon FiOS	AT&T U-verse
Services launched	August 2004	December 2005
Network technology	FTTP (BPON, migrating to GPON)	Mostly FTTN; FTTP in greenfield areas (BPON, migrating to GPON)
Video technology	RF, with IPTV for VoD	IPTV
Maximum Internet bandwidth	50 Mbps down/20 Mbps up (30/15 in some markets)	6 Mbps down/1 Mbps up
Number of video channels offered	200+ and special packages	320 and special packages
Number of HD video channels offered	~30	40+
2010 plan		
Homes passed	18 million	30 million
Subscribers	7 million+	
3Q 2007 actual		
Homes passed	8.5 million	5.5 million
Homes to which high-speed Internet is marketed	6.5 million	2.2 million
Homes to which video services are marketed	4.7 million	2.2 million
Number of high-speed Internet subscribers	1.3 million	~115,000 (not considered U-verse subscribers without video services)
Number of video subscribers	.7 million	126,000
Number of subscribers (total)	~1.4 million	126,000

networks in portions of its service area. Wave7 Optics' RF return was apparently a major consideration in Lexcom's choice, because it supports the set-top boxes already in customers' homes. Another advantage of the Trident platform is that it supports a variety of FTTH network configurations and technologies – though for now, according to Wave7, Lexcom is using GePON. The deployment started in the second quarter of 2007, and the company began offering service in the fourth quarter of 2007. (As we reported several months ago, Lexcom is also using RF PON equipment from Alloptic.) **BBP**

Municipal Projects: Powell, Wyoming, to Become 'Internet City'

The city of **Powell, Wyoming**, which we reported last June was negotiating funding for a FTTH project, has now approved the funding and expects to both begin and complete construction of the project this year. Local media report that the city, which has about 2,000 households, plans to issue $6.5 million in private revenue bond financing (that is, with no pledge of city tax funds) and that the network will be run for six years by local telco **TCT**, which deployed FTTH in some other parts of its service area several years ago. The city expects to recoup costs from sales of services and from the savings generated by remote meter reading.

Mayor Scott Mangold writes on the city Web site, "Powell, Wyoming, will be known as 'Internet City.' We are planning on educating the local businesses on taking advantage of our system, as well as the schools and hospitals. The fiber-to-the-home project has been years in the making and it's finally about to happen. While other communities depend on the oil and gas industry to keep

them afloat, Powell will have something a little cleaner and more stable to hang its hat on. Plus, those playing "Halo 3" or "Call of Duty 4" online will have higher hookup speeds to kill their opponents more efficiently. Now, that's some important stuff."

The Wired Road Project is a new regional open-access, multiservice telecommunications network being deployed in Virginia by the **Blue Ridge Crossroads Economic Development Authority**, which serves Carroll and Grayson Counties and the city of Galax. Phase One of the project is designed to provide wireless access in all three localities, along with some limited fiber services; project managers are currently seeking service providers to offer and to sell a variety of services on the network – not only Internet and video but telemedicine, gaming, data backup and other advanced IP-based services. By the time Phase Three is completed in 2012, the network will offer integrated fiber and wireless services with fiber connections to more than 80 percent of the homes and businesses in the region, totaling about 16,000 premises. Consulting firm DesignNine is working with the project.

DesignNine is also involved in a project spearheaded by the city of **Danville, Virginia**, called Connecting Danville to the Future, which will provide fiber or wireless broadband connections to every home and business in Danville's electric service area over the next five to seven years. Like the Wired Road Project, the network (called nDanville) will be publicly built and operated, but will rely on private businesses to deliver services.

Phase One of nDanville, which has been operational for more than two years, connects city and county government offices and schools. Phase 2A, which is now being rolled out, will of-

fer access to business parks and the Tobacco Warehouse business district. Phase 2B will be a more general rollout to businesses throughout Danville, using fiber-to-the-premises or high-performance wireless, and Phase 3 will provide fiber-to-the-premises access to all homes and businesses throughout the Danville utilities service region. Automated electric metering will be installed along with broadband service, and customers can elect to participate in a trial of automated power management.

Providers are being actively recruited to offer services including business and residential VoIP; network backup services; entertainment and VoD packages; and home security, among others.

Morristown FiberNet, a Tennessee municipal operator that delivers triple play services to nearly 4,000 consum-

Two open-access projects in Virginia – one operated by the Blue Ridge Crossroads Economic Development Authority and the other by the city of Danville – aim to bring fiber to businesses and residences, along with high-bandwidth applications.

ers over a fiber-to-the-home network, announced that it has deployed PacketLogic for compliance with CALEA regulation. PacketLogic also provides deep packet inspection capabilities for defense against network intrusions and other inappropriate traffic. The Procera unit was installed in anticipation of area law enforcement agencies' need to receive timely, accurate information whenever a warrant is issued. ADH Communications, the consultant that worked with Morristown FiberNet to design and implement the FTTH network, also evaluated, tested and installed PacketLogic

Several other municipalities are moving forward in their consideration of fiber-to-the-home projects:

The city council of **Glenwood Springs, Colorado**, which has owned a municipal fiber optic network for five years, is reviewing the costs and benefits of extending that network to residents' homes. (Currently the city only sells services to businesses.) A referendum will be held in April to gauge citizen interest in the project, but the vote will not commit the city council to proceed.

The **Iron Range Community FiberNet**, a consortium of 12 Minnesota towns that is trying to deploy a fiber-to-the-home network, engaged consultant DynamicCity in 2007 to perform a feasibility study, including estimating costs and revenues. DynamicCity's cost estimate was $47 million, a sum that FiberNet has not yet been able to raise. However, the group is reportedly in negotiations with Hiawatha Broadband Communications, an FTTH operator based in Winona, Minnesota, to develop a lower-cost plan.

MI-Connection, a municipal cable utility formed when the towns of Mooresville and Davidson, North Carolina, bought assets of bankrupt cable provider Adelphia, was turned over from caretaker Time Warner Cable to BVU FOCUS, the consulting and management arm of FTTH provider Bristol Virginia Utilities. BVU FOCUS will manage the company's cable and Internet systems for five years. According to MI-Connection's newsletter, system upgrades beginning in early 2008 will enable the company to offer additional digital cable channels, HD channels, increased Internet speeds and other advanced products and services. The newsletter says MI-Connection is also "dedicated to the strategic addition of fiber-optic infrastructure to increase system efficiency and to promote economic development." **BBP**

Europe:
Greece on the Fast Track

This month sees two major announcements in Greece, a country with one of the lowest broadband subscription rates in Europe. First, Ericsson announced that it will be the total solution provider and prime integrator of fiber optic telecommunications networks to support the launch of seven Greek digital cities: **Agrinio, Chania, Ermoupolis, Ierapetra, Iraklio, Kozani and Rethymno**.

Initially, the networks will link municipal buildings such as the general hospital, town hall, schools and universities. In addition to the fiber backbone infrastructure, the contract also includes switching and WiFi systems. Rollout has already started.

A few days later, Greek vendor Optronics Technologies announced that it had been awarded a similar contract by the **municipality of Karditsa**. Optronics will construct a metropolitan area fiber network to connect the city's public buildings, and will also conduct a feasibility study for bringing fiber to all of the residences in the city. If the feasibility study justifies it, Optronics will also build a pilot FTTH project in Karditsa. The pilot project will enable 1 Gbps residential broadband connections, which Georgios Papastergiou, Optronics' president, calls "unique even by European standards."

Optronics says its engineers will analyze local planning and demographic data in order to produce an effective fiber penetration model that can be used to calculate the bill of materials, nodes and connections for the FTTH network. The company will make the model available to other municipalities and developers.

In France, provider **Numericable** says it is now deploying fiber optic networks throughout "the whole hexagon" (the French traditionally think of their country as hexagonal), and is no longer limiting deployments to major metropolitan areas. During the week of December 10 alone, Numericable initiated

FTTP service in the cities of Grenoble, Nimes and Perpignan. The company says, "Altogether, more than 70 cities will be connected over the course of the next three months, confirming Numericable's position as the premier fiber optic operator in France." As a traditional cable operator, however, Numericable is using a DOCSIS 3.0-based channel bonding solution from Cisco, rather than a more standard PON or Ethernet solution.

Another Cisco customer is the Dutch provider **Reggefiber**, which is rolling out an optical fiber network based on the Cisco Internet Protocol Next-Generation Network (IP NGN) architecture and using Ethernet FTTH technology. Reggefiber already owns an extensive FTTH network in the Netherlands, and the new projects will add another 100,000 to 200,000 households – making Reggefiber's FTTH coverage the largest in the Netherlands.

Reggefiber's new networks will be built in Deventer, Almere and a third, unnamed Dutch city within the next few months. Residents will have ac-

The European Commission ruled that the Amsterdam CityNet public/private partnership did not involve state aid, because all parties shared the risk and no single partner was in control.

cess to broadband speeds of up to 100 Mbps initially, and up to 1 Gbps in the future. Eventually, Reggefiber hopes to offer FTTH-based broadband services to the majority of residents in the Netherlands.

Reggefiber will deploy Cisco Catalyst 4500 Series Switches as the E-FTTH access platform at its new optical points of presence and a 10 Gigabit Ethernet core network to make optimum use of the increased capacity provided by Cisco 7600 Series Routers. Fujitsu Services will supply, install and support the Cisco equipment.

Reggefiber is also a part owner of **Amsterdam CityNet**, a joint public-private FTTH network. CityNet had been under investigation for a year by the European Commission, which strictly regulates government aid to telecommunications systems, but a recent EC decision concluded that because "the municipality participates in the project on the same terms as would a market investor," no state aid is involved.

The European Commission based its decision on the fact that all of the investing parties (Reggefiber, another private investor, the city and several housing corporations) would have to support any losses. In addition, the project is set up so that no single shareholder can exert sole control over the company. Together with a detailed analysis of the business plan, these elements convinced the Commission that the government participation was allowable.

The Commission emphasized that it will not allow public authorities to engage in FTTH projects simply by claiming that they are acting like market investors; they are required to demonstrate this through a sound business plan and significant private investment with sharing of risk.

Norwegian FTTH provider **RingNett** says it is now using a video headend from Envivio to roll out IPTV across its ADSL2+ infrastructure. RingNett's IPTV service is already available on a test basis over its GPON network. The Envivio MPEG-4 encoding platform lets RingNett offer the same IPTV content over ADSL2+, VDSL2, GPON and Active Ethernet. **BBP**

Asia: Singapore's Three-Lane Digital Highway

The government of **Singapore** took a step closer to its Next Gen National Broadband Network by issuing an RFP for the passive network infrastructure. The government wants the Next Gen NBN to offer pervasive, competitively priced ultra-high-speed broadband connectivity to businesses, residences, schools and other premises.

The Next Gen NBN is expected to be available nationwide by 2015, although high-definition videoconferencing, telemedicine, grid computing on demand, security and immersive learning applications should begin to be available around 2010.

Singapore has embraced an open-access policy with a unique twist: The current RFP will identify a network company to design, build and operate the passive infrastructure. Deployment of active electronics such as switches and routers will be done by a separate operating company, which in turn will offer wholesale broadband access to downstream retail service providers. While open access networks that separate network operation from service provision aren't unusual, we haven't heard of any other networks where network operating responsibilities are shared between two different providers.

The government is prepared to spend up to S$750 million (US$520 million) for the project, and to enforce open access through legislation if necessary. The Infocomm Development Authority of

VENDOR SPOTLIGHT

1st Co Inc.	www.1stco.com
ADH Communications	www.adhcommunications.com
Alcatel-Lucent	www.alcatel-lucent.com
Alloptic	www.alloptic.com
Auvitek International	www.auvitek.com
Cisco Networks	www.cisco.com
Dasan Networks	www.dasannetworks.com
DesignNine	www.designnine.com
DynamicCity	www.dynamiccity.com
Envivio	www.envivio.com
Ericsson	www.ericsson.com
Fujitsu Services	www.fujitsu.com
Ikanos Communications	www.ikanos.com
Mercury Corporation	www.mercury.co.kr/eng/
Occam Networks	www.occamnetworks.com
Optronics Technologies	www.optronics.gr
Procera Networks	www.proceranetworks.com
Wave7 Optics	www.wave7optics.com

Singapore expects to award the winning bid in the third quarter of 2008.

In Korea, where several providers are building out FTTH networks, **Korea Telecom**'s Megapass FTTH service is using a Dasan set-top box that supports both off-the-air and fiber-delivered programming. While KT delivers video services such as video-on-demand, interactive video (and, presumably, cable-only channels) via FTTH, the Dasan set-top box, using a demodulator from Auvitek, can also display off-the-air HD channels with the same broadcast quality. This preserves the full bandwidth of the fiber for commercial services. Megapass also provides broadband rates up to 50 Mbps, the highest speed among all broadband services in Korea.

Hanaro Telecom, the second largest Korean broadband service provider, will deploy Alcatel-Lucent's full-rate GPON solution to deliver IPTV, high-definition television, video-on-demand, high-speed Internet access and interactive multimedia services to 110,000 residential subscribers. The company selected the 7342 ISAM FTTU, which is designed for packet-based voice convergence and IPTV. "As we embark into the era of IPTV and HDTV, the household demand for high-bandwidth broadband services with the right quality of service is gaining importance," says Chan-Woong

Singapore is experimenting with an unusual three-part structure for its Next-Gen National Broadband Network: separate operators for active and passive network components, along with retail service providers.

Park, Senior Vice President of Network Technology at Hanaro, explaining why the company chose GPON. Alcatel-Lucent supplied the equipment for Hanaro's GPON trial last year.

Ikanos Communications says that a **major Korean telecommunication service provider** will be conducting a field trial of residential gateways in fiber-to-the-building, fiber-to-the-home and fiber-to-the-remote architectures for triple play applications. The provider will be testing Mercury Corporation's PHY-agnostic residential gateway, powered by Ikanos' Fusiv Vx155 processor. Mercury was able

to demonstrate in the qualification testing that its gateway provides 100 Mbps throughput with customized quality of

service and firewall/security capabilities for distributing rich-media services inside the home. **BBP**