

Deployments: FiOS at Year-End

By Masha Zager, Telecom Editor

The continued investment made by Verizon (www.verizon.com) in its FiOS network was responsible for making 2006 a year of rapid expansion for fiber-to-the-premises in the United States. FiOS passed more than 6 million premises in 16 states by the end of 2006, exceeding the company's year-end target and more than doubling the number of premises passed at year-end 2005.

While FiOS broadband service is now available to 4.8 million premises, FiOS TV service has lagged behind, due to the difficulty of obtaining video franchises. However, by year-end 2006, Verizon Telecom had obtained more than 600 cable TV franchises covering more than 7 million households. During the fourth quarter the company doubled the availability of FiOS TV, reaching 2.4 million premises in 10 states as of year-end.

Not only is the network expanding, so are take rates. FiOS Internet service penetration doubled during 2006 to more than 14 percent, or about 670,000 subscribers, and FiOS TV penetration increased to 9 percent, or about 207,000 subscribers. As a result, the company's earnings dilution from the FiOS deployment, which stood at 32 cents per share for the year as a whole, fell to 10 cents per share in the fourth quarter.

Verizon's target is to pass 9 million premises by year-end 2007, and it aims to increase take rates even further by introducing a new FiOS interactive media guide and a platform for multimedia applications linking television, Internet, personal computers and phones. By the end of 2007, according to estimates made by UBS Investment Research, Verizon could add another 1.1 million FiOS subscribers.

During the last month, Verizon obtained television franchises in communities in Massachusetts, Oregon and New York State; added FiOS TV service in Maryland, New York and Pennsylvania; and announced expansions of FiOS Internet service in Pennsylvania, Massachusetts and Washington.

Municipal Fiber in Big Cities

In the United States, municipal fiber deployments have been undertaken mainly in smaller towns and cities, mostly because

these localities are more likely to have existing municipal utilities that can run a municipal broadband network. However, larger cities are beginning to look at the merits of municipal fiber. In addition to Seattle, which we've reported on earlier, both San Francisco and St. Paul are giving serious consideration to municipal fiber-to-the-premises systems.

The San Francisco city government recently released a draft feasibility study for a municipal fiber-to-the-premises system. The study, prepared by engineering consulting firm Columbia Telecommunications Corporation (www.internetctc.com), concluded that "municipal FTTP would rank San Francisco among the world's most far-sighted cities" and recommended an open-access FTTP model in which San Francisco would allow multiple communication companies to compete over a city fiber infrastructure built using a "home run" Ethernet topology. The city will be holding hearings on the report.

An advisory committee for the city of St. Paul, Minnesota is looking at the feasibility of building a fiber-to-the-premises network. St. Paul's proposed system would cost \$300 million, but details of financing and building the network have not yet been resolved.

New Municipal Fiber Launched

Several municipal fiber networks have been lit since our last report:

- Burlington Telecom (www.burlingtontelecom.net), the municipal utility for the city of Burlington, Vermont, has begun installing fiber to homes and businesses in several neighborhoods, with plans to finish wiring the city in 2008. BT is offering triple-play services to residential and business customers, with top Internet speeds at 8 Mbps symmetrical upstream/downstream. Burlington's success inspired three nearby towns – Westford, Jericho and Underhill – to pass town-meeting initiatives to create their own fiber optic networks, possibly through Burlington Telecom.

- In Pulaski, Tennessee, the Pulaski Electric System has connected its first 100 customers on a trial basis. Pulaski's system uses equipment from Wave7 Optics (www.wave7optics.com) and will provide triple-play services to residents.

- The Circa Network, a department of Idaho Falls Power, launched its high-speed fiber optic network on March 1. The net-

work was originally built for city purposes but was upgraded and opened for commercial use. Five ISPs are now providing Internet services over the network.

Other municipalities have taken further steps toward fiber with studies and resolutions:

- The Truckee-Donner Public Utility District, a municipal utility in Truckee, California, surveyed its customers to gauge the market for services provided over a fiber-to-the-home network that it has been considering building for several years. Nearly two thirds said that more options for telephone, video and Internet were needed in the community, and nearly half said they might switch to the new video and Internet services if the price were comparable. Responses ranged from "I think the PUD should stick to electricity" to "[the current Internet service] is supposed to be a high-speed service but it isn't."

- The Iron Range Community Fiber Net Joint Powers Board, a consortium of 14 Minnesota communities that is considering building a fiber-to-the-home network, received a report from consultant DynamicCity indicating that the network might require subsidies from local governments and other sources in order to be cash-flow positive.

Connexion Technologies (www.cnxntech.com), a private company that builds and operates FTTH networks in greenfield developments, has announced that it plans to build networks for three new properties: Vistas On the James, a waterfront condominium development in Richmond, Virginia (the developer is Dominion Partners); Mosaic on Hermann Park, luxury high-rise condominiums in Houston, Texas (Phillips Development and Wood Partners); and Carothers Crossing, a traditional neighborhood development in Nashville, Tennessee (Wood Ridge Development). Service providers for these communities have not yet been announced. Connexion has already constructed FTTH networks for about 80 communities.

International Deployments

FTTP supplier Calix (www.calix.com) has broadened its presence in Canada with its selection by Téléphone Guèvremont, a Quebec-based ILEC, and its

CLEC affiliates. Téléphone Guèvremont plans to build out greenfield locations with 2.4 Gbps GPON fiber-to-the-premises networks.

Also in Canada, **NanoFibre** (www.nanofibre.ca), a member of the Columbia Mountain Open Network (www.cmon.ca), is getting ready to launch a FTTH network in the rapidly growing village of Radium Hot Springs, British Columbia. NanoFibre's network will be open access, and it is using BECS software from PacketFront (www.packetfront.com) to control and provision IP services. Residents and visitors will also have free access to wireless Internet service in downtown areas.

PacketFront had additional wins in Norway, where two power utility companies, Alta Kraftlag and Varanger Kraft, have deployed FTTH networks using PacketFront technology and expertise. The two deployments in the thinly populated northern region will give many households broadband access for the first time. Alta now has a fully operational triple-play network while Varanger has gone open access, enabling multiple providers to compete over the same network. And in Sweden, PacketFront secured Sweden's biggest "active" city network to date in Gothenburg, the second largest city in Sweden. Network service provider GothNet deployed the full PacketFront solution to deliver broadband services to businesses and residential areas.

The Swedish telecommunications regulatory agency recently outlined a strategy to provide broadband for all by 2010, saying that open fiber networks would play an important role in meeting that objective. But although GothNet is only one of many open-access networks in Sweden, single-provider networks are also being built there. For example, Swedish electric company Jönköping Energi recently began deploying a GPON fiber-to-the-premises network built by Alcatel-Lucent (www.alcatel-lucent.com) and its systems integration partner Fiberdata. Jönköping Energi, which is delivering triple-play services (voice, video and data) to customers, is one of the first utility providers in Sweden to announce a GPON build.

TRE-FOR Utilities, one of Denmark's largest utility companies, recently built a FTTP network, offering its customers triple-play services of voice, video, and data.

TRE-FOR is using OSS software from NetCracker (www.netcracker.com).

In the United Kingdom, where incumbent British Telecom (www.bt.com) remains firmly committed to ADSL technology, a local economic development agency called the Walsall Regeneration Company (www.walsall-regeneration.co.uk) is planning the nation's first fiber-to-the-premises network. A team of consultants is currently conducting a study and developing a business case for fiber.

Several large FTTH projects are underway in France, and it appears that some residents there may eventually have a choice of FTTH providers. The regional public utility **SIPPEREC** (www.sipperec.fr) awarded a contract to **LD Collectivités** (www.ldcollectivites.fr) to develop a residential fiber-to-the-home network for 13 cities in the Paris region, using EPON technology. Shortly afterward, LD Collectivités' owner, Erenis, was taken over by independent carrier Neuf Cegetel (www.groupe-neuf-cegetel.fr), which is also rolling out fiber. Neuf Cegetel expects to offer FTTH service in Paris in April and to pass a million homes with fiber by 2009. As we reported in December, Iliad, another independent, is also building fiber in and around Paris; Iliad said in its 2006 annual report that it was planning to invest €150 million (\$200 million) in its FTTH networks in Paris and other cities during 2007.

@Home (www.essentkabel.com/Top-Navigatie/English.htm), one of the largest cable operators in the Netherlands, is delivering high-speed business services using Ethernet Fiber to the Business (E-FTTB) solutions from Cisco (www.cisco.com). The optical network is designed to be capable of delivering up to 1 Gbps connections with advanced quality-of-service capabilities to support data, telephony, multimedia services and Internet access.

Swiss utility Sierre-Energie (www.vario.tv) has moved forward with a FTTH network delivering triple-play services to its 30,000 business and residential users. The network is based on technologies from Alcatel-Lucent (www.alcatel-lucent.com) and World Wide Packets (www.worldwide-packets.com), and uses IPTV technology from Amino (www.aminocom.com) and Anevia (www.anevia.com).

Orange Slovensko, a subsidiary of France Telecom (www.francetelecom.com/en/), announced its plans to deploy the first FTTH network in Slovakia. Orange says it will invest about \$42 million and pass almost 200,000 households in 10 cities by the end of the year.

In Bahrain, competitive telecommunications provider 2Connect (www.2connectbahrain.com) is building a fiber optic network using a GePON solution from Alloptic (www.alloptic.com).

Korea Telecom (www.koreatelecom.com), Korea's largest communications carrier, is adding another 30,000 access lines to its 70,000-line DWDM PON system, which uses the SpeedLIGHT platform from Novera Optics (www.noveraoptics.com). The country's second largest provider, Hanaro Telecom, which says its FTTH subscriber base is growing quickly, has launched a new HanaTV service, using TeraScale E-Series switch/routers from Force10 (www.force10networks.com).

Finally, Singapore's Infocomm Development Authority qualified four companies and eight joint ventures to bid on constructing the country's high-speed broadband network. Bidder selection should be completed by the end of the year.

Manufacturers Get Ready for 10Gbps FTTH

From BBP Wires

Even as gigabit speeds become standard in fiber-to-the-home access networks, manufacturers are already preparing for the next generation of speed increases. Mitsubishi Electric (global.mitsubishielectric.com) recently announced a new, small form factor 10 Gbps transceiver module capable of a 40 km optical communication transmission, which it says has the lowest power consumption in the industry.

MUSE (www.ist-muse.org), a European Union-sponsored consortium of vendors, telecom providers and research organizations, is organizing a project called Extended Reach PON Systems, with the goal of increasing data transmission rates in passive optical networks to 10 Gbps downstream and 2.5 Gbps upstream. Siemens (www.siemens.com), along with the universities of Eindhoven and Essex, the Heinrich-Hertz-Institut Berlin of the Fraunhofer Gesellschaft and several European network carriers have successfully created a prototype system. In the next step, the system will undergo joint testing with the participating network carriers.

Oki Shows New GPON Laser

From BBP Wires

TOKYO – Oki Electric Industry Co. (www.oki.com) announced a 1490nm wavelength semiconductor laser suitable for use in outdoor GPON fiber-to-the-home equipment. The laser can trans-

mit up to 2.5 Gbps at an output level of 15mW, the industry's highest level, over a temperature range of -40 to 85°C. Oki had already been providing similar lasers for GePON systems, which are some-

what slower than GPON. Samples of the GPON laser will be available in mid-May, and by July Oki expects to have a version with an even lower optical power output and higher temperature range.

Single-Chip GPON Solution from Mindspeed and Terawave

From BBP Wires

NEWPORT BEACH, CA – Semiconductor developer Mindspeed Technologies (www.mindspeed.com) and PON provider Terawave Communications (www.terawave.com) are collaborating on a complete system-on-chip solution for GPON optical network terminals (ONTs). The new solution will integrate Terawave's GPON media access controller (MAC), a

high-bandwidth L2 Ethernet switch, and Mindspeed's carrier class low-latency voice subsystem. The device will be partitioned to provide maximum system design flexibility and enable ONT manufacturers to speed time to market at the lowest possible cost. The two companies say that the device's performance will support both fiber-to-the-home and fiber-to-the-curb for

multi-dwelling unit deployments and enable the delivery of next-generation broadband applications at speeds up to 100 Mbps. The two companies are also immediately offering a full ONT system reference design, including complete software and packaging. System-on-chip samples are expected to be available in the fourth calendar quarter of 2007.

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