

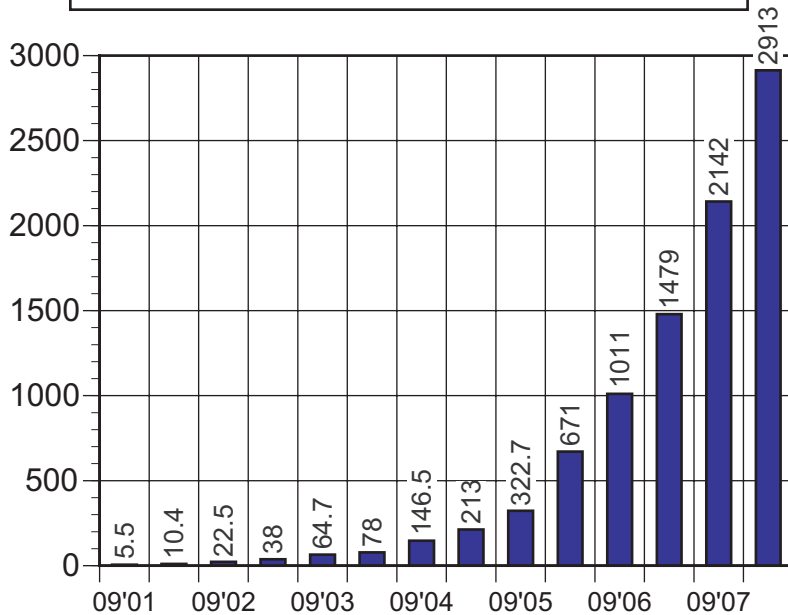
Monthly Newsletter Covering
Global Markets & Developments In
All Fiber to the Premise Proposals

FTTC FTTH FTTP
HFC PON EPON GPON

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North America FTTH homes connected (cumulative) (millions)



Source: RVA LLC

SERVICES

Verizon introduces FiOS for Business

Verizon on July 10 launched FiOS TV for Business, a new subscription-television service designed for small and medium-sized businesses, delivered exclusively by Verizon's advanced all-digital, 100 percent fiber-optic network. The new

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offering makes the picture quality and reliability of FiOS TV readily available to all types of small-business venues — ranging from medical office waiting rooms to banks, building lobbies, restaurants, and taverns.

“The introduction of FiOS TV for Business brings an extraordinary TV experience to the commercial viewing space,” said Monte Beck, vice president of business marketing for Verizon.

“Judging from the positive consumer response we’ve had to FiOS TV, it can give a competitive advantage to businesses that offer TV viewing to their customer.”

U-verse comes to Tulsa

Tulsa-area residents now have a new choice for their television and communications services. AT&T Inc. announced the launch of the company’s integrated suite of AT&T U-verse services, including AT&T U-verse TV, AT&T U-verse High Speed Internet, and AT&T U-verse Voice.

AT&T says that U-verse brings together TV, broadband, home phone, and AT&T wireless services, all on one bill, with unique features that provide a new level of integration, convenience, and control.

AT&T U-verse TV, High Speed Internet, and Voice services are all delivered over AT&T’s advanced Internet Protocol (IP) network.

Customers can currently order AT&T U-verse services in parts of Tulsa, Jenks, and Owasso. AT&T will make U-verse services available to more homes throughout the area on an ongoing basis.

“With the launch of AT&T U-verse TV, Tulsa customers are finally getting a better choice in video entertainment services,” said Ryan Stafford, AT&T general manager for Oklahoma and Arkansas. “And we’re taking it even further by making your services work together and offering cool features you can’t get anywhere else.”

Verizon adds 22 channels

Verizon FiOS TV has launched 22 new channels, including 15 additional high-definition (HD) channels. FiOS TV customers in Fort Wayne now have more than 440 HD choices available at any time, with a total of 41 HD channels and more than 400 HD video-on-demand (VOD) titles offered each month.

The first in a series of channel additions coming this year, new content includes sports favorites like the Big Ten Network and new HD channels like CNBC, Bravo, and USA. The next series of content additions will include more HD channels, including CNN, TBS, Lifetime, three new Starz channels, and two new Showtime channels, as well as 16 new multicultural channels.

Verizon will continue expanding its FiOS TV channel lineup this year, with a major focus on HD content. By year-end, Verizon will offer all available major HD programming.

“High-definition and sports content are among the most popular TV programming, and we’re bringing the best of both to FiOS TV,” said Terry Denson, vice president — FiOS TV content and programming. “The addition of new HD and sports channels, along with the new multicultural content and more, is part of our commitment to lead the industry in the scope and quality of our programming.”

POLICY

Ignis Photonix receiving EU support

The European Commission has through the ICT program recognized Ignis Photonix for their next-generation WDM PON technology.

Together with other leading European telecom system providers like Ericsson AB, Ignis Photonix will lead a joint development effort for enabling more cost-effective broadband services. The project is granted funding of EUR3 million from the European Commission.

The project, called GigaWaM, was initiated by Ignis Photonix and will be technically

lead from Ignis PLC-fab in Birkerød, Denmark.

More than 160 European telecom projects applied for EU funding through participation in the ICT program.

Only 27 projects were accepted, and GigaWaM led by Ignis Photonyx received significant recognition.

Behind the EU ICT program is the entire European telecom industry, with committee members from the leading and fastest-growing telecom providers in Europe.

“This is a strong recognition of the unparalleled expertise and know how in Ignis Photonyx – and our faith in WDM PON.

The GigaWaM project is fully aligned with the strategic roadmap for Ignis Photonyx. We are today a leading supplier of WDM PON components and we aim to further grow and strengthen this position,” said CEO Magnus Breidne at Ignis Photonyx.

The size of the market for WDM PON products that will be the offspring of the GigaWaM project is estimated to be around EUR230 million annually within the next four to five years.

This will support the fast-growing and ever-increasing demand for higher bandwidth and help the international ICT industry improve the offering of triple-play services and applications such as high-definition TV and video-on-demand.

“As the WDM PON market is maturing we will experience increased pressure on performance efficiency and production cost. The GigaWaM project is focusing on technology that can offer high speed broadband to low cost across all markets,” said Breidne.

Current technology using copper lines has reached maximum capacity, and the demand for next-generation technology is accelerating.

WDM PON will replace today’s GPON technology, and the aim of the GigaWaM project is to develop a prototype of a WDM PON optical subsystem.

NEW PRODUCTS

JDSU introduces fiber-optic inspection, cleaning and testing kits to prevent leading cause of network downtime

JDSU announced the release of all-in-one fiber-optic test kits, providing network technicians with a simple way to avoid one of the leading causes of network downtime: contaminated, or “dirty,” fiber. Based on its recognized best practice to “Inspect Before You Connect,” JDSU provides all of the tools necessary to inspect, clean, and perform power or attenuation measurements on fiber-optic connections in easy-to-use kits to prevent costly network damage during installation, qualification, and troubleshooting.

“Working with service providers worldwide, we believe that fiber contamination is the number one source of costly truck rolls and optical network impairment,” said Steve Lytle, general manager in the JDSU Communications Test and Measurement business segment. “Inspecting with a kit that contains all the necessary tools before you connect enables technicians to conveniently inspect both sides of an optical connection, clean it if necessary, and conduct the required optical testing to ensure the integrity of the network.”

JDSU inspection, cleaning, and test kits are designed specifically to meet the needs of today’s fiber applications and environments, including FTTx, LAN/WAN, and datacenters, found in both cable and telecommunications networks. The kits include JDSU video fiber microscopes, optical cleaning tools, PocketClass or SMART optical light sources and optical power meters, and a visual fault locator (VFL). The kits also include a wide selection of Westover precision tips for the video fiber microscope and a collection of fiber-optic patch cords for connecting to the system under test.

Fiber inspection and cleaning are critical components in a comprehensive fiber

deployment and operation strategy. Proactive inspection prior to network testing and installation reduces downtime, optimizes signal performance, and protects components from costly damage.

EXFO releases NQMSfiber 5.0

EXFO Electro-Optical Engineering Inc. announced the release of NQMSfiber 5.0, a Web-based fiber-monitoring solution with sophisticated functions for centralized fiber-optic network assurance enabling improved operation and maintenance.

This latest element management system (EMS) software release, which is also part of EXFO's commitment to its Service Assurance business and product offering, offers the most complete range of features for all network applications in which optical fibers and cables are mission critical. In particular, businesses connected to a fiber backbone through an access network have exacting demands for network availability and services. Without 24/7 proactive monitoring of fiber infrastructures, network service providers (NSPs) cannot preempt cable failures or respond to network degradation in due time.

NQMSfiber 5.0 is the only EMS software on the market in which all access and reporting functions are Web based. Real-time alarm management and status monitoring functions are supported using applets that are fully integrated into Web browsers like Internet Explorer and Firefox. Standard licensing provides access to as many as 20 users, whether they are connecting from inside or outside the corporate network.

Taking advantage of EXFO's nearly 20 years of best in-class expertise in optical time-domain reflectometry (OTDR), NQMSfiber combines leading-edge technology with innovative software. For example, the newly improved Learning feature automatically sets fault-detection thresholds across a full dynamic range, thus rendering the optimization of the

system very easy to achieve. Other advanced features include alarm management, scheduled reporting, trouble-ticket handling, and status view of a specific region or entire network on a two-dimensional map.

"This latest version of NQMSfiber delivers the intelligence that customers have been demanding from their fiber monitoring solutions and sets a new standard for remote fiber test systems," said Etienne Gagnon, EXFO's vice-president product management and marketing. "The combined benefits of EXFO's best-of-class OTDRs and automated functionalities within the most advanced fiber monitoring solution allow NSPs to avoid network disruptions or accelerate restoration time without the need for complex and time-consuming configurations."

Phyworks announces chip milestone

Phyworks, a provider of analog and mixed signal ICs for multi-Gigabit communications, announced the shipment of its 10 millionth chip. The company's transceivers and transimpedance amplifiers cover 1- to 10Gbps data rates. Moreover, the company claims its FTTH product line is regarded as the market leader in terms of value and performance.

"Reaching this production landmark so soon really is testament to the great vision of our product development and marketing strategies," contended Phyworks CEO Stephen King. "The world's two largest regions for FTTH, Japan and the USA, are ramping very quickly, and since beginning full production in only 2006, we have already been able to attain a position of dominant market leadership."

Releasing what it claims was the world's first integrated transceiver IC in 2003, Phyworks says it effectively changed the cost-structure of low data rate optical modules. Used with lasers and VCSELs, its transceiver and transimpedance amplifiers provide cost-effective, high-performance options for

155Mbps to 2.5Gbps SONET/SDH, 1-Gigabit Ethernet, and 1- to 4Gbps storage applications.

“Phyworks’ shipping of ten million units is a clear indicator of growth in the global FTTH market, which we predict will continue to ramp at an accelerated pace in the years ahead,” added Jag Bolaria, senior analyst at The Linley Group. “What’s also interesting is Phyworks’ 10G technology for both optical and copper networks, a technology area we believe is set to have a significant impact on future networking infrastructure.”

In February 2008, Phyworks introduced what it claimed is the world’s first fully 10GBASE-LRM-compliant serial retimer/receiver, providing integral electronic dispersion compensation (EDC) and clock and data recovery (CDR). Overcoming modal dispersion in legacy multimode fiber LAN infrastructure for links up to 300m, the PHY2060 enables simple upgrade of X2, XFP, and SFP+ modules to 10Gbps LRM operation.

BUSINESS

NTT Plala picks A10

A10 Networks announced that its AX Series next-generation server load balancers have been selected as the video distribution platform for “Hikari-TV,” a video-to-television distribution service provided by NTT Plala Inc. Consolidating “OCN Theater,” “OnDemand TV,” and “4th MEDIA,” which were previously operated by the NTT group as its three main video distribution service brands for TV, NTT Plala’s Hikari-TV provides services to deliver various video content for home TV. Hikari-TV’s services include those for video-on-demand and multichannel broadcasting via NTT East and West’s “B FLET’S,” NGN commercial service “FLET’S Hikari Next,” and NTT West’s “FLET’S Hikari Premium.”

The AX Series was selected as a server load balancer (SLB) solution for Hikari-TV, which is one of the core services of NGN operated by the NTT group, because the AX Series meets

the IPv6 and high-performance requirements for accommodating anticipated growth in the number of users. The AX Series recently won the Grand Prix/Best of Interop Tokyo 2008 award as Best Carrier/Internet Service Provider (ISP) solution for its comprehensive IPv6 solution and high-performance IPv6 server load balancing capabilities.

“After a comparative test with competitive server load balancer products, we selected A10’s AX Series for its advanced architecture, stable and superior IPv6 performance, outstanding cost-effectiveness, and prompt support from A10 and partner Bussan Networks,” said Mr. Shinro Nakagawa, general manager of the network engineering department for NTT Plala.

“We chose A10’s AX Series as the high-performance server load balancer platform for ‘Hikari-TV’ since the video distribution service is expected to grow as a future core business of NTT Plala and its killer application running on NGN (‘FLET’S Hikari Next’) of NTT East and West.”

CONTRACTS

TOP picks Enablence

Enablence Technologies, a supplier of fiber-to-the-premises (FTTP) equipment for residential and business services, announced the installation of its proprietary Trident7 Universal Access Platform for the fiber-to-the-business (FTTB) networks within the Taiwan Optical Platform Group (TOP) service areas in central Taiwan.

TOP’s service areas cover more than 600,000 homes passed in the major cities of central Taiwan. The company’s first deployment of a FTTx network will employ Enablence Technologies’ Trident7 IEEE 802.3 GE-PON (EFM PON) standard Compact OLT (COLT) platform to offer triple-play services for residential and business customers in apartment and office buildings. The targeted service area

will be more than 300 buildings with 20-60 subscribers in each building.

The Trident7 COLT platform fits perfectly with TOP's FTTx deployment model due to the unique ONT (optical network terminal) Port Extension capability, which provides for cost-effective modular expansion of in-building network. After a field trial among multiple system vendors, the Trident7 was selected for its system performance, network stability, and superior technical support.

"We are thrilled to be working with TOP through our system-integration partner in Taiwan, Hiway Broadband Co., Ltd. in Taiwan. This project illustrates how the Trident7 platform is gaining traction not only in the U.S., but also internationally," said Arvind Chhatbar, CEO of Enablence. In this deployment, TOP will roll out Enablence's ONTs with its own PLC transceiver units.

"This is a key milestone for Enablence as we integrate our components into its FTTx Network Division Products," added Chhatbar.

Neuf does GPON with AlcaLu

Alcatel-Lucent announced that it has signed a new frame agreement with Neuf Cegetel, France's leading alternative service provider, for the deployment of a fiber-to-the-home (FTTH) network in Paris. Alcatel-Lucent's Gigabit passive optical network (GPON) solution will enable Neuf Cegetel to offer very high speed access and services to more than 100,000 apartments.

The project is part of an initiative led by the Paris social housing office OPAC (Office Public d'Aménagement et de Construction) to bridge the digital divide in the French capital.

Alcatel-Lucent's GPON solution will enable Neuf Cegetel to offer triple-play services, including 18 television channels that are high-definition television (HDTV) ready, high-speed Internet access, and VoIP. Alcatel-Lucent will also provide Neuf Cegetel with installation and commissioning services.

"We renewed our confidence in Alcatel-Lucent's future-proof GPON solution as it supports the introduction of advanced applications such as HDTV to a significantly increasing number of end-users," said Jérémie Manigne, general manager of the Broadband Division of Neuf Cegetel. "Alcatel-Lucent enables us to seamlessly extend full triple-play services to all of the OPAC's apartments in the Paris region and to build on this infrastructure to wholesale our network to other applications providers."

AT&T files franchise in Tennessee

As a direct result of a new state law that encourages statewide video competition, AT&T Inc. has announced plans to offer video services in communities across Tennessee and to invest approximately \$400 million during the next several years in fiber network upgrades, further broadband deployment and Internet-based technologies to bring new services, including IP-based television, to Tennessee consumers.

These upgrades are a direct consequence of House Bill 1421, passed by the Tennessee Legislature and signed into law in May by Gov. Bredesen.

"The Legislature and the governor have created a competitive environment for video services, and consumers are the real winners," said Gregg Morton, president, AT&T Tennessee. "We commend Gov. Bredesen, Speaker Naifeh, Lt. Gov. Ramsey, Comptroller Morgan, Chairman Curtis, Chairman Jones, Rep. McDaniel, Sen. Ketron, Sen. Jackson, Sen. Finney and all of the members of the Tennessee Legislature for their vision."

FINANCING

PacketFront raises EUR26 million

PacketFront, a supplier of purpose-built FTTH solutions, has closed a EUR26 million financing round to address new market opportunities in the broadband sector. The financing round was completed by the existing

stakeholders European Equity Partners, Amadeus Capital Partners Ltd., and TLcom Capital LLP.

PacketFront has established a position as a leading supplier of broadband solutions to city and greenfield carriers in Europe and the Middle East and is now looking to take its capabilities into the carrier segments of the market.

“From the outset, PacketFront has been recognized for delivering feature rich, service aware broadband infrastructure and, as our current customer base expands, these capabilities are being recognized by the carrier community,” said PacketFront chairman and European Equity Partner Hans Blomberg. “We have seen many of our customers transform to small Telecom Operators in their own right, and this give us the platform to address the much larger Telecom Operator market.”

“The fundings will be used to expand our access portfolio to include GPON and to make the total solution more open, standard based and modular,” said PacketFront CEO Niclas Sonesson. “Our intentions are to go head to head with the large traditional telecommunication equipment vendors.

“Our unique selling point will be the same as with our existing city carrier customers offering purpose built and feature rich access products and customer premises equipment. PacketFront’s award-winning BECSTM network control system enable operators the ability to lower operational costs by automating business processes, network provisioning and management tasks”

MERGERS AND ACQUISITIONS

TranSwitch to acquire Centillium Communications

TranSwitch Corp. has entered into a definitive agreement to acquire Centillium Communications Inc. TranSwitch, provider of carrier-class semiconductor equipment for

Ethernet-over-SONET/SDH, broadband access, and Carrier Ethernet applications, says the acquisition will further diversify its product portfolio to include rapidly growing fiber-to-the-home and VoIP offerings.

The combination strengthens TranSwitch’s position in the next-generation communications semiconductor market, say company representatives. They claim the combined companies will have greater scale, a significantly improved expense structure, and a truly global reach. Management of TranSwitch has identified approximately \$10.5 million of annual expense savings and expects the transaction to be accretive to earnings in the first full quarter after closing and significantly accretive in 2009.

Per the agreement, TranSwitch will issue an aggregate of 25 million shares of common stock and \$15 million, which will be allocated pro rata among holders of Centillium common stock and vested, in-the-money, stock options outstanding at the closing of the merger. Based on Centillium’s capitalization as of July 9, 2009, Centillium shareholders would receive 0.5958 shares of TranSwitch common stock and \$0.36 in cash for each share of Centillium common stock. Based on TranSwitch’s closing share price on July 9, 2008, the total consideration values Centillium at \$42.8 million, or approximately \$1.02 per share on a fully diluted basis. Centillium shareholders will own approximately 16 percent of the combined company.

“We are delighted to welcome Centillium’s customers, employees, and shareholders to join the TranSwitch team,” contended Dr. Santanu Das, CEO of TranSwitch. “Centillium has a large number of important customers, including Alcatel-Lucent, OKI, Samsung, ZTE, and Tellabs. Their products have won significant industry recognition, and their Mustang chip is currently being used in OKI’s ONU platform, which is part of NTT’s EPON-based FTTH deployment. We are

particularly excited about Centillium's second recent design win in the FTTH platform of a second prominent supplier for this deployment," he noted.

"This platform is currently being qualified, and we anticipate a ramp in early 2009. The Japanese government has made a major commitment to rolling out FTTH, and NTT's goal is to reach 20 million homes by 2010. This represents a major revenue opportunity for the company.

"This combination further strengthens TranSwitch's position in the platforms of Tier-1 equipment suppliers with contracts at carriers that have made significant financial commitments to upgrade their current infrastructures," Das continued.

"These contracts include carriers in the UK, Korea, China, India, and now Japan. We believe that as these deployments begin to ramp in volume, the combined company has the potential to significantly increase its revenue in 2009. As a larger company, we will enjoy a significantly better expense structure as well as stronger relationships with both customers and suppliers."

"We are very pleased to be joining the TranSwitch team," added Faraj Aalaei, co-founder and CEO of Centillium, who will also serve on TranSwitch's board upon closing of the transaction.

"Consolidation in the communications industry is both good and necessary, and the combined company will be significantly stronger and more profitable than either one by itself."

The boards of directors of both companies have unanimously approved the transaction, which is subject to customary closing conditions, including the approval of Centillium's shareholders.

The transaction is expected to close in the fourth quarter of 2008. Upon completion of the transaction, TranSwitch will have approximately 158 million fully diluted shares outstanding, with current TranSwitch

shareholders owning approximately 84 percent and current Centillium shareholders owning approximately 16 percent of the combined company's shares.

Enablence acquires DuPont Photonics' PLC-based assets

Enablence Technologies, a supplier of fiber-to-the-home (FTTH) equipment for triple-play residential and business services and optical components and subsystems for access, metro, and long-haul markets, announced that it has signed a definitive Asset Purchase Agreement with DuPont Photonics Technologies LLC, a wholly owned subsidiary of DuPont, to acquire certain assets of DuPont Photonics based in the Boston suburb of Wilimington, Massachusetts, subject to certain approvals, conditions, and consents. Concurrent with the agreement, DuPont will make a cash investment in Enablence.

Per the agreement, Enablence will issue common shares equivalent to \$9.5 million based on a 30-day average share price prior to the closing of the transaction for the assets and the investment. All shares issued will be subject to the statutory 120 days hold period. The conditions are expected to be satisfied on or before July 24, 2008.

DuPont Photonics has developed a switching fabric using planar lightwave circuits (PLCs) that enable such devices as integrated reconfigurable optical add/drop multiplexers (ROADMs); 1xN, MxN, and NxN switches; and variable optical attenuators.

All the intellectual property and associated know-how will be transferred to Enablence under the terms of the agreement.

"DuPont Photonics' product portfolio is complementary to our current component and subsystems offerings and is consistent with our vertical integration strategy that allows us to build on our core technology strength with higher value added products," explained Arvind Chhatbar, CEO of Enablence.

“Our acquisitions allow us to focus on capturing innovative products and technologies that will help us solidify our Planar Lightwave Circuit (PLC) leadership position in the access, metro, and long haul markets.

We are also pleased with the investment DuPont is making in Enablence, which will permit us to continue to build on the product portfolio we are acquiring from DuPont,” he added.

Enablence also announced that it has made changes to its corporate structure and management team to expedite the integration of DuPont Photonics and other recent acquisitions. DuPont Photonics, Albis Optoelectronics, and ANDevices will now form the Optical Components and Subsystems Division of the corporation and be headed by Dr. Jacob Sun, who was previously the CEO of ANDevices.

He will continue in his role as chief operating officer of Enablence and serve as president of Enablence’s new Optical Components and Subsystems Division. Peter Caioli, the president of Enablence’s Albis Optoelectronics, will now head Enablence’s European operations to assist in streamlining the corporation’s operations in that region.

Dan Hilton, the current vice president of finance and administration, has been given additional new responsibilities as senior vice president for corporate development and administration and will lead Enablence’s integration efforts related to recent mergers and acquisitions. Ronald I. Benn, a Chartered Accountant with several years experience as CFO in several publicly traded and private companies, has been appointed as vice president of finance, taking over the finance function.

Tom Tighe, the former CEO of Wave 7 Optics, will lead Enablence’s efforts in building our FTTx global deployments in his capacity as president of Enablence’s new FTTx Networks Division.

Opnext to acquire StrataLight Communications

Opnext Inc. announced that it has reached a definitive agreement to acquire privately held StrataLight Communications Inc.

StrataLight Communications designs, develops, and manufactures 40Gbps line-side optical subsystems and advanced dispersion compensation modules for the communications industry.

The company says it has shipped more than 2,500 units to its customers, which include many of the world’s largest communications equipment manufacturers. StrataLight’s subsystems, together with the optical systems of its customers, are widely deployed in several of the world’s largest Tier 1 service provider networks, claim company representatives.

“Through this acquisition, Opnext will provide a complete 40G solution, which we believe will make us the market leader in 40G,” contended Harry Bosco, president and CEO of Opnext. “Opnext is known for one of the most comprehensive and best performing product portfolios in the marketplace and now, by incorporating StrataLight’s leading 40G line-side products into our portfolio, we will be able to address both the line- and client-sides, significantly expanding our addressable market,” he reports.

“The combined expertise and technologies of Opnext’s client-side and StrataLight’s line-side products will position Opnext to address current and future 40G applications as well as the emerging 100G applications.”

“With its industry-leading technology and solid customer base, StrataLight is well positioned as the leader in commercial deployment of 40G optical transmission subsystems,” added Shri Dodani, president and CEO of StrataLight Communications. “Together with Opnext, we will be positioned to lead in high-growth and strategic segments of the market, leveraging Opnext’s strength in module

development, complementary product portfolio, and proven track record of delivering quality components.”

As per the agreement, which has been approved by the boards of directors of both companies, Opnext will acquire StrataLight Communications for a total consideration of approximately 26.55 million common shares and \$30 million in cash. Based on Opnext’s closing share price of \$5.35 on July 8, 2008, this represents a value of approximately \$172 million. Upon completion of the acquisition, StrataLight Communications’ shareholders will own approximately 29 percent of the combined company.

The completion of the proposed merger is subject to the satisfaction of customary closing conditions, including the approval of the stockholders of Opnext and StrataLight and the receipt of required regulatory approval. Under separate agreements, the significant stockholders of Opnext and StrataLight holding a sufficient number of shares to approve the transaction have agreed to vote in favor of the transaction. The combination is expected to close in the fourth calendar quarter of 2008.

MARKET INTELLIGENCE

FTTH group studies usage

According to a new report from the FTTH Council Europe, improvements in broadband connectivity speeds are having a direct impact on consumer bandwidth usage, with demand per broadband home growing at almost 20 percent per annum over the last five years. The research, undertaken with Ventura Team LLP, is believed to be the first of its kind to directly test the hypothesis of Nielsen’s Law of Internet bandwidth against patterns of fiber and ADSL broadband usage in Europe.

Joeri Van Bogaert, president of the FTTH Council Europe, explained, “Everyone is familiar with Moore’s Law for Computing, and Nielsen’s Law takes a similar approach to measuring

Internet bandwidth. Whilst Moore sees computing power grow 60 percent annually, Nielsen states that the bandwidth available to a high-end user grows at 50 percent per year. For the first time, we wanted to find out if this increase in available speed is true and is related to an increase in consumer demand and usage.”

In summary, the FTTH Council Europe report findings are as follows:

- European broadband speeds are rising at 50 percent+ per annum;
- High-end broadband usage per home is growing at 20 percent per annum;
- FTTH broadband homes drive three times more traffic than ADSL in Europe.

The first part of the research tested Nielsen’s Law from a technology perspective. It was found that a decade after it was first conceived, Nielsen’s Law is still working well as a guide to the trend in broadband speeds, as the growth rate of 50 percent per annum held true for all European countries evaluated.

Secondly, the study tested Nielsen’s Law from a usage perspective, examining European broadband traffic patterns across a sample of 100,000 broadband homes using FTTH. The results of this research show that high-speed broadband usage is growing at an annual rate of 20 percent.

To further qualify this growth in user demand for increased bandwidth, the study compared fiber broadband usage with ADSL across four European countries and found that fiber homes currently drive three times more traffic than ADSL homes.

Floyd Wagoner, of the FTTH Council Europe’s Market Intelligence Committee that headed up this research, explained, “This rise in usage when fiber networks are in use is significant at this stage of market evolution. Already there is a large difference between the traffic used by ADSL and fiber users, and this despite the fact that many of the mass market applications that will realise the potential of fiber

are not even available yet. We expect this to increase significantly as fiber adoption continues to increase across Europe and further services are developed with fiber in mind.”

According to Van Bogaert, the message is simple: “When customers have faster connections they use them more. When discussing FTTH business cases and investments, two basic questions about bandwidth always arise: Who needs all that bandwidth and what will they use it for? I think the findings provide a compelling answer. For example, despite the advancement in the motor industry, the average speed of today’s modern car is actually under 30km/h, but that doesn’t mean that the driver never exceeds this speed. The same can be said for broadband usage; when the opportunity to utilise it to its full potential arises, consumers grasp it with both hands.”

Study: FTTH favors incumbents

Definitive research released at the High Speed Europe conference is the first to analyze the business case of rolling out next-generation fiber networks across Europe.

The study, carried out by WIK, a European telecoms research and analysis firms, shows overwhelmingly that only incumbent operators, with their extensive infrastructure and customer bases, can profitably roll out high-speed fiber-to-the-home (FTTH) lines to large parts of Europe. This raises the possibility that incumbents could once again increase their market share, reversing the trend towards more competition in telecoms.

The research, which was commissioned by the pro-competition group ECTA, covers six major countries (Germany, France, Spain, Italy, Portugal, Sweden) and combines results from these with independent research carried out for regulators, governments, and the OECD in other countries, which reaches a similar conclusion. The WIK study demonstrates that, because of substantial economies of scale, replication of

fiber access lines for high-speed services is not economically viable on any widespread basis.

The research shows that it is significantly more cost-effective for incumbents to roll out fiber networks than it is for entrant operators to do so. Incumbents can save up to 30 percent of their investment compared to standalone operators. The three key reasons are that incumbents already own ducts on a nationwide basis; they can make substantial efficiency savings compared with their current network structure; and they already have the number of required subscribers that would pay for the investments simply by switching customers from their existing lines. In some of the countries examined, significant viability was found for incumbents to roll out next-generation access networks even with a relatively conservative return on capital of around 10 percent, which is commensurate with returns made on today’s regulated copper access networks.

Dr. Karl-Heinz Neumann, director of WIK, said, “Incumbents have accepted in principle the concept of open ducts, but this research clearly shows this is not enough. Europe needs open networks and not just open ducts to generate a competitive environment and to develop an optimal degree of replicability and investment in a next-generation access environment. Dominant firms should construct their networks from the outset to foresee access. Open networks in a competitive next-generation access environment make good business sense and incumbents should improve their business cases by pursuing a positive attitude to infrastructure sharing and access.”

Report: Bandwidth famine looms

An independent Global Bandwidth Study, commissioned by CIP Technologies, has revealed that the bandwidth glut is history and the world’s consumers are facing a bandwidth famine.

Due to huge changes in network content and social behaviors, the bandwidth demand is

set to exceed 160Tbps by 2010 — an annual demand that exceeds the equivalent of the combined broadband network usage of the previous decade (1998-2008).

The demonstrable explosion of consumers' use of online video and data services, which includes the BBC's iPlayer and YouTube, has seen the demand for Internet bandwidth soar. The BBC reported that over 21 million programs were requested on iPlayer in April 2008 alone, only four months after going live.

The author of the new independent study, David Payne, formerly of BT and now with the Institute of Advanced Telecommunications at Swansea University, has calculated that the increasing demands are not a temporary change in behavior, but the beginning of a massive requirement for additional bandwidth as the use of online video and data services increases.

Explained Payne, "Around the turn of the millennium, we used to talk about a bandwidth 'glut.'

There was a lot of idle capacity. Networks now are being used in a way that few people foresaw, for example early take-up of personalised video, rather than broadcast television, dominating Internet video services. Based on a range of service scenario models, it is clear that demands for bandwidth will continue to put increasing pressure on existing network infrastructures.

By 2018, assuming that this capacity is made available by the operators; usage could grow to 40 to 100 times the levels seen in networks today. However it is difficult to see how operators can economically grow existing network architectures to meet this demand, and further consideration of the types of networks and the technology deployed is required if they are to ensure profitability.

"A significant investment is needed to ensure that businesses can share large files and send high quality images (for health, design and videoconferencing purposes) and home users

are able to access and enjoy high definition Internet television (IPTV), on-line gaming and other services requiring large data transfers at high speed such as video-clip and image sharing."

David Smith, chief technology officer for CIP, said, "The Global Bandwidth Study demonstrates that current telecom networks will be unable to cope with the scaling demands for bandwidth.

A step-change in technology is needed that can not only deliver this bandwidth demand at economic cost but also significantly reduce the amount of energy required to power and cool it.

The current technology will be physically too large and energy-hungry to deliver the levels of bandwidth growth demanded by users. A new technology is required that will help deliver the bandwidth and support the telcos' challenge to reduce costs and their carbon footprint. CIP believes that photonic integration will be increasingly the way forward to provide the step change cost reduction per unit bandwidth necessary to economically meet projected demand."

GPON sales up 33 percent in 1Q08

Communications market research firm Infonetics Research reports that the nascent GPON market posted healthy sequential growth worldwide in 1Q08, driven by service provider investments in broadband access networks to deliver bandwidth-intensive services such as IPTV bundled with voice and high-speed Internet services.

Infonetics' report, "PON and FTTH Equipment and Subscribers," shows that during the same period, BPON equipment sales declined significantly and EPON sales dipped, together bringing the overall PON market down 3 percent to \$417 million worldwide in 1Q08.

"Service providers increasingly turn to PON as the next generation of residential broadband access, primarily in areas where DSL

service penetration has reached maturity and operators are looking to increase average revenue per user (ARPU),” said Mark Showalter, directing analyst for broadband networks at Infonetics Research.

Other report highlights

- The top 3 overall PON market share leaders maintained their positions in 1Q08, with Mitsubishi leading, followed by Tellabs and Hitachi;
- Between 4Q07 and 1Q08, worldwide GPON manufacturer revenue increased 33 percent and ports climbed 38 percent;
- Alcatel-Lucent retains 1st place in worldwide GPON revenue, followed ever more closely by Huawei;
- In 1Q08, worldwide Ethernet FTTH equipment revenue fell 6 percent sequentially but is expected to increase 75 percent by 1Q09, as operators in Asia continue using Ethernet in metro areas to connect apartment buildings and businesses.

Updated quarterly, Infonetics’ PON report tracks PON equipment revenue and ports, including BPON, EPON, GPON, WDM-PON, and OLTs and ONTs with FTTH vs. FTTB splits; Ethernet FTTH equipment (CPE vs. service provider); and total FTTH equipment (CPE vs. non-CPE). The report also tracks PON, POTS, Ethernet, and DSL ports; and PON, PON FTTH, and Ethernet FTTH subscribers. The report provides worldwide and regional market size, worldwide market share, and forecasts.

Companies tracked include Alcatel-Lucent, Allied Telesis, Alloptic, Calix, Carrier Access, Cisco, Corecess, ECI, Ericsson, FiberHome, FlexLight, Fujitsu, Furukawa Electric, Hitachi, Huawei, Mitsubishi, Motorola, NEC, Nokia Siemens Networks, Novera Optics, Occam Networks, PacketFront, Sagem, Samsung, Sumitomo, Telco Systems, Tellabs, UTStarcom, Wave7 Optics, World Wide Packets, ZTE, and others.

China and India lead worldwide telecom carrier CapEx and revenue growth

Communications market research firm Infonetics Research reports that worldwide service provider CapEx (capital expenditures) totaled \$248.8 billion in 2007, a 7 percent increase from 2006. Infonetics’ report, “Service Provider Capex, Opex, ARPU, and Subscribers: Worldwide,” projects a spike in worldwide carrier CapEx in 2008, followed by a plateau in 2010 and a decline in 2011, and emphasizes that the weak US dollar is inflating current growth rates in Brazil, Canada, China, Europe, India, and Japan.

“Our CapEx analysis indicates we are in the fourth year of an investment phase, and we may be reaching the plateau this year in both North America and Europe, where large service providers’ capital intensity (the ratio of CapEx to revenue) will likely be as low as 12 percent.

Meanwhile, China and India will drive a significant jump in carrier CapEx in 2008 as a result of network construction projects combined with currency appreciation against the US dollar. Both countries are still posting double-digit revenue growth in their native currencies, which, converted in US dollars creates a big spike in worldwide carrier revenue as well,” said Stéphane Téral, principal analyst at Infonetics Research and lead author of the report.

Other highlights from the report include the following:

- Telecom service providers earned a combined \$1.5 trillion in annual worldwide revenue in 2007, up 10 percent from 2006, with currency appreciation making up the bulk of the growth, while the rest came from wireless services;
- Carriers are increasingly investing in application software (vs. hardware) for media rich applications such as content, storage, and security for broadband-based wireline and wireless services;

- Current investment drivers for carrier spending include convergence between IT, media, Internet, and telecom, which is adding new competitive pressures to carriers, and the shift from legacy TDM to next-generation IP networks;

- The world's 10 largest service providers (ranked by 2007 revenue) are AT&T, Verizon, NTT, Deutsche Telekom, France Télécom, Vodafone, Telefónica, China Mobile, BT, and Sprint;

- The next-largest service providers include Telecom Italia, Comcast, and KDDI, which, according to their most recent growth rates, are poised to join the top 10;

- The incumbent share of North American carrier CapEx jumped from 56 percent to 63 percent in 2007; MSOs are expected to increase their share of North American carrier CapEx by 2011;

- The Asia-Pacific telecom industry is squeezed between two opposite market forces: a saturated market made up of Australia, Hong Kong, Japan, South Korea, Singapore, and Taiwan characterized by flat to decreasing CapEx, and a fast-growing market driven by China and India, characterized by double-digit growth for both CapEx and revenue;

- Caribbean and Latin America (CALA) service provider revenue jumped 29 percent between 2006 and 2007;

- Mobile infrastructure makes up the bulk of total equipment CapEx in 2007, accounting for about 20 percent, followed by voice infrastructure, optical equipment, and broadband aggregation equipment;

- WiMAX equipment spending by service providers as a portion of total carrier CapEx has roughly doubled each year since 2004 and will continue to increase its share in the near term, driven by major WiMAX projects in the US, India, and Latin America.

Infonetics' report tracks revenue, CapEx, CapEx-to-revenue ratios, OpEx, ARPU, subscribers, and access lines of 154 public and

semiprivate/government-owned service providers. The report includes actual data and forecasts, market drivers, in-depth analysis, service provider demographics, and pivot tables for customizing analysis with data viewable by service provider, service provider type, and equipment category. Much of the data and analysis is updated monthly; the rest is updated biannually.

Infonetics publishes CapEx reports for North America, Europe/Middle East/Africa (EMEA), Asia-Pacific, Caribbean/Latin America (CALA), and Worldwide.

Fiber subs overtake cable in q1

The latest data from Point Topic reveal that in Q1 2008, fiber-optic broadband for the first time added more subscribers than cable. While there were 2.5 million cable broadband subscribers added worldwide in the first 3 months of 2008, fiber grew by over 4.2 million users.

"It's a significant milestone for fiber-optic broadband, where it is available consumers will take fiber over other broadband technologies," said Oliver Johnson, Point Topic CEO. There have been doubts expressed that consumers will find additional speed necessary or attractive, but the evidence is that users value bandwidth. A significant factor in their choice of technology is price.

"If you look at the cost per megabit then DSL comes in at around \$20 per megabit per month taking global averages. Cable does better at roughly \$12 but they are both completely eclipsed by fiber where costs can get as low as 50 cents per megabit per month," continued Johnson. There are sizeable variations from country to country, region to region, and operator to operator, but a rule of thumb is that DSL can cost the consumer 15 times as much as fiber to get a megabit of bandwidth and cable is seven times as expensive.

The growth in fiber numbers is being driven by China, Japan, and South Korea, where

cable and DSL are losing subscribers to the fiber technologies. In the US, UK, France, and Germany, low availability means low adoption.

“There are problems in the de-regulated markets when it comes to major infrastructure investment. Fiber deployment is expensive and in the US and Europe there are significant regulatory hurdles to overcome,” said Johnson.

“It’s difficult to persuade operators to make the sort of commitment needed when they can’t guarantee their returns. In most western

markets regulators frown on monopolies and it’s very difficult to sanction government expenditure given the self-imposed legal frameworks. Without some form of centralised funding however it will be a long time before consumers in these markets get access to cheaper bandwidth,” concluded Johnson.

China also continues to gain momentum in terms of broadband overall. At the moment it’s still No. 2 in the world, after the USA, in terms of total broadband subscribers, but the gap continues to close.

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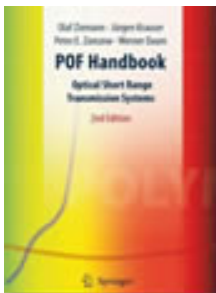
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Day 1: Active Components and Fibers

Wednesday - August 20, 2008

Transmitter and Receiver for POF Systems

- Olaf Ziemann, POF-AC Germany
- LED and laser for data communication
 - Large area photo detectors
 - Comparison of different wavelengths for POF transmission
 - Coupling technologies for active components
- Wed. AM Tutorial 9:00 a.m. - 1:00 p.m.

Large Core Diameter Optical Fibers

- Olaf Ziemann, POF-AC Germany
- Polymer Optical Fibers, hybrid and glass fibers
 - Standards for POF
 - Optical and mechanical properties of POF
 - Measurement techniques for large core diameter fibers
- Wed. PM Tutorial 2:00 p.m. - 6:00 p.m.

Day 2: Passive Components and System Design

Thursday - August 21, 2008 Thu. AM Tutorial

Design of POF Systems

- Olaf Ziemann, POF-AC Germany
- Review of published transmission systems
 - Power budget calculation for POF systems
 - Commercial available systems
- 9:00 a.m. - 1:00 p.m.

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Passive Components for POF

- Karl-Friedrich Klein, FH Gießen/Friedberg, Germany
- Connectors
 - Attenuators, filters and mode converters
 - POF surface preparation
 - Measurement and calculation of connector losses
- Thu. PM Tutorial 2:00 p.m. - 6:00 p.m.

Day 3: Test and Measurement, Environmental Tests and Status

Friday - August 22, 2008

Measurements on POF

- Olaf Ziemann, POF-AC Germany
- Attenuation and bandwidth measurements
 - POF-OTDR
 - Climatic behavior and lifetime measurements
- Fri. AM Tutorial 9:00 a.m. - 1:00 p.m.

Specialty Optical Fibers

- Karl-Friedrich Klein, FH Gießen/Friedberg, Germany
- Microstructured POF
 - Silica glass and conventional glass fibers
 - Fibers and light guides for power transmission
 - UV fibers
 - Specialty POF
- Fri. PM Tutorial 2:00 p.m. - 6:00 p.m.



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