FIBER OPTICS and COMMUNICATIONS

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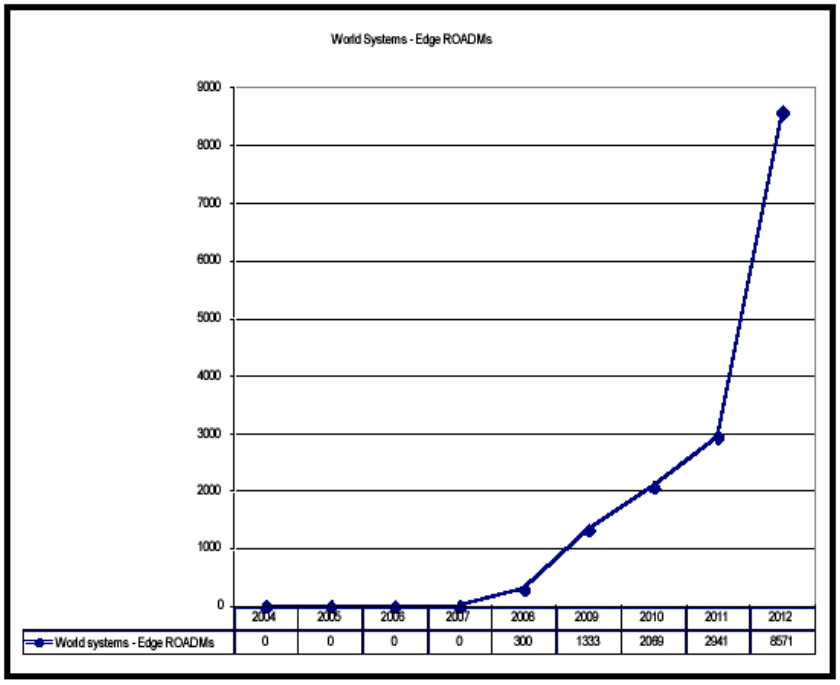
World Systems — Edge ROADMs



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CONTRACTS

RENCI selects Infinera for 'Breakable' N.C. research network

The Renaissance Computing Institute (RENCI) has selected Infinera to support its research on the experimental network testbed dubbed BEN (Breakable Experimental Network), which links RENCI to sites at three universities in North Carolina's Research Triangle Park.

In This Issue...

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In addition, RENCI, Duke University, and Infinera are collaborating on a proposal to the National Science Foundation (NSF) for the GENI project, a federally backed research effort to build a nationwide networking testbed to enable the exploration of technologies for a future Internet with enhanced security, stability, and advanced features.

The Infinera equipment will support RENCI's research agenda for BEN, which serves as a testbed for experimentation with disruptive technologies such as enabling researcher access to the dark fiber; experiments with new transmission, modulation, and coding formats; interaction between the optical plane and the packet forwarding plane in the network; network virtualization; and remote visualization of high-definition images on visualization walls using multiple optical wavelengths. BEN connects sites at Duke University, North Carolina State University, University of North Carolina at Chapel Hill, and RENCI's main office in Chapel Hill and enables university researchers to test their software and hardware by placing equipment at these sites. North Carolina's MCNC, which manages the North Carolina Research and Education Network (NCREN), is also collaborating with RENCI on BEN, and its offices in Research Triangle Park will connect to the network.

For its experiments using BEN, RENCI chose an Infinera Digital Optical Network because Infinera's scalability, flexibility, and ease of operations make it an ideal platform for an advanced research network where researchers are experimenting with cutting-edge technologies and applications using large volumes of bandwidth and requiring frequent reconfiguration. Infinera's Bandwidth Virtualization capabilities also enabled the joint GENI proposal.

Last year, the NSF launched an ambitious multimillion-dollar project, the Global Environment for Network Innovations (GENI), to design and construct a large-scale network that will enable the worldwide research community to test ideas and clean-slate designs in a range of technology areas including network design, distributed systems, and cyber-security. GENI's aim is to forge new solutions to problems facing today's Internet, including inadequate security, reliability, manageability, and scalability. RENCI, Duke University, and Infinera have collaborated on a proposal that envisages a sliceable and highly programmable optical network that connects diverse storage and computing resources to enable dynamic, reliable network provisioning. End-to-end slicing, which combines provisioning of edge computer and storage resources as well as core network resources, is considered one of the top technical risks by GENI.

The Infinera optical platform can deliver these advanced experimental features because of its innovative design. Based on large-scale photonic integrated circuits (PICs) that integrate more than 60 optical devices on a pair of chips, the Infinera system delivers bandwidth in increments of 100Gbps and is scalable to 800Gbps today and more with Infinera's next-generation ILS2 line system. The Infinera paradigm of Bandwidth Virtualization creates a "pool" of available bandwidth that can be deployed and reconfigured to deliver a wide range of optical services, from 1Gbps to 40Gbps services today, and 100Gbps services in the future. The Infinera PIC-based optical engine enables a highly flexible pool of bandwidth, which can be configured through service adapters to support a wide variety of services, with the entire architecture controllable with advanced GMPLS-powered network software.

The RENCI-Duke-Infinera proposal for GENI takes advantage of the strengths of each organization. RENCI and Duke will use ORCA — a software framework developed at Duke — to implement a model for the GENI management plane and deploy it on BEN in order to create a "GENI island" — a miniature version of the future GENI testbed. Infinera has used its innovative

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photonic integrated circuits and Bandwidth Virtualization feature to enable an unsurpassed level of flexibility and programmability in an optical platform for this project.

"We partnered with Infinera because we needed a scalable and flexible solution to accommodate our wide-ranging research agenda for BEN, and because we needed a product that would meet the demands for cutting-edge research necessary to participate in the GENI initiative," said Ilia Baldine, manager of network research and infrastructure at RENCI. "Infinera's solutions provided us with the best pathway to create a high-speed reconfigurable experimental network and to become a leader in developing the next generation of advanced research networks."

"We are excited to partner with RENCI on its Breakable Experimental Network and on the GENI proposal," said Infinera chief technology officer Drew Perkins. "Leading-edge research like that envisaged by GENI will play a vital role in developing new technologies for a more powerful, flexible, scalable Internet that can support the applications of the future."

The Infinera DTN is a Digital ROADM for long-haul and metro core networks, combining high-capacity DWDM transport, integrated digital bandwidth management, and GMPLS-powered service intelligence in a single platform.

Occam Networks signs contract with Telecarrier in Panama

Telecarrier, a telecommunications service provider in Panama, has selected Occam Networks as the principal broadband access supplier in a program designed to increase broadband services and push broadband access throughout the country. This expansion is intended to help meet the needs of Panama's national economic development initiative, which has to date attracted significant foreign business investment.

"Telecarrier is increasing the number of services it offers its subscribers to include IP-based voice and data services and will extend broadband access to a wider number of business customers throughout Panama," said Alvaro Aguilar Cabello, director of engineering and outside plant at Telecarrier. "We analyzed several factors when selecting a new access provider that included the range of equipment the provider offered, the ease of deployment and service activation and the simplicity of installing the equipment and integrating it into our existing packet network. On all counts, we found Occam offered a superior solution to other access equipment suppliers."

Telecarrier is enjoying significant growth as a result of Panama's Export Processing Zones program, a public-private partnership between Panama's government and the private sector to spur the establishment and growth of manufacturing, assembly, distribution, and other operations by foreign businesses. Panama has provided significant tax incentives, access to buildings and other infrastructure, and additional support as part of this program. Panama-based businesses require advanced broadband access and services that Telecarrier plans to provide.

"Panama is a vibrant and growing business center for a wide range of companies eager to trade throughout Central and South America, these businesses require the most current broadband access technology to ensure smooth communication," said Enrique Soler, director of Netcom S.A., the telecommunications systems integrator that recommended Occam's BLC to Telecarrier. "Occam Networks and Netcom have partnered well to bring high-speed broadband access to Telecarrier and potentially other service providers in the future as well."

Today, Telecarrier offers local and long-distance telephone service, DSL, VoIP, datacenter hosting, and related services. As part of the first phase of the next-generation network deployment, the company will upgrade these services to include TLS, VPNs, and additional Ethernet service offerings.

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National LambdaRail chooses Cisco's ONS 15454 for optical network upgrade

National LambdaRail, a consortium of US research universities and private-sector technology companies, announced that it has chosen the Cisco ONS 15454 DWDM system for its strategic Internet Protocol next-generation network (IP NGN) upgrade. NLR says its nationwide optical infrastructure, used extensively by the research community in the US, will benefit by having more reliable services and future enhancements to higher capacity and faster speeds in line with emerging standards.

"The Cisco ONS 15454 platform gives NLR users a great advantage," contended Grover Browning, NLR's director of engineering and leader of the evaluation team. "Because the Cisco equipment has an extended-reach capability and is much less expensive to deploy, we can lower the barriers of optical networking access and encourage researchers to utilize fast network pipes. We evaluated vendors across the DWDM spectrum and chose Cisco as the complete solution — offering low cost, great reliability, and proven technical features — paired with a corporate commitment to our academic community."

"The high-bandwidth, data-intensive applications that characterize many of NLR's larger customers makes its infrastructure an ideal environment to showcase the performance and integrity of Cisco's optical transport platform," added Surya Panditi, vice president and general manager of the Cisco access and transport technology group, which includes the Cisco optical business unit. "We are proud of our long-standing partnership with National LambdaRail, and its selection of our ONS 15454 is evidence of our solution's strength, value, and our vision of how IP transport will evolve.

"The Cisco ONS 15454 MSTP platform also provides NLR with an industry-leading, IP next-generation network transport solution capable of supporting IP-over-DWDM architecture and scaling in-service up to 40-Gigabits-per-second and up to100 Gigabits DWDM," Panditi continued.

The defining characteristic of the NLR infrastructure is its ability to support many distinct networks for the US research community using the same core infrastructure. The planned upgrade will involve the northern tier of NLR covering 6,349 route miles — from Los Angeles through Seattle, Chicago, and Washington, DC, to Jacksonville, Florida. According to Cisco, the ONS 15454 Multiservice Transport Platform (MSTP) is a DWDM system that features two-through eight-degree reconfigurable optical add/drop multiplexer technology that enables wavelength provisioning across entire networks and eliminates the need for optical-to-electrical-to-optical (OEO) transponder conversions. The Cisco ONS 15454 MSTP interconnects with Layer 2, Layer 3, and storage area network (SAN) devices at rates up to 40Gbps. It delivers any service type to any network location and supports all DWDM topologies.

Optelian nabs contract award in Czech Republic

Czech-based services provider OptoNet Communication has selected Optelian's active CWDM and management system to provide services to Ceské Radiokomunikace, the second-largest telecom provider in the Czech Republic. OptoNet is using Optelian's LightGAIN RGN-3GSF CDWM system to provide STM-1 and STM-4 transport as well as Optelian's full network management suite to provide a complete overview of the network services it is providing to Ceské Radiokomunikace.

Ceské Radiokomunikace a.s. is the leading provider of broadcast services in the Czech Republic and was the first carrier to launch public digital television broadcasting in the Czech marketplace. Ceské Radiokomunikace is the largest alternative telecommunications provider and second-largest operator of landlines in the Czech Republic.

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OptoNet is a wholly owned subsidiary of OPTOKON. Co. Ltd., a Czech company specializing in optical fiber, test and measurement equipment, and optical transport solutions.

The RGN-3GSF is Optelian's protocol-independent Quad SFP regenerator card that handles data rates from 10Mbps to 2.7Gbps.

Bresnan increases capacity

Harmonic Inc. announced that Bresnan Communications, a cable service provider in the United States with more than 300,000 subscribers, has increased its video-on-demand (VoD) service capacity with the addition of Harmonic's Narrowcast Service Gateway (NSG) 9000 and 9116 edgeQAMs with Privacy Mode encryption. The NSG's integrated support for real-time encryption at the network edge allows Bresnan to reliably and efficiently protect VoD assets as they are transmitted to the home. The versatility of the NSG 9000 universal edgeQAM platform also provides Bresnan with the flexibility to migrate to a modular cable modem termination system (M-CMTS) architecture in the future. Both NSG models are used to perform a variety of other functions at the edge, including multiplexing, program routing, PCR restamping, QAM modulation, and RF up-conversion.

VoD is a critical application for cable operators like Bresnan to differentiate their services, increase customer satisfaction, and generate new revenue streams. Harmonic has an extensive track record in edgeQAM innovation and market leadership — NSG systems deployed by cable operators today support more than 3 million concurrent VoD sessions. Using best-of-breed technology, Harmonic's NSG systems enable Privacy Mode encryption at the network edge to effectively protect the on-demand content against content piracy.

"As we were planning the expansion of our VOD architecture, two requirements were critical: the ability to deliver a secure and robust on-demand service today and to support other future applications such as modular CMTS to deliver more bandwidth in the future. The NSG 9000 satisfies these requirements," said Pragash Pillai, vice president of strategic engineering for Bresnan.

JDSU test solutions selected by Carphone Warehouse Networks

JDSU announced that it has entered into a contract to provide service-assurance test solutions to The Carphone Warehouse Networks (CPWN), one of the largest and most advanced telecom networks in the UK and a wholly owned division of the fixed-line and broadband business of The Carphone Warehouse (CPW) Group plc. The JDSU service-assurance system, NetComplete, will support the design, implementation, and management of the next-generation network (NGN) for CPWN, covering both its residential and business customers via local loop unbundling.

The JDSU NetComplete Broadband/IP test solution and services were chosen by CPWN after a competitive, extensive evaluation process that determined JDSU's solution to be their best option for increasing operational efficiency. CPWN also noted JDSU's extensive broadband test and performance monitoring experience in the UK. CPWN selected the JDSU NetComplete QT-200 xDSL/triple-play probe and on-board applications together with NetAnalyst software for its sophistication, service history, and suite of available applications.

The CPW Group has over 4 million customer lines across its TalkTalk, AOL Broadband, and Opal brands including over 2.7 million residential broadband customers. This makes CPW the third-largest broadband supplier in the UK. The JDSU solution will be deployed at more than 1,600 exchanges for TalkTalk, CPW's ISP operation, and will play a

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significant role in the CPWN UK-wide fault management process carried out at their new service management center (SMC) at Irlam, Manchester. CPWN staff and technicians will use the solution to proactively troubleshoot complex physical- and service-layer faults, improve diagnostics accuracy, and reduce time-to-repair and trouble ticket volume, as well as help demarcate problems between CPW and BT. In addition, the JDSU NetAnalyst Test Operating System (OS), a centralized test management platform, is being used as middleware between the CPWN front office OS and the QT-200.

JDSU was also awarded an expansion contract for an identical solution to support the AOL Broadband business as it further extends its UK service footprint.

"The Carphone Warehouse Networks is committed to ensuring our customers enjoy a reliable next-generation network that delivers quality voice and broadband services," said Neil McArthur, chief executive of The Carphone Warehouse Networks. "With complete performance monitoring and fault management capabilities by JDSU, we can focus on further improvements on network quality and the customer experience as we seek to become a market leader not only on price but also on service and innovation."

NetComplete's range of solutions comprises probes and software for fixed and mobile networks, as well as quality-of-service and quality-of-experience multiplay solutions for the home.

"JDSU is proud to have been selected by CPWN to help ensure excellent network performance and service quality," said Tom Waechter, president of JDSU's Communications Test & Measurement business segment. "Our test solutions have a proven track record since 2003 in the UK and Europe, helping service providers resolve complex faults correctly the first time, lowering customer churn, improving quality of service and reducing mean-time-to-repair. We also help customers achieve substantive business gains when delivering advanced IP/broadband-based services."

The NGN effort led by CPWN is evolving rapidly and includes a 40G core that will allow the business to scale up capacity and address customers' growing demands for broadband. Two-thirds of all CPW's broadband customers are now on its network, and the business expects to increase this number to 80 percent by March 2009.

Nortel lands Deloitte

Deloitte's global organization has chosen Nortel as a global managed services provider for telepresence, videoconferencing, and associated multimedia services.

Under a new managed services agreement with Nortel, Deloitte's global organization and as many as 130 Deloitte member firm locations around the world will be able to obtain telepresence and open standards-based videoconferencing services.

With oil prices fueling skyrocketing airfares and an increasing global outcry for environmental responsibility, organizations like Deloitte are seeking viable business alternatives to travel. Managed telepresence is one such alternative.

"Being able to meet clients and colleagues in real time without travel is an efficient, effective and environmentally considerate way to address their needs," said Yezdi Pavri, managing partner for Deloitte Canada's Toronto office.

NETWORKS

GÉANT2 gets upgrade

Researchers across Europe are now benefiting from faster collaboration, thanks to upgrades to the high bandwidth pan-European research network GEANT2. The upgrades were announced by DANTE, an international research and education network provider

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working alongside the National Research and Education Networks (NRENs). The upgrades will provide increased bandwidth to a number of countries, further highlighting GÉANT2 as the most advanced, innovative research network in the world.

The planned upgrades are taking place on a number of connections between specific NRENs on the GÉANT2 backbone. Specific regions that will benefit from improved high-speed routes include mainly the Baltic States, south east Europe, and Iberia. Connectivity has been upgraded to 10Gbps to the NRENs in Estonia, Latvia, Lithuania, Romania, Bulgaria, Luxembourg, and Portugal. An additional 10Gbps link has been added to the NREN in Greece, increasing the connectivity to three 10Gbps links. Further upgrades include 2.5Gbps links to Turkey from Bulgaria and Romania and a 2.5Gbps link between Germany and Israel.

GÉANT2 provides an extensive, high-bandwidth connectivity backbone across Europe, with links to other world regional networks, to allow effective joint research and education collaboration between researchers on a global scale. By increasing the connectivity of links to these regions and improving the network further, it provides researchers with world-class resources that will benefit science and education research by bringing together the best minds and eliminating distance as a barrier to innovation.

DANTE, the international research and education network provider responsible for the operation of GÉANT2, is managing the planned upgrades and is working with a number of suppliers, including Lattelecom SIA, Baltic Optical Network (represented by Televorgu AS, Latvenergo AS, and Lietuvos energija AB), Pantel, Memorex Telex Communications (now part of Invitel), OTE Globe, Telefonica International Wholesale Services, Bezeq International, T-Systems Business Services GmbH, and Prime Telecom. The upgrades are currently in progress and will be completed later in 2008.

"High speed networking has revolutionised research across the globe and scientists, academics and students rely on advanced infrastructures effectively collaborate without distance being a barrier" commented Dai Davies, general manager of DANTE. "With these upgrades to the GÉANT2 network providing even greater available bandwidth and faster connection speeds, we are able to provide a world-class service and infrastructure to Europe's research and education community."

FTTX

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 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."

Suo Cable Net taps Alcatel-Lucent for Japanese GPON

Suo Cable Net, a Japanese cable TV operator, has selected Alcatel-Lucent to design, integrate, and deploy a GPON. The new network, which will enable Suo Cable Net to begin rolling out high-speed Internet and video services in July, will be the first commercial GPON deployment in Japan, the systems house says.

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With more than 10 million FTTH subscribers, Japan is one of the most advanced countries in terms of high-speed broadband coverage. While most initial deployments used BPON technology, GE-PON has been the technology of choice for the most recent generation of deployments. GPON supports downstream capacities of up to 2.5Gbps, more than twice the 1Gbps downstream bit rate standard GE-PON provides.

"With Alcatel-Lucent's industry-leading GPON solution, we will be able to offer our customers broadband capacities that support the delivery of high-definition TV and high-speed Internet services," said Tetsuaki Kanai, vice president of Suo Cable Net. Suo Cable Net provides cable TV services in Yanai City.

Alcatel-Lucent will deploy its 7342 Intelligent Services Access Manager Fiber-to-the-User (ISAM FTTU) equipment, a product line complemented by a wide range of optical network terminals (ONTs) that support FTTH, fiber-to-the-building (FTTB), and mobile backhaul.

"We are very excited to be part of the first-ever commercial deployment of GPON technology in Japan," said Frederic Rose, president of Alcatel-Lucent's activities in Europe, Africa, and Asia. "FTTH architectures are clearly the end-game of any planned or ongoing access network transformation. GPON stands out as the optimal and most cost-effective FTTH technology option — thanks to its stability, scalability, flexible management and operations, as well as its guaranteed evolutionary path. GPON will allow Japanese end users to truly experience the power of next-generation triple-play services."

Nokia Siemens Networks announces plans to prioritize wireline broadband access R&D investments

An enormous hunger for bandwidth is driving the fixed broadband access networks and will lead into a hundredfold traffic growth until 2015. This development and the operators' need for revenue growth are driving Nokia Siemens Networks' investment in fiber-based next-generation optical access (NGOA) technologies. At the same time, the company plans to limit its investment into existing Gigabit passive optical networks (GPONs) due to the fact that the mass-market rollout of fiber-to-the-home (FTTH) is unlikely in the short term.

Nokia Siemens Networks plans to focus on DSL and next-generation optical access (NGOA) technology and limit its investment in existing Gigabit passive optical networks (GPONs). In parallel, NSN will develop next-generation optical (NGOA) technologies aiming to take a leading role in the future FTTH market. Nokia Siemens Networks will also continue its fixed access investment in DSL by introducing new products addressing the increasing deployment of FTTC/B.

"Fiber is progressing closer to the home with the focus today on fiber-to-the-curb or building with last mile connectivity based on proven DSL technology," said Christoph Caselitz, Nokia Siemens Networks chief market operations officer. "Our view is that mass market roll out of fiber-to-the-home is unlikely in the short term due to regulatory uncertainty and the operator's business cases. This will be different with the NGOA technology, where we will target to take a leading role."

Verizon FiOS TV offers more channels

Verizon FiOS TV has launched 22 new channels, including 15 additional high-definition (HD) channels. FiOS TV customers in Oregon now have more than 440 HD choices available at any time, with a total of 42 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 to Oregon, new content includes sports favorites like the Big Ten Network and Setanta Sports and new HD channels like CNN, CNBC, Bravo, and USA.

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The next series of content additions will include more HD channels, including three new Starz channels and two new Showtime 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."

Ignis Photonyx receiving EU support

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

Together with other leading European telecom system providers like Ericsson AB, Ignis Photonyx 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 Photonyx and will be technically lead from Ignis PLC-fab in Birkeröd, 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 effciency 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.

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,

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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 Nielson'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."

SUBMARINE CABLES

BT links to Scottish Isles

BT is laying a new fiber-optic submarine cable between Orkney and the Scottish mainland to help bring its 21st Century Network to the Northern Isles.

The 70km cable will run from Skaill Bay in Orkney under the Pentland Firth to Dunnet Bay, around five miles east of Thurso. BT has awarded the contract to independent marine engineering company Global Marine Systems Ltd. (Global Marine). Weather permitting, the work should be completed in around three weeks. Global Marine's cableship CS Sovereign is using its submersible plough and remotely operated vehicle systems to install the cable up to one meter below the seabed.

The new cable is the latest step towards bringing BT's 21 Century Network — the world's most radical next-generation communications transformation program — to the islands.

BT has already reached agreement with Faroese Telecom to share part of a new fiber-optic submarine cable that has been laid between the Faroe Islands, Orkney, and

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Shetland and the Scottish mainland. The cable, which comes ashore at Banff, will provide connectivity to the Northern Isles alongside existing microwave radio links.

Japan-Russia cable lit

TransTeleCom Company CJSC (TTK), a Russian telecommunications backbone operator, and NTT Communications Corporation (NTT Com) announced that the Hokkaido-Sakhalin Cable System (HSCS) — which directly links the two companies' telecom networks via an undersea cable between Nevelsk, Sakhalin, in Russia and Ishikari, Hokkaido, Japan — began commercial operation on July 3. The two companies jointly started to construct the fiber-optic submarine cable HSCS in 2007, and the work was completed in December 2007. HSCS measures 570km in length and has a capacity of 640Gbps. Its startup gives NTT Com the shortest route between Japan and Europe, compared with existing cable routes through southern Asia and the United States, by connecting the cable to the TTK's extensive backbone network in Russia, which exceeds 55,000km.

The HSCS route will enable NTT Com to provide the following high-reliability, high-quality services:

- Global Leased Line — NTT Com will provide additional offering in Arcstar Global Leased Line Service using the new route and taking orders starting now. It is estimated to shorten the latency within the company's backbone by 20 percent to 30 percent compared to the existing routes.
- Global IP-VPNs — The HSCS route will be added to the backbone of NTT Com's secure, scalable Arcstar Global IP-VPN Service (MPLS) beginning August 2008.
- Transit Service — The HSCS route will be added to NTT Com's global IP Tier 1 network covering Asia-Pacific Europe and North America, with connection to major ISPs worldwide, beginning now.

NEW PRODUCTS

Keyed LC System ensures network physical-layer security

The Panduit Keyed LC Fiber Optic System is designed to facilitate secure, modular, end-to-end keyed connectivity for all LC cabling and interconnect elements in the enterprise — from the main equipment room to the desk.

The system comprises keyed LC versions of Panduit OPTI-CORE Patch Cords and Pigtails, OPTICAM Pre-Polished Cam Connectors, OPTICOM Fiber Adapter Panels (FAPs), and MINI-COM Adapter Modules. These components use color-specific keys with positive and negative keying features that mechanically and visually distinguish connectivity to prevent unauthorized mating with unlike keyed or non-keyed adapters.

The key design provides the strictest keying integrity available to help comply with physical-layer security practices, and also addresses identification and authorization aspects of the Defense Information Systems Agency (DISA) Security Technical Implementation Guides (STIG), according to Panduit. Additionally, Panduit Keyed LC Connectors use the same rear pivot latch design as all Panduit LC connectors to provide superior latch cycle life and snagless installation to improve reliability and speed installation. The wide "positive grip" finger latch provides easier access and better control during matings and unmatings for faster moves, adds, and changes, the company concludes.

BTI Systems debuts Intelligent Ethernet Access portfolio

BTI Systems has introduced its Intelligent Ethernet Access portfolio — the BTI 700 Series. This new product portfolio is designed to tightly integrate with the company's Packet Optical Edge platform, the BTI 7000 Series, to provide customers with end-to-end Carrier Ethernet technology, simplifying the delivery of Ethernet

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and IP services in service provider and enterprise networks. The BTI 700 Series delivers high performance at low operation cost points in a compact, fully managed platform for exceptional deployment flexibility, according to BTI Systems. “The demand for Carrier Ethernet is growing quickly as operators make the shift from legacy to Carrier Ethernet services as part of their transition to converged multi-service networks,” said Michael Howard, principal analyst, Infonetics Research. “The worldwide market for end-to-end Carrier Ethernet services is estimated to grow from $12.5 billion in 2007 to almost $28 billion in 2011. Carrier Ethernet has evolved beyond a simple demarcation technology to meet the demands of **today**’s high-speed service-delivery environment — largely because it is cost-effective, reliable, scalable, and easily managed.”

The BTI 700 series can be deployed directly into customer premises, delivering differentiated capabilities for business and service-provider Ethernet connectivity and service delivery. The new product line supports applications including Ethernet virtual private networks (VPNs), E-LINE, and E-LAN; dedicated Internet access service delivery; Ethernet access for IP VPN connectivity; Ethernet backhaul for 4G wireless and WiMAX deployments; and triple-play service delivery (Internet, voice, video). “The BTI 700 Series gives our customers the ability to deliver next-generation Carrier Ethernet services on a fully featured access platform with minimum capital and operational expenses,” said Jean-Charles Fahmy, vice president product management, BTI Systems. “We are addressing both requirements for a successful Carrier Ethernet portfolio: delivering the technology to provide significant, differentiated end-to-end service value across our portfolio and doing so with a cost-effective service delivery vehicle which is necessary to maintain operator margins.”

As the first in BTI’s 700 Series, the BTI 701 provides end-to-end Carrier Ethernet service networking functionality in an “ultracompact system” with two combo ports offering SFP (100/1000Mbps) or RJ-45 (10/100/1000Mbps) interfaces. With AC and DC power options and extended operating temperature from -20 degrees C to +65 degrees C, the 701 is designed for a wide range of site deployments. Management is provided via CLI, SNMPv3, and BTI’s proNX Management Software Suite.

The BTI 700 Series portfolio provides VLAN tagging (IEEE 802.1Q) and VLAN stacking (IEEE 802.1ad — Provider Bridges) to provide network scalability, traffic segmentation, and service security. Traffic classification and quality-of-service (QoS) definition is provided by IEEE 802.1p with up to eight configurable priority queues. Traffic management functionality for service rate adherence is delivered with traffic policing and traffic shaping functionality. Metro Ethernet Forum (MEF) defined User-to-Network Interface (UNI) and compliancy with MEF 9 (Ethernet Services) and MEF 14 (Traffic Management) specifications ensure standardized service offerings and interconnect.

Ethernet in the First Mile — EFM (IEEE 802.3ah) provides standard link discovery, link monitoring, remote loopback, and remote failure indications. Connectivity Fault Management (IEEE 802.1ag) delivers service continuity verification, loopback, and link trace capabilities. Ethernet and optical performance metrics are provided to ensure service level agreement performance. Service and network security is provided for both customer traffic and device administration with IEEE 802.1X, SNMPv3, Port Mirroring, RADIUS Client, IP Source Guard, DHCP Snooping, Dynamic ARP Inspection, Storm Control and Broadcast Suppression Capabilities, and Access Control Lists (ACLs).

CyOptics introduces 10G TOSAs with a wide operating temperature range

CyOptics’ new 10Gbps Miniature Device (XMD) Multi-Source Agreement (MSA) TOSAs, 1625L3 for 40km and 1626L3 for 80km

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applications, are available for an extended operating temperature range of -40 to +90 degrees C, while the 10Gbps TOSAs with integrated driver IC, 1635L7 (40km) and 1636L7 (80km), are offered for an operating temperature range of -5 to +85 degrees C.

All of these new products target high-performance XFP transceivers addressing OC-192/STM-64 SONET/SDH, 10Gbps DWDM, and 10-Gigabit Ethernet applications. Both product families are designed to deliver very low thermo-electric cooler power consumption values over the entire temperature range of less than 0.8W for the 1626L3 and less than 1.2W for the 1636L7.

"Our new and improved TOSAs address the need of transceiver manufacturers for higher operating temperatures driven by the increased packing density of pluggable transceivers on optical line cards," said Stefan Rochus, vice president of marketing and business development. "With the addition of these TOSAs and the availability of industrial temperature range performance we have one of the industry's broadest 10-Gbps transmit and receive product offerings."

The 1625&1626 L3 and 1635&1636 L7 are available in production quantities now.

PLP offers terminal closures

Preformed Line Products (PLP) has introduced the COYOTE Terminal Closure product line, which is designed to be adapted as networks grow.

The Terminal Closure line is available in single- or dual-chamber configurations. The externally mounted OptiTap-style hardened adapters allow for future installation of hardened drops without closure reentry. To add more flexibility to support closures deeper in communications networks, additional drop capacity can be achieved through cable entry ports in the closure base.

The COYOTE Terminal Closure family offers a flexible grommet system, which allows for the addition and removal of adapters and interchange covers. Changing installation needs can be addressed with no special tools required for assembly.

COYOTE Terminal Closures features include the following:

- Internal organizer manages buffer tube or ribbon cable;
- Strand, pedestal, pole, and hand-hole mounting hardware available;
- Provided standard with SCAPC pigtail kits;
- Tested in accordance to Telcordia GR-771 CORE.

The Single Chamber unit with 12-port cover is 17.5 inches (45cm) long x 10 inches (25cm) wide x 6 inches (15cm) deep. It accepts a maximum of 12 hardened adapters and is capable of accepting four 1.25-inch (32mm) diameter entry ports.

The Dual Chamber with two 12-port covers is 17.5 inches (45cm) long x 10 inches (25cm) wide x 12 inches (30cm) deep and accepts a maximum of 24 hardened adapters. It can accept eight 1.25-inch (32mm) diameter entry ports and provides two distinct chambers that can be configured differently. A window allows fiber to be passed between chambers. The product supports externally mounted hardened adapters, standard splice and storage applications, or internally mounted cross-connect bulkheads.

Corning Cable Systems debuts new fusion splicer

Corning Cable Systems introduced its new OptiSplice M90e Fusion Splicer, which it says is a feature-rich machine for networks where low-loss performance and high-end accuracy are imperative.

The latest addition to the OptiSplice Fusion Splicer product family, the M90e Fusion Splicer offers the active core alignment accuracy of the company's existing LID-SYSTEM Unit, along with the speed and versatility of a passive core-alignment technology known as the core

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detection system (CDS), explained company representatives. The M90e provides an advanced set of features, yielding precise performance while reducing training and maintenance costs, all in a compact, user-friendly fusion splicer. The splicer offers what Corning claims is the industry's fastest total splice cycle time (splicing and heatshrink) for a core-alignment fusion splicer, and it uses automatic fusion time to optimize each splice.

The accuracy of the LID-SYSTEM Unit and its power-through splice loss measurement method eliminates the time-consuming task of evaluating splices with an OTDR. The single-mode LID-SYSTEM Unit first optimizes core alignment in each of the X, Y, and Z axes. When the fusion process begins, the OptiSplice M90e Fusion Splicer's auto-fusion time control monitors the power level through the splice and completes the fusing process when splice loss is at a minimum, ensuring an optimum splice, reports the company. Finally, the LID-SYSTEM Unit measures splice loss by comparing power levels before and after the fusion process.

The M90e Fusion Splicer is equipped with a secondary method for core alignment (CDS) based on three-dimensional cameras. This technology allows for fast (13 seconds) single-mode core-alignment on 250- or 900-micron coated fibers, bend-insensitive fibers such as ClearCurve, or fibers with live traffic. The M90e is also capable of automatically choosing the best alignment method for the application at hand.

The splicer contains precise and durable (P&D) electrodes, which are maintenance-free and can reduce the average splice loss up to 50 percent when compared to standard electrodes, says the company.

Corning introduces OTS-600

Corning Cable Systems LLC, part of Corning Incorporated's Telecommunications segment, introduced its new OTS-600 Series optical sources, meters, testers, and kits with data storage capabilities. Designed with ease of use as a top priority, the series of units maintains all the functionality one expects from an optical tester.

Corning Cable Systems' OTS-600 Series units have data storage for 10,000 results, USB data transfer interface, and a video inspection probe port. Both the OT-600 and OS-400 units come standard with a 650nm visual fault locator (VFL) for convenient troubleshooting of optical networks. Ease of use has been achieved using a large color LCD screen, soft-key menus, and a testing wizard.

The OTS-600 Series features an intuitive certification wizard that takes the user step-by-step through testing. During the testing, the results are shown in tabular format, making it easy for the user to view results. The table conveniently shows any saved data for a specified fiber, making reviewing and updating results simple and efficient.

The OTS-600 Series comes with OTS-View reporting software for creating comprehensive certification reports. The software allows the user to save, upload, manage, and print reports. The software automatically transfers the unit model, serial number, date tested, and other data from user input fields. The output of the report can be printed or stored electronically in HTML format for viewing with any Web browser, CSV format for viewing with MS Excel, or TXT for viewing with a document editor.

The OTS-600 Series comes ready for connector inspection with a built-in video probe port and software. The video inspection probe (VIP) allows for the inspection of a fiber-optic connector's end-face quality. The resulting images can be used as documentation of end-face quality and cleanliness.

Cube Optics touts LAN WDM grid mux for multiwavelength 100G transceivers

Cube Optics says it has successfully manufactured what it claims are the world's first

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LAN WDM grid passive optical multiplexers.

Faced with constantly increasing bandwidth in LAN, SAN, and metro applications, network operators, datacenters, enterprises, and ISPs are demanding higher-speed optical interfaces. To meet those needs, the IEEE High Speed Study Group is in the process of setting new standards for 100Gbps fiber-optic transceivers. At high data rates, a serial transport even over relatively short distances (10 to 40km) is not possible with current electronics; the transceivers will need to optically multiplex several lower bit streams. The new standard for pluggable transceivers is anticipated to multiplex 4 times 25Gbps optically to form a 100Gbps transmission. To enable the integration of four laser diodes, four PIN detectors with the corresponding multiplexers and demultiplexers into a space-constrained pluggable transceiver, miniaturized multiplexers are the enabling factor. The wavelengths that will be used are summarized as the LAN WDM grid, an 800GHz grid in the 1310nm band.

Cube Optics AG says it has now built the first multiplexers in the so-called "zig-zag" direct-bounce design, which enables the needed miniaturized size and the 800GHz LAN WDM grid. It features 400GHz pass bands for the center wavelengths of 1295.56/1300.05/ 1304.58 and 1309.14nm. The insertion loss does not exceed 1.5dB, while adjacent channel isolation is above 30dB.

According to CUBO, this design is directly transferable from the existing ITU standardized CWDM grid to the much narrower LAN WDM. "The design, set-up, and assembly of the first LAN WDM grid muxes was realized in only eight weeks, and we are very happy that already at the first try we could prove an outstanding performance," contended Dr. Thomas Paatzsch, Cube Optics' COO.

SENKO introduces dry cloth cleaner

SENKO Advanced Components recently introduced the Smart Cleaner, a dry cloth cleaner specifically designed to clean single fiber connections residing in an adapter, faceplate, or bulkhead.

The dust cap acts as an adapter for cleaning unmated connectors, and its extendable tip reaches recessed connectors. Made out of antistatic material, the Smart Cleaner is ideal for working in sensitive environments and can be used for 525+ cleanings, say company representatives. The Smart Cleaner is simple to use and highly effective at removing oil and dust contaminants that can negatively affect optical performance.

Tips for SC, FC, ST, LC, MU, MPO, and hardened connectors are available.

Telect's modular outdoor enclosures enable flexible configurations

Telect, a supplier of connectivity, power, and equipment housing products, recently launched a line of modular outdoor enclosures engineered to bring a high level of flexibility and versatility to outside plant (OSP) applications. The company says it has engineered the enclosures to function in a broad range of communications network environments and applications.

Based on a standard footprint (66x30x30-inch), the Standard Telect Modular Enclosure (TME) provides 32 rack units of interior space for a variety of equipment. Users can choose from frame, top panel, door, hatch, side panel, and mounting rail options to handle all types of electronic equipment, along with power gear, cooling components, and more. Accessories are available to finish the installation.

Modular side panels can be removed from the enclosures to simplify expansion and scalability. Change is a matter of retrofitting a door, hatch, or side panel, rather than replacing the entire enclosure as required with traditional cabinets, says Telect. Modularity also provides the advantage of being able to stock components in a "mix and match" fashion and assemble enclosures as needed, helping to

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better manage capital expenditures, inventory, and overall costs.

The design is also engineered to key industry standards, helping to ensure reliable long-term performance. Telect also offers a 45RU enhanced modular enclosure and a compact 22RU enclosure for lower-capacity installations.

Optelian expands tunable optical transport portfolio

Optelian announced the expansion of its LightGAIN tunable optical transport portfolio.

The Optelian RGN-10GXT is a multirate optical regenerator, tunable over the full C band of ITU channels. It supports short-, long-, and extended-reach applications over single-mode and multimode fiber. The client interface provides flexibility through 10-Gigabit small form factor pluggable (XFP) optics.

The RGN-10GXT provides 3R operation (reshape, regenerate, and retime) from 9.95 to 11.3Gbps. The built-in electronic dispersion compensation (EDC) enables reach performance up to 100km, say company representatives.

As part of LightGAIN, the unit mounts in any of the family's active shelves and can operate standalone or under network management. To support standalone operation, the unit provides alarm relay contacts and intuitive status and configuration access via a front panel graphic display, touch pad controls, and LEDs.

Also announced, the Optelian RGN-3GST is a multirate optical regenerator, tunable over the full C band of ITU channels. The client interface provides flexibility through small form factor pluggable (SFP) optics. Both 3R (reshape, regenerate, and retime) and 2R (reshape and regenerate) operation are configurable, with data rates from 10Mbps to 2.7Gbps.

The unit mounts in any of the family's active shelves and can operate standalone (alarm relay contacts) or under network management. The unit provides intuitive status and configuration access via a front panel graphic display, touch pad controls, and LEDs.

PANDUIT launches PANVIEW iQ System

PANDUIT introduced what it claims is an industry-first physical infrastructure management system that automates the documentation of physical-layer connectivity and provides intelligent patch-field management without the need for additional rack space.

The PANDUIT PANVIEW iQ System consolidates all management hardware into innovative Panel Managers and Expansion Modules, which snap into the back of PANVIEW iQ Patch Panels, say company representatives. A functional keypad interface unit on the front of the patch panel permits initiating patch cord tracing and diagnostic navigation without the need for dedicated fixed placement or handheld controllers. This design enables organizations to cost-effectively scale their installations as well as conserve valuable rack space, notes the company.

Furthermore, the company says its PANDUIT Physical Infrastructure Manager Software is a Web-based application that offers robust performance functions, including automated documentation of network connectivity, change notifications, asset management and reporting, virtual server mapping, and work order management functions. An application program interface (API) built into the software allows integration between the PANVIEW iQ System and familiar third-party applications.

Financial, technology, and services company LaSalle Solutions is currently integrating the PANVIEW iQ System into its service portal. "In today's complex IT environments, we see PANVIEW iQ's ability to manage the assets and move/add/change activity key to a successful operation — not to mention the advantages to compliance and security," reported Steven Robb, vice president

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and general manager of LaSalle Solutions. As a customer service-oriented company, Robb said, "We manage assets and contracts to some of the largest organizations in the world. By incorporating PANVIEW iQ into our business, we are streamlining our process and have the potential to increase our levels of service and customer satisfaction."

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.

MARKET INTELLIGENCE

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

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'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,

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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

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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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