

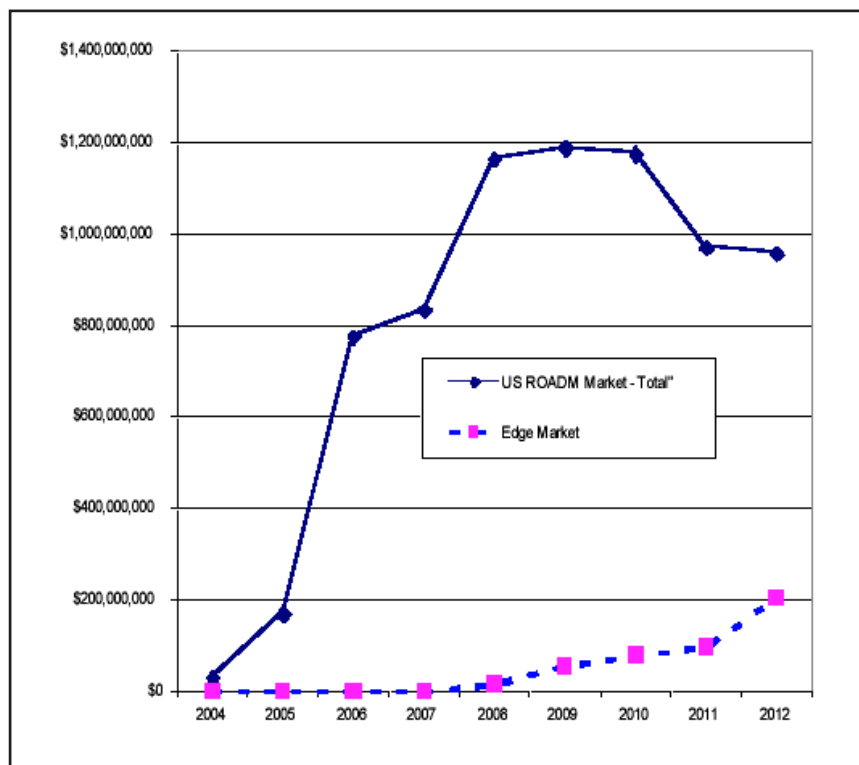
Optical Networks and WDM

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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.

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The 70km cable will run from Skail 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 cables ship 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 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

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 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).

DISA passes Sycamore

Sycamore Networks Inc., a provider of intelligent bandwidth management solutions for network operators worldwide, announced that its SN 9000 Intelligent Multiservice Switch has successfully completed rigorous interoperability testing with the US Defense Information Systems Agency (DISA) Joint Interoperability Test Command (JITC). JITC assessment and approval is required for systems intended to participate in US Department of Defense networks.

The SN 9000 joins other Sycamore optical switching solutions — including the

previously certified SN 16000, SN 3000, and SILVX Network Management System — in successfully completing JITC interoperability testing. By reaching this milestone with the SN 9000, Sycamore has strengthened its position as an established provider of JITC-approved, core-to-edge optical switching solutions.

During the JITC evaluation, Sycamore's SN 9000 successfully completed a battery of standards conformance and systems performance tests involving a variety of broadband optical and electrical interfaces, including procedures for traffic capacity and stress response, failure recovery, traffic protection and rerouting, and verification of data and control planes.

"We are very pleased to successfully complete JITC interoperability testing of the SN 9000," said Jim Mooney, vice president of product management and marketing at Sycamore. "This milestone is further evidence of Sycamore's commitment to the demanding and rapidly evolving communications requirements of our military, and our ability to meet those needs with a broad portfolio of intelligent bandwidth management platforms."

TECHNOLOGY

Australian R&D group designing wavelet-based, dispersion-tolerant 40G links

A private R&D fiber-optic transmission (FOT) group in Canberra, Australia, is developing fiber-optic transmission systems by combining mixed time-frequency signal representations with photonic properties of light. The transmission system includes a standard 40Gbps intensity modulator and a standard direct detection receiver. The novelty consists of introducing a simple spectrum converter in the electronic driver of the electro-optic modulator, says the group.

The conventional approach of shaping signal waveforms, e.g., pulses, by means of controlling and tailoring the corresponding

Fourier spectrum of the signal runs into the limitations associated with the Fourier analysis; the separation between the time domain and the frequency domain leads to the pulse duration being inversely proportional to the Fourier spectral bandwidth needed to shape the pulse.

In contrast, by mixing the time and frequency domains, the spectrum becomes a function of time, which provides an additional and significant element in shaping signals. In this context, wavelets — defined as short-duration sinusoidal waves — can break away from the Fourier constraints. The modulation format used will be the on-off keying (OOK) or binary ASK with return-to-zero (RZ) pulse structure to mitigate the effect of polarization-mode dispersion. The spectral efficiency will be higher than that of the dual-polarization QPSK.

The development is intended for multihaul networks operating at 10G and the emerging 40G fiber-optic transmission systems and will use commercially available components and devices. According to the group, three elements stand out:

- The very narrow physical distribution of the optical spectrum that enables the elimination of dispersion compensation modules comprising specialized fiber and optical amplifiers;
- Reduction in the crosstalk between adjacent optical channels leading to enhanced optical signal-to-noise ratio (OSNR) and the elimination of forward error correction codes;
- Simplification of the electronic driver, which will be designed in terms of digital combinational logic circuits rather than analog circuits requiring complex spectral shaping configurations.

In the quest for an optimal modulation format for an optical transmission channel bit rate of 40Gbps, the suppression of the optical carrier — in order to reduce the degradations induced by nonlinear effects in optical fibers — singled out the DPSK as the preferred technique. However, the need for phase-

decoding and dispersion compensations, particularly for RZ pulses, increases the cost of deployment and operation.

The wavelet approach to high-speed optical pulse modulation has the capability of delivering high-quality transmission with simple setup configurations and reduced operational costs, claims the R&D group.

Details about the wavelet approach to high-speed optical transmission and its design considerations can be obtained from the group's R&D coordinator Andre Vatarescu.

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 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 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.

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 to 100 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.

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.

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 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."

Global Crossing provides Eurovision link to Brazil during Beijing 2008 Olympics

Global Crossing, a global IP solutions provider, announced that it will provide a link

between Rio de Janeiro and New York for Eurovision, a premier sports and news content distributor for the world's top broadcast and media platforms, during the Beijing 2008 Olympic Games.

The contract expands the broadcaster's existing Private Line Services to accommodate enhanced audio-visual content.

"Eurovision has over 50 years of experience in putting sports programming exactly where broadcasters and federations want it, in a seamless, reliable and cost-effective way," said Stefan Kuerten, director of Eurovision operations. "We're delighted to work with Global Crossing for this vital SDH leg in our worldwide video network. Global Crossing delivers highly reliable and secure services, which are critical for our operations."

Global Crossing Private Line services provide highly reliable, secure, point-to-point, digital connectivity for a wide range of applications used by enterprise customers, including hosting, resource planning, business continuity, content distribution, and disaster recovery.

"This agreement with Eurovision illustrates our ability to meet the exacting demands of the corporate market in Brazil and worldwide," said Marcos Malfatti, Global Crossing's senior vice president of sales in Brazil. "Our success is based on our commitment to understanding the needs of our customers and to becoming a key business partner to them."

Global Crossing Private Line services also support high-bandwidth operations such as large data transfers, medical imaging, record archiving, database sharing and replication, and remote office access to application servers. The services' capacities range from T1/E1 up to OC-48/STM-16.

ZTE wins in Ethiopia

ZTE Corporation, a global provider of telecommunications equipment and network

solutions, is exclusively developing Ethiopia's nationwide network to cover 14 major cities in Ethiopia, including Addis Ababa, the capital of Ethiopia.

This cooperation marks ZTE's continuous success in penetrating Ethiopia, after reaching an agreement with ETC to help construct IP-backbone network late last year.

As part of the agreement, ZTE will help ETC establish two separate networks that will allow ETC to provide NGN- and BTS-related network services by deploying ZTE's GSM bearer network optical solutions. ZTE will play a role in helping ETC to establish a metropolitan area network (MAN) by deploying ZXMP M800 high-end optical transmission equipment, and an access network by using ZXMP M600, coarse wavelength division multiplexer (CWDM) system with Fixed Service Access Gateway (SAG). ZTE's ZXMP M600 is a highly integrated CWDM transmission system, supporting 18 wavelengths and a maximum rate of 2.7Gbps. It features an open multiservice access model and high flexibility in consolidating voice and data services.

Moreover, it can be widely deployed at the convergence and access layers of large-scale metro network, the backbone, convergence, and access layers of small to medium-sized metro network, as well as the private network of utility infrastructure. With its high deployment flexibility and large capacity, ZXMP M600 helps telecom carriers lower operating costs.

"With our state-of-the-art optical transmission solution, we believe we can provide a smooth transmission route for Ethiopia's telecom network to help them satisfy their customers' demands for multi-service transmission within GSM, CDMA, IP and fixed line. ZTE is committed to playing a key role in bolstering Ethiopia's telecom infrastructure, and in return, boost its economic growth," said Mr. Han Ling, ZTE's vice president and general manager, optical network products.

THUS wins charity deal

THUS plc announced that it had signed a contract with CfBT Education Trust to supply a fully managed Internet Protocol virtual private network (IPVPN), broadband access, and a range of remote connection solutions. THUS will connect 30 of the charity's key sites and provide network access via broadband at a further 150 locations over its next-generation network.

CfBT Education Trust provides education for public benefit in the UK and overseas and employs more than 2,500 staff around the world who support educational reform, teach, advise, research, and train, designing and delivering education services. The THUS solution will provide a next-generation network with quality of service allowing reliable delivery of audio, video, and other key network services. This will lead to a reduction in staff travel and internal communication costs — key benefits for such a diverse organization. It also offers improved management of network capacity and greater visibility of, and control over, telecoms costs.

The communication network solution from THUS will run voice and data, Internet access, and IP telephony for 1,800 users over a multiprotocol label switching (MPLS) IPVPN delivering functionality, reliability, and resilience to the organization as it seeks to both rationalize and centralize core applications. In addition, the network offers remote working solutions, such as mobile, BlackBerry, and 3G datacards, and the scalability required to future-proof the network and provide a platform for the further expansion of remote and flexible working.

Andrew Terry, head of ICT services at CfBT, said, "We chose THUS as it offered a solution that provides a one stop shop for all our telecoms needs. As an education charity we operate in multiple locations supporting educational reform, and as such we need to ensure we have robust and efficient telecommunications systems in place. THUS took time to understand our current needs. The infrastructure they will be providing will enable

the efficient delivery and use of services to our diverse workforce."

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.

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.

NEC, Sumitomo Electric to acquire submarine cable manufacturer

NEC Corp. and Sumitomo Electric Industries, Ltd have announced the acquisition of OCC Holdings and its subsidiary OCC Corp., which manufactures fiber-optic submarine cables.

NEC and Sumitomo Electric will acquire 100 percent ownership of OCC Holdings from an investment fund managed by the Longreach Group. NEC will hold approximately 75 percent and Sumitomo Electric will hold approximately 25 percent of OCC Holdings. The acquisition is scheduled to be completed in July 2008.

“The need for broadband capacity is rapidly expanding on a global scale. In order to

accommodate the growing worldwide demand, a broad range of new submarine cable systems are being planned and built.

This acquisition represents a strategic advancement for NEC, one of the leading suppliers of submarine cable systems, and Sumitomo Electric, a leading supplier of optical products, that secures stable access to a rich source of high quality; highly reliable optical submarine cables. NEC is pleased to announce the acquisition of OCC, which assures the company of maintaining a dynamic leading presence in undersea industries, and promises to solidify each company’s market position,” said Masamichi Imai, executive general manager of the Broadband Networks Operations Unit of NEC.

“With the acquisition of OCC today by NEC and Sumitomo Electric, we aim to firmly establish our presence in the market of optical components and materials for the submarine fiber-optic network construction industry that is forecast to grow,” said Dr. Shigeru Tanaka, managing director of Sumitomo Electric Industries, Ltd.

AFL Network Services announces North Star acquisition

AFL Network Services Inc. is expanding its telecommunications services business with the acquisition of the assets and related business of North Star Communications Group Inc., currently headquartered in Birmingham, Alabama. The acquisition not only develops AFL’s footprint into Alabama, Mississippi, California, and Nevada, but also enhances its service offering with North Star’s expertise in outside plant engineering, say AFL representatives.

“North Star complements our existing business very well,” noted Mike Booth, executive vice president of AFL Network Services. “Their skills in outside plant engineering and wireless services, together with the enhanced footprint, provide the capability for us to continue growing.

Furthermore, we both share a strong commitment to quality and service.”

With the addition of North Star’s full scope of capabilities, including engineering, network operations and maintenance, construction management, cable broadband and wireless, and expertise in outside plant distribution design and route feasibility studies, AFL Network Services says it has a complete array of experienced professionals along with products and services designed to meet unique networking needs.

BUSINESS

Global Crossing expands Network Management Services in Latin America

Global Crossing, a global IP solutions provider, announced that it is expanding its offer of Network Management Services in Latin America. Currently, Global Crossing offers these services to several large enterprises in Colombia, supporting more than 2,500 monitored end-points in the country. Based on this success and more than two years of its own market research, Global Crossing recently expanded the services to Brazil and will offer them in Argentina soon.

Through its Network Management Services, Global Crossing can manage part or all of its customers’ communications infrastructure, based on their preference. Additionally, by using Network Management Services, enterprises can benefit from the best practices of the IT Infrastructure Library (ITIL) and Project Management Institute (PMI), adopted by Global Crossing for its customers in Latin America. ITIL is the world’s most widely accepted approach to IT service management, while PMI is the leading membership association for project management professionals.

“As outsourcing demands grow in the enterprises we serve, Global Crossing continues to focus on the critical needs of IT managers and CIOs to ensure high-quality, security and

reliability,” said Leonardo Barbero, senior vice president of data and Internet products for Global Crossing Latin America. “The expansion of these services to other countries addresses market demand, while the adoption of best practices underscores our commitment to provide the corporate market with services supported by the highest standards in the industry.

“One of the advantages of adopting ITIL and PMI best practices in our Network Management Services is the ability to establish rigorous task divisions and documentation criteria focused on business goals in order to minimize potential failure and to ensure enough flexibility to the company’s operations on a daily basis,” added Barbero.

Network Management Services are part of Global Crossing’s Professional Services portfolio and are supported by two operational centers in Brazil and in Colombia that are owned and staffed by Global Crossing.

In conjunction with other data transport, datacenter, Internet, and telephony services, these services can be configured as solutions for more critical business demands, such as accessibility, security, continuity, productivity, and collaboration, as part of the Dynamic Needs Architecture (DNA). DNA is an intelligent interface that allows Global Crossing to define the solutions enterprises need with precision, based on these five key components of information and communications management. By functioning as a high-level conceptual framework, DNA allows enterprises, with the right consulting support, to align their business objectives with the appropriate technological resources.

Global Crossing Network Management Services are operated 24 hours a day, seven days a week by a dedicated team comprising monitoring technicians, who keep constant watch over customers’ networks; operation engineers, who are responsible for network planning and configuration; managing

engineers, who are in charge of processes and tools; and service managers, who interface with customers.

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 '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."

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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