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# Technology Watch

LAN Newsletter

4th Quarter 2008

Table of Contents

1.0 General Market Trends ..... 1

2.0 Panduit’s 10Gig Interconnect System ..... 1

3.0 Copper LAN Cabling..... 2

    3.1 Market ..... 2

        3.1.1 Cisco May Sell Blade Servers ..... 2

    3.2. Technology: Cloud Computing..... 3

4.0 Optical Technologies ..... 3

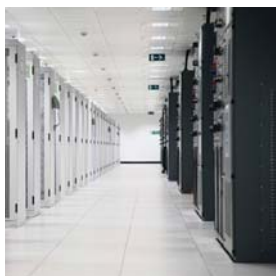
    4.1 Market ..... 3

    4.2 Technology ..... 4

        4.2.1 Finisair Introduces 40Gbps Parallel Active Optical Cable ..... 4

        4.2.2 Merger of Ethernet Alliance and the Road to 100G ..... 4

        4.2.3 Fiber to the Where? Browfield and MDUs..... 4





## 1.0 General Market Trends

Efficiency has taken over center stage, replacing “Green Power” according to a recent article in “ars technica”. As the worldwide slowdown continues, organizations are being forced to reexamine the financial implications of adopting environmentally-friendly practices and technologies, thus the dilemma of not having enough “green” (as in \$\$\$) to support the “greening” (environmentally friendly) of their businesses. Some businesses, however, view this situation differently because many efficiency efforts actually result in big financial wins. The reality, though, is that these green technology solutions will probably take a back seat until the financial markets are restored.

Speaker after speaker at the recent EPA Climate Leaders meeting emphasized that paying attention to efficiency at their companies has resulted in significant financial rewards. One example is Intel who, over the past eight years, has invested \$24 million in conservation projects; the annual return for that work is now up to over \$44 million. Even small efforts are significant when adopted on the scale of such a large company. John Fojut of Kohl’s department stores described how, at the suggestion of a store manager, the wall lights were turned off during the first hour of business, when few people shopped. This small action resulted in saving the company over \$500,000 annually when rolled out in a thousand stores. A representative from Exelon, a power generating company, estimated that enacting “LEED” green building certification added less than five percent to construction costs, and will pay for itself in a very short period of time through energy savings. Adopting efficiency efforts doesn’t require creating a new bureaucracy, just a new mindset.

In spite of proven returns for efficiency, green efforts are nonetheless a hard sell in tough economic times because they do cost money up front. For some companies, however, the returns are high enough that, difficult times make them even more appealing.

## 2.0 Panduit’s 10Gig Interconnect System (For top of Rack I/O consolidation)

Panduit has unveiled a network equipment rack system solution that supports I/O consolidation, virtualization and thermal management in the data center. This system solution includes their Net-Access™ Cabinets, cable management, overhead cable routing, grounding, 10G fiber connectivity, and direct attach 10G SFP+ copper cable assemblies. Each of these elements contributes to the overall effectiveness of this consolidation scheme as follows:



### Server Cabinet Switch:

Provides 10GE performance and fast installation using a comprehensive system that supports I/O consolidation through a top-of-rack switch deployment.

### Cable Management:

A modular cable management finger section allows easy mounting to all four cabinet posts. Rack spacers further provide a uniform means of support and bend radius control for the cables.

**Integrated Equipment Grounding:**

The Net-Access™ Cabinet has a fully integrated, electrically bonded structure to maintain system performance while protecting network equipment and personnel.

**10G OM3 Fiber Connectivity:**

Facilitates 10 Gigabit Ethernet transmission up to 300 meters. It also accommodates ANSI Fiber Channel for 1,2,4,8 and 10GFC to process, manage, and store large amounts of data across the network

**Direct Attach Copper Cables:**

These SFP+ passive copper cable assemblies provide low power, low latency 10Gbps interconnection between SFP+ host ports. Cables designed for short reach, high-speed connection and are SSF-8430 compliant.

**Overhead Cable Pathway:**

Large knockouts in the top of the cabinet allow for a smooth transition between the cabinet and overhead pathway mounted directly on the cabinet.

## 3.0 Copper LAN Cabling

### 3.1 Market

The reduction in 10GBASE-T chip power dissipation continues with a new release from Solarflare. The 10Xpress® SFT9001 chip (65nm CMOS process) is a 10 Gigabit Ethernet compliant chip which has a sub-4Watt operating mode and also exceeds all the IEEE 802.3an 10GBASE-T specifications. This product supports a 100 meter channel over copper Ethernet cabling and features a triple-speed, auto-negotiation capability for 10GBASE-T, 1000BASE-T and 100BASE-TX. By leveraging the architecture of their previous chip designs, this new product supports both new and legacy copper cabling specified for deployment in building networks, including unshielded CAT-5e, CAT-6, CAT-6A and CAT-7 cables. This ability to support lower Ethernet speeds over legacy

copper cabling gives IT managers the flexibility of upgrading to 10GbE, while preserving investments in current infrastructure. On the other hand, it facilitates “Greenfield” implementation of 10GbE transmission. Other new features of this chip include power scaling down to hundreds of milliwatts and support for Wake-on-LAN, both critical for making network equipment more power efficient.

#### 3.1.1 Cisco May Sell Blade Servers

The organization “Data Networking” recently posted an article implying that Cisco might enter the blade server computing market and compete directly with Dell, HP and IBM who all currently partner with Cisco. This conjecture was made after Cisco’s VP for Network and Security Systems, Marie Hatter, made the statement: “If the blade server market provides a market where we can differentiate and we have a compelling offer, and it’s something where a complete architectural play has an opportunity to shine, then it would be a market we’d consider.”

This move would be a departure from currently accepted business practices in the server and networking market in that server vendors don’t make and sell network boxes, and network vendors don’t invade the server space. This code was first, broken by HP when they decided to sell their own in-house development, the “ProCurve” switch, putting at risk the long-held partnership HP had with Cisco in this arena. Cisco’s entry into the storage networking business some time ago is a strong indicator that the company is not shy about entering new markets.

Should Cisco decide to enter the blade server market, however, you can be sure that its competitors such as Foundry and Blade Network Technologies would jump at the chance to develop closer working relationships with the three big server makers: Dell, HP and IBM. The article from Data Networking goes on to say that should Cisco enter the blade server market, a price war would likely ensue causing the “big three” (Dell, HP, IBM) to upgrade their current products with value-



added features in an effort to make Cisco's market entry very unpleasant. Such a market could be worth about \$5 billion/year to Cisco (according to Data Networking) but it remains to be seen if Cisco is willing to sacrifice current partnerships to gamble on this new blade server market.

### 3.2 Technology: Cloud Computing

Cloud computing has been mentioned as one of the next logical evolutionary steps for information communication technology (ICT). The concept is derived from the fact that there is a migration towards IP-enabled (cloud) services where future applications, development tools, storage, servers, and network services that businesses currently buy as products will be accessible on an as-needed basis from a virtual source. The technology encompasses many different outsourcing models, from the traditional Manager/Host relationship to the emerging concept of software-as-a-service (SaaS) approach. In this latter approach, the customer employs a packaged application service on a pay-as-you-go basis. It is timely that the "cloud computing" concept is coming into vogue at a time when businesses are strapped for cash and lines of credit. As companies attempt to rein in capital expenditures (capex) and drive down internal IT costs, outsourcing services to the "cloud" might become a tempting value proposition.

A recent white paper published in "Heavy Reading" ([www.heavyreading.com](http://www.heavyreading.com)) does, however, suggest that caution be used before adopting cloud computing technology as a means of controlling operating expenditures (opex). Some thought must be given to some basic questions such as:

1. Does the technology deliver the service the customer expects?
2. How safe is the data being transmitted between the enterprise and the service provider of "cloud" applications?
3. Does the service comply with required local and

governmental regulations?

4. Does it provide the same or better visibility and control as an internal resource might?
5. Is the service scalable and flexible enough to meet the future needs of the enterprise?

## 4.0 Optical Technologies

### 4.1 Market

The Dell'Oro Group recently published their report on the Optical transport market for 2009. They indicate that the worldwide optical transport equipment market grew 7% in the third quarter of this year compared to a year ago. They caution, however, that following this 20th consecutive quarter with year-over-year growth, the optical market is forecast to enter a period of contraction, or a declining projection of about 10% in 2009. Dell'Oro also mentions that this quarter marks the fifth year of growth since the telecom contraction of 2001, suggesting that this five year period of relative growth would naturally be followed by a correction or slowdown regardless of the state of the world's financial markets. The current situation, they say, only exacerbates the condition which will further result in less consumer confidence and thus reduced enterprise spending.

The top vendors in the third quarter based on market share continued to be Alcatel-Lucent, Huawei, Nortel and Fujitsu. Note: some recent press indicates that Nortel is having some difficulty and will probably seek protection from its creditors under chapter 11 of the US bankruptcy laws.

### 4.2 Technology

#### 4.2.1 Finisar Introduces 40Gbps Parallel Active Optical Cable

Finisar has climbed another rung of the ladder of active fiber-optic cable assemblies by releasing their Quadwire cable assembly product. The field of offerings in this



active cable technology market has grown considerably since players like Molex, Amphenol and Gore introduced the first active copper cable assemblies in late 2006. Since then, the number of manufacturers has grown to about ten with both active copper and active fiber products.

Finisar's introduction of their 40G product, however, raises the stakes for data center applications requiring high bandwidth and long transmission distances up to 100meters. Quadwire, as they call their product, is a parallel active optical cable that provides a 40 Gbps aggregate link via four 10Gbps full-duplex channels. The connector footprint is based on the QSFP form factor which was released under a multi-source agreement (MSA) industry standard. Multi-mode ribbon fiber is used in this case as the cable transmission medium. Finisar's intent is to challenge other media, such as twin-axial and twisted-pair copper cable in the upcoming race for dominance in the emerging markets for 40 and 100Gbps transmission.

The targeted applications include:

- 40G Ethernet (40GbE)
- InfiniBand Quad Data Rate (QDR)
- Fiber channel
- SAS/SATA
- Proprietary high-speed interconnects



## 4.2.2 Merger of Ethernet Alliance and Road to 100G

Back in November, two organizations with similar missions -- to promote 100G transmission -- announced their intention to merge. The two entities are the "Ethernet Alliance" and the "Road to 100G." Both organizations had similar agendas with the Ethernet Alliance having more clout and visibility in the general data communications industry. This development would unite two industry organizations that are both committed to the promotion and advancement of high-performance Ethernet networking. From all accounts, the Road to 100G Alliance has met or exceeded its original expectations in terms of bringing to light some of the challenges of developing 100G platforms but felt the time was right to merge the collective energies of both entities to accelerate 100G initiatives in the industry. This move is very positive for the industry and is a welcomed development for the IEEE 802.3ba taskforce, who are currently working on a draft standard for 40 and 100 gigabit Ethernet.

## 4.2.3 Fiber to the Where?

### Brownfields and MDUs

Most of us are familiar with passive optical networks (PON) typically used for "Greenfield" (new) deployments of fiber to the home (FTTH). For densely populated metropolitan areas like New York City or Paris where apartments and multi-dwelling units (MDUs) are the norm, the use of PONs is problematic because of well-embedded infrastructures such as roadways, sidewalks, steam pipes, etc. The prospect of providing higher bandwidth services via fiber is a proposition that demands careful consideration for new service providers. They must weigh the costs involved in altering existing infrastructure against the reality that their competition (cable operators) already have coaxial cable running in these buildings and are delivering "triple-play" services of voice, data and video. The need for higher bandwidth services, however, gives some leverage to new service providers



if their technology can be deployed economically. To address these challenges, PON vendors plan to use a combination of optical network technologies (ONTs) that leverage very high speed digital subscriber lines (VDSL2) to deliver FTTH quality services. As an access technology, VDSL2 is being used to exploit the existing infrastructure of copper wires (twisted-pair CAT3) originally deployed for plain old telephone service (POTS).

While the use of PONs might not fit the general mantra of “fiber all the way to the subscriber” reusing the existing CAT3 drop cables found in “brownfields” (residential, apartments, and MDUs) is a good value proposition. In a typical “Greenfield” application where fiber to the home is done over a PON network, the fiber is taken only to a distribution point. See Figure 1.

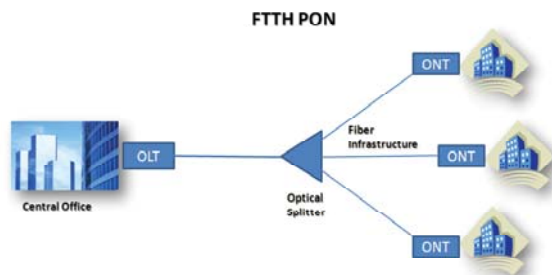


Figure 1. Typical Fiber-to-the-Home Deployment

With the PON VDSL2 system, fiber is brought closer to the subscriber and sometimes within the dwelling at the twisted-pair drop wires. See Figure 2. The ONT provides the VDSL2 interface to the network and connects to the twisted-pair/CAT3 drop wire. At the subscriber end of the drop, a VDSL2 modem provides the interface to the customer’s in-home wiring. This modem can now deliver up to 200Mbps on twisted-pairs using a bandwidth of up to 30 MHz where previously only 20 Mbps was being offered. It is expected that this new application for PON in delivering fiber-capable service to densely populated “brownfields” will become more prevalent as the demand for HDTV, IPTV and VoIP increases over the next few years.

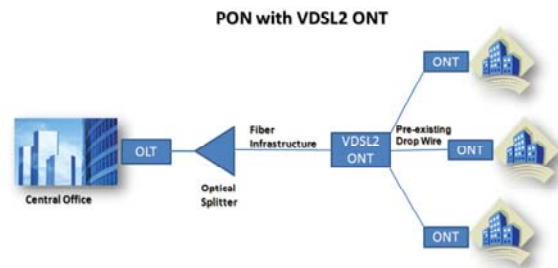
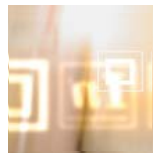


Figure 2. Fiber-Near-the-Subscriber Deployment with VDSL2

## Data Communications Competence Center

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Nexans' Data Communications Competence Center, located at the Berk-Tek Headquarters in New Holland, Pennsylvania, focuses on advanced product design, applications and materials development for networking and data communication cabling solutions. The Advanced Design and Applications team uses state-of-the-art, proprietary testing and modeling tools to translate emerging network requirements into new cabling solutions. The Advanced Materials Development and Advanced Manufacturing Processes teams utilize sophisticated analytical capabilities that facilitate the design of superior materials and processes. The Standardization and Technology group analyzes leading edge and emerging technologies and coordinates data communication standardization efforts to continuously refine Nexans' Technology Roadmap. An international team of experts in the fields of cable, connectors, materials, networking, standards, communications and testing supports the competence center. The competence center laboratories are a part of an extensive global R&D network that includes eight competence centers, four application centers and two research centers dedicated to advanced technologies and materials research.



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