

OFC Show Wrap: Huawei on Fire- Verizon Focus on the Core- Optical 1 IP 0- Do Components Have Value?

Three days at the Optical Fiber Communications Show held in San Diego March 23-25, including two days on the show floor and Monday's OSA Executive Forum, yielded a variety of insights and datapoints regarding the communications technology sector in general and the optical networking systems and components markets in particular. At the highest level, OFC underscored again the vast differences between the sector implosion in 2002 and recent trends, namely that is not nearly as dire this time around. Combine this with share prices that are at levels well below the 02 trough valuation levels and therein lies the investment value. Specific differences include

- **Lack of overcapacity-** Perhaps the biggest technology focus at the show was on 100G transport technology and the limitations of the current installed base of fiber, driven by both continued strong growth in traffic loads and networks that are running at capacity. Verizon indicated plans to deal with a 10X increase in network capacity over the next few years. This contrasts sharply with the competitive carrier driven overcapacity in the 02 timeframe.
- **Capex declines in single digits,** versus 30-40% declines that characterized the 02-03 time period. Carriers for the most part are financially strong and investing from cash flow and are spending on the order of 15% of revenue on capex in line with long term averages. Verizon noted a flattish to slightly down profile over the next few years, though datapoints and comments from suppliers focused on the Chinese, Indian and Japanese markets are calling for growth.
- **End demand bandwidth drivers remain strong.** Commentary at the show underscored continued strong trends in terms of both carrier investment and consumer interest in telco delivered video services such as FiOS and UVerse as well as FTTH services in Japan and China. Other key current and potential bandwidth drivers include enterprise videoconferencing, cloud computing and over the top video streaming. Bandwidth demand also grew sharply during the 02-03 slowdown period eventually soaking up excess network capacity by mid 2005.

Overall any near term weakness on the telecom side we view as exaggerated seasonality, as telco budgets that are usually slow to unlock are even slower given the current environment, with real weakness in evidence on the enterprise and CATV fronts.

Table 1: Select Comm Tech Winners and Losers- OFC 2009

Company	Ticker	Price	Mkt Cap	Status	Comment
Avanex	AVNX	\$2.32	\$36M	Winner	Big discount to BKHM bid, vote 4/27
Ciena	CIEN	\$8.87	\$804M	Winner	OTN Switching leader
Commscope	CTV	\$14.84	\$1.1B	Winner	China 3G strength
Corning	GLW	\$15.96	\$24.8B	Winner	Benefits from Stimulus, Fiber reaching capacity
Infinera	INFN	\$8.45	\$797M	Winner	Working with VZ on 100G
Occam Networks	OCNW	\$2.60	\$53M	Winner	Customers to receive stimulus
PMC Sierra	PMCS	\$6.90	\$1.5B	Winner	Japan FTTH, China 3G exposure
UT Starcom	UTSI	\$0.93	\$117M	Winner	China, India strength
Cisco	CSCO	\$18.16	\$106B	Loser	Public smackdown by Verizon
Finisar	FNSR	\$0.51	\$243M	Loser	Balance sheet issues/enterprise exposure
Harmonic	HLIT	\$6.94	\$662M	Losers	Negative CATV component datapoints
Arris	ARRS	\$8.10	\$997M		
Juniper	JNPR	\$17.03	\$8.9B	Loser	Largest customer obsessed with bypassing router ports
Tellabs	TLAB	\$4.86	\$1.9B	Loser	28% cust throws a party- TLAB not invited

From a technology and market standpoint, there were a number of key trends in evidence at the show highlighted by a Verizon led blitzkrieg on the optical technology community looking for new core networking solutions. Highlights include:

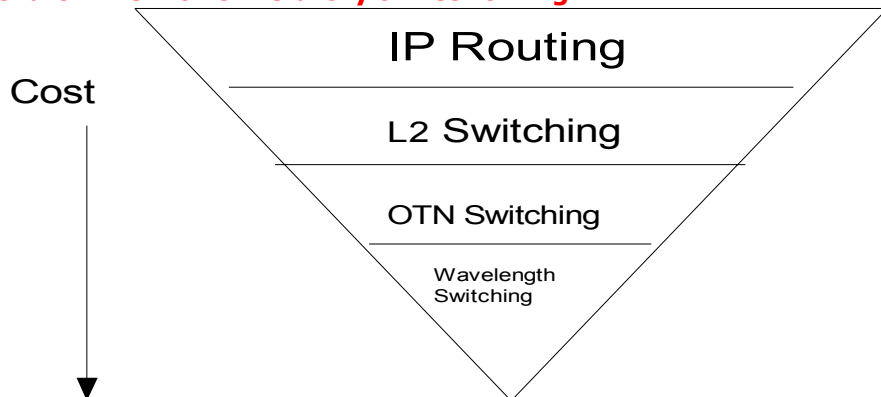
- **Major architectural shift at Verizon to the network core:** The carrier outlined plans to completely rebuild and upgrade its core network based on new integrated switching and transport platforms for both the long haul and the metro. The carriers obsession with OTN switching is a major positive for Ciena, the pioneer and leader in OTN with a high capacity platform well along in development, and its lust for 100G transport, echoed at the show by Comcast, as well as comments suggesting PIC (Photonic Integrated Circuit) technology as a potential solution are significant positives for Infinera. Along with commentary from NTT Verizon's message may be a leading indicator of a shift in focus to the network core after several years of focus on broadband access. Thus in an overall flat to slightly down capex budget over the next few years expect to see increases in core networking spend as the FiOS build, likely costing the carrier something in the range of \$2-3B annually, nears its end in 2011.

There is a strong case to be made for Verizon as a leading indicator, much in the same way Cisco's internal enterprise network has been a leading indicator for global IP network trends, given the size of its network, presence in both the wireless and wireline markets and aggressive, and successful, gamble of fiber access and video. We expect capital spending at Verizon to be down in the low to mid single digits at most in 2009 but within this overall flat to down, but still very large, pie at around \$17B, expect to see significant growth opportunities in metro/core transport and switching as well as continued FiOS subscriber driven growth.

- **Optical's Gain is IP's Loss-** As positive as Verizon was on OTN and wavelength switching, IP routing was treated with enthusiastic disdain. The most expensive per port element in Verizon's, or any other carriers, network by far, the Verizon team dedicated a fair bit of time in three separate presentations to strategies for router bypass. This is a major negative for Juniper, which was counted Verizon as a 10 pct customer in the past, and by implication for carrier routing in general if Verizon's strategy can be taken as a sign of things to come. Perhaps the most notable chuckle at an otherwise fairly somber show came at Cisco's expense in this regard, as keynote speaker Surya Panditi, Cisco's VP of Carrier Transport and Access Technologies, touted integration of DWDM ports into routers as an attractive solution only to be followed moments later by Verizon's SVP of Network Architecture completely repudiating that approach.

Verizon singled out a number of other important technologies to get the most of the current installed base of fiber, while clearly intimating in a major positive for Corning that there is a limit to how much can be done across the three axes of fiber bands (C, L, etc) channel spacing (100 Ghz moving to 50 and perhaps 35 GHz) and serial line rates (10G moving to 40G and 100G). Verizon is targeting transports capacities of 2-8 Tb/s per fiber over the next few years, or roughly 10X current capacities, and switching capacities of up to 16 Tb/s compared to a current CoreDirector capacity of 640 Gb/s.

Chart 1: Verizon's Hierarchy of Networking



These technologies include Photonic Integrated Circuits or PICs which is the main area of focus for Infinera, Forward Error Correction (FEC) technologies, filtering technologies for Wavelength Selective Switches, which enable the wavelength switching as a part of ROADM systems at the bottom of Verizon's cost pyramid but the top of its deployment focus and finally a focus on end to end mesh provisioning via OTN and variants of MPLS which again has been the historical focus at Ciena.

In scaling its network the company's focus is to "stay optical as much as we can" given lower costs not only in terms of per port equipment costs both also in terms of the space and power associated with electronics. This in turn is a broad positive for the photonic communications component sector that is currently accorded no value by the market. What is also increasingly clear is that all this planning regarding future architectures at Verizon, along with macro pressures, has caused a slowdown in spending on current infrastructure most notably at Tellabs and potentially Juniper as well. Given Verizon's very direct commentary regarding plans to bypass routers in the network and the likelihood that other carriers adopt this view over time we believe the strategic value of a Ciena or Infinera to a Cisco or Juniper is clear.

- **Strong trends in evidence among Asian carries and suppliers-** If there was one message than ran consistently among the optical component suppliers at the show it was this: Huawei is off the charts. Driven by a combination of 3G wireless backhaul investment in China and optical market share gains globally, suppliers of components into Huawei and its smaller competitor ZTE, which had a representative on a Monday panel and reported an outlook for growth in 2009, are seeing much stronger than expected growth. In general trends across the Asia Pacific region remain positive in terms of communications infrastructure investment including Japan, where NTT, whose head of network operations spoke, plans to double its FTTH subscribers over the next three years and NGN backbone investment continues apace. Trends in India were discussed by the CEO of privately held Tejas Networks, which derives 70% of its revenue from carrier Ethernet and transport infrastructure in India and expects to grow in 2009 (Sycamore founder Desh Deshpande is Chairman of Tejas and Sycamore is an investor). The strength in China in particular can be seen in capex plans outlined this week by China Unicom calling for a 57% increase in 2009 capital spending to \$16B, including a 100% increase in broadband access/FTTH spending to \$2.5B in addition to the anticipated huge increase in 3G wireless spending. Likewise China Telecom indicated the week prior plans to double wireless capex to \$6.6B on its newly acquired CDMA properties

Table 2: Asia Pacific Exposure

Company	Ticker	Price	China%	Other%	Huawei/ZTE%
Bookham/Avanex	BKHM	\$0.54	25%	10%	15%
Commscope	CTV	\$14.84	15% (APAC)		NA
Oplink	OPLK	\$8.27	43% (APAC)		15%
PMC Sierra	PMCS	\$6.90	15%+ end mkt	18% (Japan)	
UT Starcom	UTSI	\$0.93	50%	20% (India)	Competitor

Datapoints from the show also pointed to a great deal of China 3G driven strength at the Source Photonics subsidiary of MRV Communications along with continued solid triplexer demand from vendors supplying Verizon's FiOS rollout. We have been focused on PMC Sierra as the prime beneficiary of both the strength among the Chinese OEMs and Japanese FTTH deployment, but also see major near term positives for Commscope through its Andrew acquisition, UT Starcom given its broad based exposure to the region as the leading supplier of IPTV systems in China and a major broadband access supplier in India and the combined Bookham/Avanex which will count Huawei as a 10% plus customer. Oplink counts Huawei as a major customer but is likely seeing an offset in terms of weakness at Tellabs.

- **Discussion at the OFC show centered around some of the same themes that were heard early in the optical recovery of 2005-06**, namely (1) can optical components suppliers make money and (2) the industry requires consolidation to prosper. Despite having proven that the answer to question one is clearly affirmative, with substantially every player in the industry profitable in the better, but certainly not bubbly, 06-07 timeframe and players such as Finisar, Oplink and Avago currently profitable and despite three major M&A deals in the last year (Finisar/Optium, Opnext/Stratlight, Bookham/Avanex) the market continues to value the sector under cash. Given the relatively decent demand dynamics outlined above as well as previously demonstrated profitability and ongoing consolidation, Terrapin is fairly confident that the sector has non zero value. Having said this it is clear that certain corners of the sector, namely in enterprise/datacom, where Cisco is jamming suppliers with inventory yet again, and cable TV infrastructure, are having their challenges and specific companies have their own balance sheet issues to resolve. These concerns keep us clear of Finisar, Emcore and Opnext in the near term, though Opnext is at the top of that list given recently announced cost cuts and a solid balance sheet compared with non zero enterprise values and balance sheet issues at Finisar and Emcore.

Our primary focus is on Avanex, which continues to trade at a healthy discount to the Bookham offer (currently valued at \$2.93 per Avanex share for a 20% discount) with shareholder votes on the merger upcoming on April 27 and a high degree of confidence that the deal goes through. On a combined basis the entity continues to trade around cash, with catalysts including the aforementioned strength among Chinese OEMs Huawei and ZTE, the resolution of the Nortel bankruptcy and a synergy estimate (\$7M per quarter on a \$90M cost base) that is likely to prove conservative based on recent discussions. Even with the near term revenues under pressure from Nortel on the Bookham side and Tellabs on the Avanex side, the entity has a combined \$300M plus revenue run rate, a strong technology portfolio and broad Tier 1 customer base which also includes significant exposure to industry leader Alcatel Lucent as well as Avanex's ten percent customer status with Infinera.

Table 3: Optical Component Sector Comps

Company	Ticker	Price	Mkt Cap	Cash	Debt	Ann Revs	Profits?
Avanex/Bookham	BKHM	\$0.54	\$100M	\$81M	\$0M	\$300M	no
Finisar	FNSR	\$0.51	\$243	\$35	\$142	\$480	BE
Emcore	EMKR	\$0.80	\$63	\$30	\$15	\$200	No
JDSU	JDSU	\$4.07	\$875	\$690	\$375	\$1,140	No
MRV/Source	MRVC	\$0.38	\$60	\$60	\$30	\$200	No
Oplink	OPLK	\$8.27	\$170	\$147	\$0	\$120	Yes
Opnext	OPXT	\$2.17	\$199	\$194	\$0	\$330	No

Note: MRV Cash and Debt are estimated

Oplink remains of interest trading just over cash as the owner of a \$150M cash hoard and a variable cost base that is producing positive cash flow even a reduced revenue run rate, with Huawei likely to help more than Tellabs hurts over time. MRV Communications also sports an enterprise value near zero with healthy trends at its \$200M Source Photonics unit and a \$250M networking systems and systems integration unit likely to suffer from its European exposure. Though the value case is compelling for MRV the company continues to struggle with parent level options accounting issues.

- Also of potential benefit to the optical sector was a detailed discussion of the elements of the recently passed \$7B broadband stimulus package, discussed in detail in a presentation during the OSA Executive Forum. Designed to encourage broadband infrastructure investment in underserved areas. The package includes \$2.5B allocated to the Rural Utilities Service (RUS) for loans, grants and loan guarantees to carriers serving rural areas and another \$4.35B allocated to the National Telecommunications and Information Administration (NTIA), part of the Department of Commerce. The initial evaluation window, the first of three, for NTIA grants is in the May-July 2009 timeframe and while it is likely to be a challenge to meet that deadline given a need to scale resources to evaluate projects, it is clear that the program is both large and moving fast with a number of separate and joint NTIA and RUS meetings in the last few weeks. The more established RUS, part of the Department of Agriculture, is likely to move more effectively given that it is already active in providing loans to rural utilities. With 300 rural telco customers and significant current RUS participation Occam Networks remains well positioned to benefit, while suppliers of PON infrastructure components as well as fiber optic cable such as Corning could also see modest positives.