

# GPON Explosion: *Four Vendors Announce GPON Solutions*

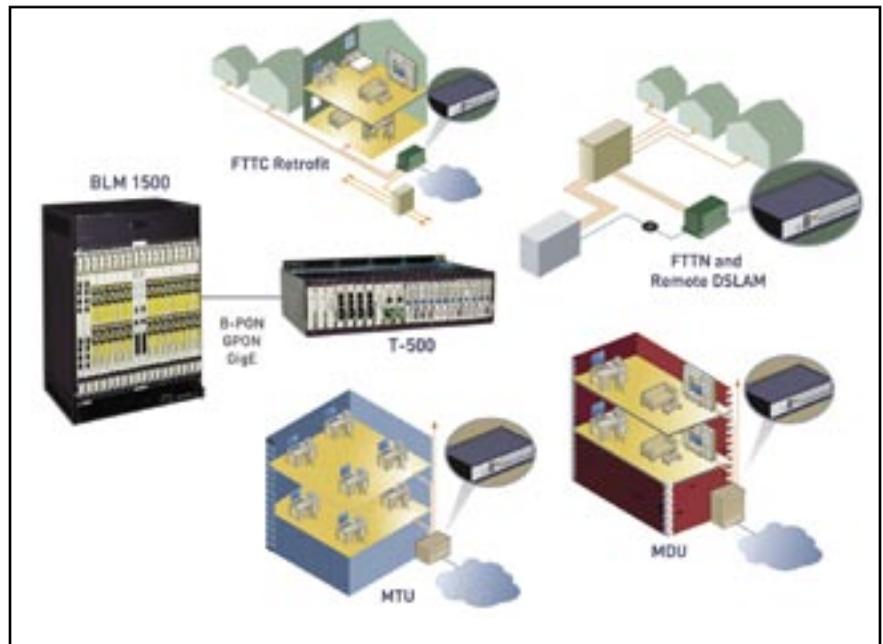
Entrisphere, Fujitsu, Motorola and Tellabs show new GPON gear; lower prices, more features

*A BBP Staff Report*

Looking for more proof that fiber is taking over? In the past two months, four experienced vendors have entered the GPON market: Entrisphere, Fujitsu, Motorola and Tellabs. They join Calix (which acquired GPON leader Optical Solutions last year), Hitachi Telecom (USA) and NEC America, who beat them by a few months with new or expanded GPON product lines, and such firms as Alcatel and Wave7 who announced last year. (Alcatel was not actually selling GPON at press time. FlexLight Networks, the first vendor to actually sell GPON equipment as far as we can determine; partners with AFL in the US and sells widely in China.)

Fujitsu Network Communications started selling its Hybrid Gigabit Passive Optical Networking architecture this month; it was announced in February. Entrisphere matched Fujitsu on timing. Motorola's entry is a new "blade" for its AXS2200 OLT platform.

GPON's current incarnation offers 2.488 Gbps downstream and 1.244 Mbps upstream, using the telephony-friendly ITU standard (see article on optical technologies, this issue). That's four times the downstream speed of BPON and 8 times the upstream bandwidth, with more software versatility to boot. But GPON equipment is selling for about the same as BPON now (about \$300 per line, or a bit more, in



*Entrisphere's T500 line, showing end-to-end deployment versatility, now for GPON as well as BPON, GePON and FTTN as well as FTTP.*

RBOC-volume; as much as \$700 in small quantities), and the price surely will go lower every month or two. The typical GPON OLT card (for the network end of the system) has four ports to BPON's two. GePON equipment is cheaper (thanks to huge economies of scale in the pure Ethernet market), but the gap is clearly closing.

At the ONT (customer) end, there are new twists, such as Entrisphere's built-in coax connectivity as well as

Ethernet. (System builders can, however, convert Ethernet to coax in a tiny box with solutions from, for example, Foxcom.) The industry has always said fiber is future-proof, requiring only a change in electronics to keep up with increasing bandwidth needs. Now, at least at the customer end where changing the ONT would require a truck roll and expensive labor, even the electronics have staying power.

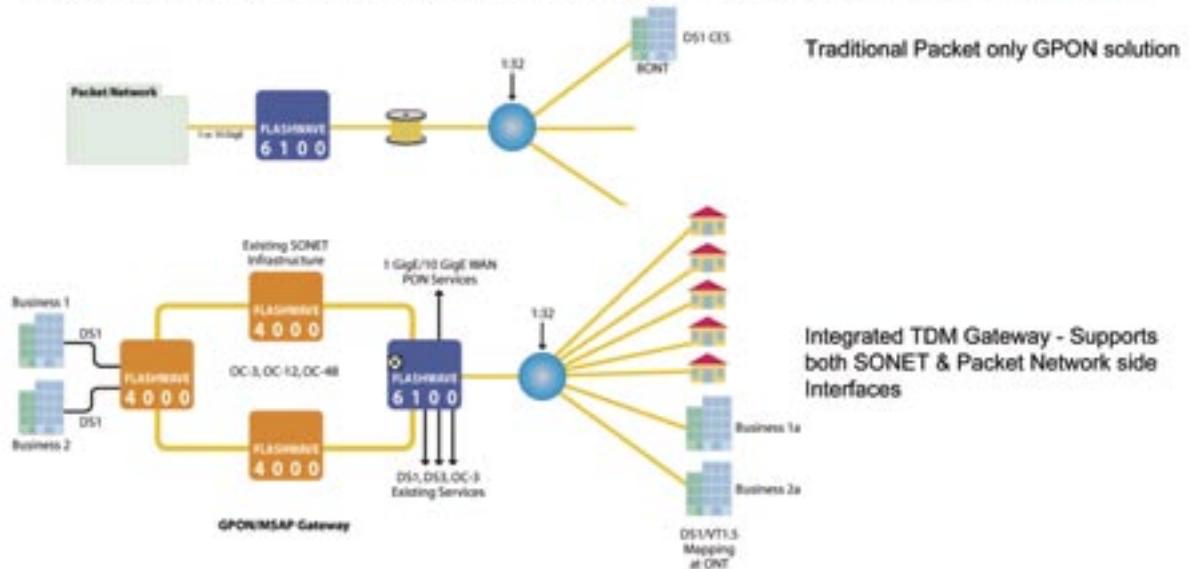
The new Calix 700-Series ONTs include an auto-detect feature so that network providers can start with BPON and upgrade subscribers to GPON without a truck roll. Fujitsu's "hybrid" GPON will allow service providers who start with GPON to increase customer bandwidth as much as 8-fold without chang-

***Fujitsu's "hybrid" GPON will allow service providers who start with GPON to increase customer bandwidth as much as 8-fold without changing the ONT in any way.***

# Integrated TDM Gateway

## Integrated TDM Gateway

- Next Generation GPON that fits seamlessly into existing SONET infrastructure
  - Both Packet & SONET Network interfaces
  - Mix & match packet services with TDM services
- Eliminates multiple DS1 protocol translations in the network
- Allows telcos to manage the transition to a packet network efficiently and on their own timeframe



Fujitsu emphasizes its ability to handle TDM in native format, and to upgrade easily to higher bandwidths.

ing the ONT in any way. The idea is to use coarse wave division multiplexing (CWDM) with customers getting their own wavelength as bandwidth needs increase over the next few years.

### Entrisphere

Entrisphere's complete GPON access solution, including network platforms, software, network terminals and management systems, is based on the firm's proven BLM 1500, T-Series and EntriView product lines, all of which have been deployed at major carriers for copper and BPON networks.

"Major carriers are evaluating GPON systems now and will begin volume GPON rollouts in late 2006 and 2007," said Teresa Mastrangelo, principal analyst at BroadbandTrends.com. "Entrisphere's BLM 1500 and T-Series are one of the few existing ac-

cess product lines with the bandwidth capacity to support GPON services. By releasing this complete set of upgrades now, Entrisphere is anticipating the deployment schedule of the largest North American GPON customers."

The solution also includes software upgrades that expand existing IP service-aware features such as IGMP multicasting, VLAN stacking and tagging, and security upgrades. These software additions also make the system ready for IMS integration. Entrisphere has en-

hanced existing key features in its line, including higher density GigE uplinks and integrated voice gateways for increased TDM (telephone T-1 and DS1) and VoIP support. Both the hardware and software components build on the existing base of BLM 1500, T-Series and EntriView systems.

"High-bandwidth, cost-effective, service-aware access systems have been hallmarks of Entrisphere's products since the beginning," said Don McCullough, director of product marketing at Entri-

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## Vendors Mentioned

AFL	<a href="http://www.afltele.com">www.afltele.com</a>
Alcatel	<a href="http://www.alcatel.com">www.alcatel.com</a>
Calix	<a href="http://www.calix.com">www.calix.com</a>
Entrisphere	<a href="http://www.entrisphere.com">www.entrisphere.com</a>
FlexLight	<a href="http://www.flexlight-networks.com">www.flexlight-networks.com</a>
Foxcom	<a href="http://www.foxcom.com">www.foxcom.com</a>
Fujitsu	<a href="http://us.fujitsu.com/telecom">us.fujitsu.com/telecom</a>
Hitachi Telecom	<a href="http://www.hitel.com">www.hitel.com</a>
Motorola	<a href="http://www.motorola.com">www.motorola.com</a>
NEC America	<a href="http://www.necus.com">www.necus.com</a>
Tellabs	<a href="http://www.tellabs.com">www.tellabs.com</a>
Wave7 Optics	<a href="http://www.wave7optics.com">www.wave7optics.com</a>

sphere. "Our GPON solution extends the value of the BLM 1500 and our T-Series of ONTs and ONUs by enabling high-density, high-bandwidth fiber services without requiring forklift upgrades."

The new Entrisphere ONTs and ONU introduced today serve single family homes, businesses, residences in multi-dwelling unit buildings (MDUs), businesses in multi-tenant buildings (MTUs), and fiber-to-the-curb (FTTC)

applications. All the applications meet North American standards in addition to G.984, including NEBS Level 3, GR-303/TR-08, 99.999 percent reliability and environmental hardening. By adhering to G.984 standards, both the OLT and ONTs are designed to be interoperable with other G.984-compliant GPON systems. The EntriView Element Management System (EMS) has also been upgraded to manage the

GPON network elements.

In addition, Entrisphere announced a series of new product features that enhance the performance of the GPON OLT and ONTs in the access network. These new features include new SIP-based VoIP service on all of its ONTs and ONUs, coupled with integrated voice gateways to legacy Class 5 switches and H.248 softswitches in the BLM 1500. (As an alternative to using an integrated gateway, the system interoperates with external SIP and H.248 voice gateways.)

### Fujitsu

Fujitsu's new Flashwave 6100 GPON platform includes a new OLT, and a family of ONTs. The OLT supports dual- and quad-port GPON cards within a 9U (9 rack units is about 15.75 inches) chassis to provide broadband services to up to 10,240 customers per standard rack with a 1:64 split.

The Flashwave 6100 supports all service interface cards from the widely deployed Flashwave 4100 Multi-Service Provisioning Platform (MSPP), so providers can deploy traditional MSPP, Ethernet, and GPON services from a single multi-service access node. The integrated TDM gateway function enables the provisioning of both packet and TDM services, allowing providers to manage the transition to a carrier-class packet-based network efficiently, and, most importantly, on their own schedule.

Fujitsu ONTs all include an integrated Multimedia over Coax Alliance (MoCA) interface, which uses existing coaxial wiring within a home to provide a broadband distribution network. "In today's broadband access market, telecom and cable service providers face intense competition to provide a new generation of rich, interactive, and personalized voice, video and data services," said Jim Hintze, senior vice president of marketing at Fujitsu Network Communications. "Our new GPON solution overcomes many of the limitations of legacy fiber-to-the-home solutions that are based on BPON technology, while providing a 75% increase in density."

"After spending billions of dollars on an FTTP infrastructure, the last thing

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**Motorola and Tellabs are building on their position as Verizon's major FTTH vendors. Verizon, of course, is deploying BPON but intends to transition to GPON.**

service providers need is another expensive build-out in five or ten years," said Hintze. "Our Hybrid GPON approach lets service providers inexpensively meet future bandwidth needs without replacing ONT equipment, thereby completely eliminating the equipment and labor costs of a truck roll to customer premises."

Just as Entrisphere benefits from its experience in carrier-class DSL, Telecom and electronics giant Fujitsu (a \$40 billion a year company) benefits from its GePON products, widely deployed in the Asian market. Fujitsu is also the primary supplier of Multi-Service Access Node (MSAN) solutions and IP Digital Subscriber Line Access Multiplexers (DSLAMs) for the British Telecom 21CN network in the U.K.

End-to-end network management and operations is provided by the Fujitsu Netsmart 1500 Element Management System (EMS), software that automates operations including provisioning, alarm monitoring, visibility, control, remote software upgrades and database backups. The Netsmart 1500 EMS supports all Fujitsu FLM and Flashwave Synchronous Optical Networking (SONET) and Wavelength Division Multiplexing (WDM) products, providing a common interface for management and provisioning of a unified Fujitsu transport network.

### Motorola

Motorola's new GPON blade for its year-old AXS2200 OLT platform also shipped in May. The platform includes a complete line of ONTs as well, including one that serves as many as 16 apartments in MDUs. The company is pushing an end-to-end solution that goes beyond fiber, with connections to wireless (both 802.11 "WiFi" and 802.16 WiMAX) and coax.

At the TelecomNEXT show in March, it showed IPTV streaming over the

multi-pathway system. Floyd Wagoner, Motorola's IPTV operations manager, said homes will need 30 to 38 Mbps bandwidth in the near future, due to HDTV demands, and maybe more. He noted that "some telephone companies" believe only 20-24 Mbps is enough. The reference was clearly to AT&T.

Motorola is building on its position as one of Verizon's major FTTH vendors (the other is Tellabs). Verizon, of course, is deploying BPON but intends to transition to GPON, a key requirement for Motorola.

### Tellabs

As we went to press, Tellabs showed its 8865 next-generation GPON OLT, a blade for the hardware-centric architec-

ture of the Tellabs 8800 multi-service router series (Tellabs got the 8800 by buying Vivace back in 2003). The Tellabs 8865 OLT has integrated service edge router functionality, multiple 1 Gbps and 10 Gbps uplinks, and support for nearly 4,000 ONTs.

With installation of a new GPON line module, the Tellabs 1000 multi-service access series offers simple and cost-effective migration to GPON from BPON, Digital Subscriber Line (DSL) or Digital Loop Carrier (DLC) technologies. At the subscriber premises, the Tellabs® 1600-712 GPON ONT supports residential voice, high-speed data, Internet Protocol Television (IPTV) and cable television in a single, cost-effective unit.

"Consumers and businesses demand more from the Internet," said Carl DeWilde, executive vice president of broadband products for Tellabs. "They want personalized, on-demand applications, greater entertainment choices and reliable data." **BBP**

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- Patrick Cunningham – Vice President, Sales and Marketing, MDU Communications, and
- Bryan Rader – President and CEO, MediaWorks

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