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Q3 2010

Fast-forward to the mobile Internet

TIME for a Change

Upgrading from SDH to DWDM gives Malaysia's TIME dotCom a new competitive edge

"We had a tight deadline. Tellabs was able to keep to this."

— Azman Imen, head of network roll-out, project management, for TIME dotCom

tellabs insight

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Innovative viewpoints that help you succeed

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www.tellabs.com/blog

One Tellabs Center
1415 West Diehl Road
Naperville, IL 60563 USA
Phone: +1.630.798.8800
Fax: +1.630.798.2525
www.tellabs.com

President and CEO
Robert W. Pullen

Editorial Managers
George Stenitzer
Ted Meister

Publisher
Connected Planet Custom Media
330 North Wabash Avenue
Suite 2300
Chicago, IL 60611
Phone: +1.312.595.1080
Fax: +1.312.595.0296
www.telephonyonline.com

Editor
Tim Kridel

Editorial Contributors
Gabriel Brown, Joan Engebretson, Kevin Fitchard, Lynnette Luna, M.J. Richter

Art Direction
Cavedweller Studio

Account Manager
Bethany Borger

leading edge

Innovating the Global Mobile Internet

The world loves two telecom technologies: mobile phones and the Internet. We just can't live without our iPhones, Androids and BlackBerries. Not to speak of our laptops, PCs and TVs.

As a result, the telecom industry sees a mix of tremendous growth, technology innovation and towering challenges ahead. We find these challenges not only in mobile networks, but also in optical, business and residential networks.

In discussions with customers around the world, we hear similar concerns:

- How do you keep up with annual mobile data traffic growth of 30% to 50% or more?
- How do you limit capital needs and keep operating costs in line?
- How do you deliver a quality of user experience that is unmatched?

"Tellabs is increasing our R&D spending and we're hiring."
— Dan Kelly, Executive Vice President, Global Products

Mobile Internet Revolutionizes Networks

In the mobile Internet, one path that service providers may choose is a common mobile packet core network for 2G, 3G and 4G mobile networks, says industry analyst Gabriel Brown of Heavy Reading (page 16). Mobile packet core is the key to gaining a commercial competitive advantage in the mobile Internet, says Brown.

But there's real risk in addressing tomorrow's mobile Internet needs with the built-in constraints of the fixed Internet. A more thoughtful approach may be required (pages 6-7), says Tellabs CTO Dr. Vikram Saksena.

In Russia, network challenges are compounded by the need to cover a huge geographic area with mobile service. Tellabs and local partners are helping customers transform networks with innovative mobile backhaul solutions (pages 12-13).

How can service providers vault from the middle of the pack into a leadership position? In Malaysia, DWDM makes the difference for TIME dotCom (cover story, pages 8-11).

And as broadband stimulus funds roll out in rural America, Woodstock is future-proofing its network with gigabit passive optical network technology (GPON), pages 14-15.

Increasing R&D, Hiring Engineers

More challenges mean more need for technology innovations. To help our customers address such challenges, Tellabs is increasing our research and development spending. We're hiring engineers around the world, with an emphasis on IP/Ethernet skills. To see our current openings in Silicon Valley, Naperville, Finland and China, check out www.tellabs.com/careers.

Sincerely,

Dan Kelly
Executive Vice President, Global Products

Mobile Backhaul Spending Tops $7.2 Billion

As the number of 3G, LTE and WiMAX networks grows, so does the market for backhaul. In 2009, backhaul equipment spending totaled $7.2 billion worldwide. It's on track to hit $10.4 billion by 2014, according to a recent Infonetics Research report.

ABI Research is equally bullish, predicting a fivefold revenue increase between 2009 and 2014, with a sharp increase after 2012. Both firms also expect microwave sales to remain strong. In 2009, TDM, Ethernet and Ethernet-TDM microwave equipment was 81% of all backhaul sales, Infonetics found.

"The Ethernet-only microwave segment is poised for rapid growth over the next few years, outperforming hybrid TDM/Ethernet solutions," said Richard Webb, Infonetics' directing analyst for microwave. ■

Mobile Voice Upgrades to HD

Although mobile data is now 33% of average revenue per user (ARPU) for some operators, voice remains wireless' killer app. That's one reason why a growing number of operators — including 3 and Orange — are launching products aimed at improving voice quality.

"HD voice" uses a codec that supports a wider range of audio frequencies: 50–7000 Hz versus the 300–3400 Hz in conventional handsets and networks. That clarity should benefit mobile operators by giving them another way to differentiate themselves, especially in the eyes of business customers and other people who talk hundreds or thousands of minutes per month.

Noticeably better voice quality also might convince some customers to talk longer and thus upgrade to a bigger bucket of minutes — or shift all of their voice spending to wireless.

Noticeably better voice quality might convince some customers to talk longer.

"Price per minute won't go up for HD voice subscribers, but it may not erode as quickly as for subscribers to conventional services," said Fritz Jordan, ABI Research principal analyst.

By 2015, 487 million people will have an HD-enabled handset, ABI predicts. The firm expects growth to increase suddenly in 2013 and then "skyrocket" in 2014, all because on the network side, deploying HD voice is relatively quick and inexpensive.

"Newer 3G networks — those deployed since about 2005-2006 — can already use the new format and require only a software update and a changeover to HD handsets," Jordan said. "That's why HD voice, unlike most technologies, will first find traction in developing markets: Eastern Europe, Latin America, Middle East and Africa. In North America and Western Europe, 3G infrastructure installed earlier in the decade must be changed to a new format." ■

Bull Market for M-Commerce?

When the global economy finally rebounds, a lot of pent-up spending will flow through mobile phones, according to two new analyst reports.

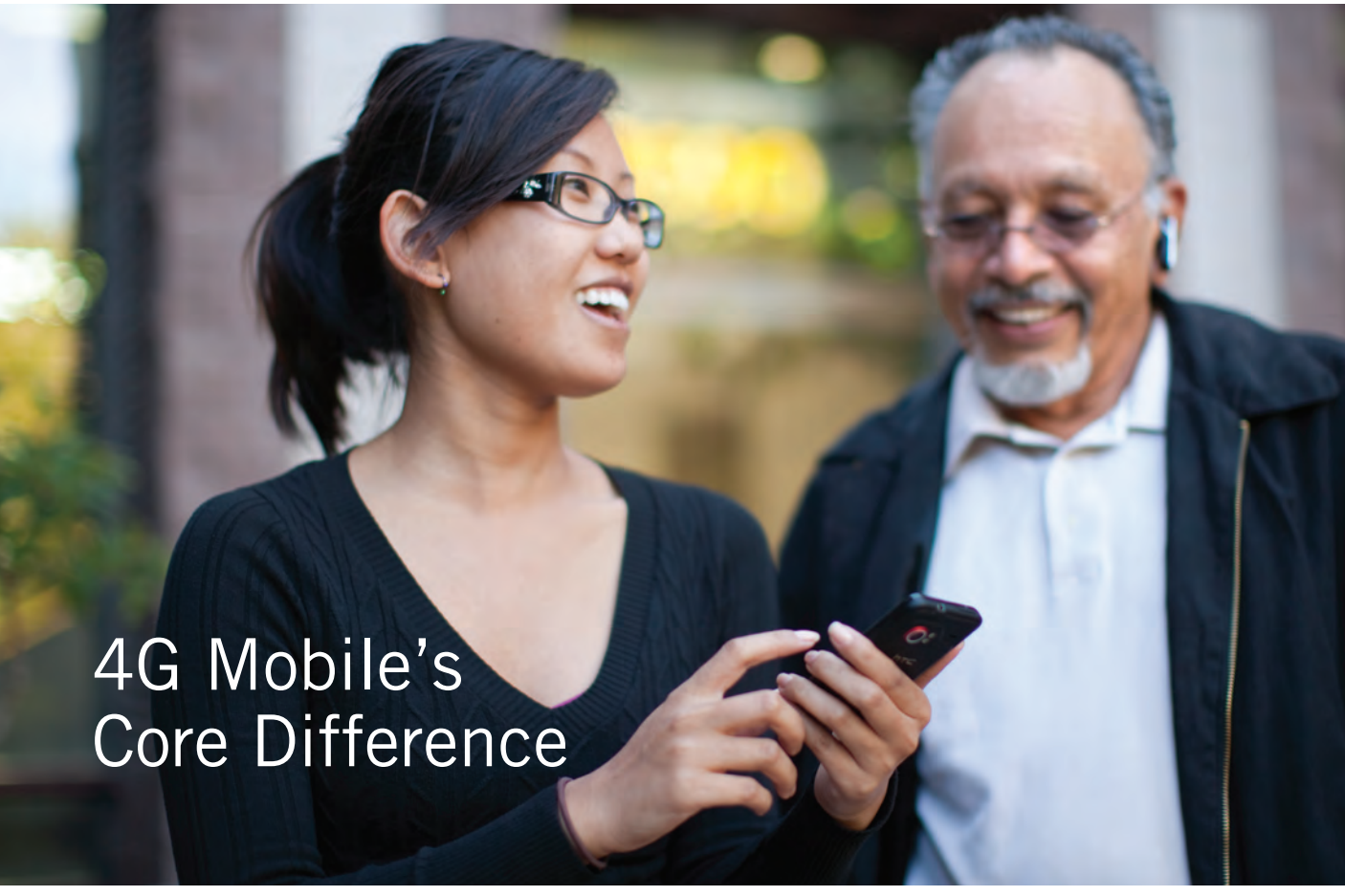
Berg Insight predicts that the number of people using mobile banking and other m-commerce services will have a compound annual growth rate of 59% through 2015, when it will hit 894 million worldwide.

"The global number of mobile banking users more than doubled between 2008 and 2009, and is expected to almost double again in 2010," said Marcus Persson, telecom analyst at Berg Insight.

Meanwhile, Juniper Research expects that mobile spending on digital and physical goods, money transfers and other transactions will grow from $170 billion this year to nearly $630 billion by 2014. Growth in smartphone adoption and app store usage is one major driver, but so is an expanding range of m-commerce services — such as transportation ticket purchases — running over low-tech SMS.

Some wireless carriers are equally bullish, judging by where they've been putting their money lately. For example, in March, China Mobile spent nearly $6 billion for a 20% stake in Shanghai Pudong Development Bank Co. That could turn out to be a wise investment: Asia-Pacific will be home to more than half of all m-commerce users by 2015, Berg predicts. ■

Source: which.co.uk



4G Mobile's Core Difference

For LTE and WiMAX, router-based platforms adapted from 3G are a bad fit. A purpose-built platform is a smarter move.

By Kevin Fitchard

A year ago, the words "mobile core" and "Tellabs" wouldn't have been mentioned in the same sentence. As far as wireless networks went, Tellabs was focused almost entirely on backhaul.

But that all changed for two reasons. First, Tellabs bought WiChorus, an upstart vendor that made a big mark in 2009 with several key WiMAX core contracts. Second, the 4G core's distributed architecture breaks down the distinctions between the core and backhaul network, enabling Tellabs to expand beyond its backhaul niche.

In a recent interview with Kevin Fitchard, wireless infrastructure editor at *Connected Planet*, Tellabs CTO Vikram Saksena explained why his company chose to enter the core market, how its platform fits into its portfolio and overall wireless strategy and how it plans to compete in the larger 4G core market.

Kevin Fitchard: ***Why get into the packet core space?***
Vikram Saksena: We historically have been strong in the backhaul space, and what we were trying to do was find adjacencies to see where we could expand beyond just doing backhaul. When we looked at 4G, because of the way the networks are being flattened to be more data-centric, the obvious play beyond backhaul was the packet core.

There are synergies between backhaul and the packet core when you look at how 4G networks are built. We felt that having both those pieces would offer our customers an advantage. We feel we can leverage our backhaul presence and innovate for customers in ways that would be hard to do with a stand-alone packet core.

In 3G and before, the RNC was the demarcation point between backhaul and the packet core. When you go to 4G, there is no RNC. There is the radio part, and then there's an IP network behind it. Artificially you can break it up into packet core and backhaul, but it's really all one IP network.

KF: ***Tellabs isn't just entering a core market; it's doing so with a different strategy than the established core vendors. Explain how your purpose-built platform is different from the router-based approaches of your competitors.***

VS: In broad terms, what the router vendors are doing is to take an existing router platform and then graft a packet core onto it. This creates some architectural issues in terms of scalability and performance.

A router is a Layer 3 platform, while a packet core is more of a Layer 4 through Layer 7 platform. When your initial product wasn't designed to be a gateway product, it creates fundamental limitations when you try to add gateway functionality to it.

However, when you start with a packet core platform and try to add routing and switching — which is the approach we are taking — you get a completely different product with significantly better scale and performance characteristics.

In some ways, both approaches combine routing and packet core functions in one product, but the resulting architectures and designs are very different. We're starting at the gateway layer and moving down the stack rather than starting at the routing layer and moving up the stack.

"You want to make the user experience consistent."

— Vikram Saksena, CTO, Tellabs

The router vendors are building their packet core on top of their existing operating system, which is built around routing and switching. In that model, when you add packet core you're adding a server blade: an application layer blade in the router. You're taking traffic in from a line card, hair-pinning it into a server blade and then bringing it out through another card.

That is very inefficient because traffic has to traverse the switch multiple times. What we do is perform all the processing functions when traffic enters the line card.

We have a very distributed architecture, in which we've built the packet core into our platform operating system itself, as opposed to adding it as an application on an existing operating system. When the packets enter the line card, they get processed, not only at Layer 2 and Layer 3 but also at Layers 4 through 7. This reduces latency and increases the effective throughput of the platform.

Compared with stand-alone packet core platforms, we paid special attention to the multi-dimensional aspects of packet core performance. Our architecture supports independent scaling of control plane, data plane and application plane performance.

The stand-alone packet core platforms from other vendors were designed originally for 2G and early 3G networks. This was well before the advent of smartphones. Back then, data traffic demands were not as stringent, and only the data plane throughput was of primary concern. We recognized that with the plethora of smart devices coming on to the 3G and 4G networks, dealing with control plane and application plane performance was equally important.

Therefore we dedicate processing resources to scale every dimension of performance. We've done things that we would consider more 4G-centric, rather than trying to reuse older platforms originally designed for 2G and 3G networks of the pre-smartphone era.

KF: What do you think the competitive landscape will be like? Many analysts have projected that a few radio access vendors will dominate the 4G radio market. Will the same be true — or even more so — for the 4G core market?

VS: The closer you go to the edge, there is more opportunity for more players. As you get to the core, it condenses down to fewer players.

I think most operators are drawing the line between the radio and the core. Radios are very cost-sensitive components, and that's where most of the CapEx lies. It's good to drive the cost down by having more competition in that space.

The packet core is a little different because it's the control point for the users' experience. There are very few operators who will deploy multiple different packet cores. Each aligned with a different radio vendor, because when you move from base station to base station and end up on a different packet core, service layer consistency may be lost.

In that situation, it's not clear that you'll get the same user experience because of the different ways these packet cores deal with traffic and user sessions. Many operators are trying to create more of a single- or dual-vendor packet core, along with a multiple-vendor radio access network. You want to make the user experience consistent, and you want to make your charging and billing functions consistent, so you won't see as much diversity in the packet core as you will in the radio network.

KF: Are you saying operators are willing to pay a premium for a packet core that they wouldn't necessarily pay for the radio network?

VS: In our industry, generally speaking, pricing is value-driven. The packet core is the "brain" of the wireless network; it is where the service logic and policies are enforced, which enables the operators to differentiate their offerings.

This is quite different from the radio layer, which provides commoditized access. The pricing models are consistent with the value delivered by these segments in the operator's network. ■

2G: Second Generation
3G: Third Generation
4G: Fourth Generation
CapEx: Capital Expenses
RNC: Radio Network Controller

DWDM Makes a Difference at TIME

Capacity, reliability and Tellabs' support help the Malaysian operator win new wholesale and enterprise customers.

By Joan Engebretson

Hairun Nizam Hashim (left) and Azman Imen (right).

For TIME dotCom, the Ds in DWDM stand for "difference." TIME is a competitive carrier with a fiber optic network that covers a large portion of Malaysia and features 5 redundant routes totaling 6,000 kilometers. Until recently, TIME served its wholesale and business customers using SDH, but that technology did not provide the efficiencies the company wanted for its customers.

All of that has changed since the company deployed a DWDM network based on the Tellabs® 7100 Optical Transport System (OTS). The new network enables TIME to offer strongly differentiated, high-bandwidth services backed by SLAs. It is supported by a unique mesh protection scheme that provides sophisticated reroute capability to help ensure service even in the event of multiple fiber cuts.

After just a few months of operation, the new network already has helped TIME win new wholesale business from one major wireless carrier and attract significant interest from several others. In addition, the new network capabilities have generated strong interest on the part of key enterprises, including several in the financial industry.

"We had a tight deadline," Azman said, and of the vendors participating in the proof of concept, "Tellabs was able to keep to this."

Capacity and Confidence

TIME decided to make the move to DWDM because as Azman Imen, head of network roll-out, project management, for TIME, explained, "Our concentration is in the wholesale market, and we needed to have a very effective network that could provide 99.999% reliability."

Capacity was another motivation. "SDH networks are subject to congestion, and wholesale customers now want more bandwidth," said Hairun Nizam Hashim, transmission and service management engineer for TIME.

The maximum connection speed that the SDH network could support was 10 Gb/s. The new network can support as many as 88 wavelengths per fiber, with each wavelength providing 10 Gb/s connectivity. And in the future, the system can be easily upgraded to support 40 Gb/s or even higher data rates per wavelength.

Tellabs was 1 of 6 manufacturers that competed for the TIME business and had not previously supplied any equipment to the carrier. Tellabs won the business because its product was rated the highest in TIME's stringent internal tests and because decision-makers were impressed by Tellabs' responsiveness to their needs.

"What interested us most was the mesh protection," Azman said.

Tellabs was one of only a few vendors that would be able to support mesh protection capability using GMPLS at the wavelength level. This was critical for supporting TIME's 5 fiber routes running across Malaysia.

Tellabs is in the process of enhancing the Tellabs 7100 OTS to support this capability, which it has scheduled for delivery in third quarter 2010. By using GMPLS-based mesh protection at the wavelength level, each of TIME's fiber paths will have 4 different backup paths. Traffic can be switched onto those paths instantaneously, helping ensure connectivity even in the event of multiple fiber cuts. This mesh protection scheme enables TIME to offer service with 99.999% reliability.

Proof on a Tight Timeline

Prior to deploying DWDM, TIME wanted to do a proof of concept involving a limited installation of the DWDM equipment.

Winning Wireless

Although the new DWDM network has been operational only since December 2009, TIME has won wholesale backhaul business from a major wireless carrier that the company had been trying to land.

"What we offered earlier was based on SDH, and they weren't very keen," said Azman Imen, head of project management for TIME. "But once we offered DWDM, we got the business."

That wireless carrier, along with others, are impressed by the bandwidth and capacity TIME now can provide. With 88 wavelengths per fiber, capacity is virtually unlimited, and the 99.999% reliability that TIME can provide using its 5 fiber routes and Tellabs' GMPLS-based mesh protection scheme was also an important differentiator.

"The wireless operators demand bigger bandwidth and the protection," Azman said. And measured on a per-bit basis, the DWDM-based offering is less expensive than SDH-based alternatives.

TIME is proud of its network and confident that it is ready for any eventuality.

"We had a tight deadline," Azman said, and of the vendors participating in the proof of concept, "Tellabs was able to keep to this."

Decision-makers were also impressed with Tellabs' global approach to customer support. To meet the schedule, Tellabs not only leveraged its extensive Asia-Pacific-based services expertise, but also sent people from its U.S. operations to help with the proof of concept.

"We were able to demonstrate the full ROADM functionality required," said Chua Joo Kwang, Tellabs' regional sales director for Singapore, Malaysia, Thailand, Philippines, Hong Kong and Taiwan. "The proof of concept was completed in a very short time."

Tellabs also made some modifications to the Tellabs 7100 OTS to help meet the unique needs of TIME's network, based partly on submarine cables connecting markets located along the country's 2 coasts. The use of submarine cables could have increased the solution costs, but Tellabs minimized the number of regenerators and other expensive components needed to reduce costs by about 35%.

TIME's network has a total of 66 nodes and includes 4 landing points in Malaysia, as well as 2 points in Singapore. Once Tellabs was chosen, the first phase of the network upgrade was completed in just 4 weeks, meeting TIME's ambitious deployment schedule. Additional phases of the network upgrade will roll out during 2010.

With the network in operation for just a few months, it's too early for TIME executives to estimate the savings thus

THE TELLABS® 7100 OTS ADVANTAGE

The Tellabs® 7100 Optical Transport System (OTS) initially caught TIME's attention because it provides GMPLS-based mesh protection at the wavelength level. This design offers automatic reroute protection even in the event of multiple fiber cuts and enables the carrier to offer 99.999% reliability.

TIME knew that high-resiliency, combined with the Tellabs 7100 platform's ability to support virtually unlimited bandwidth at improved price points, would be a hit with customers. Johari Raja Affendi, Tellabs' account rep for TIME, said that the Tellabs 7100 network will lead to potential growth in the enterprise market for TIME, with more Tellabs® 7100 Nano™ products expected to be deployed and more services revenue generated in the process.

Other Tellabs 7100 OTS capabilities also can help TIME and other service providers differentiate their service offerings. One example is remote provisioning, which enables TIME to provision DWDM-based services for its wholesale and enterprise customers in less than 24 hours without a truck roll.

Customers also can add new services and locations quickly by adding new cards rather than new devices. That capability, in turn, can eliminate the need for customers to issue requests for proposal when expanding a service or purchasing a new one, thereby simplifying the sales process. And by eliminating the need for equipment ordering and installation, Tellabs' approach helps minimize customers' waiting times.

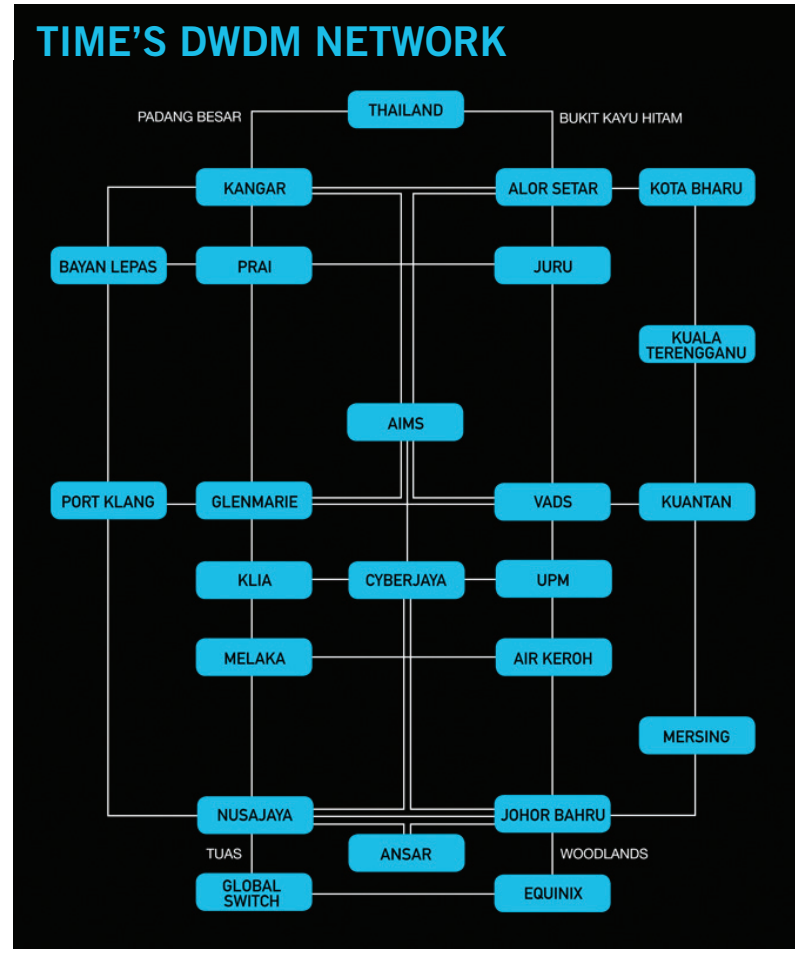
Service providers find the Tellabs 7100 OTS easy to manage, using the point-and-click capability of the Tellabs® 8000 Intelligent Network Manager (INM). The Tellabs 8000 INM also provides end-to-end performance monitoring and remote troubleshooting using unique testing tools that use live traffic at the packet level.

Despite these advanced capabilities, the Tellabs 7100 OTS is more economical than legacy solutions. One of Tellabs' North American service provider customers saw savings of up to 65% in CapEx and 85% in OpEx compared with its previous network.

Tellabs estimates that an upgrade to the Tellabs 7100 OTS delivers 4 times the bandwidth at less than 75% of the cost of legacy systems.

far, but they expect a significant OpEx reduction. The DWDM network provides substantially higher bandwidth with fewer network elements and should be less expensive to operate, particularly when costs are calculated on a per-bit basis.

According to data from other Tellabs customers, a Tellabs 7100 OTS-based DWDM solution can deliver 4 times the bandwidth at 50% to 75% of the cost of legacy systems. Network elements and CapEx can be reduced by up to 65%, and OpEx can be reduced as much as 85%.



Strategy and Support

To help persuade TIME, Tellabs shared its experiences with Verizon, which uses a Tellabs 7100 OTS-based DWDM network to serve enterprise customers. TIME was at a stage where it was also looking at ways to widen its range of services, as Verizon had.

TIME also liked that Tellabs provided comprehensive post-sale support. TIME was eligible for Tellabs' Enterprise Partnership Program, a sales support and training program aimed at helping Tellabs' service provider customers sell more services based on Tellabs equipment.

Tellabs personnel worked with TIME's sales and marketing team to explain the benefits of features such as GMPLS-based mesh protection. Using the Tellabs 7100 OTS, TIME is able to provision services for wholesale and enterprise customers in less than 24 hours without a truck roll. (See sidebar.)

"Tellabs conducted workshops to explain the benefits of TIME's network redundancy and resiliency, and how customers could be hooked up and provisioned quickly," Joo Kwang said.

Tellabs also worked with TIME to position TIME's DWDM-based services against other service provider offerings. Using this technical information, TIME salespeople can demonstrate how their offering provides greater resiliency and capacity than competitors, including Malaysia's incumbent carrier.

Tellabs' participation helped TIME generate substantial interest from large enterprises, including some Singapore-based financial organizations looking for reliable high-speed connectivity to Malaysia's major city Kuala Lumpur, sometimes referred to as simply "KL."

"They like the fact that we can do add/drops in KL and connect to Singapore," Azman said. "You can't do that with SDH."

TIME's Cross Peninsular Cable System (CPCS) network is now the most robust transborder terrestrial system ever built. Its design only has one goal in mind — high availability. Tough and resilient, TIME is proud of its network and confident that it is ready for any eventuality.

Designed as a fully meshed network over 5 diverse routes, CPCS traverses more than 6,000 km with dedicated fiber optics connecting Thailand and Singapore, CPCS was designed to provide the ultimate in physical path protection. With 5 dedicated fiber routes running along both coasts, alongside major highways and via utility corridors, TIME does admit to an element of over-engineering.

The results, however, are stunning: up to 99.999% availability. ■

CapEx: Capital Expenses
DWDM: Dense Wavelength Division Multiplexing
GMPLS: Generalized Multiprotocol Label Switching
OpEx: Operating Expenses
ROADM: Reconfigurable Optical Add/Drop Multiplexer
SDH: Synchronous Digital Hierarchy
SLA: Service-Level Agreement

Russia's Transport Transformation

As mobile data usage skyrockets, operators jettison E1s for faster, more cost-effective Ethernet.

By Lynnette Luna

The U.S. and Western European mobile markets receive much of the attention when it comes to mobile data consumption, and China and India are typically singled out as vastly untapped mobile broadband markets.

But north of these emerging markets sits Russia. With a land mass nearly twice the size of the U.S., Russia is on the cusp of explosive growth in high-speed wireless data services. Indeed, its operators may very well overtake their peers abroad in rolling out 4G networks.

Many Russian operators are gearing up for growth by deploying HSPA. Despite a global economic crisis that lingered throughout 2009, mobile broadband growth has surged in Russia. Pyramid Research estimates that revenue from mobile data there reached $951 million in 2009 and forecasts revenues of $1.5 billion in 2010 as the economic recovery continues.

"Russia's telecom market offers considerable opportunities for vendors and investors," said Deniss Radcenko, senior analyst with Pyramid Research. "Operators are heavily investing in mobile broadband and, in line with this, upgrading their 3G networks in order to compete in the vital mobile data segment."

The 3G Boom

Several trends will drive explosive revenue growth through the end of this year, Radcenko said.

A spectrum shortage had limited the country's largest operators — MegaFon, MTS and VimpelCom — to providing indoor 3G service in Moscow. However, in December 2009, regulators authorized them to substantially expand their outdoor services throughout the capital city.

These 3 operators operators continue to aggressively roll out 3G networks across the rest of Russia. For instance, VimpelCom recently launched services in its 400th town, Radcenko said.

Meanwhile, MTS, Eastern Europe's largest mobile operator, recently announced plans to spend up to $1.6 billion on 3G network upgrades in Russia in 2011. It anticipates mobile data to exhibit the fastest growth in its mobile business, with a compound annual growth rate of 41% between 2009 and 2012.

"We are very pleased to be considered for such an opportunity and look forward to spreading our expertise within the CIS region, enabling operators to lead the market by introducing the latest technologies," said Aleksandr Andrianov, sales director at Intracom, a Tellabs partner.

Dmitry Ivanov, head of technical sales with system integrator Jet Info Systems, a Tellabs partner, predicts that Russian operators will soon face a dilemma familiar to their Western counterparts: Data traffic will start outpacing data revenues. That trend will only accelerate, thanks to unlimited Internet access, flat-rate data packages and the penetration of 3G-enabled devices.

"We definitely see a trend of ARPU falling and traffic growing," Ivanov said. "Operators are seeking ways to monetize usage on the radio network side, such as Deep Packet Inspection (DPI) and new tariff models."

"Developments including the take-up of smartphones in Russia mean congestion on the air interface is a real possibility," said Matz Hedman, technology specialist at Tellabs. "Fair usage schemes that use context- and application-aware DPI to trigger traffic management actions enable more users in a cell area to share the spectrum with 'good enough' quality. So when congestion does occur, the 'best-effort' traffic can be held back in favor of higher-paying subscribers."

Target: 100 Mbps

But some argue that another factor — how the backhaul network is provisioned — could make or break the mobile broadband business case in Russia.

"Mobile carriers must improve the transport network," said Konstantin Fetisov, sales director with General DataComm (GDC), a mobile equipment provider and long-time Tellabs partner. "The speed of the Internet will be growing. If operators want to offer IPTV solutions, for instance, we need something at about 50 Mbps per second for each subscriber. It will be necessary to improve the transport network."

"There is a strategic network change that needs to happen if operators want to be competitive."

— Petri Markkanen, Vice President, Russia & CIS region at Tellabs

Yet another reason for backhaul upgrades: Russia's Minister of Telecommunications has set a goal for broadband providers — mobile and fixed — of offering 100 Mbps.

In response, GDC and other Tellabs partners working with Russian operators advocate the Tellabs® 8600 Managed Edge System. The Tellabs 8600 system enables Pseudowire over MPLS as a cost-effective alternative to adding more expensive E1 lines to connect each base station.

Ethernet is a much less expensive and more flexible technology than TDM, the basis of E1 and T1 lines. Ethernet supports high-bandwidth scalability that lets carriers pay only for what they use.

INSIDE TELLABS' RUSSIAN AND CIS STRATEGY

Rob Pullen, Tellabs' CEO and president, recently spoke with *Standard*, a magazine covering the Russian and Commonwealth of Independent States (CIS) telecom markets. Following are some excerpts from that interview.

***Standard:* How does the geography of Tellabs' business look?**
Rob Pullen: 43 of the top 50 global operators are using our mobile, optical or business solutions. About one-third of our sales are outside of North America.

We consider India, Russia, Brazil and African countries as strategic markets. It's in these regions, mainly with local partners, where we are investing our money.

***S:* How does Tellabs operate in Russia and the CIS?**
RP: As in most countries outside the U.S., here we operate through partners, who have local competence and knowledge of local bureaucratic specifics. Our partners in Russia are system integrators such as Sitronics/Intracom, AMT Group and IMAQLIQ (formerly General DataComm), and newly appointed partners Technoserve, Jet Info Systems and Satel.

In 2010, we intend to expand our presence in Russia and the CIS, so we're going to increase the number of our local partners, switching from a single rank of partners to a 3-level system. Traditionally the dialogue with systems integrators was initiated by Tellabs, but in the past 6 months, our potential partners have contacted us.

***S:* Who are your main customers in the region?**
RP: Our key customers are 3G license holders, so our focus includes the entire Russian "great cellular three." MTS, Vimpelcom and MegaFon purchase our optical solutions, and this year, we'll also offer products for boosting their network capacity.

In the CIS, we're interested in large countries, namely Kazakhstan, Belorussia and Ukraine. Our current customers include the Ukrainian cellular operator Astelit.

"There is a strategic network change that needs to happen if operators want to be competitive and react quickly to customer demands." said Petri Markkanen, vice president, Russia & CIS region at Tellabs. "They have to re-adjust their backhaul cost structure."

Up to 93% Savings

The change in backhaul also creates a significant advantage for operators looking to deploy 4G networks alongside their 3G networks.

Operators are allocating significant capital to HSPA rollouts today, but new competitors with 4G licenses are expected to roll out all-IP LTE networks by 2011, said Pyramid's Radcenko. Russia's 5 largest operators — MTS, VimpelCom, MegaFon, Tele2 and Svyazinvest — all plan to conduct LTE trials in various regions and spectrum allocations.

Mobile data revenue in Russia will grow more than 50% this year, estimates Pyramid Research.

"The beauty of the Tellabs 8600 system is that once operators move to Ethernet as their transport layer, they can use it to backhaul 2G, 3G and LTE traffic," said Tellabs' Markkanen. "That means operators can effectively double their radio capacity in the radio access network with little to no impact on OpEx."

Analysts estimate that each LTE base station must be capable of handling bandwidth in the range of 100 Mbps to 300 Mbps. As demand skyrockets, that number could reach 1 Gbps or more, yet operators won't see an impact in terms of ongoing costs.

Tellabs' estimates, gleaned from working with some 100 operators that have deployed the Tellabs 8600 system, show potential savings of 63% to 93% in the evolution from 3G to 4G. For example, in a 30,000-cell-site network employing Tellabs' Ethernet backhaul, an operator can save up to $78 million in CapEx and $876 million in OpEx over 5 years. With Russia covering one-eighth of the Earth's inhabited land area and facing an upsurge of data traffic, those numbers make compelling reading. ■

2G: Second Generation
3G: Third Generation
4G: Fourth Generation
ARPU: Average Revenue Per User
CapEx: Capital Expenses
HSPA: High-Speed Packet Access
IP: Internet Protocol
IPTV: Internet Protocol Television
LTE: Long-Term Evolution
MPLS: Multiprotocol Label Switching
OpEx: Operating Expenses
TDM: Time Division Multiplexing

Woodstock Goes All Out with Fiber

Minnesota operator uses Tellabs GPON solutions for an aggressive upgrade.

By M.J. Richter

In rural Minnesota, Ken Knuth divides his time between raising horses and delivering advanced communications services to area residents and businesses. On one recent morning, he helped a mare get through a difficult delivery and then turned to another complex task: continuing the buildout of a FTTH network that can deliver access speeds of up to 75 Mbps.

Woodstock Telephone Co., where Knuth is owner and president, decided that FTTH was essential for staying ahead of both his customers' bandwidth needs and the competition. With 1,300 access lines serving an operating territory of 450 square miles in southwestern Minnesota, the independent operating company provides Internet and voice services to subscribers in 5 neighboring communities and the surrounding rural areas.

Knuth said many of his customers are farmers who use the Internet for applications such as checking commodity prices, buying equipment, plowing their fields along GPS-defined grids and using software to measure crop yields in real time.

From the Node to the Home

Woodstock initially responded to the bandwidth demand by deploying FTTN in some exchanges, "putting in a couple cabinets a year, burying 5 to 8 miles of fiber here and there," Knuth said.

Although that shortened the copper loops, they still couldn't muster more than 512 Kbps. Worse, a lot of that copper, which Woodstock had installed in 1976, was near exhaustion. The piecemeal FTTN strategy wasn't working, and it wasn't economical.

"The copper had all gotten wet anyway," Knuth said.

About 3 years ago, Knuth decided to shift to a FTTH architecture. At the time, Woodstock's network consisted of a 5E switch in Ruthton, Minn., with fiber links to Tellabs® 1000 Multiservice Access Series DLCs in the towns of Garvin, Holland, Russell and Woodstock. Copper loops ran from the DLCs to customer premises.

Until very recently, Woodstock's fiber backbone was an ATM-based SONET OC-12 ring serving 4 of the 5 towns, with Garvin tied in via DS1/DS3 connections leased from Qwest Communications.

Woodstock delivers up to 75 Mbps via fiber to homes.

Preparing for the Future

Woodstock first replaced the 5E switch with a softswitch that can provide SIP-based voice service. Then Knuth began to look for a future-ready access platform that could support services such as IPTV and video on demand. Knuth also wanted a proven vendor with the staying power to continue evolving that platform.

The problem within the access-equipment market, Knuth said, is that "Company A comes out with a good product but, a year later, Company B leapfrogs them. Company A is not big enough and well-enough established to do the research or spend the research dollars to keep up with Company B or to leapfrog them."

Knuth chose the Tellabs® 1150 Multiservice Access Platform (MSAP) with integrated SIP interface and GPON line modules for a FTTH solution. The choice was based partly on Knuth's decades of experience with Tellabs equipment and his expectations of the vendor's staying power.

The Tellabs 1150 MSAP's non-blocking architecture was another key factor. With its 720-Gbps backplane, 44 Gbps to every multiservice card slot and 10-Gigabit Ethernet uplink capabilities, the Tellabs 1150 MSAP has the scalability to help Woodstock stay ahead of customers' bandwidth requirements. Knuth expects that in a few years, many customers will want to boost their access speeds to 40 Mbps or 50 Mbps.

Woodstock has deployed 3 Tellabs 1150 MSAPs in a ring and plans to add a fourth. Eventually it will install a fifth Tellabs 1150 MSAP in a point-to-point connection off the ring. Although the ring now supports GigE transport, Knuth said Woodstock likely will ramp that up to 10 Gbps to handle all the IP traffic among the 5 exchanges.

Desktop Fiber Eventually

Knuth also likes the Tellabs 1150 MSAP's GPON line module because "that's the latest technology, and that's what we use."

Woodstock has no immediate plans to take fiber all the way to the desktop, but Knuth said he may consider that application within the next several years. "That would be an advantage because you could put a splitter in a business system, put in indoor ONTs and run fiber right to the desktop."

"70/80/90" BENEFITS

With the Tellabs® 1150 Multiservice Access Platform (MSAP), Woodstock Telephone now has the option to take fiber all the way to customers' desktops. That's because Tellabs has converged FTTD software with the Tellabs 1150 MSAP to make it function as a GPON OLT.

Combined with the deployment of new indoor ONTs such as the Tellabs® 1600-704, that adds up to an opportunity for Woodstock to deliver not only residential triple-play services, but also highly secure FTTD applications for commercial customers.

"An FTTD application would really make Woodstock stand out from the competition because other vendors and operators can't offer that," said Ken Berniklau, Tellabs product manager. "In the process, Woodstock could leverage its existing investment in the Tellabs 1150 platform to create additional revenue streams and simultaneously reduce costs. There's no need to maintain multiple systems."

He cites business models that quantify the "70/80/90" benefits of offering an FTTD application based on the Tellabs 1150 platform, compared with an Active Ethernet solution: 70% less CapEx, 80% lower power requirements and 90% less physical space.

In keeping with its long-term perspective, Woodstock also will be the first non-government customer to field-trial the new Tellabs® 1600-704 Indoor GPON ONT, which features 4 1-G Ethernet ports and 2 voice ports. Because many rural networks will not move to VoIP in the near future, the voice ports make the GPON ONT an ideal solution.

Although Woodstock customers haven't asked for FTTD service yet, Knuth said the indoor ONT would enable his company to deliver the service when banks and other commercial customers are ready for it. In addition, he expects the smart home, with appliances wired for remote control, to be "quite an application in the future," and one that clearly depends on an indoor ONT.

"We're seeing a lot of development in that area, so we're trying to get everything inside." ■

ATM: Asynchronous Transfer Mode
CapEx: Capital Expenses
DLC: Digital Loop Carrier
DSL: Digital Subscriber Line
FTTD: Fiber to the Desktop
FTTH: Fiber to the Home
FTTN: Fiber to the Node
GigE: Gigabit Ethernet
GPON: Gigabit Passive Optical Network
GPS: Global Positioning System
IP: Internet Protocol
IPTV: Internet Protocol Television
VoIP: Voice over Internet Protocol
OLT: Optical Line Terminal
ONT: Optical Network Terminal
PON: Passive Optical Network
SIP: Session Initiation Protocol
SONET: Synchronous Optical Networking

The Core of the Mobile Broadband Experience

Most mobile operators want a common core network for 2G, 3G and 4G. Here's why.

By Gabriel Brown

Gabriel Brown is a senior analyst who covers wireless at Heavy Reading. For more information, visit www.heavyreading.com.

The mobile data services market is on fire. With advanced devices and rapid application innovation, the quality and range of services offered to end-users are phenomenal and improving every day.

Underlying this service experience are tremendous advances in the performance of data-centric mobile broadband networks. The mobile packet core is at the center of this transformation. Its vital mobility, session management and security functions are what make a wireless network a truly mobile network. And because it's the conduit through which mobile users connect to applications, attention is starting to gravitate to this critical — if historically low-profile — part of the mobile network infrastructure.

Broadly, there are 3 focus areas in the mobile packet core domain where progress will enable operators to continue to improve the subscriber experience and gain a competitive commercial advantage: subscriber and traffic growth, network monetization and architecture transition.

Subscriber and Traffic Growth

With demand for capacity exploding, the mobile packet core must scale in both the throughput and compute dimensions.

It's well understood that more users, each generating more and more traffic, increase demands on user-plane capacity. But unlike the wireline world, in a mobile broadband network, user mobility, security and a sessions-based connectivity model place a far greater emphasis on control-plane scalability.

Increasingly, the "transaction rate" at which packet core equipment can communicate with devices and surrounding network elements is emerging as an important scalability metric. As a result, new requirements on vendor's hardware and software platforms are necessary.

Network Monetization

By virtue of its place in the network, its policy, charging and control functions and its traffic management capabilities, the mobile packet core is strategic to operator initiatives to monetize investments in RAN and backhaul.

Whether related to charging and billing, congestion management, quality of service or value-added services such as parental control, core network equipment must support traffic-processing capabilities. Operators can use these capabilities to layer services on to what is otherwise just a smart piece of connectivity infrastructure.

Increasingly, as third-party applications and service become more important, there's also a need to expose these advanced service capabilities to partner organizations and developers via network APIs.

Architecture Transition

The all-IP evolved packet core architecture defined for 4G/LTE networks represents a major change relative to the 2G/3G network. With the circuit-switch domain eliminated, voice service must now be carried over the packet core alongside best-effort data traffic, increasing latency and reliability requirements on network equipment very significantly.

Then the nature of the flatter network architecture itself drives other changes. For example, the direct interface between packet core and base station increases control-plane load on packet gateways, pooling concepts change design assumptions and "fan-in" requirements increase dramatically.

One further point is that these 3 aspects of mobile packet core evolution apply across the technology generations. Recent Heavy Reading research has confirmed, without ambiguity, that the majority of operators around the world are targeting a common core network capable of simultaneous support for 2G, 3G and LTE radio access.

This finding re-states the strategic importance of mobile packet core and highlights the importance operators place on consistent yet flexible service sets and roaming/interworking between generations of technology as a way to serve as broad a range of customers as possible. ■

API: Application Programming Interface
2G: Second Generation
3G: Third Generation
4G: Fourth Generation
IP: Internet Protocol
LTE: Long-Term Evolution
RAN: Radio Access Network

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