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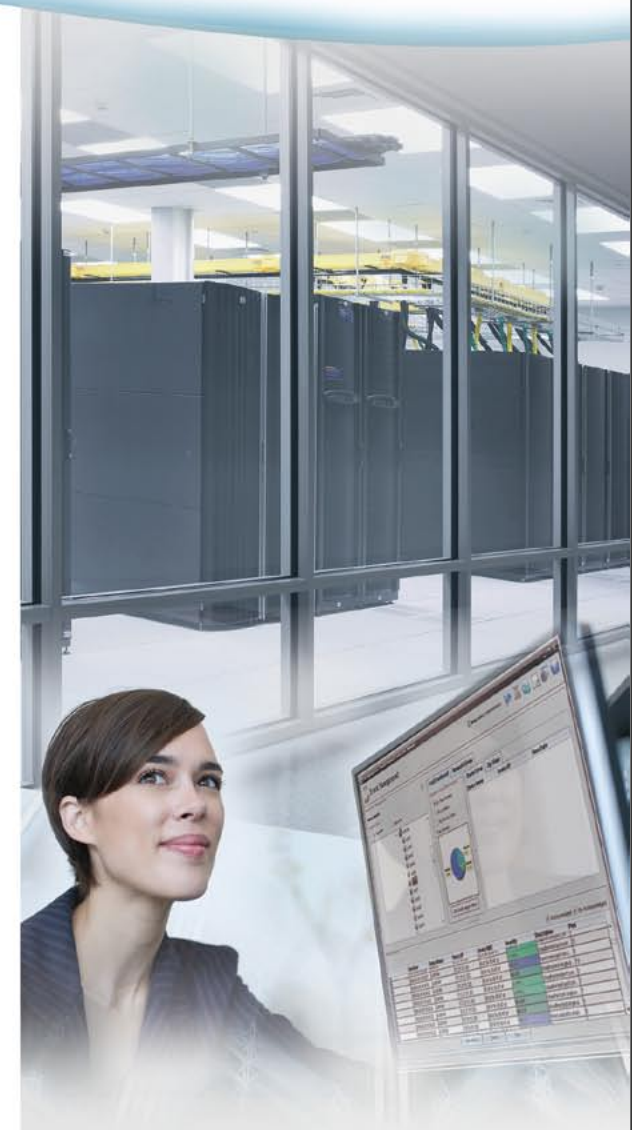

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Editor's Notes

Google and the Physical Network

by Paula Bernier

The hot news on the next-generation network front as of mid-February, as I was writing this, was Google's news that it again is dipping its toe into the broadband waters – this time with plans to bring 1gbps fiber-to-the-home access to an undisclosed number of users at (surprise!) undisclosed locations.

The planned test bed, as it's being called, aims to bring competitively priced broadband to between 50,000 and 500,000 people, reports Google. The tech giant apparently has launched this initiative at least in part to help the FCC explore new ways to build fiber networks as the commission moves to implement the National Broadband Plan, which is scheduled to be presented to Congress this month.

"We'll test new ways to build fiber networks, and to help inform and support deployments elsewhere, we'll share key lessons learned with the world," Google announced in a recent company blog, which noted the network(s) would grant open access to whatever service providers ask for it.

But first Google is seeking input from the world at large on its efforts. Exactly what kind of input it's looking for I'm not quite clear, but the company has issued a request for information "to help identify interested communities."

Just what special insight on building fiber networks Google might be able to offer is a question mark. The company certainly has done a great job of creating new businesses and business models, and has plenty of resources. But the vendor and facilities-based service provider communities have a long and rich history of researching, building, operating and optimizing fiber networks, so I'm not sure what else Google will bring to the table, assuming this fiber test bed actually sees the light of day.

Indeed, many folks in the communications space have been questioning what Google's true ambitions are as they relate to this fiber test bed announcement. Some believe the company lacks a real desire to be involved in the infrastructure side of things, but is using this news as a way to forward its lobbying efforts around open networks and net neutrality. This skepticism is not completely undeserved considering the company made a lot of noise about buying wireless spectrum and getting into the mobile infrastructure space, but ultimately did none of the above, with the exception of building a small Wi-Fi network in Mountain View.

On the heels of the Google test bed news, FCC Chairman Julius Genachowski last month at the NARUC Conference for the first time talked about an effort called the "100 Squared" initiative, which aims to outfit 100 million U.S. households with 100mbps access. Again, no details were offered as to locations, timelines or involved parties. But Genachowski in the same speech pointed to the Google announcement as encouraging news in the nation's effort to expand broadband.

I would never argue that bringing more companies into the fold so the U.S. can catch up, and potentially even surpass, other countries in the broadband race is a bad idea. In fact, the NTIA and RUS already are doing just that as part of the federal government's broadband stimulus effort.

However, it's the service providers – telcos and cablecos – that actually have experience in building networks, which is no small task, and that have been investing and continue to invest in the nation's broadband networks. Meanwhile, Google continues to deliver over-the-top solutions that leverage these networks, while making a show about its broadband network ambitions. That said, I think I speak for many in the communications space when I say we'll believe Google is serious about forwarding broadband infrastructure when it puts its money where its mouth is. **NGN**

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Looking Back and Charging Ahead

by Rich Tehrani

Blogger and TMCnet contributor Doug Mohney recently had the big scoop that Supercomm will be cancelled. He blogged it as a rumor, which was subsequently confirmed by the TIA and USTelecom.

As a show organizer myself I get a lot of questions regarding what this news means to our industry. Rather than continuing to opine on a person-by-person basis, I thought it made sense to put my thoughts in writing. Before I begin, however, I would like to say thanks to the TIA and USTelecom associations for holding this show, which I have faithfully gone to for decades. I have always held the show in tremendous regard.

Some of my most memorable moments from the expo are around 1997 or so when it was held the same week as COMDEX, which took place in Atlanta. I had to get from Georgia to New Orleans in record time to attend meetings at both shows. When I finally got to the show, a behemoth of an event, I was yelled at by an advertiser. But I digress.

Sadly, this colossus of an event split into two, changed names and dates and locations as a result of an internal disagreement. The situation sadly continued for years resulting in shows with a lack of attendees and terrible ROI for exhibitors. This had a negative effect on the entire industry, as many companies counted on this expo for their livelihoods.

The trade show business has changed dramatically, and what most people outside this industry may not understand is that 15 years ago if you wanted to hold an event, you typically went out and rented targeted mailing lists from magazine publishers. Magazine lists were the absolute best names and still are because regular mailing and address changes keeps the addresses up to date. I have seen 50 percent of a list become undeliverable over the course of one year, meaning that a six-month old list is likely 25 percent inaccurate.

But those days are gone. The main magazines that used to support this event were *America's Network* and *Telephony*, and neither is printed anymore. To make matters worse, direct mail continues to be less effective, meaning even the best list is far less effective than it used to be.

This gets me to the TMC philosophy on events – in order to have a successful conference, you need to have community interaction with your audience every moment of the day of every year. You need to be a media company with a strong Web presence and magazines. Trade show companies have limited days ahead of them if they don't own their communities 24/7. This is exactly why you shouldn't think the demise of a show alone can predict the health of an industry. Sure the economy is bad but Ethernet, wireless backhaul, 4G, M2M and smart grid are some of the hottest areas I have ever seen in the communications space.

We have seen the death of COMDEX, and as far as I can tell there is a tech industry. Then we experienced the death of VON (twice now) and the last I checked, IP communications is alive and growing. Also – anyone remember Internet World – a great show before it died; guess what, the Internet is still around!

Shows – especially tech events – are cyclical; they rise and fall in popularity, and if you aren't reinventing yourself always, you die. While Supercomm should have been reinventing itself instead it was busy changing its name, postponing the show and dealing with infighting.

But back to the carrier CLEC/ILEC/ISP/rural telco/cable/wireless community that TMC has been doing its best to serve all these years... In order to continue fostering community among this group, TMC will continue to cover breaking news, foster online communities, run Webinars and publish magazines focused on the topics of interest to the industry. In addition, ITEXPO has seen increased carrier attendance, and we continue to focus on this area of the market with collocated events such as 4GWE, M2M Evolution, Smart Grid Summit and a plethora of content aimed at telco 2.0 topics.

Dear carriers, ITEXPO will continue to be your home, now more than ever. We continue to listen to you and provide you with leading-edge information. **NGN**

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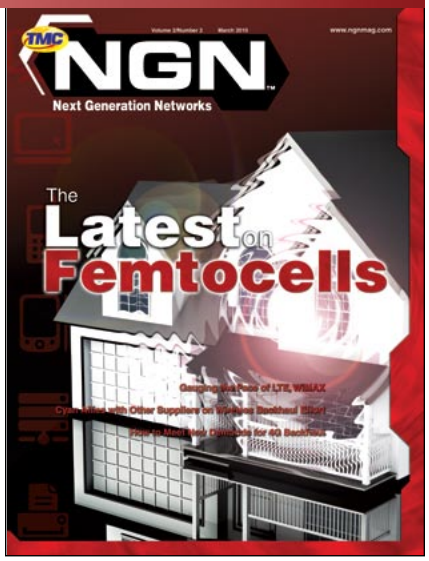

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http://tmcnet.com/23744.1

Motorola Gets Zain Deal

Alcatel-Lucent and Ericsson have garnered the big LTE contracts with AT&T and Verizon Wireless in the states, but Motorola Inc. has won yet another LTE deal abroad, this one with Zain Saudi Arabia. As part of the Zain Saudi Arabia deal, Motorola will provide LTE gear – including radio access network and evolved packet core infrastructure, devices, and optimization and integration services – for a network in the capital city of Riyadh. The build, which will involve FDD LTE technology operating at 2.6GHz, is scheduled to commence in the second quarter.

www.motorola.com

http://tmcnet.com/23745.1

HSPA+ Propels T-Mobile Forward

T-Mobile USA says it will deploy nationally a HSPA+ 3G network upgrade, offering consumers access speeds up to 21mbps by the end of 2010. Though much attention rightly is focused on LTE and the fourth-generation network, many mobile operators are more interested in the moment in HSPA+, which offers access speeds comparable to LTE.

www.t-mobile.com

http://tmcnet.com/23746.1

KPN Weighs Outsourcing Options

KPN CTO Damir Hajdarovic said his firm is working with Alcatel-Lucent's Bell Labs on a network and business transformation program looking at technology development and deployment, transformation to new services and applications and the introduction of new business models. So far, such talks have led to a score of outsourcing deals where service providers hand off some operational details to their technology suppliers.

www.alcatel-lucent.com
www.kpn.com

http://tmcnet.com/23746.1

Analyst Calls for Wireless 'Backhaul on Demand'

Operators need to find economical ways to address mobile data growth, by offloading data traffic onto Wi-Fi hotspots and femtocells and by finding economical ways to expand capacity at macrocell and microcell sites, said Philip Bates, a senior manager at Analysys Mason, in his comments last month at Mobile World Congress. That said, it might make sense for backhaul providers to offer wireless operators the option of sharing packet-based backhaul services by offering a "backhaul-on-demand" offer.

www.analysysmason.com

http://tmcnet.com/23749.1

BT Embraces Open Ducts Idea

Ofcom, the U.K. communications regulator, has been preparing the groundwork for at least a year to allow competitors access to BT ducts, in an effort to spur more facilities-based competition. Now BT is embracing the idea that all U.K. ducts be opened to the competition.

www.ofcom.org.uk

http://tmcnet.com/23750.1

GIPS Brings Video Chat to the iPhone

Global IP Solutions, a provider of HD voice and video processing solutions, has launched video chat technology that will let iPhone developers incorporate videoconferencing/video chat into their mobile applications.

www.bt.com

http://tmcnet.com/23751.1

Maravedis: Mobile WiMAX Has Outgrown Fixed

A new report from analyst firm Maravedis indicates the number of mobile WiMAX subscribers has surpassed the number of fixed WiMAX subscribers worldwide. About 4.73 million active BWA/WiMAX subscribers were reached by the end of the third quarter of 2009, according to the report.

www.maravedis-bwa.com/wimax.asp

http://tmcnet.com/23746.1

Tekelec Announces Trio of Wins

Tekelec recently unleashed a flurry of announcements, including the fact that Portuguese service provider Optimus has expanded its relationship with the company to monitor performance on its IMS-based network. Machine-to-machine provider Numerex, meanwhile, is using Tekelec short messaging service technology to outfit customers with more options through which to monitor and manage their assets remotely. And Bharat Sanchar Nigam Ltd., the world's seventh largest telecommunications company, has tapped Tekelec to provide mobile number portability and SIP-based routing.

www.tekelec.com

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http://voice-quality.tmcnet.com/

http://tmcnet.com/23752.1

Sprint Gets High Marks for Reliability

In the last two years, Sprint seems to have inched into the shadows while AT&T and Verizon have captured the spotlight. But recent studies indicate that Sprint's network quality is improving faster than its competitors. In fact, Sprint's 3G network has been called the most reliable in the nation's major metropolitan areas.

www.sprint.com

http://tmcnet.com/23747.1

IBM Scales Sierra

Sierra Wireless has signed a services contract with IBM to host a new services platform dedicated to its software as a service machine-to-machine offering. IBM, as part of the agreement, will provide data center collocation facilities and services to Sierra Wireless.

www.ibm.com
www.sierrawireless.com

http://tmcnet.com/23748.1

Verizon Introduces Dynamic Mobile Network Routing

Verizon Wireless has announced the availability of Dynamic Mobile Network Routing to improve and enhance the ability of enterprise customers to seamlessly integrate their wireline and wireless networks. Mike Lanman, president of the global enterprise and government sales team at Verizon Wireless says: "We have realigned our organization; we are expanding our portfolio with products like Dynamic Mobile Network Routing, and we have aligned our teams with the resources that can draw upon the best practices of Verizon and Vodafone."

www.verizonwireless.com

http://tmcnet.com/23753.1

Research Firm: Ethernet Services Will Continue to Climb

Verizon Systems Group projects Ethernet business services will hit $40.2 billion by 2014. Additionally, double-digit annual growth of business Ethernet is projected during this time period for all regional markets throughout the world.

www.verticalsystems.com

March 11, 2010 • 2:00pm ET/11:00am PT

Managing Convergence: Five Keys to Bullet-Proofing Your Converging Voice and Data Network

Sponsored by: Tone Software Corporation

http://www.tmcnet.com/webinar/tone-software2

TONE SOFTWARE CORPORATION

March 30, 2010 • 2:00pm ET/11:00am PT

Metrics that Wow! How Coremetrics Became the Customer Service Model of Success

Sponsored by: Parature

http://www.tmcnet.com/webinar/parature4

PARATURE.

March 16, 2010 • 2:00pm ET/11:00am PT

Internal Monitoring Isn't Enough... Treat Yourself Like a Customer – Remote Availability & Performance Monitoring from IQ Services

Sponsored by: iqservices

http://www.tmcnet.com/webinar/iqservices2

iqservices
Proactive Testing for Confident Customer Interactions

April 13, 2010 • 2:00pm ET/11:00am PT

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by Marc Leclerc

Apple and Google and Facebook, Oh My!

It's a strange new world as we take our first steps into the new decade. The telecom space is abuzz with talk of recent introductions and announcements by Apple, Google and Facebook. Both Apple and Google have made interesting moves in the area of mobile terminals and connected devices, while Facebook is exploring new ways to turn social networking into cash. Taken together, these movements are creating tantalizing new revenue opportunities for our industry, while also raising anxieties about the impact these will have on established players and value chains.

Let's start with Apple's introduction of the iPad, a device that defies easy categorization. It is neither a scaled up iPhone, nor is it the usual vision of a tablet computer. Perhaps it is more useful to describe it by the experience it provides the user: a device that can be reconfigured by an application to mimic the look of anything of that general size, responds to touch in a way that supports this mimicry and that connects to the Internet or 3G networks to allow it to interact with the greater world around it. With the addition of iBooks to iTunes and the App Store, Apple also provides the iPad with a comprehensive sales channel for media providers, application developers and now print media publishers. Apple is a true believer in the retail model, and used this model to build and maintain quickly genuine user value for its products.

With all this happening, telecom service providers understandably are concerned that they may be relegated to becoming bit-pipe outlets, and reduced to commodity pricing and margins.

Google has for the first time launched its own branded phone, the Nexus One. It is an unlocked Android-based device with touch capabilities, access to an application store and excellent integration into social networking services such as Facebook and Twitter. It also has launched Google Buzz, which closely links these capabilities to its G-mail offering. All these functions keep the user more closely tied to Google and provide Google a new outlet for advertising, its main source of revenues.

In the background to Apple and Google product introductions, Facebook is working hard to make Facebook Chat the center of the social networking user experience by supporting integration to third-party instant messaging services. Facebook Connect also has received full Facebook Chat support so that developers can bring the chat experience to their own third-party Web sites or applications

With all this happening, telecom service providers understandably are concerned that they may be relegated to becoming bit-pipe outlets, and reduced to commodity pricing and margins. However, I think this outcome is far from certain and, in fact, affords service providers with interesting new opportunities to monetize both their network capabilities and customer relationships.

Both retail and advertising models can significantly benefit from interaction with network status and user profile information. With Rich Communications Suite, operators can offer an enriched multimedia communications user experience that includes status, chat and file sharing, and can be integrated with social networking services. In addition, the interoperability and inter-working relationships built up by the global telecoms community makes it possible for users to take their services with them wherever they go.

Telecom service providers also can extend the use of communications-oriented social networking activities into the global telecoms network, extending the community addressable with voice messaging and chat to more than 4 billion people. This creates a huge opportunity for service providers to participate actively in advertising-based value chains, of course getting a share of proceeds.

Credit and credit cards are not readily available to most people in many countries, so the prepaid infrastructure of telecoms operators and their ability to handle micro-transactions efficiently and securely has become a mainstay of peoples' lives, and an essential tool for both commerce and governments. This infrastructure could become a key tool for handling retail sales of media and content, ensuring service providers don't end up in a bit-pipe only role.

A final consideration is that an increasing number of different devices are becoming endpoints for communications services and participating in users' daily lives. These include PCs, Web clients, cars, TVs and TV set-top boxes and more. Increasing available bandwidth with HSPA, and soon LTE, will only accelerate that trend. Telecoms service providers are uniquely positioned to offer users a way to conveniently manage all these vertical platform-based offerings and integrate them into common identity, user experience and payment mechanisms – provided by a partner they already know. While individual platform vendors might aspire to vertically integrated value chains, the possibility of that outcome is decreasing on a daily basis.

So all in all the prospects of service providers are multiplying even as traditional telecoms value chains erode. It's up to us to make the most of this situation, and take telecoms into this new decade of opportunity. **NGN**

Marc Leclerc is manager of the Global IMS Expert Centre at Ericsson (www.ericsson.com).

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By Paula Bernier

The State of 4G

Gauging the Pace of LTE, WiMAX

Fourth-generation wireless technology is one of the hottest areas of public networking – if not the hottest – today. But it's early days for both LTE and WiMAX, and the transition to at least the first of the two is expected to be on a gradual and as-needed basis.

As discussed in the September/October 2009 NGN magazine article "The Race to 4G," while LTE has garnered a lot of the attention because big wireless operators like AT&T and Verizon (and now MetroPCS) have committed to it, WiMAX technology actually is deployed commercially today. However, LTE builds are expected to commence this year, and most folks seem to believe this will be the more lasting and widespread technology.

For its part, Verizon has stated plans for early LTE deployments this year, with mass market availability in 2011 and beyond. AT&T, which last month followed in Verizon's footsteps by naming Alcatel-Lucent and Ericsson as its LTE equipment suppliers, seems to have a similar timeframe. It expects to do LTE trials later this year and early commercial deployments starting in 2011 – to coincide with widespread availability of equipment and LTE-compatible end user devices.

And while hopes are high for LTE, these carriers' (particularly AT&T's) interest in leveraging their 3G networks to whatever extent possible into the future, as well as spectrum issues and other concerns, will make this technology true to its name: long-term evolution.

Allen Nogee, In-Stat analyst, emphasized that fact in pointing out what he sees as some "glaring issues" around 4G.

"These include lack of spectrum, signal-to-noise ratio, and non-established patent and royalty pool," he says. "It's clear that the shift toward 4G LTE will be gradual and protracted."

Despite its well-known network capacity issues, AT&T seems just fine with that, as the company apparently will continue investing in 3G gear. Indeed, the carrier's new 4G supplier agreements stipulate that the 3G equipment delivered by Alcatel-Lucent and Ericsson to AT&T starting this year must be software-convertible to LTE, so the company doesn't have to rip out hardware when it needs to make the long-term evolution.

But while the move to LTE is expected to be gradual, at least one very large supplier seems convinced this is the way to go.

According to reports, Alcatel-Lucent's wireless Chief Operating Officer Patrick Plas recently indicated his company is not putting a lot of effort into WiMAX any longer, but instead is favoring its LTE efforts. That may not be a surprise, but it is somewhat notable in light of the fact that Infonetics Research recently gave the vendor high marks for its WiMAX work.

"Mobile WiMAX service providers we surveyed recently gave highest ratings to Alvarion, Alcatel-Lucent and Motorola based on various criteria, such as WiMAX technology, pricing and service and support, although no one vendor was rated strong across the board," says Richard Webb, directing analyst for WiMAX, microwave, and mobile devices at Infonetics Research. "Cisco and Huawei also have good ratings, suggesting they are capable of closing ground on the top three. As the WiMAX market consolidates to a remaining handful of vendors and becomes more competitive, the perception of different aspects of the business will come under increasing scrutiny."

Some of these suppliers of gear for WiMAX, which has seen the most uptake abroad, have been anxiously awaiting spectrum auctions in India to commence. But their hopes for a quick turnaround on that were recently dashed when the auctions were delayed. Expectations are now that auctions for WiMAX spectrum in India will commence next month. **NGN**

Cyan Allies with Other Suppliers on Wireless Backhaul Effort

By Paula Bernier

Backhaul is expected to be one of the major challenges for service providers as they move to 4G networks. That fact has led a handful of suppliers to join forces on a wireless backhaul effort called CyAlliance.

Through the partnership, ANDA Networks, Cyan, Dragonwave, Hatteras Networks and Overture Networks aim to address service providers' wireless backhaul requirements by ensuring interoperability via verification testing; providing rapid problem resolution through the creation of pre-defined escalation processes; and facilitating collaboration on architectural endeavors such as end-to-end packet synchronization in multi-vendor environments.

"The industry is entering another era of accelerated technology innovation," says Frank Wiener, vice president of marketing and business development for Cyan. "While services have switched from TDM to packet, the network and industry standards for packet transport continue to evolve, creating new opportunities and potential multi-vendor challenges for service providers."

That's why Cyan created CyAlliance, he says, explaining the effort was established to mitigate service provider risk and empower network operators to pick best-in-class solutions involving copper, fiber and/or microwave-based backhaul in combination with scalable packet optical transport. While wireless backhaul providers are deploying fiber to the tower solutions, fiber is not always available. If that's the case, the CyAlliance comes into play, enabling Cyan to call on its partners for T1/E1, bonded DSL and/or Ethernet over copper solutions. **NGN**

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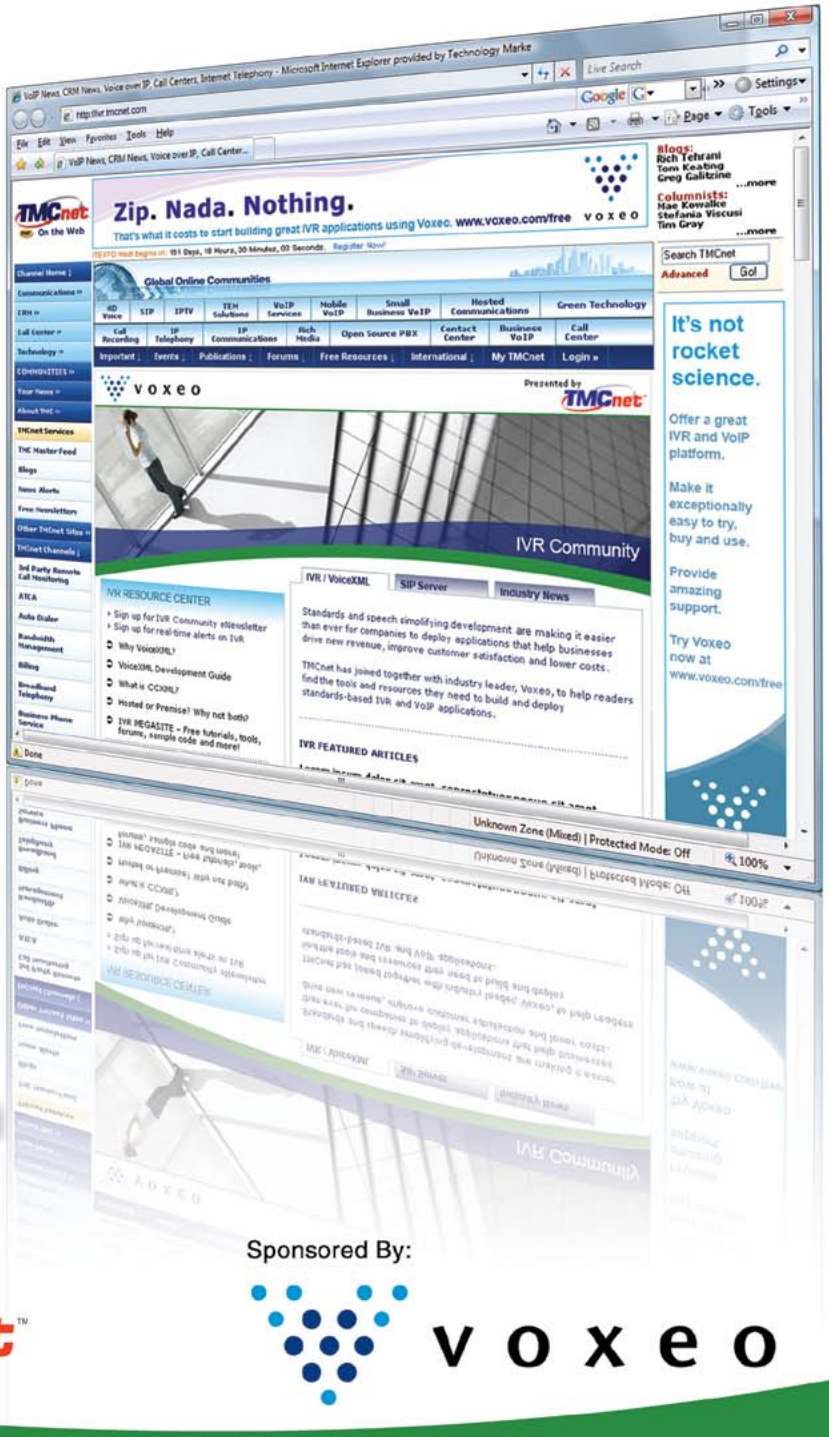

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By Taylor Salman

How to Meet New Demands for 4G Backhaul

Based on Clearwire's WiMAX deployments in 27 cities and on public announcements from Verizon Wireless, AT&T and others about evolving to LTE, mobile networks quickly are moving toward 4G, which will place new demands on backhaul networks.

Mobile operators historically have used time division multiplexing transport to interconnect cell sites. Typically that means T1 circuits, anywhere from one to four links delivering about 1.5mbps to 6mbps, respectively. With target peak data rates of 100mpbs for 4G radio downlink speeds, that presents a serious traffic bottleneck. Moreover, TDM, while a sure method for providing stable QoS, is an inherently inefficient transport mechanism – wasting frames in favor of delivering a steady stream of data.

comScore data on the U.S. market shows that touchscreen mobile phone growth has no signs of slowing down. The 2008 to 2009 period featured a 159 percent growth rate, with 23.8 million consumers buying touchscreen mobile phones – the devices proven to use mobile data the most. Backhaul transport between cell towers and mobile operators' core networks is already strained, and that's not going to change unless operators examine some planning and design options now so their networks will be ready to scale down the road.

As more video and Web 2.0 traffic moves onto mobile networks, 4G backhaul networks must be designed with the following attributes:

Capacity Networks must easily scale up bandwidth to meet rising demand, as well as increased MAC address space as more end-user devices are able to connect as IP endpoints.

Performance Service providers should offer low-latency connections with multiple QoS levels with granular management to optimize service delivery and customer experience.

Survivability Connections from towers require diverse protection paths so control traffic and user data can be preserved and maximize reliability.

Hybrid architectures Operators also should consider deploying hybrid networks by connecting towers using both microwave and fiber to extend the network reach to more towers.

LTE has some specific technical requirements to consider for backhaul networks. That includes synchronization, which entails both phase and frequency clock synchronization to support network MIMO and MBMS-single frequency node requirements; and X2 interface support, which provides efficient delivery of tower-to-tower traffic.

These design considerations do not exist in a vacuum, of course. Many smartphone users enjoy unlimited data plans that, while excellent for retaining subscribers, come at an eventual expense to mobile operators. Operators do not monetize heavy usage of mobile data services, and that impacts how much they can reinvest in their networks to prepare for issues like 4G backhaul. Backhaul generally accounts for 15 percent of a mobile operator's total operating expenses and 30 percent of an operator's network operating expenses. Faster 4G connections will exacerbate this problem, so carriers have to keep costs down while improving existing infrastructure.

While it isn't always possible due to capital expense, population densities and market footprint, fiber is an ideal choice for 4G backhaul that will truly scale with subscriber demand. And there are ways to use it even more efficiently than the industry's standard SONET deployments. With some key operational efficiencies in mind, operators can minimize the costs of integrating fiber into their backhaul networks. Here are a few considerations for design and deployment:

- 1,000+ node Ethernet network design per metro region
- Turn up and provisioning of hybrid fiber/microwave Ethernet networks
- Effective performance management of multi-layer QoS service environments
- Optimization of turn up and provisioning processes with automation

For integrating fiber into backhaul networks while reducing operational costs, Ethernet is the key to making it happen. But there are different ways to deliver Ethernet services to tower sites: Ethernet VLANs, Ethernet over SONET, Layer 3 routers with multiprotocol label switching or connection-oriented Ethernet. Ethernet VLANs provide the advantage of low cost but suffer from scalability and manageability issues as the network grows. Ethernet over SONET provides the predictability and manageability of SONET but only increases long-term costs in the backhaul network. Routers with MPLS provide comparable capabilities to connection-oriented Ethernet but with significantly higher complexity when deployed on the scale required for backhaul.

There are lots of options, but here's why connection-oriented Ethernet is gaining traction: it takes MPLS routing capabilities and moves them closer to the switching layer. Ethernet is standard. Ethernet is cheap. Ethernet switches featuring protocols like MPLS transport profile and provider backbone bridge traffic engineering can take advantage of the same intelligence as expensive Layer 3 routers, but do it faster and cheaper at the Layer 2 data link level. Connection-oriented Ethernet provides the traffic engineering and protection capabilities of MPLS; the predictable and controllable circuit provisioning of SONET; and, since it's a Layer 2 technology, the price points of Ethernet VLANs.

Consumers need more mobile data, and the big carriers are rushing to provide it. Today's 4G towers are a great investment, but without faster fiber and microwave backhaul networks that can rise to meet the demand, 4G performance will suffer. **NGN**

Taylor Salman is product marketing director at Ciena Corp.

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By Paula Bernier

The Latest on Femtocells

Carriers Move from Trial to Commercial Stage, but Pricing Questions Loom

Femtocell technology was flying high in months past for its potential to offload traffic from overburdened wireless networks and enable fixed/mobile converged services. Like so many technologies before it, the hype around femtocells led to over-inflated expectations. Then, the excitement around femtocells experienced a slow leak. Whether this type of product will combust, have limited lift or rise to mass market adoption, however, remains to be seen.

Many large service providers have engaged in trials of femtocells, and some have significant commercial efforts around them. There also are several femtocell suppliers in the market, including Airvana; ip.access, a U.K.-based picocell vendor that's now moving into the femtocell space; Samsung; Ubiquisys; and larger suppliers that are acting as femtocell solution integrators of sorts.

However, major suppliers like Ericsson and Motorola, which along with Alcatel-Lucent are among the big wireless equipment players, seem to be distancing themselves from the technology.

Jeff Baher, head of IP network marketing at Ericsson, recently told NGN it's not a major supporter of femtocell technology. Erik Ekudden, vice president of technology and industry at Ericsson, in a different recent interview with this magazine said femtocells, picocells and microcells could complement current systems, but declined to discuss femtocell technology further. And although sources tell NGN magazine that Motorola introduced a femtocell-type product in the 2006-2007 time frame and was demonstrating a femtocell-enabled digital picture frame on the trade show circuit as recently as a year ago, the company declined to accept an interview request for this story, stating simply: "We continually monitor market requirements, and although we are not actively pursuing the development of femtocells at this time, we believe that serving a fast growing mobile broadband market using only a macro layer is probably not the final answer."

Airvana's UMTS HubBub

One could argue that femtocells are too expensive and complex, particularly compared with Wi-Fi. While a Wi-Fi router, which could help customers get better in-building mobile data services while offloading traffic from cellular networks, runs between $60 and $80, femtocell suppliers typically are charging between $150 and $200 per 2G/3G unit. That means service providers either have to pass on heavy fees to users or subsidize the cost of the units.

But given not even half a million femtocell units have shipped to date, it's clearly early days for the technology; and, as everyone knows, costs typically come down with volume.

According to Aditya Kaul, practice director of mobile networks at ABI Research, a total of 400,000 femtocells shipped last year, with service providers typically ordering tens or hundreds of the devices at a time for trials. However, Kaul says, many of those trials are now concluding and some are being followed by actual commercial rollouts.

"Operators really are starting to put their weight behind it," Kaul says.

Major suppliers like Ericsson and Motorola, which along with Alcatel-Lucent are among the big wireless equipment players, seem to be distancing themselves from the technology.

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ABI Research forecasts that there will be 2 million femtocell units shipped this year; 6 million shipped in 2011; and 40 million delivered in 2014.

Sprint, which quietly launched Airave services in 2008 using Samsung technology, has led the way in terms of femtocell adoption. The service provider is shipping femtocells in an effort to target suburban and remote users with less than ideal voice coverage, Kaul says, but he adds that Sprint is not heavily promoting the offer. Airvana tells NGN that Sprint also is a customer of its 3G femtocell solution.

Verizon in early 2009 followed in Sprint's footsteps, introducing a similar offer that is intended to address the needs of those customers with coverage concerns. The Network Extender solution from Verizon Wireless outfits customers with a $249.99 "mini-cell site" from Samsung that covers up to 5,000 square feet. Verizon Wireless spokesman Tom Pica says the product was introduced to help extend network coverage to customers that live on the fringes of the company's network or may, for example, have a basement office in which they'd like better coverage.

"Our new Network Extender device will bring the full benefit of the Verizon Wireless voice network to the small but important segment of customers who may experience a weaker signal in their homes because of geographic or structural conditions," said Jack Plating, executive vice president and chief operating officer of Verizon Wireless, who was quoted in a press release issued in January of 2009. "Current and prospective customers have told us they want this, and we are responding to that demand. For those who have wanted to sign up for Verizon Wireless service but hesitated because of reception problems unique to their home location, this is the answer."

More recently, AT&T made its move into this new area. The company toward the middle of last year began using femtocell-like technology from Cisco in pilot tests in areas of North Carolina (including Charlotte and Raleigh), South Carolina (including Columbia), Georgia (including Atlanta), as well as in San Diego.

Airvana's Femtocell Demos at MWC

Musical Mashup
Music was streamed from an Airvana enterprise femtocell to 16 mobile handsets simultaneously to create a wireless symphony. The demonstration showcased the femtocell's capabilities in a multi-user environment.

The Family Tablet
This demonstration involved a touch-screen tablet device connected via a femtocell. It featured a range of social, multimedia-based services designed to keep the family "location aware" and fully connected. An Android-based mobile phone app, operating on the Google Nexus One device, enabled the demo's family members to interact remotely via the femtocell-connected tablet.

Fast Femto and HD
Airvana's latest generation HubBub femtocell, which the company says is five times faster on average than the typical indoor macro network performance, in this demo showed how it could support buffer-free HD video streamed live to a mobile handset simultaneous with other applications.

"Customers can benefit from improved wireless voice coverage in their homes, particularly those with coverage conditions we cannot mitigate, such as homes and buildings with thick walls or with geographic challenges," AT&T spokeswoman Jenny Bridges tells NGN, adding that although the company is using Cisco gear for the trials it has not yet confirmed the final vendor for its planned national launch. "The 3G MicroCell also supports 3G data where a Wi-Fi connection is unavailable. Customers can simply create a list of up to five devices that can access the 3G MicroCell. The device serves as a small cell tower in the home and utilizes the customers' broadband Internet connection to carry the call or data traffic to the AT&T network. AT&T 3G MicroCell complements AT&T's wireless and Wi-Fi networks and is more evidence of AT&T's commitment to serve its customers with the best in mobile broadband."

Comcast, which resells the WiMAX-based services of partner Clearwire, also is reportedly testing femtocells in an effort that some believe could signal the beginnings of a femtocell movement within the WiMAX community.

Cell Sights

With all the different mini-cell site technologies out there, it can be difficult to discern between a femto, a micro and a pico. Aditya Kaul, practice director of mobile networks at ABI Research, helps sort things out.

Category	Application	Reach
Femtocells	Indoor residential or office	5,000 feet or less typically
Macrocells	Various	4 to 10 miles, depending on the power
Picocells	Typically for offices	10,000 to 20,000 feet-plus

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While U.S. operators as a rule are not making a big push around femtocell technology, at least one wireless service provider abroad has taken the plunge. Vodafone in the U.K. recently made a splash with its introduction of Sure Signal, a femtocell-based service that Kaul says the company is promoting in a big way.

The company is using billboards, the Web and other media to promote Sure Signal as a way to boost mobile phone coverage for up to four simultaneous callers within the home, regardless of where the Vodafone customer resides. The service, which requires users to have in-home broadband of at least 1mbps, is available for a one-time fee of £50 or for as little as £5 a month.

Promoting Sure Signal on its Web site, Vodafone quotes one customer saying: "Finally, I feel like I'm not living in a hole anymore." But, interestingly, Kaul says that Vodafone is widely recognized for its good coverage, so the introduction of femtocell technology in the company's network clearly was not an imperative. That said, Vodafone in January launched the iPhone so, having seen the capacity problems faced in light of AT&T's introduction of the iconic smartphone across the pond, perhaps the U.K. operator moved to address potential capacity overload issues before they became a real problem.

> Femtocells allow for significant capital and operational savings for wireless service providers, given the customer pays for the backhaul because femtocell traffic returns to the Internet over home broadband connections.

Elsewhere in Europe, France's SFR is using femtocells and Germany's T-Mobile has made public its interest in the technology. In Asia, meanwhile, Japan's big operators KDDI, NTT DoCoMo (which NGN sources say is offering the unit for $50) and SoftBank all have femtocell services in operation, as do service providers in Singapore, South Korea and Taiwan.

All told, Kaul estimates there are about 100,000 to 200,000 paying femtocell households worldwide.

Airvana is among the companies that expect those numbers to grow – both in terms of households as well as on the business side.

Paul Callahan, vice president of business development, says the Chelmsford, Mass.-based supplier started business in 2000 providing EVDO blades and software for Nortel basestations. Ericsson recently bought the Nortel business and is now Airvana's largest customer, Callahan says.

Airvana about three years ago decided to expand by moving into the femtocell space and two years ago purchased Cambridge, England-based 3Way Networks to help it with that effort.

Today Airvana offers both CDMA- and UMTS-based femtocell solutions, which it markets under the name HubBub. KDDI and Sprint are among the service providers using Airvana's CDMA femtocell solutions.

The UMTS business is expected to follow, says Callahan, noting that Vodafone (not a current Airvana customer) alone has a 40,000- to 50,000-unit femtocell deployment today. Among Airvana's equipment partners on the UMTS femtocell front are NEC and NSN, both of which provide femtocell gateways.

Callahan notes that femtocells allow for significant capital and operational savings for wireless service providers, given the customer pays for the backhaul because femtocell traffic returns to the Internet over home broadband connections. He notes that femtocells also can help enable new applications, particularly those relying on presence information. For example, says Callahan, NTT DoCoMo's commercial UMTS-based femtocell service allows for an application that triggers an e-mail to other family members when someone in their household returns home. Of course, this could be a great feature for working moms, or spouses that like to keep in touch, as just two examples. Airvana demonstrated a variety of other applications involving femtocells (see box on page 20) at last month's Mobile World Congress in Barcelona, Spain.

Just what consumers are willing to pay for this kind of functionality, however, is a question mark. But Airvana is hedging its bets by targeting both consumer and business applications.

The company in November introduced the HubBubT UMTS High-Capacity Femtocell, which supports 16 simultaneous users over a range of up to 600 meters, and delivers 21.6mbps download and 5.7mbps upload speeds.

"The major drawback to femtocells in commercial or enterprise environments has always been low concurrent call capacity, which significantly limited usefulness in a business setting," says Peter Jarich, research director of wireless infrastructure and converged core at Current Analysis. "Capacity increases, along with improved range and performance will open the door for much greater acceptance of femtocells as a viable business technology."

Callahan says a wireless operator could offer a business a femtocell and related service plan that would enable that company to bring all of its employees under one wireless umbrella, which would make costs and security easier to manage and lower fees because many calls would as a result run over the femtocell/wireline network.

"So it's a customer capture device," he says. NGN

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Offload Solutions Address Mobile Data Boom

By Paula Bernier

Femtocells are one method of offloading traffic from overburdened cellular networks. But they're not the only one.

Equipment suppliers now are pushing a variety of solutions to help wireless operators better address capacity concerns on the cellular networks of today and tomorrow. In fact, so popular is this idea that Peter Jarich, an analyst with Current Analysis, referred to offload as "the sleeper theme" of last month's Mobile World Congress in Barcelona, Spain, in his Feb. 4 blog.

Indeed, NGN magazine has recognized this trend as well, having recently conducted offload-related discussions with at least three equipment providers.

Tellabs last month unveiled what it calls the Smart Internet Breakout Gateway, which the company claims offers instant savings by diverting as much as 70 percent of Internet-bound traffic from the network core. The product, which leverages the technology Tellabs got with its recent purchase of WiChorus, was designed to help service providers address the very immediate problem they're facing as their networks are choked by Internet traffic, says Vikram Saksena, executive vice president and CTO at Tellabs.

The gateway sits at the edge of the network, in front of the packet core, and offloads the traffic that doesn't generate any incremental ARPU for the service provider before that traffic goes deeper into the operator's network and unnecessarily uses up more resources, says Saksena.

While Tellabs and other optical vendors employ ROADM technology to optimize optical transport to deliver what some may refer to as network offload solutions, this new gateway is doing something entirely different, explains Stu Benington, director of portfolio planning at Tellabs.

"The difference here is that you're actually looking into the traffic that's going over these mobile networks, and you're making decisions based on the signaling that's going back and forth between the packet core and the node or the cell site" as to what hits the backbone, Benington says. "And you want to keep your packet core assets focused specifically on the highest margin, most important traffic, which is business traffic and so forth; and standard Internet traffic you just need to get back to the Internet."

While deep packet inspection solutions do part of the job, Saksena says the Tellabs gateway goes at least a step further by offering service providers the ability to do more granular sorting of what traffic is and is not offloaded. Of course, it's up to the service provider to create the policies around what paths various traffic takes on their networks, says Saksena, but a carrier may decide, for example, to send BlackBerry e-mail services through the packet core while directing peer-to-peer traffic away from the packet core and on to the Internet.

Tekelec Chief Technology Officer Vince Lesch also recently spoke with NGN magazine about the theme of overloaded cellular networks and how his company offers probes that work on the user plane, and intelligent data monitoring that enables service providers to get a holistic view of their networks and what services are running over them.

Meanwhile, a company called Aylus Networks was at Mobile World Congress last month pushing its solutions for heavily-trafficked cellular networks.

"There has been an unprecedented explosion in bandwidth demand for the mobile operators largely brought on by the popularity of the iPhone and video services," says Shamim Naqvi, CEO, Aylus Networks. "As a vertically integrated solutions provider, Aylus provides a full suite of traffic management solutions and real-time media sharing and video sharing applications. Aylus transforms the mobile operators' business models by offering them the ability to better manage the current avalanche of data and media traffic."

Elsewhere on the wireless offload frontier, Kineto Wireless has a solution that leverages Wi-Fi technology to help alleviate the stress on cellular networks.

The company's new Smart Wi-Fi Offload solution offloads all mobile services to Wi-Fi networks. It consists of a gateway and software, which runs on smartphones. The software can be preloaded by the service provider or downloaded by the user.

For the consumer, Smart Wi-Fi Offload can mean better wireless coverage and performance, says Steve Shaw, Kineto's vice president of corporate marketing. For the operator, it can result in a lighter load on the network, he says. It also can enable mobile operators to address the mobile VoIP threat by offering discounted or free Wi-Fi calling, Shaw adds.

"Smartphones are driving tremendous increases in mobile data usage, straining mobile networks in the process," says Jarich of Current Analysis. "Mobile operators need to dramatically increase network capacity in short order, while meeting the performance requirements of their subscriber base. Wi-Fi, installed in millions of homes and offices around the world, as well as in many smartphones themselves, is a natural technology choice for mobile operators to address these growing problems." **NGN**

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By Paula Bernier

Telecom Suppliers Embrace Cloud, Virtualization Technology to Enable Service Creation

As telephone companies and other facilities-based service providers search for ways to avoid commoditization and bring to market new revenue-generating applications, some of their equipment suppliers are coming out with new solutions that leverage technologies like cloud computing, software as a service and virtualization.

In its latest step to play matchmaker between its service provider customers and the developer community, Alcatel-Lucent recently revealed cloud-based efforts to open carrier APIs to application folks, as well as to outfit these software types with tools to test and distribute their wares.

The vendor back in December unveiled a trio of new offers – the Application Exposure Suite, the Open API Service and Transformation Service – aimed at helping network operators and developers more easily enable and create new applications that are manageable, reliable, scalable and secure. Laura Merling, vice president of Alcatel-Lucent's developer strategy, told *NGN* magazine in mid-February that now the company is offering cloud-based solutions that takes those efforts to the next level by not only exposing APIs, but also providing an end-to-end ecosystem through which developers can build, test, manage and distribute their applications.

> Alcatel-Lucent is providing an end-to-end ecosystem through which developers can build, test, manage and distribute their applications.

That includes developer tools, available through the cloud, that provide an abstraction layer to enable applications to run on any device; support for debugging; and more. It also includes a "sandbox in the sky" that allows developers to test their applications at scale. A special dashboard, meanwhile, allows developers to track traffic on their applications, look at what other developers are charging for their apps, and more. The management piece Merling mentions has to do with exposing APIs; she says it enables carriers to expose APIs securely, and in a rate limiting way so they don't bring down the network. From a distribution standpoint, Alcatel-Lucent offers a platform on which developers can load applications, and those applications can be tested as well as made available to interested parties.

"So it works both ways, it's a push and a pull," says Merling.

The ecosystem is paid for by those carriers that wish to expose their APIs, says Merling. She notes that's an important change from the current model in which developers typically have to prepay something like $8,000 to $10,000 a month for access to particular network resources, like SMS. This way, she says, it's a pure revenue share model in which only the service provider assumes risk, but in which the service provider also has a lot to gain.

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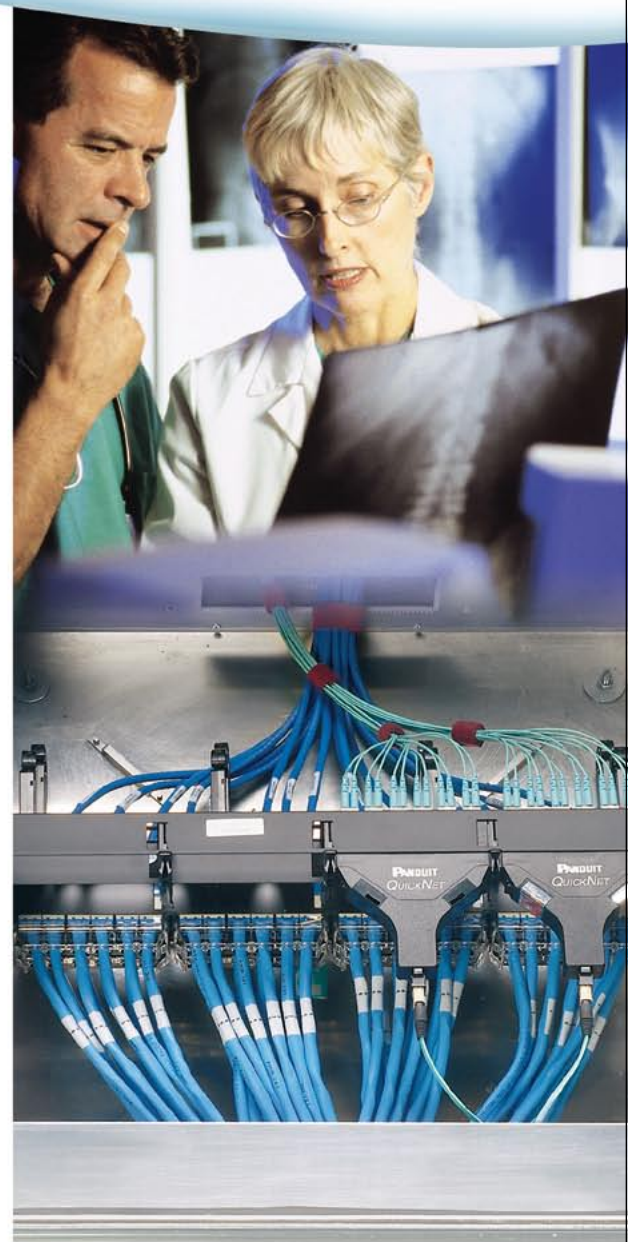

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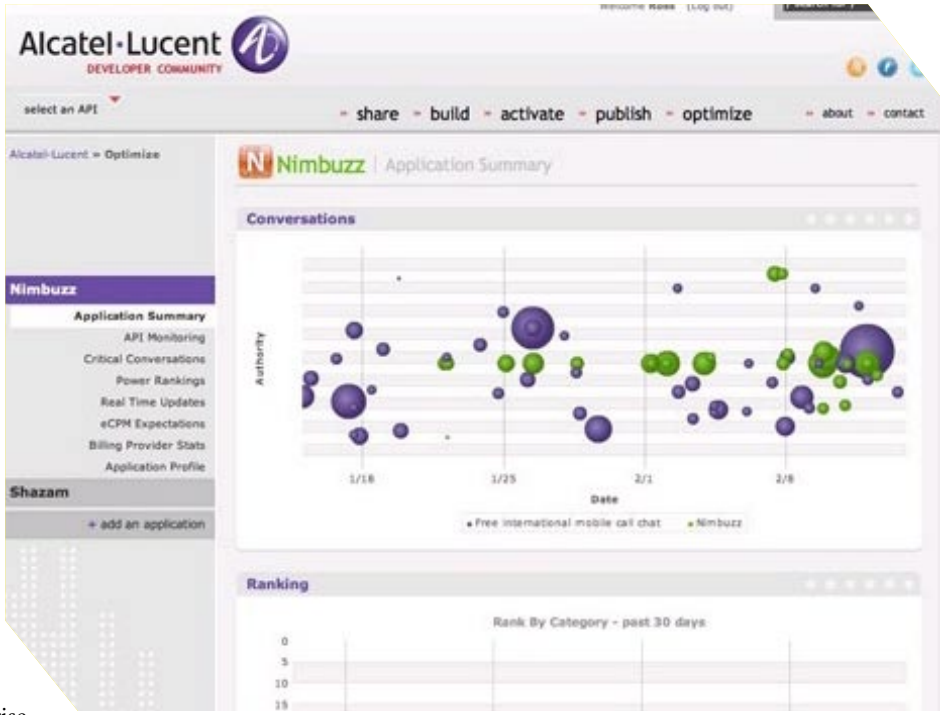
She adds that in this model developers also get a lot of added value given that they are offered bundles of APIs for specific verticals.

The first version of this SaaS-based ecosystem will be Alcatel-Lucent branded, says Merling. Longer term, she says, the goal is to give service providers the dashboard to offer as part of their developer programs. The sandbox and dashboard are available now.



Merling adds that while the developer community is clearly the target of its new cloud-based ecosystem initiative, it would also make sense for over-the-top service providers as well as enterprise network operators to get in on the action. For example, she says, Netflix might want to take advantage of a carrier's API to ensure QoS for a video-on-demand service. Conversely, she says, enterprise network operators might want to open their networks with APIs to enable new capabilities on their networks. In fact, she says, enterprises such as Best Buy, the BBC and Tesco are already opening their networks in efforts to drive customer engagement and otherwise meet their business objectives.

While Alcatel-Lucent is leveraging cloud computing to help service providers make the best use of their network assets and find a common ground with the developer community, Ciena talks about both the cloud as well as another technology made popular in data center and enterprise circles: virtualization.

Merling adds that while the developer community is clearly the target of its new cloud-based ecosystem initiative, it would also make sense for over-the-top service providers as well as enterprise network operators to get in on the action.

"When we talk to our carrier customers, clearly these folks are really on the page of IT and cloud services as a forward kind of focal point of revenue creation and margin protection," says Ciena's Chris Janz, senior director of portfolio management.

That involves bringing IT together with network elements, he says. It also entails transforming the network to an end revenue service delivery vehicle to being more in the middle of a supply chain – as more of a cost center than a direct revenue source, he adds. Janz says virtualization is a term that could be used to describe what needs to happen to enable all that. Rather than virtualization in terms of data center servers, he explains, the virtualization here has to do with migrating from a world with multiple networks each with their own operating systems, a lack of standardized interfaces and long new service development cycles, to a world with more converged, flexible networks that offer stable APIs written in languages developers want.

To enable that transition Ciena talks about what it calls the Converged Optical Ethernet, a foundation layer distinct from Layer 3 that Janz says includes core and metro edge transport, mesh, packetization capabilities and carrier Ethernet access. This foundation network can offer various bandwidth options, including QoS controls. Additionally, Janz talks about how Ciena offers a next-generation NMS of sorts that offers northbound service-oriented provisioning capabilities and southbound standards-based machine-based interfaces.

Additionally, next month Ciena will unveil a new 4200 family feature called enterprise services optimization, which allows fluid bandwidth to be brought to applications at the edge, allowing on-demand provisioning to be coupled with various applications or flows. **NGN**

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Monitoring LTE Networks

By Philippe Besset

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Fueled by the uptake of advanced applications like Web browsing, video and content downloads, mobile data traffic is skyrocketing. A look at industry statistics tells the story. In 2008, the number of mobile broadband subscribers increased dramatically in the U.S., Latin America and Central and Eastern Europe. And there's no end in sight. Informa predicts a staggering growth rate in mobile data traffic of 1,000 percent overall between 2007 and 2012.

Technological advances, flat rate billing plans, smarter devices, and attractive data services are driving the accelerated adoption of mobile broadband services.

The Downside of Success

The widespread success of mobile data services should be good news for global operators, but there is a downside to success. Escalating data traffic is straining the capacity of existing mobile networks and driving up network costs. To remain competitive, operators must increase network capacity while lowering the cost for delivering data services.

To meet this challenge, global operators are looking for an upgrade path for their current universal mobile telecommunications system 3G networks that will enable the delivery of more bandwidth and services at a lower cost. Recent deployment figures indicate that many network operators are choosing long term evolution as their course for network evolution. Designed to increase bandwidth, LTE lowers network operation costs and improves network performance for time-sensitive services such as mobile TV, Web browsing, IP voice and video.

The Challenges of Implementing LTE and High-Bandwidth Applications

With the advent of LTE, subscribers will demand data-intensive services like mobile TV, video streaming and Web 2.0 applications as routinely as they used to request voice service. As mobile data traffic swells, operators face a growing challenge: How to cost effectively provide monitoring and performance management for their entire network. Other challenges include:

Network security The proliferation of increasingly intelligent mobile devices poses a particular security threat to operators and mobile users. Subscribers are becoming more and more dependent on their mobile devices as a primary communication tool, creating an ideal opening for cyber criminals to access sensitive personal and corporate data.

Quality of service Operators need to move beyond basic network monitoring and troubleshooting tools to advanced systems capable of overseeing end-to-end network connectivity and service interaction. Quality of service is a key differentiator in this service/subscriber-focused business model, and is often the single most critical factor that separates one operator from another in the subscriber's mind.

Quality of experience Numerous factors can degrade a session's connection quality – a delay in packet delivery (latency), missing data (loss of packets), data arriving out of order or jitter. Imperfections in the transmission media, particularly in the RAN, can result in pulse degradation or loss, leading to throughput degradation and delays that negatively impact the customer's QoE.

LTE Monitoring System Requirements

The ability to perform a call or session trace network-wide across multiple interfaces/protocols is critical. Operators must have the ability to test multiple network technologies, route calls efficiently and effectively, and monitor all traffic passing through their networks. In addition, troubleshooting in real time is essential to supervising transactions between domains and monitoring protocols as they traverse and convert across gateways. It enables operators to test and assure interoperability as new services and network elements are deployed.

The key to profitability in delivering multimedia services across converged networks is having access to data that allows the carrier to understand the quality of the subscriber experience. To maintain customer satisfaction and ensure the successful delivery of new services, providers need tools that track service availability, reliability and delivery.

About Tekelec's Integrated Applications Solution

Tekelec's Integrated Applications Solution (IAS) provides operators with complete visibility to everything going on within their networks. Tekelec's solution supports: KPIs; multi-protocol and multi-technology support; real-time and historical data gathering; drill-down capabilities; end-to-end network visibility and call/session tracing; and configurable user-data filtering, sampling and reporting. The IAS system processes and archives call detail records, transaction detail records, and IP detail records from the network that can be used to generate service packages for optimizing a variety of services.

Summary

As operators deploy LTE networks, monitoring and performance management will have a direct impact on competitiveness and profitability. Network-wide visibility is essential to protect revenues and ensure application interaction, service delivery and quality of experience. As data traffic increases, operators need the capability to choose the type and quantity of data they collect so they can scale their monitoring systems and data collection incrementally. LTE networks require a configurable, network-wide monitoring solution that can provide a holistic view of the entire network – one that supports both existing as well as emerging technologies and protocols. **NGN**

Philippe Besset is product marketing manager at Tekelec (www.tekelec.com).

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by Charlie Rubin

Exalt-Linked Video Surveillance Assists CAL FIRE in Wildland Fires

With a mission to protect 31 million acres of privately-owned land in California, The California Department of Forestry and Fire Protection, better known as CAL FIRE, has a difficult job. The department provides emergency services response in 36 of the state's 58 counties. And its resources include firefighters, fire engines and aircraft responding to an average of more than 5,600 wildland fires each year. Those fires burn more than 172,000 acres annually.

Facing drought conditions every summer, along with California budget issues that have reduced the number of staffed fire lookout towers, CAL FIRE needed to devise a system to allow for additional fire information because of the loss of staffed lookout towers. Exalt microwave backhaul systems have become part of a new solution that reduces costs and delivers more accurate information so CAL FIRE personnel can respond to wild land fires more quickly and efficiently.

Lines of Sight

Historically, forestry agencies have used staffed lookout towers to monitor for fires and assist response crews in determining a fire's size and direction of travel. But budget cutbacks have left organizations like CAL FIRE with fewer eyes in the forest, leaving them to rely on 911 caller reports for information about fire locations.

"It's not an ideal situation for us to only use information from 911 calls," says Justin Sanders, battalion chief at CAL FIRE's Amador/El Dorado Unit Emergency Command Center, "9-1-1 callers often do not know exactly where a fire is located."

As a result, CAL FIRE has had to dispatch aircraft to assist in determining the location, size and direction of fires. With such flights potentially costing thousands of dollars each, CAL FIRE decided to find a better, more cost-effective solution.

The result is a system that uses high-definition video cameras mounted on unstaffed lookout towers. Two years in development, the system relies on microwave backhaul systems to connect the cameras with monitors and personnel at the ECC in Camino, Calif.

The Exalt Solution

Funded under a State of California grant, the video surveillance system in El Dorado County is the largest in the United States. The winning proposal was submitted by Vicom Wireless of Sacramento, Calif., which designed a system using Pelco Esprit HD video cameras featuring 35X zoom lenses with remote pan/tilt/zoom controls along with Exalt all-outdoor microwave radio systems that deliver video content over links ranging from 18 to 26 miles in length. The tower locations are at Big Hill, Pine Hill and Mount Danaher, where the command center is located. Each radio system uses the 5.8GHz frequency band and is configured for 200mbps of aggregate Ethernet throughput.

"We chose Exalt radios simply because they are, hands-down, the best radios on the market," says Jim Cinquini, president of Vicom Wireless. "We knew they had the reliability to stand up to extreme weather conditions, and they are among the only radios that have built-in spectrum analyzers, which are incredibly valuable when setting up channels."

Another key advantage of the Exalt radios is that they offer throughput symmetry control, which allows users to adjust the amount of uplink and downlink capacity. "With a video application like this, most of the traffic is coming from the cameras," says Cinquini. "We have the network configured so that 80 percent of the aggregate capacity is allocated to traffic from the cameras to the ECC."

The radios, switches and cameras on the lookout towers operate on 24 volt AC via power over Ethernet, and the cameras include built-in heaters to help protect them from the elements at elevations of 6,000 feet and higher.

Better Information Means Better Response

Since August 2009, the remote cameras have provided extremely precise information about the location of fires. Software on the monitoring workstation in the emergency command center can triangulate the azimuth and elevation figures from two different cameras to show a fire's longitude and latitude, as well as the number of degrees above or below the horizon. By viewing this information on the workstation's 52-inch monitor, the fire team can quickly evaluate how best to respond.

Since its deployment, the surveillance system has worked great. "The camera system has become an important tool we can use to identify a fire's location," says Sanders.

The Exalt microwave backhaul links have been completely reliable in all weather conditions, prompting CAL FIRE to plan for further expansion in 2010 and beyond. One additional camera and microwave link will be deployed atop Heavenly Valley in 2010, and the agency has an overall goal of eventually deploying as many as 22 cameras throughout Amador and El Dorado counties. NGN

The CAL FIRE JOB

Challenges

- Connect video surveillance cameras on forest lookout towers with command center
- Provide optimum capacity for inbound video traffic from cameras
- Ensure 24/7 link reliability

Solutions

- Deploy Exalt EX-5i microwave backhaul systems to support 200mbps aggregate Ethernet capacity
- Use throughput symmetry control to configure 80 percent of available capacity for inbound camera traffic
- Ensure 99.999 percent throughput availability in all weather conditions

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by Michael Khalilian

IP BSS/OSS and Security are Essential in Migration to NGN, IMS Networks

Telecommunications service providers are experiencing turbulent times when it comes to managing the expectations of their respective customers, who are more cognizant of their communication needs than their predecessors were.

With voice-based communication services becoming commoditized in the eyes of customers, service providers have been forced either to extract operational efficiencies or come up with frequent innovations, none of which is easy to come by. Technical limitations of traditional network systems are limiting the capabilities of service providers to create loyal customers, which is hampering the revenue generation for the entire industry.

Even though a surge in the customer base is expanding the market for telecommunications services, the share of the pie is reducing for each of the players. This is largely impacted by the introduction of non-telecom players in the value chain. As a result, traditional telecom companies are forced to partner with these players to address service needs that go beyond personal communications. That includes things like music downloads, caller tunes, directory services, IPTV, gaming, etc.

Also, these companies are forced to integrate fixed and mobile services and move toward integrated network technology to provide unified voice, data and video services with an unprecedented requirement for scalability. Increased competition in non-voice offerings increases cost of acquisition while reducing the average revenue per user, as more and more operators are forced to lower prices. High customer churn necessitates having an extensive assortment of services driven by continuous innovation. However, to truly achieve continuous innovation, operators' business support systems must also be up for the challenge.

BSS/OSS solutions for a next generation landscape must work as one with the network while unifying critical business functions to better manage and effectively monetize NGN services and the next-generation subscriber experience. This will call for solutions that are open and keep the customer experience at the heart, while adhering to industry standards and providing the much needed flexibility to accommodate new requirements.

The BSS/OSS reality for most operators today is one of multiple, discrete systems that each have their own ways of looking at and managing data, and that require time-consuming and costly integration while hindering marketing agility and the customer experience. Industry experts recognize that communications service providers face the impossible task of bridging yesterday, today and tomorrow with software systems designed in the past.

Innovation in this next generation world will need to be driven not only by network advancements but also via an open and flexible BSS/OSS infrastructure that will allow communications service providers to realize operational efficiencies in terms of new service introduction and customer management. Thus the BSS/OSS strategy will need to be aligned with the network strategy.

The NGN IMS Forum just completed a guidelines document for implementation by BSS/OSS & Security in the NGN IMS. This document is the result of the work of the BSS/OSS & Security working group and our recent plugfest interoperability test events. Comverse, HP, Mu Dynamics, Traffix Systems, Tech Mahindra and T-Mobile are member companies that contributed to this document, which covers the following points regarding the implementation of NGN BSS/OSSs:

- Introduction of Next Generation BSS/OSS & Security Architectures
- Security and Reliability
- BSS/OSS Unification
- Adopting or moving toward NGOSS
- Deploying IP subsystem networks
- IMS/NGN rating and charging impacts
- Diameter compatibility challenges
- IMS/next generation network BSS/OSS
- Suggested best practices

Given the pressure on achieving the business KPIs, it is imperative on the part of IT groups to evaluate their strategies from a long-term perspective wherein they push the IT landscape toward achieving unified systems that address legacy service offerings can adapt to technological advances and emerging customer demands. In light of this requirement, having the BSS aligned with the IMS philosophy is vital to extract the efficiencies promised by the IMS architecture.

These topics will be further tested at our next IMS Plugfest and NGN Plugfest interoperability test event, to be held from June 1 to June 4, 2010, at the InterOperability Lab in Durham, N.H. Themes for this plugfest center on NGN Network and IMS Rich Applications deployment, including location-based services, interoperability testing and real-time IP service integrity. Registration for the Interoperability and Testing (Plugfest)Working Group is now open for any service providers, integrators and vendors that would like to participate (www.imsforum.org/Plugfest). **NGN**

Michael Khalilian is chairman and president of the NGN Forum & IMS Forum (www.NGNForum.org/www.IMSForum.org).

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