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NGN™

Next Generation Networks

ADTRAN CEO, Tom Stanton

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Network Monetization

Editor's Notes

Comcast Debuts 4G WiMAX Internet Access

by Richard "Zippy" Grigonis

Many of Comcast Corporation's 15.3 million high-bandwidth Internet customers have long desired a mobile extension to their service so they could access the Internet while on-the-go. Now Comcast has finally brought forth mobile WiMAX-based data services.

It all started when Comcast and Time Warner, bidding under the Sprint/cable joint venture name of "SpectrumCo", paid $2.4 billion for 137 spectrum licenses during the Federal Communications Commission's Advanced Wireless Service auction in 2006. Then Comcast made a $1 billion+ investment in Clearwire in November 2008, to gain access to their WiMAX technology. At the time, Comcast COO Stephen Burke was quoted as saying, "We didn't invest in Clearwire to make money on the stock. We invested in Clearwire to roll out a product that our customers want."

Those investments are about to start paying off, as Portland, Oregon has the distinction of being the first market in which Comcast introduces a 4G / 3G data-only Internet access service, enabling users to enjoy both America's fastest wireless as well as a fast wired connection to the Net.

Comcast is selling two different data cards and service plans:

- Comcast High-Speed 2go Metro service uses a 4G-only USB-based wireless data modem, the 4G Mobile Broadband Device, to provide 4 Mbps download and 500 Kbps upload wireless service within the 4G metro coverage area. The device and Metro service operates only in the Clearwire 4G service footprint.
- Comcast High-Speed 2go Nationwide service delivers the Metro 4G service plus coast-to-coast access on Sprint's national 3G network. The Nationwide modem automatically switches between available 4G and 3G networks.

Comcast sells these wireless services bundled with one or more of its Internet, phone and TV products. Both new and existing Comcast customers will be eligible for special bundled pricing. Existing triple play customers can add the 4G WiMAX wireless service as an add-on for $30 per month. The $49.99 Fast Pack Metro service includes Comcast's 12 Mbps home Internet service, a free WiFi router for mobility and extended coverage in the home, and the 4G service providing up to 4 Mbps download speed when customers are in the field.

Consumers can upgrade to the Fast Pack Nationwide service for an additional $20 per month, that includes the same services plus nationwide 3G mobile network access. Or they can order the Nationwide service *sans* home service for $50 a month. Small and mid-sized businesses (SMBs) can also subscribe to these High-Speed 2go services via Comcast Business Services sales teams. The 4G Metro service is available now for just $30 per month and the cost of the data modem ($99) is waived, as is the activation fee ($49) if you sign a two-year agreement for Business Class Internet.

These new Comcast WiMAX-based services are data-only. That's probably because Comcast got burned a bit when they, in 2005, joined Time Warner, Cox Communications, and Advance/Newhouse Communications in the joint venture with Sprint Nextel to offer a bundled wireless service called Pivot, which flopped. The operators all forgot the first rule of telecom survival: differentiate yourself. "Me too" services won't make you rich.

Knowing Comcast, once this service gets going they'll push pretty hard, maintaining WiMAX' head start over the LTE (Long-Term Evolution) technology favored by Verizon and AT&T. **NGN**

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Publisher's Outlook

Cablevision's Vision

by Rich Tehrani

Optimum Lightpath division of the Cablevision Systems Corporation (www.optimumlightpath.com) is now a major presence in Ethernet-based communication solutions for small and medium-sized businesses in the New York metropolitan area.

I recently spoke with Optimum Lightpath's Senior Vice President of Product Strategy and Management, John Macario, who told me how Optimum Lightpath offers a full line of metro Ethernet transport products, and a set of voice services right on top of that.

As Macario says, "Here at Cablevision it's all about building a product line that's taking us up-market and deepening our relationships with customers. We have recently launched a hosted voice product that we think is unique not because of any feature functionality — frankly, it's no different than anything Verizon or AT&T has got — but it's packaged in a way that I think is unique in the industry. We're selling it for a single monthly recurring charge for certain company sizes, such as 50, 75, 100, up to 300 seats. The package includes all of the IP endpoints. We deal with LAN assessment and LAN remediation. It includes all of the customer premise equipment required to remediate the customer's LAN, all of the servicers for installing and configuring the system, along with 7x24 flaw or break-fix care on anything we put on the customer premise, and there's no upfront charge for any of it. If you buy our transport product, we'll sell you 50 seats of hosted VoIP for $749 a month with no other charges, which comes out to roughly $15 for a full-featured voice seat. I don't think anybody else has an offer anywhere near to ours."

Of course, the company focuses on businesses in their footprint, but Macario says that, while the footprint is geographically constrained, they're pretty happy that it's a big, rich and densely-populated one.

"We do have some transport customers off-net, but that's the exception rather than the rule," says Macario. "Ideal customers for us are things like hospitals — big, regional businesses. Right now 98 percent of the hospitals on Long Island are Cablevision Lightpath customers and 70 percent of the hospitals across our footprint are Lightpath customers. They need high bandwidth, low-latency, committed information rates circuits, to get information from one place to another. Many of them also use our voice services. We do offer what amounts to a TDM trunking product that we bundle in. To give you an example, one of our TDM trunking products is a 20 Mbps Internet pipe plus 50,000 voice minutes, and we price that a bit south of $3,000 month. If you do the arithmetic on that, if you're currently running on copper and PRIs, we can blow that away. Medical is one of our fastest-growing verticals."

"The Government is also becoming a big market for us," says Macario. "Education is up-and-coming as well. Right now, financial services may not sound interesting or exciting, but we're actually doing really well in that field too, since they've spread their operations across our footprint, moving facilities originally situated in Manhattan, say, and moving them to Jersey City."

"Three basic principles underlie all of our products," says Macario. "First, the pricing must be simple and easy to understand. Second, none of our products or pricing must resemble anything offered by a typical phone company – no incremental charges, for example. Special configurations cost a bit more, of course. Third, we enter markets where we can price disruptively. We're not particularly interested in competing 'around the edges' for half a percent market share. If we're entering into a market with our data connectivity services, our interesting video transport services, our many voice services and other managed services including unified communications that we're bringing online — we do it to take a significant share of the market. We want to do as well in new markets as we already do in the medical market."

Telcos beware, Cablevision's Optimum Lightpath division is one aggressive player. NGN

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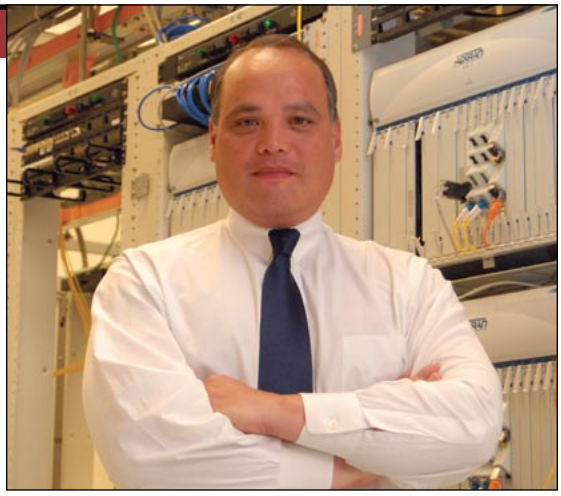

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In Every Issue

Columns

Feature Articles

www.tmcnet.com/11768.1

Ceske Radiokomunikace Extends WiMAX Network

Fixed Czech operator Ceske Radiokomunikace plans to gradually expand its WiMAX network to another 25 cities, after it launched a WiMAX network in Prague in January of this year. The operator will launch commercial WiMAX operations in ten new cities in the the beginning of August.

www.radiokomunikace.cz

www.tmcnet.com/11769.1

Aldi to Launch MVNO Aldi Talk

Germany-based discount supermarket chain Aldi is launching an MVNO (Mobile Virtual Network Operator) on the KPN network. Aldi Talk will be the brand of Aldi unit Medion Mobile, which will offer prepaid services via the Aldi supermarkets. Calls will cost EUR 0.06 per minute within the network and EUR 0.16 for calls outside the network to Dutch numbers. An SMS message will cost EUR 0.06. Receiving calls in the EU will cost EUR 0.26 per minute, while calling will cost EUR 0.52 per minute. Aldi Talk has already been launched in Germany and Belgium.

www.aldi.com

www.tmcnet.com/11770.1

Spanish MVNO FonYou Launches Online Mobile Phone Service'

Spanish MVNO FonYou launched an Internet-based mobile phone service on July 9, 2009. On their personal space at the FonYou website, customers can access a historical record of their calls and messages, as well as online calendar features. The service will also feature call filter capabilities and voicemail service enabling users to personalize the greeting message for each contact.

www.fonyou.com

www.tmcnet.com/11771.1

Telecom Italia, 3 Italia to Share Mobile Sites

Telecom Italia and 3 Italia have signed a co-siting agreement for sharing access sites for the radio mobile network. The agreement applies to both existing and future sites. The deal includes sharing passive infrastructures such as poles, cables, electricity supply and air conditioning systems as well as other civil infrastructure. While maintaining the ownership of its own infrastructure, each operator will host the radio mobile stations of the partner with the goal of optimizing network coverage on a national level. The agreement does not include the electronic devices that permit the supply to their own clients of mobile telephony services or related management services. The agreement lasts three years, is renewable and will cover at least 2,000 sites, providing savings of 30 percent on costs, the operators said.

www.telecomitalia.com
www.tre.it

www.tmcnet.com/11772.1

Shentel Selects ADTRAN Total Access 5000 for Its Access Network

ADTRAN, a leading provider of next-generation networking solutions, recently announced that Shenandoah Telecommunications (Shentel) has selected ADTRAN's Total Access 5000 Multi-Service Access and Aggregation Platform (MSAP) to upgrade its access network to a single voice, data, and transport network capable of supporting the bandwidth-intensive needs of a next-generation network. Shenandoah Telecommunications selected ADTRAN for its network upgrade based on the Total Access 5000's flexibility, providing the ability to offer multiple services from a single platform along with an industry-leading warranty, outstanding customer service and unprecedented bandwidth capacity.

"ADTRAN's Total Access 5000 will allow us to provide our customers with a breadth of services in a very cost-effective manner from a single platform," said Jeff Manning, manager, network engineering, Shenandoah Telecommunications. "Having the ability to migrate our legacy DSLAMs into our Ethernet core with the same platform that will provide advanced services over copper and fiber is a huge advantage for us."

The ADTRAN Total Access 5000 is a carrier class multi-service access and aggregation platform that bridges the gap between existing and next-generation networks. With an all-Ethernet core, the Total Access 5000 supports both legacy and emerging service interfaces over copper and fiber, easily scaling to support bandwidth-intensive applications. This scalable Ethernet architecture allows carriers to use the Total Access 5000 to address both legacy and next-generation services economically while providing a seamless path toward a converged network.

www.adtran.com
www.shentel.com

www.tmcnet.com/11773.1

Huawei Launches Mass-Market Femtocell Device

Huawei Technologies Co., Ltd. a provider of next-gen telecom network solutions for operators worldwide, recently launched a new end-user oriented Femtocell device.

Dubbed "Femtocell 2.0", the portable wireless access device allows users to connect directly to a standard broadband DSL or cable service and delivers in-door 3G network coverage for handsets. It enhances delivery of mobile voice and data services in both enterprise and home environments, and sets new benchmarks in terms of quality, reliability, intuitive use, and appealing design.

Huawei's innovative Femtocell 2.0 has already received Germany' s prestigious iF Design Award and the Red Dot Design Award. It's engineered to allow operators to address both household and enterprise markets simultaneously. The device supports applications for streaming video, IPTV, video conferencing and mobile broadband and it is a critical component for operators to implement a full-service operation.

Huawei has established more than 20 pre-commercial and trial femtocell networks with global top-tier telecom operators. In December 2008, Huawei developed the world's first commercial 3G femtocell network for StarHub in Singapore.

www.huawei.com

www.tmcnet.com/11774.1

ManageEngine Unveils VQManager 6.2

ManageEngine has released an update to its VoIP quality monitoring solution, VQMan-

ager, which focuses on catering to the management requirements of VoIP service providers. VQManager is a web-based, 24x7 real-time QoS monitoring tool for VoIP networks. It monitors any VoIP equipment that supports SIP, H.323,Cisco SCCP (Skinny) and RTP/RTCP. VQManager helps in troubleshooting VoIP calls for failures and quality deterioration. It provides features such as Live VoIP QoS Monitoring with MOS scores, Alarms&Notifications, Call QoS detail views.

The latest release, VQManager 6.2 makes it possible to support larger VoIP environments, monitoring up to 1000 simultaneous VoIP calls and improves on the application's existing VoIP packet processing capability. According to ManageEngine, the new VQManager is designed to perform equally well on different versions and flavors of Windows and Linux operating systems. VQManager is now also available in a licensing model. Here, pricing is based upon the number of simultaneous calls to be monitored. It provides features such as improved performance to support environments, exclusive licensing and pricing model for VoIP Service Providers, total support for Cisco CallManager 6.x and 7.1 environments, and ability to create 'Schedulers' for predefined reports and e-mail them as PDF files.

www.manageengine.com

www.tmcnet.com/11775.1

Raketu Intros Mobile Video Calling

New York-based Internet communications, information and entertainment company Raketu Inc. has introduced Raketu Mobile Video Calling, designed to allow mobile users on WiFi or data services to make free video calls. The service also offers free voice to voice calls, mobile to mobile or mobile to desktop calls, over WiFi or data.

Mobile and desktop users can also benefit from low dial-out calling rates at up to 65 percent lower than Skype's. The users can also enjoy the flexibility of calling with computer to computer, computer to phone, and phone to phone calls. It's even possible for users to make calls directly from any browser without a download. The service can be availed from any device, anywhere in the world, mobile or desktop/laptop.

Raketu's p2p technology ensures seamless VoIP calling and the highest call-completion, devoid of the security concerns related to supernodes and other conventional p2p technologies. The company currently has users in over 150 countries around the world. According to a recent TMCnet report, Raketu has unveiled the RakSIP service, which allows users to connect to Raketu any third-party mobile or desktop SIP software client, IP Phone or session initiation protocol hardware device.

http://www.raketu.com

www.tmcnet.com/11776.1

Streamezzo and Atos Origin to Power Mobile TV iPhone Application

Streamezzo, a major provider of Rich Application Software platform for mobile, and Atos Worldline, the European expertise of Atos Origin in electronic payments and transactions, have announced a partnership to power an interactive Live TV application for iPhone 3G. Effective today, this solution enables mobile operators and broadcasters to offer iPhone subscribers the best-in-class Mobile TV experience, combining the power of Streamezzo's technology and of Atos Worldline in-depth experience in the telecom market with large volume hosting capacity. The solution has already been implemented by a leading European Mobile Telecom provider, and is distributed through Apple's App Store. Streamezzo and Atos Worldline Mobile TV solution couples the a unique and intuitive Mobile TV application with additional features provided by the iPhone platform in terms of user experience and navigation. The ready-to-deploy service offers all the functionality of Mobile TV such as access to Live TV through the embedded video player, channel grid and interactive Electronic Program Guide (EPG) in the most intuitive way. The service can be easily and quickly customized to the specific requirements of both mobile operators and broadcasters in terms of customizing the look-and-feel, and including additional services such as fast channel switching, video-on-demand catalogue and personal video recording including live catch-up TV functionality.

The solution is developed and operated by Atos Worldline, using Streamezzo's Rich Media technology. The same application can completely be re-used for other mobile platforms including Android, BlackBerry, Java, Linux, Symbian and Windows Mobile . Thanks to this cross-platform technology, mobile operators and broadcasters can extend their reach in terms of subscribers and accelerate their return on investment.

www.streamezzo.com
www.atosworldline.com

www.tmcnet.com/11777.1

BoxTone Launches BlackBerry Platform for MSP Community

BoxTone, which provides mobile user management solutions, recently announced a packaged offering of BlackBerry platform management software and services. The offering is designed specifically for the Managed Service Provider (MSP) and messaging hosting community. BoxTone software is used by such managed service providers as EDS, LiveOffice, Perot Systems and Raiffeisen Informatik, to manage and monitor their clients' BlackBerry platforms.

MSPs and messaging hosters are seeking to differentiate themselves and generate more revenue from existing BlackBerry service engagements through new offerings coupled with a lower cost to serve. While the overall opportunity for BlackBerry support has grown dramatically, margins for the service have also come under pressure. With the BoxTone MSP Bundle, MSPs can expand market opportunity in new ways to generate incremental revenue while also lowering the actual cost to serve. With fewer calls demanding less time to resolve, help desk costs can be reduced significantly, impacting the overall bottom line. MSPs can also use the Bundle solution to generate more top-line revenue per mobile user, since it includes software and services designed to provide incremental value outside the scope of existing engagements. The Bundle can create a special white-glove Mobile Executive Support service capable of real-time monitoring of actual VIP mobile users experiences and alert a support team to even minor service disruptions or issues.

www.boxtone.com

by Ronald Gruia

Chinese Ante Portas

During the second Punic war (218-201 B.C.), the great Carthaginian general and strategist Hannibal managed to march on Rome after conquering almost all of Lower Italy. At that time, Cicero, in one of his philippic speeches mentioned *"Hannibal ante portas"*, which literally means "Hannibal before the gates". This famous sentence is still used as a warning of imminent danger – indeed, one might well use it in reference to Chinese telecom infrastructure vendors such as Huawei and ZTE as they increasingly compete against North American and Western European players.

For instance, Huawei performance thus far this year has been outstanding, despite a tough macroeconomic environment, having become the Number One optical vendor and improving its mobile infrastructure market share to Number 3 all in Q1 2009. ZTE has been also aggressive in the Americas and one example is its voicemail win at Vivo (Brazil's largest wireless operator) with its AnyService platform (they're on the short list for messaging tender at TIM Brasil as well with the same offering). The company has also shipped 10 million handsets globally in Q1 2009, a 30 percent increase compared to the same period last year (68 percent of those were in overseas markets).

Of course, many pundits believe that these vendors progress is mainly due to very healthy capital spending by operators in Asia Pacific, such as ongoing 3G mobile rollouts in countries such as China and India. However, deeper inspection reveals that significant portion of these companies' growth comes from service providers in other regions such as EMEA and Latin America. Despite this progress, the North American region still remains relatively under-penetrated by the Chinese NEVs with very few exceptions (such as Huawei's HSPA overlay win at Bell Canada and Telus, alongside NSN).

North America: The Final Frontier? At MWC in Barcelona this year, Verizon Wireless and AT&T both announced their intentions to deploy LTE, with Verizon going a step further and announcing the winners of the RAN, packet core and IMS portions of their LTE deployment. Given the more accelerated pace of the Verizon buildout (initial deployment plans for late 2009 with a couple of cities probably having only data card service), this was not surprising. AT&T's plans called for a deployment that will more likely start in the 2010-11 timeframe. However, some details began to emerge about AT&T's deployment.

A story that was widely circulated on Wall Street (based on a UBS report) suggested that AT&T has chosen Ericsson, Alcatel-Lucent and Huawei for the RAN (Radio Access Network) portion of its LTE trials. Chances are AT&T will eventually pick two out of these three vendors for their actual deployment which could start sometime in 2011. The fact that Nortel was not on this short list is not surprising, given the uncertainty of the company; however, the fact that NSN is not a part of the list is surprising. Other parts of the LTE buildout (packet core and IMS) remain to be decided and it's likely that AT&T probably will make selections by Q3.

The inclusion of Huawei in the LTE RAN trial short list represents an important initial victory for Chinese vendors. After establishing an important beachhead in North America with mobile wins at Cox and Leap in the U.S. and the joint Bell Canada/Telus HSPA overlay, a win in the actual AT&T LTE deployment would further establish Huawei as a force to contend with in North America.

Outlook & Conclusions. Western NEVs have to closely watch this better performance from Chinese players, as the latter improve their share of the market. Huawei has been particularly active in the swap-out contracts where the previous incumbent was displaced (examples include Vodafone Hungary, Ghana Telecom and Turkcell), perhaps the best indicator of the "sharp end" of the market. There have also been some reports of US$15 billion loan for various activities including project financing for the Number 2 Chinese player (ZTE). During turbulent times like these, vendor financing can be, simply put, an irresistible temptation for telecom operators.

The implication to Ericsson, Alcatel-Lucent and NSN is to focus on differentiators such as services (this also includes advisory/planning) and compelling applications that can take advantage of the new LTE environment. Services will increasingly become more important and can serve potentially as a back-door to win future business. If NSN was indeed left out of this initial short list for RAN trials, this might serve as an impetus for the JV to consider making an investment in Nortel's carrier business in order to attain more scale in North America. **NGN**

Ronald Gruia is program leader and principal analyst at Frost & Sullivan covering emerging communications solutions. Reach him at rgruia@frost.com.

by Grant Lenahan

Mixed Revenue Models

Over the past two years I've been fortunate to be a core member of the TM Forum's living laboratory — named the "Content Encounter". Every 6 months this group of operators and vendors has demonstrated the value and viability of new business and technology models for content and information services. Interestingly, all the realistic and well-accepted models employed a holistic approach to service revenues in which all recognized that a complex interaction exists between fees, plans, ads, benefits, discounts and content.

Back in the real world, the talk is different. So maybe the lessons learnt within the TM Forum need to be spread more widely. This column affords us all that opportunity.

There's a lot of chatter about advertising revenues on broadband (IMS/NGN) networks and on mobile networks. Talk about things like "will consumers accept ads on their phones" and "can ads really replace fees" and "why would consumers accept an ad, I wouldn't". These kinds of statements reveal just how far some of the talk misses the point. It's not one or the other. And it's certainly not "pay me your full mobile bill and I'll send you SPAM too." Consumers *won't* stand for that; nor should they. Nor, if we're the slightest bit savvy in our economics and our history, will they have to. Ads and fees are just two ways to pay for services and content. Historically, they have been tightly linked to content (as in TV ads), but have also paid for distribution (as in the local affiliate's share of network show ads). There is also a long history of "mixed revenue models" in which a combination of service fees (such as your monthly cable or satellite TV bill) and content-linked ads pay the freight.

The key is trading off one form of payment (money) for another form of payment (willingness to watch and reply ads). Different people will prefer different trade-offs. Some may be cash poor but have significant influence on others' purchases (think children); while others may be time poor but sufficient cash (think busy professionals, maybe like you). No single ideal combination likely exists. But a rang of plans may cater well to various market segments, making them al happier. Economists have observed this behavior in nearly all choice consumers make: the trade-offs are drawn as indifference curves, an they always exist. (See the accompanying graphic.)

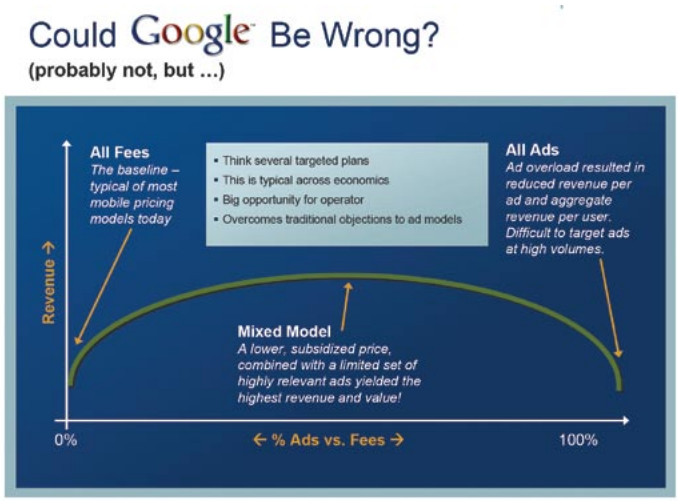
Advertising has always been based on a social contract. Simply, us ers knowingly watched ads in return for free or discounted content Consumers fast-forwarding through ads violates this social contract Likewise, forcing ads on consumers without a commensurate benefi violates the contract. From this follows a simple conclusion — we nee a new social contract within which ads will be delivered. The variation will be myriad, limited only by marketers' creativity; but they will al share one defining characteristic: consumers will actively choose a pla that meets their needs — and either includes ads (a form of opt in) o does not (and carries higher fees or fewer benefits). Either way, the socia contract is preserved, and individuals are left in charge of their choices. This, after all, is just good consumer marketing. Operators often ask about whether our approach is based on "opt in." I believe it raises this a notch or two — consumers most definitely "opt in" but as a much more sophisticated process of choosing the right overall plan for them.

We should envision a world in which there is innovation not only in services, but in plans. Plans with ads and without. Prepaid and postpaid. Family plans with different characteristics for each family member. Plans targeted to various demographics, or even to take advantage of events or market conditions. What all this boils down to are two needs: the need to innovate easily; and the ability to easily define new plans complete with rating rules, account balance tracking, and ad components. This is important — the advent of ads, and the maintenance of the "social contract" places new and complex demands on billing and charging systems (postpaid and/or prepaid) — because they must be modified to include ads as an integrally engineered component of the overall plan.

I believe we need to stop thinking in simple absolutes — it's not fees *or* ads — it's some combination of both. Its not "op in or not" — rather it's about consumers choosing their plan, their preferences, and defining their interests. And it's most certainly not the "ad system" vs. the "billing system" — from a process perspective they must be one.

So don't think about ads in a vacuum. Think about them in the context of your business, and the value proposition you offer. And above all, don't let technology prevent you from doing it right. There's too much money at stake, and the TM Forum demos prove that it's feasible. Let's — as an industry — do it right. **NGN**

Grant F. Lenahan is vice president and strategist, IMS Service Delivery Solutions at Telcordia Technologies, Inc. (www.telcordia.com).



by Marc Leclerc

The Importance of Relevance

Previously, I discussed the importance of *contextual* information (identity, presence, group lists, location, session, the weather, etc...) and how it can be used to anticipate peoples' future actions and trigger an offer of services they will likely want. More specifically, the service provider takes on a more active role by proposing actions to the consumer, making it easier to introduce new services while creating an improved user experience.

This approach could be easily be overused and as a result be a major annoyance to the consumer. Fortunately, context is not the only way to understand consumers' needs. The most direct way is to simply *ask about a person's preferences* and then create a mechanism that can store this information as a "profile" allowing for selective services exposure.

Asking for information is not only smart and polite, but in many jurisdictions it is a legal requirement for consumers to specifically select services which require the use of personal historical data for any purpose beyond its original context. Direct discussions with consumers also gives them a feeling of control over their own information, a significant factor in service adoption rates. Of course, this mechanism could also be augmented passively (without requiring consumer intervention) by collecting users' purchase choices and activities. However, it is paramount that the consumer decides whether they will allow this information to be collected.

Why would a consumer choose to participate? Well, first let's review a simple mathematical formula: **Context + Preferences = Relevance**

By combining *contextual* information about a person's environment with the *preferences* about what choices this person is likely to make under certain circumstances, a service provider can offer *choices that are relevan*t to the person's situation and inclination.

Consumers benefit in (at least) two main ways from relevance:

1. It reduces the constant inflow of offers cluttering their message boxes, and

2. The service provider is enabled to reduce or even totally eliminate usage costs via advertising and sponsorships.

Not all spam is useless, otherwise no one would ever act on it, spam would cease to generate revenue and disappear. Actually, some spam are acted upon by the recipients to generate sales. But the sheer volume that makes spam such an annoyance necessitates spending time separating out the chaff from relevant messages. By using "Context + Preferences = Relevance" as a filter, service providers can make timely, targeted offers that are more likely to be of genuine value and acted upon by the consumer.

Opting for quality over quantity is even more important to another crucial stakeholder in the value chain: advertisers. Many people considered advertising to be the bane of modern life — and then spam came along! However, advertising pays for broadcast TV, subsidizes the consumer cost of magazines and newspapers, and informs the public about products they *may* want and where they *might* purchase them. The relevance mechanism allows advertisers to reach highly interested consumers who are more likely to pay attention, more likely to buy, and less likely to be annoyed into the arms of a competitor. Targeted advertising is gold for advertisers, and means the service provider can charge a good price, raising ARPU. In fact, taking and improving on a widely-used Internet marketing technique, targeted advertising revenues might even justify offering the service to consumers for free.

What could such a service look like? Here's an example: Mike leaves the office mid-morning to go visit a customer downtown. He arrives 20 minutes early and notices that it's cold outside. His mobile carrier knows he is out of the office, downtown and between appointments. While waiting, Mike gets a generated ad message for "20% off a latte" at his favorite coffee chain. In midsummer, the same situation repeats itself. However, this time its sweltering downtown and Mike instead gets a different offer for "20% off an iced cappuccino."

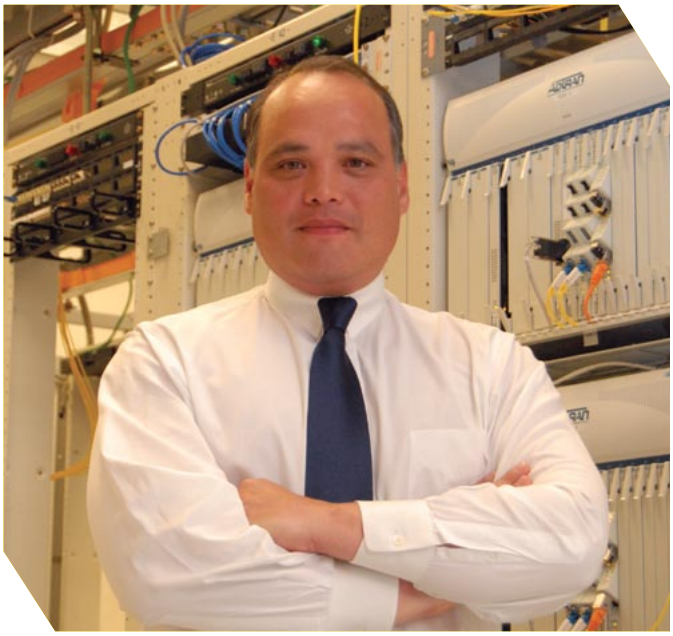
Let's explore a more complex scenario. After leaving the office, Mike is standing in the parking lot when he receives a message with detailed driving directions, allowing him to avoid current traffic hot spots. He also gets a message from his wife reminding him to buy apples, milk and bread. Attached to the message is a map showing his favorite grocery store's location and a brief ad of the week's special on fruit. On the way home he receives a route update due to a traffic accident. Included with the update is a map directing him to the next-closest grocery store of the same preferred chain along his new route.

These are relatively simple ideas, but the principle remains: combine *context with* preferences to offer choices relevant to consumers' changing situations and desires. This supports and enhances the two-sided business models of Telco 2.0 and Web 2.0, generating revenues for carriers from both subscribers (ARPU) and service providers (advertising, web service providers, retailers, etc.). Perhaps most importantly, this approach leverages key capabilities of telecom networks, including IMS, to deliver value to consumers, provide rich communications services and new ways to monetize them, and build an offering that can even compete effectively with free services on the Internet. **NGN**

Marc Leclerc is manager, Global IMS Expert Center, Ericsson (www.ericsson.com).

By Rich Tehrani

ADTRAN Advances Access Solutions



We've followed the ADTRAN success story from its beginnings in Huntsville, Ala., in 1985, though its great accomplishments in developing equipment for the carrier market, then to its move into the enterprise space in the 1990s with their TSU family of Data Service/Channel Service Units (DSU/CSUs). ADTRAN then branched out further into ISDN termination equipment and Integrated Access Devices, quickly becoming the market leader. The 21st century brought ADTRAN into increasingly advanced access solutions. Today, the company is growing rapidly in the areas of broadband access, optical access and Internetworking.

The Carrier Networks Division has made a mark in Ethernet and IP-based network technologies. Service providers worldwide use ADTRAN equipment to connect central offices or remote terminals directly to the subscriber's terminating equipment.

Indeed, ADTRAN's Carrier Networks Division now offers a huge portfolio of products including broadband access platforms, FTTP, FTTN, sealed DSLAMs, Ethernet aggregation and switching equipment, fiber access platforms, fiber add/drop multiplexers, M13/STS-1 multiplexers, HDSL2/4 technologies, SHDSL and ADSL technologies, and narrowband access platforms. Moreover, the rise of the Internet, LANs and enterprise WANs spurred the company into increasing their presence in the world of end-user termination equipment for Small and Mid-sized Businesses (SMBs) as well as distributed enterprise customers. This also led to the development of sophisticated Internetworking equipment.

With its tremendous portfolio of over 1,700 products, ADTRAN can satisfy the network needs of not just carriers but any kind of business. They encompass everything: routers, Fast Ethernet, Gigabit and PoE switches; IP Communications platforms; IP phones; IP PBX platforms; wireless access points; security appliances and management platforms.

I recently spoke with ADTRAN CEO, Thomas Stanton, to get his view of what ADTRAN is up to these days and where things are heading in our industry.

RT: How have you managed to be profitable every quarter for so many years?

TS: Our drivers of profitability are fundamental in nature. Historically, we've always focused on product cost. Technology must not just be exciting and advanced, it must also be cost-effective. We also keep our operating expenses in check by empowering employees. We have learned that if you empower employees, they begin to spend money as if it were there own. They manage to reduce expenses themselves without being told to do so. As a result, we have sales margins that have increased over the past three to four years to an industry-leading range — about 59 to 60 percent.

RT: Tell me about your company's history of innovation.

TS: In the beginning we had to make a name for ourselves by out-engineering everybody else in terms of product design, both to meet standards and to win market share. An example of this is our plug-to-plug HDSL technology. Back in the 1990s delivering HDSL over extended distances required adding 'local powering' for the remote unit or line powering with voltages considered to be unsafe for handling. We developed a low voltage HDSL system allowing the central office unit to provide line power at safe voltages without making things complicated with local powering. It was the first safe, cost-effective method for extended- range HDSL deployment. We also had to out-engineer everyone on the cost side of the card to get to the lowest price point. One way we achieved this was by building our own ASICs [Application-Specific Integrated Circuits]. We still do this — we have a semiconductor development group that we call upon for a large percentage of our products. By doing this we can lower the bottom line cost and have complete control in terms of adding features. Of course, as systems become more complex we have developed a larger 'toolset' and we continue to transform innovations into overall solutions.

Consider our Total Access 5000 Multi-Service Access and Aggregation Platform (MSAP) and its more compact brother, the Total Access 5006. These innovative products will shine as the world's networks evolve over time. Basically, the Total Access 5000 is a carrier-class MSAP that bridges the gap between existing and next-gen networks. We believe that Ethernet is at the heart of the future of the network and, with its all-Ethernet core, the Total Access 5000 supports both legacy and emerging service

interfaces over copper and fiber. It scales easily to support bandwidth-intensive applications, so carriers can use it to deal with both legacy and next-gen services as they map out and follow a seamless path toward a converged network. As a Broadband Loop Carrier, the Total Access 5000 can deliver both POTS and enhanced broadband services via ADSL2+, VDSL2 and GPON technologies. It supports any kind of migration path since it can deal with both TDM and VoIP switches. Also, the Total Access 5000's Ethernet core can serve as a scalable, cost-effective network aggregation point, with interfaces ranging from DS1 to Multi-Gigabit Ethernet. It's even environmentally hardened, so service providers can deploy it in a CO, remote terminal or any type of remote node location.

The Total Access 5000 fits in perfectly as a great example of how to bring fiber to the node and enterprise. We help customers reduce and/or defray costs by examining a solution's lifecycle cost. Cost of ownership, ease and manageability are important factors to which we always pay attention.

RT: Tell me about your corporate divisions.

TS: Our Carrier Networks Division provides infrastructure to telcos, such as fiber-to-the-node and optical backhaul products. It mainly focuses on access. We founded our Enterprise Division about five years after the Carrier Division. We initially found we could leverage our CO expertise by infusing carrier ideas into enterprise-class gear. Even today, our customer premises equipment shares the same standards as our carrier products. We always want to facilitate end-to-end connectivity, which brings with it additional benefits. And now, of course, for the first time we're seeing this connectivity in the Ethernet world, along with service level agreements.

RT: How do you think the broadband stimulus will affect the market and ADTRAN?

TS: We think we are well positioned. The customer base that will see significant benefit is rural service providers that deal with underserved or completely unserved customers. We've been selling to rural telcos for 10 years now. All of the large rural, independent telcos have rolled out our Total Access 5000 and 1100 systems, and they are now looking to roll out broadband in areas where previously it did not make sense to deploy. So, we have a great track record because we know our customers and we have the right products.

RT: You spoke highly about Ethernet. How are IP and Ethernet technologies affecting you?

TS: They affect most of our development efforts. About 90 percent of our development work involves IP and Ethernet products. That's a 50 to 60 percent shift from just five years ago. The network is evolving faster and faster toward Ethernet. Fortunately, our product set allows us to be at the leading edge of this evolution

RT: How do you see business growing in various global regions?

TS: The long-term growth of ADTRAN is dependent upon our ability to grow outside of the United States. We began focusing on global growth approximately two years ago and we are seeing some success, especially in Latin American, Asia and Europe. Over the next two years, you will see ADTRAN increase its focus on global markets and introduce more products with features that are tailored to address the unique needs of service providers and businesses in other regions of the world.

RT: How is the Green movement affecting ADTRAN?

TS: We started a green initiative inside the company two years ago. "Green" is inevitable. It's not going away tomorrow. Besides, it's the right thing to do. If rolled out correctly, it can be financially beneficial for everybody. It's also a positive thing from an employee perspective. Consumers are in the early adoption phase, but I'd rather be at the forefront in this than be the last company to get onboard.

RT: How has ADTRAN done in the current economic climate?

TS: Our Carrier Division proved to be the most resilient in 2008. We did see a slowdown in legacy SMB products. Still, I'd say we were affected less than other vendors in our space. Our new products and 'growth'-positioned products actually grew in excess of 20 percent last year.

RT: How are you differentiating your products from others?

TS: As a leading provider of both Carrier and Enterprise solutions, ADTRAN is uniquely positioned to leverage the strengths of our two divisions to offer fully managed, integrated, end-to-end Ethernet and IP solutions. We have a strong heritage in engineering and our strength lies in the unique ability to re-engineer solutions to deliver higher performance, reduced costs, and integration of the latest technologies. This ability combined with industry-leading warranties and best-in-class technical support allows ADTRAN to set the bar in delivering industry-leading total cost of ownership to our customers. This is especially important to our service provider customers who depend on our solutions to increase their service revenue, simplify their networks and reduce their costs.

RT: Why should enterprise and carrier customers buy from your company?

TS: We offer the industry's best customer service as well as terrific end-to-end management capability. We have expertise in both carrier and enterprise technologies. We can take very expensive-to-develop carrier technology and roll it into enterprise products in a much more effective manner than would a company solely focused on the enterprise market. That's why more and more core technologies on the carrier side can trickle down to the enterprise in a short time. Our carrier-class products are highly reliable. Our enterprise products are of carrier-class quality but at reasonable prices. Indeed, our price points beat the competition. As I said previously, we offer a great TCO, and yet we manage to bring innovation to the market every year, taking it right into the embedded space. And financially, we are very stable in an era when many companies are not.

RT: What does the future hold for ADTRAN? What can customers expect?

TS: Customers can expect an Ethernet-centric product portfolio that will evolve as the market evolves and showcase our engineering talent and innovation. We will take this product set to a global audience and provide those customers with the same top-notch experience that North American customers have enjoyed for almost 25 years. It's going to be very exciting. **NGN**

By Richard "Zippy" Grigonis

QoS, QoE and Bandwidth Management

Quality of Service (QoS) is merely about metrics: packet delay, loss and jitter. Certainly delay and loss are critical because of a recent increased boom in the use of conferencing applications: videoconferencing, internal/external webinars/webcasts, etc. But QoS is just the first step. Quality of Experience (QoE) is more about what happens in the customer's psyche. Good metrics mean nothing if a subscriber to a service is having a problem that is getting him or her angry enough to switch service providers, thus adding to "churn". Even if QoE factors are fine, transaction times may be slow, interfaces awkward, or other subtle, subjective problems may exist, which takes us into the realm of Customer Experience Management (CEM).

Many problems can be linked to how bandwidth is handled by network operators and businesses. Enterprises want more bandwidth but at an increasingly lower cost per bit. Smaller businesses want more bandwidth because they're beginning to adopt hosted applications. Such applications will drive the need for more bandwidth worldwide since applications are no longer on the customer premise, and there's an offset caused by lower application licensing fees (Web 2.0, SaaS and Cloud-based computing). These applications/services will create demand for not just higher bandwidth but better QoS and QoE. There's also a feedback loop: if QoE is good, hosted applications will flourish and in turn drive more QoS, QoE and even more bandwidth demands. The network core is still pretty solid and robust, so the area where improvements in bandwidth efficiency and QoS will have the greatest impact on QoE and margins will occur in metro aggregation and transport networks, and at the very edge of the network itself, where bottlenecks can easily occur as IP-based devices proliferate.

QoE for Everybody

One company that practically invented and popularized the term QoE is Psytechnics, a leader in IP voice and video performance management and call quality assessment. Psytechnics offers products that measure and troubleshoot service performance based on a user's call experience and, in real-time, creates a more efficient operations and support environment for both enterprises and service providers. Psytechnics' Experience Manager solution for voice and video performance management and troubleshooting is capable of real-time, objective, call analysis measurement of users' QoE as well as network QoS for every call. Experience can detect and diagnose the factors that typically impact call quality including acoustic noise, echo, delay, distortion and video blocking, blurring and freezing. It enables rapid and efficient diagnosis, using the correct responder, resource or service provider.

Psytechnics' Joe Frost, Vice President of Marketing, says "QoS and QoE are completely different. We've been sending out the message about QoE for five or more years now. It started when we began working on our next-generation voice performance management tools. Among our customers – primarily managed services providers – is this generic belief, fostered initially by the vendors, is that if you get the network architecture and you've implemented QoS, you won't have any problems. Now that's fine for non-real-time applications, but that clearly doesn't apply to real-time applications, according to our customers. It's a completely different environment. Within North America we're now seeing a lot more videoconferencing and telepresence activity and so quality issues arise. When you encounter problems with voice and video they generate an instant emotional reaction among users. If you and I can't hear each other, or if I can hear you but you can't hear me, or one of us has to keep repeating ourselves, it very quickly becomes an emotional situation and one of us will simply pick up a mobile phone and make a call. Many service providers thus realize that in the case of real-time communications applications, you really have to take into account the emotional aspects of the user experience. People just don't tolerate packet delay, echo or strange sounds when making a call."

"In the QoS *versus* QoE debate, there's a lot more focus now on QoE from the perspective of the actual user experience. Many vendors are talking about QoE, but it covers a wide range of applications. They're talking about applications response times and from a usability perspective of applications. Instead, when we talk about QoE what we mean is, 'Are you and I able to have a good interaction or communications experience? Do we have to repeat ourselves? Can I hear you clearly? Can you see me clearly?' We're extremely focused on the real-time communications experience when we refer to QoE."

PAETEC

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The IP Communications world is being driven on many fronts and at the heart of this activity is a host of Communications Solutions to help streamline operations.

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Finding Those Bandwidth Gluttons

Comptel Corporation is an international telecom software company specializing in the Operations Support Systems (OSS) market for network operators. They sell software licenses as well as services and maintenance related to their products.

Comptel's Olivier Suard, Director of Marketing, says "We focus on service providers but we don't do a great deal when it comes to QoS *per se*. However, we've done quite a bit of work recently that relates to policy management, which is about what a user can do and when. One of the main areas in which we've done some work has to do with bandwidth management — more specifically, with mobile bandwidth management. A lot of our experience originates out of Asia, where they're forging ahead with mobile broadband and lots of exciting services. They're encountering a lot of the problems that will follow in Europe and America."

"We did a project for a leading operator in Hong Kong that's partly owned by Vodafone," says Suard. "Hong Kong is not a very large territory, but we're talking about millions of subscribers. They brought out a 7.2 Mbps download and 2 Mbps upload broadband offering for mobile. One of their objectives is to offer a true Internet experience equivalent to fixed broadband, something that's appearing all over the place. As a result, they went for what's essentially flat-fee pricing, but it's a bit 'tiered' with gold and silver classes of users. The issue with such pricing is that, when it's an all-you-can-eat situation, some people use far more bandwidth than their fair share. The operator wanted to avoid that kind of bandwidth hogging, since it could affect everyone's QoS. So we did a bandwidth management solution for them based on our mediation product, which collects usage data in real time. In this case we also deployed our provisioning products. Basically, we monitor usage on a continual basis at both the cell level and user levels — not in a 'big brother' scenario but simply to look at levels of usage. When cell congestion occurs, then the usage is compared with the kind of users there are and what type of services they are using, to see if they are QoS-critical services. Then, the QoS is adjusted for a particular user in that particular cell downwards, thus freeing up bandwidth for the other users and boosting their QoS. The bandwidth and QoS situation is monitored constantly in such a way that if the overly active user finishes whatever they're doing, or of the congestion disappears, then we can reinstate their QoS."

Battle of the Flows – Voice, Video, Data

Founded in 2000, Shenick's offerings meet the challenges of network business-class service quality and the issues associated with the introduction of new revenue-generating applications for next-gen broadband network equipment vendors and IP-oriented network service providers.

Robert Winters, CMO of Shenick, says, "QoE is becoming more of an issue on an individual application basis. Now more than ever, there are more applications behind a residential gateway and there's more and more of a requirement that each of these are being viewed individually to see that each one delivers on the service the customer is expecting. Service providers need to know if can they have 2 or 3 TVs behind one home or will they only be able to support service for one TV. With multiple applications behind the typically residential gateway, whether it's cable or DSL, wireless or WiMAX — the critical factor is the quality measurement. When you add to the mix the detrimental effect that P2P traffic is having on everyone's bandwidth and, in particular, what effect that's having on video or voice or other web transactions in a typical home environment, then providers need to be able to accurately determine the quality of each application flow. That's where Shenick can help — we are a provider of IP communications test and performance monitoring systems that can drill down to monitor each and every application flow in a test or live environment right up to 10 Gbps levels."

Shenick also addresses next-generation converged network and application performance issues for IPTV, VoD, Triple Play (VoIP video, data), IMS, Security Attack Mitigation, Deep Packet Inspection (DPI), Traffic Shaping, Peer to Peer (P2P), Application Server, Metro Ethernet and IPv4/IPv6 hybrid network deployments. Their two core products are diversifEye and servicEye. diversifEye is a converged network IP test and monitoring system that offers a per-flow, per-application view of each and every traffic flow in the network helping service providers and NEMs generate and analyze large volumes of concurrent, stateful, real-time traffic flows for applications such as IPTV, VoIP, Video on Demand and Peer-to-Peer. As for Shenick's servicEye, it provides IPTV monitoring and service assurance from the video head end right through to the end viewer, delivering a proactive approach to quality assurance through regular, active quality checks and round-the-clock monitoring of each IPTV channel. It enables service providers to pinpoint where problems occur in the network or the encoder. Moreover, service providers can proactively reduce and rapidly isolate quality issues saving on repair costs and increase productivity rates through efficient resource allocation. They can also manage content provider quality issues and establish reliable mechanisms to guarantee content service level agreements.

Another approach to examining various types of traffic can be found over at Allot Communications, whose mastery of network traffic management is based on integrating their expertise in subscriber and traffic control, Internet access, and WAN optimization. Their plug-and-play products include the NetEnforcer family of Deep Packet Inspection (DPI)-based devices, which offer best-of-class traffic shaping technology for QoS/SLA enforcement, real-time IP monitoring and IP accounting; and NetXplorer, a centralized management system for network business intelligence offering global visibility and control, extensive reporting and analysis, and a high level of network security.

Allot's Director of Product Management, Cam Cullen, says, "The biggest problem for service providers and even enterprises is that it's increasingly more difficult to figure out 'what traffic is what' on their networks. You want to prioritize real-time traffic, but that's difficult because you may encounter something as simple as YouTube, and you instruct the system to look for YouTube.com from a classification perspective, but you may have video that's embedded in web browsers, Windows Media, Skype, Yahoo or what have you. There are so many different forms of audio and video communication that unless you have something like DPI or the technology that we have to understand what applications are really running on the network, the challenge of actually prioritizing real-time applications is nearly impossible. One of Allot's biggest efforts is to ensure that we keep up-to-date with the latest applications, what they look like and how they behave on the network. In the case of Skype and Vonage, two very important

apps on the network today, they're actually encrypted so you can't just look at the packet stream and say, 'Oh, this is Skype'. You really need to know its signature and how the application behaves."

"Then there's the challenge of wanting real-time and non-real-time in different 'buckets'," says Cullen. "But even in the case of non-real-time apps, some of these are more important that others. Outside of MPLS EXP bit marking, on the differential services or 'diffserv' side, there has been defined 'expedited forwarding' and 'multiple levels of assured forwarding', so there are a number of different classes of service that can be applied to traffic. The question becomes, 'How much is a service provider using them?' You don't see many deployments that are working with more than three or four levels of prioritization of service simply because it's too complicated to do that on networks from a configuration and user perspective. The biggest trend among service providers is to try and delegate some control back to users so they can figure out what they want prioritized during times of net congestion or reduced bandwidth. But in that case, everyone has a differing opinion of what's important. So to be able to deliver QoS or QoE on a per-user basis is a big challenge. You need something that can do both subscriber identification as well as application identification."

Keeping It Simple

The Fanfare Group another major player in the system and device testing arena, provides solutions to help service providers and equipment manufacturers accelerate testing and improve product quality.

David Gehringer, Vice President of Marketing, says, "QoS is on the lips of the carriers far more than the device manufacturers, although the carrier are trying to shove at least part of that responsibility — at the device level — back to the manufacturers. Some carriers have started to levy fines or penalties against manufacturers for every bug that's found in the field by their customers. This relates to QoS, even though most of us think of QoS in terms of dropped frames, jitter or delay. But carriers also consider QoS more in terms of QoE — the perception of the customer."

Fanfare's own testing tool, iTest, is an integrated test authoring and execution solution built for testers, developers, and automation teams. There are 3 versions of iTest: iTest Personal (for manual testers, developers, or those who test infrequently), iTest Team (a preferred solution for feature testers and engineers with experience using scripting languages and how must create pass/fail criteria for tests), and iTest Enterprise (which provides expert testers and automation teams with all the functionality of iTest Team, plus powerful abstraction for regression testing and test portability).

In May 2009, Fanfare released iTest 3.4, said to include the industry's first virtualized test environment, called the Virtual Testbed. Interestingly, this will allow testing teams to formulate device test scenarios even before the device itself is available for testing. That also goes for applications, which can now be coded before the target equipment is ready for testing. Tests can be scheduled for automatic execution. Version 3.4 also improves on layer 2 to 3 and 4 to 7 testing. It also supports Ixia's IxNetwork and Spirent Avalanche network simulation and test technology.

Testing Before Deployment

Empirix has since 1992 helped telecom equipment makers, enterprise contact centers and even service providers test and monitor communications-based products, services and networks. Their Hammer-based service quality assurance solutions are used by all top 10 Network Equipment Manufacturers [NEMs], 9 of the top 10 service providers and most of the Fortune 100 companies.

Bob Hockman, Empirix' Director of Product Management for the Network Assurance Solutions Group, says, "Our Service Assurance Solution group deals with distributed systems that monitor SIP-signaling, SS7, and voice-type applications. I'm part of the Network Assurance Group, where we're more into testing than monitoring and developing products used in the pre-deployment of network elements and mocked-up networks before they go operational. Our Contact Center group is into testing, but it's testing that specifically involves agent, voice quality, IVR and so forth, for contact centers."

"We've also dealt with voice quality, heavy signaling on voice, all of the IMS stuff, and what have you," says Hockman. "Our newest product is the Hammer Edge, which is our first testing product that goes above and beyond voice. It not only tests voice and signaling, but it's also going to be testing data and video. The Hammer Edge targets the network edge, an area that's becoming more intelligent and deals more and more with security issues to protect the network core. There are many edge devices, such as firewalls, network border switches, session border controllers, deep-packet inspection devices and application-level gateways. These different kinds edge devices take on more and more functionality, taking offloads from the core and providing security of the core. Today we always are hearing about how security is no longer an option. It's required in these devices, especially devices that connect and deal with mobile wireless data, such as connections to-and-from femtocells. Security — specifically in this case IPsec — is critical."

"Hammer Edge has differentiators from the traditional way of testing devices or pre-deployed networks," says Hockman. "It used to be done with just load generation and packet blasting. Hammer Edge is quite different: it emulates realistic behavior of users of the network who employ web browsers, do big video file downloads, voice calls, or what have you. All these users have different behaviors when they use the network and each person's experience and expectations are different. Hammer Edge allows the test engineer to emulate the realistic behavior of these kinds of users in the form of smart, state-aware type traffic that truly simulates the dynamic interactions of all these different types of data. The Edge also keeps metrics and statistics of everything happening from layer 2 on up to 7. We have 'indicators' that can immediately show you if there's a problem."

From QoS to GoS (Guarantee of Service)

U4EA Technologies is known for its Multi-Service Business Gateways (MSBGs) and Home Office Gateways used by service providers and resellers to provide integrated, single-device unified communications solutions to SMB, SME, and types of small office customers. One of the more attractive aspects of U4EA's all-in-one customer premises devices is its patented QoS (GoS™) technology, which ensures the secure, reliable and cost-effective delivery of converged VoIP, data and video services. U4EA's SMB solution includes a wireless LAN controller for mobility applications.

U4EA's Vice President of Marketing, Jim Greenway, says, "Our Chief Scientist, Peter Thompson, is one of the key architects of our packet queuing and QoS mechanisms. With us, our main thesis is that unified

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communications and converged communications over IP networks will proliferate. Most new services are using in some way the IP network fabric. There's an interesting discussion going on right now about whether the Internet will support all of this traffic in the future. But the fact is that voice, video and data will increasingly travel over packet-switched networks. Over the past 20 years, many techniques appeared to solve QoS and QoE. You've had standards such as RSVP, diffserv and MPLS. They address different aspects of the network, so to speak. MPLS concerns itself more with the network core/backbone. But we can see that there's a bottleneck forming at the network edge, which will degrade QoS and QoE, and that's where we've focused our efforts."

"We at U4EA went back to first principles," says Greenway. "Our staff in Britain in early 2000 analyzed the QoS problem mathematically and used those insights to come up with a new queuing/scheduling system which is designed from the outset for multiple real-time services. It provides independent control over loss and delay, the two big enemies of QoS in packet-based networks. We trademarked that technology as Guarantee of Service, or GoS. Our design principles stipulated that it had to be easy to use, a low level of configuration – indeed, we do that automatically. There can be multiple queues, and we make it very easy for people to assign different traffic types to those queues. We also made sure that the system was predictable. If you have multiple real-time or near-real-time queues, you have to be able to predict and calculate how that traffic will react from a loss-and-delay perspective. It also has to be efficient. We find that if you do are really good job with QoS and QoE, especially with multiple real-time streams, you can maximize or at least come close to that magic number of 100 percent bandwidth utilization. We feel we do that better than anybody, especially when you have multiple real-time streams. As I said, most QoS mechanisms, such as diffserv and Weighted Fair Queuing [WFQ] are designed with one priority queue, and everything else battles for the remainder of the bandwidth. It's sort of like the expressway here in California. You have one High Occupancy Vehicle [HOV] lane, and cars are cruising down that lane, while everybody else is battling in the rest of the 3 or 4 lanes for traffic. In the case of packets, we actually create the equivalent of multiple HOV lanes if that's required at the network edge. That allows you to utilize the network bandwidth much more efficiently."

"With our GoS we can achieve quality communications, but not at the expense of adding bandwidth," says Greenway. "Applications that have very sensitive QoS requirements can be mapped without having to overprovision or reserve bandwidth. That's a big difference for us. Other mechanisms require you to overprovision. Some consultants will walk into a small business and say, 'If you want to add video phones and other equipment, we should install another T1 to make sure there's enough bandwidth.' In our case, we always identify how much bandwidth each real-time application requires. We try to meet our goal of utilizing 90 to 99 percent of that bandwidth instead of just adding bandwidth for bandwidth's sake."

"With our technology, the WAN link from the premise to the network is utilized to the greatest extent possible," says Greenway. "We definitely achieve at least 90 percent traffic with controlled packet loss and delay, and the other 9 or 10 percent can be best-effort service. Another of our differentiators is that we can configure up to 90 percent of a link. Take a T1 link, 1.544 Mbps. We can configure about 1.3 Mbps of that to deal with multiple real-time queues and traffic types."

"The fact that we designed our QoS from the outset for multiple real-time queues dovetails nicely with today's network where there's all kinds of traffic: more video traffic, cloud computing, and anything that's managed in the network from a VoIP perspective, any real-time services such as presence status data that are sensitive to delay and loss. We can deal with this at the edge of the network. Our devices sit at the edge of the premise and they all incorporate our GoS. Our target continues to be SMBs and branch offices of enterprises. Our devices are not mammoth in nature, but they do scale well. We can accommodate locations with up to 500 employees. We believe that many of these smaller businesses will subscribe to hosted unified communications services, because there's no way they can possibly afford the correct Microsoft OCS servers on their premise or deal with the complexity of putting all of these servers and applications together. So we think that there's a looming business opportunity for hosted UC apps aimed at small businesses, or it could be an enterprise hosting these services at a very large location and servicing the enterprise's branches. In either scenario, the companies will need edge devices that help them efficiently deal with the quality, the bandwidth management and even other functions that we integrate into our devices, such as security, routing and switching."

From QoE to CEM (Customer Experience Management)

Empirix' great rival, Tektronix, has for 60+ years offered test, measurement and monitoring instrumentation to solve design challenges, improve productivity and dramatically reduce time to market. Their Tektronix Communications division continues to sell advanced test and monitoring solutions to communications providers and manufacturers worldwide. The company's solutions encompass fixed, mobile and converged network monitoring, mobile network troubleshooting and optimization, and functional load and interoperability testing.

Rich McBee, the President of Tektronix Communications, says, "We don't do any policy management of traffic shaping. Basically we're a passive probe kind of company, with physical probes in the network. We're optimized today for classic QoS, passive monitoring with real-time data, service assurance – which is how the application is working – and customer assurance, which involves how the services to individuals are working. With the Arantech acquisition we just completed, we bridge into the link between OSS and BSS, which we call Customer Experience Management [CEM]. So we have large distributed probes in the network, we do real-time correlations so we can do real-time call trace, and we look at network assurance. In the upper layer we examine how services are working – is a provider able to deliver text and music downloads? Then with our customer solutions piece we can determine how are solutions actually being transacted. Are downloads being completed, and so forth. CEM involves yet another layer, examining the individual transaction and what's experienced there. For example, concerning downloads of music, our classic solution would output either a Yes or a No. But CEM asks what the 'experience gap' is, which is, 'How long did it take to make the transaction happen?' So CEM provides a whole different view of each and every transaction that consumers/subscribers experience on the application that they're using. You can see how very important that is. After spending lots of money to bring a new application to market, a service provider may see that his network is working, the service appears okay, transactions are occurring – all green lights. But the provider doesn't know if great customer dissatisfaction and churn is happening because events in the network are just taking too long to transpire, or too many keystrokes were required, or customers gave up and exited the process."

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"CEM is becoming a hot growth area in the marketplace, since providers are concerned about their end-users and churn," says McBee. "You don't want to lose customers because they're very expensive to acquire. The blind spot for providers has always been what the customer experience is. One of the things we've brought to the marketplace which we feel is important is the concept of Network Intelligent Solutions. What that really means is the ability to identify a problem, whether it relatees to network assurance, service assurance, customer assurance, or customer experience management, and then do something about it. Because we have products that look at the network, services, customers and customer experience – that's all 'Northbound' information, real-time data captured from real-time probes, feeding all sorts of applications, some of which are ours and some are third-party. We can drill right out to the end-user and come back and say, 'This is why the problem occurred and here's where you fix it.' That's what real Network Intelligent Solutions are."

More for Less

Fujitsu's Market Development Director Ralph Santitoro, says, "We focus on three areas: mobile backhaul, residential broadband backhaul and business Ethernet and IP services. I would say that mobile backhaul, or wireless networks in general, is one of the hottest topics in the industry now, because it has the most challenges that require immediate-term action. As the new 3G services have rolled out, you have a hockey-stick curve of bandwidth consumption, and the mobile operators such as Verizon, AT&T, and so forth, are charging a flat rate for that bandwidth. So people are using more and more bandwidth. 3G download bandwidth is on the order of hundreds of kilobits per second. It's like a slow DSL but from a mobile perspective it's a considerable bandwidth, because you must multiply that figure by literally hundreds of thousands of subscribers using the services. The problem with 3G is that bandwidth is growing, but the revenue is fixed, so operators must find lower-cost ways managing that bandwidth in order to maintain their margins. The problem is compounded when you go to 4G services, which deliver megabits per second. And yet flat-rate data plans are pretty much set in concrete now."

"On the QoS front, the challenge is that mobile services are designed to run over TDM networks such as T1 and SONET in the U.S. which provide deterministic or 'precision' QoS," says Santitoro. "Those services require that kind of solid, TDM-based QoS to work. As operators attempt to solve their bandwidth challenges by sending services over less expensive packet-switched networks, the discover that those networks normally don't offer the kind of stringent QoS found in the TDM world."

"As for QoE, if you look at it in terms of mobile backhaul," says Santitoro, "you'll remember the old days when you didn't drop any calls and the voice quality was pretty good. But now with things such as service coverage, outages and the rich multimedia capabilities of devices like the iPhone and the Google Android, the QoE challenges will be compounded as you resort to higher bandwidth with 3G and 4G services. After all, you'll be able to watch TV shows streamed to your mobile device. You can do that in a somewhat adequate way with 3G networks, but with 4G it'll actually be comparable to what you get on your broadband connection at home. Thus, with mobile backhaul or wireless networks, there are many challenges, solutions are available, but there are many technology choices, and it makes it difficult and complicated for mobile operators to weed through all of this."

'Fujitsu also focuses on residential triple-play backhaul," says Santitoro. "The bandwidth challenges on that are much more severe than in the mobile network, driven by the needs of multiple IP video streams, such as movies or TV shows on demand. However, IPTV bandwidth is much more easily managed because the bandwidth is determined by the total amount of channels supported, so it's not really an issue. Still there's a lot of bandwidth and it's driving the deployment of fiber to the home and curb."

"Then there's Internet access," says Santitoro. "I recently read that, even in this economic downturn, people will not give up their broadband Internet connection. Internet access continues to increase, particularly with the introduction of DOCSIS 3.0 in the cable world, which can get you up to about 100 Mbps."

"Basically, there will be a lot of QoS and QoE challenges centered on video," says Santitoro. "That's because people are not very tolerant of poor video quality. When alternative providers start supplying video, such as hulu and Netflix, that puts a lot more pressure on the Internet piece of the triple-play backhaul."

Santitoro concludes, "The third major application on which we focus here at Fujitsu is retail and wholesale business services, in particular Ethernet and IP services. The bandwidth challenges here are a little different. It's not so much that massive amounts of bandwidth are required; it's more that enterprises want lower costs per bit. They need more bandwidth, but they're not willing to switch to a higher bandwidth service unless it costs less than their current service, such as a T1 private line or frame relay service. The service providers realize this and they want to grow their revenue, and so they have to find ways to more efficiently manage the Ethernet and IP bandwidth to deliver those higher bandwidth services at a lower cost per bit. Another piece driving this consists of hosted applications such as Web 2.0 apps that you run right from your web browser."

The Policy Angle

Integrated BroadBand Services, LLC (iBBS) provides Operational Support Software (OSS) and back-office services deployed by cable and broadband operators worldwide. They're known for their Customer Care and Support Service products and Broadband Explorer software platform enabling operators to rapidly launch new revenue-generating services, provide high-quality customer care, and ensure high levels of network availability while minimizing capital and operational expenses.

Dave Keil, CEO of iBBS, says, "Our company provides both a set of proprietary software that we deliver as an ASP model, that handles provisioning and diagnostics, and we complement that with a set of robust services. We target mid-sized cable companies and outsource a significant amount of their technology and call center capabilities around broadband and VoIP. We talk to operators weekly and we believe we've developed a set of best practices as a result of those conversations through our account management teams, product management teams and marketing groups."

This article can be found online in its entirety on our website at http://www.tmcnet.com/11490.1 NGN

Richard Grigonis is Executive Editor of TMC's IP Communications Group.

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by Michael Khalilian

Network Monetization: BSS is a Critical Component

The NGN and IMS Forum recent Technical and Business Working Group have focused on monetization of NGN and IMS services. The following article from one of our executive members, Gabriel Matsliach, VP&General Manager, Comverse Billing & Active Customer Management (www.Comverse.com), is featured below.

Today operators are looking towards convergent infrastructure investments to enable a "next-generation" user experience — seamless access to advanced/converged services across multiple access points.

IMS already plays a key role in the rapid deployment of convergent offerings with a single common service and control layer. And on the horizon, Long-Term-Evolution (LTE), the reference architecture from 3GPP, promises to support new high bandwidth services by providing greater bandwidth to end-users as well as more efficient management of data traffic and faster service provisioning for operators.

However, with all this focus on the network, operators must not forget about the back office implications of delivering and monetizing new advanced services. When charging for 'next generation services', operators will have to charge end-users for their communication and content through any means of access and payment type, moreover because the "next generation" user experience involves mixing communication and content sharing, bundling will play a pivotal role in operators' strategies.

Beyond the Network

So while a fast, effective and up-to-date network certainly plays its part in providing the subscriber with a "next generation" experience, a single system that can intelligently accept an order for, provision, rate and charge all services, regardless of location, access point and payment type will be key. Critical BSS requirements include the following:

- **Real Time Policy Management.** Billing offers need to be tied to real time policy enforcement in the network.
- **Real Time Charging Rules.** To extract value from the network, the billing system needs to tell the network how to charge the customer's service regardless of account type, payment type or device.
- **Service(s) Provisioning.** Service providers need a single provisioning point to ensure faster service roll out and bundling flexibility
- **Real-time Unified View of the Customer.** A real-time view of customers' accounts (profile, usage, status) across all services will enable personalization and consistent customer management.
- **Smart Charging.** Flexible charging for any service or service combination, content and any payment type whether prepaid, postpaid or hybrid.

The Optimal Approach

It takes a converged approach to BSS to achieve the above requirements. Only BSS convergence provides a complete real-time view of the customer and a single provisioning starting point for all services. This unification starts with a data model built to support all aspects of convergence, with all relevant components — from call control, to customer management, through to financial management — built on a single architecture around that single data model. A converged BSS approach by definition cannot be created through a set of discrete parts — even if connected by a bus — it requires one unified whole. The unified whole must be supported by a single central product catalog and a unified operations and security approach across the entire architecture. In this way, operators can consistently and efficiently manage customers — from the network to the bank.

Moreover only BSS convergence effectively supports convergent business models — a natural expectation of next generation networks and convergent services — by streamlining business processes across sales, marketing, care and fulfillment and charging.

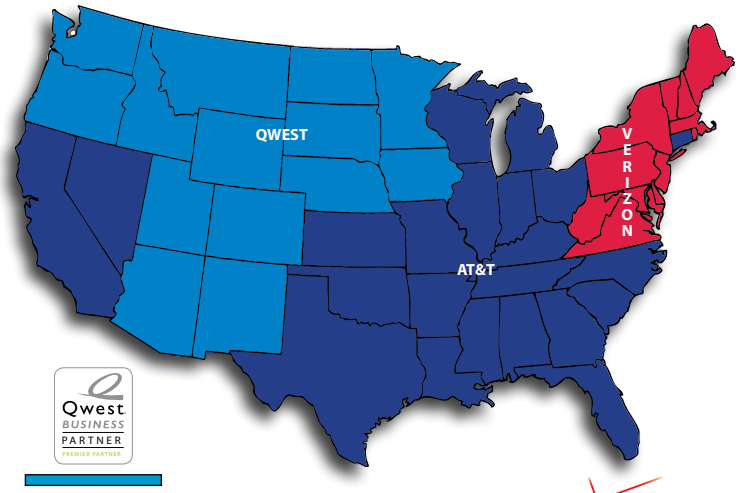
One Sure Way to Succeed

A converged BSS infrastructure spanning the network to the customer to the bank, delivered as a single system is an essential — and efficient — strategic weapon. This approach will enable operators to truly leverage and monetize their networks by delivering a myriad of benefits:

- Accurate and flexible rules-based charging — for any service type — to fully monetize services across all payment types.
- Ability to support seamless service or account changes for customers as needs evolve over time (e.g. convert prepaid to postpaid or add family members to an account).
- Bundling flexibility and faster time to market of new products and services via a single product catalog for all services, applications and product families.
- Targeted real-time promotions and marketing campaigns to: promote the uptake of new services and applications; increase usage; stimulate loyalty.
- Real-time financial management to reduce exposure both for the service provider and the subscriber.

In short, a unified and complete architecture helps operators remove complexity and increase agility, enabling the effective implementation and execution of convergent business models — required by next generation networks and services. **NGN**

Michael Khalilian is Chairman and President, NGN Forum™ & IMS Forum® (www.NGNForum.org / www.IMSForum.org).



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