

Quarterly Industry News

Volume 2: Issue 2

MESSAGE FROM THE CEO: PERFECTING ROUTING

I started my career as a Provisioning Engineer building a T1/T3 network for voice origination and termination. Then, like now, the whole idea was to build a network that allowed you to 'perfect' routing of telephone calls. 'Perfect' as you may have noted, I write in quotes for a reason. Perfect routing has a different meaning for every carrier and service provider. The meaning depends on many business factors that change over time or that are based on shifting product type, customer expectations, use of network, pricing, etc. When I was provisioning T1s and T3s back in the '90s, I reluctantly understood that 'perfect' wasn't the goal and that 'better' would suffice.

Now, though, with a decade of VoIP and SIP, we've seen many technology changes that could bring this goal into sight. Among these changes are rapidly growing wireline and wireless broadband networks, extensive carrier and service provider VoIP peering, over 300 million global VoIP end-users, Electronic Number (ENUM) databases and still few regulatory boundaries (though they persist or in many cases remain to be drawn). Perhaps it might be the time to 'perfect' routing. With readily available technology tools and diligent management of the data inputs and required operational metrics, carriers and service providers, on balance, are moving closer to 'perfect' routing. As a person that appreciates an orderly universe, I am excited to see more route/cost professionals devoting time and effort to this cause.

The following are some of the common types of routing that carriers and service providers are trying to 'perfect' and how tools available through VoIP technology can help:

1. Carrier Intra-network Routing - Within a carrier or service providers network there are several ways to standardize procedures via technical prefix management, digit manipulation, dial-code normalization SIP header manipulation and, generally, to move signaling and media most efficiently between internal POPs. As in many cases below SIP Redirect messaging, stateful session management via session controller technology and network data capacity management allows an operator to achieve routing to their very specific requirements.
2. Origination Routing - There are still many regulatory variables that differ by jurisdiction, dial plan, operating companies, etc., as you will read about in the *Voices From the Industry* article at the end of this quarter's newsletter. That being said, soft switches and/or session border controller technology can manage digits, dynamically match codec, match protocol and forward to any network device or end point on the Internet.
3. Termination Routing - Telephone call transportation and termination can be 'perfected' using VoIP at least to the point that data inputs are correct and meticulously managed. Because the cost of a public Internet interconnect is nominal, interconnects are abounding. I.e., instead of two options to route telephone calls to Mexico and 500 breakouts, you can have 20 options and 20,000 breakouts. And there are also exchanges and minutes clearinghouses where a single interconnect nets you dozens of routing options to every destination. Smart management of costs, pricing and the ability to manage the quality of service are all possible across heterogeneous network types, providing that they all use packet routing variants. This has a huge potential for an operators ability to save money and control quality but also to minimize hops in the larger Public Packet Telephone Network (PPTN) (see #5 below on Media Management).
4. ENUM and Data 'dips' - There is a growing list of places to make real-time 'dip' for information. Neustar's Number Portability database and Telcordia's various ENUM databases, among others, are necessary and popular as are services from Xconnect that are aggregating information to more intelligently route calls. With VoIP technology you can incorporate one or more of these databases into your routing matrices. As VoIP device addressing becomes more complicated - i.e., in addition to telephone numbers (DIDs) we are starting to find SIP User IDs as valid addresses for call routing - this type of real-time look-up service is important for perfecting certain types of routing. These and other data sources should be accessed by more carriers for cost savings alone.
5. Call Stream/Media Management - Using VoIP protocols like SIP, SIP-B, MGCP, SCCP from the desktop on a call gives an operator (or a pair of operators depending on who is being called) extensive control over the media stream. Some of the highest user-rated features of VoIP like simultaneous-ring, find me, voicemail to email, etc., all use split and redirected call streams which easily make use of 'cloud' systems - leveraging the ubiquity of the Internet. While this type of 'perfecting' of routing is less likely to save money or improve quality, it expands the capabilities of the technology.

If you couple together these five advantages of using VoIP technology and Internet network topology together with diligent attention to managing the data integration used to make routing decisions, you can make significant strides towards perfecting your routing.

Micah Singer, CEO

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VoIP Regulatory Issues

ANDREW ISAR, PRESIDENT OF MILLER ISAR, INC.

The ongoing debate over VoIP and access charges in the US

When is Voice over IP (VoIP) communication subject to access charges? It depends on whom you ask. Two recent court decisions shed some light, but they result in diametrically opposed findings that offer no definitive conclusions.

Access charges comprise compensation paid by telecommunications providers for originating and terminating traffic over each other's networks. Carriers have vehemently argued that access charges should apply to VoIP providers whose traffic passes through their networks. VoIP providers have generally argued that VoIP is not a telecommunications service, imposes no cost on network carriers and should not be subject to access charges. And some have argued that some charge, less than what telecommunications carriers pay each other, should apply.

Although the matter has been argued extensively, it was not until the beginning of 2010, when two key, albeit contradictory court decisions began adding some clarity. The first was a February federal district court for the District of Columbia ruling, which found that CommPartners LLC's VoIP traffic terminated on PAETEC Communications, Inc.'s (PAETEC) network, was not subject to PAETEC's access rate tariff. The Court found that PAETEC's tariff's on VoIP traffic was "inconsistent" with FCC rules and court rulings. According to the Court, PAETEC's tariff did not apply to VoIP-originated traffic, because CommPartners VoIP is an "information service" exempt from such charges, and instead is applicable to "reciprocal compensation" rules. Though not ruling on this issue, the Court supported application of the FCC's \$0.0007 reciprocal compensation cap, an amount to be paid for local traffic exchange between networks, established by the Commission as and upheld by the U.S. Court of Appeals for the District of Columbia in January 2010, for VoIP services.

Weeks later, on March 31, 2010, U.S. District Court for the Southern District of New York reached an opposite conclusion in a suit pitting VoIP provider GlobalNAPs, Inc. against carrier Manhattan Telecommunications Corp. (MetTel). While acknowledging the findings in the CommPartners case, the court found that an inability to apply the tariff regime as did not preclude MetTel's entitlement to recover in equity for costs it assumed in terminating Global's traffic, and concluded that GlobalNAPs was not entitled to "unjust enrichment," e.g. was required to compensate MetTel for access.

Until definitive action is taken by the FCC, each side of the controversy will have support for its position. GlobalNAPS has petitioned the FCC to definitively clarify that VoIP services are not subject to access charges following the CommPartners ruling. Incumbent local exchange providers and state regulators are overwhelmingly opposed. The FCC has long ago expressed its intent to see VoIP providers pay some form of access. When the FCC will act remains unclear, though the recent court rulings are likely to bring this matter quickly to a head.

Andrew Isar is President of Miller Isar, Inc. www.millerisar.com, a regulatory consulting firm specializing in telecommunications and iVoIP regulatory compliance. He may be contacted at 253.851.6700, or via email at aisar@millerisar.com.

Founded in 1991, Miller Isar, Inc. concentrates on the telecommunications industry. Headquartered near Seattle, WA, with offices in Philadelphia, PA, Miller Isar focuses its practice on Regulatory Compliance, Public Policy, and Business Practices, as they relate to Regulatory obligations.

www.millerisar.com

Customer Corner

A Conversation with Brian F. Smiley Vice President - Business Development, Network Intelligence

Please tell us a little bit about Network Intelligence, its market and industry.

Network Intelligence started out in 1985 as a Telecommunications Consultancy. Today, we deliver Managed Network Services. We have evolved from providing our clients with information and advice to providing fully customized and outsourced operating solutions for their telecommunications business models.

Network Intelligence provides Managed Network Services to Telecom Resellers, Master Agents, CLECs, Telcos and large Enterprise clients.

Where are Network Intelligence headquarters?

Monterey, California

What is the Network Intelligence business offering?

Network Intelligence will design, maintain, and operate a carrier-grade switching and routing infrastructure resulting in the creation of a "Virtual Private Switch" (VPS).

Both Network Intelligence and your VPS become an extension of your operational environment. A highly trained staff complements your existing operations, a custom designed infrastructure addresses your specific corporate needs and applications.

Network Intelligence manages all operational aspects of providing SIP-based Carrier Services, Telecom Resellers, Master Agents, CLECs, Telcos and large Enterprise clients have SIP products tied directly to individual carriers and often do not have the resources or expertise in-house to be able to combine multiple carriers products' into one, custom service.

Please explain how the business is unique (i.e., your market differentiation). Our readers always enjoy any "out-of-the-box" nuggets about your Company that you'd care to share.

Network Intelligence provides a unique economic and operational alternative to owning and operating your own switch. Little or no capital investment is required, and significant operational savings are realized by outsourcing network operations to an experienced and professional staff. Network Intelligence operates the network so you can focus on your core business and strengths.

There is growing competition in the managed LCR space. Our business is unique because we provide a total outsourced and managed solution to our clients. We don't just supply a managed LCR, we partner with our clientele to provide a comprehensive and custom solution to business needs.

Can you prognosticate about the future and/or describe any current and key industry trends you're responding to (e.g., Voice 2.0, Fixed-Mobile Convergence, Telepresence, 3G/4G expansion, IP Telephony & Security, Billing & OSS, or any issues regarding Class 5 market trends, etc.)

For the first time, Telecommunications switch resources are available to companies on an outsourced basis. Up until now, if you needed Class 4 services or the security of an SBC, you either had to purchase them as products from a carrier or purchase the equipment and build the network yourself.

How has VoIP Logic been of service to you?

VoIP Logic has enabled us to leverage their hosted infrastructure and deliver both a hosted and managed infrastructure to our clients. VoIP Logic's technology allows us to deliver a cost effective, usage-based service to our clients with a pay-as-you-grow infrastructure cost.

Any other thoughts, concerns, insights, anecdotes?

The timing is perfect in this current economy for the VoIP Logic and Network Intelligence solution as client companies seek a higher velocity to new revenue. They save operational expense, avoid capital expenditure, add or enhance SIP feature capabilities and gain technical and professional staff depth. This has been and continues to be a great partnership!

Network Intelligence is a real-world networking solutions based consultancy. Network Intelligence builds and manages networks for their customers. The company offers hosted telecom solutions, getting customers up and running within 30 days anywhere in the world, and utilizing SIP and TDM connections, delivered from carrier-class equipment in hardened and secure data centers.

<http://www.netg2.com/>

Industry News and Trends

FCC CHAIRMAN JULIUS GENACHOWSKI INTRODUCTION TO /SUMMARY OF BROADBAND REPORT



See: [Executive Summary](#)

VOIP = CONSUMERS WANT TO CHAT (VIA VOICE + MESSAGING + VIDEO) VIA WIRED + WIRELESS INTERNET

Morgan Stanley Internet Trends April 2010

Mary Meeker

If VoIP Leader Skype Were a Carrier, it Would be Largest 'Carrier' in World 521MM Users (+41% Y/Y) & 12% of Cross-Border Calling Minutes (34% Video-Enabled)"

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APPLE UNVEILS MOBILE AD SYSTEM

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GARTNER SAYS WORLDWIDE IT SPENDING TO GROW 5.3 PERCENT IN 2010. TELECOM SPEND- ING TO ACCOUNT FOR \$2 TRILLION OF \$3.5 TRILLION TOTAL IT SPENDING.

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THE IMPACT OF VOIP, WIFI AND 3G DATA ON WIRELESS TELECOM: HOW FIXED-MOBILE CONVERGENCE WILL RESHAPE THE WIRELESS INDUSTRY

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SKYPE CONFIRMED VOIP OVER 3G IS COMING

As we reported few days ago, Apple is now allowing iPhone, iPad and iPod touch developers to build apps that can make VoIP Internet calls over a 3G cellular network.

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NATIONAL BROADBAND PLAN IMPACTS ON FIBER NETWORK DEVELOPERS

Following on from our article on the key points of the National Broadband Plan, we've set out the likely impacts on Fiber network developers below:

1. 50Mbps D/L – 20Mbps U/L goal for 100 million households by 2015
2. 100Mbps D/L – 50Mbps U/L goal for 100 million households by 2020
3. Lead the world in Wireless network capability
4. Make 300Mhz of Wireless spectrum available by 2015
5. Make 500Mhz of Wireless spectrum available by 2020
6. Ensure every citizen has access to broadband, at a price they can afford
7. Aim for an adoption rate of over 90% by 2020
8. Every anchor institution such as schools and hospitals should have a minimum 1Gbps broadband service
9. Create a national wireless first responder emergency network by 2020
10. Every citizen should be able to monitor their power usage on a Smart Grid energy network

[From MiniFlex blog](#)

TECH INSIGHTS - THE FUTURE OF VOICE

By Elliott Drucker

As U.S. operators begin to accommodate VoIP calling over their current networks and operators worldwide work toward a single LTE VoIP standard, it's not clear how 4G networks, built for data, will handle voice traffic in the future.

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MOBILE VOIP - PCS STRESS MOBILE NET- WORKS MORE THAN SMARTPHONES

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3G ENTERPRISE VOIP COMES TO THE IPHONE

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ENCRYPTING YOUR VOIP NETWORK FOR A SECURE CONNECTION

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Voice from the Industry

Understanding Least Cost Routing

The scope, complexity and capabilities of call routing have grown exponentially. And while optimization of call routing used to be a relatively straightforward exercise, this is now no longer the case. Using the North American numbering plan as a case study, this article describes the major challenges in least cost routing (LCR) for the North American telephone network.

Routing Table Size

Area Codes were first established in 1947 with a total of seventy-eight area codes across the North American Numbering Plan Area (NANPA). Over the next four plus decades only thirty-six additional area codes were added. In the 1990s though the growth in wireless services, ATMs and other telephone number-using devices (gas pumps and anything else with credit card readers) drove the addition of 109 new area codes. The pace of demand accelerated in the '00s. In 2000, the FCC ordered that NPA-NXX number blocks of 10,000 should be further partitioned into 1000 blocks (NPA-NXX-X). Partitioning of NPA-NXX blocks, also known as number pooling, dramatically increased the supply of new numbers blocks to be allocated – a desired result – but it also introduced a requirement for seven-digit routing based on the smaller 1000 block partitions. To route with perfect efficiency these number blocks have to be considered and distinguished in each routing decisions. The Local Exchange Routing Guide (LERG) currently lists 166,431 six-digit NPA-NXX dial codes and 644,327 seven digit NPA-NXX dial codes.

In telephone routing tables, a dial code matched with a destination – an IP address or trunk group – is called a translation. Least cost routing (LCR) tables usually have at least three destinations per dial code to account for overflow or temporary unavailability. This means that a basic optimized LCR table for domestic US routing can have more than 1.5M translations. Now factor in the complexities of several countries around the world and more destination options per dial code. I have seen customers on our Transnexus systems with 50 million translations in their routing table.

Jurisdictional Routing

Jurisdictional routing is another name for local, intra-state, inter-state and 'unidentified' routing. Call routing decisions are based on both the calling and called number. How a call gets routed depends on where the calling party is located. Paradoxically, in the US, intra-state calls cost more than inter-state calls. For a service provider to optimize their least cost routing, they must have two routing tables, one for intra-state calls and a second for inter-state call.

Jurisdictional routing is determined by the ANI (Automatic Number Identification), or telephone number, of the calling party. With VoIP calls, it is common for the ANI to be an invalid value, such as a random number that is not a telephone number or the SIP URI of the calling party. Calls with an invalid ANI are rated at the higher intra-state rate if they are completed. Most major carriers will block calls that do not have a valid ANI, though in the interest of call completion, some

service providers will accept calls with an invalid ANI – effectively creating a third routing table.

Local routing is another form of jurisdictional call routing that is determined by the NPA-NXX-X of the calling party and the called party. Interconnection of local calls is usually charged at very low rates, much less than intra-state, and offers another LCR optimization. Unlike Local Exchange Carrier switches that serve limited geographic areas, a VoIP service provider's softswitch can serve customers anywhere in the US. A table that defines all the local calling areas in the US would have over a billion NPA-NXX-X combinations! Deeper investigation shows that there are as many as 20 countries around the world that require this depth of routing control to perfect LCR.

Deciphering Rates by LATA, OCN and Tier

LCR is all about analyzing dial codes and the rates carriers charge to complete calls to those dial codes. Unfortunately, most carriers do not quote rates for US termination by dial code. Instead they quote rate in terms of Operating Company Number (OCN), Local Access Transport Area (LATA) and Tier. So the first step in LCR analysis is to normalize carrier rates from OCN, LATA and Tier to E.164 [define this] dial codes. Manually normalizing carrier rates using the OCN and LATA data from the LERG is too big a task for even the most industrious technician.

Number Portability Correction

In 1996 the FCC mandated number portability. For the consumer, this was and still is a great convenience. However, once again, it layers more complexity onto routing that requires a database query (to the Number Portability Administration Center or NPAC) on every phone call to be assured of accurate routing. If the number has been ported, then the NPAC returns the Location Routing Number (LRN) for the ported number. The call is then routed using the LRN, not the dialed telephone number.

There are, at the last count I made in the NPAC, 197M ported telephone numbers in North America. TransNexus customers report that 40% of their calls are to ported telephone numbers. This means that without real-time or near real-time information from the NPAC database routing is compromised.

Complexity abounds and grows in US domestic routing and in many countries around the world. Carriers often settle for sub-optimal routing solutions or sub-optimal investment in the technical skills and time that would allow them the control and flexibility that is necessary to keep ahead of this complex market.

Jim Dalton

Founder and CEO of
TransNexus, Inc.

VoIP Logic: News & Notes

NEWS:

VoIP Logic and CEO Micah Singer were featured in *Berkshire Business Quarterly*.

In January 2010, VoIP Logic became a Master Reseller of Genband

VoIP Logic now has its Q4 2009 Industry newsletter posted in Spanish. Please look for our VoIP Industry Newsletter Q1 2010 (Spanish version) [on our site](#).

EVENTS:

VoIP Logic will be attending the following industry gatherings in the coming quarter. Please feel free to contact us in case you'll be there and would like to meet: michael@voiplogic.com

May 24 -26

ITW 2010

International Telecoms Week
Washington, DC

www.internationaltelecomsweek.com

June 9-11

Billing and OSS World 2010

Washington, DC

www.billingworldexpo.com/2010/exhibit-2010.html

September 12-15

Comptel Plus Fall 2010 Convention

Dallas, TX

www.comptel.org

September 20-22

Channel Partners Fall 2010

Washington, DC

www.channelpartnersconference.com/2010/dc

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