By Hunter Newby

Least Cost ENUM Routing

Being a moderator of voice peering sessions at industry conferences has its moments. I often make fascinating discoveries right in the middle of a session and that can sometimes be awkward depending on who is on the panel. This has a lot to do with the fact that we live in changing times and sometimes change happens, or is realized, in a single instance. Questions, conclusions, and corresponding answers occur to different people at different times, and trying to capture information in real-time up on a stage and reformat it for audience consumption can be a challenge. Such was the case in two separate sessions on the same topic at the most recent Comptel and Internet Telephony Expo conferences in October.

The subject was Least Cost Routing and ENUM, how they differ related to technology, terminology, and the associated economic models and benefits. In the process of breaking down each component, it was made clear that both LCR and ENUM were software-based routing intelligence mechanisms. Identifying what their reasons for existence are is what became the interesting twist.

LCR has traditionally been a function of bilateral TDM minutes trading with the associated Call Detail Records (CDR), billing and settlement components that minutes carriers have based their businesses on since Day One. LCR has been around over 20 years as a commercial "service," or software function provided to and used by carriers. Through the introduction of IP in to the voice world, LCR has now found itself right where it was in circuit switching, finding the lowest cost IP route for a minute.

ENUM, on the other hand, has had a relatively short commercial life span thus far. Originally, ENUM, which is based on DNS, was introduced to the voice business as a multilateral, free traffic exchange routing facilitator. This is due to its roots in ISP multilateral peering which has been around commercially since 1990 and has always been a free exchange of traffic between "peers." Recently, there have been several new entrants to the ENUM service model business and those models include some fee, be it per registered number monthly, or annually, per query, per successful registry look-up, etc. As this new dimension — the departure from multilateral free back to bilateral billed minutes — was openly discussed, it raised a few eyebrows and caused some confusion amongst the audience.

The basis for the confusion it seemed stemmed from the belief, right, or wrong, that somehow ENUM was analogous to multilateral voice peering and the protocol was linked to its economic meaning as well as its technical definition. Many believe that as we all evolve into the future of IP communications, voice as an application ceases to become (or dramatically decreases as) a standalone revenue generating business. In fact, it is believed that voice becomes "part of" an experience, be it gaming, or full-duplex video, or at the very least emulates the Skype model. So, given that assumption, ENUM as a protocol and the providers that offer it as a service should be moving towards that goal and essentially away from LCR.

What materialized from the various models and viewpoints on the panel was actually somewhat different. First, there was the issue of how to interconnect the various, disparate ENUM registry islands. Potential users in the audience wanted to understand the utility of any one such registry if it did not possess "all" of the numbers itself or at least have access to the other registries for look-ups. The barrier to that problem's solution is not in fact a technical one as the separate registries could in fact sort out interoperability issues in the same fashion as email providers have in the past. The real obstacle is in fact the disparity of the various business models and how to get them to interoperate.

If one ENUM service charges a fee per registered number and another charges per query, how do they reciprocally compensate each other? Neither have the others' model, nor revenue streams to adequately pay the other. It quickly became evident that this was a

> **If one ENUM service charges a fee per registered number and another charges per query, how do they reciprocally compensate each other?**

"show-stopper." But then, one of the panelists, a software engineer, made a comment that logically led many to the solution of the issue. He said, "The best way to build ENUM look-up functionality into your network to deal with this is to build a Least Cost Routing engine for ENUM. The first registry your voice switch should query is the free one because this is the best option. If the ENUM number is not found there then go to then next cheapest option. The challenge will be to determine what that next option is beyond the free one. If you know your average call duration you will be able to factor if a fee per query is less expensive than a fee per number, but this requires significant analysis and programming."

What? An LCR for ENUM? Many in the audience thought, "Isn't that an oxymoron?" As Mark Fedor, CTO of SunRocket sees it, "Eliminating the cost accounting, billing and settlement for minutes is the primary reason for multilateral peering." The complexity of building and maintaining an LCR for ENUM is only matched in difficulty level by the

question of who is going to pay for it and then of course coming up with the cash.

As one member of the audience stated after the IT Expo session, "If a free exchange is the first logical choice because of the clear benefits of no fees to account for, then why would any user want to have a service with fees for ENUM?"

The complexity of building and maintaining an LCR for ENUM is only matched in difficulty level by the question of who is going to pay for it.

These sessions dedicated to ENUM and LCR were an eye-opener to the reality that there may not actually be a sustainable, long-term, revenue generating business model for ENUM itself. Well, at least not one without the added complexity and cost of building an entirely new method of least cost ENUM routing. On that note, I would like to thank Rich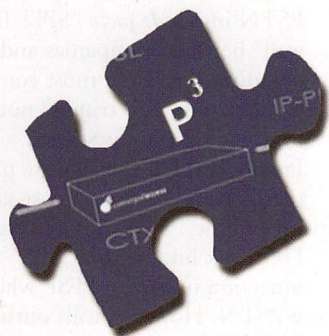 Tehrani, Greg Galitzine, and the entire staff of TMC for making the IT Expo and that session possible. Without their efforts, these realities would not so soon be realized. **IT**

Hunter Newby is chief strategy officer for telx. For more information, please visit the company online at www.telx.com.