

The VoIP Peering Puzzle◆Part 7: Implementing ENUM

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In our last two tutorials, we examined the theory and principles of ENUM—the Electronic Numbering system that has been developed by the Internet Engineering Task Force (IETF), in concert with other standards organizations, such as the ITU-T. We first looked at some of the underlying protocols, such as the [IETF's Domain Name System \(DNS\) and the ITU-T's E.164](#). Next, we looked at the [ENUM protocol](#), as defined in RFC 3761 (see <ftp://ftp.rfc-editor.org/in-notes/rfc3761.txt>), and looked at its operation in more detail.

If a thorough understanding of the ENUM protocol was all that was required for the telecommunications industry to migrate to a new numbering system, then all of us might be looking for other ways to spend our working hours, since the protocol itself is straightforward. The implementation of that protocol is quite another story, however.

How, for example, do you build a database large enough to store all of the telephone numbers and IP addresses currently in use—and also keep up with the ongoing moves, adds, and changes that occur to that database?

Moreover, since this topic involves the Public Switched Telephone Network (PSTN) and the Internet, both of which are global entities, public policy questions also factor into these discussions. For example, how can you assure that the records stored in that ENUM registry are secure? If one carrier obtained access to their competition's portion of that database, could you envision some marketing arbitrage in the works? Who "owns" the address, the carrier or the end user? Should government organizations—such as those that regulate the communications and commerce of a country—also participate in the ENUM development and implementation process?

And further complicating the implementation challenge is the fact that there are two different forms of ENUM under consideration, and defined in a recent IETF Internet Draft titled Infrastructure ENUM Requirements (see <http://www.ietf.org/internet-drafts/draft-ietf-enum-infrastructure-enum-reqs-03.txt>). First is Infrastructure ENUM (sometimes called provider or carrier ENUM):

Infrastructure ENUM is defined as the use of the technology in RFC3761 by the carrier-of-record for a specific E.164 number to map a telephone number into a URI that identifies a specific point of interconnection to that service provider's network that could enable the originating party to establish communication with the associated terminating party. It is separate from any URIs that the end-user, who registers their E.164 number, may wish to associate with that E.164 number.

This is in contrast, to User ENUM:

User ENUM, defined in RFC3761, in which the entity or person having the right to use a number has the sole discretion about the content of the associated domain and thus the zone content. From a domain registration perspective, the end user number assignee is thus the registrant.

In other words, infrastructure and user ENUM differ in terms of the entity that is performing the address mapping, the registrant of any services associated with that number, and possibly other functions.

Field trials are under way using both variants of this technology; these are documented by the ITU-T at <http://www.itu.int/ITU-T/inr/enum/trials.html>. Countries noted include Austria, China, Finland, France, Japan, the Netherlands, Poland, Sweden, the United Kingdom, and the United States.

Of special interest are the notes on the ITU site regarding the United States' participation, which has now involved the Department of Commerce, the Department of State, and the Federal Communications Commission, with terms such as national sovereignty, competition, innovation, privacy, security, and interoperability being bandied about in their correspondence.

So will the politicians get deeply involved in the development of ENUM, or leave that work to the engineers? Our next tutorial will continue our exploration of ENUM implementation and look at some of the field trials that are underway in the United States.

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