Preminilary Study on Electronic Number Mapping in Malaysia

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ABSTRACT

ENUM (Electronic Number Mapping) is a scheme for searching an address out of Internet resources by DNS retrieval in a form of URI which corresponds to a telecommunication number based on ITU-T E164 recommendation. ENUM Working Group was formed in 1999 by IETF. ENUM was standardized by introducing the basic protocol (RFC291) in 2000 which has been later improved (RFC3761) in 2004. With this protocol, ENUM will be extended to e-mail, facsimile on telephone line, web browsing etc. Currently, trials are done mainly in Europe, America and Asia, where Europe been the most active. Trials are also going on in main IT countries in Asia-Pasific region like Australia, Japan and South Korea. ENUM Working Group in Malaysia was formed sometime in 2003 but revived on 2007. Among the group duties are to perform various phases of ENUM and conduct future trials. Currently ENUM technology is still at its infant stage and not fully explored. This paper discusses the possible Malaysian implementation of ENUM, its challlenges and issues.

Keywords

Electronic Numbering Mapping(ENUM), Domain Name System (DNS), voice-over-IP (VoIP)

1.0 INTRODUCTION

Keeping in touch with people is no longer a barrier to us. We can select from so many available communication tools and devices that are offered around. Unfortunately, these communication tools require separate numbers/addresses in order to support telecommunication. As multiple addresses are now attached to a single individual, the idea of a single unique identity for all is appealing. Due to this, ENUM is the most probable solution to associate a number to multiple communication devices.

2.0 LITERATUR REVIEW

It is possible to view the Internet and telecommunications as distant relatives. As a general rule, the two systems exist separately from one another. Sometimes, however, it happens that one of them uses one of the other resources to make certain services available. Examples of this are VoIP (telephone calls via the Internet) or WAP (a technology for displaying web pages on mobile phones). Now ENUM provides the means of building a bridge between these different worlds, transcending system boundaries.

ENUM is derived from telephone number mapping and is the short name for a protocol for connecting resources from telecommunications and the Internet to one another (Abu Samah et al, 2007; Ching 2003). It defines a rule that makes it possible to relate a domain to a telephone number without any risk of ambiguity. This domain can then be used to identify various communication services, such as fax, mobile radio, voice-mail systems, e-mail addresses, IP telephony addresses, web pages, GPS coordinates, call diverts or unified messaging.

ENUM unifies traditional telephony and next-generation IP networks, and provides a critical framework for mapping and processing diverse network addresses (Abu Samah et al, 2007). It transforms the telephone number the most basic and commonly-used communications address into a universal identifier that can be used across many different devices and applications (voice, fax, mobile, email, text messaging, location-based services and the Internet) (Abu Samah et al, 2007).

2.1 ENUM Benefits

The benefits of Electronic Number Mapping that operator and user will enjoy are it facilitate terminating calls to IP based networks, ENUM too is an important ingredient in the convergence of the PSTN, the Internet and other IP based networks, ENUM is a directory infrastructure, by right ENUM by itself has no value.

The existing revenues will be driven by new value-added services and applications enabled by ENUM, the benefits to the end user (that is simplicity- one number addressing eliminates need to remember multiple, complex addresses and expand the connectivity- calls to non-PSTN (i.e., IP) devices can be completed) and lastly, our service provider (come out with new services revenues – PSTN to IP Telephony, enjoying strategic services to accommodate user needs and expanding their services into the Internet) (Kang and Shin, 2003).

2.2 ENUM outside Malaysia

Currently, there are countries running on ENUM. Austria and The Netherlands are having ENUM as production. While, Japan and South Korea are having ENUM's trial at the moment.

2.2.1 ENUM in Austria

The Austrian ENUM trial was initiated by a group of interested parties to test architectural, technical, operational, and user experience aspects related to the provision of ENUM capabilities, as defined in IETF RFC 2916, for Country Code 43 (Stastny, 2005 and NIC, 2002).

The results collected in the trial has enabled all interested parties to gain information and experienced to provide and implemented ENUM capabilities in the commercial phase (NIC, 2002).

The Rundfunk und Telekom Regulierungs-GmbH (RTR-GmbH, RTR) supported this initiative by providing an administrative and technical Policy Framework at the national level for this trial (NIC, 2002). It included the request for the delegation of the national ENUM domain 3.4.e164.arpa to the RTR, which was successfully performed in June 2002 with the official delegation from RIPE NCC (NIC, 2002). This allows the Trial-Participants to use an ENUM domain conforming to the international standards for their tests.

The administrative responsibility for the national ENUM Tier 1 Registry is by the RTR-GmbH as Domain Name Holder (NIC, 2002). Their responsibility for the technical operation was delegated to the Austrian ccTLD administration NIC.AT.

The official start of the trial that included the current interested parties was planned in January 2003 and it ended in May 2003 (NIC, 2002). Phase 1 was evaluated and the further progress of a phase 2 coordinated if necessary.

As a result, the Austrian ENUM Trial Platform was founded in September 2002 by all members currently participating in the Austrian ENUM Trial (NIC, 2002).

This platform may act later as a basis for the Austrian ENUM Platform (NIC, 2002).

2.2.2 ENUM in The Netherlands

In the Netherlands, the Ministry of Economic Affairs (EZ) is responsible for ENUM implementation. EZ ensures that the supply is in adequate numbers, sufficiently large and assured for the future. It plays an active role in order to meet the demand of the market and to promote innovation.

ENUM started here way back in June 2000 (EIPN, 2007). During this time, EZ was organizing a public workshop on ENUM.

During October 2001, the establishment of the Dutch Working ENUM (NLEG) with representatives from the market and the Directorate-General for Telecommunications and Post of the Ministry of Economic Affairs (DGTP). The NLEG has explored the possibility of ENUM implementation in Netherlands allign with international guidelines.

In 2002, NLEG presented a report 'ENUM in the Netherlands', which in fact marked the foundation for the introduction of ENUM in the Netherlands. The recommendations in this report stated that NLEG serves as a starting point for discussion within the ENUM Innovation Platform Netherlands (EIPN, 2007). ENUM is later starts to flourish toward its production.

2.2.3 ENUM in Korea

ENUM in Korea was initiated by National Internet Development Agency of Korea (NIDA). During 2001 to 2002, the need for ENUM is significantly recognized and therefore, the technology and trend are analyzed.

NIDA then implemented ENUM trial system in 2003 and provided trial services for the 2nd time worldwide. NIDA organized ENUM Service Council consisting of, six telecommunication companies, one national ENUM portal that distributed the activites and information, and etc (NIDA, 2006).

In 2004, NIDA enhanced and retested the ENUM Trial System. Korea country's code 82 were delegated to NIDA in 2005 by RIPE NCC (NIDA, 2006). Pre-commercial service (User ENUM/ Infrastructure ENUM) was offered in 2006 and was enhanced (Infrastructure ENUM) in 2007.

2.2.4 ENUM in Japan

ENUM trial is taken place in 17 September 2003 (ETJP, 2003) in Japan. There are few phases of ENUM Trials in Japan (Phase 2 in December 2003 and phase 3 in April 2004).

The Purpose of ENUM Trial in Japan is to ensure ENUM feasibility in term of basic technical facility readiness, became a standard platform for international and local use and also it acts as shareable repositories for ENUM among participants (ETJP, 2003).

The ENUM Trial Japan commission's activities are DNS operation for ENUM trial, feasibility test of communication applications (device, software) using ENUM and feasibility test of communication services (ETJP, 2003).

Their expected results are the technical verification (communication devices and software provided by participants and communication services) and clarification and consideration of relevant issues.

3.0 DISCUSSION AND FINDING

ENUM is offering good values of services for telecommunication. In order to get optimal ENUM's benefits, necessary preparation need to be done.

Malaysia needs to be ready in adopting these technologies. But ENUM is still in its planning stage by our Malaysian Regulator (Ghazali, 2007).

Malaysian communication's landscape need to put in order few things before ENUM can come in. We are up-and-coming of providing communication with 2 services, namely Mobile Number Portability (MNP) and 3+8 mobile number expansion (Ghazali, 2007).

Table 1 shows the countries that are currently implemented ENUM in their Tier 1. Table 2 shows the countries that are currently in ENUM trial. These two tables show that, ENUM implementation is only rolled out in seven countries and five countries are still piloting ENUM. Since ENUM implementation is still in its infant stage, there would be many upcoming challenges, issues and opportunities be faced by the operators.

Table 1: Countries with ENUM in production (retrieved from http://enumdata.org/).

Country	E.164	Status
Austria	43	Production
Czech Republic	420	Production
Finland	358	Production
Germany	49	Production
Ireland	353	Production
Poland	48	Production
Romania	40	Production

Table 2: Countries with ENUM in trial (retrieved from http://enumdata.org/).

Country	E.164	Status
South Korea	82	Trial
Japan	81	Trial
China	86	Trial
France	33	Trial
Switzerland	41	Trial

4.0 CONCLUSION

This paper is based on the preliminary research of Electronic Numbering Mapping that is going to be implemented in Malaysia soon. More research output is available in future works.

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