

## **TELECOMMUNICATIONS NUMBERING ADVISORY COMMITTEE**

### **Update on ENUM Development**

#### **Introduction**

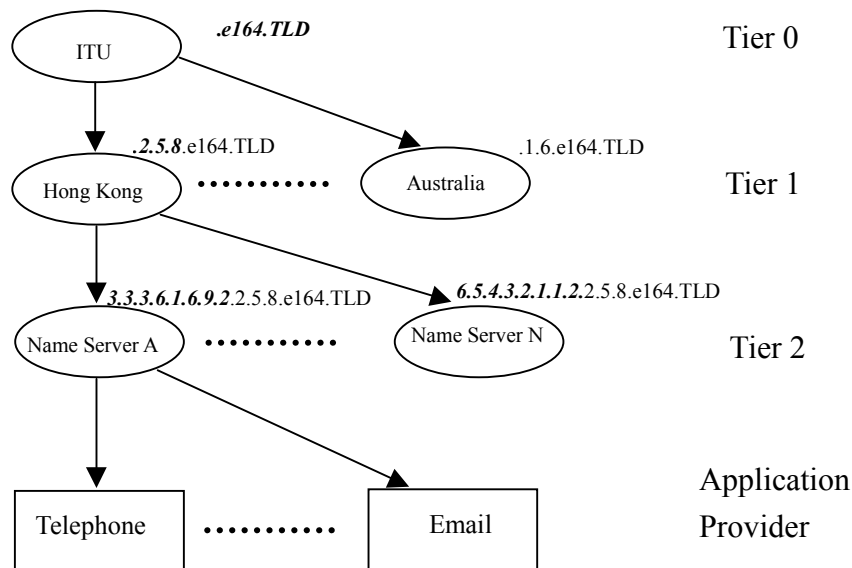
ENUM refers to the protocol developed by the Internet Engineering Task Force (IETF) for mapping an E.164 telephone number into a collection of service-specific Uniform Resource Identifiers (URI) based on a Domain Name Server (DNS) architecture. The URI provides for access to various applications such as telephony service, electronic mail and personal web page under an Internet Protocol (IP) infrastructure. This paper provides a brief update on the development progress of ENUM subsequent to the last report on this subject in the NAC Paper No. 6/2001.

#### **Overview of ITU's Work on ENUM**

2. The global ENUM implementation issues are now jointly addressed by the International Telecommunication Union (ITU), the IETF and the Internet Architecture Board (IAB). In May 2002, the ITU-T Study Group 2 (ITU-T SG2) set out the interim procedures for administration of ENUM to allow for trials by Member States. Meanwhile, the ITU-T SG2 is working on the concerned draft new Recommendation E.A-ENUM, *Principles and Procedures for the Administration of E.164 Geographic Country Codes to be Registered into the Domain Name System*, which covers the final procedures for administration of ENUM and is scheduled for finalization by mid-2003.

#### **Tiered Architecture of ENUM**

3. Under the ENUM mapping, an E.164 number "+852 2961 6333" is converted into a domain "3.3.3.6.1.6.9.2.2.5.8.e164.TLD", where e164.TLD is the ENUM Top Level Domain. The ENUM implementation will employ a DNS-based tiered architecture as exemplified below.



4. The ITU Recommendation E.A-ENUM defines principles and procedures for the administration of E.164 geographic Country Codes (CC) to be registered in a CC sub-domain at the ENUM root level (Tier 0) within the DNS. The levels below the CC in the ENUM domain, including Tier 1 and Tier 2, are national matters and there is only guidance rather than recommendation provided by ITU for their administration, in the form of ENUM Supplement(s) to ITU-T Recommendation E.164.

5. The ITU Telecommunication Standardization Bureau (TSB) is the ENUM Tier 0 Registrar and has the administrative responsibility for the authorization of E.164 Country Code resources in the ENUM Top Level Domain e164.TLD. The technical operation of the DNS at the ENUM root level is however the responsibility of the ENUM Tier 0 Registry. In accordance with the ENUM administrative provisions set by the ITU TSB, OFTA is the only party authorized to notify the ITU at any time of its position regarding delegation of the country code 852 for ENUM.

**Adoption of Top Level Domain**

6. The IAB recommends that the domain zone e164.arpa be deployed as the ENUM Top Level Domain, i.e. TLD being arpa in the above illustration, as set out in the concerned IETF ENUM standard. The registry of e164.arpa is delegated to and operated by the Reseaux IP Europeens Network Coordination Centre (RIPE NCC), which is one of the four Regional Internet Registries in the world providing allocation and registration services that support the operation of the Internet globally. Over the world there are totally twelve DNS root servers for .arpa, nine of which are in the United States. There are in turn six servers as the second-level top level domain for

e164.arpa, with two in the United States. The resolution of ENUM address based on e164.arpa will result in dependence on countries that host these root servers and second-level servers, in particular the United States.

7. There is no consensus among ITU Member States on adoption of the e164.arpa domain, as advocated by some countries including the United States and the United Kingdom, or a new TLD exclusively for ENUM implementation, as advocated by China and supported by other countries like France and Germany. A TLD Evaluation Group was set up in February 2002 under the ITU-T SG2 to review the TLD selection, taking into consideration the technical, administrative and financial aspects. Discussions on this issue are still on going. So far, no conclusion has been reached.

### **ENUM Evaluation and Trial**

8. Given the immediate availability of the e.164.arpa domain zone and the interest of some Member States on ENUM trial, the ITU has agreed with the RIPE NCC on the interim procedures to conduct trial for assigned geographic country codes on such domain. Member States have the right to choose whether to participate in the common designated ENUM domain or not, at their discretion. So far 16 countries, including China and most European nations, have arranged with the RIPE NCC on registration of the domain name for their own country codes to facilitate ENUM trial. On corporation level, there are two companies namely VISIONng<sup>1</sup> and NeuStar<sup>2</sup> conducting the ENUM trial on specific number levels.

9. In the United States, its Department of Commerce, Federal Communications Commission and Department of State have stepped up their collaboration since February 2003 to push the ENUM implementation. Their target is to implement it with “minimal domestic and international regulation”, while addressing the need for “preserving national sovereignty, competition, interoperability, innovation, stability, security, and privacy”. At the same time, the *Specifications for United States Implementation of ENUM* were also released by the ENUM Forum<sup>3</sup> to facilitate the implementation there. It lays out the fundamental structure for Tier 1

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<sup>1</sup> VISIONng is a company that deploys telephony service on international interconnected IP networks.

<sup>2</sup> NeuStar operates the telephone numbering registry for the North American Numbering Plan as a public numbering resource.

<sup>3</sup> ENUM Forum is an industry group formed in 2001, and comprises some 40 major Internet and telecommunications companies in the United States.

service, Registrar functionality as well as guidelines for the Tier 2 providers for ENUM implementation in the States and potentially other countries of the North American Numbering Plan.

10. The interim procedures for ENUM implementation are subject to review by the ITU-T SG2 by May 2003, and it will ultimately be superseded by the Recommendation E.A-ENUM. Any implementation at this stage based on the interim procedures may be subject to changes after approval of the relevant IETF standards or ITU-T Recommendations. Subject to any industry demand, OFTA may notify ITU and register with the ENUM Tier 0 Registry for the country code 852.

### **Way Forward**

11. ENUM is currently at an early stage of development, with some countries in the process of evaluating the need for ENUM services, or arranging for trials to assess the technical viability, the roles and responsibilities of various ENUM-related parties as well as the concerned logistics arrangement. There is no full scale ENUM implementation in any country yet. As for the work of ITU, the issue of TLD for ENUM and Recommendation E.A-ENUM are also outstanding at the moment. OFTA will continue to keep track of the ENUM development and report the status to the NAC in due course. Meanwhile, if Members have any ideas or views on the development of ENUM, they are welcomed to submit their comments to OFTA at any time.

Office of the Telecommunications Authority

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