ENUM Trial in Japan

ENUM BoF in RIPE47
January 28, 2004
Hiro HOTTA <hotta@jprs.co.jp>
Background
# Trends in Communication Market in Japan

## Drivers
- **Change of Regulation**
  - Privatization of Public Telecom Corporation
  - Relaxation of Regulation
- **Evolution of Devices**
  - Small, Wireless, High-functioned (e.g., mobile phones with cameras)
- **Popularization of Internet and IP Technology**
  - From Circuit Exchange to Packet Data Exchange

## History

<table>
<thead>
<tr>
<th>Period</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>~Sept.1987</td>
<td>only NTT provided public telephone services</td>
</tr>
<tr>
<td>First half of 1990s</td>
<td>communication cost decreased rapidly by competition</td>
</tr>
<tr>
<td>Latter half of 1990s</td>
<td>share of mobile phones grew rapidly</td>
</tr>
<tr>
<td></td>
<td>subscribers of mobile phones overtook PSTN in March 2000</td>
</tr>
<tr>
<td>2000~</td>
<td>broadband including IP telephony grew rapidly</td>
</tr>
</tbody>
</table>

individual IP phone service providers ==> a couple of groups
Assignment of 050-xxxxxxxx to IP Phones

050-xxxxxxxx are being assigned to IP phones so that PSTN users can make calls to IP phones.

* prefix 050 is an easily recognized code for IP Phone

IP Phone Numbering Structure

050-CDEF-GHJK

IP phone Assigned to service provider Assigned to subscriber

MPHPT
↓ 10 million 050 phone numbers service providers
↓ 5 million 050 phone numbers users
cf.
PSTN subscribers 60 million mobile subscribers 80 million
ENUM activities in Japan

- ENUM Study Group & ENUM Trial Japan -
ENUM Study Group

- Established
  - September 2002

- Objectives
  - Understanding the ENUM technology: desk work
  - Studying the implementation and operation of the ENUM-based system, and related matters
  - Finding political/regulatory issues related to ENUM-based implementation and operation
  - Finding technological issues related to ENUM
  - Clarifying pros and cons in ENUM usage

- Final report
  - Published in May 2003
  
ENUM Trial Japan (ETJP)

- **Established**
  - on 17 September 2003 (1 year activity)

- **Purpose**
  - Perform ENUM trials to ensure functioning and feasibility of basic technical facility
  - Demonstration of technology for international use
  - Accumulation and sharing of know-how about ENUM
  - DNS operation for ENUM Trial
  - Feasibility test of communication applications (device, software) using ENUM
  - Feasibility test of communication services

- **Results**
  - Technical verification
    - Communication devices and software provided by participants
    - Communication services
  - Clarification and consideration of relevant issues

http://etjp.jp/english/index.html
ETJP organization

• Participants
  – Companies, organizations, and individuals who hope to contribute to ETJP activities
  – Number of members: 42 (as of January 28, 2004)

• Officers
  – Chairman
    • Shigeki Goto
      Japan Network Information Center (JPNIC)/Waseda University
  – Vice chairman
    • Hirofumi Hotta
      Japan Registry Service Co., Ltd.(JPRS)
    • Yoshiki Ishida
      WIDE Project
ETJP Working Groups

• Privacy and Security WG
  – Objective
    • Discuss data treatment policy in each phase of trial and then publish guidelines
  – Milestone
    • Jan 2004: First draft, request for comments
    • Feb 2004: Second draft
    • Mar 2004: Publish guideline

• DNS WG
  – Objective
    • Definition of possible ENUM DNS models in Japan, their requirements and evaluation criteria, then evaluate current DNS implementations
  – Milestone
    • Feb 2004: Definition of possible ENUM DNS models, requirements, evaluation criteria
    • Mar 2004: Build Testbed, evaluation
    • Apr 2004: publish reports of the evaluation
DNS structure design

• Depends on what model to select
  – User ENUM / Operator ENUM
  – Requirements (such as Number-Portability?)

• Typical requirements for Tier1 DNS:
  – Handling of large zone
    • even over 100M entries (if all the numbers are held in Tier1)
  – Scalability and stability
  – Performance

• Typical requirements for Tier2 DNS:
  – Capability for frequent update
  – EDNS0 support?
    • To hold a number of NAPTR RRs for a single E.164 number
      that may exceed 512 octets in one DNS packet
Consideration on DNS

• **Typical ENUM services like Web, Mail, SIP also lookup DNS.**
  – Web: Hyper-links(A).
  – Mail: sending (MX, A), receiving (PTR).
  – SIP: service protocol (D2U/D2T NAPTR), service location(SRV), sip server(A)

• **The number of DNS queries will increase when ENUM is deployed.**

• **Users are nervous about service quality.**
  – Users don’t care where the bottle neck is.
ENUM trial (phase1)

1. Look-up
2. Response with communication method
3. Communication

* experiment on connectivity among applications

** ENUM registrar **
- Initial registration of phone
- Service registration

** Internet **
- ENUM DNS
- Service registration in bulk (daily)

** Trial secretariat **
- Initial registration of phone

** End user **
- PSTN
- SIP
- E-mail

** Trial team member **
- Adapter

** Copyright © 2004 JPRS **
**ENUM trial (phase2)**

- **Trial secretariat**
  - Initial registration of phone#
  - Service registration
- **Operator**
  - Service registration application
  - Tel#
  - ** ENUM registrar**
    - Authentication
  - Service registration in bulk (daily)
- **End user**
  - **Internet**
  - ** ENUM DNS**
  - 1. Look-up
  - 2. Response with communication method
  - 3. Communication
  - PSTN
  - SIP
  - E-mail

*experiment on communication services*
 ENUM trial (phase 3)

• Experiment on connection among communication services with user ENUM

1. Look-up
2. Response with communication method
3. Communication
Layer of ENUM services and standards

Communication service (multiple carriers)
Authentication, Social Security

Communication service (single carrier)
Provisioning, Communication Security

Applications/Terminals
SIP, Mail, Web, etc.

Infrastructure
ENUM DNS
ETJP Registration system (Phase 1)

- Each ETJP member can apply their preferred numbers as their trial E.164 numbers.
- Verification is performed by each member’s ID and password.
NAPTR Registration Web I/F (Phase 1)

- ETJP members can set their preferred NAPTR RRs to the trial DNS through this Web I/F.
- Those NAPTR RRs are updated within a few minutes.
- Can be examined via ENUM client-like Web I/F.
ETJP applications (Phase 1)

- ENUM enabled SIP Proxy (Softfront)
- ENUM enabled VoIP Router (Yamaha, CISCO)
- ENUM enabled InternetFAX (Panasonic)
- Sample Software ENUM Client (JPRS)
  - Source codes are open to the members
  - Object codes of runtime libraries used by the sample software are open to the members
  - API (under development)
    - SetDNS : specifies the DNS server
    - SetAUS : specifies the Telephone Number
    - CreateAUS : create the AUS Number using the locale info
    - ENUMQuery : look-up NAPTR records
    - ENUMGetData : picks up NAPTR records one by one
More application and SDK

1) start

2) input telephone number and look-up

3) services are shown and select one

4) Start the communication service
References

• ETJP
  – http://etjp.jp/english/

• ENUM Study Group

• JPRS
Q & A