On the ENUM horizon...

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What is E2MD

- E2MD:
  - E.164 To Meta-Data mapping
- Use cases are about providing further information on E.164 numbers
- Why not use ENUM (E.164 To URI Mapping)?
  - ENUM has limitations for usage for metadata:
    - Result must always be a URI and indicate Resource
    - Using this URI establishes a communication session

Some E2MD Use Cases

- **unused**
  - Indicator that number is not in use
- **send-n**
  - Information about the numbering plan
- **cnam**
  - Name of calling party
- **Global Service Provider Identifier**

unused

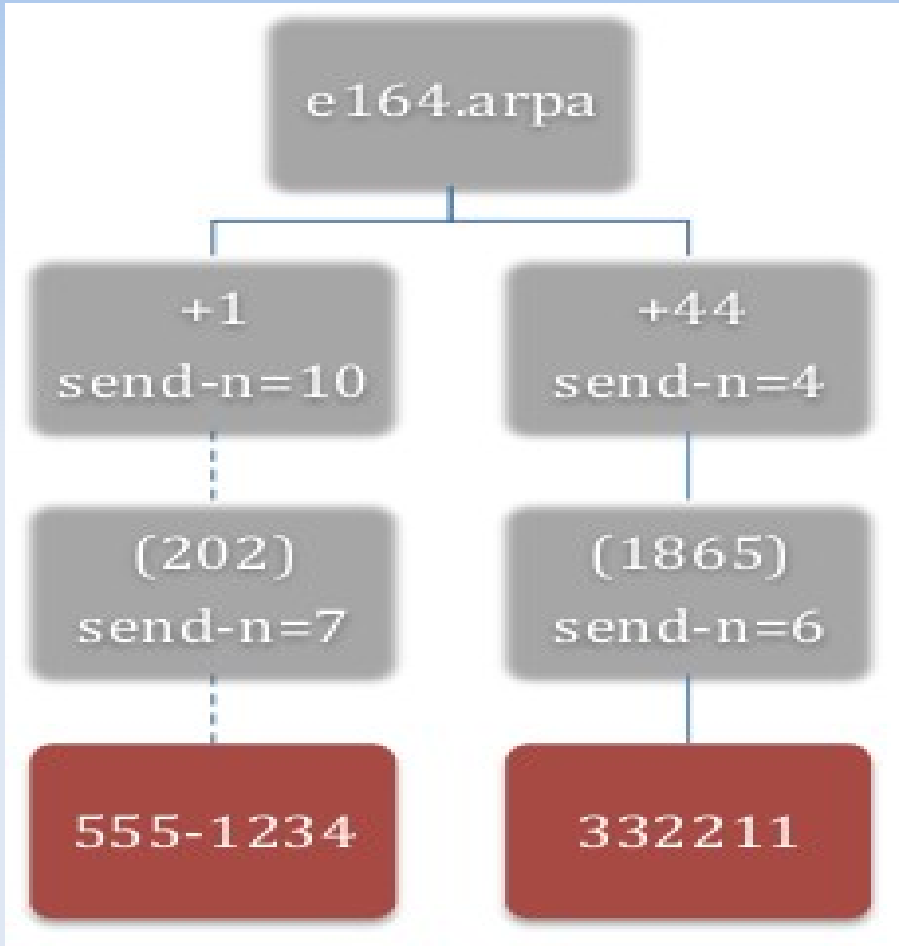
- Indicates whether an E.164 number (or number range) is allocated or assigned for communications service.
- Lets client know that a call will fail without wasting the effort of a session setup
  - E2MD lookup is faster than SIP INVITE
  - The user can be provided with a correct announcement (or other indication)
- See: draft-ietf-enum-unused-04

send-n (1/2)

- Increases efficiency of overlapped dialing
  - Reduces DNS lookups and SIP INVITEs
  - Decreases frequency of timeouts
  - Could extend SIP "484 address incomplete" handling: no need for a new SIP dialogue for each dialed digit
- Deployed in empty non-terminals (i.e. in the branches)
- Indicates the minimum depth of the tree below this record

send-n (2/2)

- "You must send N more digits before any leaf-node NAPTRs will be returned"
- Designed for private ENUM, but works also in public ENUM
- See: draft-bellis-enum-send-n-02



cnam

- Returns the Calling Name (like directory name) for a given phone number.
- Used in cases where this information is not available or lost:
  - Calls that originate on (or transited via) the Public Switched Telephone Network (PSTN)
  - Calling Name to be displayed on VoIP or other Real-time Clients
- See: draft-ietf-enum-cnam-08

Global Service Provider Identifier

- Indicates the Communication Service Provider (CSP) responsible for this number
  - AKA the “carrier-of-record” or “ITAD identifier”
- Potential uses:
  - Optimize routing
  - Advising end-users about costs when charging depends on the terminating CSP
- Not yet documented in an Internet-Draft

More E2MD Use Cases

- Service capabilities:
  - SMS | MMS | video calls | presence | IM | …
- Payment Type:
  - PrePaid | PostPaid | ...
- Network Type:
  - TDMA | GSM | 3G | …
- Region Code:
  - Numeric value indicating a region within a country
- Least cost routing information
  - e.g. preferred gateway

Potential E2MD Use Cases

- Charging information
  - In particular useful for premium rate numbers
- Assignee address information
  - e.g. to report abuse of premium rate number
- Emergency Call routing:
  - Location information
  - PSAP (Public Safety Answering Point)

Differences ENUM / E2MD

ENUM:

- **E2U** “label”
- Result must **always** be a **URI**
- **Indicates** a **Resource** and establishes a **communication session**

E2MD:

- **E2M** “label”
- Result can be either a **URI or** a (short) **ASCII String**
- Provides information about a phone number (i.e. **Meta-Data**)

Common to ENUM and E2MD (1/2)

- Base Specification & framework for services*
  - DDDS application (E2U / E2M) and field syntax
  - Template and process for IANA registration of ENUM / E2MD services*
- Any new ENUM / E2MD service* follows this registration process
  - Specification Required (implies Expert Review)
- ENUM and E2MD may share the same tree
  - e.g. sub-delegations within e164.arpa.

** service refers to Enumservices / metadata types*

Common to ENUM and E2MD (2/2)

- Both make use of DNS NAPTR RR
- Privacy issues must be handled in each service registration
  - Base-specification will mandate security considerations section in each registration and guidance on privacy
  - Security / Privacy considerations shared by all services can be described in the base-specification

- **E2MD is so much like ENUM that we can re-use almost everything we know about ENUM**

Results E2MD BoF at IETF-77 (1/2)

- Market need for E2MD?
  - Has been clearly demonstrated
  - “Net-Heads” as well as “Bell-Heads” expressed need
- Approach
  - Approach is feasible and easy to implement
- Benefit
  - Benefits seen in all forms of ENUM
  - Immediate benefits are expected in particular in Infrastructure and Private ENUM deployments
- Is the IETF the right place?
  - Most people think *yes* due to close ties to ENUM

Results E2MD BoF at IETF-77 (2/2)

- Scope considered too large
  - Registration Framework approach seen problematic
- Some DNS “purists” claim:
  - DNS may not be a good place for E2MD
  - NAPTR was already the wrong choice for ENUM / Multiple problems with NAPTR
  - DNS answers might get too large
  - Some Use Cases may not only be specific E.164 numbers, but apply to DNS as whole
- Private vs. public usage
- Security and Privacy issues need to be addressed

Conclusions

- There is a wide support in favor of working on the E2MD problem
- All arguments were known before the BoF at IETF-77
  - Nothing new came up during the BoF
- Most of the arguments made against E2MD equally apply to ENUM
  - Was the E2MD BoF misused by some ENUM opponents to express their discomfort with ENUM?
- Many arguments were FUD and/or OSI Layer 9+ issues
- No WG could be formed at IETF-77
- **E2MD work goes on** (mailing-list, conf-calls and WiKi)

Questions?

Links

- E2MD Mailing List
  - https://www.ietf.org/mailman/listinfo/e2md
- Proceedings from IETF-77
  - https://datatracker.ietf.org/meeting/77/materials.html#wg-e2md
- List of Objections (draft version)
  - http://trac.tools.ietf.org/bof/e2md/trac/report/10
- List of Requirements (draft version)
  - http://trac.tools.ietf.org/bof/e2md/trac/wiki/RequirementsList

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