

DRAFT - List of Issues Encountered During the  
ITU ENUM Workshop, January 2000 -  
for discussion purposes only

## ENUM ISSUES

### Introduction

The ITU ENUM Workshop on 17 January 2001 in Geneva consisted of informational presentations and interactive panel discussions. This document captures some of the issues discussed, and comments made, during the second half of the one-day meeting. It is provided as informational for participants and interested parties. This document has no formal status.

### Important Notes

- Terminology: Some terms may have more than one interpretation, depending for example on different perspectives (such as operational or commercial), contexts (such as technical or regulatory), or usage (such as generic or specific). Accordingly, this is an illustrative document and not a formal reference document.
- Issue Status: The issues listed in this document were discussed during the limited time available at the workshop. There was no opportunity for the participants to review output documents on the day of the workshop. No agreements, consensus, decisions, or resolution of issues are intended or implied. This material is being made available for the information of participants and other interested parties.
- Clarifications: The scope of listed issues tended towards ENUM administrative issues with operational, deployment, technical, or related aspects. Notes to listed issues are explanatory and are not intended to be definitive. The order of listed issues is arbitrary and does not convey any classifications or priorities. The list is incomplete and clearly not exhaustive, neither is it authoritative; since it is indicative of discussion points only.
- National matters: Issues generally are considered to have aspects that are national matters. Some issues may have international aspects as well.
- Other text: Additional text intended to help document some of the issue items as discussed was offered, and was supplied shortly after the workshop, by several participants. Shorter portions are incorporated in the list, and the Attachment to this list contains additional longer text.

### Issues List

**ISSUE 1:** An agreed process needs to be developed, e.g., between appropriate authorities.

- Notes: "ITU & IETF position states: ITU has responsibility to provide assignment information. Geographic Country Codes will only be included in the DNS when authorised by the Member State responsible for that code." (from slide text based on the Berlin Liaison Statement, now RFC 3026)

The slide considered information about Geographic Country Codes (for "Countries"). The information is whether or not a Member State has authorized its Country Code to be included in DNS for ENUM. The process needing development is for provision of that information.

**ISSUE 2:** The status of .arpa matters (including e164.arpa matters) is ??

- Note: Some text describing status is contained in the Attachment.

**ISSUE 3:** The following "issues" text was discussed. The text came from a slide from one of the workshop presentations.

- Maintaining integrity of E.164
- Building ENUM integrity
- Not all countries have the same regulation or rules of administration BUT all need to address the same issues for ENUM
- How should Tier 1 Registries be selected?
  - it's a national matter
  - but there are options.....

- Notes: "ITU & IETF position states: Each administration is responsible for ensuring DNS administrators (Registries) are aware of appropriate changes" (from slide text on the Berlin LS, now RFC 3026)

The slide considered the responsibility to ensure that DNS administrators (for Registries) are aware of (or are provided with information about) appropriate changes. Those changes pertain to numbering resources within Geographic Country Codes. Presumably, "administration" refers to national administration of national numbering resources, and so responsibility here is a national matter. There was a very wide range of comments. The item listed here notes that there was such a discussion.

**ISSUE 4:** These are also items about inserting numbers into Registries (for ENUM) for numbers that are within a Country Code for a Country (or an integrated numbering plan), as national matters:

- How to determine the most appropriate arrangement?
- Who runs national Registries?
- An agreed process needs to be developed between participating Member States.

- Note: These were discussed in response to a presentation slide.

**ISSUE 5:** These are items about inserting numbers into DNS for numbering resources that are within a Country Code shared by Networks:

- Assignees of Network Codes need to be formally made aware of their obligations with respect to ENUM.
- Some ITU-T Recommendations related to E.164 Network Codes may require review/amendment/revision.

- Notes: "Networks" and "Network Codes" are used here in the sense of ITU-T Rec. E.164 and related Recommendations. Assignment of a Network Code is the assignment of an E.164 "CC+IC" resource, where CC is a Country Code shared by Networks, and where IC is an Identification Code (within that CC) assigned to a Network. The assignment of a CC+IC carries with it the responsibility for numbering resource administration for those numbering resources within the CC+IC.

**ISSUE 6:** These are items about inserting numbers into DNS for numbering resources that are within a Country Code shared by Groups of Countries (noting that this is work in progress in ITU-T SG2):

- Assignees of E.164 resources for Groups of Countries need to be formally made aware of their obligations with respect to ENUM.
- Some ITU-T Recommendations related to E.164 resources for Groups of Countries may require review/amendment/revision.

- Notes: "Groups of Countries" is used here in the sense of Draft New ITU-T Rec. E.164.3, the status of which is "requiring further development" within SG2. Assignment of such an E.164 resource is the assignment of an E.164 "CC+GIC" resource, where CC is a Country Code shared by Groups of Countries, and where GIC is an Identification Code (within that CC) assigned to a Group of Countries. The assignment of a CC+GIC carries with it the responsibility for numbering resource administration for those numbering resources within the CC+GIC.

**ISSUE 7:** For E.164 resources behind a CC+IC (for Networks) or a CC+GIC (for Groups of Countries), resource assignees are responsible for providing E.164 assignment information to DNS Administrators (for ENUM).

- Notes: See Issue 5 and Issue 6. Responsibility for the provision of information is an assignee's obligation with respect to ENUM.

**ISSUE 8:** This item was discussed when Number Portability (NP) was considered with respect to ENUM:

- In some cases with Number Portability, the name server must point to a Service Registrar on an individual E164 number basis, not a number block.

- Notes: A comment was made concerning "maintaining the 'right' of a user to benefit from NP". A comment was made concerning "the impact of NP on a user's ability to authenticate 'ownership' of a (ported) number". There was also discussion about the use of terms such as "rights" or "ownership".

**ISSUE 9:** This item was discussed when aspects of Service Providers were considered with respect to ENUM:

- Some countries are moving to single number administration and payment for numbers, does this raise additional issues?

- Note: This was discussed in response to a presentation slide.

**ISSUE 10:** What is the relationship between a user and a telephone number, and how is that relationship expressed in ENUM?

- differences across Administrations?
- Intellectual Property Rights?

- Notes: There was discussion of a number of related items, including:

- terminology (such as "rights" or "control"),
- impacts with respect to complex value chains,
- consumers and choosing ENUM, and
- wide range of issues (such as policy, commercial, implementation).

**ISSUE 11:** Customer perception where an E.164 number that provides access to an ISP, other than the one responsible for the number, experiences differing QoS and cost?

- Note: This is from the point of view of the calling user's perception, calling to the E.164 number of the "callee".

**ISSUE 12:** Privacy of information/consumer protection.

- Note: This was discussed in response to a presentation slide.

**ISSUE 13:** Legal intercept?

- Notes: There were comments about how this needs to be scoped, and about aspects related to (specific types of) services. There was discussion about considering the applicability of legal intercept to ENUM itself.

**ISSUE 14:** Regulatory implications  
e.g monitoring of QoS etc?

- Note: This was discussed in response to a presentation slide.

**ISSUE 15:** Determination of who qualifies to be a Service Registrar?

- Notes: This item is from a slide. The context is that a Registry points to the Service Registrar for an E.164 number, and that a Service Registrar hosts (service-specific) NAPTR records. There were comments advising that various alternatives/models are under discussion.

**ISSUE 16:** Concerning some ENUM administration issues related to the Service Registrar models:

- Is one model, or are a number of different models, preferable?

- Note: This was discussed in response to a presentation slide.

**ISSUE 17:** How can E.164/DNS integrity be safeguarded if responsibility for number insertion in the DNS lies with the customer?

- Note: This is related to other issues, e.g., 10, 11, and 18.

**ISSUE 18:** How should validation of subscriber identity, data, and NAPTRs (service-specific records) occur?

- Note: This is related to other issues, e.g., 10, 11, and 17.

**ISSUE 19:** How can number/name hijacking/fraud be prevented?

- Note: This was discussed in response to a presentation slide.

**ISSUE 20:** How will number changes/number churn be handled?

- Note: This was discussed in response to a presentation slide.

**ISSUE 21:** How will ceased numbers be notified/recovered?

- Note: This was discussed in response to a presentation slide.

**ISSUE 22:** Could prepaid mobile numbers, or pagers, be inserted?  
If so how will ownership, e.g., of mobile terminals, be validated?

- Note: This was discussed in response to a presentation slide.

**ISSUE 23:** How will changes/ownership/loss/ theft/cease issues be addressed?  
Who has these responsibilities?

- Note: There was a comment to consider assignment "rights" in relation to these items.

**ISSUE 24:** Geographic numbers would lose location information, and will begin to look more like personal numbers

- Note: There was a comment on how some plans currently show segregation by various characteristics, such as geographic.

**ISSUE 25:** Impact on number plans/number administration?  
Possible new requirements?

- Notes: See the issue on number Portability. This issue is related to several other issues.

**ISSUE 26:** Are additional controls required where numbers are shared?

- Note: The context of this issue could not be clarified in the time available.

**ISSUE 27:** Should/could requirements on carriers/third parties be enforced?

- Note: This is related to aspects of the next issue .

**ISSUE 28:** There are issues concerning technical/operational matters (such as testing, performance/loading characteristics, dependencies on infrastructure characteristics, etc.) that are related to ENUM administration. There are matters are related to machine types, architectures, reliability, etc., as additional technical issues.

- Notes: This was raised during discussion. Some aspects are related to the previous issue.

**ISSUE 30:** There is a major procedural issue: How is RIPE-NCC to know who is authoritative when claiming so (to RIPE-NCC)?

- Notes: This was raised during discussion. It assumes that RIPE-NCC is the DNS administrator for the e164.arpa zone. The issue is RIPE-NCC is to evaluate requests of DNS administrative nature, such as for delegations.

This issue clearly has international aspects. Note that new material related to this issue is in the Attachment.

**ISSUE 31:** When (international) E.164 addresses are used as routing numbers, how can they be authenticated?

- Notes: This issue arose from discussion of a question submitted from the floor. A clarification was offered: How does ENUM apply to routing numbers as opposed to dialed numbers, especially when at some point only the routing number is available?

There was a comment that this could well be the case with E.164 numbers for Global Services or for Groups of Countries.

**ISSUE 32:** What ENUM administrative issues apply to E.164 numbering for global services as defined by ITU-T Recommendations?

- Note: The previous issue concerning routing numbers, whereas this issue concerns dialed numbers.

**ISSUE 33:** Other comments and discussions, limited by lack of time, included:

- more concerns about integrated numbering plans,
- subdelegation issues, and
- opinions that technical issues totally within DNS, or totally within E.164 numbering resource administration, are out of scope.

**ISSUE 34:** How can competition for ENUM services, and for service provision, be promoted in different market segments and by different service providers?

- ATTACHMENT (to Issues List) -

**Additional Text**

This attachment to the Issues List contains additional text related to Issue 2 (status of .arpa matters) and Issue 30 (how is RIPE-NCC to know who is authoritative when claiming so). The text in this attachment is informational only, and is based on information provided very quickly via the IETF for the purpose of giving some current (but unofficial) status information.

Additional text related to Issue 2 (status of .arpa matters):

- (1) What does IANA do - excerpted from RFC 2860 ("Memorandum of Understanding Concerning the Technical Work of the Internet Assigned Numbers Authority", June 2000)

4. Agreed technical work items. ICANN agrees that during the term of this MOU it shall cause IANA to comply, for protocols within IETF's scope, with the following requirements, which ICANN and IETF acknowledge reflect the existing arrangements under which the IANA is operated:

>

4.1. The IANA will assign and register Internet protocol parameters only as directed by the criteria and procedures specified in RFCs, including Proposed, Draft and full Internet Standards and Best Current Practice documents, and any other RFC that calls for IANA assignment. If they are not so specified, or in case of ambiguity, IANA will continue to assign and register Internet protocol parameters that have traditionally been registered by IANA, following past and current practice for such assignments, unless otherwise directed by the IESG.

>

If in doubt or in case of a technical dispute, IANA will seek and follow technical guidance exclusively from the IESG. Where appropriate the IESG will appoint an expert to advise IANA.

>

The IANA will work with the IETF to develop any missing criteria and procedures over time, which the IANA will adopt when so instructed by the IESG.

>

4.2. In the event of technical dispute between the IANA and the IESG, both will seek guidance from the IAB whose decision shall be final.

>

4.3. Two particular assigned spaces present policy issues in addition to the technical considerations specified by the IETF: the assignment of domain names, and the assignment of IP address blocks. These policy issues are outside the scope of this MOU.

>

Note that (a) assignments of domain names for technical uses (such as domain names for inverse DNS lookup), (b) assignments of specialised address blocks (such as multicast or anycast blocks), and (c) experimental assignments are not considered to be policy issues, and

shall remain subject to the provisions of this Section 4. (For purposes of this MOU, the term "assignments" includes allocations.) In the event ICANN adopts a policy that prevents it from complying with the provisions of this Section 4 with respect to the assignments described in (a) - (c) above, ICANN will notify the IETF, which may then exercise its ability to cancel this MOU under Section 2 above.

>

4.4. The IANA shall make available to the public, on-line and free of charge, information about each current assignment, including contact details for the assignee. Assignments published in RFCs by the RFC Editor and available publicly will be deemed to meet the requirements of this Section 4.4.

>

4.5. The IANA shall provide on-line facilities for the public to request Internet protocol parameter assignments and shall either execute such assignments, or deny them for non-conformance with applicable technical requirements, in a timely manner. There shall be no charge for assignments without the consent of the IAB. Requests shall only be denied on legitimate technical grounds. For protocols within the IETF scope (i.e., registries created by IETF action), appeals against such denials may be made to the IESG and subsequently to the IAB as provided in 4.2 above.

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4.6. The IANA shall have non-voting liaison seats on appropriate IETF committees as determined by the IETF, and may participate in all IETF discussions concerning technical requirements for protocol parameter assignment through such liaisons.

>

4.7. The IANA shall review all documents in IETF Last Call to identify any issues of concern to the IANA, and shall raise these issues with the IESG.

(2) IAB requested on May 17 2000 that assignment of subdomains of arpa should be a task of IANA according to the specification of "technical uses" in bullet point 4.3 above. The "whois" record of .arpa was changed accordingly on request by Department of Commerce. This implies that registration of subdomains to .arpa is done according to instructions in RFCs (see point (1) above).

>Registrant:

>ARPA Domain

>Internet Assigned Numbers Authority (IANA)

>4676 Admiralty Way, Suite 330

>Marina del Rey, CA 90292

>US

>

>Administrative Contact, Technical Contact, Zone Contact:

>Internet Assigned Numbers Authority (IANA) iana@iana.org

>4676 Admiralty Way, Suite 330

>Marina del Rey, CA 90292

>US

>310-823-9358

>Fax - 310-823-8649

- (3) Instructions to IANA to register e164.arpa, delegate e164.arpa according to instructions from IAB, handling content of e164.arpa according to E.164 as specified in RFC 2916 - excerpted from some email messages.

>4. IANA Considerations

>

This memo requests that the IANA delegate the E164.ARPA domain following instructions to be provided by the IAB. Names within this zone are to be delegated to parties according to the ITU recommendation E.164. The names allocated should be hierarchic in accordance with ITU Recommendation E.164, and the codes should assigned in accordance with that Recommendation.

>

Delegations in the zone e164.arpa (not delegations in delegated domains of e164.arpa) should be done after Expert Review, and the IESG will appoint a designated expert.

Additional text related to Issue 30 (how is RIPE-NCC to know who is authoritative when claiming so):

The following text gives one example of work currently in progress via email. It is unofficial and is provided for informational purposes only.

This is the first cut of a piece of paper which describes how a delegation is to be handled administratively.

This is to help ITU-T on the path forward, BUT, still ITU-T needs to let IETF know:

- Who is "ITU-T" which confirms that a requested is the authority for the resource that is allocated? Is that ITU-T Secretariat?
- What is "a legitimate holder"? Is that only an NRA, or can it be also for example Canada (well, that is a member state) which comes to RIPE-NCC directly with their area codes, or even the city of Montréal which uses 1-514, or even an individual user?

ITU-T should really initiate discussions on first of all where these decisions need to be made, and then also start those discussions.

Request template for delegations according to RFC2916 (proposed)

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1. Who can submit a request:

An ITU member state and/or a legitimate holder of an E.164 resource (such as a network code assignee or an assignee of an appropriate test resource) can make a request to the RIPE NCC, with a copy to the ITU-T, for delegation of a sub-domain of e164.arpa that represents the ITU-T Recommendation E.164 resource the requester is authoritative for.

ITU-T is to confirm that the requester is the authority for the resource being allocated.

2. What needs to be submitted:

Requests need to be submitted by electronic mail in 7-bit ascii in the following format:

Administrative Contact

Organisation Name:  
Address:  
Address:  
Contact person:  
Phone:  
Fax-no:  
e-mail:

Technical Contact (in case different from administrative contact):

Organisation Name:  
Address:  
Address:  
Contact person:  
Phone:  
Fax-no:  
e-mail:

3. Arbitration procedure:

In case of conflict where more than one organisation sends a request of delegation of the same E.164 resource to the RIPE NCC, the RIPE NCC will deny delegation of the zone until the ITU-T has resolved this conflict.

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