The ENUM Dip Indicator parameter for the "tel" URI
<draft-ietf-iptel-tel-enumdi-01.txt>

Status of this Memo

This document is an Internet-Draft and is subject to all provisions of Section 3 of RFC 3667. By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she become aware will be disclosed, in accordance with RFC 3668.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt.

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

This Internet-Draft will expire on September 2, 2005.

Copyright Notice

Copyright (C) The Internet Society (2005).

Abstract

This document defines a new parameter "enumdi" in the "tel" Uniform Resource Identifier (URI) as defined in RFC3966 to support the handling of ENUM queries in SIP proxies, H.323 gatekeepers and other
VoIP network elements. The presence of the "enumdi" parameter indicates to the VoIP network element receiving an URI containing an E.164 number that an ENUM query as defined in RFC3761 has already been performed on the E.164 number indicated by the previous VoIP network element.

Table of Contents

1. Terminology ........................................... 3
2. Introduction ......................................... 4
3. Formal Syntax ....................................... 5
4. Normative Rules ...................................... 6
   4.1 Handling an URI with the "enumdi" parameter ..... 6
   4.2 Adding the "enumdi" parameter to URIs ............ 6
5. Examples ............................................... 7
6. Security Considerations ............................. 8
7. IANA Considerations .................................. 9
8. References ........................................... 10
   8.1 Normative References .............................. 10
   8.2 Informative References ............................ 10
Authors' Addresses ..................................... 10
   Intellectual Property and Copyright Statements ...... 12
1. Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, RFC 2119 [1].
2. Introduction

VoIP network elements (including UAS and UAC) may be set up in different ways to handle E.164 [2] numbers during call setup, depending on the capabilities provided. One common approach is to query ENUM as defined in RFC3761 [3].

If the ENUM query leads to a result, the call is set-up accordingly. If the ENUM query does not lead finally to a result, another database may be queried and/or the call may finally routed to the PSTN. In doing so, the call may be routed to another VoIP network element. To indicate in signalling to this next VoIP element that an ENUM query has already been made for the "tel" URI (specified in RFC3966 [4]), the "enumdi" parameter is used, to prevent the next VoIP network element from repeating redundant queries.
3. Formal Syntax

The following syntax specification uses the augmented Backus-Naur Form (BNF) as described in RFC2234 [6].

\[
\text{enumdi} = \ast 1(\text{enum-dip-indicator}) \\
\text{enum-dip-indicator} = ";\text{enumdi}\"
\]

The "enum-dip-indicator" can appear in the "tel" URI at most once.
4. Normative Rules

This section discusses how a VoIP network element handles a received "tel" URI that contains the "enumdi" parameter or has accessed ENUM in e164.arpa for a given E.164 number and needs to add the parameter to a "tel" URI.

4.1 Handling an URI with the "enumdi" parameter

If a VoIP network element receives a "tel" URI containing the "enumdi" parameter, the VoIP network element SHOULD NOT retrieve the related information for this number from ENUM in e164.arpa even if it would normally do so.

If the received "tel" URI is to be passed to the next network element, the VoIP network element MUST pass on the received URI containing the "enumdi" parameter unchanged.

4.2 Adding the "enumdi" parameter to URIs

When a VoIP network element accesses ENUM in e164.arpa for a given E.164 number and the result of the query is NXDOMAIN, and the network element chooses to pass the call to the next network element by using a "tel" URI, the "enumdi" parameter MUST be set.

When a VoIP network element accesses ENUM in e164.arpa for a given E.164 number and either:

- the result of the query includes a NAPTR RR containing a "tel" URI that has the same E.164 number, or
- the result of the query includes a NAPTR RR containing a "tel" URI with the "enumdi" parameter set,

then if that retrieved "tel" URI is chosen to be passed to the next network element, the sending VoIP network element MUST pass on the retrieved URI with the "enumdi" parameter set.
5. Examples

a. A VoIP network element "server.example.com" receives a "tel" URI
   <tel: 端口编号>. The VoIP network element accesses the DNS
   for NAPTR RR in 8.3.0.0.6.9.2.3.6.1.4.4.e164.arpa., and gets the
   response NXDOMAIN. The VoIP network element decides to route the
   call to the PSTN via another VoIP network element called
   "gw.example.com".

   It therefore signals to the next VoIP network element with:
   <tel: 端口编号;enumdi>
   or (using the procedures of RFC3261 [5] section 19.1.6):
   <sip: 端口编号;enumdi@gw.example.com;user=phone>.

b. A VoIP network element "server.example.com" receives a "tel" URI
   <tel: 端口编号>. The VoIP network element accesses the DNS
   for NAPTR RR in 8.3.0.0.6.9.2.3.6.1.4.4.e164.arpa., and receives
   the same "tel" URI in reply (i.e. <tel: 端口编号>).

   The VoIP network element decides to route the call to the PSTN
   via another VoIP network element "gw.example.com".

   It therefore signals to the next VoIP network element with:
   <tel: 端口编号;enumdi>
   or (using the procedures of RFC3261 [5] section 19.1.6):
   <sip: 端口编号;enumdi@gw.example.com;user=phone>.
6. Security Considerations

In addition to those security implications discussed in the "tel" URI [4] specification, there are new security implications associated with the defined parameter.

If the "enumdi" is illegally inserted into the "tel" URI when the signaling message carrying the "tel" URI is en route to the destination entity, the call may be routed to the PSTN network, incurring unexpected charges or the causing a downstream VoIP network element to reject the call setup.

It is less a problem if the "enumdi" is illegally removed. An additional ENUM query may be performed to retrieve the routing number information and have the "enumdi" included again.

It is RECOMMENDED that protocols carrying the "tel" URI ensure message integrity during the message transfer between the two communicating network elements so as to detect any unauthorized changes to the content of the "tel" URI and other information.
7. IANA Considerations

This document requires no IANA actions.
8. References

8.1 Normative References


8.2 Informative References


Authors' Addresses

Richard Stastny
Oefeg
Postbox 147
1103 Vienna
Austria

Phone: 664-420-4100
Email: Richard.stastny@oefeg.at
Intellectual Property Statement

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in BCP 78 and BCP 79.

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at http://www.ietf.org/ipr.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Disclaimer of Validity

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright Statement

Copyright (C) The Internet Society (2005). This document is subject to the rights, licenses and restrictions contained in BCP 78, and except as set forth therein, the authors retain all their rights.

Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.