                  Dial String syntax for the "tel" URI Scheme
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Abstract

The "tel" URI (Uniform Resource Identifier) for Telephone Numbers [RFC3966] describes resources identified by telephone numbers. These resources specify termination points within a public or private telephone network. The termination points are a globally or locally unique endpoint. RFC3966 does not address the means by which the telephone URI can be used to reach termination point from a specific node in the telephone network.

This document specifies the means by which the termination point is reached from a specific node in the telephone network. This document specifies how to encode the numbers, symbols and pauses required to traverse the phone network to reach the termination point in an RFC 3966 compliant "tel" URI.

Table of Contents

1. Introduction

    The "tel" URI for Telephone Numbers [RFC3966] defines unique endpoints in the local or global telephone network. It is quite useful in its own right. It permits an unambiguous URI for an endpoint independent of the means required to traverse the telephone network. This is referred to as the Address-Of-Record.

    There are applications that require additional information to connect to the endpoint. Examples include an individual's address book or an address book embedded in a device such as a FAX machine. There are instances where pre-dial and/or post-dial information is required to not only connect the two telephone devices but also specify an account where the cost for the phone call will be charged. This is referred to as the Dial String.

The now obsolete URLs for Telephone Calls [RFC2806] accommodated some of this capability. It allowed post-dial information to be explicitly specified. The pre-dial information had to be hidden in the local phone number. The "tel" URI for Telephone Numbers [RFC3966] clarified the separation of Dial Strings from the Address-Of-Record.

The purpose of this document is to specify, in an RFC3966 compliant fashion, the parameters that encode the pre-dial and post-dial Dial Strings. In a phone call carrying the ITU FAX protocol there are mail boxes that can be addressed. These are referred to as T33 SubAddressing [T.33]. This document will also specify the parameter for T33 SubAddressing.

2. Conventions used in this document

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 RFC-2119 [RFC2119].

In this document, these words will appear with that interpretation only when in ALL CAPS. Lower case uses of these words are not to be interpreted as carrying RFC-2119 significance.

In this document, the characters ">>" preceding an indented line(s) indicates a compliance requirement statement using the key words listed above. This convention aids reviewers in quickly identifying or finding the explicit compliance requirements of this RFC.

2.1. Terminology

As stated in The "tel" URI for Telephone Numbers [RFC3966], telephone numbers comprise two related but distinct concepts:

Address-Of-Record or identifier: The telephone number is understood here as the canonical Address-Of-Record or identifier for a termination point within a specific network. For the public network, these numbers follow the rules in E.164 [E.164], while private numbers follow the rules of the owner of the private numbering plan. Subscribers publish these identifiers so that they can be reached, regardless of the location of the caller. (Naturally, not all numbers are reachable from everywhere, for a variety of technical and local policy reasons. Also, a single termination point may be reachable from different networks and may have multiple identifiers.)

Dial string: "Dial strings" are the actual numbers, symbols, and pauses entered by a user to place a phone call. A dial string is consumed by one or more network entities and understood in the context of the configuration of these entities. It is used to generate an Address-Of-Record or identifier (in the sense described above) so that a call can be routed. Dial strings may require prepended digits to exit the private branch exchange (PBX) the end system is connected to, and they may include post-dial dual-tone multi-frequency (DTMF) signaling that could control an interactive voice response (IVR) system or reach an extension.

3. Dial String Parameters

This document specifies Dial string parameters for the "tel" URI scheme. The dial string parameters encode the numbers, symbols and pauses required to traverse the phone network to reach an Address-Of-Record. All of these parameters are optional. Local entities SHOULD support these. Otherwise they MUST be ignored and the initiater of the call SHOULD be informed.

The Dial String parameters defined here are not intended to be globally applicable. They are applicable for a specific telephone node enabling it to reach the desired termination point. For example a telephone in companies A and B may both be used to reach a Company C as specified by an Address-Of-Record. Company A may require an '8' to be dialed before entering the Address-Of-Record. Company B may not require any such pre-dialing and can reach Comapany C simply by dialing the Address-Of-Record.

Three Dial String parameters are defined here:

Predial: The Dial string entered before the Address-Of-Record is applied.

Postdial: The Dial string entered after the Address-Of-Record is applied.

T33 SubAddress: A FAX specific Dial string passed through to the FAX Protocol component that uses the T33 SubAddress in the FAX protocol carried over the telephone connection.

4. Formal Syntax

   The formal syntax specification uses the augmented Backus-Naur Form
   (BNF) as described in RFC-5234 [RFC5234].

   The following syntax is defined in RFC3966 and is required to define
   the ABNF for the Dial String parameters.

```
   parameter            = ";" pname ["=" pvalue ]
   pname                = 1*( alphanum / "-" )
   pvalue               = 1*paramchar
   paramchar            = param-unreserved / unreserved / pct-encoded
   unreserved           = alphanum / mark
   mark                 = "-" / "_" / "." / "!" / "~" / "*" /
   alphanum             = ALPHA / DIGIT
   phonedigit           = DIGIT / [ visual-separator ]
   visual-separator     = "-" / "." / "(" / ")"
                            "'" / "(" / ")"
   pct-encoded          = "%" HEXDIG HEXDIG
   param-unreserved     = "[" / "]" / "/" / ":" / "&" / "+" / "$"
```

   The Dial String parameter syntax is described below. The syntax is
   based on syntax from RFC2806. Changes have been made to be
   compliant with RFC3966 and to define Dial Strings before the
   telephone number as well as afterwards.

```
   Dial-string-params   = pre-dial / post-dial / t33-subaddress
   pre-dial             = ";pred=" 1*(phonedigit /
                            dtmf-digit / pause-character)
   post-dial            = ";postd=" 1*(phonedigit /
                            dtmf-digit / pause-character)
   t33-subaddress       = ";tsub=" 1*phonedigit

   pause-character      = one-second-pause / wait-for-dial-tone
   one-second-pause     = "p"
   wait-for-dial-tone   = "w"
   dtmf-digit           = "*" / "A" / "B" / "C" / "D" / sharp-digit
   sharp-digit           = "%23"
```

5. Security Considerations

   The security considerations include those of the "tel" URI scheme
   [RFC3966]. Those consideration include that applications MUST NOT

use the URI to place calls without the explicit consent of the user
of that application. Placing calls without user consent exposes a
number of risks including:

o The call may incur a cost.

o The call will take the user's phone line off hook preventing its
   use by others.

o The call can reveal a user's phone number to an attacker.

o The URI may be used to place annoying or malicious calls.

o URIs embedded in HTML links could hide the true nature of the URI

The use of the Dial Strings introduces some additional security
concerns.

o Dial Strings parameters are locally significant. Using the Dial
   String parameters in another local telephone network may have
   unintended side effects.

o Dial String parameters that include account information and
   SHOULD NOT be publically (i.e. unencrypted) visible to other
   users.

6. IANA Considerations

   The Dial String parameters do not require IANA registration.

7. International Considerations

   The Dial String parameters have no international considerations
   since they consist of numbers, symbols and characters to be consumed
   by automata.

8. References

8.1. Normative References

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[RFC3966] H. Schulzrinne, "The tel URI for Telephone Numbers", RFC
          3966, Columbia University, December 2004.

[E.164]   International Telecommunications Union, "The international
          public telecommunication numbering plan", Recommendation
          E.164, May 1997.

 [T.33]   ITU-T Recommendation T.33: Facsimile Routing Utilizing the
          Subaddress. 1996.

8.2. Informative References

[RFC2806] A. Vaha-Sipila, "URLs for Telephone Calls", RFC 2806,
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9. Acknowledgments

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