

URLs for Telephony  
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Abstract

This document specifies a URL (Uniform Resource Locator) scheme 'callto' for specifying a location for an entity in the phone network and the connection types (modes of operation) that can be used to connect to that entity. This specification covers voice calls (normal phone calls, answering machines and voice messaging systems), facsimile (telefax) calls and data calls, both for POTS and digital/mobile subscribers.

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at its disposal, it is possible to specify which kind of call (voice/fax/data) is requested. It is also possible to give information about the capabilities of the remote entity.

## [2.2](#) callto URL Scheme

The callto URL does not have a 'path' in it - it is always absolute. Everything is case-insensitive, except for the "user-name" and "password", which may be case-sensitive in some environments.

Some characters are considered "reserved" and cannot be used in the free text fields (such as "user-name" and "password") without

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escaping them using URL encoding.

reserved = " " | ":" | "?" | ";" | "="

The URL syntax is formally described as follows:

```
callto-url      = scheme ":" scheme-specific-part
scheme          = 'callto'
scheme-specific-part = subscriber-id [type-specifier]
subscriber-id   = ["+"] phone-number
type-specifier  = [";type=" call-type]
call-type       = "voice" | "data" {[";params="
data-capabilities]
[";proto=" protocol-specifier]
[";user=" user-name] [";pass=" password]} |
"fax" [";params=" facsimile-capabilities]

phone-number    = 1*phonedigit [pause-character
*(phonedigit | dtmf-digit |
pause-character)]

phonedigit      = digit | "-"
pause-character = "p" | "w"
digit           = "0" | "1" | "2" | "3" | "4" | "5" |
"6" | "7" | "8" | "9"
dtmf-digit      = "*" | "#" | "A" | "B" | "C" | "D"
user-name       = 'a user name for authentication;
in URL-encoded notation'
password        = 'a password for authentication;
in URL-encoded notation'
protocol-specifier = "raw" | "ppp"
data-capabilities = modem-type ["?" data-bits parity
stop-bits]
data-bits       = "7" | "8"
parity          = "n" | "e" | "o" | "m" | "s"
stop-bits       = "1" | "2"
```

modem-type = "V21" | "V22" | "V22b" |  
"V23" | "V26" | "V32" |  
"V32b" | "V34" | "V110" |  
"V120" | "B103" | "B212" |  
"X75"  
facsimile-capabilities = "G1" | "G2" | "G3" | "G4"

"Subscriber-id" is the phone number to be dialed. This phone number SHOULD be written in international notation with country (CC) and area (NDC) codes, that is, both ITU-T CC and NSN elements SHOULD be present.

International numbers MUST begin with "+", which indicates that the number begins with a country code (CC). Hyphens are only to aid readability; they MUST NOT have any other meaning. Numbers that only work from inside a certain geographical area or from a certain network MUST NOT start with a "+". For the meaning of "p" and "w", see below.

"Type-specifier" specifies the call type (which kind of terminal

equipment is used or what services are requested from the network). If not defined, it defaults to "voice".

"Data-capabilities" is an optional field which indicates what kind of entity is answering at the other end. The "modem-type" field is present to indicate the line speed or protocol. The "modem-type" listed should be the one that offers the fastest connection. If several, incompatible modem types are connected to the same number, each of these is listed. Possible modem types are described below. Also, optional information on data bits, parity and stop bits may be provided for each "modem-type".

"Proto" is the definition of the protocol that is spoken over the data connection. If not specified, it defaults to "raw", which implies no higher-level protocol at either end (for example a terminal connection). "PPP" tells the user agent (client, caller) to start negotiating a PPP connection with the server.

"User-name" and "password" are the credentials used for authenticating the user. These direct the upper-level protocol or session that utilitises the newly created data connection. Use of this information is left to the user agent. When specified in a URL that directs the user agent to create a PPP connection this information SHOULD be used for PPP authentication. In a normal terminal ("raw") connection, this information MAY be utilised by automatic login scripts or a similar purpose.

"Facsimile-capabilities" inform the user agent about the remote

fax capabilities. These are described below.

### [2.3](#) Parsing a callto URL

A. The "subscriber-id" is extracted. If it begins with a "+", it is an international number. This kind of a number is converted to the user agent's local format (for example, if the agent is a browser component that dials out, the "+" is replaced by the international call prefix, or if the country code matches the country code of user agent's home country, the "+" and the country code are replaced by a domestic call prefix).

A phone number may contain "p" or "w" characters which indicate a pause of 1 second while dialing, or a wait for user input, respectively. User agents SHOULD support this method of dialing. If it is not supported, user agents MUST ignore everything after the "p" or "w" characters. All digits after the first "p" or "w" character MUST be sent to line using DTMF (Dual Tone Multifrequency) in-band signaling, even if dialing is done using direct network signaling (a digital subscriber loop or a mobile phone).

B. If there is no "type-specifier" after the "subscriber-id", the user agent MUST open a normal voice call, and if the true nature of the call type can be defined later (for example, modem/fax autodetection), user agent MAY opt to change to the detected mode.

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C. If there is a "type-specifier" after "subscriber-id", the user agent MUST call out using either a suitable terminal equipment (modem, telefax) or request that the network provides such a service. If call type is specified, calls MUST NOT be done in such a way that is incompatible with the recipient entity (such as calling a voice number with a modem, or calling a modem number with a telefax). Type specifiers are "voice" for normal voice call, or a call to a voice mailbox, or a voice messaging service; "fax" for a facsimile (telefax) call; "data" for a data call, with no processing of transferred data implied at either end by default; and data with a "ppp" protocol specifier for a data call where the caller (client) and the callee (server) should begin negotiating a PPP connection after the call has been established. What protocols are negotiated at this phase depends on the user agent's and server's capabilities and configuration. What happens after the call has been established is outside of the scope of this document.

D. If there are any parameters after "call-type", the user agent SHOULD parse the remote capabilities, such as the data

bits/parity/ stop bits and remote user name and password and adjust itself appropriately. The capability tokens are listed below. If listed capabilities have been parsed and suggest that it is impossible to create a connection, the connection MUST NOT be created.

Capability	Explanation
V21	ITU-T V.21
V22	ITU-T V.22
V22b	ITU-T V.22bis
V23	ITU-T V.23
V26t	ITU-T V.26ter
V32	ITU-T V.32
V32b	ITU-T V.32bis
V34	ITU-T V.34
V110	ITU-T V.110
V120	ITU-T V.120
X75	ITU-T X.75
B103	Bell 103
B212	Bell 212
G1	ITU-T T.2 (G1) facsimile
G2	ITU-T T.3 (G2) facsimile
G3	ITU-T T.4 (G3) facsimile
G4	ITU-T T.6 (G4) facsimile
Data bits: "8" or "7"	The number of data bits. If not specified, defaults to "8".
Parity: "n", "e", "o", "m", "s"	Parity. None, even, odd, mark or space parity, respectively. If not specified, defaults to "n".
Stop bits: "1" or "2"	The number of stop bits. If not specified, defaults to "1".
Protocol specifier: "ppp" or "raw"	The higher level protocol to be used over the raw data stream. If not

specified, defaults to "raw" which implies that the data stream does not contain any higher level protocol (for example, a terminal connection). "ppp" implies that PPP handshake should be started over the data stream.

## [2.4](#) Examples of Use

```
callto:+358-55-1234567
```

This URL instructs the user agent to place a voice call to the specified number in Finland. The hyphens are included to make the

number more human-readable: country and area codes have been separated from the subscriber number.

```
callto:+358-55-1234567;type=fax
```

The above URL instructs the user agent to place a fax call to the specified number.

```
callto:+358-55-1234567;type=data;params=v34?7e1;params=v110
```

This URL instructs the user agent to place a data call to the specified number. The user agent may opt to use either a ITU-T V.34 modem (or a slower one, which is compatible with V.34), using settings of 7 data bits, even parity and one stop bit, or an ISDN connection using ITU-T V.110 protocol.

```
callto:+358-55-1234567pp22
```

The above URL instructs the user agent to place a voice call to +358-55-1234567, then wait two seconds and emit two DMTF dialing tones "2" on the line (for example, to choose a particular extension number). (Most Hayes AT compatible modems accept commas ",", as the pause characters.)

### 3. References

[RFC1738] Uniform Resource Locators (URL). December 1994. T. Berners-Lee et al. <URL:ftp://ftp.ds.internic.net/rfc/rfc1738.txt>

[RFC2119] Key words for use in RFCs to Indicate Requirement Levels. March 1997. S. Bradner.  
<URL:ftp://ftp.ds.internic.net/rfc/rfc2119.txt>

### 4. Security Considerations

It should be noted that the user agent SHOULD NOT call out without the knowledge of the user because of associated risks, which include

- call costs (including long calls, long distance calls, international calls and prime rate calls)

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- wrong numbers inserted on web pages by malicious users
- making the user's phone line unavailable (off-hook) for a malicious purpose
- opening a data call to a remote host, thus possibly opening a back door to the user's computer

The user agent SHOULD have some mechanism that the user can use to filter out unwanted numbers. The user agent SHOULD NOT use rapid redialing of the number if it is busy to avoid the congestion of (signaling) network. Also, user agent SHOULD detect if the number is unavailable or if the call is terminated before the dialing string has been completely processed (for example, the call is terminated while waiting for user input) and not try to call again, unless instructed by the user.

## 5. Authors' Addresses

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