

## Minimal PSTN address format in Internet Mail

### Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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### IESG NOTE

This memo describes a simple method of encoding PSTN addresses in the local-part of Internet email addresses, along with an extension mechanism to allow encoding of additional standard attributes needed for email gateways to PSTN-based services.

As with all Internet mail addresses, the left-hand-side (local-part) of an address generated according to this specification, is not to be interpreted except by the MTA that is named on the right-hand-side (domain).

### 1. Introduction

Since the very first e-mail to PSTN services gateway appeared, a number of different methods to specify a PSTN address as an e-mail address have been used by implementors. Two major objectives for this were

- enable an e-mail user to access these services from his/her e-mail interface;
- enable some kind of "PSTN over e-mail service" transport, to reduce the costs of PSTN long distance transmissions, and use the existing e-mail infrastructure.

This memo describes the MINIMAL addressing method to encode PSTN addresses into e-mail addresses and the standard extension mechanism to allow definition of further standard elements. The opposite problem, i.e. to allow a traditional numeric-only PSTN device user to access the e-mail transport service, is not discussed here.

All implementations supporting this PSTN over e-mail service MUST support as a minimum the specification described in this document. The generic complex case of converting the whole PSTN addressing into e-mail is out of scope in this minimal specification: there is some work in progress in the field, where also a number of standard optional extensions are being defined.

In this document the formal definitions are described using ABNF syntax, as defined into [7]. We will also use some of the "CORE DEFINITIONS" defined in "APPENDIX A - CORE" of that document. The exact meaning of the capitalised words

"MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", "OPTIONAL"

is defined in reference [6].

## 2. Minimal PSTN address

The minimal specification of a PSTN address in e-mail address is as follows:

```
pstn-address = pstn-mbox [ qualif-type1 ]
pstn-mbox = service-selector "=" global-phone
service-selector = 1*( DIGIT / ALPHA / "-" )
                  ; note that SP (space) is not allowed in
                  ; service-selector.
                  ; service-selector MUST be handled as a case
                  ; INSENSITIVE string by implementations.
```

Specifications adopting the "pstn-address" definition MUST define a unique case insensitive "service-selector" element to identify the specific messaging service involved.

These specifications MUST also define which minimal "qualif-type1" extensions, if any, MUST be supported for the specified service.

Implementations conforming to these minimal requirements specification are allowed to ignore any other non-minimal extensions address element which can be present in the "pstn-address". However,

conforming implementations MUST preserve all "qualif-type1" address elements they receive.

The generic "qualif-type1" element is defined as:

```
qualif-type1 = "/" keyword "=" string

keyword = 1*( DIGIT / ALPHA / "-" )
          ; note that SP (space) is not allowed in keyword

string = PCHAR
         ; note that printable characters are %x20-7E
```

As such, all "pstn-address" extensions elements MUST be defined in the "qualif-type1" form.

## 2.1 Minimal "global-phone" definition

We now define the minimal supported syntax for global-phone:

```
global-phone = "+" 1*( DIGIT , written-sep )

written-sep = ( "-" / "." )
```

The use of other dialling schemas for PSTN numbers (like private numbering plans or local dialling conventions) is also allowed. However, this does not preclude nor remove the minimal compulsory requirement to support the "global-phone" syntax as defined above.

Any non "global-phone" dialling schema MUST NOT use the leading "+" between the "=" sign and the dialling string. The "+" sign is strictly reserved for the standard "global-phone" syntax.

Note:

The specification of these different dialling schemas is out of scope for this minimal specification.

User specification of PSTN e-mail addresses will be facilitated if they can insert these separators between dial elements like digits etc. For this reason we allow them in the syntax the written-sep element.

Implementors' note:

Use of the written-sep elements is allowed, but not recommended. Any occurrences of written-sep elements in a pstn-mbox MUST be ignored by all conformant implementations. User Agents SHOULD remove written-sep elements before submitting messages to the Message Transport System.

## 2.2 Some examples of a minimal "pstn-address"

VOICE=+3940226338

FAX=+12027653000/T33S=6377

SMS=+33-1-88335215

## 3. The e-mail address of the I-pstn device: mta-I-pstn

An "I-pstn device" has an e-mail address, or to be more exact, a name which enables a mail system to identify it on the e-mail global system.

In Internet mail, this is the Right Hand Side (RHS) part of the address, i.e. the part on the right of the "@" sign. We will call this "mta-I-pstn"

mta-I-pstn = domain

For "domain" strings used in SMTP transmissions, the string MUST conform to the requirements of that standard's <domain> specifications [1], [3]. For "domain" strings used in message content headers, the string MUST conform to the requirements of the relevant standards [2], [3].

Note: in both cases, the standards permit use of "domain names" or "domain literals" in addresses.

## 4. The pstn-email

The complete structure used to transfer a minimal PSTN address over the Internet e-mail transport system is called "pstn-email". This object is a an e-mail address which conforms to RFC822 [2] and RFC1123 [3] "addr-spec" syntax, with some extra structure which allows the PSTN number to be identified.

pstn-email = ["/"] pstn-address ["/"] "@" mta-I-pstn

Implementors' note:

The optional "/" characters can result from other mail transport services gateways, where it is also an optional element. Implementations MUST accept the optional slashes but SHOULD NOT generate them. Gateways are allowed to strip them off when converting to Internet mail addressing.

It is essential to remind that "pstn-address" element MUST strictly follow the "quoting rules" specified in the relevant standards [2], [3].

#### 4.1 Multiple subaddresses

In case a particular service requires multiple subaddresses (in any form defined by the specific standard specification for that service), and these subaddresses need to be given on the same "pstn-mbox", multiple "pstn-email" elements will be used.

Implementors' note:

The UA could accept multiple subaddress elements for the same global-phone, but it must generate multiple "pstn-mbox" elements when passing the message to the MTA.

#### 4.2 Some examples of "pstn-email"

VOICE=+3940226338@worldvoice.com

FAX=+1.202.7653000/T33S=6377@faxserv.org

/SMS=+33-1-88335215/@telecom.com

#### 5. Conclusions

This proposal creates a minimal standard encoding for PSTN addresses within the global e-mail transport system and defines the standard extension mechanism to be used to introduce specific new elements.

The proposal requires no changes to existing e-mail software. Each specific PSTN service using this proposal MUST define its own "service-selector" specification and MUST define the eventual other "qualif-type1" elements to be supported for its minimal addressing specification. An example is in reference [13].

#### 6. Security Considerations

This document specifies a means by which PSTN addresses can be encoded into e-mail addresses. As routing of e-mail messages is determined by Domain Name System (DNS) information, a successful attack on this service could force the mail path via some particular gateway or message transfer agent where mail security can be affected by compromised software.

There are several means by which an attacker might be able to deliver incorrect mail routing information to a client. These include: (a) compromise of a DNS server, (b) generating a counterfeit response to

a client's DNS query, (c) returning incorrect "additional information" in response to an unrelated query. Clients SHOULD ensure that mail routing is based only on authoritative answers. Once DNS Security mechanisms [5] become more widely deployed, clients SHOULD employ those mechanisms to verify the authenticity and integrity of mail routing records.

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## 8. References

- [1] Postel, J., "Simple Mail Transfer Protocol", STD 10, RFC 821, August 1982.
- [2] Crocker, D., "Standard for the format of ARPA Internet text messages", STD 11, RFC 822, August 1982.
- [3] Braden, R., "Requirements for Internet hosts - application and support", RFC 1123, October 1989.
- [4] Malamud, C. and M. Rose, "Principles of Operation for the TPC.INT Subdomain: Remote Printing -- Technical Procedures", RFC 1528, October 1993.
- [5] Eastlake, D. and C. Kaufman, "Domain Name System Security Extensions", RFC 2065, January 1997.
- [6] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119, March 1997.
- [7] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications", RFC 2234, November 1997.
- [8] ITU F.401 - Message Handling Services: Naming and Addressing for Public Message Handling Service; recommendation F.401 (August 1992)

- [9] ITU F.423 - Message Handling Services: Intercommunication Between the Interpersonal Messaging Service and the Telefax Service; recommendation F.423 (August 1992)
- [10] ITU E.164 - Numbering plan for the ISDN era; recommendation E.164/I.331 (August 1991)
- [11] ITU T.33 - Facsimile routing utilizing the subaddress; recommendation T.33 (July, 1996)
- [12] ETSI I-ETS 300,380 - Universal Personal Telecommunication (UPT): Access Devices Dual Tone Multi Frequency (DTMF) sender for acoustical coupling to the microphone of a handset telephone (March 1995)
- [13] Allocchio, C., " Minimal FAX address format in Internet Mail", RFC 2304, March 1998.
- [14] Kille, S., "MIXER (Mime Internet X.400 Enhanced Relay): Mapping between X.400 and RFC 822/MIME", RFC 2156, January 1998.

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