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## Minimal FAX 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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### Abstract

This memo describes a simple method of encoding Global Switched Telephone Network (GSTN) addresses of facsimile devices in the local-part of Internet email addresses.

### 1. Introduction

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).

Since the very first e-mail to fax gateway objects appeared, a number of different methods to specify a fax address as an e-mail address have been used by implementors. Several objectives for this methods have been identified, like to enable an e-mail user to send and receive faxes from his/her e-mail interface, to allow some kind of "fax over e-mail service" transport (possibly reducing the costs of GSTN long distance transmissions) while using the existing e-mail infrastructure.

This memo describes the MINIMAL addressing method and standard extensions to encode FAX addresses into e-mail addresses, as required in reference [13]. The opposite problem, i.e., to allow a traditional numeric-only fax device user to access the e-mail transport service, is not discussed here.

These IANA forms used to register the standard elements defined here are given in the "IANA Considerations" chapter (section 7 of this document).

All implementations supporting FAX over e-mail address format MUST support this minimal specification.

## 1.1 Terminology and Syntax conventions

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 capitalized words

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

is defined in reference [6].

In this document the following new terms are also defined:

I-fax device:

an I-pstn device type [13] which is able to communicate either directly or indirectly with the traditional FAX over GSTN service;

mta-I-fax:

the Internet domain name which identifies uniquely an I-fax device over the Internet (see also mta-I-pstn in [13]);

fax-email:

the complete Internet e-mail address structure which is used to transport a FAX address over the Internet e-mail service (see also pstn-email in [13]).

## 2. Minimal Fax address

The minimal fax address within e-mail has been defined for consistency with reference [13] and it contains two elements: the fax-mbox and an optional qualif-typel element.

More precisely the GSTN minimal address specification requires the use of a unique service-selector for each specific application (section 2 in [13]).

The "service-selector" defined for the fax service is as follows:

service-selector = "FAX"

In the syntax for the fax address a `qualif-type1` element has been defined for support of T.30/T.33 subaddresses (see section 2 of [13]). The use of this element is OPTIONAL, but compliant implementations MUST be able to support and correctly interpret it when present. Its definition is as follows:

```
qualif-type1 = "/" t33-sep "=" sub-addr
```

where

```
t33-sep = "T33S"
```

```
sub-addr = 1*( DIGIT )
```

Thus, the minimal specification of a fax in e-mail address is:

```
fax-address = fax-mbox [ "/T33S=" sub-addr ]
```

```
fax-mbox = "FAX=" global-phone
```

Notes:

For the case of a single subaddress, only numbers are allowed in `<sub-addr>` which is consistent with T.30, T.33, and this document. While T.30 and T.33 use SPACE to pad its field, padding isn't necessary in the `<sub-addr>` field defined by this document.

For the case of multiple subaddresses, T.33 specifies the "#" character be used to specify multiple subaddresses. However, only digits are permitted in the `<sub-addr>` field defined by this document. Refer to section 4.1 in case multiple `<sub-addr>` per `<fax-mbox>` need to be specified.

The Minimal supported syntax for `global-phone` (as described in section 2.1 of reference [13]) is:

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

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

Refer to section 2.1 in [13] for other important considerations about the `global-phone` element.

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

Some examples of minimal fax-address follows:

FAX=+3940226338

FAX=+12027653000/T33S=1387

FAX=+33-1-88335215

Note:

the examples shown are just for illustration purposes.

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

An "I-fax device" has, among its characteristics, a unique Internet domain name which identifies it on the Internet. Within Internet mail, this is the Right Hand Side (RHS) part of the address, i.e., the part on the right of the "@" sign. For purposes of this document we will call this "mta-I-fax"

mta-I-fax = domain

For "domain" strings used in SMTP transmissions, the string MUST conform to the requirements of that standards <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:

the use of "domain names" or "domain literals" is permitted in addresses in both the SMTP envelope and message header fields.

### 4. The fax-email

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

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

Implementors' note:

The optional "/" characters can result from translations from other transport gateways (such as some X.400 gateways) which have included the "/" as 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. The relevant standard [2], [3] define exactly when the optional "quotes" characters surrounding the entire local part (i.e., the part on the left of the "@" character into the fax-email) MUST be added.

#### 4.1 Multiple subaddresses

There are some instances in GSTN applications where multiple subaddresses are used: T.33 subaddresses in fax service are one of these cases. In e-mail practice a separate and unique e-mail address is always used for each recipient; as such, if multiple T.33 subaddresses are present, the use of multiple "fax-email" elements is REQUIRED.

Implementors' note:

The UA MAY accept multiple subaddress elements for the same global-phone, but it MUST generate multiple "fax-mbox" elements when submitting the message to the MTA.

#### 4.2 Some examples of minimal "fax-email"

Some examples of minimal fax-email addresses follows:

FAX=+3940226338@faxworld.org

FAX=+12027653000/T33S=1387@faxworld.org

/FAX=+33-1-88335215/@faxworld.org

Note:

the examples shown are just for illustration purposes.

#### 5. Conclusion

This proposal creates a minimal standard encoding for FAX addresses within the global e-mail transport system. The proposal is consistent with existing e-mail standards.

#### 6. Security Considerations

This document specifies a means by which FAX addresses can be encoded into e-mail addresses. Since e-mail routing is determined by Domain Name System (DNS) data, a successful attack to DNS could disseminate tampered information, which causes e-mail messages to be diverted via some MTA or Gateway where the security of the software has been compromised.

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.

## 7. IANA Considerations

The IANA registration forms for "FAX" service-selector and "T33S" qualif-typel elements are defined here. These forms update the previous registration forms defined in [15].

### 7.1 IANA Registration form for updated value of GSTN address service-selector "FAX"

To: IANA@iana.org  
Subject: Registration of updated values for the GSTN address service-selector specifier "FAX"

service-selector name:

FAX

Description of Use:

FAX - specify that the GSTN address refers either to an Internet Fax device, or an onramp/offramp Fax gateway.

For a complete description refer to RFC 3192 and RFC 3191.

Security Considerations:

See the Security Consideration section of RFC 3192.

Person & email address to contact for further information:

Claudio Allocchio  
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c/o Sincrotrone Trieste  
SS 14 Km 163.5 Basovizza  
I 34012 Trieste  
Italy

RFC2822: Claudio.Allocchio@garr.it  
X.400: C=it;A=garr;P=garr;S=Allocchio;G=Claudio;  
Phone: +39 040 3758523  
Fax: +39 040 3758565

7.2 IANA Registration form for updated value of GSTN  
address qualif-typel keyword "T33S" and value

To: IANA@iana.org  
Subject: Registration of updated values for the GSTN address  
qualif-typel element "T33S"

qualif-typel "keyword" name:

T33S

qualif-typel "value" ABNF definition:

sub-addr = 1\*( DIGIT )

Description of Use:

T33S is used to specify the numeric only optional fax sub-address element described in "ITU T.33 - Facsimile routing utilizing the subaddress; recommendation T.33 (July, 1996)". Further detailed description is available in RFC 3192.

Use Restriction:

The use of "T33S" is restricted to "FAX" service-selector, is it has no meaning outside the fax service.

Security Considerations:

See the Security Consideration section of RFC 3192.

Person & email address to contact for further information:

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RFC2822: Claudio.Allocchio@garr.it  
X.400: C=it;A=garr;P=garr;S=Allocchio;G=Claudio;  
Phone: +39 040 3758523  
Fax: +39 040 3758565

## 8. Changes since RFC 2304 specification

Although there are no major or technical changes from RFC 2304 specification, this section briefly describes where updates and clarifications were introduced:

- considering the case that telephony systems do not conform any more to the "single/few" Public Operator paradigm, the old definition "PSTN - Public Switched Telephone Network" was changed into the more adequate "GSTN - Global Switched Telephone Network" one. However, in order to remain consistent with the previous specification, the ABNF variables names were not changed.
- section 7 "IANA Considerations" and the IANA registration forms for the "FAX" "service-selector" and for the "T33S" "qualif-type1" elements were added;
- an explicit list of "new terms" with explanations was added to section 1.1;
- the case when multiple T.33 subaddresses are present was described more explicitly in order to clarify how to handle them (section 4.1);
- in section 3 the language describing "mta-I-fax" was updated to better describe its relationship with an Internet Mail address;
- in section 4., the quoting rules of the "fax-address" and their practical use was made explicit both in the definition of "fax-email" and in the Implementors' note;
- the Author's Address was updated;
- the References list was updates to substitute ITU E.164 (1991) with ITU E.164 (1997).

9. Author's Address

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SS 14 Km 163.5 Basovizza  
I 34012 Trieste  
Italy

RFC2822: Claudio.Allocchio@garr.it  
X.400:    C=it;A=garr;P=garr;S=Allocchio;G=Claudio;  
Phone:    +39 040 3758523  
Fax:      +39 040 3758565

10. 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", STD 3, 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.
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- [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 - The International Public Telecommunication Numbering Plan E.164/I.331 (May 1997).

- [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 GSTN address format in Internet Mail", RFC 3191, October 2001.
- [14] Kille, S., "MIXER (Mime Internet X.400 Enhanced Relay): Mapping between X.400 and RFC 822/MIME", RFC 2156, January 1998.
- [15] Allocchio, C., "GSTN address element extensions in e-mail services", RFC 2846, June 2000.

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