

GSTN Address Element Extensions in E-mail Services

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.

Copyright Notice

Copyright (C) The Internet Society (2000). All Rights Reserved.

Abstract

There are numerous applications where there is a need for interaction between the GSTN addressing and Internet addressing. This memo defines a full syntax for one specific case, where there is a need to represent GSTN addresses within Internet e-mail addresses. This full syntax is a superset of a minimal syntax which has been defined in [1].

1. Introduction

The possible elements composing a "Global Switched Telephone Network (GSTN) address in e-mail" (also known as the Public Switched Telephone Network - PSTN) can vary from a minimum number up to a really large and complex collection. As noted the minimal format and general address syntax have been defined in [1], along with the mechanism needed to define additional address elements. This memo uses this extension mechanism to complete the syntax for representing GSTN addresses within e-mail addresses and contains the IANA registrations for all newly defined elements.

In particular, the following additional address elements shall be defined:

- the detailed definition of GSTN number formats, in order to cover various alternative standard GSTN numbering schemes, (i.e. gstn-phone, sub-addr-spec and post-dial)

- the message originator and/or recipient specification (pstn-recipient)

GSTN addresses in e-mail MAY contain additional elements defined and registered in other specifications (see for example "T33S" element in [2]), but they MUST use definitions contained in this memo for those elements specified here.

In particular, "service-selector" names and "qualif-type1" elements MUST be registered with IANA, and published within the "ASSIGNED NUMBERS" document. This provides a standard mechanism for extending the element sets and should avoid unnecessary duplication. IANA Registration form templates for the purpose of registering new elements are provided in Appendix B. In addition the IANA consideration section of this document defines the procedures required to proceed with new registrations.

A collection of forms for already defined "service-selector" and "qualif-type1" elements is listed in appendix C and appendix D respectively.

In particular, efforts have been made to maintain compatibility with elements defined in existing e-mail gateway services and standard specifications. For example, to the extent possible, compatibility has been maintained with the MIXER [3] gateways specifications.

1.1 Relationship with Internet addressing other than e-mail

Even if in this memo we focus on e-mail addresses, a number of elements defined in this specification can also be used for other specifications dealing with embedding GSTN addresses into other addresses: for example there is some work in progress about URLs specification which adopts similar definitions, with slight changes in the global syntax due to specific URL format.

1.2 Terminology and Syntax conventions

In this document the formal definitions are described using ABNF syntax, as defined into [4]. 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 [5].

2. GSTN extended number and pstn-mbox extended format

In reference [1], section 2, the minimal definition of pstn-mbox includes the global-phone element, and further details are defined in [1] section 2.1.

However other non global-phone numbering schemes are also possible. Thus, the minimal set syntax defined in [1] shall be extended to enable support for local-phone elements. Therefore, the gstn-phone format is defined as follows:

```
gstn-phone = ( global-phone / local-phone )
```

The complexity of the GSTN system includes also the optional use of subaddresses and post dialling sequences. As a consequence, there is a need to extend the definition of pstn-mbox per [1] to include support for both the minimal set definition and an extended syntax.

The expanded definition of pstn-mbox is as follows:

```
pstn-mbox = service-selector "=" global-phone
```

```
pstn-mbox =/ service-selector "=" gstn-phone  
            [ sub-addr-spec ] [post-sep post-dial]
```

NOTE: see section 4 in the event multiple "sub-addr-spec" elements per pstn-mbox need to be specified.

2.1 The local-phone syntax

The local-phone element is intended to represent the set of possible cases where the global-phone numbering schema does not apply. Given the different and complex conventions currently being used in the GSTN system, the local-phone definition supports a large number of elements.

The detailed syntax for local-phone elements follows:

```
local-phone = [ exit-code ] [ dial-number ]
```

```
exit-code = phone-string  
           ; this will include elements such as the digit to  
           ; access outside line, the long distance carrier  
           ; access code, the access password to the service,  
           ; etc...
```

```
dial-number = phone-string
              ; this is in many cases composed of different elements
              ; such as the local phone number, the area code
              ; (if needed), the international country code
              ; (if needed), etc...
```

Note:

the "+" character is reserved for use in global-phone addresses per [7] and MUST NOT be used as the starting character in a local-phone string.

```
phone-string = 1*( DTMF / pause / tonewait / written-sep )
```

```
DTMF = ( DIGIT / "#" / "*" / "A" / "B" / "C" / "D" )
        ; special DTMF codes like "*", "#", "A", "B",
        ; "C", "D" are defined in [6]
        ; Important Note: these elements only apply for
        ; alphabetic strings used in DTMF operations.
        ; They are NOT applicable for the alphabetic
        ; characters that are mapped to digits on phone
        ; keypads in some countries.
```

```
pause = "p"
```

```
tonewait = "w"
```

The written-sep element is defined in [1], section 2.1.

Note:

"pause" and "tonewait" character interpretation in local-phone numbers depends on the specific MTA implementation. Thus its exact meaning is not defined here. Both "pause" and "tonewait" are case insensitive.

Important Note:

A local-phone specification is a sequence which should be used only by the destination MTA specified by mta-I-pstn (see [1], section 3). Per [12], other MTAs should transfer the message without modifying the LHS.

2.2 The sub-addr-spec element

In GSTN service there are cases where a sub-addr-spec is required to specify the final destination. In particular there are ISDN subaddresses [7], which apply for various services, whereas other subaddress types may be service specific (see the fax service T.33 subaddress [8], [2]).

Within actual telephone operations there may be cases where different types of subaddresses are used as part of a single complete address. Therefore, the sub-addr-spec syntax definition which follows defines the subaddress element for the context of ISDN use; the T.33 subaddress element is defined in [2], section 2.

The definition of sub-addr-spec is:

```
sub-addr-spec = [ isdn-sep isub-addr ]
```

In detail:

```
isdn-sep = "/ISUB="
           ; note that "/ISUB=" is case INSENSITIVE
```

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

```
isub-addr =/ 1*( DIGIT / written-sep )
```

The IANA registration form for sub-addr-spec is given in appendix D.2

2.3 The post-sep and post-dial elements

In some cases, after the connection with the destination GSTN device has been established, a further dialling sequence is required to access further services. A typical example is an automated menu-driven service using DTMF sequences. These cases may be handled using "post-sep" and "post-dial" elements as defined below:

```
post-sep = "/POSTD="
           ; note that "/POSTD=" is case INSENSITIVE
```

```
post-dial = phone-string
```

The IANA registration form for post-sep and post-dial are given in appendix D.3

3. The pstn-recipient

There are some application where it is valuable to supplement the pstn-mbox element with additional details. Common examples include the use of originator and/or recipient names and physical addresses, particularly in the context of onramp and/or offramp gateways.

The optional pstn-recipient element provides support for such details.

As an example, when an offramp fax gateway is involved, the pstn-recipient element could be used to specify the intended recipient on a fax cover page, and the fax cover page headers could be qualified using the originator pstn-recipient information.

In the interest of a compact syntax, the pstn-recipient element may be used to support both originator and recipient addresses. For all cases within the ABNF definitions to follow, the elements labelled with "recipient" may also be used for originator information.

The pstn-recipient is a sequence of qualif-type1 elements as defined below:

```
pstn-recipient = [ recipient-name ]
                  [ 1*( recipient-qualifier ) ]
```

As a consequence, the extended definition of pstn-address becomes:

```
pstn-address = pstn-mbox [ qualif-type1 ]
pstn-address =/ pstn-mbox [ pstn-recipient ] [ qualif-type1 ]
```

The definition for qualif-type1 elements is contained in [1] section 2.

3.1 The recipient-name

The recipient-name specifies the personal name of the originator and/or recipient:

```
recipient-name = "/ATTN=" pers-name
pers-name = [ givenname "." ]
             [ initials "." ]
             surname
```

The following definitions come directly from the MIXER specification [3]:

```
surname = printablestring
givenname = 1*( DIGIT / ALPHA / SP / "'" / "+" /
                "," / "-" / "/" / ":" / "=" / "?" )
initials = 1*ALPHA
```

Note:

the "initials" element can specify the middle initial which is common in some countries; however it is also possible to support multiple initials, which may be commonly used in other countries. This allows the complete set of givennames initials in any possible combination. See examples at section 5.2

It is essential to remember that the "pstn-address" element (in all its components and extensions) MUST strictly follow the "quoting rules" specified in the relevant e-mail standards [11], [12].

The IANA registration form for recipient-name is given in appendix D.4.

3.2 The extensible recipient-qualifier

The recipient-name is sometimes not enough to specify completely the originator and/or recipient. An additional set of optional elements, whose specific definition is in most cases application dependent, is thus defined:

```
recipient-qualifier = ( qualif-type1 / qualif-type2 )
```

The recipient-qualifier is a qualif-type1 element, and contains a qualif-type1 element in a recursive definition which allows an extensible format. The purpose of qualif-type2 element is to permit additional extensibility for items which go beyond the scope of those defined for use with the qualif-type1 element.

A series of qualif-type2 elements are defined below:

```
qualif-type2 = "/" qual2-label "=" string
```

```
qual2-label = "ORG" / "OFNO" / "OFNA" / "STR" / "ADDR"
              "ADDU" / "ADDL" / "POB" / "ZIP" / "CO"
```

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

```
printablestring = 1*( DIGIT / ALPHA / SP /
                      "'" / "(" / ")" / "+" / "," / "-" /
                      "." / "/" / ":" / "=" / "?" )
                ; this definition comes from ITU F.401 [9]
                ; and MIXER [3]
```

Table 1 includes short definition of qual2-label fields:

Table 1 - qual2-label

qual2-label	Description
"ORG"	Organization Name for Physical Delivery (example: ACME Inc)
"OFNO"	Office Number for physical delivery (example: BLD2-44)
"OFNA"	Office Name for physical delivery (example: Sales)
"STR"	Street address for physical delivery (example: 45, Main Street)
"ADDR"	Unformatted postal address for physical delivery (example: HWY 14, Km 94.5 - Loc. Redhill)
"ADDU"	Unique postal name for physical delivery (example: ACMETELEX)
"ADDL"	Local postal attributes for physical delivery (example: Entrance 3, 3rd floor, Suite 296)
"POB"	Post Office Box for physical delivery
"ZIP"	Postal ZIP code for physical delivery
"CO"	Country Name for physical delivery

One or a combination of some of the above elements is usually enough to exactly specify the originator and/or recipient of the message. The use of a large number of these elements could in fact create a very long recipient-qualifier. Thus, only the strictly needed elements SHOULD be used. The maximum total length of the pstn-email MUST in fact not exceed the limits specified in the relevant e-mail standards [11] [12].

IMPORTANT NOTE: Although the meaning of the above elements is derived directly from similar elements available in F.401 specification [9], the naming convention used in this document is explicitly different. In this way a conflict is avoided with related X.400 addressing rules. Other specification which use the extension mechanism of this document to define new qualif-type1 elements which overlap with F.401 are cautioned to create new labels which are different than those used in F.401.

The IANA registration form for these elements is given in appendix D.5 to D.14.

4. Multiple sub-addr-spec cases

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 subaddresses are present, the use of multiple "pstn-email" elements [1] is REQUIRED.

Implementors' note:

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

5. Examples

In order to clarify the specification we present here a limited set of examples. Many of the examples refer to the fax service, but also additional possible services are included. Check also the examples in [1] and [2] for additional information. Please note that all the examples are for illustration purposes, only.

5.1 pstn-mbox examples

A pstn-mbox address in Italy for the fax service, dialled from U.S.A., using local-phone, without sub-addr-spec and without written-sep:

FAX=0103940226338

A pstn-mbox address in Germany for an hypothetical XYZ service, using global-phone, with ISDN sub-addr-spec 1234 and written-sep ".":

XYZ=+49.81.7856345/ISUB=1234

A pstn-mbox address in U.S.A. for fax service, using global-phone, with T.33 sub-addr-spec 8745, with written-sep "-" and post-dial sequence plw7005393w373

FAX=+1-202-455-7622/T33S=8745/PostD=plw7005393w373

A pstn-mbox address in Italy for fax service, using local-phone, dialed from an MTA in Germany, (international access code "00", with ISDN subaddress 9823, with T.33 subaddress "4312" and without pause or written-sep:

FAX=003940226338/Isub=9823/T33S=4312

The same pstn-mbox address in Italy, using local-phone dialed from an MTA in Italy (long distance call), with long distant access "0", with exit-code "9", T.33 subaddress "4312", pause "p" and written-sep ".":

FAX=9p040p22.63.38/t33s=4312

A pstn-mbox address in North America for hypothetical service XYZ, using global-phone, without sub-addr-spec and written-sep "-" and ".":

XYZ=+1.202.344-5723

A pstn-mbox address for fax service in France, using local-phone dialed from an MTA in France (long distance call), with exit-code "0", T.33 subaddress "3345" and pause "p":

FAX=0p0134782289/T33s=3345

A pstn-mbox address for fax service in North America, using local-phone, without sub-addr-spec, without local-number, using only post-dial sequences to reach numbers stored in a locally defined short-dial numbers database, where 6743 is an access password, and 99p51 is the sequence to access the local short-dial number:

FAX=/postd=w6743w99p51

5.2 pstn-recipient examples

Here are a number of pstn-recipient examples. Please note that pstn-recipient is just an optional element, and thus a pstn-mbox element also is required in a pstn-address.

A pstn-recipient using only recipient-name, with givenname initials and surname:

/ATTN=Tom.J.Smiths

A pstn-recipient using only recipient-name, with givenname, a complete set of initials (including the first name initial "C") and surname (where the "real life" givennames are "Carlo Maria Luis Santo" and the surname is "Nascimento"):

/ATTN=Carlo.CMLS.Nascimento

A pstn-recipient using only recipient-name, with givenname and surname:

/ATTN=Mark.Collins

A pstn-recipient using only recipient-name, with surname only:

/ATTN=Smiths

A pstn-recipient using recipient-name, and one recipient-qualifier element:

/ATTN=J.Smiths/OFNA=Quaility-control

A pstn-recipient using two recipient-qualifier extension, only:

/OFNO=T2-33A/OFNA=Quality-Ccontrol

A fax-recipient using some recipient-qualifier for physical delivery:

/STR=45, Main.Street/OFNA=Sales.dept

5.3 pstn-address examples

Some pstn-address examples, obtained combining elements from previous examples. There are complete addresses which can be used as "local part" (LHS) element of an e-mail address.

Without optional pstn-recipient (fax service):

FAX=+12023445723

With pstn-recipient (XYZ service):

XYZ=+3940226338/ATTN=Mark.Collins

With pstn-recipient made of two recipient-qualifier extensions (fax service):

FAX=9p040p22.63.38/t33s=4312/ofno=T2-33A/OFNA=Q-C

5.4 pstn-email examples

Here are the same addresses as before, where "faxgw" is the mta-I-pstn field for the fax service.

FAX=+12023445723@faxgw

FAX=+39-40-226338/ATTN=Mark.Collins@faxgw

FAX=9p040p226338/T33S=4312/OFNO=T2-33A/OFNA=Q-C@faxgw

FAX=+39040226338/ATTN=Mark.Collins/@faxgw

NOTE: the optional "/" in front for the "@" sign can be generated by gateways to other services, like MIXER [3].

5.5 A complete SMTP transaction example:

Here is an example of complete SMTP transaction.

```
S: <listening on SMTP port>
C: <opens connection to SMTP port>
S: 220 foo.domain.com ESMTP service ready
C: EHLO pc.mailfax.com
S: 250 foo.domain.com says hello
C: MAIL FROM:<tom@mailfax.com>
S: 250 <tom@mailfax.com> Sender ok
C: RCPT TO:<FAX=+3940226338@foo.mailfax.com>
S: 250 <FAX=+3940226338> recipient ok
C: DATA
S: 354 Enter your data
C: From: Thomas Blake <tom@mailfax.com>
C: To: Jim Burton <FAX=+3940226338@foo.mailfax.com>
C: Subject: Hello there
C: MIME-version: 1.0
C: Date: Mon, 01 Sep 1997 18:14:23 -0700
C: Content-Type: multipart/mixed; boundary=16820115-1435684603#2306
C:
C: This is a MIME message. It contains a
C: TIFF fax bodypart
C:
C: --16820115-1435684603#2306
C: Content-Type: image/TIFF
C: Content-Transfer-Encoding: BASE64
C: Content-Description: FAX
C:
C: ABAA745HDKLSW932ALSDL3ANCVSASDFLALSDFA
C: 87AASS2999499ASDANASDF0000ASDFASDFNANN
C: 87BBHDXBADS00288SADFNAZBZNNDNNSNNA11A0
C: H8V73KS0C8JS6BFJEH78CDWWDUJEDF7JKES8==
C: --16820115-1435684603#2306--
C: .
S: 250 Okay
C: QUIT
S: 221 Goodbye
```

6. Conclusion

This proposal creates a standard set of extensions for GSTN addresses, enriching the existing minimal specification [1]. The proposal is consistent with existing e-mail standards, but allows a more detailed GSTN address specification, including per originator and/or recipient specific elements. The IANA registration mechanism to permit the addition of new services and qualifiers using the GSTN addresses is also provided.

7. Security Considerations

This document specifies a means by which GSTN addresses and more 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 are based only on authoritative answers. Once DNS Security mechanisms [7] become more widely deployed, clients SHOULD employ those mechanisms to verify the authenticity and integrity of mail routing records.

Some GSTN service require dialing of private codes, like Personal Identification Numbers, to dial a G3 fax recipient or to access special services. As e-mail addresses are transmitted without encoding over the MTAs transport service, this could allow unauthorized people to gain access to these codes when used inside local-phone. More over these codes might appear in some cases in the originator and/or recipient addresses on cover pages delivered via offramp gateways to G3 fax recipients. Senders SHOULD be provided methods to prevent this disclosure, like code encryption, or masquerading techniques: out-of-band communication of authorization information or use of encrypted data in special fields are the available non-standard techniques.

8. Appendix A: Collected ABNF Syntax

In this section we provide a summary of ABNF specifications defining both the minimal [1] and the extended elements of pstn-address.

```
pstn-email = [ "/" ] pstn-address [ "/" ] "@" mta-I-pstn
mta-I-pstn = domain
pstn-address = pstn-mbox [ qualif-type1 ]
pstn-address = / pstn-mbox [ pstn-recipient ] [ qualif-type1 ]
pstn-mbox = service-selector "=" global-phone
pstn-mbox = / service-selector "=" gstn-phone
               [ sub-addr-spec ] [ post-sep post-dial ]
service-selector = 1*( DIGIT / ALPHA / "-" )
qualif-type1 = "/" keyword "=" string
keyword = 1*( DIGIT / ALPHA / "-" )
string = PCHAR
gstn-phone = ( global-phone / local-phone )
global-phone = "+" 1*( DIGIT , written-sep )
local-phone = [ exit-code ] [ dial-number ]
exit-code = phone-string
dial-number = phone-string
phone-string = 1*( DTMF / pause / tonewait / written-sep )
DTMF = ( DIGIT / "#" / "*" / "A" / "B" / "C" / "D" )
written-sep = ( "-" / "." )
pause = "p"
tonewait = "w"
sub-addr-spec = [ isdn-sep isub-addr ]
```

```

isdn-sep = "/ISUB="
isub-addr = 1*( DIGIT )
isub-addr =/ 1*( DIGIT / written-sep )
post-sep = "/POSTD="
post-dial = phone-string
pstn-recipient = [ recipient-name ]
                  [ 1*( recipient-qualifier ) ]
recipient-name = "/ATTN=" pers-name
pers-name = [ givenname "." ]
             [ initials "." ]
             surname
surname = printablestring
givenname = 1*( DIGIT / ALPHA / SP / "'" / "+" /
               "," / "-" / "/" / ":" / "=" / "?" )
initials = 1*ALPHA
recipient-qualifier = ( qualif-type1 / qualif-type2 )
qualif-type2 = "/" qual2-label "=" string
qual2-label = "ORG" / "OFNO" / "OFNA" / "STR" / "ADDR"
              "ADDU" / "ADDL" / "POB" / "ZIP" / "CO"
printablestring = 1*( DIGIT / ALPHA / SP /
                      "'" / "(" / ")" / "+" / "," / "-" /
                      "." / "/" / ":" / "=" / "?" )

```

10. Appendix B: IANA Considerations

As the service-selector and qualif-type1 elements values are extensible ones, they MUST be registered with IANA.

To register a service-selector or a qualif-type1 element, the registration form templates given in B.1 and B.2 MUST be used. Any new registration MUST fulfill the "Specification Required" criterion, as defined in RFC 2434, section 2 [13]:

"Specification Required - Values and their meaning MUST be documented in an RFC or other permanent and readily available reference, in sufficient detail so that interoperability between independent implementations is possible."

IANA MUST NOT accept registrations which are not supplemented by a Specification as defined above and which are not fully specified according to the template forms given in B.1 and B.2. In case of need for further consultation about accepting a new registration, IANA SHOULD refer to the Application Area Director to be directed to the appropriate "expert" individual or IETF Working Group.

After successful registration, IANA should publish the registered new element in the appropriate on-line IANA WEB site, and include it into the updates of the "Assigned Numbers" RFC series.

B.1: IANA Registration form template for new values of GSTN address service-selector

To: IANA@isi.edu

Subject: Registration of new values for the GSTN address
service-selector specifier "foo"

service-selector name:

foo

Description of Use:

foo - ("foo" is a fictional new service-selector used in this template as an example, it is to be replaced with the new value being registered. Include a short description of the use of the new value here. This MUST include reference to Standard Track RFCs and eventually to other Standard Bodies documents for the complete description; the use of the value must be defined completely enough for independent implementation).

Security Considerations:

(Any additional security considerations that may be introduced by use of the new service-selector parameter should be defined here or in the reference Standards Track RFCs)

Person & email address to contact for further information:

(fill in contact information)

INFORMATION TO THE SUBMITTER:

The accepted registrations will be listed in the "Assigned Numbers" series of RFCs. The information in the registration form is freely distributable.

B.2: IANA Registration form template for new values of GSTN address `qualif-type1` keyword and value

To: IANA@isi.edu

Subject: Registration of new values for the GSTN address
 `qualif-type1` element "bar"

`qualif-type1` "keyword" name:

bar

`qualif-type1` "value" ABNF definition:

abnf - ("abnf" MUST define the ABNF form of the `qualif-type1` value. The ABNF specification MUST be self-contained, using as basic elements the tokens given in specification [4]. To avoid any duplication (when appropriate), it MUST also use as building non-basic tokens any already registered non-basic token from other `qualif-type1` elements, i.e. it MUST use the same non-basic token name and then repeat its identical ABNF definition from basic tokens; see appendix E for examples).

Description of Use:

bar - ("bar" is a fictional description for a new `qualif-type1` element used in this template as an example. It is to be replaced by the real description of `qualif-type1` element being registered. Include a short description of the use of the new `qualif-type1` here. This MUST include reference to Standards Track RFCs and eventually to other Standard Bodies documents for the complete description; the use of the value MUST be defined completely enough for independent implementation.)

Use Restriction:

(If the new `qualif-type1` elements is meaningful only for a specific set of service-element, you MUST specify here the list of allowed service-element types. If there is no restriction, then specify the keyword "none")

Security Considerations:

(Any additional security considerations that may be introduced by use of the new service-selector parameter should be defined here or in the reference Standards Track RFCs)

Person & email address to contact for further information:

(fill in contact information)

INFORMATION TO THE SUBMITTER:

The accepted registrations will be listed in the "Assigned Numbers" series of RFCs. The information in the registration form is freely distributable.

11. Appendix C: IANA Registration form for new value of GSTN address service-selector "FAX"

To: IANA@isi.edu

Subject: Registration of new 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 2304 and RFC 2303

Security Considerations:

See the Security Consideration section of RFC 2304.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

12. Appendix D: IANA Registration forms for new values of GSTN address qualif-type1 keyword and value

D.1 - T33S

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "T33S"

qualif-type1 "keyword" name:

T33S

qualif-type1 "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 2304.

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 2304.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.2 - ISUB

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "ISUB"

qualif-type1 "keyword" name:

ISUB

qualif-type1 "value" ABNF definition:

```
isub-addr = 1*( DIGIT )  
  
isub-addr =/ 1*( DIGIT / written-sep )  
  
written-sep = ( "-" / "." )
```

Description of Use:

"ISUB" is used to specify the optional ISDN sub-address elements used in ISDN service to reach specific objects on the ISDN service. It can eventually embed written separator elements for the only scope to enhance human readability. See RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.3 - POSTD

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "POSTD"

qualif-type1 "keyword" name:

POSTD

qualif-type1 "value" ABNF definition:

```
phone-string = 1*( DTMF / pause / tonewait / written-sep )  
DTMF = ( DIGIT / "#" / "*" / "A" / "B" / "C" / "D" )  
pause = "p"  
tonewait = "w"  
written-sep = ( "-" / "." )
```

Description of Use:

POSTD is the optional further dialling sequence needed to access additional services (for example a menu' driven interface) available after the service site has been accessed using gstn-phone. See RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.4 - ATTN

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "ATTN"

qualif-type1 "keyword" name:

ATTN

qualif-type1 "value" ABNF definition:

pers-name = [givenname "."] [initials "."] surname

surname = printablestring

givenname = 1*(DIGIT / ALPHA / SP / "'" / "+" /
", " / "-" / "/" / ":" / "=" / "?")

initials = 1*ALPHA

printablestring = 1*(DIGIT / ALPHA / SP /
"'" / "(" / ")" / "+" / "," / "-" /
"." / "/" / ":" / "=" / "?")

Description of Use:

To specify the personal name of the individual intended as the originator or the recipient of the message. See RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.5 - ORG

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "ORG"

qualif-type1 "keyword" name:

ORG

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Organization Name (example: ACME Inc.) See RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it

X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;

Phone: +39 040 3758523

Fax: +39 040 3758565

D.6 - OFNO

To: IANA@isi.edu

Subject: Registration of new values for the GSTN address
qualif-type1 element "OFNO"

qualif-type1 "keyword" name:

OFNO

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Office Number (example: BLD2-44) See RFC 2846
for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.7 - OFNA

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "OFNA"

qualif-type1 "keyword" name:

OFNA

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Office Name (example: Sales) See RFC 2846
for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.8 - STR

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "STR"

qualif-type1 "keyword" name:

STR

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Street Address (example: 45, Main Street).
See RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.9 - ADDR

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "ADDR"

qualif-type1 "keyword" name:

ADDR

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Unformatted Postal Address (example: HWY 14,
Km 94.5 - Loc. Redhill). See RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.10 - ADDU

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "ADDU"

qualif-type1 "keyword" name:

ADDU

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Unique Postal Name (example: ACMETELEX). See
RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.11 - ADDL

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "ADDL"

qualif-type1 "keyword" name:

ADDL

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Local Postal Attributes (example: Entrance 3,
3rd floor, Suite 296). See RFC 2846 for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.12 - POB

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "POB"

qualif-type1 "keyword" name:

POB

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Post Office Box (example: CP 1374). See RFC 2846
for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.13 - ZIP

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "ZIP"

qualif-type1 "keyword" name:

ZIP

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify Postal ZIP code (example: I 34012). See RFC 2846
for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

D.14 - CO

To: IANA@isi.edu
Subject: Registration of new values for the GSTN address
qualif-type1 element "CO"

qualif-type1 "keyword" name:

CO

qualif-type1 "value" ABNF definition:

string = PCHAR

Description of Use:

To specify the Country Name (example: Belgium) See RFC 2846
for further details.

Use Restriction:

none.

Security Considerations:

See the Security Consideration section of RFC 2846.

Person & email address to contact for further information:

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

13. Author's Address

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

RFC822: Claudio.Allocchio@elettra.trieste.it
X.400: C=it;A=garr;P=Trieste;O=Elettra;
S=Allocchio;G=Claudio;
Phone: +39 040 3758523
Fax: +39 040 3758565

14. References

- [1] Allocchio, C., "Minimal PSTN address format in Internet Mail", RFC 2303, March 1998.
- [2] Allocchio, C., "Minimal FAX address format in Internet Mail", RFC 2304, March 1998.
- [3] Kille, S., "MIXER (Mime Internet X.400 Enhanced Relay): Mapping between X.400 and RFC 822/MIME", RFC 2156, January 1998.
- [4] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications", RFC 2234, November 1997.
- [5] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

- [6] 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)
- [7] ITU E.164 - The International Public Telecommunication Numbering Plan E.164/I.331 (May 1997)
- [8] ITU T.33 - Facsimile routing utilizing the subaddress; recommendation T.33 (July, 1996)
- [9] ITU F.401 - Message Handling Services: Naming and Addressing for Public Message Handling Service; recommendation F.401 (August 1992)
- [10] ITU F.423 - Message Handling Services: Intercommunication Between the Interpersonal Messaging Service and the Telefax Service; recommendation F.423 (August 1992)
- [11] Crocker, D., "Standard for the format of ARPA Internet text messages", STD 11, RFC 822, August 1982.
- [12] Braden, R., "Requirements for Internet hosts - application and support", STD 3, RFC 1123, October 1989.
- [13] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 2434, October 1998.

15. Full Copyright Statement

Copyright (C) The Internet Society (2000). All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, such as by removing the copyright notice or references to the Internet Society or other Internet organizations, except as needed for the purpose of developing Internet standards in which case the procedures for copyrights defined in the Internet Standards process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the Internet Society or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIMS 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.

Acknowledgement

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

