

Internet Draft: A string encoding of Presentation Address  
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## A string encoding of Presentation Address

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A revised version of this draft document will be submitted to the RFC editor as a Proposed Standard for the Internet Community. Discussion and suggestions for improvement are requested, and should be sent directly to the authors. Distribution of this draft is unlimited.

### Abstract

There are a number of environments where a simple string encoding of Presentation Address is desirable. This specification defines such a representation. This is a revision of [RFC 1278](#).

This document also defines a string representation for IPv6 network addresses as defined in [RFC 1888](#) and [draft-melnikov-nsap-ipv6-XX.txt](#).

### 1. Conventions Used in this Document

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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](#) [[KEYWORDS](#)].

Editorial comments/questions or missing paragraphs are marked in the text with << and >>.

## [2.](#) Introduction

OSI Application Entities use presentation addresses to address other Application Entities. The model for this is defined in [[ISO87b](#)]. Presentation addresses are stored in the OSI Directory using an ASN.1 representation defined by the OSI Directory [CCI88]. Logically, a presentation address consists of:

- o A presentation selector
- o A session selector
- o A transport selector
- o A set of network addresses

The selectors are all octet strings, but often have IA5 character representations. The format of network addresses is defined in [[ISO87a](#)]. There is a need to represent presentation addresses as strings in a number of different contexts. For example, in order to set up a connection system administrators often need to communicate Presentation addresses by email or other mechanisms, and having a common notation to write down Presentation addresses facilitates this communication.

This document defines a format for use on the Internet. It is for display to human users, and its use is recommended whenever this needs to be done. Typically, this will be for system administrators rather than for end users. It is not intended for internal storage, however the note in [section 4](#) gives an example when this might be advisable.

## [3.](#) Requirements

The main requirements are:

- o Must be able to specify any legal value.
- o Should be clean in the common case of the presentation address

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containing network addresses and no selectors.

- o Must deal with selectors in the following encodings:
  - IA5
  - Decimal digits encoded as IA5 (this is the most common syntax in Europe, as it is required by X.400(84) and should receive a straightforward encoding)
  - Numeric encoded as a 16 bit unsigned integer (US GOSIP). This is mapped onto two octets, with the first octet being the high order byte of the integer (network byte order).
  - General Hexadecimal
- o Should give special encodings for the ad hoc encoding proposed in "An interim approach to use of Network Addresses" [[RFC1277](#)].
  - TCP/IP Networks
  - X.25(80) Networks
- o Should be extensible for additional forms.
- o Should provide a reasonably compact representation.
- o Should be human friendly.

#### [4.](#) Format

The following syntax specification uses the Augmented Backus-Naur Form (ABNF) notation as specified in [[ABNF](#)]. The IPv6address, IPv4address and reg-name non-terminals are defined in [[RFC 3986](#)]. Other non terminals not defined in this document are defined in

[Section 6.1](#) [ABNF] ("Core Rules").

other = ALPHA / DIGIT / "+" / "-" / "."

any = other / ":" / "[" / "]" / "/" / "\_" / "'" / "<" /  
/ "#" / "(" / ")" / "|" / "="

hexoctet = HEXDIG HEXDIG

decimaloctet = DIGIT / DIGIT DIGIT  
/ DIGIT DIGIT DIGIT  
; 0 - 255, no leading 0 allowed

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digitstring = 1\*DIGIT

otherstring = 1\*other

hexstring = 1\*hexoctet

dotstring = decimaloctet "." dotstring  
/ decimaloctet "." decimaloctet

dothexstring = dotstring / hexstring

presentation-address = [[[ psel "/" ] ssel "/" ] tsel "/" ]  
network-address-list

network-address-list = network-address network-addr-delimit network-address-  
/ network-address

network-addr-delimit = "\_" / "|"

psel = selector

ssel = selector

tsel = selector

selector = "'" otherstring "'"  
; IA5  
; For characters not in this string use hex  
/ "#" digitstring

```

        ; US GOSIP
/ "" hexstring ""H"
        ; Hex
/ ""
        ; Empty but present

network-address = "NS" "+" dothexstring
                  ; Concrete Binary Representation
                  ; This is the compact encoding
/ afi "+" idi [ "+" dsp ]
                  ; A user oriented form
/ idp "+" hexstring
                  ; ISO 8348 Compatibility

idp = digitstring
    ; This is afi + idi

dsp = "d" digitstring
    ; Abstract Decimal

```

```

/ "x" dothexstring
    ; Abstract Binary
/ "l" otherstring
    ; IA5: local form only
/ dsp_rfc1006
/ "X.25(80)" "+" prefix "+" dte
  [ "+" cudf-or-pid "+" hexstring ]
/ "ECMA-117-Binary" "+" hexstring
  "+" hexstring "+" hexstring
/ "ECMA-117-Decimal" "+" digitstring "+"
  digitstring "+" digitstring

dsp_rfc1006 = "RFC-1006" "+" [prefix] "+" iphost
              [ "+" port [ "+" tset ] ]
              ; The "tset" and the "prefix" MUST NOT be used
              ;   with "IPV6ADDR" or "IPV6FULL" AFIs.
              ;
              ; The port MUST NOT be used with "IPV6ADDR" AFI.
              ;
              ; The "prefix" is REQUIRED for all other AFIs.

idi = digitstring / ""

```

```

; IDI can be empty, e.g. for AFI "LOCAL"

afi = "X121" / "DCC" / "TELEX" / "PSTN" / "ISDN"
    / "ICD" / "LOCAL" / ipv6_afi

ipv6_afi = "IPV6ADDR" / "IPV6FULL"
; "IPV6ADDR" is AFI=35 as defined in section 6
; of RFC 1888.
; "IPV6FULL" is for the AFI defined in
; draft-melnikov-nsap-ipv6-XX.txt

ipv6reference = "[" IPv6address "]"

prefix = DIGIT DIGIT

iphost = reg-name | IPv4address | ipv6reference
; domain (e.g., example.com) or
; dotted decimal form of IPv4 address
; (e.g., 10.0.0.6) or an IPv6 address
; (e.g., [1234::567f:890a:bcde])

port = digitstring
; 1-65535

tset = digitstring

```

```

dte = digitstring

cudf-or-pid = "CUDF" / "PID"

```

Six examples:

"256"/NS+a433bb93c1\_NS+aa3106

#63/#41/#12/X121+234219200300

'3a'H/TELEX+00728722+X.25(80)+02+00002340555+CUDF+"892796"

TELEX+00728722+[RFC-1006](#)+03+10.0.0.6

IPV6FULL+0+[RFC-1006](#)++[1234::567:890a:bcde]+399

IPV6ADDR+0+[RFC-1006](#)++[1234::567:890a:bcde]

Note that the dsp\_rfc1006 non-terminal permits use of either a DNS Domain Name or an IP (IPv4 or IPv6) address. The former is primarily for ease of entry. If this DNS Domain Name maps onto multiple IP addresses, then multiple network addresses SHOULD be generated. When mapping from an encoded address to string form, the IP address form MUST<<SHOULD?>> be used.

<<Note, that the translation from a string encoding of a presentation address containing a DNS domain name to the binary representation is not reversible, as binary form of a network address can't store a DNS domain name, only an IP address of the domain name.>>

#### [4.1.](#) Encoding

Selectors are represented in a manner which can be easily encoded. In the NS notation, the concrete binary form of network address is given. Otherwise, this string notation provides a mechanism for representing the Abstract Syntax of a Network Address. This must be encoded according to Addendum 2 of ISO 8348 [[IS087a](#)].

#### [5.](#) Macros

There are often common addresses, for which a cleaner representation is desired. This is achieved by use of Macros. If a <network-address> can be parsed as:

otherstring "=" \*any

where:

macro\_name = otherstring

Then the leading string is taken as a Macro, which is substituted. (Note that macro names are case-insensitive.) This MUST be applied recursively. However, implementations MUST limit the maximal number of substitutions, as it is possible to construct a string that will

cause an infinite loop. <<Do we need to say how many?>> When a macro substitution is performed, the longest available substitution MUST be used. For example:

Macro	Value
UK.AC	DCC+826+d110000
Leeds	UK.AC=120

Then "Leeds=22" would be expanded to "DCC+826+d11000012022".

### 5.1. Standard Macros

All implementations of this document MUST support the following macros:

Macro	Value
ITOT-IPv4	TELEX+00728722+ <a href="#">RFC-1006</a> +03+
ITOT-IPv6	IPV6FULL+0+ <a href="#">RFC-1006</a> ++
NS-IPv6	IPV6ADDR+0+ <a href="#">RFC-1006</a> ++

Note, that the "ITOT-IPv4" macro has the same value as the "Internet-[RFC-1006](#)" macro specified in the following section.

### 5.2. Obsoleted Macros

The following macroses were specified in [RFC 1278](#). They MAY be supported by implementations.

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Int-X25(80)	TELEX+00728722+X25(80)+01+
Janet-X25(80)	TELEX+00728722+X25(80)+02+
Internet-RFC-1006	TELEX+00728722+ <a href="#">RFC-1006</a> +03+
IXI	TELEX+00728722+ <a href="#">RFC-1006</a> +06+

## [6.](#) Acknowledgment

This document is a revision of [RFC 1278](#).

David Wilson and Chris Ridd gave valuable suggestions on this revision of the document.

## [7.](#) IANA Considerations

<<TBD>>

## [8.](#) Security Considerations

An implementation that supports conversion from a string encoding of Presentation Address into binary form, MUST be designed to guard itself from buffer overflows and MUST properly reject invalid input (including input that causes overflow).

<<TBD>>

## [9.](#) References

### [9.1.](#) Normative References

[KEYWORDS] Bradner, "Key words for use in RFCs to Indicate Requirement Levels", [RFC 2119](#), Harvard University, March 1997.

[ABNF] Crocker, D., and Overell, P. "Augmented BNF for Syntax Specifications: ABNF", [RFC 2234](#), November 1997.

<<[CCI88] The Directory --- overview of concepts, models and services, December 1988. CCITT X.500 Series Recommendations.>>

[RFC1277] Kille, S., "Encoding network addresses to support operation over non-osi lower layers", [RFC 1277](#), November 1991.

[IS087a] Information processing systems - data communications - network services definition: Addendum 2 - network layer addressing, March 1987. ISO TC 97/SC 6.

[IS087b] ISO DIS 7498-3 on naming and addressing, May 1987. ISO/IEC/JTC-1/SC 21.

[RFC1888] Bound, J., Carpenter, B., Harrington, D., Houldsworth, J. and A. Lloyd, "OSI NSAPs and IPv6", [RFC 1888](#), August 1996.

[NSAP-IPV6] Wilson, D., S. Kille and A. Melnikov, "Network Address to support OSI over IPv6", work in progress, [draft-melnikov-nsap-ipv6-XX.txt](#).

[RFC 3986] Berners-Lee, T., Fielding, R. and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", [RFC 3986](#), January 2005.

## [9.2.](#)   Informative References

[ITOT] Pouffary, Y. and A. Young, "ISO Transport Service on top of TCP (ITOT)", [RFC 2126](#), March 1997.

## [10.](#)   Author's Address

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13.    Appendix A. Changes since RFC 1278

- 1) Updated boilerplate, copyright, IPR, etc.
- 2) Updated contact information.

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- 3) Updated references. Split references into Normative and Informative.
- 4) Converted BNF to ABNF. Changed "ip" to "iphost", made it reference RFC 3986.
- 5) Fixed "idi" to allow it to be an empty string.
- 6) Changed text to use MUST/SHOULDs.
- 7) Added support for IPv6.
- 8) Clarified that macro names are case-insensitive.
- 9) Added two new mandatory macros.
- 10) Allow for "|" as a delimiter between network addresses, "\_" is a typo in RFC 1278.

14.    Appendix B. ToDo list.

This appendix will be deleted before publication.

- 1) Rewrite/remove any text enclosed in <<>>.
- 2) Need to update ISO references.
- 3) Need to clarify where network byte order must be used.

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