              PPP Internet Protocol Control Protocol Extensions for
                          Name Server Addresses

Status of this Memo

   This memo provides information for the Internet community. This memo
   does not specify an Internet standard of any kind. Distribution of
   this memo is unlimited.

Abstract

   The Point-to-Point Protocol (PPP) [1] provides a standard method for
   transporting multi-protocol datagrams over point-to-point links. PPP
   defines an extensible Link Control Protocol and a family of Network
   Control Protocols (NCPs) for establishing and configuring different
   network-layer protocols.

   This document extends the NCP for establishing and configuring the
   Internet Protocol over PPP [2], defining the negotiation of primary
   and secondary Domain Name System (DNS) [3] and NetBIOS Name Server
   (NBNS) [4] addresses.

Table of Contents

1. Additional IPCP Configuration Options

   The four name server address configuration options, 129 to 132,
   provide a method of obtaining the addresses of Domain Name System
   (DNS) servers and (NetBIOS Name Server (NBNS) nodes on the remote
   network.

Primary and secondary addresses are negotiated independently. They
serve identical purposes, except that when both are present an
attempt SHOULD be made to resolve names using the primary address
before using the secondary address.

For implementational convenience, these options are designed to be
identical in format and behavior to option 3 (IP-Address) which is
already present in most IPCP implementations.

Since the usefulness of name server address information is dependent
on the topology of the remote network and local peer's application,
it is suggested that these options not be included in the list of
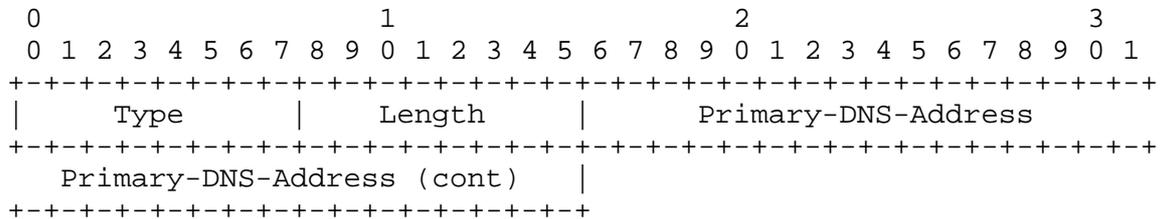"IPCP Recommended Options".

1.1. Primary DNS Server Address

Description

    This Configuration Option defines a method for negotiating with
    the remote peer the address of the primary DNS server to be used
    on the local end of the link. If local peer requests an invalid
    server address (which it will typically do intentionally) the
    remote peer specifies the address by NAKing this option, and
    returning the IP address of a valid DNS server.

    By default, no primary DNS address is provided.

A summary of the Primary DNS Address Configuration Option format is
shown below. The fields are transmitted from left to right.

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |    Length     |       Primary-DNS-Address
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
    Primary-DNS-Address (cont)   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Type

    129

Length

    6

Primary-DNS-Address

   The four octet Primary-DNS-Address is the address of the primary
   DNS server to be used by the local peer. If all four octets are
   set to zero, it indicates an explicit request that the peer
   provide the address information in a Config-Nak packet.

Default

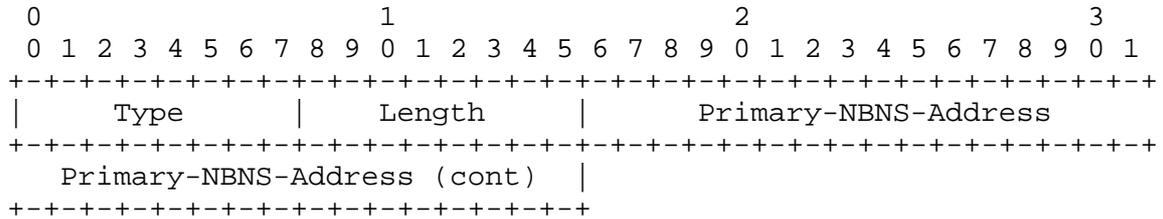   No address is provided.

1.2. Primary NBNS Server Address

Description

   This Configuration Option defines a method for negotiating with
   the remote peer the address of the primary NBNS server to be used
   on the local end of the link. If local peer requests an invalid
   server address (which it will typically do intentionally) the
   remote peer specifies the address by NAKing this option, and
   returning the IP address of a valid NBNS server.

   By default, no primary NBNS address is provided.

A summary of the Primary NBNS Address Configuration Option format is
shown below. The fields are transmitted from left to right.

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |    Length     |      Primary-NBNS-Address
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
    Primary-NBNS-Address (cont)  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Type

   130

Length

   6

Primary-NBNS-Address

   The four octet Primary-NBNS-Address is the address of the primary
   NBNS server to be used by the local peer. If all four octets are
   set to zero, it indicates an explicit request that the peer

        provide the address information in a Config-Nak packet.

   Default

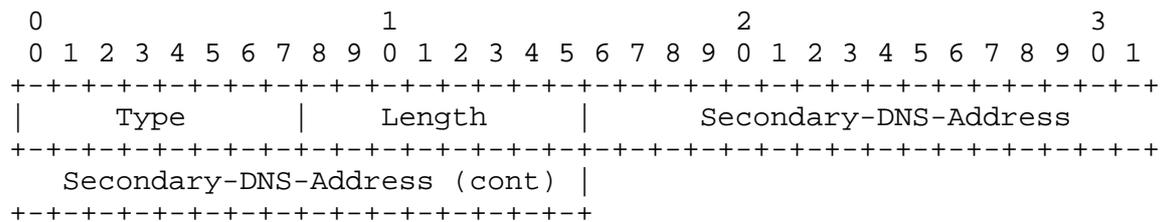   No address is provided.

1.3. Secondary DNS Server Address

   Description

        This Configuration Option defines a method for negotiating with
        the remote peer the address of the secondary DNS server to be used
        on the local end of the link. If local peer requests an invalid
        server address (which it will typically do intentionally) the
        remote peer specifies the address by NAKing this option, and
        returning the IP address of a valid DNS server.

        By default, no secondary DNS address is provided.

   A summary of the Secondary DNS Address Configuration Option format is
   shown below. The fields are transmitted from left to right.

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |    Length     |      Secondary-DNS-Address
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
    Secondary-DNS-Address (cont) |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

   Type

        131

   Length

        6

   Secondary-DNS-Address

        The four octet Secondary-DNS-Address is the address of the primary
        NBNS server to be used by the local peer. If all four octets are
        set to zero, it indicates an explicit request that the peer
        provide the address information in a Config-Nak packet.

   Default
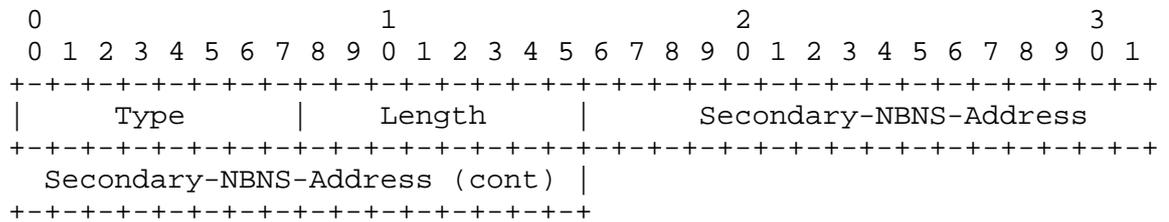
        No address is provided.

1.4. Secondary NBNS Server Address

   Description

      This Configuration Option defines a method for negotiating with
      the remote peer the address of the secondary NBNS server to be
      used on the local end of the link. If local peer requests an
      invalid server address (which it will typically do intentionally)
      the remote peer specifies the address by NAKing this option, and
      returning the IP address of a valid NBNS server.

      By default, no secondary NBNS address is provided.

   A summary of the Secondary NBNS Address Configuration Option format
   is shown below. The fields are transmitted from left to right.

```
    0                   1                   2                   3
    0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
   +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
   |     Type      |    Length     |        Secondary-NBNS-Address
   +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
     Secondary-NBNS-Address (cont) |
   +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

   Type

      132

   Length

      6

   Secondary-NBNS-Address

      The four octet Secondary-NBNS-Address is the address of the
      secondary NBNS server to be used by the local peer. If all
      four octets are set to zero, it indicates an explicit request
      that the peer provide the address information in a Config-Nak
      packet.

   Default

      No address is provided.

References

   [1] Simpson, W., Editor, "The Point-to-Point Protocol (PPP)", STD 51,
       RFC 1661, Daydreamer, July 1994.

   [2] McGregor, G., "PPP Internet Control Protocol", RFC 1332, Merit,
       May 1992.

   [3] Auerbach, K., and A. Aggarwal, "Protocol Standard for a NetBIOS
       Service on a TCP/UDP Transport", STD 19, RFCs 1001 and 1002,
       March 1987.

   [4] Mockapetris, P., "Domain Names - Concepts and Facilities", STD
       13, RFC 1034, USC/Information Sciences Institute, November 1987.

   [5] Mockapetris, P., "Domain Names - Implementation and
       Specification", STD 13, RFC 1035, USC/Information Sciences
       Institute, November 1987.

Security Considerations

   Security issues are not discussed in this memo.

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