PPP IPV6 Control Protocol Extensions for DNS Server Addresses

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Abstract

The Point-to-Point Protocol (PPP) 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 Version 6 of the Internet Protocol (IPV6) over PPP, defining the negotiation of primary and secondary Domain Name System (DNS) server IPV6 addresses.

1. Introduction

The Point-to-Point Protocol (PPP) [STD51] 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 Version 6 of the Internet Protocol (IPV6) over PPP [RFC2472], defining the negotiation of primary and secondary Domain Name System (DNS) server addresses for IPV6 [RFC1034] [RFC1035] [RFC1886].

2. Conventions used in this document

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 [RFC2119].

3. Additional IPV6CP Configuration Options

The two name server address configuration options, TBD1 and TBD2, provide a method of obtaining the addresses of Domain Name System (DNS) servers on the remote IPV6 network.

For implementation convenience, these options are designed to 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.

3.1. Primary DNS Server IPV6 Address

Description
This Configuration Option defines a method for negotiating with the remote peer the IPV6 address of the primary DNS server to be
used on the local end of the link. The 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 IPv6 address of a valid DNS server.

By default, no primary DNS address is provided.

A summary of the Primary DNS IPV6 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |    Length     |      Reserved                 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Primary-DNS-IPV6-Address                   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Primary-DNS-IPV6-Address (cont’d.)                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Primary-DNS-IPV6-Address (cont’d.)                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Primary-DNS-IPV6-Address (cont’d.)                    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

Type

TBD1

Length

20

Primary-DNS-IPV6-Address

The sixteen octet Primary-DNS-Address is the address (in network byte order) of the primary DNS server to be used by the local peer. If all sixteen 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.

3.2. Secondary DNS Server IPV6 Address

Description

This Configuration Option defines a method for negotiating with the remote peer the IPv6 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 IPV6 address of a valid DNS server.

By default, no secondary DNS address is provided.

A summary of the Secondary DNS Server IPV6 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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |    Length     |      Reserved                 |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                   Secondary-DNS-IPV6-Address                  |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Secondary-DNS-IPV6-Address (cont’d.) |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Secondary-DNS-IPV6-Address (cont’d.) |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Secondary-DNS-IPV6-Address (cont’d.) |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

**Type**

TBD2

**Length**

20

**Secondary-DNS-IPV6-Address**

The sixteen octet Secondary-DNS-IPV6-Address is the IPV6 address (in network byte order) of the secondary DNS server to be used by the local peer. If all sixteen 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.

**Normative References**

Informative References


Security Considerations

The use of these extensions is as secure as the link itself.

Acknowledgments

A major portion of the text in this memo was stolen from RFC 1877 [RFC1877].

Authors’ Addresses

Tom Hiller
Lucent Technologies
1960 Lucent Lane
Naperville, IL 60566
USA

Phone: +1 (630) 979 7673
Email: tom.hiller@lucent.com

Glen Zorn
Cisco Systems, Inc.
500 108th Avenue N.E., Suite 500
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