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PPP IPv6 Control Protocol Extensions  
draft-hu-pppext-ipv6cp-extensions-01

## Abstract

The IPv6 Control Protocol (IPv6CP) is one of Network Control Protocols (NCPs) that are defined by the Point-to-Point Protocol (PPP) for establishing and configuring different network protocols.

This document extends the IPv6CP for negotiating and configuring IPv6 network parameters over PPP links, including IPv6 address, IPv6 prefix, primary and alternative DNS server addresses.

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## 1. Introduction

The point-to-point protocol provides a standard method for transporting network-layer protocol datagrams over point-to-point links. It also defines an extensible Link Control Protocol (LCP), and a family of Network Control protocols (NCPs) for establishing and configuring different network-layer protocols.

To respond to the requirements specified by [[I-D.hu-pppext-ipv6cp-requirements](#)] and guarantee the negotiation of essential parameters needed for establishing a basic IPv6 connectivity over PPP links, this document extends the IPv6CP defining the negotiation of IPv6 address, IPv6 Prefix, primary and alternative DNS server addresses. Please note that the IPv6 prefix option is designed to meet the requirements specified in [[RFC3769](#)].

This document combines several drafts:

[[I-D.qin-pppext-ipv6-addr-pref](#)] [[I-D.ietf-pppext-ipv6-dns-addr](#)]  
[[I-D.huang-ipv6cp-options](#)]

### 1.1. Requirements Language

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 [[RFC2119](#)].

## 2. IPv6CP Configuration Options

The IPv6-Address configuration option, type TBD1, provides a method of obtaining the IPv6 address to be used by the local end of the PPP link.

The IPv6-prefix configuration option, type TBD2, provides a method of obtaining the prefix to be used by the local end of the PPP link as the address pool.

The two name server address configuration options, TBD3 and TBD4, provide a method of obtaining the addresses of DNS servers on the remote IPv6 network.

For implementational convenience, these options are designed to be identical in format and behavior to options which are already present.

## [2.1.](#) IPv6-Address

### Description

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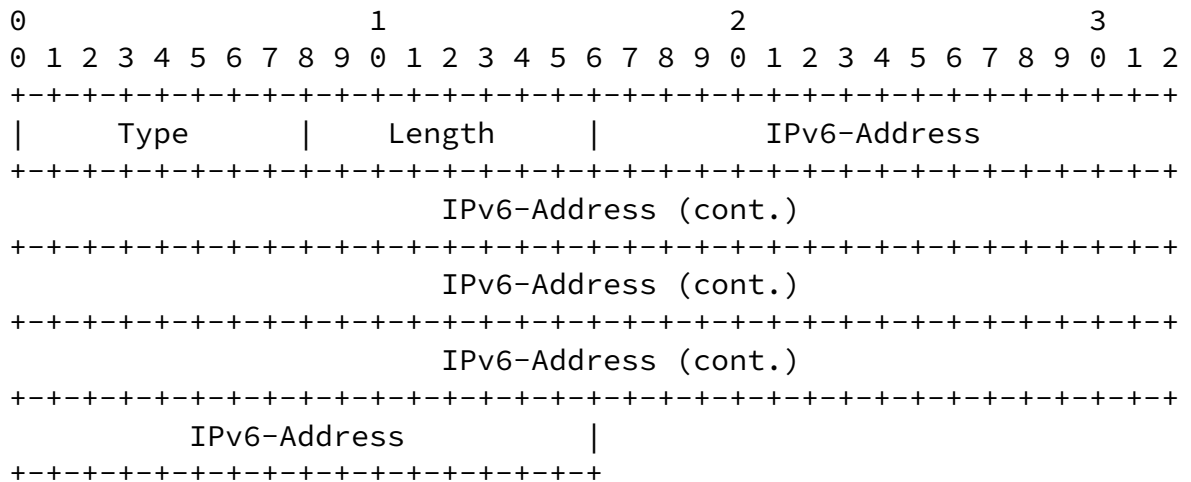
This Configuration Option provides a way to negotiate the IPv6 address to be used on the local end of the link. It allows the sender of the Configure-Request to state which IPv6-address is desired, or to request that the peer provide the information. the peer can provide this information by NAKing the option, and returning a valid IPv6-address.

If negotiation about the remote IPv6-address is required, and the peer did not provide the option in its Configure-Request, the option should be appended to a Configure-NAK. The value of the IPv6-address given must be acceptable as the remote IPv6-address, or indicate a request that the peer provide the information.

By default, no IPv6 address is assigned.

A summary of the IPv6-address Configuration Option format is shown below. The field are transimitted from left to right.

Configuration-Option: IPv6-Address



Type

3 (TBD1)

Length

18

IPv6-Address

The sixteen octet IPv6-Address is the desired local address of the sender of a Configure-Request. If all sixteen octets are

set to zero, it indicates a request that the peer provide the IP-Address information.

Default

No IPv6 address is assigned.

## 2.2. IPv6-Prefix

Description

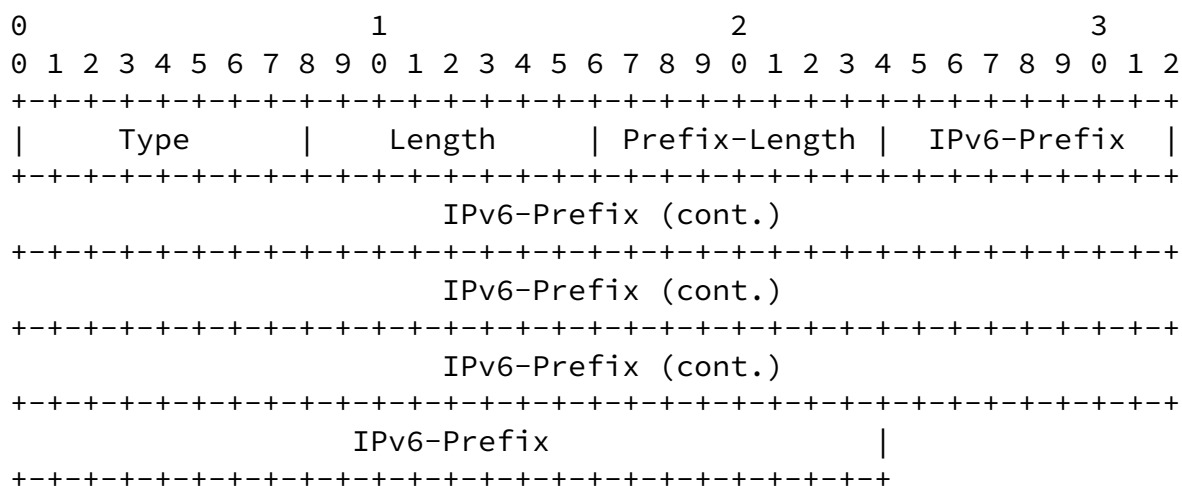
This Configuration Option provides a way to negotiate the IPv6 prefix to be used on local end(usually a Router or Residential Gateway) of the link for further allocating addresses to hosts on the attached networks. It allows the sender of the Configure-Request to state

which IPv6 prefix is desired, or to request that the peer provide the information. The peer can provide this information by NAKing the option, and returning a valid IPv6 prefix.

By default, no IPv6 prefix is assigned.

A summary of the IPv6-Prefix Configuration Option format is shown below. The field are transmitted from left to right.

Configuration-Option: IPv6-Prefix



Type

5 (TBD2)

Length

Prefix-Length

This field is one octet and indicates the available length of the prefix in the IPv6-Prefix field.





Type	Length	Primary-DNS-IPv6-Addr
	Primary-DNS-IPv6-Addr (cont.)	
	Primary-DNS-IPv6-Addr (cont.)	
	Primary-DNS-IPv6-Addr (cont.)	
Primary-DNS-IPV6-Addr		

#### Type

129 (TBD3)

#### Length

18

#### Primary-DNS-IPv6-Addr

The sixteen octet Primary-DNS-Addr 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.

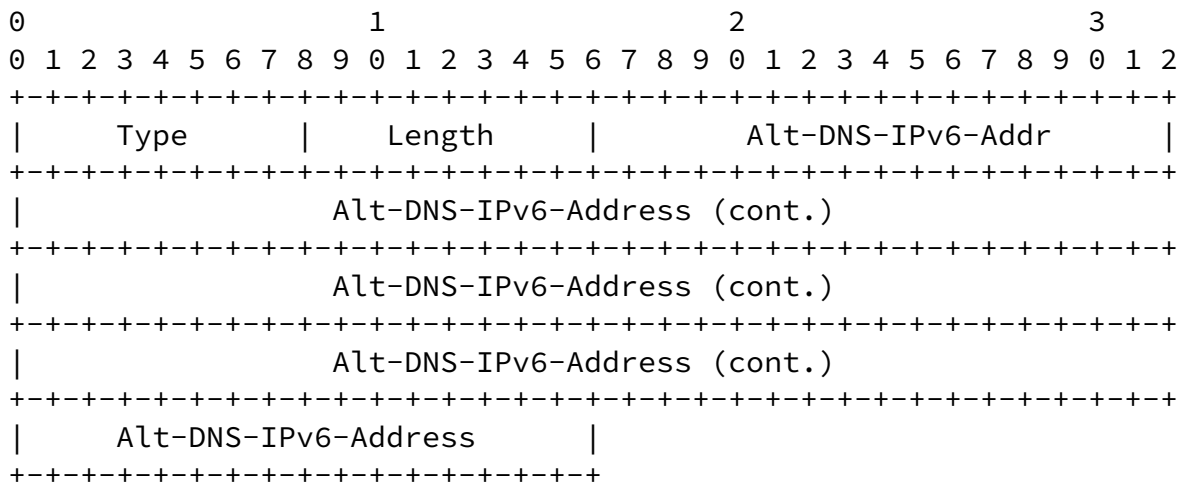
### [2.4.](#) Alternative DNS Server IPv6 Address

Description

This Configuration Option defines a method for negotiating with the remote peer the IPv6 address of an alternate DNS server to be used on the local end of the link. If the local peer requests an invalid server address (which it will typically do intentionally) the remote peer specifies the address by Making this option, and returning the IPv6 address of a valid DNS server.

By default, no alternative DNS address is provided.

A summary of the Alternative DNS Server IPv6 Address Configuration Option format is shown below. The fields are transmitted from left to right.



Type

131 (TBD4)

Length

18

Alt-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.

### [3.](#) Acknowledgements

This document combines several drafts:

[[I-D.qin-pppext-ipv6-addr-pref](#)] [[I-D.ietf-pppext-ipv6-dns-addr](#)]  
[[I-D.huang-ipv6cp-options](#)]

### [4.](#) IANA Considerations

IANA is requested to assign values for the Type field of the IPv6CP Configuration Options specified in this document.

### [5.](#) Security Considerations

No new security concerns raised out of this document.

### [6.](#) References

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

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