The IPv6 Control Protocol (IPv6CP) is a NCP that allows for the negotiation of parameters for an IPv6 interface over PPP.

This document defines the IPv6 address and prefix configuration options that can be negotiated through the IPv6CP.

The major part of the text in this document is taken from the previous RFCs.

Status of this Memo

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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.

This document extends the NCP for configuring the IPv6 over PPP, defining the negotiation of IPv6 address and IPv6 Prefix. The prefix negotiated by the means here should be used by the local node (usually a Residential Gateway) for allocating addresses to hosts on the attached networks.

Notes: As in IPv4 networks, PPP (PPPoE) will still be an important mechanism for connecting broadband access users of IPv6. To make it consistent in the way of configuring network parameters and simplify the implementations, it may be reasonable to extend the Configuration Options needed which is the mature way for PPP rather than involving additional mechanisms.

In addition to this document, there is an expired WG item, [I-D.ietf-pppext-ipv6-dns-addr] that needs to be reevaluated.

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 RFC 2119 [RFC2119].

2. Additional IPv6CP Configuration Options

The IPv6-Address configuration option, type ’X’ (TBD), 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 ’Y’ (TBD), provides a method of obtaining the prefix to be used by the local end of the PPP link for the address pool.

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

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 transmitted from left to right.
### Configuration-Option: IPv6-Address

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>IPv6-Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>'X'</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

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 fields are transmitted from left to right.

```
Configuration-Option: IPv6-Prefix

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Prefix-Length</th>
<th>IPv6-Prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IPv6-Prefix

<table>
<thead>
<tr>
<th>Type</th>
<th>Prefix-Length</th>
<th>IPv6-Prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

- **Type**: 'Y'
- **Length**: 19
- **Prefix-Length**: This field is one octet and indicates the available length of the prefix in the IPv6-Prefix field.
- **IPv6-Prefix**: The IPv6-Prefix field associated with the Prefix-length field is the desired prefix of the sender of a Configure-Request. If all sixteen octets are set to zero, it indicates a request that the peer provide the prefix information and the length required is indicated in the Prefix-Length field.

The fixed sixteen octet space is used no matter what exactly the available prefix length is.
No IPv6 prefix is assigned.

3. IANA Considerations

TBD.

4. Security Considerations

Security issues are not discussed in this document.

5. References

5.1. Normative References


5.2. Informative References


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