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Juha Heinanen
Telia Finland
Dave Allan
Nortel Networks
Arthur Lin
Shasta Networks
Paul Shieh
3Com Corporation
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PPP Internet Protocol Control Protocol Extensions for IP Subnet
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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] by defining an IP Subnet configuration option.

1. Motivation

The IP-address configuration option [2] allows negotiation of a single IP address used on the local end of a PPP link. It is adequate when the the local end is an IP host. However, when the local end is an router, for example an ISDN or ADSL router providing IP connectivity for a home or small office LAN, then it should be possible to negotiate a whole IP subnet for the LAN rather than a single IP address for the local end of the link.

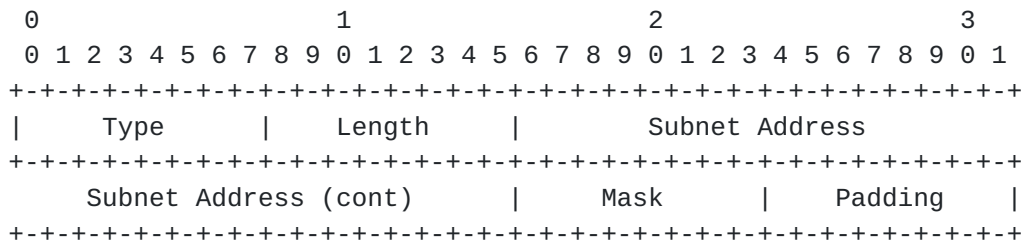
This document defines an IP subnet configuration option that allows a router at the local end of an (unnumbered) PPP link to automatically negotiate an IP subnet for a LAN for which it provides IP connectivity via the PPP link. Once the subnet has been negotiated, the router could allocate one (for example, the second) of the addresses of the subnet for its own address on the LAN. The router could also implement a DHCP server for automatic configuration of IP information for the other devices on the LAN.

The following section contains the formal definition of the IP Subnet configuration option.

2. IP Subnet IPCP Configuration Option

The IP Subnet configuration option, x (value to be assigned by IANA), is used to negotiate an IP subnet for a LAN attached to a router on the local end of an (unnumbered) PPP link. The IP Subnet configuration option allows the sender of the Configure-Request to state the address and/or mask of the desired IP subnet or to request that the peer provides the information. The peer MAY accept, provide, or deny the information by ACKing or NAKing the option. The IP Subnet configuration option MAY be present in the Configure-Nak only if the option was present in the corresponding Configure-Request. The IP Subnet configuration option MUST NOT be present in a Configure-Request if the IP-address configuration option is present.

The format of the IP Subnet configuration option is shown below. The fields are transmitted from left to right.



Type

To be assigned.

Length

8

Subnet Address

The Subnet Address MUST be the first IP address in the desired IP subnet. If all four octets of the Subnet Address are set to zero, it indicates a request for the peer to provide the Subnet Address information.

Mask

The Mask indicates the desired size of the IP subnet, i.e., how many most significant bits of the Subnet Address belong to the network part of the address. The value of the Mask MUST be from 0 to 32. If the value of the Mask is 0, it indicates a request for the peer to provide the Mask information. Mask value 32 denotes a single host address.

Padding

The Padding is used to make the length of the IP Subnet configuration option a multiple of four octets. It MAY have any value.

Default

No IP subnet is assigned.

3. Security Considerations

The remote end of the PPP link SHOULD verify that the local end is authorized to use the requested IP subnet information before ACKing the request.

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.

Author Information

Juha Heinanen
Telia Finland, Inc.
Myrmaentie 2
01600 VANTAA
Finland
Email jh@telia.fi

Dave Allan
Nortel Networks
P.O. Box 3511, Station 'C'
Ottawa, Ontario
CANADA, K2B 5P9
dallan@nortelnetworks.com

Arthur Lin
Shasta Networks, Inc.
249 Humboldt Court
Sunnyvale, CA 94089-1300
U.S.A
alin@shastanets.com

Paul Shieh
3Com Corporation
4 Technology Drive
Westborough, MA 01581-1727
U.S.A
Paul_Shie@ne.3com.com

