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The PPP XNS IDP Control Protocol (XNSCP)

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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 proposes a family of Network Control Protocols for establishing and configuring different network-layer protocols.

This document defines the Network Control Protocol for establishing and configuring the Xerox Network Systems (XNS) Internet Datagram Protocol (IDP) over PPP.

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1. Introduction

PPP has three main components:

1. A method for encapsulating multi-protocol datagrams.

2. A Link Control Protocol (LCP) for establishing, configuring, and testing the data-link connection.

3. A family of Network Control Protocols for establishing and configuring different network-layer protocols.

In order to establish communications over a point-to-point link, each end of the PPP link must first send LCP packets to configure and test the data link. After the link has been established and optional facilities have been negotiated as needed by the LCP, PPP must send XNSCP packets to choose and configure the XNS IDP network-layer protocol. Once XNSCP has reached the Opened state, XNS IDP datagrams can be sent over the link.

The link will remain configured for communications until explicit LCP or XNSCP packets close the link down, or until some external event occurs (an inactivity timer expires or network administrator intervention).

1.1. Specification of Requirements

In this document, several words are used to signify the requirements of the specification. These words are often capitalized.

MUST — This word, or the adjective "required", means that the definition is an absolute requirement of the specification.

MUST NOT — This phrase means that the definition is an absolute prohibition of the specification.

SHOULD — This word, or the adjective "recommended", means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications must be understood and carefully weighed before choosing a different course.

MAY — This word, or the adjective "optional", means that this item is one of an allowed set of alternatives. An implementation which does not include this option MUST be prepared to interoperate with another implementation which does include the option.

1.2. Terminology

This document frequently uses the following terms:

datagram The unit of transmission in the network layer (such as IP). A datagram may be encapsulated in one or more packets passed to the data link layer.

frame The unit of transmission at the data link layer. A frame may include a header and/or a trailer, along with some number of units of data.

packet The basic unit of encapsulation, which is passed across the interface between the network layer and the data link layer. A packet is usually mapped to a frame; the exceptions are when data link layer fragmentation is being performed, or when multiple packets are incorporated into a single frame.

peer The other end of the point-to-point link.

silently discard
This means the implementation discards the packet without further processing. The implementation SHOULD provide the capability of logging the error, including the contents of the silently discarded packet, and SHOULD record the event in a statistics counter.

2. A PPP Network Control Protocol for XNS IDP

The XNS IDP Control Protocol (XNSCP) is responsible for configuring, enabling, and disabling the XNS IDP protocol modules on both ends of the point-to-point link. XNSCP uses the same packet exchange mechanism as the Link Control Protocol (LCP). XNSCP packets may not be exchanged until PPP has reached the Network-Layer Protocol phase. XNSCP packets received before this phase is reached should be silently discarded.

The XNS IDP Control Protocol is exactly the same as the Link Control Protocol [1] with the following exceptions:

Frame Modifications

The packet may utilize any modifications to the basic frame format which have been negotiated during the Link Establishment phase.

Data Link Layer Protocol Field

Exactly one XNSCP packet is encapsulated in the Information field of a PPP Data Link Layer frame, where the PPP Protocol field indicates type hex 8025 (XNS IDP Control Protocol).

Code field

Only Codes 1 through 7 (Configure-Request, Configure-Ack, Configure-Nak, Configure-Reject, Terminate-Request, Terminate-Ack and Code-Reject) are used. Other Codes should be treated as unrecognized and should result in Code-Rejects.

Timeouts

XNSCP packets may not be exchanged until PPP has reached the Network-Layer Protocol phase. An implementation should be prepared to wait for Authentication and Link Quality Determination to finish before timing out waiting for a Configure-Ack or other response. It is suggested that an implementation give up only after user intervention or a configurable amount of time.

Configuration Option Types

XNSCP has no Configuration Options.

2.1. Sending XNS IDP Datagrams

Before any XNS IDP packets may be communicated, PPP must reach the Network-Layer Protocol phase, and the XNS IDP Control Protocol must reach the Opened state.

Exactly one XNS IDP packet is encapsulated in the Information field of a PPP Data Link Layer frame where the Protocol field indicates type hex 0025 (XNS IDP datagram).

The maximum length of a XNS IDP datagram transmitted over a PPP link is the same as the maximum length of the Information field of a PPP data link layer frame. Since there is no standard method for fragmenting and reassembling XNS IDP datagrams, PPP links supporting XNS IDP MUST allow at least 576 octets in the information field of a data link layer frame.

The format of the Information field itself is the same as that defined in [2].

Security Considerations

Security issues are not discussed in this memo.

References

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

[2] Xerox, "Internet Transport Protocols", January 1991, Order No. XNSS 029101.

Acknowledgements

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