CHAPTER 8

# Point-to-Point Protocol "PPP" and High Level Data Link Control "HDLC"

This chapter describes the level of support that Cisco ANA provides for PPP and HDLC, as follows:



## Technology Description

### PPP

The Point-to-Point Protocol (PPP) (RFC 1661) originally emerged as an encapsulation protocol for transporting IP traffic over point-to-point links. PPP also established a standard for the assignment and management of IP addresses,  Octet Synchronous (Asynchronous) encapsulation, using HDLC like framing (RFC 1662) protocol, Bit Synchronous encapsulation, using HDLC protocol, network Protocol Multiplexing, Link Configuration, Link Quality Testing, Error Detection, and option negotiation for such capabilities as Network Layer Address and Data Compression negotiation.

PPP supports these functions by providing an extensible Link Control Protocol (LCP) and a family of Network Control Protocols (NCPs) to negotiate optional configuration parameters and facilities.

### HDLC

High-level Data Link Control (HDLC) is a Data Link Layer (Layer 2) group of protocols for transmitting synchronous data packets between point-to-point nodes. In HDLC, data is organized into an addressable frame, which its format has been used for other multipoint to multipoint protocol as well inspired the HDLC like framing protocol described in RFC 1662.

HDLC uses zero insertion/deletion process (bit stuffing) to ensure that the bit pattern of the delimiter flag does not occur in the fields between flags. The HDLC frame is synchronous and therefore relies on the Physical Layer (Layer 1) to provide method of clocking and synchronizing the transmission and reception of frames.

# Inventory and Information Model Objects (IMOs)

This section includes the following tables:

- Point To Point Protocol Encapsulation (IVcBasedEncapsulation)
- High Level Data Link Control Encapsulation (IEncapsulation)

## Point To Point Protocol Encapsulation

The following Data Link layer Point To Point Protocol Encapsulation object, is bound by its Containing Termination Points attribute to an ATM/Frame Relay VC Multiplexer object, and is primarily accessed by a Network layer such as the IP Interface bound by its Contained Connection Termination Points attribute.

*Table 8-1 Point To Point Protocol Encapsulation (IVcBasedEncapsulation)*

| Attribute Name | Attribute Description |
|---|---|
| Virtual Connection | Virtual connection if applicable (ATM Virtual Connection, Frame Relay Virtual Connection or Virtual LAN Interface) |
| Binding Information | Binding information (*User Name*, …) |
| Binding Status | Binding status (*Not Bound, Bound*) |
| IANA Type | IANA type of the sub/layer |
| Containing Termination Points | Underlying termination points (connection or physical) |
| Contained Connection Termination Points | Bound Connection Termination Points |

## High Level Data Link Control Encapsulation

The following Data Link layer High Level Data Link Control Encapsulation (HDLC) object, is bound by its Containing Termination Points attribute to an ATM/ Frame Relay VC Multiplexer object, and is primarily accessed by a Network layer such as the IP Interface bound by its Contained Connection Termination Points attribute.

*Table 8-2 High Level Data Link Control Encapsulation (IEncapsulation)*

| Attribute Name | Attribute Description |
|---|---|
| Virtual Connection | Virtual connection if applicable (ATM Virtual Connection or Frame Relay Virtual Connection) |
| Binding Information | Binding information (*User Name*, …) |
| Binding Status | Binding status (*Not Bound, Bound*) |
| IANA Type | IANA type of the sub/layer |
| Containing Termination Points | Underlying termination points (connection or physical) |
| Contained Connection Termination Points | Bound Connection Termination Points |

# Network Topology

The discovery of Point-to-Point Protocol (PPP) Data Link layer topology is done by searching for the existence of the local IP Subnet in any one hop away remote side’s PPP interface. In particular, a comparison is made between the local and remote IP subnets gathered from the upper IP Network layers.

# Service Alarms

There are no faults and alarms related to this technology.

**Note** For a detailed description of these alarms and for information about correlation see the *Cisco Active Network Abstraction Fault Management User Guide, 3.6.*