Lecture 10 - PPP

Exercise 1: Can PPP be used over a serial link configured for 9600,7,N,1 (9600 bps, 7 data bits, no parity, 1 stop bit)? Can it be used to encapsulate IP frames for broadcast to multiple users?

(9600, 7 N 1 / 8, E, 2 / O)

NO — requires 8 bits

NO — full duplex required

Exercise 2: What sequence of characters is transmitted when an escape character appears in the frame? What range of characters is transmitted when escaping unprintable ASCII characters (those between 0x00 and 0x2f)?

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 0111   7—
 0010   2—
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 0101
```

escape = 0x7d → 7d, (7d ⊕ 20)

→ 7d, 5d

Xor w/ 0x20

adds 32_{10} to each character

Exercise 3: What are the first four bytes of a PPP-encapsulated IP(v4) frame? What bytes would be transmitted for an IP address field with value 127.126.0.1? If the IP frame was 60 bytes long, no bytes needed to be escaped and the default PPP link options were being used, what would be the length of the PPP frame? Can an encapsulated IP frame distinguish between data and padding?

4	PPP	header
+ 60	IPv4	
+ 2	FCS	
+ 1	end-flag	
67		

yes → use the total length field. (IPv4)

Flag	Address	Control
01111110	11111111	00000011

Protocol	Information	Padding
8/16 bits	*	*

→ 0x7e (flag) 0xff (addr) 0x03 (control) 0x21

127.126.0.1 = 0x7f 0x7e 0x00 0x01

0x7f → not special; 0x7e → flag!

01111110 ⊕ 0010 0000 = 0101 1110 = 5 e

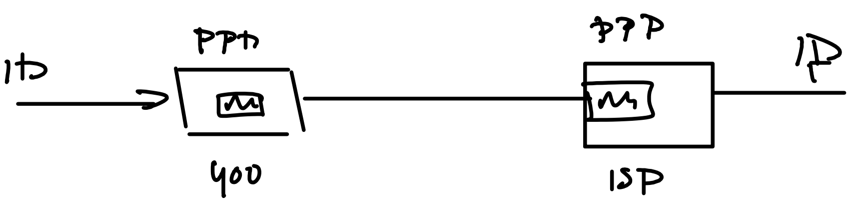
0x7e ⊕ 0x20

0x7f 0x7d 0x5e 0x00 0x01

(0x7d ↑ escape)

Exercise 4: Would LCP or NCP be used to negotiate compression (e.g. zip)? To configure a DNS server? To set the baud rate on the serial interface?

→ compression:



is link layer (L2)

∴ negotiated by LCP.

→ DNS server, NCP

→ baud rate: LCP.