

Basic Operation of ABP.

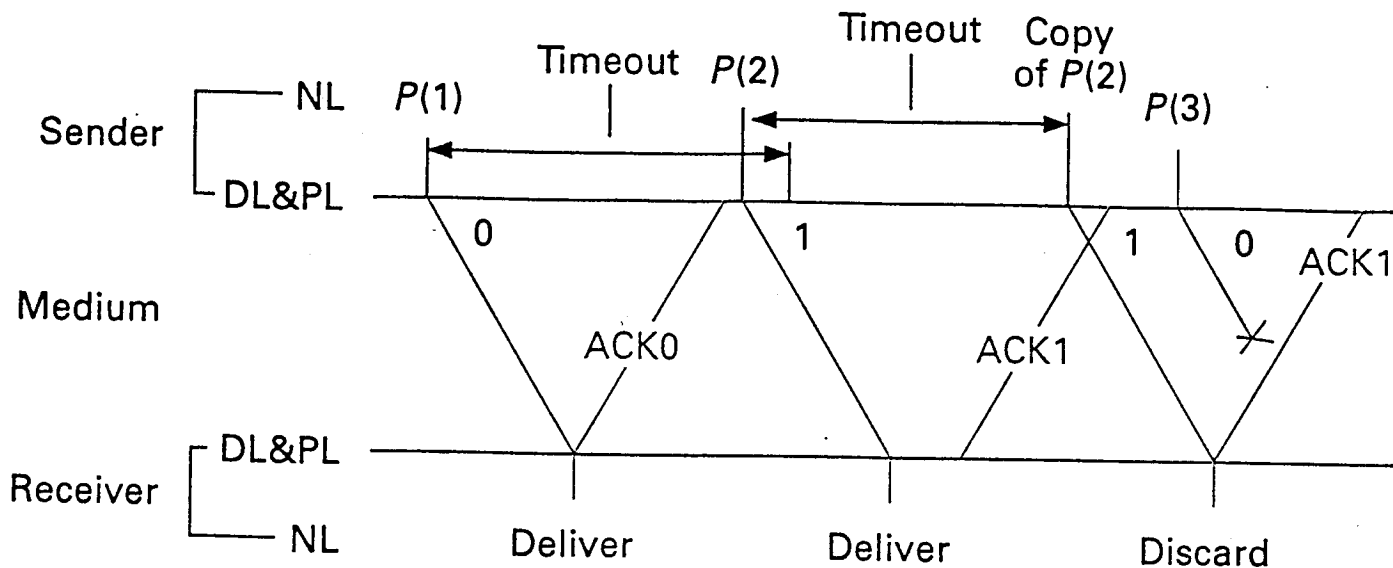
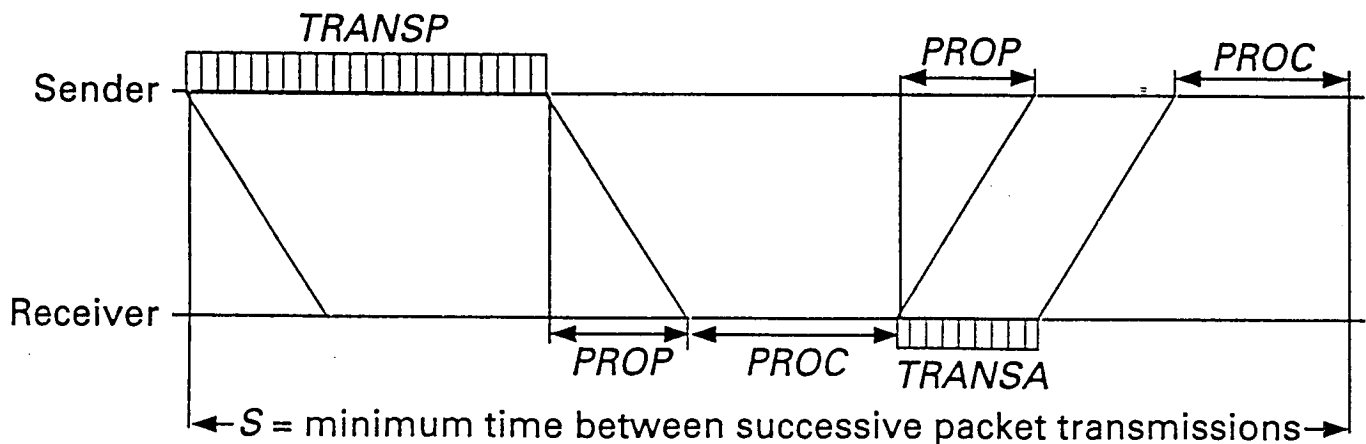


Figure 4.11 Example of events with the alternating bit protocol.

The packets and their acknowledgements are numbered 0, 1, 0, 1, ... A packet is retransmitted if it is not acknowledged before a timeout. The numbers of the packets and acknowledgements are indicated next to the oblique lines that represent their propagation.

Terminology:



Abbreviations

TRANSP = time to transmit a packet

PROP = propagation time

TRANSA = time to transmit an acknowledgement

PROC = processing time for ACK or for packet

$S = TRANSP + 2 \times PROP + 2 \times PROC + TRANSA$

Figure 4.12 Timing of error-free ABP.

The ABP is not very efficient, because the sender must wait for each packet to be acknowledged before it can send the next packet.

Two packets
were sent: #1, #2
Once ACK received:
which packet belongs
or refers to?

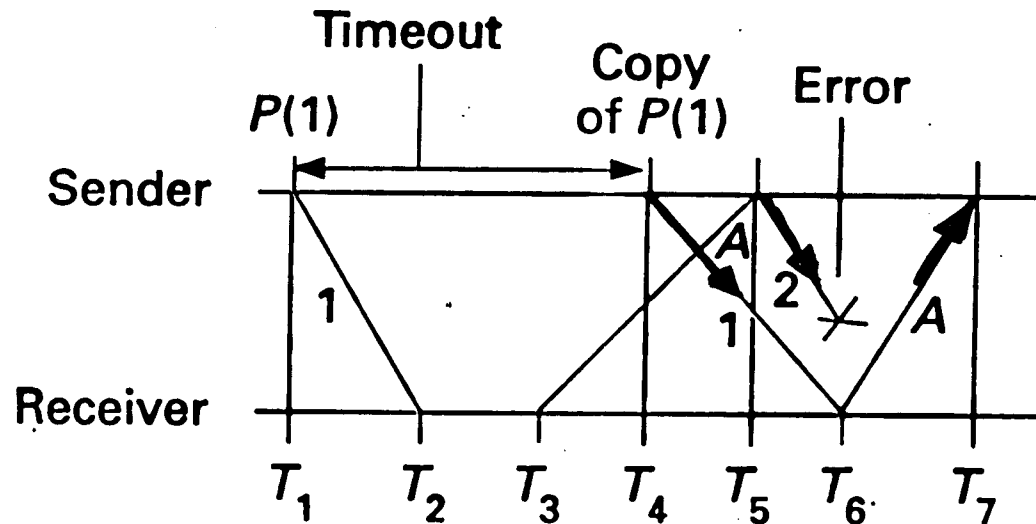


Figure 4.9 Transmission with unnumbered ACKs.

The sequence of transmissions is such that the sender cannot tell whether the ACK it receives at time T_7 is for the copy of $P(1)$ or for $P(2)$.

4.1 Data Link Protocols

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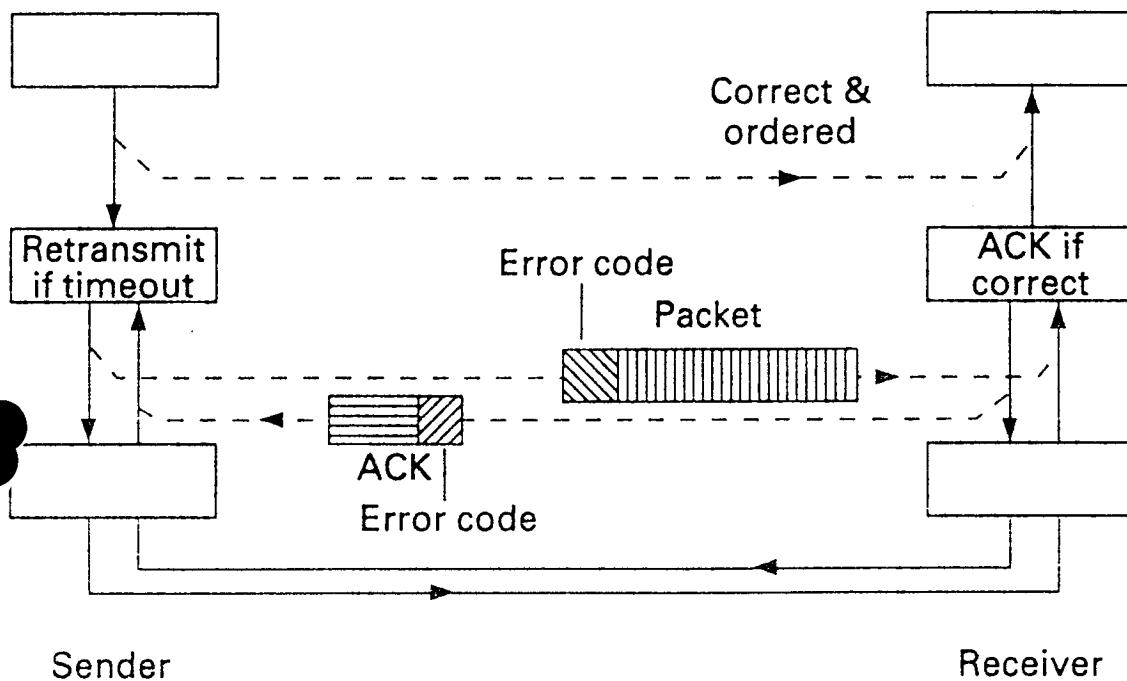


Figure 4.3 Packets and ACKs used by the data link layer.

The data link layer transmits a packet reliably by retransmitting copies of the incorrectly transmitted packets until a successful copy is received. The data link layer detects transmission errors by using a timer and acknowledgements. The data link layer suspects that an error occurred when a packet is not acknowledged before a timeout expires.