Packet Loss Detected by the Sender – RTO Timeout

TCP senders maintain a TCP Retransmission Timeout (RTO) value to determine when it should retransmit a packet that has not been acknowledged by a TCP peer.

If a data packet is sent and not acknowledged before the RTO timer expires, a TCP sender can retransmit the packet using the sequence number of the original packet.

Figure 230 shows a server resending a data packet after waiting for an ACK and not receiving it before the RTO expired. Another retransmission is resent after approximately 600 ms. Using TCP's backoff algorithm, the intervening time doubles for each retransmission attempt until the packet is acknowledged or the sending TCP host gives up after five retransmissions.

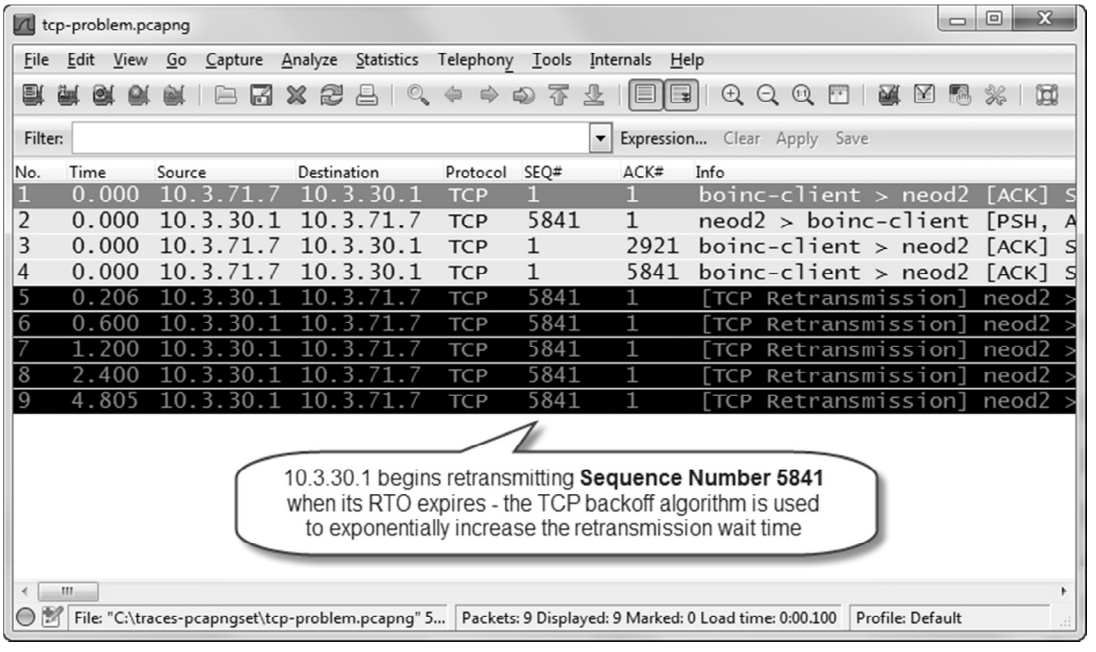

Figure 230. The HTTP server retransmits a packet when the retransmission timeout value is reached [tcp-problem.pcapng]

Move Wireshark Around when Packet Loss is Identified

When taking a trace of the traffic close to the sender, you cannot be certain whether data packets are not reaching the target or the ACKs are lost upon the return. Consider moving Wireshark further along the path to determine which case is true.

Improve Packet Loss Recovery with Selective Acknowledgments

Selective Acknowledgments (Selective ACKs or SACKs) are defined in RFC 2018, TCP Selective Acknowledgment Options. TCP Selective Acknowledgment is used to acknowledge segments of TCP data that have arrived while still defining missing segments.

Selective ACK capability must be set up during the TCP handshake process using the TCP SACK Permitted option shown in Figure 231.