

Retransmission (1/4)

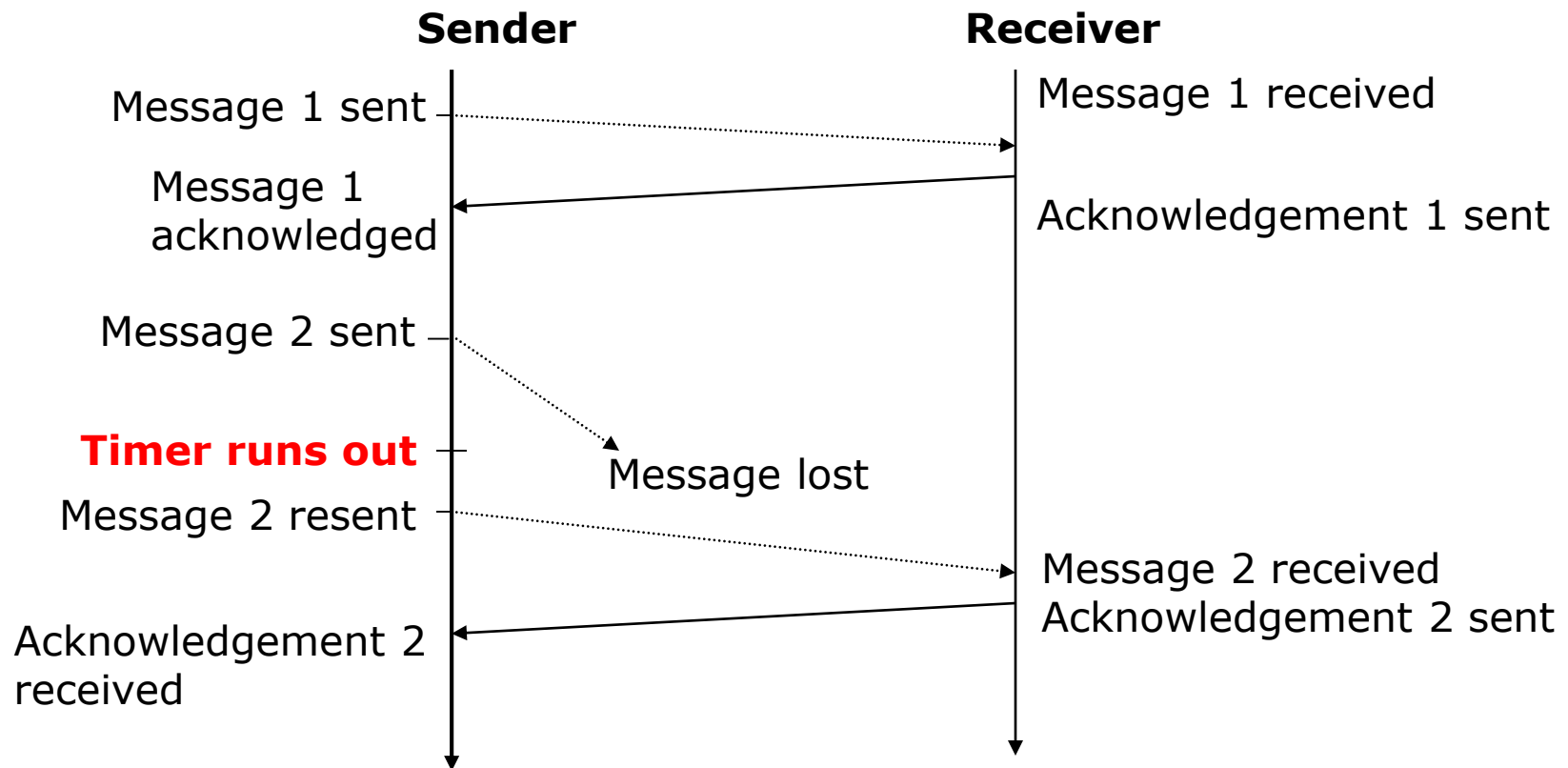
1

- **Retransmission** – TCP initiates a retransmission in case of error; a basic technique to ensure error-free transmission
- The receipt of sent TCP messages is confirmed by the receiver – **acknowledgement**
- The sender starts a **timer** when transmission of a data packet begins. If the timer runs out before the arrival of a receipt acknowledgement, the data packet is considered lost and will be retransmitted
- To force retransmission, the receiver sends no acknowledgement and waits for automatic retransmission after the timer has run out

Retransmission (2/4)

2

TCP retransmission with timeout



Retransmission (3/4)

3

- Choice of the time limit for the timer determines the efficiency of the throughput
- In a LAN, shorter times make more sense than they do in wide area connections:
 - If retransmission takes place...
 - too early, Internet is flooded with superfluous duplicates
→ throughput decreases
 - too late, many messages must be stored in the buffer
→ queues overflow

Retransmission (4/4)

4

- Fixed timers and time limits can never satisfy every situation
- TCP therefore offers an adaptive mechanism for adjusting the time barrier– **adaptive retransmission**
- TCP monitors the network load for every connection by determining the packet **round trip time** – time period between the sending of a packet and arrival of its acknowledgement:
 - A measurement is done for every transmission and compared with the previous measurement for the same connection
 - Time periods are adjusted adaptively to the momentary load situation with a moving average - **smoothed round trip time**