# Principles of Reliable Data Transfer

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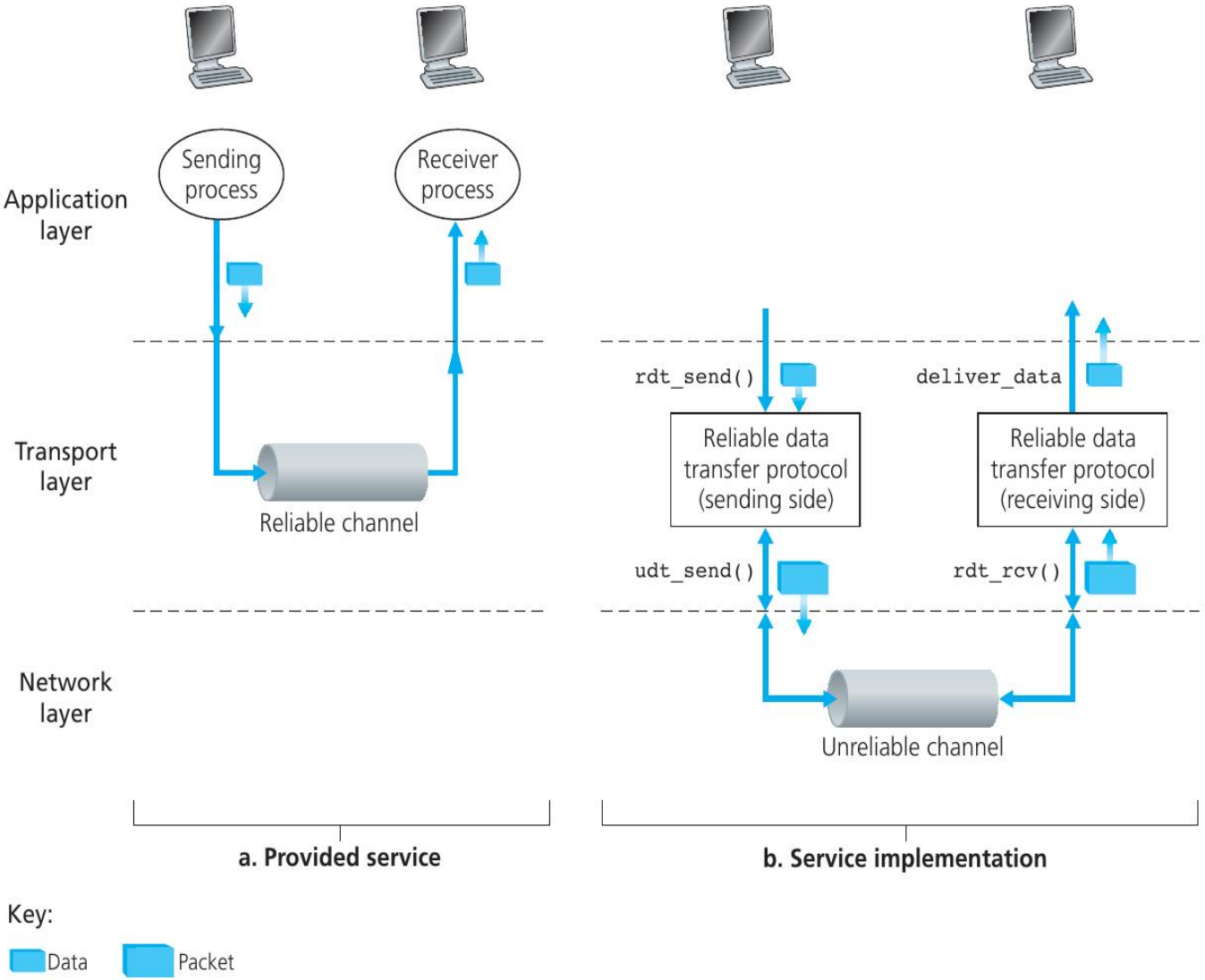
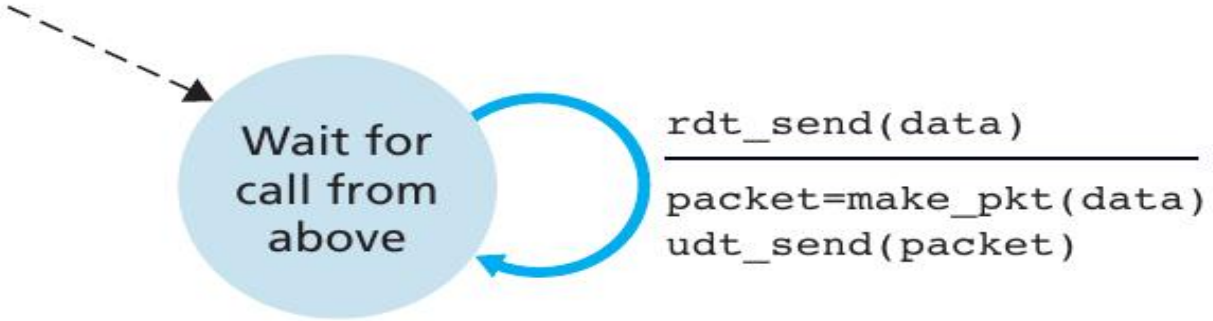
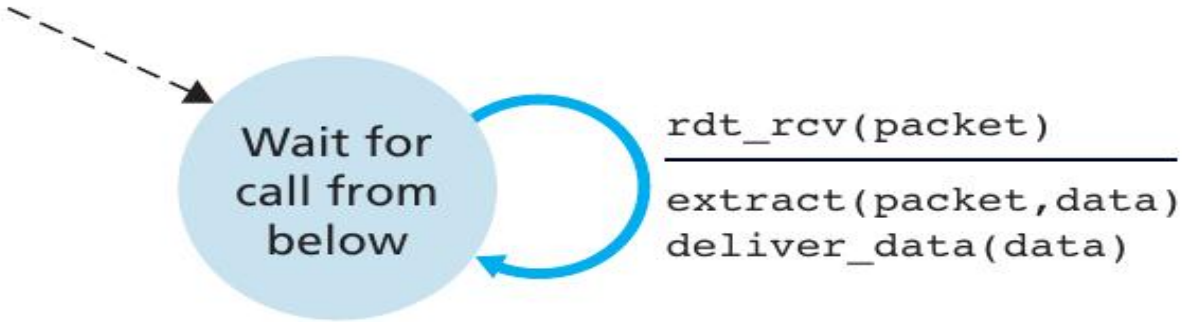
# Reliable Data Transfer



# RDT1.0

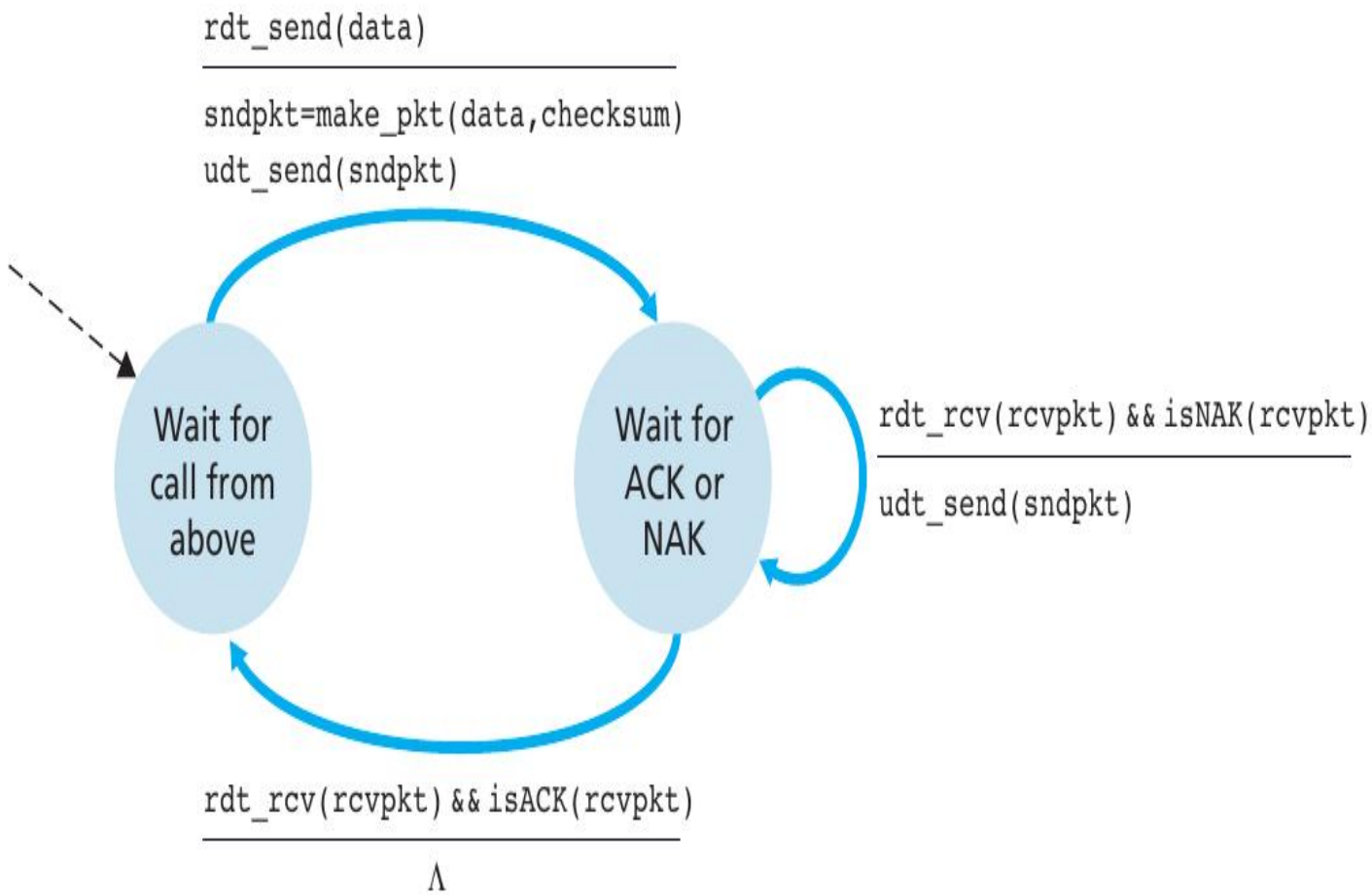



a. rdt1.0: sending side



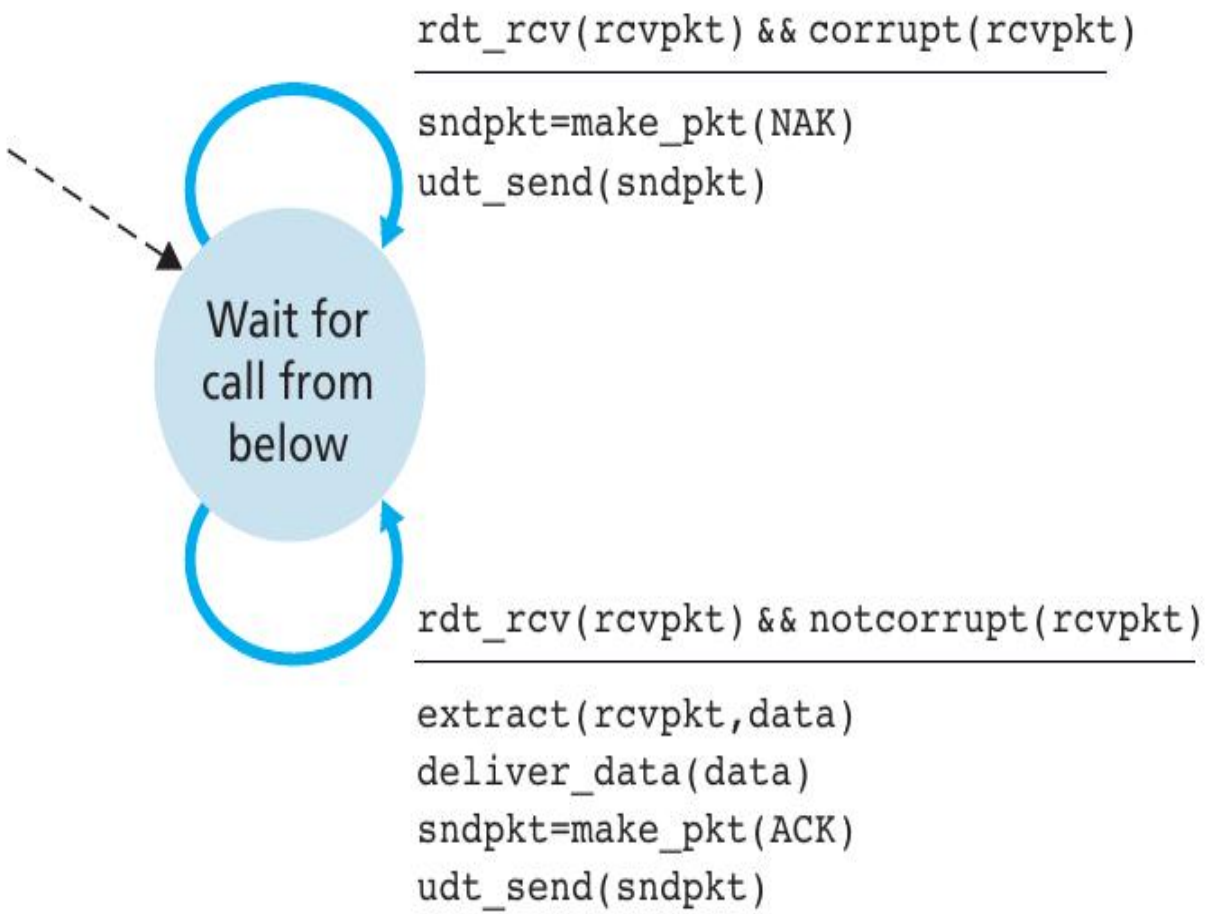

b. rdt1.0: receiving side

# RDT Over a Channel with Bit Errors: rdt 2.0 sender



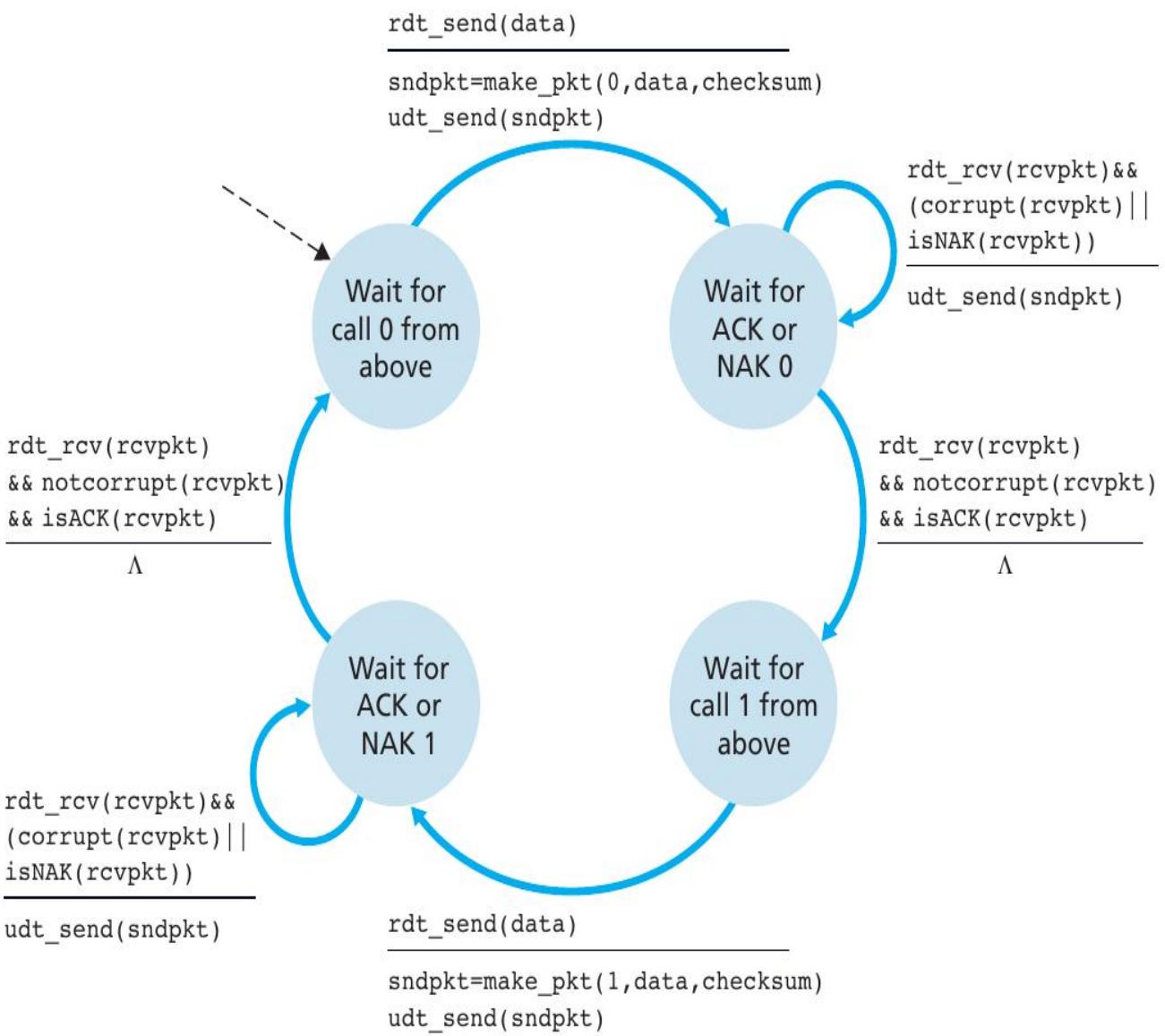

a. rdt2.0: sending side

# RDT Over a Channel with Bit Errors: rdt 2.0 receiver

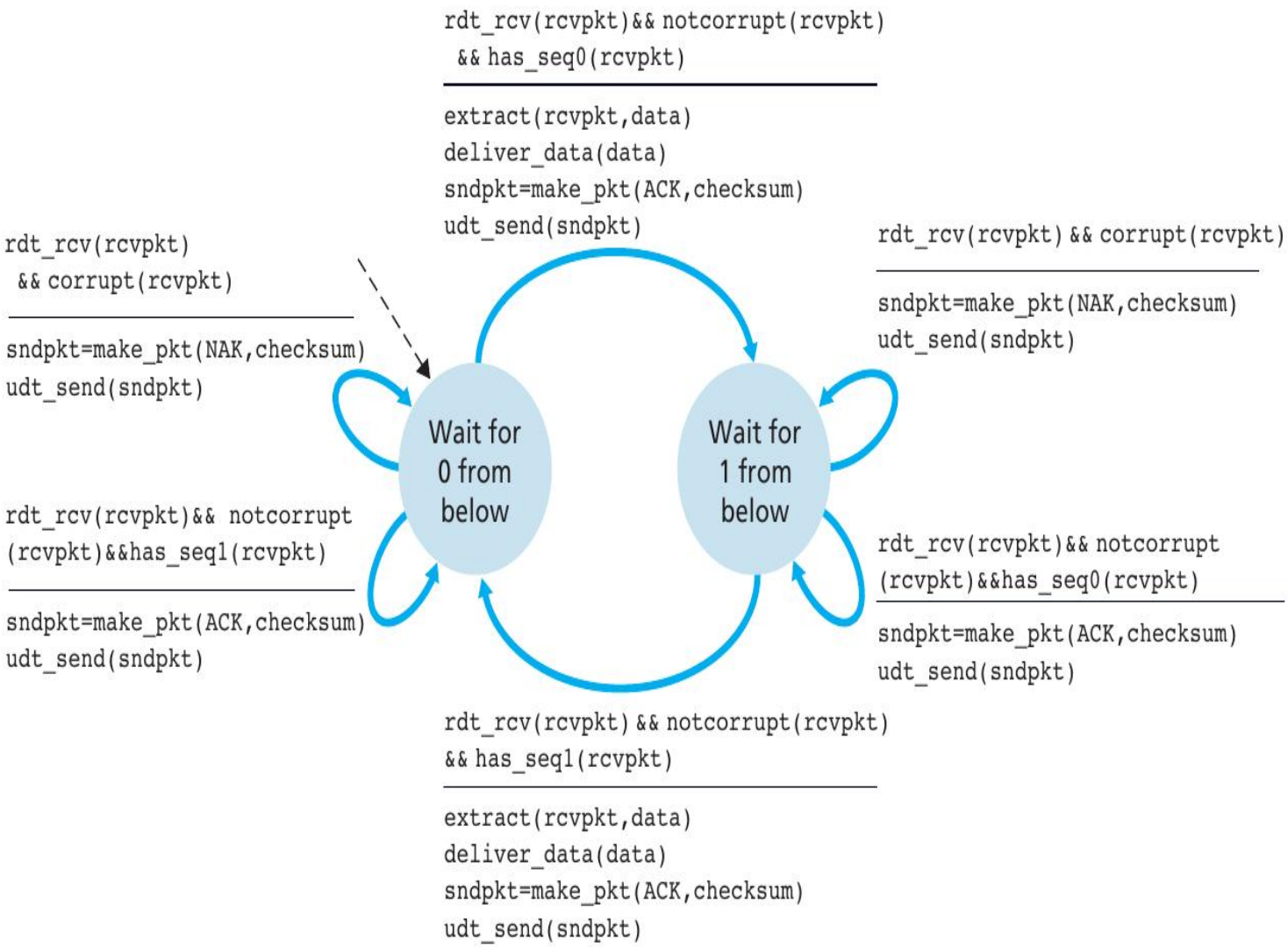



**b. rdt2.0: receiving side**

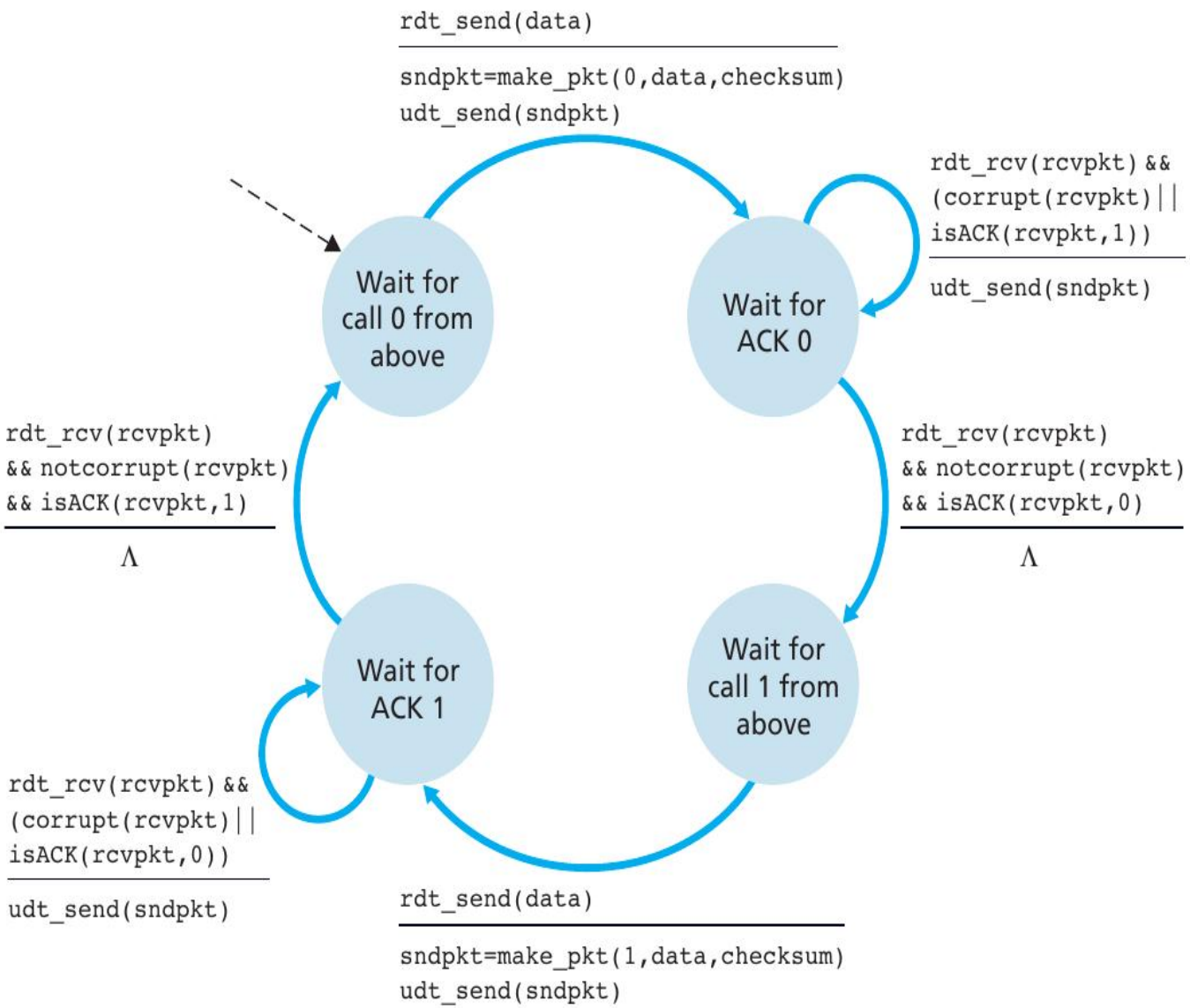
# RDT 2.1 Sender



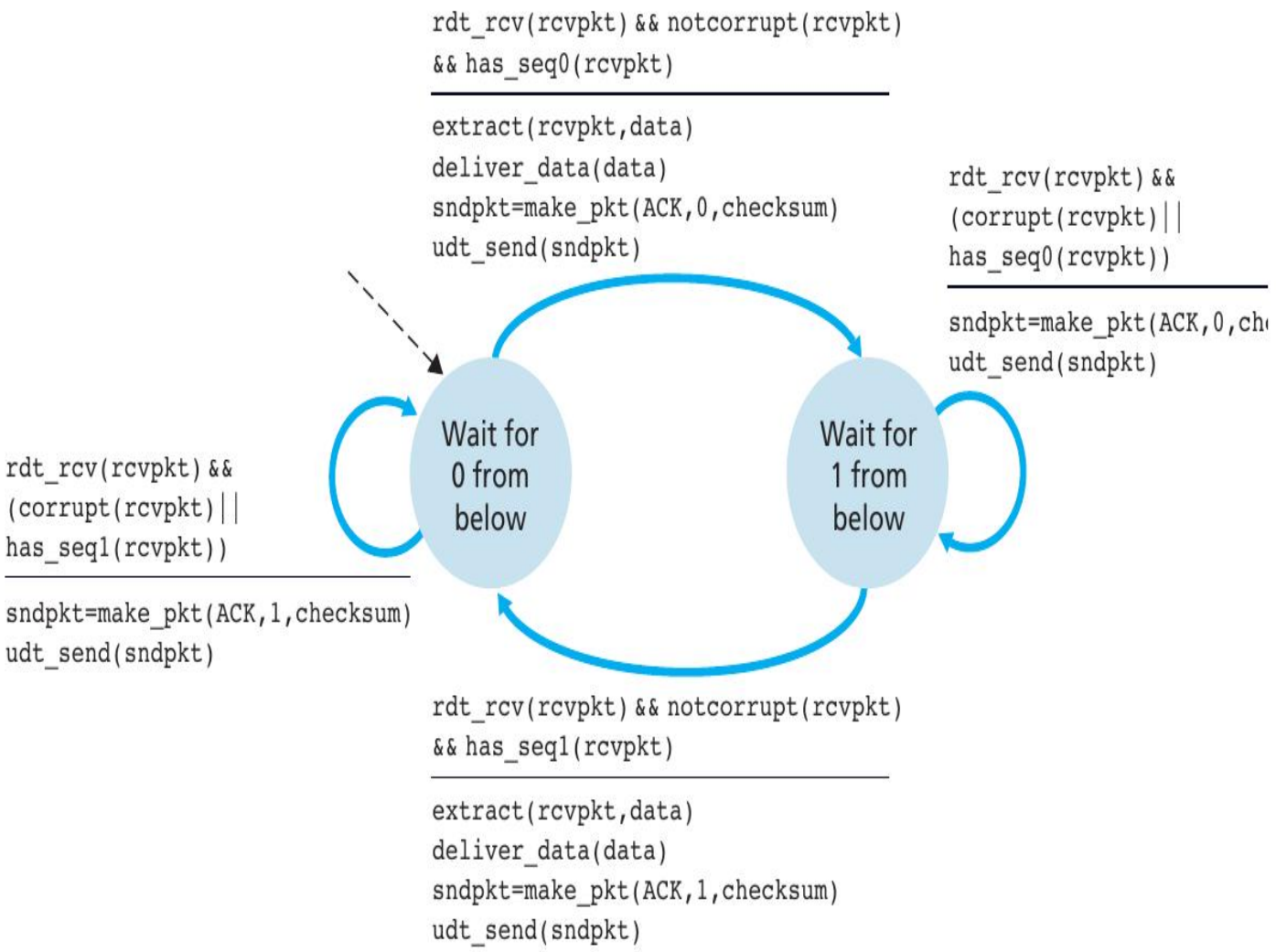
# RDT 2.1 Receiver



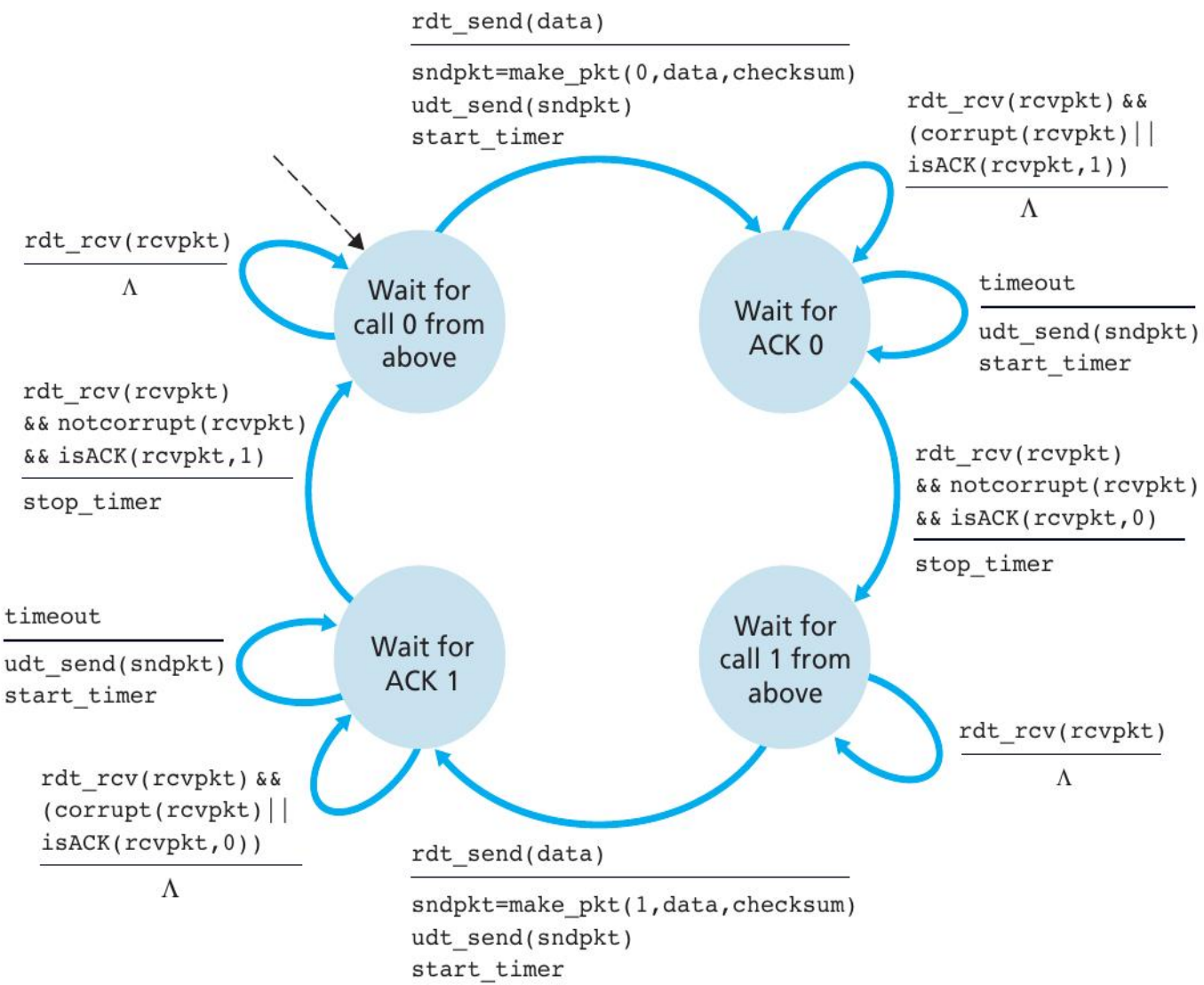
# RDT Over a Lossy Channel with Bit Errors: rdt 2.2 sender



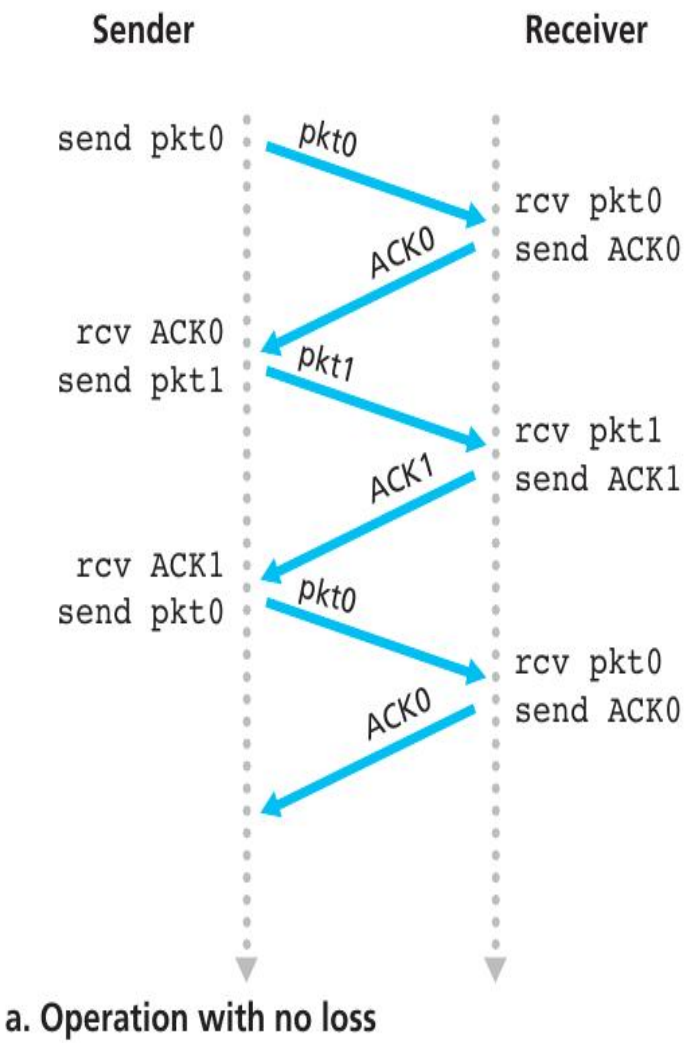
# RDT Over a Lossy Channel with Bit Errors: rdt 2.2 receiver



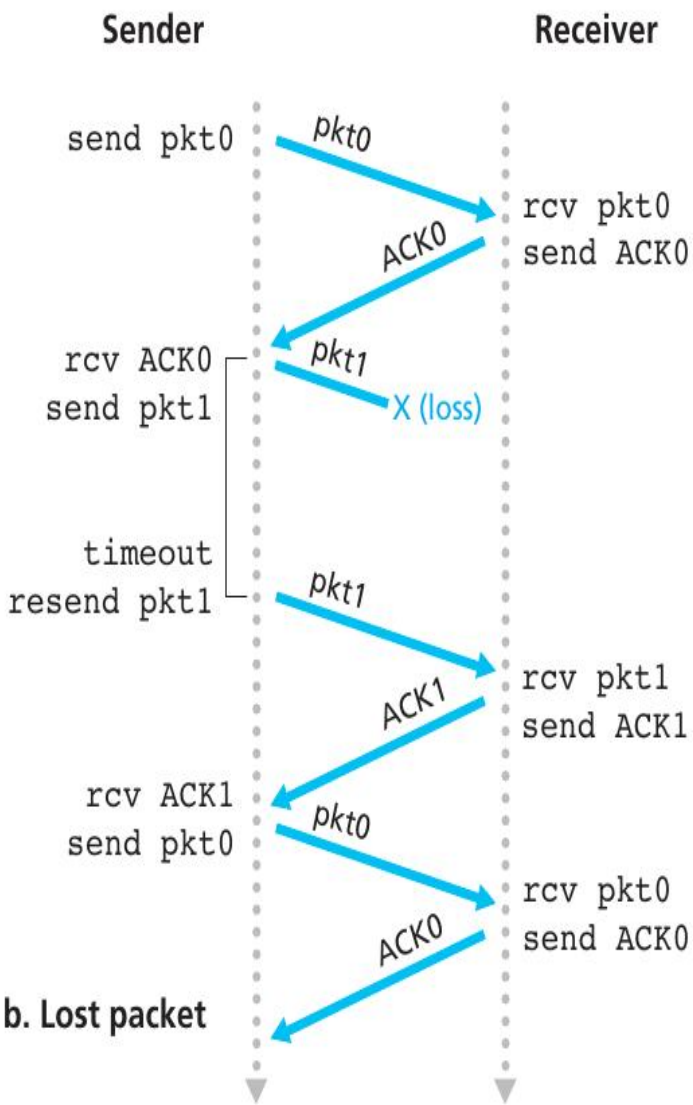
# RDT 3.0: NAK-Free



# RDT 3.0-Alternating-bit Protocol: Operation

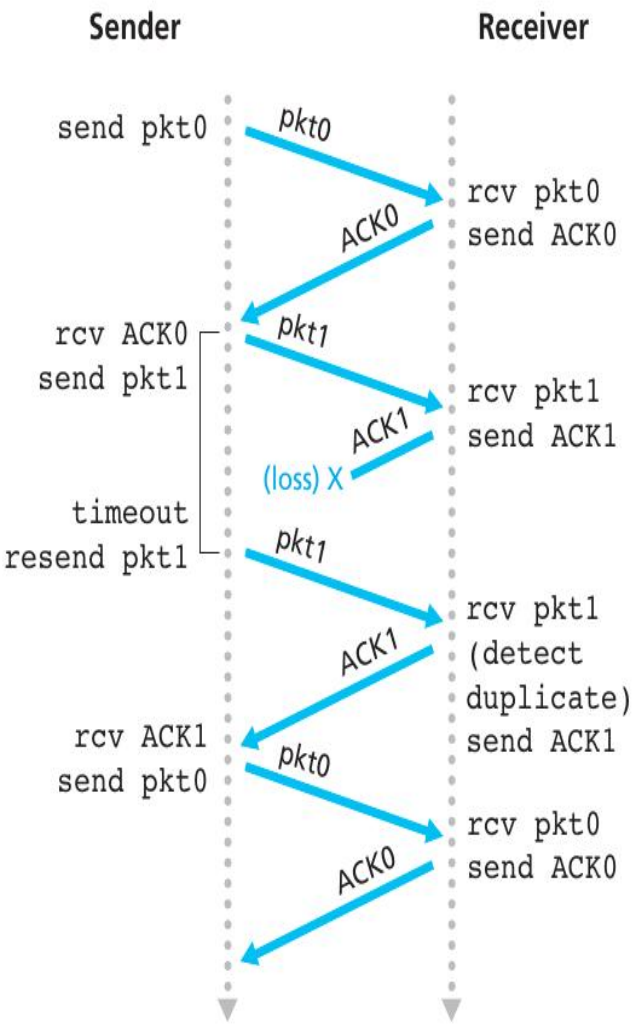



a. Operation with no loss

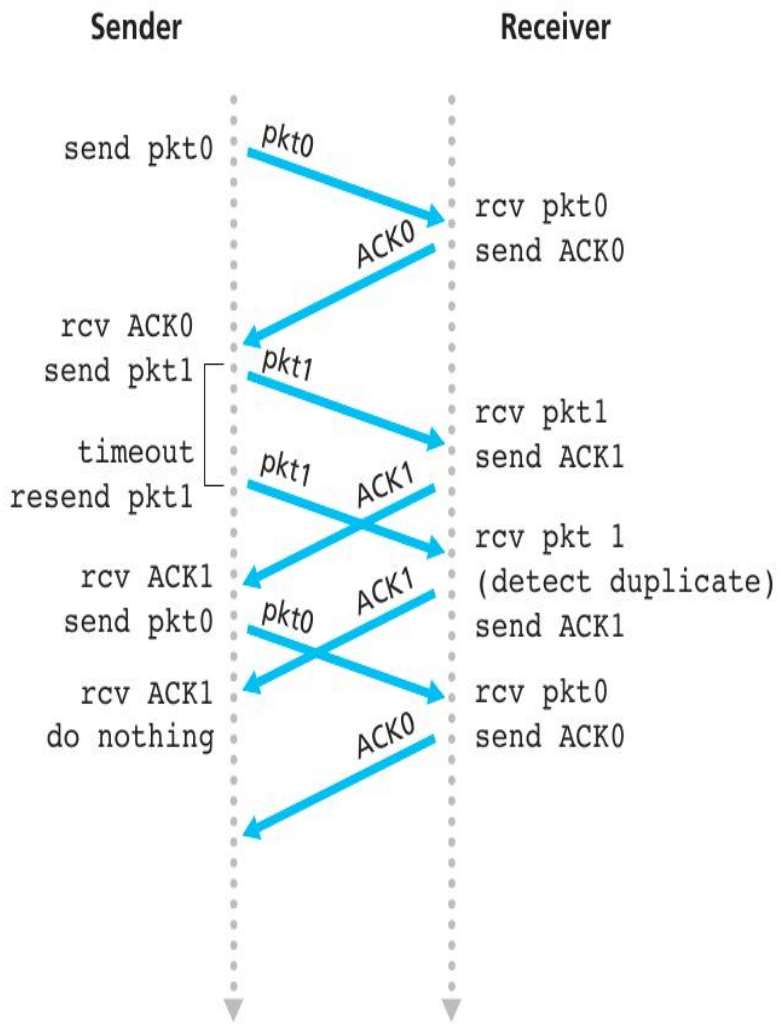



b. Lost packet

# RDT 3.0-Alternating-bit Protocol: Operation

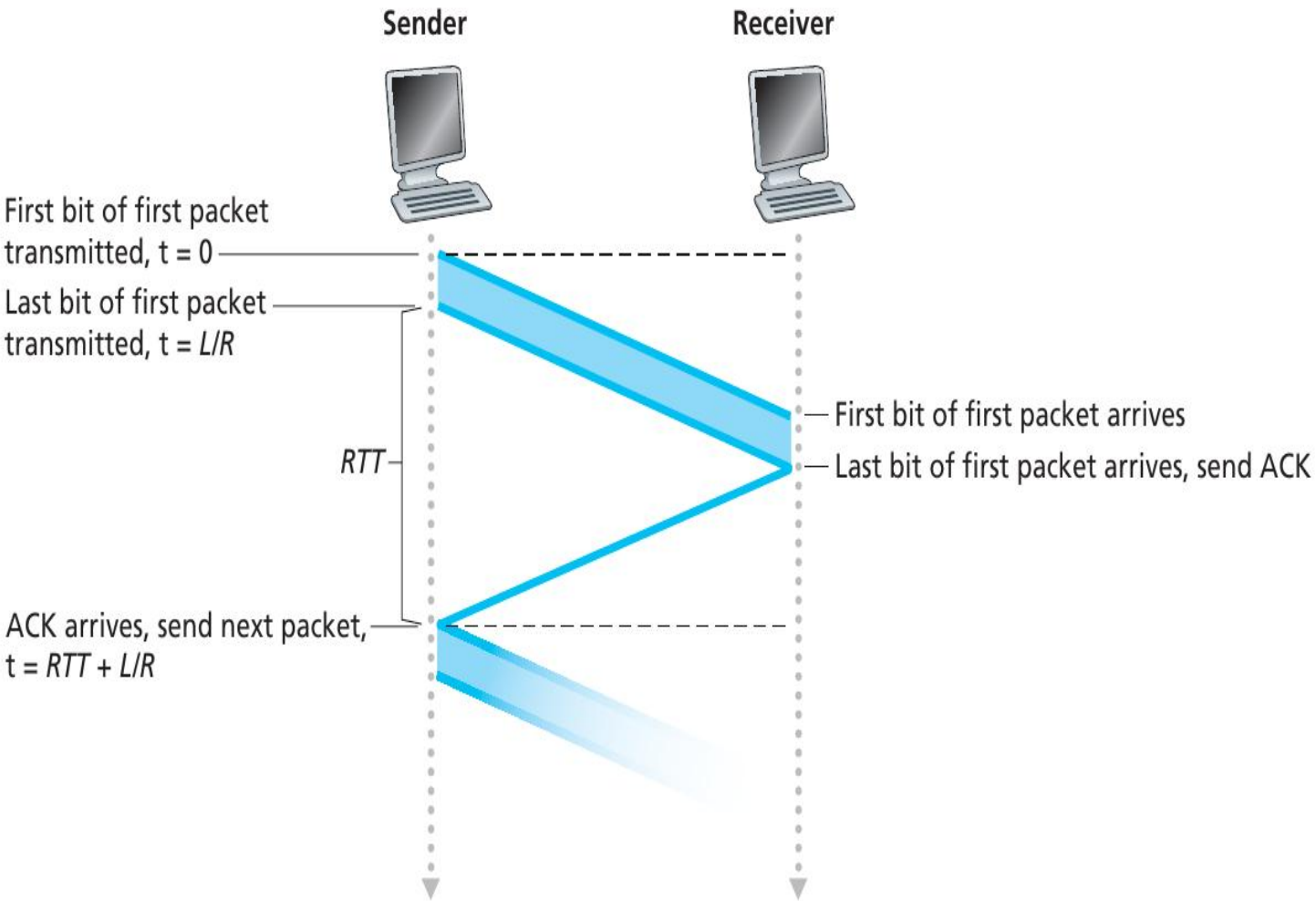



c. Lost ACK



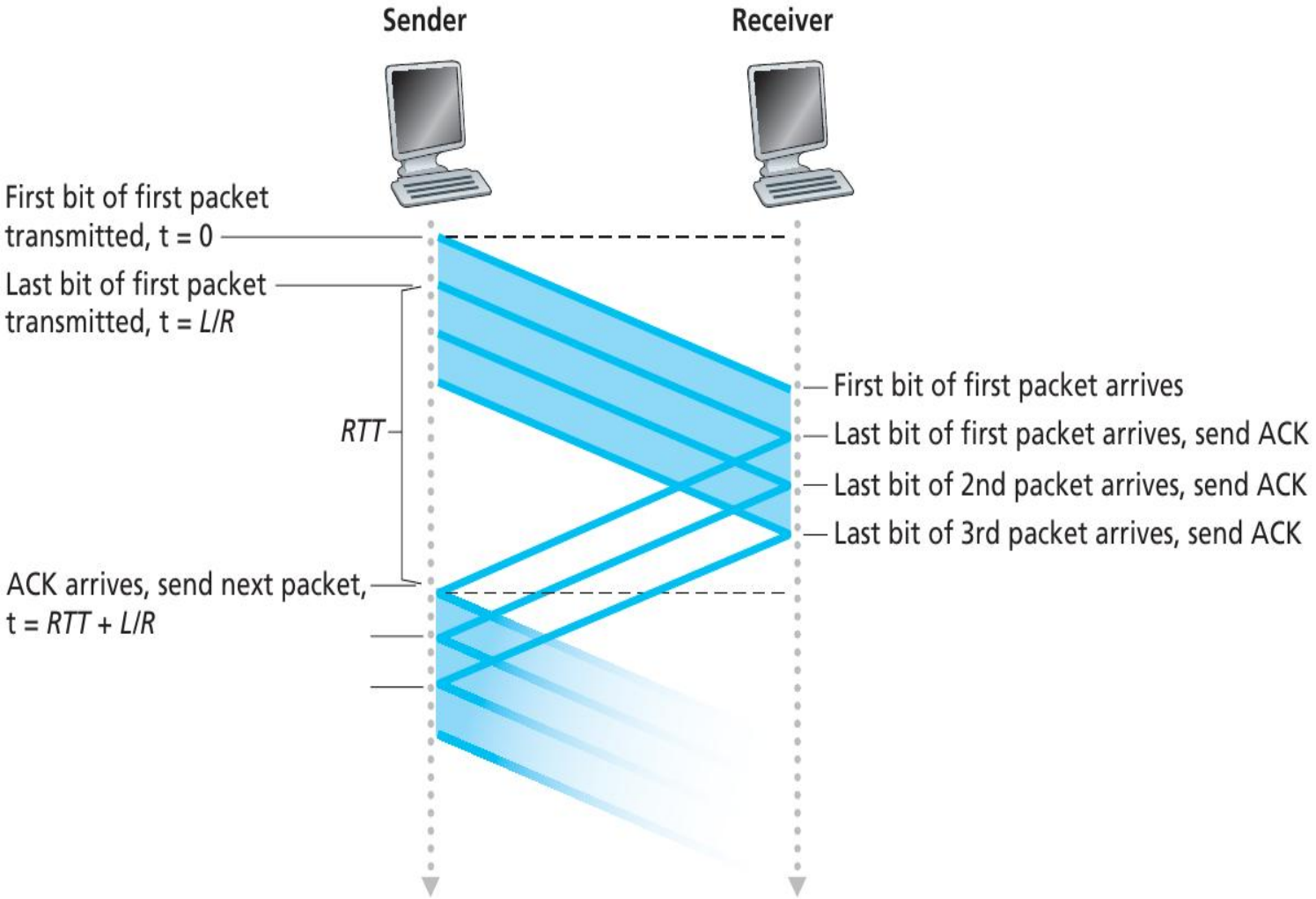

d. Premature timeout

# Stop-and-Wait Operation



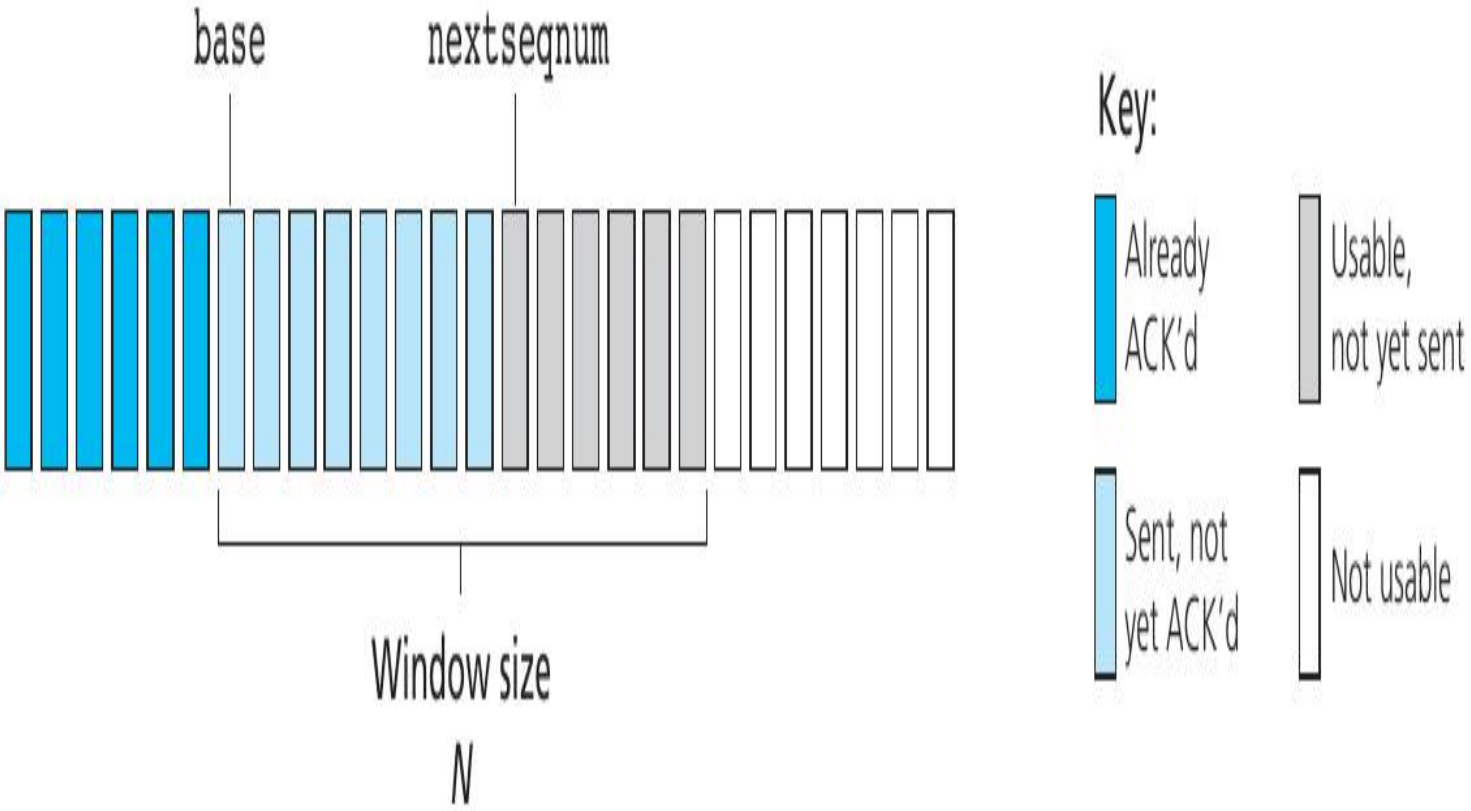

a. Stop-and-wait operation

# Pipelining

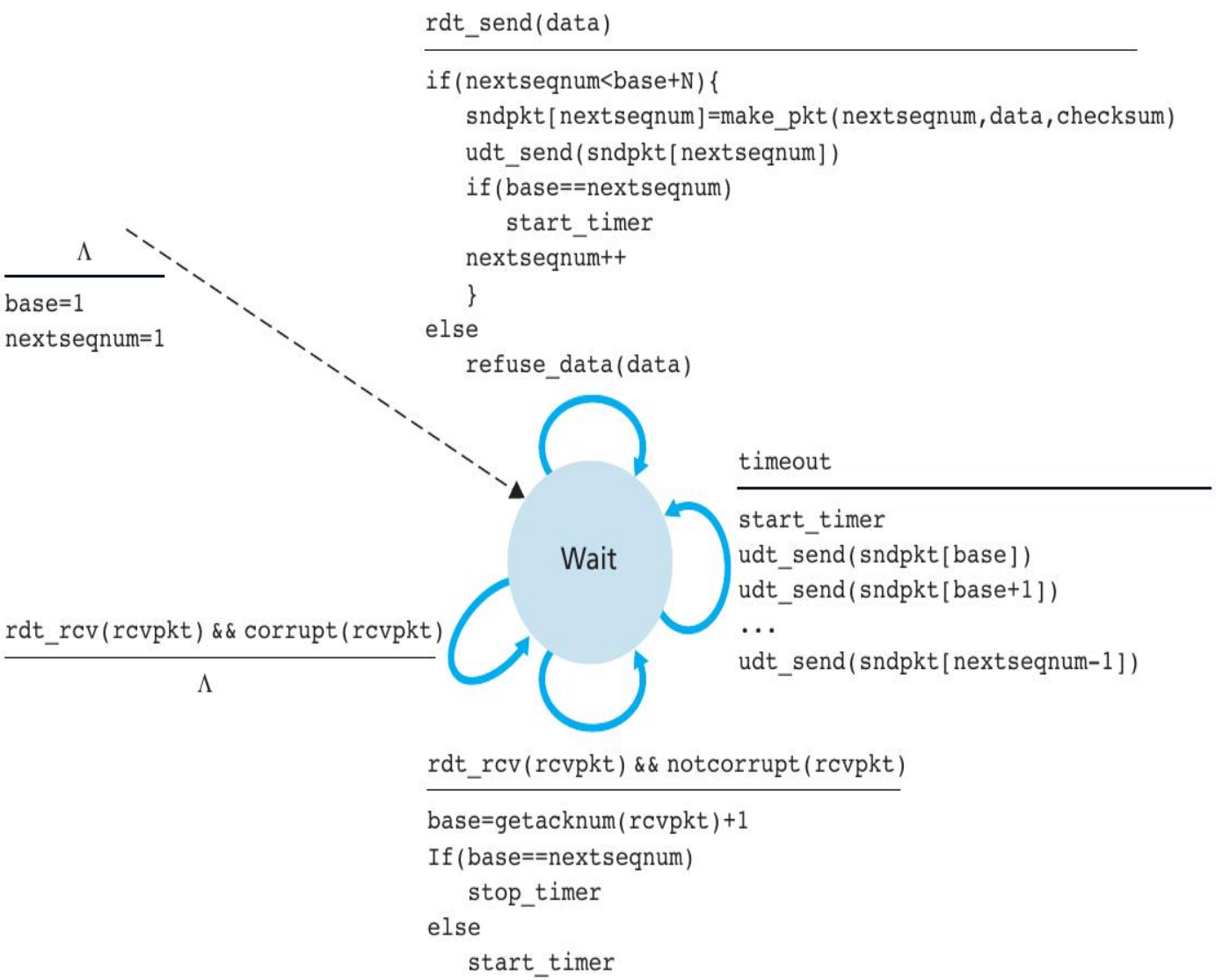



**b. Pipelined operation**

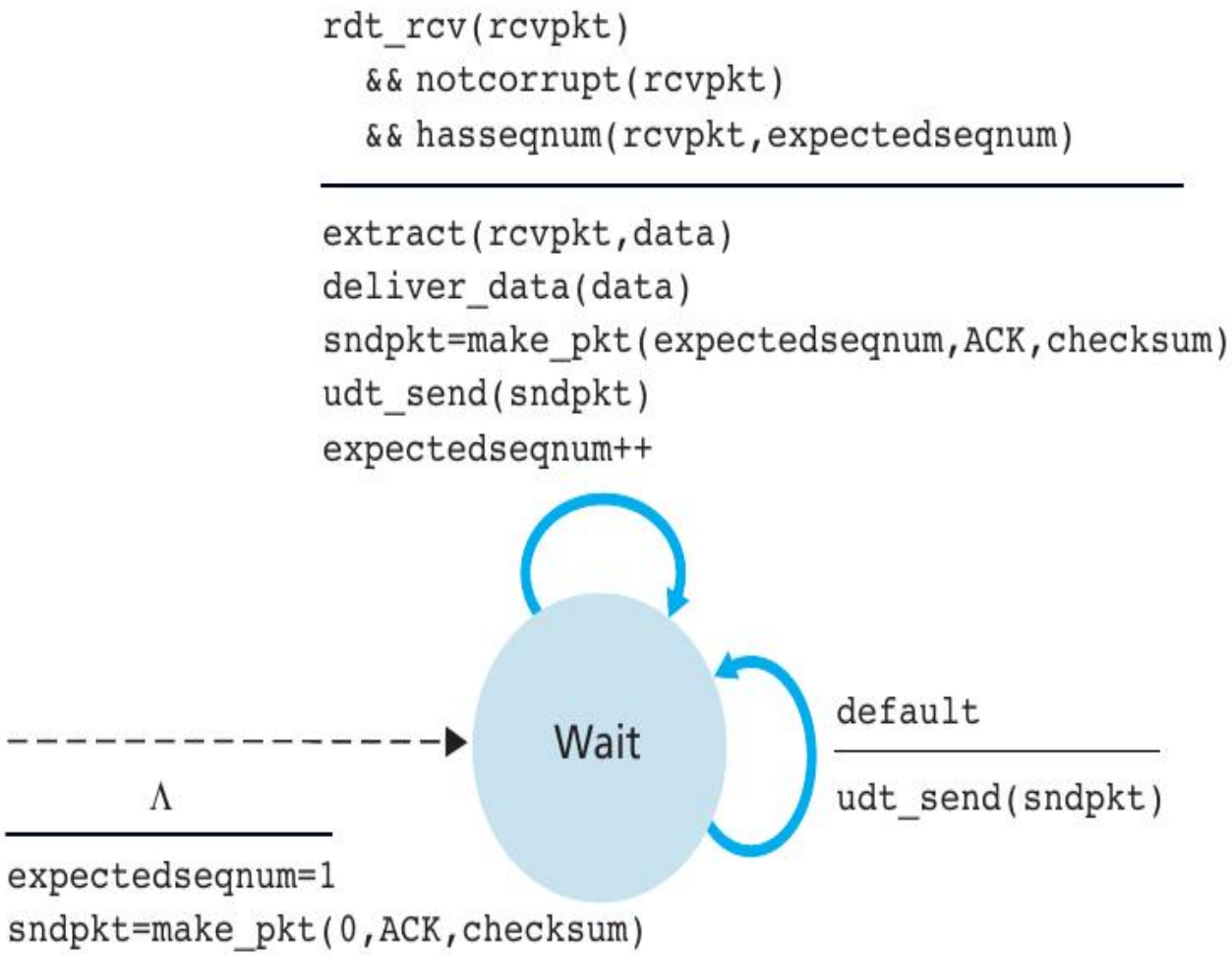
# Go-Back-N


base
nextseqnum
Window size
N
Key:
Already ACK'd
Usable, not yet sent
Sent, not yet ACK'd
Not usable

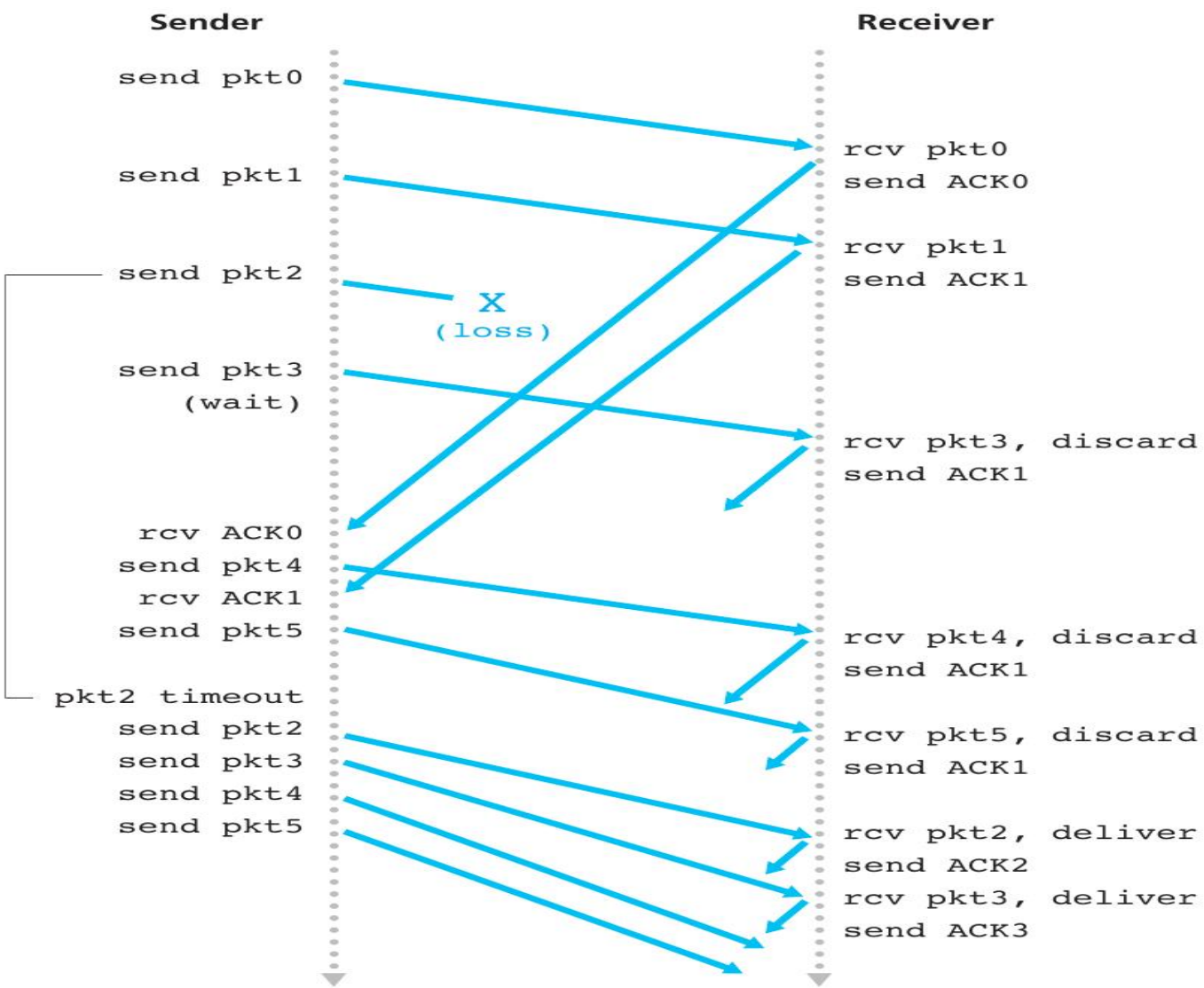
# GBN Sender


rdt_send(data)
if(nextseqnum<base+N){
sndpkt[nextseqnum]=make_pkt(nextseqnum,data,checksum)
udt_send(sndpkt[nextseqnum])
if(base==nextseqnum)
start_timer
nextseqnum++
}
else
refuse_data(data)
Λ
base=1
nextseqnum=1
Wait
timeout
start_timer
udt_send(sndpkt[base])
udt_send(sndpkt[base+1])
...
udt_send(sndpkt[nextseqnum-1])
rdt_rcv(rcvpkt) && corrupt(rcvpkt)
Λ
rdt_rcv(rcvpkt) && notcorrupt(rcvpkt)
base=getacknum(rcvpkt)+1
If(base==nextseqnum)
stop_timer
else
start_timer

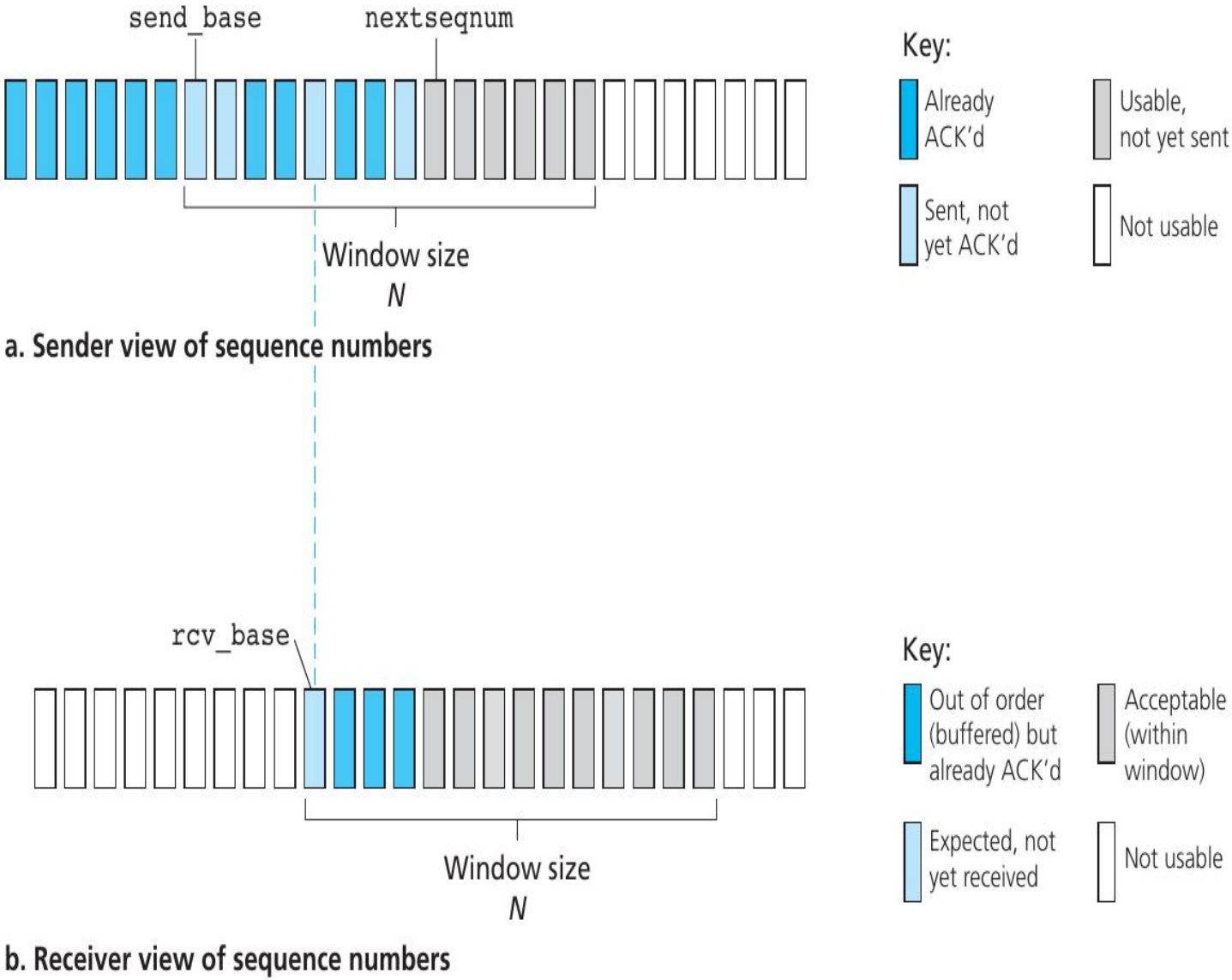
# GBN Receiver



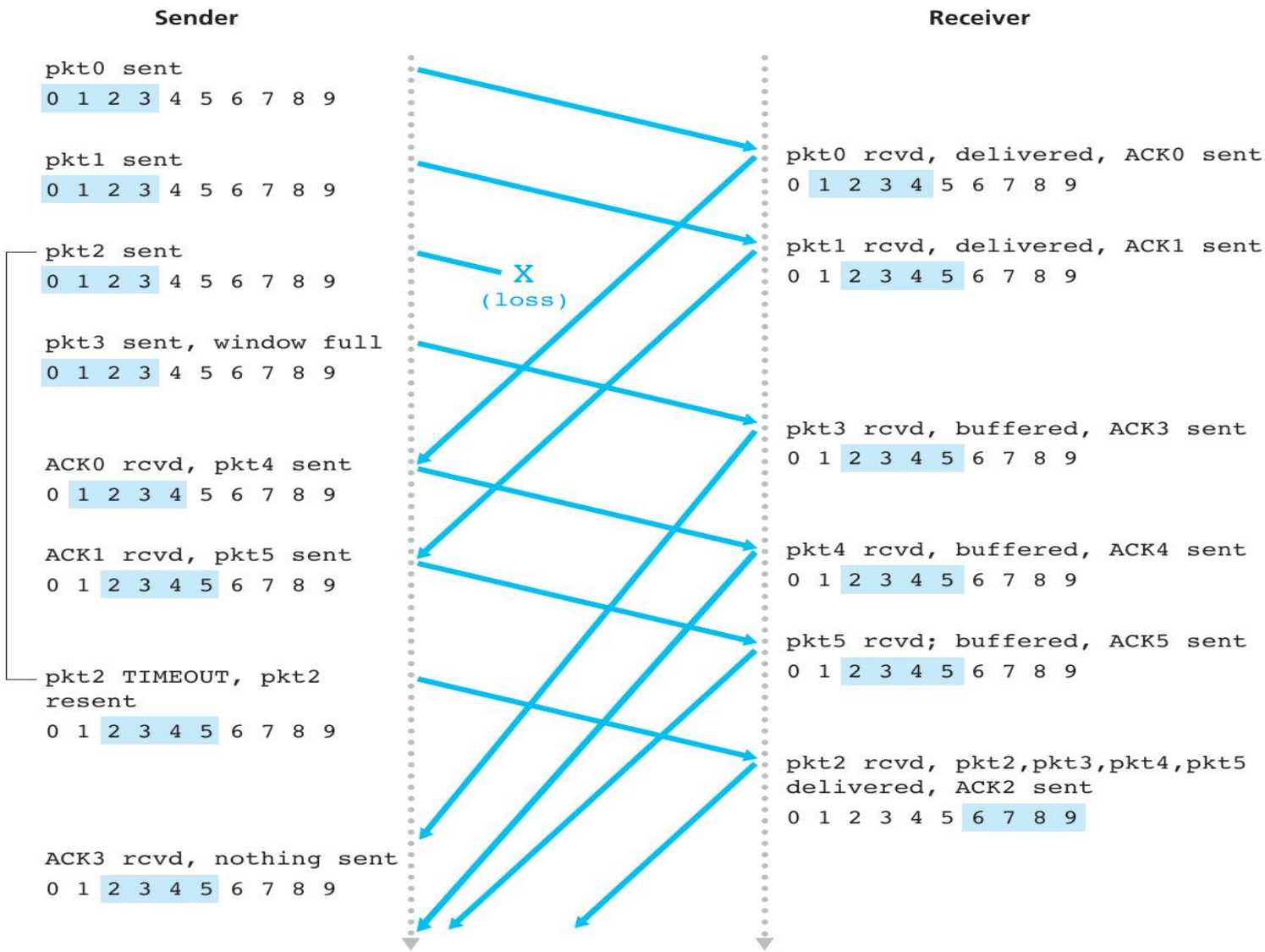
# GBN Operation



# Selective-Repeat



# SR Operation



# Window Size in SR