

Reliable transport protocol: programming with C: abp.c

sk4920

Feature

Implement both ACK and NAK

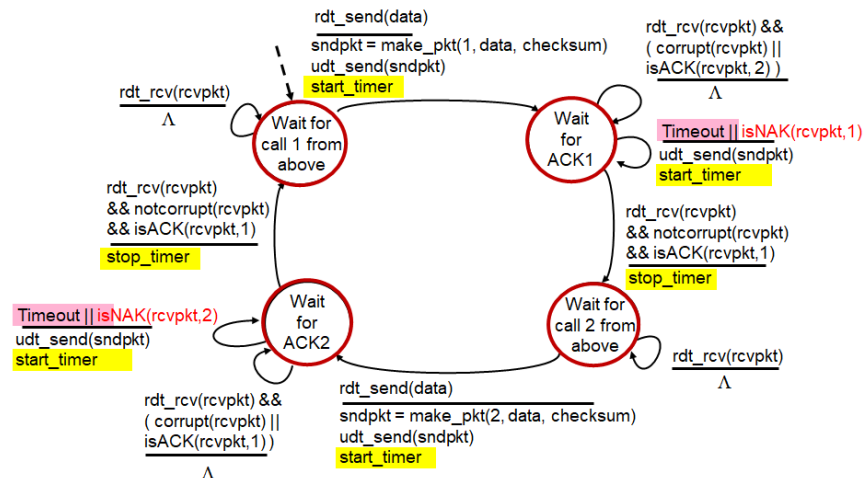
Alternating sequence numbers between 1 and 2

NAK returns a negative sequence number of the original one.

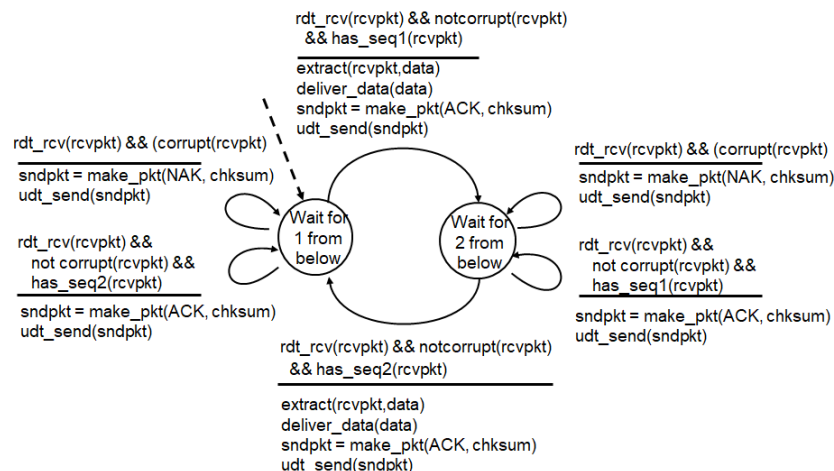
3 Types(TIMER_INTERRUPT = 0, FROM_LAYER5 = 1, FROM_LAYER3 = 2)

Finite State Machine

Alternative Bit Protocol sender



Alternative Bit Protocol receiver



Sample output(10 messages have been ACK'ed correctly at the receiver, a loss probability of 0.1, and a corruption probability of 0.3, lambda of 1000, and a trace level of 2.)

EVENT time: 93.569748, type: 1, fromlayer5 entity: sender A

A_output: send packet: aaaaaaaaaaaaaaaaaa

EVENT time: 99.062195, type: 2, fromlayer3 entity: receiver B

B_input: rcv message: aaaaaaaaaaaaaaaaaa

B_input: send ACK.

EVENT time: 101.561325, type: 2, fromlayer3 entity: sender A

A_input: ACK

EVENT time: 1607.715088, type: 1, fromlayer5 entity: sender A

A_output: send packet: bbbbbbbbbbbbbbbbbbb

EVENT time: 1609.116333, type: 2, fromlayer3 entity: receiver B

B_input: rcv message: bbbbbbbbbbbbbbbbbbb

B_input: send ACK.

EVENT time: 1614.552979, type: 2, fromlayer3 entity: sender A

A_input: ACK

EVENT time: 2322.031250, type: 1, fromlayer5 entity: sender A

A_output: send packet: cccccccccccccccccc

EVENT time: 2325.527344, type: 2, fromlayer3 entity: receiver B

B_input: rcv message: cccccccccccccccccc

B_input: send ACK.

EVENT time: 2328.412354, type: 2, fromlayer3 entity: sender A

A_input: ACK

EVENT time: 3332.804199, type: 1, fromlayer5 entity: sender A

A_output: send packet: dddddddddddddddddd

TOLAYER3: packet being corrupted

EVENT time: 3337.380615, type: 2, fromlayer3 entity: receiver B

B_input: packet corrupted. send NAK.

EVENT time: 3341.256836, type: 2, fromlayer3 entity: sender A

A_input: received NAK.

A_resend: resend last packet: dddddddddddddddddd.

EVENT time: 3346.818115, type: 2, fromlayer3 entity: receiver B

B_input: rcv message: dddddddddddddddddd

B_input: send ACK.

TOLAYER3: packet being lost

EVENT time: 3351.256836, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: dddddddddddddddddd.

EVENT time: 3357.204346, type: 2, fromlayer3 entity: receiver B
B_input: not the expected seq. send ACK with the previous sequence number.

EVENT time: 3359.402100, type: 2, fromlayer3 entity: sender A
A_input: ACK

EVENT time: 5057.893555, type: 1, fromlayer5 entity: sender A
A_output: send packet: eeeeeeeeeeeeeeeeeee
TOLAYER3: packet being corrupted

EVENT time: 5058.931152, type: 1, fromlayer5 entity: sender A
A_output: wait for ack, ignoring the packet: ffffffffffffffff

EVENT time: 5062.472656, type: 2, fromlayer3 entity: receiver B
B_input: packet corrupted. send NAK.

EVENT time: 5064.000000, type: 2, fromlayer3 entity: sender A
A_input: received NAK.
A_resend: resend last packet: eeeeeeeeeeeeeeeeeee.

EVENT time: 5065.919922, type: 2, fromlayer3 entity: receiver B
B_input: rcv message: eeeeeeeeeeeeeeeeeee
B_input: send ACK.
TOLAYER3: packet being corrupted

EVENT time: 5074.000000, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: eeeeeeeeeeeeeeeeeee.

EVENT time: 5075.554688, type: 2, fromlayer3 entity: sender A
A_input: packet is corrupted, ignoring the packet.

EVENT time: 5080.081543, type: 2, fromlayer3 entity: receiver B
B_input: not the expected seq. send ACK with the previous sequence number.

EVENT time: 5084.000000, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: eeeeeeeeeeeeeeeeeee.

EVENT time: 5084.633301, type: 2, fromlayer3 entity: sender A
A_input: ACK

EVENT time: 5090.330566, type: 2, fromlayer3 entity: receiver B
B_input: not the expected seq. send ACK with the previous sequence number.
TOLAYER3: packet being lost

EVENT time: 6557.268066, type: 1, fromlayer5 entity: sender A

A_output: send packet: gggggggggggggggggggg

EVENT time: 6562.963867, type: 2, fromlayer3 entity: receiver B

B_input: rcv message: gggggggggggggggggggg

B_input: send ACK.

TOLAYER3: packet being corrupted

EVENT time: 6567.268066, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: gggggggggggggggggggg.

EVENT time: 6570.817383, type: 2, fromlayer3 entity: sender A

A_input: packet is corrupted, ignoring the packet.

EVENT time: 6575.128906, type: 2, fromlayer3 entity: receiver B

B_input: not the expected seq. send ACK with the previous sequence number.

TOLAYER3: packet being corrupted

EVENT time: 6577.129883, type: 2, fromlayer3 entity: sender A

A_input: packet is corrupted, ignoring the packet.

EVENT time: 6577.268066, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: gggggggggggggggggggg.

EVENT time: 6578.428711, type: 2, fromlayer3 entity: receiver B

B_input: not the expected seq. send ACK with the previous sequence number.

TOLAYER3: packet being corrupted

EVENT time: 6582.625000, type: 2, fromlayer3 entity: sender A

A_input: packet is corrupted, ignoring the packet.

EVENT time: 6587.268066, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: gggggggggggggggggggg.

TOLAYER3: packet being lost

EVENT time: 6597.268066, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: gggggggggggggggggggg.

EVENT time: 6598.811523, type: 2, fromlayer3 entity: receiver B

B_input: not the expected seq. send ACK with the previous sequence number.

EVENT time: 6602.600586, type: 2, fromlayer3 entity: sender A

A_input: ACK

EVENT time: 7293.801758, type: 1, fromlayer5 entity: sender A

A_output: send packet: hhhhhhhhhhhhhhhhhhhh

TOLAYER3: packet being corrupted

EVENT time: 7301.196777, type: 2, fromlayer3 entity: receiver B

B_input: packet corrupted. send NAK.

TOLAYER3: packet being lost

EVENT time: 7303.801758, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: hhhhhhhhhhhhhhhhhh.

EVENT time: 7308.484375, type: 2, fromlayer3 entity: receiver B
B_input: rcv message: hhhhhhhhhhhhhhhhhh
B_input: send ACK.

EVENT time: 7311.453125, type: 2, fromlayer3 entity: sender A
A_input: ACK

EVENT time: 9007.599609, type: 1, fromlayer5 entity: sender A
A_output: send packet: iiiiiiiiiiiiii
TOLAYER3: packet being corrupted

EVENT time: 9015.582031, type: 2, fromlayer3 entity: receiver B
B_input: packet corrupted. send NAK.
TOLAYER3: packet being lost

EVENT time: 9017.599609, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: iiiiiiiiiiiiii.

EVENT time: 9023.338867, type: 2, fromlayer3 entity: receiver B
B_input: rcv message: iiiiiiiiiiiiii
B_input: send ACK.
TOLAYER3: packet being corrupted

EVENT time: 9027.599609, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: iiiiiiiiiiiiii.

EVENT time: 9029.708008, type: 2, fromlayer3 entity: sender A
A_input: packet is corrupted, ignoring the packet.

EVENT time: 9033.036133, type: 2, fromlayer3 entity: receiver B
B_input: not the expected seq. send ACK with the previous sequence number.
TOLAYER3: packet being corrupted

EVENT time: 9034.062500, type: 2, fromlayer3 entity: sender A
A_input: packet is corrupted, ignoring the packet.

EVENT time: 9037.599609, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: iiiiiiiiiiiiii.
TOLAYER3: packet being corrupted

EVENT time: 9046.106445, type: 2, fromlayer3 entity: receiver B
B_input: packet corrupted. send NAK.

EVENT time: 9047.449219, type: 2, fromlayer3 entity: sender A

A_input: received NAK.

A_resend: resend last packet: iiiiiiiiiiiiiiiii.

EVENT time: 9048.499023, type: 2, fromlayer3 entity: receiver B

B_input: not the expected seq. send ACK with the previous sequence number.

TOLAYER3: packet being lost

EVENT time: 9057.449219, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: iiiiiiiiiiiiiiiii.

EVENT time: 9061.534180, type: 2, fromlayer3 entity: receiver B

B_input: not the expected seq. send ACK with the previous sequence number.

EVENT time: 9062.545898, type: 2, fromlayer3 entity: sender A

A_input: ACK

EVENT time: 9790.765625, type: 1, fromlayer5 entity: sender A

A_output: send packet: jjjjjjjjjjjjjjjjjj

EVENT time: 9793.796875, type: 2, fromlayer3 entity: receiver B

B_input: rcv message: jjjjjjjjjjjjjjjjjj

B_input: send ACK.

TOLAYER3: packet being corrupted

EVENT time: 9797.985352, type: 2, fromlayer3 entity: sender A

A_input: packet is corrupted, ignoring the packet.

EVENT time: 9800.765625, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: jjjjjjjjjjjjjjjjjj.

EVENT time: 9810.701172, type: 2, fromlayer3 entity: receiver B

B_input: not the expected seq. send ACK with the previous sequence number.

TOLAYER3: packet being lost

EVENT time: 9810.765625, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: jjjjjjjjjjjjjjjjjj.

EVENT time: 9819.795898, type: 2, fromlayer3 entity: receiver B

B_input: not the expected seq. send ACK with the previous sequence number.

TOLAYER3: packet being lost

EVENT time: 9820.765625, type: 0, timerinterrupt entity: sender A

A_timerinterrupt: resend last packet: jjjjjjjjjjjjjjjjjj.

TOLAYER3: packet being corrupted

EVENT time: 9824.845703, type: 2, fromlayer3 entity: receiver B

B_input: packet corrupted. send NAK.

TOLAYER3: packet being corrupted

EVENT time: 9829.381836, type: 2, fromlayer3 entity: sender A
A_input: packet is corrupted, ignoring the packet.

EVENT time: 9830.765625, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: jooooooooooooooooo.
TOLAYER3: packet being corrupted

EVENT time: 9835.809570, type: 2, fromlayer3 entity: receiver B
B_input: packet corrupted. send NAK.

EVENT time: 9840.765625, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: jooooooooooooooooo.
TOLAYER3: packet being corrupted

EVENT time: 9845.251953, type: 2, fromlayer3 entity: receiver B
B_input: packet corrupted. send NAK.

EVENT time: 9845.398438, type: 2, fromlayer3 entity: sender A
A_input: received NAK.
A_resend: resend last packet: jooooooooooooooooo.
TOLAYER3: packet being lost

EVENT time: 9848.692383, type: 2, fromlayer3 entity: sender A
A_input: received NAK.
A_resend: resend last packet: jooooooooooooooooo.

EVENT time: 9852.514648, type: 2, fromlayer3 entity: receiver B
B_input: not the expected seq. send ACK with the previous sequence number.

EVENT time: 9858.692383, type: 0, timerinterrupt entity: sender A
A_timerinterrupt: resend last packet: jooooooooooooooooo.
TOLAYER3: packet being corrupted

EVENT time: 9859.336914, type: 2, fromlayer3 entity: sender A
A_input: ACK

EVENT time: 9860.536133, type: 2, fromlayer3 entity: receiver B
B_input: packet corrupted. send NAK.
TOLAYER3: packet being corrupted

EVENT time: 9868.864258, type: 2, fromlayer3 entity: sender A
A_input: A->B unidirection only, ignoring the packet.
Simulator terminated at time 9868.864258
after sending 10 msgsg from layer5

Process returned 0 (0x0) execution time : 0.228 s
Press any key to continue.