Discussion Section

01/27/2017

Updated from Alex’s excellent note
Sender

LAR - Sequence number of last acknowledgement received, defines lower extreme of window
LFS - Sequence number of last frame sent, defines upper extreme of window
Window is from [LAR+1, LFS], that is all frames that have been sent but not yet acked
SWS - Bound on sliding window size
Frame Sequence Number in Window

CASE 1: Usual Case
LAR \leq LFS

LAR \leq LFS \&\& \text{seqNo} > \text{LAR} \&\& \text{seqNo} \leq LFS

CASE 2: Sequence Number Wrap Around
LAR > LFS

LAR > LFS \&\& (\text{seqNo} > \text{LAR} |\| \text{seqNo} \leq LFS)

In this case, we are not using the full window of 4.

On Sender with SWS = 4, [0,7] sequence numbers
**Receiver**

NFE - Next frame expected  
LFR - Sequence number of largest consecutive frame received  
LAF - Sequence number of largest acceptable frame  
RWS - Max receive window size  

\[ LFR = NFE - 1 \]  
\[ LAF = NFE + RWS - 1 \]
Frame Sequence Number in Window

CASE 1: Usual Case
NFE + RWS - 1 >= NFE

Remember NFE is just LFR + 1 and LAF is just NFE + RWS - 1.

Green sequence numbers are in window and grey are outside.

CASE 2: Sequence Number Wrap Around
NFE + RWS - 1 < NFE

NFE + RWS - 1 < NFE & (seqNo >= NFE || seqNo <= NFE + RWS - 1)

On Receiver with RWS = 4, [0,7] sequence numbers
Frame Not in Window On Receiver

Send ack that acknowledges NFE - 1
This tells the sender that we have successfully received all frames up to NFE - 1 = LFR.
Will happen when ack is lost and needs to be resent
Circular Send / Receive Window

Implement send and receive queue as circular array or list

Index in to sender’s send queue using sequence number % SWS

Index in to receiver’s receive queue using sequence number % RWS

Used in book’s code for SWP