EECS 489 Discussion 4

Annoucements A2

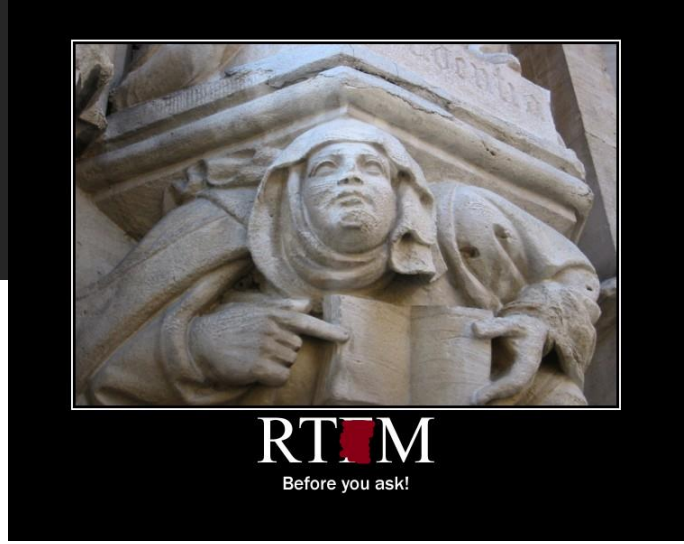
- Please check you team and repos in the eecs489 organization
  - https://github.com/eecs489
- Start early, this one is really hard
- Please follow updates on Piazza

Piazza != Office Hour

	# of people	# of responses	Resp. per capita
Students	120	50	**0.417**
Instructors	3	167	**55.67**

- Please contribute to Piazza
- Significant contribution **will be rewarded (w/ extra test chances)**

Use Piazza Efficiently



- Detail, Detail, Detail…
  - As if asking grandma to reproduce your problem

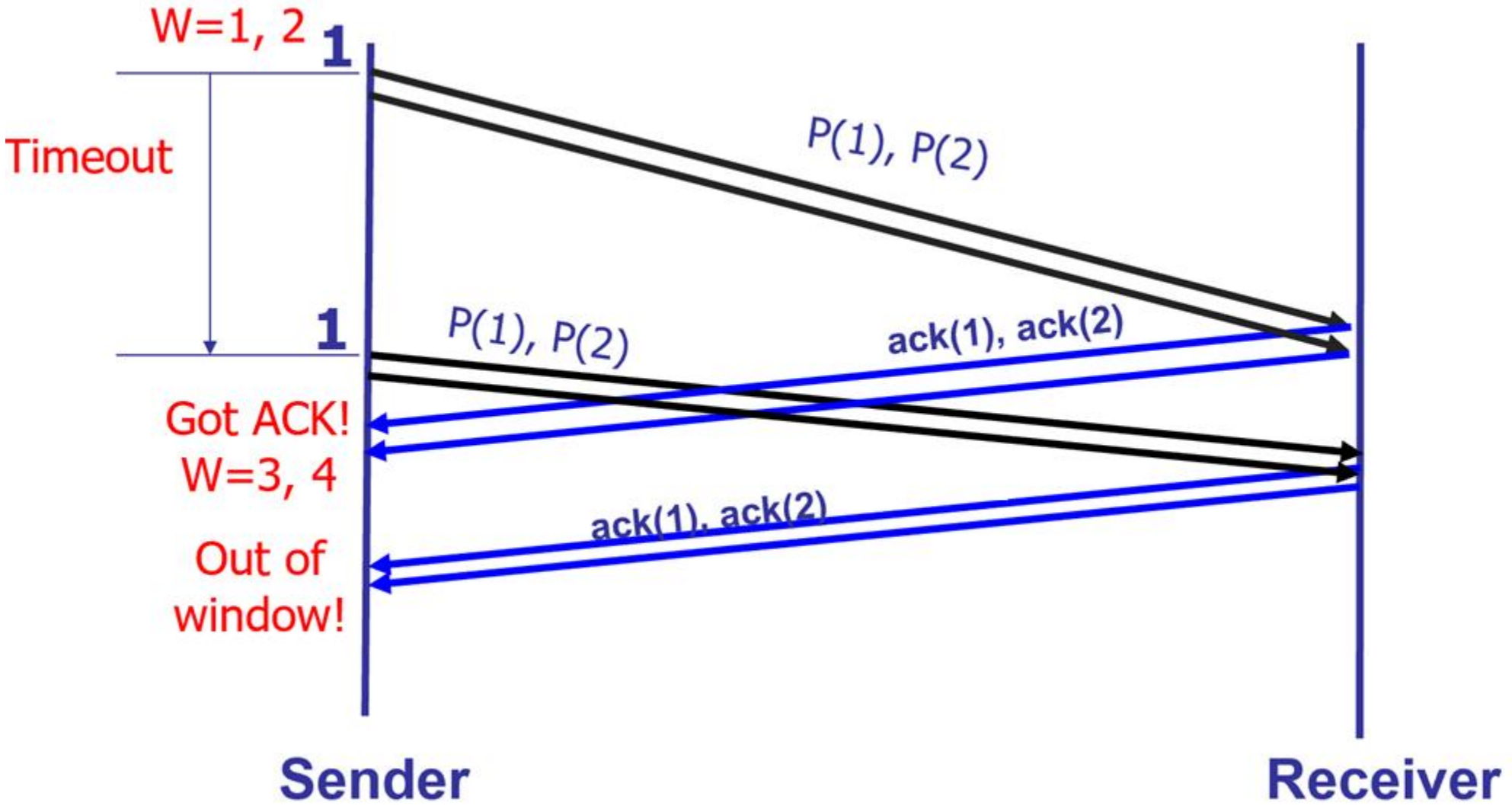
- Think/Search (google+piazza) before you ask
  - “Is X normal” -> “I think X is not normal, because of Y. Does this make sense?”
  - Don’t ask duplicate questions

Q1

- With the Selective Repeat (SR) protocol, Is it possible for the sender to receive an ACK for a packet that falls outside of its current window? Why?

- **True**

Q1


W=1, 2
1
Timeout
P(1), P(2)
1
P(1), P(2)
ack(1), ack(2)
Got ACK!
W=3, 4
ack(1), ack(2)
Out of
window!
Sender
Receiver

Q2

- With the GBN (Go-Back-N) protocol, Is it possible for the sender to receive an ACK for a packet that falls outside of its current window? Why?

- **True**
- **Same scenario**

Q3

- Consider a reliable data transfer protocol that uses only **negative acknowledgments (NACK)**. Suppose the sender sends data only infrequently. Would a NACK-only protocol be preferable to a protocol that uses ACKs? Why?
  - NACK: send NACK upon packet loss

- **No. In a NAK only protocol, the loss of packet x is only detected by the receiver when packet x+1 is received. If there is a long delay between the transmission of x and the transmission of x+1, then it will be a long time until x can be recovered, under a NAK only protocol.**

Q4

- Now suppose the sender has a lot of data to send and the end-to-end connection experiences few losses. In this second case, would a NACK-only protocol be preferable to a protocol that uses ACKs? Why?

- **Yes. If data is being sent often, then recovery under a NAK-only scheme could happen quickly. Moreover, if errors are infrequent, then NAKs are only occasionally sent (when needed).**

GBN v.s. SR Demo

https://www2.tkn.tu-berlin.de/teaching/rn/animations/gbn_sr/

Try it yourselves! Change delay/timeout too!

For SR	Drop first pkt	Drop middle pkt	Drop last pkt
Drop data pkt			
Drop ACK pkt			

For GBN	Drop first pkt	Drop middle pkt	Drop last pkt
Drop data pkt			
Drop ACK pkt			

Demo of Network Utilities

Super useful tools to debug all your projects:

- wireshark (install w/ APT) www.wireshark.org/docs/
- nc (netcat) linux.die.net/man/1/nc

- Demos:
  - HTTP
  - TCP
  - UDP
  - DNS