**In class activity - Ch.3 (3.6 Congestion Control Principles)**

1. Congestion control (CC)
   * Congestion pb.: too many senders sending at high rate🡺 overflowed buffer 🡺 package loss
   * Resend packages does not solve the congestion (our problem)
2. Causes/costs of CC
   * If arrival rate is close to link capacity (even with ∞ queuing in router) 🡺 high queuing delay – Fig. 3.43, 3.44
   * If buffer overflow in router 🡺 dropped packets 🡺 re-transmit 🡺 decreased throughput of original data – Fig. 3.46 (b)
   * If re-transmit packets too soon (=due to premature timeout) – Fig. 3.46 (c)

🡺 Decreased throughput of original data

🡺 Unneeded copies use bandwidth

🡺 If connection already congested, it is even more congested now

* + If a packet is dropped at router r, traffic capacity (and bandwidth) was wasted at routers r-1, r-2, …

1. Two majors CC approaches
   1. End-to-end CC –
   2. Network-assisted CC -

Ex. ATM ABR – uses RM cells (packets)

* + - 1. EFCI bit
      2. CI and NI
      3. ER