What is the Role of Congestion Control (CC) in Today's Internet?

Is it even needed?

Argument 1: No, it's not needed

- Applications demand more, capacities grow, this is a positive cycle...
    - Would we get a congestion collapse if we completely removed it?

- Right now, we don't have many services that require long-distance communication (e.g. intercontinental), data access is more localized
    - Probably CC is not needed between CDN caches, in the core

- Granted, CC may reduce latency by cutting round-trips, but delay can also be decreased by putting the content closer to the user

Argument 2: Yes, it's needed

- Underload is the result of poor congestion control
  - Good CC can reduce latency (round-trips), which is also important when the RTT is short, and saves energy
  - The term "congestion control" is misleading

- Congestion control realizes fairness
  - "TCP-friendliness" is the wrong type of fairness
  - Fairness matters in the wireless access - how else can we fairly provision users with capacity?

Argument 2: Yes, it's needed /2

- In the future, the edge may be more large and dense
  - Networks that don't yet exist (e.g. vehicular networks, ..) may need congestion control
  - Another example from today: users on a plane see a very congested link

- If all data resides within a user's private range (personal home network, vehicle, ..), all communication is at the edge and we need cc there
  - Previously, CC was over long distance & multi-hop, soon it may be meant for short-distance, wireless multi-hop

- CC will need to be done differently per application
  - ICN allows to have different forwarding strategies with different types of content
  - Traffic isolation helps... Either which way, can be DiffServ, ICN, L4S or 5g Slicing
  - Multipath communication is of interest here

That's all folks ☺