

# Computer Networks

## Contention-Free Multiple Access (§4.2.3)



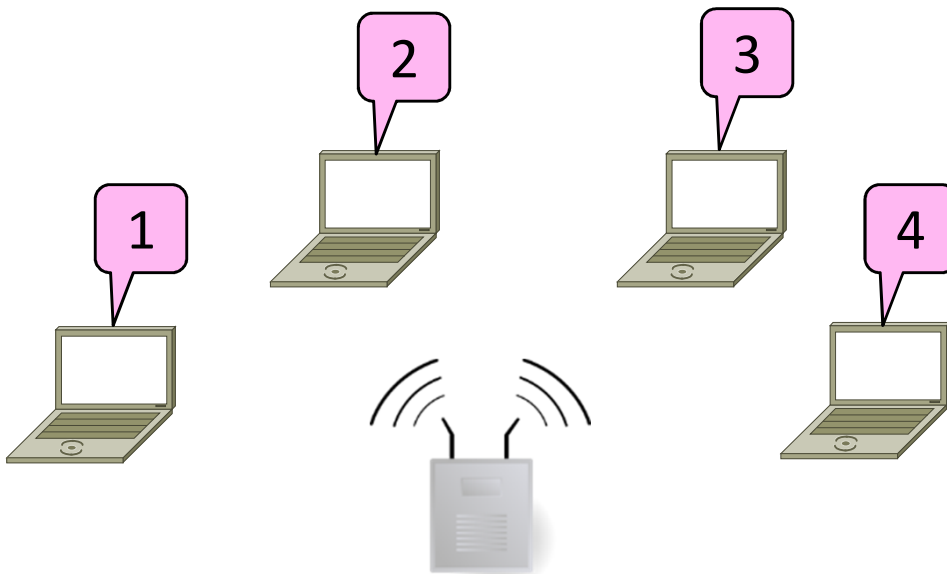
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# Topic

- A new approach to multiple access
  - Based on turns, not randomization



# Issues with Random Multiple Access

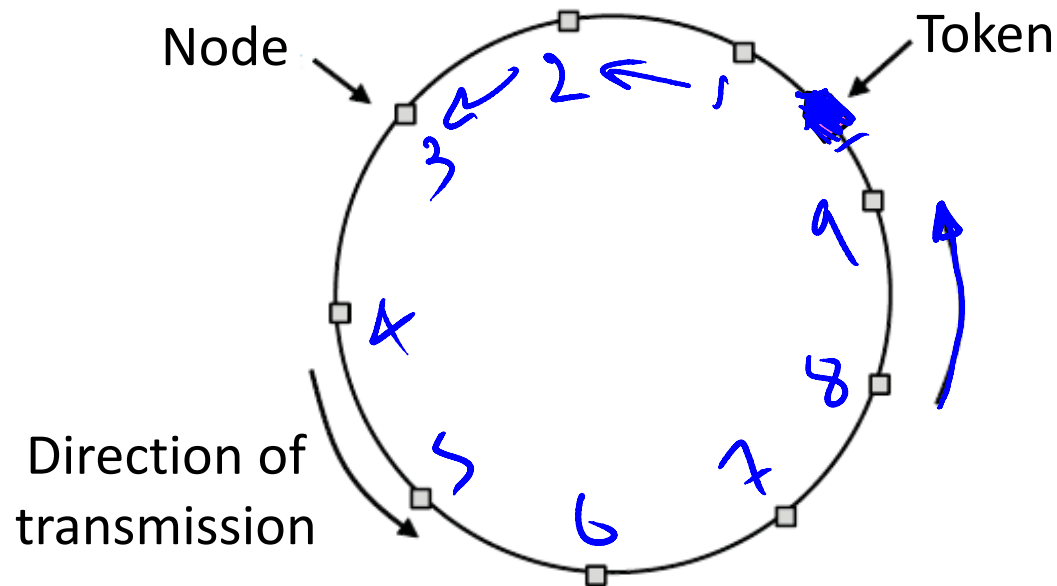
- ~~✗~~ CSMA is good under low load:
  - Grants immediate access
  - Little overhead (few collisions)
- ~~✗~~ But not so good under high load:
  - High overhead (expect collisions)
  - Access time varies (lucky/unlucky)
- We want to do better under load!

# Turn-Taking Multiple Access Protocols

- They define an order in which nodes get a chance to send
  - Or pass, if no traffic at present
- We just need some ordering ...
  - E.g., Token Ring »
  - E.g., node addresses

# Token Ring

- Arrange nodes in a ring; token rotates “permission to send” to each node in turn




# Turn-Taking Advantages

- Fixed overhead with no collisions
  - More efficient under load
- Regular chance to send with no unlucky nodes
  - Predictable service, easily extended to guaranteed quality of service

# Turn-Taking Disadvantages

- Complexity
  - More things that can go wrong than random access protocols!
    - E.g., what if the token is lost?
  - Higher overhead at low load

# Turn-Taking in Practice

- Regularly tried as an improvement offering better service
  - E.g., qualities of service
-  But random multiple access is hard to beat
  - Simple, and usually good enough
  - Scales from few to many nodes



# END

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