CS3200: Computer Networks

Lecture 14

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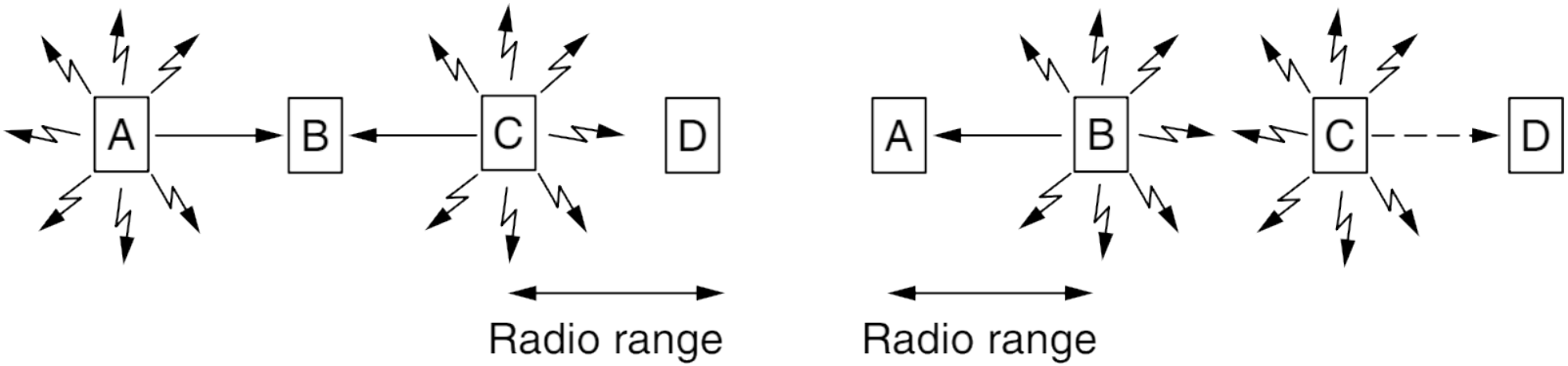
Wireless LAN protocols

- Wireless LAN — a set of nodes sending messages to each other via a wireless medium.
- A station on a wireless LAN may not be able to transmit frames to or receive frames from all other stations because of the limited radio range of the stations..
- Detection of collision is difficult and often impossible. Acknowledgments are used to discover collisions and other errors.
- We will assume that each radio transmitter has some fixed range, represented by a circular coverage region within which another station can sense and receive the station's transmission.

Wireless LAN protocols

Will CSMA work?

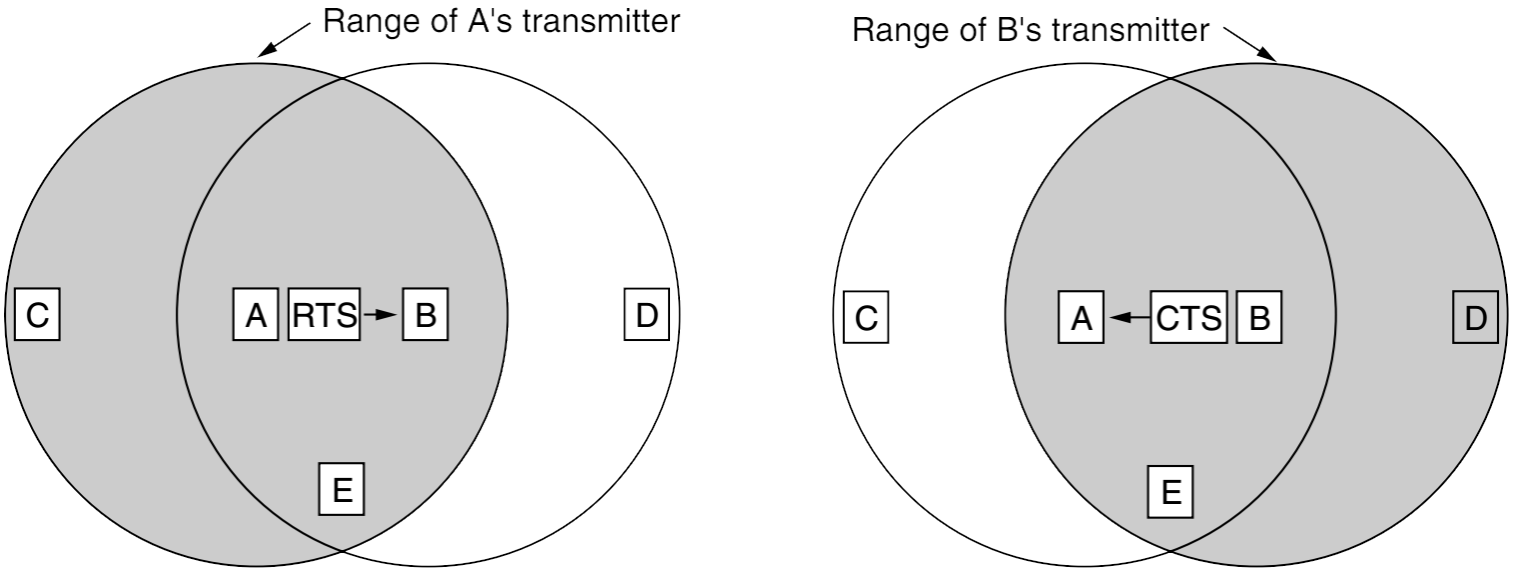


The problem of a station not being able to detect a potential competitor for the medium because the competitor is too far away is called the **hidden terminal problem**.

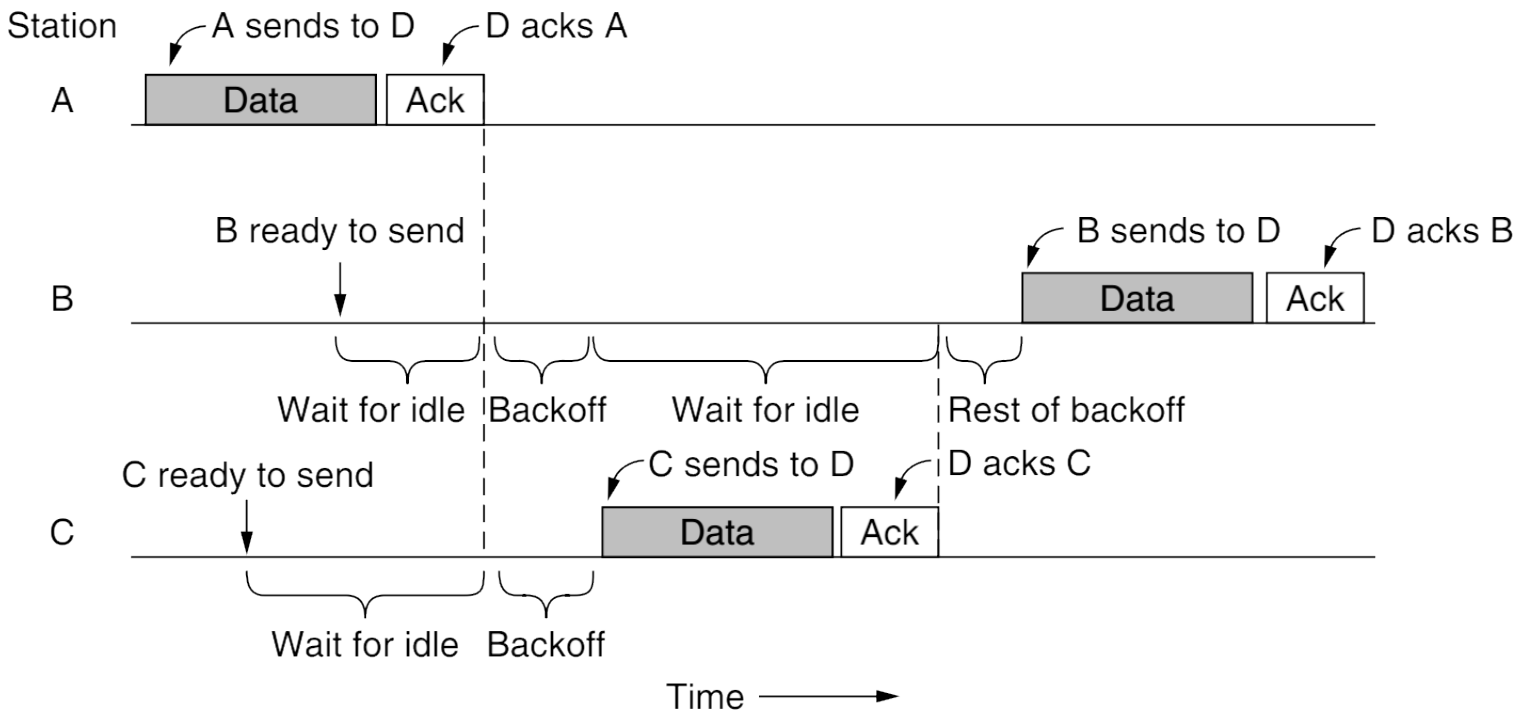
Transmitters deferring even if signals do not interfere at the receivers is known as **exposed terminal problem**.

Multiple Access with Collision Avoidance (MACA)

The basic idea behind it is for the sender to stimulate the receiver into outputting a short frame, so stations nearby can detect this transmission and avoid transmitting for the duration of the upcoming (large) data frame.

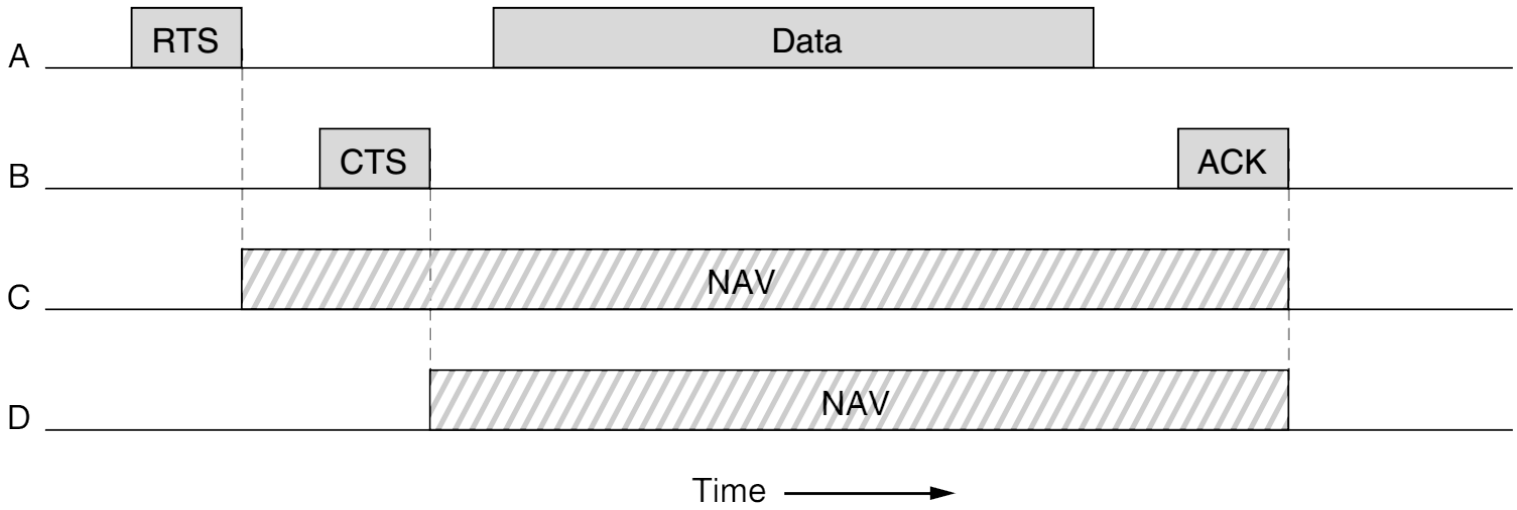


CSMA/CA (CSMA with Collision Avoidance)



This mode of operation is called **DCF (Distributed Coordination Function)** because each station acts independently, without any kind of central control. In **PCF (Point Coordination Function)** access point controls all activity in its cell, just like a cellular base station.

CSMA/CA with virtual sensing



Interframe spacing in 802.11