Reservation based Schemes

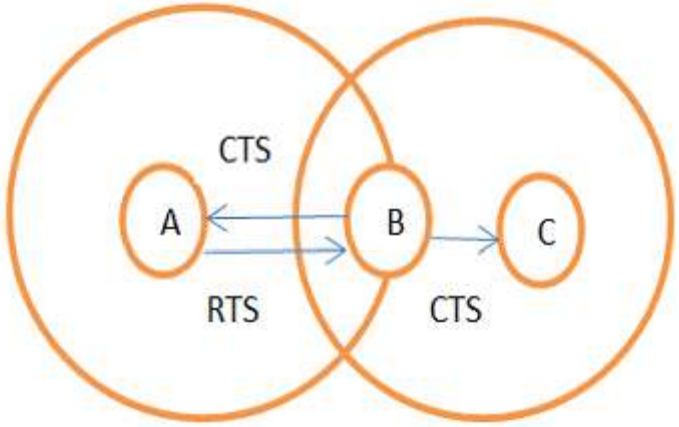
Reservation Based Schemes

- Basic reservation scheme is **RTS / CTS** Scheme works as follows:
- Sender transmit Request to Send (RTS) before actual transmission
- Receiver sends Clear to Send (CTS) in response to RTS, after which actual transmission takes place
- Neighboring Nodes that receives RTS and CTS, on sender and receiver side, refrain from transmission, until sender completes transmission
- Examples of RTS-CTS MAC Protocols – MACA, MACAW, MACA-BI, PAMAS, DBTMA, S-MAC – designed for Sensor Network

Multiple Access Collision Avoidance (MACA)

- MACA solves hidden and exposed terminal problem by regulating the transmission power (use of Omnidirectional antennas)
- A node running MACA requests to use the medium by sending an RTS to the receiver.
- Since the radio signals propagate omni-directionally, every terminal within the senders radio range will hear this and refrain from transmitting.
- As soon as the receiver is ready to receive data, its responds with a CTS.

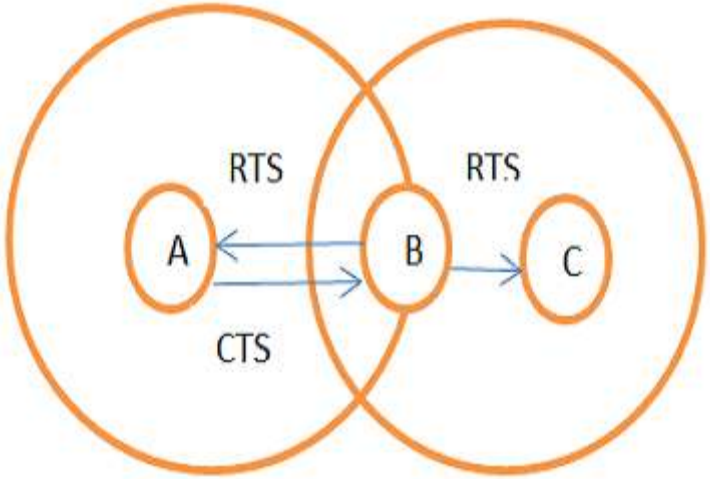
MACA – Solution to Hidden Terminal Problem



MACA – Solution to Hidden Terminal Problem

- A sends RTS to B before transmitting actual data
- RTS – contains sender name, receiver name and length of transmission
- Neighboring node C of sender receives RTS and refrain transmitting
- B sends CTS to A, in response to RTS
- CTS contains – sender and receiver name, length of planned transmission
- D receive this and refrain from sending data to receiver

MACA – Solution to Exposed Terminal Problem



MACA – Solution to Exposed Terminal Problem

- B wants to send to A, so sends RTS to B
- C also gets RTS, but inspecting the packets sender and receiver address, it knows it is not intended for it
- It rejects the packet
- A sends CTS to B in response to RTS, it is not anyway received by C (not in range with A)
- Now if C has packet to D, it will send simultaneously along with B
- No transmission delay and bandwidth wastage