SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NAAC-UGC with 'A' Grade

Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

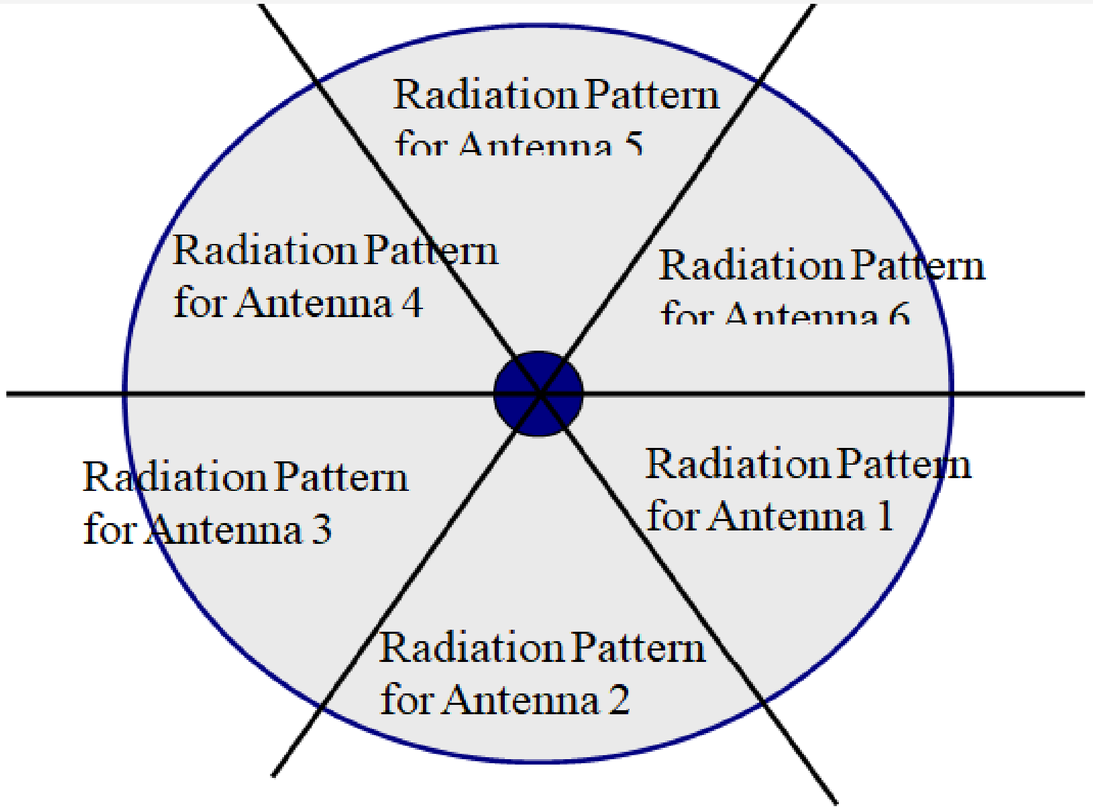
19EC701 - ADHOC NETWORKS

Unit -2 – DATALINK LAYER – CONTENTION BASED PROTOCOLS WITH DIRECTIONAL ANTENNA

Contention-based Protocols with directional antenna

- Advantages
  - Reduced signal interference, increase system throughput, and improved channel reuse
- Assumptions
  - Only one radio transceiver can transmit and receive only one packet at any given time
  - *M* directional antennas, each antennas having a conical radiation pattern, spanning an angle of 2/*M* radians
  - Adjacent antennas never overlap
- If a node transmits when all its antennas are active, then the transmission's radiation pattern is similar to that of an omni- directional antennas
- Packet transmission

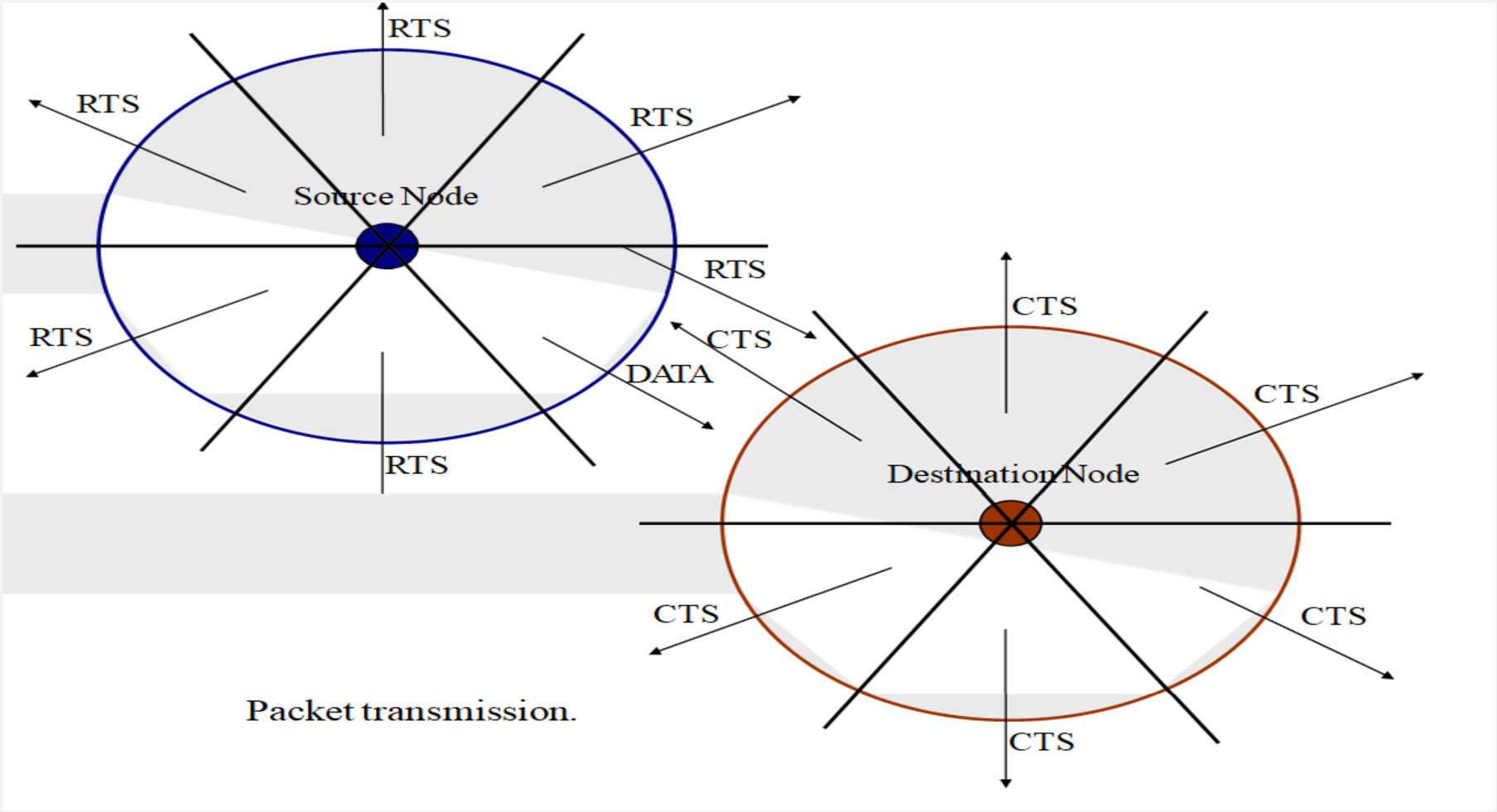
Contention-based Protocols with directional antenna



Node with 6 antennas ($M = 6$)

Radiation patterns of directional antennas.

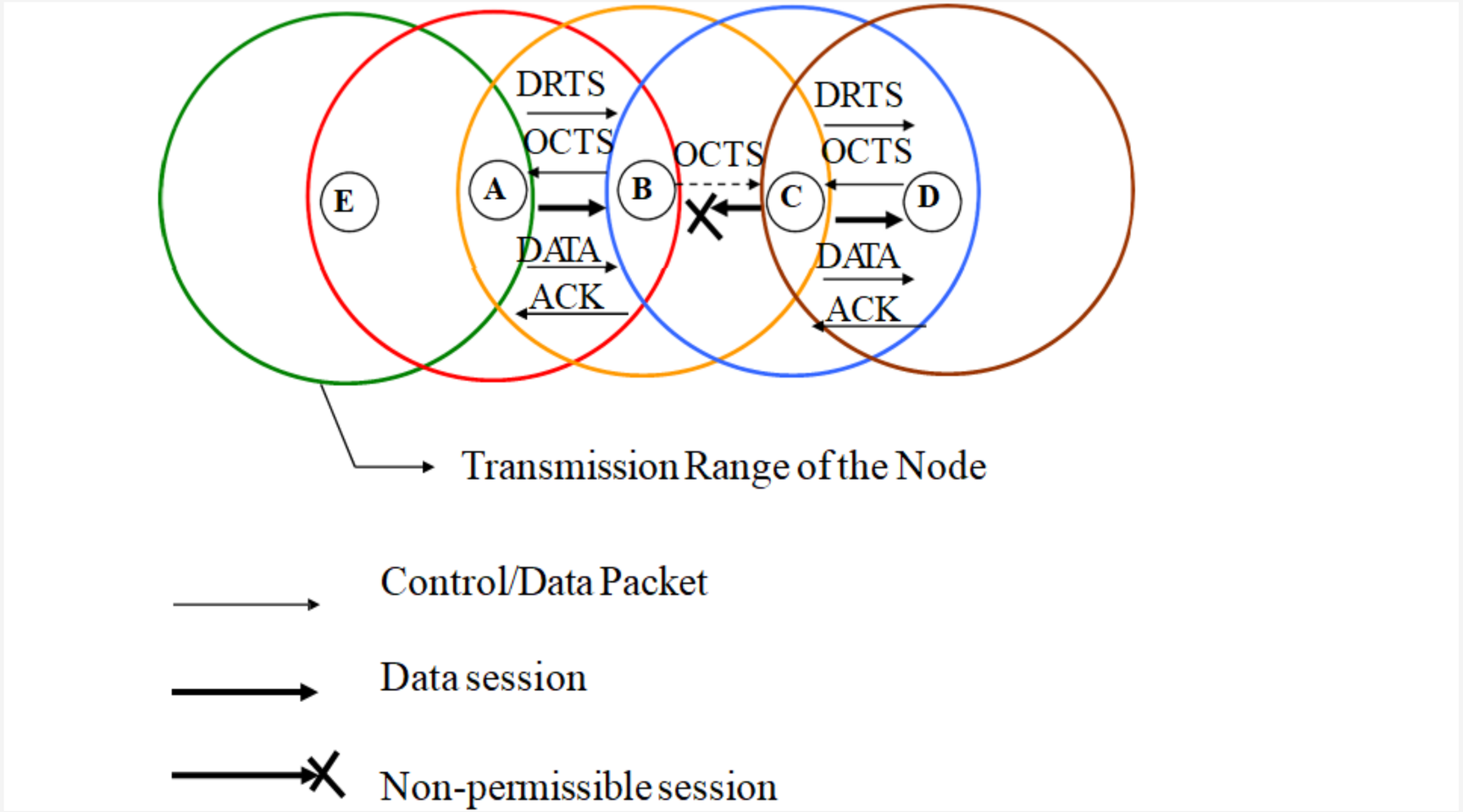
Contention-based Protocols with directional antenna



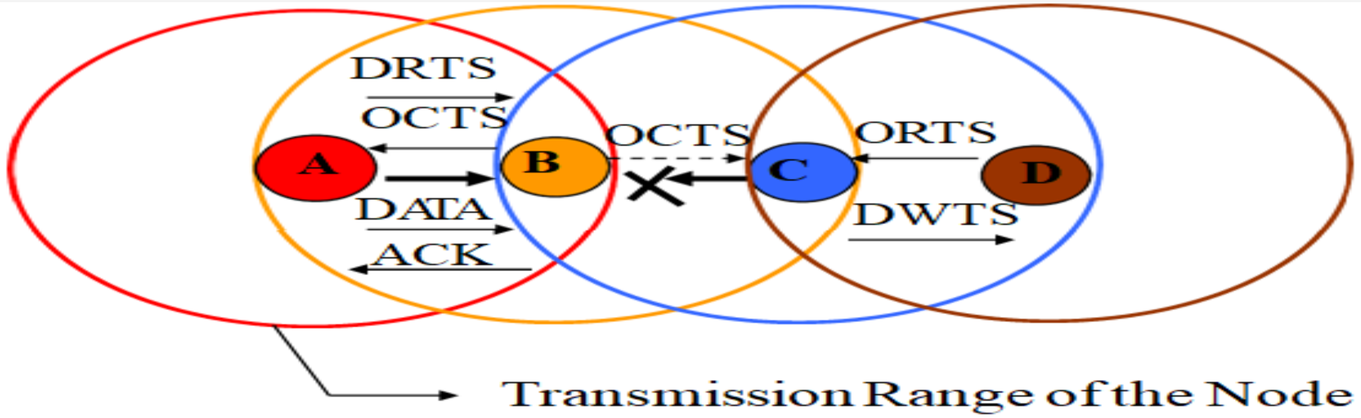
Directional MAC Protocols for Ad Hoc Wireless Networks

- D-MAC: assume each node knows about the location of neighbors
- In the first directional MAC scheme (DMAC-1)
  - Directional RTS (DRTS) omni-directional CTS (OCTS)Directional DATA (DDATA) Directional ACK(DACK)
  - May increase the probability of control packet collisions
  - (if node E send a packet to node A, it will collide the OCTS or DACK)
- In the second directional MAC scheme (DMAC-2)
  - Both the directional RTS (DRTS) and omni-directional RTS (ORTS) transmissions are used
    - Reduced control packet collisions
- Rules for using DRTS and ORTS:
  - ORTS: none of the directional antennas are blocked
  - DRTS : otherwise
  - Another packet called directional wait-to-send (DWTS) is used in this scheme

Directional MAC Protocols for Ad Hoc Wireless Networks



Directional MAC Protocols for Ad Hoc Wireless Networks



Operation of DMAC protocol.

Assessment

List out the assumptions of Contention based protocol using directional antenna?

THANK YOU