

⑥ AODV

Adhoc On demand distance vector routing protocol-

The Route Request packet in AODV carries the following information:

→ The source identifier (SRCID): that identifies the source.

→ The destination identifier (DestID): this identifies the destination to which the route is required.

→ Source Sequence Number (SRCSeqNum)

→ Destination Sequence Number (DestSeqNum) - indicates freshness of path.

→ Time to Live (TTL) - Does not allow loops.

→ Broadcast identifier (BcastID).

AODV protocol performs as follows:

→ when a node does not have a valid route to destination a route request is forwarded.

→ when intermediate node receives the route request packet, 2 cases are possible -

- If it does not have a valid route, the node forwards it

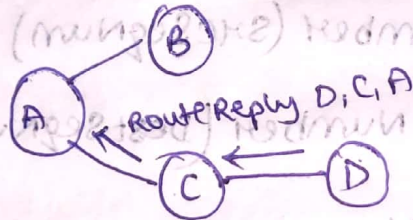
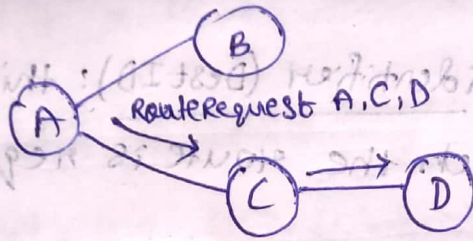
- If it has a valid route, node prepares RouteReply

→ If route request is ^{received} sent multiple times, BcastID - SRCID pairs are compared and duplicate copies are discarded.

→ when route request is forwarded, the address of the previous node and its BestID is stored and forwarded to the source.

→ If route reply is not received before a time expires, this entry is deleted.

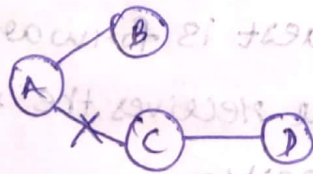
→ Either destination node or intermediate node responds with valid route.



If the link is broken -
→ End node is notified with route reply with hopcount set with ∞.

→ End node deletes entries, establishes a new path.

→ Link status observed using link-level ACKs.



MACA protocol-

multiple access collision avoidance.

CSMA (carrier sense multiple access) operates as-

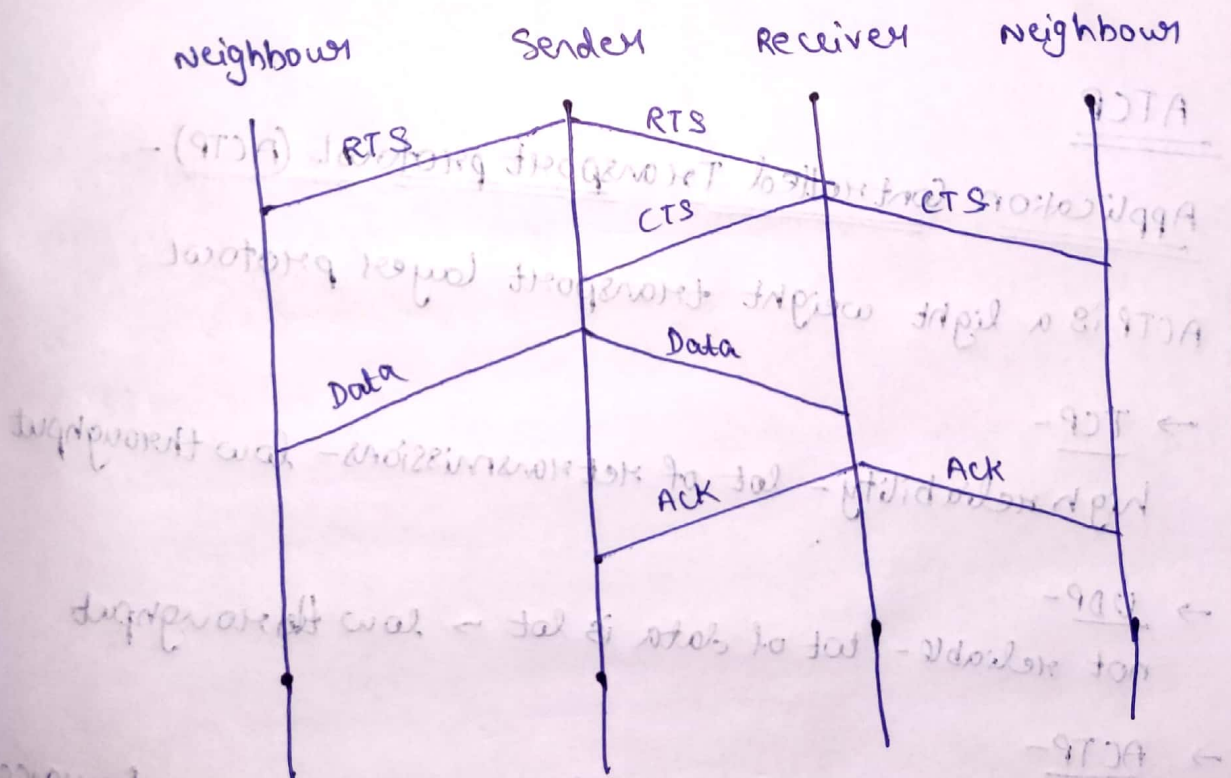
- The sender senses the channel for the carrier signal
- If the carrier is present, it retries to sense the channel after some time
- If not, the sender transmits the packet.

Shortcomings of CSMA/CA-

- hidden terminal problem leading to frequent collisions.
- exposed terminal problem leading to worse bandwidth utilization.

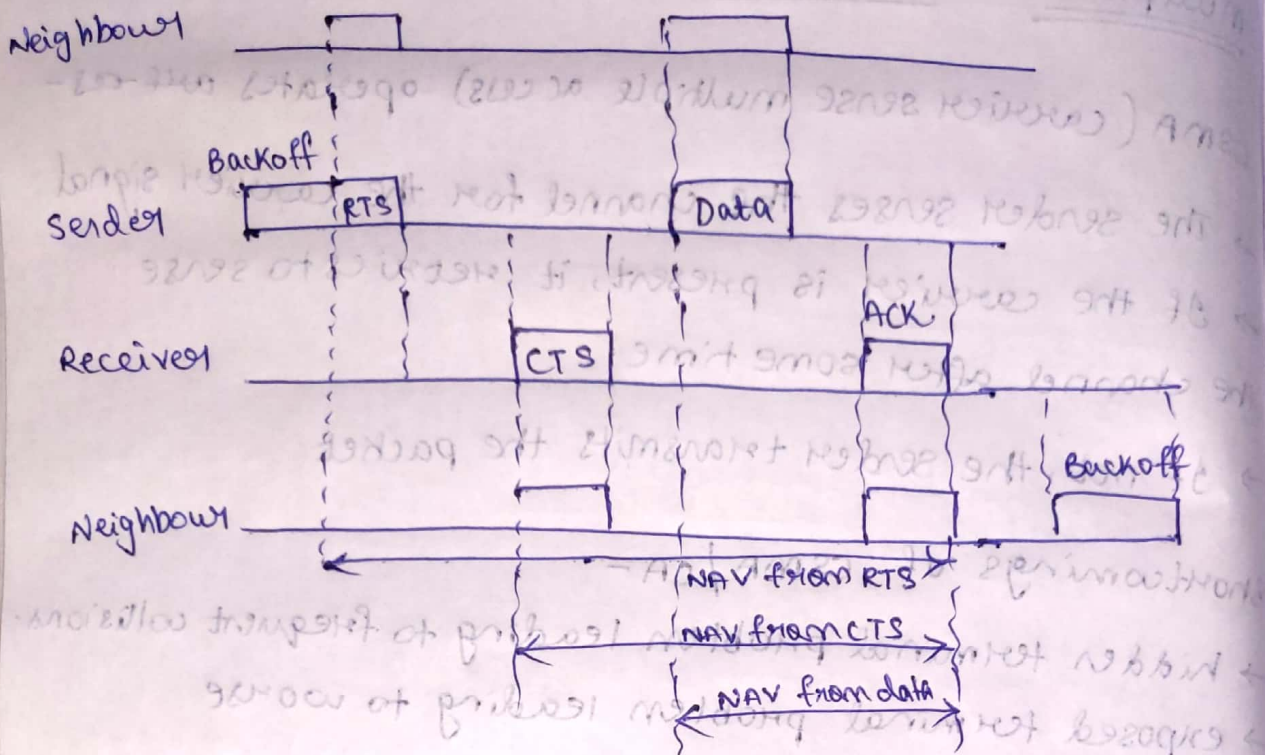
To avoid it-

- virtual carrier sensing
- RTS-CTS handshake ~~after~~ before transmission



Packet transmission in MACA

Usage of virtual carrier sensing -



NAV - Network Allocation Vector.

If transmission fails - retransmission is done

contention window: $CW \times 2$

ATCP

Application Controlled Transport Protocol (ACTP) -

ACTP is a light weight transport layer protocol.

→ TCP -

high reliability - lot of retransmissions - low throughput

→ UDP -

not reliable - lot of data is lost → low throughput

→ ACTP -

B/w TCP & UDP → some lost data can → higher performance
be recovered

Each data to be transmitted contains -

- delay (maximum tolerable delay)
- number of packets
- priority of packet

Delivery status is maintained at ATCP and available to application via is Acked ().

- successful delivery (ACK was returned).
- possible loss of packet (ACK not returned within deadline).
- remaining time for packet (ACK not returned, deadline not expired).
- no information available.

Advantages of ATCP-

Light weight, scalable.

allows to set priorities to data

no congestion window.

Shortcomings-

Congestions possible

is not compatible with TCP

suitable for particular applications only.