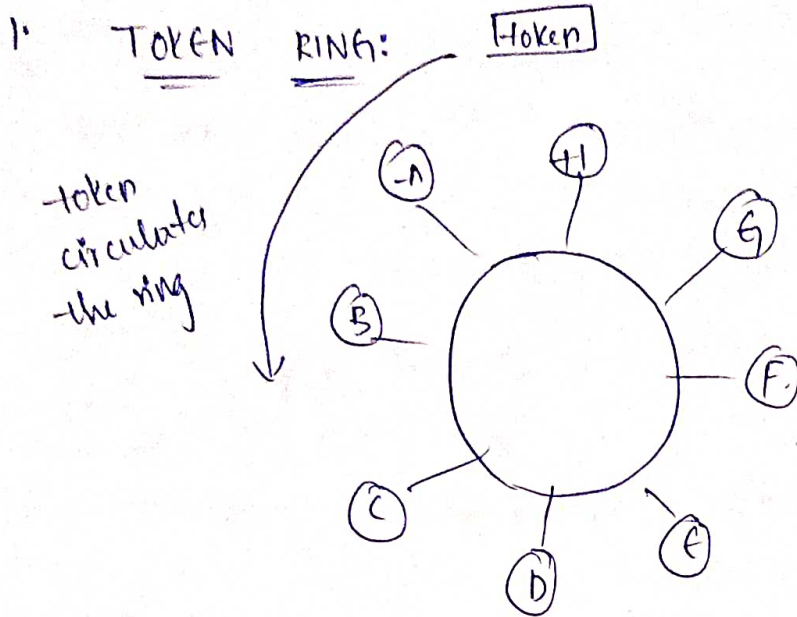


UNIT - 2



- It is a set of nodes connected in a ring
- Data always flow in a particular direction around the ring
- Each node in the ring receives the frame from its ~~upstream~~ upstream neighbor and then forwarding them to its downstream neighbor
- * When a node sees the token,
 - If it has a frame to transmit, it takes the token off the ring and inserts the frame into the ring.
 - Each node along the way simply forwards the frame.
 - Destination node saves the copy of the frame into the adaptor and forwards the message to the next node.
 - When the frame reaches the sender, it strips the frame off the ring and reinserts the token.
 - Each node in the ring gets a chance to transmit.
 - Nodes are

physical properties:

- Uses ring topology
- If any node or link failure leads entire network failure, then it connects each station into the ring using electro-mechanical relay.

characteristics of token rings

- Supports 4 Mbps or 16 Mbps data rate.
- Differential Manchester encoding scheme is used.
- Number of stations in the ring is limited to 250 for IEEE 802.5
- station that has token can send data.
- Each transmitted packet contains the destination address of the intended receiver
- Each node in the ring looks inside the packet to see if it is the intended receiver.
- Then, sending station removes the frame from the ring and reinserts the token to the ring.

Issues of token ring

- ~~the~~ Token Holding Time (THT) - is the time period given to nodes to hold the token.
 - But unfair to station other than the station holding the token.
- $TRT \leq \text{Active nodes} * THT + \text{Ring latency.}$

Ring latency

→ how long it takes the token to circulate around the ring when no one has data to send.

Active nodes

→ number of nodes that have data to send.

Priority Bits

→ The token contains 3 bit priority field.

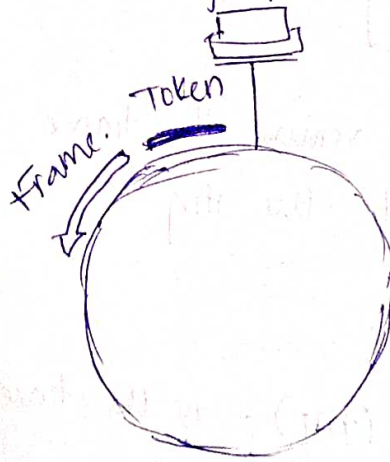
→ Each device that wants to transmit the packet, assigns a priority to the packet & the device can hold the token if the priority is at least as great as token's priority.

→ lower priority packets circulate for long in ring.

Token Release

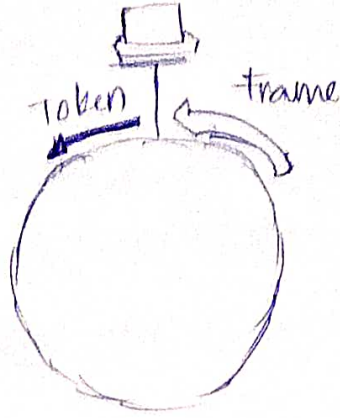
— Early release

— After transmitting packet



— Delayed Release

• After removing the packet when it returns to the sender.



Token Ring Maintenance:

- Token rings have a designated monitor
- The monitor's job is ensure the health of the token
- Any station in the ring can become the monitor.
 - monitor is first elected when the ring is first connected
 - or failure of the current monitor
- Healthy monitor periodically announces its presence with a special control message.
- When a station decides that a new monitor is needed, it transmits a "claim token" frame, announcing its intent to become the new monitor.
 - If the token gets back to the sender, it can assume that it is ok for it to become a monitor
 - If some other is trying to become monitor at the same instant, the sender might see "claim token" message from that other station first.