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Assignment # 02

Q:-1 Analyze and describe the working of selective repeat protocol.

Ans Selective repeat is a type of Automatic Repeat reQuest (ARQ) protocol used in data communication. It is a variant of the Go-back-N protocol, but it offers greater efficiency by retransmitting only those packets that have been detected as lost or corrupted. Let's dive into how selective repeat works:

1. **Sender Window:** The sender maintains a sliding window of size N, where N is the maximum number of unacknowledgable packets ~~that have been detected~~ allowed in the network at any given time. Each packet in the ~~window~~ window has a unique sequence number assigned to it.

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2. **Receiver Window:** Similarly, the receiver maintains a sliding window of the same size N, but in this case, it tracks the packets it expects to receive.

3. **Packet Transmission:** The sender sends packets from the beginning of the window sequentially. Each packet contains a sequence number.

4. **Acknowledgment:** Upon receiving a packet, the receiver checks for errors. If a packet is error free in sequence, it sends an acknowledgment containing the sequence number of the next expected ~~pot~~ packet.

5. **Selective Repeat:** Here's where the selective repeat protocol differs from Go-Back-N. Instead ~~packet~~ of retransmitting all packets from the beginning ~~of~~ of the window upon detecting a lost or corrupted packet, Selective repeat retransmits only the specific packet(s) that are missing or corrupted. This selective retransmission is more efficient than retransmitting the entire window, especially in networks with high bandwidth delay product.

Selective repeat protocol offers efficient error recovery and utilizes network

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resources more effectively compared to Go-Back-N, especially in scenarios where packet loss or corruption is relatively rare. However, it requires additional buffer space at both the sender and receiver ends to store out-of-order packets.