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Practical 7

AIM:

Write a program to implement flow control at data link layer using SLIDING WINDOW PROTOCOL. Simulate the flow of frames from one node to another.

ALGORITHM:

Initialize Frames:

- Input the window size from the user.
- Input a message to be sent as a sequence of frames.
- Create a list of frames from the message, where each frame consists of:
  - A frame number (frame_no).
  - The data (a single character from the message).
  - An acknowledgment status (acknowledged), initially set to False.

Set Initial Variables:

- Set base to 0, representing the starting position of the sliding window.
- The window_size determines how many frames can be sent without waiting for acknowledgments.

Loop Until All Frames are Sent:

- **Send Frames**:
  - Send up to window_size frames starting from the current base.
  - Display the frame numbers and data being sent.
  - Introduce a delay (2 seconds) to simulate transmission time.
- **Receive Acknowledgments**:
  - Simulate acknowledgment for each frame in the window:
    - With an error probability of 20%, mark the frame as not acknowledged.

        - Otherwise, mark the frame as successfully acknowledged.
    - Display the acknowledgment status for each frame (OK for success, ERROR for failure).
    - Introduce a delay to simulate acknowledgment processing time.

Update Window Base:

- Shift the window (base) to the next unacknowledged frame:
    - Move base forward as long as frames at base are acknowledged.
    - If base has moved to the next set of unacknowledged frames, resend the remaining frames in the window.

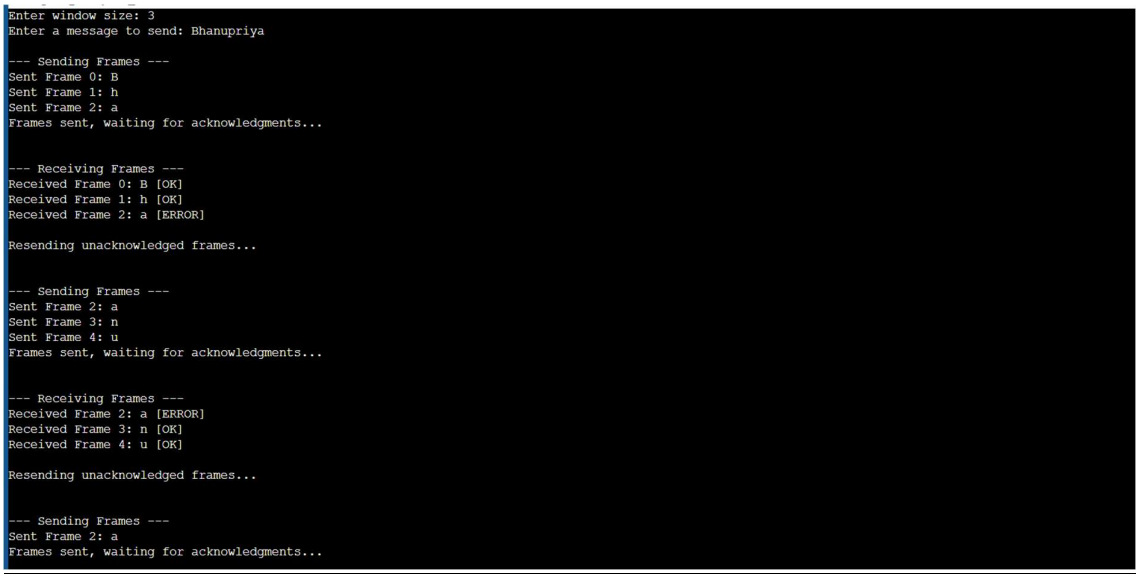
Repeat Until All Frames are Acknowledged:

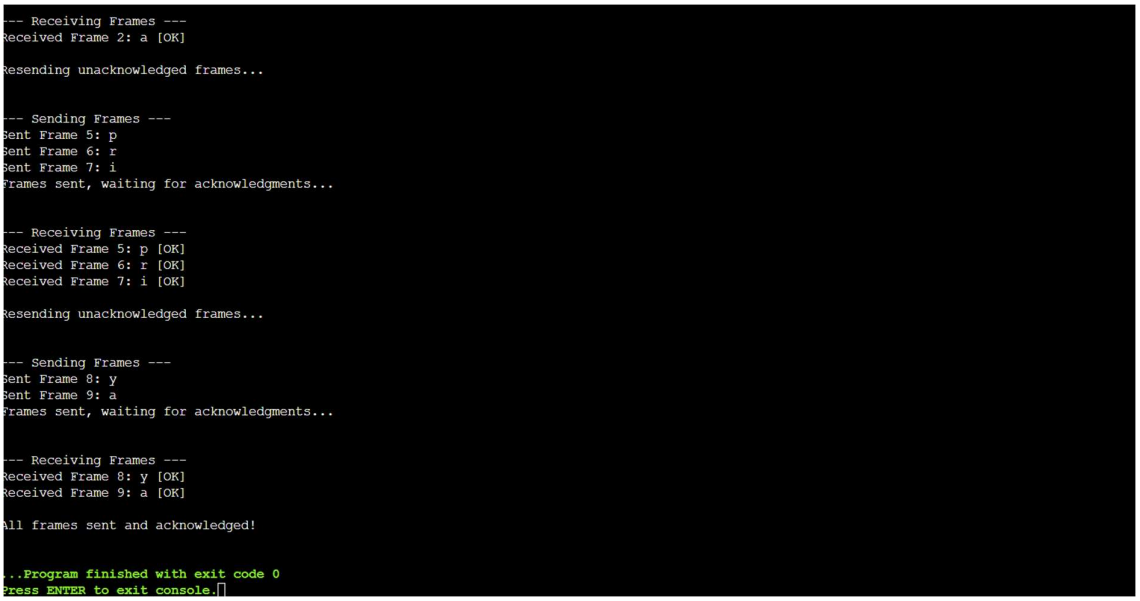
- Continue until base reaches the end of the frame list.
- If there are still frames left unacknowledged after a complete cycle, resend them.
- Introduce a delay for retransmission.

End Protocol:

- Print a confirmation message that all frames have been sent and acknowledged.

OUTPUT:




--- Receiving Frames ---
Received Frame 2: a [OK]
Resending unacknowledged frames...
--- Sending Frames ---
Sent Frame 5: p
Sent Frame 6: r
Sent Frame 7: i
Frames sent, waiting for acknowledgments...
--- Receiving Frames ---
Received Frame 5: p [OK]
Received Frame 6: r [OK]
Received Frame 7: i [OK]
Resending unacknowledged frames...
--- Sending Frames ---
Sent Frame 8: y
Sent Frame 9: a
Frames sent, waiting for acknowledgments...
--- Receiving Frames ---
Received Frame 8: y [OK]
Received Frame 9: a [OK]
All frames sent and acknowledged!
...Program finished with exit code 0
Press ENTER to exit console.