

Title: N-bit Sliding Protocol

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Objective:

The objective is to implement an N-bit sliding window protocol. The window size of N-bit sliding window protocol is N.

Problem Statement:

In this protocol, the sending window for the sender and the receiving window for the receiver are separate buffers. Multiple frames can be sent by a sender at a time before receiving an acknowledgment from the receiver. The sequence number of the outbound frames is determined by the size of the sending window.

Algorithm:

Step 1 – Here, the sliding window of size is N.

Step 2 – After receiving a frame from the sender, the receiver sends an acknowledgment (ACK), which includes the number of the next frame it expects to receive.

Step 3 – If the N value is 3 then we can see the sender first sends 1, 2, and 3 to the receiver, then after receiving an acknowledgment for receiving 1 and sending 4 from the receiver, the sender again sends 4. It works similarly for sending 5, 6, and so on to N.

Step 4 – But this process can face errors sometimes. Considering the receiver faces some error while receiving a frame, the receiver doesn't send an ACK back. For these situations, the sender maintains a timeout for receiving an ACK for every frame.

Step 5 – If it exceeds the time, then the sender resends the frame and adds it to the receiver if it's not already present there otherwise ignores it.

Code:

```
#include<stdio.h>

int main()
{
    int w,i,f,frames[50];

    printf("Enter window size: ");
    scanf("%d",&w);    //Input the window size as 1

    printf("\nEnter number of frames to transmit: ");
    scanf("%d",&f);    // Input number of frames that need to be transmitted

    printf("\nEnter %d frames: ",f);

    for(i=1;i<=f;i++)
        scanf("%d",&frames[i]);    //Enter the frame numbers

    printf("\nWith sliding window protocol the frames will be sent in the
    following manner (assuming no corruption of frames)\n\n");

    printf("Here window size is %d so, at each stage only %d frame is send and
    wait until Acknowledgement is sent by the receiver. \n\n",w,w);

    for(i=1;i<=f;i++)
    {
```

```
    if(i%w==0) // if frame is successfully transmitted acknowledgement is received
```

```
    {
```

```
        printf("Frame no. %d\n",frames[i]);
```

```
        printf("Acknowledgement is received\n\n");
```

```
    }
```

```
    else
```

```
        printf("%d ",frames[i]);
```

```
    }
```

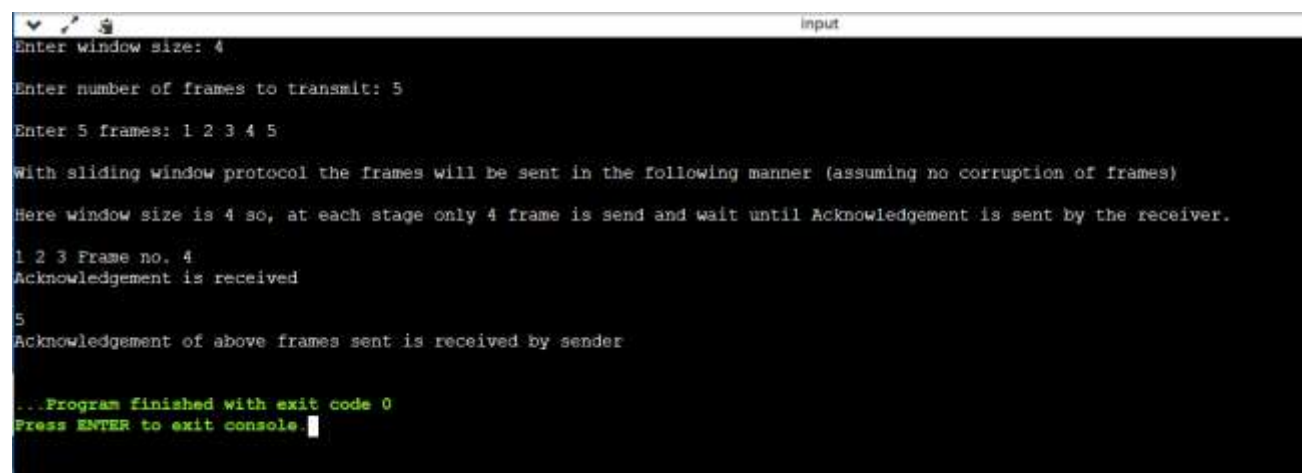
```
    if(f%w!=0)
```

```
        printf("\nAcknowledgement of above frames sent is received by sender\n");
```

```
    return 0;
```

```
}
```

Output:



```
input
Enter window size: 4
Enter number of frames to transmit: 5
Enter 5 frames: 1 2 3 4 5
With sliding window protocol the frames will be sent in the following manner (assuming no corruption of frames)
Here window size is 4 so, at each stage only 4 frame is send and wait until Acknowledgement is sent by the receiver.
1 2 3 Frame no. 4
Acknowledgement is received
5
Acknowledgement of above frames sent is received by sender
...Program finished with exit code 0
Press ENTER to exit console.
```

Explanation:

Here it is a N-bit sliding window, the window size is given as 4 and the number of frames along with the frame numbers are taken as input and 4 frames are sent at each stage as n is 4. Here number of frames are 5, so 4 frames are sent and acknowledgement is received and frame 5 is sent then ack of first 4 frames is received by the sender

Problems Faced:

Initially I found it difficult to understand the concept behind frame transmission and sending the acknowledgement. Later understood and implemented it.

Conclusion:

Here in this experiment, I have learnt about implementation of N-bit sliding window protocol using C programming. The transmission of frames by sender and acknowledgement of received frames is clearly understood.