

PROJECT TITLE

# **Sliding Window Protocol Simulation**

MINI PROJECT CS6172 LAB

*A report submitted for Mini Project for the course CS6172*

*Lab by*

Team Members

**Alen Scaria (121CS0237)**

**Hrishikesh Reddy Thirupatigari (121CS0251)**

**Pothuraju Chanukya Kumar (121CS0692)**



Department of Computer Science and Engineering

National Institute of Technology Rourkela

Odisha, 769008

# Contents

1. Title of the project
2. Team Members (Name and Register Number)
3. Objective of the Project
4. Introduction – Description of the project
5. Module description
6. Sample Code
7. Output Screenshots
8. What did we learn?

# **Title of the Project**

## **Sliding Window Protocol Simulation**

### **Team Members**

**Name:**

- **Alen Scaria (121CS0237)**
  - **Hrishikesh Reddy Thirupatigari (121CS0251)**
  - **Pothuraju Chanukya Kumar(121CS0692)**
- 

### **Objective of the Project**

The objective of this project is to simulate the sliding window protocol, a crucial technique in computer networking for reliable data transfer. Through HTML, CSS, and JavaScript, the simulation will help visualize how packets are sent and acknowledged, demonstrating key aspects of flow control in data communication.

---

### **Introduction – Description of the Project**

The "Sliding Window Protocol Simulation" project offers a visual, interactive representation of a fundamental network protocol. Using HTML, CSS, and JavaScript, it illustrates how data packets are transmitted between sender and receiver, ensuring reliability and managing data flow. This simulation highlights the role of sliding windows in efficient network communication.

Key features of the project include:

- **Packet Transmission Visualization:** Displays packet journey between sender and receiver.
  - **Error Handling and Retransmission:** Simulates packet loss with automatic retransmission.
  - **Window Movement and Flow Control:** Shows dynamic window shift with acknowledgments.
- 

## Module Description

### 1. Send Module

- Initiates packet transmission sequence.
- Handles sliding window adjustments.
- Tracks sent packets status

### 2. Pause Module

- Temporarily halts packet flow.
- Pauses data transmission processes.
- Resumes upon user command

### 3. Kill Packet/Ack. Module

- Simulates packet or acknowledgment loss.
- Triggers protocol retransmission mechanism.
- Demonstrates error handling feature

### 4. Reset Module

- Resets simulation to starting state.
  - Clears all packet-related data.
  - Prepares for new transmission.
-

## Code

Github Link: <https://github.com/Alen-Scaria1516/sliding-window-protocol-simulator>

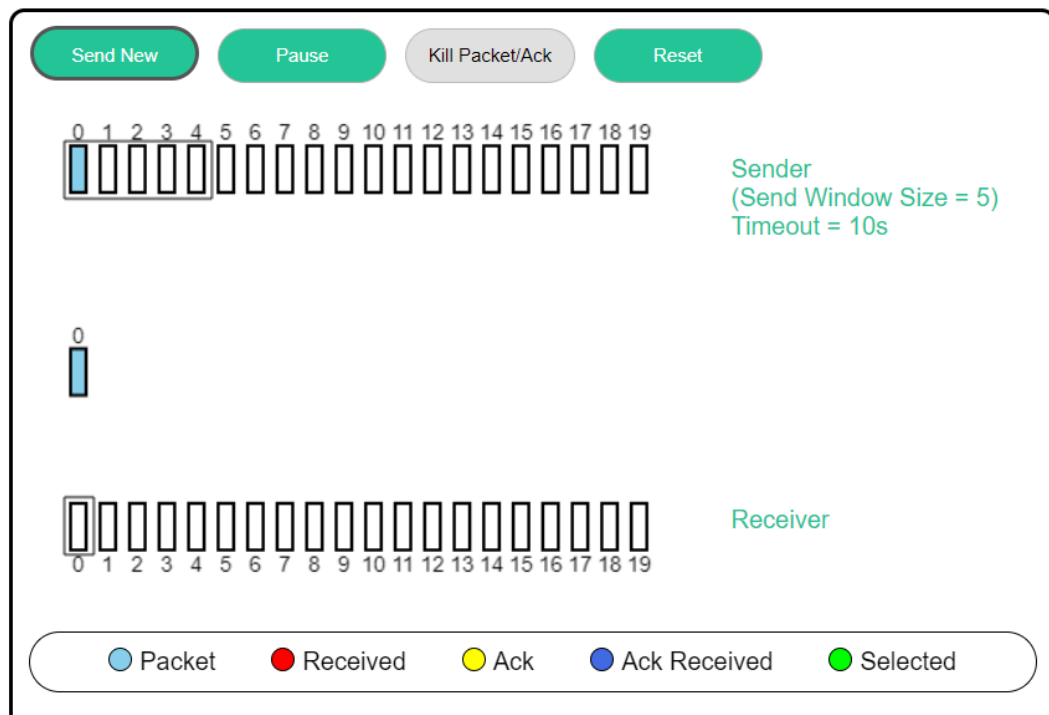
## Output Screenshots:

**Send New** : Sends new data packet

**Kill Packet/Ack** : Simulate a loss of Packet/Ack,  
Select a moving packet/ack then click this.

**Pause** : To pause Simulation (Helpfull in Killing pkt/ack)

**Reset** : Resets Simulation

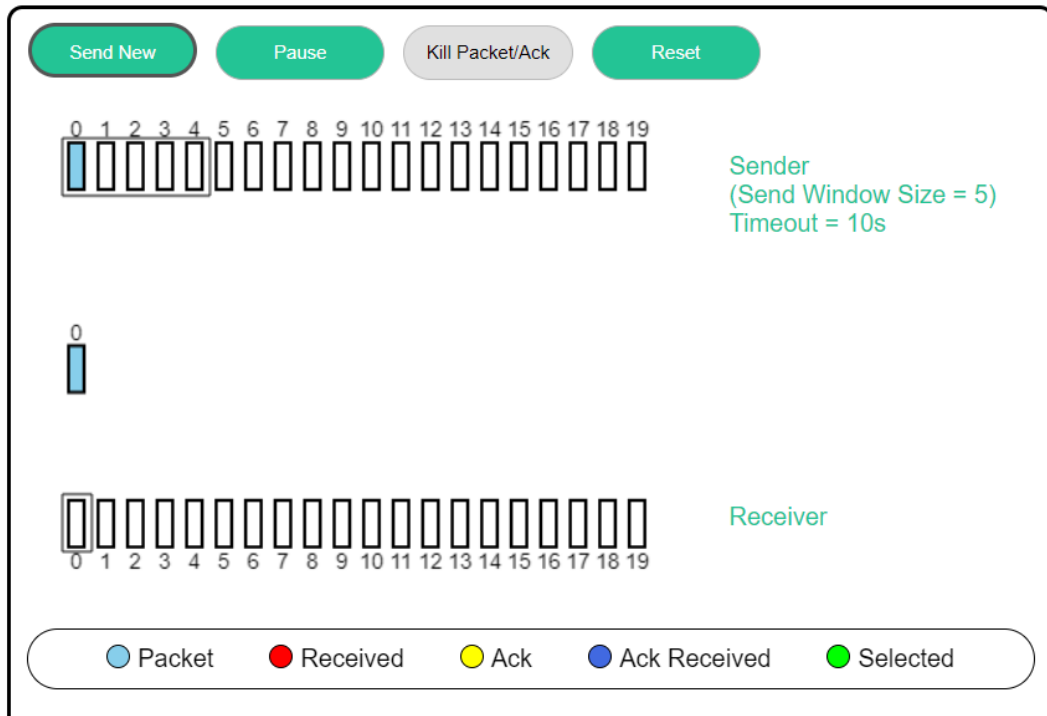


**Send New** : Sends new data packet

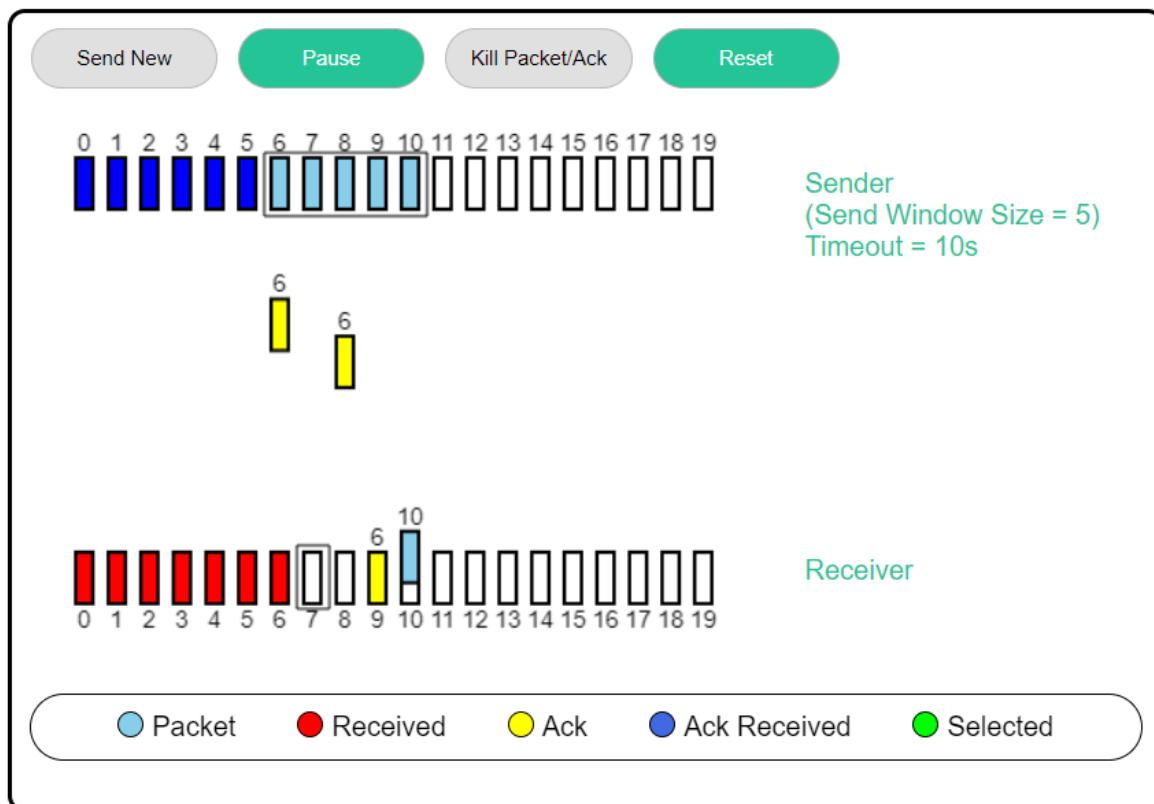
**Kill Packet/Ack** : Simulate a loss of Packet/Ack,  
Select a moving packet/ack then click this.

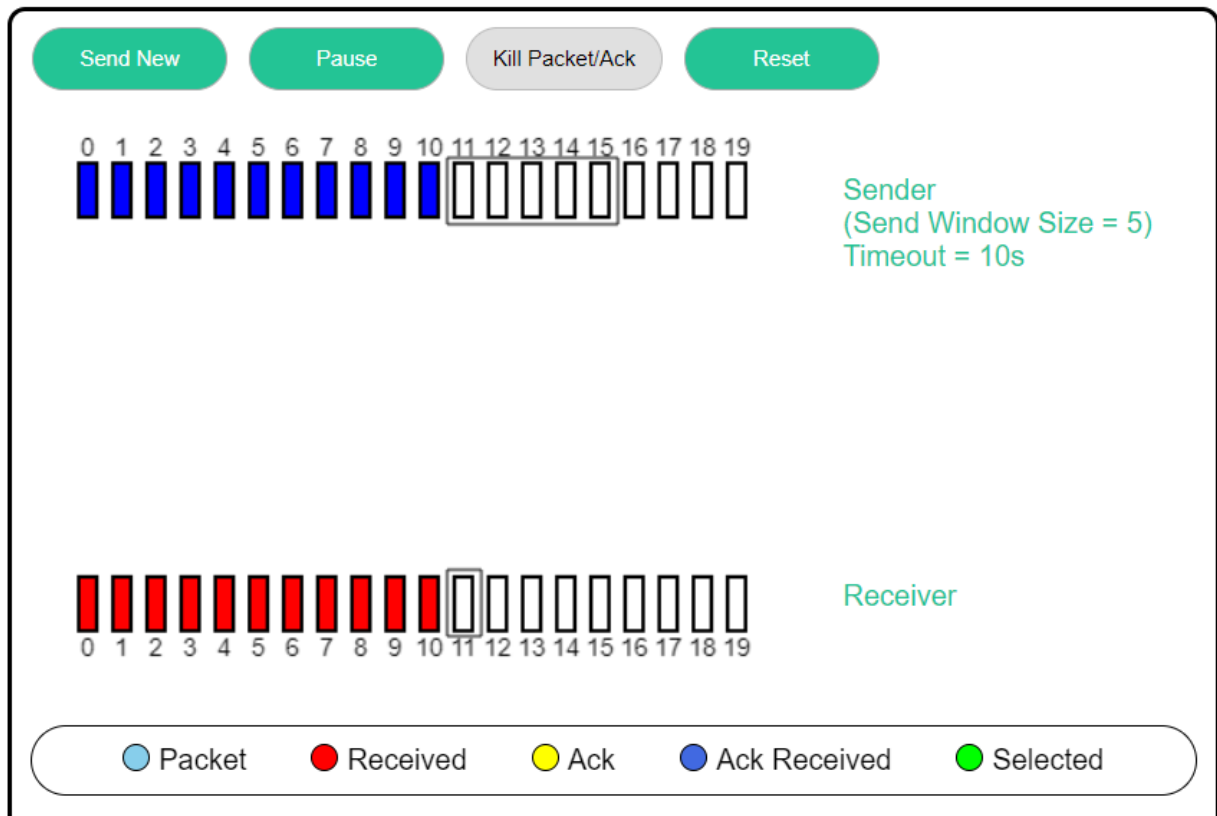
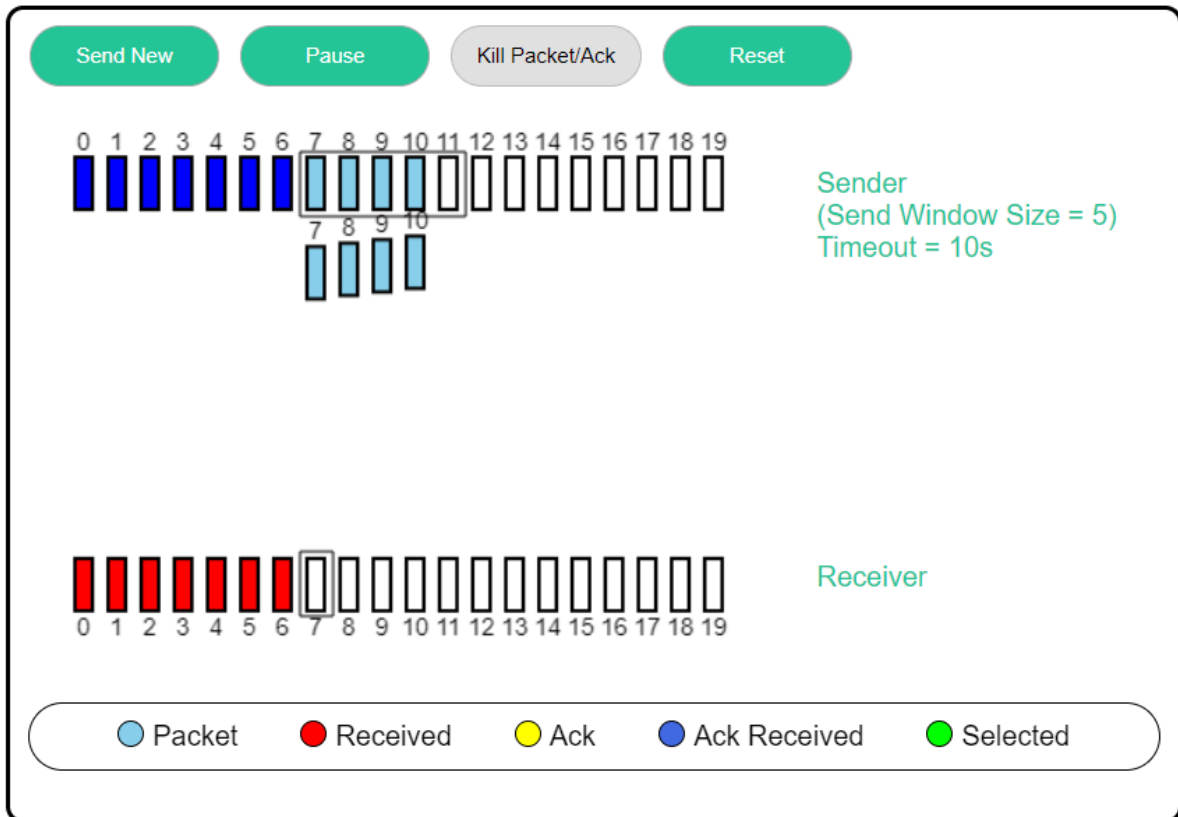
**Pause** : To pause Simulation (Helpfull in Killing pkt/ack)

**Reset** : Resets Simulation



Reset : Resets Simulation





## **What did we learn?**

### **1. Understanding Data Transmission**

Gained insights into packet-based data transmission, learning how packets are sent, acknowledged, and retransmitted, enhancing understanding of reliable data transfer in networking.

### **2. Flow Control Mechanisms**

Explored flow control techniques within the sliding window protocol, observing how dynamic window sizes optimize data flow and prevent congestion.

### **3. Error Handling and Recovery**

Learned how the protocol detects errors and retransmits lost packets, ensuring reliability even in networks with data loss or corruption.

### **4. JavaScript for Network Simulation**

Developed practical skills in JavaScript to simulate network protocols, deepening knowledge of how frontend development tools can visualize complex technical concepts.

### **5. Interactive Data Visualization**

Created a visual interface to represent packet flow, which improved



comprehension of abstract networking principles.

**6. Go-Back-N Protocol Mechanics**

Explored the Go-Back-N protocol, understanding its retransmission logic and how it differs from other sliding window techniques.

**7. Project Management and Team Collaboration**

Enhanced project management skills through planning, assigning roles, and meeting deadlines, while improving collaboration in coding, problem-solving, and effective communication within the team.