Homework 1

# Overview

## TCP:

The Transmission Control Protocol (TCP) is one of the main protocols of the Internet protocol suite. TCP provides reliable, ordered, and error-checked delivery of a stream of octets (bytes) between applications running on hosts communicating via an IP network.

## UDP:

In computer networking, the User Datagram Protocol (UDP) is one of the core communication protocols of the Internet protocol suite used to send messages (transported as datagrams in packets) to other hosts on an Internet Protocol (IP) network. Within an IP network, UDP does not require prior communication to set up communication channels or data paths.

## Streaming:

Streaming is a mechanism for transmitting and receiving data in a continuous flow, typically over a network connection. Instead of waiting for the entire data to be transferred before processing it, streaming allows for data to be transmitted in small packets or chunks and processed in real-time as it arrives.

## Stop-Wait:

Stop-and-wait is a flow control mechanism used in data communication systems to ensure reliable delivery of data packets between a sender and a receiver. In this mechanism, the sender sends a packet of data to the receiver and waits for an acknowledgment (ACK) signal from the receiver before sending the next packet. The receiver, upon receiving a packet, sends an acknowledgment signal to the sender to indicate that the packet has been received successfully.

# Results (Average based on 100 runs)

## TCP Stop-Wait (Buffer 65535)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 0.91 | 16007 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16023 | 1049231350 |

## TCP Streaming (Buffer 65535)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 0.39 | 16001 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16581 | 1048576000 |

## UDP Stop-Wait (Buffer 65507)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 5.98 | 16009 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16009 | 1048576004 |

## UDP Streaming (Buffer 65507)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 4.78 | 16008 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16009 | 1048576004 |

## TCP Stop-Wait (Buffer 65535)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 0.45 | 8001 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 8011 | 524550140 |

## TCP Streaming (Buffer 65535)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 0.18 | 8001 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 8101 | 524288000 |

## UDP Stop-Wait (Buffer 65507)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 3.01 | 8004 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 8005 | 524288004 |

## UDP Streaming (Buffer 65507)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 2.42 | 8004 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 8005 | 524288004 |

## TCP Stop-Wait (Buffer 32767)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 1.51 | 32001 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 32002 | 1048576000 |

## TCP Streaming (Buffer 32767)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 0.70 | 32001 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 32005 | 1048576000 |

## UDP Stop-Wait (Buffer 32753)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 11.86 | 32015 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 32016 | 1048576004 |

## UDP Streaming (Buffer 32753)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 9.25 | 32015 | 1048576000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 32016 | 1048576004 |

## TCP Stop-Wait (Buffer 32767)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 0.74 | 16001 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16002 | 524288000 |

## TCP Streaming (Buffer 65535)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 0.21 | 16001 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16002 | 524288000 |

## UDP Stop-Wait (Buffer 32753)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 5.89 | 16008 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16009 | 524288004 |

## UDP Streaming (Buffer 32753)

### Client:

|  |  |  |
| --- | --- | --- |
| Time | Messages-Sent | Bytes-Sent |
| 4.59 | 16008 | 524288000 |

### Server:

|  |  |
| --- | --- |
| Messages-Received | Bytes-Received |
| 16009 | 524288004 |