



PACKET TRANSFER ANALYSIS

USING FLOW CONTROL PROTOCOLS

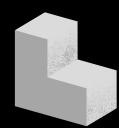
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INTRODUCTION

Computer networks are an integral part of modern communication and information systems.

The design and analysis of computer networks require simulation of different network topologies and protocols to evaluate their performance under different conditions, including different traffic loads, network topologies, and transmission rates.

The proposed simulator includes different network devices, including hubs, switches, and bridges.





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ABOUT OUR HISTORY

- Computer network simulators play an important role in the design and analysis of network protocols and configurations.
- In this project we propose a computer network simulator that includes different network devices, including hubs, switches, and enables users to send messages using flow control protocols.





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ABOUT OUR HISTORY

- The network devices communicate using the Ethernet protocol, which defines the format of Ethernet frames and the rules for transmitting and receiving frames.
- The simulation demonstrated the effectiveness of both Stop-and-Wait ARQ and Selective Repeat ARQ in mitigating the effects of flow control issues.



FEATURES



FEATURES



- Provides a highly modular platform for wired and wireless simulations supporting different network elements, protocols, traffic, and routing types.
- Network Topology Editor: A user-friendly interface for creating and modifying network topology.
- Network Components Library: A wide range of components such as routers, switches, hosts, hubs, and protocols to use in network simulation.
- Traffic Generator: The ability to generate different types of traffic to simulate real-world network conditions.
- Statistics and Monitoring: Real-time monitoring of network behavior, data flow, and performance statistics such as latency, bandwidth utilization, throughput, and packet loss.

IMPLEMENTATION



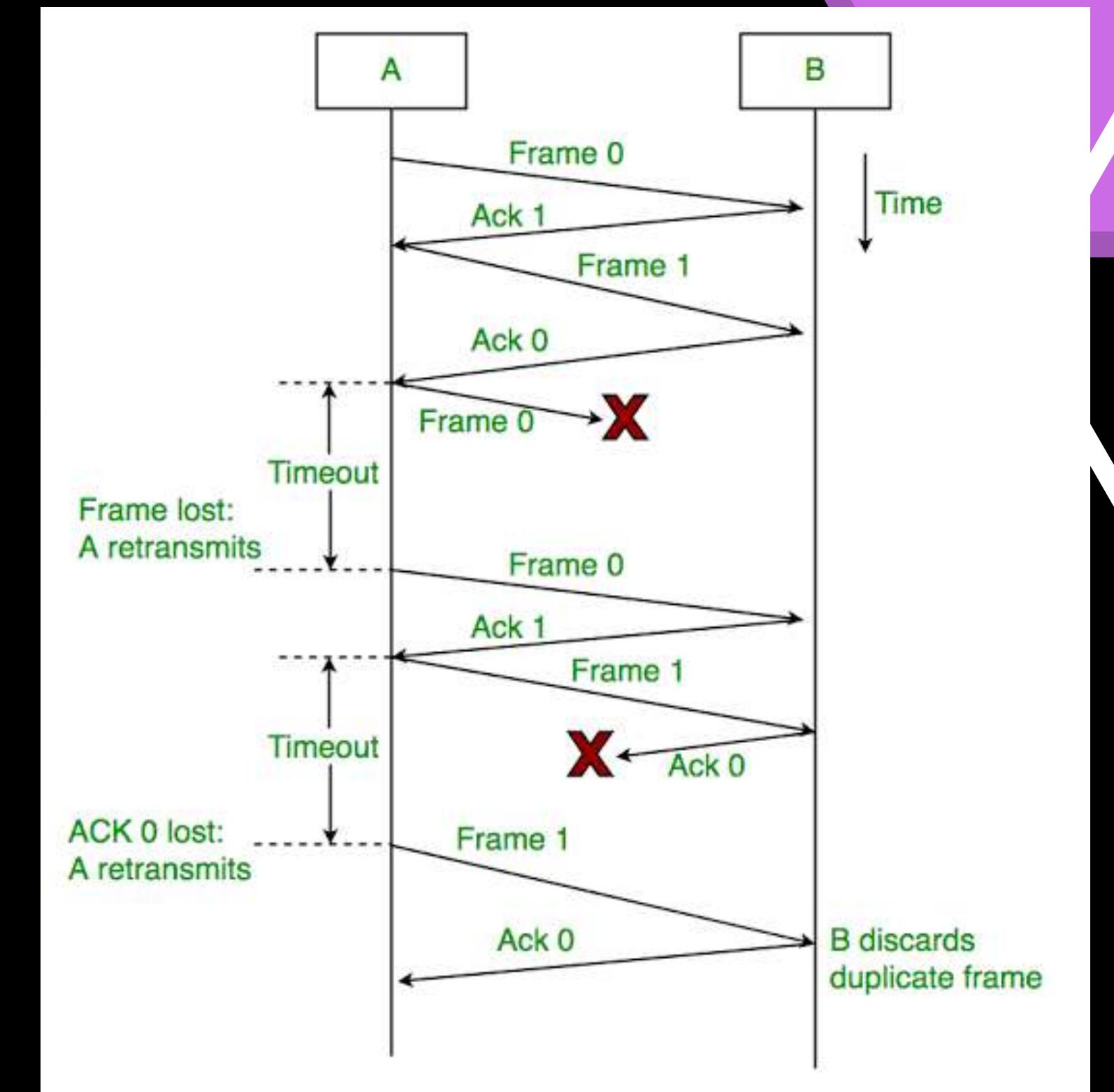
- The proposed network simulator is implemented using Python programming language and the socket API for network communication.
- The simulator includes multiple network devices, including hubs, switches, and bridges, which are represented by Python classes.
- The script can identify Ethernet frames, IPv4 packets, TCP segments, and UDP segments.
- To simulate network traffic, the simulator includes multiple user processes, which send and receive messages using the network devices.
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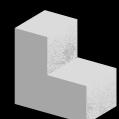
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WAIT & STOP ARQ

The Wait and Stop ARQ (Automatic Repeat Request) protocols are used in data communication to provide error control.

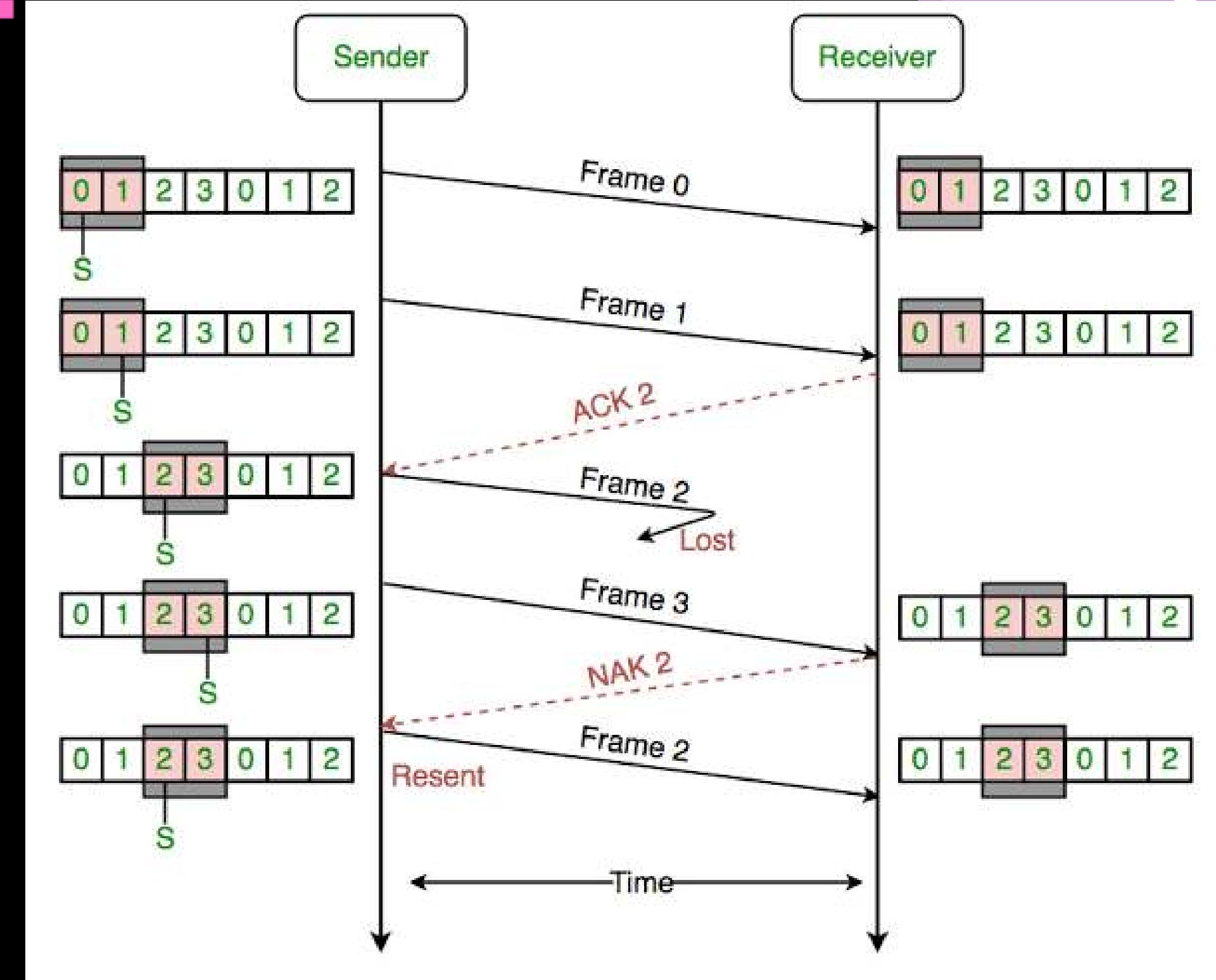
The stop and wait ARQ is used for noisy channels or links and it manages the flow and error control between the sender and the receiver. The stop and wait ARQ protocol sends a data frame and then waits for an acknowledgment or ACK from the receiver.





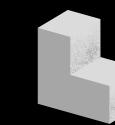
SELECTIVE REPEAT ARQ

The selective repeat ARQ is used for noisy channels or links and it manages the flow and error control between the sender and the receiver. In the selective repeat ARQ, we only resend the data frames that are damaged or lost.



CONCLUSION & RESULT

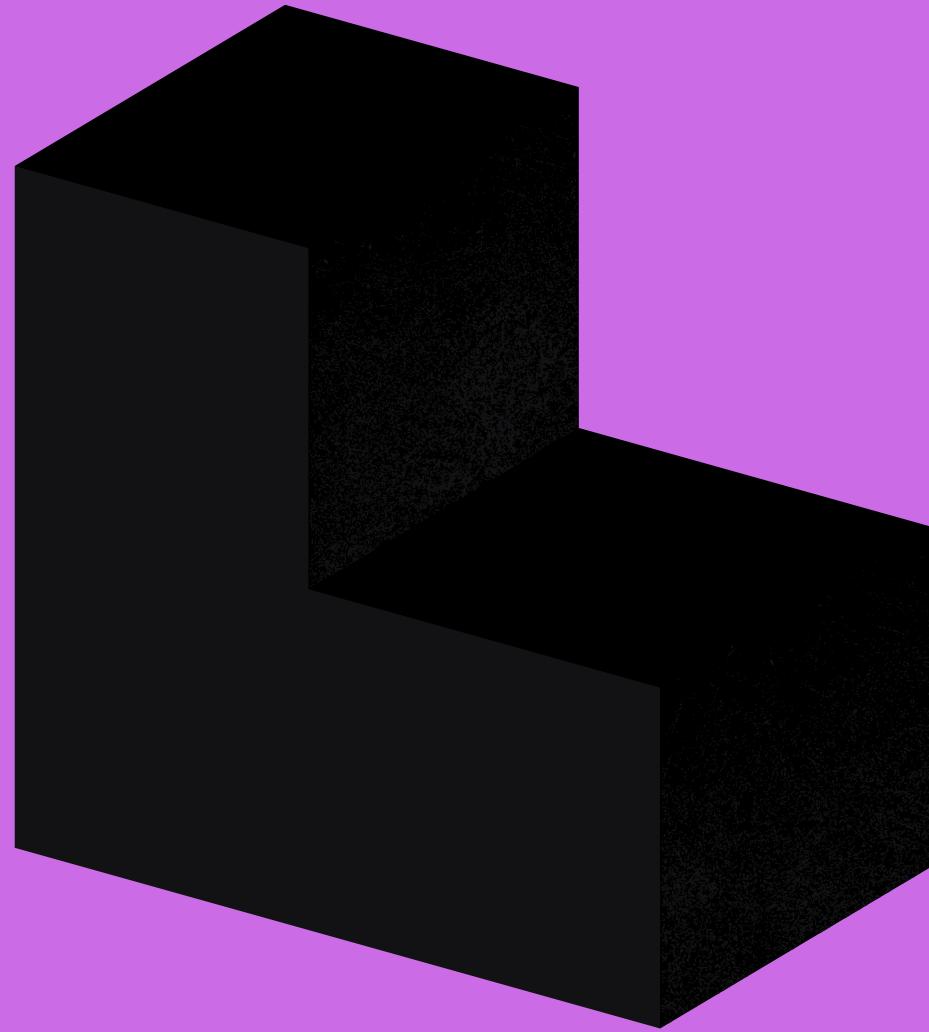
- In conclusion, computer network simulation is an essential tool for evaluating the performance and reliability of computer networks. The use of flow control protocols like Stop-and-Wait ARQ and Selective Repeat ARQ, in combination with appropriate network devices, can significantly enhance the efficiency and reliability of data transmission in a network.



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- The simulation demonstrated the effectiveness of both Stop-and-Wait ARQ and Selective Repeat ARQ in mitigating the effects of flow control issues. Stop-and-Wait ARQ works by sending one data packet at a time and waiting for an acknowledgment before sending the next packet, while Selective Repeat ARQ sends multiple packets before waiting for acknowledgments. Both protocols showed high levels of efficiency in transmitting data with minimal errors.

**THANK
YOU**



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