**深 圳 大 学 实 验 报 告**

**课程名称：­ 计算机网络（Computer Networks）**

**实验名称： Transport Layer Assignment**

**学院： 电子与信息工程学院**

**专业： 电子信息工程**

**指导教师： 毕宿志**

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**实验时间： 2023 年 11 月 23 日**

**实验报告提交时间： 2023 年 11 月 25 日**

**教务部制**

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| 1. **Purpose of experiment**   (1) Complete the implementation of a "Stop-and-Wait" protocol;  (2) Manually simulate the packet loss process and obtain the packet loss rate and RTT;  (3) Familiarize yourself with the implementation of transport layer protocols;  (4) Interconnect with the group.   1. **Experimental principle**   (1) Client sends packets: The data to be sent by the client is divided into multiple packets and sent to the server one by one. Each packet has a unique sequence number for identification and confirmation.  (2) Server receives packets: The server receives the packets sent by the client and processes them in sequence. After the server receives a packet, it sends an acknowledgement message (ACK) to the client so that the client knows that the packet has been successfully received.  (3) Client waits for an acknowledgement message: After sending a packet, the client waits for the server to send an acknowledgement message. If the client does not receive an acknowledgement message within a certain period of time, i.e., timeout, the client assumes that the packet is lost and resends the packet.  (4) Server sends an acknowledgement message: After receiving a packet, the server sends an acknowledgement message to the client. The acknowledgement message usually contains the sequence number of the received packet. After receiving the confirmation message, the client confirms that the packet has been successfully sent to the server.  (5) Packet Loss Simulation: In order to simulate real-world transmission processes, servers artificially introduce a mechanism for packet loss. This means that the server will intentionally not send an acknowledgement message in some cases, causing the client to time out and resend the packet.  (6) Statistics: When the client has sent all the packets, it calculates the packet loss rate, the average round trip time (RTT) and the total time. The packet loss rate is the percentage of sent packets for which no acknowledgement message was received, while the average RTT is the average of the round-trip time for each packet.   1. Translated with www.DeepL.com/Translator (free version)**Content** 2. communication in “localhost”   In this section I set up statements to get the desired number of packets and packet loss rate.  ①Sending 10 packets, packet loss rate is set to 0.5  Enter 10 in client, 0.5 in server  ②Sending 100 packets, packet loss rate is set to 0.2  Enter 100 in client, 0.2 in server  ③Sending 100 packets, packet loss rate is set to 0.5  Enter 100 in client, 0.5 in server   1. Communication with partner   In this section I set up statements to get the desired number of packets and packet loss rate.  ①Sending 10 packets, packet loss rate is set to 0.5  I enter 10 in client, and she enter 0.5 in server  ②Sending 100 packets, packet loss rate is set to 0.2  I enter 100 in client, and she enter 0.2 in server  ③Sending 100 packets, packet loss rate is set to 0.5  I enter 100 in client, and she enter 0.5 in server |
| 1. **Conclusion and discussion**   （1） communication in “localhost”  ①Sending 10 packets, packet loss rate is set to 0.5  截屏2023-11-24 00.07.03截屏2023-11-24 00.06.51  ②Sending 100 packets, packet loss rate is set to 0.2  Omit the middle part due to too many messages in the middle of 100 packages  截屏2023-11-24 00.12.01  截屏2023-11-24 00.12.07截屏2023-11-24 00.11.49  ③Sending 100 packets, packet loss rate is set to 0.5  截屏2023-11-24 00.12.01  截屏2023-11-24 00.15.44截屏2023-11-24 00.16.01  According to the three experiments, the more packets are transmitted, the closer the true packet loss rate is to the set packet loss rate, and the fewer packets are transmitted, the higher the true packet loss rate is compared to the set packet loss rate, but the RTT is smaller.  (2) Communication with partner  ①Sending 10 packets, packet loss rate is set to 0.5  截屏2023-11-26 18.12.47截屏2023-11-26 18.12.38  ②Sending 100 packets, packet loss rate is set to 0.2  Omit the middle part due to too many messages in the middle of 100 packages  截屏2023-11-26 18.16.07截屏2023-11-26 18.15.46  ③Sending 100 packets, packet loss rate is set to 0.5  截屏2023-11-26 18.14.42截屏2023-11-26 18.14.12  Based on these three experiments the Stop-and-Wait protocol interconnection of hosts in the LAN is realized. We can find that the more packets sent the closer the packet loss rate is to the set value, while the less packets sent the smaller the RTT is. |
| 指导教师批阅意见：  成绩评定：  指导教师签字：  年 月 日  备注： |

注：1、报告内的项目或内容设置，可根据实际情况加以调整和补充。

2、教师批改学生实验报告时间应在学生提交实验报告时间后10日内。