**深 圳 大 学 实 验 报 告**

**课程名称：­ 计算机网络**

**实验项目名称： Application Layer**

**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**

**报告人： 陈闻天 学号： 2023280259**

**班级： 04**

**实验时间： 2024年10月22日**

**实验报告提交时间： 2024年11月26日**

**教务处制**

|  |
| --- |
| Aim of Experiment:   1. Master Socket communication in Python 2. Simulate HTTP protocol in Python 3. Simulate UDP protocol in Python 4. Simulate FTP protocol in Python |
| Experiment Content:   1. Create a Web server to handle the request from client 2. Create client ping program to calculate the delay between client and server 3. Develop a simple TCP-based FTP program |
| Experiment Process：   1. Web Server Lab:    1. Client:       1. Create a client socket and connect server socket       2. Input command to determine what are to be sent       3. Open specified file to write down the response    2. Server:       1. Create a client socket and bind server address       2. Connect client socket       3. If web sends request, server will response the messages in HTTP format, otherwise, server will response in normal format 2. UDP Pinger    1. UDP\_pinger:       1. Create a client UDP socket and connect with server UDP socket       2. Randomly product a sequence to decide when a timeout happens       3. Client will send a correct packet to server, but client will send a “incorrect” packet which is placed by specified text.       4. Start the timer when client sends packet, and end the timer when client receive the packet from server. Calculate the delay and print this outcome.       5. When before client receive the response, it had taken more than 1s, and client will think that it meets the case for “Request time out”. 3. UDP\_ponger:    * 1. We set the server response to client after an interval of time, which is useful to calculate the delay. Because without this method, client will quickly receive server’s response in extremely small interval of time, which will lead to that the delay is nearly equal to 0. 4. FTP protocol    1. Client:       1. Create a client TCP socket and connect with server       2. Input the name of file you want       3. Send the packet including the name to server       4. If client successfully to receive the file, it will save it in FTP\_File and print them       5. If not, client will receive an error which means that server does not hold the file client asks for    2. Server:       1. Create a server TCP socket and wait to connect       2. Server receives the request from client       3. Server checks whether it holds the file client asks for       4. If server does, it will open and read the file, sends them to client       5. If server does not, it will send error back to client to tell client that it does not have the file |
| Data Logging and Processing:   1. Web Server Lab:    1. Client to request the existing file and nonexistent file:      * 1. Web request file:      1. Successfully get      * + 1. Unable to get      1. UDP Pinger:    1. Delay and request time out:      1. FTP Protocol:    1. Ask for existing file and nonexistent file: |
| Experimental Results and Analysis:   1. Results:    1. In the web section, we successfully write two Python programs, client and server, to complete TCP communication through client or web browser.    2. In the UDP pinger section, we successfully to calculate the delay between client and server using specified method to make it possible.    3. In the FTP section, we successfully transfer the file through TCP. 2. Analysis:    1. Web browser can connect with TCP socket, which suggests that HTTP is based on TCP    2. The delay will be influenced by different factors, such as loss rate and the number of packets sent    3. In TCP, the file is transferred as bytes, which means any files which can be convert to bytes can be transferred through TCP |
| 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。