National University of Computer and Emerging Sciences

Laboratory Manuals

for

Computer Networks - Lab

(CL -3001)

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Lab Manual 04

Objective:

- Analyzing the **FTP** packets using Wireshark
- TCP Socket Programming using Multithreaded Server to handle multiple clients at the same time

Lab Statement 1: Capturing FTP packets using Wireshark (10)

Step 1: **Start a Wireshark capture.**

a. Close all unnecessary network traffic, such as the web browser, to limit the amount traffic during the Wireshark capture.

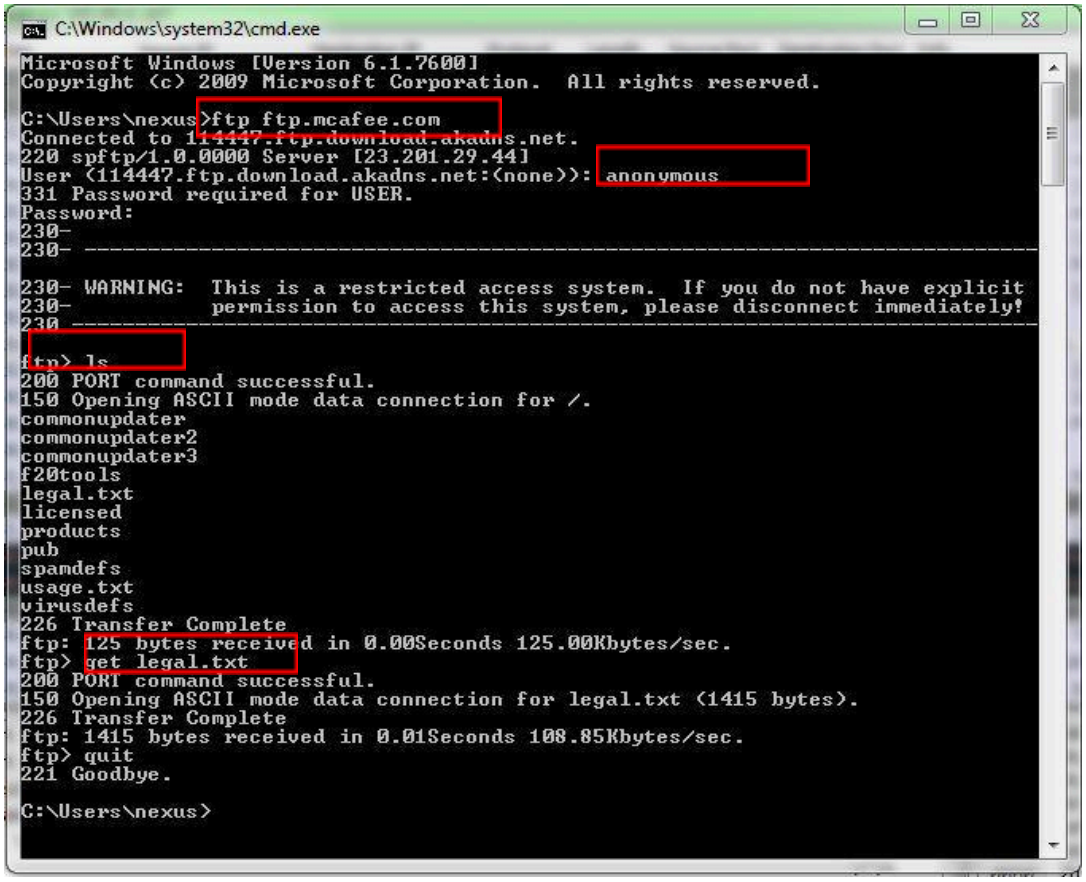
b. Start the Wireshark capture.

Step 2: **Download the .txt file.**

a. From the command prompt, enter ftp ftp.mcafee.com

b. Log into the FTP site for mcafee.com with user **anonymous** and no password.

c. Locate and download any .txt file.



Step 3: **Stop the Wireshark capture.**

Step 4: **View the Wireshark Main Window**

Wireshark captured many packets during the FTP session to ftp.mcafee.com. To limit the amount of data for analysis, type **tcp and ip.addr == 195.89.6.167** in the Filter. The IP address, **195.89.6.167**, is the address for ftp.mcafee.com.

Step 5: **Analyze the packets**

Carefully analyze the packets in Wireshark windows and answer the following question:

Use the FTP_Session.pcapng (Wireshark Capture File) to answer the questions below

1. FTP uses two port numbers: 20 and 21. Apply **tcp.port==20** and **tcp.port==21**. Analyze the result and write down the purposes of these two ports for FTP.

2. Filter out each packet using either FTP or FTP-DATA Protocol (using **ftp || ftp-data** filter). Mention each packet number and its purpose with reference to request made and response received in the above mentioned FTP Session in command line to get file legal.txt (screenshot show above). Also look for **Response Code** and **Response Arg** in the FTP Header for each packet

   (There are **19 such packets** and you have to write one/two lines explanation for each packet, what the packet is doing w.r.t FTP Session (Screenshot shown above) **e.g., Packet 104: Client asks server to send the data on IP:192.168.1.2 and Port:16341** [63(0x3F),213(0xD5) and **(0x3FD5=16341)])**

Lab Statement 2: HTTP Requests and Multithreading (10)

Task 1: Fetch Users (GET Request)

1. **Connect to the API**

   Use the URL `https://jsonplaceholder.typicode.com/users` to send an HTTP GET request and fetch the list of users.

2. **Display the following information:**
   - The HTTP status code of the response.
   - The `Content-Type` from the response headers.
   - The total number of users from the JSON response.
   - The name of the first user in the list**.**

Task 2: Fetch Photos (GET Request)

1. **Connect to the API**

   Use the URL `https://jsonplaceholder.typicode.com/photos` to send an HTTP GET request and fetch a list of photos.

2. **Display the following information:**
   - The HTTP status code of the response.
   - The title of the first photo in the list.
   - The URL of the first photo.

Task 3: Post New Comments (POST Request)

1. **Send multiple HTTP POST requests simultaneously**

   Use the URL `https://jsonplaceholder.typicode.com/comments` and send **multiple** POST requests concurrently using **multithreading**.

2. **Comment Data:**

   Each thread will post a new comment with the following fields:

   - `name`: Your name
   - `email`: Your email
   - `body`: A sample comment text
   - postId: Identifier

3. **Multithreading:**

   - Create multiple threads, with each thread sending a separate POST request.
   - For example, if you create 5 threads, 5 different comments will be posted simultaneously.

4. **Display the following information for each POST request:**

   - The status code of the POST request.
   - The response body contains the created comment.