

# Lab 1: Set Up Environment and Test Basic Software

## Questions

1. What protocol does "ping" and "nslookup" use? (10 points)

**Requirements:**

- a) Use the ping command to test a website or a certain IP address, and use the nslookup command to query the IP address of a domain name. Then, use Wireshark to capture the network traffic and figure out the protocols used by ping and nslookup.
- b) Apart from the answers, please provide screenshots of the interface of wireshark in your report.

2. What is the IP address of [www.sjtu.edu.cn](http://www.sjtu.edu.cn)? (10 points)

**Requirements:**

- a) You are required to use the ping command in this question.
- b) Apart from the answers, please provide screenshots of the Ubuntu terminal in your report.

3. What is the average round trip time (RTT) from your VM to [www.sjtu.edu.cn](http://www.sjtu.edu.cn) and [mit.edu](http://mit.edu). Analyze the reason for the difference of their RTTs. (15 points)

**Requirements:**

- a) You are required to use the command ping to send 10 packets and get the average RTT.
- b) Apart from the answers, please provide screenshots of the Ubuntu terminal in your report

4. What is the TCP bandwidth between your two VMs? (15 points)

**Requirements:**

- a) Open another VM and use iperf3 to test the TCP bandwidth between the two VMs.
- b) Apart from the answers, please provide screenshots of the Ubuntu terminal in your report.

5. Select a VM as your host machine, and another VM as your server machine, then use SSH and Telnet on your host to connect to the server. What are the differences between the protocols used by SSH and Telnet? (25 points)

**Requirements:**

- a) Use the ssh command to connect to the server from your host machine, and provide a screenshot of the Ubuntu terminal showing the successful connection.
- b) Use the telnet command to connect to the server from your host machine, and provide a screenshot of the Ubuntu terminal showing the successful connection.
- c) Capture the network traffic using Wireshark for both SSH and Telnet connections. Provide screenshots of the Wireshark interface showing the captured packets, and analyze the differences in their protocols.

6. Use scp to copy a file from your host to the server. (15 points)

**Requirements:**

- a) Create a file named as “abc.txt” in your host machine, and copy it to the “/home/test” directory of the server machine.
- b) Please provide screenshots of the Ubuntu terminal in your report.

7. Using ifconfig to display and analyze network interface information (10 points)

**Requirements:**

- a) Use the ifconfig command in your terminal to display the network interface details of your machine.
- b) Identify and record the IP address, MAC address, and subnet mask of your primary network interface.
- c) Provide screenshots of the terminal in your report, showing the output of the ifconfig command.