

Assignment 1: Intro to Networking

Problem 1. TCP/IP

(2 pts) List layers of TCP/IP stack. For each, identify an example of the protocol that falls into the level

Application layer - HTTP

Transport layer - TCP

Network layer - IP

Link layer - Point-to-Point

Problem 2. Layer Protocols

(2 pts) While a lot of Internet protocols are standardized, not all protocols have (publicly available) standard. Give your view on why standardization is important for an Internet protocol and what is the implication of a protocol not having a standard?

standardization of internet protocols allows the internet network to scale to theoretical levels since there is no need to come to a consensus on any of the specifications of the internet stack.

if a widely used protocol in the current internet stack didn't have a standard, the network would run into a lot of friction as new nodes leave and enter the network. this would not be ideal for a dynamic network that has a high throughput.

Problem 3. Wireshark

a) (0.5 pts) What is wireshark app?

wireshark is an app that is used to analyze incoming and outgoing traffic data from the current device

b) (1 pts) Normally, Wireshark is a GUI app. However, it has a purely command line interface (not just to start, but to see packet flows) called tshark. Highlight a few differences between tcpdump and tshark command line tools

tcpdump is a simple cli tool used to grab network data from a stream

tshark is a more complex cli tool used to do the same thing, but it has additional filters and transformations that can be applied to network data.

c) (0.5 pts) Show command line options for wireshark (tshark or tcpdump, all have the same options) to save traffic into a file and read captured traffic from the file. (You may use this option to debug your Project 2 implementation later)

```
tshark -i <interface> -w <output_file>
```

```
tshark -r <file_to_read>
```

Problem 4. git

a) (0.5pts) What for have you used git before this class?

for github repositories

b) (0.5pts) What is the difference between Self-Hosted and Github.com hosted git repositories?

self-hosted repositories are stored on your local server while github.com repositories are hosted on the companies servers

c)

d) (1pts) Let's consider that both you and your partner modified different lines of **server.py** file and your partner happened to be the first to create commit and push it to GitHub.

Will you be able to create your own commit with your changes?

yes if there is no merge conflict between the changes

Will you be able to push your commit to GitHub?

yes

If you need to do any actions, list git commands and actions you need to do to push your commit to GitHub

git pull origin main

git add .

git commit -c "git message"

git push -u origin

Problem 5. Cloud Providers

(2 pts) There are many cloud provider vendors today, including Amazon S3, Google Cloud, Azure, Alibaba. If you are given a choice to make between using clouds and deploying your own server infrastructure, what factors will you consider making the decision. List at least 5 factors.

security

scalability

reliability

affordability

reachability