David Vallecampo

Student ID: 991487504

**Q1.** Distinguish between the process of routing a packet from the source to the destination and the process of forwarding a packet at each router.

Routing will find the best possible path to send the packet from the source to its destination. Whereas Packet forwarding is simply that; forwarding packet information from one router to the next without determining a path itself. The routing process is made up of multiple packet forwarding processes.

**Q2.** An ISP is granted the block 16.12.64.0/20. The ISP needs to allocate addresses for 8 organizations each with 256 addresses. a. Find the number and range of addresses in the ISP block b. Find the range of addresses for each organization and the range of unallocated addresses

The address range is from 16.12.64.1 to 16.12.79.254.

Organization 1: from 16.12.64.1 to 16.12.64.254

Organization 2: from 16.12.65.1 to 16.12.65.254

Organization 3: from 16.12.66.1 to 16.12.66.254

Organization 4: from 16.12.67.1 to 16.12.67.254

Organization 5: from 16.12.68.1 to 16.12.68.254

Organization 6: from 16.12.69.1 to 16.12.69.254

Organization 7: from 16.12.70.1 to 16.12.70.254

Organization 8: from 16.12.71.1 to 16.12.71.254

The unused addresses range from 16.12.72.1 to 16.12.79.254

**Q4.** Can you find an analogy in our daily life as to when we use two separate connections in communication similar to the control and data connections in FTP?

The control connection remains open throughout the entire FTP session. The data connections open during the file transfer process and close as soon as there is nothing more to transfer. A good example from our daily lives would be our phones. The mobile telephone is always on a receiving signal from the nearest cell tower, while the phone call itself resembles our data connection. The call needs to be started and subsequently ended once the conversation is over.

**Q5.** In the client-server paradigm, explain why a server should be run all the time, but a client can be run when it is needed.

The purpose of a server is to maintain its availability, while the client side is free to run its services whenever it is needed. The server is supposed to stay on and that way, it will always be accessible to its clients. A server is made to run like this, while clients will have the option to shut down and be used whenever needed, as opposed to running all the time.