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DPS912: Assignment 1 Reflection

1. **In a few sentences, describe the general architecture of your entire layout with the network monitor and interface monitors. What does each do? [0.5 mark]**

   The general architecture of the network and interface monitor is a simulation of a client & server program which will communicate with each other. The IntfMonitor sends a ready message to networkMonitor to begin. The networkMonitor sends a Monitor a message. intfMonitor grabs the information and checks the operstate. If operstate is up, continue monitoring. If operstate is down, intfMonitor sends a Link Down message. The networkMonitor receives a Link Down message, then sends a Set Link Up message. intfMonitor receives a Set Link Up message, and calls ioctl function to set the link up. The intfMonitor sends a Link Up message to networkMonitor. networkMonitor receives Link Up message, then sends Monitor message intfMonitor repeats steps 3 until SIGINT is sent to networkMonitor. When SIGINT is received, networkMonitor will send the Quit message to all intfMonitors. All intfMonitors will receive the Quit message, exit out of their infinite while loops, close all opened directories and gracefully terminate networkMonitor will close all socket connections, unlink socket path from /tmp, and gracefully terminate.

2. **Could the interface monitor and network monitor all be contained within one process, if so how? [0.5 mark]**

   The interface monitor and network monitor can all be contained in one process by using multithreading. Multithreading is used for handling multiple tasks at one time. By using multithreading, each process can run parallel to one another.

3. **Could the interface monitor and network monitor all be contained within one process, assuming 128 network interfaces running at several Giga-bits per second, which require a polling interval of one millisecond per interface. [0.5 mark]**

   The interface monitor and network monitor can all be contained within one process but it wouldn't be the most ideal situation. Having a lot of network interfaces running on the same process could bring other issues such as crashing the server. This would require high server maintenance. Machines such as desktops and laptops aren't built for this since the task at hand is very dependent on its resources.

4. **What is a software defined network? In doing so, describe the applications layer, the control layer, and the forwarding layer. [2.5 marks]**

   A software defined network is made up of three layers that contribute to network efficiency. The goal of this is to monitor the different parts of the network to make sure everything is running smoothly. The Application layer is where the program communicates with the network. Firewalls and load balancing are used to receive information about the network so that data can connect with the control layer. The control layer is responsible for managing the traffic that is running on the network. It decides what data is passed onto the network and how to handle it. The forwarding layer is responsible for forwarding the data that has been passed onto the network. All data has a place to travel to and the forwarding layer uses a combination of switches and routers to send data to the proper location. The three layers work together to manage networking.