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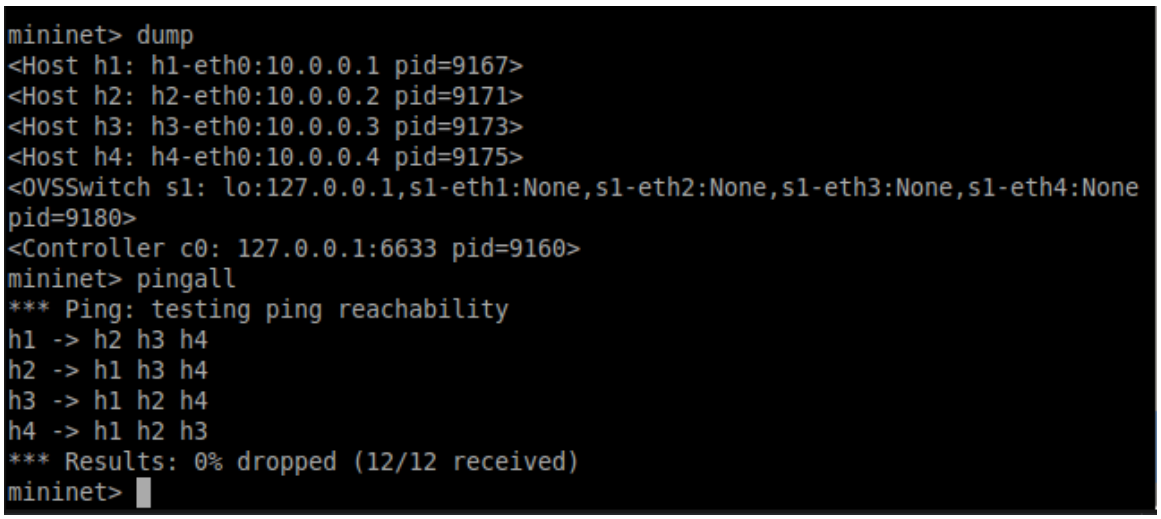
CMPE 150
1/29/18

Pre-Lab & Lab 1 Solutions

1. What command will show you what groups you are a member of?
    a. "groups <username>"
2. What does the environmental variable "$?" hold?
    a. Holds the return number of the last executed program
3. What key combination will suspend a currently running process and place it as a background process?
    a. Press control+Z to suspend a currently running process. To place it as a background process, you run the command bg after the running process is suspended
4. With what command (and arguments) can you find out your kernel version and the "nodename"?
    a. "uname –r" for kernel version, "uname –n" for nodename
5. What is the difference between the paths ".", "..", and "~"? What does the path "/" refer to when not preceded by anything?
    a. "." refers to current directory. ".." refers to parent directory of current directory. "~" refers to home directory. "/" refers to the root directory
6. What is a "pid"? Which command would you use to find the "pid" for a running process?
    a. "pid" is process ID. "ps" will list the current running processes and their ID's . "ps –e" will show all running processes. To find a specific "pid", you type "ps ax | grep <process name>.
7. Write a single command that will return every user's default shell.
    a. Default shell for every user is '/etc/passwd'; we need to access this file. We can do this with the "getent" command, which queries the default shell and grabs the desired info. Every user has 7 columns: *username:password:UID:GID:UserInfo:Home:ShellPath.* To get the username, we run "cut –d: -f1, 7". Full command: getent passwd | cut –d: -f1,7
8. What is the difference between "sudo" and "su root"?
    a. "sudo" lets you run single command. "su root" allows you to create another shell instance for a specified user. Basically, "su" allows you to change user
9. How would you tell your computer to run a program or script on a schedule or set interval on Linux?
    a. To run a program once on a schedule or set interval, you use the "at" command. You type the command at <time>, where time is when you want to run it. To run a set interval, you use the "cron" command.
10. See KevinLoi-script.sh

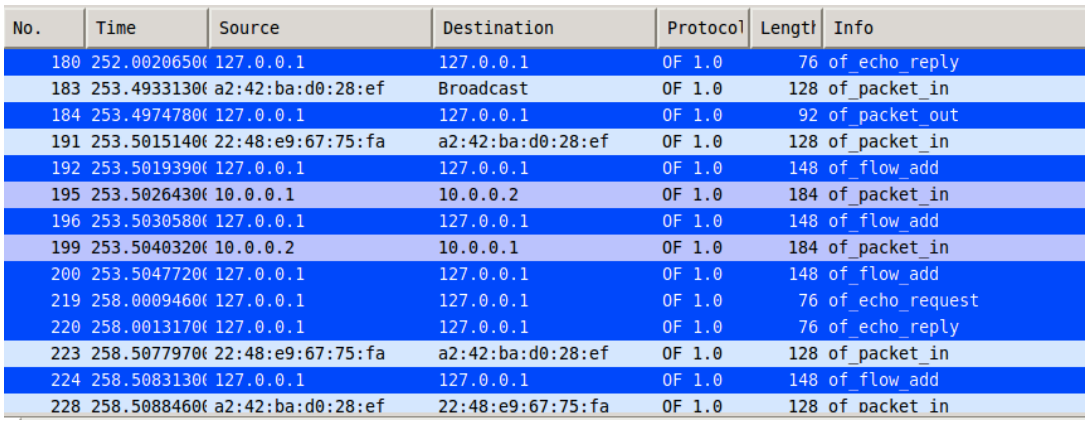
Lab 1

1. In Mininet change the default configuration to have 4 hosts connected to a switch.
    a. See KevinLoi-topo.py
2. Save a screenshot of *dump* and *pingall* output. Explain what is being shown in the screenshot.
    a. 

    Dump: shows information of each node network. We can see each host connected to eth0 network and its "pid."
    Pingall: tests ping reachability, send a ping from each host to all other hosts
3. Run the *iperf* command as well, and screenshot the output, how fast is the connect?
    a. 

    The connect runs around 21 Gbits/sec.
4. Run wireshark, and using the display filter, filter for "of".
    a. Run ping from a host to any other host using *hX ping –c 5 hY*. How many *of_packet_in* show up? Take a screenshot of your results.

i.

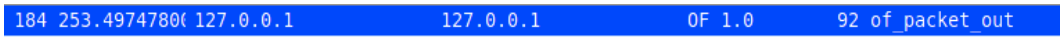


No.	Time	Source	Destination	Protocol	Length	Info
180	252.0020650(	127.0.0.1	127.0.0.1	OF 1.0	76	of_echo_reply
183	253.4933130(	a2:42:ba:d0:28:ef	Broadcast	OF 1.0	128	of_packet_in
184	253.4974780(	127.0.0.1	127.0.0.1	OF 1.0	92	of_packet_out
191	253.5015140(	22:48:e9:67:75:fa	a2:42:ba:d0:28:ef	OF 1.0	128	of_packet_in
192	253.5019390(	127.0.0.1	127.0.0.1	OF 1.0	148	of_flow_add
195	253.5026430(	10.0.0.1	10.0.0.2	OF 1.0	184	of_packet_in
196	253.5030580(	127.0.0.1	127.0.0.1	OF 1.0	148	of_flow_add
199	253.5040320(	10.0.0.2	10.0.0.1	OF 1.0	184	of_packet_in
200	253.5047720(	127.0.0.1	127.0.0.1	OF 1.0	148	of_flow_add
219	258.0009460(	127.0.0.1	127.0.0.1	OF 1.0	76	of_echo_request
220	258.0013170(	127.0.0.1	127.0.0.1	OF 1.0	76	of_echo_reply
223	258.5077970(	22:48:e9:67:75:fa	a2:42:ba:d0:28:ef	OF 1.0	128	of_packet_in
224	258.5083130(	127.0.0.1	127.0.0.1	OF 1.0	148	of_flow_add
228	258.5088460(	a2:42:ba:d0:28:ef	22:48:e9:67:75:fa	OF 1.0	128	of_packet_in

There are 6 of_packet_in

b. What is the source and destination IP addresses for these entries? Find another packet that matches the "of" filter with the OpenFlow typefield set to *OFPT_PACKET_OUT*. What is the source and destination IP address for this entry?

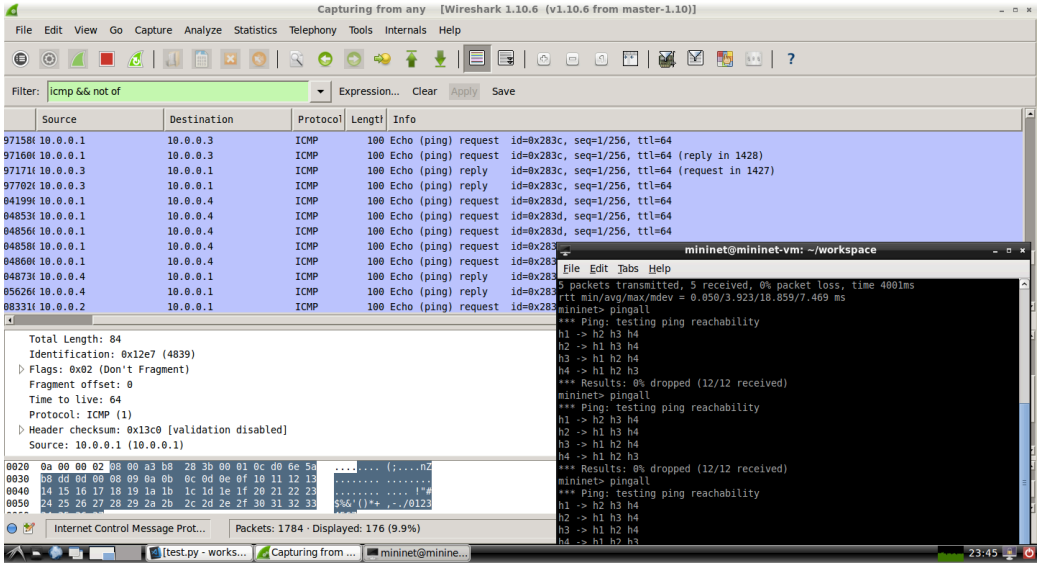
i. Entry: Source → Destination
1: a2:42:ba:d0:28:ef → Broadcast
2: 22:48:e9:67:75:fa → a2: 42:ba:d0:28:ef
3: 10.0.0.1 → 10.0.0.2
4: 10.0.0.2 → 10.0.0.1
5: 22:48:e9:67:75:fa → a2: 42:ba:d0:28:ef
6: a2:42:ba:d0:28:ef → 22:48:e9:67:75:fa



184	253.4974780(	127.0.0.1	127.0.0.1	OF 1.0	92	of_packet_out

Source: 127.0.0.1 → Destination: 127.0.0.1

c. Replace the display filter for "of" to "icmp && not of". Run pingall again, how many entries are generated in wireshark? What types of icmp entries show up?

i. 

There are 57 entries generated in wireshark. There are 2 types of icmp entries: echo reply and echo request.