CSCI 340 Operating Systems t Homework 5

Collaboration Policy: Individual Assignment Total
Points: 100

Project Goals

In this assignment you will develop a command-line packet capture (**cmd-pcap**) software application that only captures TCP/IP packets. Furthermore, the cmd-pcap shall only display TCP segments that have or source or destination port of 80 (i.e. HTTP network packets). To complete this assignment the header file named "`sniffex.h`" is required.

Project Specification

The **cmd-pcap** application shall meet the requirements listed below.

a) Shall design and develop a C/C++ command-line application that compiles and runs in your Ubuntu 16.04 LTS OS. Note: you will need to install **libpcap**. From a terminal type: `sudo apt-get install libpcap-dev`.
b) Shall prompt the user to select a network device.
c) Shall display the IPv4 information for the selected network device: 1) host, 2) IP address, and 3) netmask.
d) Shall start a live packet capture using the selected network device.
e) Shall only capture IP datagrams and TCP segments.
f) Shall filter TCP segments based on the source or destination ports.
g) Shall **only display** TCP/IP and port 80 packet data. Specifically, if the filter criteria are met, i.e. IP datagram and TCP segment and source or destination port is 80, the source and destination IP addresses along with the source and destination ports shall be displayed.
h) The output format must be same as the provided example (see Example Output).

Submission

Use the tarball target in the provided Makefile to create an archive file. Please change put your lastname (instead of mine) in the tarball target. Only assignments submitted in the correct format will be accepted (no exceptions). Please submit the tarball file (via OAKS) to the Dropbox setup for this assignment by the due date. You may resubmit the tarball file as many times as you like, Dropbox will only keep the newest submission.

Grading Rubric

Spec. B: Prompt user to select network device	5 points
Spec. C: Display IPv4 information for selected network device	10 points
Spec. D: Start a live packet capture	5 points
Spec. E: Only capture IP datagrams and TCP segments	15 points
Spec. F: Shall filter TCP segments based on the source or destination ports.	20 points
Spec. G: Shall only display TCP/IP and port 80 packet data. Specifically, if the filter criteria are met, i.e. IP datagram and TCP segment and source or destination port is 80, the source and destination IP addresses along with the source and destination ports shall be displayed	15 points
Spec. H: Output format is correct	15 points
Compiles	5 points
Runs with correct output	10 points
Total	**100 points**

Important: if the submitted solution is not written using the C/C++ language, and/or does not use the libpcap library, it will not be graded. No exceptions.

The assignment is graded as follows:

- Does not compile: 0 of 100 points (stop grading)
- Compiles, runs, and meets specification: 100 of 100 points

Example Output

```
----------------------------------------
List of available network devices:
----------------------------------------
(1) nflog       "Linux netfilter log (NFLOG) interface"
(2) nfqueue     "Linux netfilter queue (NFQUEUE) interface"
(3) em1
(4) usbmon1     "USB bus number 1"
(5) usbmon2     "USB bus number 2"
(6) any         "Pseudo-device that captures on all interfaces"
(7) lo
----------------------------------------
Please select a device [1 through 7]: 3
Selected device: em1
host 153.9.220.0
inet 153.9.220.165
netmask 255.255.255.0
----------------------------------------
Starting live packet capture!
Source [153.9.220.165 : 2105 ] -> Destination [153.9.220.139 : 80]
Source [153.9.220.139 : 80 ] -> Destination [153.9.220.165 : 2105 ]
Source [153.9.220.165 : 2015 ] -> Destination [153.9.220.139 : 80 ]
Source [153.9.220.139 : 80 ] -> Destination [153.9.220.165 : 2015 ]
.
.
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```