NASA: Assignment 1

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Network Administration

Part 1

a)

TCP: transport layer
IP: network layer

b)

UDP is a unreliable protocol. Thus when requiring a stable connection, we will rather choose TCP for reliable connection.

c)

We would use the HTTP protocol to send HTTP request to the remote website. With method like `GET`, `POST` and `PUT`, we could get the response we want.

Part 2

a)

140.112.30.28

b)

because 192.168.0.1 is a private IP defined by IANA. It is only accessible by LAN.

Part 3

Filter: `tcp && ip.dst==140.112.30.32`
b01705041.pcapng

Part 4

a)

A **media access control address** (MAC address) is a unique identifier assigned to network interfaces for communications on the physical network segment.[1]

[1] `http://en.wikipedia.org/wiki/MAC_address`

b)

Blocking MAC address enable only certain unique devices to access. Rather than IP addresses differ from network, MAC addresses differ from devices.

System Administration

Problem 1

Listing **??** shows the shell script.

Listing 1: find-junk-messages.sh

```
#!/bin/bash
#find-junk-messages

tail +2 | grep -v '^ *(' | awk -v a=$1 'BEGIN { RS = "" } { if ($7 == a) print  \
>    $1 }' | tr -d '*!'
```

Problem 2

Listing **??** shows the shell script.

Listing 2: compiler-wrapper.lib

```
#!/bin/bash
#compiler-wrapper

cc(){
    local compiler = "/usr/bin/cc -isystem /usr/local/include"
    local linking = ""
    local body = ""
    shift
    while test $# -gt 0
    do
        body = "$body$1 "
        case "$1" in
            -c) $linking = "-Wl,-Y/usr/local/lib"
                ;;
            -S) $linking = "-Wl,-Y/usr/local/lib"
                ;;
            -E) $linking = "-Wl,-Y/usr/local/lib"
                ;;
        esac
        shift
    done
    $compiler $body $linking
}

c++(){
```

```
    local compiler = "/usr/bin/c++ -isystem /usr/local/include"
    local linking = ""
    local body = ""
    shift
    while test $# -gt 0
    do
        body = "$body$1 "
        case "$1" in
            -c) $linking = "-Wl,-Y/usr/local/lib"
                ;;
            -S) $linking = "-Wl,-Y/usr/local/lib"
                ;;
            -E) $linking = "-Wl,-Y/usr/local/lib"
                ;;
        esac
        shift
    done
    $compiler $body $linking
}

cpp(){
    local compiler = "/usr/bin/cpp -isystem /usr/local/include"
    local body = ""
    shift
    while test $# -gt 0
    do
        body = "$body$1 "
        shift
    done
    $compiler $body
}
```

Problem 3

Listing **??** shows the shell script.

Listing 3: show-recent-logintime-and-desktopsession.sh

```
#!/bin/bash
#show-recent-logintime-and-desktopsession

id = `id $1 | cut -d'=' -f2 | cut -d'(' -f1`
time = `dbus-send --system --print-reply --dest=org.freedesktop.Accounts --type= \
>    method_call /org/freedesktop/Accounts/User$1 org.freedesktop.DBus. \
>    Properties.Get string:org.freedesktop.Accounts.User string:LoginTime | cut  \
>    -d' ' -f9`
timeFormat = `date -d @$time '+%Y-%m-%d %H:%M:%S'`
session = `dbus-send --system --print-reply --dest=org.freedesktop.Accounts -- \
>    type=method_call /org/freedesktop/Accounts/User$1 org.freedesktop.DBus. \
>    Properties.Get string:org.freedesktop.Accounts.User string:XSession | cut - \
>    d' ' -f9`
```

```
echo "$1 $id $session $timeFormat"
```

Problem 4

Listing **??** shows the shell script.

Listing 4: project-shared-folder.sh

```
#!/bin/bash
#project-shared-folder

setfacl -m u:student2:rwx -m u:student3:rwx -m u:ta1:rx -m u:ta2:rx -m g:--- -m  \
>    m:rwx -m other:--- project_shared_folder
```

The result is as follow.

```
# file: project_shared_folder
# owner: student1
# group: student
user::rwx
user:student1:rwx
user:student2:rwx
user:student3:rwx
user:ta1:r-x
user:ta2:r-x
user:prof1:r-x
group::---
mask::rwx
other::---
```