CSC 577 Lab Homework 1 (Q3)

Readme

Guidance Manual

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Introduction

:About the Program:

- This program works by first getting all the details of the interfaces from the device and saves it into a data dictionary data structure. Then we transform the data into a Pandas Table so that we can display the details of the interface based on the user query options. The print result will contain: Name, Interface Type, MAC Address, IP address.

  We have provided these querying options:
  1. IP Address (v4)
  2. IP Address (v6)
  3. MAC Address
  4. Interface Type

  The user can enter any of the options to search for the corresponding interface details. So, if the user chooses to search by any option, the user will then be prompted to enter the relevant search string. Then if that string is presented in a proper format and it's present in the interface details that was collected in the first step, then the details of the interface corresponding to the query string is printed.

:Program Behavior and Running:

Let's see how you'll be able to reach to the program:

1. **SSH to the staging server:**

```
ssh csc547@152.14.83.162
Password: CsCEcE547@Cloud
```

2. **SSH to Cloud VM and sudo:**

```
ssh csc547@192.168.122.63
        Password: jparikh@rrajpur
sudo su –
        Password: jparikh@rrajpur
```

3. **Change directory to /home/csc547/LAB-HW1:**

```
cd /home/csc547/LAB-HW1
```

Let's see how you'll be run the program:

1. **Run using ./:**

```
./labhw1.py
```

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Navigating Through the program

:Using the program/navigating through the options:

- Once you run the program, you will see on output like this:

```
csc547@t12-vm9:~$ sudo su -
[sudo] password for csc547:
root@t12-vm9:~# cd /home/csc547/LAB-HW1/
root@t12-vm9:/home/csc547/LAB-HW1# ./labhw1.py

-----------------------
Here are the details of the interfaces that we have fetched:
        name    state           mac                 ip4                          ip6      type
lo          lo  UNKNOWN   00:00:00:00:00:00       127.0.0.1/8                   ::1/128  loopback
enp1s0  enp1s0       UP   52:54:00:7b:09:ac   192.168.122.63/24  fe80::5054:ff:fe7b:9ac/64  ethernet
-----------------------

Please select which method you want to search with:
1. IP Address (v4)
2. IP Address (v6)
3. MAC Address
4. Interface Type
0. EXIT teh program

Enter the choice number: █
```

1. The program will firstly print the interface details that it was able to fetch from the device, between the lines.
2. Then you will be able to see the choices that we have provided in order to search through the data. (0 Exits the program)

[Scenario 1: Searching using IP Address v4]

1. **Enter "1" to search the data using IP Address v4:**

```
Enter the choice number: 1
```

```
Enter the choice number: 1
You chose to search by IP Address v4, great choice!
Enter the IP Address v4 you want to search for (in the format of X.X.X.X/Y) - █
```

2. **Enter the IP Address you want to search with (Please note the format-you will have to enter the IP with mask):**

```
Enter the IP Address v4 you want to search for (in the format of X.X.X.X/Y) -
<IP Address/Mask>
```

Here, there are two ways the program can go:

a. We found the details based on the IP you gave:

```
You enter: 192.168.122.63/24

(which is assigned to enp1s0, so it's a valid one)
```

So, as the IP is a valid one, this is what you will get upon hitting enter:

```
Enter the IP Address v4 you want to search for (in the format of X.X.X.X/Y) - 192.168.122.63/24
Here are your details:
-----------------------------------
        name state          mac            ip4          ip6             type
enp1s0  enp1s0   UP  52:54:00:7b:09:ac  192.168.122.63/24  fe80::5054:ff:fe7b:9ac/64  ethernet
-----------------------------------
Enter the choice number: █
```

You will notice that the details of the current interface with the IPv4 are printed and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

b. Or there was no interface with that IP:

```
You enter: 192.168.122.62/24

(which is not assigned to any interfaces!, so an error will be thrown)
```

So, as the IP is an invalid one, this is what you will get upon hitting enter:

```
Enter the IP Address v4 you want to search for (in the format of X.X.X.X/Y) - 192.168.122.62/24
There was no interface found in the device with the IP Address v4 you asked for
Enter the choice number: █
```

You will notice that the details of the current interface with the IPv4 are printed and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

[Scenario 2: Searching using IP Address v6]

1. **Enter "2" to search the data using IP Address v6:**

```
Enter the choice number: 2
```

```
Enter the choice number: 2
You chose to search by IP Address v6, seems you are starting to adapt to the future!
Enter the IP Address v6 you want to search for (in the proper v6 format with mask) - █
```

2. **Enter the IP Address you want to search with (Please note the format-you will have to enter the IP with mask):**

```
Enter the IP Address v4 you want to search for (in the proper v6 format with m
ask)) - <IP Address/Mask>
```

Here, there are two ways the program can go:

a. We found the details based on the IP you gave:

```
You enter: fe80::5054:ff:fe7b:9ac/64

(which is assigned to enp1s0, so it's a valid one)
```

So, as the IP is a valid one, this is what you will get upon hitting enter:

```
Here are your details:
----------------------------------
         name state            mac                ip4             ip6        type
enp1s0 enp1s0    UP  52:54:00:7b:09:ac  192.168.122.63/24  fe80::5054:ff:fe7b:9ac/64  ethernet
----------------------------------
Enter the choice number: ▮
```

You will notice that the details of the current interface with the IPv6 are printed
and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

b. Or there was no interface with that IP:

> You enter: fe80::5054:ff:fe7b:9ab/64
>
> (which is not assigned to any interfaces!, so an error will be thrown)

So, as the IP is an invalid one, this is what you will get upon hitting enter:

```
Enter the IP Address v6 you want to search for (in the proper v6 format with mask) - fe80::5054:ff:fe7b:9ab/64
There was no interface found in the device with the IP Address v6 you asked for or you entered it in a different format!
Enter the choice number: ▮
```

You will notice that the details of the current interface with the IPv4 are printed
and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

[Scenario 3: Searching using MAC Address]
1. **Enter "3" to search the data using MAC Address:**

> Enter the choice number: 3

```
Enter the choice number: 3
You chose to search by MAC Address, old school, eh!:
Enter the MAC you want to search for (in the format of XX:XX:XX:XX:XX:XX) - ▮
```

2. **Enter the MAC Address you want to search with (Please note the format):**

> Enter the MAC you want to search for (in the format of XX:XX:XX:XX:XX:XX) -

Here, there are two ways the program can go:
a. We found the details based on the MAC you gave:

> You entered: 52:54:00:7b:09:ac
>
> (which is assigned to enp1s0, so it's a valid one)

So, as the MAC is a valid one, this is what you will get upon hitting enter:

```
Here are your details:
----------------------------------
         name state            mac                ip4             ip6        type
enp1s0 enp1s0    UP  52:54:00:7b:09:ac  192.168.122.63/24  fe80::5054:ff:fe7b:9ac/64  ethernet
----------------------------------
Enter the choice number: ▮
```

You will notice that the details of the current interface with the MAC are printed and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

b. Or there was no interface with that MAC:

```
You entered: 52:54:7b:09

(which is not assigned to any interfaces!, so an error will be thrown)
```

So, as the MAC is an invalid one, this is what you will get upon hitting enter:

```
Enter the MAC you want to search for (in the format of XX:XX:XX:XX:XX:XX) - 52:54:7b:09
There was no interface found in the device with the MAC you asked for
Enter the choice number:
```

You will notice that the details of the current interface with the MAC are printed and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

[Scenario 4: Searching using interface type]
3. **Enter "4" to search the data using interface type:**

```
Enter the choice number: 4
```

```
Enter the choice number: 4
Hello there, here are the interface types:
        1. ethernet
        2. loopback
Enter the interface type which you want details of:
```

You will observe that we have provided the interface types that are present in the system. So, all interfaces here are either of ethernet or loopback type.

4. **Enter the Interface Type you want to search with (not the number, but the type):**

```
Enter the interface type which you want details of:
```

Here, there are two ways the program can go:
a. We found the details based on the type you gave:

```
You entered: loopback

(this device has loopback interfaces, so it's a valid one)
```

So, as the type is present in the device, this is what you will get upon hitting enter:

```
Hello there, here are the interface types:
        1. ethernet
        2. loopback
Enter the interface type which you want details of:loopback
Here are your details:
--------------------------------
   name    state              mac              ip4        ip6        type
lo    lo   UNKNOWN   00:00:00:00:00:00   127.0.0.1/8   ::1/128   loopback
--------------------------------
Enter the choice number:
```

You will notice that the details of the current interface with the interface type are printed and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

b. Or there was no interface with that type:

```
You entered: bridge

(this type of interface in not present on the device, so an error will
be thrown)
```

So, as there is no interface with the type you gave, this is what you will get upon hitting enter:

```
Enter the interface type which you want details of:bridge
The interface type you asked for was not found in teh interfaces of this device
Enter the choice number:
```

You will notice that the details of the current interface with the type are printed and you are prompted again to add your choice (from 1, 2, 3, 4, 0)

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