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Subject : Operating System

ASSIGNMENT - 1

SHELL CODE ANALYSIS

Linux (Intel x86-64)

Aim : To automate the wifi connection by using bash script in Linux 64 bit shell code

Procedure : Connect to Wi-Fi Network

Step 1 : Start Ubuntu and open the terminal.

Step 2 : Check Wi-Fi Status:

- Use the ``nmcli`` command to retrieve the current Wi-Fi status.
- Store the Wi-Fi status in the variable ``wifi_status``.

Step 3 : Turn on Wi-Fi (if it's off):

- Check if the Wi-Fi status is "disabled".
- If Wi-Fi is disabled, turn it on using the ``nmcli radio wifi on`` command.
- Print a message indicating that Wi-Fi has been turned on.
- Wait for 10 seconds using ``sleep 10`` to allow time for the Wi-Fi to initialise.

Step 4 : List Available Wi-Fi Networks:

- Print a message indicating that the script is listing available Wi-Fi networks.
- Use the ``nmcli device wifi list`` command to display a list of available Wi-Fi networks.

Step 5 : Set Wi-Fi Credentials:

- Set the Wi-Fi SSID and password in variables ``wifi_ssid`` and ``wifi_password``.

Step 6 : Check if Already Connected:

- Use `nmcli` to check if the device is already connected to the specified Wi-Fi network (`\$wifi_ssid`).
- If connected, print a message indicating that the device is already connected.

Step 7 : Connect to Wi-Fi (if not already connected):

- If not connected, check if the specified Wi-Fi network is available in the list of available networks.
- If available, use `nmcli` to connect to the Wi-Fi network with the specified SSID and password.
- Print a success or failure message based on the result of the connection attempt.

Program :

```
#!/bin/bash

# Check Wi-Fi status
wifi_status=$(nmcli radio wifi)

# Check if Wi-Fi is turned off
if [ "$wifi_status" = "disabled" ]; then
    # If Wi-Fi is off, turn it on
    nmcli radio wifi on
    echo "Wi-Fi turned on"

    # Wait for 10 seconds before attempting to connect
    sleep 10
else
    echo "Wi-Fi is already on"
fi

# List available Wi-Fi networks
echo "Available Wi-Fi networks:"
nmcli device wifi list

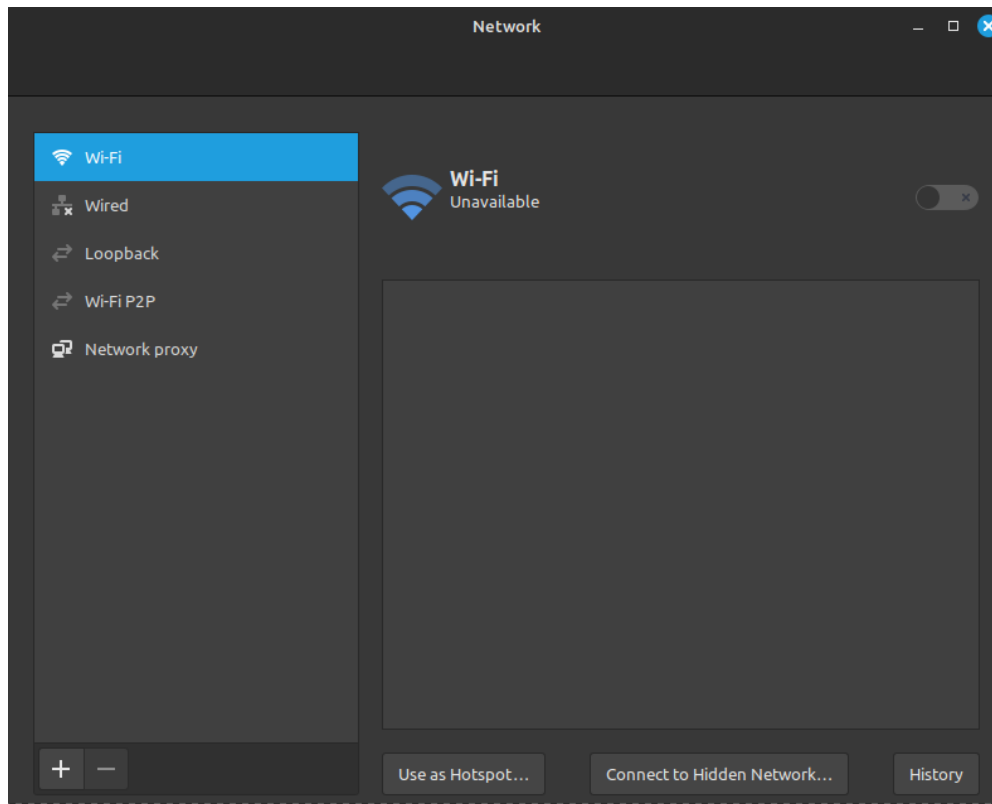
# Set Wi-Fi credentials
```

```
wifi_ssid="YourWiFiSSID"
wifi_password="YourWiFiPassword"

# Check if the Wi-Fi is already connected
if nmcli -t -f NAME,STATE dev wifi | grep -q "^$wifi_ssid:connected$"; then
    echo "Already connected to $wifi_ssid"
else
    # Check if the desired network is available
    if nmcli device wifi list | grep -q "$wifi_ssid"; then
        # Connect to the Wi-Fi network
        nmcli device wifi connect "$wifi_ssid" password "$wifi_password"
        if [ $? -eq 0 ]; then
            echo "Connected to $wifi_ssid"
        else
            echo "Failed to connect to $wifi_ssid"
        fi
    else
        echo "$wifi_ssid not found among available networks"
    fi
fi
```

Output :

Before program execution :



On execution :

```
shathish@acer: ~/Desktop
File Edit View Search Terminal Help
shathish@acer:~/Desktop$ nano wifi_connect.sh
shathish@acer:~/Desktop$ ls
test.sh wifi_connect.sh
shathish@acer:~/Desktop$ chmod +x wifi_connect.sh
shathish@acer:~/Desktop$ ./wifi_connect.sh
Wi-Fi turned on
Available Wi-Fi networks:
IN-USE  BSSID          SSID              MODE  CHAN  RATE        SIGNAL  BARS  SECURITY
D6:E5:F8:3B:E4:E5  Nokia C01 Plus   Infra  5     117 Mbit/s  69      ████  WPA2
C6:7B:D4:BD:41:A0  Shathish          Infra  6     117 Mbit/s  67      ████  WPA2
60:BD:2C:60:2A:99  DINESH Home Wi-Fi Infra  10    130 Mbit/s  52      ████  WPA1 WPA2
B4:A7:C6:5A:0B:C1  Ajith.2           Infra  11    130 Mbit/s  49      ████  WPA2
C4:E9:84:C2:B6:88  Suresh            Infra  6     135 Mbit/s  34      ████  WPA2
28:C8:7C:E8:28:C8  Jika              Infra  1     130 Mbit/s  30      ████  WPA1 WPA2
B4:A7:C6:5A:0B:C2  Ajith.5           Infra  44    270 Mbit/s  30      ████  WPA2
60:BD:2C:60:2A:9D  DINESH Home Wi-Fi 5G Infra  52    270 Mbit/s  30      ████  WPA2
FC:22:F4:37:75:D2  Sakthivel/Raja    Infra  1     270 Mbit/s  29      ████  WPA1 WPA2
90:67:17:93:BB:E4  Airtel_9840825052 Infra  3     270 Mbit/s  19      ████  WPA1 WPA2
78:90:A2:E7:85:9E  Airtel_NARESH     Infra  6     130 Mbit/s  19      ████  WPA1 WPA2
F4:8C:EB:CA:01:93  ACTFIBERNET       Infra  6     270 Mbit/s  12      ████  WPA1 WPA2
E8:65:D4:8A:F4:31  actfibernet_2.4G  Infra  3     270 Mbit/s  9       ████  WPA1 WPA2
5E:8C:30:C9:12:19  --                Infra  11    130 Mbit/s  7       ████  WPA2
5C:8C:30:A9:12:19  Airtel_9677163899 Infra  11    130 Mbit/s  7       ████  WPA1 WPA2
Error: 'device wifi': invalid field 'STATE'; allowed fields: NAME,SSID,SSID-HEX,BSSID,MODE,CHAN,FREQ,RATE,SIGNAL
,BARS,SECURITY,WPA-FLAGS,RSN-FLAGS,DEVICE,ACTIVE,IN-USE,DBUS-PATH
Device 'wlp2s0' successfully activated with '6de82fae-e6b4-4573-8c17-3ae50451ced7'.
Connected to Shathish
shathish@acer:~/Desktop$
```

After execution :

