QUT-DV25 : Environment Setup with eBPF Program and Linux Kernel Installation Guidelines

Router Configuration:

Address	Password
192.168.0.1	

Item	Value
SSID (5G)	
SSID (2.4G)	
Password	

RPIs Node: Operating system- Ubuntu 24.04 LTS OS (64-bit)

Cluster 1				
DNS	**IP**	**Username**	**Password**	**Memory**
TruNETS-QUT-1.local	192.168.0.50			4/32
TruNETS-QUT-2.local	192.168.0.51			4/32
TruNETS-QUT-3.local	192.168.0.52			4/32
TruNETS-QUT-4.local	192.168.0.53			4/32
TruNETS-QUT-5.local	192.168.0.54			4/32
TruNETS-QUT-6.local	192.168.0.55			4/32
TruNETS-QUT-7.local	192.168.0.56			4/32
TruNETS-QUT-8.local	192.168.0.57			4/32
Cluster 2				
DNS	**IP**	**Username**	**Password**	**Memory**
TruNETS-QUT-9.local	192.168.0.58			4/32
TruNETS-QUT-10.local	192.168.0.59			4/32
TruNETS-QUT-11.local	192.168.0.60			4/32
TruNETS-QUT-12.local	192.168.0.61			4/32
TruNETS-QUT-13.local	192.168.0.62			4/16
TruNETS-QUT-14.local	192.168.0.63			4/32
TruNETS-QUT-15.local	192.168.0.64			4/32
TruNETS-QUT-16.local	192.168.0.65			4/32

To connect: `TruNETS-QUT-14.local`

- Connect to the Router first
- `ssh username@TruNETS-QUT-14.local`
- Enter “password”

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Digitally signed by Sk Tanzir Mehedi
Date: 2025.07.27 00:04:39 +10'00'

Secure Socket Shell (SSH) Connection Setup:

- Check SSH is active or not:

  ```
  sudo systemctl status ssh
  ```

- If it's not active or not found, try installing with the help of these commands:

  ```
  sudo apt update
  sudo apt install openssh-server
  ```

- Start the SSH service:

  ```
  sudo systemctl start ssh
  ```

- Enable the SSH service to start on boot:

  ```
  sudo systemctl enable ssh
  ```

- Verify that the SSH service is running:

  ```
  sudo systemctl status ssh
  ```

Now try to access the server/system with the following command:

```
ssh username_of_your_desktop@ip_address

(e.g., ssh username@192.168.0.63)
```

Uncomplicated Firewall (UFW) Setup:

- Verify that the UFW service is running:

  ```
  sudo ufw status
  ```

- If you are using UFW, allow SSH connections:

  ```
  sudo ufw allow ssh
  ```

- Enable the firewall if it's not already enabled:

  ```
  sudo ufw enable
  ```

Hostname and Host Setup:

- Assign a desired hostname to your Raspberry Pi:

  ```
  sudo nano /etc/hostname
  ```

- Edit (only root access) hosts to the loopback address:

```
sudo nano /etc/hosts
```

- Restart the hostname service:

```
sudo systemctl restart systemd-logind.service
```

Domain Setup (If not available):

- Install avahi-daemon on your Raspberry Pi:

```
sudo apt update
sudo apt install avahi-daemon
```

- Start and enable avahi-daemon:

```
sudo systemctl status avahi-daemon
sudo systemctl start avahi-daemon
sudo systemctl enable avahi-daemon
```

Access your Raspberry Pi from another computer: `ssh username@TruNETS-QUT-14.local`

Remote Desktop (Not Necessary):

- Install ubuntu-desktop Environment:

```
sudo apt update

sudo apt install ubuntu-desktop
```

- Install XRDP:

```
sudo apt install xrdp xorg
```

- Version Check:

```
xrdp --version
```

- Check Status:

```
sudo systemctl status xrdp
```

- Add xrdp user to ssl-cert group and reboot:

```
sudo adduser xrdp ssl-cert
```

- Open port 3389 on the firewall:

```
sudo ufw allow 3389/tcp
```

eBPF Setup:

- Install BCC and header files for Linux kernel:

```
sudo apt-get install bpfcc-tools linux-headers-$(uname -r)
```

- Installs tools for kernel:

```
sudo apt install linux-tools-$(uname -r)
```

- Version Check:

```
bpftool –version uname -r
sudo bpftool feature
```

- Install bpftrace

```
sudo apt install bpftrace
```

- Version Check:

```
bpftrace –version
```

Set up the virtual environment and run the eBPF program in Ubuntu:

```
pip install virtualenv --break-system-packages
```

- Then create and activate a new virtual environment for every package:

```
virtualenv packageName_env_tr
```

- Activate the virtual environment:

```
source packageName_env_tr/bin/activate
```

- Install system dependencies (If applicable and note in Excel):

```
sudo apt-get install libx11-dev libxtst-dev
```

- Open a terminal and run the following file in main Ubuntu:

```
sudo ./monitor.sh
```

- Install packages in the virtual environment:

```
pip install packageName  or

pip3 install packageName  or
```

- After installing deactivate a virtual environment:

```
deactivate
```