Department of Electronic & Telecommunications Engineering

University of Moratuwa

EN3250 - Internet of Things Systems Engineering

Node-Red Lab - Preparation

2018 Batch **Semester 6**

Please be ready with the following before the lab session

Prerequisites

1. Raspberry Pi installed with Raspbian OS.

Setting-Up RPi in headless mode

Enabling SSH access

1. **Put the microSD card in the card reader** of your computer. Wait until the card mounts. You may need to use a microSD to SD card adapter. All recent Raspberry Pi versions use microSD instead of standard-size SD cards.
2. Navigate to the **boot** folder. This is the root folder of your SD card. ***Boot*** is the default volume name when you install a Raspbian system on an SD card.
3. On Windows, right-click anywhere in the boot volume's white space and select New > Text Document. Delete the .txt extension before you hit Enter. If Windows Explorer on your computer does not show file extensions, click View and enable File name extensions in the menu bar.

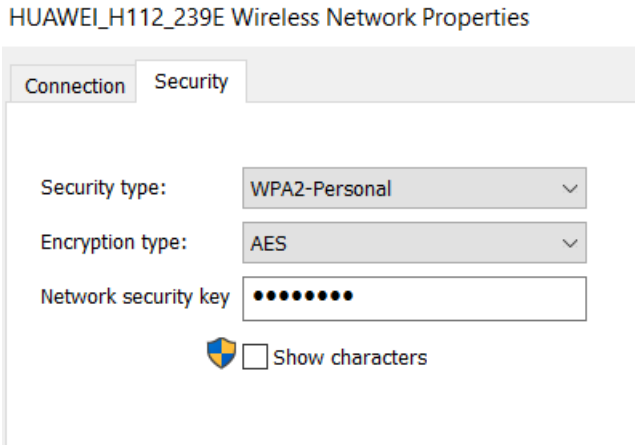
Configuring WiFi AP

1. Connect the SD card into laptop. Open the **boot** partition.
2. Create **wpa_supplicant.conf** file and add following content to the file

```
country=LK # Your 2-digit country code
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
network={
ssid="YOUR_NETWORK_NAME"
psk="YOUR_PASSWORD"
key_mgmt=WPA-PSK
} #copy upto here
```

- SSID should be your WiFi network / hotspot name
- Password can be retrieved by

Open Network and Sharing Settings → Change Adapter Options → Right Click on WiFi Adapter→Status→ Wireless Properties → Security Tab → Show Characters



- Above Window can be used to find **security type** which is the **key_mgmt** property in the config file.
    - For WPA/WPA2 with PSK authentication → key_mgmt = WPA-PSK
    - For WPA with EAP authentication → WPA-EAP
- After booting the RPi with SD card above file will be moved to **/etc/wpa_supplicant/** folder

Connecting using SSH into the RPi

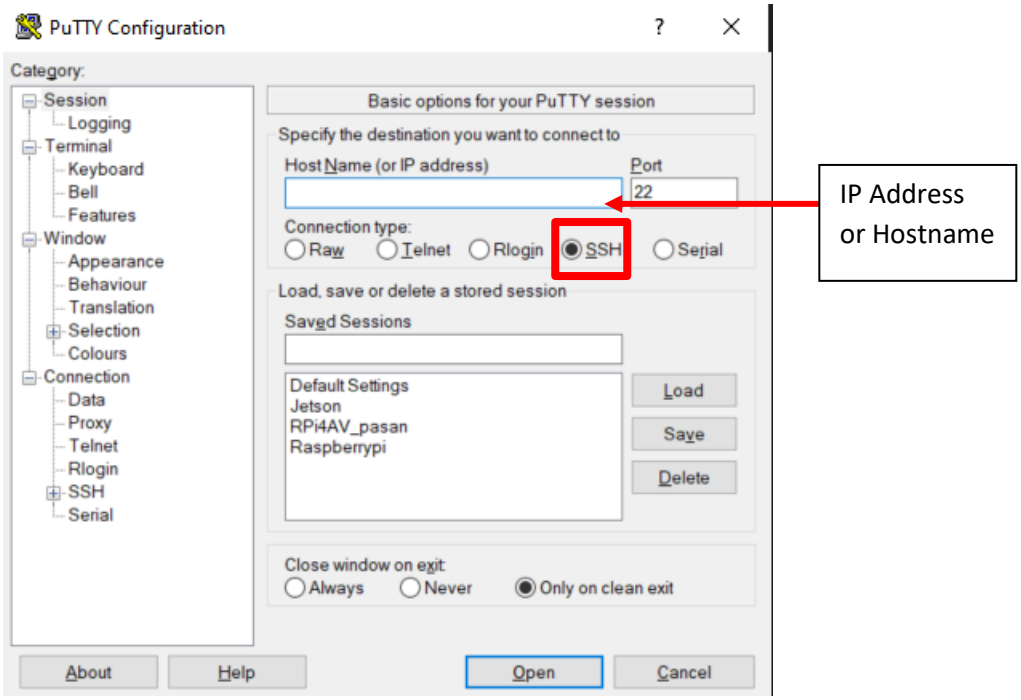
1. Open CMD on the windows computer and type **ping raspberrypi -4**
2. Use the reply from the cmd and note the IP address for further use.
    - In case above ping returns with no hostname found under raspberrypi, reconnect to the WiFi network on your windows computer allowing wlan network services to restart and set the WiFi SSID as a private network in your computer.

OR

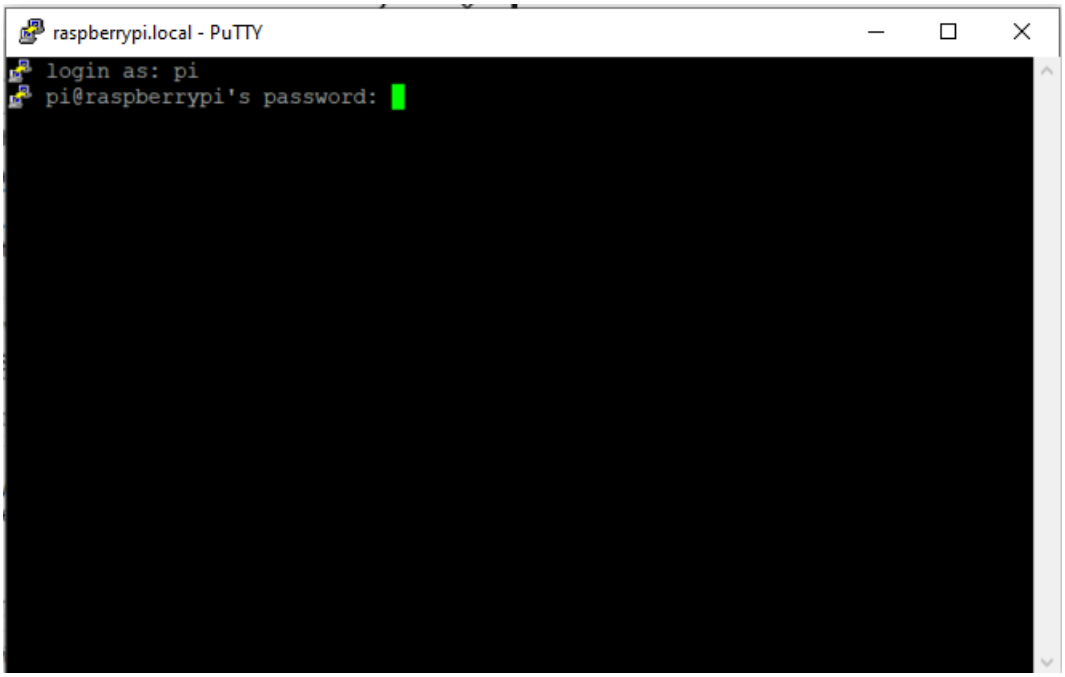
1. Login to the WiFi router which distributes the above SSID.
2. Look for Client table who are currently connected into the router via the SSID. Mark down the IP address of the RPi.

THEN

1. Download Putty (Follow this Link) or any other SSH client software. https://www.putty.org/
2. Steps for connecting via Putty.



3. Click Open connection to proceed.
4. On the prompt insert username as ***pi*** and default password for the **pi user** is ***raspberry***



Installing Node-Red on Raspberry Pi

1. Running following script is used to install Node.js, npm and Node-RED onto a Raspberry Pi.

   The script can also be used to upgrade an existing install when a new release is available.

   bash <(curl -sL https://raw.githubusercontent.com/node-red/linux-installers/master/deb/update-nodejs-and-nodered)

2. If you want Node-RED to run when the Pi is turned on, or re-booted, you can enable the service to autostart by running the command:

   sudo systemctl enable nodered.service

   Disabling service

   sudo systemctl disable nodered.service

3. Official node-red website tutorial guides for further installation and setup.
   https://nodered.org/docs/getting-started/raspberrypi