**Raspberry Pi 3 Documentation**

**Installation**

1. Download NOOB’s Raspberry Pi OS from

https://www.raspberrypi.org/downloads/noobs/

1. Extract files into your SD card
2. Put the SD card back to Raspberry Pi
3. Boot and install (first item). It takes around 30 minutes to complete.

**Connect Raspberry Pi Through SSH**

*Raspberry Pi Configuration*

1. Start > Preferences > Raspberry Pi Configuration
2. Set Hostname e.g. node3
3. Interface tab > Enable SSH
4. You can enable VNC for remote desktop capability though VNC Viewer
5. Use this for login as

User: pi

Password: raspberry

*Windows*

1. Download PuTTY and install from <https://putty.org>
2. Enter Hostname.local or IP address

node5.local

10**.**10**.**0**.**5

*Mac and Linux*

1. Open terminal
2. Type

ssh pi**@<**IP address**>**

ssh pi**@<**Hostname**>**

ssh pi**@**10**.**10**.**0**.**4

ssh pi**@**node4.local

**Update and Install Essential Software**

sudo apt-get update **-**y

sudo apt-get upgrade **-**y

sudo apt-get dist-upgrade **-**y

sudo pip install **--**upgrade pip

sudo apt-get install olsrd iperf wavemon python-numpy python-scipy python-matplotlib **-**y

sudo pip install filterpy

**Raspberry Pi wlan0 Ad-Hoc Setup**

1. Edit the interfaces file in /etc/network/

sudo nano **/**etc**/**network**/**interfaces

1. Add the following

auto wlan0

iface wlan0 inet static

address <IP address>

netmask 255.255.255.0

mtu 1500

wireless-channel <channel>

wireless-essid <network name>

wireless-mode ad-hoc

wireless-ap any

1. Reboot Raspberry Pi to take effect.

**Optimized Link State Routing Protocol Daemon (OLSRD)**

1. Start OLSRD using wlan0 interface on Raspberry Pi with debug level 1

sudo olsrd **-**i wlan0 -d 1

1. Check the communication by using ping command

ping **<**IP address**>**

ping 10**.**10**.**0**.**5

1. For multi-hop capability. You need to force two nodes to use a gateway by using firewall to block each other. There is no direct implementation on OLSRD.

sudo iptables -A INPUT **-**m mac **--**mac-source XX**:**XX**:**XX**:**XX**:**XX**:**XX **-**j DROP

1. Use the command route or traceroute to see if they use a gateway

route

traceroute <IP address>

**Throughput Measurement**

The command is iperf. iperf is a tool for active measurements of the maximum achievable bandwidth on IP networks.

* Server side

sudo iperf -s

* Client side

sudo iperf -c **<**IP address**>** -t **<**time in second**>**