

Home Network Setup & Troubleshooting Project

This document provides a detailed overview of the Home Network Setup & Troubleshooting Project. The purpose of this project is to gain hands-on experience with basic networking, device connectivity, Wi-Fi configuration, and troubleshooting all essential skills for ICT Support Officer roles.

Network Overview

The home network consists of the following components:

- Wi-Fi Router (2.4GHz & 5GHz bands)
- Second Wi-Fi Network
- Laptop (Windows 10/11)
- Smartphone (Android/iOS)
- Smart TV / Additional device

the project includes configuring SSIDs, setting up device connectivity, and verifying network stability.

Wi-Fi Configuration Steps

The screenshot shows the administrative interface of an OPTUS FTTH router. The top navigation bar includes links for Home, My Wi-Fi (selected), Connected Devices, Settings, Restart, and Help. A status message 'FTTH SIM Card not inserted' is displayed. The main content area is titled 'My Wi-Fi' and contains tabs for Basic (selected), Expert, MESH, WPS, Stats, Guest Wi-Fi, Nayan2, and Wi-Fi 3. Under the Basic tab, there are several configuration options: 'Enable Wi-Fi' (ON), 'Enable Band Steering' (ON), 'Wi-Fi Name (SSID)' set to 'Nayan' (with a note '3-32 characters'), 'Hide Wi-Fi Name (SSID)' (ON), '2.4GHz Channel Selection' set to 'Auto' (Current channel: 11), and '5GHz Channel Selection' set to 'Auto' (Current channel: 161).

Fig: Logged into router admin panel via 192.168.0

FTTH SIM Card not inserted

OPTUS

Logged in as: optus [Log out](#)

Home **My Wi-Fi** **Connected Devices** **Settings** **Restart** **Help**

Basic Expert MESH WPS Stats Guest Wi-Fi **Nayan2** Wi-Fi 3

Wi-Fi settings

Nayan2 Settings

Internet Access Control	2.4GHz	5GHz
LAN/DNS settings	<input checked="" type="button"/> Enable Wi-Fi	<input checked="" type="button"/> ON
URL Filtering	Wi-Fi Name (SSID) 3-32 characters	Nayan2
		Nayan2
	Hide Wi-Fi Name (SSID)	<input checked="" type="button"/> ON
		<input checked="" type="button"/> ON
	Wi-Fi Security	WPA2/WPA3 Personal
		WPA2/WPA3 Personal

Fig: Configured WPA2 security for main and guest networks

Home **My Wi-Fi** **Connected Devices** **Settings** **Restart** **Help**

Basic Expert MESH WPS Stats **Guest Wi-Fi** Nayan2 Wi-Fi 3

Guest Wi-Fi

A feature that allows users to access the internet whilst allowing you to keep normal Wi-Fi network private, Guest Wi-Fi keeps guests from accessing your networked devices such as printers and prevents access to your music and video streams.

Guest Wi-Fi Settings

Internet Access Control	2.4GHz	5GHz
LAN/DNS settings	<input checked="" type="button"/> Enable Wi-Fi	<input checked="" type="button"/> ON
URL Filtering	Guest Wi-Fi Name (SSID) 3-32 characters	Guest_BFF7BDM
		Guest_BFF7BDM_5GHz
	Hide Wi-Fi Name (SSID)	<input type="button"/> OFF
		<input type="button"/> OFF
	Wi-Fi Security	WPA2/WPA3 Personal
		WPA2/WPA3 Personal

Fig: Configured WPA2 security for main and guest networks

The screenshot shows the Optus router's web interface. At the top, there are status indicators for 'FTTH' and 'SIM Card not inserted'. The title 'OPTUS' is centered above a navigation bar with icons for Home, My Wi-Fi, Connected Devices (which is selected), Settings, Restart, and Help. On the right, it says 'Logged in as: optus' and has a 'Log out' button. Below the navigation bar, the section title 'Wi-Fi connected devices' is displayed. A table lists three devices: DESKTOP-0EB361N, Nayans-iPad, and de:3f:bb:a2:7b:e8. The table columns are: Name, Internet Rule?, IPv4 address, Wi-Fi, Mac address, Frequency, Signal, and Allow access. Each row includes a question mark icon for help.

Name	Internet Rule?	IPv4 address	Wi-Fi	Mac address	Frequency	Signal	Allow access
DESKTOP-0EB361N	No	192.168.0.13	Main	[REDACTED]	5GHz	-76 dBm	<input type="checkbox"/>
Nayans-iPad	No	192.168.0.12	Main	[REDACTED]	5GHz	-68 dBm	<input type="checkbox"/>
de:3f:bb:a2:7b:e8	No	192.168.2.3	Wi-Fi 2	[REDACTED]	5GHz	-74 dBm	<input type="checkbox"/>

Fig: Connected multiple devices to ensure compatibility

Device Connectivity Testing

Connectivity tests were performed using:

- Ping test to verify latency and stability.
- Wi-Fi signal strength analysis
- Browser tests for loading pages

Troubleshooting Commands

Below are the primary troubleshooting commands used during testing:

```
C:\Users\nayan>ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

C:\Users\nayan>
```

Fig: Flush DNS: ipconfig/flushdns

```
C:\Users\nayan>ipconfig /renew

Windows IP Configuration

No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Local Area Connection* 3 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection while it has its media disconnected.

Ethernet adapter Ethernet:

  Connection-specific DNS Suffix . . .
  Link-local IPv6 Address . . . . . : fe80::2414:2071:790a:9245%5
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 1:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . .

Wireless LAN adapter Local Area Connection* 3:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . .

Wireless LAN adapter Wi-Fi:

  Connection-specific DNS Suffix . . : home
  Link-local IPv6 Address . . . . . : fe80::d707:5f3c:45fe:db63%11
    IPv4 Address. . . . . : 192.168.0.13
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.0.1

Ethernet adapter Bluetooth Network Connection:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . .
```

Fig: **Renew IP:** ipconfig /renew

```
C:\Users\nayan>ipconfig/all

Windows IP Configuration

Host Name . . . . . : DESKTOP-0EB361N
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : home

Ethernet adapter Ethernet:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : VirtualBox Host-Only Ethernet Adapter
Physical Address. . . . . :
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::2414:2071:790a:9245%5(Preferred)
IPv4 Address . . . . . : 192.168.56.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
DHCPv6 IAID . . . . . : 621412391
DHCPv6 Client DUID. . . . . : 00-01-00-01-2A-50-8E-45-9C-B6-D0-1B-16-38
DNS Servers . . . . . : fec0:0:0:ffff::1%1
                         fec0:0:0:ffff::2%1
                         fec0:0:0:ffff::3%1
NetBIOS over Tcpip. . . . . : Enabled

Wireless LAN adapter Local Area Connection* 1:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . :
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Local Area Connection* 3:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . :
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Wi-Fi:
```

Fig: Check IP configuration:ipconfig

```
C:\Users\nayan>ping google.com

Pinging google.com [142.250.195.142] with 32 bytes of data:
Reply from 142.250.195.142: bytes=32 time=108ms TTL=115
Reply from 142.250.195.142: bytes=32 time=105ms TTL=115
Reply from 142.250.195.142: bytes=32 time=107ms TTL=115
Reply from 142.250.195.142: bytes=32 time=105ms TTL=115

Ping statistics for 142.250.195.142:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 105ms, Maximum = 108ms, Average = 106ms
```

Fig: Ping Test: ping google.com

Shared Folder Configuration

A shared folder was created to practice basic network permissions:

Your folder is shared.

You can [e-mail](#) someone links to these shared items, or [copy](#) and paste the links into another app.

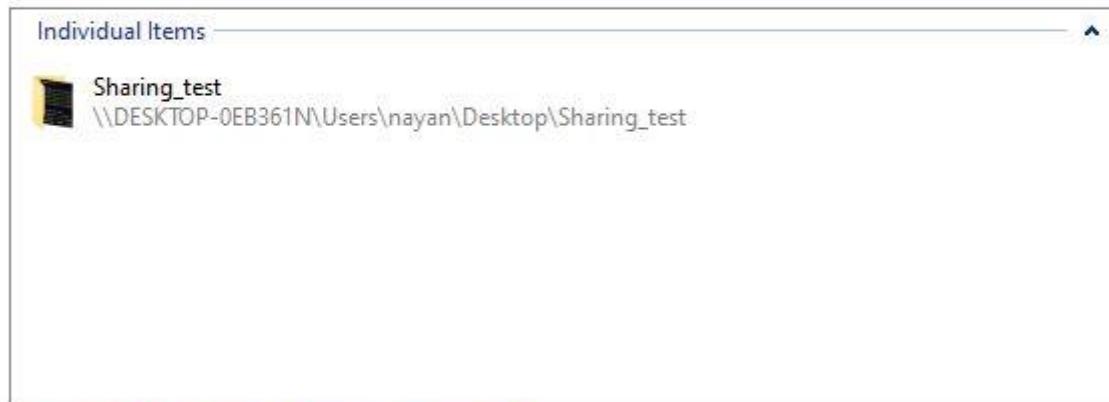


Fig: Enabled folder sharing via Windows File Explorer

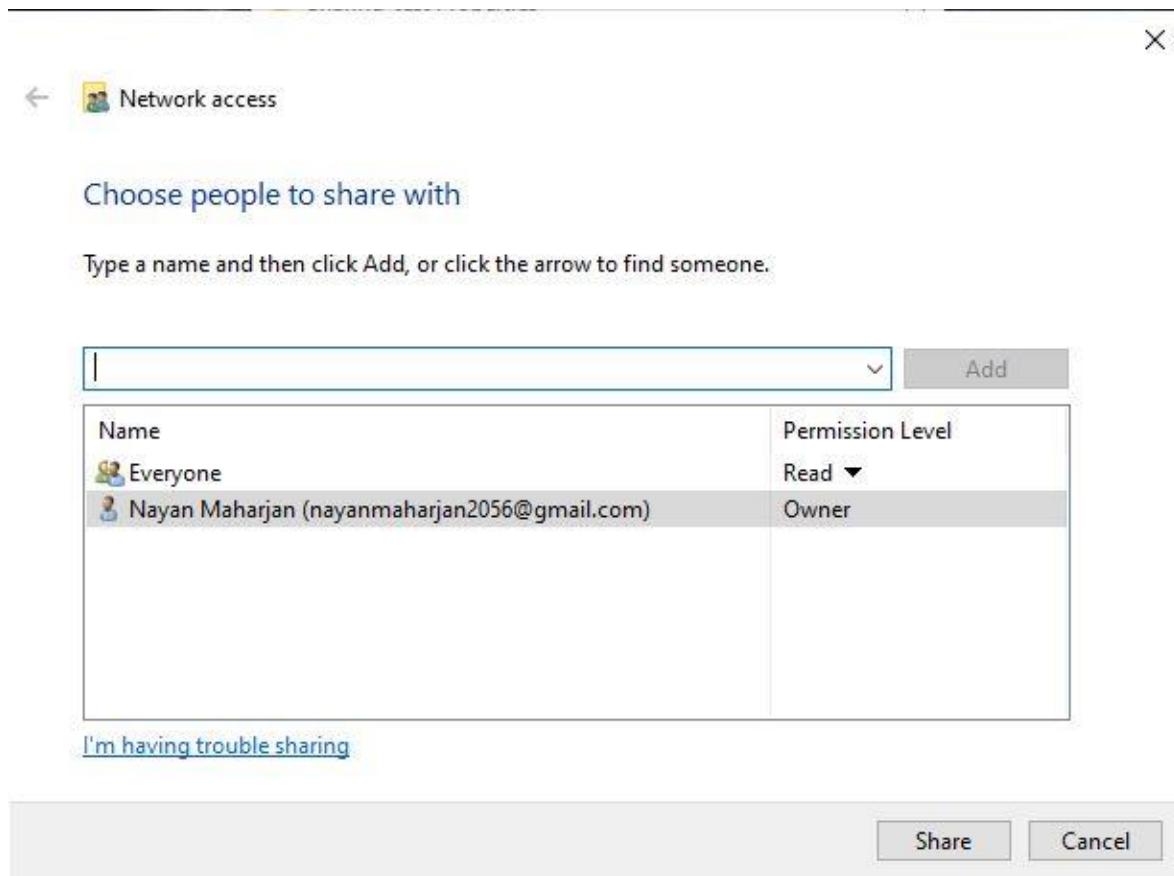


Fig: Set 'Read' access for testing device

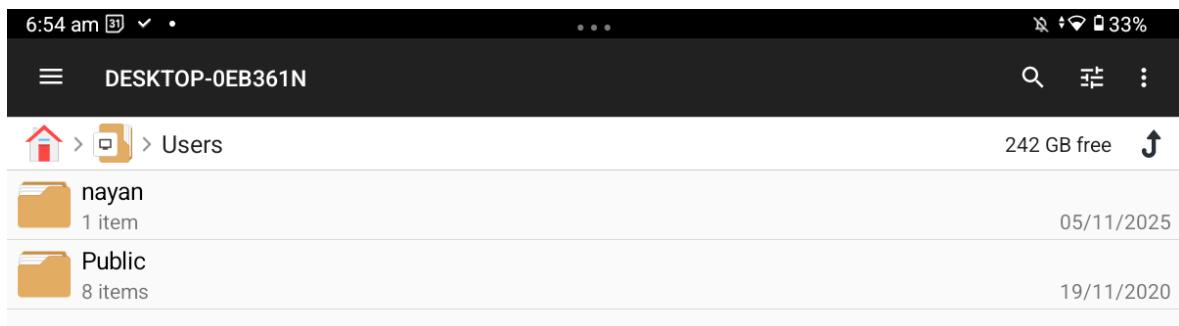


Fig: Accessing from a tablet.

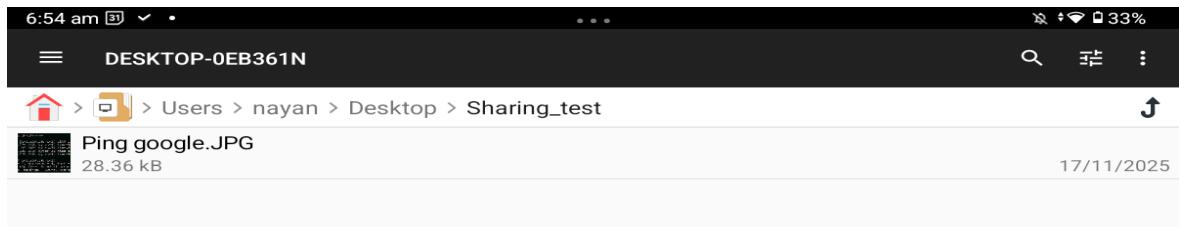


Fig: Accessing from a tablet.

Issues Encountered & Solutions

Issue 1: Device connected but no internet.

Solution: Reset the adapter, renew IP, restart router

Issue 2: Slow Wi-Fi speed

Solution: Switched to the 5GHz network and checked the signal strength

Issue 3: Shared folder not visible.

Solution: Adjusted sharing permissions and checked firewall settings

What I Learned

This project improved my understanding of:

- Wi-Fi configuration and network security
- Device management and connectivity
- Basic troubleshooting commands
- Explaining technical steps clearly
- Documentation skills.

Conclusion

This practical home network project helped build real foundational ICT support skills. It demonstrates the ability to troubleshoot, learn independently, and support users, key strengths for a school ICT environment.