

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 displays the Optus router's web-based administration interface. At the top, a teal header bar contains the text 'FTTH SIM Card not inserted' on the left, the 'OPTUS' logo in the center, and 'Logged in as: optus' with a 'Log out' button on the right. Below the header is a navigation menu with icons and labels: 'Home' (house icon), 'My Wi-Fi' (Wi-Fi signal icon), 'Connected Devices' (monitor icon), 'Settings' (gear icon), 'Restart' (circular arrow icon), and 'Help' (phone handset icon). A secondary menu below this includes tabs for 'Basic' (selected), 'Expert', 'MESH', 'WPS', 'Stats', 'Guest Wi-Fi', 'Nayan2', and 'Wi-Fi 3'. The main configuration area is divided into two columns. The left column contains 'Enable Wi-Fi' with an 'ON' toggle, 'Wi-Fi Name (SSID)' with a text box containing 'Nayan' (noted as 3-32 characters), and 'Channel Selection' for the 2.4GHz band with a dropdown set to 'Auto' (noted as 'Current channel: 11'). The right column contains 'Enable Band Steering' with an 'ON' toggle, 'Hide Wi-Fi Name (SSID)' with an 'ON' toggle, and the 5GHz band settings with a dropdown set to 'Auto' (noted as 'Current channel: 161').

Fig: Logged into router admin panel via 192.168.0

Wi-Fi settings

Internet Access Control

LAN/DNS settings

URL Filtering

Nayan2 Settings

2.4GHz

5GHz

Enable Wi-Fi

ON

ON

Wi-Fi Name (SSID)

Nayan2

Nayan2

3-32 characters

Hide Wi-Fi Name (SSID)

ON

ON

Wi-Fi Security

WPA2/WPA3 Personal

WPA2/WPA3 Personal

Fig: Configured WPA2 security for main and guest networks

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.

Wi-Fi settings

Internet Access Control

LAN/DNS settings

URL Filtering

Guest Wi-Fi Settings

2.4GHz

5GHz

Enable Wi-Fi

ON

ON

Guest Wi-Fi Name (SSID)

Guest_BFF7BDM

Guest_BFF7BDM_5GHz

3-32 characters

Hide Wi-Fi Name (SSID)

OFF

OFF

Wi-Fi Security

WPA2/WPA3 Personal

WPA2/WPA3 Personal

Fig: Configured WPA2 security for main and guest networks

FTTH

SIM Card not inserted

OPTUS

Logged in as: optus

Log out

Home

My Wi-Fi

Connected Devices

Settings

Restart

Help

Wi-Fi connected devices

Name	Internet Rule?	IPv4 address	Wi-Fi	Mac address	Frequency	Signal	Allow access
?							
DESKTOP-OEB361N	No	192.168.0.13	Main		5GHz	-76 dBm	<input type="checkbox"/>
Nayans-iPad	No	192.168.0.12	Main		5GHz	-68 dBm	<input type="checkbox"/>
de:3f:bb:a2:7b:e8	No	192.168.2.3	Wi-Fi 2		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-16-3B
    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.

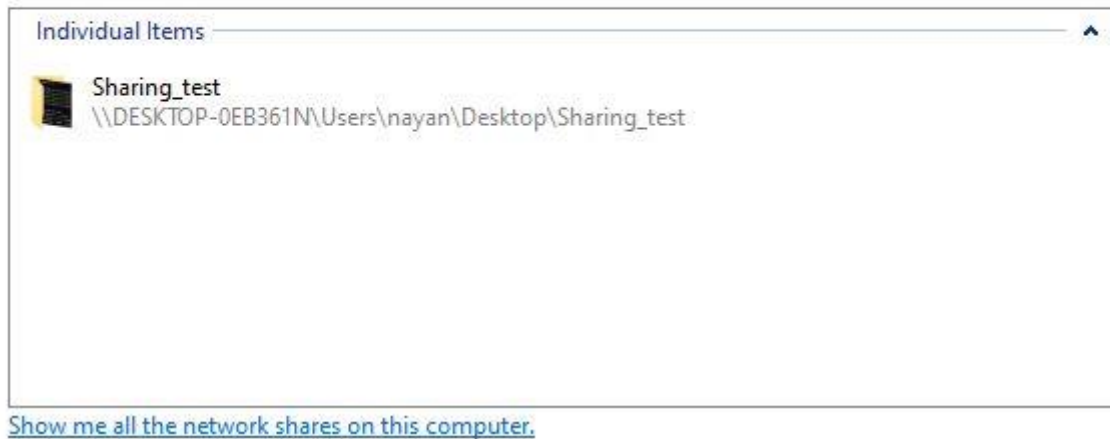


Fig: Enabled folder sharing via Windows File Explorer

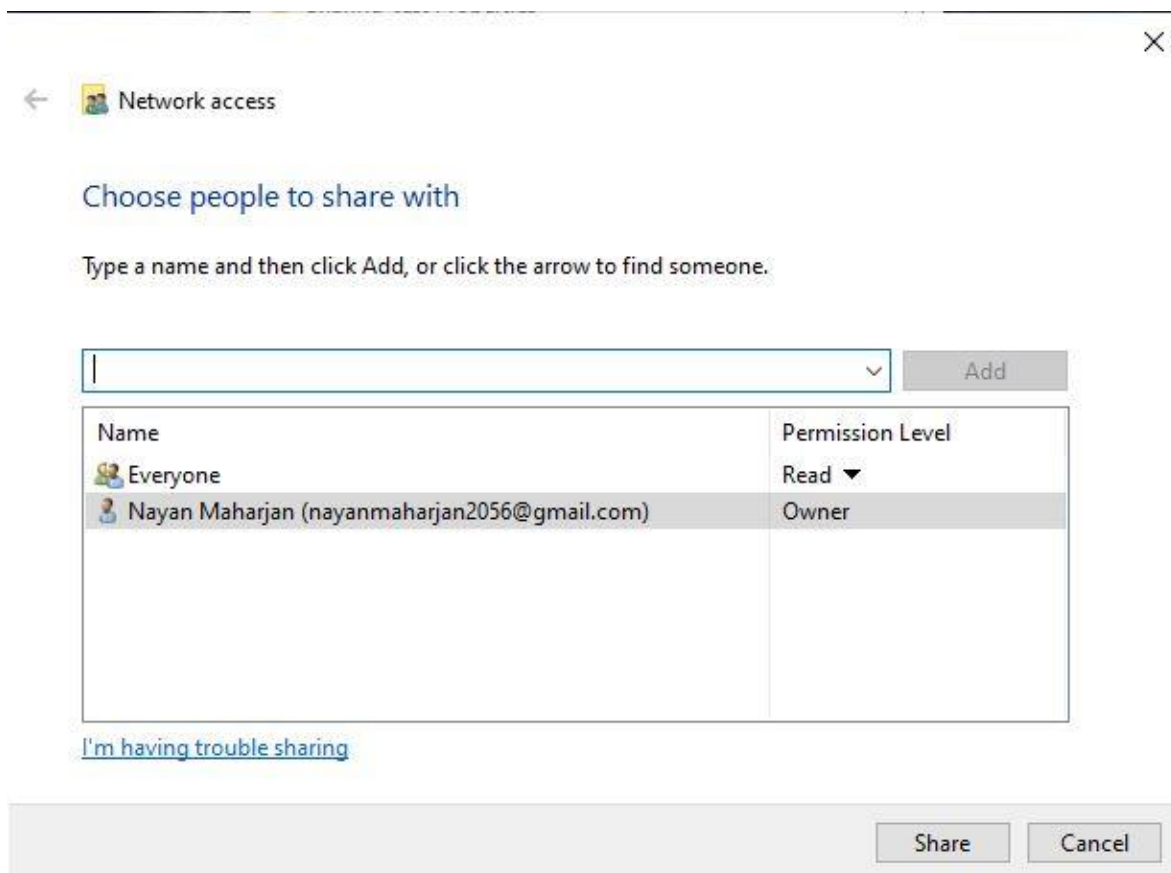


Fig: Set 'Read' access for testing device

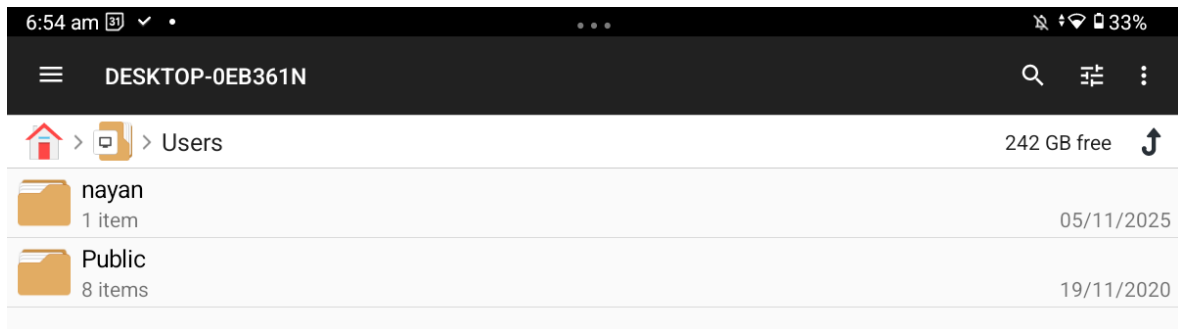


Fig: Accessing from a tablet.

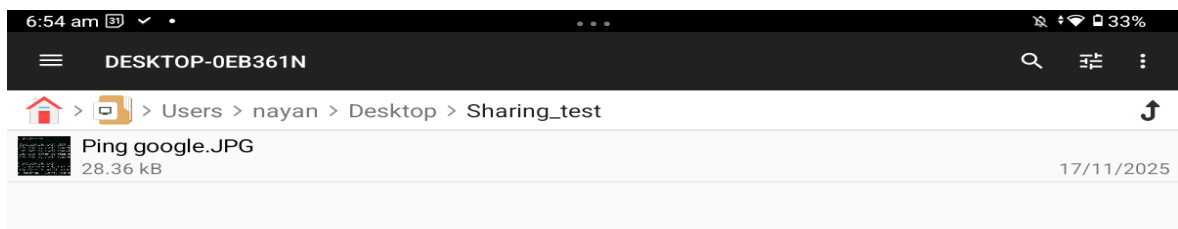


Fig: Accessing from a tablet.

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.