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

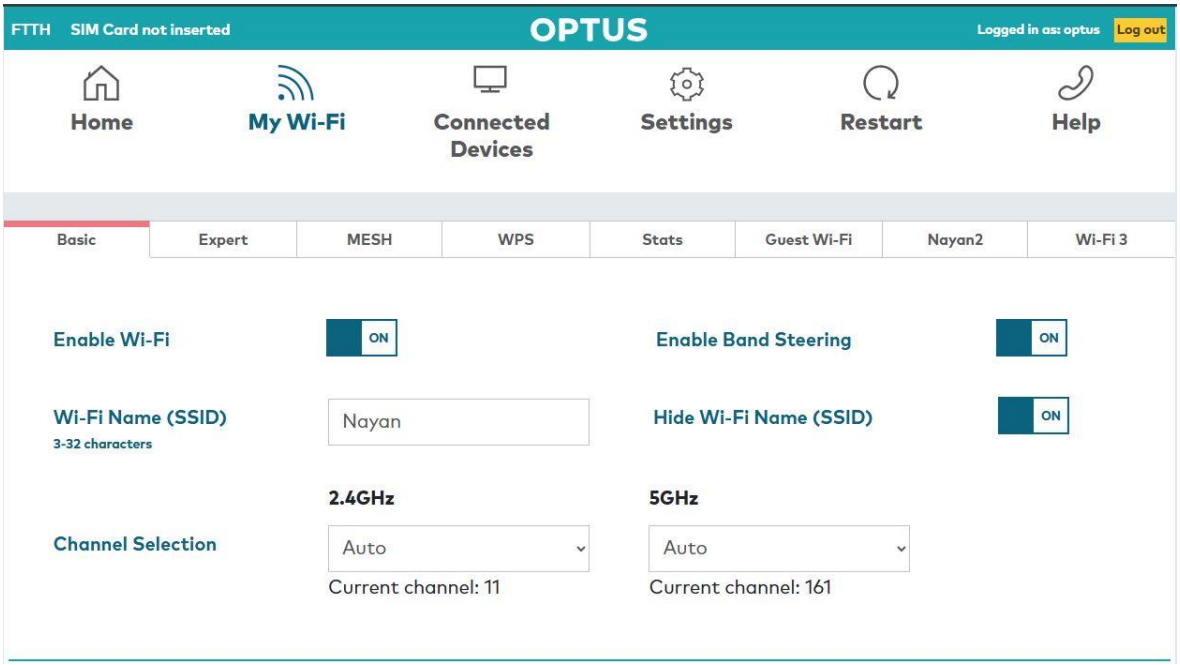


Fig: Logged into router admin panel via 192.168.0

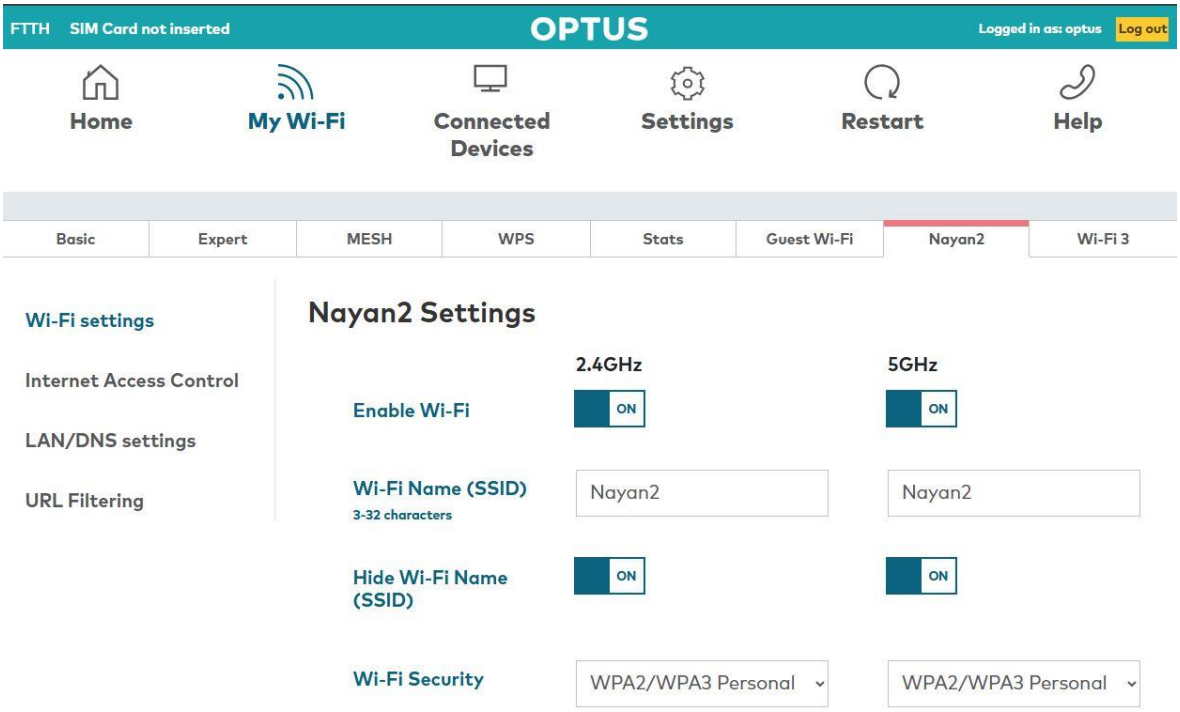
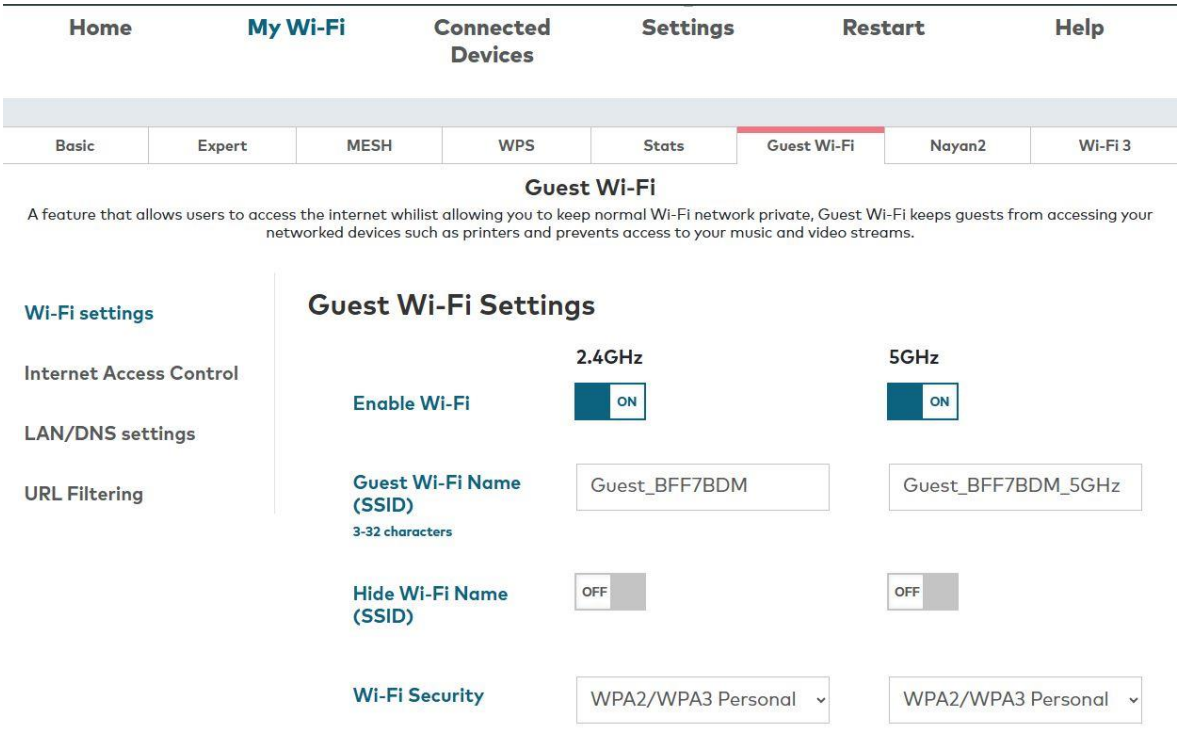


Fig: Configured WPA2 security for main and guest networks



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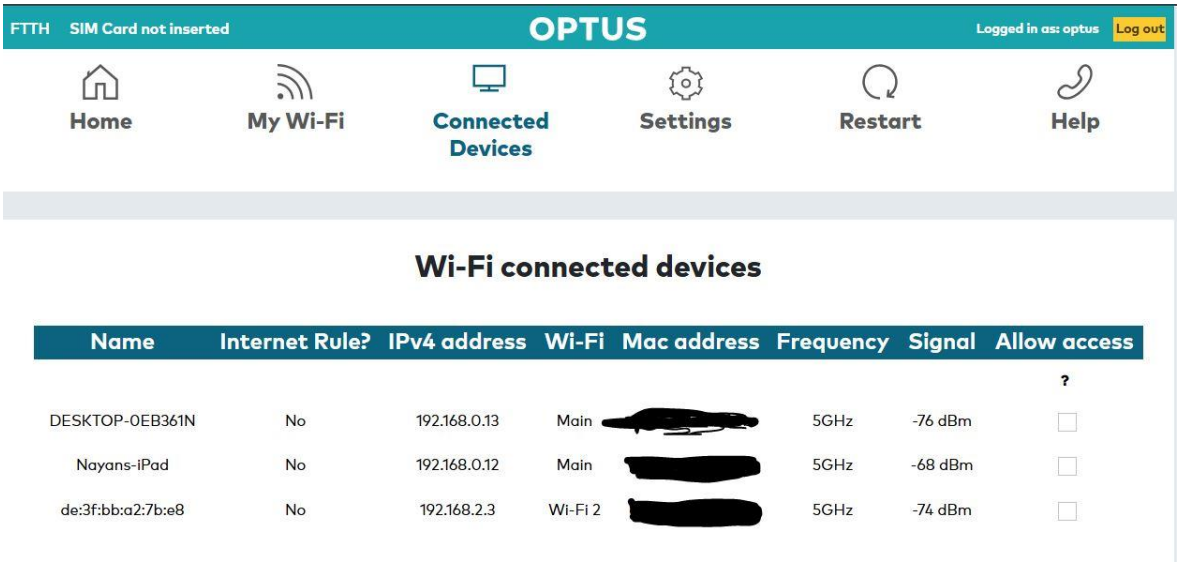

Fig: Connected multiple devices to ensure compatibility

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

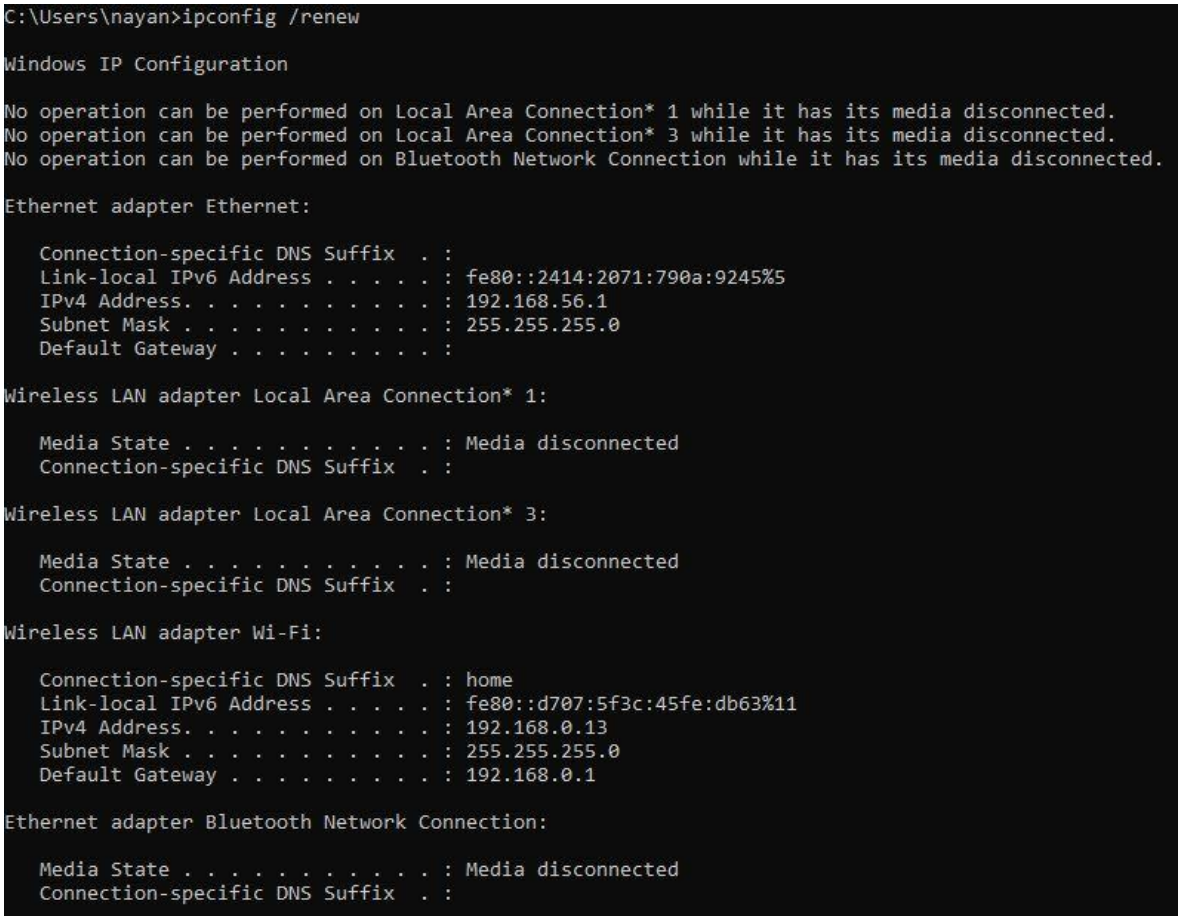

Fig: **Renew IP:** ipconfig /renew

```
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. . . . . . . . . : [redacted]
   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. . . . . . . . . : [redacted]
   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. . . . . . . . . : [redacted]
   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:

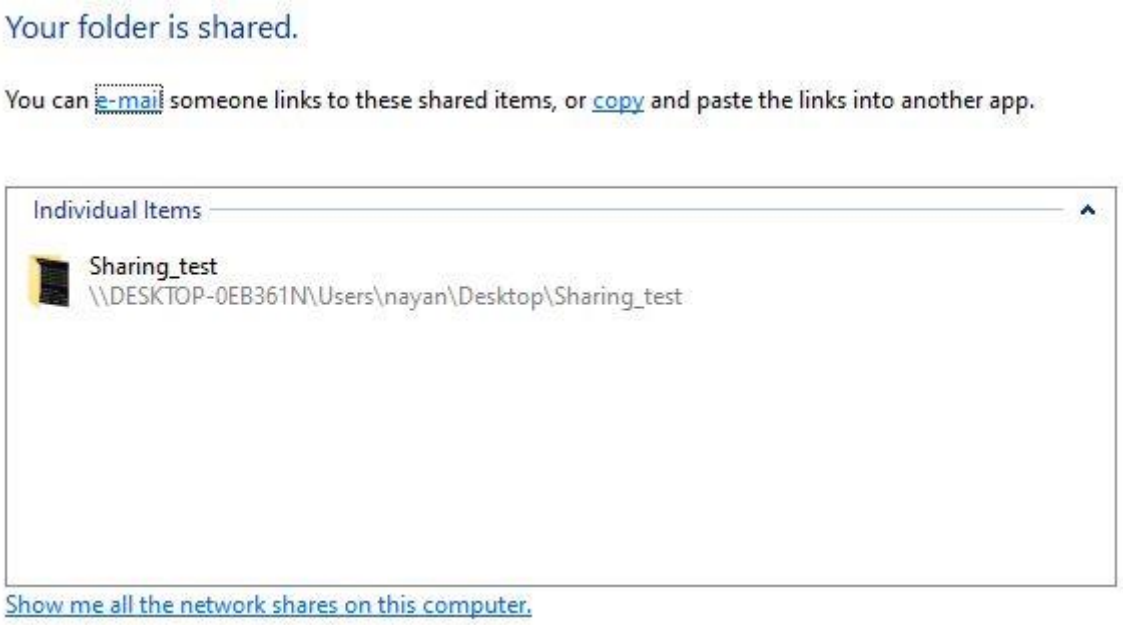

Fig: Enabled folder sharing via Windows File Explorer

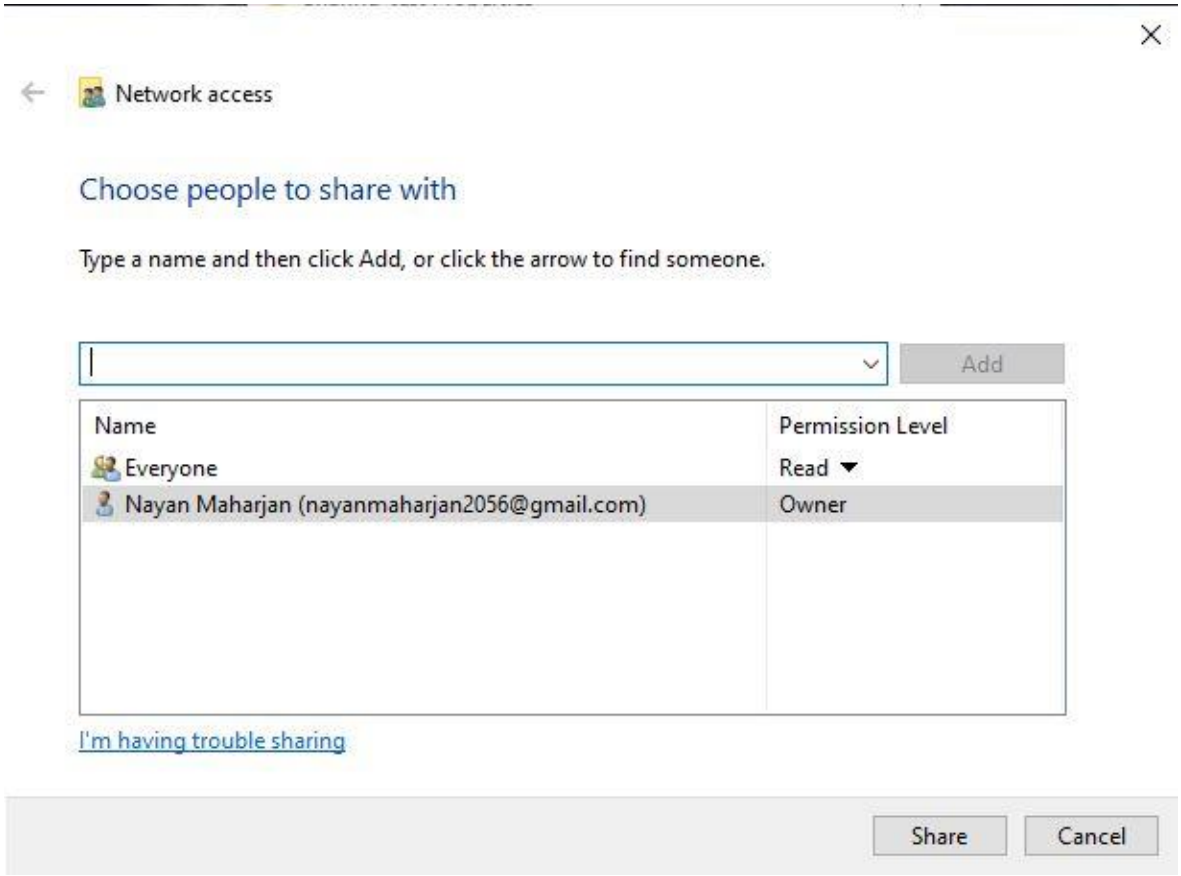

Fig: Set 'Read' access for testing device

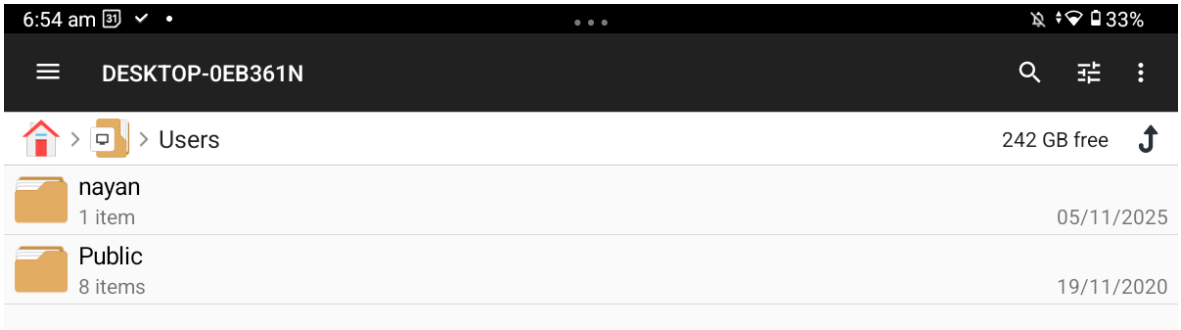

Fig: Accessing from a tablet.

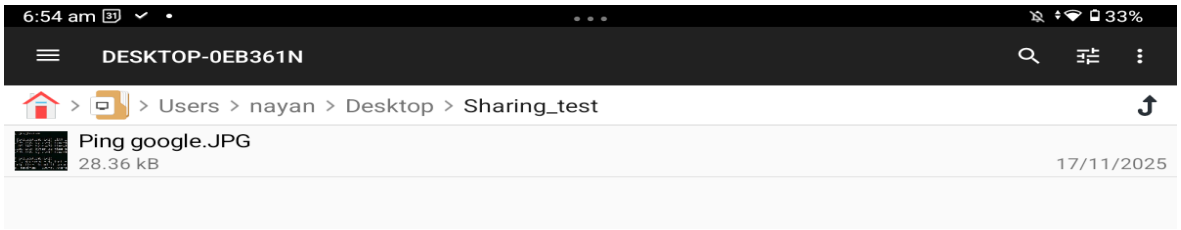

Fig: Accessing from a tablet.

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.