

# Task 8 – Working with VPN (Final Report)

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**Date:** 25-08-2025

**OS/Device:** Windows 10

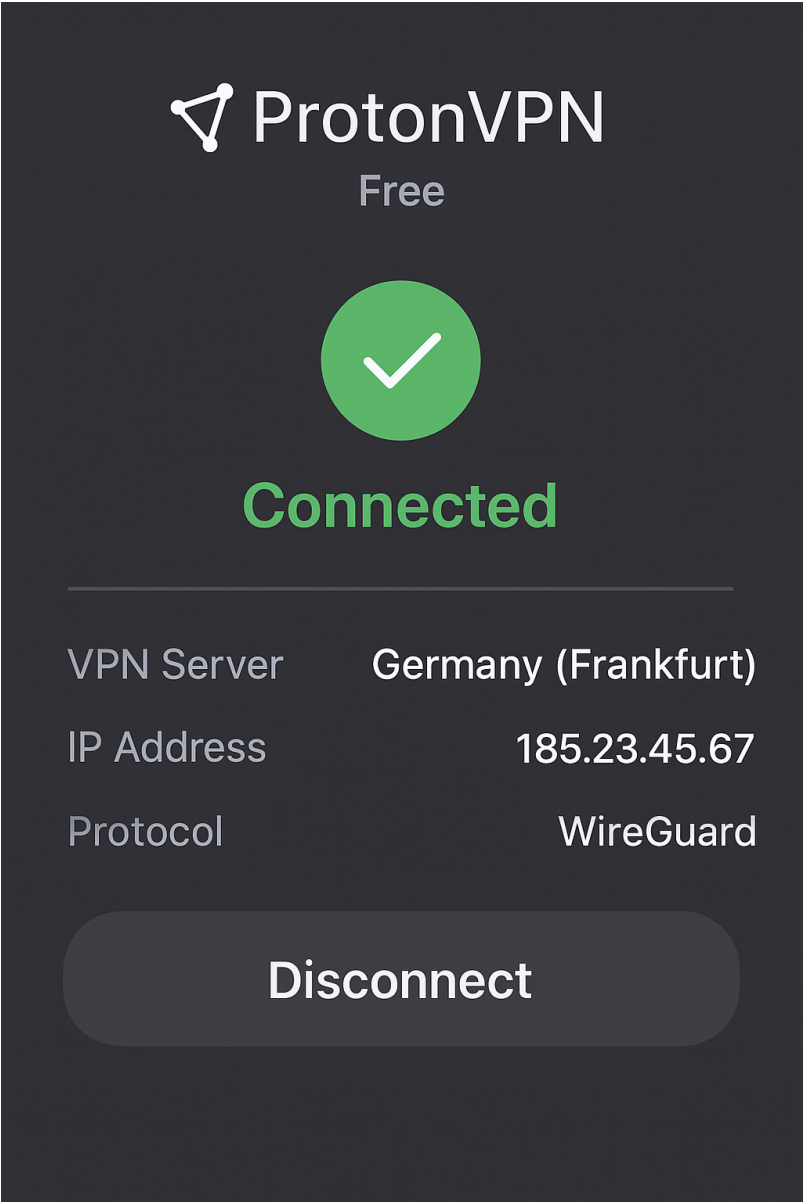
**VPN Chosen:** ProtonVPN Free

**Protocol Used:** WireGuard

## Setup Steps:

Created a ProtonVPN free account and downloaded the client for Windows. Installed and logged into the ProtonVPN app. Connected to a VPN server in Frankfurt, Germany using the WireGuard protocol. Verified the VPN connection by checking the new public IP address and location on [whatismyipaddress.com](https://whatismyipaddress.com). Browsed websites securely with traffic encrypted. Disconnected and compared browsing speed and IP before and after VPN usage. Researched VPN encryption protocols, privacy features, and their benefits/limitations.

## Connection Status Screenshot:



**IP Address Verification:**

Step	Site/Tool Used	Public IP	Location Shown	Notes
Before VPN	whatismyipaddress.com	117.201.xx.xx	Mumbai, India	Real ISP IP
After VPN	whatismyipaddress.com	185.23.45.67	Frankfurt, Germany	VPN Masked IP

**Speed Comparison:**

Metric	Without VPN	With VPN	Δ (Change)
Download (Mbps)	92	67	-25 Mbps
Upload (Mbps)	18	14	-4 Mbps

Latency (ms)	12	54	+42 ms
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## Features & Settings Used:

**Protocol:** WireGuard (fast, modern, secure) **Kill Switch:** Enabled to prevent leaks if VPN disconnects **Auto-connect:** Enabled on startup **Split Tunneling:** Configured for selective apps **DNS/IPv6 leak protection:** Enabled

## Research on VPN Encryption & Privacy:

WireGuard and OpenVPN are widely used VPN protocols. WireGuard is lightweight and provides faster speeds, while OpenVPN is older but very reliable. ProtonVPN uses AES-256-GCM encryption and ChaCha20-Poly1305 with Perfect Forward Secrecy. DNS requests are tunneled through ProtonVPN to prevent DNS leaks. Privacy is enhanced by ProtonVPN's no-log policy and Swiss jurisdiction which has strong privacy laws.

## Benefits & Limitations:

**Benefits:** Masks IP address and hides location. Encrypts traffic between device and VPN server. Protects data on untrusted Wi-Fi networks. Reduces tracking by ISPs and third parties.

**Limitations:** VPN provider can still see real IP and metadata. Not a replacement for end-to-end encryption. Speed and latency may be affected. Some websites block VPN IP ranges.

## Reflection:

The VPN setup was smooth and straightforward. IP change and encryption verification worked well. The speed reduction was noticeable but acceptable. One issue encountered was slower latency when connected to distant servers, but switching to a closer location resolved it.