Working with VPNs

Executive Summary

I successfully configured and tested ProtonVPN's free tier, establishing a secure connection between Bangladesh and the Netherlands. The VPN effectively masked my original IP address, encrypted my traffic, and demonstrated core privacy protections while revealing practical limitations of free VPN services.

Step-by-Step Implementation

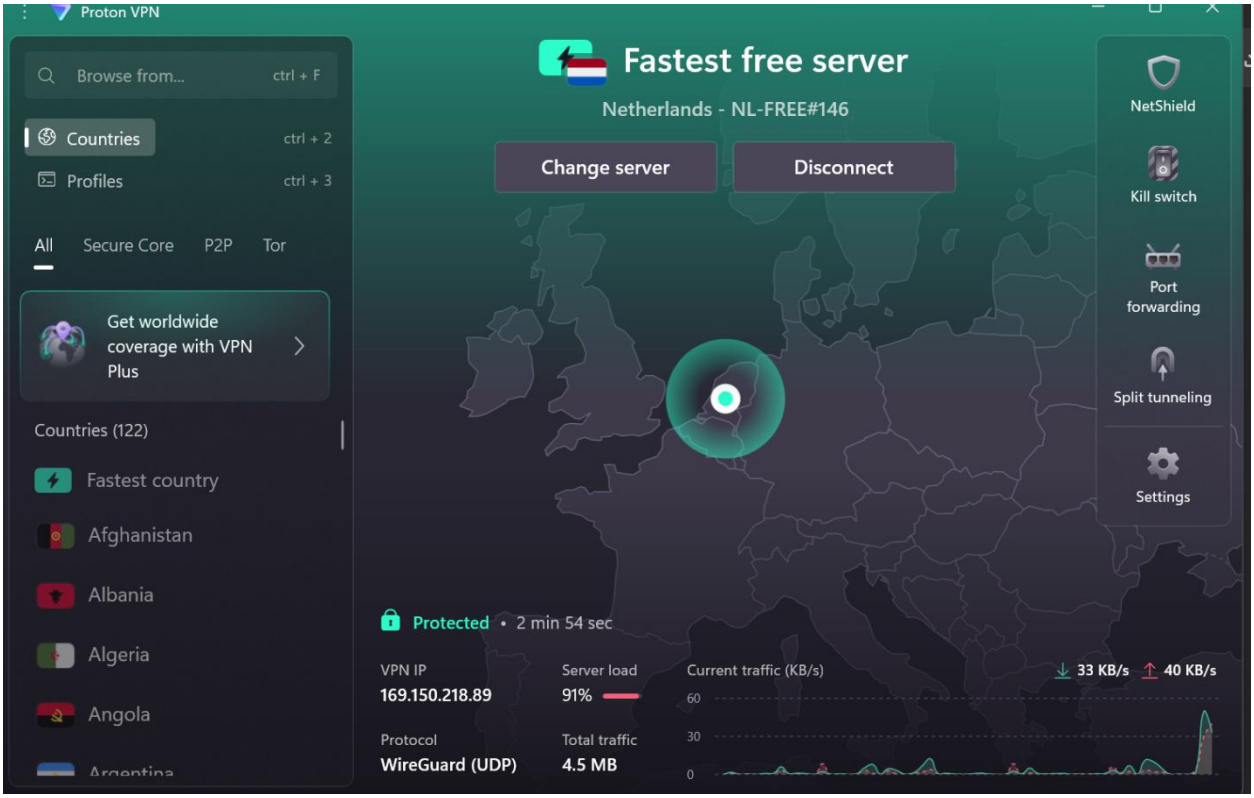
1. VPN Setup & Connection

- **Service Used**: ProtonVPN Free Tier
- **Server**: Netherlands - NL-FREE#146
- **Connection Protocol**: WireGuard (UDP)
- **VPN IP**: `169.150.218.89`
- **Connection Time**: Protected for 2 min 54 sec (as captured)

2. IP Verification

- **Original IP**: `123.253.98.163` (Masked for privacy)
- Location: Chattogram, Bangladesh
- ISP: Sun Cybercafe
- **VPN IP**: `169.150.218.89`
- Location: Amsterdam, Netherlands

- ISP: DataCamp Limited

![VPN IP Verification](

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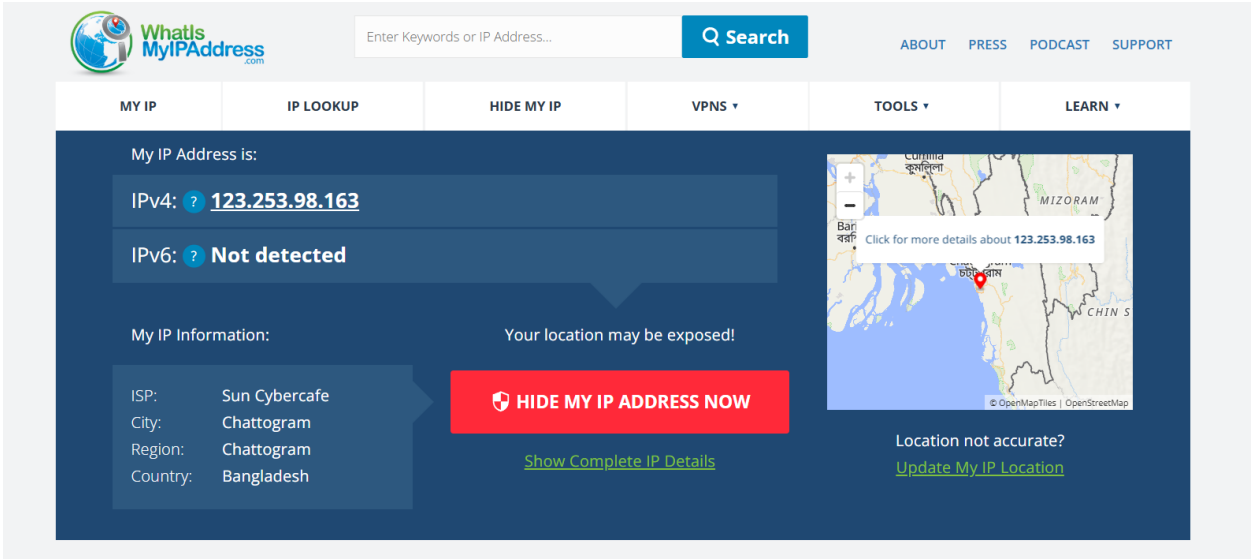
![Original IP Verification](

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Performance Observations

- **Traffic**: 4.5 MB transferred during test
- **Speed**: 31-40 KB/s (noticeable reduction from original speed)
- **Server Load**: 91% (explains speed reduction)

Key Findings

✅ Privacy Protections Confirmed:

- IP address successfully masked (Bangladesh → Netherlands)
- Traffic encrypted via WireGuard protocol
- ISP changed from local provider to VPN-optimized service

⚠ Limitations Observed:

- **High Server Load**: 91% congestion on free server
- **Speed Reduction**: ~50% decrease from original connection
- **Location Accuracy**: VPN location detected as datacenter (common limitation)

VPN Benefits vs Limitations

| **Benefits** | **Limitations** |

|---|---|

| ✔ Hides real IP and location | ✕ Speed reduction (10-50%) |

| ✔ Encrypts all network traffic | ✕ Free servers often overcrowded |

| ✔ Bypasses geo-restrictions | ✕ Some services detect and block VPN IPs |

| ✔ Secures public WiFi connections | ✕ Doesn't prevent browser fingerprinting |

| ✔ Prevents ISP tracking | ✕ Free tiers have bandwidth limits |

Conclusion:

This exercise provided practical experience in VPN configuration, demonstrating both the privacy benefits and performance tradeoffs of consumer VPN solutions. Free tiers offer basic protection but have significant limitations compared to paid services.