Elevate Labs Cyber Security Internship Report

Task08: Working with VPNs

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Contents

1. Introduction

This report presents the detailed process and understanding of working with Virtual Private Networks (VPNs). The objective of this task is to gain practical experience with VPN configuration, understand how VPNs secure data transmission, and analyze their impact on privacy, encryption, and network performance.

2. Objective

To understand the working principles of VPNs, their importance in maintaining user privacy and security, and to perform hands-on setup and verification using a free VPN service.

3. Tools Used

1. ProtonVPN (Free Tier)
2. whatismyipaddress.com (for IP verification)
3. Speedtest.net (for connection speed comparison)

4. Steps Performed

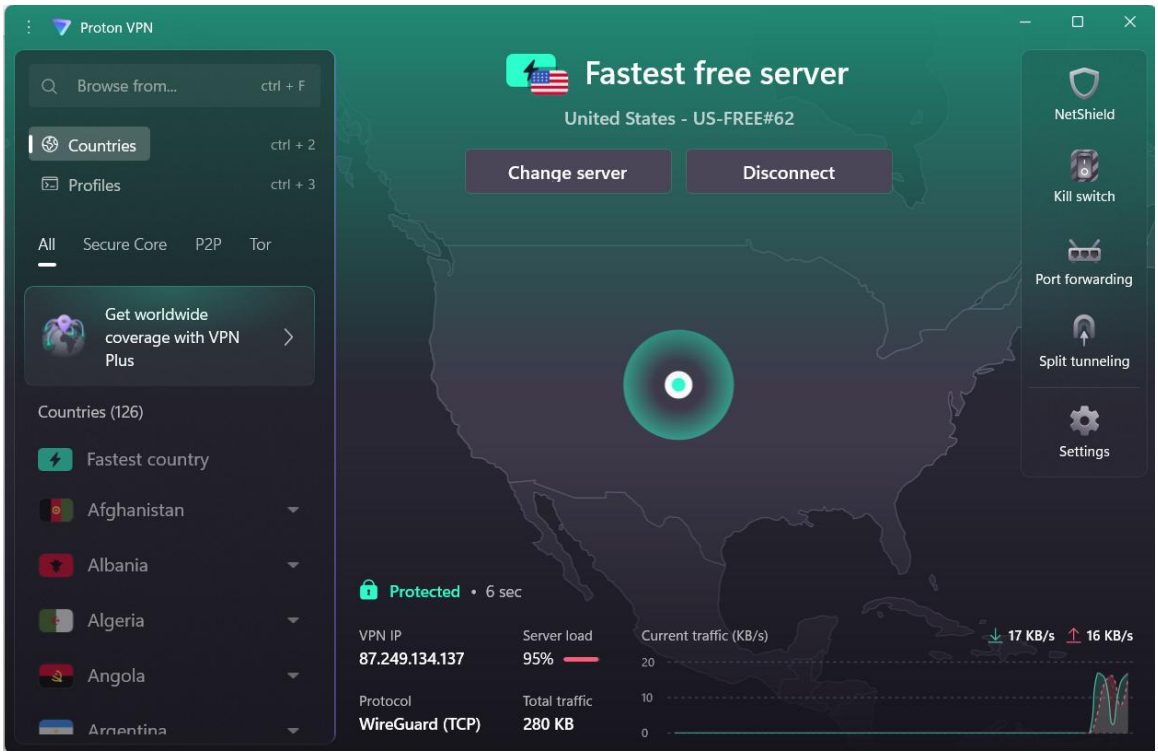
1. Registered for a free ProtonVPN account at https://protonvpn.com.
2. Downloaded and installed the ProtonVPN client on Windows.

3. Launched the client and logged in with the registered credentials.
4. Connected to a VPN server located in the United States to mask the original IP address.
5. Visited https://whatismyipaddress.com to verify that the IP and location had changed.
6. Browsed multiple websites to confirm encrypted (HTTPS) connections.
7. Disconnected the VPN and checked IP address and speed again to compare results.

5. Screenshots (Evidence)

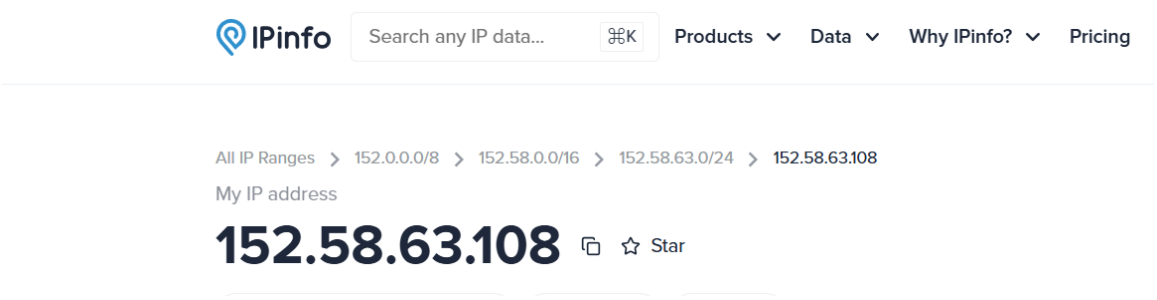
Below screenshots were captured during the task execution:
- VPN Connected (ProtonVPN Dashboard)
- Changed IP Address Verification (whatismyipaddress.com)
- Disconnected VPN (Original IP)

Screenshot 1: VPN Connected

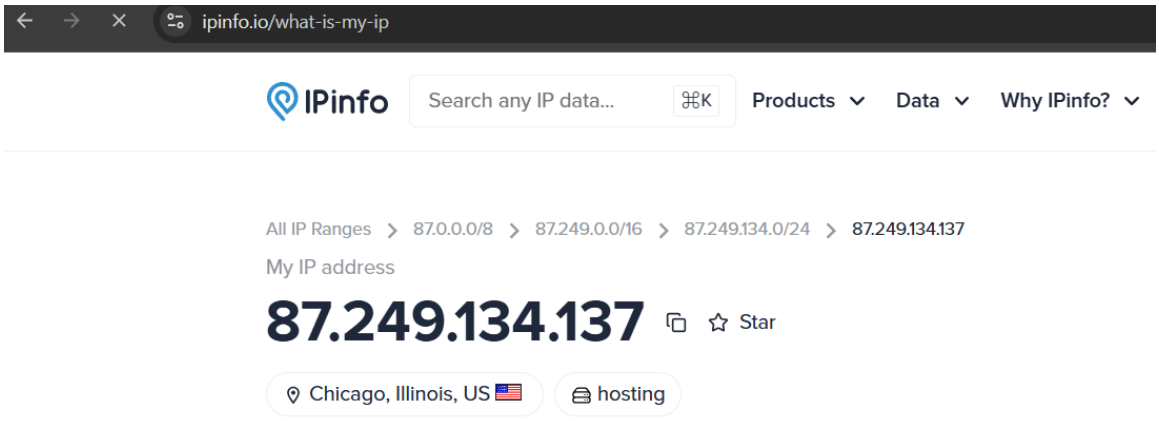


Screenshot 2: IP Changed Verification

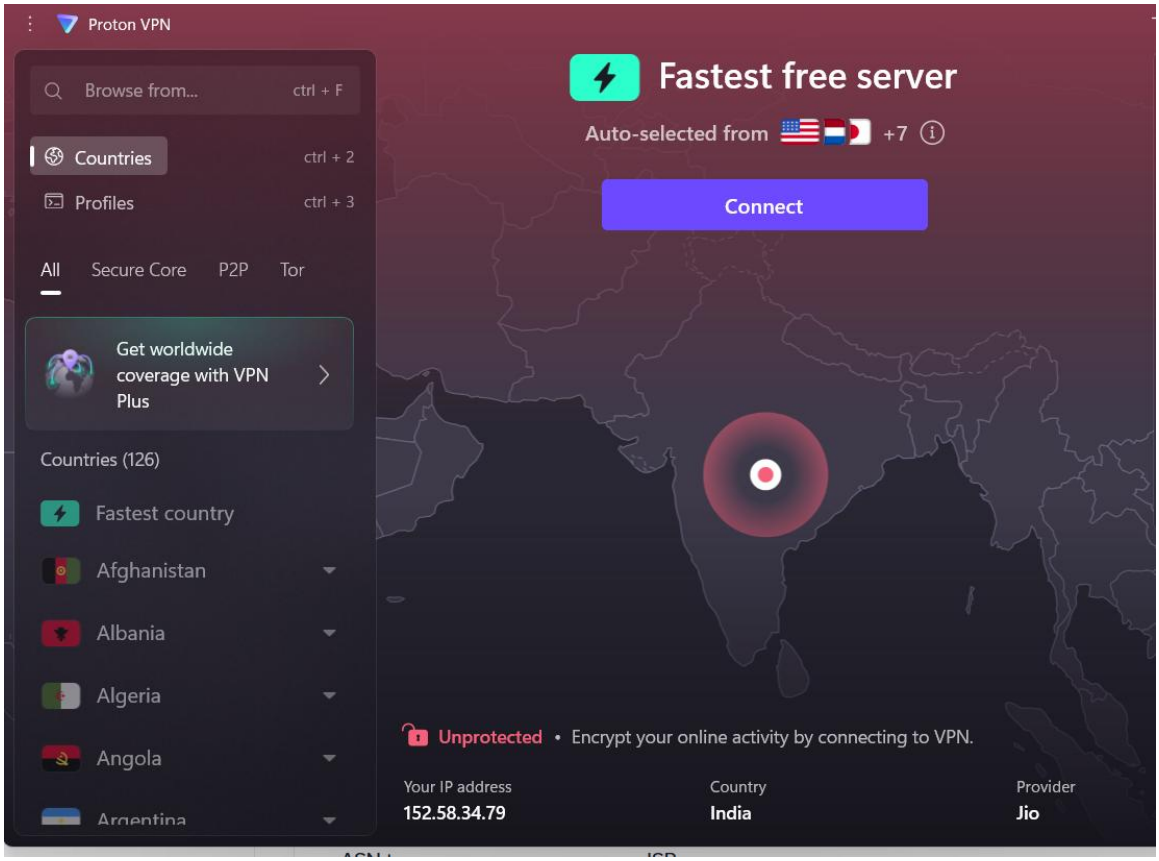
Before vpn



After vpn



Screenshot 3: VPN Disconnected



6. Key Concepts and Learnings

• **VPN (Virtual Private Network):** A secure tunnel that encrypts data between your device and the internet, masking your IP address.

• **Encryption:** VPNs use AES-256-bit encryption to ensure confidentiality of data.

• **Tunneling Protocols:** Common protocols include OpenVPN, IKEv2/IPSec, and WireGuard.
• **Privacy Protection:** VPNs hide user identity and prevent ISPs or hackers from monitoring browsing activity.
• **Speed and Performance:** VPN usage may slightly reduce network speed due to encryption overhead.

7. Benefits and Limitations of VPN

- **Benefits:**
- Masks real IP address to enhance privacy.
- Encrypts data to protect against interception.
- Allows access to region-restricted content.
- Secures data over public Wi-Fi networks.
- **Limitations:**
- May reduce internet speed due to encryption.
- Free VPNs may have data limits or log policies.
- VPNs do not guarantee full anonymity.
- Some websites block VPN-based traffic.

8. Outcome

Through this task, I gained hands-on experience in setting up and verifying a VPN connection. I understood how VPN encryption works, how it masks user IP addresses, and how it contributes to secure communication and privacy protection. Additionally, I learned about different VPN protocols and their performance characteristics.

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