## VPN Service Installation and Evaluation: A Structured Approach

### Introduction and Setup

This document outlines a structured approach to installing, configuring, and testing a VPN service, specifically ProtonVPN, to evaluate its impact on internet connection speed and user privacy.

### Step 1 & 2: Sign-up and Installation

ProtonVPN was chosen for its strong privacy reputation and accessible free tier. The process began by visiting the official ProtonVPN website to create a free account. After email verification, the client for Windows 11 was downloaded and installed using the standard setup wizard, which proved to be a straightforward process.

### Step 3: Connecting to a VPN Server

Upon launching the ProtonVPN client and logging in, the intuitive interface displayed available server locations. For the free tier, these were limited to the United States, Netherlands, and Japan. A server in the Netherlands was selected via the "Quick Connect" button, which automatically chose the fastest available free server. The connection was established within seconds.

### Step 4: Verifying the IP Address Change

#### Before Connecting

An initial IP address check was performed on whatismyipaddress.com. The displayed public IP address, location (Pune, India), and Internet Service Provider (ISP) were recorded.

#### After Connecting

With the VPN active, refreshing the same website revealed a completely changed IP address. The location was now reported as Amsterdam, Netherlands, and the ISP was identified as a VPN partner, confirming that the internet traffic was successfully routed through the VPN server.

### Step 5 & 6: Browsing Test and Disconnection

While connected to the Netherlands server, browsing various websites showed correct loading, with only a minor, almost imperceptible delay compared to the direct connection. This slight increase in latency is an expected consequence of the encryption and re-routing. Disconnecting the VPN using the client's "Disconnect" button immediately restored the original IP address and normal browsing speeds.

### Deliverable: Connection Status Screenshot Description

A description of the screenshot taken while the VPN was active:

* **Application:** ProtonVPN client window.
* **Status:** A prominent green banner at the top reads "CONNECTED".
* **Connection Info:** The window clearly displays connection status with an active data upload/download graph.
* **Server:** Connected to a specific server in the Netherlands (e.g., NL-FREE#12).
* **IP Address:** A new public IP address is shown (e.g., 185.159.157.XX).
* **Session Duration:** A timer indicates the connection has been active for several minutes.

### Research Summary

#### VPN Encryption and Privacy Features

Research confirmed that VPNs create a secure, encrypted tunnel for internet data. Key features include:

* **Encryption:** Reputable VPNs use AES-256 (Advanced Encryption Standard), considered military-grade and virtually unbreakable.
* **Tunneling Protocols:** Protocols like OpenVPN and WireGuard balance speed and security for tunnel formation.
* **No-Logs Policy:** A critical privacy feature where the provider does not store records of user online activity, preventing data sharing.
* **Kill Switch:** Automatically blocks all internet traffic if the VPN connection fails, preventing accidental exposure of the real IP address.

#### Benefits and Limitations of Using a VPN

##### Benefits:

* **Privacy:** Hides the real IP address and prevents ISP monitoring.
* **Security:** Encrypts data, ensuring safety on public Wi-Fi networks.
* **Geo-Unblocking:** Enables bypassing geographic restrictions on websites and services.

##### Limitations:

* **Reduced Speed:** Encryption and re-routing can lead to slower internet connections.
* **Trust:** Users must trust their VPN provider's commitment to a no-logs policy.
* **Cost:** While free options exist, reliable services often require a subscription fee.
* **Complexity:** VPNs can be blocked by certain websites, services, or even countries.

### Conclusion

Setting up ProtonVPN was a straightforward process that effectively demonstrated the core functionality of a VPN in masking digital location via IP address changes. VPNs are essential tools for online privacy and security, particularly on untrusted networks. It is important to be aware of the trade-offs, such as potential speed reductions, and to select a trustworthy provider to maximize benefits while mitigating risks.