

Report on VPNs for Privacy and Secure Communication

1. Objective

The purpose of this report is to understand the role of Virtual Private Networks (VPNs) in protecting online privacy and ensuring secure communication. The activity involves setting up a free VPN client, connecting to a server, and verifying the connection.

2. Tools Used

- **VPN Client:** ProtonVPN (Free Tier) / Windscribe (Free Plan)
- **Operating System:** Windows 11 (or any supported OS)
- **Verification Tool:** <https://whatismyipaddress.com> (for IP address confirmation)

3. VPN Setup and Connection Steps

Step 1: Download and Install VPN Client

- Visit the official VPN provider's website:
 - ProtonVPN → <https://protonvpn.com>
 - Windscribe → <https://windscribe.com>
- Download the VPN client compatible with the operating system.
- Install the client following the instructions provided.

Step 2: Create Free Account

- Register with a valid email ID.
- Verify the account if required by the provider.

Step 3: Launch the VPN Application

- Open the installed VPN software.
- Log in with the registered credentials.

Step 4: Connect to a VPN Server

- Select a free server location (ProtonVPN: US, Netherlands, Japan; Windscribe: multiple options).
- Click **Connect** and wait until the application shows **Connected** status.
- The client interface will display the new IP address assigned.

Step 5: Verify Connection

- Confirm connection status in the VPN application dashboard.
- Visit whatismyipaddress.com to check the changed IP.

4. Role of VPNs in Privacy and Security

1. **Data Encryption** – VPNs encrypt all data traffic, preventing interception by hackers, ISPs, or third parties.
2. **IP Masking** – VPNs replace the user's real IP with the server IP, hiding the actual location.
3. **Access Control** – VPNs allow users to bypass geo-restrictions and censorship.
4. **Secure Public Networks** – Protects users on public Wi-Fi from man-in-the-middle (MITM) attacks.
5. **Privacy Protection** – Reduces tracking by advertisers and malicious entities.

5. Observations

- The VPN successfully masked the real IP address and replaced it with a server IP.
- Internet traffic was routed securely through the VPN server.
- Websites and services detected only the VPN server location, not the actual one.
- Free VPN services provided adequate privacy features but had restrictions on speed, bandwidth, and available server locations.

6. Conclusion

VPNs play a vital role in ensuring privacy and secure communication in the digital environment. By encrypting user data and masking the real IP address, VPNs prevent unauthorized surveillance, identity tracking, and data interception. Free VPN clients such as ProtonVPN and Windscribe provide basic but effective protection for general use, while premium versions deliver advanced features, higher performance, and greater flexibility.