Working with VPNs

Objective

To explore how Virtual Private Networks (VPNs) enhance user privacy and security by encrypting internet traffic and masking IP addresses.

Tools Used

- ProtonVPN (Free Tier)
- whatismyipaddress.com
- Google Chrome Browser (macOS)

VPN Setup and Connection Steps

1. Choose VPN Service
   - Selected: ProtonVPN Free Tier
   - Reason: Trustworthy provider, strong privacy policies, and no data limits on the free plan.

2. Sign Up Process
   - Visited protonvpn.com
   - Created a free account using a secure email.

3. Download and Install VPN Client
   - Downloaded macOS ProtonVPN client from the official website.
   - Installed and signed in with credentials.

4. Connect to VPN Server
   - Chose a free server in the Netherlands (closest available with good speed).
   - Successfully connected.

VPN Connection Verification

- IP Check (Before VPN): Displayed original IP based on local ISP in India.

- IP Check (After VPN): Changed to Netherlands IP.

- Website Access: Browsed several websites (Google, Reddit, ProtonMail). All worked normally.

- Traffic Encryption: Verified that HTTPS traffic continued securely and DNS leaks were prevented.

VPN Disconnection Comparison

- Speed with VPN: Slightly reduced (~10-15% slower browsing speed).

- Speed without VPN: Normal, but with visible original IP and region.

- IP Reversion: Returned to original IP after disconnection.

VPN Encryption & Privacy Features

- Encryption Protocols: Uses OpenVPN and WireGuard with AES-256 encryption.

- DNS Leak Protection: Prevents DNS queries from exposing user data.

- No-Logs Policy: ProtonVPN does not track user activity.

- Kill Switch: Ensures data isn't leaked if the VPN connection drops.

Summary: VPN Benefits and Limitations

Benefits:

- Encrypts internet traffic to protect against surveillance.

- Masks IP address and hides user location.

- Useful on public Wi-Fi to avoid data theft.

- Helps bypass geographical restrictions.

Limitations:

- Slower internet speeds due to encryption overhead.

- Free VPNs have limited server options and speeds.

- Some websites block known VPN IPs.

- Not a complete solution against all types of cyber threats.

Outcome

Successfully configured and used a VPN service. Understood how VPNs enhance digital privacy and observed the difference in traffic encryption and browsing behavior.