

William Prado  
05/16/2025

13.2

## Remote Network Considerations.

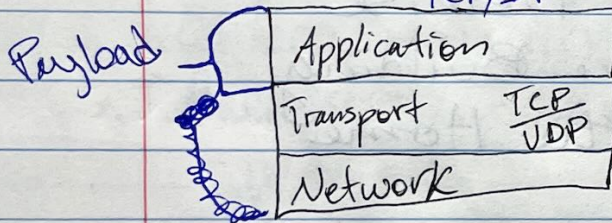
Remote network access > user device does not make direct cable or wireless connection to the network.

Old School method - Remote Access Server (RAS) - eg. RADIUS

- authentication & authorization.
- Authentication/Gateway
  - device assists in authenticating client.
- Modem Pool
  - dial-up device
- Remote Client
  - host

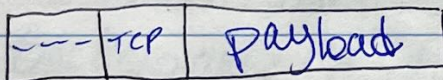
## Remote Network Considerations

TCP/IP



- 1) Tunnel
- 2) Security (encrypt)

Packets

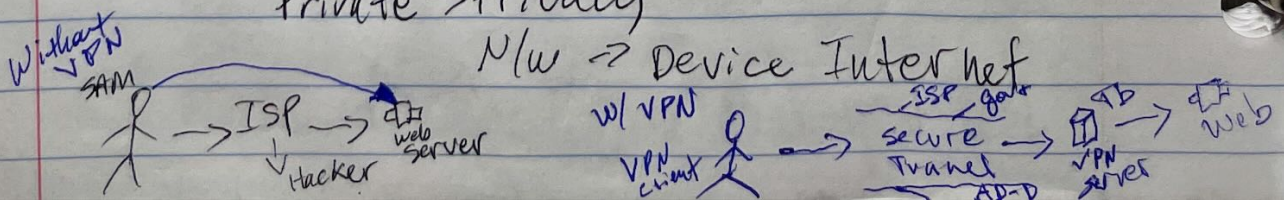


## VPN - Virtual Private Network

- network connection encrypted.
- VPN often called "Tunnel".

## VPN - Virtual Private Network

What is VPN? No hard ware or cables  
Private → Privacy





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Remote access →  
Site to site

download proton  
VPN  
"NordVPN"

Wifi

Authentication

DSA

psk = personal "CoR"

Enterprise

Notes

1<sup>st</sup> VPN creates a tunnel

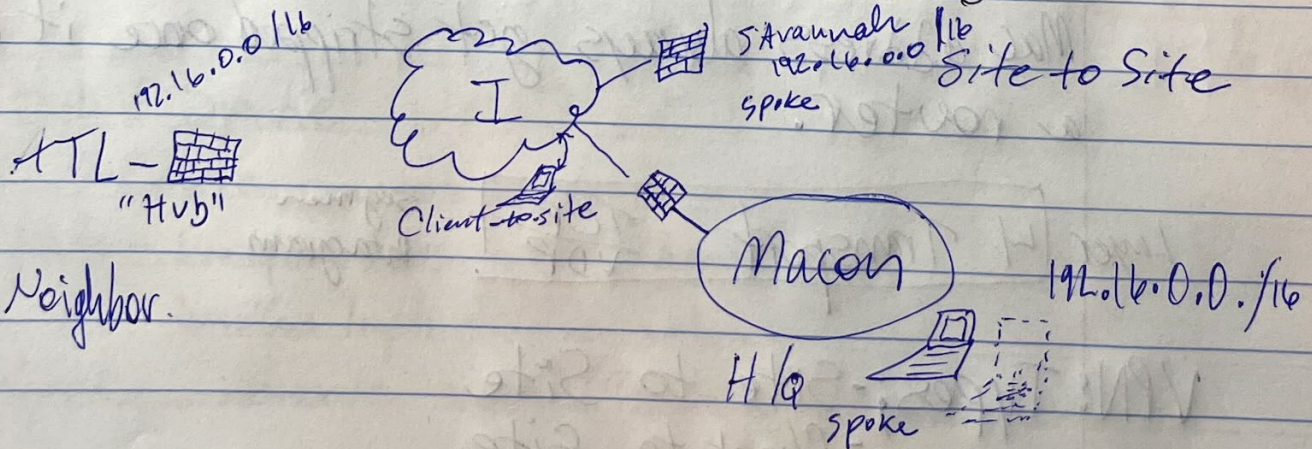
2<sup>nd</sup> VPN encrypts.

3<sup>rd</sup> VPN help Bypassing Censorship

YTB Three types of VPN

YTB VPN (Virtual Private Network) Explained

YTB How does a VPN tunnel work?



Exam  
Prep.

U pursvit - study Guides & Doc  
Comptia Net +

Resume Due Monday 4pm.

- make it shorter
- delete associates
- delete volunteer
- take out ~~etc~~ student prof. experience.



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Prep for exam:

- Comptia Objectives.

Practice quizzes

- Class notes review.

Focus on weak areas.

- YouTube videos

Cisco Packet Tracer.

- Dion exam

- Flash cards

## Tunneling & Encapsulation Protocols

- Tunneling Protocols

• PPP  
• PPTP

• GRE  
• IKEv2/IPsec

• L2TP/IPsec

• TLS/DTLS

• SSTP

• OpenVPN/Wireguard

- Internet Key Exchange (IKEv2) / IP Security (IPsec)
- Layer 2 Tunneling Protocol (L2TP) / IP Security (IPsec)

Layer 3  $\rightarrow$  IPv6  $\leftarrow$  IPsec

Mac address always get stripped once it goes thru a router.

Layer L1 Transport TCP  
UDP segment  
datagram

VPN: Types;

- Site to Site
- Client to Site
- Commercial

VPN Protocols: PPP, PPTP, IKEv2/IPsec, L2TP/IPsec

TLS/DTLS, SSTP - microsoft, OpenVPN, Wireguard

tunnel encryption/security



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IPsec = Encryption, authentication, & key management

- Authentication Header (AH)
- Encapsulated Security Payload (ESP)

IPsec modes - transport mode <sup>(end to end)</sup> & Tunnel mode <sup>(router implementation)</sup>

IPsec 2 modes 

```
graph LR
    A[IPsec 2 modes] --- B{ }
    B --- C[transport]
    B --- D[Tunnel]
    C --- E[Client to client]
    D --- F[site to site]
    D --- G[Firewall to firewall]
```

Tunnel part IKE

Client to Client Private Networks

Split Tunnel  
Full <sup>vs.</sup> Tunnel

Hub & Spoke VPNS & VPN Headend  
3 or more remote sites.

Hub - headquarters site ("head end")  
handles high traffic volume.

Spoke - remote sites ("branch office routers")

VPN concentrator - vpn server

13.3 Remote Management  
Remote Host Access  
SSH port TCP/22



Telnet

Telnet Daemon - port TCP/23

Plain text protocol - no security.

Remote Desktop Protocol

RDP - port TCP/3389

Console connection

console (or rollover) cable connected

Out of Band Management (OOB)

\* Putty Configuration

other network appliances.

Jum Server - To management only

Proffered  
messy  
MTB