Ford's Colony Computer & Technology Club

VPN (Virtual Private Network)

April 27, 2020

THE COMPUTING ENVIRONMENT

- We use the Internet for many, many tasks we perform on our computers, tablets and smartphones.
- And we know that there are many, many miscreants out in cyberspace who wish to snoop, spy, and steal and monetize our data.
  - Identity theft
  - Hacking for financial information
  - Fraud
  - Harassment
  - Terrorization

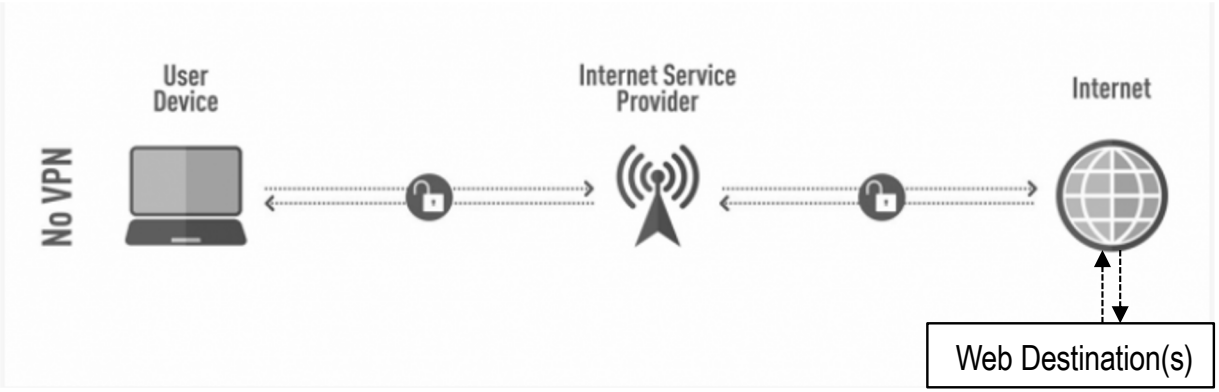
THE COMPUTING ENVIRONMENT

- We used to think and believe that if we had a firewall and anti-virus software – we were secure… - WRONG!
- We know that our software is subject to exploitation
  - Browsers & Applications
  - Patches & Updates
- And almost all the legs in the connections we make to external web destinations are vulnerable to hacking
- To be safe – requires a multi-faceted defense and common-sense operating practices
  - Firewall, anti-virus, malware & VPN
  - Be a skeptic – if it looks fishy, it probably is!
  - Don’t trust every enbedded URL or request to Click here in an email

HTTP:// VS. HTTPS://

- When using a browser, you connect and communicate to your destination using the following protocols:
  - **HTTP** stands for **H**yper**T**ext **T**ransfer **P**rotocol. When you enter http:// in your address bar in front of the domain, it tells the browser to connect over HTTP. To put it simply it is a protocol that's used by a client and server which allows you to communicate with other websites.
  - **HTTPS** stands for **H**yper**T**ext **T**ransfer **P**rotocol. When you enter https:// in your address bar in front of the domain, it tells the browser to connect over HTTP to communicate over a secured connection.
- Although HTTPS provides encryption of your communication, it is susceptible to being hacked.
  - Public WiFi connections and spoofs of same are notorious for "man in the middle" attacks.
- Smartphone (Mobile broadband) is data that is carried on your mobile or cellular provider's network. It's a convenient approach to connectivity if you're in an area where traditional Internet conductivity is difficult to find or you're mobile, as its name implies. Mobile data is in fact encrypted. However, most smartphones will automatically try to connect to WiFi if in range; and you may be vulnerable in that situation.

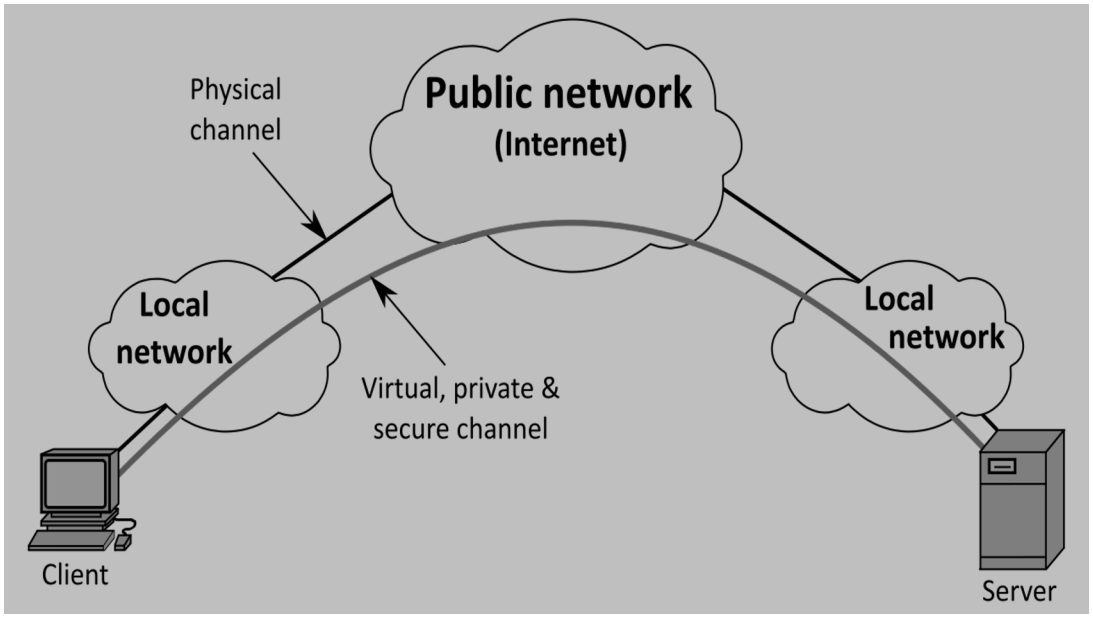
SIMPLIFIED NETWORK CONNECTION



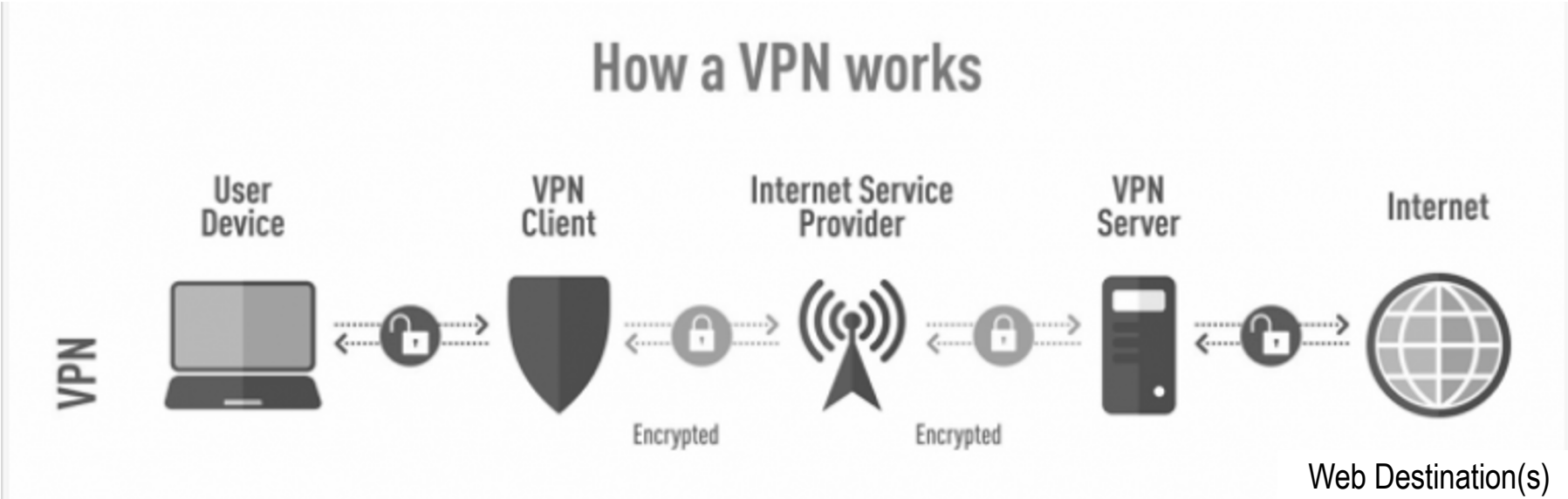
- When your you use the Internet with your devices, your data may or may not be encrypted
  - Browsing to https sites are encrypted; but may still be susceptible
  - Programs/Applications
- Major risk scenarios
  - Public and Open Wi-Fi
  - Public wired connections
  - Spoofs
  - Public charging stations

WHAT IS A VPN?

- A VPN creates an encrypted tunnel between you (your device) and a remote server operated by the VPN service.
  - All your internet traffic is routed through this tunnel and your data is secure through encryption from prying eyes along the way.
  - The remote VPN server then routes your data to your internet destination.
- Examples:
  - Websites –Amazon, your bank, gov't accounts
  - Cloud applications like email, Adobe, Microsoft, etc.



SIMPLIFIED VPN CONNECTION – ANOTHER GRAPHICAL REPRESENTATION



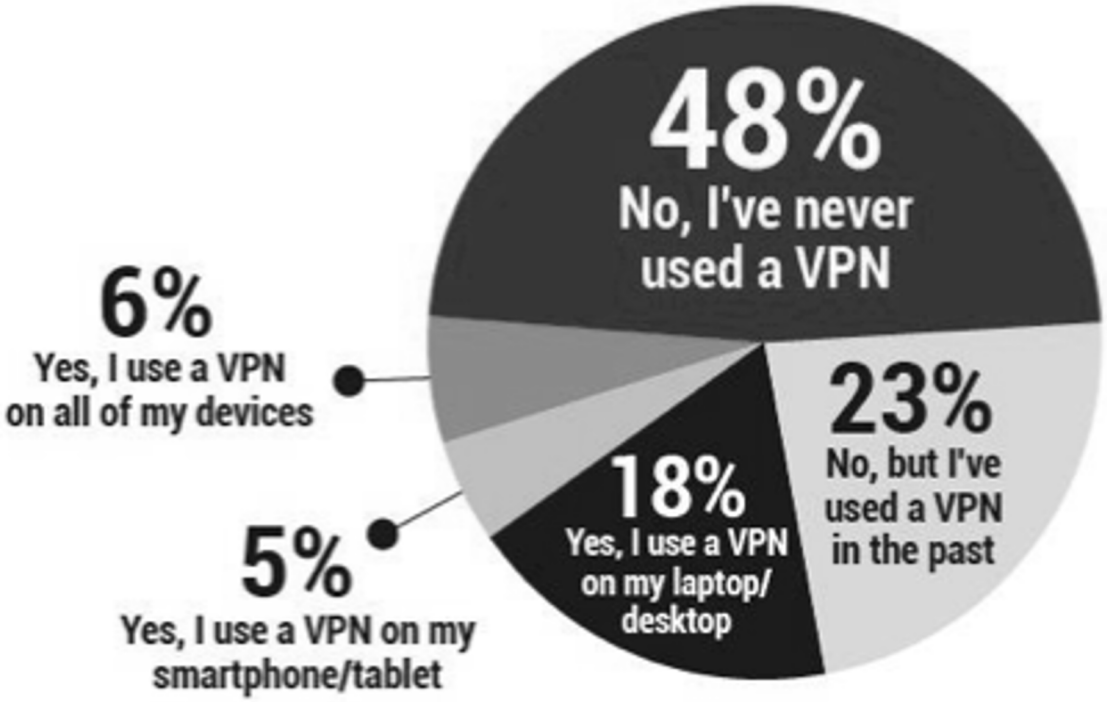
OTHER CONSIDERATIONS

- Do I need VPN on all my devices?
  - Yes, hacking can occur on ANY device that uses the Internet to communicate information.
  - Many VPN providers can support a variety of devices and usually through a single account.
- VPN's do provide you with anonymity with VPN's IP address as being the originator of the transaction
  - Location spoofing
  - Malware can render it unsecure
  - Cookies can also make you more discoverable
- Are FREE VPN's a good deal?
  - You really need to ask the question – how does this VPN make their money, if they don't charge for the service? Answer: they're selling your data.
- When selecting a VPN provider, do your homework.
  - What is their policy regarding your data?
  - Where are they incorporated? Legal jurisdiction?
  - Performance metrics

Source: PCMag.com

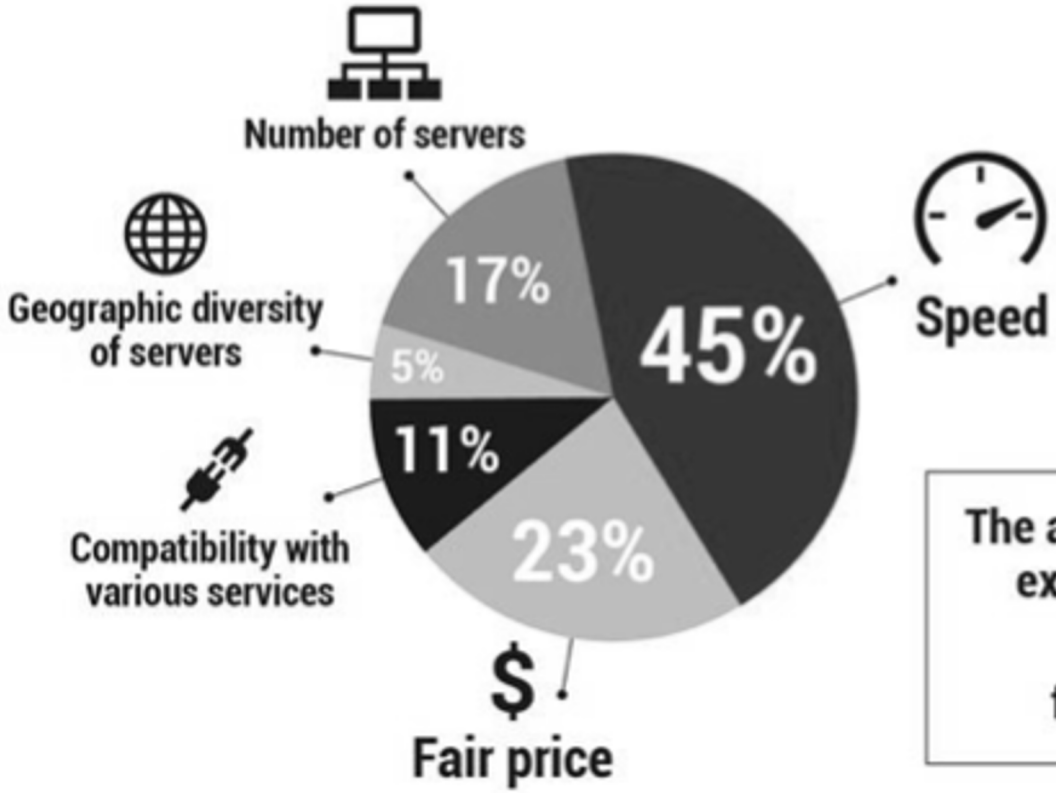
Consumer VPN Usage

Are you currently using a VPN service?



Source: PCMag.com

What is the most important feature in a VPN?



The average U.S. consumer expects to pay around **$8 monthly** for a VPN service."

Source: PCMag.com

VPN PERFORMANCE

	Download Speed Percent Change	Upload Speed Percent Change	Latency Percent Change
Top Scores in *Red*	(Lower Is Better)	(Lower Is Better)	(Lower Is Better)
HidelPVPN	*52.8%*	*53.0%*	300.0%
TunnelBear VPN	74.7%	61.0%	100.0%
Hide.me VPN	75.8%	68.4%	*0.0%*
CyberGhost VPN	77.0%	59.2%	66.7%
Trust.Zone VPN	77.7%	58.5%	325.0%
Private Internet Access	80.7%	76.3%	25.0%
IPVanish VPN	81.0%	78.8%	*0.0%*
TorGuard VPN	81.8%	75.5%	66.7%
NordVPN	82.6%	77.7%	*0.0%*
Buffered VPN	83.3%	78.6%	175.0%

Source: PCMag.com

Source: PCMag.com	Rating	Allows 5+ Simultaneous Connections	500+ Servers	Geographically Diverse Servers
NordVPN	4.0 Review	✓	✓	✓
Private Internet Access VPN ›	EDITORS' CHOICE 4.0 Review	✓	✓	—
TunnelBear VPN ›	EDITORS' CHOICE 4.0 Review	✓	✓	—
CyberGhost VPN	4.0 Review	✓	✓	✓
ExpressVPN ›	4.0 Review	✓	✓	✓
IPVanish VPN ›	4.0 Review	✓	✓	✓
TorGuard VPN ›	4.0 Review	✓	✓	✓
Surfshark VPN ›	3.5 Review	✓	✓	✓
Norton Secure VPN ›	3.5 Review	✓	✓	✓
ProtonVPN ›	EDITORS' CHOICE 4.5 Review	✓	✓	✓

Source: PCMag.com	Rating	Blocks Ads	Free Version	Server Locations
NordVPN	●●●●○ 4.0 Review	✓	—	59 Countries
Private Internet Access VPN ›	EDITORS' CHOICE ●●●●○ 4.0 Review	✓	—	30 Countries
TunnelBear VPN ›	EDITORS' CHOICE ●●●●○ 4.0 Review	✓	✓	23 Countries
CyberGhost VPN	●●●●○ 4.0 Review	✓	—	90 Countries
ExpressVPN ›	●●●●○ 4.0 Review	—	—	94 Countries
IPVanish VPN ›	●●●●○ 4.0 Review	—	—	55 Countries
TorGuard VPN ›	●●●●○ 4.0 Review	✓	—	50 Countries
Surfshark VPN ›	●●●◐○ 3.5 Review	✓	—	57 Countries
Norton Secure VPN ›	●●●◐○ 3.5 Review	✓	—	30 Countries
ProtonVPN ›	EDITORS' CHOICE ●●●●◐ 4.5 Review	—	✓	44 Countries

VPN TAKEAWAYS

When should you use VPN?

- Public & Semi-Public Wi-Fi
  - Airports, transportation hubs
  - Hotels, motels
  - Coffee shops, malls, restaurants, etc.
- Wi-Fi Services on airlines, trains, etc.
- VPN Tradeoffs
  - When using VPN, you most likely will be sacrificing some of your internet connection speed – both download and upload
  - Some websites may block or prevent logins

When VPN is Not Necessary?

- When you're on your Home Network
  - Assuming your network is encrypted and secure, both wired and wireless
  - You have enabled your firewall, anti-virus software, and malware protection
- When on a known, encrypted and secure network