

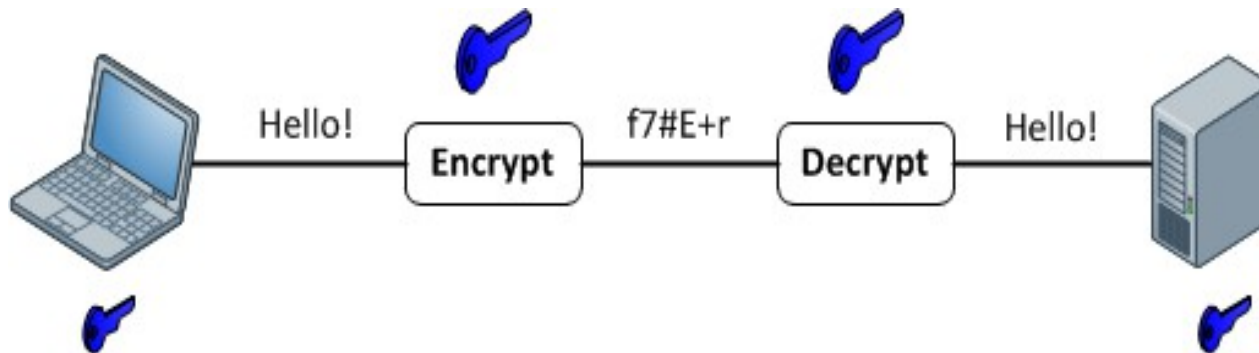


Virtual Private Networking - VPN

Alan Baker
San Jose IBM PC Club
November 8, 2016

Virtual Private Networking

- Why would I want a VPN?
- How does it work?
- How do I use it?
- How do I get it or make it?



Why would I want a VPN?

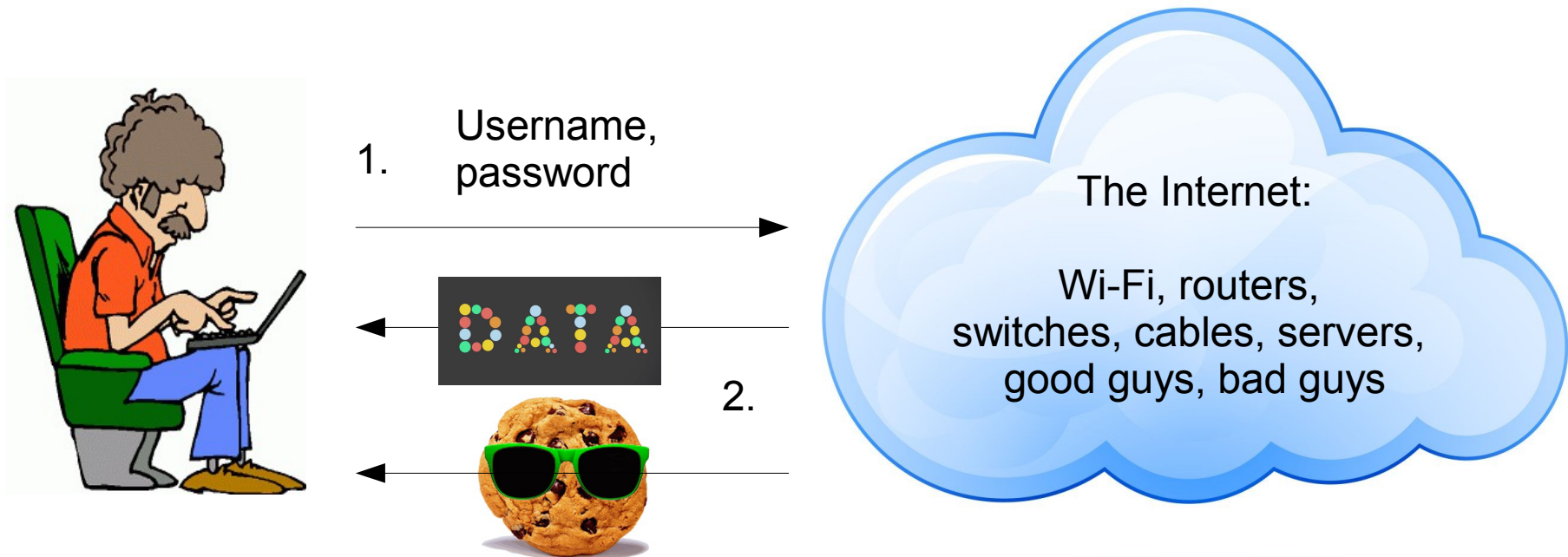
Secure Internet access from Wi-Fi hotspots

- Do you ever connect your phone or laptop to a public Wi-Fi hotspot at a coffee shop, hotel, or classroom?
- How do you know that it's secure??



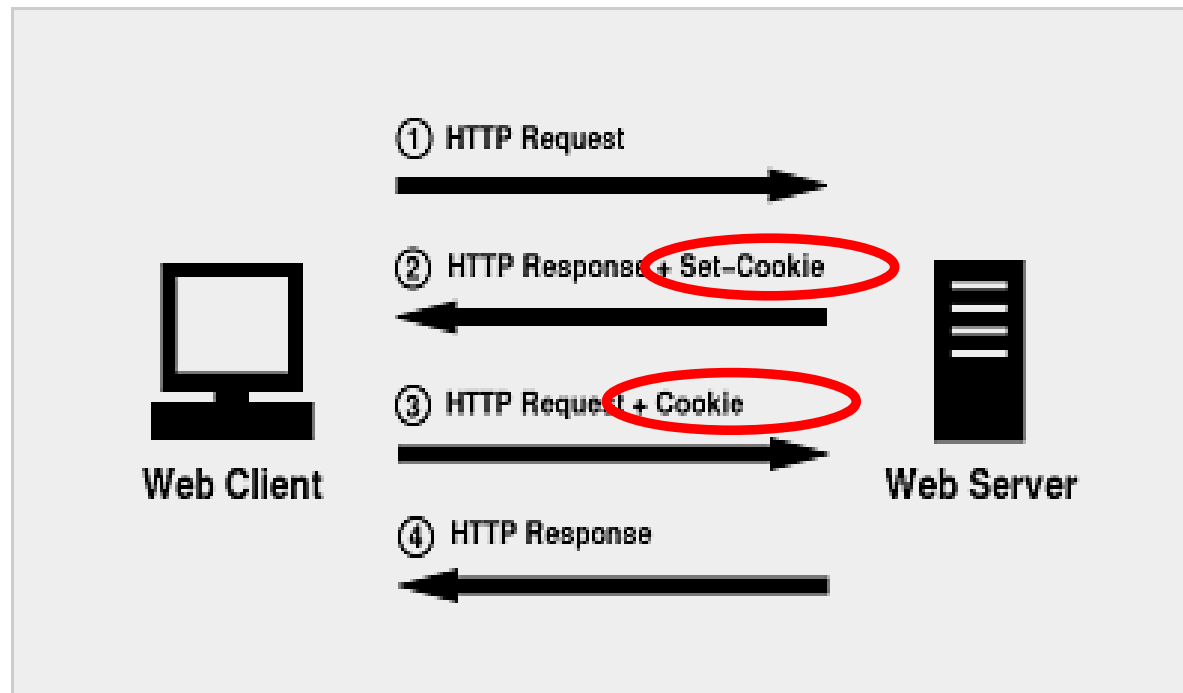
Logging in - Steps 1 & 2

What happens when you log in?

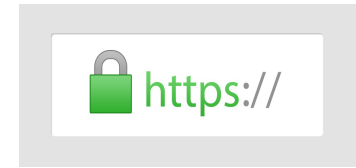


Logging in - Steps 3 & 4

But why don't you have to log in each time you click a link?

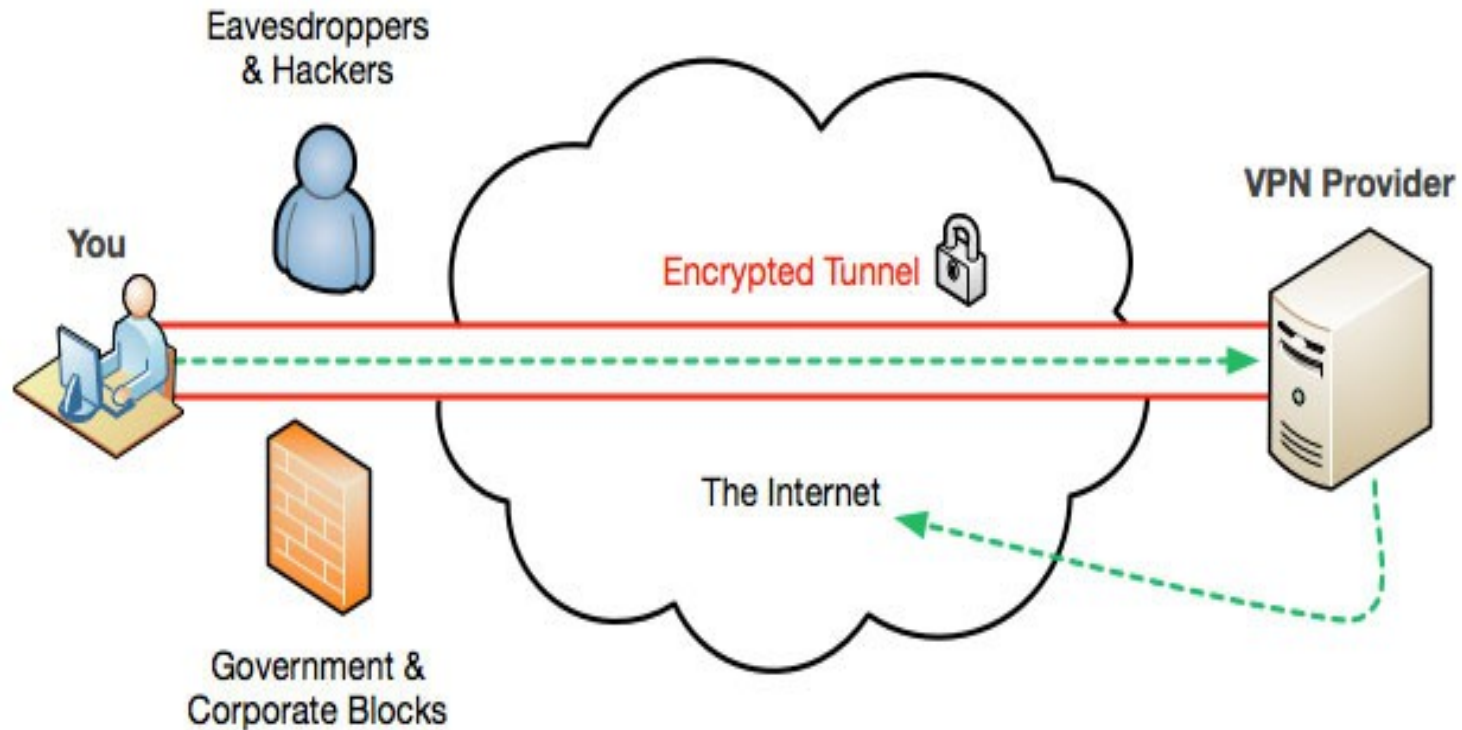


Is HTTPS enough?



- An https session only guarantees encryption of the *data, not* the session cookie.
- If your session cookie is unencrypted, anyone logged into the hotspot can see it.
- A man-in-the-middle attack can replace an encrypted cookie and send you to a fake site.
- HSTS will address this *someday*. As of 2015, only 5% of the internet's top 145,000 websites support HSTS.

How Does a VPN Work?



How do I use a VPN?

One time:

- Create or subscribe to a VPN server
- Install client software on your laptop, tablet, or phone
- Install the unique key on your laptop, tablet, or phone

Every time you use a hotspot:

- Connect to the VPN server first



How Do I Get Access to a VPN?

- Subscribe to a VPN service
 - Multiple locations, optimized speed
 - \$5 to \$10 per month
 - Privacy? Whom do you trust?
- Run an OpenVPN server at home
 - Computer running Windows, MacOS, or Linux
 - Router running DD-WRT or Tomato
 - Raspberry Pi running Linux



Your Own OpenVPN Server

- **Bonus!** Remote access to your home computer, router, baby monitor, media center, or security camera from your laptop, tablet, or phone. *One* open port for all protocols.
- Uses unique encryption keys, so
 - Only *your* devices can access your VPN.
 - No password is required so there is none to be hacked.
 - A password can also be added for two-factor authentication.



Installing OpenVPN Server at Home

For a Windows computer, follow

https://community.openvpn.net/openvpn/wiki/Easy_Windows_Guide

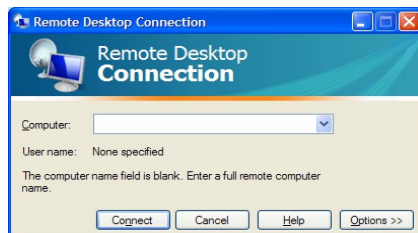
And

- **Give administrator access:** Change the properties of files openvpn.exe and openvpnserv.exe so they always run as admin. This will prevent access denied errors.
- **First test:** Run `c:\Program Files\openvpn\conf\server.ovpn` from Windows command prompt. Use the local IP address of your computer as the server address.
- **Windows Services** for openvpn
 - ✓ Add `c:\Program Files\openvpn\conf\server.ovpn` as the parameter
 - ✓ Set automatic start (delayed)
- **Firewall:** Open port 1194 on the computer's firewall.
- **Router:**
 - ✓ Reserve an IP address for your computer so it remains the same.
 - ✓ Forward port 1194 to that IP address.
- **Your external IP address**
 - ✓ From a web browser: <http://canihazip.com/>
 - ✓ Set your VPN client to that IP address OR use a dynamic DNS service



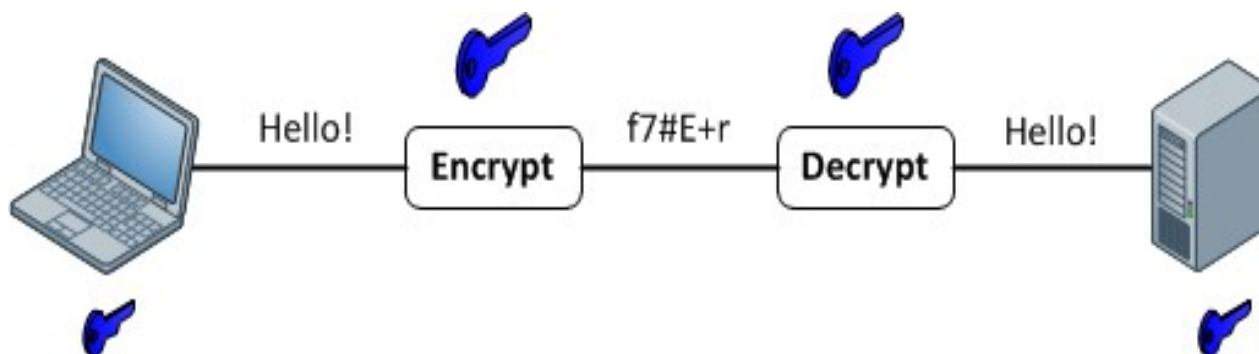
Demo

- **http, https:** MythWeb + stream a video 60 Minutes
- **VNC, Plex:** camerapi video Video_from_Pi-1015-Set_07-201610151629
- **Microsoft Remote Desktop:** Sprinklers pi 192.168.0.5
- **FTP:** from phone via WinSCP 10.8.0.22
- **SSH, SCP, SFTP** mythtv



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