**WireGuard/SSH**

The project started beginning in January this year when I simply wanted a way to browse Reddit at work without anyone knowing - what I do on my lunch break is my time. Nothing illegal, just a simple privacy request that, with our school network, simply wasn’t going to be the case. That thought, that idea, turned into a three month endeavour in which I would take all my networking and network management training to a whole new level. The OSI model, layer two and three routing, Virtual Private Networks(VPNs), data encryption, Dynamic Name Service (DNS) or resolution and Dynamic DNS(DDNS) and finally Secure Socket Shell (SSH). Just a few of the of the concepts I quickly learned as I ventured down the rabbit hole. Browse Reddit on my own time over lunch - that’s all I wanted to do. It turned into a wonderful project that no one understood its beauty, except for me. It is called WireGuard.

Free WIFI, you see it everywhere. If an establishment doesn’t offer it, they are behind the times. Right? Would you agree? We as a society demand to be connected 24 hours a day but we also have limited data plans. Free WIFI seems to be the answer, or is it? Look at this report from The Guardian: <https://www.theguardian.com/business/2019/may/28/spies-with-that-police-can-snoop-on-mcdonalds-and-westfield-wifi-customers>.

It basically says that all information and everything you go to on McDonald’s free WIFI is free to hand over to the authorities and snooped on quite easily. I was starting this WireGuard project simply to connect to Reddit at work and I began to understand what I could do with it. Before WireGuard and a VPN there was SSH - let’s begin and I’ll take you through what I did and what I learned and why I did what I did .I hope you enjoy.

Initial Project

Connecting to Reddit was my first goal. How do I bypass all internet filters and restrictions work or school impose to protect us? First and foremost, I do not promote doing anything illegal - I did this simply to browse the popular internet news site Reddit as there is often very valuable and relevant life information posted. Why does work need to know this kind of information? Simple answer - they don’t. Out of this idea birthed an SSH tunnel. Secure Socket Shell - an old protocol to allow two computers to essentially connect to each other securely and transmit data. I won’t bore you with the details but that’s all you need to know - it’s a solution in which we can securely connect two active computers together. Over the years we have evolved and one really practical application of SSH is what is known today as SSH tunnelling or SSH socks5 proxy. I know I mentioned VPNs but we will get to that. What you need to understand is that and SSH proxy and a VPN in theory solve the same problem but in a different way - and we can utilize their differences to our benefit depending on the need. A SSH tunnel or proxy allows a tunnel to be created to a remote destination (home) and allow you to connect from a distance (work or school). This tunnel then is created and can be used and configured by different applications such as FireFox, Telegram, essentially any application that supports a socks proxy. THIS IS EXTREMELY powerful and where I literally took this small need (Reddit) to a whole new level of understanding and application. With only configuring certain applications to use the SSH tunnel (FireFox) for example, I can continue to access the local network here with my computer and have no interruption of service. If I connected to a VPN, all my traffic would go through my house and lead me to losing all access to my internal network. In other words, securing my internet browsing like Reddit would actually inhibit my ability to do my work - something my boss would have a problem with. So I first started with building an SSH tunnel to browse Reddit and then continued to learn and configure WireGuard to then secure all my traffic on my personal phone at work.

There is always more than one solution to a problem and that’s the beauty of IT - I chose to finally use OpenSSH and WireGuard to give me the solutions I needed to operate in a way that I wanted to. My SSH tunnel runs at home so I can have my socks5 proxy and FireFox at work connected at home - this bypasses ALL internet filtering at school or work (don’t forget to add the remote DNS flag in FireFox). I have my WireGuard server running at home so I can connect my personal phone to it on my work or school WIFI (now all traffic on my phone cannot be snooped on). With this setup I can access my home network while keeping my private information private and still do my work effectively, win-win situation, wouldn’t you say?

Everything starts with a need - my need was unfiltered internet over lunch, what’s yours? How would you use this technology? Do you have a cool idea that Open SSH or WireGuard could solve? I’m so passionate about this idea I literally live and breathe SSH tunnels and VPNs - we all have a right to privacy. I hope you enjoy this class - I never learned best by a written project on a course outline - we have built this class to be fun, rewarding and something you can take away and build yourself. One reminder: knowledge is power and with power comes responsibility - please be an example to others and use your skills for good.