What is VPN?

A virtual private network (VPN) extends a private network across a public network, such as the internet. It enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network, thus are benefiting from the functionality, security and management policies of the private network.

Home VPN Server

A cost-effective home solution that provides an extra layer of security to your mobile devices or laptop when you are on the go and are using an unfamiliar network.
Raspberry Pi

One might ask, “Why use the Raspberry Pi and not just some old PC?” The first major reason is the cost. Sure you can find an old PC lying around at a flea market and can find the parts needed to get it running properly again. However the main problem is with the amount of money you would need to put into it, it would not compare to the $35 you would spend for the Pi.

Hardware

Another good reason for using the Pi is the hardware that powers it. The Raspberry Pi 2 uses the latest ARM chip. Some older PCs may still be using older architecture in which could provoke compatibility issues with new updates or software. Plus there are wide variety of operating systems available now, such as Android and Windows 10.

Not to mention there is a large community of support online for updates and troubleshooting. With the amount of power, cost and support the Pi offers, one would be unreasonable to not use it for this Home VPN server.

OpenVPN

OpenVPN is an open-source software application that implements virtual private network, also known as VPN, techniques for creating secure point-to-point or site-to-site connections in routed or bridged configurations and remote access facilities.

Encryption

OpenVPN uses the OpenSSL library to provide encryption of both data and control channels. It lets OpenSSL do all the encryption and authentication work, allowing OpenVPN to use all the ciphers available in the OpenSSL package.

It also uses hardware acceleration to get better encryption performance, considering the amount of power the Pi provides, it’s a great combination.

Authentication

OpenVPN has several ways to authenticate peers with each other. OpenVPN offers pre-shared keys, certificate-based, and username/password-based authentication. The type of authentication used in this VPN server is the certificate-based, mainly because it is the most robust and feature-rich.

Security

OpenVPN offers several internal security features. It has up to 256-bit Encryption through OpenSSL library. OpenVPN runs in userspace, instead of requiring IP stack operation.

OpenVPN has the ability to drop root privileges, use mlockall to prevent sqapping sensitive data to disk, enter a chroot jail after initialization and apply a SELinux context after initialization.

PuTTY

PuTTY is a free and open-source terminal emulator, serial console and network file transfer application. It supports several network protocols including SCP, SSH, Telnet, rlogin, and raw socket connection.

Usage in Project

Using PuTTY in my project provides me the ability to SSH into my Pi and execute commands without needing a keyboard, mouse and monitor. Also it provides me the ability to make changes, keys, or certificate without being at the server physically.

Contact Me

David Rufty
Eastern Kentucky University
Dept. of Applied Engineering & Technology
859-582-0611
david_rufty@mymail.eku.edu
NET 399