Abstract

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Build an interconnected network of routers with advanced features

Due to the fast development of the Internet, people are now capable of doing more and more on the web. On top of that, many networking devices available for commercial purposes on the market cannot keep up with people's demands. For average users, these networking devices may be suitable. However, for advanced consumers, they clearly need more flexibility with their networking devices such as routers or home-server machines. On the other hands, by building custom networking hardware, we can save some money on expensive devices sold by many ISPs. Thus, it is recommended to build our own networking hardware for our needs.

By developing our own network of routers from Raspberry Pi 3 hardware, we are able to achieve more and avoid all of the limitations (throttling by ISPs, etc.…) of commercial routers. In fact, with proper set-up, we could configure our own virtual private local network (VPN). By having our own VPN, we can easily access to blocked websites and bypass geographical restriction on the web. In addition, we are able to set-up secure connection with remote network. Another benefit of using VPN with custom router is anonymous browsing, which has recently become a hot issue among advanced Internet users (due to many online privacy scandals happening in recent years). On the other hands, with a custom router, we are capable of allowing certain host devices to get connected to our home Wi-Fi network. And of course, we could do a lot more with custom built routers.

For this specific project, our goal is to build our own private network of routers based on Raspberry Pi 3 hardware and other related networking devices. This private network of routers has to be able to route packets coming in and out as usual with other commercial routers. Besides, we also configure this router to support VPN and firewall. Thus, it will be able to allow anonymous browsing, access to geographically blocked content from other regions, secure connection to another host or remote network. Last but not least, we can also provide pre-defined routing within the network of routers.