**Personal Vulnerability Investigation**

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Cyber Security, Semester 4.

2022

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# **SCOPE**

The aim of this research is to investigate how vulnerable the modern routers are. I will be taking advantage of the available resources that my school offers (ISSD), and I will try to use online open-source tools to hack the router. The whole process can take up to 3 weeks.

# **Main Question**

### **How safe is it to only rely on routers to stay away from hackers?**

# **Sub Questions**

### What is the difference between router and modem?

### What are most popular routers used nowadays?

### How routers work?

### How can a hacker take over routers systems?

# **My Plan**

In this research, I will be using the DOT framework to answer my questions. (<https://ictresearchmethods.nl/Methods>)

DOT framework consists of 5 strategies:

1. Library
2. Field
3. Lab
4. Showroom
5. Workshop

Each strategy offers several methods.

Here is my plan for this research:

Table

Description automatically generated

# **Results**

### **What is the difference between router and modem?**

* **Modem**

The internet uses **Analog signal** to send data, the computer can only read **Digital signal**.Therefore,we need a device that translates **Analog signal** to **Digital signal** and vice versa, here comes the modem.

The modem **demodulates** the incoming analog signals into digital signals for the computer to understand.

It also **modulates** the outgoing digital signals into analog signals for the internet to understand.

Modem is perfect to bring the internet for one device. However, connecting only one device to the internet is not realistic. Nowadays, people tend to have more than one device to connect to the internet.

Unfortunately, the modem was not built to connect to more than one device. Therefore, the router comes in.

* **Router**

Router is placed between the modem and the clients to manage the routing for the incoming and outgoing data.

It knows the Mac and the ip addresses for the devices, this would help it to organize the packets.

There are a few types for routers:

* Wired Router

Connects with the clients using wires.

* Wireless Router

Has wireless capabilities built-in. Most of these routers will also offer ports for wired connections as well.

* Core Router

Forwards packets to hosts within a network, but not between networks. (Ellis, 2022)

Conclusion

To sum up, the modem only gives the access to the internet, where routers route the packets to the right destination.

### **How routers work?**

# **References**

* Ellis, J. (2022, August 22). *What Is A Router And How Does It Work?* Retrieved October 21, 2022, from https://www.comms-express.com/blog/what-is-a-router-and-how-does-it-work/