**Cybersecurity**

**What is cyber security and what does it do?**

Cyber security refers to the body of technologies, processes, and practices designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access (De Groot, J. 2021). A wide variety of sub-categories is encompassed by cybersecurity. These include:

* Network security
* Application security
* End-point security
* Data security
* Database and infrastructure security
* Cloud security
* Mobile security
* Disaster recovery and business continuity

To be able to explore and describe the “state of the art” in this specific area in terms of technology involved, we first must delve into one of the sub-categories that fall under cybersecurity. Here we will investigate what network security involves and what is used to enforce this type of security.

What is network security? To simply put it: Network security is a broad term that covers a multitude of technologies, devices, and processes. In its simplest term, it is a set of rules and configurations designed to protect the integrity, confidentiality and accessibility of computer networks and data using both software and hardware technologies (Forcepoint 2021).

In terms of network security, there are a vast number of layers that need to be addressed when it comes to defending people and an organization from cyberattacks. Network security consists of three different controls points. These include physical, technical, and administrative. There are numerous ways to defend against these threats and attacks to network security, to name a few we have:

* Firewalls
* Anti-virus/malware software
* Network segmentation
* Access control
* Virtual private networks otherwise known as a VPN

As there are a lot of different software and hardware technologies used to defend against network attacks and threats, we will be analysing what firewalls are, and what they do to protect networks from attacks and threats.

What is a firewall? A firewall is a network security device that monitors incoming and outgoing network traffic and decides whether to allow or block specific traffic based on a defined set of security rules (Cisco 2021). Firewalls establish a barrier between internal networks and incoming traffic from external traffic for example: the internet.

How does it work? A firewall will analyse traffic based on a set of security rules that have been set by this type of firewall. It will then filter any/all traffic, allowing secure sources through and blocking any suspicious and unsecured sources of traffic that might cause an attack on the network.

There are different types of firewalls. These include:

* Proxy firewall – serves as the gateway between one network to another
* Stateful inspection firewall – a firewall that allows or blocks traffic base on state, port, and protocol
* Unified threat management firewall – combines functions of a stateful inspection firewall with intrusion prevention and antivirus
* Next-generation firewall (NGFW) – blocks modern threats that include malware application layer attacks
* Threat-focused NGFW – provide the same defences as a NGFW with added threat detection and remediation

Now that we have explored all these categories and sub-categories of network security and firewalls, we are going to look at what is considered as “state of the art” in terms of firewalls. Technology is advancing and changing at a rapid pace, and everyone, especially millennials who were born after the 2000s, are moving into a more digital platform for seeking and storing private information. With the advancement of technology, also comes the advancement cyber threats, which aim to gain unauthorized access to an individual’s or business’s sensitive data and information. For this ever-looming threat, is the need of constant improvement on technology that protect us against a threat that we cannot see.

Next-generation firewalls are currently seen as the future of firewalls. As their name suggests, next generation firewalls are a more advanced version of the traditional firewall, and they offer the same benefits. Like regular firewalls, NGFW use both static and dynamic packet filtering and VPN support to ensure that all connections between the network, internet, and firewall are valid and secure. Both firewall types should also be able to translate network and port addresses in order to map IPs. (Book, C. 2021)

Further advancements of next-generation firewalls mainly involve software and hardware updates to protect from viruses and ransomware. Not much else is needed when it comes to this type of firewall as it is the whole package when protecting business networks and data. The ability to protect from viruses, ransomware along with spam protection and endpoint security, there is not much more that you can ask for in terms of cyber protection when everything is included from one thing.

**Likely Impacts**

Cybersecurity in general is very hard to be pro-active in. Development in this field is, in some eyes, considered as “playing catch up”. Why I say this is because for example, Video games have hundreds and thousands of people every day who try to find a backdoor to hack into their systems. Where they exploit certain features or use programs to enhance their gameplay that is not considered fair. This is where a business’/company’s cybersecurity team try to catch up with such hackers and cyber threats to patch and update their security systems. This can be said for firewalls, where there are constantly cyber threats and attacks that are trying to find a way into a business’ systems and gain access to their private and sensitive data.

**How will this affect you?**

Firewalls are essential part of cybersecurity from the day the internet and computers were invented to the present day. This is because as time goes by, technology advances more and more to the point where almost everything will be digital. This can be said about the present day, where we are slowly (thought quicker than before due to the recent pandemic) becoming a cashless/card-less society. By card-less, I am talking about how our licenses can now be used and stored digitally, our rewards cards and health cards can all be conveniently kept in our digital wallets on our phones.

Due to these very reasons, cybersecurity has become even critical to everyone’s everyday lives. You don’t know when you’ll be subject to a cyberattack, where your private data is hacked into and used against you. You don’t know when a family member or friend has had their social media or other confidential information exposed through a cyberattack and then send you links to websites that contain viruses and ransomware. All this impacts everyone’s lives on some scale and the impact it has for me and most people is that they will be wary of who/where/what they give their confidential data to, and how secure that information is stored.

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