**Personal Specialisation Project**

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# **SCOPE**

The aim of this research is to

# **Main Question**

### **How can Cisco Certified Network Associate (CCNA) certificate prepare me to become a network engineer?**

## Sub Questions

### What network fundamentals do I need to take the exam?

### What is IP address and what does it offer?

### What security skills do I need to pass the exam?

### What is Automation and Programming in the CCNA?

# **My Plan**

# Network Fundamentals

## Network Topologies

There are many types that people used to design networks. Some of them are:

* Bus Topology
* Ring Topology
* Star Topology

#### Bus Topology

The internet started with 2 devices that were connected using the same cable, this is called Bus Topology. It can handle more than 2 devices as long as they are connected to the same cable.

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This design shows that the 3 devices can talk to each other because they use the same cable.

This design is outdated and not used nowadays.

#### Ring Topology

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Ring topology is creating a circle with the devices that are connected with each other.

Advantages:

* Network Management: devices can be replaced/removed from the network without shutting it down.
* Cost: Twisted pair cabling is inexpensive and easily available. Therefore, the installation cost is very low.
* Reliable: It is a more reliable network because the communication system is not dependent on the single host computer.

Disadvantages:

* Difficult troubleshooting.
* Delay

#### Star Topology

This design is the most used design these days. The shared device is in the middle, and a cable is going out from it to each device.

Advantages:

* Efficient troubleshooting: troubleshooting is easier than the other designs.
* Easily expandable: more devices can be easily connected to the centered device using its own cable.

Disadvantages:

* A Central point of failure.
* So many cables.

(*Computer Network Topologies - Javatpoint, n.d.)*.

## TCP/UDP

TCP requires 2 devices to be connected for them to send packets, therefore TCP is considered connection-based protocol. The following are some of the services that the TCP protocol brings:

* The server ensure that the client received the packets, if not, the server will keep sending the same packet until it is received.
* It uses three-way-handshake to establish a connection.
* Ordered packets
* Reliable

UDP, on the other hand, doesn’t require a connection between the receiver and the sender, therefore, people call it “connectionless”. The UDP has many pros, such as:

* Smaller packets
* Less bandwidth
* Fast

(BasuMallick, 2022).

# References

* BasuMallick, C. (2022, April 18). *TCP vs. UDP: Understanding 10 Key Differences*. <https://www.spiceworks.com/tech/networking/articles/tcp-vs-udp/>
* *Computer Network Topologies - javatpoint*. (n.d.). www.javatpoint.com. https://www.javatpoint.com/computer-network-topologies