**NET1014 Networking Principles Group Assignment**

**Section A: Individual Work – Digital Skills**

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# **Introduction**

Communication is essential to us as it builds relationships, share experiences and connect us altogether. With the use of networks in today’s world, we are more connected than ever before. Advancements in networking technologies change the world today, with easier access to global communications, knowledge sharing and storing. This main objective is setting up VanTech’s Cyberjaya branch, First Floor, a new network infrastructure, new floor plan, necessary networking devices and an IP addressing scheme.

# **Cyberjaya Branch 1st Floor Plan**

Diagram

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**Figure 1: Floor Plan**

# **Floor Justification**

The first floor of Cyberjaya Branch consists of a reception, CTO office, branch manager office and pantry room with a connected stairway to 2nd floor. The entrance towards the first floor is the reception, with two sofas and a coffee table to accommodate clients or guests. The receptionist counter consists of devices such as a desktop setup, printers, and a phone. The branch manager’s office has a simple office table and chair setup, the devices include a desktop setup, a printer, a laptop and a smartphone. Likewise, the CTO office consists of the same office setup, the devices include a desktop setup, a printer, a laptop, and a smartphone. Since the pantry room is in the middle between the CTO office, Branch Manager office and Reception, the router, switch and wireless router are deployed there for better signal distribution by distributing the Wi-Fi signal more evenly throughout the space of the office. The office pantry room has appliances such as refrigerator, microwave, water dispenser, and a sink as well as a table and multiple chairs for employees to take breaks, socialize and eat meals. The pantry room has a staircase access to the 2nd floor.

# **Network Diagram**

Chart, diagram, radar chart

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**Figure 2: Network Diagram**

# **Justification & Analysis**

A network diagram shows the visual representation of computer architecture. It shows how network packets flow to different nodes and devices. This is the network diagram of the 1st floor office, where I used star topology. Network topology refers to the physical and logical layout of a computer network, it describes how network devices such as router, switch, and end devices are connected and how they communicate with each other. The benefits of choosing Star Topology on the 1st Floor is to provide centralized management, as it simplifies troubleshooting and maintenance, as issues can be easily solved since it will only be the central hub. It also has high scalability, as it can easily add new devices to the network compared to other topologies, such as bus and ring topology. However, the are also some disadvantages to consider such as a high dependence on the central network. If the central hub fails, the entire network can be affected as well. The cost can be considered as a disadvantage because it requires a central hub and a switch. Additionally, the cost of cabling will be higher since most devices need to be connected to the central hub. The router, switch and the wireless router act as the central hub, while the end devices such as PC, Printer, Smartphone, Laptop and Tablet are connected to the central hub. The desktop setup and the printer are connected to the switch with a copper straight through cable, while wireless devices such as smartphones, laptops and tablets are connected to the wireless router, while the wireless router are connected to the switch with a copper straight through cable.

# **Network Configuration**

Chart, radar chart

Description automatically generatedNetwork configuration refers to the process of setting up and assigning the parameters of a computer network to ensure successful connection between different devices. The configuration process involves assigning unique IP to devices, setting up network security measures and configuring network protocols. Cisco Packet Tracer is the software used to demonstrate this configuration.

**Figure 3: Network Configuration**

In the above shown network configuration, I have done configuration on one main router, one switch and one wireless router. Meanwhile, I have individually assigned IP addressing to all the end devices that are connected to the switch. I have used DHCP (Dynamic Host Configuration Protocol) to automatically provide IP addresses, subnet mask and default gateway. The default gateway is 192.168.3.1 for all devices except for wireless devices, the wireless devices default gateway is 192.168.3.3 which is IP address for the wireless router. The subnet mask used is 255.255.255.0, which allows up to 254 usable IP addresses.

# **Router Configuration**

Graphical user interface, text

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**Figure: Hostname Configuration**

Graphical user interface, application, Word

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**Figure: Banner Configuration**

**Graphical user interface, text

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**Figure: Password Configuration**

**Graphical user interface, text

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**Figure: Secret Password Configuration**

Graphical user interface, text

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**Figure: Password Encryption Configuration**

Graphical user interface, text, application

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**Figure: IP address Configuration (Router)**

# **Switch Configuration**

Graphical user interface, text, application, email

Description automatically generated

**Figure: Switch IP configuration**

# **Wireless Router Configuration**

**Graphical user interface

Description automatically generated with low confidence**

**Figure: Wireless Router Configuration**

I have configured the Router IP to 192.168.3.3 with the subnet mask 255.255.255.0. I have enabled DHCP for automatic assignment of IP address towards wireless devices. With my start IP address starting at 192.168.3.100 to prevent overlapping with other devices. With maximum user set at 50, so the IP address range is 192.168.3.100 – 149.

# **IP Assignment Addresses Configuration**

Text

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# **Demonstration**

Graphical user interface, text

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Able to ping successfully from Smartphone0 (Reception Smartphone) towards Printer2 (Branch Manager’s Printer). This shows that wireless devices can ping to connected devices.

Graphical user interface, text, application

Description automatically generated

Able to ping successfully from PC0 (Branch Manager) towards the Router0 (Main Router).

Graphical user interface, text, application

Description automatically generated

The Main Router can get data from the Smarthpone3 (Pantry Room), which shows that successful connection between the Main Router to Wireless Router to Smartphone.