GROUP PROJECT

SEMESTER 2 2021/2022

BCN2093 - NETWORK ANALYSIS & DESIGN

TITLE: NATIONAL REGISTRATION DEPARTMENT

SECTION: 01A & 01B

LECTURER NAME: DR SYAHRIZAL AZMIR BIN MD. SHARIF

GROUP MEMBERS :

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Table of Contents

1.0 EXECUTIVE SUMMARY

Our Mission

The Alpha Tech SDN. BHD (AT) which is our company, offers services related to IT and Networking Services and also provides technical support to ensure that the network can be maintained by the time. By the mean time we already have around 250 staff that have been working full time in the company. Therefore, AT will ensure that all the requirements by the client will work as requested.

The Company and Management

Alpha Tech SDN. BHD islocatedat Pekan, Pahang Malaysia . This company management is managed by the shareholder which consists of five members :-

- The Chief Executive Officer, Amysha Sofea binti Md Roslee

- The Chief Operating Officer, Muhammad Nur Aiman bin Ali

- The Chief Financial Officer, Muhammad Irfan bin Rosli

- The Chief Information Officer, Fadhlullah Suhaimi bin Ahmad Sobri

- The Chief Technology Officer, Mohammad Zaid bin Uni

Our Services

Over recent years 70% of our customers have been very satisfied with our service. Therefore, the National Registration Department(JPN) will be ensured to enjoy our current technology in implementing the network infrastructure. The Alpha Tech SDN. BHD will confirm that we will give the first class of maintenance and support to your organization.

Our Competitive Advantages

As an Alpha Tech customer, the National Registration Department(JPN) should not be worried about our service because recently our company has been adding new offers that after 2 years of service we will reduce the cost for replacement with new up-to-date and less problematic equipment.

Although, our top priority is on focusing on the quality of hardware and software design that we delivered to customers for long term of usage. Hence, the customer no need to worry about the maintainability of the network infrastructure. We also will provide our technicians monthly to ensure that everything will be working and running smoothly.

Financial Projections

Base on the asset position, liabilities position and the size of our market, the sales projections for our organization in the first year rare RM 500,000 . Therefore, we estimate that the growth rate is 15% per two years .

In addition, the budget of network implementation will be determined by the National Registration Department(JPN) itself. However, we will guide the National Registration Department(JPN) from time to time in order to satisfy their requirements.

The Network Design Implemented

The network design will be implemented in the new branch of JPN and will provide an ISP. Furthermore, the network design should be able to communicate between each floor in the same building and it also must set up a VPN for at least 30 staff who work remotely. Then, the project will help you further understand Alpha Tech SDN. BHD will be beneficial to the National Registration Department(JPN) users.

2.0 PROJECT GOAL

Our company's objective is to evaluate and improve the existing JPN network in order to improve network performance and enable it to accommodate an increase in customers and employees. In order to achieve their aim and provide their clients with exceptional service in line with the expected consumer base, more personnel are being hired. Unfortunately, the workers have a difficult time doing their jobs and frequently complain that the network connection is sluggish or that the server is unavailable. This is because the bandwidth is currently insufficient for the full staff to use the internet for travel. A network overload is the outcome of this. The problems JPN was experiencing have a remedy thanks to Alpha Tech. Alpha Tech decided to position JPN towards a few goals by setting specific priorities in order to address these problems.

1. Boost performance to give JPN great service by increasing network speed, bandwidth, and dependability.
2. Expanding the network without interfering with JPN business operations.
3. Creating a network that might increase operational efficiency.
4. Creating a network that can be made faster and more capable.
5. Expanding the JPN network to meet their needs.
6. Designing a stable infrastructure that can adapt to future requirements using the most modern technology.
7. An environment that is user-friendly, efficient, requires no technical support, is open to. performance upgrades and future expansion, and is capable of efficiently accommodating all data transmission services to the workstations.
8. Promote effective communication.
9. Providing fast network access to all floors of the main building and its annex.
10. To create a reliable telephone switching system, supply voice-cabling infrastructure.

3.0 PROJECT SCOPE

The scope of our project is to implement the network infrastructure to the National Registration Department(JPN) new branch. connection to the internet will be provided by an ISP. The company is occupying 3 floors in a building. Floor 1 is the administration part of the company. Floor2 and floor3 are the main service floors of the company. This network design consists of 100 employees and 30 staff who work remotely which has a web server, application server, VPN server and database.

1. The wireless connection can support clients and employees as much as possible, especially on the second and third floor.

2. The network will be accessed by all the employees of Registration Department(JPN) and clients, however clients can only access it by using a wireless connection.

3. The network can accommodate the increase in the number of National Registration Department(JPN)'s employees and clients in the future.

4. Analyse the performance of the upgraded network that has been implemented by doing testing in order to ensure that the network performance can be optimized by all the network users.

4.0 DESIGN REQUIREMENT

4.1 Basic Requirement

Based on the existing building plan of JPN's 3-storey buildings where;

- First Floor - Administrative Department, Information & Communication Technologies Department

- Second Floor - Identity Cards Department, Citizenship Department

- Third Floor - Record Management Department, Financing & Development Department, Human Resources Department

The building is used by up to 100 employees from various floors. All Web servers, Application servers, and databases connect to the Internet, and clients from all departments can connect to the server. The server is backed up, and clients can connect through Wi-Fi.

From one site to another, a virtual private network (VPN) is utilized to encrypt the connection between several sites within the 3-story building's private network. It is handy for delivering files over intranet networks without interfering with other departments' access to the data.

Network connections on each level provide Internet Protocol (IP) services. End devices, servers, network switches, routers, and other equipment with the necessary specifications are assessed and distributed based on the requirements of each department.

4.2 TECHNICAL REQUIREMENTS

Equipment	Description
Database server	A server that runs a database application and provides database services to all computers linked to the national registration building.
Web server	Use (Hypertext Transfer Protocol (HTTP) protocol that is used to host websites to serve the client that is placed in floor 1.
Application server	A server that hosts software or software that provides a business application via TCP/IP protocol.
Printer	For the employees to create a document on paper.
ISP	Provides internet connectivity across the national registration building
Firewall	Network security device that monitors and filters incoming and outgoing network traffic in accordance with security policies of the national registration department.
VPN server	Provide access to the department website for the employees that are working remotely.

Switches	A wired network device used to connect other devices in the national registration building via Ethernet cables.
Multilayer Switch	Possesses 24 Fibre Channel ports capable of 4, 2, and 1 Gbps speeds
Access Point	Creates a wireless local area network, or WLAN, for the employees and customers in national registration building.
Personal Computers	For the employees to perform their task.
Router	A device connects two or more packet-switched networks or subnetworks.
VPN router	A router with a VPN that has been set up for remote workers.
IP phone	A phone system that sends and receives voice data via the internet.

5.0 Logical Design

The figure below shows the logical design for the network infrastructure of the new branch for the National Registration Department. In the building, there are 7 different departments that will be split in three floors. Each department will be assigned with a printer that they can use. There will be a wireless router or access point in each floor for the people in the building to access the internet through their wireless devices.

The servers and routers will be stored in the Information & Communication Technologies Department. The servers used in the building are DHCP Server, TP & FTP Server, and DNS & HTTP Server. The building used these servers because the National Registration Department would want to have its own email domain and service, dynamic device addressing, and its website housed on a server that it owns.

The routers will be used for transferring and separating the network connections for each floor. Therefore, three routers will be needed as there are three floors in the building.

The main internet connection that will be coming from the ISP will pass through a firewall server before entering the main switch in the Information & Communication Technologies Department, which will distribute the internet connections to the other departments in the building.

Each floor will be assigned with three different IP addresses. The IP addresses will be private IPv4 addresses using Class C since it is used within a private network to connect securely to other devices. Router 01 will use the IP **192.168.10.0/24.** Router 02 will use **192.168.20.0/24**. Router 03 will use **192.168.30.0/24.** Each department in each floor will use different subnet masks for their IP addresses.

Therefore, the network addresses for each department will be:-

Floor 1: **192.168.10.0/24**

  Administrative Department: **192.168.10.0/26**

  Information & Communication Technologies Department: **192.168.10.64/26**

Floor 2: **192.168.20.0/24**

  Identity Cards Department: **192.168.20.0/26**

  Citizenship Department: **192.168.20.64/26**

Floor 3: **192.168.30.0/24**

  Record Management Department: **192.168.30.0/26**

  Financing & Development Department: **192.168.30.64/26**

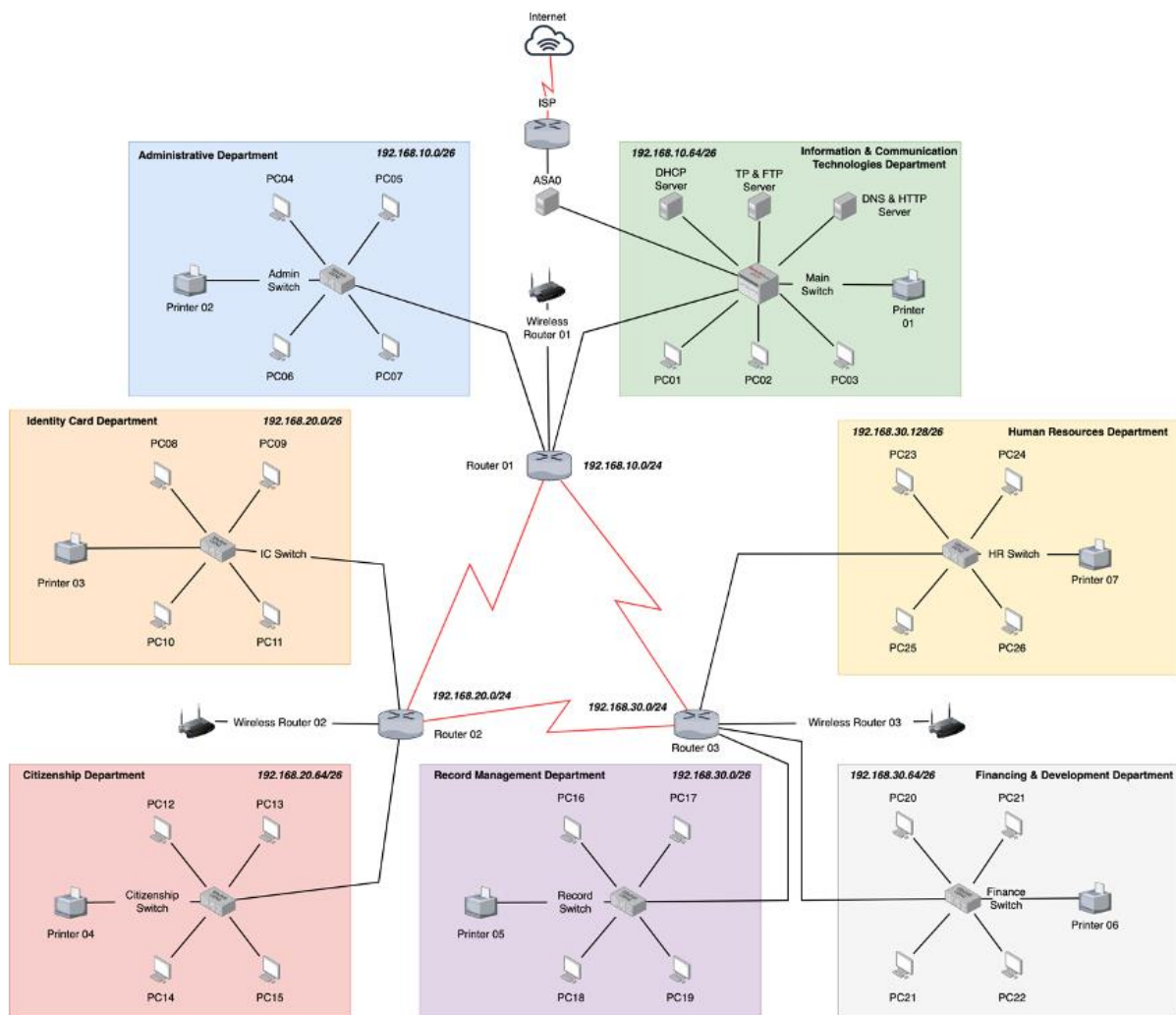 Human Resources Department: **192.168.30.128/26**

Figure 1.1: Logical Design for National Registration Department

6.0 Physical Design

The figure below shows the physical design for the network infrastructure of the new branch for the National Registration Department. The departments that are placed in the first floor are the Information & Communication Technologies Department, and the Administrative Department. The servers and routers for the building will be in the Information & Communication Technologies Department. There is an access point located in the middle of the floor so that both the Information & Communication Technologies Department, and the Administrative Department can access the internet with ease. The internet connection from the ISP will come from the first floor into the main switch in the Information & Communication Technologies Department. The network in this floor can service at least 20 employees which will dynamically assigned from the DHCP server.

The second floor will be for the Identity Card Department, and the Citizenship Department. Similar to the first floor, the access point for the second floor is located in the middle of the floor so the employees from both departments can easily access the internet. The network in this floor can service at least 30 employees.

There are three department in the third floor which are the Record Management Department, Financing & Development Department, and the Human Resources Department. The access point for this floor is located near the Financing & Development Department since it between the Record Management Department, and the Human Resources Department. The network in this floor can service at least 50 employees.

A router and a printer is assigned in each department. Therefore, the number of routers and printers in each floor are:-

First floor   : 2 switches, 2 printers

Second floor   : 2 switches, 2 printers

Third floor   : 3 switches, 3 printers
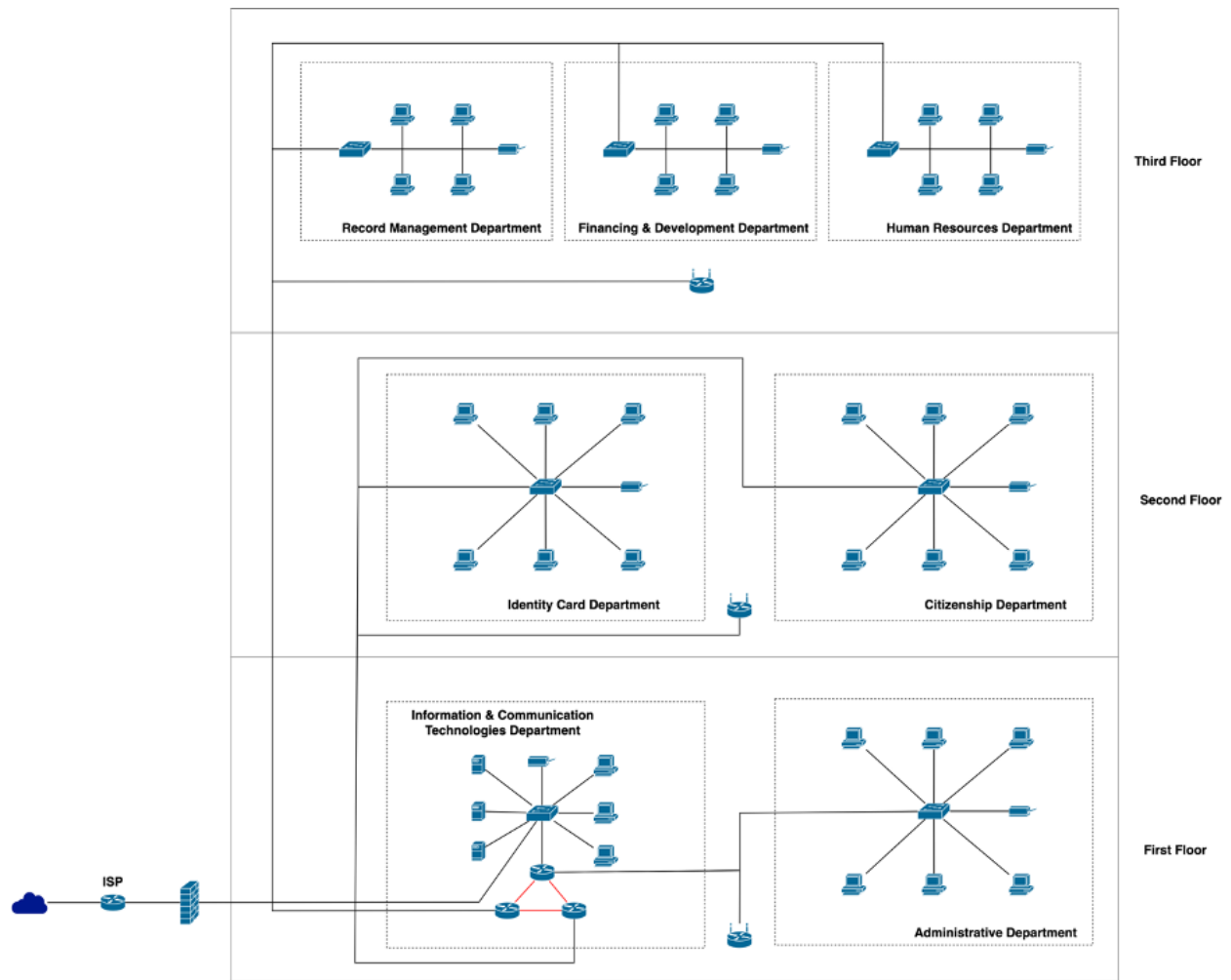
Figure 1.2: Physical Design for National Registration Department

7.0 Topology Diagram

The network structure of the National Registration Department resembles a tree topology which has nodes that are connected to one another in a hierarchy. A tree topology is also known as hierarchical topology since all of the elements in this topology are organised like the branches of a tree. Similar topologies include the star and bus topologies. Data in databases and workstations in corporate networks are frequently organised using tree topologies.

Based on this information, each department has its own unique databases. Therefore, each department is a series of unique nodes or branches that are connected to the routers. The routers then connected to the main branch which comes from the main switch in the Information & Communication Technologies Department. This department can be considered the main branch in topology since it is important as it the connected to the internet through the ISP.
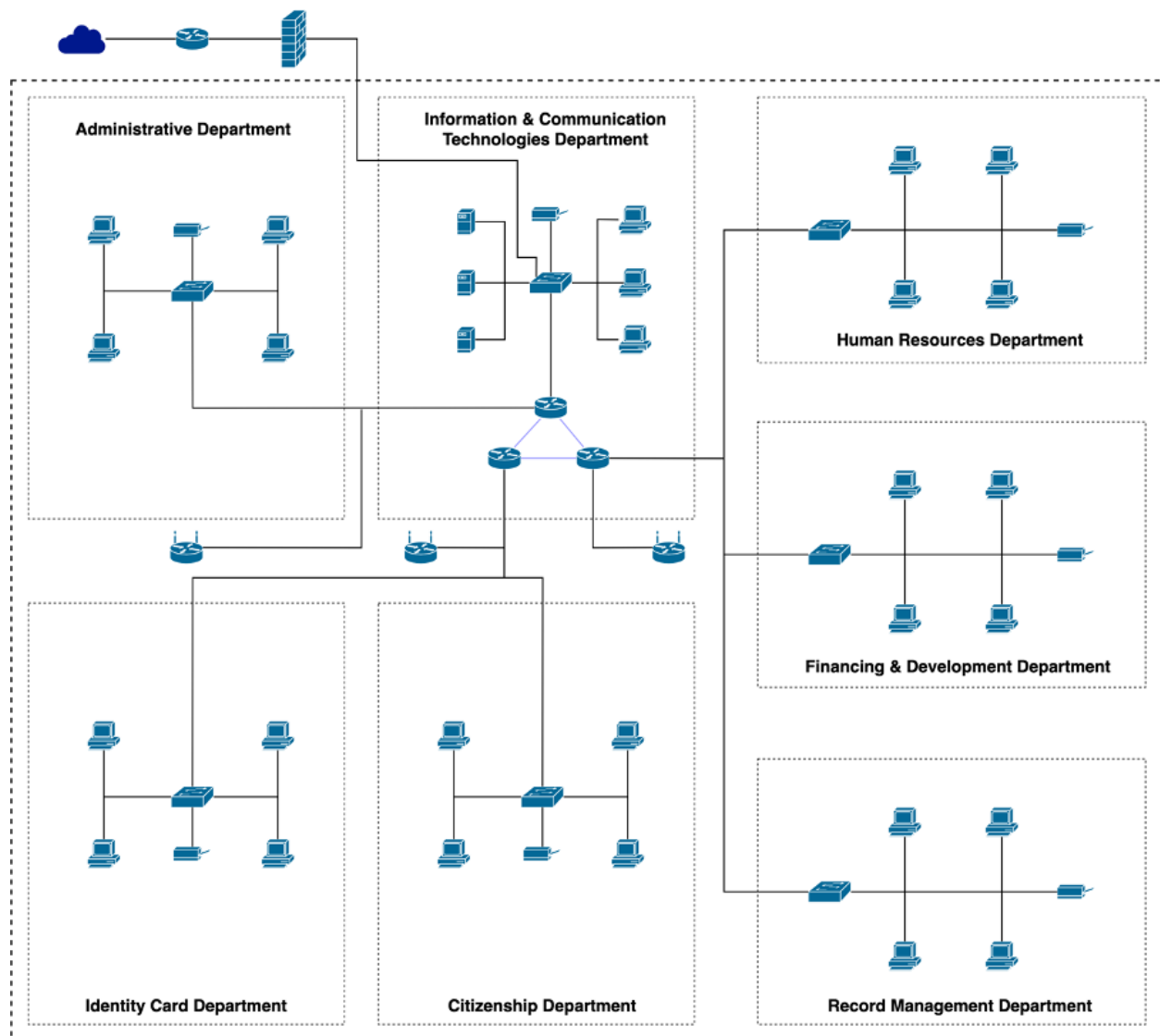
Figure 1.3: Topology Diagram for National Registration Department

8.0 TCP/IP network design

Device	Address	Interface	Subnet Mask	Default Gateway
VPN Router	192.168.1.1	G0/0	255.255.255.0	N/A
Router 01	192.168.3.1	S0/2/0	255.255.255.252	N/A
	192.168.4.1	S0/2/1	255.255.255.252	N/A
	192.168.10.0	G0/0/0	255.255.255.128	N/A
	192.168.10.130	G0/0/1	255.255.255.128	N/A
Router 02	192.168.5.1	S0/2/0	255.255.255.252	N/A
	192.168.6.1	S0/2/1	255.255.255.252	N/A
	192.168.20.0	G0/0/0	255.255.255.128	N/A
	192.168.20.130	G0/0/1	255.255.255.128	N/A
Router 03	192.168.7.1	S0/2/0	255.255.255.252	N/A
	192.168.8.1	S0/2/1	255.255.255.252	N/A

	192.168.30.0	G0/0/0	255.255.255.224	N/A
	192.168.30.32	G0/0/1	255.255.255.224	N/A
	192.168.30.64	G0/0/2	255.255.255.224	N/A
Lightweight Access Point1	192.168.110.0	Fa0/12	255.255.255.0	N/A
Admin Department Switch 1	192.168.	Fa0/1	DHCP	N/A
It Department Switch 1	10.21.23.20	Fa0/2	255.255.255.0	N/A
Lightweight Access Point2	192.168.120.0	Fa0/12	255.255.255.0	N/A
Identity Cards Department Switch 1	DHCP	Fa0/1	DHCP	N/A
Citizenship Department Switch2	10.21.23.20	Fa0/2	255.255.255.0	N/A

Lightweight Access Point3	192.168.130.0	Fa0/12	255.255.255.0	N/A
Record Management Department Switch 1	DHCP	Fa0/1	DHCP	N/A
Financing & Development Department Switch 2	DHCP	Fa0/2	DHCP	N/A
Human Resources Department Switch 3	DHCP	Fa0/3	DHCP	N/A
VPN Server	DHCP	Fa0/8	DHCP	DHCP
DNS & HTTP Server	DHCP	Fa0/12	DHCP	DHCP

Database Server	DHCP	Fa0/7	DHCP	DHCP
TP & FTP server	DHCP	Fa0/8	DHCP	DHCP
DHCP server	DHCP	Fa0/9	DHCP	DHCP
Print server	DHCP	Fa0/10	DHCP	DHCP

9.0 Router configuration (LAN, Default route, access control lists, IP Helper address)

ROUTER 1

Router>enable

Router#configure terminal

Router01(config)#hostname Router01

Router01(config)#interface g0/0/0

Router01(config-if)#ip address 192.168.10.1 255.255.255.0

Router01(config-if)#no shutdown

Router01(config-if)#exit

Router01(config)#interface serial 0/2/0

Router01(config-if)#ip address 192.168.3.1 255.255.255.252

Router01(config-if)#no shutdown

Router01(config-if)#exit

Router01(config)#interface serial 0/2/1

Router01(config-if)#ip address 192.168.4.1 255.255.255.252

Router01(config-if)#clock rate 64000

Router01(config-if)#no shutdown

Router01(config-if)#exit

Router01(config)#ip route 192.168.20.0 255.255.255.0 192.168.5.1

Router01(config)#ip route 192.168.20.128 255.255.255.128 192.168.5.1

Router01(config)#ip route 192.168.30.0 255.255.255.0 192.168.7.1

ROUTER 2

Router>enable

Router#configure terminal

Router02(config)#hostname Router02

Router02(config)#interface g0/0/0

Router02(config-if)#ip address 192.168.20.1 255.255.255.128

Router02(config-if)#no shutdown

Router02(config-if)#exit

Router02(config)#interface g0/0/1

Router02(config-if)#ip address 192.168.20.130 255.255.255.128

Router02(config-if)#no shutdown

Router02(config-if)#exit

Router02(config)#interface serial 0/2/0

Router02(config-if)#ip address 192.168.5.1 255.255.255.252

Router02(config-if)#clock rate 64000

Router02(config-if)#no shutdown

Router02(config-if)#exit

Router02(config)#interface serial 0/2/1

Router02(config-if)#ip address 192.168.6.1 255.255.255.252

Router02(config-if)#no shutdown

Router02(config-if)#exit

Router02(config)#ip route 192.168.10.0 255.255.255.128 192.168.4.1

Router02(config)#ip route 192.168.10.128 255.255.255.128 192.168.4.1

Router02(config)#ip route 192.168.30.0 255.255.255.0 192.168.8.1

ROUTER 3

Router>enable

Router#configure terminal

Router03(config)#hostname Router03

Router03(config)#interface g0/0/0

Router03(config-if)#ip address 192.168.30.1 255.255.255.0

Router03(config-if)#no shutdown

Router03(config-if)#exit

Router03(config)#interface serial 0/2/0

Router03(config-if)#ip address 192.168.7.1 255.255.255.252

Router03(config-if)#clock rate 64000

Router03(config-if)#no shutdown

Router03(config-if)#exit

Router03(config)#interface serial 0/2/1

Router03(config-if)#ip address 192.168.8.1 255.255.255.252

Router03(config-if)#no shutdown

Router03(config-if)#exit

Router03(config)#ip route 192.168.10.0 255.255.255.128 192.168.3.1

Router03(config)#ip route 192.168.10.128 255.255.255.128 192.168.3.1

Router03(config)#ip route 192.168.20.0 255.255.255.128 192.168.6.1

Router03(config)#ip route 192.168.20.128 255.255.255.128 192.168.6.1

10.0 Proposed network security and network management strategies

10.1 Proposed network security

To secure the National Registration Department's network, the following measures should be implemented:

➢ Authorized Access Control: Ensure that only approved users can access the network and its resources by utilizing strong authentication methods.

➢ Firewall Deployment: Implement a firewall to defend against cyberattacks and restrict unauthorized access.

➢ Data Encryption: Employ encryption techniques such as SSL and TLS to secure data during transmission and storage.

➢ Anti-Virus and Anti-Malware: Install and frequently update anti-virus and anti-malware software to detect and eliminate cyber threats.

➢ Vulnerability Analysis and Penetration Testing: Regularly perform vulnerability analysis and penetration testing to recognize and resolve security weaknesses.

➢ Network Division: Divide the network into smaller sub-networks to minimize the impact of potential threats.

➢ Software and Firmware Updates: Keep software and firmware up-to-date by installing the latest security patches and upgrades.

➢ Data Backup and Recovery Plan: Develop a data backup and recovery plan to ensure the availability and security of critical data.

➢ Employee Training: Provide employees with training on cybersecurity best practices, such as avoiding phishing scams and using strong passwords.

➢ Regular Security Audits: Conduct regular security audits to monitor network activity and detect potential security breaches.

10.2 Network management strategies

The National Registration Department may adopt the following strategies to secure and optimize its network performance:

- Segmentation of the network into different sections for different user groups, departments, and functions, for better security and control.

- Implementation of secure access control through the use of authentication methods like usernames/passwords, firewalls, and security protocols.

- Continuous monitoring of network activities and performance to promptly identify and resolve any issues.

- Regular maintenance and optimization of network devices to improve performance and minimize downtime.

- Development of a disaster recovery plan to guarantee the availability of critical network resources during disruptions or emergencies.

- Installation of security measures such as firewalls, anti-virus/anti-malware, encryption, and intrusion detection systems to protect the network from cyber-attacks.

- Updating network hardware and software regularly to enhance performance, fix bugs, and address security vulnerabilities.

11.0 Hardware List

Equipment Type	Equipment Name	Specs	Quantity
Server	Dell PowerEdge R7525 Rack Server	RAM: Up to 4TB Octa rank LRDIMM (32 sockets) Storage: Up to 12 x 3.5", 16 2.5", 24x 2.5" NVMe CPU: Up to two AMD EPYC 7002 series processors Power: up to two AC or DC PSUs	3
Switch	Cisco switch C1000-48P-4G-L	48x 10/100/1000 Ethernet PoE+ and 370W PoE budget ports, 4x 1G SFP uplinks	6
Main Switch	Cisco Catalyst 9606R	48 x Gigabit SFP , OSPF, IS-IS, RIP-2, BGP, EIGRP, IGMP,	1

		VRRP,PIM-SM, PIM-SSM, MSDP, RIPng, MPLS, MSTP	
Firewall	CISCO ASA5508-K9	8*GE ports, 1GE Mgmt, AC, 3DES/AES, AVC, FirePower, FireSIGHT	1
Router	Cisco ISR 4221	35Mbps-75Mbps system throughput, 2 WAN/LAN ports, 1 SFP port, multi-Core CPU,2 NIM	3
Wireless Access Point	Cisco Catalyst 9130 WiFi 6 Access Point	Wi-Fi 6 certified, supporting 802.11ax on both 2.4-GHz and 5-GHz bands PoE ready	3

Printer	HP OfficeJet Pro 8020 All-in-One Printer	Print, Copy, Scan and Fax, ADF, Duplex Print speed up to 22 ppm (black) and 18 ppm (color) USB, Ethernet, Wi-Fi, RJ-11 modem ports	7
Personal Computer	DELL OptiPlex 3000 Small Form Factor (3779.00)	CPU intel i5-12500, Windows 11 Pro, Intel® Integrated Graphics, 16 GB DDR4 ram, 256GB SSD	100
Cable	Cat 6 UTP cable	100m length per box	20
VPN Router	Cisco Meraki Go Plus GX50 Firewall	Recommended Number Of Clients:50, Firewall Protection, Dhcp	1

		Support, Port Forwarding, Vpn Client, Router Mode, Security Slot	

12.0 Implementation plan

The Stage of The Project		(December 2022 - March 2023)														
		Weeks														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Site Survey	The inspection of a location to collect information.	█														
Procurement	Procurement of equipment, materials, and software	█	█													
Cabling	Installation and testing of network cabling.			█	█											
Accommodation	Installation of racks and cabinets.				█	█	█									

Task	Description														
Network Hardware Installation	Installation, configuration and testing of network hardware.						▓	▓	▓						
End-User Equipment Installation	Installation, configuration and testing of network servers, workstations, network printers and peripheral devices							▓	▓						
Operating System Installation	Installation, configuration and testing of operating systems on network servers and workstations.								▓						
Application Installation	Installation, configuration and testing of application software on network								▓						

Task	Description													
	application servers and workstations.								▓					
Network File System	Creation and testing of network file systems.								▓					
Domain Structure	Creation and testing of domain structure (directory services).									▓				
Network Accounts	Creation and testing of user and group network accounts.									▓				
Network Services	Setup and testing of network services.									▓				
Data Transfer	Transfer and verification of data from existing to new system.									▓	▓			

User Training	Train the client to develop sufficient skill in operating the client's website and software.																		
System Testing	To evaluate the user login, data access, networked applications, network services, backup and restore processes, network services, network security, and UPS functionality.																		

13.0 Project budget

Equipment Type	Equipment Name	Specs	Quantity	RM	Total(RM)
Server	Dell PowerEdge R7525 Rack Server	RAM: Up to 4TB Octa rank LRDIMM (32 sockets) Storage: Up to 12 x 3.5", 16 2.5", 24x 2.5" NVMe CPU: Up to two AMD EPYC 7002 series processors Power: up to two AC or DC PSUs	3	RM 35,688.53	RM107,065.59
Switch	Cisco switch C1000-48P-4G-L	48x 10/100/1000 Ethernet PoE+ and 370W PoE budget ports, 4x 1G SFP uplinks	6	RM7,537.14	RM45,222.84

Main Switch	Cisco Catalyst 9606R	48 x Gigabit SFP , OSPF, IS-IS, RIP-2, BGP, EIGRP, IGMP, VRRP,PIM-SM, PIM-SSM, MSDP, RIPng, MPLS, MSTP	1	RM33,990.86	RM33,990.86
Firewall	CISCO ASA5508-K9	8*GE ports, 1GE Mgmt, AC, 3DES/AES, AVC, FirePower, FireSIGHT	1	RM7,115.84	RM7,115.84
Router	Cisco ISR 4221	35Mbps-75Mbps system throughput, 2 WAN/LAN ports, 1 SFP port, multi-Core CPU,2 NIM	3	RM6,719.81	RM20,159.43
Wireless Access Point	Cisco Catalyst 9130 WiFi 6 Access Point	Wi-Fi 6 certified, supporting 802.11ax on both 2.4-GHz and 5-GHz bands PoE ready	3	RM6,521.80	RM19,565.40

Printer	HP OfficeJet Pro 8020 All-in-One Printer	Print, Copy, Scan and Fax, ADF, Duplex Print speed up to 22 ppm (black) and 18 ppm (color) USB, Ethernet, Wi-Fi, RJ-11 modem ports	7	RM886.00	RM6202.00
Personal Computer	DELL OptiPlex 3000 Small Form Factor (3779.00)	CPU intel i5-12500, Windows 11 Pro, Intel® Integrated Graphics, 16 GB DDR4 ram, 256GB SSD	100	RM3779.00	RM377,900
Cable	Cat 6 UTP cable	100m length per box	20	RM199.00	RM3980.00
VPN Router	Cisco Meraki Go Plus GX50 Firewall	Recommended Number Of Clients:50, Firewall Protection, Dhcp	1	RM1627.99	RM1627.99

		Support, Port Forwarding, Vpn Client, Router Mode, Security Slot			
				Total	RM622,829.95

14.0 A training plans

A Training Plan is a crucial component of an organization's overall strategy for employee development and growth. It outlines the goals and objectives of the training program, the audience it targets, the methods and techniques used for instruction, and the resources required for its implementation. The Training Plan also includes a timeline for completion, evaluation criteria for measuring its effectiveness, and a budget for expenses related to training materials, instructors, and other costs.

The purpose of a Training Plan is to ensure that employees have the necessary skills and knowledge to perform their job duties effectively. It provides a roadmap for the training program and helps to ensure that the training is well-organized and delivered consistently to all participants. The plan is also a valuable resource for management and stakeholders to understand the scope and impact of the training program, and to track progress towards achieving the goals and objectives outlined in the plan.

Overall, the Training Plan is an important tool that supports a company's growth and success by providing employees with the skills and knowledge they need to perform their job functions effectively. It also helps to align training efforts with the company's overall goals and objectives, and to ensure that resources are allocated efficiently and effectively.

15.0 Support and services information

We have partnered with Cisco Systems Malaysia to provide additional support to your organization. Our partnership with Cisco Systems Malaysia offers a range of benefits to your organization. As a leading player in the IT and networking industry, Cisco has a wealth of expertise and experience in creating, manufacturing, and distributing networking hardware, solutions, and services. With our partnership, we aim to provide a comprehensive suite of support services to help your organization succeed. As a leading company in the IT and networking sector, Cisco creates, manufactures, and distributes networking hardware, solutions, and services. This support is available to you around the clock, ensuring that you can resolve any issues quickly and effectively. Through this partnership, we are able to offer:

a) Technical support for issues related to software downloads, network failures, licensing support, entitlement services, and other technical challenges.

b) Training and Certification opportunities for students and instructors. Students can enroll in courses offered by Cisco covering subjects such as networking, cabling, and wiring. Instructors can also receive post-exam certification services and specialized training in networking through partner certifications to enhance their knowledge and expertise in the field.

With the technical assistance and training provided by Cisco, we are confident that they will be able to address your organization's needs and provide the solutions and services you require. Overall, our partnership with Cisco Systems Malaysia is designed to help your organization succeed by providing technical support, training and certification opportunities, and a range of other services and solutions. We believe that by leveraging the expertise and resources of both our organizations, we can provide you with the support you need to thrive in today's fast-paced and ever-changing business environment.

16.0 Appendices

Company Name: Alpha Tech SDN. BHD

Contact Number: 010-8167357

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