**TASK 1 – Installation, operation and troubleshooting a medium enterprise router – Site #1**

**Case Scenario**

Using Cisco Packet Tracer, design a network that includes a minimum of two routers and three switches. One of the routers should be configured as a gateway for internet connectivity, using the ADSL service.

Your task is to divide the network XX.XX.0.0/23 into three subnets, each designated for different departments:

- Product Development : 150 staff members
- Marketing : 80 staff members
- IT & Admin : 25 staff members

*Note: You will need to create an additional subnet for any link between two routers.*

Each staff member will have their own PC connected to the network. Replace "XX.XX" with the appropriate portion of your student ID. For example, if your student ID is DAN1205, you would use the 12.5.0.0/23 network for this task.

Security Requirements:

1. The Product Development and Marketing subnets must be isolated from the IT & Admin subnet.
2. The IT & Admin subnet must have access to all other subnets.
3. Configure usernames and passwords for your routers.
4. Implement a TACACS+ server to manage AAA (Authentication, Authorization, and Accounting) across all routers.

**Resources**

Cisco Packet Tracer: https://skillsforall.com/course/getting-started-cisco-packet-tracer?courseLang=en-US

**Deliverables**

**Your document must include**

1. **PLAN**
    a. Introduction
    b. Description of the network devices that you will use in your implementation
    c. The proposed topology of your network (screenshot the Logical Workspace shown on your Cisco Packet Tracer)

d. The design of your classless IP addressing scheme. For **each subnet**, provide the following information:
   - Total IP addresses needed
   - Network Address
   - Broadcast Address
   - Range of Usable IP address
   - Subnet Mask (CIDR)

e. Provide a detailed IP address table for all of Routers, PCs, and Servers you will use in your implementation. For staff PCs, you are allowed to indicate certain range of IP address is used for a certain range of staffs (see the table below for example).

| Device Name | IP Address | Subnet Mask | Username | Password |
|---|---|---|---|---|
| <Department>-<StaffNumber> | | | | |
| Example-1<br>To<br>Example-10 | 12.5.0.1<br>to<br>12.5.0.10 | 255.255.255.240 | | |

*(remember the name of your devices must match the name in the topology)*

You will also need to assign username and password for your Routers. Please also mention which interface of the Router the IP address will be assigned to.

**2. IMPLEMENTATION**

a. Screenshot of your configuration, **crop** your screenshot making sure all the **relevant information is captured** and make a small comment of what the screenshot is about (You must take screenshot of the configuration process. The "#show run" command can be used in the testing phase)

b. First, setup all the basic configuration settings (HOSTNAME, IP ADDRESS…ETC)

c. Second, test all the basic configuration works and that you have proper connectivity in your network and to the ISP

d. Third, implement the security features you proposed in your PLAN and test them.

**3. CONCLUSION**

a. In your conclusion include any problems you may include and the troubleshooting process you follow to solve them.

**4. REFERENCING**

a. The Referencing requirements have changed, please follow the link below for more information https://www.danford.edu.au/wp-content/uploads/2021/02/Guidelines-for-Referencing.pdf

**TASK 2 - Installation, operation and troubleshooting a medium enterprise router – Site #2**

**Case Scenario**

Using Cisco Packet Tracer, design a network that includes a minimum of two routers and four switches. One of the routers should be configured as a gateway for internet connectivity, using the ADSL service. Your task is to divide the network XX.XX.0.0/23 into four subnets, each designated for different departments:

- Product Development : 150 staff members
- Marketing : 80 staff members
- Finance : 50 staff members
- IT & Admin : 20 staff members

*Note: You will need to create an additional subnet for any link between two routers.*

Each staff member will have their own PC connected to the network. Replace "XX.XX" with the appropriate portion of your student ID. For example, if your student ID is DAN1205, you would use the 12.5.0.0/23 network for this task.

Security Requirements:

1. The Product Development, Marketing, and Finance subnets must be isolated from the IT & Admin subnet.
2. The IT & Admin subnet must have access to all other subnets.
3. Configure usernames and passwords for your routers.
4. Implement a TACACS+ server to manage AAA (Authentication, Authorization, and Accounting) across all routers.

**Deliverables**

**Your document must include**

1. **PLAN**
    a. Introduction
    b. Description of the network devices that you will use in your implementation
    c. The proposed topology of your network (screenshot the Logical Workspace shown on your Cisco Packet Tracer)
    d. The design of your classless IP addressing scheme. For **each subnet**, provide the following information:
        - Total IP addresses needed
        - Network Address

- Broadcast Address
- Range of Usable IP address
- Subnet Mask (CIDR)

e. Provide a detailed IP address table for all of Routers, PCs, and Servers you will use in your implementation. For staff PCs, you are allowed to indicate certain range of IP address is used for a certain range of staffs (see the table below for example).

| Device Name | IP Address | Subnet Mask | Username | Password |
|---|---|---|---|---|
| <Department>-<StaffNumber> | | | | |
| Example-1<br>To<br>Example-10 | 12.5.0.1<br>to<br>12.5.0.10 | 255.255.255.240 | | |

*(remember the name of your devices must match the name in the topology)*

You will also need to assign username and password for your Routers. Please also mention which interface of the Router the IP address will be assigned to.

## 2. IMPLEMENTATION

a. Screenshot of your configuration, **crop** your screenshot making sure all the **relevant information is captured** and make a small comment of what the screenshot is about (You must take screenshot of the configuration process. The "#show run" command can be used in the testing phase)

b. First, setup all the basic configuration settings (HOSTNAME, IP ADDRESS…ETC)

c. Second, test all the basic configuration works and that you have proper connectivity in your network and to the ISP

d. Third, implement the security features you proposed in your PLAN and test them.

## 3. CONCLUSION

a. In your conclusion include any problems you may include and the troubleshooting process you follow to solve them.

## 4. REFERENCING

a. The Referencing requirements have changed, please follow the link below for more information https://www.danford.edu.au/wp-content/uploads/2021/02/Guidelines-for-Referencing.pdf