Group Assignment 3 - Group Lab Activity 3

TNE10006/TNE60006 S1 2022

Assignment Weight:

5%

Assignment Points:

50

Submission Due Date:

Before Week 12 Lab Session

Reference Material:

- Sample Final Practical Assessment (available in Canvas Lab Sessions page, Week 11 tab)

Instructions:

1. Form a group of 3-4 people amongst the students present in the lab session

2. Your group discussion time will be in the last 20 minutes of the lab session in Collaborate Ultra, Breakout groups.

3. Discuss and answer the questions in Group Assignment 3 in your breakout group.

4. Organise for your group to meet again to complete all the questions.

5. Each group will submit one completed Group Assignment 3

6. Submit Group Assignment 3, in the Canvas shell, under the Group Lab Activity 3

7. Late penalties will apply for submission after the due date.

Group Assignment 3 Questions:

- Section 1: Sample Final Practical Assessment Configuration (30 marks)
- Section 2: Sample Final Practical Assessment Verification and Troubleshooting (20 marks)

Group Assignment 3:

Group Members	
Name	**Student Id:**
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Section 1: Sample Final Practical Assessment Configuration (30 marks)

Refer to the Sample Final Practical Assessment.

Q1. List the configuration commands required to complete **Task 1: Configure Device Names and MOTD**. For each command, specify the device(s) and operation mode. (1 mark)

NOTE:

The current device name will be **NameOfTheDevice** and the name that will be changed will be **ChangedNameOfTheDevice**.

Operation mode will be specified in line with:

> stands for User EXEC mode.

stands for Privileged EXEC mode.

NameOfTheDevice(config)# stands for Configuration mode.

NameOfTheDevice(config-if)# stands for Interface Configuration mode.

NameOfTheDevice(config-line)# stands for Line Configuration mode.

With that being declared we will move onto our Assignment.

To configure hostname:

```
NameOfTheDevice> en
NameOfTheDevice# conf t
NameOfTheDevice(config)# hostname ChangedNameOfTheDevice
```

To configure MOTD:

```
NameOfTheDevice(config)# banner motd #MESSAGE#
```

Q2. List the configuration commands required to complete **Task 2: Configure VLANs and VLAN membership**. For each command, specify the device(s) and operation mode. (4 marks)

IP Calculation for this topology:

55.252.16.240/28 has 16 subnets each has 16 IP and only 14 usable for each.
=> 55.252.16.241 -> 55.252.16.254 (Usable hosts) So we will use 55.252.16.254 for VLAN 150.

165.45.160.0/19 has 8 subnets each has 8192 IP and only 8190 usable for each.
=> 165.45.160.1 -> 165.45.191.254 (Usable hosts) So we will use 165.45.191.254 for VLAN 50.

213.17.144.128/25 has 2 subnets each has 128 IP and only 126 usable each.
=> 213.17.144.129 -> 213.17.144.254 (Usable hosts) So we will use 213.17.44.254 for VLAN 15.

To ensure that all VLANs exist on Tokyo and Lisbon:

```
Tokyo(config)# vlan 15

Tokyo(config)# name Centralbank

Tokyo(config)# vlan 50

Tokyo(config)# name Royalmint

Tokyo(config)# vlan 150

Tokyo(config)# name Management


Lisbon(config)# vlan 15

Lisbon(config)# name Centralbank

Lisbon(config)# vlan 50

Lisbon(config)# name Royalmint

Lisbon(config)# vlan 150

Lisbon(config)# name Management
```

To configure gi1/0/1-3 access port for Centralbank and gi1/0/11-13 access ports for Royalmint on Lisbon

```
Lisbon(config)# int range gi1/0/1-3

Lisbon(config-if-range)# switchport mode access

Lisbon(config-if-range)# switchport access vlan 15
```

```
Lisbon(config)# int range gi1/0/11-13

Lisbon(config-if-range)# switchport mode access

Lisbon(config-if-range)# switchport access vlan 50
```

To disable all unused ports in Lisbon:

```
Lisbon(config)# int range gi1/0/4, gi1/0/7-10, gi1/0/14-24, gi1/1/1-4

Lisbon(config-if-range)# shutdown
```

Q3. List the configuration commands required to complete **Task 3: Configure Router-on-a-Stick**. For each command, specify the device(s) and operation mode. (6 marks)

To make sure that Nairobi is the default gateway for all VLANs and the default gateway IP for all VLANs must be the last usable IP:

```
Nairobi(config)# int gi0/0/1

Nairobi(config-if)# no shutdown


Nairobi(config-if)# int gi0/0/1.15

Nairobi(config-if)# ip address 213.17.44.254 255.255.255.128

Nairobi(config-if)# description Connection to VLAN 15

Nairobi(config-if)# encapsulation dot1q 15


Nairobi(config-if)# int gi0/0/1.50

Nairobi(config-if)# ip address 165.45.191.254 255.255.255.240

Nairobi(config-if)# description Connection to VLAN 50

Nairobi(config-if)# encapsulation dot1q 50


Nairobi(config-if)# int gi0/0/1.150
```

```
Nairobi(config-if)# ip address 55.252.16.254 255.255.240.0

Nairobi(config-if)# description Connection to VLAN 150

Nairobi(config-if)# encapsulation dot1q 150


Tokyo(config)# ip default-gateway 55.252.16.254

Tokyo(config)# int gi1/0/11,gi1/0/5-6

Tokyo(config-if)# switchport mode trunk


Lisbon(config)# ip default-gateway 55.252.16.254

Lisbon(config)# int gi1/0/5-6

Lisbon(config-if)# switchport mode trunk
```

==To configure Loopback0 with IP address 53.15.30.33/29==

```
Nairobi(config-if)# int lo0

Nairobi(config-if)# ip address 53.15.30.33 255.255.255.248

Nairobi(config-if)# description Loopback
```

Q4. List the configuration commands required to complete **Task 4: Configure Switch Management**. For each command, specify the device(s) and operation mode. (6 marks)

==To make sure that the Management IP on Tokyo and Lisbon are correctly done and configured:==

Tokyo is second-last usable of Management => 55.252.16.253
Lisbon is third-last usable of Management => 55.252.16.252

```
Lisbon(config)# int vlan 150

Lisbon(config)# ip address 55.252.16.252 255.255.240.0


Tokyo(config)# int vlan 150

Tokyo (config)# ip address 55.252.16.253 255.255.240.0
```

To configure SSH on Lisbon:

```
Lisbon(config)# ip domain-name ccna.lab

Lisbon(config)# crypto key generate rsa general-key modulus 1024

Lisbon(config)# username cisco privilege 15 cisco

Lisbon(config)# line vty 0 15

Lisbon(config)# transport input ssh

Lisbon(config)# login local
```

Q5. List the configuration commands required to complete **Task 5: Fine-tune STP**. For each command, specify the device(s) and operation mode. (4 marks)

To make sure that Tokyo is the root bridge of Royalmint and Lisbon is the root bridge of Centralbank:

In my topology:

+**Tokyo: 00D0.BAE5.B374**
-VLAN1: 32769
-VLAN15:32783
-VLAN50:32818
-VLAN150:32918

+**Lisbon: 0030.F2B8.3423**
-VLAN1:32769
-VLAN15:32783
-VLAN50:32818
-VLAN150:32918

=> With lower MAC address, **Lisbon is currently the root in all VLANs**

If Tokyo want to be the root bridge for Royalmint, then change the priority of Tokyo in VLAN 50 to 4096 (or lower than that of Lisbon).

```
Tokyo(config)# spanning-tree vlan 50 priority 4096
```

Lisbon is already root for all VLANs so no configuration is needed.

To make all access ports in Lisbon portfast:

```
Lisbon(config)# spanning-tree portfast default
```

Q6. List the configuration commands required to complete **Task 6: Configure Port-Security.** For each command, specify the device(s) and operation mode. (4 marks)

To perform port security on Gi1/0/3:

```
Lisbon(config)# int gi1/0/3

Lisbon(config-if)# switchport port-security

Lisbon(config-if)# switchport port-security maximum 2

Lisbon(config-if)# switchport port-security violation protect

Lisbon(config-if)# switchport port-security mac-address sticky
```

Q7. List the configuration commands required to complete **Task 7: Configure EtherChannel**. For each command, specify the device(s) and operation mode. (4 marks)

To bundle links between Tokyo and Lisbon, assigning native VLAN for the etherchannel to VLAN 150, and use LACP as the aggregation protocol:

```
Lisbon(config)# int range gi1/0/5-6

Lisbon(config-if-range)# channel-group 1 mode active

Lisbon(config-if-range)# int po1

Lisbon(config-if)# switchport mode trunk

Lisbon(config-if)# switchport trunk native vlan 150


Tokyo(config)# int range gi1/0/5-6

Tokyo(config-if-range)# channel-group 1 mode passive

Tokyo(config-if-range)# int po1

Tokyo(config-if)# switchport mode trunk

Tokyo(config-if)# switchport trunk native vlan 150
```

Q8. List the configuration commands required to complete **Task 8: Additional Settings.** For each command, specify the device(s) and operation mode. (1 mark)

Description on all interfaces has been done previously in Q3.

To configure synchronous logging on Tokyo and Lisbon:

`Tokyo(config)# logging synchronous`

`Lisbon(config)# logging synchronous`

Section 2: Sample Final Practical Assessment Validation and Troubleshooting
(20 marks)

Refer to the Sample Final Practical Assessment.

Q1. Answer the following questions regarding validating and troubleshooting **VLANs and VLAN membership**

    a) What command(s) can be used on **Tokyo** to validate VLANs and VLAN membership configuration? For each command, describe the expected output. (2 marks)

        There are two main ways of showing and validating VLANs and VLAN membership:

        + Show vlan: This command will display information about all configured VLANs on the switch.

        + Show interfaces switchport: This command will display detailed information about all switch's interfaces, including their VLAN membership and Native VLAN.

        We can also opt for using more specific commands:

        + show vlan id #vlan_id#: This command is just the same as show vlan but will only show the specified vlan.

        + show interfaces #interface# switchport: This command is just the same as show interfaces switchport but will only show the specified vlan.

    b) What command(s) can be use on **Lisbon** to validate VLANs and VLAN membership configuration? For each command, describe the expected output. (2 marks)

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+ Show vlan: This command will display information about all configured VLANs on the switch.

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We can also opt for using more specific commands:

+ show vlan id #vlan_id#: This command is just the same as show vlan but will only show the specified vlan.

+ show interfaces #interface# switchport: This command is just the same as show interfaces switchport but will only show the specified vlan.

c) What command(s) can be use on **Lisbon** to validate that all unused ports have been disabled? For each command, describe the expected output. (1 marks)

To show all unused ports have been disabled:

+ Show interface status: this command will display the status of all interfaces, if the interfaces is connected meaning that it is in-use, if it is unconnected meaning that it is not in-use, and if it is disabled meaning that it is disabled.

Q2. Answer the following question regarding validating and troubleshooting **Router-on-a-Stick**

a) What command(s) can be used on **Nairobi** to validate Router-on-a-Stick configuration? List at least 2. For each command, describe the expected output. (4 marks)

To verify RoaS on Nairobi, we can use the following:

+ Show interfaces: this command will display detailed information about all router interfaces, including their status, description. It will also display information about sub-interfaces of the router, if our sub-interfaces is connected and trunking then it is working normally.

+ Show ip route: this command will displays the routing table of the router, we can verify our configuration by looing at the routing entries for each VLAN network.

b) What command(s) can be used on **Tokyo** to validate Router-on-a-Stick configuration? For each command, describe the expected output. (1 mark)

To verify RoaS on Tokyo, we can use the following command:
+ Show interfaces gi1/0/11 switchport: this command will display detailed information

about gi1/0/11, if it is enabled and on trunking mode with the correct encapsulation, then it is working normally.

c) <u>Troubleshooting Scenario:</u> The routing table on **Nairobi** is not displaying all the correct connected (C) routes and their exit interfaces.

What are the possible configuration issues? List at least 3 possible issues. (3 marks)

+ Incorrect interface configuration: If the router interface is shutdown or if it is not configured with a correct IP address and subnet mask, the router will not be able to add the connected routes to the routing table.

+ Incorrect VLAN configuration: If the VLAN configuration on the switch is incorrect, for example configuring the incorrect VLAN id or encapsulation protocol for a sub-interface, the router may not be able to display the correct connected networks.

+ Bad mask or incorrect calculation of IP addresses: If there is a mistake in the calculation of subnet mask or IP allocation, the route table would not be able to display the correct routes.

Q3. Answer the following questions regarding validating and troubleshooting **Switch Management**

a) What command(s) can be used on **Tokyo** to validate that the Management IP has been correctly configured? For each command, describe the expected output. (1 mark)

+ Show ip int br: this command will show all the interfaces and active vlan with its ip addresses, so using this command will give us information of whether Management IP is correctly allocated.

+ Show running-config: this command will display the running configuration of all interfaces on a switch and we can see if Tokyo is allocated with the correct Management IP on its according VLAN.

b) What command(s) can be used on **Tokyo** to test SSH access to **Lisbon**? (1 mark)

Tokyo# ssh -l cisco 55.252.16.252

c) <u>Troubleshooting Scenario:</u> **Tokyo** and **Lisbon** can ping each other. **Tokyo** can ping all IP addresses configured on **Nairobi**. However, **Lisbon** can only ping the IP address configured on **Nairobi's** Management sub-interface; it cannot ping any other router IP.

What is the most likely configuration issue? (1 mark)

The most likely configuration issue might be that Lisbon does not have the VLAN associated with Nairobi's other sub-interfaces in VLAN 15 and 50.

Q4. Answer the following questions regarding validating and troubleshooting **STP, Port-Security and EtherChannel**

a) Using the ***show spanning-tree*** command, how do we validate that **Tokyo** has been correctly configured as the root bridge for the Royalmint VLAN? (1 mark)

When we use show spanning-tree command, it will display all the information about the spanning-tree on the switch, if we look at the information for VLAN 50, if the the root id and bridge id of VLAN 50 is has the MAC address of Tokyo or if it says that 'This bridge is the root' then we have correctly configured this option.

b) What command can be used on **Lisbon** to validate the current Port-Security status of interface Gi1/0/3? (1 mark)

Lisbon#show port-security

c) If the Port-Channel between **Tokyo** and **Lisbon** has been correctly configured and is fully operational; what should be the status flag(s) next to the Port-Channel interface on the ***show etherchannel summary*** output? (1 mark)

It should be (SU) meaning that the port channel is in Layer 2 and is currently in use.

d) If the Port-Channel between **Tokyo** and **Lisbon** has been correctly configured and is fully operational; what should be the status flag(s) next to the member interfaces on the ***show etherchannel summary*** output? (1 mark)

It should be (P) meaning that the member interfaces are bundled in port-channel.