Dorset College Dublin

QQI AWARD

Bachelor of Science in Computing

Stage 2, Semester 1

November 2023

Practical Assignment 1

Module Title:	Network Routing and Switching
Assessment Type:	Practical Assignment
Weighting:	25%
Maximal Possible Mark:	100 marks
Date:	20/11/2023

Addressing Table

Device	Interface	Address	Subnet Mask	Default Gateway	VLAN
MLS1	INT VLAN 10	192.168.10.254	255.255.255.0	N/A	
	INT VLAN 20	192.168.20.254	255.255.255.0	N/A	
	INT VLAN 30	192.168.30.254	255.255.255.0	N/A	
	INT VLAN 40	192.168.40.254	255.255.255.0	N/A	
	INT VLAN 99	192.168.99.254	255.255.255.0	N/A	
S1	INT VLAN 99	192.168.99.1	255.255.255.0	192.168.99.254	
S2	INT VLAN 99	192.168.99.2	255.255.255.0	192.168.99.254	
S3	INT VLAN 99	192.168.99.3	255.255.255.0	192.168.99.254	
S4	INT VLAN 99	192.168.99.4	255.255.255.0	192.168.99.254	
S5	INT VLAN 99	192.168.99.5	255.255.255.0	192.168.99.254	
S6	INT VLAN 99	192.168.99.6	255.255.255.0	192.168.99.254	
Host 1	NIC	192.168.10.1	255.255.255.0	192.168.10.254	VLAN 10
Host 2	NIC	192.168.20.1	255.255.255.0	192.168.20.254	VLAN 20
Host 3	NIC	192.168.30.1	255.255.255.0	192.168.30.254	VLAN 30
Host 4	NIC	192.168.40.1	255.255.255.0	192.168.40.254	VLAN 40
Host 5	NIC	192.168.99.1	255.255.255.0	192.168.99.254	VLAN 99
Host 6	NIC	192.168.10.2	255.255.255.0	192.168.10.254	VLAN 10
Host 7	NIC	192.168.20.2	255.255.255.0	192.168.20.254	VLAN 20
Host 8	NIC	192.168.30.2	255.255.255.0	192.168.30.254	VLAN 30
Host 9	NIC	192.168.40.2	255.255.255.0	192.168.40.254	VLAN 40
Host 10	NIC	192.168.99.2	255.255.255.0	192.168.99.254	VLAN 99
Server 1	NIC	192.168.40.252	255.255.255.0	192.168.40.254	VLAN 40
Server 2	NIC	192.168.40.253	255.255.255.0	192.168.40.254	VLAN 40

Note that all hostnames should be configured with your student ID added to the beginning of the hostname as follows:

If you student ID is 12345 then the hostname should be for example:

12345-S2

12345-MLS1

This is not required for PC and Server hostnames.

Equipment

To complete this assessment the following are required:

- Laptop / PC
- Latest version of Packet Tracer installed, version 8.2.1 or above.
- This document and the Packet Tracer file.

Remember at all times you can save your work in Packet Tracer and open the file later and continue from where you left off. Make sure to save using a friendly filename, for example: draft1 or draft2.

Background / Scenario

Umbrella Corporation is reworking their network. You have been asked to prototype the proposed configuration in Packet Tracer for evaluation by senior network staff.

Objectives

In this assessment, you will configure the following:

- Best practice configuration and secure management
- VLAN's and Trunking
- Layer 3 Switching and Inter-VLAN routing

Part 1: Basic Device Configuration and SSH Management

Step 1 – Switch configuration

Hint: Leave the configuration of switch passwords and SSH to the end. Configure switch hostnames and move to step 2. When you have finished everything else come back to Step 1.

Apply a best practice / basic device configuration to all switches in your topology. Use the following passwords etc on all devices.

- All device names are listed in the table at the beginning of this document. When configuring the device hostnames add your student ID to the beginning of each devices' name.

  Example:

  For device S1 if your student number is 12345 the device name will be 12345-S1

- Console password: bsc2con
- Enable password: bsc2enable
- Local username and password:
  - Username: bsc2admin

- Password: localadmin

- SSH configuration
  - Domain name: bsc2.local
  - Modulus (key length): 2048
  - Disable Telnet

Do not use any other passwords, only the ones listed above.

Please add any additional configuration you think is necessary as I have <u>not</u> included all configuration items above that would normally be in a best practice device configuration.

Configure interface IP addressing on all switches using the information provided in the table at the beginning of this document.

Step 2 - PC's and Servers

Using the information supplied in the table at the beginning of this document configure static IP addresses on all PC's and servers.

Part 2: VLAN and Trunking Configuration

Using the details in the table at the beginning of this document configure the required VLAN's and Trunk links on all switches.

Step 1: Configure VLANs

a. Configure VLAN 10 with the name **Staff**.

b. Configure VLAN 20 with the name **Supervisors.**

c. Configure VLAN 30 with the name **Engineering**.

d. Configure VLAN 40 with the name **Accounts**.

e. Configure VLAN 99 with the name **Management&Native.**

f. Configure VLAN 999 with the name **Unused**

Step 2: Configure active switch ports.

On the active switch ports configure the following:

a. Configure the ports on S1 and S5 as static access ports as follows:
   - FastEthernet 0/1 in VLAN 10
   - FastEthernet 0/2 in VLAN 20
   - FastEthernet 0/3 in VLAN 30

b. Configure the ports on S3 and S6 as static access ports as follows:
   - FastEthernet 0/4 in VLAN 40

- FastEthernet 0/5 in VLAN 99

c. Connect all PC's and Server's to the correct port on each switch as detailed in the table.

Step 3: Configure Trunk Links

Configure the following Trunk links and set VLAN 99 as the native VLAN.

a. S1 G0/1 to MLS1 G0/1
b. S1 Fa0/24 to S2 Fa0/24
c. S1 Fa0/23 to S3 Fa0/23
d. S4 G0/1 to MLS1 G0/2
e. S4 Fa0/24 to S5 Fa0/24
f. S4 Fa0/23 to S6 Fa0/23

Step 4: Secure unused switch ports.

a. Move **all** unused switch ports to VLAN 999.
b. Configure all unused switch ports as static access ports.
c. Deactivate all unused switch ports.

Part 4 – Layer 3 Switching and Inter VLAN routing

Complete all requirements for Layer 3 switching on MLS1 and configure routing between VLAN's.

The following tests should be successful.

- Ping from any device on any VLAN to any other device on any VLAN.
- Browse the Web servers from any PC in any VLAN.

Submission

To complete submission of this assessment please use the Assignment Link in the Assessments section on you Moodle course page.

Click Here: **Practical 1**

In Packet Tracer click **File** > **Save As** > choose a location to save your file and make sure to include your student ID in the filename.

The file will have a .pkt file extension, upload this file to Moodle.