## COURSE Diploma of Information Technology (VDIT)

## UNIT OF STUDY VIT1104 – Computer Networks

## ASSESSMENT TITLE Lab Task 3

## ASSESSMENT TYPE Lab Work

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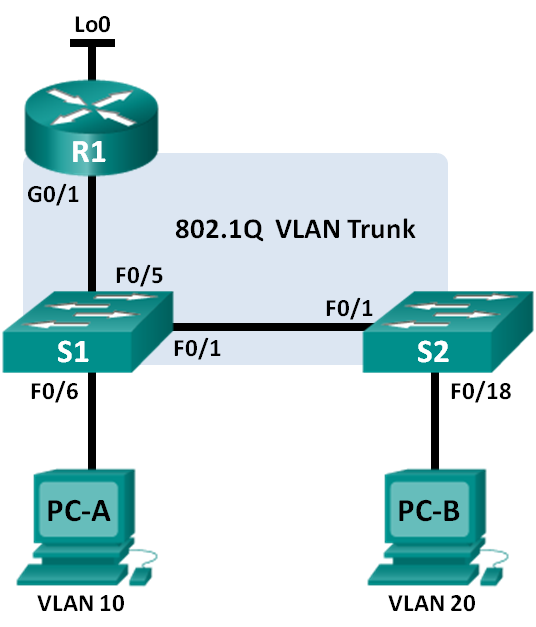
## Instructions

* **Weighting** This assessment is worth 10% of your final result for this unit of study.
* You must put your VU student ID on all items submitted for assessment.
* You have 60 minutes to complete this assessment.
* This assessment is restricted OPEN BOOK. Only your paper based study notes or engineering hand written journals are permitted. No electronic resources or storage devices are allowed.
* Name your Packet Tracer Solution file Lab Task 3 s1234567.pka where the digits represent your student ID.
* Download the Assessment Packet Tracer Activity File (Lab Task 3 – Assessment.pka) under Assessment Information - Lab Task 3 – Assessment.
* Rename the Packet Tracer Activity file Lab Task 3 s1234567.pka where the digits represent your student ID. Save this file.
* Complete all steps in Part 1 – 2 in this assessment. Answer the reflection questions.
* When you are ready to submit the completed solution please make sure you do the following:
* **Save the file.**
* Upload the Packet Tracer file Activity file solution to **Assessment -** **Lab Task 3 drop box** on your VU Collaborate space.
* Upload this Assessment sheet with your answers to the reflection questions to the **Assessment -** **Lab Task 3 drop box** on your VU Collaborate space.

## Resources required

* PC with Packet Tracer Software (student version) installed
* Select Cisco Models1941 routers and 2960 Catalyst switches
* Access to the VU Collaborate Learning Management System.
* Assessment Packet Tracer File

1. Topology



Internet

**VLAN 18**

**VLAN 17**

1. Addressing Scheme

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Device | Interface | IP Address | Subnet Mask | Default Gateway |
| R1 | G0/1.17 | 172.29.17.1 | 255.255.255.0 | N/A |
|  | G0/1.18 | 172.29.18.1 | 255.255.255.0 | N/A |
|  | G0/1.99 | 172.29.99.1 | 255.255.255.0 | N/A |
|  | Lo0 | 209.165.200.225 | 255.255.255.224 | N/A |
| S1 | VLAN 99 | 172.29.99.11 | 255.255.255.0 | 172.29.99.1 |
| S2 | VLAN 99 | 172.29.99.12 | 255.255.255.0 | 172.29.99.1 |
| PC-A | NIC | 172.29.17.17 | 255.255.255.0 | 172.29.17.1 |
| PC-B | NIC | 172.29.18.18 | 255.255.255.0 | 172.29.18.1 |

1. Switch Port Assignment Specifications

|  |  |  |
| --- | --- | --- |
| Ports | Assignment | Network |
| S1 F0/1 | 802.1Q Trunk – Native VLAN 99 | 172.29.99.0/24 |
| S2 F0/1 | 802.1Q Trunk – Native VLAN 99 | 172.29.99.0/24 |
| S1 F0/5 | 802.1Q Trunk – Native VLAN 99 | 172.29.99.0/24 |
| S1 F0/6 | VLAN 17 | 172.29.17.0/24 |
| S2 F0/18 | VLAN 18 | 172.29.18.0/24 |

1. Vlan Information

|  |  |
| --- | --- |
| VLAN | Name |
| VLAN 17 | Retail |
| VLAN 18 | Wholesale |
| VLAN 99 | Management |

## Objectives

Part 1: Build the Network and Configure Basic Device Settings

Part 2: Configure Switches with VLANs and Trunking

Part 3: Configure Trunk-Based Inter-VLAN Routing

## Background / Scenario

In this Lab Task you must use router-on-a-stick inter-VLAN routing technology. In this method, the physical router interface is divided into multiple sub-interfaces that provide logical pathways to all VLANs connected.

In this Lab Task, you will configure trunk-based inter-VLAN routing and verify connectivity to hosts on different VLANs as well as with a loopback on the router.

## Required Resources

* 1 Router (Cisco 1941)
* 2 Switches (Cisco 2960)
* 2 PCs (Terminal Emulation App Available)
* Console cables to configure the Cisco IOS devices via the console ports
* Ethernet cables as shown in the topology

## Reflection Questions

There are 8 reflection questions on this assessment. There are NO MARKS given for answering reflection questions. Your answers to these questions are evidence to verify that your submission is your work. You must complete all reflection questions and then submit this assessment document to the specified drop box.

1. Build the Network and Configure Basic Device Settings

In Part 1, you will set up the network topology and configure basic settings on the PC hosts, switches, and router.

* 1. Cable the network as shown in the topology.
  2. Configure PC hosts.
  3. Initialize and reload the router and switches as necessary.
  4. Configure basic settings for each switch.
     1. Configure hostname, disable DNS lookup, passwords, password encryption, banner, and set the clock.
     2. Configure the IP address listed in the Addressing Table for VLAN 99 on the switch.
     3. Configure the default gateway on the switch.
     4. Administratively deactivate all unused ports on the switch.
     5. Configure Port Security on all switch ports attached to PCs

(Turn on port security, limit MAC addresses to 2, any learned MACs should remain in memory until port is reset)

* + 1. Copy the running configuration to the startup configuration.
  1. Configure basic settings for the router.
     1. Configure hostname, disable DNS lookup, passwords, password encryption, banner, and set the clock.
     2. Configure the Lo0 IP address as shown in the Address Table.
     3. Copy the running configuration to the startup configuration.

1. Configure Switches with VLANs and Trunking

In Part 2, you will configure the switches with VLANs and trunking.

* 1. Configure VLANs on Switch S1.
     1. On S1, configure the VLANs and names listed in the Switch Port Assignment Specifications table. Write the command used to display the newly created VLANs. (1 mark)

Show ip int br

* + 1. On S1, configure the interface connected to R1 as a trunk. Also configure the interface connected to S2 as a trunk. Configure the trunk links to only allow traffic from VLAN 17, VLAN 18 and VLAN 99
    2. Verify that the trunk interfaces are up and trunking on the correct native VLAN. Write the commands used to display the status of the trunk interfaces. (1 mark)

Show interface trunk

* + 1. On S1, assign the access port for PC-A to VLAN 17. Write the command to verify the switch port configuration.

(1 mark)

Show interface switch port

* 1. Configure VLANs on Switch 2.
     1. On S2, configure the VLANs and names listed in the Switch Port Assignment Specifications table.
     2. On S2, verify that the VLAN names and numbers match those on S1.
     3. On S2, assign the access port for PC-B to VLAN 18.
     4. On S2, configure the interface connected to S1 as a trunk. Configure the trunk link to only allow traffic from VLAN 17, VLAN 18 and VLAN 99. Verify that the interface is up and trunking on the correct native VLAN.

1. Configure Trunk-Based Inter-VLAN Routing

In Part 3, you will configure R1 to route to multiple VLANs by creating sub-interfaces for each VLAN. This method of inter-VLAN routing is called router-on-a-stick.

* 1. Configure a sub-interface for VLAN 99.
     1. Create a sub-interface on R1 G0/1 for VLAN 99 using 99 as the sub-interface ID. Write the command you used in the space provided.

Int ing g0/99

* + 1. Configure the sub-interface to operate on native VLAN 99. Write the command you used in the space provided.

Encapsulation doteq 99

* + 1. Configure the sub-interface with the IP address from the Address Table. Write the command you used in the space provided.

Ip address 172.29.25 255.255.255.0

* 1. Configure a sub-interface for VLAN 17.
     1. Create a sub-interface on R1 G0/1 for VLAN 17 using 17 as the sub-interface ID.
     2. Configure the sub-interface to operate on VLAN 17.
     3. Configure the sub-interface with the address from the Address Table.
  2. Configure a sub-interface for VLAN 18.
     1. Create a sub-interface on R1 G0/1 for VLAN 18 using 18 as the sub-interface ID.
     2. Configure the sub-interface to operate on VLAN 18.
     3. Configure the sub-interface with the address from the Address Table.
  3. Enable the G0/1 interface.

Activate the G0/1 interface.

* 1. Verify connectivity.

Enter the command to view the routing table on R1. What networks are listed?

Show ip br

172.29.0.0/16 is variably subnetted, 6 subnets, 2 masks

C 172.29.17.0/24 is directly connected, GigabitEthernet0/1.17

L 172.29.17.1/32 is directly connected, GigabitEthernet0/1.17

C 172.29.18.0/24 is directly connected, GigabitEthernet0/1.18

L 172.29.18.1/32 is directly connected, GigabitEthernet0/1.18

C 172.29.99.0/24 is directly connected, GigabitEthernet0/1.99

L 172.29.99.1/32 is directly connected, GigabitEthernet0/1.99

209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks

C 209.165.200.224/27 is directly connected, Loopback0

L 209.165.200.225/32 is directly connected, Loopback0

Enter the command to trace the connectivity from PCA to the internet (Lo0)

Ping 209.165.200.0

RUBRICS

* You are free to choose own host addresses (within the host range of each network) for your device’s interfaces.

|  |  |  |
| --- | --- | --- |
| Mark Breakdown | Your Marks | Marks possible |
| Disable DNS lookup (1 mark for each network device) |  | 3 |
| Device host names (1 mark for each network device) |  | 3 |
| Message of the day (1 mark for each network device) |  | 3 |
| Encrypted privileged exec password (1 mark for each network device) |  | 3 |
| Console access password (1 mark for each network device) |  | 3 |
| Telnet access Password (1 mark for each network device) |  | 3 |
| Encrypt all clear passwords (1 mark for each network device) |  | 3 |
| Set clock on all network devices (1 mark for each network device) |  | 3 |
| Save the running configuration files on all network devices (1 mark for each) |  | 3 |
| Assign appropriate IP addresses/Subnet mask/Default Gateways on interfaces of 2 PCs |  | 6 |
| Configure VLANs on switches (3 VLANs per Switch) |  | 6 |
| Assign switch access ports to the appropriate user VLANs (2 ports) |  | 6 |
| Configure Trunk ports on switches on native VLAN99. Do not use DTP. |  | 8 |
| Configure switch port security and shutdown all unused ports – (2 switches) |  | 14 |
| Assign appropriate IP address/Subnet mask and Default Gateway on each LAN Switch. |  | 6 |
| Configure Inter-VLAN routing on R1 (3 sub-interfaces) |  | 9 |
| Configure Loopback interface on R1 to simulate the internet |  | 2 |
| Use the ping or trace utility to test connectivity for the following: |  |  |
| PC-A can communicate with internet (R1’s Lo0) |  | 2 |
| PC-B can communicate with internet (R1’s Lo0) |  | 2 |
| PC-A can communicate with PC-B |  | 2 |
| PC-A can communicate with Switch S2 |  | 2 |
| PC-B can communicate with Switch S1 and S2 |  | 4 |
| Switch S1 can communicate with internet (R1’s Lo0) |  | 2 |
| Switch S2 can communicate with internet (R1’s Lo0) |  | 2 |
| Total Marks |  | /100 |
| Total Adjusted |  | /10 |

Refer to the Activity Results with breakdown of items given by the Packet Tracer Assessment Activity File at the end of the assessment session. Your result for this assessment is the total points correctly configured assessment items (out of 84) and successful connectivty tests (out of 16).