# Group Assignment 1 - Group Lab Activity 1

TNE10006/TNE60006 S2 2023

**Assignment Weight:**   
7.5%

**Assignment Points:**   
75

**Submission Due Date:**Week 7 Lab session.

**Reference Material:**

* Lab SU-5a – Configuring Per-Interface Inter-VLAN Routing
* Lab SU-5b – Configuring 802.1Q Trunk-Based Inter-VLAN Routing
* Lab SU-6a – Troubleshooting Inter-VLAN Routing

**Instructions:**

1. Form a group of 3-4 people amongst the students present in the lab session.
2. Discuss and answer the questions in Group Assignment 1 with your group members.
3. Organise for your group to meet as needed to complete all the questions.
4. Each group will submit one completed Group Assignment 1
5. Submit Group Assignment 1, in the Canvas shell, under the Group Lab Activity 1
6. Late penalties will apply for submission after the due date.

**Group Assignment 1 Sections:**

Section 1: Lab SU-5a Per-Interface Inter-VLAN Routing Configuration (15 marks)

Section 2: Lab SU-5b 802.1Q Trunk-Based Inter-VLAN Routing Configuration (7 marks)

Section 3: Labs SU-5a and SU-5b Reflection (14 marks)

Section 4: Lab SU-6a Inter-VLAN Routing Troubleshooting (30 marks)

Section 5: Lab SU-6a Connectivity Scenarios (9 marks)

**Group Assignment 1 Members Information:**

|  |  |
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| **Name** | **Student ID** |
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**Section 1: Lab SU-5a Per-Interface Inter-VLAN routing Configuration  
(15 marks)**

Q1. After completing steps 1-3 in **Part 2 Configure Switches with VLANs and Trunking of Lab SU-5a**,

* + 1. Did S3 and S4 ping each other? Yes/No? If yes, explain why? If no, explain why not.  
       (1 mark)
    2. Would S3 ping PC-A? Yes/No? If yes, explain why? If no, explain why not.  
       (1 mark)
    3. Would S3 ping PC-B? Yes/No? If yes, explain why? If no explain why not.  
       (1 mark)
    4. Would S4 ping PC-A? Yes/No? If yes, explain why? If no, explain why not.  
       (1 mark)
    5. Would PC-A ping PC-B? Yes/No? If yes, explain why? If no explain why not.  
       (1 mark)

Q2. After completing steps 1-3 in **Part 3: Basic Router Configuration of Lab SU-5a**,

* + 1. How many directly connected networks (C) were there in R1’s routing table? If any, list them.   
       (2 marks)

* + 1. Would all devices now be able to ping each other? Give reasons for your answer.   
       (2 marks)

* + 1. When PC-A pings PC-B, would this traffic traverse R1? Yes/No? If yes, explain why. If no, explain why not.  
       (1 mark)
    2. When PC-A pings S3, would this traffic traverse R1? Yes/No? If yes, explain why. If no, explain why not.  
       (1 mark)

Q3. If you shutdown port Gi0/0/1 on R1,

* + 1. How many directly connected (C) networks would there be in R1’s routing table? If any, list them.   
       (2 marks)
    2. Would S3 and S4 still ping each other? Yes/No? If yes, explain why. If no, explain why not.  
       (1 mark)
    3. Would PC-A and PC-B still ping each other? Yes/No? If yes, explain why. If no, explain why not.  
       (1 mark)

**Section 2: Lab SU-5b Trunk-Based Inter-VLAN Routing Configuration  
(7 marks)**

Q1. After completing steps 1-4 in **Part 2 Configure Switches with VLANs and Trunking of lab SU-5b**,

1. How many directly connected (C) networks are there in R1’s routing table? If any, list them.  
   (2 marks)
2. Would S3 ping PC-A? If yes, would this traffic traverse R1?  
   (1 mark)
3. Would PC-A ping PC-B? If yes, would this traffic traverse R1?  
   (1 mark)
4. What was the purpose of pinging S3 and S4 using the source option from R1?  
   (1 mark)

Q2. If you shutdown port Gi0/0/1 on R1,

1. How many directly connected (C) networks would there be in R1’s routing table? If any, list them.   
   (2 marks)

**Section 3: Labs SU-5a and SU-5b Reflection  
(14 marks)**

Q1. Answer the following questions regarding IP settings on layer 2 switches:

* + 1. On a layer 2 switch, what is the purpose of creating an interface VLAN and allocating and IP address to it?  
       (1 mark)
    2. On a layer 2 switch, what is the purpose of configuring a default gateway?   
       (1 mark)
    3. Based on what you learned on labs SU-5a and SU-5b, which IP address should be configured as the default gateway IP on layer 2 switches?   
       (1 mark)

Q2. Answer the following questions regarding inter-vlan routing configuration:

* + 1. Explain the benefits of using the “router-on-a-stick” topology for inter-vlan routing instead of the per-interface routing approach?  
       (4 marks)
    2. Are there any disadvantages to using “router-on-a-stick” inter-vlan routing as compared to the per-interface routing approach?   
       (2 marks)
    3. When configuring a router-on-a-stick topology, the link between the switch and the router must carry traffic for multiple VLANs. How is this achieved on the router? How is this achieved on the switch?   
       (4 marks)
    4. Other than directly connected (C) networks, did you observe any other type of networks in R1’s routing table? If yes, specify what type of networks were there and what do they represent.  
       (1 mark)

**Section 4: Lab SU-6a Inter-VLAN Routing Troubleshooting  
(30 marks)**

Q1. Refer to **Part 2 Troubleshoot Inter-VLAN Routing Configuration of Lab SU-6a**,

* + 1. Were there any networks missing from R1’s routing table? If so, which networks?   
       (3 marks)
    2. After all relevant R1 interfaces were enabled, were there any networks still missing? were there any networks that should not have been present? If so, specify which networks are missing and which networks should not be present.   
       (1 mark)
    3. Were all R1’s interfaces, including loopback and sub-interfaces, configured correctly? If not, list the configuration issues you found.  
       (3 marks)

Q2. Refer to **Part 3 Verify VLAN Configuration and Port Assignments and Trunking of Lab SU-6a**,

* + 1. Were there any VLANs numbers or names missing from S3’s VLAN database? If so, list them.  
       (1 mark)
    2. Were all access ports on S3 assigned to the correct VLANs? If not, list the missing or incorrect assignments.  
       (1 mark)
    3. Were there any VLANs numbers or names missing from S4’s VLAN database? If so, list them.  
       (1 mark)
    4. Were all access ports on S4 assigned to the correct VLANs? If not, list the missing or incorrect assignments.  
       (1 mark)
    5. Based on Lab SU-6a topology diagram, which port(s) on S3 should operate in trunking mode?   
       (2 marks)
    6. Based on Lab SU-6a topology diagram, which port(s) on S4 should operate in trunking mode?   
       (1 mark)
    7. Were all ports that should operate in trunking mode configured correctly? If not, list the configuration issues you found.  
       (2 marks)

Q3. Use the table provided to list the configuration issues you found in Lab SU-6a. For each issue, list the troubleshooting command(s) that helped you find it and the configuration command(s) you used to fix it.  
(2 marks for each correct issue)

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| --- | --- | --- | --- |
| **Device** | **Configuration Issue** | **Troubleshooting Command(s)** | **Re-Configuration Command(s)** |
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**Section 5: Lab SU-6a Connectivity Scenarios   
(9 marks)**

Q1. After fixing all configuration issues in Lab SU-6a,

* + 1. Can S3 and S4 ping each other? If so, does this traffic traverse R1? Give reasons for your answers.  
       (1 mark)

* + 1. Can S3 and S4 ping all router sub-interfaces and loopback interface? Give reasons for your answer.  
       (1 mark)

Q2. If you were to connect PC-A and PC-B to the network as shown in Lab SU-6a Topology Diagram,

* + 1. What IP address would you configure on PC-A as the Default Gateway?   
       (1 mark)
    2. What IP address would you configure on PC-B as the Default Gateway?   
       (1 mark)
    3. Would PC-A and PC-B be able to ping each other? If so, would this traffic traverse R1? Give reasons for your answers.  
       (1 mark)

Q3. In Lab SU-6a, if you did not configure VLAN 20 on S3,

* 1. Would PC-A and PC-B ping each-other? Give reasons for your answer.  
     (1 mark)
  2. Would PC-A ping R1’s loopback interface? Give reasons for your answer.  
     (1 mark)
  3. Would PC-B ping R1’s loopback interface? Give reasons for your answer.  
     (1 mark)

Q4. In Lab SU-6a, if you did not configure the default gateway on S3 and/or S4,

* 1. Would PC-A and PC-B ping each-other? Give reasons for your answer.  
     (1 mark)