

Packet Tracer Lab 3 Solution Guide

Inter-VLAN Routing Failure Investigation

Incident ID: INC-1003

Objective

This lab focuses on identifying and resolving an inter-VLAN routing issue affecting multiple departments within a corporate office environment.

Users are unable to access resources located in other network segments following network maintenance activities performed earlier in the day.

The objective is to troubleshoot the issue using a structured methodology, identify the root cause, restore inter-VLAN communication, and validate successful connectivity between departments and shared resources.

Root Cause

The router subinterface responsible for VLAN 20 was configured with an incorrect VLAN encapsulation value (encapsulation dot1Q 200 instead of encapsulation dot1Q 20). After correcting the encapsulation, the VLAN 20 subinterface IP address (192.168.20.1) also needed to be restored before inter-VLAN routing was fully operational.

Symptoms Observed

- Users in the Sales department unable to access shared resources
- Inter-VLAN communication failing
- Sales users unable to reach their default gateway
- HR and OPS departments operating normally
- Internet connectivity unavailable for Sales users
- Internal application access unavailable for Sales users

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- Network issue isolated to a single VLAN

Troubleshooting Process

1. Run ipconfig and verify the workstation configuration.
2. Ping the default gateway (192.168.20.1).
3. Compare connectivity from HR and OPS VLANs.
4. Verify VLAN assignments using show vlan brief.
5. Verify the trunk using show interfaces trunk.
6. Review the router subinterface configuration using show running-config.
7. Correct the VLAN encapsulation.
8. Validate connectivity.
9. If connectivity still fails, review the router configuration again and restore the missing IP address.

Commands Used

```
ipconfig
ping
show vlan brief
show interfaces trunk
show ip interface brief
show running-config

show interfaces trunk
```

Resolution

Access the router sub-interface configuration for VLAN 20.

Remove the incorrect encapsulation value:

```
conf t
```

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```
interface GigabitEthernet0/0.20  
  
no encapsulation dot1Q 200  
  
encapsulation dot1Q 20  
  
ip address 192.168.20.1 255.255.255.0  
  
end  
  
write memory
```

Validation

Successful resolution should include:

- Ping 192.168.20.1 succeeds.
- Successful communication between Sales and HR.
- Successful communication between Sales and OPS.
- Successful ping to bridgeopsone.com.
- Inter-VLAN routing restored.

Key Takeaways

- Follow a structured troubleshooting methodology.
- Compare working and non-working VLANs to isolate the issue.
- Router subinterfaces require both the correct VLAN encapsulation and IP address.
- Always validate configuration changes before closing an incident.
- Inter-VLAN routing issues may affect only a single department.
- Successful troubleshooting requires verifying the outcome after every fix.