

# COMP 012 - Network Administration

*Windows + Linux + Packet Tracer + Python Automation*

## SESSION 3: SWITCHING FUNDAMENTALS

### ACTIVITY 3.1: SWITCH CONFIGURATION VIA CLI

**Topic:** Basic switch configuration commands

**Description:** Learn essential switch configuration using command-line interface

#### INSTRUCTIONS:

In Packet Tracer, add a 2960 Switch

Basic configuration commands:

- enable - enter privileged mode
- configure terminal - enter config mode
- hostname SW1 - set device name
- enable secret [password] - set enable password
- line console 0 → password [pass] → login
- line vty 0 15 → password [pass] → login
- banner motd #Authorized Access Only#
- no ip domain-lookup - disable DNS lookup

Interface configuration:

- interface fastethernet 0/1
- description Connection to PC1
- speed 100
- duplex full

Save configuration:

- copy running-config startup-config
- show running-config - verify

Document all commands used

**Deliverables:** Submit switch running-config and command reference

**25 Points**

### ACTIVITY 3.2: VLAN CONFIGURATION

**Topic:** Creating and configuring VLANs

**Description:** Implement network segmentation using VLANs

#### INSTRUCTIONS:

Understand VLANs:

- What are VLANs? (Virtual LANs)
- Benefits: security, performance, management
- VLAN ID range (1-4094)

Create VLANs on switch:

- vlan 10 → name SALES
- vlan 20 → name IT
- vlan 30 → name MANAGEMENT
- vlan 99 → name NATIVE

Assign ports to VLANs:

- interface range fa0/1-4
- switchport mode access
- switchport access vlan 10

Repeat for other VLANs

Verify configuration:

- show vlan brief
- show interfaces switchport

Test VLAN isolation:

- Ping between same VLAN (should work)
- Ping between different VLANs (should fail)

Explain WHY inter-VLAN traffic fails

**Deliverables:** Submit .pkt file with VLANs and verification screenshots

**35 Points**

### ACTIVITY 3.3: TRUNKING AND INTER-VLAN ROUTING

**Topic:** VLAN trunking and Router-on-a-Stick

**Description:** Enable communication between VLANs using trunking and routing

#### INSTRUCTIONS:

Configure trunk link between switches:

- interface gig0/1
- switchport mode trunk
- switchport trunk native vlan 99
- switchport trunk allowed vlan 10,20,30,99

Verify trunk:

- show interfaces trunk
- show interfaces gig0/1 switchport

Configure Router-on-a-Stick:

Add router and connect to switch trunk port

Router configuration:

- interface gig0/0.10
- encapsulation dot1Q 10
- ip address 192.168.10.1 255.255.255.0

Repeat for VLAN 20 (.20) and VLAN 30 (.30)

- interface gig0/0 → no shutdown

Configure default gateway on all PCs

Test inter-VLAN routing:

- Ping from VLAN 10 to VLAN 20
- Traceroute to verify path through router

**Deliverables:** Submit .pkt file and inter-VLAN routing verification

**40 Points**

**TOTAL POINTS: 100**