COMP 012 - Network Administration

Windows + Linux + Packet Tracer + Python Automation

SESSION 4: ROUTING FUNDAMENTALS

ACTIVITY 4.1: ROUTER CONFIGURATION BASICS

Topic: Basic router configuration via CLI

Description: Learn essential router configuration commands

INSTRUCTIONS:

In Packet Tracer, add a 2911 Router
Basic router configuration:
• hostname R1
• enable secret [password]
• line console 0 → password → login
• line vty 0 4 → password → login
• service password-encryption
• banner motd #message#
Interface configuration:
• interface gig0/0
• ip address 192.168.1.1 255.255.255.0
• description LAN Interface
• no shutdown
Configure serial interface (WAN):
• interface serial0/0/0
• ip address 10.0.0.1 255.255.255.252
• clock rate 64000 (DCE side only)
• no shutdown
Verify:
• show ip interface brief
• show interfaces
• show running-config

Deliverables: Submit router configuration and verification screenshots	**25 Points**

ACTIVITY 4.2: STATIC ROUTING

Topic: Configuring static routes between networks

Description: Connect multiple networks using static routing

INSTRUCTIONS:

Build 3-router network:

• R1 (HQ) - LAN: 192.168.1.0/24
• R2 (Branch1) - LAN: 192.168.2.0/24
• R3 (Branch2) - LAN: 192.168.3.0/24
WAN links:
• R1-R2: 10.0.0.0/30
• R2-R3: 10.0.0.4/30
• R1-R3: 10.0.0.8/30 (redundant link)
Configure static routes on R1:
• ip route 192.168.2.0 255.255.255.0 10.0.0.2
• ip route 192.168.3.0 255.255.255.0 10.0.0.10
Configure routes on R2 and R3 similarly
Alternative: Default route on branch routers
• ip route 0.0.0.0 0.0.0.0 [next-hop]
Verify routing:
• show ip route
• ping from LAN1 to LAN3
• traceroute to verify path
Test with Simulation mode

Deliverables: Submit .pkt file with static routing and routing tables	**35 Points**

ACTIVITY 4.3: DYNAMIC ROUTING (OSPF, RIP, EIGRP)

Topic: Implementing dynamic routing protocols

Description: Configure OSPF, RIP, and EIGRP for automatic route discovery

INSTRUCTIONS:

Using the 3-router network, remove static routes
Configure OSPF on all routers:
• router ospf 1
• router-id 1.1.1.1 (unique per router)
• network 192.168.1.0 0.0.0.255 area 0
• network 10.0.0.0 0.0.0.3 area 0
(Configure all connected networks)
Verify OSPF:
• show ip ospf neighbor
• show ip route ospf
• show ip ospf interface
Test failover: Shutdown a link
• Observe OSPF recalculation
• Verify alternate path used
Compare with RIP (optional):
• router rip → version 2 → network statements

Compare with EIGRP (optional):

• router eigrp 100 → network statements

Document: When to use each protocol

Create comparison table: OSPF vs RIP vs EIGRP

Deliverables: Submit .pkt file with OSPF and protocol comparison document	**40 Points**

TOTAL POINTS: 100