COMP 012 - Network Administration

Windows + Linux + Packet Tracer + Python Automation

SESSION 12: CLOUD INTEGRATION AND TROUBLESHOOTING

ACTIVITY 12.1: CLOUD VM DEPLOYMENT

Topic: Deploying VMs in AWS or Azure

Description: Learn to deploy and manage cloud virtual machines

INSTRUCTIONS:

Create cloud account:
• AWS Free Tier OR Azure Free Account
• Set up billing alerts
• Enable MFA for security
Deploy cloud VM:
AWS EC2:
• Launch t2.micro Ubuntu instance
• Create key pair for SSH
• Configure Security Group:
- Allow SSH (22) from your IP
- Allow HTTP (80) from anywhere
• Connect via SSH
Azure (alternative):
• Create B1s Ubuntu VM
• Configure NSG rules
• Connect via SSH
Post-deployment:
• Update system packages
• Install web server
• Configure firewall
• Test public access
Document cloud costs and usage

Deliverables: Submit cloud VM deployment screenshots and connection proof	**30 Points**

ACTIVITY 12.2: HYBRID INFRASTRUCTURE SETUP

Topic: Connecting on-premises to cloud

Description: Create hybrid connectivity between local lab and cloud

INSTRUCTIONS:

Design hybrid architecture:

• Local lab: Windows Server, Linux Server
• Cloud: Ubuntu VM as web server
• Communication between environments
Configure connectivity:
Option 1 - SSH Tunnel:
• Create SSH tunnel for specific services
• Forward ports securely
Option 2 - VPN (advanced):
• Set up WireGuard or OpenVPN
• Connect cloud VM to local network
Python hybrid management script:
• Manage both local and cloud servers
• Single inventory file
• Execute commands on any server
• Health check across environments
Test scenarios:
• Deploy app locally, database in cloud
• Backup local data to cloud storage
Document hybrid architecture

Deliverables: Submit hybrid connectivity setup and management script	**35 Points**

ACTIVITY 12.3: NETWORK TROUBLESHOOTING SCENARIOS

Topic: Systematic network problem solving

Description: Practice troubleshooting common network issues

INSTRUCTIONS:

Troubleshooting methodology:
• OSI layer approach (bottom-up, top-down)
• Divide and conquer
• Documentation of steps
Scenario 1 - No network connectivity:
• Check physical layer (cables, link lights)
• Check IP configuration (ipconfig, ip addr)
• Check gateway (ping gateway)
• Check DNS (nslookup)
• Check remote host (ping, traceroute)
Scenario 2 - Slow network performance:
• Bandwidth testing
• Check for errors (interface counters)
• Look for bottlenecks
• Analyze traffic patterns

Scenario 3 - Intermittent connectivity:
• Monitor over time
• Check logs for patterns
• Identify problematic component
Scenario 4 - Cannot access specific service:
• Verify service is running
• Check firewall rules
• Verify port connectivity (telnet, nc)
Create troubleshooting documentation template

Deliverables: Submit troubleshooting documentation for all scenarios	**35 Points**

TOTAL POINTS: 100