Deploying DNS and DHCP on Ubuntu Server with Client Verification

Duration: 2 weeks (Deadline: June 22nd, 2025)

Note: The completed assignment document must be submitted as a **PDF** named **Introduction_to_Basic_Networking_Concepts.pdf** to https://school.wso2.com/

Objective:

Deploy and configure a DNS and DHCP server on an Ubuntu Server VM. Verify that two Ubuntu Desktop VMs receive IP addresses via DHCP and can resolve domain names both for internet sites and internal network devices.

Lab Setup Requirements:

- Virtual Box
- Ubuntu Server 22.04 LTS Image
- Ubuntu Desktop 22.04 LTS Image
- Internet access to All VMs

Assignment Steps:

1. Setup two Linux Servers and two Linux Desktops on Virtual Box
    - Add one network interface for internet connectivity with NAT
    - Configure other network adapter to internal network
2. Deploy two Ubuntu Server VMs with a Static IP
    - DNS server IP - 192.168.50.1/24 (Use the DNS server as 127.0.0.1)
    - DHCP server IP - 192.168.50.2/24 (Use the DNS server as 192.168.50.1)
3. Install and configure DNS (BIND9) with linuxtraining25.com domain.
    - Add forward lookup zone
        - Create the A record for the clients and servers.
            - *dns.linuxtraining25.com > 192.168.50.1*
            - *dhcp.linuxtraining25.com > 192.168.50.2*
    - Add reverse Lookup zone to DNS
        - Add the PTR records corresponding to above A records.

4. Verify the DNS server records (From DNS server)
    - nslookup *dns.linuxtraining25.com*
    - *nslookup 192.168.50.1*
5. Install and configure DHCP (ISC-DHCP-SERVER)
    - Subnet - 192.168.50.0/24
    - DHCP scope - From 192.168.50.100 to 192.168.50.200
    - DNS Server - 192.168.50.1
    - DNS Domain Name - linuxtraining25.com
6. Deploy two Ubuntu Desktop VMs (Client1, Client2)
    - Set network mode to internal network in VirtualBox
    - Configure each client's network interface to use Automatic (DHCP) (Inside the OS)

      Note that the DNS server IP is automatically assigned to the client's network interface via the DHCP configurations.
    - Verify IP addresses assignment
7. Add the following records to the DNS server forward and reverse lookup zones accordingly.
    - client1.linuxtraining25.com > {IP address assigned to the client1 via DHCP}
    - client2.linuxtraining25.com > {IP address assigned to the client1 via DHCP}
8. Verification (Required screenshot in the detailed document)
    - IP Assignment
        - Verify that the IP address falls within the correct range (192.168.50.100 to 192.168.50.200) using the "*ifconfig"* or "*ip a"* command.
    - Inter-Client Communication (When you are using nslookup/dig commands, make sure that you are getting the DNS server as the 192.168.50.1)
        - Test ping/nslookup/dig from client1 desktop to client2 by DNS name
            - *ping client2.linuxtraining25.com*
            - *nslookup client2.linuxtraining25.com*
            - *dig client2.linuxtraining25.com*
        - Test ping/nslookup/dig from client2 desktop to client1 by DNS name
            - *ping client1.linuxtraining25.com*
            - *nslookup client1.linuxtraining25.com*
            - *dig client1.linuxtraining25.com*
        - Use the dig command to check PTR records for reverse lookup for each client.
            - *dig -x <ip address of the client1>*
            - *dig -x <ip address of the client2>*

Submission Requirements:

Create a detailed document outlining the steps you followed, any troubleshooting done and screenshots of following areas.

Screenshots of:

- IP addresses configuration file of DHCP and DNS Server VMs
- IP addresses configuration file of Client1 and Client2 VMs
- DNS and DHCP server configuration files:
    - Forward lookup zone file
    - Reverse lookup zone file
    - named.conf file
    - dhcpd.conf file
- DNS forward and reverse zone configuration files
- All screenshots of the verification step (6th Step)