

Network Infrastructure Implementation with Ansible

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1. Objective

Automate the configuration of the **Luanda and Cabinda domains**, including **Active Directory (AD DS)**, **DHCP**, **DNS**, and **IIS**, using **Ansible** from an administration host (Ubuntu 24.04 LTS).

2. Environment Architecture

Administration Host

- OS: Ubuntu 24.04 LTS

Tools:

- Ansible
- Python3 + pywinrm

Virtual Machines in VMware Workstation Pro 17

Luanda Domain

- `luaw19vm1` – Windows Server 2019 (AD DS + DNS + DHCP)
- `luaw16vm2` – Windows Server 2016
- `luacliente1` – Windows 10 (Client)

Cabinda Domain

- `cabw19vm1` – Windows Server 2019 (AD DS + DNS + DHCP)
- `cabw16vm2` – Windows Server 2016
- `cabcliente1` – Windows 10 (Client)

3. Prerequisites

3.1. Ubuntu Configuration

```
sudo apt update
sudo apt install ansible python3-pip -y
pip install pywinrm
```

3.2. Windows Configuration (execute on each VM)

Open **PowerShell (Admin)** and run:

```
winrm quickconfig -q
winrm set winrm/config/service/auth @{Basic="true"}
winrm set winrm/config/service @{AllowUnencrypted="true"}
Set-Item WSMan:\localhost\Service\AllowUnencrypted -Value true
Set-Item WSMan:\localhost\Service\Auth\Basic -Value true
```

4. Ansible Inventory

inventory.yml

```
all:
  vars:
    ansible_user: Administrator
    ansible_password: "P@ssw0rd!"
    ansible_connection: winrm
    ansible_winrm_transport: basic

  children:
    luanda:
      hosts:
        luaw19vm1:
          ansible_host: 144.188.5.10
        luaw16vm2:
          ansible_host: 144.188.5.11
        luacliente1:
```

```
    ansible_host: 144.188.5.X

cabinda:
  hosts:
    cabw19vm1:
      ansible_host: 144.188.5.20
    cabw16vm2:
      ansible_host: 144.188.5.21
    cabcliente1:
      ansible_host: 144.188.5.X
```

5. Playbook Structure

site-luanda.yml

```
- name: Configure Luanda Domain
  hosts: luanda
  tasks:
    - name: Install AD DS on Server 2019
      win_feature:
        name: AD-Domain-Services
        state: present
      when: inventory_hostname == "luaw19vm1"

    - name: Install DNS on Server 2019
      win_feature:
        name: DNS
        state: present
      when: inventory_hostname == "luaw19vm1"

    - name: Install DHCP on Server 2016
      win_feature:
        name: DHCP
        state: present
      when: inventory_hostname == "luaw16vm2"
```

- name: Install IIS on Server 2016
win_feature:
 - name: Web-Server
 - state: presentwhen: inventory_hostname == "luaw16vm2"

site-cabinda.yml

- name: Configure Cabinda Domain
hosts: cabinda
tasks:
 - name: Install AD DS on Server 2019
win_feature:
 - name: AD-Domain-Services
 - state: presentwhen: inventory_hostname == "cabw19vm1"
 - name: Install DNS on Server 2019
win_feature:
 - name: DNS
 - state: presentwhen: inventory_hostname == "cabw19vm1"
 - name: Install DHCP on Server 2016
win_feature:
 - name: DHCP
 - state: presentwhen: inventory_hostname == "cabw16vm2"
 - name: Install IIS on Server 2016
win_feature:
 - name: Web-Server
 - state: presentwhen: inventory_hostname == "cabw16vm2"

6. Execution Flow

6.1. Test Connectivity

```
ansible -i inventory.yml all -m win_ping
```

6.2. Execute Luanda Domain Configuration

```
ansible-playbook -i inventory.yml site-luanda.yml
```

6.3. Execute Cabinda Domain Configuration

```
ansible-playbook -i inventory.yml site-cabinda.yml
```

7. Validation

7.1. On the Servers

Verify installation of **AD DS, DNS, DHCP, IIS**:

```
Get-WindowsFeature | ? Installed
```

7.2. On the Clients

Confirm that the domain is available and clients can join:

```
Add-Computer -DomainName luanda.com -Restart
```