Q1. Ansible Introduction

Introduction to Ansible

Ansible is an open-source automation tool used for configuration management, application deployment, orchestration, and task automation. It is widely adopted in DevOps and IT environments due to its simplicity, agentless architecture, and powerful capabilities.

Key Features

- **Agentless:** Ansible uses SSH to connect to remote systems, requiring no special software or agent on the managed nodes.

- **Simple Syntax:** It uses YAML (Yet Another Markup Language) for writing playbooks, making it easy to learn and understand.

- **Idempotent:** Running the same playbook multiple times ensures the system remains in the desired state without unintended changes.

- **Scalable:** Suitable for managing just a few servers or thousands of machines at once.

Core Concepts

- **Inventory:** A file listing the hosts or groups of hosts to be managed.

- **Modules:** Units of work in Ansible (e.g., yum, apt, copy, service) that perform specific tasks.

- **Playbooks:** YAML scripts that define the desired state of the system using plays and tasks.

- **Tasks:** Individual actions within a playbook that use modules to perform operations.

- **Roles:** A way to organize playbooks and related files into reusable components.

How Ansible Works

1. The user writes a playbook that describes tasks to be executed.

2. Ansible connects to target machines over SSH.

3. Tasks are executed using modules.

4. Ansible reports back with results and ensures the defined state is achieved.

Use Cases

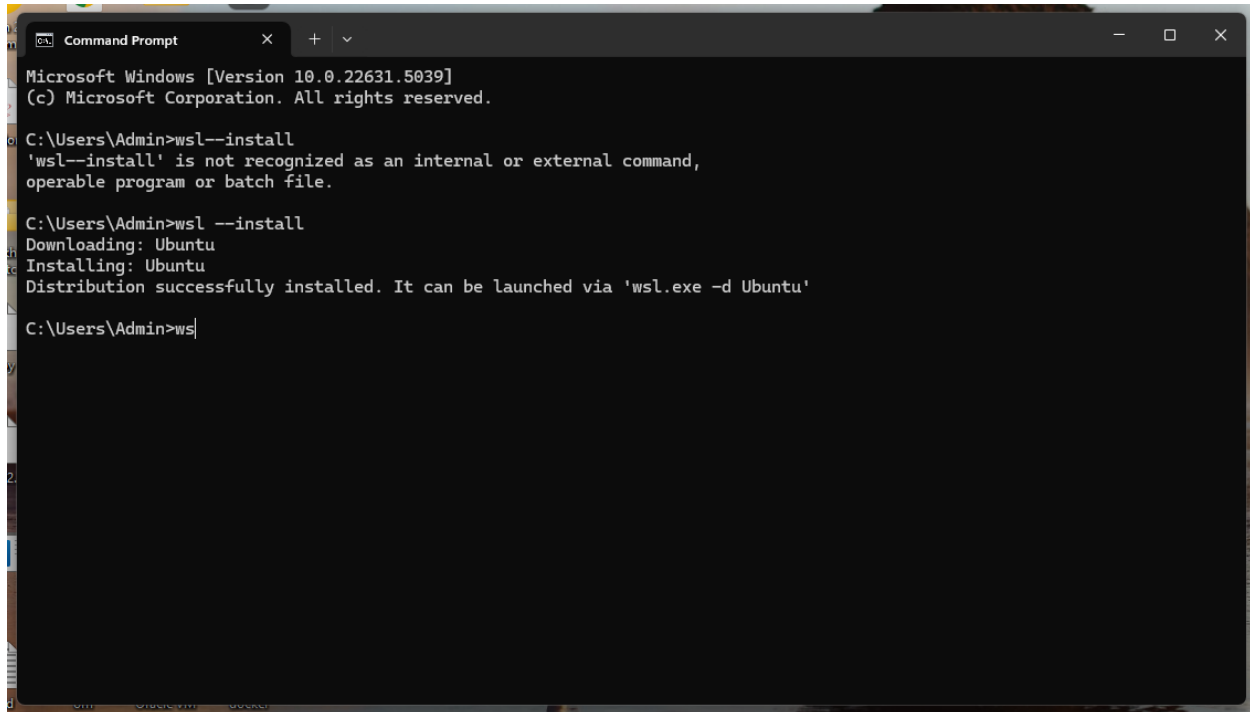- Automating software installations and updates.

- Configuring servers and network devices.

- Deploying applications across multiple environments.

- Orchestrating complex workflows and infrastructure provisioning.

Why Choose Ansible?

- No dependencies or daemons.

- Easy to learn and quick to implement.

- Large community and extensive module library.

- Integrates well with cloud providers and CI/CD pipelines.
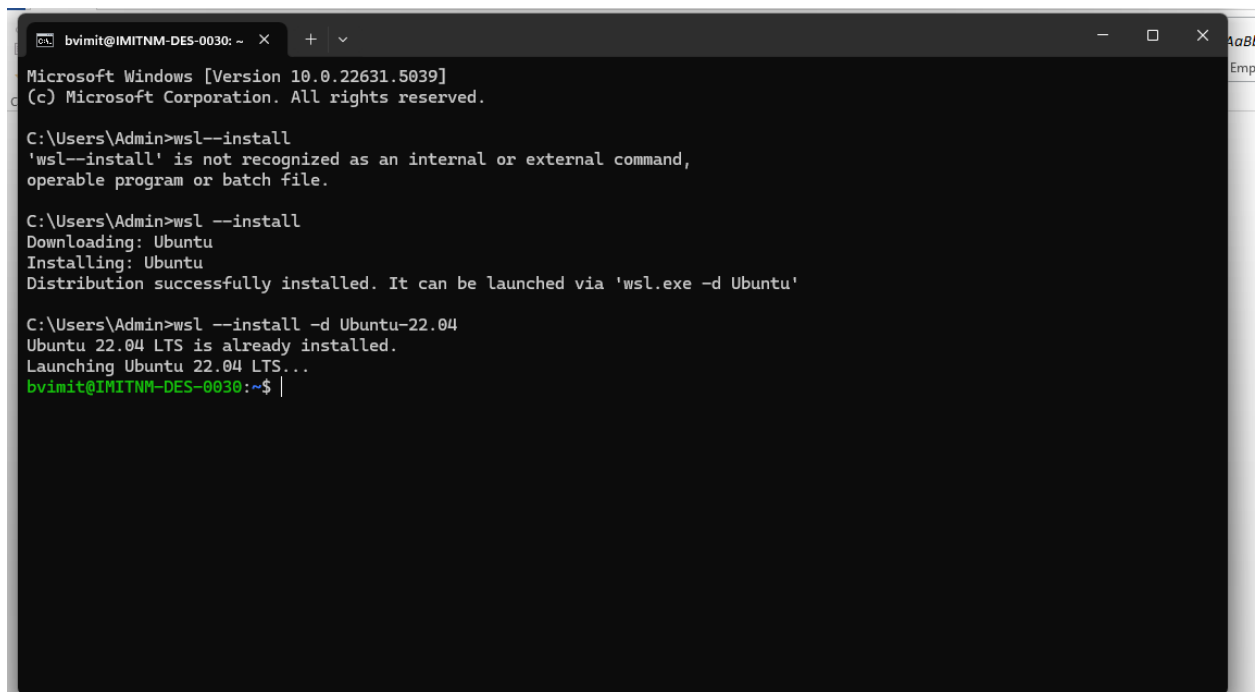
Q2. Ad-hoc Ansible commands

Install wsl

Install ubuntu

```
Ubuntu 22.04 LTS is already installed.
Launching Ubuntu 22.04 LTS...
bvimit@IMITNM-DES-0030:~$
bvimit@IMITNM-DES-0030:~$ wsl -l -v
Command 'wsl' not found, but can be installed with:
sudo apt install wsl
bvimit@IMITNM-DES-0030:~$ sudo apt update && sudo apt upgrade -y
[sudo] password for bvimit:
Sorry, try again.
[sudo] password for bvimit:
Hit:1 http://archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Fetched 384 kB in 1s (302 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
Get another security update through Ubuntu Pro with 'esm-apps' enabled:
  ansible
Learn more about Ubuntu Pro at https://ubuntu.com/pro
#
# Patch available for a potential RCE vulnerability
# in FreeType, tracked by CVE-2025-27363.
# For more see: https://ubuntu.com/security/CVE-2025-27363
```

```
bvimit@IMITNM-DES-0030:~$ ansible --version
ansible 2.10.8
  config file = None
  configured module search path = ['/home/bvimit/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.10.12 (main, Feb  4 2025, 14:57:36) [GCC 11.4.0]
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ wsl --unregister ubuntu
```

```
bvimit@IMITNM-DES-0030:~$ mkdir vaishnavi
bvimit@IMITNM-DES-0030:~$ ls
vaishnavi
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ mkdir gayatri
bvimit@IMITNM-DES-0030:~$ ls
gayatri  vaishnavi
bvimit@IMITNM-DES-0030:~$
```

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```
[local]
localhost ansible_connection=local
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
-- INSERT --                                                2,35        All
```

Esc + : + wq

```
bvimit@IMITNM-DES-0030:~$ sudo mkdir -p /vaishnavi/ansible
bvimit@IMITNM-DES-0030:~$ sudo vi /vaishnavi/ansible/hosts
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m ping
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "whoami"
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>
bvimit
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "ls -la /home/$USER"
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>
total 44
drwxr-x--- 7 bvimit bvimit 4096 Apr  7 14:08 .
drwxr-xr-x 3 root   root   4096 Apr  7 09:25 ..
drwxr-xr-x 3 bvimit bvimit 4096 Apr  7 09:38 .ansible
-rw------- 1 bvimit bvimit 1267 Apr  7 10:54 .bash_history
-rw-r--r-- 1 bvimit bvimit  220 Apr  7 09:25 .bash_logout
-rw-r--r-- 1 bvimit bvimit 3771 Apr  7 09:25 .bashrc
drwx------ 2 bvimit bvimit 4096 Apr  7 09:25 .cache
drwxr-xr-x 3 bvimit bvimit 4096 Apr  7 14:05 .local
-rw-r--r-- 1 bvimit bvimit    0 Apr  7 09:25 .motd_shown
-rw-r--r-- 1 bvimit bvimit  807 Apr  7 09:25 .profile
-rw-r--r-- 1 bvimit bvimit    0 Apr  7 09:33 .sudo_as_admin_successful
drwxr-xr-x 2 bvimit bvimit 4096 Apr  7 13:48 gayatri
drwxr-xr-x 2 bvimit bvimit 4096 Apr  7 13:47 vaishnavi
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "echo 'Hello' > /tmp/hello.txt"
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "ls -l /tmp"
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>
total 24
drwx------ 2 bvimit bvimit 4096 Apr  7 14:18 ansible_ansible.legacy.command_payload_rpz6eh03
-rw-r--r-- 1 bvimit bvimit    6 Apr  7 14:17 hello.txt
drwx------ 2 root   root   4096 Apr  7 13:23 snap-private-tmp
drwx------ 3 root   root   4096 Apr  7 13:23 systemd-private-b0b6f50969c740919565fc44dea3a6db-systemd-logind.service-C6YgOn
drwx------ 3 root   root   4096 Apr  7 13:23 systemd-private-b0b6f50969c740919565fc44dea3a6db-systemd-resolved.service-08OPP3
drwx------ 3 root   root   4096 Apr  7 13:23 systemd-private-b0b6f50969c740919565fc44dea3a6db-systemd-timesyncd.service-GVoQz4
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "ls -l /tmp | grep hello"
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>
-rw-r--r-- 1 bvimit bvimit    6 Apr  7 14:17 hello.txt
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "uptime"
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>
 14:21:52 up 59 min,  1 user,  load average: 0.00, 0.00, 0.00
bvimit@IMITNM-DES-0030:~$ A
```

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```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "cat /etc/os-release"
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>
PRETTY_NAME="Ubuntu 22.04.5 LTS"
NAME="Ubuntu"
VERSION_ID="22.04"
VERSION="22.04.5 LTS (Jammy Jellyfish)"
VERSION_CODENAME=jammy
ID=ubuntu
ID_LIKE=debian
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
UBUNTU_CODENAME=jammy
bvimit@IMITNM-DES-0030:~$
```

```
bvimit@IMITNM-DES-0030:~$ ansible localhost -m shell -a "name=nginx state=present"-b
[WARNING]: No inventory was parsed, only implicit localhost is available
localhost | CHANGED | rc=0 >>

bvimit@IMITNM-DES-0030:~$
```

Q3. Using Ansible playbooks

```
bvimit@IMITNM-DES-0030:~$ sudo apt install nginx
[sudo] password for bvimit:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libgd3 libnginx-mod-http-geoip2 libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter libnginx-mod-mail libnginx-mod-stream
  libnginx-mod-stream-geoip2 libxpm4 libxslt1.1 nginx-common nginx-core
Suggested packages:
  libgd-tools fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  libgd3 libnginx-mod-http-geoip2 libnginx-mod-http-image-filter libnginx-mod-http-xslt-filter libnginx-mod-mail libnginx-mod-stream
  libnginx-mod-stream-geoip2 libxpm4 libxslt1.1 nginx nginx-common nginx-core
0 upgraded, 12 newly installed, 0 to remove and 0 not upgraded.
Need to get 1028 kB of archives.
After this operation, 3466 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libxpm4 amd64 1:3.5.12-1ubuntu0.22.04.2 [36.7 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libgd3 amd64 2.3.0-2ubuntu2.3 [129 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 nginx-common all 1.18.0-6ubuntu14.6 [40.1 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-http-geoip2 amd64 1.18.0-6ubuntu14.6 [12.0 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-http-image-filter amd64 1.18.0-6ubuntu14.6 [15.5 kB]
Get:6 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libxslt1.1 amd64 1.1.34-4ubuntu0.22.04.3 [164 kB]
Get:7 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-http-xslt-filter amd64 1.18.0-6ubuntu14.6 [13.8 kB]
Get:8 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-mail amd64 1.18.0-6ubuntu14.6 [45.8 kB]
Get:9 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-stream amd64 1.18.0-6ubuntu14.6 [73.0 kB]
Get:10 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnginx-mod-stream-geoip2 amd64 1.18.0-6ubuntu14.6 [10.1 kB]
Get:11 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 nginx-core amd64 1.18.0-6ubuntu14.6 [483 kB]
Get:12 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 nginx amd64 1.18.0-6ubuntu14.6 [3882 B]
Fetched 1028 kB in 1s (877 kB/s)
Preconfiguring packages ...
Selecting previously unselected package libxpm4:amd64.
(Reading database ... 81042 files and directories currently installed.)
Preparing to unpack .../00-libxpm4_1%3a3.5.12-1ubuntu0.22.04.2_amd64.deb ...
Unpacking libxpm4:amd64 (1:3.5.12-1ubuntu0.22.04.2) ...
Selecting previously unselected package libgd3:amd64.
Preparing to unpack .../01-libgd3_2.3.0-2ubuntu2.3_amd64.deb ...
Unpacking libgd3:amd64 (2.3.0-2ubuntu2.3) ...
```

```
bvimit@IMITNM-DES-0030:~$ nginx -v
nginx version: nginx/1.18.0 (Ubuntu)
```

```
---
- name: First Demo Ansible Playbook
  hosts: localhost
  gather_facts: false
  tasks:
    - name: Print Hello World message
      debug:
        msg: "Hello, World!"
```

```
"firstplaybook.yml" 9L, 171B                                          9,0-1        All
```

```
bvimit@IMITNM-DES-0030:~$ sudo mkdir /home/vaishnavi
[sudo] password for bvimit:
bvimit@IMITNM-DES-0030:~$ sudo chown bvimit:bvimit /home/vaishnavi
bvimit@IMITNM-DES-0030:~$ cd /home/vaishnavi
bvimit@IMITNM-DES-0030:/home/vaishnavi$ vi firstplaybook.yml
bvimit@IMITNM-DES-0030:/home/vaishnavi$ cat firstplaybook.yml
bvimit@IMITNM-DES-0030:/home/vaishnavi$ cat firstplaybook.yml
bvimit@IMITNM-DES-0030:/home/vaishnavi$ vi firstplaybook.yml
bvimit@IMITNM-DES-0030:/home/vaishnavi$ vi firstplaybook.yml
bvimit@IMITNM-DES-0030:/home/vaishnavi$ ansible-playbook firstplaybook.yml
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'

PLAY [First Demo Ansible Playbook] ********************************************************************************************

TASK [Print Hello World message] *********************************************************************************************
ok: [localhost] => {
    "msg": "Hello, World!"
}

PLAY RECAP *******************************************************************************************************************
```

```
bvimit@IMITNM-DES-0030:/home/vaishnavi$ vi firstplaybook.yml
bvimit@IMITNM-DES-0030:/home/vaishnavi$ cat firstplaybook.yml
---
- name: First Demo Ansible Playbook
  hosts: localhost
  gather_facts: false
  tasks:
    - name: Print Hello World message
      debug:
        msg: "Hello, World!"

bvimit@IMITNM-DES-0030:/home/vaishnavi$ S
```