**1. What is Ansible? How does it work?**

**Answer:** Ansible is an **open-source IT automation tool** used for **configuration management, application deployment, and task automation**.

* **How it works**:
  + It uses **SSH** to connect to remote machines (no agents required).
  + Uses **YAML** to write playbooks.
  + Executes tasks in a defined order.

Ansible allows you to deploy an application to many nodes with one single command

Push Architecture: The core concept is to push multiple small codes to configure and run the action on client nodes

SSH: Passwordless network authentication makes it more secure and easy to set u

It is agentless and only requires the SSH service running on the target machines. • Python is the only required dependency, and, fortunately, most systems have Python pre-installed.

**2. What are the key components of Ansible?**

**Answer:**

* **Inventory**: List of target hosts.
* **Playbook**: YAML files with tasks.
* **Module**: Reusable units of code (like copy, yum, service).
* **Task**: A single action in a playbook.
* **Role**: Pre-defined way to organize playbooks and files.
* **Facts**: Collected data about the system. Ip addres and all

### ****3. What is a Playbook?****

**Answer:** A playbook is a **YAML file** that defines **a series of tasks** to be executed on remote hosts. Example:

Series of automation steps that are executed on remote hosts

- name: Install Apache

  hosts: webservers

  become: yes

  tasks:

    - name: Install Apache

      yum:

        name: httpd

        state: present

### ****4. What is the difference between Ansible and other configuration management tools like Puppet or Chef?****

**Answer:**

| **Feature** | **Ansible** | **Puppet / Chef** |
| --- | --- | --- |
| Setup | Agentless | Agent-based |
| Language | YAML | Ruby |
| Learning Curve | Easy | Medium to Hard |
| Communication | SSH | Requires agent |

### ****5. What is an Ansible Inventory?****

**Answer:** An inventory is a file that defines which **hosts (nodes)** Ansible will manage.

**Example (hosts.ini):**

[web]

web1.example.com

web2.example.com

[db]

db1.example.com

Explain a few of the basic terminologies or concepts in Ansible A few of the basic terms that are commonly used while operating on Ansible are as follows:

• Controller Machine: The controller machine is responsible for provisioning servers that are being managed. It is the machine where Ansible is installed.

Task: Each task represents a single procedure that needs to be executed, e.g., installing a library

### ****6. What are Ansible ad-hoc commands?****

**Answer:** Ad-hoc commands are **one-liner commands** to perform tasks **without writing a playbook**.

**Example:**

ansible all -m ping

ansible web -m yum -a "name=httpd state=present"

Where are tags used? A tag is an attribute that sets the Ansible structure, plays, tasks, and roles.

* Run only specific part of playbool

### ****7. What is the difference between**** vars****,**** vars\_files****, and**** vars\_prompt****?****

**Answer:**

| **Type** | **Description** |
| --- | --- |
| vars | Hardcoded in playbook |
| vars\_files | External YAML files with variables |

14. Which protocol does Ansible use to communicate with Linux and Windows?

In Linux systems, the Secure Shell (SSH) protocol is employed, while Windows systems utilize the Windows Remote Management (WinRM) protocol

15. What are ad hoc commands? Give an example.

Ad hoc commands are simple, one-line commands used to perform a certain task. You can think of ad hoc commands as an alternative to writing playbooks

**🔹 8. How do you handle secrets in Ansible?**

**Answer:** Use **Ansible Vault** to encrypt sensitive data.

ansible-vault create secret.yml

ansible-playbook site.yml --ask-vault-pass

 9. What is a role in Ansible?

Answer: Roles help in organizing playbooks into reusable components. A role has a structure like:

markdown

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roles/

  apache/

    tasks/

    handlers/

    defaults/

    vars/

    templates/

    files/

Explain how you can disable cowsay.

If cowsay is installed, then by executing playbooks inside Ansible, you can

disable cowsay by using the two methods given below:

• Uninstall cowsay

• Set up a value for the environment variable.

export ANSIBLE\_NOCOWS = 1

In Ansible, "cowsay" is a joke feature that, when enabled, displays Ansible's output messages as ASCII art images of a cow (or other animals, depending on the configuration). I

**10. How can you run a playbook on a specific host?**

**Answer:** Use --limit:

bash

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ansible-playbook site.yml --limit "web1.example.com"

execute playbook on this host only web-eax1.com

What is Ansible-doc?

Ansible-doc displays information on modules installed in Ansible libraries. It

displays a listing of plug-ins and their short descriptions, provides a printout of

their documentation strings,

 11. How do you check syntax errors in a playbook?

Answer:

bash

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ansible-playbook playbook.yml --syntax-check

 13. What is the difference between when and register in Ansible?

Answer:

register: Stores the result of a task.

when: Used for conditional execution.

Example:

yaml

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- name: Check Apache status

  shell: systemctl status httpd

  register: apache\_status

- name: Restart Apache if not running

  service:

    name: httpd

    state: restarted

  when: "'inactive' in apache\_status.stdout"

21. What is Ansible-doc?

Ansible-doc displays information on modules installed in Ansible libraries. It displays a listing of plug-ins and their short descriptions, p

Using this testing methodology, we only need to make very minimal or zero code changes.

14. How can you loop through a list in Ansible?

Answer: Use with\_items or loop.

Example:

yaml

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- name: Install packages

  yum:

    name: "{{ item }}"

    state: present

  loop:

    - httpd

    - git

    - curl

15. How can you test a playbook before deploying it to production?

Answer:

Use a staging environment.

Use --check mode (dry run):

bash

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ansible-playbook playbook.yml --check

 16. What is the difference between ansible and ansible-playbook commands?

Answer:

Command Purpose

ansible Run ad-hoc commands

ansible-playbook    Execute YAML-based playbooks

Example:

bash

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ansible all -m ping                   # Ad-hoc

ansible-playbook install\_apache.yml  # Playbook execution

 17. How can you notify a handler in Ansible?

Answer: Handlers are tasks triggered only when notified (used for restart/reload).

yaml

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tasks:

  - name: Update config

    template:

      src: nginx.conf.j2

      dest: /etc/nginx/nginx.conf

    notify: Restart Nginx

handlers:

  - name: Restart Nginx

    service:

      name: nginx

      state: restarted

What are callback plug-ins in Ansible?

Callback plug-ins mostly control the output we see while running CMD

(Command Prompt) programs. Apart from this, it can also be used for adding

additional or, even, multiple outputs.

29. Define Ansible inventory and its types

. An Ansible inventory file is used to define hosts and groups of hosts upon which the tasks, commands, and modules in a playbook will operate.

 Static Inventory: Static inventory file is a list of managed hosts

declared under a host group using either hostnames or IP

addresses in a plain text file.

Dynamic Inventory: Dynamic inventory is generated by a script written in Python, any other programming language, or, preferably, using plug-ins

18. What are facts in Ansible? How do you use them?

Answer: Facts are system properties collected automatically like IP, OS, CPU, etc.

Use with ansible\_facts:

yaml

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- debug:

    var: ansible\_facts['os\_family']

Or directly:

yaml

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- debug:

    var: ansible\_hostname

 19. How can you disable fact gathering?

Answer: Add this to your playbook:

yaml

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gather\_facts: no

Useful for performance or when facts are not needed.

🔹 20. How can you include or import another playbook or task?

Answer:

include: Dynamic (evaluated during runtime)

import: Static (evaluated at playbook parse time)

yaml

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- import\_playbook: setup.yml

- include\_tasks: install.yml

 21. How can you run only a specific task in a playbook?

Answer: Use tags and --tags or --skip-tags.

tasks:

  - name: Install Apache

    yum:

      name: httpd

      state: present

    tags: apache

# Run only tagged task

ansible-playbook playbook.yml --tags apache

 22. What is Ansible Vault and how do you use it?

Answer: Ansible Vault is used to encrypt sensitive data (passwords, keys, etc.).

Commands:

bash

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ansible-vault create secrets.yml

ansible-vault edit secrets.yml

ansible-vault view secrets.yml

ansible-playbook playbook.yml --ask-vault-pass

 23. How can you pass variables to a playbook?

Answer:

✅ From command line:

bash

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ansible-playbook playbook.yml -e "user=deepanshu port=22"

✅ From file:

bash

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ansible-playbook playbook.yml -e "@vars.yml"

### ****24. What is the purpose of**** become ****in Ansible?****

**Answer:** become allows you to **run tasks as a different user (typically root)**.

yaml

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- name: Install Nginx

become: yes

apt:

name: nginx

state: present

You can also use:

* become\_user: Specify the user
* become\_method: su/sudo/pbrun etc.

**25. How does Ansible differ from Terraform?**

**Answer:**

| **Feature** | **Ansible** | **Terraform** |
| --- | --- | --- |
| Use Case | Configuration Management | Infrastructure Provisioning |
| Language | YAML | HCL (HashiCorp Configuration) |
| Agentless | Yes | Yes |
| Idempotency | Yes | Yes |
| Examples | Install Nginx, restart DB | Create VPC, launch EC2 |

### 🔹 ****27. How can you test roles/playbooks locally?****

**Answer:**

* Use **Vagrant** for spinning up test VMs.
* Use **Docker + Molecule** for automated role testing.

**28. What are some useful modules in Ansible?**

**Answer:**

| **Module** | **Purpose** |
| --- | --- |
| copy | Copy files |
| yum/apt | Install packages |
| service | Manage services |
| file | File permissions, ownership |
| template | Jinja2 template rendering |
| uri | API testing & REST calls |
| git | Clone git repos |

What is an Ansible vault?

Ansible vault is used to keep sensitive data, like passwords, rather than placing it

as plain text in playbooks or roles. Any structured data file or single value inside

a YAML file can be encrypted by Ansible

handlers are executed when notified

🔹 29. How is idempotency achieved in Ansible?

Answer: Idempotency means running the same playbook multiple times has the same effect as running it once.

Ansible achieves this through state-based modules like:

yaml

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yum:

  name: nginx

  state: present     # Will not reinstall if already installed

Feature Facts   Variables

Source  Auto-collected by Ansible   User-defined

Example ansible\_hostname, ansible\_os\_family my\_package: nginx

### ****What is Ansible Galaxy and how is it used?****

**Answer:**

🪐 **Ansible Galaxy** is a hub for **sharing Ansible roles**.

You can:

* Install roles:

bash

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ansible-galaxy install geerlingguy.apache

* Create a role skeleton:

bash

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ansible-galaxy init myrole

Useful for **reusing roles** and contributing to open-source Ansible ec

**34. How can you write idempotent shell commands in Ansible?**

**Answer:**

Avoid shell unless necessary. Use creates or removes flags for idempotency:

yaml

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- name: Extract archive if not already done

shell: tar -xzf code.tar.gz

args:

creates: /opt/mycode

**35. How can you execute playbooks in parallel for multiple hosts?**

**Answer:**

By default, Ansible executes tasks in parallel using **forks**.

Configure in ansible.cfg:

ini

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[defaults]

forks = 10

You can control parallelism using serial keyword in playbook:

yaml

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serial: 2 # Execute on 2 hosts at a time

**36. How does block, rescue, and always work in Ansible?**

**Answer:**

**Try-Catch-Finally style error handling**

yaml

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tasks:

- block:

- name: Try something risky

command: /bin/false

rescue:

- name: Do this on failure

debug:

msg: "Task failed"

always:

- name: Always do this

debug:

msg: "Cleanup"

### ****37. How to run Ansible playbooks on Windows targets?****

**Answer:**

* Install **WinRM** on Windows
* Use ansible\_connection: winrm in inventory

Example:

ini

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[windows]

winhost ansible\_host=192.168.1.10 ansible\_user=admin ansible\_password=secret ansible\_connection=winrm

Use Windows-specific modules like:

* win\_copy
* win\_shell
* win\_feature

**38. What is the difference between roles and includes?**

**Answer:**

| **Feature** | **Roles** | **Includes** |
| --- | --- | --- |
| Reusable unit | Yes, organized with structure | Not structured |
| Auto-loaded | Yes (via roles: keyword) | No |
| Purpose | Share code across playbooks | Split tasks for readability |

### ****40. Explain dynamic inventory in Ansible.****

**Answer:**

Static inventory = hardcoded IPs  
**Dynamic inventory** = Script that returns list of hosts in JSON

Examples:

* AWS EC2: ec2.py
* GCP, Azure, Kubernetes plugins
* Custom scripts

**Enable in ansible.cfg:**

ini

CopyEdit

[defaults]

inventory = ./inventory/ec2.py

### ****41. How do you debug and test Ansible playbooks effectively?****

**Answer:**

* Use --syntax-check
* Use --check (dry run)
* Use -vvv for verbose logging
* Use debug: and pause:
* Use **Molecule** for testing roles

**42. Can Ansible manage Docker containers?**

**Answer:** Yes, with the **community.docker collection**.

bash

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ansible-galaxy collection install community.docker

Example module usage:

yaml

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What are the registered variables under Ansible?

 43. How do you deal with rolling updates in Ansible?

Answer:

Use serial and pause:

yaml

Copy

Edit

- hosts: webservers

  serial: 2

  tasks:

    - name: Update app

      shell: ./deploy.sh

    - pause:

        seconds: 10

**🔹 45. What are callbacks in Ansible?**

**Answer:**

Callbacks modify how Ansible displays or logs output.

Example: json, yaml, minimal, log\_plays, profile\_tasks

Enable in ansible.cfg:

ini

CopyEdit

[defaults]

callback\_whitelist = profile\_tasks

Create custom ones in /callback\_plugins/.

**What is an Ansible Role (in simple words)?**

An **Ansible Role** is just a **structured folder** where you keep all your related playbook files for better reusability and organization.

💡 Think of a **Role** like a mini-module:  
📁 It contains tasks, handlers, files, templates, variables, etc., all organized in a standard way.

### 📁 ****Basic Role Structure****

When you run:

bash

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ansible-galaxy init myrole

You get this:

python

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myrole/

├── defaults/ # default variables

│ └── main.yml

├── files/ # static files (copy as-is)

├── handlers/ # notify and listen

│ └── main.yml

├── meta/ # role info & dependencies

│ └── main.yml

├── tasks/ # main logic

│ └── main.yml

├── templates/ # Jinja2 templates (e.g., config)

├── tests/ # test inventory/playbook

└── vars/ # other variables

└── main.yml

### ✅ ****Minimum Required for Role to Work****

At the very least, you need:

yaml

CopyEdit

myrole/

└── tasks/

└── main.yml ← This is where the actual logic goes

### ✏️ ****How to Use a Role in Your Playbook****

Let’s say you created a role called nginx\_setup.

Here's your main playbook:

yaml

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- name: Use nginx role

hosts: webservers

roles:

- nginx\_setup

That’s it! Ansible will now automatically:

* Look into nginx\_setup/tasks/main.yml
* Execute tasks from there

### 🔧 ****Example: NGINX Role****

#### 👉 Step 1: Create Role

bash

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ansible-galaxy init nginx\_setup

#### 👉 Step 2: Add task to install nginx

Edit nginx\_setup/tasks/main.yml:

yaml

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- name: Install NGINX

apt:

name: nginx

state: present

update\_cache: yes

- name: Start and enable NGINX

service:

name: nginx

state: started

enabled: yes

#### 👉 Step 3: Use the Role in your Playbook

Create main.yml:

yaml

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- hosts: localhost

become: yes

roles:

- nginx\_setup

#### 👉 Step 4: Run it!

bash

CopyEdit

ansible-playbook main.yml

### 🎯 ****Benefits of Roles****

| **Feature** | **Why It’s Useful** |
| --- | --- |
| Reusable | Use the same role in many projects |
| Organized | Keeps your playbooks clean |
| Shareable | Upload to Ansible Galaxy |
| Easy to Maintain | Everything is modular |

### 📦 Bonus: Download a Ready-Made Role

bash

CopyEdit

ansible-galaxy install geerlingguy.mysql

Use it:

yaml

CopyEdit

roles:

- geerlingguy.mysql

Would you like me to generate a **ready-to-use role zip**