

Core Ansible Concepts

What is Ansible and how does it work internally?

Ansible is an agentless configuration management and automation tool.

It works using :

SSH (default transport)

Push model

YAML-based playbooks

Python modules executed remotely

Internal Flow :

Control Node reads inventory

Connects to managed nodes via SSH

Copies module to remote node

Executes module

Returns JSON result

Cleans up temp files

What is Inventory in Ansible?

Inventory defines target hosts.

```
[web]
```

```
192.168.1.10
```

```
192.168.1.11
```

```
[db]
```

```
db01 ansible_host=10.0.0.5 ansible_user=ec2-user
```

What is Idempotency?

Idempotency means : Running the same playbook multiple times results in the same state.

Practical Scenario-Based Questions

You have 10 web servers behind a load balancer. How will you update them without downtime?

Use :

- serial
- Load balancer removal
- Health checks
- Handlers

How do you manage secrets in Ansible?

Options :

- Ansible Vault
- HashiCorp Vault integration
- Environment variables
- External secret manager

How would you automate node patching in Kubernetes cluster using Ansible?

Answer Strategy :

- Cordon node
- Drain node
- Apply OS patches
- Reboot
- Wait for node ready
- Uncordon

What is the difference between include_tasks and import_tasks?

include_tasks	import_tasks
Dynamic	Static
Evaluated at runtime	Evaluated at parse time

Use include when :

- Condition based execution
- Looping task files

What are Roles?

Roles provide structured project layout :

What are Handlers?

Handlers run only when notified.

Your playbook sometimes fails and sometimes works. How do you debug?

Use : -vvv

Check :

- SSH connectivity
- Python version on remote
- Idempotency
- Race conditions

Use :

- register
- debug
- failed_when
- ignore_errors

How do you optimize Ansible for scale?

Use forks

Use fact caching

Disable unnecessary fact gathering

Use async tasks

Use strategy plugins (free)

Use Ansible AWX/Tower

How do you integrate Ansible in Jenkins pipeline?

Install Ansible plugin

Use SSH credentials

Rapid Fire

What is ansible.cfg precedence?

Ansible configuration precedence (highest to lowest) is: ANSIBLE_CONFIG env variable → ./ansible.cfg → ~/.ansible.cfg → /etc/ansible/ansible.cfg.

What is check mode?

Check mode (--check) runs a playbook in dry-run mode without making actual changes.

What is diff mode?

Diff mode (--diff) shows the differences between current and desired configuration changes.

What is strategy free?

The free strategy allows hosts to run tasks independently without waiting for other hosts to complete the same task.

What is run_once?

run_once ensures a task executes only once, regardless of how many hosts are targeted.

What is changed_when?

changed_when manually defines when a task should be marked as changed.

What is failed_when?

failed_when allows you to control custom failure conditions for a task.

What is block/rescue/always?

block groups tasks, rescue runs if block fails, and always runs regardless of success or failure.

How do you handle conditional execution?

Conditional execution is handled using the when statement.

What is Jinja2?

Jinja2 is the templating engine used in Ansible for variable interpolation and dynamic content rendering.

What is lookup plugin?

A lookup plugin retrieves data from external sources like files, APIs, environment variables, or secret managers.

What is dynamic inventory?

Dynamic inventory automatically fetches host information from external systems like AWS, GCP, or Kubernetes.

What is async and poll?

async runs a task in the background and poll controls how frequently Ansible checks its status.

How to handle retries?

Retries are handled using retries, delay, and until keywords.

What is Ansible Galaxy?

Ansible Galaxy is a repository for sharing and downloading Ansible roles and collections.

How to create collection?

A collection is created using `ansible-galaxy collection init <namespace.collection_name>`.

How do you test playbooks?

Playbooks are tested using `--check`, Molecule, linting tools, or in staging environments.

How to handle rolling updates?

Rolling updates are handled using the serial keyword.

What is fact caching?

Fact caching stores gathered facts for reuse to improve performance in large environments.

What is connection: local?

connection: local runs tasks on the control node instead of remote hosts.