**Introduction to Ansible - Basic Study Material**

**What is Ansible?**

Ansible is an open-source automation tool used for configuration management, application deployment, and task automation. It allows users to automate IT infrastructure with simple, human-readable scripts written in YAML.

**Core Components of Ansible**

**1. Inventory**

The inventory file is a list of managed hosts stored in a file. This file can be in **INI** or **YAML** format. By default, Ansible uses the inventory located at /etc/ansible/hosts.

**Example of Inventory File (INI format)**

[webservers]

web1.example.com

web2.example.com

[dbservers]

db1.example.com

db2.example.com

In the above example, there are two groups: webservers and dbservers, each containing multiple hosts.

**2. Modules**

Modules are scripts that perform specific tasks like installing packages, copying files, or restarting services. Each module accepts parameters and returns output in JSON format.

**Example of a Module Usage**

The following command installs nginx on a remote machine:

ansible all -m apt -a "name=nginx state=present" -b

**3. Variables**

Variables help in managing system differences and making playbooks dynamic. Variables can be stored in **dictionaries** or **lists**.

**Example of Variables in Playbooks**

vars:

database\_name: mydb

destination: /etc/config/

Variables can also be grouped based on host or playbook level.

**4. Facts**

Facts are system information automatically gathered by Ansible. These include OS type, IP addresses, and memory usage.

**Example of Fact Gathering**

To display facts about a host, run:

ansible all -m setup

**5. Playbooks**

Playbooks define automation tasks in **YAML format**. They contain multiple plays that map groups of hosts to specific tasks.

**Example of a Simple Playbook**

- name: Install and start Apache

hosts: webservers

become: yes

tasks:

- name: Install Apache

apt:

name: apache2

state: present

- name: Start Apache

service:

name: apache2

state: started

**6. Configuration File**

Ansible uses a configuration file (ansible.cfg) to override default settings. The order of configuration file lookup is:

1. ansible.cfg in the current directory
2. ~/.ansible.cfg in the home directory
3. /etc/ansible/ansible.cfg (default)

**Example of an Ansible Configuration File**

[defaults]

inventory = ./inventory

host\_key\_checking = False

retry\_files\_enabled = False

**Summary Table**

| **Component** | **Description** |
| --- | --- |
| **Inventory** | List of managed hosts (INI/YAML format) |
| **Modules** | Predefined tasks executed by Ansible |
| **Variables** | Store data dynamically for tasks |
| **Facts** | Automatically gathered system information |
| **Playbooks** | YAML-based automation scripts |
| **Configuration File** | Controls Ansible's default behavior |

**Conclusion**

Ansible simplifies automation using YAML-based playbooks and eliminates the need for manual configuration. Understanding these basic components will help in efficiently managing and automating IT tasks.