

## Ansible Variables – Complete Guide

Ansible variables are **key-value pairs** that allow you to **parameterize** playbooks and templates for flexibility, reusability, and control.

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### Why Use Variables?

Variables let you:

- Avoid hardcoding values.
  - Write dynamic, reusable code.
  - Apply configuration to different environments or hosts.
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### Declaring Variables

#### 1. Inline in a Playbook

```
- hosts: web
  vars:
    app_port: 8080
    app_name: myapp
```

#### 2. Host or Group Vars

- ◆ **Host-specific** (in `host_vars/hostname.yml`)

```
ansible_host: 192.168.1.10
env: production
```

- ◆ **Group-specific** (in `group_vars/web.yml`)

```
app_user: nginx
timezone: UTC
```

### 3. Command Line

```
ansible-playbook playbook.yml -e "env=dev region=us-east-1"
```

### 4. Inventory File

```
[web]
web1 ansible_host=192.168.1.10 app_port=80
```

### 5. Vars Files

```
# vars/common.yml
package_name: nginx
```

In Playbook:

```
vars_files:
  - vars/common.yml
```

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## Variable Precedence (High to Low)

Precedence (High → Low)	Example
Extra vars via CLI	<code>-e "foo=bar"</code>
Task-level vars	Inside a task
Block-level vars	Inside a block
Role defaults	<code>defaults/main.yml</code> in roles
Inventory vars	<code>host_vars/</code> / <code>group_vars</code>
Playbook vars	<code>vars:</code> section
Vars files	<code>vars_files:</code> section
Set facts	Using <code>set_fact</code>

Environment variables      `lookup('env',  
                  'HOME')`

Default in Jinja2      ``{{ var`

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## Types of Variables

### 1. Scalar Variable

`env: production`

### 2. List Variable

`users:`

- alice
- bob
- charlie

### 3. Dictionary Variable

`db_config:`

`user: admin  
  pass: secret`

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## Using Variables

### ◆ In Playbooks:

`- name: Install package  
  apt:  
    name: "{{ package_name }}"`

### ◆ In Templates (.j2):

Welcome to {{ env }} environment

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## **set\_fact** Module

To define variables **dynamically at runtime**:

```
- name: Set dynamic variable
  set_fact:
    full_name: "{{ first_name }} {{ last_name }}"
```

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## Best Practices

- Use descriptive names (e.g., `nginx_port`, `app_path`)
  - Use `group_vars/` and `host_vars/` for clean separation
  - Store secrets in Ansible Vault
  - Avoid hardcoding in tasks
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