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ANSIBLE

Configuration Management

Configuration management is a process for maintaining computer systems, servers, and software in a desired, consistent state. It's a way to make sure that a system performs as it's expected to as changes are made over time.



Why CM?

Configuration Management

Provisioning

Application Deployment

Orchestration

Uptime and Site Reliability



CM Tools



CHEF



ANSIBLE

SALTSTACK®



puppet

What do we cover

- **Introduction**

- What & Why Ansible
- How Ansible works
- Pre-requisites to start

- **Prepare Ansible lab environment**

- Ansible lab setup
- Install Ansible
- Setup managed nodes



ANSIBLE

What do we cover

- **Ansible components**

- Inventory
- Modules
- Playbooks
- Ansible configuration file

- **Ansible playbooks**

- Ansible syntax
- Write first ansible playbook



AN S I B L E

What do we cover

- **Modules**

- Yum
- File
- Copy

- **Conditions**

- When
- With_items
- Notify & handlers



AN S I B L E

What do we cover

- **Ansible Variables**
- **Additional concepts**
 - Converting a shell script into a playbook
 - Gather facts
 - Error handling
 - Tags
- **Multitask Ansible Playbooks**
 - Install apache on Managed nodes



AN S I B L E

What do we cover

- **Ansible Vault**

- Ansible vault introduction
- Using vault with git

- **Ansible Roles**

- Roles introduction
- Converting a playbook into a role
- Push changes onto git



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What is Ansible

Radically simple open-source IT automation engine.

Ansible Automates:

Configuration Management

Provisioning

Application Deployment

Orchestration



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AN S I B L E



SIMPLE

Human readable
No special code skills
Tasks executed in order



POWERFUL

Configuration
App Deployment
Provisioning
Orchestration



AGENTLESS

Use OpenSSH
Secure

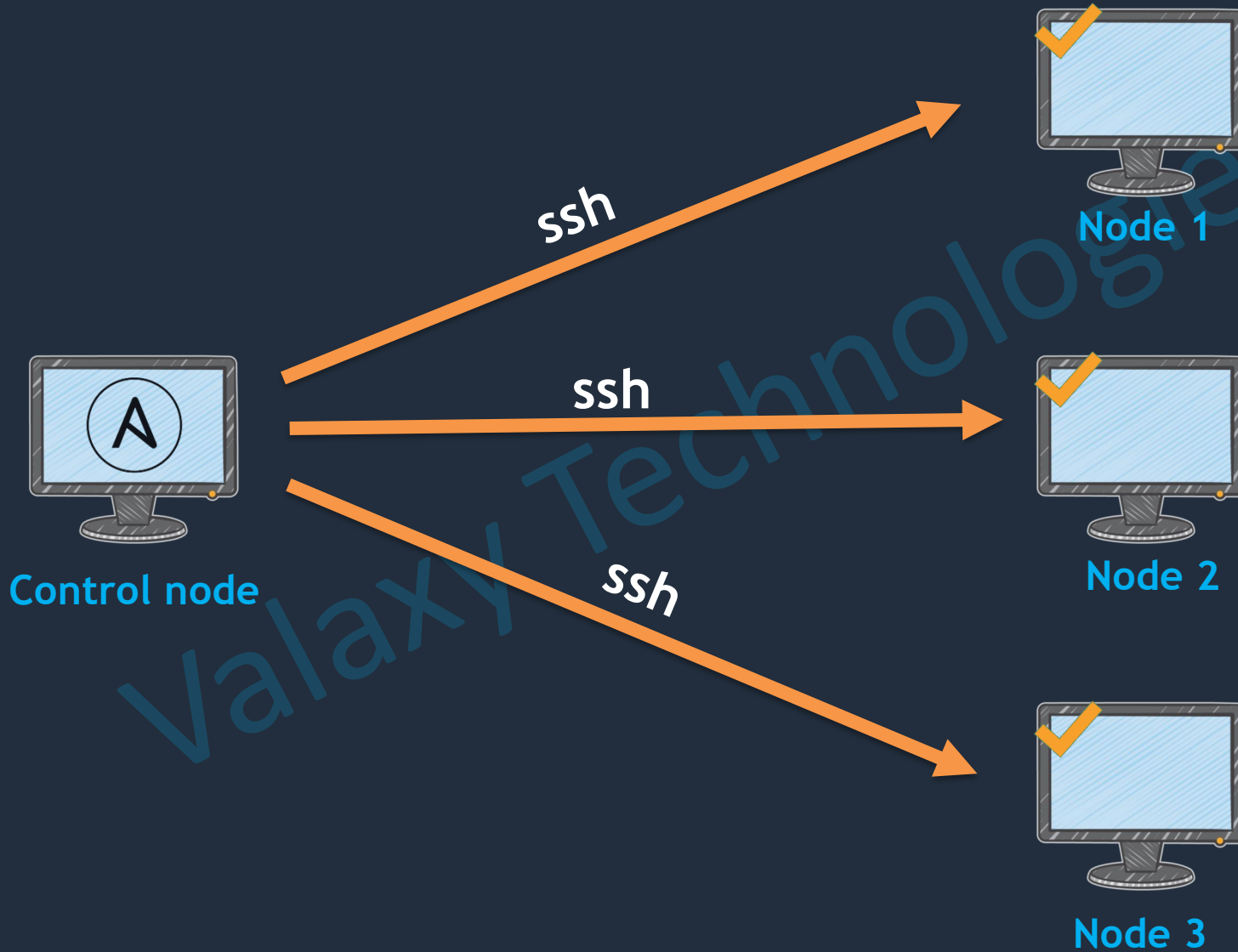
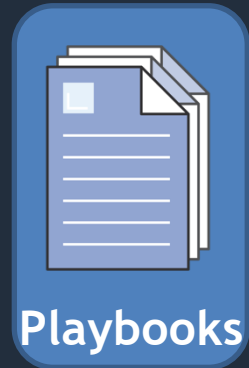
Efficient

Open Source

Flexible

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How Ansible works



Ansible Terminology

- **Control node**

- Any machine with Ansible installed.

- **Managed nodes**

- The network devices (servers) you manage with Ansible

- **Inventory**

- A list of managed nodes. An inventory file is also sometimes called a “hostfile”.

Ansible Terminology

- **Modules**

- The units of code Ansible executes. Each module has a particular functionality.

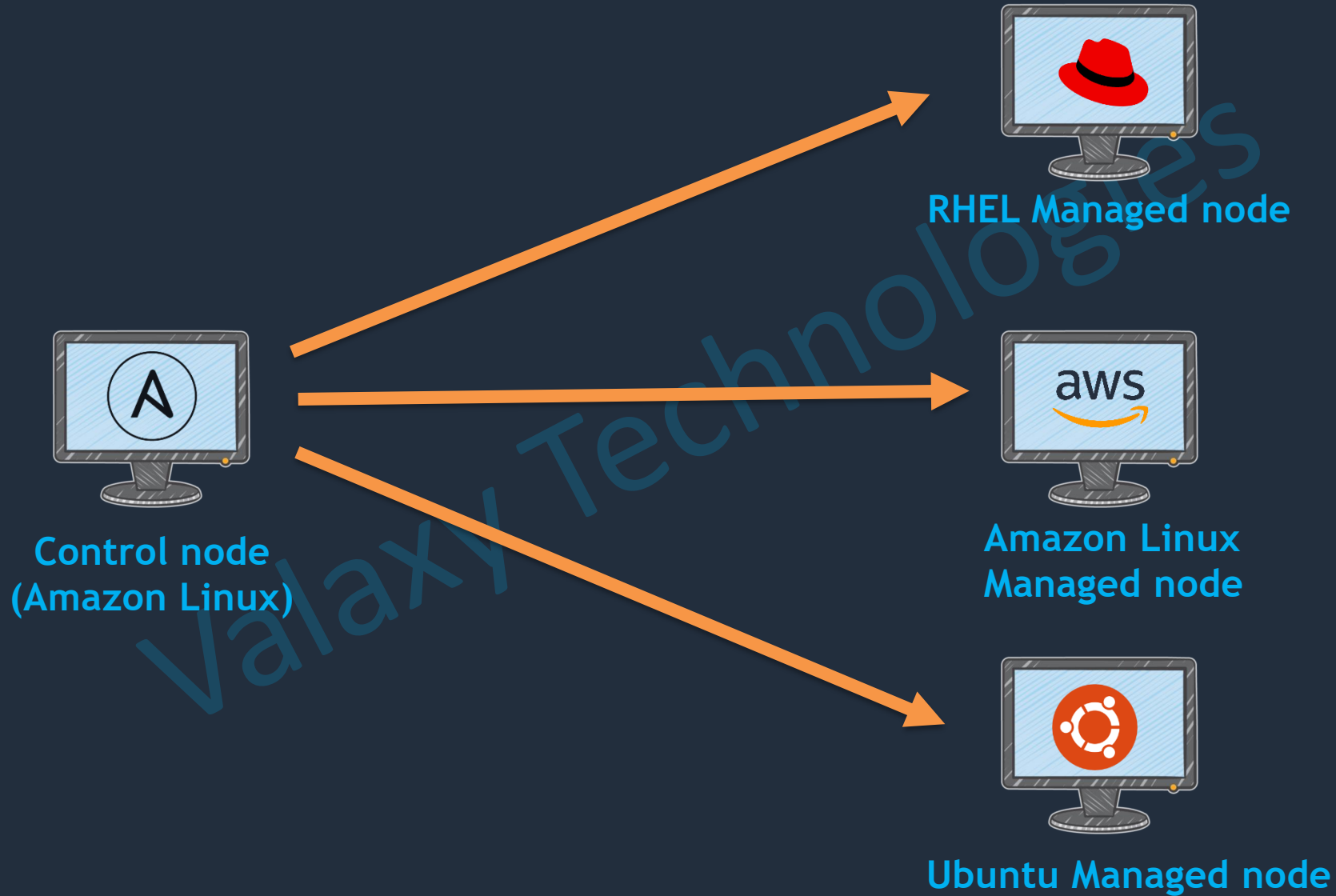
- **Tasks**

- The units of action in Ansible.

- **Playbooks**

- Ordered lists of tasks.

Ansible lab setup



Setup Ansible control node



Control node
(Amazon Linux)

Prepare ansible server

1. Setup EC2 instance
2. Setup hostname
3. Create ansadmin user
4. Add user to sudoers file
5. Generate ssh keys
6. Enable password based login
7. Install ansible

Setup managed nodes

1. Setup EC2 instance
2. Setup hostname
3. Create ansadmin user
4. Add user to sudoers file
5. Enable password based login

Adding managed nodes to ansible

1. Add server to inventory file
2. Copy public ssh keys on to managed nodes
3. Do a ping test

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Ansible Components

- `/etc/ansible/ansible.cfg`
- Inventory / Hosts
- Tasks
- Playbooks
- Modules

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Ansible basics

- All ansible commands start with “ansible”
- Ansible default configuration file exists under /etc/ansible/ansible.cfg
- Default inventory file available under /etc/ansible/hosts
- Managed nodes information should be available in inventory file.

Setting up ansible environment



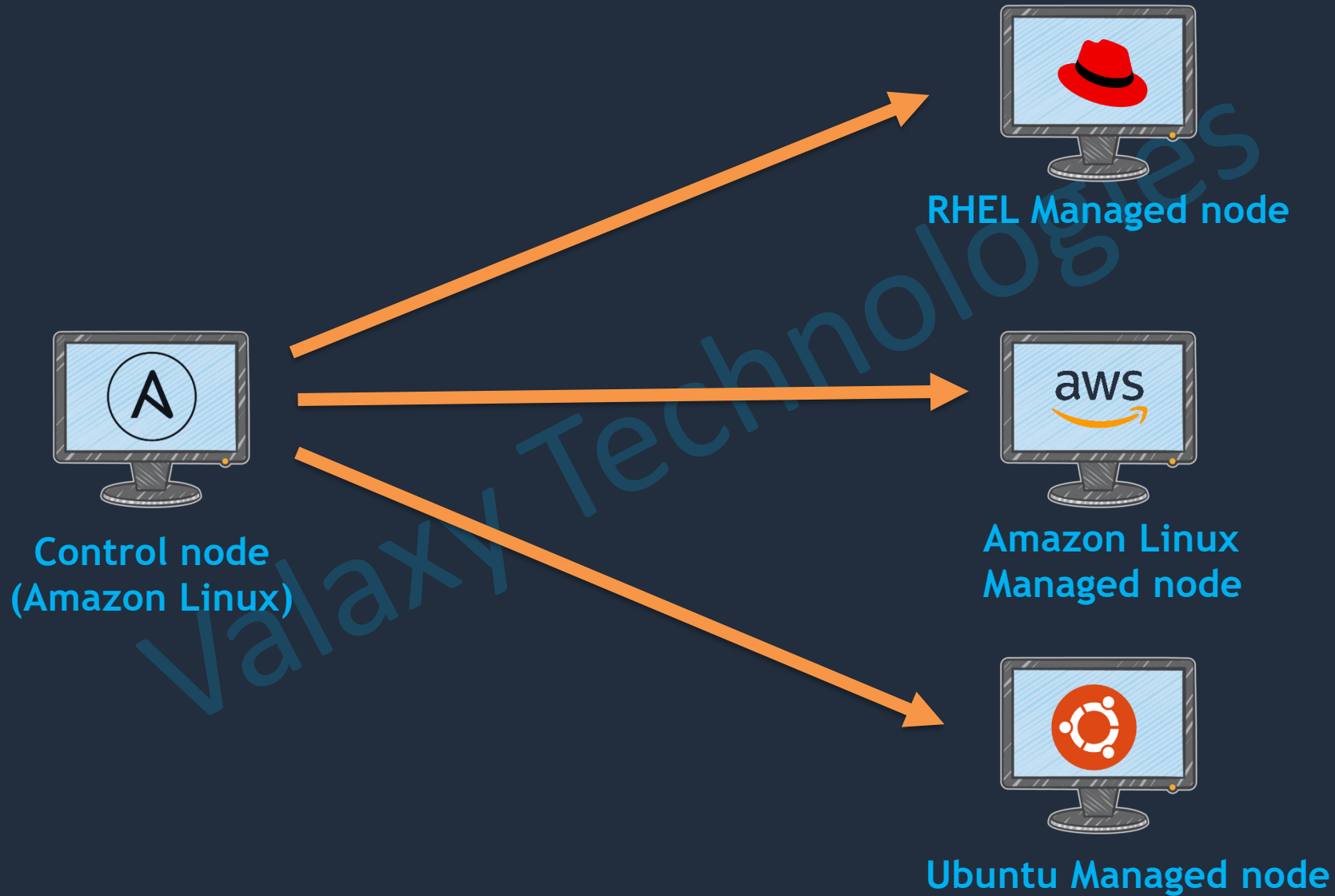
Control node (Amazon Linux)



RHEL Managed node

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Setting up ansible environment



Ansible Ad-hoc commands

- Ping
- command
- Stat
- Yum
- User
- Setup

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What is inventory

Ansible works against multiple managed nodes or “hosts” in your infrastructure at the same time, using a **list or group of lists** known as **Inventory**.

Inventory file is a **collection of hosts(nodes)** which are managed by ansible control node.

Hosts information can be defined in following ways.

- Default Location: **/etc/ansible/hosts**
- Use -i option : **ansible -i my_hosts**
- Defined in **ansible.cfg** file



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Install Tomcat using Playbook

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Inventory:

a list of hosts or group of hosts

The default location for the host inventory file is **/etc/ansible/hosts**

The **ansible*** commands will use a different host inventory file when they are used with the **--inventory PATHNAME** option, **-i PATHNAME** for short

https://docs.ansible.com/ansible/latest/user_guide/intro_inventory.html#intro-inventory

Ansible modules

A **module** is a **reusable, standalone** script that Ansible runs on your behalf, either locally or remotely.

Modules interact with your **local machine, an API, or a remote system** to **perform** specific **tasks** like

Creating users

Installing packages

Updating configurations

Spinning up instances Etc...

Modules are the programs that perform the actual work of the tasks of a play

Ansible ships with thousands of modules.

Ansible playbook

- A playbook is a text file written in YAML (YAML Ain't Markup Language) format, and is normally saved as **.yaml**.
- The playbook begins with a line consisting of three dashes (**---**) as a start of document marker.
- An item in a YAML list starts with a **single dash** followed by a **space**.
- **hosts** and **tasks** are **mandatory** items in a playbook
- The playbook primarily uses **indentation** with **space characters** to indicate the structure of its data
- **Modules** are used to perform **tasks**
- **Comment** start with **#**

create_user.yaml

```
---  
- hosts: all  
  become: true  
  tasks:  
    - user: name=john
```

ansible all -m user -a "name=john" -b

Modules:

Modules are the programs that perform the actual work of the tasks of a play

Core modules are the modules that come bundled with Ansible, There are over 400 core modules.

tasks:

The goal of a play is to map a group of hosts to some well defined roles, represented by things ansible calls tasks. At a basic level, a task is nothing more than a call to an ansible module

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Ansible Variables

- Define with in the playbook
- Passing from external files
- Passing from hosts inventory
- Passing while running playbook
- Using group_vars or hosts_vars and so on..



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Ansible Vault

Ansible Vault

Ansible Vault is a feature of ansible that allows you to keep sensitive data such as passwords or keys in encrypted files, rather than as plaintext in playbooks or roles.

- **create** : to create ansible vault file in the encrypted format
- **view**: to view data of encrypted file
- **edit**: to edit encrypted file
- **encrypt** : to encrypt an unencrypted file
- **decrypt**: to decrypt an encrypted file
- **--ask-vault-pass** : to provide password while running playbook
- **--vault-password-file** : to pass a vault password through a file.