Complete Ansible Automation Training

Introduction

Complete Ansible DevOps Automation Training

Course Overview

Section 1 thru 10

By: Imran Afzal
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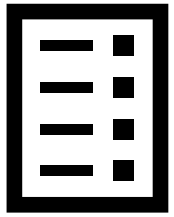
Introduction

Section 1



- Course overview
- What is Ansible?
- History of Ansible
- Benefits
- Terminologies in Ansible
- How Ansible works?
- Other Automation tools
- Free source Ansible and Red Hat Ansible
- Handouts
- Quiz

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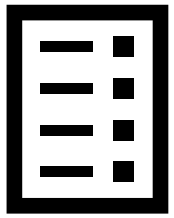
Lab Design and Setup

Section 2



- Lab design
- Installing virtualization software
- Creating a VM and Installing Linux
- Creating Ansible Clients
- Installing Ansible
- Handouts
- Quiz

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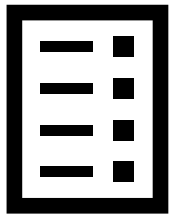
Ansible Automation with Simple Playbooks

Section 3



- YAML file syntax
- YAML file syntax example
- Creating first playbook
- Output playbook
- Multiple tasks playbook
- Playbook for installing and starting a service
- Handouts
- Quiz

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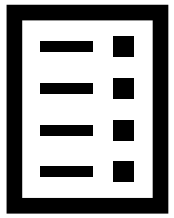
Ansible Automation for Remote Clients

Section 4



- Remote Clients hosts File Syntax
- Establish Connection to Remote Clients
- Playbook
  - Check Remote Clients Connectivity
  - Copy Files to Remote Clients
  - Change File Permissions
  - Setup Apache and Open Firewall Port
  - Run Shell Scripts on Remote Clients
  - Schedule a job (crontab)
  - User Account Management
  - Add or Update User Password
  - Download Package from a URL
  - Kill a Running Process
- Pick and Choose Steps
- Handouts
- Quiz

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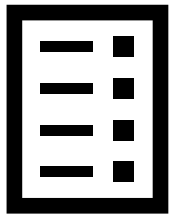
Ansible Automation with Ad-hoc Tasks

Section 5



- Ansible Ad-Hoc Commands (Part 1)
- Ansible Ad-Hoc Commands (Part 2)
- Ansible Ad-Hoc Commands (Part 3)
- Handouts
- Quiz

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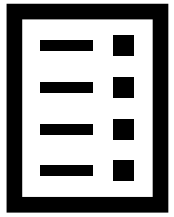
Advance Ansible Automation Features

Section 6



- Roles
- Roles by Application
- Roles on Ansible Galaxy
- Tags
- Variables
- Variables in Inventory File
- Handouts
- Quiz

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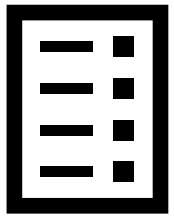
Additional Features in Ansible

Section 7

- Handlers
- Conditions
- Loops
- Handouts
- Quiz



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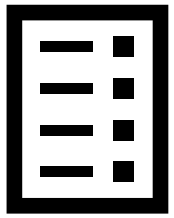
Securing Ansible

Section 8

- Ansible Vault
- Encrypt Strings within a Playbook
- Handouts
- Quiz



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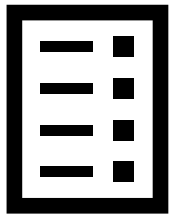
Ansible Management Tools

Section 9

- Ansible AWX
- Ansible Tower
- Handouts
- Quiz



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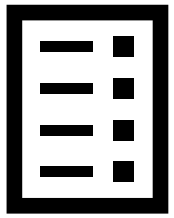
Ansible Resources

Section 10



- Ansible Additional Commands
  - `ansible`
  - `ansible-playbook`
  - `ansible-vault`

  - `ansible-config`
  - `ansible-connection`
  - `ansible-console`
  - `ansible-doc`
  - `ansible-galaxy`
  - `ansible-inventory`
  - `ansible-pull`

- Ansible Documentation
- Community Help

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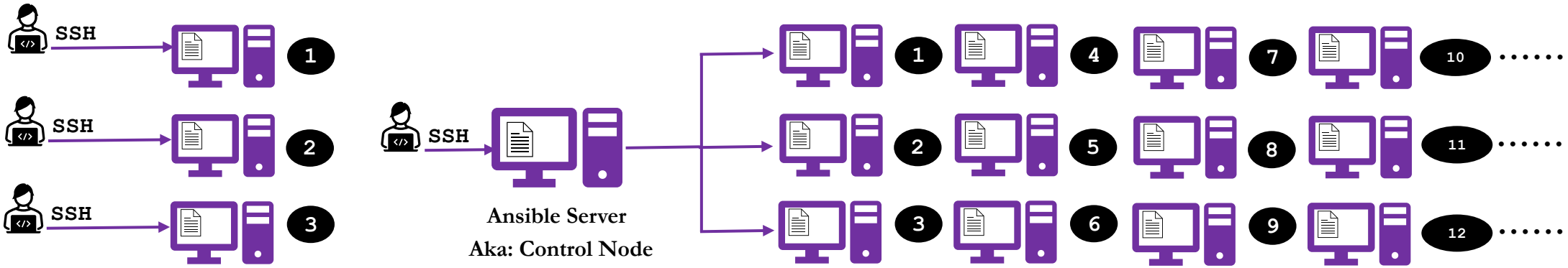
What is Ansible?

- Ansible is an open-source software provisioning, configuration management, and application-deployment tool enabling infrastructure as code. It runs on many Unix-like systems, and can configure both Unix-like systems as well as Microsoft Windows *(Wikipedia)*

- In simple words: Ansible is a free automation tool that can automate IT tasks on local machine where it is running and on remote machines



- **Please note:** Ansible is written in python language, but it does not mean you need python knowledge to use Ansible

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What is Ansible?

- Ansible can be used to:

- Provision system
- Configure system
- Deploy Apps
- Manage system and Apps

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What is Ansible?

- **Example of Tasks**
  - Provisioning
    - Bare-metal serves
    - Virtualization systems
    - Network devices
    - Storage systems
    - Cloud platform
  - System Configuration Management
    - Updates or upgrades
    - Package installation
    - Service configuration
    - Stop|Start|Restart of services
    - User or groups
    - Assigning permissions to files and directories
  - Application deployment
  - Backups
  - Weekly or monthly system reboots
  - Orchestration.

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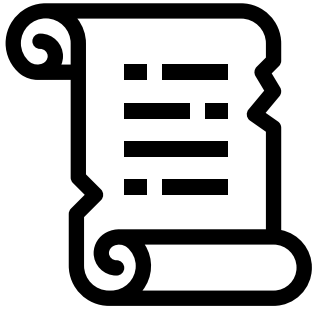
Brief History of Ansible

- The Ansible project was started in 2012 by Michael DeHaan
- It is open source and community driven
- Ansible Inc was purchased by Red Hat in 2015
- It is available for most of the Linux distributions such as, Red Hat, CentOS, Fedora, Ubuntu, Debian and SUSE



- Need?
  - Infrastructure management (specially virtualization)
  - Configuration management (System or Application configuration)
  - Multi-tier application automation (e.g. app, web and db servers)
  - Single point of automation (having scripts on each system vs. one automation management platform).

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Benefits of Ansible

- Agentless!!!
- Open-source
- Avoid human errors
- Saves time by automating repetitive or tedious tasks
- Increase productivity
- Easy to use
- Simple (human readable text files)
- Flexible
- Secure (over SSH).

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Benefits of Ansible

- Provides pre-written modules
- Easy to learn *(as long as you have a good instructor)* ☺
- Great product for Orchestration
- Ansible can be used not only for systems but also for network, storage, cloud etc.
- Provides approx. 1300 modules out of the box and about 4000 modules on galaxy
- Huge online Ansible resources
  - www.ansible.com
  - www.docs.ansible.com
  - www.galaxy.ansible.com
  - www.github.com

- **A big plus + for job seekers and those who want to level up their career**

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Terminologies in Ansible

- **Control node or Ansible Server**
  - Server which runs Ansible application

- **Modules**
  - Module is a command meant to be executed on the client-side
  - Most of the IT tasks modules are already created and can be found on Ansible website
    - www.docs.ansible.com → search for module index
    - www.galaxy.ansible.com
  - Example of modules:
    1. Install http
    2. Enable http service
    3. Start http service

    } Task

- **Task**
  - A task is a section that consists of a single procedure to be completed. A task can have multiple modules

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Terminologies in Ansible

- **Playbook**
  - Automation file with step-by-step execution of multiple tasks
- **YAML**
  - A Playbook written in YAML language (Yet another markup language)
- **Inventory**
  - File that has information about remote clients where tasks are executed
- **Tag**
  - A reference or alias to a specific task
- **Variable**
  - Variables are like containers that holds the defined value which can be used repetitively
- **Role**
  - Splitting of Playbook into smaller groups. Roles let you automatically load related vars, files, tasks, handlers, and other Ansible artifacts based on a known file structure. After you group your content in roles, you can easily reuse them and share them with other users

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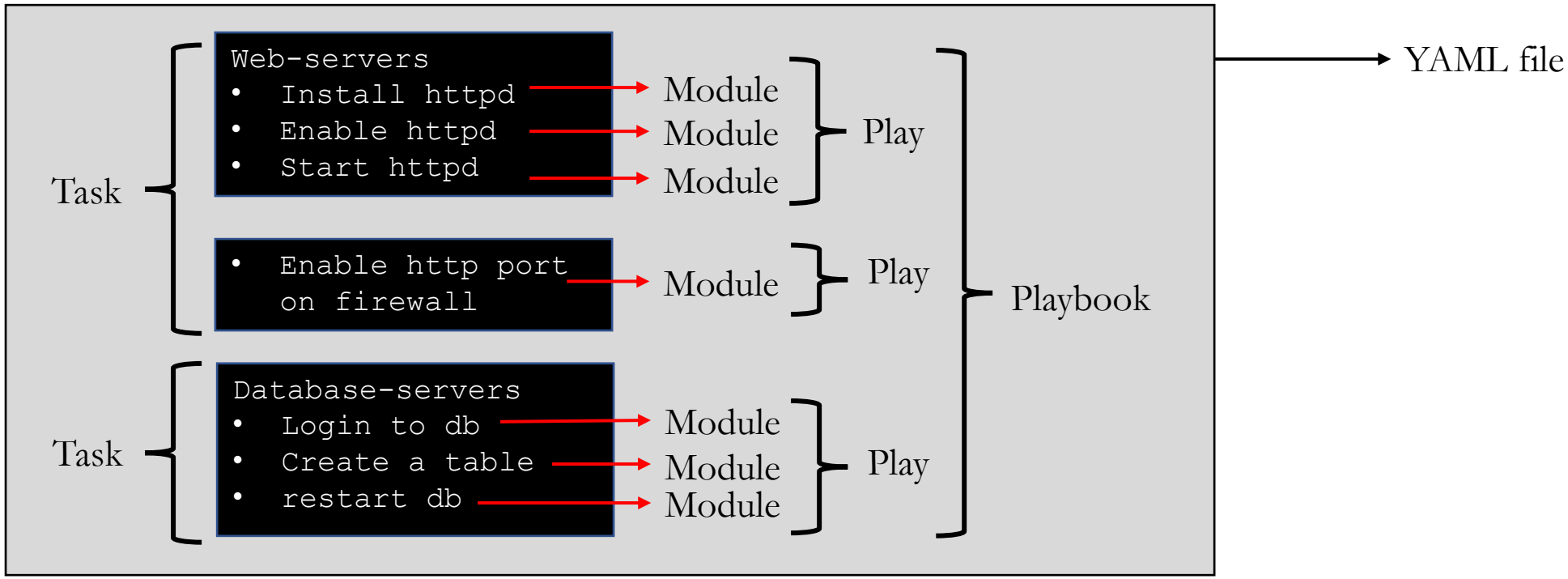
How Ansible Works?

- Each specific **Task** in Ansible is written through a **Module(s)**
- Multiple **Modules** are written in sequential order
- Multiple **Modules** for related **Tasks** is called a **Play**
- All **Plays** together makes a **Playbook**
- **Playbook** is written as a file format called YAML



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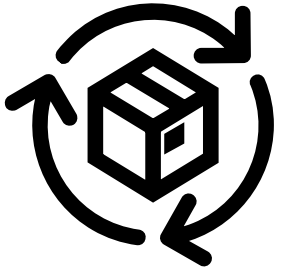
How Ansible Works?

Commands examples:



To run modules through yaml file:

```
# ansible-playbook example.yml
```

To run module independently

```
# ansible myservers -m ping
```

Ansible configuration files:

- `/etc/ansible/ansible.cfg`
- `/etc/ansible/hosts`
- `/etc/ansible/roles`

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Other Automation Tools

- **Puppet and Chef**
  - Uses Ruby language which is more difficult to learn, and their support is declining day by day
  - These tools require agents to be installed on clients
  - The installation process is very complex
  - Lack of documentation

- **Ansible**
  - Uses simple YAML
  - Agentless (Only requires SSH access)
  - Easy installation
  - Well documented product

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Open Source Ansible vs. Red Hat Ansible

- Ansible is an open-source software
- It was purchased by Red Hat in 2015
- Ansible software itself is free even though it is owned by Red Hat
- Ansible is the same software across all platforms
- The only difference is, Red Hat provides additional product **Ansible Tower** and **Consulting or Technical Support** for Ansible
- Learn more about Red Hat Ansible at www.redhat.com

- Red Hat Ansible Tower
  - Red Hat provides Ansible tower which is GUI based tool to manage Ansible automation
  - Ansible tower is a paid product by Red Hat
  - Manages multiple Ansible servers for large enterprise environment

- Ansible AWX
  - Open source
  - Free software.

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