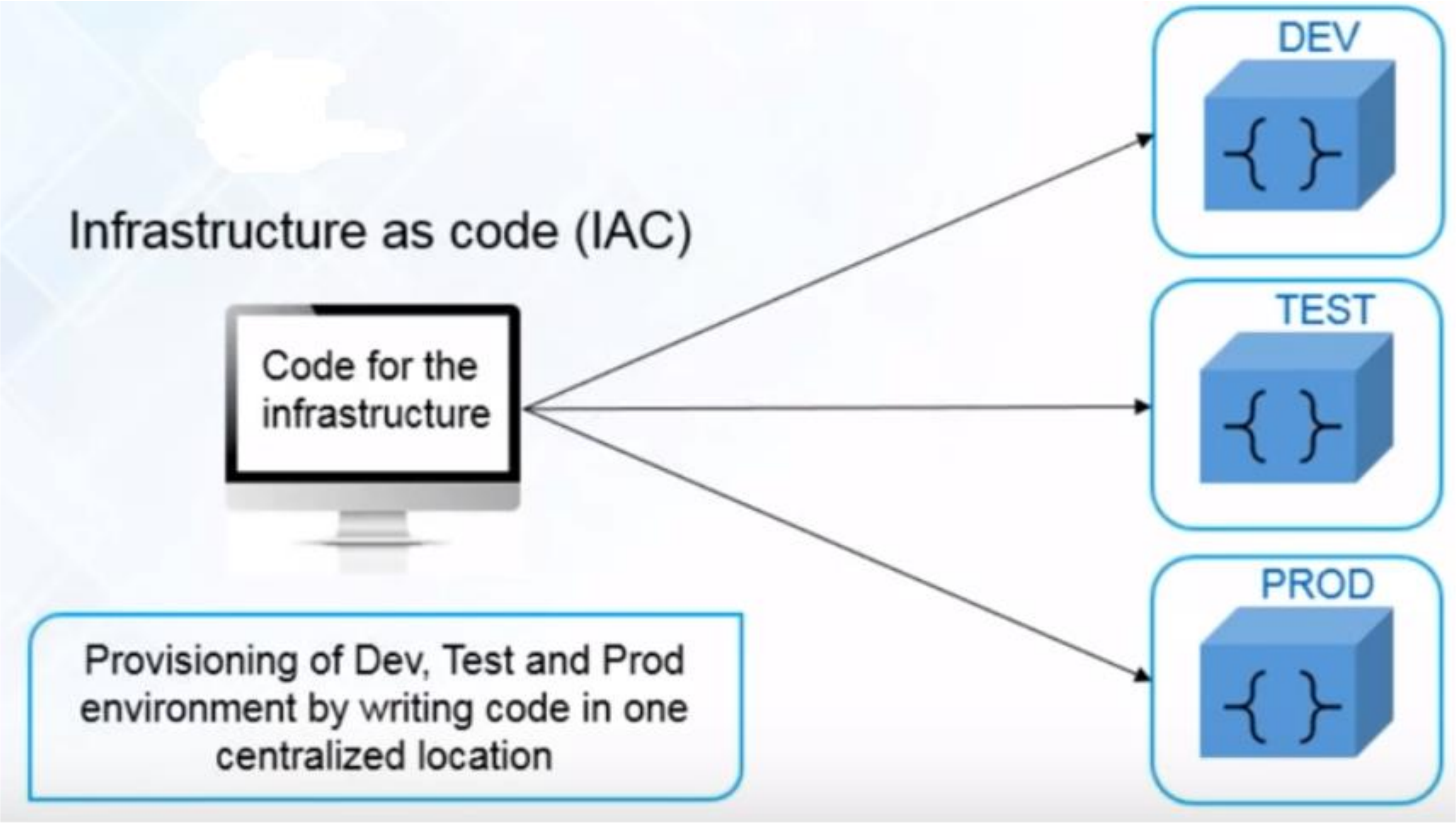
Welcome to Ansible

What is 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.
- Managing IT system configurations involves defining a system's desired state—like server configuration—then building and maintaining those systems.
- Closely related to configuration assessments and drift analyses, configuration management uses both to identify systems to update, reconfigure, or patch.

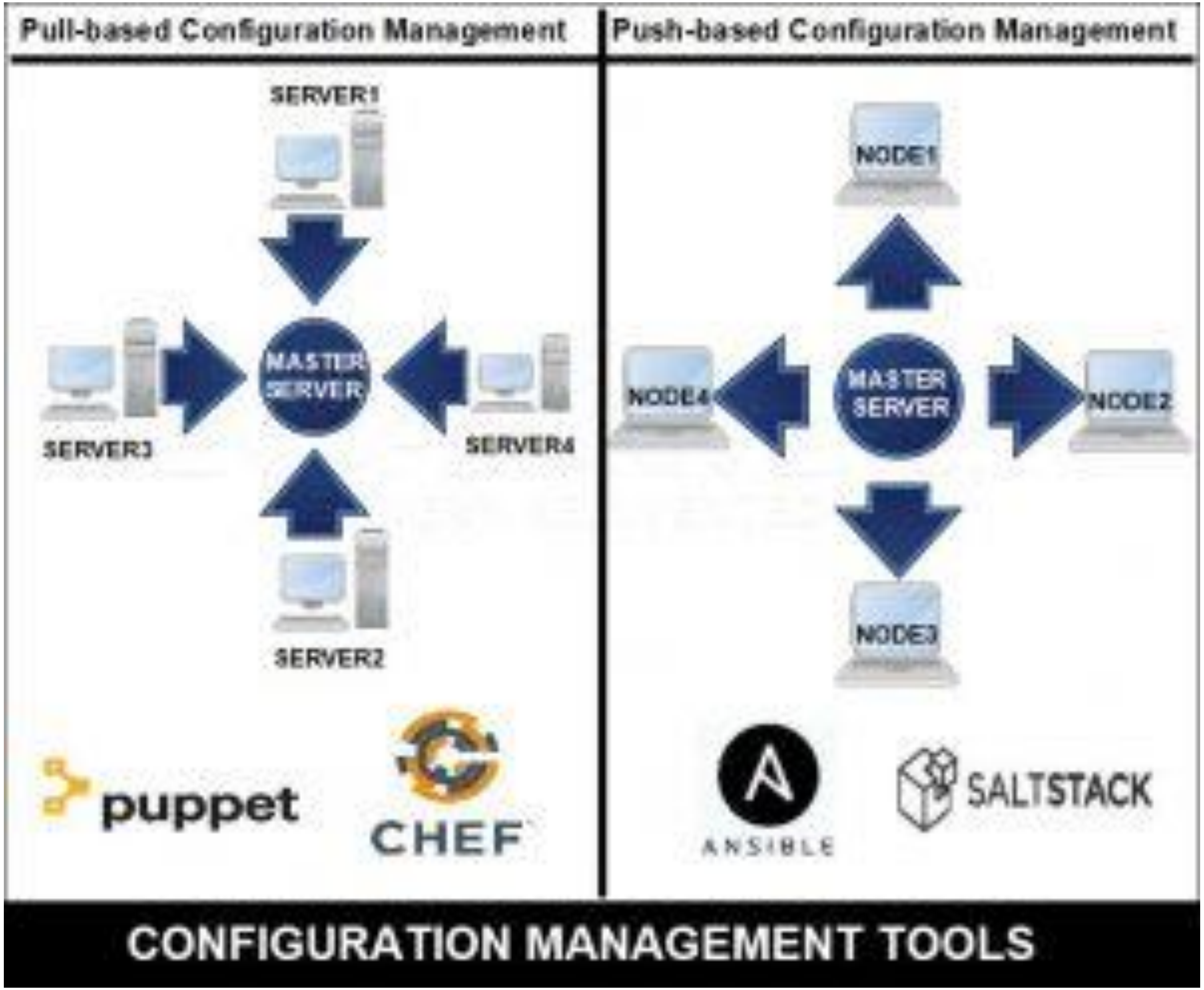
Configuration Management



Infrastructure as code (IAC)

Provisioning of Dev, Test and Prod environment by writing code in one centralized location

Configuration Management Types


Pull-based Configuration Management
SERVER1
SERVER3
MASTER SERVER
SERVER4
SERVER2
puppet
CHEF
Push-based Configuration Management
NODE1
NODE4
MASTER SERVER
NODE2
NODE3
ANSIBLE
SALTSTACK
CONFIGURATION MANAGEMENT TOOLS

Configuration Management Tools

- Ansible
- Salt Stack
- Chef
- Puppet

Introduction to Ansible

- Ansible is an open source IT Configuration Management, Deployment & Orchestration tool.
- It aims to provide large productivity gains to a wide variety of automation challenges.
- This tool is very simple to use yet powerful enough to automate complex multi-tier IT application environments.
- What Problems we have before Ansible?
- Ansible is a helpful tool that allows you to create groups of machines, describe how these machines should be configured or what actions should be taken on them.
- Ansible issues all commands from a central location to perform these tasks.
- No other client software is installed on the node machines. It uses SSH to connect to the nodes.
- Ansible is a product of Redhat.
- Ansible is written in Python Language.

Ansible Features

Simple:

- A very simple syntax written in YAML called playbooks is used by Ansible.
- YAML is a legible data serialization language. No special coding skills are required and even people who do not know what is Ansible can likely read a playbook and understand what is happening.
- Installation is simple too. Simplicity ensures a quick start.

Agentless:

- Ansible is completely agentless. There are no agents/software or additional firewall ports that you need to install on the client systems or hosts which you want to automate.
- You don’t have to set up a management infrastructure separately like managing your entire systems, network and storage.

Ansible Features

Powerful & Flexible:

- Ansible provides you with hundreds of modules to manage the infrastructure, networks, operating systems and services.
- Ansible’s capabilities all put together, allow you to organize and coordinate the entire application environment regardless of the deployment location.

Efficient:

- No extra software on your servers means more resources available for your applications.
- Ansible introduces modules which act as basic building blocks for your software. So, you can even customize as per your needs.

What all Ansible can do?

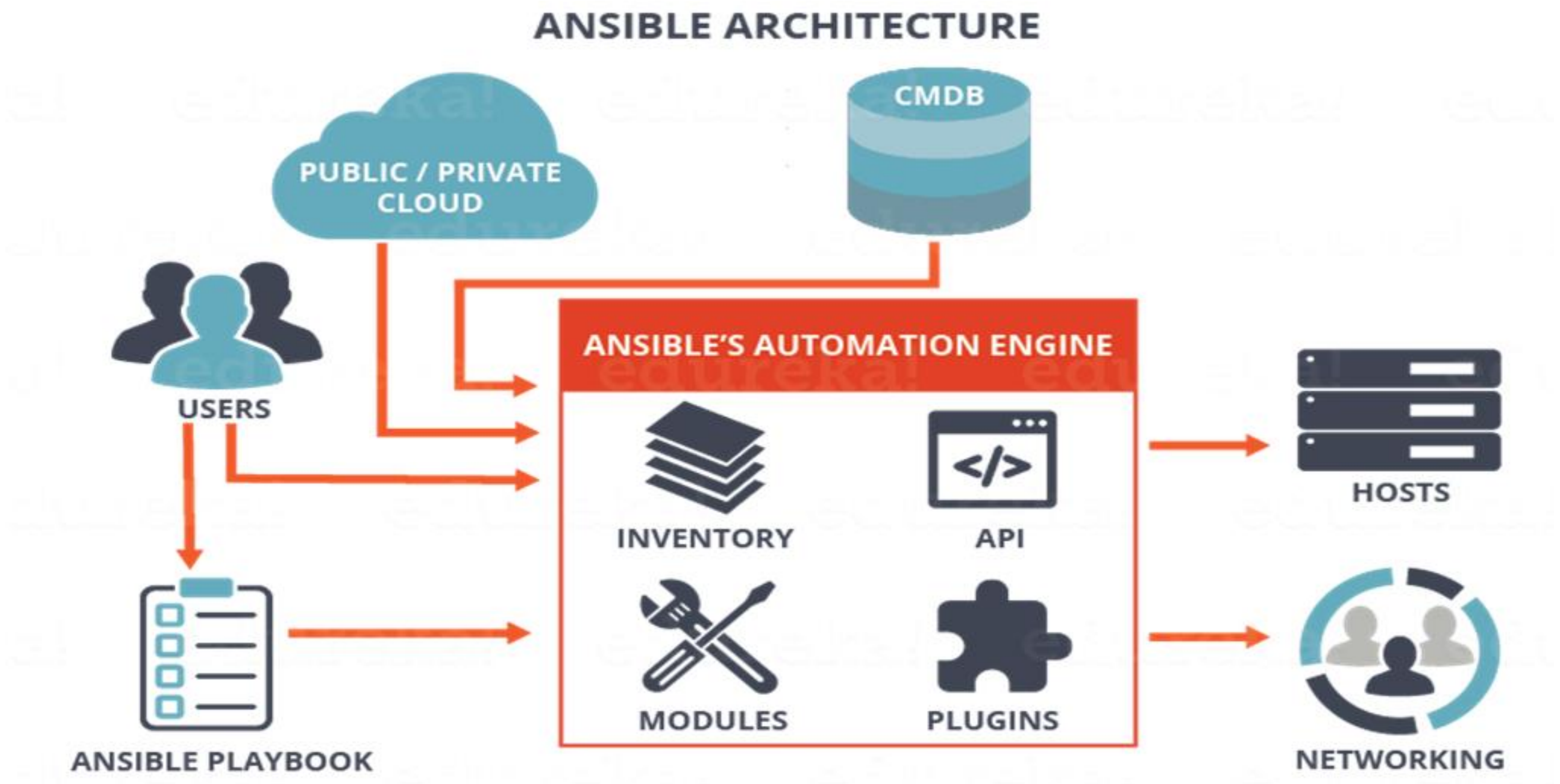
Provisioning: Ansible is used to provision the basic infrastructure, install services etc. After the underlying environment is provisioned, Ansible can also be used to provision resources, services, and cloud applications.

Configuration Management: It establishes and maintains consistency of the product performance by recording and updating detailed information which describes an enterprise’s hardware and software.

Application Deployment: You can make DevOps easier by automating the deployment of internally developed applications to your production systems. There are a number of steps that needs to be performed to deploy the engine, which Ansible does for you:

- Move a .war application from dropins directory to apps directory
- Add server.xml file
- Navigate to the webpage to see your application

Ansible Architecture



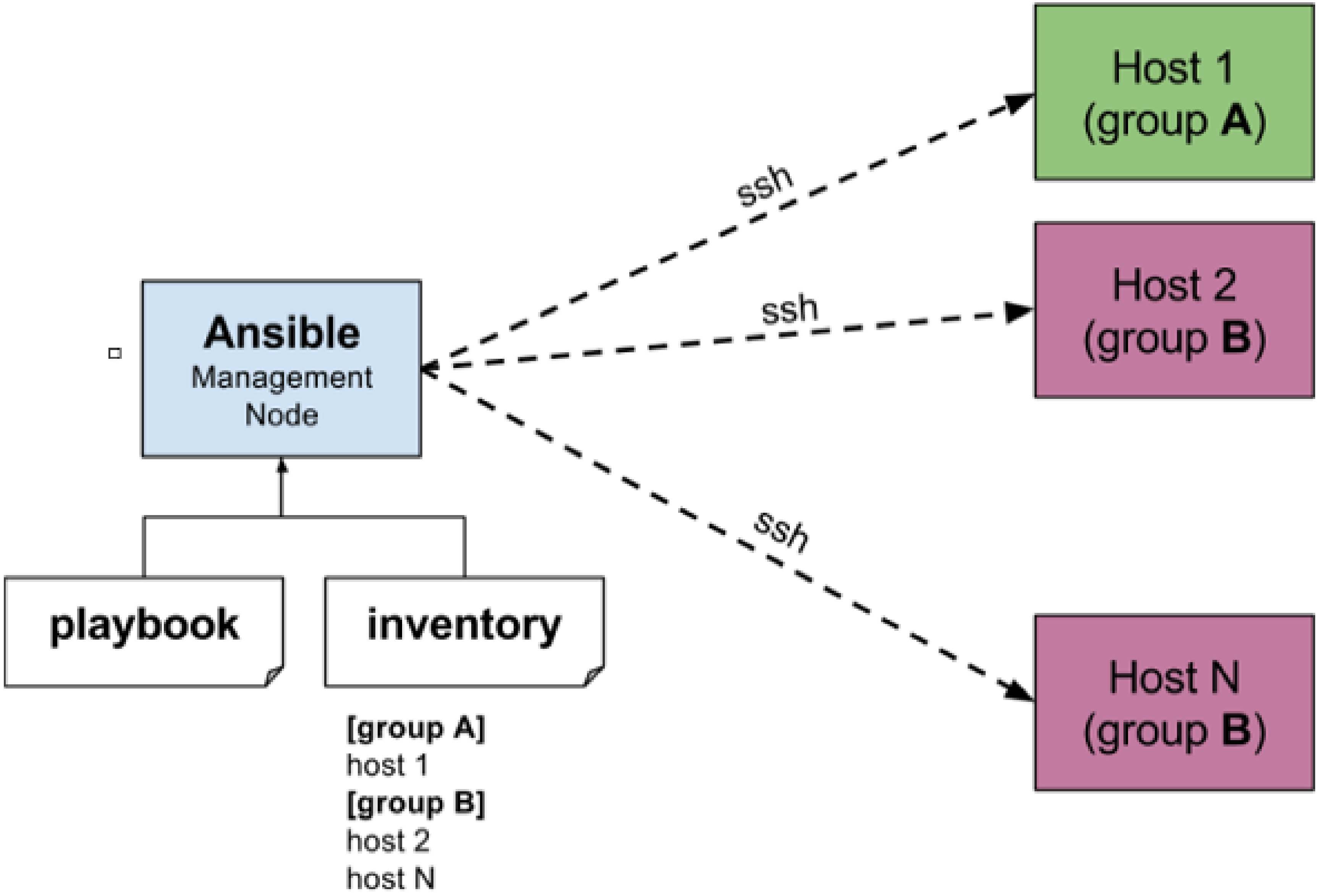
Ansible Architecture

- We can classify the Ansible architecture into 3 sections
  - Ansible Users and Playbooks
  - Ansible Engine
  - Hosts and Networking
- The **Ansible Engine** consists of Inventory, API, Modules and Plugins.
- A **user** writes **playbooks** i.e. set of tasks, then the playbook scans the inventory and matches for the listed hosts or IP addresses where the tasks must be executed.
- Ansible copies all the modules to the managed node using Python API calls and plugins to complete the given tasks. Once the tasks are completed/executed, all the modules are destroyed on the Managed Nodes. Ansible on linux executes the modules on managed hosts using SSH.

Environment Setup

- Setup Ansible Control Server
- Setup Ansible Node Server

How Ansible Works



[group A]
host 1
[group B]
host 2
host N

YAML

- is a data serialization language that matches user’s expectations about data.
- It designed to be human friendly and works perfectly with other programming languages.
- YAML is case sensitive
- The files should have .yaml extension or .yml extension
- YAML does not allow the use of tabs while creating YAML files; spaces are allowed instead
- Comments in YAML begins with the (#) character.
- Indentation of whitespace is used to denote structure.
- YAML supports single line comments, does not support multi line comments
- Keys and Values are separated by colon(:) and space
- Refer YAML Basics Document

Ansible Playbooks

- Ansible playbooks are written using the YAML Ain't Markup Language
- YAML files generally begin with a three dash (---) (optional)
  - **---**
- Next immediate line starts with single dash (-). name is optional here
  - **- name: description**
- hosts expect value like all or group.
  - **hosts: all**
- Do you want to become a root on target server uses become
  - **become: yes**
- What action do you want to perform? Specify under tasks
  - tasks:
- You can validate it by online tools YAML lint
- To verify if the package is installed on the server
  - yum list installed | grep nginx
  - ps –ef | grep nginx
- ansible-playbook nginx-install.yml –check – dry run, don’t execute the tasks but will check if tasks can be performed

Q & A