#ANSIBLEFEST2019

Getting Started with Ansible

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Red Hat | ANSIBLE

Share your automation story

1. How did you get started with Ansible?
I had a school project that asked us to go and find OSS that we thought was interesting and I found ansible.

2. How long have you been using it?
3+ years

3. What's your favorite thing to do when you use Ansible?
Automation of meaningless tasks, most lineinfile config changes.

Agenda

- Introduction (We just did that didn't we?)
- Introduction to Ansible
  - What is Ansible?
  - Where can I use it?
  - How does it work?
- Using Ansible
  - Brief of Ad-hoc commands
  - Anatomy of a Playbook
- Tips and Tricks and where to find them
  - Simplicity, Inventory, Syntax and Roles
- NEW STUFF ALERT
- Final thoughts

Ansible Intro

WHAT IS ANSIBLE AUTOMATION?

- The Ansible project is an open source community sponsored by Red Hat. It's also a simple automation language that perfectly describes IT application environments in Ansible Playbooks.
- **Ansible Engine** is a supported product built from the Ansible community project.
- **Ansible Tower** is an enterprise framework for controlling, securing, managing and extending your Ansible automation (community or engine) with a UI and RESTful API.

SIMPLE

Human readable automation

No special coding skills needed

Tasks executed in order

Usable by every team

Get productive quickly

POWERFUL

App deployment

Configuration management

Workflow orchestration

Network automation

Orchestrate the app lifecycle

AGENTLESS

Agentless architecture

Uses OpenSSH & WinRM

No agents to exploit or update

Get started immediately

More efficient & more secure

With Ansible you can automate

CROSS PLATFORM – Linux, Windows, UNIX

Agentless support for all major OS variants, physical, virtual, cloud and network

HUMAN READABLE – YAML

Perfectly describe and document every aspect of your application environment

PERFECT DESCRIPTION OF APPLICATION

Every change can be made by playbooks, ensuring everyone is on the same page

VERSION CONTROLLED

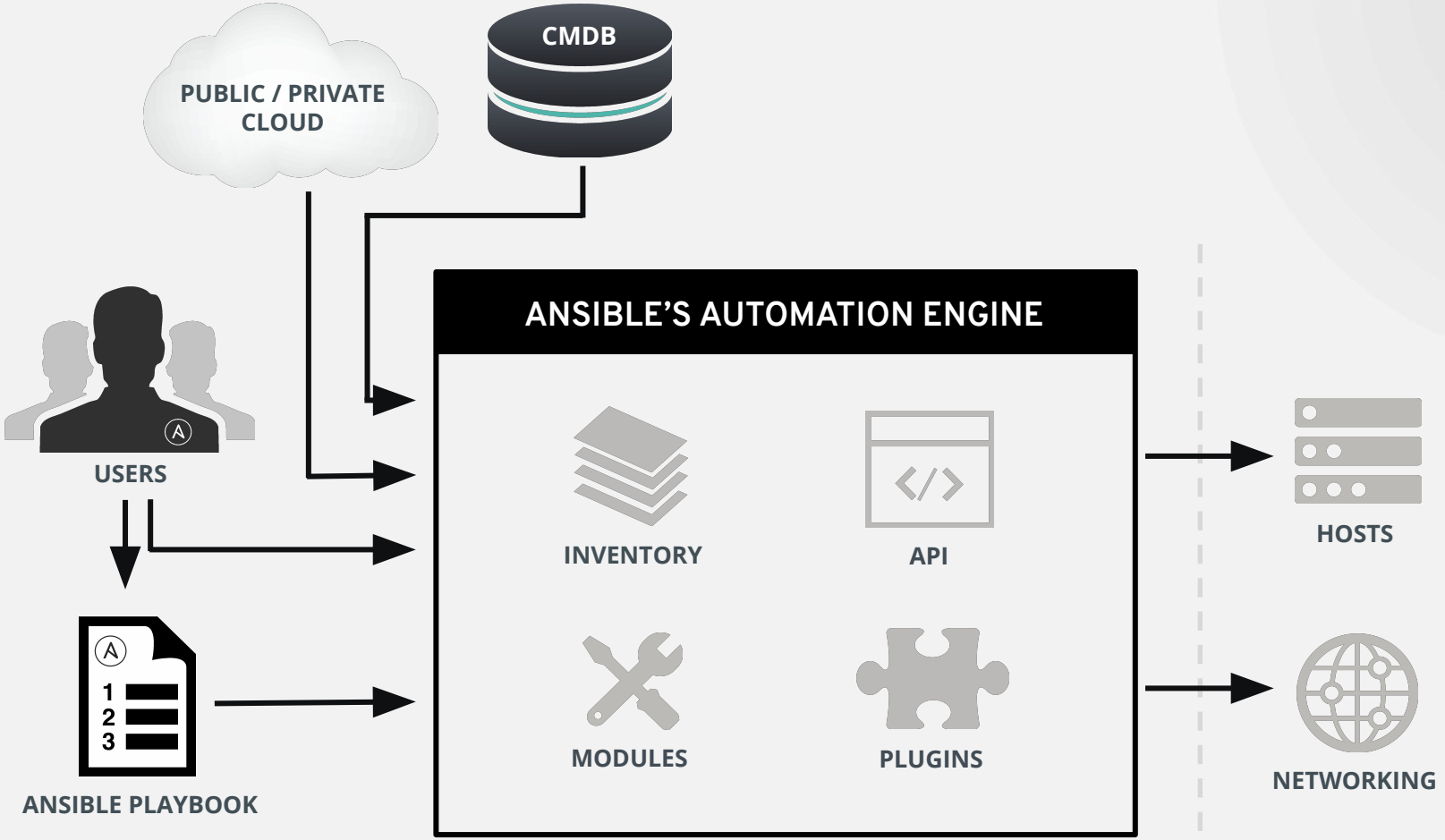
Playbooks are plain-text. Treat them like code in your existing version control.

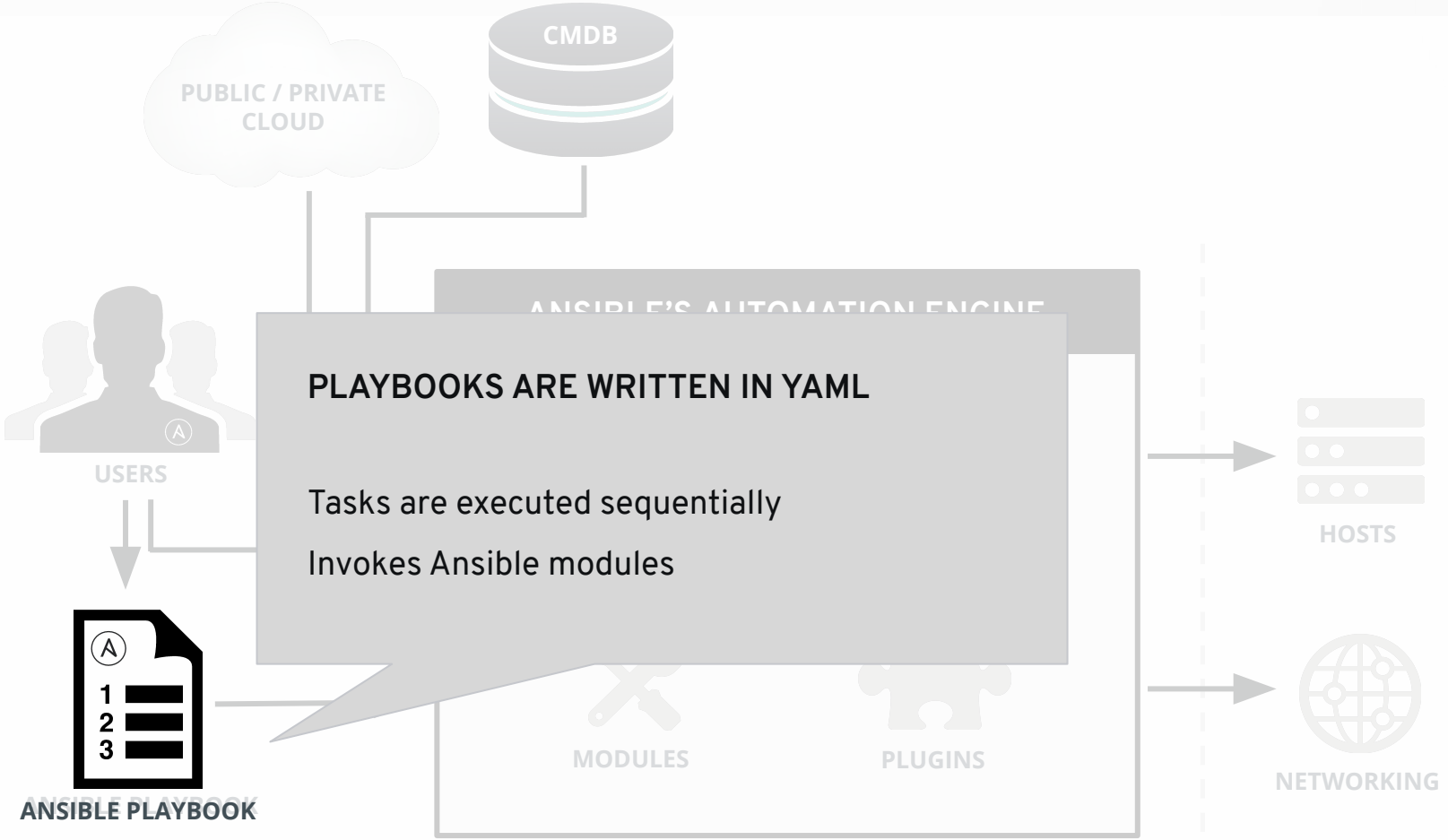
DYNAMIC INVENTORIES

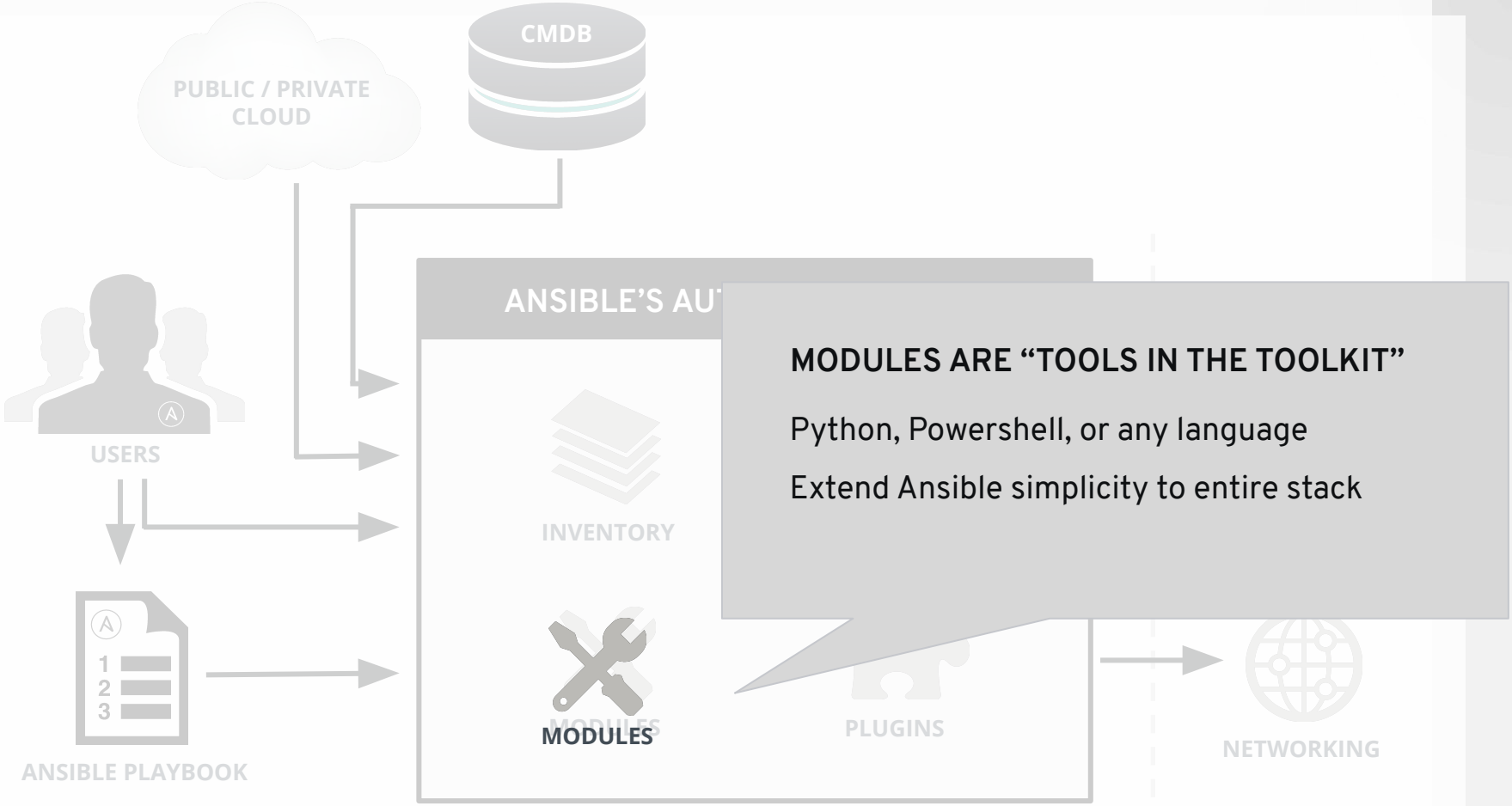
Capture all the servers 100% of the time, regardless of infrastructure, location, etc.

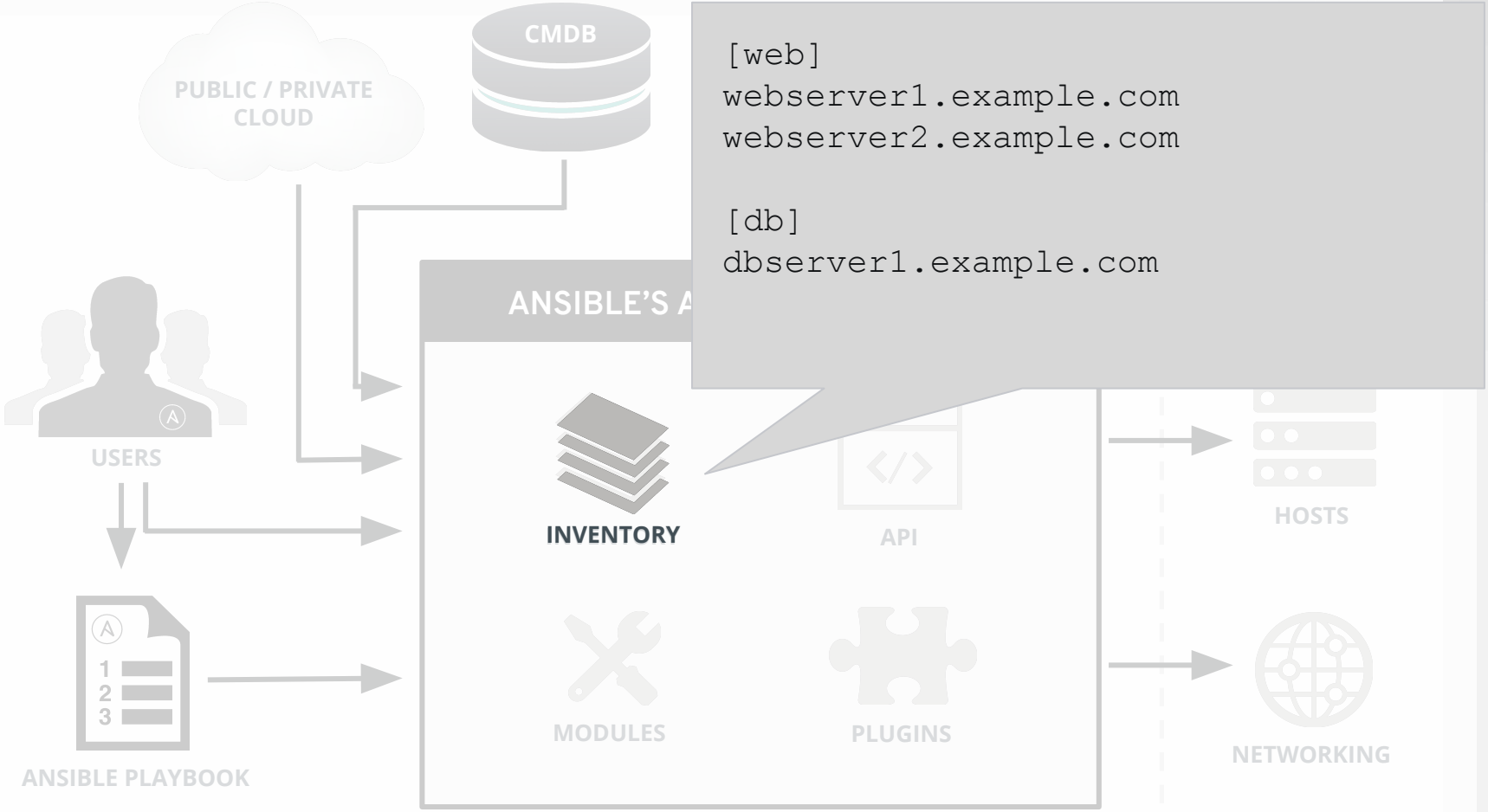
ORCHESTRATION THAT PLAYS WELL WITH OTHERS – HP SA, Puppet, Jenkins, RHNSS, etc.

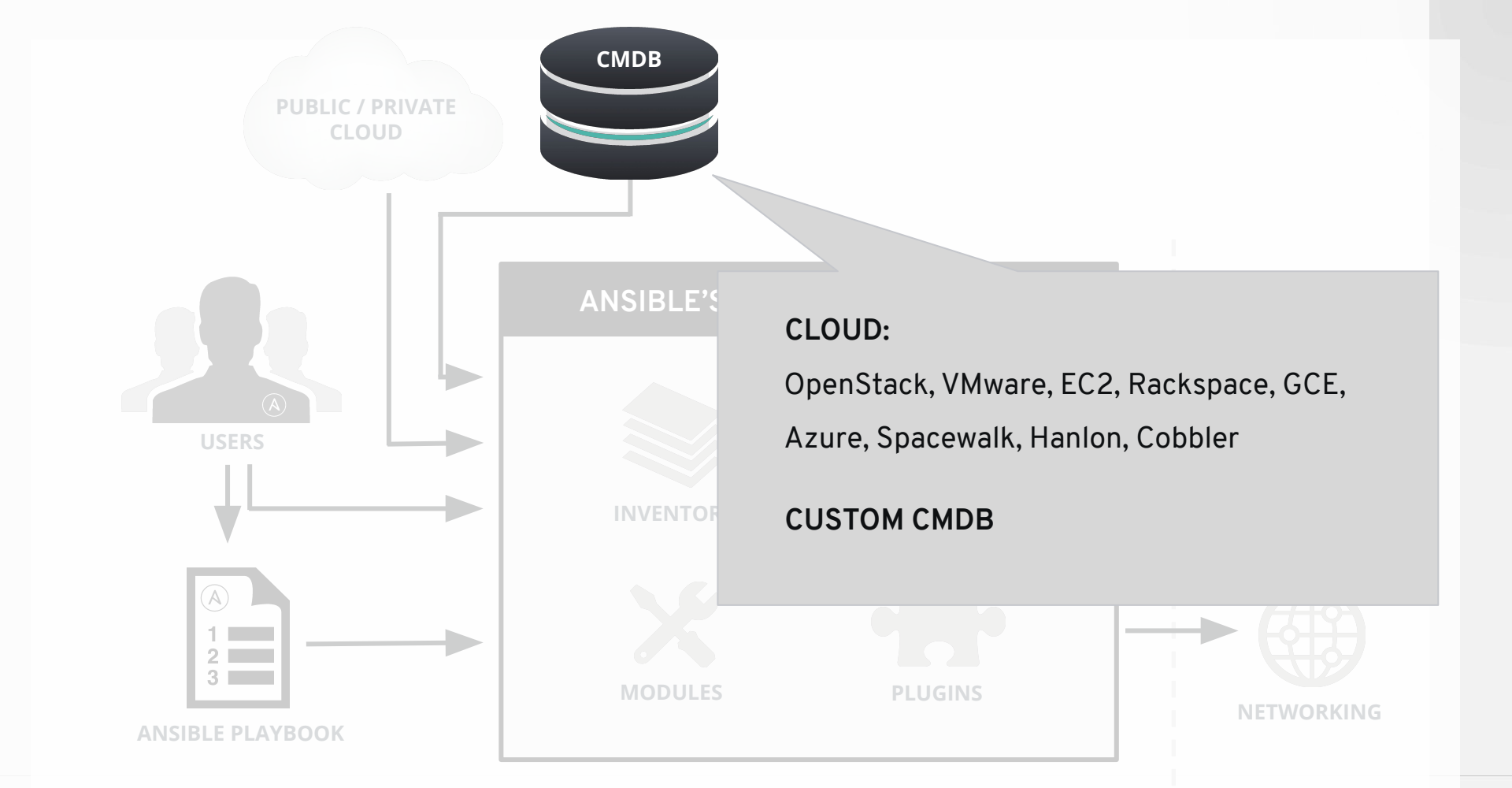
Homogenize existing environments by leveraging current toolsets and update mechanisms.

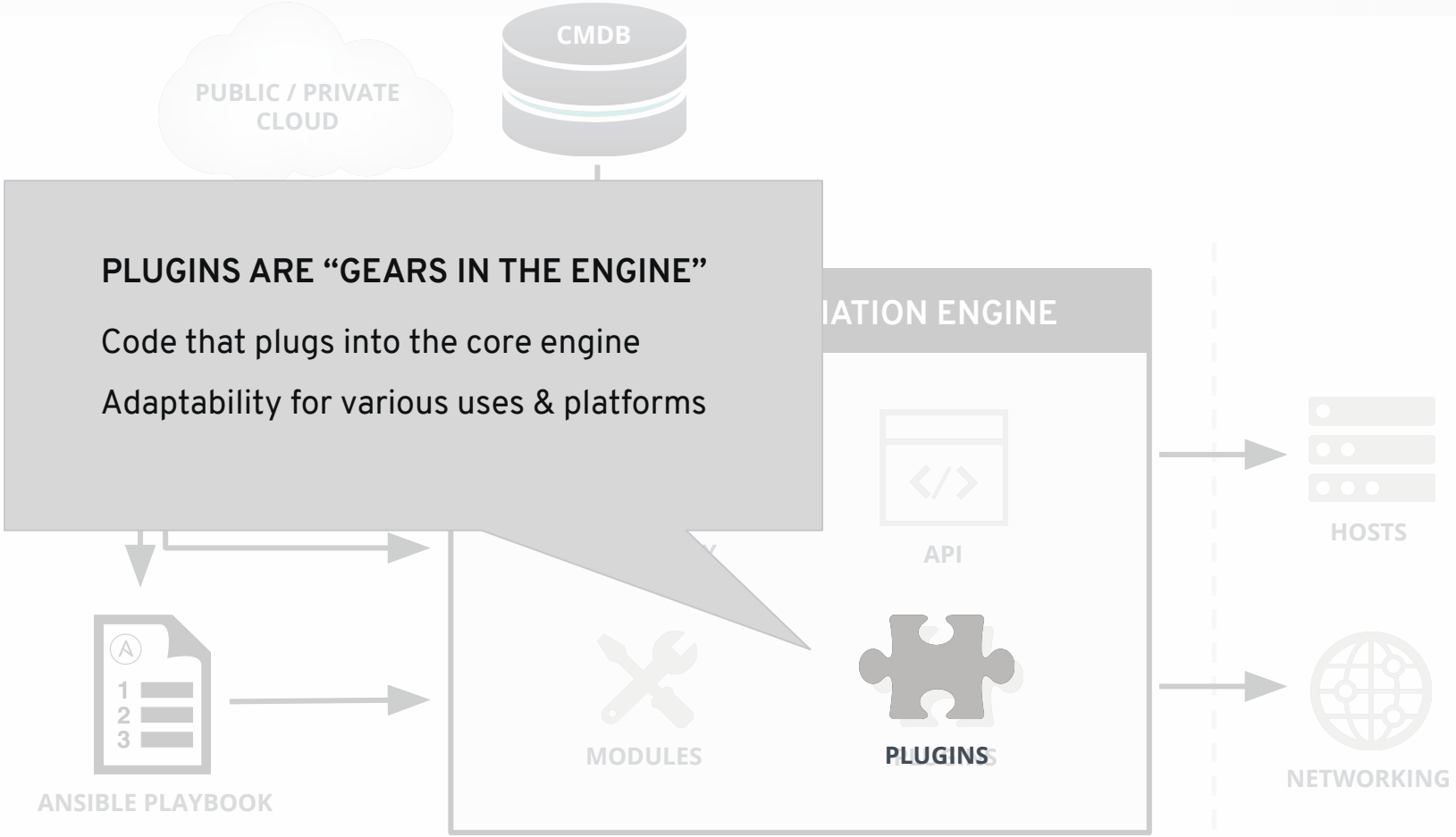

PUBLIC / PRIVATE CLOUD
CMDB
ANSIBLE'S AUTOMATION ENGINE
USERS
INVENTORY
API
HOSTS
1
2
3
ANSIBLE PLAYBOOK
MODULES
PLUGINS
NETWORKING


CMDB
PUBLIC / PRIVATE CLOUD
USERS
PLAYBOOKS ARE WRITTEN IN YAML
Tasks are executed sequentially
Invokes Ansible modules
HOSTS
1
2
3
ANSIBLE PLAYBOOK
MODULES
PLUGINS
NETWORKING


CMDB
PUBLIC / PRIVATE CLOUD
ANSIBLE'S AU
USERS
INVENTORY
MODULES ARE "TOOLS IN THE TOOLKIT"
Python, Powershell, or any language
Extend Ansible simplicity to entire stack
1
2
3
ANSIBLE PLAYBOOK
MODULES
PLUGINS
NETWORKING


CMDB
PUBLIC / PRIVATE CLOUD
[web]
webserver1.example.com
webserver2.example.com
[db]
dbserver1.example.com
ANSIBLE'S A
USERS
INVENTORY
API
HOSTS
1
2
3
ANSIBLE PLAYBOOK
MODULES
PLUGINS
NETWORKING


CMDB
PUBLIC / PRIVATE CLOUD
USERS
ANSIBLE'S
INVENTOR
MODULES
PLUGINS
NETWORKING
ANSIBLE PLAYBOOK
1
2
3
CLOUD:
OpenStack, VMware, EC2, Rackspace, GCE,
Azure, Spacewalk, Hanlon, Cobbler
CUSTOM CMDB


CMDB
PUBLIC / PRIVATE CLOUD
PLUGINS ARE “GEARS IN THE ENGINE”
Code that plugs into the core engine
Adaptability for various uses & platforms
IATION ENGINE
API
HOSTS
1
2
3
ANSIBLE PLAYBOOK
MODULES
PLUGINS
NETWORKING

Using Ansible

Ad-hoc commands

```
# check all my inventory hosts are ready to be
# managed by Ansible
$ ansible all -m ping

# run the uptime command on all hosts in the
# web group
$ ansible web -m command -a “uptime”

# collect and display the discovered for the
# localhost
$ ansible localhost -m setup
```

Ad-hoc example

Inventory

An inventory is a file containing:

- Hosts
- Groups
- Inventory-specific data (variables)
- Static or dynamic sources

Playbooks

```
---
- name: install and start apache
  hosts: web
  vars:
    http_port: 80
    max_clients: 200
  remote_user: root

  tasks:
  - name: install httpd
    yum: pkg=httpd state=latest
  - name: write the apache config file
    template: src=/srv/httpd.j2 dest=/etc/httpd.conf
  - name: start httpd
    service: name=httpd state=started
```

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  - name: write the apache config file
    template: src=/srv/httpd.j2 dest=/etc/httpd.conf
  - name: start httpd
    service: name=httpd state=started
```

Handlers

```
tasks:
  - name: add cache dir
      file:
       path: /opt/cache
       state: directory

  - name: install nginx
    yum:
      name: nginx
      state: latest
    notify: restart nginx

handlers:
  - name: restart nginx
    service:
      name: nginx
      state: restarted
```

Variables

Ansible can work with metadata from various sources and manage their context in the form of variables.

- Command line parameters
- Plays and tasks
- Files
- Inventory
- Discovered facts
- Roles

Tips/Best Practices

Simplicity

Simplicity

```
- hosts: web
  tasks:
  - yum:
      name: httpd
      state: latest


  - service:
      name: httpd
      state: started
      enabled: yes
```

Simplicity

```
- hosts: web
  name: install and start apache
  tasks:
    - name: install apache packages
      yum:
        name: httpd
        state: latest

    - name: start apache service
      service:
        name: httpd
        state: started
        enabled: yes
```

Naming Example

Inventory

```
10.1.2.75
10.1.5.45
10.1.4.5
10.1.0.40

w14301.example.com
w17802.example.com
w19203.example.com
w19304.example.com
```

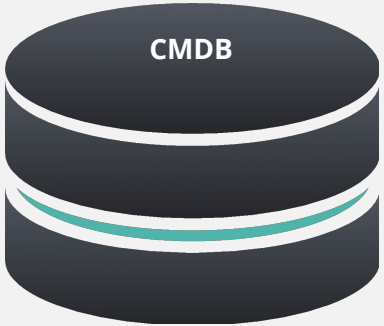
Inventory

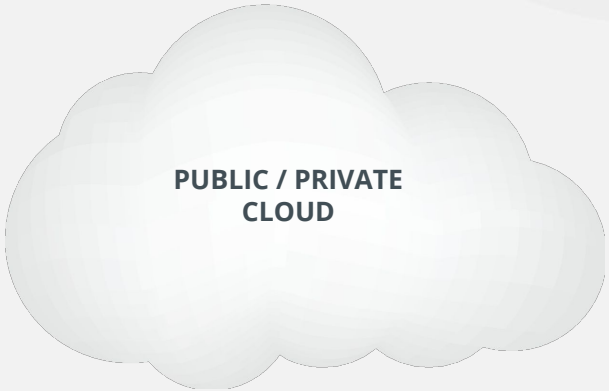
```
db1  ansible_host=10.1.2.75
db2  ansible_host=10.1.5.45
db3  ansible_host=10.1.4.5
db4  ansible_host=10.1.0.40

web1 ansible_host=w14301.example.com
web2 ansible_host=w17802.example.com
web3 ansible_host=w19203.example.com
web4 ansible_host=w19203.example.com
```

Dynamic Inventories

- Stay in sync automatically
- Reduce human error





YAML Syntax

YAML and Syntax

```
- name: install telegraf
  yum: name=telegraf-{{ telegraf_version }} state=present update_cache=yes disable_gpg_c
  notify: restart telegraf

- name: configure telegraf
  template: src=telegraf.conf.j2 dest=/etc/telegraf/telegraf.conf

- name: start telegraf
  service: name=telegraf state=started enabled=yes
```

YAML and Syntax

```
- name: install telegraf
  yum: >
      name=telegraf-{{ telegraf_version }}
      state=present
      update_cache=yes
      disable_gpg_check=yes
      enablerepo=telegraf
  notify: restart telegraf

- name: configure telegraf
  template: src=telegraf.conf.j2 dest=/etc/telegraf/telegraf.conf

- name: start telegraf
  service: name=telegraf state=started enabled=yes
```

YAML and Syntax

```
- name: install telegraf
  yum:
    name: telegraf-{{ telegraf_version }}
    state: present
    update_cache: yes
    disable_gpg_check: yes
    enablerepo: telegraf
  notify: restart telegraf

- name: configure telegraf
  template:
    src: telegraf.conf.j2
    dest: /etc/telegraf/telegraf.conf
  notify: restart telegraf

- name: start telegraf
  service:
    name: telegraf
    state: started
    enabled: yes
```

```
ansible-playbook playbook.yml --syntax-check
```

Roles

Roles

- Think about the full life-cycle of a service, microservice or container — not a whole stack or environment
- Keep provisioning separate from configuration and app deployment
- Roles are not classes or object or libraries – those are programming constructs
- Keep roles loosely-coupled — limit hard dependencies on other roles or external variables

Variable Precedence

The order in which the same variable from different sources will override each other.

1. Extra vars
2. Include params
3. Role (and include_role) params
4. Set_facts / registered vars
5. Include_vars
6. Task vars (only for the task)
7. Block vars (only for tasks in the block)
8. Role vars
9. Play vars_files
10. Play vars_prompt
11. Play vars
12. Host facts / Cached set_facts
13. Playbook host_vars
14. Inventory host_vars
15. Inventory file/script host vars
16. Playbook group_vars
17. Inventory group_vars
18. Playbook group_vars/all
19. Inventory group_vars/all
20. Inventory file or script group vars
21. Role defaults
22. Command line values (*e.g.*, `-u user`)

Things to Avoid

- Using command modules
  - Things like shell, raw, command etc.
- Complex tasks...at first
  - Start small
- Not using source control
  - But no really...

New stuff!

Collections Q and A

What are they?

- Collections are a distribution format for Ansible content that can include playbooks, roles, modules, and plugins. You can install and use collections through Ansible Galaxy and Automation

How do I get them?

- ansible-galaxy collection install namespace.collection -p /path

Where can I get them?

- Today
  - Galaxy.ansible.com
- Future
  - Galaxy and Automation Hub

COMPLEXITY KILLS PRODUCTIVITY

That's not just a marketing slogan. We really mean it and believe that. We strive to reduce complexity in how we've designed Ansible tools and encourage you to do the same. **Strive for simplification in what you automate.**

OPTIMIZE FOR READABILITY

If done properly, it can be the documentation of your workflow automation.

THINK DECLARATIVELY

Ansible is a desired state engine by design. If you're trying to "write code" in your plays and roles, you're setting yourself up for failure. Our YAML-based playbooks were never meant to be for programming.

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THANK YOU


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https://docs.ansible.com/ansible/latest/user_guide/playbooks_variables.html#variable-precedence-where-should-i-put-a-variable
https://docs.ansible.com/ansible/latest/user_guide/playbooks_variables.html#using-variables
https://docs.ansible.com/ansible/latest/user_guide/playbooks_intro.html
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