Playbooks

Module Outline

- Playbooks

- YAML

- Tasks

- Modules

- Variables & Jinja2

- Review

Playbook

Play
- task
- task
- task

Play
- task
- task
- task

```
$ ansible-playbook -i hosts playbook.yml
```

```yaml
---
- hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```
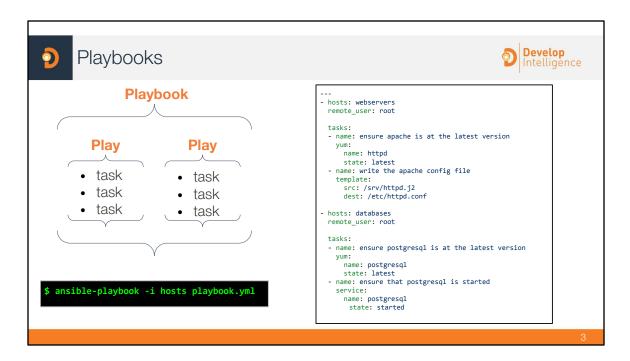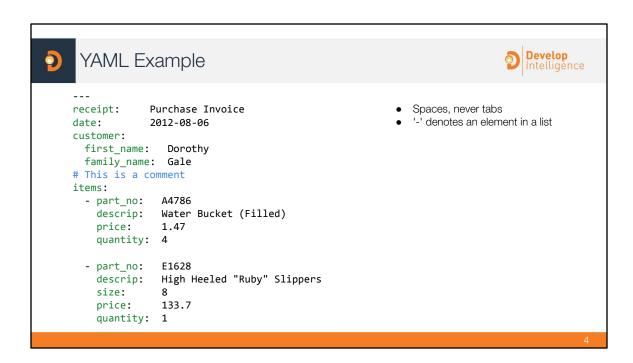
A **playbook** is a file containing one or more plays

Plays are ordered sets of tasks to execute against hosts from your inventory.

```
---
receipt:     Purchase Invoice
date:        2012-08-06
customer:
  first_name:   Dorothy
  family_name:  Gale
# This is a comment
items:
  - part_no:   A4786
    descrip:   Water Bucket (Filled)
    price:     1.47
    quantity:  4

  - part_no:   E1628
    descrip:   High Heeled "Ruby" Slippers
    size:      8
    price:     133.7
    quantity:  1
```

- Spaces, never tabs
- '-' denotes an element in a list

Playbooks are written in the **YAML** format.

Compare with JSON
http://convertjson.com/yaml-to-json.htm

Objects

Develop Intelligence

```
...
receipt:     Purchase Invoice
date:        2012-08-06
customer:
  first_name:   Dorothy
  family_name:  Gale

...
```

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Compare with JSON
http://convertjson.com/yaml-to-json.htm

```
...
items:
  - part_no:   A4786
    descrip:   Water Bucket (Filled)
    price:     1.47
    quantity:  4

  - part_no:   E1628
    descrip:   High Heeled "Ruby" Slippers
    size:      8
    price:     133.7
    quantity:  1
```

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Compare with JSON
http://convertjson.com/yaml-to-json.htm

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```
---
- hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

Playbook

Play

Task

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Having multiple plays in a playbook allows you to orchestrate multi-machine deployments by running certain tasks on one group and others on another. All tasks within a play are executed in order against the same hosts.

```
- name: ensure apache is at the latest version
  yum:
    name: httpd
    state: latest
```

Task results:
- CHANGED
- SUCCESS
- FAILED

```
$ ansible-playbook -i hosts playbook.yml
35.239.103.48 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false
}
```

Every task should have a name, which is included in the output from running the playbook. This is human readable output, and so it is useful to provide good descriptions of each task step.

Tasks have one of the following states after executing:
* CHANGED
* SUCCESS
* FAILED

https://docs.ansible.com/ansible/latest/user_guide/playbooks_tests.html#task-results

Common Modules

- **apt/yum** - manages packages
- **copy** - copies files from local or remote machine to remote machine
- **file** - manage and delete files
- **git** - checkout git repos
- **ping** - test ansible connectivity to remote machines
- **debug** - print statements during playbook execution
- **assert** - asserts given expressions are true

- **shell** - execute shell commands
- **command** - executes a single command with arguments
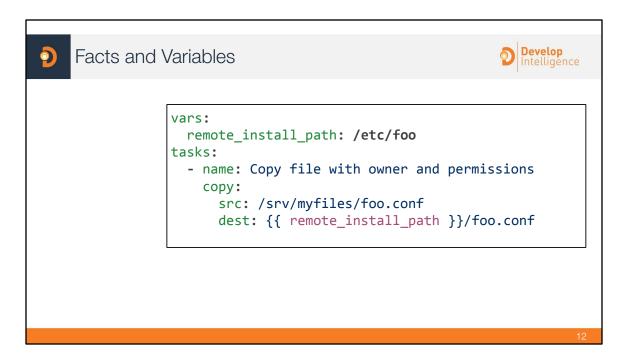- **raw** - execute a raw SSH command

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https://docs.ansible.com/ansible/latest/modules/modules_by_category.html

```
- name: Copy file with owner and permissions
  copy:
    src: /srv/myfiles/foo.conf
    dest: /etc/foo.conf
    owner: foo
    group: foo
    mode: '0644'
```

https://docs.ansible.com/ansible/latest/modules/copy_module.html

command module example

```
- name: Bootstrap database
  command: /usr/bin/make_database.sh
```

https://docs.ansible.com/ansible/latest/modules/command_module.html#command-module

```
vars:
  remote_install_path: /etc/foo
tasks:
  - name: Copy file with owner and permissions
    copy:
      src: /srv/myfiles/foo.conf
      dest: {{ remote_install_path }}/foo.conf
```

Variables can be set in many different locations and inserted anywhere in a playbook using the Jinja2 templating engine.

https://docs.ansible.com/ansible/latest/user_guide/playbooks_variables.html#variables-discovered-from-systems-facts
Facts are variables not set by the user. You can see facts through the ansible_facts variable.

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[Docs](#)

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https://docs.ansible.com/ansible/latest/reference_appendices/special_variables.html

ansible localhost -m debug -a var=<var name>

```
...
receipt:     Purchase Invoice
date:        {{ now() }}
customer:
    first_name:   {{ first_name }}
    family_name:  {{ last_name }}

...
```

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```
...
receipt:     Purchase Invoice
date:        {{ now() }}
customer:
    first_name:  {{ first_name | capitalize }}
    family_name: {{ last_name | capitalize }}

...
```
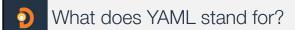
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Playbooks

What is the correct relationship between ansible resources?

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1. **Playbooks** contains **plays** contains **tasks** use **modules**

2. **Tasks** run **plays** contain **modules**

3. **Modules** contain **playbooks** contain **tasks**

What does YAML stand for?

1. You Ain't My Language

2. Yet Another Markup Language

3. Yet Another Mailing List

4. Yes, Alex Meade is a Legend

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Additional Resources

- YAML Syntax
  https://docs.ansible.com/ansible/latest/reference_appendices/YAMLSyntax.html
- Ansible Modules
  https://docs.ansible.com/ansible/latest/modules/modules_by_category.html