“Ansible is an IT automation tool. It can configure systems, deploy software, and orchestrate more advanced IT tasks such as continuous deployments or zero downtime rolling updates.”

Ansible Documentation

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WHOAMI

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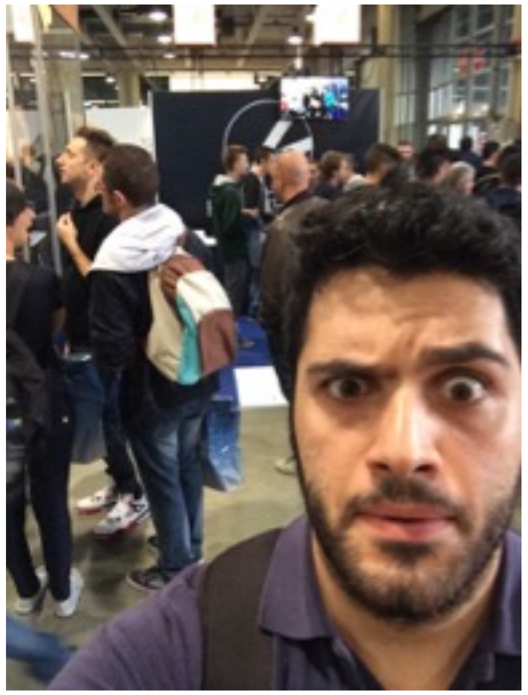


Overview

Example

CASE

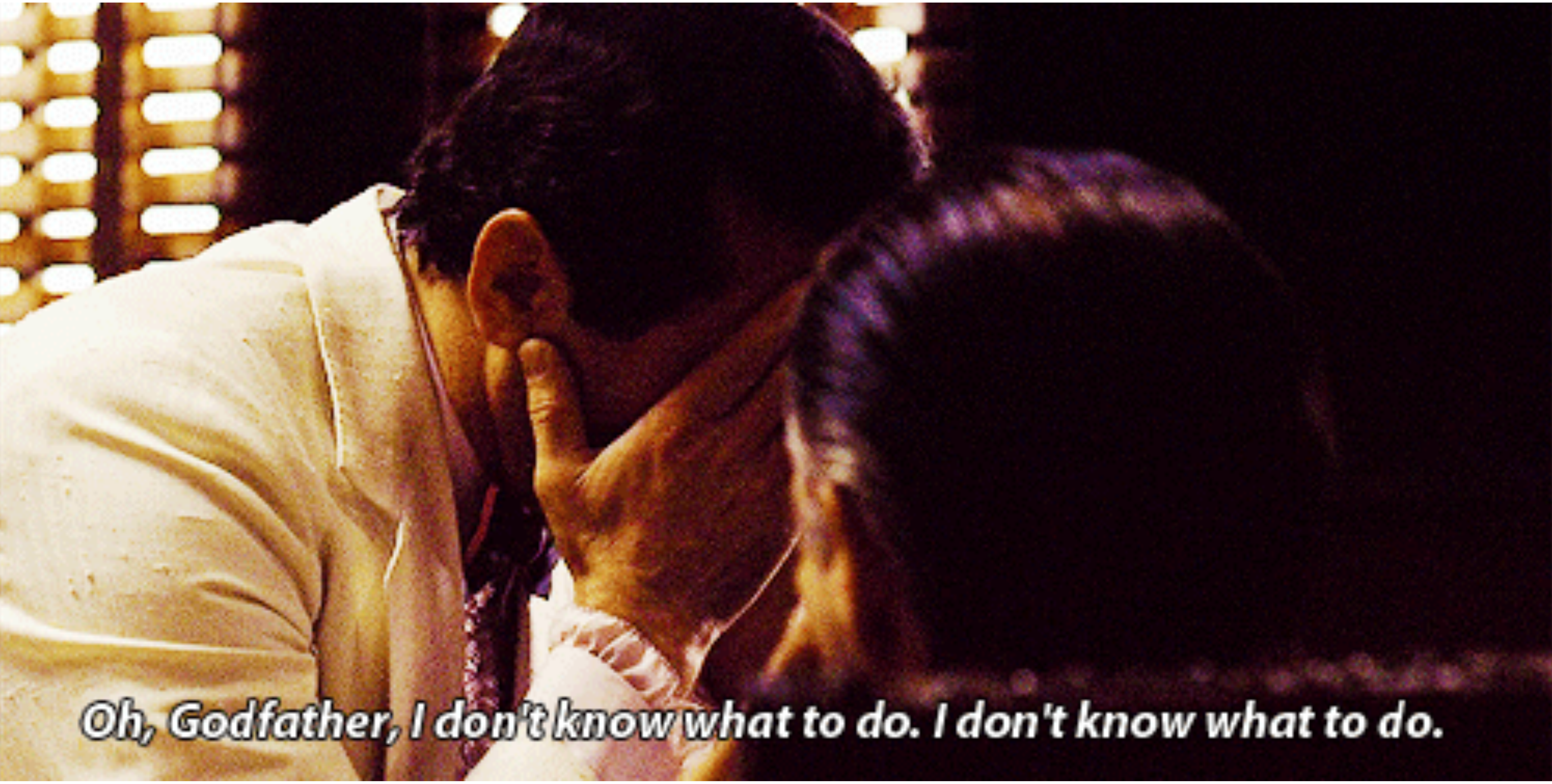
I need of an environment for develop a web application

SOLUTION (probably)

I’ll create a Virtual Machine (VM), when It’s ready, I’ll install nginx before, after php-fpm, MySQL and so on.
…I start to work but shortly after… I’ve broken the VM!!!!

I begin again, and I’ll spend a lot of time to configure a machine and i don't know how many time yet.

But what can I do for automate this process?


Oh, Godfather, I don't know what to do. I don't know what to do.

RELAX

There is Ansible!

what do I need?
a computer (with Unix distributions or OS X), of course!

with python™ 2.6 or 2.7 installed

If you don’t have pip installed, install it

```
$ sudo easy_install pip
```

Ansible uses the following Python modules

```
$ sudo pip install paramiko PyYAML Jinja2 httplib2
```

And now It’s time to install Ansible

```
$ sudo pip install ansible
```

Now in your mind there is a question, why is not there windows in the list of OS supported?

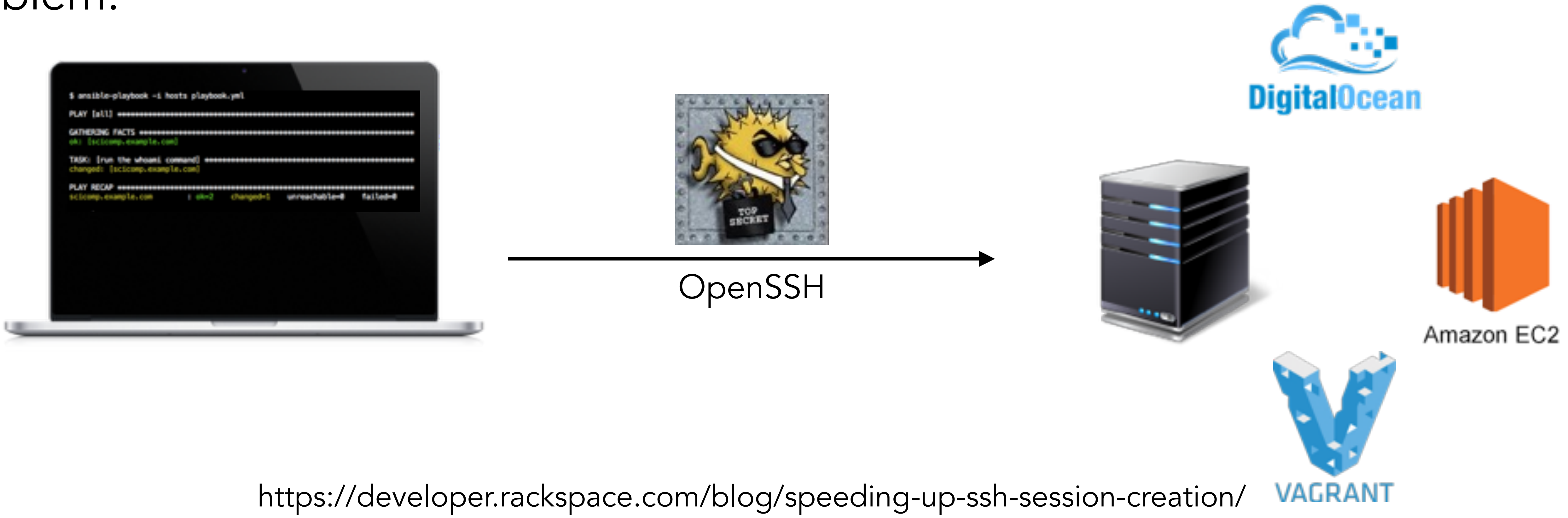
Because you can install a Unix distribution on your pc, with a lot of benefits for your mental health :)

Used by

Now we understand how works Ansible

Ansible communicates withs remote machines over SSH

From Ansible 1.3 and later (Now 1.9) will try to use OpenSSH when possible, this enables **ControlPersist**.
There are enterprise Linux 6 OS (Red Hat Enterprise Linux and derivates such as CentOS) where the version of OpenSSH may be too old to support ControlPersist, but no problem Ansible will fallback into using implementation of OpenSSH called **paramiko**. For OS X, Ubuntu, Fedora there isn't this problem.



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

PLAY [all] ********************************************************************

GATHERING FACTS ***************************************************************
ok: [scicomp.example.com]

TASK: [run the whoami command] ************************************************
changed: [scicomp.example.com]

PLAY RECAP ********************************************************************
scicomp.example.com        : ok=2    changed=1    unreachable=0    failed=0
```

https://developer.rackspace.com/blog/speeding-up-ssh-session-creation/

fazland

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Structure

Inventory

hosts is an INI-like

```
[webservers]
foo.example.com
bar.example.com

[dbservers]
one.example.com
two.example.com
three.example.com
```

The things in brackets are group names, which are used in classifying systems and deciding what systems you are controlling at what times and for what purpose.

If you have hosts that run on non-standard SSH ports you can put the port number after the hostname

```
badwolf.example.com:5309
```

Playbook

yaml file

```
---
- hosts: all
  sudo: yes
  tasks:
    - name: Update apt-cache
      apt: update_cache=yes
    - name: Install htop
      apt: pkg=htop state=present
```

Variables

```
---
- hosts: all
  sudo: yes
  vars:
    package_1: curl
  tasks:
    - name: Update apt-cache
      apt: update_cache=yes
    - name: “Install {{ package_1 }}”
      apt: pkg=“{{ package_1 }}” state=present
```

Loops

```
---
- hosts: all
  sudo: yes
  tasks:
    - name: Update apt-cache
      apt: update_cache=yes
    - name: “Install {{ item }}”
      apt: pkg=“{{ item }}” state=present
      with_items:
        - htop
        - curl
        - unzip
```

Conditionals

```
---
- hosts: all
  sudo: yes
  tasks:
    - name: copy authorized_keys
      copy:
        src: authorized_keys
        dest: /home/ubuntu/.ssh/authorized_keys
        owner: ubuntu
      when: environment == “Stage”
```

Provisioner file
site.yml

```
---
hosts: all
sudo: yes
tasks:
      - name: install nginx
        apt: name=nginx update_cache=yes
      - name: copy nginx config file
        copy: src=files/nginx.conf dest=/etc/nginx/sites-available/default
      - name: enable configuration
        file: >
          dest=/etc/nginx/sites-enabled/default
          src=/etc/nginx/sites-available/default
          state=link
      - name: copy index.html
        template: src=templates/index.html.j2 dest=/usr/share/nginx/html/index.html mode=0644
      - name: restart nginx
        service: name=nginx state=restarted
```

DEMO 1
ansible-playbook

But If I had more tasks

```
---
- hosts: servers
  vars_files:
    - vars.yml
  gather_facts: false
  sudo: true

  tasks:
  - name: Create the project directory.
    file: state=directory path={{ project_root }}

  - name: Create user.
    user: home={{ project_root }}/home/ name={{ project_name }} state=present

  - name: Update the project directory.
    file: group={{ project_name }} owner={{ project_name }} mode=755 state=directory path={{ project_root }}

  - name: Create the code directory.
    file: group={{ project_name }} owner={{ project_name }} mode=755 state=directory path={{ project_root }}/code/

  - name: Install required system packages.
    apt: pkg={{ item }} state=installed update-cache=yes
    with_items: {{ system_packages }}

  - name: Install required Python packages.
    easy_install: name={{ item }}
    with_items: {{ python_packages }}

  - name: Mount code folder.
    mount: fstype=vboxsf opts=uid={{ project_name }},gid={{ project_name }} name={{ project_root }}/code/ src={{ project_name }} state=mounted
    only_if: "$vm == 1"

  - name: Create the SSH directory.
    file: state=directory path={{ project_root }}/home/.ssh/
    only_if: "$vm == 0"

  - name: Upload SSH known hosts.
    copy: src=known_hosts dest={{ project_root }}/home/.ssh/known_hosts mode=0600
    only_if: "$vm == 0"

  - name: Upload SSH key.
    copy: src=key dest={{ project_root }}/home/.ssh/id_rsa mode=0600
    only_if: "$vm == 0"

  - name: Create the SSL directory.
    file: state=directory path={{ project_root }}/home/ssl/

  - name: Upload SSL private key.
    copy: src=files/ssl/{{ project_name }}.pem dest={{ project_root }}/home/ssl/{{ project_name }}.pem

  - name: Upload SSH public key.
    copy: src=files/ssl/{{ project_name }}.key.encrypted dest={{ project_root }}/home/ssl/{{ project_name }}.key

  - name: Change permissions.
    shell: chown -R {{ project_name }}:{{ project_name }} {{ project_root }}

  - name: Install nginx configuration file.
    copy: src=files/conf/nginx.conf dest=/etc/nginx/sites-enabled/{{ project_name }}
    notify: restart nginx

  - name: Install init scripts.
    copy: src=files/init/{{ item }}.conf dest=/etc/init/{{ project_name }}_{{ item }}.conf
    with_items: {{ initfiles }}

  - name: Create database.
    shell: {{ project_root }}/env/bin/python {{ project_root }}/code/webapp/manage.py sqlcreate --router=default | sudo -u postgres psql

  handlers:
    - include: handlers.yml

- include: deploy.yml

- hosts: servers
  vars_files:
    - vars.yml
  gather_facts: false
  sudo: true

  tasks:
  - name: Restart services.
    service: name={{ project_name }}_{{ item }} state=restarted
    with_items: {{ initfiles }}
```

It's not readable and maintainable

Group Vars & Host Vars

You can create a separate variable file for each host and each group

group_vars/dbservers

```
db_primary_host: rhodeisland.example.com
db_replica_host: virginia.example.com
db_name: widget_production
db_user: widgetuser
db_password: pFmMxcyD;Fc6)6
rabbitmq_host:pennsylvania.example.com
```

host_vars/foo.example.com

```
http_port: 80
security_port: 2555
```

Roles

- project organization tool
- reusable components

`roles/mongodb/tasks/main.yml`

Tasks

`roles/mongodb/files/`

Holds files to be uploaded to hosts

`roles/mongodb/templates/`

Holds Jinja2 template files

`roles/mongodb/vars/main.yml`

Variables that shouldn't be overridden

Templates

```
server {
  charset utf-8;

  listen 80 default_server;
  server_name {{ host }};
  root {{ wp_root }};

  client_max_body_size {{ client_max_body_size }};
…
```

Templates

In playbook

```
- name: Upload configuration File
  template: src=default.j2 dest="/etc/nginx/sites-available/default"
```

Provisioning

```
site.yml                         #master playbook
hosts                            #inventory
group_vars/
      group1                     # here we assign variables to particular groups
      group2
host_vars/
      hostname1                  # if systems need specific variables, put them
here
      hostname2
roles/
      common/                    # this hierarchy represents a "role"
            files/               #  <-- files for use with the copy resource
            templates/           #  <-- files for use with the template resource
            tasks/               #  <-- tasks file can include smaller files
            vars/                #  <-- variables associated with this role
      webservers/
            …
            …
      applicationservers/
            …
            …
      databaseservers/
            …
            …
```

DEMO 2

ansible-playbook

And on web services?
(such as AWS)

New host file called Dynamic Inventory

remember to export
AWS_ACCESS_KEY_ID
AWS_SECRET_ACCESS_KEY

https://raw.githubusercontent.com/ansible/ansible/devel/plugins/inventory/ec2.py

DEMO 3

ansible-playbook

Thanks!

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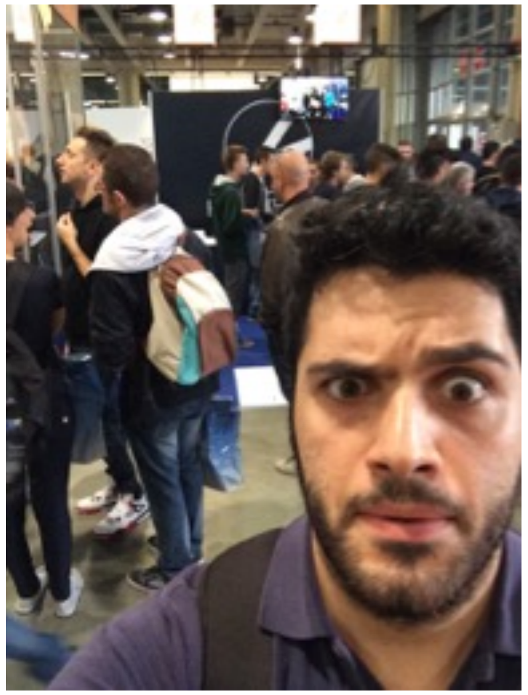

https://github.com/giovannialbero1992/ansible