

Deploying PHP applications using Ansible, Ansible Vault and Ansistrano

What we'll be looking at

- **Ansible** crash course
- Keeping secrets with **Ansible Vault**
- Deployments with **Ansistrano**

- Full Stack Software Developer & System Administrator
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What is Ansible?

Ansible is an open-source **software provisioning, configuration management, and application-deployment** tool.



What is Ansible?

- CLI tool
- Written in Python
- Configured with YAML
- Executes ad-hoc remote commands
- Installs software packages
- Performs deployment steps
- Batteries included



A N S I B L E

What is Ansible?

- Hosts/Inventories
- Commands
- Playbooks
- Tasks
- Roles



Why Ansible?

- Familiar syntax
- Easily readable
- No server dependencies
- Easy to add to an existing project
- Includes relevant modules (e.g. Composer)
- Idempotency



Hosts / Inventories

```
# hosts.ini
```

```
[webservers]
```

```
192.168.33.10
```

```
[webservers:vars]
```

```
ansible_ssh_port=22
```

```
# hosts.yml
```

```
all:
```

```
  children:
```

```
    webservers:
```

```
      hosts:
```

```
        192.168.33.10:
```

```
      vars:
```

```
        ansible_ssh_port: 22
```

Commands

```
ansible all -i hosts.yml -m ping
```

```
webservers | SUCCESS => {  
    "ansible_facts": {  
        "discovered_interpreter_python": "/usr/bin/python"  
    },  
    "changed": false,  
    "ping": "pong"  
}
```



```
ansible all  
-i hosts.yml  
-m command  
-a 'git pull  
--chdir=/app'
```

```
ansible all -i hosts.yml  
-m git -a 'repo=https://  
github.com/opdavies/dransible  
dest=/app'
```

Tasks and Playbooks

```
# playbook.yml
```

```
---
```

```
- hosts: webservers # or 'all'
```

```
vars:
```

```
  git_repo: https://github.com/opdavies/dransible
```

```
tasks:
```

```
- name: Update the code
```

```
  git:
```

```
    repo: '{{ git_repo }}'
```

```
    dest: /app
```

```
    version: master
```

```
    update: true
```

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

Roles:

configuring a LAMP stack

```
# requirements.yml
```

```
---
```

- src: geerlingguy.apache
- src: geerlingguy.composer
- src: geerlingguy.mysql
- src: geerlingguy.php
- src: geerlingguy.php-mysql

```
ansible-galaxy -r  
requirements.yml install
```



```
# provision.yml
```

```
---
```

```
- hosts: webservers
```

```
roles:
```

- geerlingguy.apache
- geerlingguy.mysql
- geerlingguy.php
- geerlingguy.php-mysql
- geerlingguy.composer

```
# provision.yml
```

```
---
```

```
- hosts: webservers
```

```
  # ...
```

```
vars:
```

```
  apache_vhosts:
```

```
    - servername: dransible.wip
```

```
      documentroot: /app/web
```

```
# provision.yml
```

```
---
```

```
- hosts: webservers
```

```
  # ...
```

```
vars:
```

```
  # ...
```

```
  php_version: '7.4'
```

```
  php_packages_extra:
```

```
    - libapache2-mod-php{{ php_version }}
```

```
    - libpcre3-dev
```

```
# provision.yml
```

```
---
```

```
- hosts: webservers
```

```
# ...
```

```
vars:
```

```
# ...
```

```
mysql_databases:
```

```
- name: main
```

```
mysql_users:
```

```
- name: user
```

```
password: secret
```

```
priv: main.*:ALL
```

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

PLAY [Provision the webserver machines] *****

TASK [Gathering Facts] *****
ok: [webservers]

TASK [geerlingguy.apache : Include OS-specific variables.] *****
ok: [webservers]

TASK [geerlingguy.apache : Include variables for Amazon Linux.]
skipping: [webservers]

TASK [geerlingguy.apache : Define apache_packages.] *****
ok: [webservers]

TASK [geerlingguy.apache : include_tasks] *****
included: /Users/opdavies/.ansible/roles/geerlingguy.apache/tasks/setup-Debian.yml for webservers

TASK [geerlingguy.apache : Update apt cache.] *****
changed: [webservers]

TASK [geerlingguy.composer : Ensure composer directory exists.] *****
ok: [webservers]

TASK [geerlingguy.composer : include_tasks] *****
skipping: [webservers]

TASK [geerlingguy.composer : include_tasks] *****
skipping: [webservers]

RUNNING HANDLER [geerlingguy.apache : restart apache] *****
changed: [webservers]

RUNNING HANDLER [geerlingguy.mysql : restart mysql] *****
changed: [webservers]

RUNNING HANDLER [geerlingguy.php : restart webserver] *****
changed: [webservers]

RUNNING HANDLER [geerlingguy.php : restart php-fpm] *****
skipping: [webservers]

PLAY RECAP *****
webservers : ok=111 changed=32 unreachable=0 failed=0 skipped=78 rescued=0 ignored=0

Forbidden

You don't have permission to access this resource.

Apache/2.4.18 (Ubuntu) Server at dransible.wip Port 80

Keeping secrets with Ansible Vault

```
# provision.yml
```

```
---
```

```
- hosts: webservers
```

```
# ...
```

```
vars:
```

```
# ...
```

```
mysql_databases:
```

```
- name: main
```

```
mysql_users:
```

```
- name: user
```

```
password: secret
```

```
priv: main.*:ALL
```

```
# provision.yml
---
- hosts: webservers
  # ...

vars:
  # ...
  mysql_databases:
    - name: main

mysql_users:
  - name: user
    password: secret
    priv: main.*:ALL
```

```
ansible-vault create  
vault.yml
```

```
# vars/vault.yml
```

```
---
```

```
vault_database_name: main
```

```
vault_database_user: user
```

```
vault_database_password: secret
```

\$ANSIBLE_VAULT;1.1;AES256

36656233323539616336393838396137343939623233393338666530313
73037323366326363306531336333353163643063663335396139363762
39383133330a35636566623262353733373066363837393264616134613
16366376266646437373366373738303931616333626332353839353332
32663432346662613438330a38643539343232376138613733373636343
63864666430313866623539333039363138646331326565386263386666
35306264396230633939346532356665306564626431353936643135376
23834346635366637613235656165643361316663396530383263333064
33326264316235396431666262346637366563376330363238373331373
43533386165366531626462643662666266316639306262666539373236
343662313265376261316636623963353933613366353737363435

```
# vars/vars.yml
```

```
---
```

```
database_name: '{{ vault_database_name }}'
```

```
database_user: '{{ vault_database_user }}'
```

```
database_password: '{{ vault_database_password }}'
```



```
# provision.yml
```

```
---
```

```
mysql_databases:
```

```
- '{{ database_name }}'
```

```
mysql_users:
```

```
- name: '{{ database_user }}'
```

```
password: '{{ database_password }}'
```

```
priv: '{{ database_name }}.*:ALL'
```

```
ansible-vault edit vault.yml
```

```
ansible-playbook  
  -i hosts.yml  
  deploy.yml  
--ask-vault-pass
```

```
ansible-playbook  
  -i hosts.yml  
  deploy.yml  
--vault-password-file secret.txt
```

Basic deployment

```
# deploy.yml
```

```
tasks:
```

- name: Creating project directory
file:
 - path: /app
 - state: directory
- name: Uploading application
synchronize:
 - src: '{{ playbook_dir }}/../'
 - dest: /app
- name: Installing Composer dependencies
composer:
 - command: install
 - working_dir: /app

Disadvantages

- Single point of failure
- No ability to roll back
- Sensitive data stored in plain text

Better deployments



ansistrano.deploy and **ansistrano.rollback** are Ansible Galaxy roles to easily manage the deployment process for scripting applications such as PHP, Python and Ruby. It's an Ansible port for Capistrano.

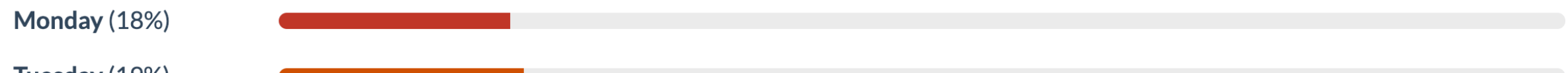
Wow! 943303 deployments so far!

Today, teams using Ansistrano have already deployed **812** times. When considering the whole month, the amount of deployments is **22145** and this year we've reached the **22145** deployments.

Ouch! 2601 rollbacks so far!

On the other hand, today teams rollbacked **0** times. That's **18** times considering the whole month and **18** if considering the whole year. Rollback vs. Deployment ratio is **0.28%**, nice! Keep the good work.

Deployments by weekday



Features

- Multiple release directories
- Shared paths and files
- Customisable
- Multiple deployment strategies
- Multi-stage environments
- Prune old releases
- Rollbacks

```
# requirements.yml
```

```
---
```

```
# ...
```

- ansistrano.deploy
- ansistrano.rollback

```
# deploy.yml
```

```
---
```

```
- hosts: all
```

```
roles:
```

```
  - ansistrano.deploy
```

```
# deploy.yml
```

```
---
```

```
# ...
```

```
vars:
```

```
  project_deploy_dir: /app
```

```
  ansistrano_deploy_to: '{{ project_deploy_dir }}'
```

```
  ansistrano_deploy_via: git
```

```
  ansistrano_git_branch: master
```

```
  ansistrano_git_repo: 'git@github.com:opdavies/dransible'
```

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

PLAY [webservers] *****

TASK [Gathering Facts] *****
ok: [webservers]

TASK [ansistrano.deploy : include_tasks] *****

TASK [ansistrano.deploy : include_tasks] *****
included: /Users/opdavies/.ansible/roles/ansistrano.deploy/tasks/setup.yml for webservers

TASK [ansistrano.deploy : ANSISTRANO | Ensure deployment base path exists] *****
ok: [webservers]

TASK [ansistrano.deploy : ANSISTRANO | Ensure releases folder exists] *****
ok: [webservers]

TASK [ansistrano.deploy : ANSISTRANO | Ensure shared elements folder exists] *****
ok: [webservers]

TASK [ansistrano.deploy : ANSISTRANO | Ensure shared paths exists] *****
ok: [webservers] => (item=web/sites/default/files)

TASK [ansistrano.deploy : Update file permissions] *****
changed: [webservers]

TASK [ansistrano.deploy : include_tasks] *****

TASK [ansistrano.deploy : include_tasks] *****
included: /Users/opdavies/.ansible/roles/ansistrano.deploy/tasks/cleanup.yml for webservers

TASK [ansistrano.deploy : ANSISTRANO | Clean up releases] *****
changed: [webservers]

TASK [ansistrano.deploy : include_tasks] *****

TASK [ansistrano.deploy : include_tasks] *****
included: /Users/opdavies/.ansible/roles/ansistrano.deploy/tasks/anon-stats.yml for webservers

TASK [ansistrano.deploy : ANSISTRANO | Send anonymous stats] *****
skipping: [webservers]

PLAY RECAP *****
webservers : ok=33 changed=14 unreachable=0 failed=0 skipped=7 rescued=0 ignored=0


```
vagrant@dransible:/app$ ls -l
```

```
total 8
```

```
lrwxrwxrwx 1 26 Jul 19 00:15 current -> ./releases/20190719001241Z
```

```
drwxr-xr-x 5 4096 Jul 22 20:30 releases
```

```
drwxr-xr-x 4 4096 Jul 19 00:00 shared
```

```
vagrant@dransible:/app/releases$ ls -l
```

```
total 20
```

```
drwxr-xr-x  5 4096 Jul 22 20:30 .  
drwxr-xr-x  4 4096 Jul 19 00:15 ..  
drwxr-xr-x 10 4096 Jul 19 00:02 20190719000013Z  
drwxr-xr-x 10 4096 Jul 19 00:14 20190719001241Z  
drwxr-xr-x  9 4096 Jul 22 20:30 20190722203038Z
```

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

```
# rollback.yml
```

```
---
```

```
- hosts: all
```

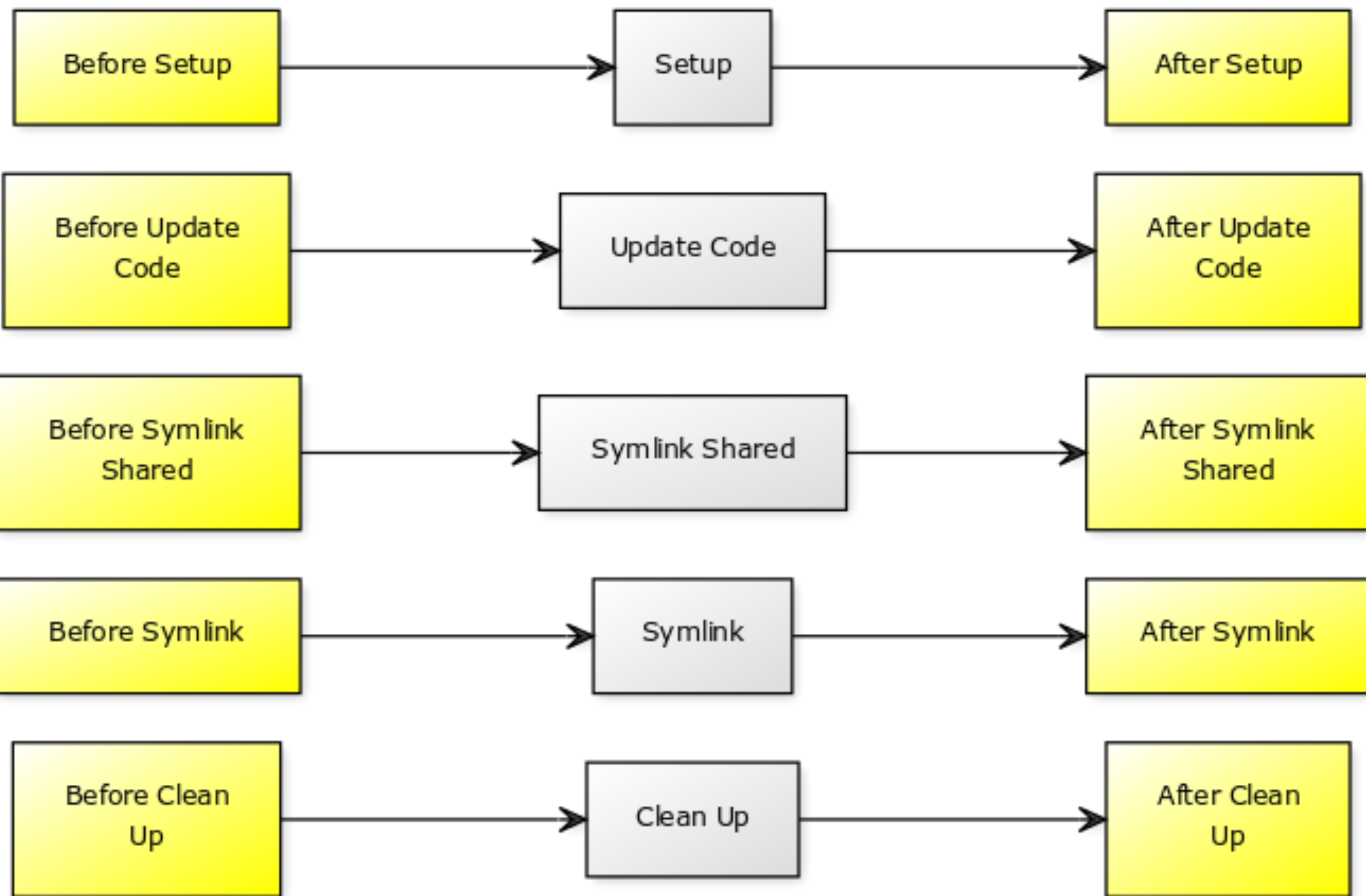
```
roles:
```

```
  - ansistrano.rollback
```

```
vars:
```

```
  ansistrano_deploy_to: '{{ project_deploy_dir }}'
```

Customising Ansistrano: Build Hooks



```
# deploy.yml
```

```
---
```

```
# ...
```

```
ansistrano_after_symlink_shared_tasks_file:
```

```
'{{ playbook_dir }}/deploy/after-symlink-shared.yml'
```

```
ansistrano_after_symlink_tasks_file:
```

```
'{{ playbook_dir }}/deploy/after-symlink.yml'
```

```
ansistrano_after_update_code_tasks_file:
```

```
'{{ playbook_dir }}/deploy/after-update-code.yml'
```

```
release_web_path: '{{ ansistrano_release_path.stdout }}/web'
```

```
release_drush_path: '{{ ansistrano_release_path.stdout }}/vendor/bin/drush'
```

```
# deploy/after-update-code.yml
```

```
---
```

```
- name: Install Composer dependencies
```

```
  composer:
```

```
    command: install
```

```
    working_dir: '{{ ansistrano_release_path.stdout }}'
```



```
# deploy/after-symlink-shared.yml
```

```
---
```

```
- name: Run database updates
```

```
  command: '{{ release_drush_path }} --root {{ release_web_path }} updatedb'
```

```
# deploy/after-symlink.yml
```

```
---
```

```
- name: Clear Drupal cache
```

```
  command:
```

```
    '{{ release_drush_path }} --root {{ release_web_path }} cache-rebuild'
```



Search



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Managing data across deployments

```
# deploy.yml
```

```
vars:
```

```
# ...
```

```
ansistrano_shared_paths:
```

```
- '{{ drupal_root }}/sites/default/files'
```

```
vagrant@dransible:/app/shared/web/sites/default/files$ ls -la
```

```
total 28
```

```
drwxrwxrwx 6 4096 Jul 19 00:18 .  
drwxr-xr-x 3 4096 Jul 19 00:00 ..  
drwxrwxr-x 2 4096 Jul 22 21:24 css  
-rwxrwxrwx 1 487 Jul 19 00:02 .htaccess  
drwxrwxr-x 2 4096 Jul 19 00:19 js  
drwxrwxrwx 3 4096 Jul 19 00:18 php  
drwxrwxrwx 2 4096 Jul 19 00:03 styles
```

```
vagrant@dransible:/app/current/web/sites/default$ ls -la
total 48
dr-xr-xr-x  2  4096 Jul 19 00:14 .
drwxr-xr-x  3  4096 Jan 22 17:30 ..
-rw-r--r--  1  6762 Jul 19 00:14 default.services.yml
-rw-r--r--  1 31342 Jul 19 00:14 default.settings.php
lrwxrwxrwx  1    45 Jul 19 00:14 files -> ../../../../../../shared/web/sites/default/files
-rw-r--r--  1    35 Jul 19 00:12 settings.php
```

Generating settings files per deployment


```
# vars/vault.yml
```

```
---
```

```
vault_database_name: main
```

```
vault_database_user: user
```

```
vault_database_password: secret
```

```
vault_hash_salt: dfgiy$fd2!34gsf2*34g74
```

```
# vars/vars.yml
```

```
---
```

```
database_name: '{{ vault_database_name }}'
```

```
database_password: '{{ vault_database_password }}'
```

```
database_user: '{{ vault_database_user }}'
```

```
hash_salt: '{{ vault_hash_salt }}'
```

```
# vars/vars.yml
---
drupal_settings:
  - drupal_root: /app/web
    sites:
      - name: default
        settings:
          databases:
            default:
              default:
                driver: mysql
                host: localhost
                database: '{{ database_name }}'
                username: '{{ database_user }}'
                password: '{{ database_password }}'
          hash_salt: '{{ hash_salt }}'
          config_directories:
            sync: ../config/sync
```

```
// templates/settings.php.j2

// {{ ansible_managed }}

{% for key, values in item.1.settings.databases.items() %}
{% for target, values in values.items() %}
$databases['{{ key }}']['{{ target }}'] = array(
    'driver' => '{{ values.driver|default('mysql') }}',
    'host' => '{{ values.host|default('localhost') }}',
    'database' => '{{ values.database }}',
    'username' => '{{ values.username }}',
    'password' => '{{ values.password }}',
);

{% endfor %}
{% endfor %}

{% if item.1.settings.base_url is defined %}
$base_url = '{{ item.1.settings.base_url }}';
{% endif %}

{# ... #}
```

```
# tasks/main.yml
---
- name: Ensure directory exists
  file:
    state: directory
    path: '{{ item.0.drupal_root }}/sites/{{ item.1.name|default("default") }}'
  with_subelements:
    - '{{ drupal_settings }}'
    - sites
  no_log: true

- name: Create settings files
  template:
    src: settings.php.j2
    dest:
      '{{ item.0.drupal_root }}/sites/{{ item.1.name|default("default") }}/{{
        item.1.filename|default("settings.php") }}'
  with_subelements:
    - '{{ drupal_settings }}'
    - sites
  no_log: true
```

Multiple environments

Dev, test, production

mysql_databases:

- name: production
- name: staging

mysql_users:

- name: production
password: '{{ live_db_password }}'
priv: '{{ live_db_name }}.*:ALL'
- name: staging
password: '{{ staging_db_password }}'
priv: staging.*:ALL

```
# inventories/live.yml
```

```
---
```

```
all:
```

```
  hosts:
```

```
    webservers:
```

```
      ansible_ssh_host: 192.168.33.10
```

```
      ansible_ssh_port: 22
```

```
      project_deploy_path: /app
```

```
      git_branch: master
```

```
      drupal_hash_salt: '{{ vault_drupal_hash_salt }}'
```

```
      drupal_install: true
```

```
      drupal_settings:
```

```
        # ...
```



```
# inventories/staging.yml
```

```
---
```

```
all:
```

```
  hosts:
```

```
    webservers:
```

```
      ansible_ssh_host: 192.168.33.10
```

```
      ansible_ssh_port: 22
```

```
      project_deploy_path: /app-test
```

```
      git_branch: develop
```

```
      drupal_hash_salt: '{{ vault_drupal_hash_salt }}'
```

```
      drupal_install: true
```

```
      drupal_settings:
```

```
        # ...
```

```
ansible-playbook deploy.yml -i  
inventories/staging.yml
```

```
ansible-playbook deploy.yml -i  
inventories/live.yml
```

Demo

Questions?

oliverdavies.uk/dransible
[@opdavies](https://twitter.com/opdavies)