



Intro



- Manual -> Script -> Infrastructure automatization
- Easy
- Procedural
- Idempotent
- Push
- Agent-less
- Batteries included

No OS abstraction (e.g. Packages)
No good noop

Platforms

- Linux/Mac/BSD – SSH + Python
- Windows – PowerShell
- SSH raw mode:
 - Cisco IOS/ASA
 - Juniper Junos
 - VyOS
 - Any SSH enabled node

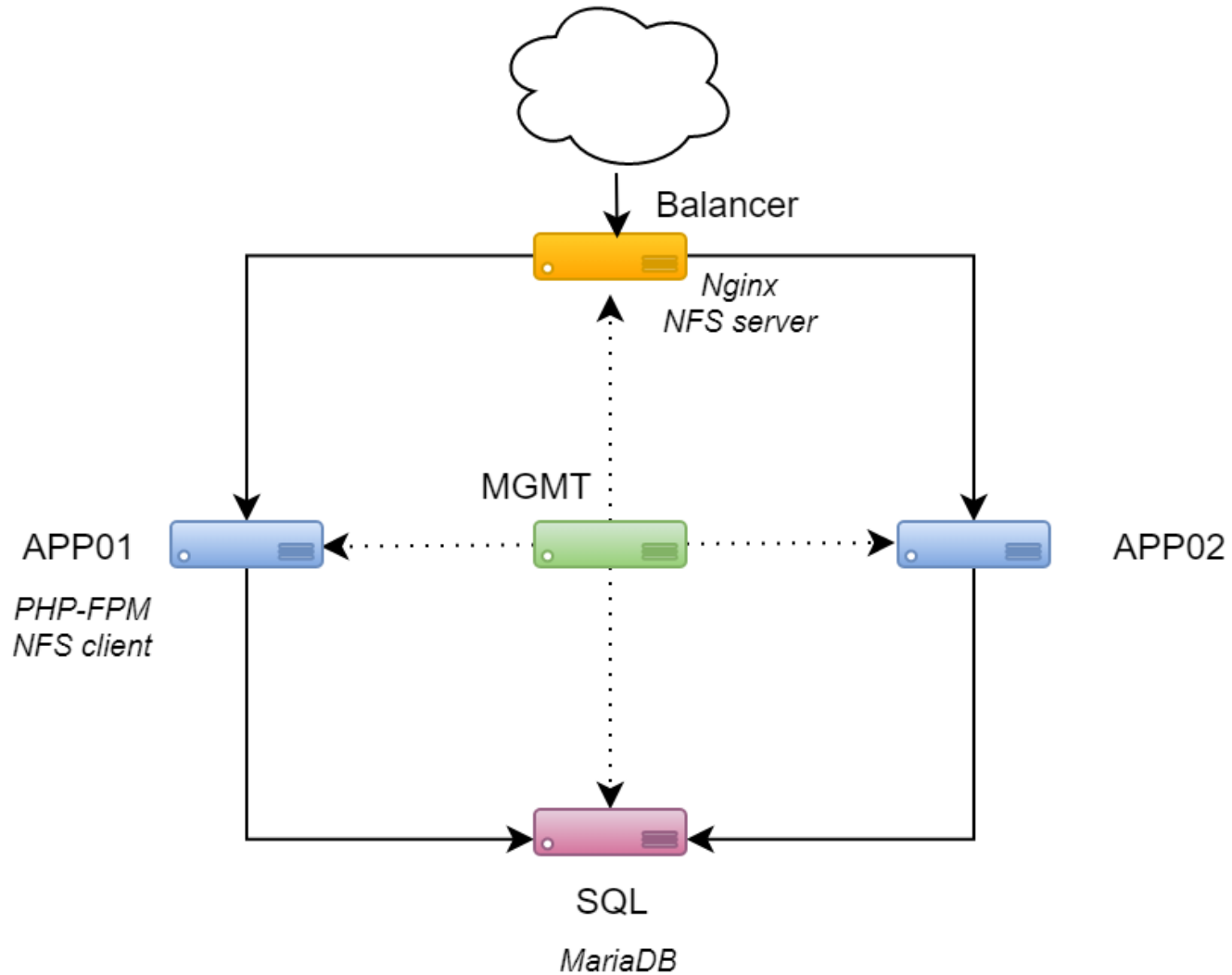
-

Content



- Inventory
- Patterns
- Tasks
- Playbooks
- Lookups
- Modules
- Jinja
- Handlers
- Roles
- Variables
- Facts
- Vault
- Galaxy
- Troubleshooting
- Performance
- Strategies

Lab



Versions

- <https://github.com/ansible/ansible/blob/devel/CHANGELOG.md>
- ...
- 1.9
- ...
- 2.2 – Python 3 (3.5+), Stretch
- 2.3 – dest->path (backward compatible)
- 2.4 – Centos 7 (Centos 6 - Epel)

Installation

- `apt install ansible`



- `alias apl="ansible-playbook"`

Inventory



INI, YAML

- `/etc/ansible/hosts`
- `ansible --list-hosts all`
- Localhost: `ansible ansible_connection=local`
- `ansible -m ping all`
- `ansible -m command -a "uptime" all`
- `ansible -a "uptime" all`

Default module

Groups



[apps]

192.168.1.115


hostname

[mgmt]

ansible ansible_connection=local

Local Inventory

-work_dir/hosts
- ansible -i hosts --list-hosts all
- (-i <dir> - "inventory" file lookup)
- Config overloading:
 - ENV ANSIBLE_CONFIG
 - ./ansible.cfg
 - ~/.ansible.cfg



group_vars
host_vars

[defaults]
inventory = ./hosts

Patterns

- http://docs.ansible.com/ansible/latest/intro_patterns.html
- `ansible --list-hosts all`
- `ansible --list-hosts *`
- `ansible --list-hosts 192*`
- `ansible --list-hosts ansible`
- `ansible --list-hosts 'all,!ansible'`

Dynamic inventory



Script output:

```
{
  "app": {
    "hosts": [
      "192.168.1.115"
    ]
  },
  "mgmt": [
    "ansible"
  ],
  "_meta": {
    "hostvars": {
      "ansible": {
        "ansible_connection": "local"
      }
    }
  }
}
```

Tasks

- Base building blocks
- ansible `-m module -a mod_arguments hosts`
- ansible `-m command -a uptime all`
- Options
 - f 5 / --forks=5 - FORKS, parallel runs
 - b / --become – privileged mode (su, sudo)
 - l / --limit – subset of hosts

Modules

- http://docs.ansible.com/ansible/latest/modules_by_category.html
- **Commands** – command, shell, raw, ...
- **Packing** – yum, apt, pip,...
- **System** – service, cron, iptables, authorized_keys
...
- **Cloud** – various cloud providers
- **Files** – various files operations
- **Utilities** – playlist logic helpers

Playbooks



- tasks YAML format

- hosts: **all**
tasks:
 - **command**: **uptime**

http://docs.ansible.com/ansible/latest/common_return_values.html

Add SSH key

- hosts: **new**
tasks:
 - name: Add SSH key
authorized_key:
 - user: root
 - state: present
 - key: "{{lookup('file', '~/.ssh/id_rsa.pub') }}"
- `apl sshkey.yml --ask-pass -u user --become --become-method=su --ask-become-pass --ssh-common-args='-o StrictHostKeyChecking=no'`

Lookups

- http://docs.ansible.com/ansible/latest/playbooks_lookups.html
- File
- Password

Inventory arguments



```
[new]
```

```
192.168.1.117
```

```
192.168.1.118
```

```
192.168.1.119
```

```
[new:vars]
```

```
ansible_user=user
```

```
ansible_become=yes
```

```
ansible_become_method=su
```

```
ansible_ssh_common_args='-o StrictHostKeyChecking=no'
```

APT

- hosts: **all**

- tasks:

- name: install package

- apt**:name=mc state=present

- update_cache=yes

APT multiple packages



- hosts: **all**

- tasks:

- name: install packages

- apt**:name=mc,curl

- state=present update_cache=yes

APT multiple packages – yaml syntax

```
- hosts: all
  tasks:
    - name: install packages
      apt:
        name: mc,curl
        state: present
        update_cache: yes
```

APT multiple packages - loop

```
- hosts: all
  tasks:
    - name: install packages
      apt: name={{item}} state=present update_cache=yes
      with_items:
        - mc
        - curl
        - vim
        - git
```

http://docs.ansible.com/ansible/latest/playbooks_loops.html

Files operations

- http://docs.ansible.com/ansible/latest/list_of_files_modules.html
- Copy
- File
- LineInFile/BlockInFile
- Ini_file
- Replace
- Template

File module

- http://docs.ansible.com/ansible/latest/file_module.html
- Set owner, mode
- Create dir (whole path), symlink, hardlink
- Touch file (state=touch)
- Remove file (state=absent)

Copy module

- http://docs.ansible.com/ansible/latest/copy_module.html
- copy:
 - src: nginx.conf
 - dest: /etc/nginx/nginx.conf
 - backup: yes
- content/src
- force

Copy content

- copy:

dest: /etc/hosts

backup: yes

content: |

127.0.0.1	localhost
-----------	-----------

192.168.1.115	ansible
---------------	---------

LineInFile module

http://docs.ansible.com/ansible/latest/lineinfile_module.html

- lineinfile:
 dest: /etc/hosts
 line: '8.8.8.8 dns'
- lineinfile:
 dest: /etc/nginx/nginx.conf
 regexp: '^user '
 line: 'user www-data;'

** last instance*

Replace module

- replace:
 - dest: /etc/nginx/web.conf
 - regexp: old\.domain'
 - replace: 'new.domain'
 - backup: yes

** All instances*

BlockInFile module

http://docs.ansible.com/ansible/latest/blockinfile_module.html

```
- blockinfile:
    dest: /etc/ssh/sshd_config
    block: |

    ...
# BEGIN ANSIBLE MANAGED BLOCK
...
# END ANSIBLE MANAGED BLOCK
```

IniFile module

http://docs.ansible.com/ansible/latest/ini_file_module.html

```
- ini_file:  
    dest="/etc/php/7.0/fpm/php.ini"  
    section="Date"  
    option="date.timezone"  
    value="Europe/Prague"
```

Template module

http://docs.ansible.com/ansible/latest/template_module.html

- `template:`
 - `src=nginx.conf.j2`
 - `dest=/etc/nginx/nginx.conf`

Jinja Templates

- <http://jinja.pocoo.org/docs/2.10/templates>

- **Variables**

```
{{ ansible_distribution }}
```

- **Filters**

```
{{ ansible_distribution|capitalize }}
```

- **Loops**

```
{% for item in groups.app %}  
    server {{ item }};  
{% endfor %}
```

- **Conditionals + tests**

Jinja Conditionals + tests



{% if variable is defined %}

value of variable: {{ variable }}

{% else %}

variable is not defined

{% endif %}

Handlers



tasks:

- name: config nginx
template: src=nginx.conf.j2
dest=/etc/nginx/nginx.conf
notify:
 - restart nginx

handlers:

- name: restart nginx
service: name=nginx state=restarted

Roles

- `ansible-galaxy init <role-name>`

```
test-role/
├── defaults
│   └── main.yml
├── files
│   └── file.txt
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── tasks
│   └── main.yml
├── templates
│   └── template.j2
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml
```

Variables

- http://docs.ansible.com/ansible/latest/playbooks_variables.html#variable-precedence-where-should-i-put-a-variable
- `apl x.yml --extra-vars "..."`
- roles:
 - { role: mysql, db_name: demo }
- group_vars folder
- host_vars folder

Facts

- `ansible -m setup all`
- `/etc/ansible/facts.d/*.fact`
- name: Upload simple fact
 - copy:
 - content: "1"
 - dest: `/etc/ansible/facts.d/test.fact`

Facts

- `ansible -m setup all`

...

```
"ansible_local": {  
    "one": 1  
}
```

...

Dynamic facts



- `chmod +x ;-)`
- `Json output`

```
#!/bin/bash
```

```
curl --silent --connect-timeout 1 ifconfig.co/json
```

Vault



- `ansible-vault create vault.file`
- `ansible-vault edit vault.file`
- `apl stack-init.yml --ask-vault-pass`

[default]

`vault_password:file = ~/.vaultpass`

Vault example



- pass: 'secret'

cat vault.file

\$ANSIBLE_VAULT;1.1;AES256

326564303339633037383163333836653564633339313130306632323635313336353
36637373162...

- hosts: mgmt

vars_files:

- 'vault.file'

tasks:

- debug:

msg: '{{pass}}'

Galaxy



- <https://galaxy.ansible.com/>
- ansible-galaxy install username.role_name
- ansible-galaxy install -p roles -r requirements.yml

requirements.yml:

```
# from galaxy
- src: yatesr.timezone
# from GitHub
- src: https://github.com/bennojoy/nginx
```

Performance



- `gather_facts: false`
- `hosts: all`
`become: true`
`gather_facts: false`
`tasks:`
 - `name: update apt cache`
`apt: update_cache=yes cache_valid_time=86400`

`[ssh_connection]`

`Pipelining = True`

Ansible-pull

- https://github.com/ansible/ansible-examples/blob/master/language_features/ansible_pull.yml