Introduction to Ansible

yench

ANSIBLE

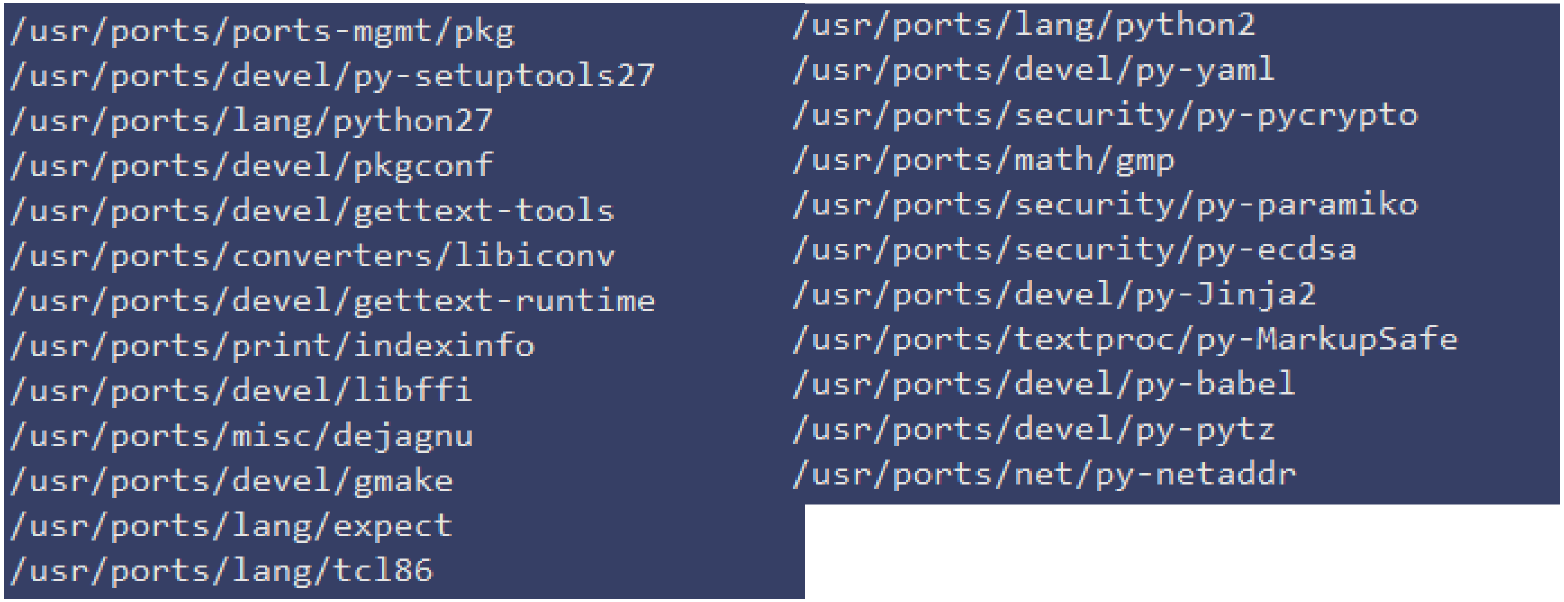
What is ansible

- ❑ Anisble @ github : a radically simple IT automation system
  - Configuration management
  - Deployment
  - Multi-node orchestration

Ansible on Freebsd

❑Control host

- ❑Ports : make install @ /usr/ports/sysutils/ansible
- ❑Pkg : pkg install ansible
- ❑Dependency :



```
/usr/ports/ports-mgmt/pkg
/usr/ports/devel/py-setuptools27
/usr/ports/lang/python27
/usr/ports/devel/pkgconf
/usr/ports/devel/gettext-tools
/usr/ports/converters/libiconv
/usr/ports/devel/gettext-runtime
/usr/ports/print/indexinfo
/usr/ports/devel/libffi
/usr/ports/misc/dejagnu
/usr/ports/devel/gmake
/usr/ports/lang/expect
/usr/ports/lang/tcl86
```

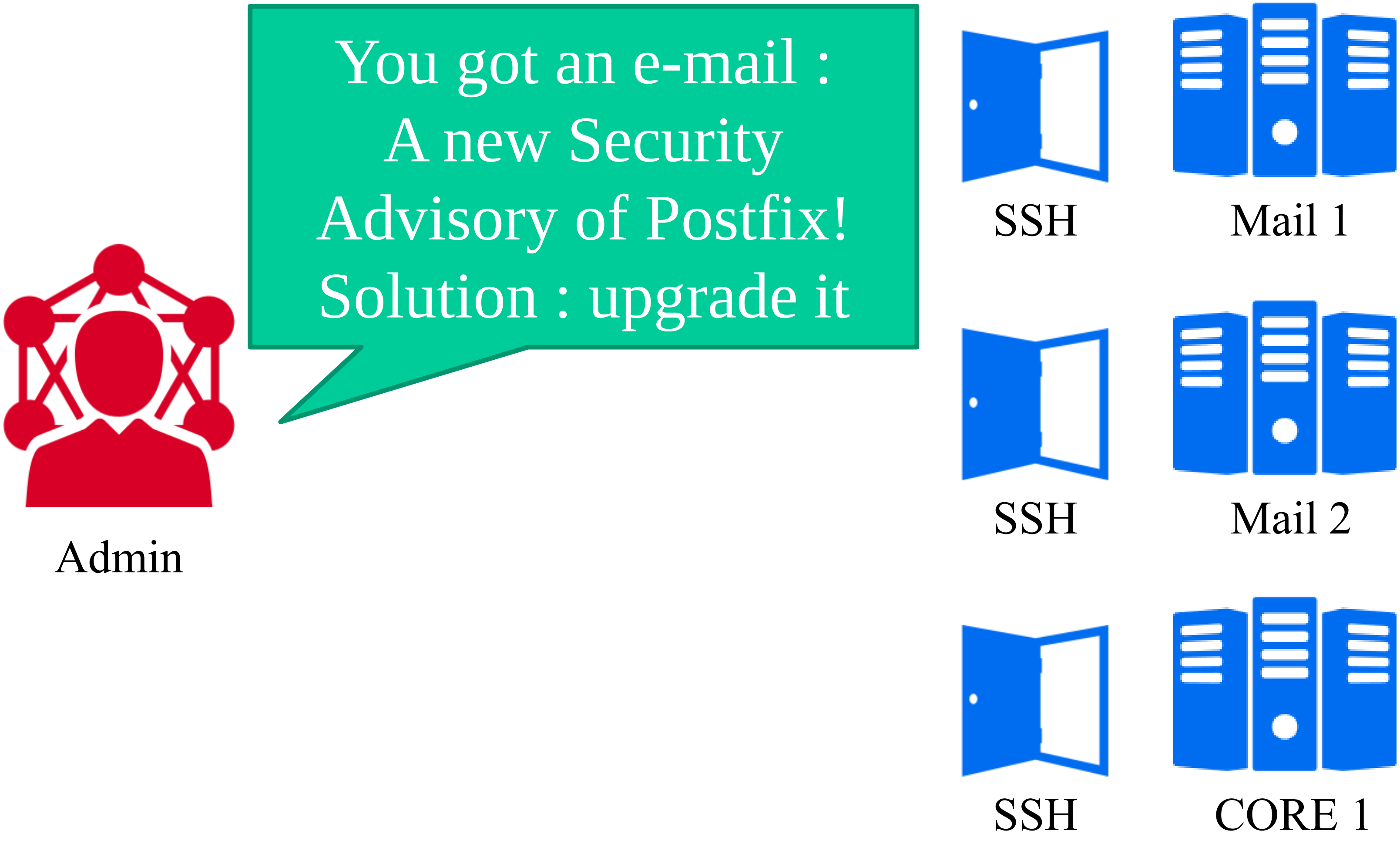
```
/usr/ports/lang/python2
/usr/ports/devel/py-yaml
/usr/ports/security/py-pycrypto
/usr/ports/math/gmp
/usr/ports/security/py-paramiko
/usr/ports/security/py-ecdsa
/usr/ports/devel/py-Jinja2
/usr/ports/textproc/py-MarkupSafe
/usr/ports/devel/py-babel
/usr/ports/devel/py-pytz
/usr/ports/net/py-netaddr
```

Ansible on Freebsd

❑Managed nodes

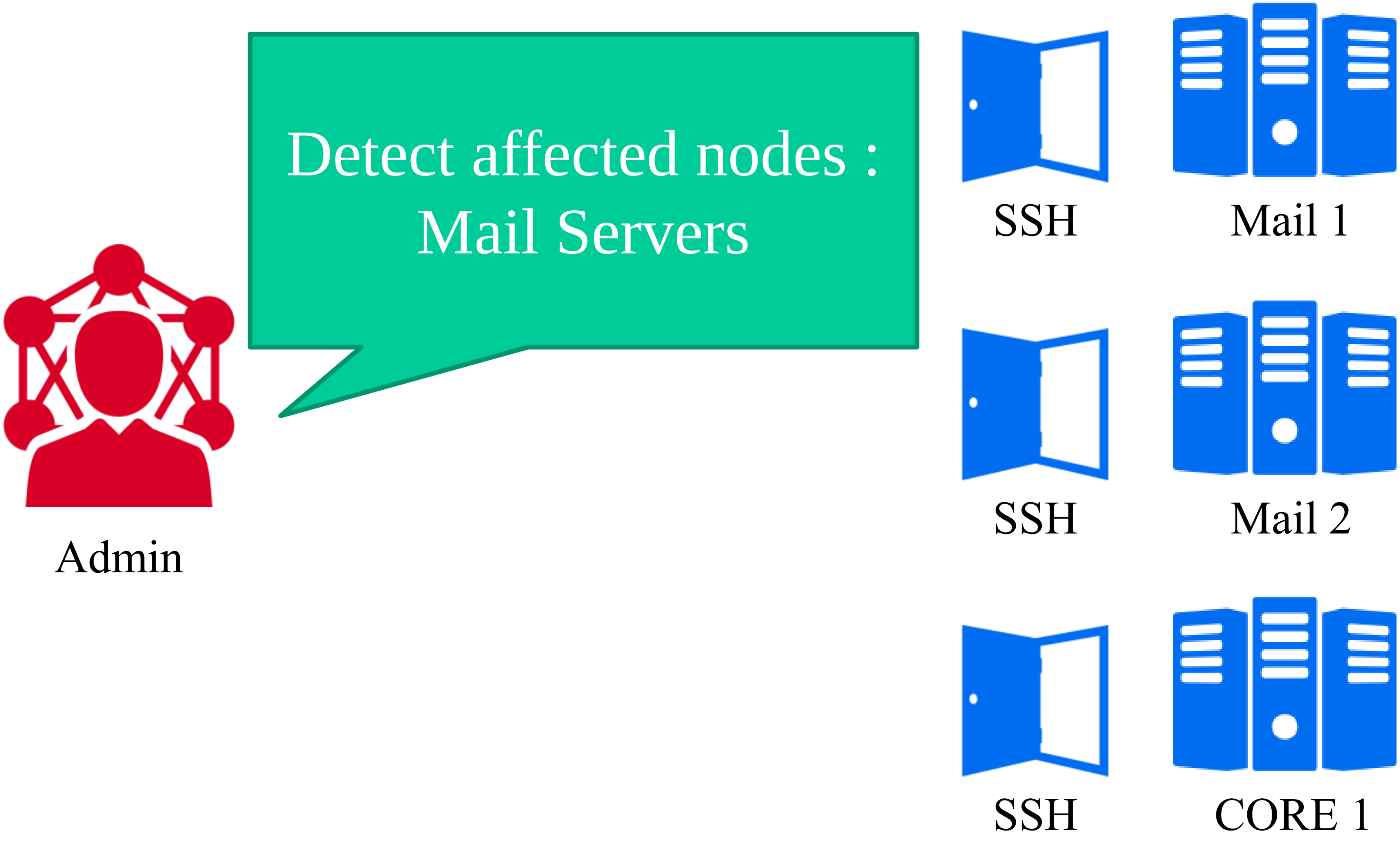
- ❑Only need ssh daemon and python 2.6~7 !

HOW IT WORKS



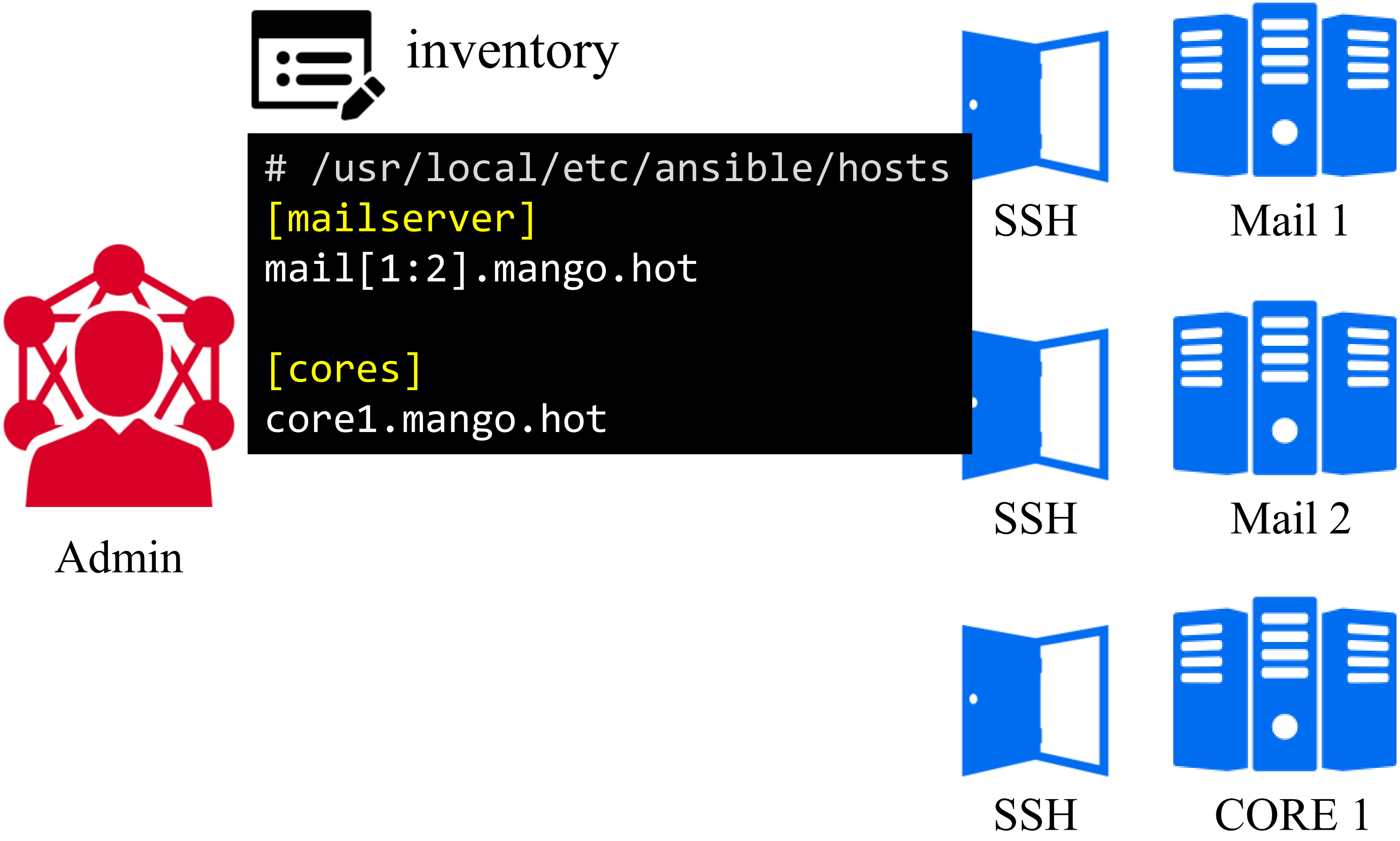
You got an e-mail :
A new Security
Advisory of Postfix!
Solution : upgrade it

HOW IT WORKS



Detect affected nodes : Mail Servers

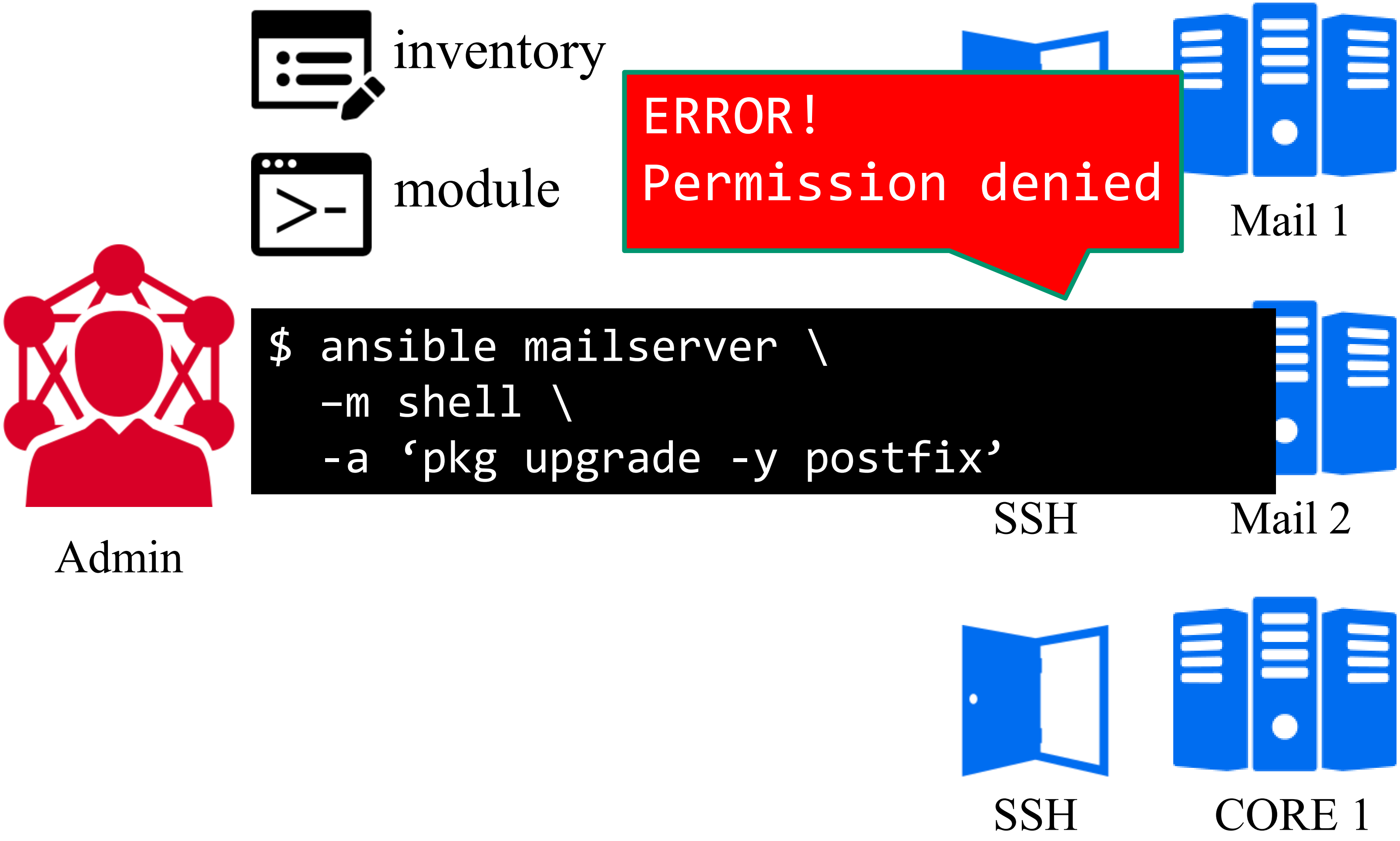
HOW IT WORKS



```
# /usr/local/etc/ansible/hosts
[mailserver]
mail[1:2].mango.hot

[cores]
core1.mango.hot
```

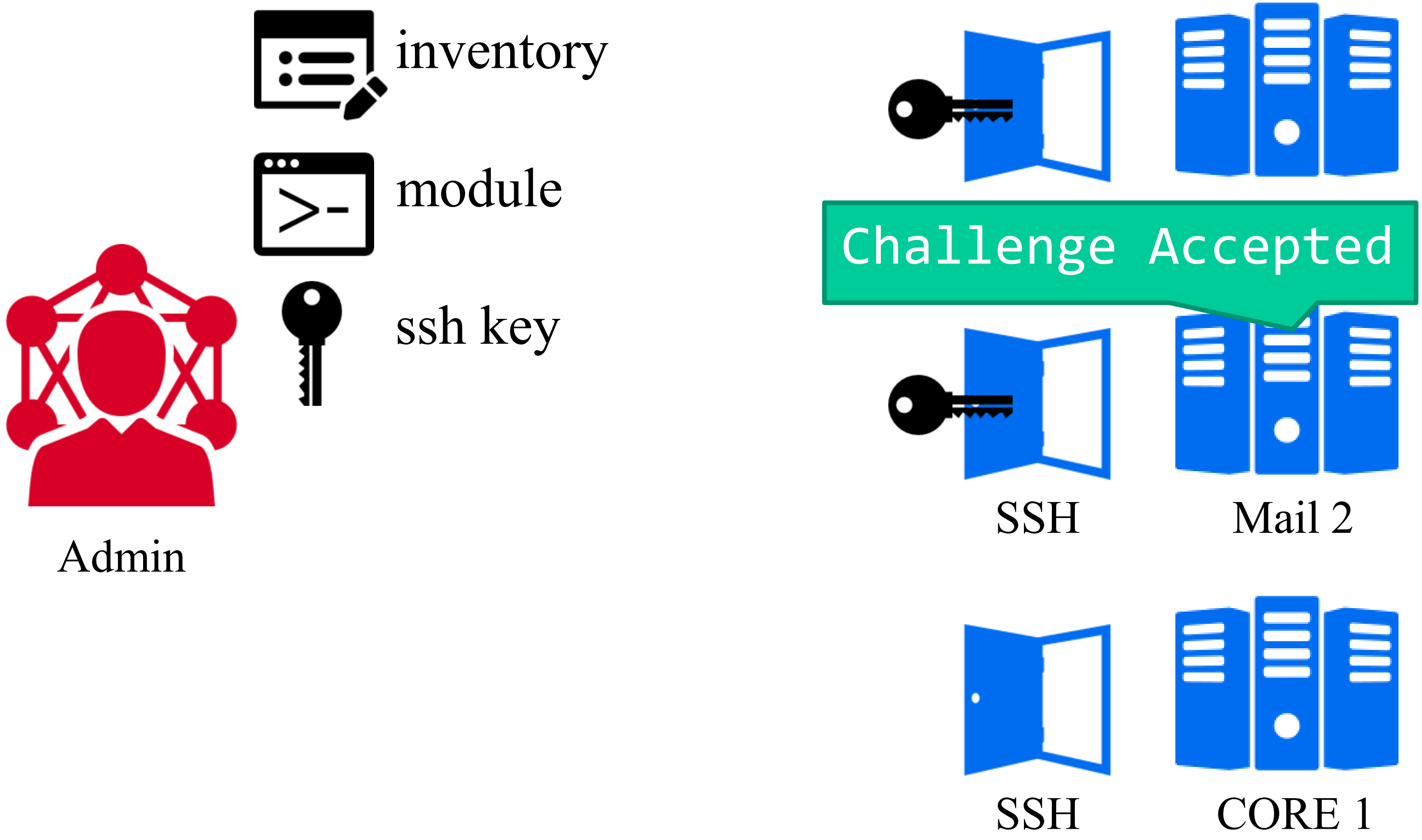
HOW IT WORKS



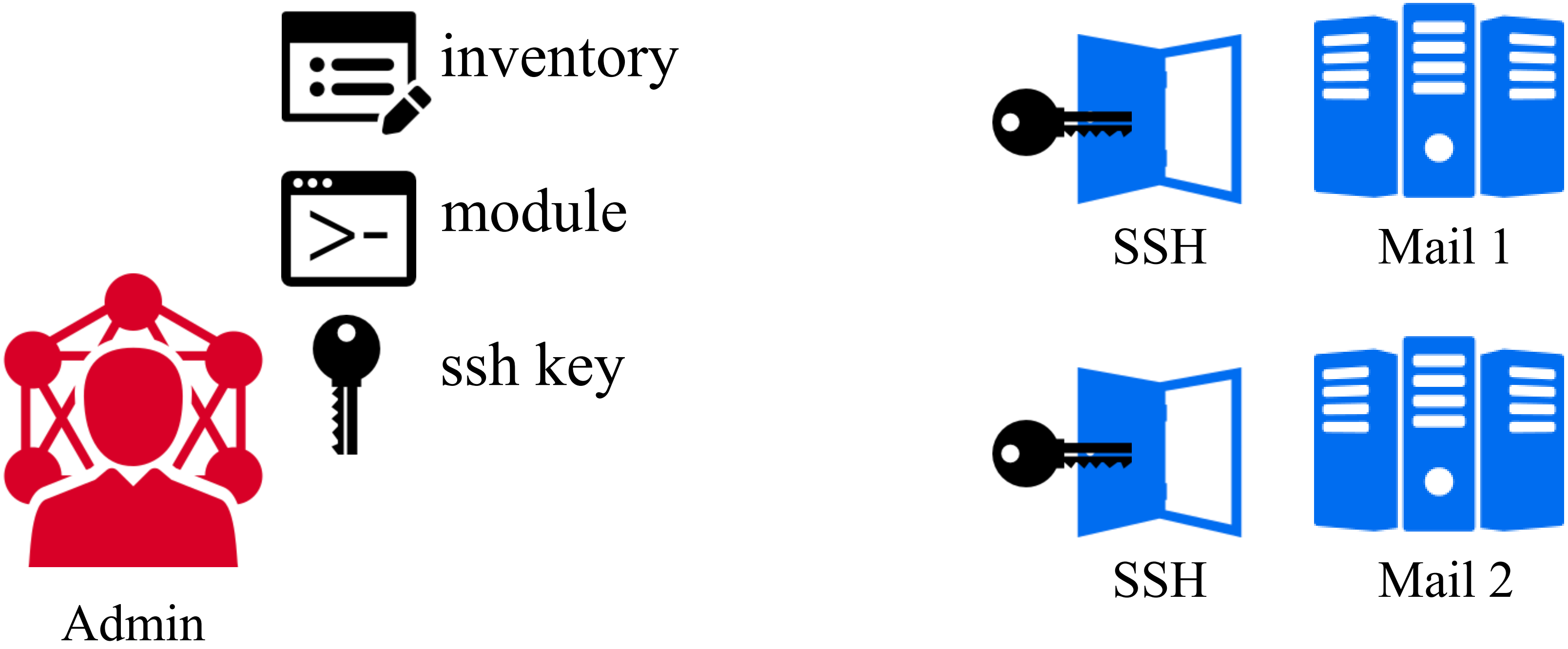
```
ERROR!
Permission denied
```

```
$ ansible mailserver \
  -m shell \
  -a ‘pkg upgrade -y postfix’
```

HOW IT WORKS


inventory
module
ssh key
Admin
Challenge Accepted
SSH
Mail 2
SSH
CORE 1

HOW IT WORKS



inventory

module

ssh key

Admin

SSH

Mail 1

SSH

Mail 2

```
mail1.mango.hot | SUCCESS | rc=0 >>
Updating FreeBSD repository catalogue...
FreeBSD repository is up-to-date.
All repositories are up-to-date.
......
```

Inventory – basic

- ❑ Default location: /path/to/ansible/hosts
- ❑ Basic usage

```
[group]
domain.name:port variable=value

Example :
    [mailserver]
    mail1.mango.hot:2222 service_type=MTA
    mail2.mango.hot:2222 service_type=MDA
```

Inventory – basic

- ❑ Pattern

  core[1:6].mango.hot

  [a:z].ftp.mango.hot

- ❑ Alias

  [group]

  $(alias_name) ansible_port=$(port_num) ansible_host=$(host)

  Example :

  ```
  [cores]
  ace ansible_port=5566 ansible_host=core1.mango.hot
  ```

Inventory – host variables

❑ Host variables

- Assign variables to hosts that will be used in playbooks

Example :

```
    mail3.mango.hot:2222 service_type=MUA
```

Then in playbooks :

```
    tasks:
    - name: “Mail User Agent : nginx server for web mail client"
      pkgng: name=nginx state=present
      when: service_type==MUA
```

Inventory – group variables

❑ Group variables

```
[group_Mail] # define a group of hosts
mail[1:3].mango.hot

[group_Mail:vars] # set variables on all hosts of this group
fail2ban_duration=168

[metagroup_workstation:children] # define a group of two groups
group_Linux
group_BSD

[metagroup_workstation:vars] # set variables on all groups of this meta group
service_type=workstation
login_limit=none
```

Inventory – ansible variables

❑ Ansible varibles (started with ansible_)

- ansible_host
  - ➢ The name of the host to connect to, if different from the alias you wish to give to it.
- ansible_port
  - ➢ The ssh port number, if not 22
- ansible_user
  - ➢ The default ssh user name to use.
- ansible_ssh_pass
  - ➢ The ssh password to use (this is insecure, we strongly recommend using --ask-pass or SSH keys)
- ansible_ssh_private_key_file
  - ➢ Private key file used by ssh. Useful if using multiple keys and you don’t want to use SSH agent.

http://docs.ansible.com/ansible/intro_inventory.html#list-of-behavioral-inventory-parameters

Inventory – ansible variables

❑ Ansible varibles (started with ansible_)

- ansible_become
  - ➢ Equivalent to ansible_sudo or ansible_su, allows to force privilege escalation
- ansible_become_method
  - ➢ Allows to set privilege escalation method
- ansible_become_user
  - ➢ Equivalent to ansible_sudo_user or ansible_su_user, allows to set the user you become through privilege escalation
- ansible_become_pass
  - ➢ Equivalent to ansible_sudo_pass or ansible_su_pass, allows you to set the privilege escalation password

http://docs.ansible.com/ansible/intro_inventory.html#list-of-behavioral-inventory-parameters

Module

- Modules are the ones that do the actual work in ansible.

  Example in ad-hoc :

  ```
  $ ansible pongserver -m ping
  $ ansible webserver \
    -m service -a ‘name=httpd state=started’
  ```

  Example in playbook :

  ```
  # playbook.yml
  - hosts: webserver
    tasks:
    - name: keep httpd service running
      service: name=httpd state=started
  ```

Module

Pkgng module :

parameter	required	default	choices
annotation (added in 1.6)	no		
cached	no		•yes •no
chroot (added in 2.1)	no		
name	yes		
pkgsite	no		
rootdir	no		
state	no	present	•present •absent

http://docs.ansible.com/ansible/list_of_all_modules.html

Module – setup

- ❑ One of the most useful module
  - “setup” module

```
$ ansible localhost -m setup
localhost | SUCCESS => {
    "ansible_facts": {
        "ansible_all_ipv4_addresses": [
            "192.168.64.111"
        ],
        "ansible_all_ipv6_addresses": [
            "fe80::20c:29ff:fed5:cec0"
        ],
        "ansible_architecture": "x86_64",
        "ansible_bios_date": "07/02/2015",
        "ansible_bios_version": "6.00",
        "ansible_cmdline": {
            "BOOT_IMAGE": "/vmlinuz-linux",
            "quiet": true,
            "root": "UUID=2ab96c0b-fbc4-41bc-9b4a-8cefb1c937e5",
```

Ad-hoc

- ansible <host-pattern> [-m module_name] [-a args] [options]
  - -a
    - The ARGUMENTS to pass to the module.
  - -m
    - Execute the module called NAME.
  - -b
    - Use privilege escalation
  - --ask-pass
  - --ask-become-pass
  - -f
    - Level of parallelism.

Playbook

- ❑ Playbooks are Ansible's configuration, deployment, and orchestration language.
- ❑ Usage: `$ansible-playbook example_playbook.yml`
- ❑ Example playbook

```
#example_playbook.yml  (YAML format)
- hosts: workstation
  remote_user: root  # by default
  tasks:
  - name: mail configuration
    copy:
      src: /etc/ansible/config/mail_relay.cfg
      dest: /usr/local/etc/postfix/main.cf
```

Playbook – trigger and handler

```
tasks:
- name: mail configuration
  copy:
    src: /etc/ansible/config/mail_relay.cfg
    dest: /usr/local/etc/postfix/main.cf
  notify:
  - restart postfix
handlers:
- name: restart postfix
  service: name=postfix state=restarted
```

Playbook – trigger and handler

```
tasks:
- name: mail configuration
  copy:
    src: /etc/ansible/config/mail_relay.cfg
    dest: /usr/local/etc/postfix/main.cf
  notify:
  - restart postfix
- meta: flush_handler
- mail: to=root@localhost subject=“Test mail”
```

Playbook – conditional

```
tasks:
  - name: “FreeBSD: install openldap”
    pkgng: name=openldap state=present
    when: ansible_os_family == “FreeBSD“
  - name: “Archlinux: install openldap”
    pacman: name=openldap state=present
    when: ansible_os_family == “Archlinux“
```

Playbook – conditional

```
when: condition_a and condition_b
when: (condition_a and condition_b) or condition_c

when: var is defined
when: var is undefined

when: boolean_var
when: not Boolean_var
```

Playbook – loop

```
- name: add users
  user: name={{ item }} state=present groups=wheel
  with_items:
      - user1
      - user2

- command: echo {{ item }}
  with_items: [ 0, 2, 4, 6, 8, 10 ]
  when: item > 5
```

Role

```
# structure of roles
roles/
   common_role/
     files/
     templates/
     tasks/
     handlers/
     vars/
     defaults/
     meta/
   second_role/ …
```

If roles/x/tasks/main.yml exists, tasks listed therein will be added to the play.

If roles/x/handlers/main.yml exists, handlers listed therein will be added to the play.

If roles/x/vars/main.yml exists, variables listed therein will be added to the play.

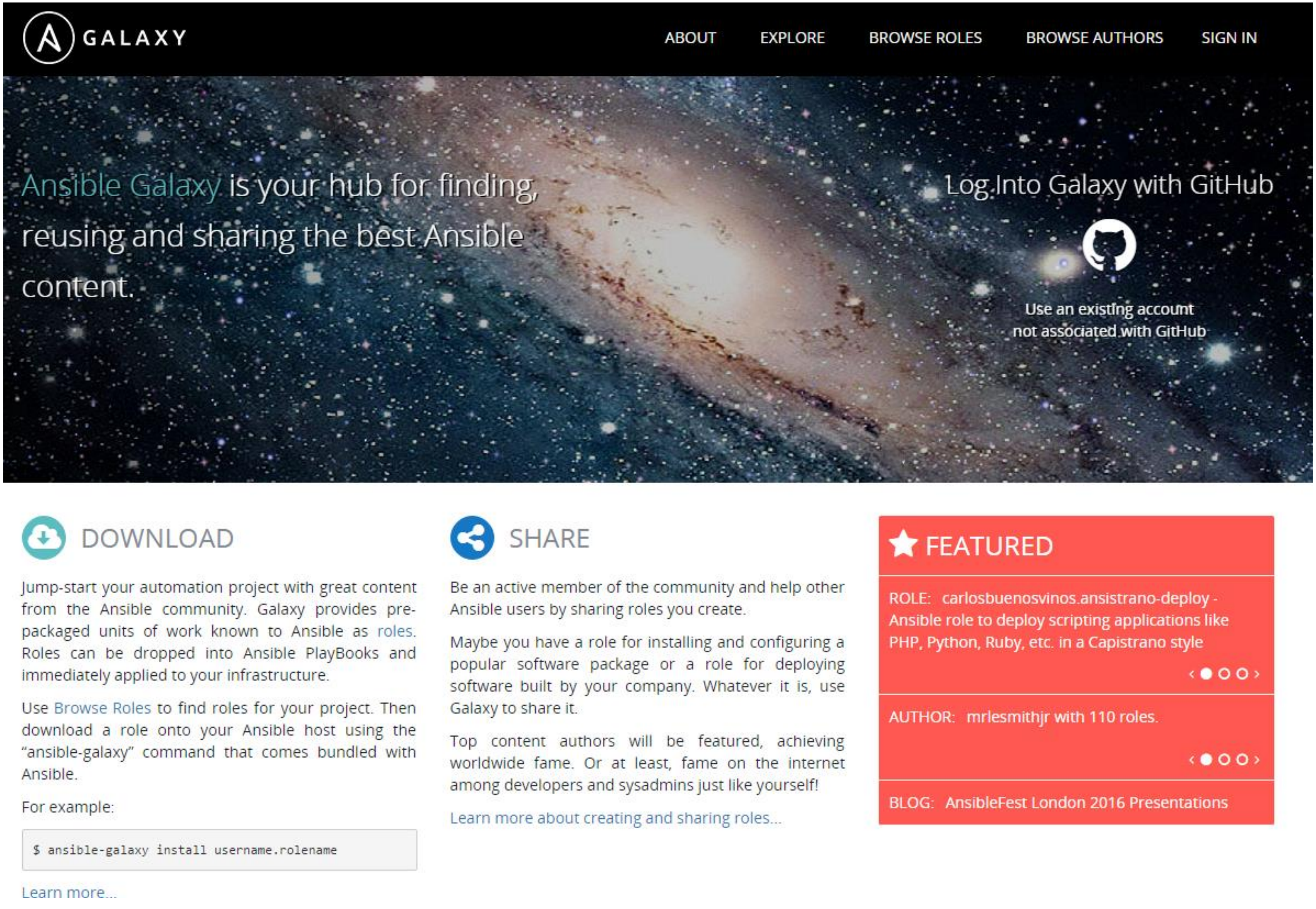
If roles/x/meta/main.yml exists, any role dependencies listed therein will be added to the list of roles (1.3 and later).

Role

```
# structure of roles
roles/
  common_role/
    files/
    templates/
    tasks/
    handlers/
    vars/
    defaults/
    meta/
  second_role/ …
```

```
- hosts: mailserver
  roles:
    - core_machine
    - mail_service
    - { role: ldap_service, ldap_type: slave }
```

Ansible Galaxy



Ansible Galaxy is your hub for finding, reusing and sharing the best Ansible content.

DOWNLOAD

Jump-start your automation project with great content from the Ansible community. Galaxy provides pre-packaged units of work known to Ansible as roles. Roles can be dropped into Ansible PlayBooks and immediately applied to your infrastructure.

Use Browse Roles to find roles for your project. Then download a role onto your Ansible host using the "ansible-galaxy" command that comes bundled with Ansible.

For example:

```
$ ansible-galaxy install username.rolename
```

Learn more...

SHARE

Be an active member of the community and help other Ansible users by sharing roles you create.

Maybe you have a role for installing and configuring a popular software package or a role for deploying software built by your company. Whatever it is, use Galaxy to share it.

Top content authors will be featured, achieving worldwide fame. Or at least, fame on the internet among developers and sysadmins just like yourself!

Learn more about creating and sharing roles...

★ FEATURED

ROLE: carlosbuenosvinos.ansistrano-deploy - Ansible role to deploy scripting applications like PHP, Python, Ruby, etc. in a Capistrano style

‹ ● ○ ○ ›

AUTHOR: mrlesmithjr with 110 roles.

‹ ● ○ ○ ›

BLOG: AnsibleFest London 2016 Presentations