Ansible – Automate Server Administration Like a Boss

You've got configs!

Ansible vs Shell scripts

```
pramodr@knowops:~$ sudo apt-get update && \
> sudo apt-get install software-properties-common -y && \
> sudo apt-add-repository -y ppa:ansible/ansible && \
> sudo apt-get update && \
> sudo apt-get install ansible -y
```

```
pramodr@knowops:~$ sudo vi /etc/ansible/hosts
```

```
## db-[99:101]-node.example.com


[local]

127.0.0.1


[remote]

dev.knoweng.org


                                    50,0-1              Bot
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts --connection=local local -m ping
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts --connection=local local -m ping
127.0.0.1 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}

pramodr@knowops:~$
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts --connection=local local -m ping
127.0.0.1 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
pramodr@knowops:~$ ansible -i /etc/ansible/hosts remote -m ping
The authenticity of host 'dev.knoweng.org (141.142.208.218)' can't be established.
ECDSA key fingerprint is SHA256:mzPeM79mNZBQdqcIn3m56oz8r5b3/KBwGiMaKLWW934.
Are you sure you want to continue connecting (yes/no)?
```

```
# additional paths to search for roles in, colon separated
#roles_path     = /etc/ansible/roles



# uncomment this to disable SSH key host checking
host_key_checking = False



# change the default callback
#stdout_callback = skippy
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts remote -m ping
dev.knoweng.org | UNREACHABLE! => {
    "changed": false,
    "msg": "Failed to connect to the host via ssh: Warning: Permanently added 'dev.knoweng.org,141.142.208.218' (
ECDSA) to the list of known hosts.\r\nPermission denied (publickey).\r\n",
    "unreachable": true
}
pramodr@knowops:~$
```

```
127.0.0.1


[remote]
dev.knoweng.org ansible_ssh_private_key_file=~/.ssh/dev-nebula.pem
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts remote -m ping
dev.knoweng.org | UNREACHABLE! => {
    "changed": false,
    "msg": "Failed to connect to the host via ssh: Permission denied (publickey).\r\n",
    "unreachable": true
}
pramodr@knowops:~$
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts remote -m ping
dev.knoweng.org | UNREACHABLE! => {
    "changed": false,
    "msg": "Failed to connect to the host via ssh: Permission denied (publickey).\r\n",
    "unreachable": true
}
pramodr@knowops:~$ ssh -i .ssh/dev-nebula.pem ubuntu@dev.knoweng.org
Welcome to Ubuntu 16.04 LTS (GNU/Linux 4.4.0-31-generic x86_64)


 * Documentation:  https://help.ubuntu.com

 * Management:     https://landscape.canonical.com

 * Support:        https://ubuntu.com/advantage
```

```
pramodr@knowops:~$ ssh -i .ssh/dev-nebula.pem pramodr@dev.knoweng.org
Permission denied (publickey).
pramodr@knowops:~$ ansible -i /etc/ansible/hosts remote -m ping -b --become-user=ubuntu
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts remote -m ping -u ubuntu
dev.knoweng.org | FAILED! => {
    "changed": false,
    "failed": true,
    "module_stderr": "Shared connection to dev.knoweng.org closed.\r\n",
    "module_stdout": "/bin/sh: 1: /usr/bin/python: not found\r\n",
    "msg": "MODULE FAILURE",
    "rc": 0
}
pramodr@knowops:~$
```

```
dev.knoweng.org ansible_ssh_private_key_file=~/.ssh/dev-nebula.pem ansible_python_interpreter=/usr/bin/python3
```

```
pramodr@knowops:~$ ansible -i /etc/ansible/hosts remote -m ping -u ubuntu

dev.knoweng.org | SUCCESS => {

    "changed": false,

    "ping": "pong"

}

pramodr@knowops:~$
```

```
pramodr@knowops:~$ ansible remote -m ping -u ubuntu
dev.knoweng.org | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
pramodr@knowops:~$
```

```
pramodr@knowops:~$ ansible remote -m shell -a 'apt-get install nginx' -u ubuntu
 [WARNING]: Consider using apt module rather than running apt-get


dev.knoweng.org | FAILED | rc=100 >>
E: Could not open lock file /var/lib/dpkg/lock - open (13: Permission denied)
E: Unable to lock the administration directory (/var/lib/dpkg/), are you root?


pramodr@knowops:~$
```

```
pramodr@knowops:~$ ansible remote -m shell -a 'sudo apt-get install nginx' -u ubuntu
 [WARNING]: Consider using 'become', 'become_method', and 'become_user' rather than running sudo


dev.knoweng.org | FAILED | rc=1 >>
Reading package lists...
Building dependency tree...
Reading state information...
The following additional packages will be installed:
  fontconfig-config fonts-dejavu-core libfontconfig1 libgd3 libjbig0
  libjpeg-turbo8 libjpeg8 libtiff5 libvpx3 libxpm4 libxslt1.1 nginx-common
  nginx-core
Suggested packages:
  libgd-tools fcgiwrap nginx-doc ssl-cert
```

```
    nginx-core
Suggested packages:
  libgd-tools fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  fontconfig-config fonts-dejavu-core libfontconfig1 libgd3 libjbig0
  libjpeg-turbo8 libjpeg8 libtiff5 libvpx3 libxpm4 libxslt1.1 nginx
  nginx-common nginx-core
0 upgraded, 14 newly installed, 0 to remove and 183 not upgraded.
Need to get 3,000 kB of archives.
After this operation, 9,783 kB of additional disk space will be used.
Do you want to continue? [Y/n] Abort.

pramodr@knowops:~$
```

```
    nginx-core
Suggested packages:
  libgd-tools fcgiwrap nginx-doc ssl-cert
The following NEW packages will be installed:
  fontconfig-config fonts-dejavu-core libfontconfig1 libgd3 libjbig0
  libjpeg-turbo8 libjpeg8 libtiff5 libvpx3 libxpm4 libxslt1.1 nginx
  nginx-common nginx-core
0 upgraded, 14 newly installed, 0 to remove and 183 not upgraded.
Need to get 3,000 kB of archives.
After this operation, 9,783 kB of additional disk space will be used.
Do you want to continue? [Y/n] Abort.


pramodr@knowops:~$ ansible remote -m shell -a 'apt-get install nginx -y' -u ubuntu
```

```
pramodr@knowops:~$ ansible remote -m apt -a 'name=nginx state=installed update_cache=true' -u ubuntu
```

```
pramodr@knowops:~$ ansible remote -m apt -a 'name=nginx state=installed update_cache=true' -u ubuntu

dev.knoweng.org | FAILED! => {
    "changed": false,
    "failed": true,
    "msg": "Failed to lock apt for exclusive operation"
}
pramodr@knowops:~$
```

```
pramodr@knowops:~$ ansible remote -m apt -a 'name=nginx state=installed update_cache=true' -u ubuntu -b --become-user
=root
```

```
pramodr@knowops:~$ ansible remote -m apt -a 'name=nginx state=installed update_cache=true' -u ubuntu -b --become-user
=root
dev.knoweng.org | SUCCESS => {
    "cache_update_time": 1504839922,
    "cache_updated": true,
    "changed": true,
    "stderr": "",
    "stderr_lines": [],
    "stdout": "Reading package lists...\nBuilding dependency tree...\nReading state information...\nThe following add
itional packages will be installed:\n  fontconfig-config fonts-dejavu-core libfontconfig1 libgd3 libjbig0\n  libjpeg-
turbo8 libjpeg8 libtiff5 libvpx3 libxpm4 libxslt1.1 nginx-common\n  nginx-core\nSuggested packages:\n  libgd-tools fc
giwrap nginx-doc ssl-cert\nThe following NEW packages will be installed:\n  fontconfig-config fonts-dejavu-core libfo
ntconfig1 libgd3 libjbig0\n  libjpeg-turbo8 libjpeg8 libtiff5 libvpx3 libxpm4 libxslt1.1 nginx\n  nginx-common nginx-
```

```
pramodr@knowops:~$ ansible remote -m apt -a 'name=nginx state=installed update_cache=true' -u ubuntu -b --become-user
=root
dev.knoweng.org | SUCCESS => {
    "cache_update_time": 1504840233,
    "cache_updated": true,
    "changed": false
}
pramodr@knowops:~$
```

```
pramodr@knowops:~$ ansible-playbook -i /etc/ansible/hosts nginx.yml
```

```
---

- hosts: remote

  remote_user: ubuntu

  become: yes

  become_user: root

  tasks:

   - name: Install Nginx

     apt:

       name: nginx

       state: installed

       update_cache: true
```

[Read 11 lines]

^G Get Help   ^O Write Out   ^W Where Is   ^K Cut Text   ^J Justify   ^C Cur Pos   ^Y Prev Page
^X Exit   ^R Read File   ^\ Replace   ^U Uncut Text   ^T To Spell   ^_ Go To Line   ^V Next Page

```
pramodr@knowops:~$ ansible-playbook nginx.yml

PLAY [remote] ***********************************************************************************************

TASK [Gathering Facts] **************************************************************************************
ok: [dev.knoweng.org]

TASK [Install Nginx] ****************************************************************************************
ok: [dev.knoweng.org]

PLAY RECAP **************************************************************************************************
dev.knoweng.org            : ok=2    changed=0    unreachable=0    failed=0

pramodr@knowops:~$
```

```
GNU nano 2.5.3                    File: nginx.yml                              Modified


---

- hosts: remote
  remote_user: ubuntu
  become: yes
  become_user: root
  tasks:
   - name: Install Nginx
     apt:
       name: nginx
       state: installed
       update_cache: true
     notify:
       - Start Nginx


  handlers:
   - name: Start Nginx
     service: name=nginx state=started




^G Get Help    ^O Write Out   ^W Where Is    ^K Cut Text    ^J Justify     ^C Cur Pos     ^Y Prev Page
^X Exit        ^R Read File   ^\ Replace     ^U Uncut Text  ^T To Spell    ^_ Go To Line  ^V Next Page
```

```
pramodr@knowops:~$ ansible-playbook nginx.yml

PLAY [remote] ********************************************************************************************

TASK [Gathering Facts] **********************************************************************************
ok: [dev.knoweng.org]

TASK [Install Nginx] ************************************************************************************
changed: [dev.knoweng.org]

RUNNING HANDLER [Start Nginx] ***************************************************************************
ok: [dev.knoweng.org]

PLAY RECAP **********************************************************************************************
dev.knoweng.org            : ok=3    changed=1    unreachable=0    failed=0

pramodr@knowops:~$
```

```
    apt:
      name: nginx
      state: installed
      update_cache: true
notify:
    - Stop Nginx


handlers:
  - name: Stop Nginx
      service: name=nginx state=stopped
```

```
pramodr@knowops:~$ ansible-playbook nginx.yml

PLAY [remote] ******************************************************************************

TASK [Gathering Facts] ********************************************************************
ok: [dev.knoweng.org]

TASK [Install Nginx] **********************************************************************
ok: [dev.knoweng.org]

PLAY RECAP ********************************************************************************
dev.knoweng.org            : ok=2    changed=0    unreachable=0    failed=0

pramodr@knowops:~$
```

```yaml
    apt:
      name: nginx
      state: removed
      update_cache: true
    notify:
      - Stop Nginx


    handlers:
    - name: Stop Nginx
      service: name=nginx state=stopped
```

```
pramodr@knowops:~$ ansible-playbook nginx.yml


PLAY [remote] ********************************************************************************************


TASK [Gathering Facts] **********************************************************************************
ok: [dev.knoweng.org]


TASK [Remove Nginx] *************************************************************************************
changed: [dev.knoweng.org]


RUNNING HANDLER [Stop Nginx] ***************************************************************************
changed: [dev.knoweng.org]


PLAY RECAP *********************************************************************************************
dev.knoweng.org            : ok=3    changed=2    unreachable=0    failed=0


pramodr@knowops:~$
```

```yaml
---
- hosts: remote
  remote_user: ubuntu
  become: yes
  become_user: root
  vars:
    - docroot: /var/www/dev.knoweng.org/public
  tasks:
    - name: Add Nginx Repository
      apt_repository:
        repo: ppa:nginx/stable
        state: present
      register: ppastable

    - name: Install Nginx
      apt:
        pkg: nginx
        state: installed
        update_cache: true
      when: ppastable|success
      notify:
        - Start Nginx

    - name: Create Web Root
      file:
        path: '{{ docroot }}'
        mode: 775
        state: directory
        owner: www-data
        group: www-data
      notify:
        - Reload Nginx

  handlers:
    - name: Start Nginx
      service:
        name: nginx
        state: started

    - name: Reload Nginx
      service:
        name: nginx
        state: reloaded
```

```
pramodr@knowops:~$ ansible-playbook nginx.yml

PLAY [remote] ***********************************************************************************

TASK [Gathering Facts] **************************************************************************
ok: [dev.knoweng.org]

TASK [Add Nginx Repository] *********************************************************************
changed: [dev.knoweng.org]

TASK [Install Nginx] ****************************************************************************
changed: [dev.knoweng.org]

TASK [Create Web Root] **************************************************************************
changed: [dev.knoweng.org]

RUNNING HANDLER [Start Nginx] *******************************************************************
ok: [dev.knoweng.org]

RUNNING HANDLER [Reload Nginx] ******************************************************************
changed: [dev.knoweng.org]

PLAY RECAP **************************************************************************************
dev.knoweng.org            : ok=6    changed=4    unreachable=0    failed=0
```

```
roles

  rolename

    - files

    - handlers

    - meta

    - templates

    - tasks

    - vars
```

```
pramodr@knowops:~$ ansible-galaxy init nginx-role

- nginx-role was created successfully

pramodr@knowops:~$
```

```
pramodr@knowops:~$ ls
nginx.retry   nginx-role   nginx.yml
pramodr@knowops:~$ ls -la nginx-role/
total 36
drwxrwxr-x 8 pramodr pramodr 4096 Sep  8 13:00 .
drwxr-xr-x 7 pramodr pramodr 4096 Sep  8 13:00 ..
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 defaults
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 handlers
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 meta
-rw-rw-r-- 1 pramodr pramodr 1328 Sep  8 13:00 README.md
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 tasks
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 tests
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 vars
```

```
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 tests
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 vars
pramodr@knowops:~$ ls -la nginx-role/handlers/
total 12
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 .
drwxrwxr-x 8 pramodr pramodr 4096 Sep  8 13:00 ..
-rw-rw-r-- 1 pramodr pramodr   34 Sep  8 13:00 main.yml
pramodr@knowops:~$ ls -la nginx-role/meta/
total 12
drwxrwxr-x 2 pramodr pramodr 4096 Sep  8 13:00 .
drwxrwxr-x 8 pramodr pramodr 4096 Sep  8 13:00 ..
-rw-rw-r-- 1 pramodr pramodr 1777 Sep  8 13:00 main.yml
pramodr@knowops:~$
```

GNU nano 2.5.3   File: nginx-role/handlers/main.yml   Modified

---

handlers file for nginx-role

- name: Start Nginx

  service:

    name: nginx

    state: started - name: Reload Nginx

  service:

    name: nginx

    state: reloaded

^G Get Help   ^O Write Out   ^W Where Is   ^K Cut Text   ^J Justify   ^C Cur Pos   ^Y Prev Page
^X Exit   ^R Read File   ^\ Replace   ^U Uncut Text   ^T To Spell   ^_ Go To Line   ^V Next Page

```
    #

    # NOTE: A tag is limited to a single word comprised of alphanumeric characters.
    #       Maximum 20 tags per role.


dependencies:
  - { role: ssl }
```

^G Get Help   ^O Write Out   ^W Where Is   ^K Cut Text   ^J Justify   ^C Cur Pos   ^Y Prev Page
^X Exit   ^R Read File   ^\ Replace   ^U Uncut Text   ^T To Spell   ^_ Go To Line   ^V Next Page

```
    # NOTE: A tag is limited to a single word comprised of alphanumeric characters.
    #       Maximum 20 tags per role.


dependencies: []
```

```
GNU nano 2.5.3              File: server.yml                          Modified

---

  hosts: remote

  roles:
    -nginx
```

```
pramodr@knowops:~$ ansible-playbook server.yml
```

Documentation

Ansible
devel

For previous versions, see the
documentation archive.

Docs » Ansible Documentation

 Edit on GitHub

Ansible Documentation

About Ansible

Welcome to the Ansible documentation!

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's main goals are simplicity and ease-of-use. It also has a strong focus on security and reliability, featuring a minimum of moving parts, usage of OpenSSH for transport (with an accelerated socket mode and pull modes as alternatives), and a language that is designed around auditability by humans–even those not familiar with the program.

We believe simplicity is relevant to all sizes of environments, so we design for

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