Setup New User and SSH Key Auth. using Ansible on Ubuntu 18.04

Ansible is a simple automation tool that automates software applications deployment, cloud provisioning, and configuration management.

On this page

It's a server orchestration tool that helps you to manage and control a large number of server nodes from single places called 'Control Machines'. Ansible was created by Michael DeHaan in 2012 and is written in Python and Powershell.

In this tutorial, we will learn how to deploy a new user and enable the SSH Key-Based authentication using the automation tool Ansible. We will also learn how to configure the Ansible 'Control Machine', as well as how to write simple ansible playbook.

Prerequisites

- 2 or more Ubuntu 18.04 Servers
- 10.0.15.10 control-machine
- 10.0.15.21 ansi01
- 10.0.15.22 ansi02
- Root privileges

What we will do?

Tutorial Info

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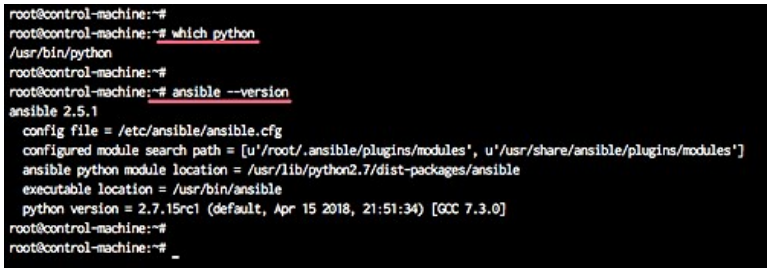
Step 1 - Setup Ansible Control Machine

In this tutorial, we will be using the Ubuntu 16.04 servers as the Ansible 'Machine Control' and ansible hosts. The first step we need to do is to set up the 'control machine'.

We will install python and ansible on the ansible 'control machine' by running the following command.

```
sudo apt install python ansible -y
```



After the installation is complete, we will add a new system user.

We will add a new user named 'provision' in order to perform server provisioning using Ansible.

Add new user 'provision' and give the user a password.

```
useradd -m -s /bin/bash provision
passwd provision
```

Now add the 'provision' user for sudo without the password by creating new configuration file under the '/etc/sudoers.d/' using the command below.

```
echo  -e 'provision\tALL=(ALL)\tNOPASSWD:\tALL' > /etc/sudoers.d/provision
```


A new user has been created, and now it can use sudo without a password.

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```
root@control-machine:~# passwd provision
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@control-machine:~#
root@control-machine:~# echo  -e 'provision\tALL=(ALL)\tNOPASSWD:\tALL' > /etc/sudoers.d/provision
root@control-machine:~#
root@control-machine:~# su - provision
provision@control-machine:~$
provision@control-machine:~$ sudo su
root@control-machine:/home/provision#
root@control-machine:/home/provision# exit
provision@control-machine:~$ _
```

Step 2 - Define User and SSH Key

In this step, we will define the user for ansible hosts. This user will be automatically created by ansible, so we just need to define the username, password, and the ssh public key.

For each server ('ansi01' and 'ansi02'), we will create a new user named 'provision' with password 'secret01'. And we need to encrypt the 'secret01' password using the mkpasswd command.

Encrypt the 'secret01' password using the command below.

```
mkpasswd --method=SHA-512
TYPE THE PASSWORD 'secret01'
```

Note:

Make sure the 'whois' package is installed on the system, or you can install using the following command.

```
sudo apt install whois -y
```

And you will get the SHA-512 encrypted password.

```
root@control-machine:~#
root@control-machine:~# mkpasswd --method=SHA-512
Password:
$6$Srdgs/R/0$YN9Cdzj7LbndRPc9cjpgJ4.M7SbMLGJ2TOgIKD52bzxHZVK9JVNTahLTFBzWs4ZDQdNsy6OOGuSd2DWc6wHVR/
root@control-machine:~#
root@control-machine:~# _
```

Next, we will generate a new ssh-key.

Login to the 'provision' user and generate the ssh key using the ssh-keygen command.

```
su - provision
ssh-keygen -t rsa
```

Now the user and password have been defined, and the ssh key has been created l(ocated at the '.ssh' directory).

```
root@control-machine:~#
root@control-machine:~# su - provision
provision@control-machine:~$
provision@control-machine:~$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/provision/.ssh/id_rsa):
Created directory '/home/provision/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
```

Step 3 - Create New Inventory

In this step, we will define the inventory files for all server hosts.

Login as the 'provision' user and create a new directory for the project.

```
su - provision
mkdir -p ansible01/
```

Go to the 'ansible01' directory and create a new inventory file 'inventory.ini' using vim.

```
cd ansible01/
vim inventory.ini
```

Paste the following configuration there.

```
[webserver]
 ansi01 ansible_host=10.0.15.21
 ansi02 ansible_host=10.0.15.22
```

Save and exit.

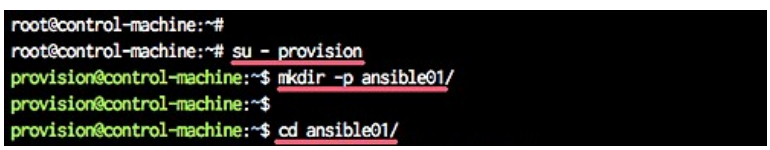
Now create a new ansible configuration file 'ansible.cfg'.

```
vim ansible.cfg
```

Paste the following configuration there.

```
[defaults]
 inventory = /home/provision/ansible01/inventory.ini
```

Save and exit.



```
provision@control-machine:~/ansible01$ vim inventory.ini
provision@control-machine:~/ansible01$
provision@control-machine:~/ansible01$ vim ansible.cfg
provision@control-machine:~/ansible01$
provision@control-machine:~/ansible01$ tree
.
├── ansible.cfg
└── inventory.ini

0 directories, 2 files
provision@control-machine:~/ansible01$ _
```

The ansible inventory file has been created, and our ansible scripts will be located under the 'provision' user, inside the 'ansible01' directory.

Step 4 - Create Ansible Playbook

Ansible Playbook is set of instructions that you send to run on a single or group of server hosts. It represents the ansible-provisioning, where the automation is defined as tasks, and all jobs like installing packages, editing files, will be done by ansible modules.

In this step, we will create a new ansible playbook to deploy a new user, deploy the ssh key, and configure the ssh service.

Before we create a new ansible playbook, we will scan all server fingerprint using the ssh-keyscan command as below.

```
ssh-keyscan 10.0.15.21 >> ~/.ssh/known_hosts
ssh-keyscan 10.0.15.22 >> ~/.ssh/known_hosts
```

Those servers fingerprint will be stored at the '.ssh/known_hosts' file.

```
provision@control-machine:~$
provision@control-machine:~$ ssh-keyscan 139.99.40.15 >> ~/.ssh/known_hosts
# 139.99.40.15:22 SSH-2.0-OpenSSH_7.6p1 Ubuntu-4
# 139.99.40.15:22 SSH-2.0-OpenSSH_7.6p1 Ubuntu-4
# 139.99.40.15:22 SSH-2.0-OpenSSH_7.6p1 Ubuntu-4
provision@control-machine:~$
provision@control-machine:~$ ssh-keyscan 139.99.100.63 >> ~/.ssh/known_hosts
# 139.99.100.63:22 SSH-2.0-OpenSSH_7.6p1 Ubuntu-4
# 139.99.100.63:22 SSH-2.0-OpenSSH_7.6p1 Ubuntu-4
# 139.99.100.63:22 SSH-2.0-OpenSSH_7.6p1 Ubuntu-4
provision@control-machine:~$
provision@control-machine:~$ _
```

Note:

If you have a lot of server nodes, you can save your host list and then manually scan the ssh key fingerprint using bash script as shown below.

```
for i in $(cat list-hosts.txt)
do
ssh-keyscan $i >> ~/.ssh/known_hosts
done
```

Next, create the ansible playbook named 'deploy-ssh.yml' using vim.

```
vim deploy-ssh.yml
```

Paste following the ansible playbook there.

```
---
 - hosts: all
   vars:
     - provision_password: '$6$w9S3t7x1kRtmG0u$6nVU9KZs
C12Q8DYI4FtgKPy.e/cq/jseB/.DViTO1SpUnoCy.dxcOf8hyfitGq5
V0yhgXccxzlqm2o.I3S1DJ0'
  gather_facts: no
   remote_user: root

   tasks:

   - name: Add a new user named provision
     user:
          name=provision
          password={{ provision_password }}

   - name: Add provision user to the sudoers
     copy:
          dest: "/etc/sudoers.d/provision"
          content: "provision  ALL=(ALL)  NOPASSWD: ALL
"

   - name: Deploy SSH Key
     authorized_key: user=provision
                     key="{{ lookup('file', '/home/prov
ision/.ssh/id_rsa.pub') }}"
                     state=present

   - name: Disable Password Authentication
     lineinfile:
           dest=/etc/ssh/sshd_config
           regexp='^PasswordAuthentication'
           line="PasswordAuthentication no"
           state=present
           backup=yes
     notify:
       - restart ssh

   - name: Disable Root Login
     lineinfile:
           dest=/etc/ssh/sshd_config
           regexp='^PermitRootLogin'
           line="PermitRootLogin no"
           state=present
           backup=yes
     notify:
       - restart ssh

   handlers:
   - name: restart ssh
     service:
       name=sshd
       state=restarted
```

Save and exit.

On the playbook script:

- we create the 'deploy-ssh.yml' playbook script to be applied on all servers defined in the 'inventory.ini' file.
- we create the ansible variable 'provision_password', containing the encrypted password for the new user.
- Set the Ansible facts to 'no'.
- Define the 'root' user as a remote user to perform tasks automation.
- We create new tasks for adding a new user, add the user to the sudoers, and upload the ssh key.

- We create new tasks for configuring the ssh services, disabling the root login, and disable password authentication. Tasks for configuring the ssh will trigger the 'restart ssh' handlers.
- We create a handler to restart the ssh service.

Step 5 - Run the Playbook

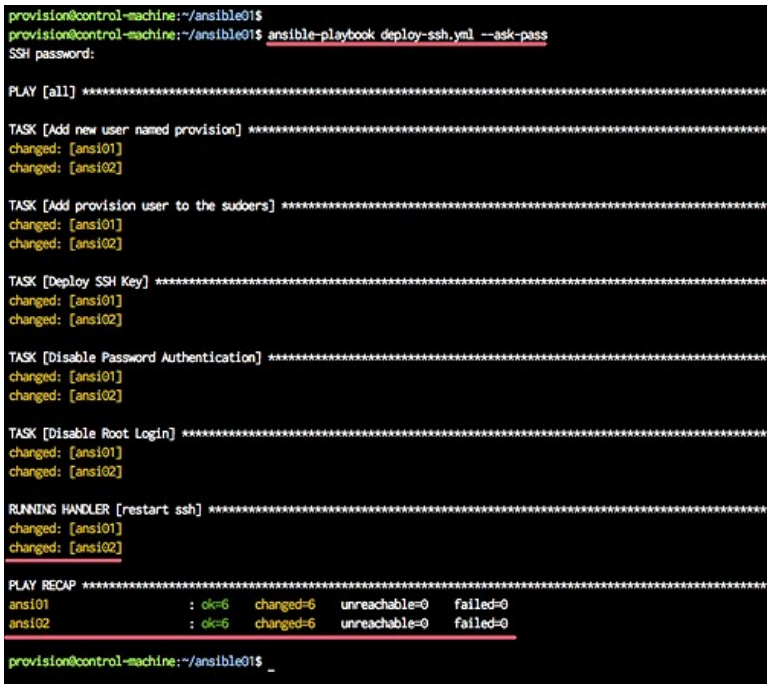
Login to the 'provision' user and go to the 'ansible01' directory.

```
su - provision
cd ansible01/
```

Now run the the 'deploy-ssh.yml' playbook using the command as shown below.

```
ansible-playbook deploy-ssh.yml --ask-pass
```

Type your root password, and you will get the result as below.



All tasks for deploying a new user and ssh key have been completed successfully.

Step 6 - Testing

Test using ansible command.

```
ansible webserver -m ping
ansible webserver -m shell -a id
```

Now you will get the green messages as below.

```
provision@control-machine:~/ansible01$
provision@control-machine:~/ansible01$ ansible webserver -m ping
ansi02 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
ansi01 | SUCCESS => {
    "changed": false,
    "ping": "pong"
}
provision@control-machine:~/ansible01$
provision@control-machine:~/ansible01$ ansible webserver -m shell -a id
ansi01 | SUCCESS | rc=0 >>
uid=1001(provision) gid=1001(provision) groups=1001(provision)

ansi02 | SUCCESS | rc=0 >>
uid=1002(provision) gid=1002(provision) groups=1002(provision)

provision@control-machine:~/ansible01$
provision@control-machine:~/ansible01$ _
```

Now we can manage those 'ansi01' and 'ansi02' servers using Ansible, and the 'provision' user will be default user for Ansible.

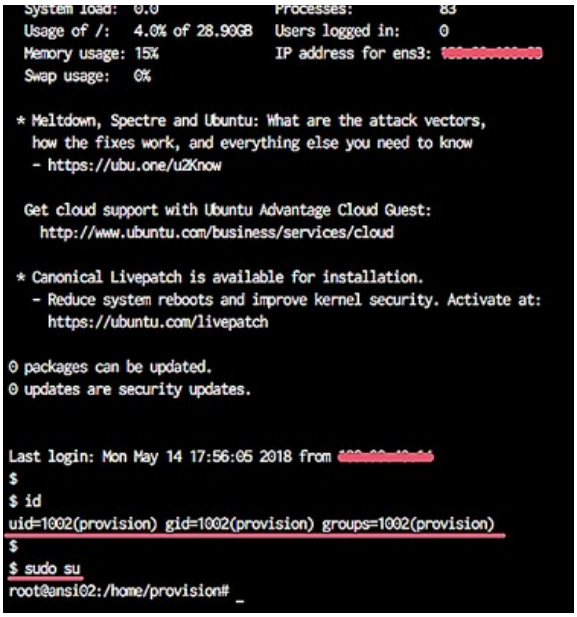
Testing connection to the servers

```
ssh 10.0.15.21
ssh 10.0.15.22
```

And you will be connected to each server using the default key '.ssh/id_rsa' file, and using the user 'provision'.

```
provision@control-machine:~/ansible01$
provision@control-machine:~/ansible01$ ssh [redacted]
Welcome to Ubuntu 18.04 LTS (GNU/Linux 4.15.0-20-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Mon May 14 18:00:17 CEST 2018

  System load:  0.0               Processes:           85
  Usage of /:   4.0% of 28.90GB   Users logged in:     0
  Memory usage: 15%               IP address for ens3: [redacted]
  Swap usage:   0%

 * Meltdown, Spectre and Ubuntu: What are the attack vectors,
   how the fixes work, and everything else you need to know
   - https://ubu.one/u2Know

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

0 packages can be updated.
0 updates are security updates.


Last login: Mon May 14 17:56:05 2018 from [redacted]
$
$ id
uid=1001(provision) gid=1001(provision) groups=1001(provision)
$ sudo su
root@ansi01:/home/provision#
root@ansi01:/home/provision# _
```

```
provision@control-machine:~/ansible01$
provision@control-machine:~/ansible01$ ssh [redacted]
Welcome to Ubuntu 18.04 LTS (GNU/Linux 4.15.0-20-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Mon May 14 18:01:23 CEST 2018
```



Deploying new user and ssh-key using ansible has been completed successfully.

Reference

- http://docs.ansible.com/ansible/latest/user_guide/intro_inventory.html
- http://docs.ansible.com/ansible/latest/user_guide/playbooks_intro.html

About Muhammad Arul

Muhammad Arul is a freelance system administrator and technical writer. He is working with Linux Environments for more than 5 years, an Open Source enthusiast and highly motivated on Linux installation and troubleshooting. Mostly working with RedHat/CentOS Linux and Ubuntu/Debian, Nginx and Apache web server, Proxmox, Zimbra Administration, and Website Optimization. Currently learning about OpenStack and Container Technology.

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By: Pete **at:** *2018-05-23 17:25:00* Reply

In the real world, where we have constant attackers, best to avoid simple accounts. Always use a random account for ansible management on every host and let ansible deal with it. Adding a 5+ numbers to the end of the username is usually sufficient.

By: Ashish **at:** *2018-09-19 11:31:35* Reply

playbook is not working for me it is giving error
ERROR! Syntax Error while loading YAML.
expected <block end>, but found '<block mapping start>'

The error appears to have been in '/home/provision/ansible01/deploy-ssh.yml': line 5, column 3, but may
be elsewhere in the file depending on the exact syntax problem.

The offending line appears to be:

- provision_password:

'6$FmwtHyEr$kvOwf4JhHJgvFvxbfFUJBwGtKmQOvbWvQldWc74t4QdKQdbv.U4ymseGWL5oaW5LlKNmOhwQHDiMufyqMWm6V1'
gather_facts: no
^ here

By: till **at:** *2018-09-19 11:40:20* Reply

Seems as if you did not keep the exact indention when writing the file. In .yml files, the white space and number of white spaces in front of the lines matters.

By: akash **at:** *2018-10-23 04:39:52* Reply

thanks for given information .
but i have to copy one file from one server to another server without asking password and we will use root access.
it means i have to copy id_rsa.pub key on another servers in authorize_keys file .
how can i do that.

By: Helpful Chap **at:** *2018-11-29 08:12:15* Reply

Here's the valid YAML as a paste on bastebin.
https://pastebin.com/raw/ntaeudav
HTH

By: Helpful Guy **at:** *2018-11-29 08:54:05* Reply

Actually, the problem is that if you look carefully at the ansible.cfg above, it looks like the box below. Notice there is one space space before the word 'inventory'? Remove the space and save. Finished.
[defaults] inventory = /home/provision/ansible01/inventory.ini

By: William Wallace **at:** *2018-12-11 14:25:32* Reply

I get this error:
cannot lock /etc/passwd; try again later.\n"

By: till **at:** *2018-12-11 14:28:53* Reply

Either you did not run the command as root user or you have the passwd file opened in another program at the same time.

By: William Wallace **at:** *2018-12-11 14:42:54* Reply

Also on the remote machines the user provision is not added to /etc/sudoers its added to /etc/sudoers.d/provision which does not work when using sudo with "provision":
$ sudo su - provision
$ sudo apt-get install

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.

[sudo] password for provision:
Sorry, try again.
[sudo] password for provision:
Sorry, try again.
[sudo] password for provision:
sudo: 3 incorrect password attempts
Let me know Thank you.

By: William Wallace **at:** *2018-12-11 14:45:45* Reply

No I didnt I did it exactly as your instructions, and that is the control machine where it failed, this is the command:
provision@debian:~/ansible01$ ansible-playbook deploy-ssh.yml --ask-pass

SSH password:

PLAY [all]
****

TASK [Add a new user named provision]
****
fatal: [debian]: FAILED! => {"changed": false, "failed": true, "msg": "usermod: Permission denied.\nusermod: cannot lock /etc/passwd; try again later.\n", "name": "provision", "rc": 1}
Thank you.

By: William Wallace **at:** *2018-12-11 14:56:11* Reply

Also as a suggestion add to the requierements list to install "sshpass" package on the control machine other ways the command will fail with: "password option requires package "sshpass" to be installed.
It just need to be intalled on the control machine.
Thank you.

By: Gaurav **at:** *2019-03-12 09:01:57* Reply

To execute my playbook as root user , control machine public key has to be added in authorized_keys file of /root/.ssh/authorized_keys ??

By: Tom **at:** *2019-03-28 19:34:18* Reply

This article should never have someone edit the sudoers file manually. especially in a how-to. Mistakes can be made that would break sudo completely and require intervention at a console level to fix, or if you're in a cloud instance with no console to possibly have to re-deploy a new server.