Ansible

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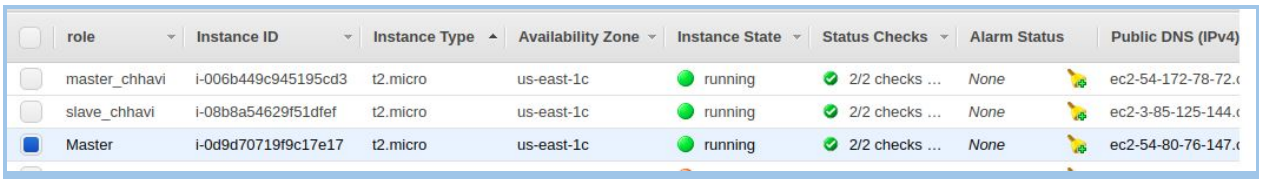
1. Create two nodes with tag:key role and tag:value master & slave respectively. Setup the dynamic inventory on ansible control nodes.

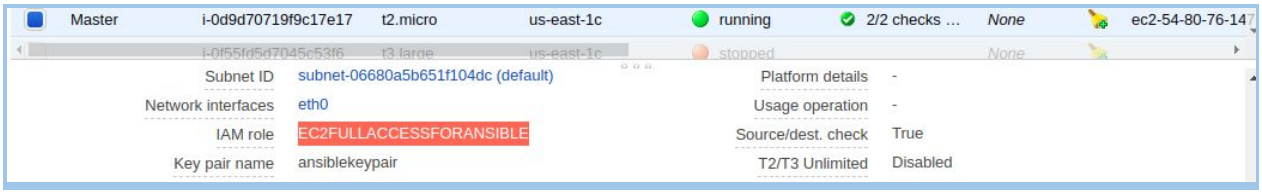
Ans.

Create two instances with the following tags.

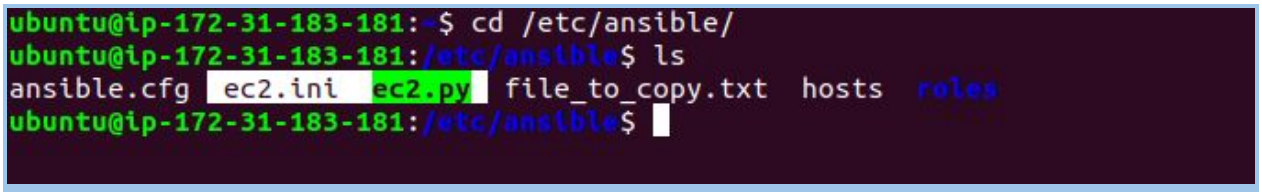


role	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)
master_chhavi	i-006b449c945195cd3	t2.micro	us-east-1c	running	2/2 checks ...	None	ec2-54-172-78-72.(
slave_chhavi	i-08b8a54629f51dfef	t2.micro	us-east-1c	running	2/2 checks ...	None	ec2-3-85-125-144.(
Master	i-0d9d70719f9c17e17	t2.micro	us-east-1c	running	2/2 checks ...	None	ec2-54-80-76-147.(

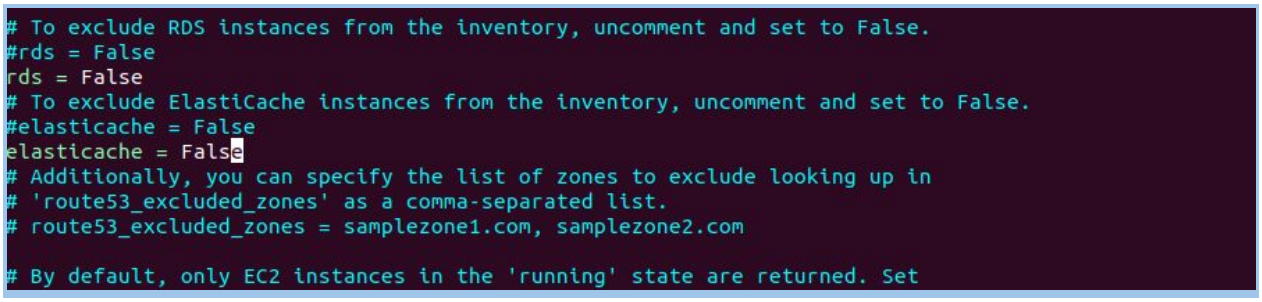
Create a control node (master instance) and attach ec2fullaccess role to it(You need to first create the role and then attach it).



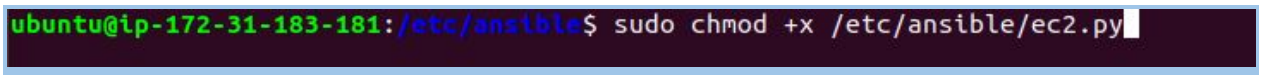
Download ec2.py and ec2.ini files and keep them in the /etc/ansible directory of the master instance.



Set rds and elasticache to False in ec2.ini



Make ec2.py executable and run the script.You'll see the following as the output.



```
ubuntu@ip-172-31-183-181:/etc/ansible$ ./ec2.py --list
{
  "_meta": {
    "hostvars": {
      "18.207.202.43": {
        "ansible_ssh_host": "18.207.202.43",
        "ec2__in_monitoring_element": false,
        "ec2_ami_launch_index": "0",
        "ec2_architecture": "x86_64",
```

```
    "3.82.122.221"
  ],
  "tag_role_master_chhavi": [
    "54.172.78.72"
  ],
  "tag_role_slave": [
    "54.152.21.13"
  ],
  "tag_role_slave_chhavi": [
    "3.85.125.144"
  ],
```

Run the following modules using tag key-value:

1.1 Ping master node and slave node separately.

Ans.

On master

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ansible -i ec2.py tag_role_master_chhavi -m ping
[DEPRECATION WARNING]: The TRANSFORM_INVALID_GROUP_CHARS settings is set to
allow bad characters in group names by default, this will change, but still be
user configurable on deprecation. This feature will be removed in version 2.10.
 Deprecation warnings can be disabled by setting deprecation_warnings=False in
ansible.cfg.
[WARNING]: Invalid characters were found in group names but not replaced, use
-vvvv to see details
The authenticity of host '54.172.78.72 (54.172.78.72)' can't be established.
ECDSA key fingerprint is SHA256:5fJYxldz/fgZstWqfB9WrTFsYuR/9s+o3J6djVsu5Mo.
Are you sure you want to continue connecting (yes/no)? yes
54.172.78.72 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
ubuntu@ip-172-31-183-181:/etc/ansible$
```

On slave

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ansible -i ec2.py tag_role_slave_chhavi -m ping
[DEPRECATION WARNING]: The TRANSFORM_INVALID_GROUP_CHARS settings is set to
allow bad characters in group names by default, this will change, but still be
user configurable on deprecation. This feature will be removed in version 2.10.
 Deprecation warnings can be disabled by setting deprecation_warnings=False in
ansible.cfg.
[WARNING]: Invalid characters were found in group names but not replaced, use
-vvvv to see details
3.85.125.144 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
ubuntu@ip-172-31-183-181:/etc/ansible$
```

1.2 To check all running processes on the slave node.

Ans.

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ansible -i ec2.py tag_role_slave_chhavi -m shell -a "ps -aux"
[DEPRECATION WARNING]: The TRANSFORM_INVALID_GROUP_CHARS settings is set to
allow bad characters in group names by default, this will change, but still be
user configurable on deprecation. This feature will be removed in version 2.10.
 Deprecation warnings can be disabled by setting deprecation_warnings=False in
ansible.cfg.
[WARNING]: Invalid characters were found in group names but not replaced, use
-vvvv to see details
3.85.125.144 | CHANGED | rc=0 >>
USER       PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.2  0.9 159848  9332 ?        Ss   07:10   0:03 /sbin/init
root         2  0.0  0.0      0     0 ?        S    07:10   0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        I    07:10   0:00 [kworker/0:0]
root         4  0.0  0.0      0     0 ?        I<   07:10   0:00 [kworker/0:0H]
root         6  0.0  0.0      0     0 ?        I<   07:10   0:00 [mm_percpu_wq]
root         7  0.0  0.0      0     0 ?        S    07:10   0:00 [ksoftirqd/0]
root         8  0.0  0.0      0     0 ?        I    07:10   0:00 [rcu_sched]
root         9  0.0  0.0      0     0 ?        I    07:10   0:00 [rcu_bh]
root        10  0.0  0.0      0     0 ?        S    07:10   0:00 [migration/0]
root        11  0.0  0.0      0     0 ?        S    07:10   0:00 [watchdog/0]
root        12  0.0  0.0      0     0 ?        S    07:10   0:00 [cpuhp/0]
root        13  0.0  0.0      0     0 ?        S    07:10   0:00 [kdevtmpfs]
root        14  0.0  0.0      0     0 ?        I<   07:10   0:00 [netns]
```

1.3 To copying files to both nodes concurrently.

Ans.

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ls
ansible.cfg  ec2.ini  ec2.py  file_to_copy.txt  hosts  roles
ubuntu@ip-172-31-183-181:/etc/ansible$
```

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ansible -i ec2.py tag_role_*_chhavi -m co
py -a "src=/etc/ansible/file_to_copy.txt  dest=/home/ubuntu/"
[DEPRECATION WARNING]: The TRANSFORM_INVALID_GROUP_CHARS settings is set to
allow bad characters in group names by default, this will change, but still be
user configurable on deprecation. This feature will be removed in version 2.10.
 Deprecation warnings can be disabled by setting deprecation_warnings=False in
ansible.cfg.
[WARNING]: Invalid characters were found in group names but not replaced, use
-vvvv to see details
3.85.125.144 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "checksum": "ea6cb5d95b80d4803e46c2c5390d7d5c3917e121",
    "dest": "/home/ubuntu/file_to_copy.txt",
    "gid": 1000,
    "group": "ubuntu",
    "md5sum": "9f76886a27cde770ef48e0959929cf77",
    "mode": "0664",
    "owner": "ubuntu",
    "size": 15,
    "src": "/home/ubuntu/.ansible/tmp/ansible-tmp-1585813465.74-180018018283178/
source",
    "state": "file",
    "uid": 1000
}
54.172.78.72 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "checksum": "ea6cb5d95b80d4803e46c2c5390d7d5c3917e121",
    "dest": "/home/ubuntu/file_to_copy.txt",
    "gid": 1000,
    "group": "ubuntu",
    "md5sum": "9f76886a27cde770ef48e0959929cf77",
    "mode": "0664",
    "owner": "ubuntu",
    "size": 15,
    "src": "/home/ubuntu/.ansible/tmp/ansible-tmp-1585813465.73-103250557434190/
source",
    "state": "file",
    "uid": 1000
}
```

On master

```
ubuntu@ip-172-31-99-118:~$ pwd
/home/ubuntu
ubuntu@ip-172-31-99-118:~$ ls
file_to_copy.txt
ubuntu@ip-172-31-99-118:~$ cat file_to_copy.txt
File Copied...
ubuntu@ip-172-31-99-118:~$
```

On slave

```
ubuntu@ip-172-31-48-254:~$ pwd
/home/ubuntu
ubuntu@ip-172-31-48-254:~$ ls
file_to_copy.txt
ubuntu@ip-172-31-48-254:~$ cat file_to_copy.txt
File Copied...
ubuntu@ip-172-31-48-254:~$
```

2. Setup nginx on both nodes with a single custom configuration template, on master nginx should run on 8000 while on slave nginx would listen on port 80. [Jinja2+conditional]

Ans.

Set up the server configuration file usinf jinja2 and conditional.

```
ubuntu@ip-172-31-183-181:/etc/ansible/templates$ cat nginx.conf
# Default server configuration

server {
{% if ec2_tag_role == "master_chhavi" %}
        listen 8000 default_server;
        listen [::]:8000 default_server;
{% endif %}

{% if ec2_tag_role == "slave_chhavi" %}
        listen 80 default_server;
        listen [::]:80 default_server;
{% endif %}
        root /var/www/html/;

        index index.html index.nginx-debian.html;
        server_name _;

        location / {
                try_files $uri $uri/ =404;
        }
}
ubuntu@ip-172-31-183-181:/etc/ansible/templates$
```

Next, create an ansible playbook to run nginx and copy the configuration file.

```
---
- hosts: tag_role_*_chhavi
  gather_facts: False
  become: true
  tasks:
    - name: Ensure nginx is at the latest version
      apt:
          name: nginx
          state: latest
    - name: Start nginx
      service:
          name: nginx
          state: started
    - name: Add nginx configuration template to the Nginx available sites
      template:
          src: templates/nginx.conf
          dest: "/etc/nginx/sites-available/nginx.conf"
    - name: Delete default file from sites enabled
      file:
          path: "/etc/nginx/sites-enabled/default"
          state: absent
    - name: Enable nginx config template
      file:
          src: "/etc/nginx/sites-available/nginx.conf"
                                                                    1,
```

```
    - name: Add nginx configuration template to the Nginx available sites
      template:
          src: templates/nginx.conf
          dest: "/etc/nginx/sites-available/nginx.conf"
    - name: Delete default file from sites enabled
      file:
          path: "/etc/nginx/sites-enabled/default"
          state: absent
    - name: Enable nginx config template
      file:
          src: "/etc/nginx/sites-available/nginx.conf"
          dest: "/etc/nginx/sites-enabled/nginx.conf"
          state: link
    - name: Restart nginx
      service:
          name: nginx
          state: restarted
                                                          30,11         Bot
```

Next, run the nginx.yml playbook.

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ansible-playbook -i ec2.py nginx.yml
[DEPRECATION WARNING]: The TRANSFORM_INVALID_GROUP_CHARS settings is set to allow bad characters in group
names by default, this will change, but still be user configurable on deprecation. This feature will be
removed in version 2.10. Deprecation warnings can be disabled by setting deprecation_warnings=False in
ansible.cfg.
[WARNING]: Invalid characters were found in group names but not replaced, use -vvvv to see details

PLAY [tag_role_*_chhavi] ***************************************************************************

TASK [Ensure nginx is at the latest version] *******************************************************
ok: [18.205.116.87]
ok: [54.175.23.197]

TASK [Start nginx] *********************************************************************************
ok: [18.205.116.87]
ok: [54.175.23.197]

TASK [Add nginx configuration template to the Nginx available sites] ********************************
ok: [18.205.116.87]
ok: [54.175.23.197]

TASK [Delete default file from sites enabled] ******************************************************
ok: [18.205.116.87]
ok: [54.175.23.197]
```

```
TASK [Delete default file from sites enabled] ******************************************************
ok: [18.205.116.87]
ok: [54.175.23.197]

TASK [Enable nginx config template] ****************************************************************
ok: [18.205.116.87]
ok: [54.175.23.197]

TASK [Restart nginx] *******************************************************************************
changed: [18.205.116.87]
changed: [54.175.23.197]

PLAY RECAP *****************************************************************************************
18.205.116.87              : ok=6    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ig
nored=0
54.175.23.197              : ok=6    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ig
nored=0
```

Now curl nginx url on both the nodes.

On Master :

On slave

```
ubuntu@ip-172-31-183-181:/etc/ansible$ curl 54.175.23.197:80
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
    body {
        width: 35em;
        margin: 0 auto;
        font-family: Tahoma, Verdana, Arial, sans-serif;
    }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
```

3. Setup mysql on a remote server, create a user with password. Passwords should be encrypted using Ansible vault. Verify the setup by log in to mysql.

Ans.

Encrypt password using ansible vault.

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ansible-vault encrypt_string --vault-id @prompt pass@123
New vault password (default):
Confirm new vault password (default):
!vault |
          $ANSIBLE_VAULT;1.1;AES256
          34363339623161363666343362316431616264333561363132633634633461663063353734663961
          66653837653335303864646635653136623961303965663 20a3661303136663037346336663030 37
          38343334633433316539396435656437366632303239303139633631313237623730383939343730
          36353363613234323 30a35646337376432323765333264336662653239393566383038316334376 1
          6635
```

Mysql.yml

```
ubuntu@ip-172-31-183-181:/etc/ansible$ cat mysql.yml
---
- hosts: tag_role_*_chhavi
  gather_facts: False
  become: true
  vars:
    mysql_user_password: !vault |
          $ANSIBLE_VAULT;1.1;AES256
          34363339623161363666343362316431616264333561363132633634633461663063353734663961
          66653837653335303864646635653136623961303965663 20a3661303136663037346336663030 37
          38343334633433316539396435656437366632303239303139633631313237623730383939343730
          36353363613234323 30a35646337376432323765333264336662653239393566383038316334376 1
          6635
  tasks:
    - name: Ensure mysql is at the latest version
      apt:
        name: "{{ item }}"
        update_cache: yes
        state: present
      with_items:
      - python-mysqldb
      - mysql-server
    - name: Start mysql
      service:
        name: mysql
        state: started
    - name: Adding a mysql user
```

```
    - name: Start mysql
      service:
        name: mysql
        state: started
    - name: Adding a mysql user
      mysql_user:
        user: mysql_user
        password: "{{ mysql_user_password }}"
        priv: '*.*:ALL'
        host: "%"
    - name: restart mysql
      service:
        name: mysql
        state: restarted
```

Run playbook

```
ubuntu@ip-172-31-183-181:/etc/ansible$ ansible-playbook -i ec2.py mysql.yml --ask-vault-pass
Vault password:
[DEPRECATION WARNING]: The TRANSFORM_INVALID_GROUP_CHARS settings is set to allow bad characters in group
names by default, this will change, but still be user configurable on deprecation. This feature will be
removed in version 2.10. Deprecation warnings can be disabled by setting deprecation_warnings=False in
ansible.cfg.
[WARNING]: Invalid characters were found in group names but not replaced, use -vvvv to see details

PLAY [tag_role_*_chhavi] ***************************************************************************

TASK [Ensure mysql is at the latest version] *******************************************************
[DEPRECATION WARNING]: Invoking "apt" only once while using a loop via squash_actions is deprecated.
Instead of using a loop to supply multiple items and specifying `name: "{{ item }}"`, please use `name:
['python-mysqldb', 'mysql-server']` and remove the loop. This feature will be removed in version 2.11.
Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
[DEPRECATION WARNING]: Invoking "apt" only once while using a loop via squash_actions is deprecated.
Instead of using a loop to supply multiple items and specifying `name: "{{ item }}"`, please use `name:
['python-mysqldb', 'mysql-server']` and remove the loop. This feature will be removed in version 2.11.
Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [54.175.23.197] => (item=[u'python-mysqldb', u'mysql-server'])
[WARNING]: Updating cache and auto-installing missing dependency: python-apt
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 54.175.23.197 should use /usr/bin/python3, but is
 using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release
will default to using the discovered platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
 This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting
```

Now, to check ssh into any one of the two servers and login into mysql with the created user.