



INDIAN INSTITUTE OF  
INFORMATION  
TECHNOLOGY

## **DevOps (CS457)**

### **ASSIGNMENT 3 – Task 5**

#### **Add users to EC2 instances with SSH Access – Ansible**

Submitted to:

Dr. Uma S

Submitted by:

##### Team 1

Sumith Sai Budde (18BCS101)

Syed Sufyan Ahmed (18BCS103)

Shaik Fharook (18BCS091)

Parvati Jayakumar (18BEC036)

P Chethan Krishna (18BEC040)

G Rithika (18BCS031)

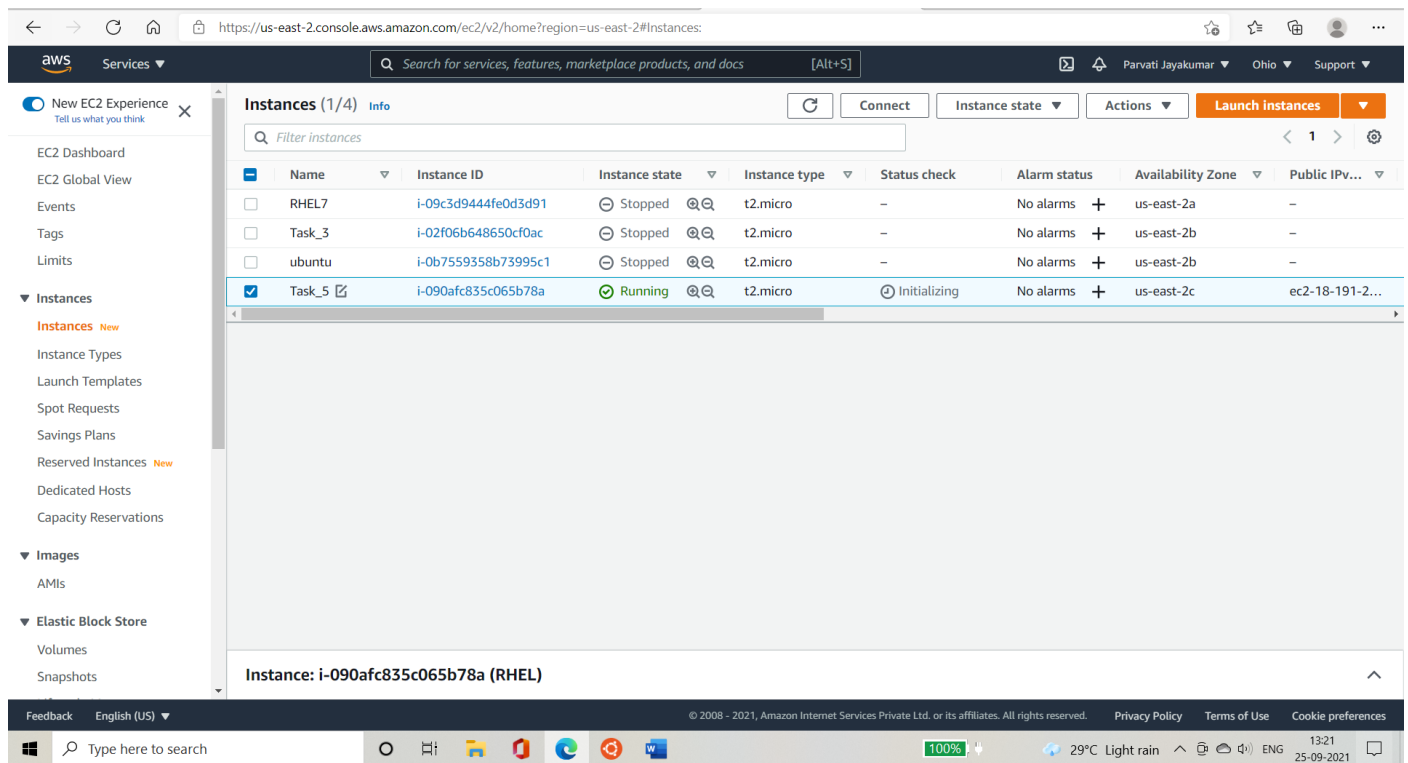
Pokala Dattatreya (18BCS067)

Rama Dundi Saketh (18BCS076)

## STEP 1: Set up the EC2 instances

Step 1.1: Launch a Red Hat Enterprise Linux served (Example: as server named 'Task\_5').

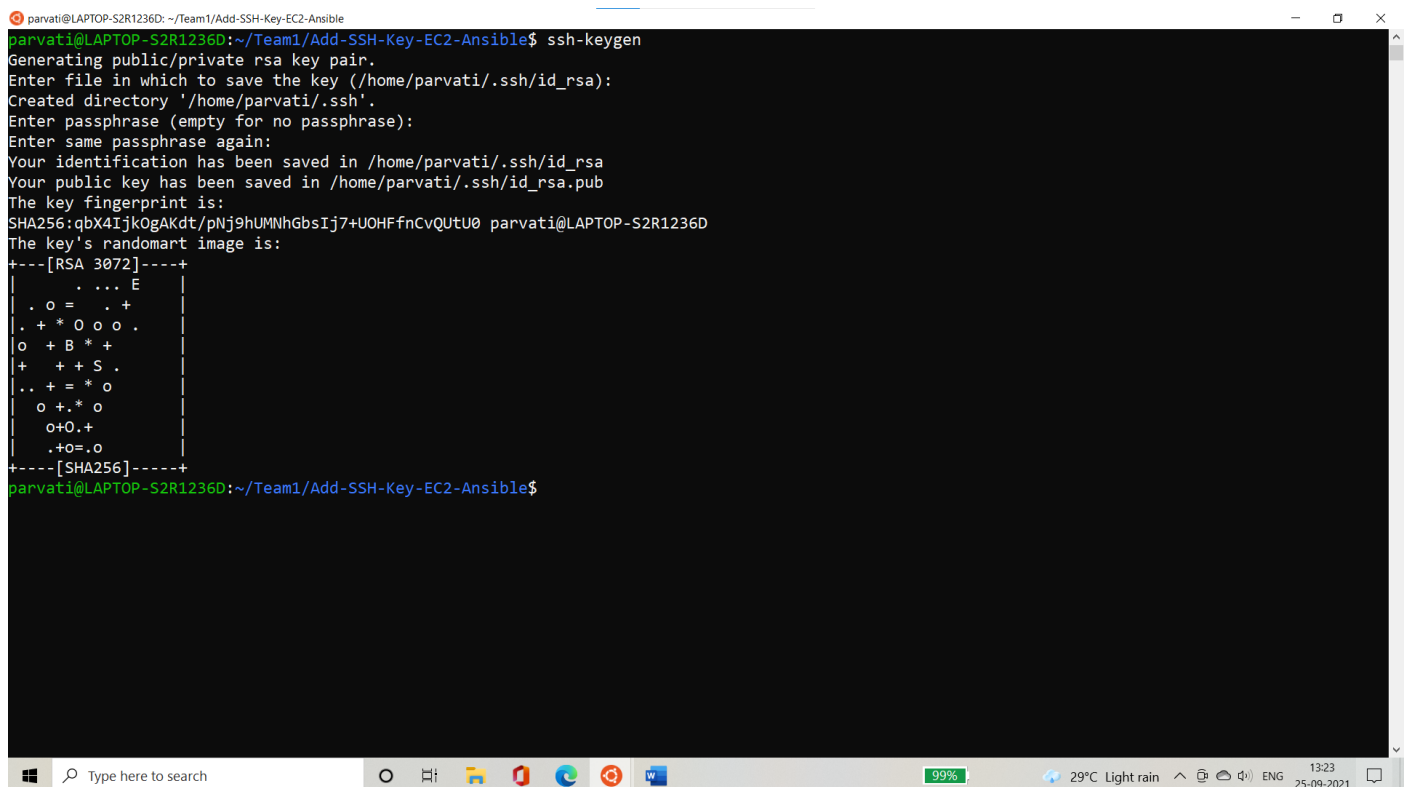
Make sure that port - 22 is open.



The screenshot shows the AWS Management Console interface for EC2 instances. The left sidebar contains navigation links for EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances, Images, and Elastic Block Store. The main content area displays a table of instances. The instance 'Task\_5' is highlighted, showing its details: Name (Task\_5), Instance ID (i-090afc835c065b78a), Instance state (Running), Instance type (t2.micro), Status check (Initializing), Alarm status (No alarms), Availability Zone (us-east-2c), and Public IP address (ec2-18-191-2...). Below the table, the instance details for 'Task\_5' are shown, including its name, ID, and state.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP...
RHEL7	i-09c3d9444fe0d3d91	Stopped	t2.micro	-	No alarms	us-east-2a	-
Task_3	i-02f06b648650cf0ac	Stopped	t2.micro	-	No alarms	us-east-2b	-
ubuntu	i-0b7559358b73995c1	Stopped	t2.micro	-	No alarms	us-east-2b	-
Task_5	i-090afc835c065b78a	Running	t2.micro	Initializing	No alarms	us-east-2c	ec2-18-191-2...

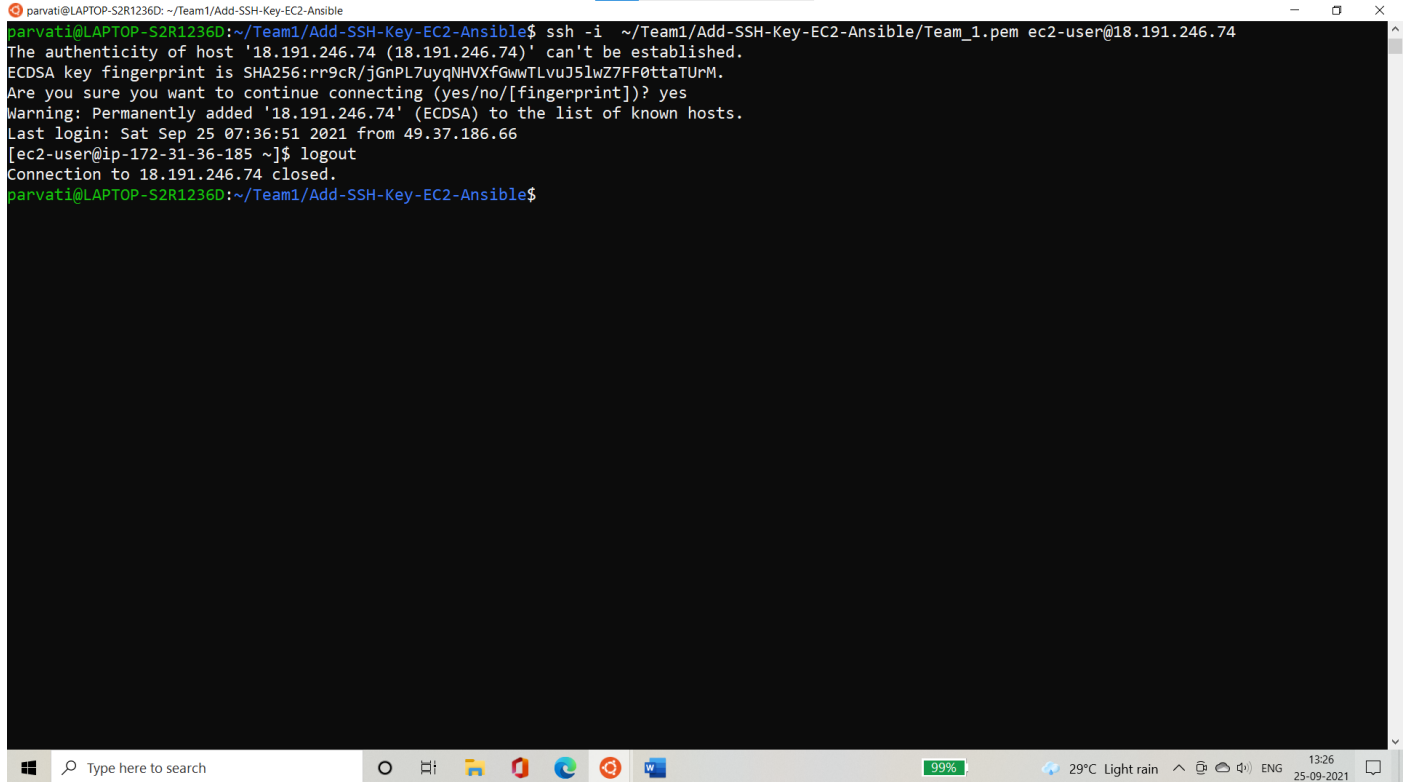
Step 1.2: Generate a SSH key.



```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/parvati/.ssh/id_rsa):
Created directory '/home/parvati/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/parvati/.ssh/id_rsa
Your public key has been saved in /home/parvati/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:qbX4IjkOgAKdt/pNj9hUMNhgbsIj7+UOHFfnCvQUTu0 parvati@LAPTOP-S2R1236D
The key's randomart image is:
+---[RSA 3072]-----+
| . . . . E |
| . o = . . + |
| . + * o o o . |
| o + B * + |
| + + + S . |
| .. + = * o |
| o + . * o |
| o + O . + |
| . + O = . o |
+---[SHA256]-----+
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```

Step 1.3: Make sure that the remote server 'Task\_5' can be accessed through our local machine.

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ssh -i ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem ec2-user@18.191.246.74
The authenticity of host '18.191.246.74 (18.191.246.74)' can't be established.
ECDSA key fingerprint is SHA256:rr9cR/jGnPL7uyqNHVXfGwwTLvuJ5lwZ7FF0ttaTurM.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '18.191.246.74' (ECDSA) to the list of known hosts.
Last login: Sat Sep 25 07:36:51 2021 from 49.37.186.66
[ec2-user@ip-172-31-36-185 ~]$ logout
Connection to 18.191.246.74 closed.
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```



## STEP 2: Configure the files required for executing the playbook

### Step 2.1: Create the files: ansible\_hosts, add-key.yml.

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ vi ansible_hosts
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ cat ansible_hosts
[hosts_to_add_key]
18.191.246.74 ansible_user=ec2-user ansible_port=22

[hosts_to_add_key:vars]
ansible_ssh_common_args="-o StrictHostKeyChecking=no"
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ vi add-key.yml
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ cat add-key.yml
---
- name: "Playbook to Create User and Add Key to EC2 Instance"
  hosts: hosts_to_add_key
  become: true
  tasks:

  - name : "Create Groups"
    group:
      name: "{{item}}"
      state: "present"
    with_items:
      - TeamA
      - TeamB

  - name : "Create a user"
    user:
      name: "{{item.name}}"
      create_home: yes
      group: "{{item.group}}"
      state: present
      ssh_key_file: .ssh/id_rsa
      ssh_key_type: rsa
    with_items:
      - { name: 'user1', group: 'TeamA'}
      - { name: 'user2', group: 'TeamB'}

  - name: "Copy the authorized key file from"
```

```
      - TeamB

  - name : "Create a user"
    user:
      name: "{{item.name}}"
      create_home: yes
      group: "{{item.group}}"
      state: present
      ssh_key_file: .ssh/id_rsa
      ssh_key_type: rsa
    with_items:
      - { name: 'user1', group: 'TeamA'}
      - { name: 'user2', group: 'TeamB'}

  - name: "Copy the authorized key file from"
    authorized_key:
      user: "{{item.name}}"
      state: "{{item.userstate}}"
      key: "{{ lookup('file', '{{ item.key }}') }}"
    with_items:
      - { name: 'user1', key: 'user1.pub', userstate: 'present'}
      - { name: 'user2', key: 'user2.pub', userstate: 'present'}

parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ls
Team_1.pem add-key.yml ansible-hosts ansible_hosts user1 user1.pub user2 user2.pub
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```

## STEP 3: Execute the playbook

### Step 3.1: Ping to check if the connection is successful

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ansible hosts_to_add_key -i ansible_hosts -m ping --key-file ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem --user ec2-user
18.191.246.74 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/libexec/platform-python"
  },
  "changed": false,
  "ping": "pong"
}
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ echo "We were successfully able to ping the server."|cowsay

  __  __
 /  __  \
(  oo  )\
 |_____|) \/\
 ||----w |
 ||       ||

parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```

### Step 3.2: Use the command ansible-playbook to execute add-key.yml

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ansible-playbook add-key.yml -i ansible_hosts --user parvati --key-file ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem -e "key=~/.ssh/id_rsa.pub"

< PLAY [Playbook to Create User and Add Key to EC2 Instance] >
-----
  __  __
 /  __  \
(  oo  )\
 |_____|) \/\
 ||----w |
 ||       ||

< TASK [Gathering Facts] >
-----
  __  __
 /  __  \
(  oo  )\
 |_____|) \/\
 ||----w |
 ||       ||

ok: [18.191.246.74]

< TASK [Create Groups] >
-----
  __  __
 /  __  \
(  oo  )\
 |_____|) \/\
 ||----w |
 ||       ||

ok: [18.191.246.74] => (item=TeamA)
ok: [18.191.246.74] => (item=TeamB)

< TASK [Create a user] >
-----
  __  __
 /  __  \
(  oo  )\
 |_____|) \/\
 ||----w |
 ||       ||

ok: [18.191.246.74] => (item={'name': 'user1', 'group': 'TeamA'})
ok: [18.191.246.74] => (item={'name': 'user2', 'group': 'TeamB'})

< TASK [Copy the authorized key file from] >
-----
  __  __
 /  __  \
(  oo  )\
 |_____|) \/\
 ||----w |
 ||       ||
```

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
< TASK [Copy the authorized key file from] >
-----
      ^ ^
      (oo)\_____
      (___)\       )\/\
          ||----w |
          ||     ||

ok: [18.191.246.74] => (item={'name': 'user1', 'key': 'user1.pub', 'userstate': 'present'})
ok: [18.191.246.74] => (item={'name': 'user2', 'key': 'user2.pub', 'userstate': 'present'})

< PLAY RECAP >
-----
      ^ ^
      (oo)\_____
      (___)\       )\/\
          ||----w |
          ||     ||

18.191.246.74      : ok=4    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

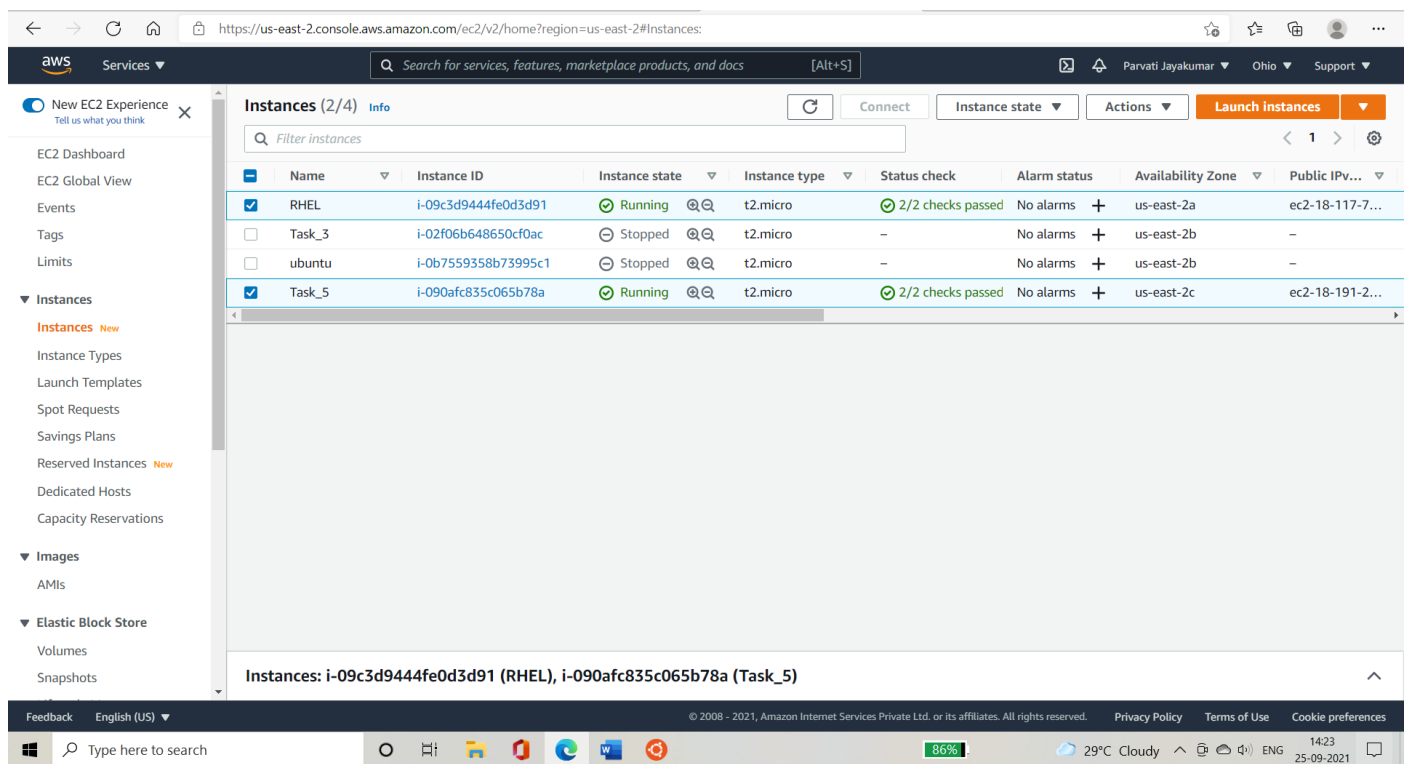
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```

Step 3.3: Validate the results using ssh and public ip of the instance.

```
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ssh -p 22 -i ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem ec2-user@18.191.246.74 "id user1 && id user2"
uid=1001(user1) gid=1003(TeamA) groups=1003(TeamA)
uid=1002(user2) gid=1004(TeamB) groups=1004(TeamB)
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```

## STEP 4: You can also try to add users to multiple instances by giving multiple hosts.

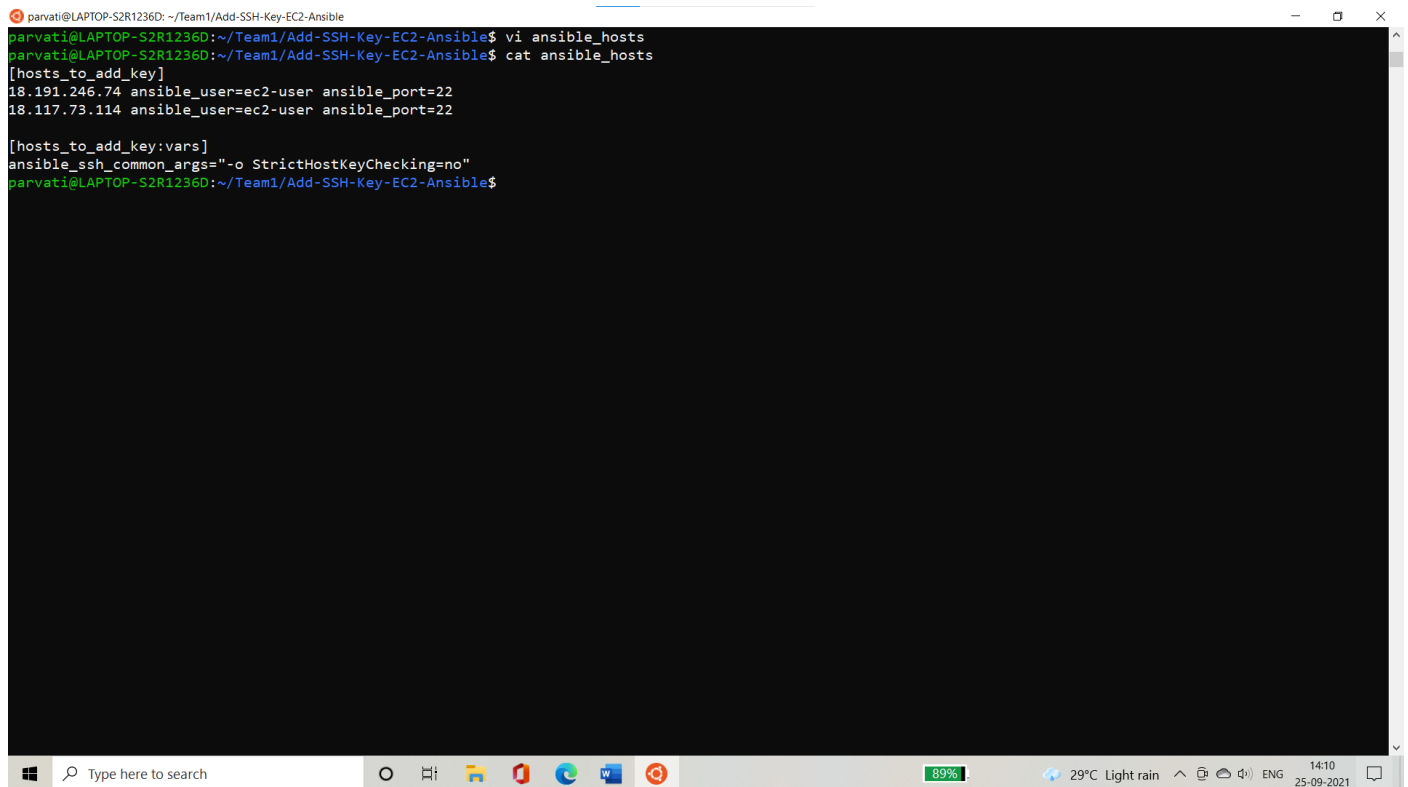
### Step 4.1: Launch a new instance (Example: RHEL)



The screenshot shows the AWS Management Console for the 'us-east-2' region. The 'Instances' page is active, displaying a list of EC2 instances. The left sidebar shows the navigation menu with 'Instances' selected. The main content area shows a table of instances with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IP. There are four instances listed: 'RHEL' (Running), 'Task\_3' (Stopped), 'ubuntu' (Stopped), and 'Task\_5' (Running). The 'Task\_5' instance is highlighted. Below the table, there is a summary bar for the selected instances: 'Instances: i-09c3d9444fe0d3d91 (RHEL), i-090afc835c065b78a (Task\_5)'.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP...
<input checked="" type="checkbox"/> RHEL	i-09c3d9444fe0d3d91	Running	t2.micro	2/2 checks passed	No alarms	us-east-2a	ec2-18-117-7...
<input type="checkbox"/> Task_3	i-02f06b648650cf0ac	Stopped	t2.micro	-	No alarms	us-east-2b	-
<input type="checkbox"/> ubuntu	i-0b7559358b73995c1	Stopped	t2.micro	-	No alarms	us-east-2b	-
<input checked="" type="checkbox"/> Task_5	i-090afc835c065b78a	Running	t2.micro	2/2 checks passed	No alarms	us-east-2c	ec2-18-191-2...

### Step 4.2: Configure ansible\_hosts file



The screenshot shows a terminal window with the following commands and output:

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ vi ansible_hosts
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ cat ansible_hosts
[hosts_to_add_key]
18.191.246.74 ansible_user=ec2-user ansible_port=22
18.117.73.114 ansible_user=ec2-user ansible_port=22

[hosts_to_add_key:vars]
ansible_ssh_common_args="-o StrictHostKeyChecking=no"
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```

### Step 4.3: Execute the YAML file

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ansible hosts_to_add_key -i ansible_hosts -m ping --key-file ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem --user ec2-user
18.191.246.74 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/libexec/platform-python"
  },
  "changed": false,
  "ping": "pong"
}
18.117.73.114 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/libexec/platform-python"
  },
  "changed": false,
  "ping": "pong"
}
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ansible-playbook add-key.yml -i ansible_hosts --user parvati --key-file ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem -e "key~/ssh/id_rsa.pub"

< PLAY [Playbook to Create User and Add Key to EC2 Instance] >

  \   ^__^
   (oo)\_______
      (__)\       )\/\
         ||----w |
         ||     ||

< TASK [Gathering Facts] >

  \   ^__^
   (oo)\_______
      (__)\       )\/\
         ||----w |
         ||     ||

ok: [18.117.73.114]
ok: [18.191.246.74]

< TASK [Create Groups] >

  \   ^__^
   (oo)\_______
      (__)\       )\/\
         ||----w |
         ||     ||

changed: [18.117.73.114] => (item=TeamA)
ok: [18.191.246.74] => (item=TeamA)
changed: [18.117.73.114] => (item=TeamB)
ok: [18.191.246.74] => (item=TeamB)
```

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible

  \   ^__^
   (oo)\_______
      (__)\       )\/\
         ||----w |
         ||     ||

changed: [18.117.73.114] => (item=TeamA)
ok: [18.191.246.74] => (item=TeamA)
changed: [18.117.73.114] => (item=TeamB)
ok: [18.191.246.74] => (item=TeamB)

< TASK [Create a user] >

  \   ^__^
   (oo)\_______
      (__)\       )\/\
         ||----w |
         ||     ||

ok: [18.191.246.74] => (item={'name': 'user1', 'group': 'TeamA'})
changed: [18.117.73.114] => (item={'name': 'user1', 'group': 'TeamA'})
changed: [18.117.73.114] => (item={'name': 'user2', 'group': 'TeamB'})
ok: [18.191.246.74] => (item={'name': 'user2', 'group': 'TeamB'})

< TASK [Copy the authorized key file from] >

  \   ^__^
   (oo)\_______
      (__)\       )\/\
         ||----w |
         ||     ||

ok: [18.191.246.74] => (item={'name': 'user1', 'key': 'user1.pub', 'userstate': 'present'})
changed: [18.117.73.114] => (item={'name': 'user1', 'key': 'user1.pub', 'userstate': 'present'})
ok: [18.191.246.74] => (item={'name': 'user2', 'key': 'user2.pub', 'userstate': 'present'})
changed: [18.117.73.114] => (item={'name': 'user2', 'key': 'user2.pub', 'userstate': 'present'})

< PLAY RECAP >

  \   ^__^
   (oo)\_______
      (__)\       )\/\
         ||----w |
         ||     ||

18.117.73.114      : ok=4    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
18.191.246.74     : ok=4    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```



Step 4.4: Validate the results by checking users in both the instances using ssh and public ip .

```
parvati@LAPTOP-S2R1236D: ~/Team1/Add-SSH-Key-EC2-Ansible
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ssh -p 22 -i ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem ec2-user@18.117.73.114 "id user1 && id user2"
uid=1003(user1) gid=1003(TeamA) groups=1003(TeamA)
uid=1004(user2) gid=1004(TeamB) groups=1004(TeamB)
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ^C
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$ ssh -p 22 -i ~/Team1/Add-SSH-Key-EC2-Ansible/Team_1.pem ec2-user@18.191.246.74 "id user1 && id user2"
uid=1001(user1) gid=1003(TeamA) groups=1003(TeamA)
uid=1002(user2) gid=1004(TeamB) groups=1004(TeamB)
parvati@LAPTOP-S2R1236D:~/Team1/Add-SSH-Key-EC2-Ansible$
```

## REFERENCES

- <https://www.middlewareinventory.com/blog/add-users-to-ec2-instances-with-ssh-access-ansible/>
- <https://youtu.be/EGWyN6DMI1g>
- <https://youtu.be/kfWfj76-am8>