1. NodeJS Playbook: Create a role called nodejs under roles directory

```
osgdev@TG-DevOps-OS144:~/ansilab$ ansible-galaxy init ./roles/nodejs
- ./roles/nodejs was created successfully

osgdev@TG-DevOps-OS144:~/ansilab$ tree ./roles/nodejs
./roles/nodejs
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── node.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml

8 directories, 9 files
```

---

2. Download nodejs tar file:

```
https://nodejs.org/en/download/
```

Windows Installer (.msi)	32-bit	64-bit	
Windows Binary (.zip)	32-bit	64-bit	
macOS Installer (.pkg)	64-bit		
macOS Binary (.tar.gz)	64-bit		
Linux Binaries (x86/x64)	32-bit	64-bit	
Linux Binaries (ARM)	ARMv6	ARMv7	ARMv8
Source Code	node-v8.11.1.tar.gz		

```
osgdev@TG-DevOps-OS144:~/ansilab$ ls /home/osgdev/Downloads/
7WXOQKL6.html                              mariadb-10.2.14-linux-
x86_64.tar.gz
geckodriver-v0.19.1-linux64.tar.gz         node-v8.11.1-linux-x64.tar.xz
jfrog-artifactory-oss-5.9.0-sources.tar.gz sonarqube-6.4.zip
jfrog-artifactory-pro-5.9.0(1).zip         sonarqube-6.7.2.zip
```

```
jfrog-artifactory-pro-5.9.0.zip
```

Create nodejs directory:

```
osgdev@TG-DevOps-OS004:~/ansilab$ mkdir  nodejs
```

---

3. Create the playbook:

```
osgdev@TG-DevOps-OS144:~/ansilab$ cat ./roles/nodejs/node.yml
- hosts: localhost
  roles:
    - nodejs
```

---

4. Copy the downloaded file to nodejs folder:

```
osgdev@TG-DevOps-OS144:~/ansilab$ cat nodejs/tasks/main.yml
---
# tasks file for ./roles/nodejs
- name: copy tar file to nodejs folder
  copy:
    src: /home/osgdev/Downloads/node-v8.11.1-linux-x64.tar.xz
    dest: /home/osgdev/ansilab/nodejs
```

---

5. Run the playbook

```
osgdev@TG-DevOps-OS144:~/ansilab$ ansible-playbook ./roles/nodejs/node.yml

PLAY [localhost]
*********************************************************************

TASK [Gathering Facts]
*********************************************************************
ok: [localhost]

TASK [nodejs : copy tar file to nodejs folder]
*****************************************
changed: [localhost]

PLAY RECAP
*********************************************************************************
***
localhost                  : ok=2    changed=1    unreachable=0    failed=0
```

```
osgdev@TG-DevOps-OS144:~/ansilab/nodejs$ ls
node-v8.11.1-linux-x64.tar.xz
```

---

6. Unarchive the contents:

```
osgdev@TG-DevOps-OS144:~/ansilab$ cat nodejs/tasks/main.yml
---
# tasks file for ./roles/nodejs
- name: copy tar file to nodejs folder
  copy:
    src: /home/osgdev/Downloads/node-v8.11.1-linux-x64.tar.xz
    dest: /home/osgdev/ansilab/nodejs

- name: Extract the tar file
  unarchive:
    src: /home/osgdev/ansilab/nodejs/node-v8.11.1-linux-x64.tar.xz
    dest: /home/osgdev/ansilab/nodejs
```

---

7. Run the playbook:

```
osgdev@TG-DevOps-OS144:~/ansilab$ ansible-playbook ./roles/nodejs/node.yml

PLAY [localhost]
*********************************************************************

TASK [Gathering Facts]
*********************************************************************
ok: [localhost]

TASK [nodejs : copy tar file to nodejs folder]
*****************************************
changed: [localhost]

TASK [nodejs : Extract the tar file]
*************************************************
changed: [localhost]

PLAY RECAP
*********************************************************************************
***
localhost                  : ok=3    changed=2    unreachable=0    failed=0

osgdev@TG-DevOps-OS144:~/ansilab/nodejs$ ls
node-v8.11.1-linux-x64  node-v8.11.1-linux-x64.tar.xz
```

---

8. Create a nodejs application

```
osgdev@TG-DevOps-OS144:~/ansilab/nodejs$ ls
app.js  node-v8.11.1-linux-x64  node-v8.11.1-linux-x64.tar.xz

osgdev@TG-DevOps-OS144:~/ansilab/nodejs$ cat app.js
const http = require('http');

const hostname = '127.0.0.1';
const port = 3000;

const server = http.createServer((req, res) => {
  res.statusCode = 200;
  res.setHeader('Content-Type', 'text/plain');
  res.end('Hello World\n');
});

server.listen(port, hostname, () => {
  console.log(`Server running at http://${hostname}:${port}/`);
});
```

---

9. Run Nodejs application:

```
osgdev@TG-DevOps-OS144:~/ansilab/nodejs/node-v8.11.1-linux-x64/bin$ ls
node  npm  npx

osgdev@TG-DevOps-OS144:~/ansilab/nodejs/node-v8.11.1-linux-x64/bin$ ./node
../../app.js
Server running at http://127.0.0.1:3000/

Watch the output in browser:

http://localhost:3000/
```

---

10. Tomcat Playbook. Create a role called tomcat under roles directory.

```
osgdev@TG-DevOps-OS004:~/ansilab$ ansible-galaxy init ./roles/tomcat
- ./roles/tomcat was created successfully

osgdev@TG-DevOps-OS004:~/ansilab$ tree ./roles/tomcat/
./roles/tomcat/
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
```

```
│   └── main.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml
```

```
Note: Create a tomcat directory as target folder where the tomcat server
will be installed.

osgdev@TG-DevOps-OS004:~/ansilab$ mkdir tomcat
```

---

11. Edit the /roles/tomcat/tasks/main.yml to create your first task to copy the tar file (available in your topgear machine) to tomcat directory.

```
osgdev@TG-DevOps-OS004:~/ansilab$ ls ../myDownloads/
apache-tomcat-7.0.82.tar.gz                  fortunes.tar.gz
apache-tomcat-8.5.27-src.tar.gz              gedit_3.10.4-
0ubuntu4_amd64.deb
apache-tomcat-8.5.27.tar.gz                  jenkins.tar
eclipse-inst-linux64.tar.gz                  jenkins.war
eclipse-jee-oxygen-2-linux-gtk-x86_64.tar.gz  uex-16.1.0.22_amd64.tar.gz

osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
  - name: Copy tar file to tomcat folder
    copy:
      src: /home/osgdev/myDownload/apache-tomcat-8.5.27.tar.gz
      dest: /home/osgdev/ansilab/tomcat
```

---

12. Write a general playbook yml file to invoke the tasks.

```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tomcat.yml
- hosts: localhost
  roles:
  - tomcat

osgdev@TG-DevOps-OS004:~/ansilab$ ansible-playbook ./roles/tomcat/tomcat.yml

PLAY [localhost]
*********************************************************************************
*

TASK [Gathering Facts]
*********************************************************************
ok: [localhost]
```

```
TASK [tomcat : example copying file with owner and permissions]
****************************
changed: [localhost]

PLAY RECAP
********************************************************************************
*******
localhost                  : ok=2    changed=1    unreachable=0    failed=0

osgdev@TG-DevOps-OS004:~/ansilab$ ls tomcat
apache-tomcat-8.5.27.tar.gz
```

---

13. Unarchive the given tar file in the tomcat directory. Let us add another task to main.yml under tasks directory.

```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
  - name: Copy tar file to tomcat folder
    copy:
      src: /home/osgdev/myDownloads/apache-tomcat-8.5.27.tar.gz
      dest: /home/osgdev/ansilab/tomcat

  - name: Extract tomcat tar file
    unarchive:
      src: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27.tar.gz
      dest: /home/osgdev/ansilab/tomcat

osgdev@TG-DevOps-OS004:~/ansilab$ ansible-playbook ./roles/tomcat/tomcat.yml

PLAY [localhost]
********************************************************************************

TASK [Gathering Facts]
********************************************************************************
ok: [localhost]

TASK [tomcat : Copy tar file to tomcat folder]
*********************************************
ok: [localhost]

TASK [tomcat : Extract tomcat tar file]
***********************************************
changed: [localhost]

PLAY RECAP
********************************************************************************
*******
localhost                  : ok=3    changed=1    unreachable=0    failed=0

osgdev@TG-DevOps-OS004:~/ansilab$ ls tomcat
apache-tomcat-8.5.27  apache-tomcat-8.5.27.tar.gz
```

14. Make a small improvement by adding tar file to the playbook. Let us clear tomcat folder to take this improvement.

```
osgdev@TG-DevOps-OS004:~/ansilab$ rm -rf tomcat/*

Add the file to playbook into files folder under tomcat role.

osgdev@TG-DevOps-OS004:~/ansilab$ cp /home/osgdev/myDownloads/apache-tomcat-
8.5.27.tar.gz /home/osgdev/ansilab/roles/tomcat/files/

osgdev@TG-DevOps-OS004:~/ansilab$ ls
/home/osgdev/ansilab/roles/tomcat/files/
apache-tomcat-8.5.27.tar.gz

osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
#  - name: Copy tar file to tomcat folder
#    copy:
#      src: /home/osgdev/myDownloads/apache-tomcat-8.5.27.tar.gz
#      dest: /home/osgdev/ansilab/tomcat
#
  - name: Extract tomcat tar file
    unarchive:
      src: apache-tomcat-8.5.27.tar.gz
      dest: /home/osgdev/ansilab/tomcat

Note: The first task of copying tar file itself is eliminated.  If required
you may directly download the tar file to your files folder from internet.
The first module which is commented here will be edited out.
```

15. Copy the server.xml file from the archived content of tomcat and change the working port. This step is normally done in advance even before you start writing the playbook.

```
osgdev@TG-DevOps-OS004:~/ansilab$ cp /home/osgdev/ansilab/tomcat/apache-
tomcat-8.5.27/conf/server.xml /home/osgdev/ansilab/roles/tomcat/files/


   <Connector port="8080" protocol="HTTP/1.1"
              connectionTimeout="20000"
              redirectPort="8443" />

Change "Connector port" to 11011

osgdev@TG-DevOps-OS004:~/ansilab$ cat server.xml
      .
      .
```

```
    <Connector port="11011" protocol="HTTP/1.1"
               connectionTimeout="20000"
               redirectPort="8443" />
      .
      .
```

Create j2 file. Note that apart from changing the port number manually no other configuration changes are made here.

```
osgdev@TG-DevOps-OS004:~/ansilab$ mv server.xml server.xml.j2

osgdev@TG-DevOps-OS004:~/ansilab$ cp server.xml.j2 ./roles/tomcat/templates/

osgdev@TG-DevOps-OS004:~/ansilab$ ls ./roles/tomcat/templates/
server.xml.j2
```

---

16. Add another task to copy the template file to actual server.xml file. This is the way to make configuration changes.

```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
  - name: Extract tomcat tar file
    unarchive:
      src: apache-tomcat-8.5.27.tar.gz
      dest: /home/osgdev/ansilab/tomcat

  - name: Change the tomcat port
    template:
      src: server.xml.j2
      dest: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27/conf/server.xml

osgdev@TG-DevOps-OS004:~/ansilab$ ansible-playbook ./roles/tomcat/tomcat.yml

PLAY [localhost]
*********************************************************************************

TASK [Gathering Facts]
*********************************************************************
ok: [localhost]

TASK [tomcat : Extract tomcat tar file]
*****************************************************
ok: [localhost]

TASK [tomcat : Change the tomcat port]
*******************************************************
changed: [localhost]

PLAY RECAP
*********************************************************************************
localhost                  : ok=3    changed=1    unreachable=0    failed=0
```

```
Check whether the change happened in the server.xml file.

osgdev@TG-DevOps-OS004:~/ansilab$ vi ./tomcat/apache-tomcat-
8.5.27/conf/server.xml
```

---

17. Start the tomcat service and check whether you can access tomcat service on port 11011
    Add a task that would run the startup.sh to start tomcat service.

```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
  - name: Extract tomcat tar file
    unarchive:
      src: apache-tomcat-8.5.27.tar.gz
      dest: /home/osgdev/ansilab/tomcat

  - name: Change the tomcat port
    template:
      src: server.xml.j2
      dest: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27/conf/server.xml

  - name: Start tomcat service
    shell: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27/bin/startup.sh

You can check the tomcat service on the browser:

<<<<<<<<<<<<<<<<<<<Imge>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
```

---

18. Make an improvement. Tasks like "Start tomcat service" should always be "notify"ed by a task which will be changing the tomcat port, only after this task is successful. Also the path "/home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27" is frequently used in playbook. Make it a variable "tomcat_home"

```
Clear the home folder:

osgdev@TG-DevOps-OS004:~/ansilab$ rm -rf tomcat/*

Make following changes to main.yml under tasks folder in the tomcat role.

osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
  - name: Extract tomcat tar file
    unarchive:
      src: apache-tomcat-8.5.27.tar.gz
      dest: /home/osgdev/ansilab/tomcat
```

```
  - name: Change the tomcat port
    template:
      src: server.xml.j2
      dest: "{{tomcat_home}}/conf/server.xml"
    notify: Start tomcat service
```

Make following changes to main.yml under handlers folder in the tomcat role.

```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/handlers/main.yml
---
# handlers file for ./roles/tomcat
  - name: Start tomcat service
    shell: "{{tomcat_home}}/bin/startup.sh"
```

Make following changes to main.yml under vars folder in the tomcat role.

```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/vars/main.yml
---
# vars file for ./roles/tomcat
tomcat_home: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27

osgdev@TG-DevOps-OS004:~/ansilab$ ansible-playbook ./roles/tomcat/tomcat.yml

PLAY [localhost]
*********************************************************************************
*

TASK [Gathering Facts]
*********************************************************************
ok: [localhost]

TASK [tomcat : Extract tomcat tar file]
*****************************************************
changed: [localhost]

TASK [tomcat : Change the tomcat port]
*****************************************************
changed: [localhost]

RUNNING HANDLER [tomcat : Start tomcat service]
*********************************************
changed: [localhost]

PLAY RECAP
*********************************************************************************
*******
localhost                  : ok=4    changed=3    unreachable=0    failed=0
```

You can check the tomcat service on the browser:

<<<<<<<<<<<<<<<<<<Imge>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

Please note that as we do these changes following files which are supporting remain same.

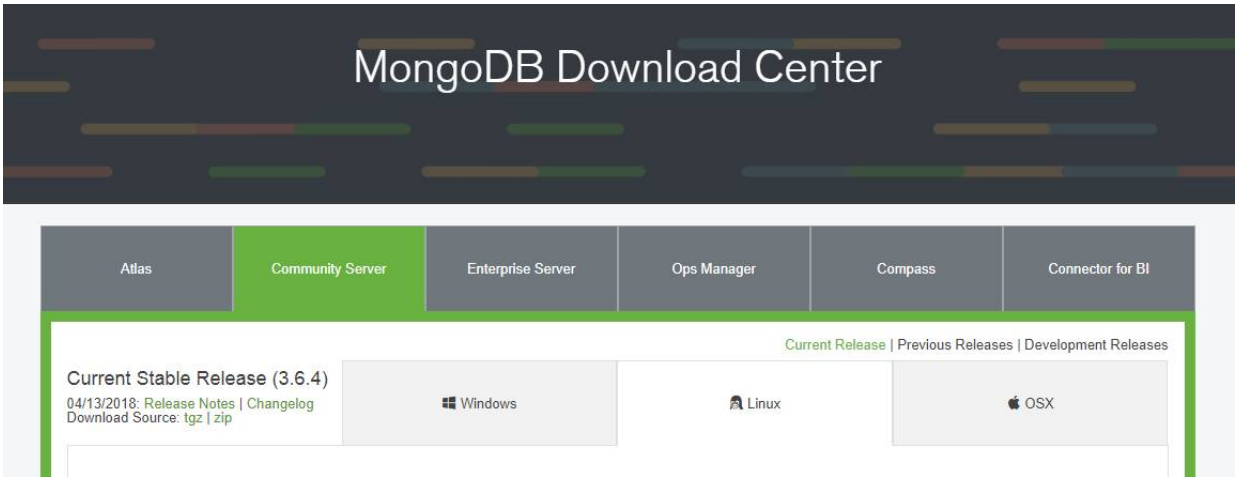
```
osgdev@TG-DevOps-OS004:~/ansilab$ cat ./roles/tomcat/tomcat.yml
- hosts: localhost
```

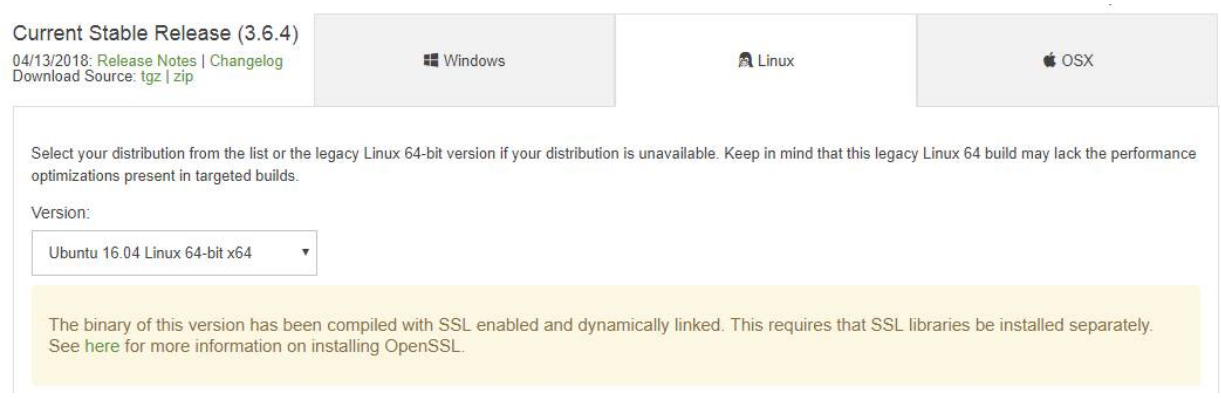
```
  roles:
  - tomcat

osgdev@TG-DevOps-OS004:~/ansilab$ cat ansible.cfg
[defaults]

inventory = /home/osgdev/ansilab/ansiserver
log_path = /home/osgdev/ansilab/ansible.log
roles_path = /home/osgdev/ansilab/roles

osgdev@TG-DevOps-OS004:~/ansilab$ cat ansiserver
[local]
localhost ansible_connection=local
TG-DevOps-OS004 hostname=127.0.1.1 ansible_ssh_user=osgdev
TG-DevOps-OS004.wipro.com hostname=127.0.1.1 ansible_ssh_user=osgdev
```

---

19. MongoDB Playbook:

Download MongoDB:






```
osgdev@TG-DevOps-OS144:~/ansilab$ ls /home/osgdev/Downloads/
```

```
7WXOQKL6.html                                   jfrog-artifactory-pro-5.9.0.zip
sonarqube-6.4.zip
geckodriver-v0.19.1-linux64.tar.gz              mariadb-10.2.14-linux-
x86_64.tar.gz        sonarqube-6.7.2.zip
jfrog-artifactory-oss-5.9.0-sources.tar.gz      mongodb-linux-x86_64-ubuntu1604-
3.6.4.tgz
jfrog-artifactory-pro-5.9.0(1).zip              node-v8.11.1-linux-x64.tar.xz
```

Create mongodb directory:

```
osgdev@TG-DevOps-OS004:~/ansilab$ mkdir  mongodb
```

---

20. Create mongodb role:

```
osgdev@TG-DevOps-OS144:~/ansilab$ ansible-galaxy init ./roles/mongodb
- ./roles/mongodb was created successfully

osgdev@TG-DevOps-OS144:~/ansilab$ tree ./roles/mongodb/
./roles/mongodb/
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── mongodb.yml
├── README.md
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml

8 directories, 9 files
```

---

21. Create mongodb playbook:

```
osgdev@TG-DevOps-OS144:~/ansilab$ vi ./roles/mongodb/mongodb.yml
osgdev@TG-DevOps-OS144:~/ansilab$ cat ./roles/mongodb/mongodb.yml
- hosts: localhost
  roles:
    - mongodb
```

---

22. Create mongodb role:

```
osgdev@TG-DevOps-OS144:~/ansilab$ cat ./roles/mongodb/tasks/main.yml
---
# tasks file for ./roles/mongodb
  - name: Extract the content of tar file
    unarchive:
      src: mongodb-linux-x86_64-ubuntu1604-3.6.4.tgz
      dest: /home/osgdev/ansilab/mongodb
```

---

23. Run the playbook:

```
osgdev@TG-DevOps-OS144:~/ansilab$ ansible-playbook
./roles/mongodb/mongodb.yml

PLAY [localhost]
*********************************************************************

TASK [Gathering Facts]
*********************************************************************
ok: [localhost]

TASK [mongodb : Extract the content of tar file]
*************************************
changed: [localhost]

PLAY RECAP
*********************************************************************************
***
localhost                  : ok=2    changed=1    unreachable=0    failed=0
```

---

24. MongoDB Installation:

```
osgdev@TG-DevOps-OS144:~/ansilab$ ls mongodb/
mongodb-linux-x86_64-ubuntu1604-3.6.4

osgdev@TG-DevOps-OS144:~/ansilab$ cd mongodb/

osgdev@TG-DevOps-OS144:~/ansilab/mongodb$ cd mongodb-linux-x86_64-
ubuntu1604-3.6.4/

osgdev@TG-DevOps-OS144:~/ansilab/mongodb/mongodb-linux-x86_64-ubuntu1604-
3.6.4$ ls
bin  GNU-AGPL-3.0  MPL-2  README  THIRD-PARTY-NOTICES

osgdev@TG-DevOps-OS144:~/ansilab/mongodb/mongodb-linux-x86_64-ubuntu1604-
3.6.4$ ls bin
```

```
bsondump          mongo    mongodump    mongofiles    mongoperf    mongorestore
mongostat
install_compass   mongod   mongoexport  mongoimport   mongoreplay  mongos
mongotop
```

---

25. Use of MongoDB:

```
osgdev@TG-DevOps-OS144:~/ansilab/mongodb/mongodb-linux-x86_64-ubuntu1604-
3.6.4$ cd ../

osgdev@TG-DevOps-OS144:~/ansilab/mongodb$ mkdir data

osgdev@TG-DevOps-OS144:~/ansilab/mongodb$ mkdir ./data/db

osgdev@TG-DevOps-OS144:~/ansilab/mongodb$ pwd
/home/osgdev/ansilab/mongodb

osgdev@TG-DevOps-OS144:~/ansilab/mongodb$ cd mongodb-linux-x86_64-
ubuntu1604-3.6.4/bin/

osgdev@TG-DevOps-OS144:~/ansilab/mongodb/mongodb-linux-x86_64-ubuntu1604-
3.6.4/bin$ ./mongod --dbpath /home/osgdev/ansilab/mongodb/data/db
2018-05-06T14:50:11.821+0530 I CONTROL  [initandlisten] MongoDB starting :
pid=15273 port=27017 dbpath=/home/osgdev/ansilab/mongodb/data/db 64-bit
host=TG-DevOps-OS144
2018-05-06T14:50:11.821+0530 I CONTROL  [initandlisten] db version v3.6.4
2018-05-06T14:50:11.821+0530 I CONTROL  [initandlisten] git version:
d0181a711f7e7f39e60b5aeb1dc7097bf6ae5856
```