Work Flow Docker & CI/CD Implement in AWS

- *Percobaan disini menggunakan 1 server backend 1 server frontend & 1 server jenkins serta 1 server reverse proxy.*

1. Persiapan install paket yang di butuhkan untuk docker dan tambahkan dependensi untuk docker diasumsikan cara pengerjaan untuk instalasi backend seperti ini.

```
ubuntu@ip-10-20-2-200:~/library-frontend$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Hit:4 https://deb.nodesource.com/node_10.x bionic InRelease
Get:5 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:6 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [1543 kB]
Get:7 http://security.ubuntu.com/ubuntu bionic-security/main Translation-en [298 kB]
Get:8 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [1108 kB]
Get:9 http://security.ubuntu.com/ubuntu bionic-security/universe Translation-en [248 kB]
Fetched 3449 kB in 2s (2000 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
All packages are up to date.
ubuntu@ip-10-20-2-200:~/library-frontend$ sudo apt install apt-transport-https ca-certificates curl software-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
ca-certificates is already the newest version (20210119~18.04.1).
ca-certificates set to manually installed.
curl is already the newest version (7.58.0-2ubuntu3.12).
software-properties-common is already the newest version (0.96.24.32.14).
software-properties-common set to manually installed.
The following NEW packages will be installed:
  apt-transport-https
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 1696 B of archives.
After this operation, 153 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

```
ubuntu@ip-10-20-2-200:~$ sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu $(lsb_release -cs)
 stable"
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 https://deb.nodesource.com/node_10.x bionic InRelease
Get:5 https://download.docker.com/linux/ubuntu bionic InRelease [64.4 kB]
Hit:6 http://security.ubuntu.com/ubuntu bionic-security InRelease
Get:7 https://download.docker.com/linux/ubuntu bionic/stable amd64 Packages [16.0 kB]
Fetched 80.5 kB in 1s (150 kB/s)
Reading package lists... Done
```

```
ubuntu@ip-10-20-2-200:~$ sudo apt install docker-ce
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  containerd.io docker-ce-cli docker-ce-rootless-extras libltdl7 pigz
Suggested packages:
  aufs-tools cgroupfs-mount | cgroup-lite
Recommended packages:
  slirp4netns
The following NEW packages will be installed:
  containerd.io docker-ce docker-ce-cli docker-ce-rootless-extras libltdl7 pig
0 upgraded, 6 newly installed, 0 to remove and 0 not upgraded.
Need to get 103 MB of archives.
After this operation, 450 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

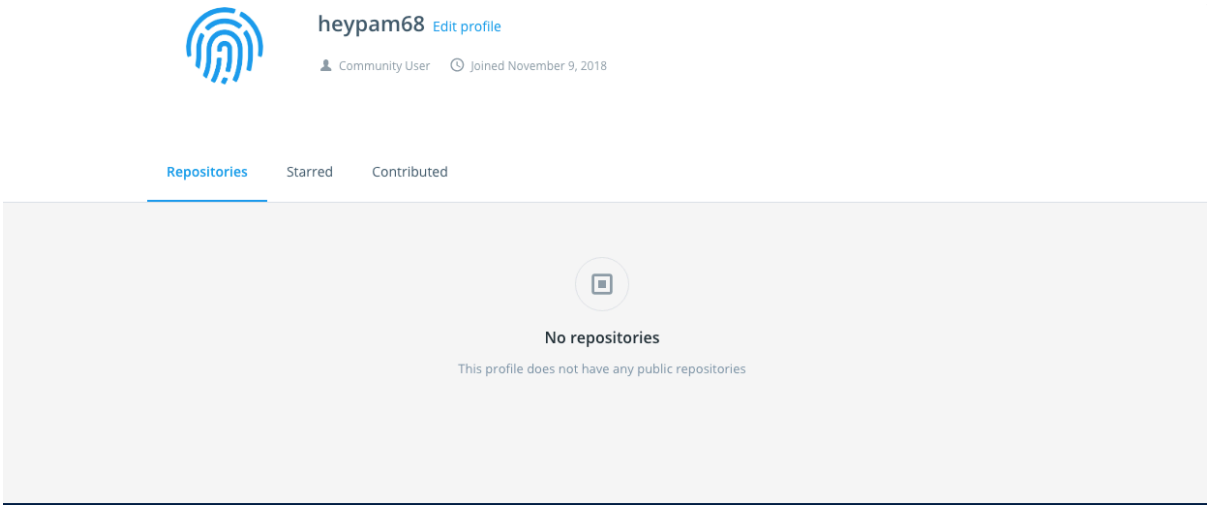
2. Cek status docker dan agar dapat menjalankan user tersebut dengan docker beri hak akses user bisa mengakses docker.

```
ubuntu@ip-10-20-2-200:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2021-02-09 12:24:15 UTC; 10s ago
     Docs: https://docs.docker.com
 Main PID: 3870 (dockerd)
    Tasks: 8
   CGroup: /system.slice/docker.service
           └─3870 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock

Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.291549252Z" level=warning msg="Your kernel does not su
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.291690502Z" level=warning msg="Your kernel does not su
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.291825259Z" level=warning msg="Your kernel does not su
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.292130383Z" level=info msg="Loading containers: start.
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.444376390Z" level=info msg="Default bridge (docker0) i
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.518003265Z" level=info msg="Loading containers: done."
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.598403740Z" level=info msg="Docker daemon" commit=4622
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.598813992Z" level=info msg="Daemon has completed initi
Feb 09 12:24:15 ip-10-20-2-200 systemd[1]: Started Docker Application Container Engine.
Feb 09 12:24:15 ip-10-20-2-200 dockerd[3870]: time="2021-02-09T12:24:15.660251817Z" level=info msg="API listen on /var/run/doc
lines 1-19/19 (END)
```

```
ubuntu@ip-10-20-2-200:~$ sudo usermod -aG docker $USER
ubuntu@ip-10-20-2-200:~$
```

3. Coba buat akun untuk docker-hub.



4. Login di server frontend & backend.

```
ubuntu@ip-10-20-3-89:~$ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.doc
ker.com to create one.
Username: heypam68
Password:
WARNING! Your password will be stored unencrypted in /home/ubuntu/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

```
ubuntu@ip-10-20-2-200:~$ docker login
Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.doc
ker.com to create one.
Username: heypam68
Password:
WARNING! Your password will be stored unencrypted in /home/ubuntu/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

5. Buat dockerfile untuk frontend dan backend.

```
FROM node:latest
WORKDIR /home/ubuntu/dockerimages
COPY . ./
RUN npm install
EXPOSE 3000
CMD [ "npm", "start" ]
```

```
ubuntu@ip-10-20-3-89:~/library-backend$ cat dockerfile
FROM node:latest
WORKDIR /home/ubuntu/dockerimages
COPY . ./
RUN npm install
EXPOSE 5000
CMD [ "npm", "start" ]
```

6. Build dockerfile frontend dan backend .

```
ubuntu@ip-10-20-2-200:~/library-frontend$ docker build -t heypam68/frontend:0.0.1 .
Sending build context to Docker daemon  325.5MB
Step 1/6 : FROM node:latest
latest: Pulling from library/node
2587235a7635: Pull complete
d4ae0ade1586: Pull complete
911674ee9a54: Pull complete
a6954b219f55: Pull complete
a801a158184b: Pull complete
77451a036ccf: Pull complete
16f7d8659ed1: Pull complete
f6cd1bd8ad9f: Pull complete
33d87699a420: Pull complete
Digest: sha256:70be18973d634e619968cf69066ea7e1e6307ef381a9aa1acb5c83892ca45411
Status: Downloaded newer image for node:latest
 ---> 96e42e8537de
Step 2/6 : WORKDIR /home/ubuntu/dockerimages
 ---> Running in 3149269179fe
Removing intermediate container 3149269179fe
 ---> b504628ed52f
Step 3/6 : COPY . ./
```

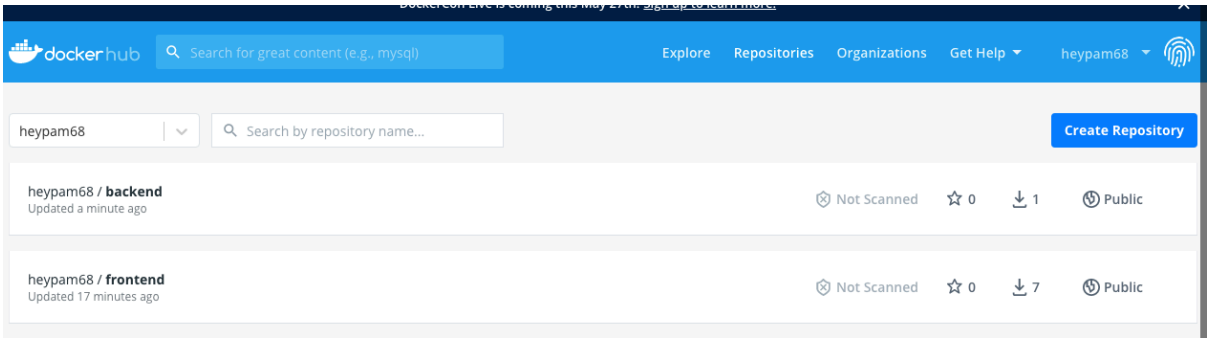
```
ubuntu@ip-10-20-3-89:~/library-backend$ docker build -t heypam68/backend:0.0.1 .
Sending build context to Docker daemon  52.29MB
Step 1/6 : FROM node:latest
latest: Pulling from library/node
2587235a7635: Extracting [======================>                            ]  21.56MB/45.38MB
d4ae0ade1586: Download complete
911674ee9a54: Download complete
a6954b219f55: Download complete
a801a158184b: Downloading [==========================================>        ]  188.3MB/214.3MB
77451a036ccf: Download complete
16f7d8659ed1: Download complete
f6cd1bd8ad9f: Download complete
33d87699a420: Download complete
```

7. Push hasil build ke docker-hub untuk frontend & backend.

```
[ubuntu@ip-10-20-2-200:~/library-frontend$ docker push heypam68/frontend:0.0.1
The push refers to repository [docker.io/heypam68/frontend]
6ab1c43207e1: Pushed
15c16c0c1a27: Pushing [==========>                                        ]  67.14MB/283.8MB
34477fd92a78: Pushed
ef23c6920b17: Mounted from library/node
5bb4dcf03b1b: Mounted from library/node
6e2ca66f6436: Mounted from library/node
1cf5a0faae92: Mounted from library/node
bf01b197a1e9: Mounted from library/node
fea6a3964664: Mounted from library/node
0c752dfe1218: Mounted from library/node
25dce16aeba5: Waiting
1fb0a31fe7c2: Waiting
```

```
[ubuntu@ip-10-20-3-89:~/library-backend$ docker push heypam68/backend:0.0.1
The push refers to repository [docker.io/heypam68/backend]
a2d3029f9bf7: Pushed
0e66e266e5b1: Pushed
7fa46077d356: Pushed
ef23c6920b17: Mounted from library/node
5bb4dcf03b1b: Mounted from library/node
6e2ca66f6436: Mounted from library/node
1cf5a0faae92: Mounted from library/node
bf01b197a1e9: Mounted from library/node
fea6a3964664: Mounted from library/node
0c752dfe1218: Mounted from library/node
25dce16aeba5: Mounted from library/node
1fb0a31fe7c2: Mounted from library/node
```

8. Cek repositori docker-hub



9. Lakukan instalasi untuk docker compose untuk server frontend & backend.

```
[ubuntu@frontend:~$ sudo curl -L "https://github.com/docker/compose/releases/download/1.23.1/doc]
ker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   633  100   633    0     0   5601      0 --:--:-- --:--:-- --:--:--  5601
100 11.1M  100 11.1M    0     0  39.9M      0 --:--:-- --:--:-- --:--:-- 39.9M
ubuntu@backend:~$ sudo curl -L "https://github.com/docker/compose/releases/download/1.23.1/dock
er-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   633  100   633    0     0   6593      0 --:--:-- --:--:-- --:--:--  6593
100 11.1M  100 11.1M    0     0  44.0M      0 --:--:-- --:--:-- --:--:-- 44.0M
```

10. Buat file docker compose untuk frontend & backend.

```
version: '3.9'
services:
  backend:
    container_name: backendcompose
    image: backendnodemon:1.0
    ports:
     - 5000:5000
```

```
version: '3.3'
services:
  backend:
    container_name: frontendcompose
    image: frontendbisa:1.1
    stdin_open: true
    ports:
     - 3000:3000
```

11. Build docker compose untuk frontend & backend.

```
ubuntu@backend:~/library-backend$ docker-compose up -d
Creating network "library-backend_default" with the default driver
Creating backendcompose ... done
ubuntu@backend:~/library-backend$
```

```
ubuntu@frontend:~/library-frontend$ docker-compose up -d
Creating network "library-frontend_default" with the default driver
Creating frontendcompose ... done
ubuntu@frontend:~/library-frontend$
```

12. Buat 1 server untuk Jenkins dan install dependensi yang di butuhkan , download file Jenkins dari docker hub.

```
ubuntu@jenkins:~$ docker pull jenkins/jenkins
Using default tag: latest
latest: Pulling from jenkins/jenkins
b9a857cbf04d: Pull complete
ce7facb6eb28: Pull complete
a19dc5962ace: Pull complete
d529f2911809: Pull complete
c3eef3ae0596: Pull complete
0328881a0a11: Pull complete
cd7e87d97dcd: Pull complete
df0afc70b392: Pull complete
d7135b4f49de: Pull complete
6fdeb6b5a1f2: Pull complete
0cfc048c9698: Pull complete
be5464ae6d91: Pull complete
49f63c01de8e: Pull complete
2daab64491de: Pull complete
567ac1d13f5a: Pull complete
390cc16090d5: Pull complete
Digest: sha256:51be1d23a806c380aa7a32984a6bf12bdb1920f42c288bb38a6587e8139646af
Status: Downloaded newer image for jenkins/jenkins:latest
docker.io/jenkins/jenkins:latest
```

13. Buat docker-compose untuk server Jenkins

```
version: '3.3'
services:
  jenkins:
    image: jenkins:latest
    ports:
      - 8080:8080
      - 50000:50000
    # uncomment for docker in docker
    privileged: true
    volumes:
        # enable persistent volume (warning: make sure that the local jenkins_home folder is created)
        - /var/wisestep/data/jenkins_home:/var/jenkins_home
        # mount docker sock and binary for docker in docker (only works on linux)
        - /var/run/docker.sock:/var/run/docker.sock
        - /usr/bin/docker:/usr/bin/docker
```

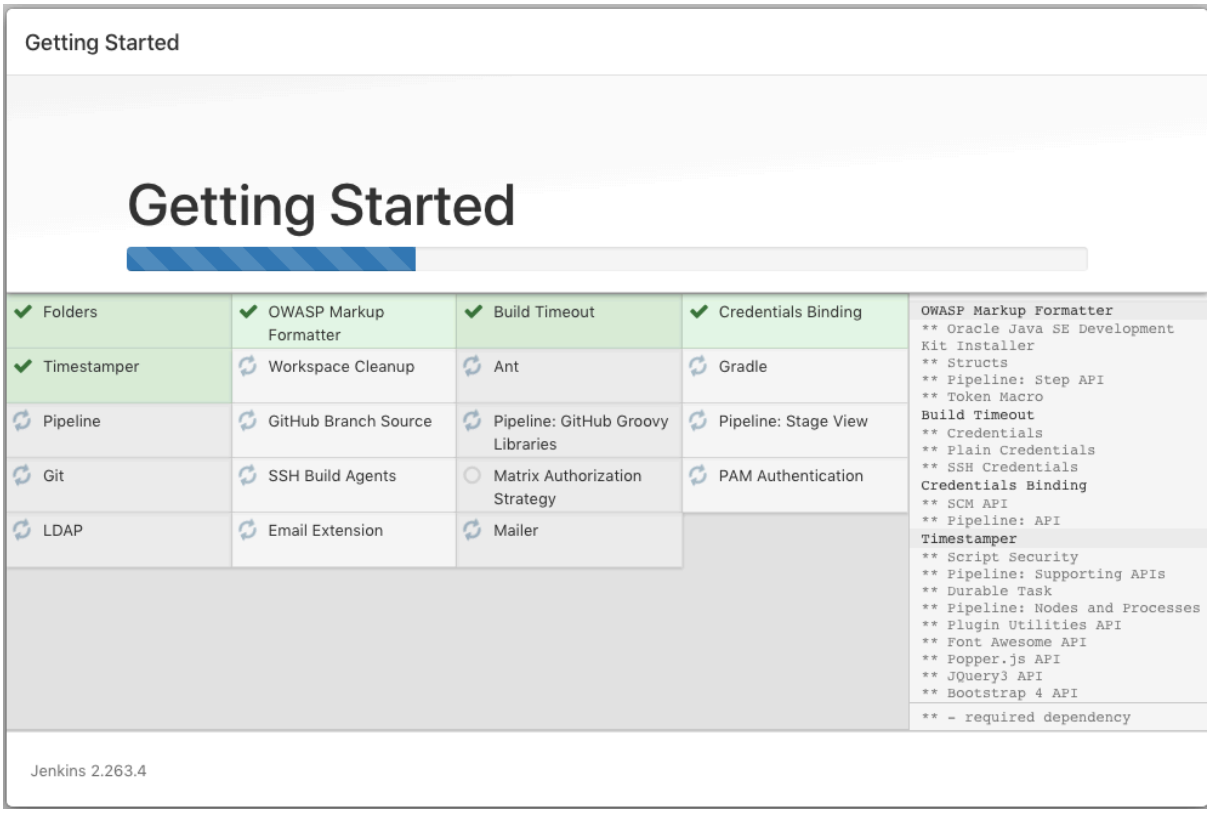
14. Lalu build docker compose , setelah di build maka cek docker ps.

```
root@jenkins:/# docker images -a
REPOSITORY       TAG       IMAGE ID       CREATED      SIZE
jenkins/jenkins  lts       3f6389c017cc   2 days ago   566MB
root@jenkins:/# docker ps
CONTAINER ID   IMAGE               COMMAND                  CREATED             STATUS             PORTS                                                NAMES
cd04c00e665d   jenkins/jenkins:lts  "/sbin/tini -- /usr/…"   About a minute ago  Up About a minute  0.0.0.0:8080->8080/tcp, 0.0.0.0:50000->50000/tcp   jenkins
```

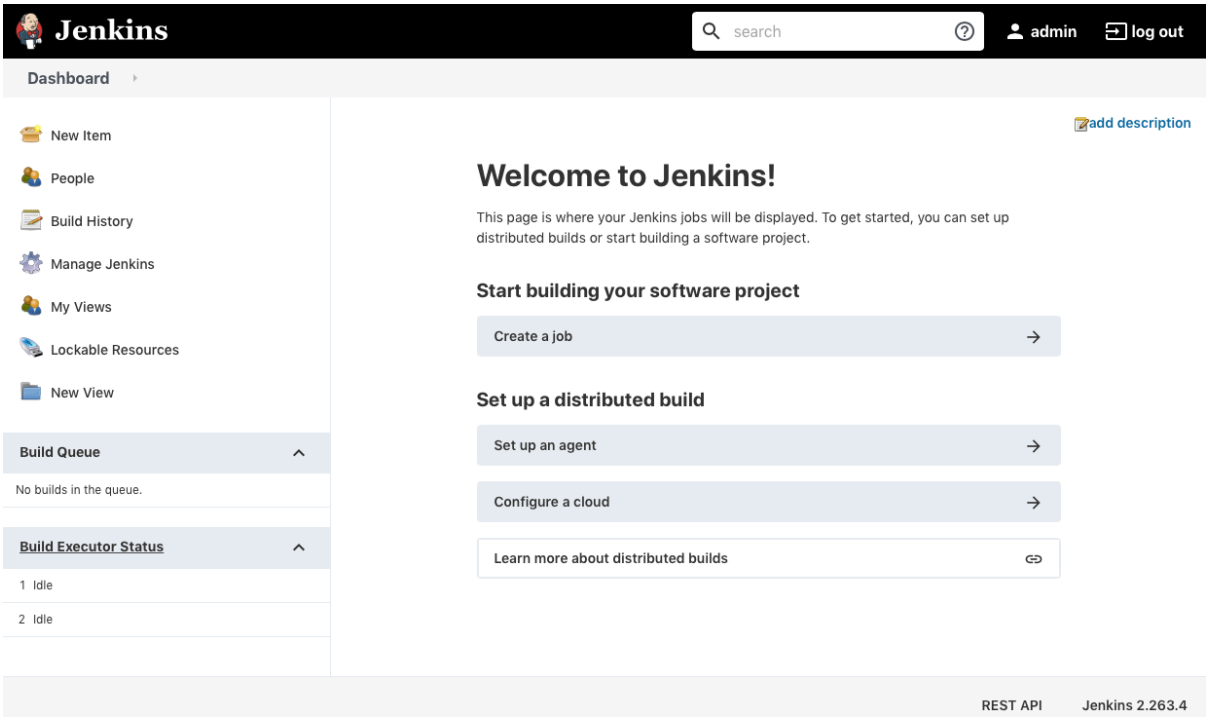
15. Agar mendapatkan password admin Jenkins pada docker yang telah di build , exec file dan liat passwordnya.

```
root@jenkins:/# docker exec jenkins cat /var/jenkins_home/secrets/initialAdminPassword
c2709fd97b6447af94eb1dd50d067378
```

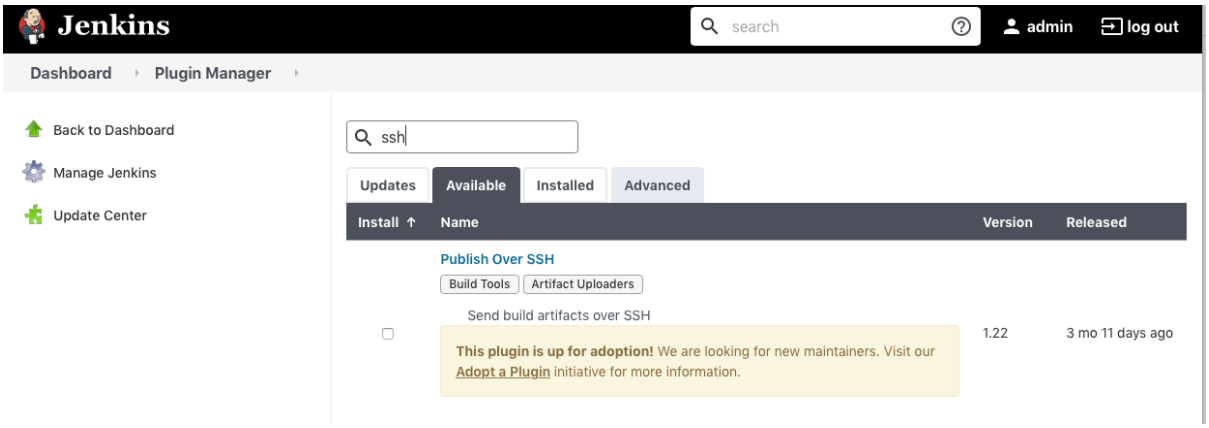
16. Akses ke domain Jenkins atau port , lalu install standar plugin yang telah di siapkan oleh pihak Jenkins.



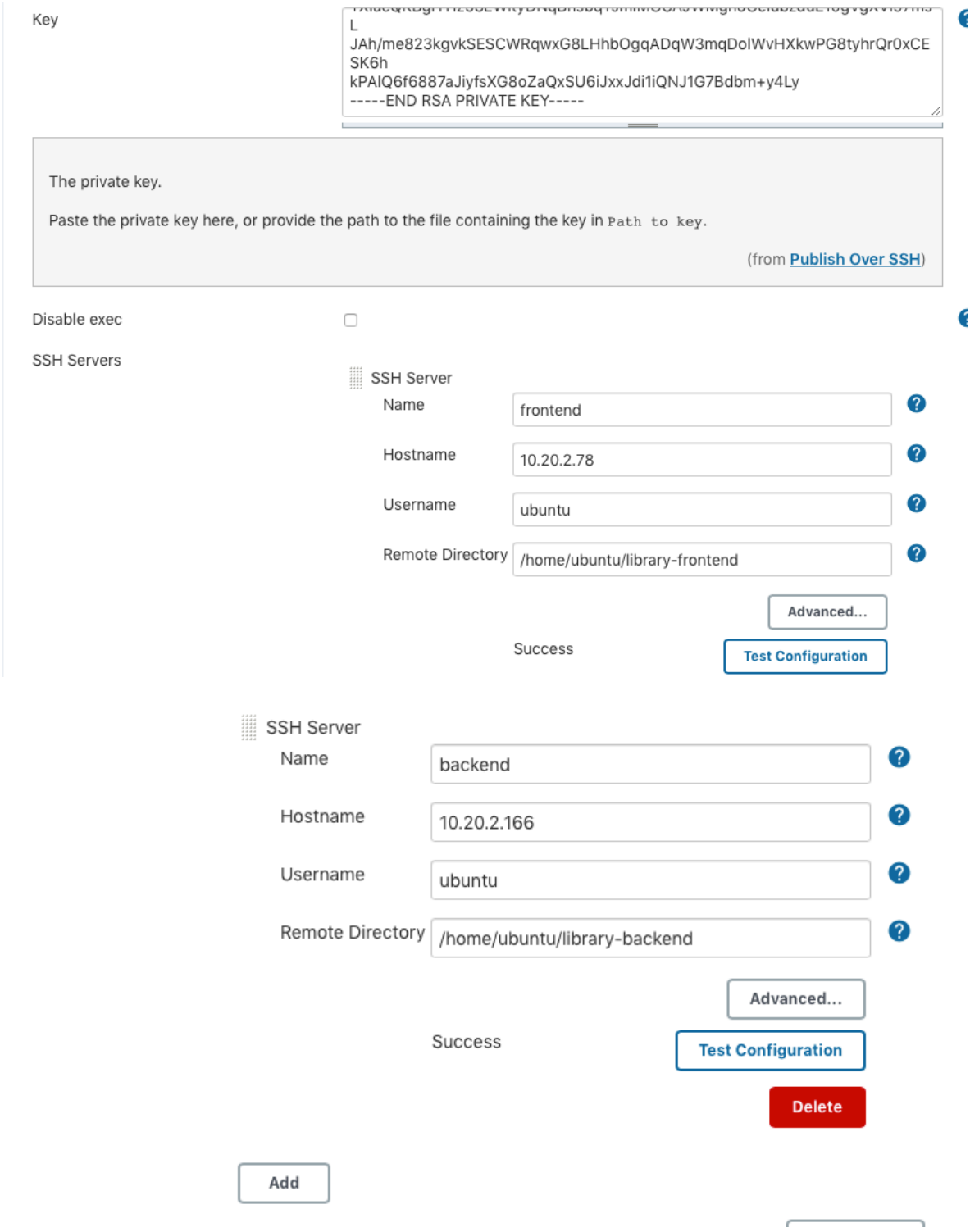
17. Setelah proses instalasi selesai maka muncul tampilan awal.



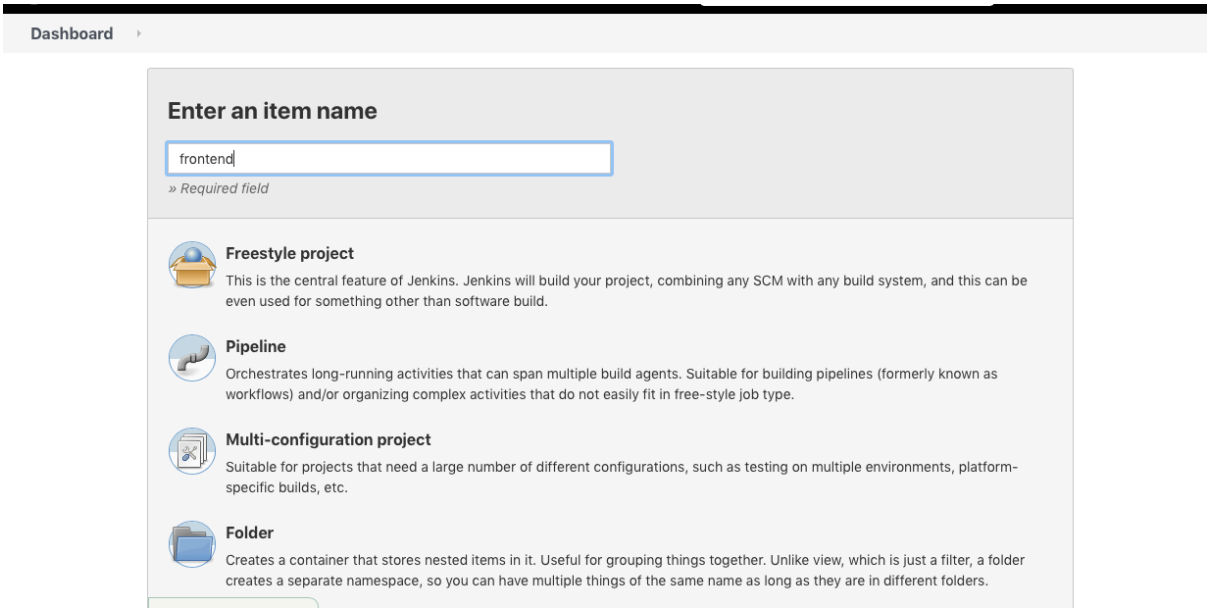
18. Install plugin untuk koneksi ke server frontend & backend , dengan nama plugin ssh publish over ssh.



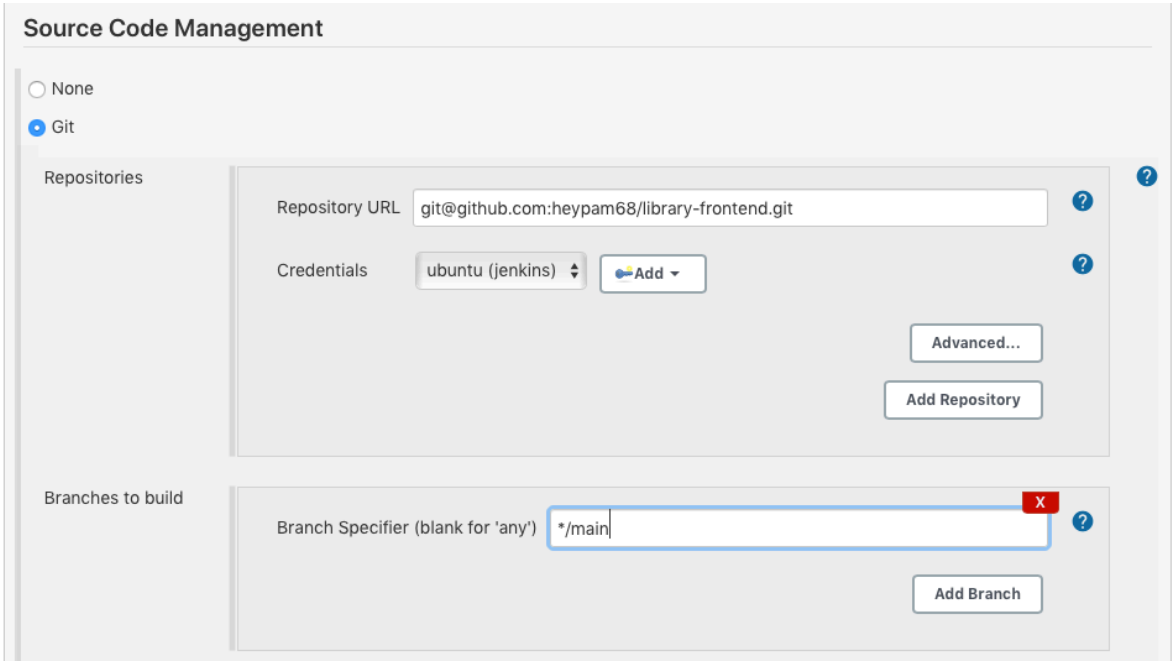
19. Tambahkan destinasi server frontend & backend , bila kunci sama dapat di tambahkan juga.



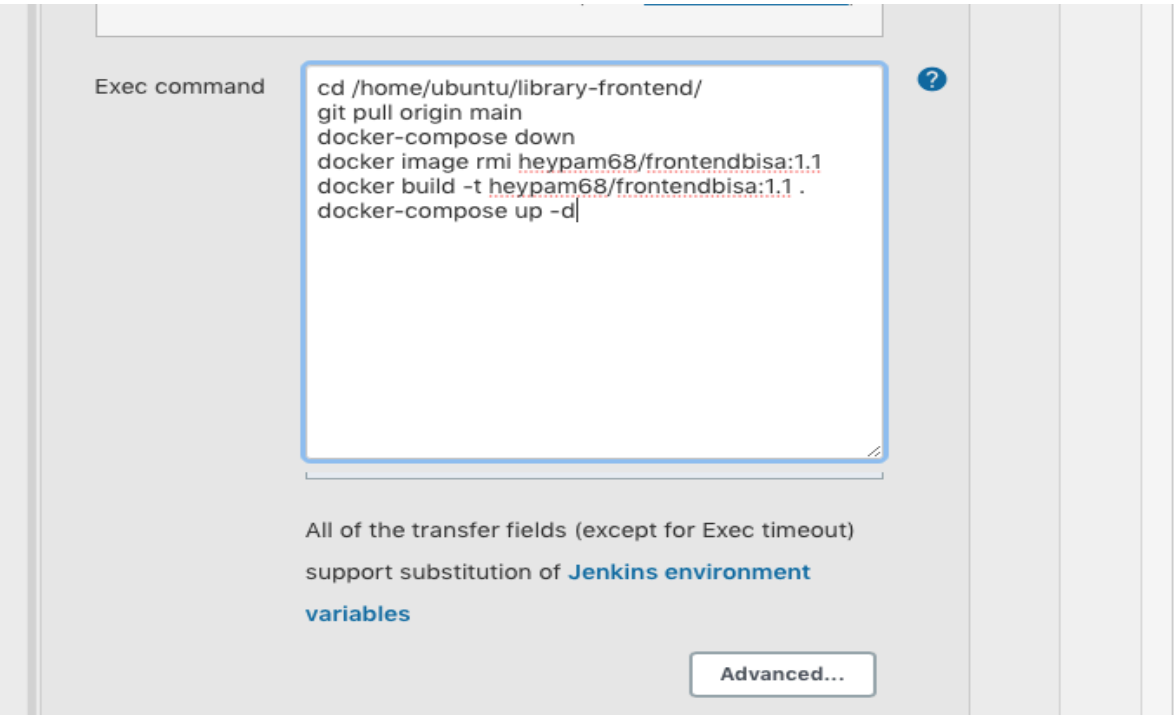
20. Buat job untuk server frontend.



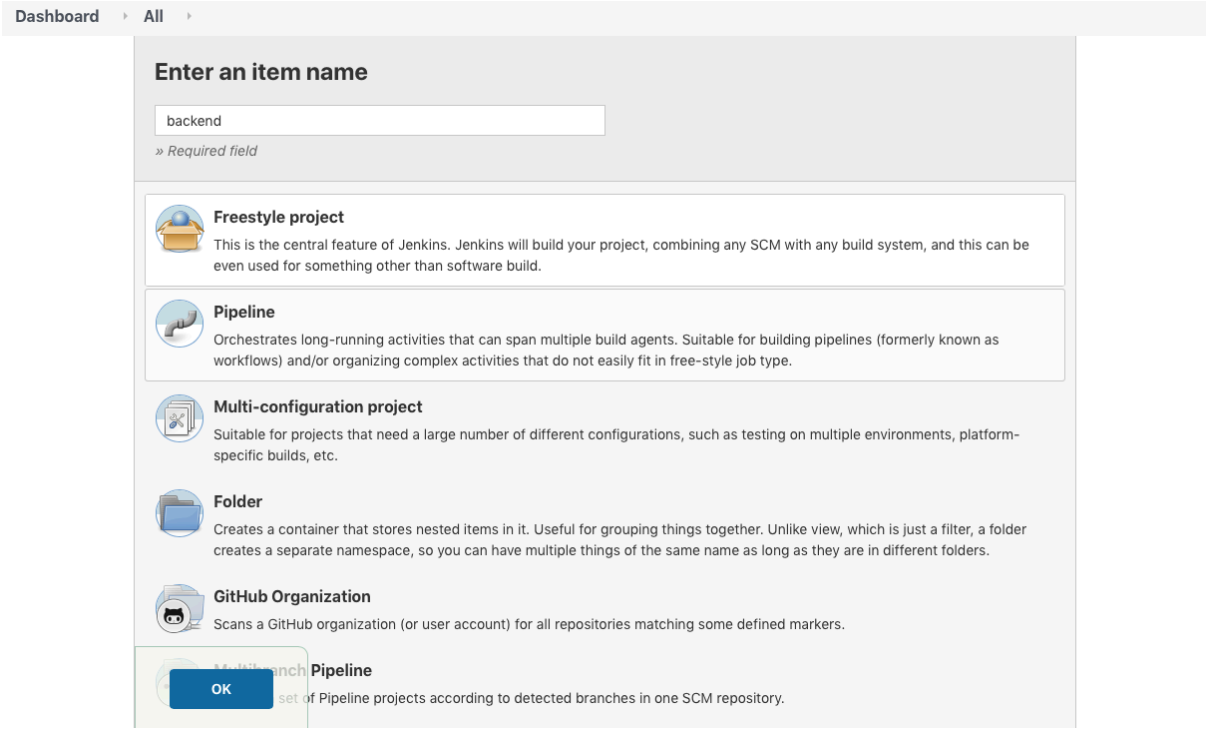
21. Tambahkan repositori github frontend.



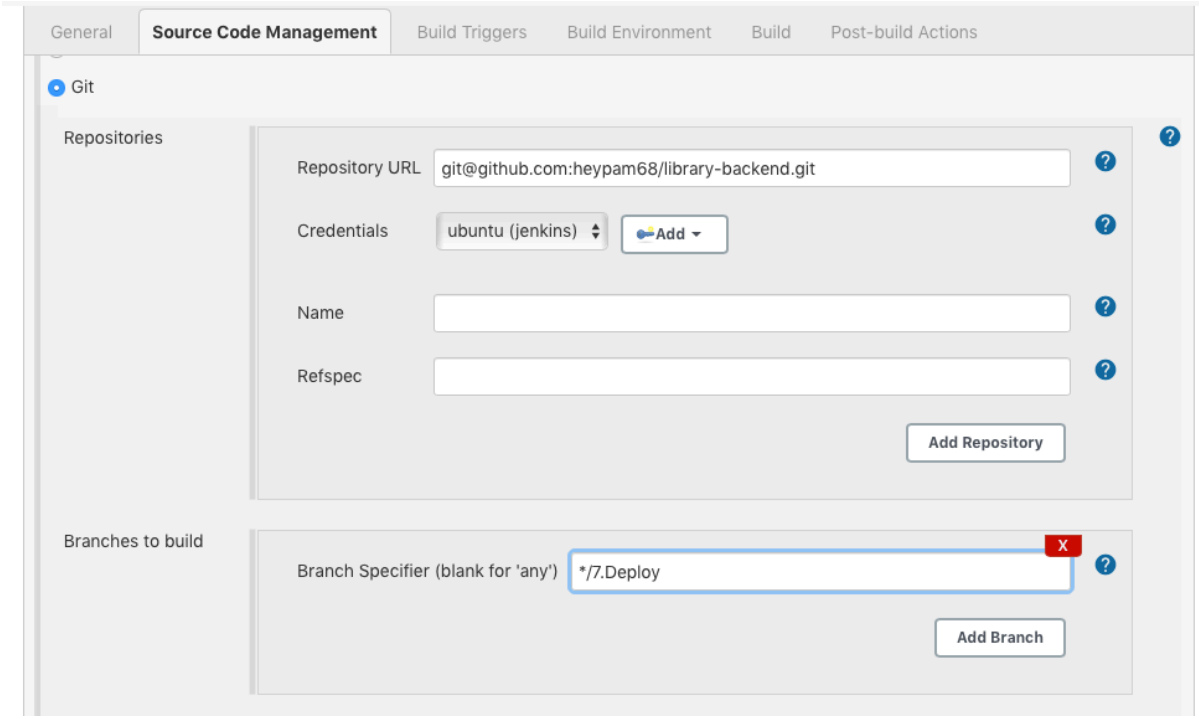
22. Pada bagian build tambahkan publish over ssh dan post build action sama dengan membuat docker compose.



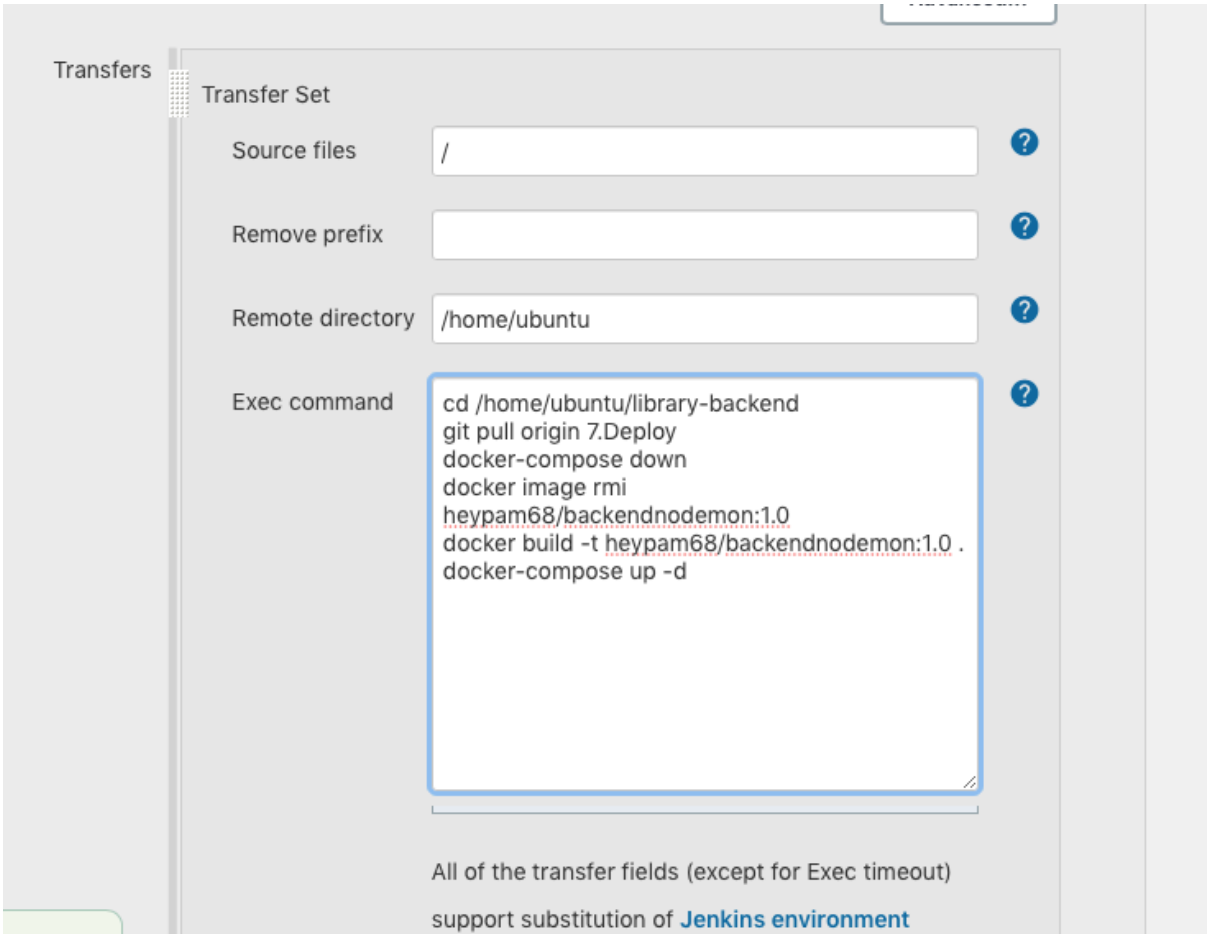
23. Buat job untuk backend.



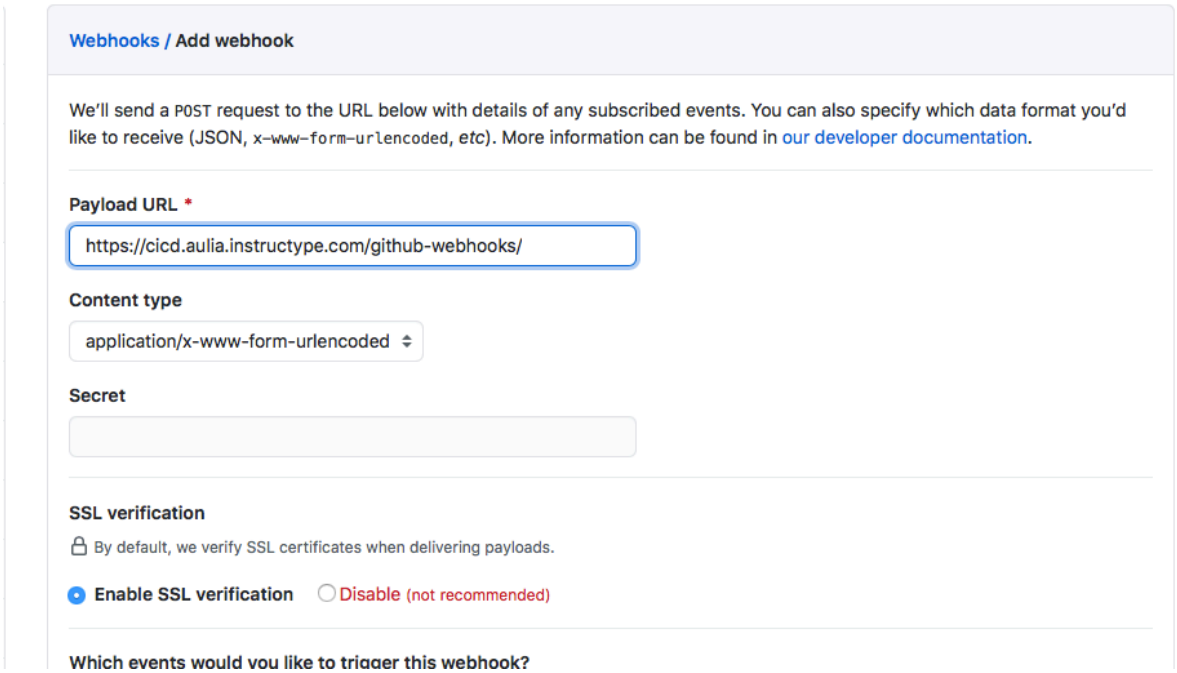
24. Tambahkan repositori github backend.

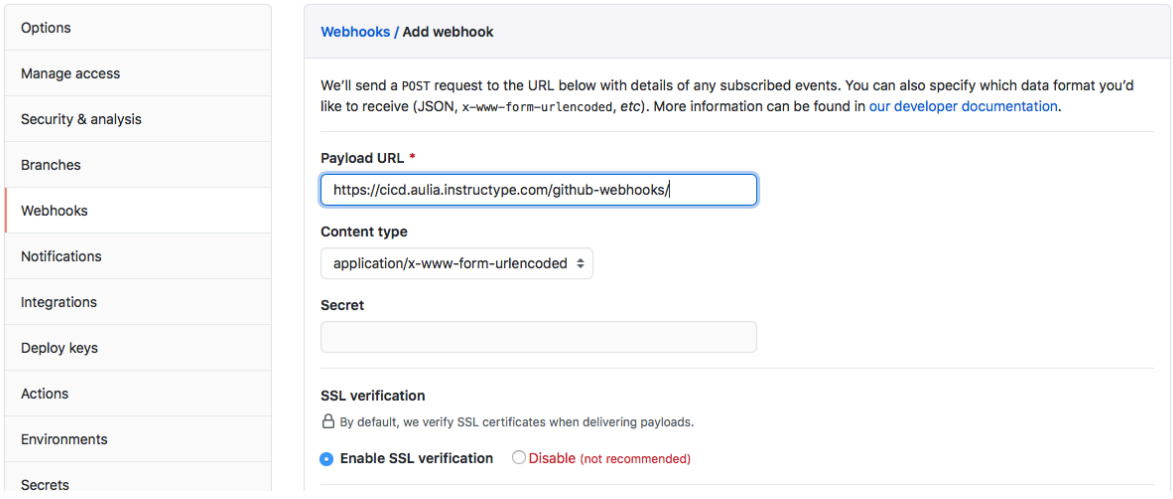


25. Sama seperti frontend , Pada bagian build tambahkan publish over ssh dan post build action sama dengan membuat docker compose.

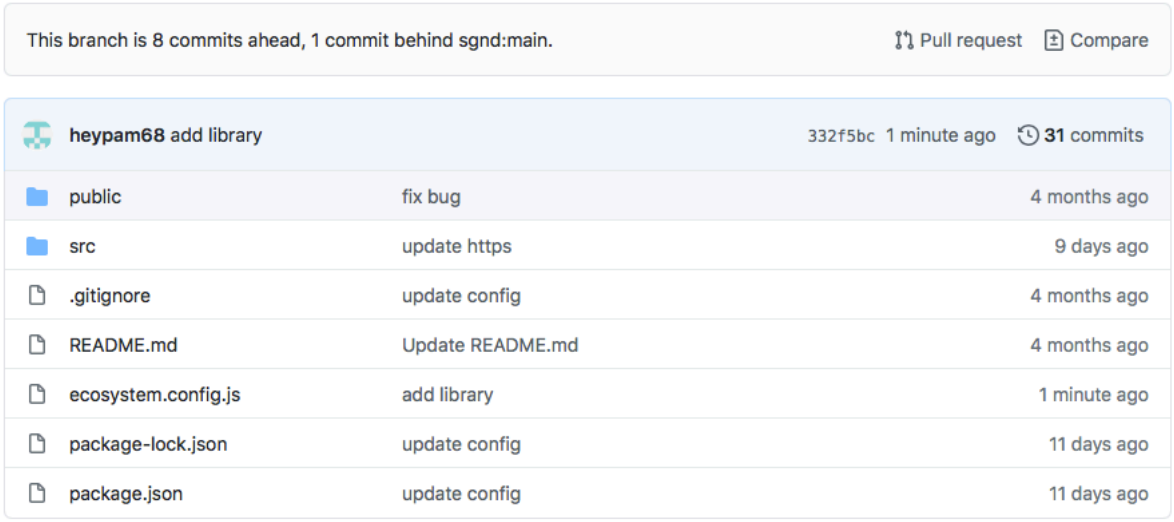


26. Hubungkan github dengan webhook untuk frontend & backend.

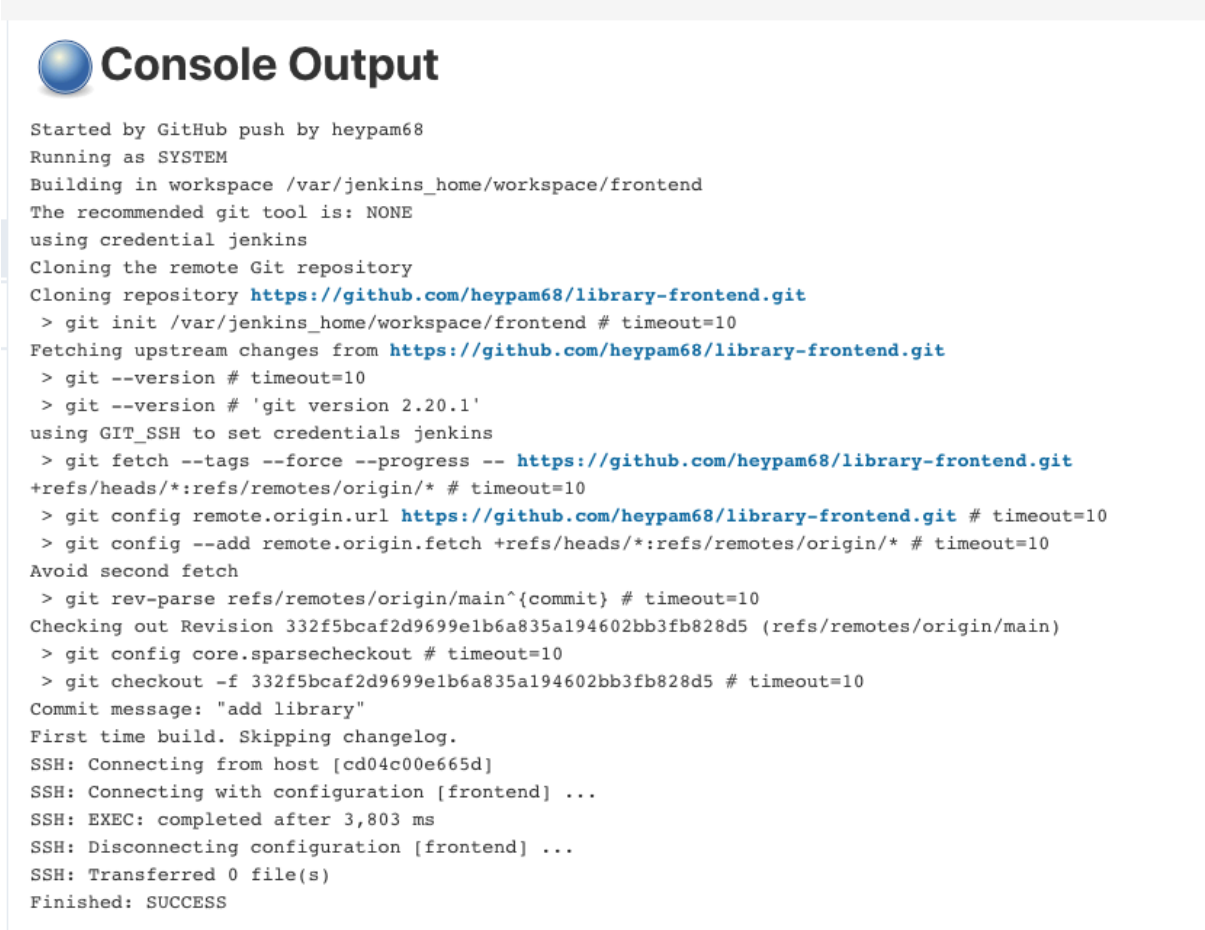




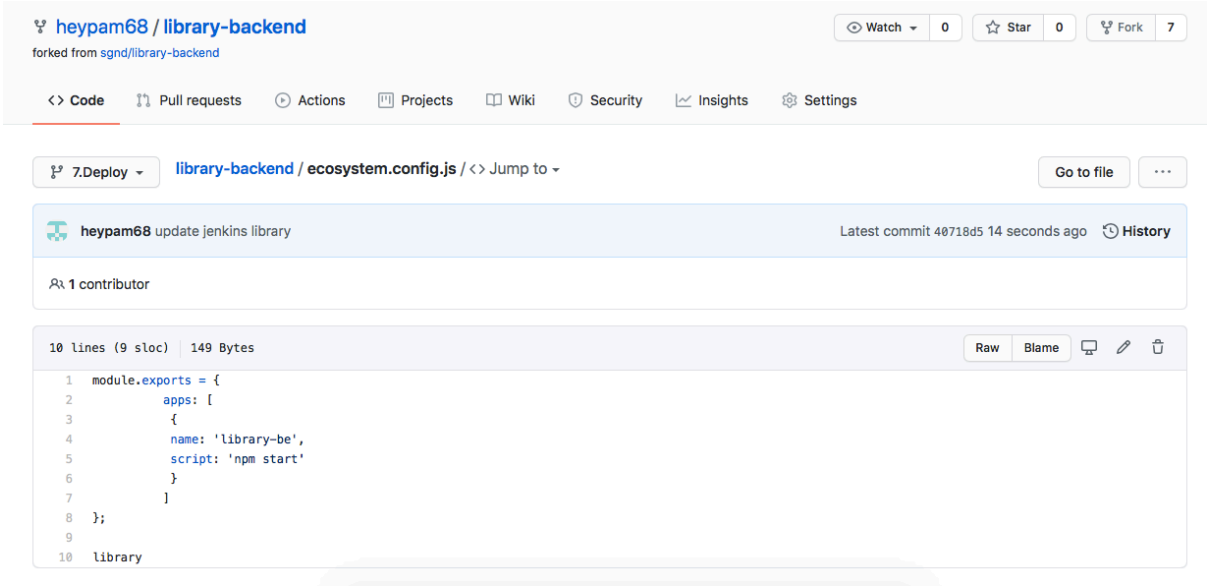
27. Coba test update pada github apakah Jenkins dapat menerima perubahan , untuk frontend.



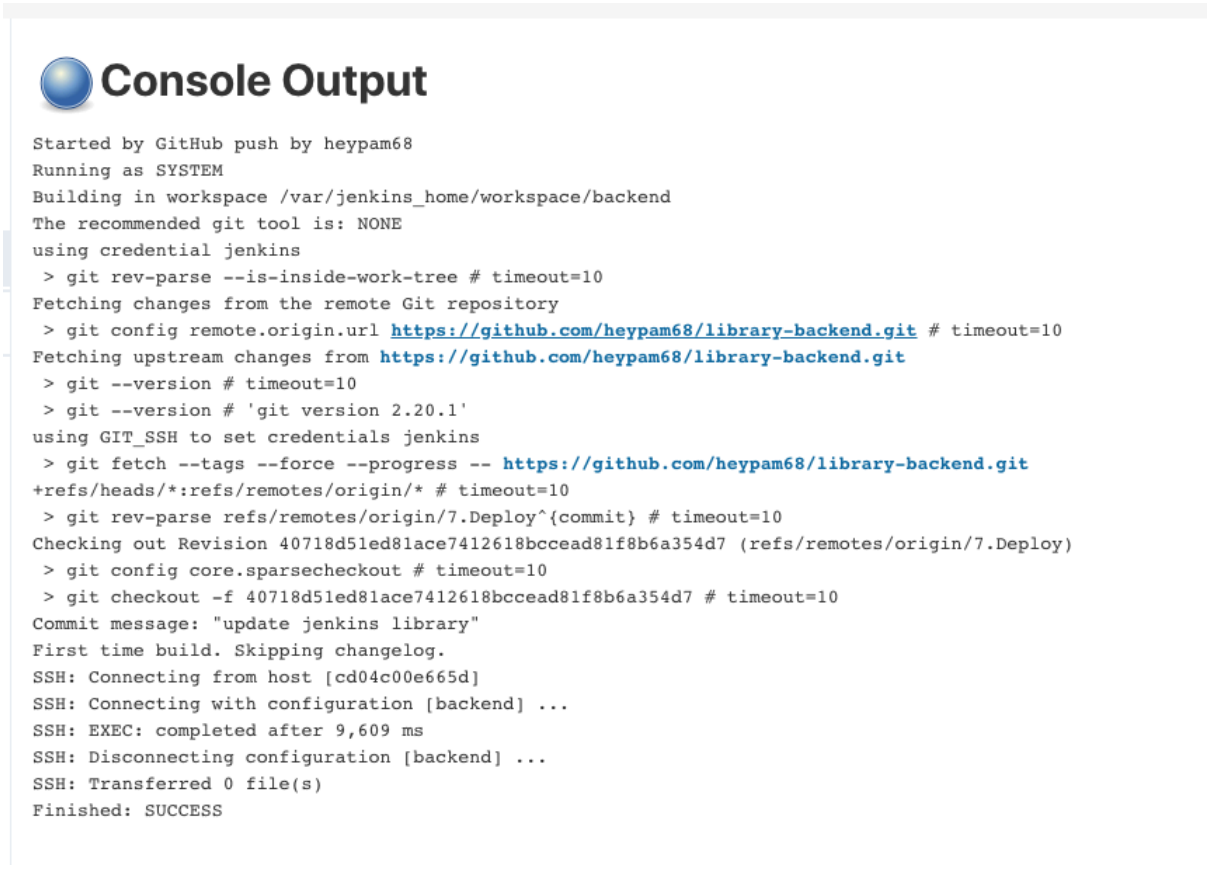
28. Jenkins menerima perubahan dari github frontend.



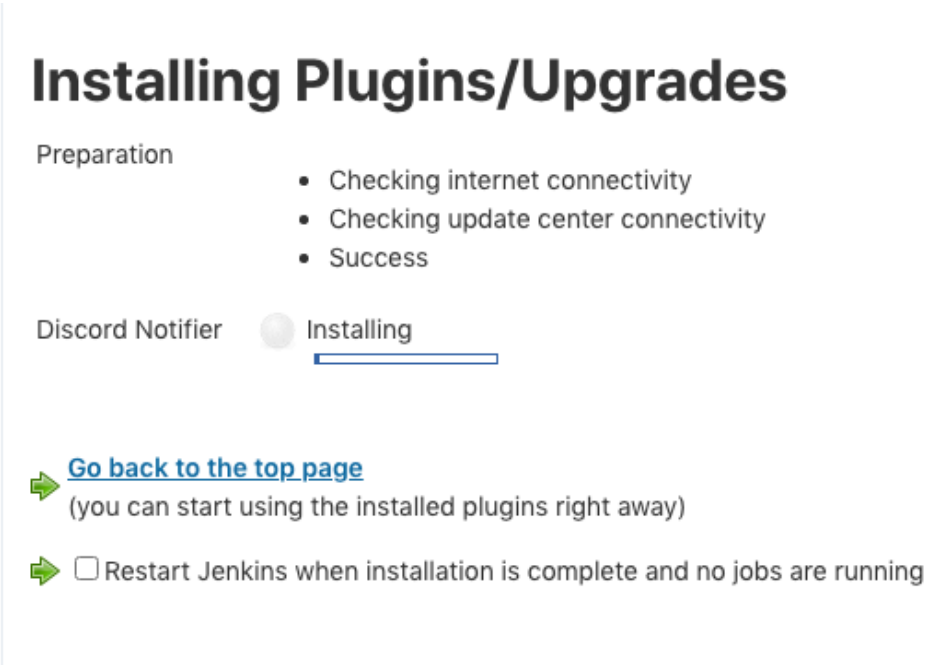
29. Coba test update pada github apakah Jenkins dapat menerima perubahan , untuk backend.



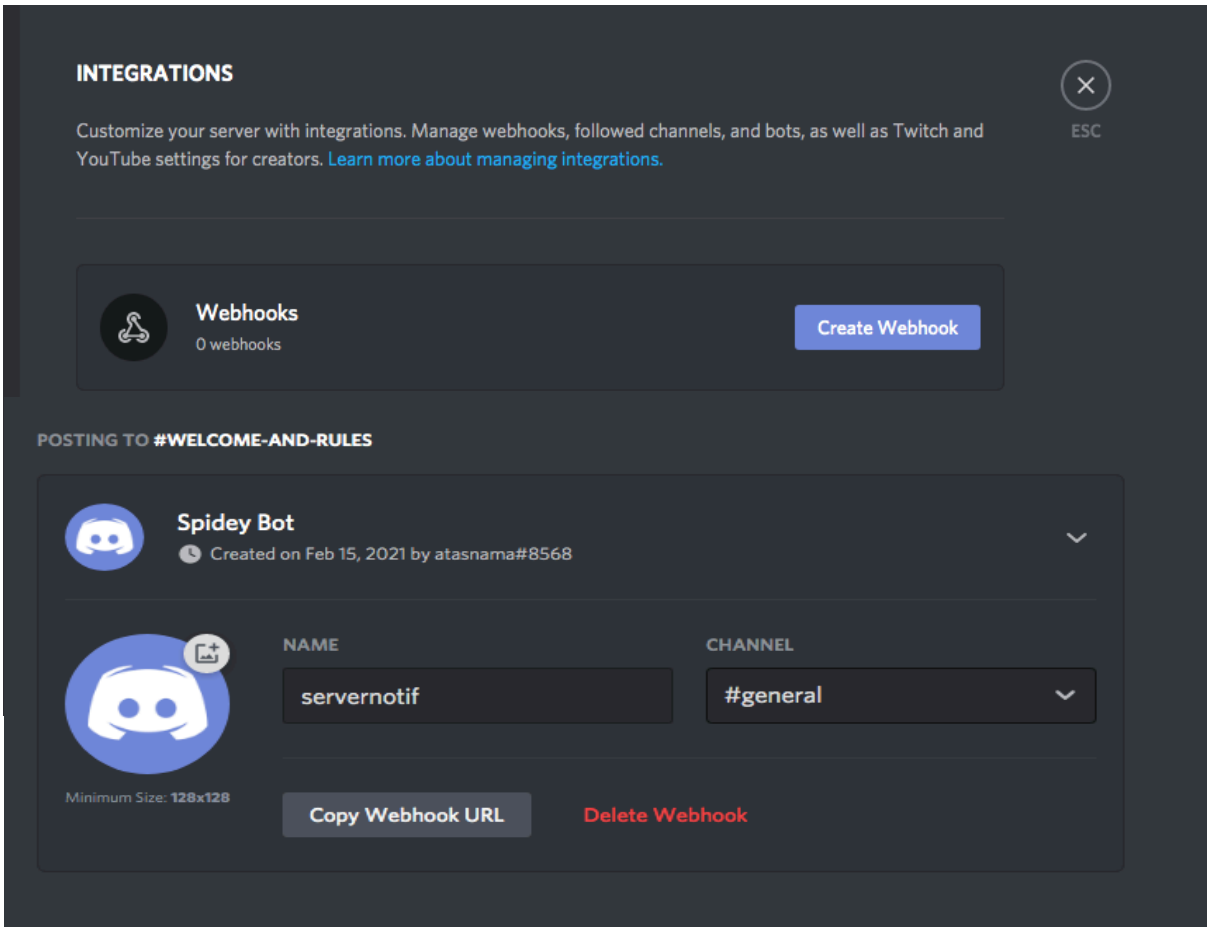
30. Jenkins menerima perubahan dari github backend.



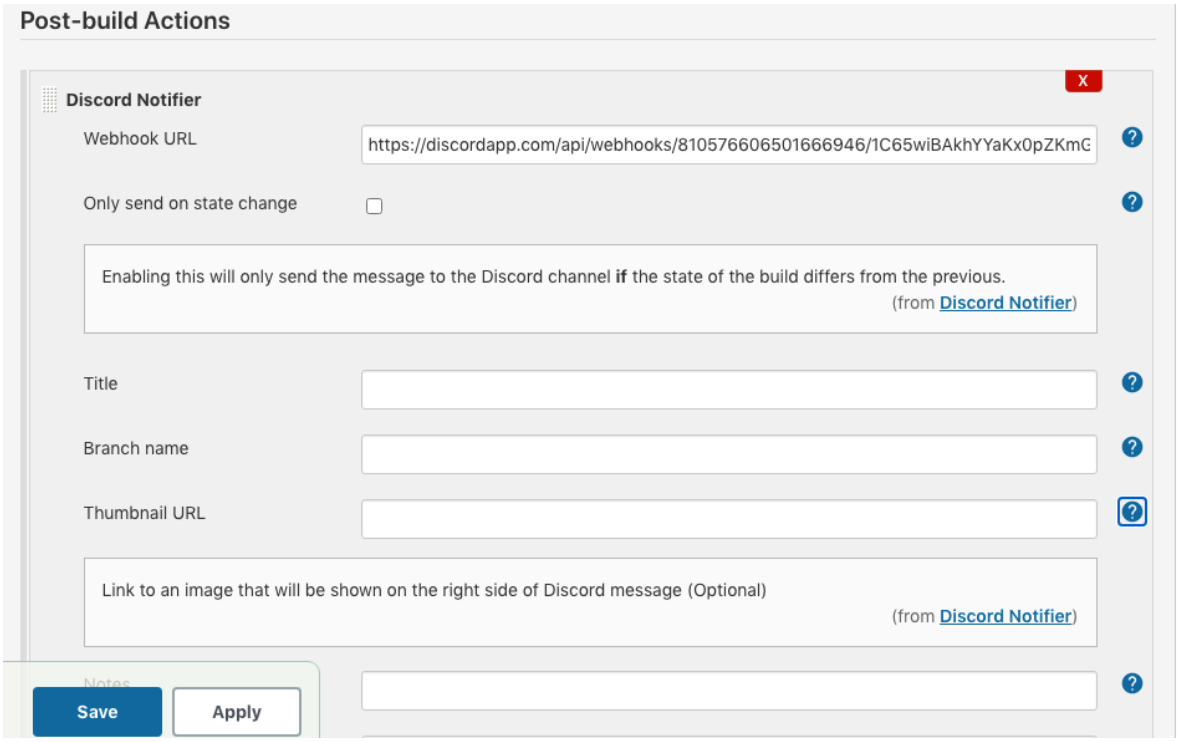
31. Agar dapat terhubung notifikasi ke beberapa platfrom , disini mencoba memakai discord , pada menu Jenkins install discord notify.



32. Coba buat room untuk notifikasi server dan hubungkan dengan webhooks , sebelum dihubungkan kita buat webhook di discord.



33. Masukan url yang telah di buat di discord ke Jenkins.



34. Coba buat update code untuk github apakah ada pemberitahuan ke Jenkins dan discord.