

GIT , SETUP DATABASE , DEPLOY BACKEND APPLICATION , REVERSE BACKEND APPLICATION & POINTING DOMAIN & SSL.

- *Percobaan disini menggunakan 2 server backend 2 server frontend & 2 server cluster mysql.*
1. Buat akun git dan login menggunakan account git yang sudah di buat , lalu lakukan fork ke repositori lain .

The image shows two screenshots of GitHub repository pages. The top screenshot is for the 'library-frontend' repository, forked from 'sgnd/library-frontend'. It shows the main branch with 4 branches and 0 tags. The commit history shows a commit by 'nuraskiah' titled 'fix styling' on Nov 20, 2020. The file list includes 'public', 'src', '.gitignore', 'README.md', 'package-lock.json', and 'package.json'. The bottom screenshot is for the 'library-backend' repository, forked from 'sgnd/library-backend'. It shows the '1.Login-API' branch with 7 branches and 0 tags. The commit history shows a commit by 'nuraskiah' titled 'add Login-API' on Oct 10, 2020. The file list includes 'config', 'migrations', 'models', 'node_modules', 'src', '.env', 'package-lock.json', 'package.json', and 'server.js'.

library-frontend
forked from sgnd/library-frontend

main 4 branches 0 tags

This branch is even with sgnd:main.

Commit History:

Commit	Author	Date	Commits
nuraskiah fix styling	67e384b	on Nov 20, 2020	23 commits

File List:

File	Description	Time
public	fix bug	3 months ago
src	fix styling	2 months ago
.gitignore	update config	3 months ago
README.md	Update README.md	4 months ago
package-lock.json	integrate backend	4 months ago
package.json	integrate backend	4 months ago

README.md

lib'rarrv

library-backend
forked from sgnd/library-backend

1.Login-API 7 branches 0 tags

This branch is even with sgnd:1.Login-API.

Commit History:

Commit	Author	Date	Commits
nuraskiah add Login-API	bd07233	on Oct 10, 2020	1 commit

File List:

File	Description	Time
config	add Login-API	4 months ago
migrations	add Login-API	4 months ago
models	add Login-API	4 months ago
node_modules	add Login-API	4 months ago
src	add Login-API	4 months ago
.env	add Login-API	4 months ago
package-lock.json	add Login-API	4 months ago
package.json	add Login-API	4 months ago
server.js	add Login-API	4 months ago

2. Sesudah melakukan fork ke repositori lain , agar repositori kita dapat menggunakan kunci public ke git maka lakukan generate kunci di server backend & frontend. Dan masukan kunci public ke settingan git , Lalu coba akses dengan ssh. Disini menggunakan git push , git clone.

```
ubuntu@ip-10-20-3-176:~/.ssh$ ssh-keygen -C "dw@be"
Generating public/private rsa key pair.
[Enter file in which to save the key (/home/ubuntu/.ssh/id_rsa):
[Enter passphrase (empty for no passphrase):
[Enter same passphrase again:
Your identification has been saved in /home/ubuntu/.ssh/id_rsa.
Your public key has been saved in /home/ubuntu/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:qFjqIHreBuVgYvv/f9Qa3eI5jI9gMyTFnfQLapSenDk dw@be
The key's randomart image is:
+---[RSA 2048]-----+
|
| .
| . + o
| = + .
|..o . . = = . .
|.o.+ . ..SE o..
|..+.. + .o + .
| +.. =. * o
|.o.o. . ++.=
|=oo.o.....
+---[SHA256]-----+
```

SSH keys / Add new

Title

dw-be

Key

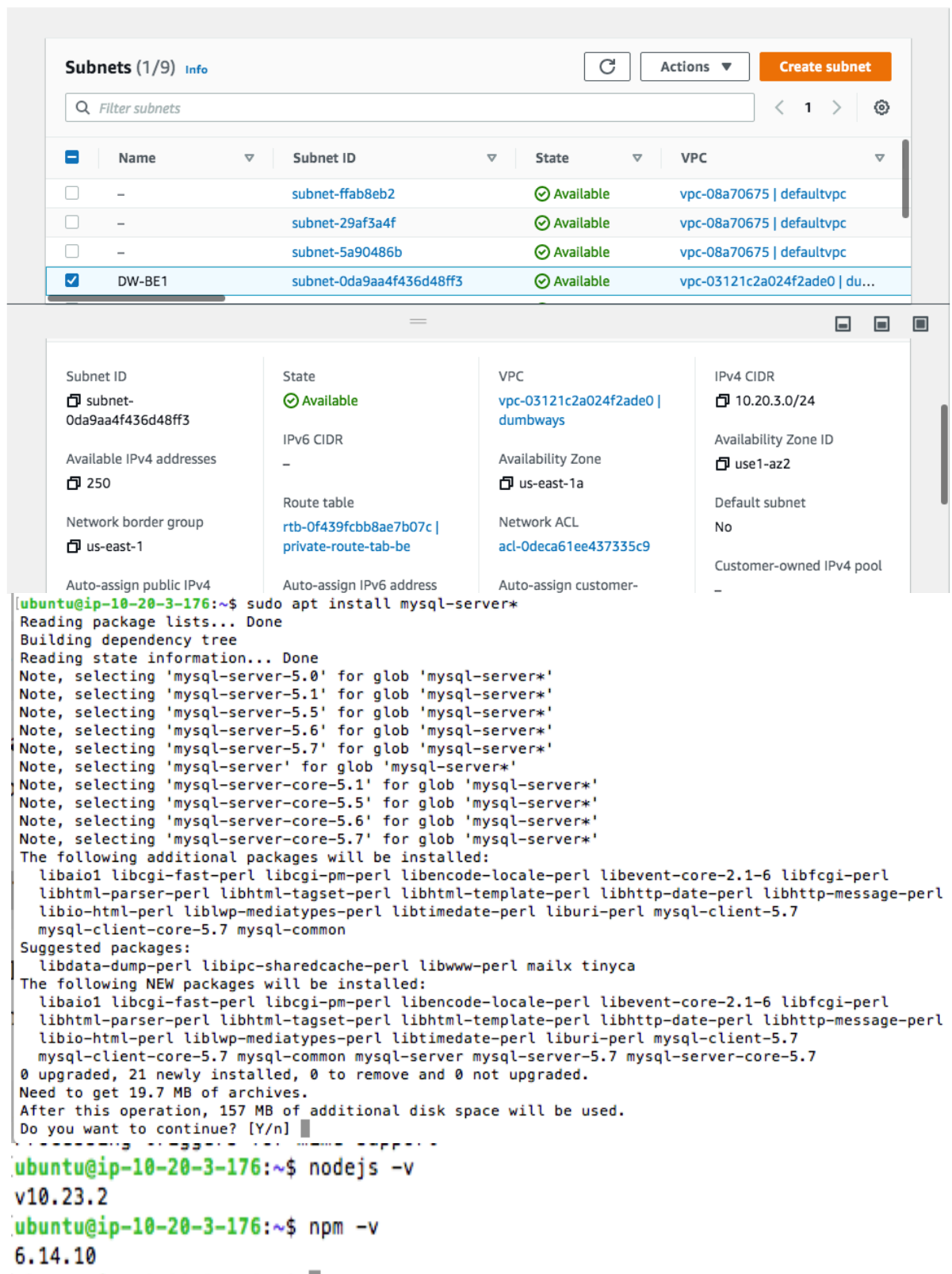
```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDAQDXWW+IKSavEuNnv85LpoSGirTGzKB9aE+8PKG50LyC8VlrO3hsAS
DYuq1sAJ2BIfj/5CRO6JBrtV7F6qd7Xi7E+wzGXWeY9vP4huBO7N/ap0LMSBKew7aRbfUOsdobpp4LI9++oGf
JinODcRx0dXR+my4egk97vMwQMPBUblBIaen5R2Ld4NwixQ4dmBk32z0Db30uaU8SHQWASTM4KK0t2iYIHt
DyALp6FBi5g+EvoSaSy+aPVu3tntshzNY+XGp+3pZ3p/K2S1rY8DANKL6PaWktoXVAwMt0rn8kbYNBp/vP7GBc
Q8ZULK0GvFS0oUUMPLE8zd+a5c0olxxwNZ dw@be
```

Add SSH key

```
ubuntu@ip-10-20-2-200:~/library-frontend$ git push
Warning: Permanently added the RSA host key for IP address '140.82.114.3' to the list of known hosts.
Counting objects: 8, done.
Compressing objects: 100% (7/7), done.
Writing objects: 100% (8/8), 7.90 KiB | 1011.00 KiB/s, done.
Total 8 (delta 4), reused 0 (delta 0)
remote: Resolving deltas: 100% (4/4), completed with 4 local objects.
To github.com:heypam68/library-frontend.git
67e384b..0b3a7ae main -> main

ubuntu@ip-10-20-3-48:~$ git clone git@github.com:heypam68/library-backend.git
Cloning into 'library-backend'...
The authenticity of host 'github.com (140.82.114.3)' can't be established.
RSA key fingerprint is SHA256:nThbg6kXUpJWGL7E1IG0CspRomTxdCARLviKw6E5SY8.
[Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'github.com,140.82.114.3' (RSA) to the list of known hosts.
remote: Enumerating objects: 6409, done.
remote: Counting objects: 100% (6409/6409), done.
remote: Compressing objects: 100% (4892/4892), done.
remote: Total 6409 (delta 1335), reused 6297 (delta 1228), pack-reused 0
Receiving objects: 100% (6409/6409), 16.52 MiB | 17.21 MiB/s, done.
Resolving deltas: 100% (1335/1335), done.
```

3. Buat 1 server backend dengan spesifikasi menggunakan 15 gb ssd , dan private ip dengan nat gateway agar dapat terkoneksi ke internet walaupun dengan koneksi private , lalu install package yang di butuhkan.



The image shows two parts: a screenshot of the AWS Subnets console and a terminal window showing the installation of MySQL and Node.js.

AWS Subnets (1/9) Info

Name	Subnet ID	State	VPC
-	subnet-ffab8eb2	Available	vpc-08a70675 defaultvpc
-	subnet-29af3a4f	Available	vpc-08a70675 defaultvpc
-	subnet-5a90486b	Available	vpc-08a70675 defaultvpc
DW-BE1	subnet-0da9aa4f436d48ff3	Available	vpc-03121c2a024f2ade0 du...

Subnet Details:

- Subnet ID: subnet-0da9aa4f436d48ff3
- State: Available
- VPC: vpc-03121c2a024f2ade0 | dumbways
- IPv4 CIDR: 10.20.3.0/24
- Available IPv4 addresses: 250
- Availability Zone: us-east-1a
- Network border group: us-east-1
- Route table: rtb-0f439fcb8ae7b07c | private-route-tab-be
- Network ACL: acl-0deca61ee437335c9
- Auto-assign public IPv4: -
- Auto-assign IPv6 address: -
- Auto-assign customer-: -

Terminal Output:

```

ubuntu@ip-10-20-3-176:~$ sudo apt install mysql-server*
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'mysql-server-5.0' for glob 'mysql-server*'
Note, selecting 'mysql-server-5.1' for glob 'mysql-server*'
Note, selecting 'mysql-server-5.5' for glob 'mysql-server*'
Note, selecting 'mysql-server-5.6' for glob 'mysql-server*'
Note, selecting 'mysql-server-5.7' for glob 'mysql-server*'
Note, selecting 'mysql-server' for glob 'mysql-server*'
Note, selecting 'mysql-server-core-5.1' for glob 'mysql-server*'
Note, selecting 'mysql-server-core-5.5' for glob 'mysql-server*'
Note, selecting 'mysql-server-core-5.6' for glob 'mysql-server*'
Note, selecting 'mysql-server-core-5.7' for glob 'mysql-server*'
The following additional packages will be installed:
  libaio1 libcgi-fast-perl libcgi-pm-perl libencode-locale-perl libevent-core-2.1-6 libfcgi-perl
  libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl
  libio-html-perl liblwp-mediatypes-perl libtimedate-perl liburi-perl mysql-client-5.7
  mysql-client-core-5.7 mysql-common
Suggested packages:
  libdata-dump-perl libipc-sharedcache-perl libwww-perl mailx tinyca
The following NEW packages will be installed:
  libaio1 libcgi-fast-perl libcgi-pm-perl libencode-locale-perl libevent-core-2.1-6 libfcgi-perl
  libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl
  libio-html-perl liblwp-mediatypes-perl libtimedate-perl liburi-perl mysql-client-5.7
  mysql-client-core-5.7 mysql-common mysql-server mysql-server-5.7 mysql-server-core-5.7
0 upgraded, 21 newly installed, 0 to remove and 0 not upgraded.
Need to get 19.7 MB of archives.
After this operation, 157 MB of additional disk space will be used.
Do you want to continue? [Y/n]

ubuntu@ip-10-20-3-176:~$ nodejs -v
v10.23.2
ubuntu@ip-10-20-3-176:~$ npm -v
6.14.10
  
```

4. Test database mysql di local dengan menggunakan user root .

```

[ubuntu@ip-10-20-3-176:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 3
Server version: 5.7.33-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> exi
[ -> exit
[ -> ;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL
server version for the right syntax to use near 'exi
exit' at line 1
mysql> \q
Bye

```

5. Buat database mysql dengan nama library dan juga usernya. Setelah pembuatan coba test pada server frontend dan local dengan alamat private ip. Disini user menggunakan root , pada kasus menggunakan library untuk user nya.

```

[ubuntu@ip-10-20-1-52:~$ mysql -u root -p -h 10.20.3.176
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 6
Server version: 5.7.33-0ubuntu0.18.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>

mysql> create database library;
Query OK, 1 row affected (0.00 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| library |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.00 sec)

```

6. Setelah membuat database dan user , agar aplikasi dapat terhubung dengan database yang telah kita buat , ganti konfigurasi untuk terhubung ke database sesuai kan dengan database yang sudah di buat.

```
ubuntu@ip-10-20-1-52:~$ mysql -u library -p -h 10.20.3.89
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 36
Server version: 5.7.33-0ubuntu0.18.04.1-log (Ubuntu)
```

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```
mysql> \q
Bye
```

- ```
ubuntu@ip-10-20-3-176:~/library-backend$ sudo sequelize db:migrate
```

```
Loaded configuration file "config/config.json".
Using environment "development".
== 20201010062448-create-user: migrating =====
== 20201010062448-create-user: migrated (0.041s)

== 20201010090313-create-category: migrating =====
== 20201010090313-create-category: migrated (0.027s)

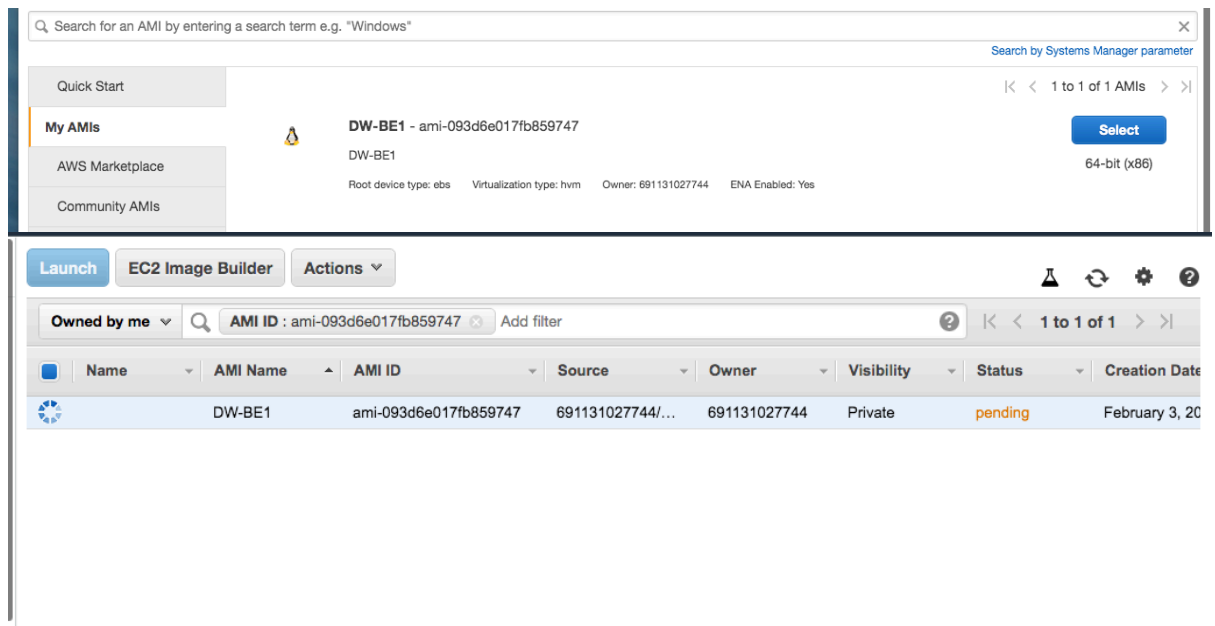
== 20201010135246-create-book: migrating =====
== 20201010135246-create-book: migrated (0.032s)

== 20201015122709-create-bookmark: migrating =====
== 20201015122709-create-bookmark: migrated (0.032s)
```

- ```
mysql> show tables;
+-----+
| Tables_in_library |
+-----+
| Bookmarks          |
| Books              |
| Categories         |
| SequelizeMeta      |
| Users              |
+-----+
5 rows in set (0.00 sec)

mysql> select * from Books;
+-----+-----+-----+-----+-----+-----+
| id | title | author | publication | categoryId | userId |
+-----+-----+-----+-----+-----+-----+
| 1  | 1234  | 12345  | 123456789  | 1          | 1      |
+-----+-----+-----+-----+-----+-----+
| 2  | 5678  | 56789  | 567890123  | 2          | 2      |
+-----+-----+-----+-----+-----+-----+
| 3  | 9012  | 90123  | 901234567  | 3          | 3      |
+-----+-----+-----+-----+-----+-----+
| 4  | 3456  | 34567  | 345678901  | 4          | 4      |
+-----+-----+-----+-----+-----+-----+
| 5  | 7890  | 78901  | 789012345  | 5          | 5      |
+-----+-----+-----+-----+-----+-----+
| 6  | 2345  | 23456  | 234567890  | 6          | 6      |
+-----+-----+-----+-----+-----+-----+
| 7  | 6789  | 67890  | 678901234  | 7          | 7      |
+-----+-----+-----+-----+-----+-----+
| 8  | 0123  | 01234  | 012345678  | 8          | 8      |
+-----+-----+-----+-----+-----+-----+
| 9  | 4567  | 45678  | 456789012  | 9          | 9      |
+-----+-----+-----+-----+-----+-----+
| 10 | 8901  | 89012  | 890123456  | 10         | 10     |
+-----+-----+-----+-----+-----+-----+
| 11 | 1234  | 12345  | 123456789  | 11         | 11     |
+-----+-----+-----+-----+-----+-----+
| 12 | 5678  | 56789  | 567890123  | 12         | 12     |
+-----+-----+-----+-----+-----+-----+
| 13 | 9012  | 90123  | 901234567  | 13         | 13     |
+-----+-----+-----+-----+-----+-----+
| 14 | 3456  | 34567  | 345678901  | 14         | 14     |
+-----+-----+-----+-----+-----+-----+
| 15 | 7890  | 78901  | 789012345  | 15         | 15     |
+-----+-----+-----+-----+-----+-----+
| 16 | 2345  | 23456  | 234567890  | 16         | 16     |
+-----+-----+-----+-----+-----+-----+
| 17 | 6789  | 67890  | 678901234  | 17         | 17     |
+-----+-----+-----+-----+-----+-----+
| 18 | 0123  | 01234  | 012345678  | 18         | 18     |
+-----+-----+-----+-----+-----+-----+
| 19 | 4567  | 45678  | 456789012  | 19         | 19     |
+-----+-----+-----+-----+-----+-----+
| 20 | 8901  | 89012  | 890123456  | 20         | 20     |
+-----+-----+-----+-----+-----+-----+
| 21 | 1234  | 12345  | 123456789  | 21         | 21     |
+-----+-----+-----+-----+-----+-----+
| 22 | 5678  | 56789  | 567890123  | 22         | 22     |
+-----+-----+-----+-----+-----+-----+
| 23 | 9012  | 90123  | 901234567  | 23         | 23     |
+-----+-----+-----+-----+-----+-----+
| 24 | 3456  | 34567  | 345678901  | 24         | 24     |
+-----+-----+-----+-----+-----+-----+
| 25 | 7890  | 78901  | 789012345  | 25         | 25     |
+-----+-----+-----+-----+-----+-----+
| 26 | 2345  | 23456  | 234567890  | 26         | 26     |
+-----+-----+-----+-----+-----+-----+
| 27 | 6789  | 67890  | 678901234  | 27         | 27     |
+-----+-----+-----+-----+-----+-----+
| 28 | 0123  | 01234  | 012345678  | 28         | 28     |
+-----+-----+-----+-----+-----+-----+
| 29 | 4567  | 45678  | 456789012  | 29         | 29     |
+-----+-----+-----+-----+-----+-----+
| 30 | 8901  | 89012  | 890123456  | 30         | 30     |
+-----+-----+-----+-----+-----+-----+
| 31 | 1234  | 12345  | 123456789  | 31         | 31     |
+-----+-----+-----+-----+-----+-----+
| 32 | 5678  | 56789  | 567890123  | 32         | 32     |
+-----+-----+-----+-----+-----+-----+
| 33 | 9012  | 90123  | 901234567  | 33         | 33     |
+-----+-----+-----+-----+-----+-----+
| 34 | 3456  | 34567  | 345678901  | 34         | 34     |
+-----+-----+-----+-----+-----+-----+
| 35 | 7890  | 78901  | 789012345  | 35         | 35     |
+-----+-----+-----+-----+-----+-----+
| 36 | 2345  | 23456  | 234567890  | 36         | 36     |
+-----+-----+-----+-----+-----+-----+
| 37 | 6789  | 67890  | 678901234  | 37         | 37     |
+-----+-----+-----+-----+-----+-----+
| 38 | 0123  | 01234  | 012345678  | 38         | 38     |
+-----+-----+-----+-----+-----+-----+
| 39 | 4567  | 45678  | 456789012  | 39         | 39     |
+-----+-----+-----+-----+-----+-----+
| 40 | 8901  | 89012  | 890123456  | 40         | 40     |
+-----+-----+-----+-----+-----+-----+
| 41 | 1234  | 12345  | 123456789  | 41         | 41     |
+-----+-----+-----+-----+-----+-----+
| 42 | 5678  | 56789  | 567890123  | 42         | 42     |
+-----+-----+-----+-----+-----+-----+
| 43 | 9012  | 90123  | 901234567  | 43         | 43     |
+-----+-----+-----+-----+-----+-----+
| 44 | 3456  | 34567  | 345678901  | 44         | 44     |
+-----+-----+-----+-----+-----+-----+
| 45 | 7890  | 78901  | 789012345  | 45         | 45     |
+-----+-----+-----+-----+-----+-----+
| 46 | 2345  | 23456  | 234567890  | 46         | 46     |
+-----+-----+-----+-----+-----+-----+
| 47 | 6789  | 67890  | 678901234  | 47         | 47     |
+-----+-----+-----+-----+-----+-----+
| 48 | 0123  | 01234  | 012345678  | 48         | 48     |
+-----+-----+-----+-----+-----+-----+
| 49 | 4567  | 45678  | 456789012  | 49         | 49     |
+-----+-----+-----+-----+-----+-----+
| 50 | 8901  | 89012  | 890123456  | 50         | 50     |
+-----+-----+-----+-----+-----+-----+
| 51 | 1234  | 12345  | 123456789  | 51         | 51     |
+-----+-----+-----+-----+-----+-----+
| 52 | 5678  | 56789  | 567890123  | 52         | 52     |
+-----+-----+-----+-----+-----+-----+
| 53 | 9012  | 90123  | 901234567  | 53         | 53     |
+-----+-----+-----+-----+-----+-----+
| 54 | 3456  | 34567  | 345678901  | 54         | 54     |
+-----+-----+-----+-----+-----+-----+
| 55 | 7890  | 78901  | 789012345  | 55         | 55     |
+-----+-----+-----+-----+-----+-----+
| 56 | 2345  | 23456  | 234567890  | 56         | 56     |
+-----+-----+-----+-----+-----+-----+
| 57 | 6789  | 67890  | 678901234  | 57         | 57     |
+-----+-----+-----+-----+-----+-----+
| 58 | 0123  | 01234  | 012345678  | 58         | 58     |
+-----+-----+-----+-----+-----+-----+
| 59 | 4567  | 45678  | 456789012  | 59         | 59     |
+-----+-----+-----+-----+-----+-----+
| 60 | 8901  | 89012  | 890123456  | 60         | 60     |
+-----+-----+-----+-----+-----+-----+
| 61 | 1234  | 12345  | 123456789  | 61         | 61     |
+-----+-----+-----+-----+-----+-----+
| 62 | 5678  | 56789  | 567890123  | 62         | 62     |
+-----+-----+-----+-----+-----+-----+
| 63 | 9012  | 90123  | 901234567  | 63         | 63     |
+-----+-----+-----+-----+-----+-----+
| 64 | 3456  | 34567  | 345678901  | 64         | 64     |
+-----+-----+-----+-----+-----+-----+
| 65 | 7890  | 78901  | 789012345  | 65         | 65     |
+-----+-----+-----+-----+-----+-----+
| 66 | 2345  | 23456  | 234567890  | 66         | 66     |
+-----+-----+-----+-----+-----+-----+
| 67 | 6789  | 67890  | 678901234  | 67         | 67     |
+-----+-----+-----+-----+-----+-----+
| 68 | 0123  | 01234  | 012345678  | 68         | 68     |
+-----+-----+-----+-----+-----+-----+
| 69 | 4567  | 45678  | 456789012  | 69         | 69     |
+-----+-----+-----+-----+-----+-----+
| 70 | 8901  | 89012  | 890123456  | 70         | 70     |
+-----+-----+-----+-----+-----+-----+
| 71 | 
```


9. Untuk Pembuatan instance backend 1 server dikarenakan akan ada proses load balancing database backend , clone dari server 1 backend , dengan cara pembuatan ami pada be-1 dan buat server dengan spesifikasi yang sama.



10. Setelah pembuatan 2 server untuk backend , lalu buat konfigurasi untuk nginx pada server reverse proxy , yang rencananya 2 server backend menggunakan load balancing. Pada server backend port yang di gunakan untuk jalankan aplikasi adalah port 5000 sedangkan pada frontend port yang di jalankan pada port 3000.

```
server {
    listen 80;
    server_name api.aulia.instructype.com;
    return 301 https://$host$request_uri; #Redirect http ke https
    access_log /var/log/nginx/api.aulia.instructype.com.access.log;
    error_log /var/log/nginx/api.aulia.instructype.com.error.log warn;
}

upstream be {
    server 10.20.3.89:5000; #dw_be1
    server 10.20.4.96:5000; #dw_be2
}

server {
    listen 443 ssl;
    server_name api.aulia.instructype.com;
    ssl_certificate /etc/letsencrypt/live/api.aulia.instructype.com/fullchain.pem;
    ssl_certificate_key /etc/letsencrypt/live/api.aulia.instructype.com/privkey.pem;
    access_log /var/log/nginx/api.aulia.instructype.com.access.log;
    error_log /var/log/nginx/api.aulia.instructype.com.error.log warn;
    #ssl_session_cache shared:SSL:50m;
    #ssl_stapling on;
    #ssl_stapling_verify on;

    location / {
        #proxy_set_header X-Real-IP $remote_addr;
        #proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        #proxy_set_header Host $host;
        #fastcgi_param REMOTE_ADDR $http_x_real_ip;
        proxy_pass http://be;
        #client_max_body_size 50m;
        #proxy_buffers 8 16m;
        #proxy_buffer_size 32m;
    }
}
```

11. Agar dapat di akses melalui domain arahkan ip reverse domain yang di gunakan untuk koneksi ke server backend , lalu isikan nama domain.

A	api.aulia	3.210.210.47	Auto	 DNS only	Edit
---	-----------	--------------	------	--	----------------------

12. Generate ssl dengan certbot untuk domain api.aulia.instructype , lalu tambahkan agar pada saat akses meminta https.

```
server {
    listen      80;
    server_name  api.aulia.instructype.com;
    return 301 https://$host$request_uri; #Redirect http ke https
    access_log  /var/log/nginx/api.aulia.instructype.com.access.log;
    error_log   /var/log/nginx/api.aulia.instructype.com.error.log warn;
}

upstream be {
    server 10.20.3.89:5000; #dw_be1
    server 10.20.4.96:5000; #dw_be2
}

server {
    listen      443 ssl;
    server_name  api.aulia.instructype.com;
    ssl_certificate /etc/letsencrypt/live/api.aulia.instructype.com/fullchain.pem;
    ssl_certificate_key /etc/letsencrypt/live/api.aulia.instructype.com/privkey.pem;
    access_log  /var/log/nginx/api.aulia.instructype.com.access.log;
    error_log   /var/log/nginx/api.aulia.instructype.com.error.log warn;
    #ssl_session_cache shared:SSL:50m;
    #ssl_stapling on;
    #ssl_stapling_verify on;

    location / {
        #proxy_set_header    X-Real-IP      $remote_addr;
        #proxy_set_header    X-Forwarded-For $proxy_add_x_forwarded_for;
        #proxy_set_header    Host            $host;
        #fastcgi_param        REMOTE_ADDR    $http_x_real_ip;
        proxy_pass            http://be;
        #client_max_body_size 50m;
        #proxy_buffers        8 16m;
        #proxy_buffer_size    32m;
    }
}
```

13. Lalu tambahkan pada konfigurasi pada server frontend agar dapat terkoneksi di server backend . disini menggunakan koneksi ke backend dengan domain.

```
import axios from 'axios';

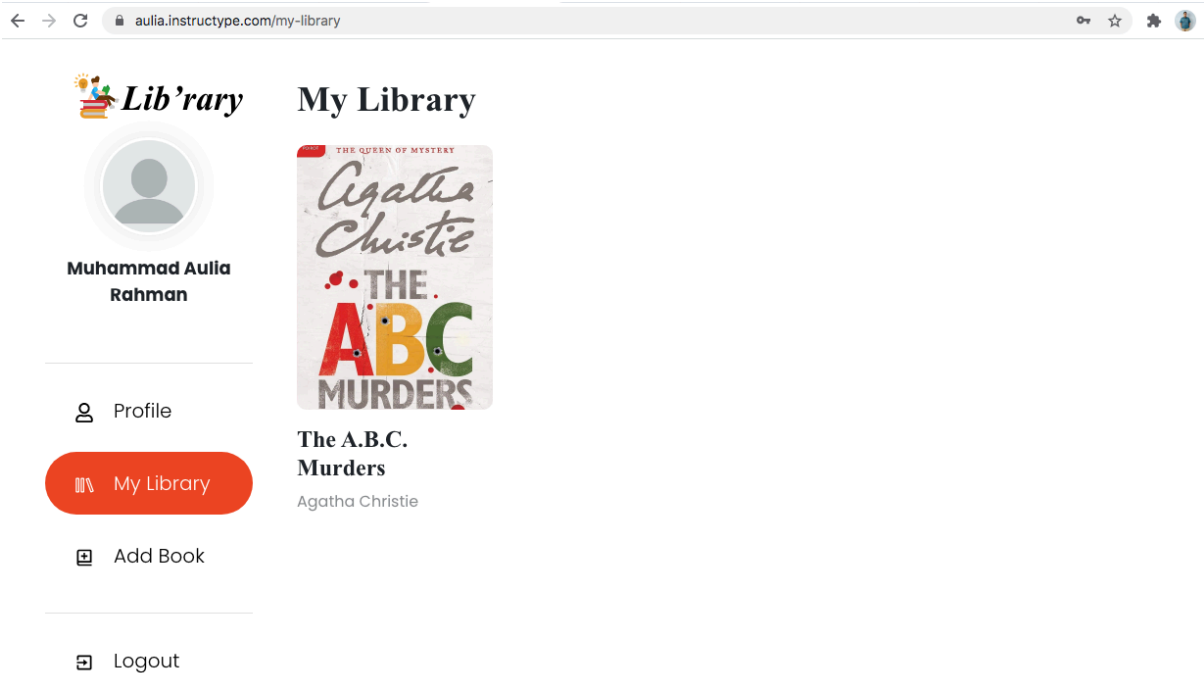
export const API = axios.create({
  ➔ baseURL: 'https://api.aulia.instructype.com/api/v1',
  //baseURL: 'http://10.20.4.96:5000/api/v1',
  //baseURL: 'http://10.20.3.89:5000/api/v1',
  //baseURL: 'https://library-dw18lsfsq.herokuapp.com/api/v1',
});

export const setToken = (token) => {
  if (token) API.defaults.headers.common['Authorization'] = `Bearer ${token}`;
  else delete API.defaults.headers.common['Authorization'];
};

export const imageURL = 'https://res.cloudinary.com/nuraskiah/image/upload';

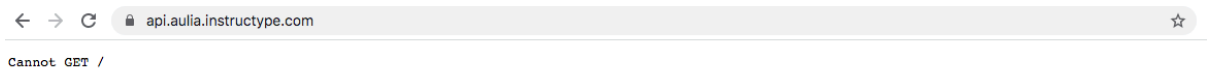
export const fileURL =
  'https://res.cloudinary.com/nuraskiah/raw/upload/library/files';
```

14. Coba lakukan akses pada browser untuk ke api.instructype.com dan aulia.instructype.com , lihat pada apakah sudah terkoneksi ke backend.



```
103.247.196.14 - - [07/Feb/2021:08:22:36 +0000] "OPTIONS /api/v1/bookmarks/8 HTTP/1.1" 204 0 "https://aulia.instructype.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/88.0.4324.146 Safari/537.36"
103.247.196.14 - - [07/Feb/2021:08:22:37 +0000] "GET /api/v1/bookmarks/8 HTTP/1.1" 304 0 "https://aulia.instructype.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/88.0.4324.146 Safari/537.36"
103.247.196.14 - - [07/Feb/2021:08:22:39 +0000] "GET /api/v1/bookmarks/8 HTTP/1.1" 200 264 "https://aulia.instructype.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/88.0.4324.146 Safari/537.36"
103.247.196.14 - - [07/Feb/2021:08:22:41 +0000] "OPTIONS /api/v1/book/6 HTTP/1.1" 204 0 "https://aulia.instructype.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/88.0.4324.146 Safari/537.36"
103.247.196.14 - - [07/Feb/2021:08:22:41 +0000] "GET /api/v1/book/6 HTTP/1.1" 200 672 "https://aulia.instructype.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/88.0.4324.146 Safari/537.36"
103.247.196.14 - - [07/Feb/2021:08:22:43 +0000] "GET /api/v1/book/6 HTTP/1.1" 200 660 "https://aulia.instructype.com/" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/88.0.4324.146 Safari/537.36"
```

- Untuk api.instructype.com koneksi ke sudah terhubung , tetapi masih 404.



```
103.247.196.15 - - [07/Feb/2021:08:26:25 +0000] "GET / HTTP/1.1" 404 139 "-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/88.0.4324.146 Safari/537.36"
```

- Jika salah satu server backend ada yang mati maka load balancing dapat mencari server tetapi sangat lambat , dikarenakan load balancing harus 2 nya berjalan dan minimal 3 server. Berikut ini percobaan disaat 1 server mati dan load balancing akan memberi pesan tidak bisa menemukan server.

```
2021/02/05 15:22:36 [error] 30787#30787: *214 connect() failed (111: Connection refused) while connecting to upstream, client: 103.247.196.57, server: api.aulia.instructype.com, request: "GET /api/v1/bookmarks/8 HTTP/1.1", upstream: "http://10.20.4.96:5000/api/v1/bookmarks/8", host: "api.aulia.instructype.com", referer: "https://aulia.instructype.com/"
2021/02/05 15:22:36 [warn] 30787#30787: *214 upstream server temporarily disabled while connecting to upstream, client: 103.247.196.57, server: api.aulia.instructype.com, request: "GET /api/v1/bookmarks/8 HTTP/1.1", upstream: "http://10.20.4.96:5000/api/v1/bookmarks/8", host: "api.aulia.instructype.com", referer: "https://aulia.instructype.com/"
```


15. Sekarang agar database dapat di akses terus menerus atau membagi peranan pada server lain , disini melakukan cluster database . Untuk cluster database menggunakan cluster yang di sediakan oleh mysql.

- Percobaan menggunakan 1 master untuk database backend-1 dan cluster
- Percobaan menggunakan 1 master untuk database backend-2 dan cluster

16. Sediakan Package yang di butuhkan untuk mysql dan mysql-cluster.

17. Tentukan database yang akan di berikan akses cluster disini database menggunakan nama library dan user library , agar database dapat di beri akses dari localhost & luar.

user	host
library	%
debian-sys-maint	localhost
library	localhost
mysql.session	localhost
mysql.sys	localhost
root	localhost

6 rows in set (0.00 sec)

18. Liat apakah database & user dapat digunakan pada localhost dan dari perubahan ip / semua ip private. Disini menggunakan semua ip. Walaupun terbuka tetapi instance tidak memiliki akses public. Menggunakan nat gateway

```
mysql> SHOW GRANTS FOR 'library'@'%';
```

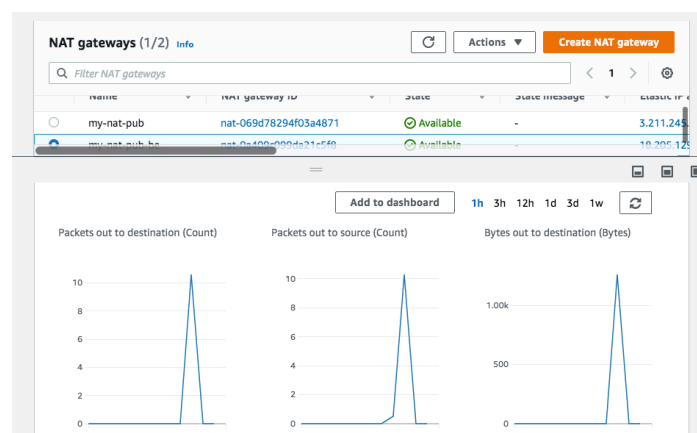
Grants for library@%
GRANT ALL PRIVILEGES ON *.* TO 'library'@'%'

1 row in set (0.00 sec)

```
mysql> SHOW GRANTS FOR 'library'@'localhost';
```

Grants for library@localhost
GRANT ALL PRIVILEGES ON *.* TO 'library'@'localhost'

1 row in set (0.00 sec)



19. Pada bawaan mysql untuk bind address masih di izinkan hanya dari localhost saja, untuk itu bisa di comment atau di buka dari = semua ip / ip private clus

```
[mysqld]
#
# * Basic Settings
#
user                = mysql
pid-file            = /var/run/mysqld/mysqld.pid
socket              = /var/run/mysqld/mysqld.sock
port                = 3306
basedir             = /usr
datadir             = /var/lib/mysql
tmpdir              = /tmp
lc-messages-dir     = /usr/share/mysql
skip-external-locking
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address         = 0.0.0.0
#
# * Fine Tuning
```

20. Agar database tersebut dapat terhubung sebagai penyedia & penerima dari master, opsi adalah konfigurasi *server-id* dan *bin_log* dengan isi database yang mau kira sync *library*. Lakukan ini pada server master 1 & Cluster server. Dimana server-id unik.

- Diasumsikan pada master

```
# other settings you may need to change.
server-id            = 1
log_bin              = /var/log/mysql/mysql-bin.log
expire_logs_days     = 10
max_binlog_size      = 100M
binlog_do_db         = library
binlog_ignore_db     = include_database_name
#
```

- Diasumsikan pada cluster

```
server-id            = 2
log_bin              = /var/log/mysql/mysql-bin.log
expire_logs_days     = 10
max_binlog_size      = 100M
binlog_do_db         = library
binlog_ignore_db     = include_database_name
```

21. Lalu database yang akan di sinkronkan diberi akses replication pada server master. Agar semua database tersinkron dengan data yang sudah ada maka ada opsi di lock.

- *Grant replication slave on *.* to 'library'@'%'.*
- *Flush Privileges;*

```
mysql> show master status;
+-----+-----+-----+-----+-----+
| File | Position | Binlog_Do_DB | Binlog_Ignore_DB | Executed_Gtid_Set |
+-----+-----+-----+-----+-----+
| mysql-bin.000002 | 751 | library | | |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> grant replication slave on *.* to 'library'@'%';
Query OK, 0 rows affected (0.00 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.00 sec)

mysql> flush tables with read lock;
Query OK, 0 rows affected (0.01 sec)
```

22. Selanjutnya lakukan sinkron data master dan slave.

```
[mysql> CHANGE MASTER TO
-> MASTER_HOST='10.20.3.89',
[
-> MASTER_USER='library',
[
-> MASTER_PASSWORD='123456Ad!',
-> MASTER_LOG_FILE='mysql-bin.000004',
[
-> MASTER_LOG_POS= 154;
Query OK, 0 rows affected, 2 warnings (0.02 sec)

[mysql> START SLAVE;
Query OK, 0 rows affected (0.00 sec)

[mysql> SHOW SLAVE STATUS\G;
***** 1. row *****
Slave_IO_State: Waiting for master to send event
Master_Host: 10.20.3.89
Master_User: library
Master_Port: 3306
Connect_Retry: 60
Master_Log_File: mysql-bin.000004
Read_Master_Log_Pos: 154
Relay_Log_File: mysql-relay-bin.000002
Relay_Log_Pos: 320
Relay_Master_Log_File: mysql-bin.000004
Slave_IO_Running: Yes
Slave_SQL_Running: Yes
Replicate_Do_DB:
Replicate_Ignore_DB:
Replicate_Do_Table:
Replicate_Ignore_Table:
Replicate_Wild_Do_Table:
Replicate_Wild_Ignore_Table:
Last_Errno: 0
Last_Error:
Skip_Counter: 0
Exec_Master_Log_Pos: 154
Relay_Log_Space: 527
Until_Condition: None
Until_Log_File:
Until_Log_Pos: 0
Master_SSL_Allowed: No
Master_SSL_CA_File:
Master_SSL_CA_Path:
Master_SSL_Cert:
Master_SSL_Cipher:
Master_SSL_Key:
Seconds_Behind_Master: 0
Master_SSL_Verify_Server_Cert: No
Last_IO_Errno: 0
Last_IO_Error:
Last_SQL_Errno: 0
Last_SQL_Error:
Replicate_Ignore_Server_Ids:
Master_Server_Id: 5
Master_UUID: fadd8c64-65b1-11eb-ae8-1253b413a6b3
```

- Untuk Proses sinkron dengan panah , *host* adalah *ip master* , *master db* dan *password* adalah database yang di sinkron. Lalu *log file* & *log pos* adalah *standby id* dari *master database* . setelah coba start slave ke master , untuk mengecek apakah berhasil dapat melihat di *show slave status\G*;
- Pada Proses ini database cluster hanya dapat menyalin tanpa dapat mengedit , untuk mendapatkan proses yang sama , agar slave dapat mengedit lakukan proses tersebut di master.

23. Lihat apakah database sudah terhubung

```
[mysql> show processlist;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Id | User | Host | db | Command | Time | State | Info |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 2 | root | localhost | library | Query | 0 | starting | show processlist |
| 4 | library | 10.20.3.72:34052 | NULL | Binlog Dump | 786 | Master has sent all binlog to slave; waiting for more updates | NULL |
| 5 | system user | | NULL | Connect | 249 | Waiting for master to send event | NULL |
| 6 | system user | | NULL | Connect | 249 | Slave has read all relay log; waiting for more updates | NULL |
+-----+-----+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

[mysql> use library
Database changed
[mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| library |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.00 sec)

[mysql> show tables;
+-----+
| Tables_in_library |
+-----+
| Bookmarks |
| Books |
| Categories |
| SequelizeMeta |
| Users |
+-----+
5 rows in set (0.00 sec)

mysql> █
```

24. Coba untuk pembuatan table pada master dan apakah pada slave dapat mereplikasi . dan coba hapus pada database slave disini contoh membuat table rep_dw .

- Database Master

```
[mysql> use library;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
```

```
Database changed
[mysql> show tables;
+-----+
| Tables_in_library |
+-----+
| Bookmarks |
| Books |
| Categories |
| SequelizeMeta |
| Users |
| rep_dw |
+-----+
6 rows in set (0.00 sec)
```

- Database Slave – Master 2

```
Database changed
[mysql> show tables;
+-----+
| Tables_in_library |
+-----+
| Bookmarks |
| Books |
| Categories |
| SequelizeMeta |
| Users |
| rep_dw |
+-----+
6 rows in set (0.00 sec)

[mysql> drop tables rep_dw;
Query OK, 0 rows affected (0.01 sec)

mysql> █
```