

Arsitektur Sistem Basis Data Terdistribusi

Pembagian Server

- NDB Management Server :
192.168.16.159
- NDB Data Server
192.168.16.160 , 192.168.16.161 , dan 192.168.16.162
- MySQL Server
192.168.16.163, 192.168.16.164, dan 192.168.16.165
- ProxySQL
192.168.16.166

Proses konfigurasi :

1. Pada server 192.168.16.159 jalankan perintah untuk mendownload file server cluster manager dan jalankan perintah install

```
wget https://dev.mysql.com/get/Downloads/MySQL-Cluster-7.6/mysql-cluster-community-management-server_7.6.12-1ubuntu16.04_amd64.deb
```

```
sudo dpkg -i mysql-cluster-community-management-server_7.6.12-1ubuntu16.04_amd64.d eb
```

2. Melakukan konfigurasi file

```
sudo mkdir /var/lib/mysql-cluster
```

```
sudo nano /var/lib/mysql-cluster/config.ini
```

3. Kemudian edit file config.ini

```
[ndbd default]
NoOfReplicas=3

[ndb_mgmd]
hostname=192.168.16.159
datadir=/var/lib/mysql-cluster

[ndbd]
hostname=192.168.16.160
```

```
NodeId=2
datadir=/usr/local/mysql/data
[ndbd]
hostname=192.168.16.161
NodeId=3
datadir=/usr/local/mysql/data
[ndbd]
hostname=192.168.16.162
NodeId=4
datadir=/usr/local/mysql/data
[mysqld]
hostname=192.168.16.163
[mysqld]
hostname=192.168.16.164
[mysqld]
hostname=192.168.16.165
```

4. Memulai Cluster Manager dengan cara melakukan perintah

```
sudo ndb_mgmd -f /var/lib/mysql-cluster/config.ini
```

5. Kemudian kill server yang berjalan pada node159

```
sudo pkill -f ndb_mgmd
```

6. Lalu edit file `/etc/systemd/system/ndb_mgmd.service` dan tambahkan

```
sudo nano /etc/systemd/system/ndb_mgmd.service

[Unit]
Description=MySQL NDB Cluster Management Server
After=network.target auditd.service

[Service]
```

```
Type=forking
ExecStart=/usr/sbin/ndb_mgmd -f /var/lib/mysql-cluster/config.ini
ExecReload=/bin/kill -HUP $MAINPID
KillMode=process
Restart=on-failure

[Install]
WantedBy=multi-user.target
```

7. Kemudian jalan reload system manager menggunakan daemon-reload jalankan kemudian start dengan mengetikkan perintah

```
sudo systemctl daemon-reload
sudo systemctl enable ndb_mgmd
sudo systemctl start ndb_mgmd
```

8. Kemudian lakukan verifikasi

```
sudo systemctl status ndb_mgmd
```

9. Setelah menyelesaikan konfigurasi pada cluster manager lakukan perintah pada setiap ndb clusternya (192.168.16.160, 192.168.16.161, 192.168.16.162)

```
sudo apt update
sudo apt install libclass-methodmaker-perl
```

10. Kemudian menginstall data node binary dengan dpkg pada setiap ndb cluster

```
sudo dpkg -i mysql-cluster-community-data-node_7.6.6-1ubuntu18.04_amd64.deb
```

11. Edit file my.cnf kemudian tambahkan setiap ndb cluster

```
[mysql_cluster]
# Options for NDB Cluster processes:
ndb-connectstring=192.168.16.159 # location of cluster manager
```

12. Kemudian membuat folder dengan melakukan perintah dan jalankan data tersebut

```
sudo mkdir -p /usr/local/mysql/data
```

```
sudo ndbd
```

13. Lakukan kill ndbd service dengan cara melakukan

```
sudo pkill -f ndbd
```

14. Edit file /etc/systemd/system/ndbd.service

```
sudo nano /etc/systemd/system/ndbd.service
```

[Unit]

Description=MySQL NDB Data Node Daemon

After=network.target auditd.service

[Service]

Type=forking

ExecStart=/usr/sbin/ndbd

ExecReload=/bin/kill -HUP \$MAINPID

KillMode=process

Restart=on-failure

[Install]

WantedBy=multi-user.target

15. Lakukan reload dengan perintah deamon-reload

```
sudo systemctl daemon-reload
```

16. Enable ndbd service

```
sudo systemctl enable ndbd
```

17. Mulai service ndbd

```
sudo systemctl start ndbd
```

18. Cek status servicenya

```
sudo systemctl status ndbd
```

```
vagrant@node160: ~  
Processing triggers for man-db (2.7.5-1) ...  
Setting up libclass-methodmaker-perl (2.24-1build1) ...  
vagrant@node160:~$ sudo dpkg -i mysql-cluster-community-data-node_7.6.6-1ubuntu18.04_amd64.deb  
Selecting previously unselected package mysql-cluster-community-data-node.  
(Reading database ... 39448 files and directories currently installed.)  
Preparing to unpack mysql-cluster-community-data-node_7.6.6-1ubuntu18.04_amd64.d  
eb ...  
Unpacking mysql-cluster-community-data-node (7.6.6-1ubuntu18.04) ...  
Setting up mysql-cluster-community-data-node (7.6.6-1ubuntu18.04) ...  
Processing triggers for man-db (2.7.5-1) ...  
vagrant@node160:~$ sudo nano /etc/my.cnf  
vagrant@node160:~$ sudo mkdir -p /usr/local/mysql/data  
vagrant@node160:~$ sudo nbd  
2019-12-09 14:26:42 [nbd] INFO: 10-- Angel connected to '192.168.16.159:1186'  
2019-12-09 14:26:42 [nbd] INFO: 10-- Angel allocated nodeid: 21-07-26 20:56:29 JT  
vagrant@node160:~$ sudo pkill -f nbd  
vagrant@node160:~$ sudo nano /etc/systemd/system/ndbd.service  
vagrant@node160:~$ sudo systemctl daemon-reload  
vagrant@node160:~$ sudo systemctl daemon-reload  
vagrant@node160:~$ sudo systemctl enable ndbd  
Created symlink from /etc/systemd/system/multi-user.target.wants/ndbd.service to  
/etc/systemd/system/ndbd.service.  
vagrant@node160:~$ sudo systemctl start ndbd  
vagrant@node160:~$ sudo systemctl status ndbd  
● ndbd.service - MySQL NDB Data Node Daemon  
   Loaded: loaded (/etc/systemd/system/ndbd.service; enabled; vendor preset: ena  
   Active: active (running) since Mon 2019-12-09 14:48:31 UTC; 48s ago  
     Process: 13200 ExecStart=/usr/sbin/ndbd (code=exited, status=0/SUCCESS)  
    Main PID: 13204 (ndbd)  
      Tasks: 46  
     Memory: 420.8M  
        CPU: 1.146s  
    CGroup: /system.slice/ndbd.service  
            └─13204 /usr/sbin/ndbd  
              13205 /usr/sbin/ndbd  
Dec 09 14:48:31 node160 systemd[1]: Starting MySQL NDB Data Node Daemon...  
Dec 09 14:48:31 node160 ndbd[13200]: 2019-12-09 14:48:31 [ndbd] INFO -- Ange  
Dec 09 14:48:31 node160 ndbd[13200]: 2019-12-09 14:48:31 [ndbd] INFO -- Ange  
Dec 09 14:48:31 node160 systemd[1]: Started MySQL NDB Data Node Daemon.  
lines 1-16/16 (END)
```

19. Langkah selanjutnya adalah melakukan konfigurasi pada cluster manager dimulai dengan download

```
wget https://dev.mysql.com/get/Downloads/MySQL-Cluster-7.6/mysql-cluster_7.6.6-1ubuntu18.04_amd64.deb-bundle.tar
```

20. Membuat folder install dan extract pada direktori tersebut

```
mkdir install
```

```
tar -xvf mysql-cluster_7.6.6-1ubuntu18.04_amd64.deb-bundle.tar -C install/
```

21. Lakukan update dan install

```
cd install
```

```
sudo apt update
```

```
sudo apt install libaio1 libmecab2
```

22. Install beberapa dependency

```
sudo dpkg -i mysql-common_7.6.6-1ubuntu18.04_amd64.deb
```

```
sudo dpkg -i mysql-cluster-community-client_7.6.6-1ubuntu18.04_amd64.deb
sudo dpkg -i mysql-client_7.6.6-1ubuntu18.04_amd64.deb
sudo dpkg -i mysql-cluster-community-server_7.6.6-1ubuntu18.04_amd64.deb
```

23. Kemudian install MySQL binary menggunakan dpkg

```
sudo dpkg -i mysql-server_7.6.6-1ubuntu18.04_amd64.deb
```

24. Lakukan edit pada my.cnf dengan melakukan perintah dan tambahkan

```
sudo nano /etc/mysql/my.cnf

[mysqld]
# Options for mysqld process:
ndbcluster          # run NDB storage engine

[mysql_cluster]
# Options for NDB Cluster processes:
ndb-connectstring=198.51.100.2 # location of management server
```

25. Kemudian lakukan restart pada setiap server mysqld

```
sudo systemctl restart mysql
```

26. Setelah restart, lakukan enable

```
sudo systemctl enable mysql
```

27. Lakukan verifikasi pada MySQL Cluster dengan cara login

```
mysql -u yanuar -p
```

28. Lakukan perintah ndb_mgm pada cluster mysqld untuk menampilkan ip yang tersambung dimanagement system

```
ndb_mgm
SHOW
```

```

Name: NdbLockHandle
Status: created=0, free=0, sizeof=48
***** 15. row *****
Type: ndbcluster
Name: binlog
Status: latest_epoch=0, latest_trans_epoch=0, latest_received_binlog_epoch=0, latest_handled_binlog_epoch=0, latest_applied_binlog_epoch=0
15 rows in set (0.00 sec)

mysql> ndb_mgm
-> ^C
mysql> exit
Bye
vagrant@node163:~$ ndb_mgm
-- NDB Cluster -- Management Client --
ndb_mgm> show
^C
vagrant@node163:~$ ndb_mgm
-- NDB Cluster -- Management Client --
ndb_mgm> SHOW
Connected to Management Server at: 198.51.100.2:1186
Unable to connect with connect string: nodeid=0,198.51.100.2:1186
Retrying every 5 seconds. Attempts left: 11 10^C
vagrant@node163:~$ sudo nano /etc/mysql/my.cnf
vagrant@node163:~$ ndb_mgm d(NDB) 2 node(s)
-- NDB Cluster -- Management Client --
ndb_mgm> show
Connected to Management Server at: 192.168.16.159:1186
Cluster Configuration
-----
[ndbd(NDB)] 3 node(s)
id=2 @192.168.16.160 (mysql-5.7.22 ndb-7.6.6, Nodegroup: 0, *)3.6)
id=3 @192.168.16.161 (mysql-5.7.22 ndb-7.6.6, Nodegroup: 0)
id=4 @192.168.16.162 (mysql-5.7.22 ndb-7.6.6, Nodegroup: 0)
[mysqld(API)] 1 node(s)
id=1 @192.168.16.159 (mysql-5.7.22 ndb-7.6.6)
[ndb_mgmd(MGM)] 1 node(s)
id=4 @198.51.100.2 (mysql-5.7.22 ndb-7.6.6)
[mysqld(API)] 3 node(s)
id=5 (not connected, accepting connect from 192.168.16.163)
id=6 (not connected, accepting connect from 192.168.16.164)
id=7 (not connected, accepting connect from 192.168.16.165)
ndb_mgm>

```

29. Download package pada node proxysql node166

```

cd /tmp
curl -OL https://github.com/sysown/proxysql/releases/download/v1.4.4/proxysql_1.4.4-ubuntu16_amd64.deb

```

30. Install package kemudian hapus package tersebut

```

sudo dpkg -i proxysql_*
rm proxysql_*

```

31. Update package repository kemudian install

```

sudo apt-get update
sudo apt-get install mysql-client

```

32. Mulai proxysql dengan cara mengetikkan perintah dibawah ini dan cek statusnya

```
sudo systemctl start proxysql
```

```
systemctl status proxysql
```

```
vagrant@node166: /tmp
Get:15 http://security.ubuntu.com/ubuntu xenial-security/universe Translation-en [192 kB]
Get:16 http://archive.ubuntu.com/ubuntu xenial-updates/universe Translation-en [324 kB]
Get:17 http://archive.ubuntu.com/ubuntu xenial-updates/multiverse amd64 Packages [16.8 kB]
Get:18 http://security.ubuntu.com/ubuntu xenial-security/multiverse amd64 Packages [5,724 B]
Get:19 http://archive.ubuntu.com/ubuntu xenial-updates/multiverse i386 Packages [15.9 kB]
Get:20 http://security.ubuntu.com/ubuntu xenial-security/multiverse i386 Packages [5,888 B]
Get:21 http://archive.ubuntu.com/ubuntu xenial-updates/multiverse Translation-en [8,468 B]
Get:22 http://security.ubuntu.com/ubuntu xenial-security/multiverse Translation-en [2,708 B]
Get:23 http://archive.ubuntu.com/ubuntu xenial-backports/universe amd64 Packages [8,064 B]
Get:24 http://archive.ubuntu.com/ubuntu xenial-backports/universe i386 Packages [7,744 B]
Get:25 http://archive.ubuntu.com/ubuntu xenial-backports/universe Translation-en [4,328 B]
Fetched 7,361 kB in 13s (542 kB/s)
Reading package lists... Done
vagrant@node166:/tmp$ sudo systemctl start proxysql
vagrant@node166:/tmp$ systemctl status proxysql
● proxysql.service - LSB: High Performance Advanced Proxy for MySQL
   Loaded: loaded (/etc/init.d/proxysql; bad; vendor preset: enabled)
   Active: active (running) since Mon 2019-12-09 19:36:20 UTC; 15s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 2025 ExecStart=/etc/init.d/proxysql start (code=exited, status=0/SUCCESS)
    Tasks: 23
   Memory: 9.0M
      CPU: 206ms
   CGroup: /system.slice/proxysql.service
           └─2032 proxysql -c /etc/proxysql.cnf -D /var/lib/proxysql
             └─2033 proxysql -c /etc/proxysql.cnf -D /var/lib/proxysql

Dec 09 19:36:20 node166 systemd[1]: Starting LSB: High Performance Advanced Proxy f
Dec 09 19:36:20 node166 proxysql[2025]: Starting ProxySQL: DONE!
Dec 09 19:36:20 node166 systemd[1]: Started LSB: High Performance Advanced Proxy fo
lines 1-15/15 (END)
vagrant@node166:/tmp$
```