CARA MENJALANKAN PROGRAM

SISTEM MONITORING ANOMALI DATA
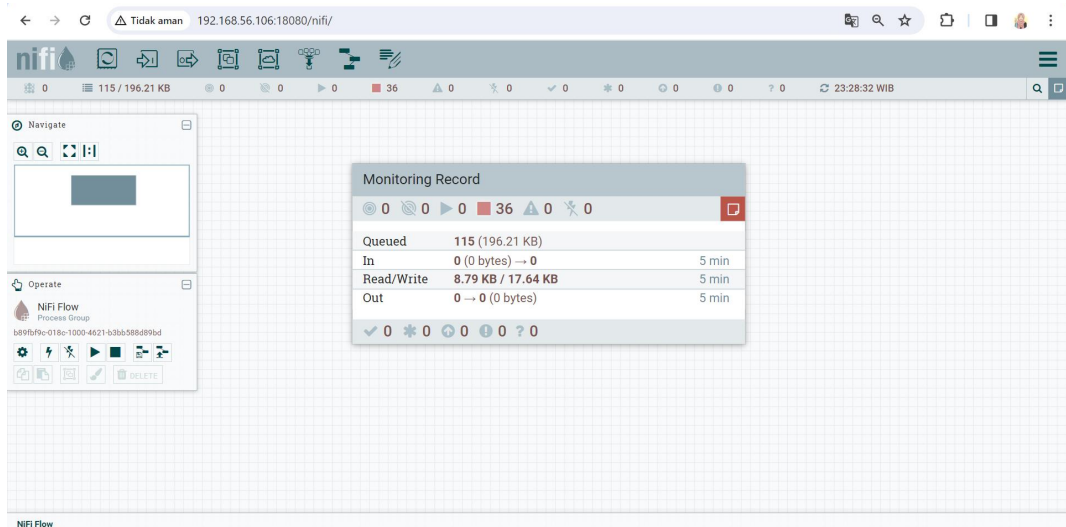
A. Menjalankan *Service Apache Nifi*

Untuk menjalankan service *Apache Nifi* dapat dilakukan dengan menjalankan perintah berikut, pada direktori *Apache Nifi* berada.

```
sudo ./bin/nifi.sh start
```

```
bihigh@server:~/nifi-1.22.0$ sudo ./bin/nifi.sh start
[sudo] password for bihigh:

Java home: /usr/lib/jvm/java-1.11.0-openjdk-amd64
NiFi home: /home/bihigh/nifi-1.22.0

Bootstrap Config File: /home/bihigh/nifi-1.22.0/conf/bootstrap.conf

bihigh@server:~/nifi-1.22.0$
```

Selanjutnya, untuk melakukan pengecekan apakah service Apache Nifi telah berjalan dapat dengan menjalankan perintah berikut.

```
sudo ./bin/nifi.sh status
```

```
bihigh@server:~/nifi-1.22.0$ sudo ./bin/nifi.sh status
Java home: /usr/lib/jvm/java-1.11.0-openjdk-amd64
NiFi home: /home/bihigh/nifi-1.22.0
Bootstrap Config File: /home/bihigh/nifi-1.22.0/conf/bootstrap.conf
2024-02-22 23:23:55,507 INFO [main] org.apache.nifi.bootstrap.Command Apache NiFi is currently running, listening to Bootstrap on port 41165, PID=1140
bihigh@server:~/nifi-1.22.0$
```

Terlihat pada gambar diatas bahwa Apache NiFi telah berjalan. Kemudian, Apache Nifi dapat diakses pada URL http://192.168.56.106:18080/nifi/, dengan tampilan sebagai berikut.

Sedangkan untuk melakukan stop pada service Apache Nifi dapat dilakukan dengan menjalankan perintah berikut.

```
sudo ./bin/nifi.sh stop
```


B. Menjalankan *Service Grafana Monitoring Dashboard*

Sistem monitoring ini menggunakan perangkat lunak *Grafana* sebagai *platform* visualisasi data. Grafana monitoring dashboard dapat dijalakan dengan perintah sebagai berikut.
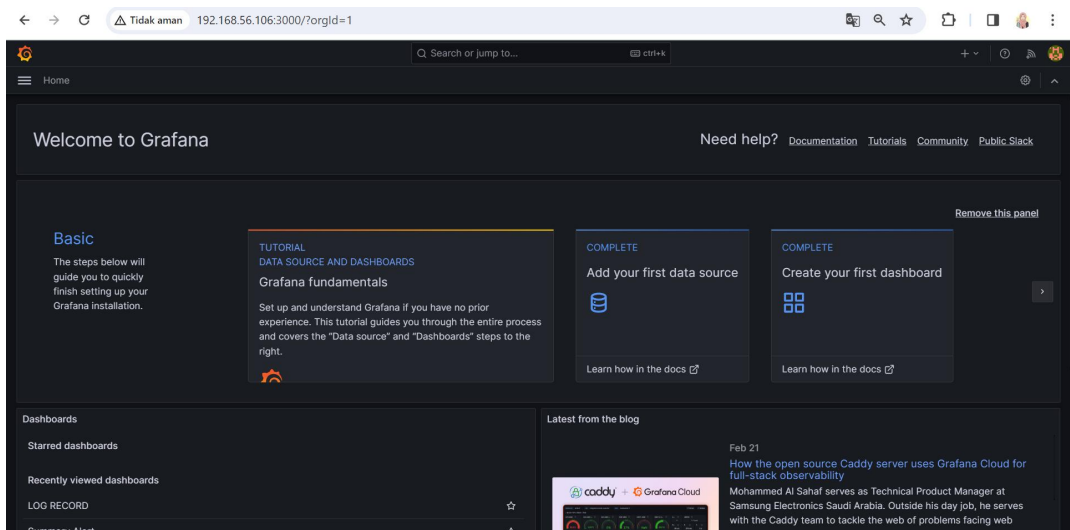
```
sudo systemctl start grafana-server
```


Untuk melakukan pengecekan status Grafana dapat dilakukan dengan menjalankan perintah berikut.

```
sudo systemctl status grafana-server
```

Ketika status Grafana telah aktif, selanjutnya Grafana dapat diakses melalui URL http://192.168.56.106:3000/?orgId=1, dengan tampilan sebagai berikut.

Sedangkan untuk melakukan stop pada service Grafana dapat dilakukan dengan menjalankan perintah berikut.

```
sudo systemctl stop grafana-server
```

C. Menjalankan Service HDFS Hadoop

Data yang telah melalu metode *Extract, Transform, Load* pada *Apache Nifi*, selanjutnya disimpan kedalam *HDFS* sebagai media penyimpanan apabila data tersebut masih dibutuhkan. Sebelum *Apache Nifi* melakukan *Load*, *service* dari *HDFS* harus dijalankan dengan perintah berikut.

```
hadoop/sbin/start-all.sh
```

```
bihigh@server:~$ hadoop/sbin/start-all.sh
WARNING: Attempting to start all Apache Hadoop daemons as bihigh in 10 seconds.
WARNING: This is not a recommended production deployment configuration.
WARNING: Use CTRL-C to abort.
Starting namenodes on [192.168.56.106]
Starting datanodes
Starting secondary namenodes [server]
Starting resourcemanager
Starting nodemanagers
bihigh@server:~$
```

Untuk melakukan *stop* pada *service HDFS* dapat dilakukan dengan perintah sebagai berikut.

```
hadoop/sbin/stop-all.sh
```

```
bihigh@server:~$ hadoop/sbin/stop-all.sh
WARNING: Stopping all Apache Hadoop daemons as bihigh in 10 seconds.
WARNING: Use CTRL-C to abort.
Stopping namenodes on [192.168.56.106]
Stopping datanodes
Stopping secondary namenodes [server]
Stopping nodemanagers
Stopping resourcemanager
bihigh@server:~$
```

D. Menjalankan Generator Data

Generator data yang dibangun pada sistem monitoring ini tersedia didalam tiga buah *source*. Berikut merupakan cara menjalankan dan mengakses masing masing generator data tersebut.

1. *UDP Record*

Script generator data *UDP* dibangun dengan memanfaatkan bahasa pemrograman *python*. Untuk menjalankan generator data ini dapat dilakukan dengan perintah berikut.

```
python3 script/generateRevenueNew.py
```


2. Flat File

Generator data *flat file* juga dibangun dengan memanfaatkan bahasa pemrograman *python*. Untuk membuat sampel data flat file dengan *generator* ini dapat dilakukan dengan menjalankan perintah sebagai berikut.

```
python3 script/generateText.py
```


3. HTTP Response

Sampel data HTTP pada sistem monitoring ini dibangun dengan memanfaatkan framework Codeigniter sehingga dapat diakses dengan URL berikut.

```
http://192.168.56.106/ci3_rest/generateData
```

```
GET          ▼    http://192.168.56.106/ci3_rest/generateData

Params    Authorization    Headers (8)    Body    Pre-request Script    Tests    Settings

Body   Cookies (1)   Headers (10)   Test Results                        🌐  Status: 200 OK   Time: 1655 ms

Pretty    Raw    Preview    Visualize    JSON ▼    ⇄

  1  [
  2      {
  3          "invoce_id": "6p7hw0m3",
  4          "city": "Naypyitaw",
  5          "cust_type": "Credit Card",
  6          "gender": "Female",
  7          "product_line": "Meat and Chicken",
  8          "total_revenue": "646.00",
  9          "dates": "2024-02-25",
 10          "hourid": "23",
 11          "minuteid": "02"
 12      }
 13  ]
```

E. Menjalankan Proses Group Apache NiFi

Proses grup dalam Apache Nifi dapat dilakukan dengan klik kanan pada proses grup kemudian pilih start seperti gambar berikut.
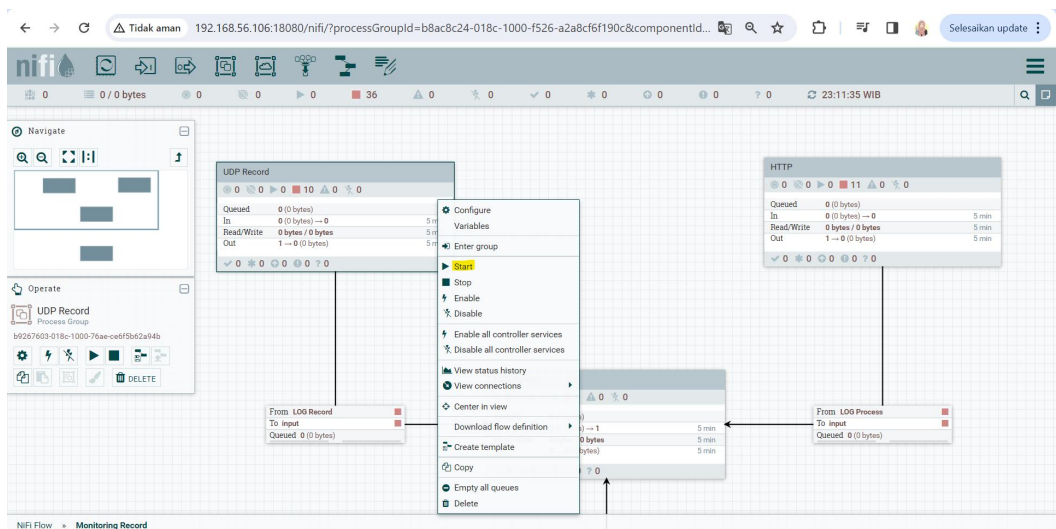
Begitupun untuk melakukan *stop* pada proses grup *Apache Nifi*, bisa klik kanan dan pilih *option stop*.

F. Akses data ke HDFS

Hasil pengolahan data yang telah dilakukan pada Apache Nifi, salah satunya disimpan kedalam HDFS file. Data ini dapat diakses dengan perintah

yang mirip dengan perintah kerja direktori linux dengan tambahan perintah *hadoop fs -[command]*, contohnya sebagai berikut.

1. *Listing* direktori

```
hadoop fs -ls /record/udp_record/2024-02-15
```

```
bihigh@server:~$ hadoop fs -ls /record/udp_record/2024-02-15
Found 10 items
-rw-r--r--   1 root supergroup       1049 2024-02-15 10:16 /record/udp_record/2024-02-15/0058ba49-819b-4adb-91e0-a1e2a736107c
-rw-r--r--   1 root supergroup       1034 2024-02-15 10:16 /record/udp_record/2024-02-15/4207ed6e-17e0-4249-988f-13b4ddddd07e
-rw-r--r--   1 root supergroup       1039 2024-02-15 10:16 /record/udp_record/2024-02-15/7ad3d561-ea0c-445d-89f4-fe3d863d9ddd
-rw-r--r--   1 root supergroup       2091 2024-02-15 10:24 /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15.csv
-rw-r--r--   1 root supergroup        324 2024-02-15 10:30 /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_102954.csv
-rw-r--r--   1 root supergroup      10441 2024-02-15 10:47 /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_104753.csv
-rw-r--r--   1 root supergroup      10433 2024-02-15 11:13 /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_111307.csv
-rw-r--r--   1 root supergroup      10464 2024-02-15 12:39 /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_123933.csv
-rw-r--r--   1 root supergroup      10437 2024-02-15 13:04 /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_130449.csv
-rw-r--r--   1 root supergroup      10454 2024-02-15 13:30 /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_133005.csv
```

2. Membaca file

```
hadoop                          fs                          -cat
/record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_133005.csv
```

```
bihigh@server:~$ hadoop fs -cat /record/udp_record/2024-02-15/UDP_RECORD_2024-02-15_133005.csv
2024-02-15T13:05:00,WW-157-157,C,Naypyitaw,Normal,Female,Electronic accessories,5.77,2024-02-15,Cash,13,05
2024-02-15T13:05:00,MM-440-440,B,Mandalay,Member,Female,Food and beverages,990.92,2024-02-15,Credit card,13,05
2024-02-15T13:05:00,VV-327-327,A,Yangon,Member,Female,Health and beauty,500.0,2024-02-15,Cash,13,05
2024-02-15T13:05:00,NN-132-132,C,Naypyitaw,Normal,Female,Electronic accessories,8.13,2024-02-15,Cash,13,05
2024-02-15T13:06:00,PP-458-458,C,Naypyitaw,Normal,Male,Electronic accessories,0.0,2024-02-15,Cash,13,06
2024-02-15T13:06:00,HH-154-154,D,Cosmo,Normal,Male,Stationary,0.0,2024-02-15,Credit card,13,06
2024-02-15T13:06:00,BB-244-244,A,Yangon,Member,Female,Health and beauty,284.23,2024-02-15,Ewallet,13,06
2024-02-15T13:06:00,MM-226-226,C,Naypyitaw,Normal,Female,Electronic accessories,969.21,2024-02-15,Cash,13,06
2024-02-15T13:07:00,II-153-153,B,Mandalay,Member,Female,Food and beverages,17.33,2024-02-15,Credit card,13,07
2024-02-15T13:07:00,XX-443-443,A,Yangon,Member,Female,Health and beauty,500.0,2024-02-15,Cash,13,07
2024-02-15T13:07:00,XX-472-472,C,Naypyitaw,Normal,Female,Electronic accessories,519.06,2024-02-15,Cash,13,07
2024-02-15T13:07:00,EE-400-400,C,Naypyitaw,Normal,Male,Electronic accessories,0.0,2024-02-15,Cash,13,07
2024-02-15T13:08:00,RR-235-235,D,Cosmo,Normal,Male,Stationary,0.0,2024-02-15,Credit card,13,08
2024-02-15T13:08:00,YY-307-307,A,Yangon,Member,Female,Health and beauty,938.29,2024-02-15,Ewallet,13,08
2024-02-15T13:08:00,GG-389-389,C,Naypyitaw,Normal,Female,Electronic accessories,551.83,2024-02-15,Cash,13,08
2024-02-15T13:08:00,JJ-418-418,B,Mandalay,Member,Female,Food and beverages,12.73,2024-02-15,Credit card,13,08
2024-02-15T13:09:00,DD-288-288,A,Yangon,Member,Female,Health and beauty,500.0,2024-02-15,Cash,13,09
2024-02-15T13:09:00,FF-320-320,C,Naypyitaw,Normal,Female,Electronic accessories,27.8,2024-02-15,Cash,13,09
2024-02-15T13:09:00,PP-493-493,C,Naypyitaw,Normal,Male,Electronic accessories,0.0,2024-02-15,Cash,13,09
2024-02-15T13:09:00,TT-383-383,D,Cosmo,Normal,Male,Stationary,0.0,2024-02-15,Credit card,13,09
2024-02-15T13:10:00,PP-374-374,A,Yangon,Member,Female,Health and beauty,846.15,2024-02-15,Ewallet,13,10
2024-02-15T13:10:00,TT-129-129,C,Naypyitaw,Normal,Female,Electronic accessories,973.35,2024-02-15,Cash,13,10
2024-02-15T13:10:00,MM-416-416,B,Mandalay,Member,Female,Food and beverages,730.63,2024-02-15,Credit card,13,10
2024-02-15T13:10:00,VV-236-236,A,Yangon,Member,Female,Health and beauty,500.0,2024-02-15,Cash,13,10
2024-02-15T13:11:00,BB-455-455,C,Naypyitaw,Normal,Female,Electronic accessories,272.48,2024-02-15,Cash,13,11
2024-02-15T13:11:00,YY-500-500,C,Naypyitaw,Normal,Male,Electronic accessories,0.0,2024-02-15,Cash,13,11
2024-02-15T13:11:00,LL-166-166,D,Cosmo,Normal,Male,Stationary,0.0,2024-02-15,Credit card,13,11
```
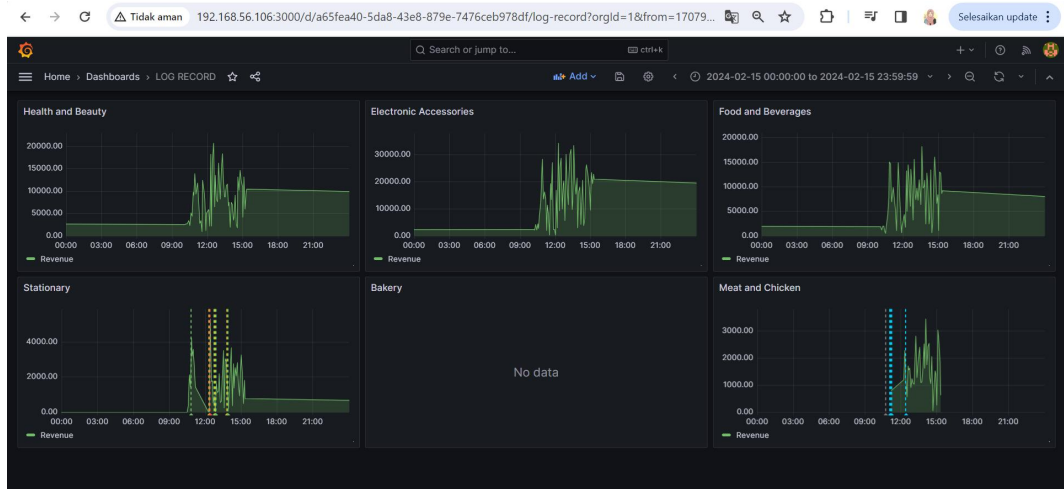
G. Akses Dashboard Log Record

Dashboard Log Record yang digunakan sebagai dashboard monitoring, dapat diakses pada URL berikut.

```
http://192.168.56.106:3000/d/a65fea40-5da8-43e8-879e-7476
ceb978df/log-record?orgId=1
```

H. Akses Dashboard Summary Alert

Dashboard summary alert digunakan sebagai dashboard summary alert apa yang pernah terjadi, serta data apa yang sedang mengalami anomali. Dashboard summary alert dapat diakses pada URL berikut.

```
http://192.168.56.106:3000/d/a7154876-6773-4b4a-a0bc-8962
7015da3f/summary-alert?orgId=1
```


I. Akses Database MySQL

MySQL yang digunakan untuk menyimpan data visualisasi pada dashboard monitoring, dapat diakses dengan perintah berikut.

```
mysql -u bihigh -p
```

```
bihigh@server:~$ mysql -u bihigh -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.35-0ubuntu0.22.04.1 (Ubuntu)

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owners.

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

mysql> use bihighdb
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> SELECT * FROM LOG_RECORD LIMIT 20;
+------------+-----------+-----------------------+---------------+--------+----------+
| dates      | city      | product_line          | total_revenue | hourid | minuteid |
+------------+-----------+-----------------------+---------------+--------+----------+
| 2023-12-30 | Naypyitaw | Electronic accessories |       347.25 | 14     | 10       |
| 2023-12-30 | Mandalay  | Food and beverages    |        193.79 | 14     | 15       |
| 2023-12-30 | Yangon    | Health and beauty     |           500 | 14     | 15       |
| 2023-12-30 | Mandalay  | Food and beverages    |        677.83 | 14     | 55       |
| 2023-12-30 | Yangon    | Health and beauty     |           500 | 14     | 55       |
| 2023-12-30 | Mandalay  | Food and beverages    |        599.51 | 15     | 00       |
| 2023-12-30 | Yangon    | Health and beauty     |        357.11 | 15     | 00       |
| 2023-12-30 | Naypyitaw | Electronic accessories |       1125.02 | 14     | 55       |
| 2023-12-30 | Cosmo     | Stationary            |             0 | 15     | 00       |
| 2023-12-30 | Naypyitaw | Electronic accessories |         78.28 | 15     | 00       |
| 2023-12-30 | Naypyitaw | Electronic accessories |             0 | 15     | 00       |
| 2023-12-30 | Cosmo     | Stationary            |             0 | 15     | 05       |
| 2023-12-30 | Cosmo     | Stationary            |             0 | 15     | 05       |
| 2023-12-30 | Yangon    | Health and beauty     |        914.04 | 15     | 10       |
| 2023-12-30 | Cosmo     | Stationary            |             0 | 15     | 05       |
| 2023-12-30 | Yangon    | Health and beauty     |           500 | 15     | 10       |
```