

# Mini Assignment 1 LAW

Nama : Muhammad Rizky Anditama  
Kelas : LAW-A  
NPM : 1706044080  
Link API : <http://localhost:8002/oauth>

## Prerequisites:

- Go, dengan library Gin(Http framework), Gorm(Database ORM), Gorm driver for SQLite
- Membuat tabel client yang memiliki field client id dan secret id. Proses pembuatan tabel ini dan tabel lainnya berjalan otomatis menggunakan automigrate dari GORM ketika menjalankan server (**go run main.go**). Untuk tugas kali ini, saya melakukan insertion ke sqlite pada tabel 'clients' menggunakan "DB Browser for SQLite".

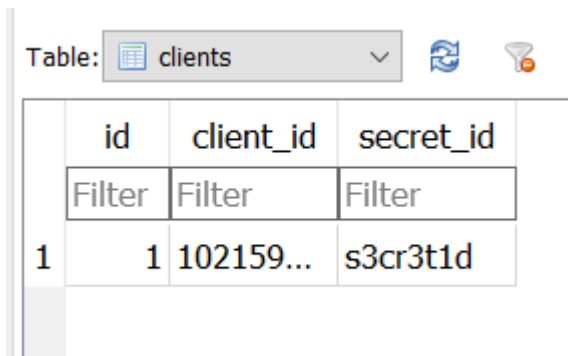


Table: <span>clients</span>			
	id	client_id	secret_id
	Filter	Filter	Filter
1	1	102159...	s3cr3t1d

- Insertion tabel User. Untuk melakukan insert user, bisa memanggil API POST pada <http://localhost:8002/api/user> dengan body User yang diinginkan. Cara lain adalah menggunakan "DB Browser for SQLite".

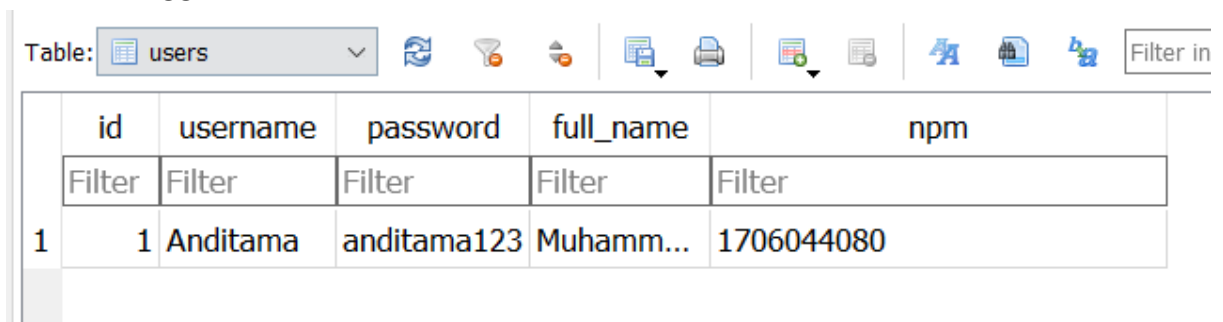


Table: <span>users</span>					
	id	username	password	full_name	npm
	Filter	Filter	Filter	Filter	Filter
1	1	Anditama	anditama123	Muhamm...	1706044080

## Request Token

Link API: <http://localhost:8002/oauth/token>

## Case 1: Field tidak lengkap

POST

http://localhost:8002/oauth/token

Params

Authorization

Headers (10)

Body

Pre-request Script

Tests

Settings

● none

● form-data

● x-www-form-urlencoded

● raw

● binary

● GraphQL

● JSON

```
1 {
2   "username": "Anditama",
3   "password": "anditama123",
4   "grant_type": "password",
5   "client_id": "1021592190"}
```

Body

Cookies

Headers (7)

Test Results

Status: 500 Internal Server Error

Pretty

Raw

Preview

Visualize

JSON

```
1 {
2   "Error_description": "ada kesalahan masbro!",
3   "error": "invalid_request"
4 }
```

## Case 2: Kombinasi Client ID dan Client Secret tidak sesuai atau tidak ditemukan pada database

The screenshot displays a REST client interface for a POST request to `http://localhost:8002/oauth/token`. The request body is a JSON object with the following fields:

```
1 {  
2   "username": "Anditama",  
3   "password": "anditama123",  
4   "grant_type": "password",  
5   "client_id": "102159190",  
6   "client_secret": "s3cr3t1d"  
7 }
```

The response status is `500 Internal Server`. The response body, shown in JSON format, contains an error message:

```
1 {  
2   "error": "Sorry, no client ID and secret ID combination found",  
3   "status": 500  
4 }
```


### Case 3: Kombinasi username dan password tidak sesuai atau tidak ditemukan pada database


POST http://localhost:8002/oauth/token

Params Authorization Headers (10) **Body** Pre-request Script Tests Settings

● none ● form-data ● x-www-form-urlencoded ● **raw** ● binary ● GraphQL **JSON** ▼

```
1 {
2   "username": "Anditama",
3   "password": "anditaa123",
4   "grant_type": "password",
5   "client_id": "1021592190",
6   "client_secret": "s3cr3t1d"
7 }
```

Body Cookies Headers (7) Test Results  Status: 500 Internal Server Error

Pretty Raw Preview Visualize JSON ▼ 

```
1 {
2   "error": "Sorry, username or/and password is incorrect",
3   "status": 500
4 }
```

#### Case 4: Semua syarat terpenuhi, respon sukses dan mengembalikan token

POST http://localhost:8002/oauth/token

Params Authorization Headers (10) **Body** Pre-request Script Tests Settings

● none ● form-data ● x-www-form-urlencoded ● **raw** ● binary ● GraphQL **JSON** ▼

```
1 {
2   "username": "Anditama",
3   "password": "anditama123",
4   "grant_type": "password",
5   "client_id": "1021592190",
6   "client_secret": "s3cr3t1d"
7 }
```

Body Cookies Headers (7) Test Results Status: 200 OK

Pretty Raw Preview Visualize JSON

```
1 {
2   "access_token": "rgdewxrissqkkpemhpvofnajuuijwkpmeuxguqag",
3   "expires_in": 300,
4   "refresh_token": "ergcluymwrnldnsgthhcagdursuvlhukwelkueeo",
5   "scope": null,
6   "token_type": "Bearer"
7 }
```

Token tersimpan dalam database SQLite dengan expired time 5 menit dari waktu pembuatan

	id	token	refresh	user_id	client_id	expired
	Filter	Filter	Filter	Filter	Filter	Filter
1	1	gmwjgsapgatlmodylumguqdiwwmnpqimgegmgb	nptniwdyjdvhvoyafnndfbkfgqdlcivnbs...	1	1021592190	2021-03-25 23:10:36.0151226+07:00
2	2	xdmiqjlsqcdlvhpdcsfxabphmkkkphxdqhjwrmvt	bcgequsltgcakmnydsjdywmhqoplbbpb...	1	1021592190	2021-03-25 23:17:30.5026968+07:00
3	3	gmwjgsapgatlmodylumguqdiwwmnpqimgegmgb	nptniwdyjdvhvoyafnndfbkfgqdlcivnbs...	1	1021592190	2021-03-26 00:06:19.3340344+07:00
4	4	xdmiqjlsqcdlvhpdcsfxabphmkkkphxdqhjwrmvt	bcgequsltgcakmnydsjdywmhqoplbbpb...	1	1021592190	2021-03-26 00:10:24.4744574+07:00
5	5	rgdewxrissqkkpemhpvofnajuuijwkpmeuxguqag	ergcluymwrnldnsgthhcagdursuvlhukw...	1	1021592190	2021-03-26 00:15:15.237785+07:00

## Request Resource with Authorization

Case 1: Header authorization tidak ada

POST http://localhost:8002/oauth/resource

Params Authorization Headers (9) Body Pre-request Script Tests

Header	Value
<input checked="" type="checkbox"/> Content-Length ⓘ	0
<input checked="" type="checkbox"/> Host ⓘ	<calculated when request
<input checked="" type="checkbox"/> User-Agent ⓘ	PostmanRuntime/7.26.8
<input checked="" type="checkbox"/> Accept ⓘ	*/*
<input checked="" type="checkbox"/> Accept-Encoding ⓘ	gzip, deflate, br
<input checked="" type="checkbox"/> Connection ⓘ	keep-alive
<input type="checkbox"/> Authorization	bearer xdmijjsqcdlvhpdc
Key	Value

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON

```
1 {
2   "error": "invalid_token",
3   "error_description": "Token Salah masbro"
4 }
```

Case 2: Header authorization ada, token invalid

Token seharusnya: rgdewxrissqkkpemhpvofnajuuijwkpmeuxguqag

Token invalid: rgdewxrissqkkpemhpvofnajuuijwkpmeuxguqa<sup>e</sup>

POST

▼

http://localhost:8002/oauth/resource

Params

Authorization

Headers (9)

Body

Pre-request Script

Tests

Settings

<input checked="" type="checkbox"/>	Content-Length ⓘ	0
<input checked="" type="checkbox"/>	Host ⓘ	<calculated when request is sent>
<input checked="" type="checkbox"/>	User-Agent ⓘ	PostmanRuntime/7.26.8
<input checked="" type="checkbox"/>	Accept ⓘ	*/*
<input checked="" type="checkbox"/>	Accept-Encoding ⓘ	gzip, deflate, br
<input checked="" type="checkbox"/>	Connection ⓘ	keep-alive
<input checked="" type="checkbox"/>	Authorization	bearer rgdewxrissqkppemhpvofnajuuijwkpmeuxguqae
	Key	Value

Body

Cookies

Headers (7)

Test Results

⌚

Status: 4

Pretty

Raw

Preview

Visualize

JSON ▼

↺

```

1  {
2    "error": "invalid_token",
3    "error_description": "Token Salah masbro"
4  }

```

Case 3: Header authorization ada, token valid, sukses

POST http://localhost:8002/oauth/resource

Params Authorization Headers (9) Body Pre-request Script Tests Settings

<input checked="" type="checkbox"/>	Content-Length ⓘ	0
<input checked="" type="checkbox"/>	Host ⓘ	<calculated when request is sent>
<input checked="" type="checkbox"/>	User-Agent ⓘ	PostmanRuntime/7.26.8
<input checked="" type="checkbox"/>	Accept ⓘ	*/*
<input checked="" type="checkbox"/>	Accept-Encoding ⓘ	gzip, deflate, br
<input checked="" type="checkbox"/>	Connection ⓘ	keep-alive
<input checked="" type="checkbox"/>	Authorization	bearer rgdewxrissqkkpemhpvofnajuuijwkpmeuxguqag
	Key	Value

Body Cookies Headers (7) Test Results

Pretty Raw Preview Visualize JSON ↕

```

1  {
2    "access_token": "rgdewxrissqkkpemhpvofnajuuijwkpmeuxguqag",
3    "client_id": "1021592190",
4    "expires": null,
5    "full_name": "Muhammad Rizky Anditama",
6    "npm": "1706044080",
7    "refresh_token": "ergcluymwrnldnsgthcagdursuvlhukwelkueeo",
8    "user_id": 1
9  }

```

#### Case 4: Token expired

Expired pada 12:15

5	rgdewxrissqkkpemhpvofnajuuijwkpmeuxguqag	ergcluymwrnldnsgthcagdursuvlhukw...	1	1021592190	2021-03-26 00:15:15.237785+07:00
---	--	-------------------------------------	---	------------	----------------------------------

Jam local menunjukan 12:17

12:17 AM  
3/26/2021



POST http://localhost:8002/oauth/resource

Params Authorization Headers (9) Body Pre-request Script Tests Settings

<input checked="" type="checkbox"/>	Content-Length ⓘ	0
<input checked="" type="checkbox"/>	Host ⓘ	<calculated when request is sent>
<input checked="" type="checkbox"/>	User-Agent ⓘ	PostmanRuntime/7.26.8
<input checked="" type="checkbox"/>	Accept ⓘ	*/*
<input checked="" type="checkbox"/>	Accept-Encoding ⓘ	gzip, deflate, br
<input checked="" type="checkbox"/>	Connection ⓘ	keep-alive
<input checked="" type="checkbox"/>	Authorization	bearer rgdewxrissqkppemhpvofnajuuijwkpmeuxguqag
	Key	Value

Body Cookies Headers (7) Test Results Status: 400

Pretty Raw Preview Visualize JSON

```

1 {
2   "error": "invalid_token",
3   "error_description": "Token Salah masbro"
4 }

```

## Performance Testing

Testing akan menggunakan apache benchmark seperti yang dicontohkan Pak Adin.

Parameter yang akan dimasukkan adalah berikut:

- -m : Method HTTP, method yang digunakan adalah POST
- -H: Header key-value, header yang akan ditambahkan adalah Authorization dengan value "Bearer <token>"
- -c: Jumlah client concurrent, untuk tes kali ini 10 concurrent users
- -n: Jumlah request, 10.000 request

### Case 1: Testing tanpa header

```

C:\Users\Asus\Documents\Work\Performance Tester\Apache24\bin>ab -m POST -c 10 -n 10000 http://localhost:8002/oauth/resource
This is ApacheBench, Version 2.3 <$Revision: 1879490 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking localhost (be patient)
Completed 1000 requests
Completed 2000 requests
Completed 3000 requests
Completed 4000 requests
Completed 5000 requests
Completed 6000 requests
Completed 7000 requests
Completed 8000 requests
Completed 9000 requests
Completed 10000 requests
Finished 10000 requests

```

```
Server Software:
Server Hostname:      localhost
Server Port:          8002

Document Path:        /oauth/resource
Document Length:      66 bytes

Concurrency Level:    10
Time taken for tests:  39.641 seconds
Complete requests:    10000
Failed requests:      0
Non-2xx responses:    10000
Total transferred:    4960000 bytes
HTML transferred:    660000 bytes
Requests per second:  252.26 [#/sec] (mean)
Time per request:     39.641 [ms] (mean)
Time per request:     3.964 [ms] (mean, across all concurrent requests)
Transfer rate:        122.19 [Kbytes/sec] received
```

```
Connection Times (ms)
              min    mean[+/-sd] median    max
Connect:      0      1   13.5        1   1352
Processing:    5     37   12.9       33    152
Waiting:       4     36   12.8       33    151
Total:        6     38   18.7       34   1387
```

```
Percentage of the requests served within a certain time (ms)
 50%      34
 66%      39
 75%      43
 80%      46
 90%      56
 95%      64
 98%      74
 99%      81
100%    1387 (longest request)
```

```
record not found
[GIN] 2021/03/26 - 10:44:54 | 401 |      23.9991ms |      ::1 | POST "
/oauth/resource"
```

```
2021/03/26 10:44:54 C:/Users/Asus/Documents/Work/LAW/MiniAssignment1/service_cru
d/main.go:100 record not found
[1.001ms] [rows:0] SELECT * FROM `tokens` WHERE token = "" LIMIT 1
[GIN] 2021/03/26 - 10:44:54 | 401 |      22.9994ms |      ::1 | POST "
/oauth/resource"
record not found
```

```
2021/03/26 10:44:54 C:/Users/Asus/Documents/Work/LAW/MiniAssignment1/service_cru
d/main.go:100 record not found
[0.000ms] [rows:0] SELECT * FROM `tokens` WHERE token = "" LIMIT 1
```

## Kesimpulan:

- **RPS: 252 request per second**
- **Average Response Time peer request: 39ms**
- **Average Response Time per request: 3.9ms untuk semua concurent requests**

## Case 2: Testing dengan header authorization, token valid

```
C:\Users\Asus\Documents\Work\Performance Tester\Apache24\bin>ab -m POST -H "Authorization:
  Bearer kbghqaomilekjptopmpajxksvpytulnwtuymysgx" -c 10 -n 10000 -l http://localhost:8002/
oauth/resource
This is ApacheBench, Version 2.3 <$Revision: 1879490 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking localhost (be patient)
Completed 1000 requests
Completed 2000 requests
Completed 3000 requests
Completed 4000 requests
Completed 5000 requests
Completed 6000 requests
Completed 7000 requests
Completed 8000 requests
Completed 9000 requests
Completed 10000 requests
Finished 10000 requests
```

```

Server Software:
Server Hostname:      localhost
Server Port:          8002

Document Path:        /oauth/resource
Document Length:      Variable

Concurrency Level:     10
Time taken for tests:  57.465 seconds
Complete requests:     10000
Failed requests:       0
Total transferred:     6480000 bytes
HTML transferred:     2270000 bytes
Requests per second:   174.02 [#/sec] (mean)
Time per request:      57.465 [ms] (mean)
Time per request:      5.746 [ms] (mean, across all concurrent requests)
Transfer rate:         110.12 [Kbytes/sec] received

```

#### Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	0	1 1.7	1	35
Processing:	18	55 18.6	50	160
Waiting:	10	54 16.8	49	160
Total:	19	57 19.5	51	164

```

[GIN] 2021/03/26 - 10:56:36 | 200 | 42.0004ms | ::1 | POST "/oauth/resource"

2021/03/26 10:56:36 C:/Users/Asus/Documents/Work/LAW/MiniAssignment1/service_crud/main.go:265
[1.000ms] [rows:1] SELECT * FROM `tokens` WHERE token = "kbghqaomilekjptopmpajxksvpytulnwtuymysgx" LIMIT 1

2021/03/26 10:56:36 C:/Users/Asus/Documents/Work/LAW/MiniAssignment1/service_crud/main.go:276
[0.000ms] [rows:1] SELECT * FROM `users` WHERE id = 1 LIMIT 1

2021/03/26 10:56:36 C:/Users/Asus/Documents/Work/LAW/MiniAssignment1/service_crud/main.go:276
[1.000ms] [rows:1] SELECT * FROM `users` WHERE id = 1 LIMIT 1
[GIN] 2021/03/26 - 10:56:36 | 200 | 40.9935ms | ::1 | POST "/oauth/resource"
[GIN] 2021/03/26 - 10:56:36 | 200 | 36ms | ::1 | POST "/oauth/resource"

2021/03/26 10:56:36 C:/Users/Asus/Documents/Work/LAW/MiniAssignment1/service_crud/main.go:276
[1.001ms] [rows:1] SELECT * FROM `users` WHERE id = 1 LIMIT 1

2021/03/26 10:56:36 C:/Users/Asus/Documents/Work/LAW/MiniAssignment1/service_crud/main.go:276
[0.998ms] [rows:1] SELECT * FROM `users` WHERE id = 1 LIMIT 1
[GIN] 2021/03/26 - 10:56:36 | 200 | 33.0002ms | ::1 | POST "/oauth/resource"
[GIN] 2021/03/26 - 10:56:36 | 200 | 30.0001ms | ::1 | POST "/oauth/resource"

```

#### Kesimpulan:

- RPS: 174 request per second (asumsi: Takes longer time to extract token, search from database etc)
- Average Response Time per request: 57ms
- Average Response Time per request: 5.7 ms untuk semua concurrent requests

