Introduction to AWS Lambda

Mobile App Programming

What we learn today?

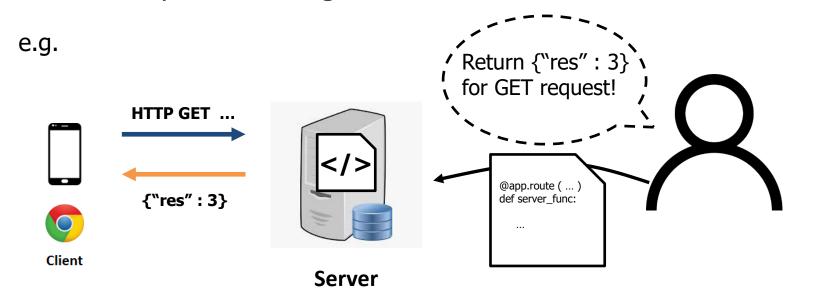
- Let's learn the AWS Lambda.
 - Basic tutorials of AWS lambda.
 - Create a simple lambda function on lambda console
 - Use Flask & zappa to create lambda function.
 - Connect lambda server with android application (Next week)
- · edu.skku.MAP.week10
 - Create project which contains empty Activity

What's Serverless Computing?

Server + less

- Developers don't have to consider
 - HW configurations (CPU, NIC, memory etc.)
 - Network configuration (Forwarding rules, IP setups, DNS etc.)

Executes your server logics as "Function". (FaaS, Function as a Service)



AWS Lambda

Popular <u>serverless computing service</u> provided by <u>AWS</u>

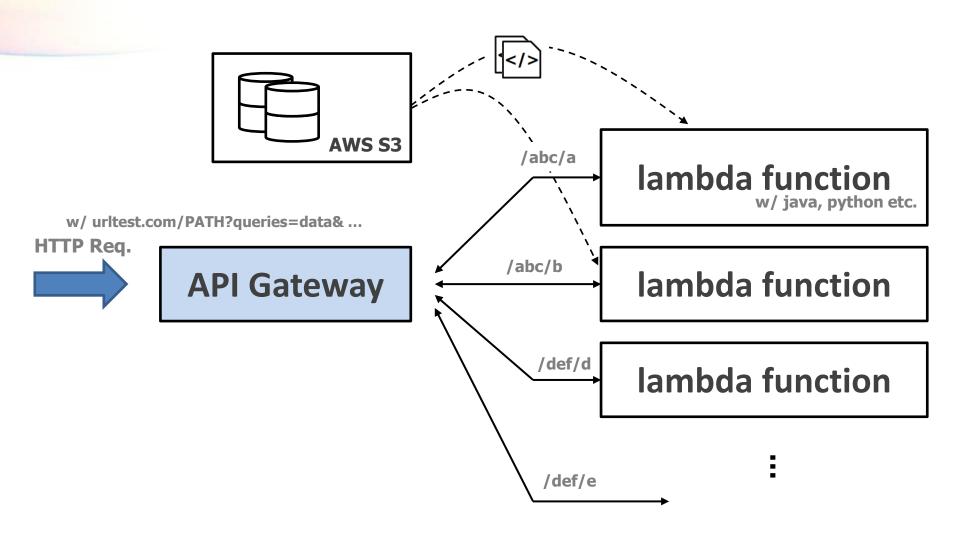
*JavaScript

- Can implement functions using C#, python, java, go, js, ruby.
- Provide Free-tier (can use lambda without any charge)

AWS Lambda 프리 티어에는 월별 1백만 건의 무료 요청과 월별 400,000GB-초의 컴퓨팅 시간이 포함되어 있으며

- Event-driven
- Can connect to other AWS services such as S3, RDS etc.

AWS Lambda



Why should we learn AWS Lambda?

- Simply adapt your web-server.
 - You can ignore (you don't care about) proxy.
 - You can use domain name provided by AWS.

Simply... URL

URL+요형어네트 HTTP request
HTTP Response
상태코드 +응당 body

Client

Web application Server (WAS)

WESQL request
HTTP request
HTTP request
WSGL repuse
WSGL response
WSGL response
Python application
WSGL response
WSGL response
WSGL response
WSGL response
Python application
Web application Server (WAS)

WSGL request
HTTP request
WSGL response
Python application
WSGL response

WSGI: Web Server Gateway Interface

Don't have to consider load balancing

Referenced from: https://hyeo-noo.tistory.com/205

Create AWS accounts

- Access AWS web page and create an account.
 - https://portal.aws.amazon.com/billing/signup#/start/email



새로운 AWS 계정으로 프리 티어 제품 을 살펴보세요.

자세히 알아보려면 aws.amazon.com/free를 방 무하세요.



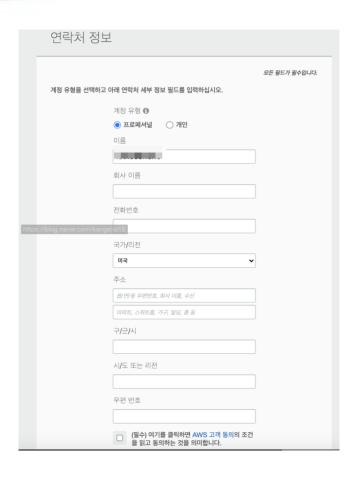
| AWS에 가입 | |
|--|---|
| 루트 사용자 이메일 주소 계정 복구 및 일부 관리 기능에 사용 | |
| AWS 계정 이름 계정의 이름을 선택합니다. 이름은 가입 후 계정 설정에 서 변경할 수 있습니다. |] |
| 이메일 주소 확인 | |
| 또는 | |
| 기존 AWS 계정에 로그인 | |

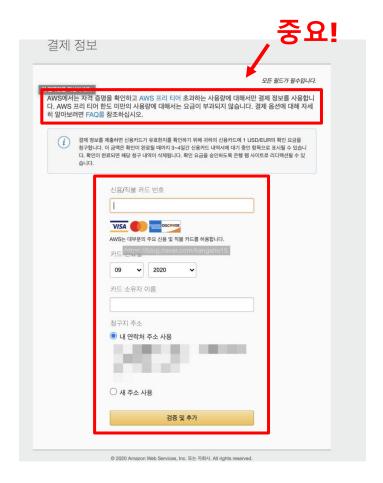
| AWS ⁰ | フ | l 인 |
|-------------------------|---|-----|
| \mathcal{A}_{VV} | - | _ |

| 사용자 확인 | |
|---------------------|-----------|
| 보안 유지 – AWS가 하는 일입니 | 다. |
| 확인 코드가 포함된 이메일을 | 보냈습니다. (귀 |
| 하의 계정이 아닙니까?) | - M |
| 이메일을 확인하려면 아래에 입력 | 력하세요. |
| 확인 코드 | |
| | |
| 확인 | |
| 코드 재전송 | |

Create AWS accounts

Fill personal information

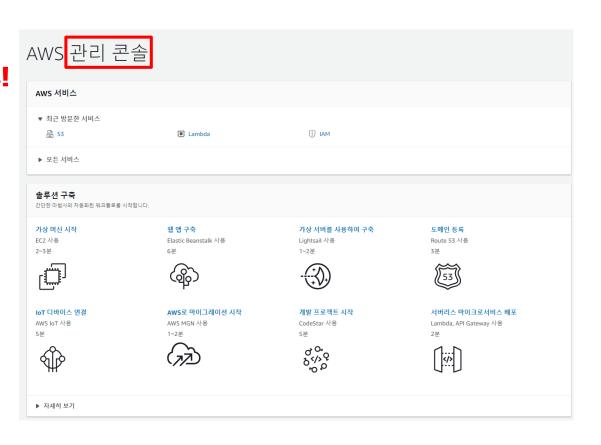




Create AWS accounts

When you login again...

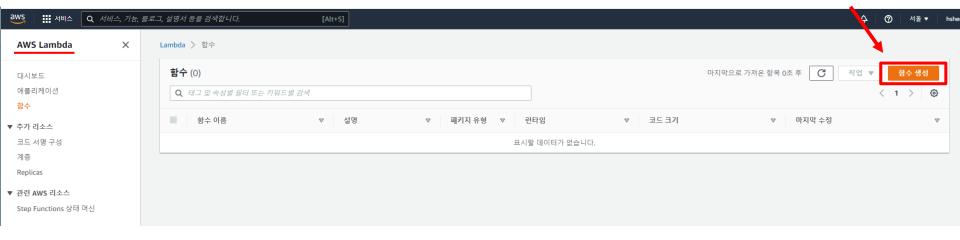




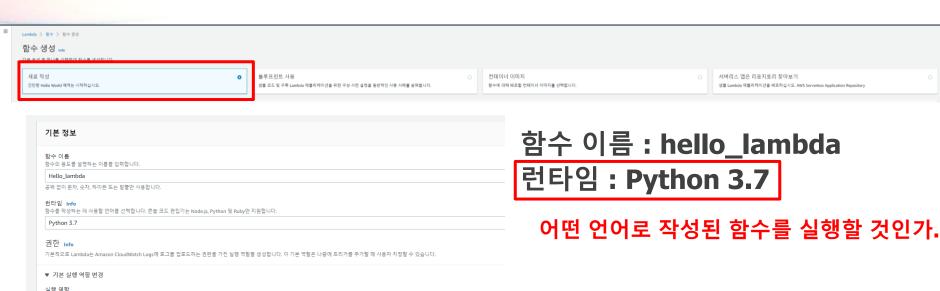
We can make a simple http web server only with console



Clich Here



We can make a simple http web server only with console



_____ 함수에 대한 권한을 정의하는 역할을 선택합니다. 사용자 지정 역할을 생성하려면 IAM 콘솔로 이동합니다.

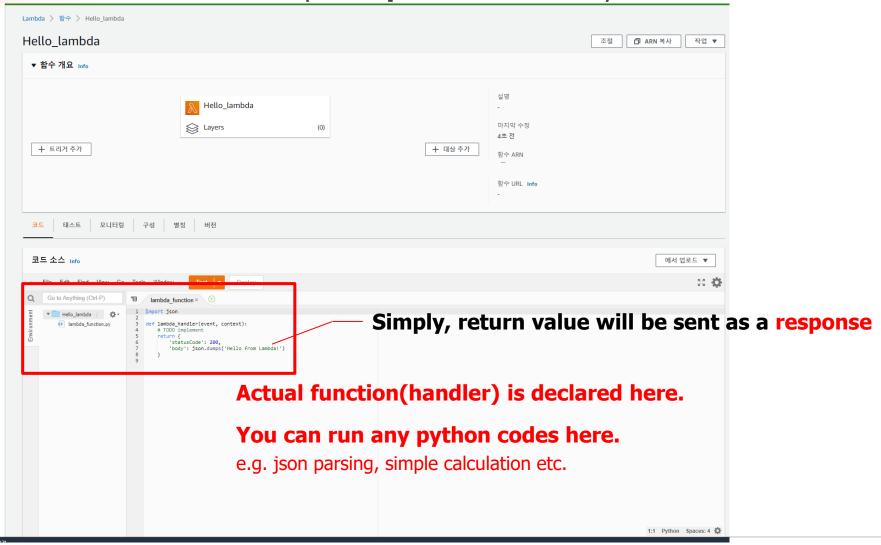
○ 기본 Lambda 권한을 가진 새 역할 생성

O AWS 정책 템플릿에서 새 역할 생성

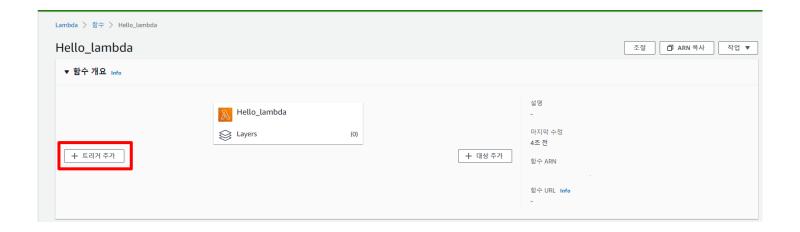
○ 기존 역할 사용



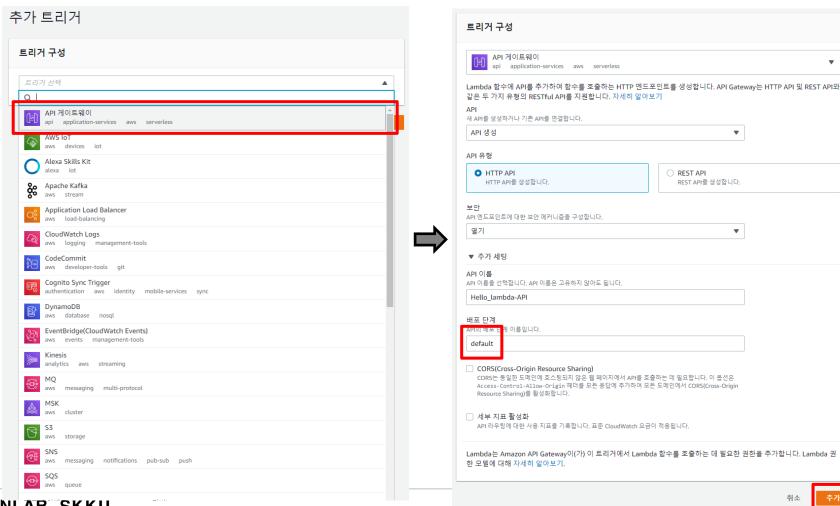
We can make a simple http web server only with console



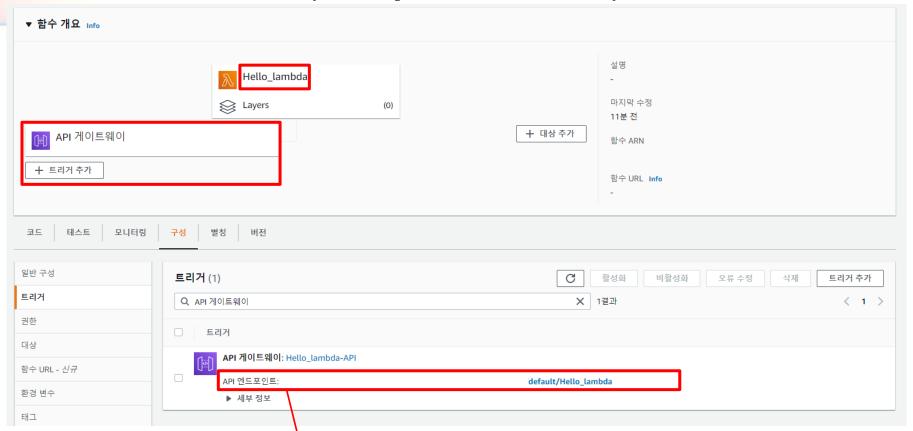
- We can make a simple http web server only with console
- To make clients' HTTP requests forwarded to our lambda function, we need a trigger called API gateway of AWS.



We can make a simple http web server only with console



We can make a simple http web server only with console



An URL with path /default/Hello_lambda will be printed here

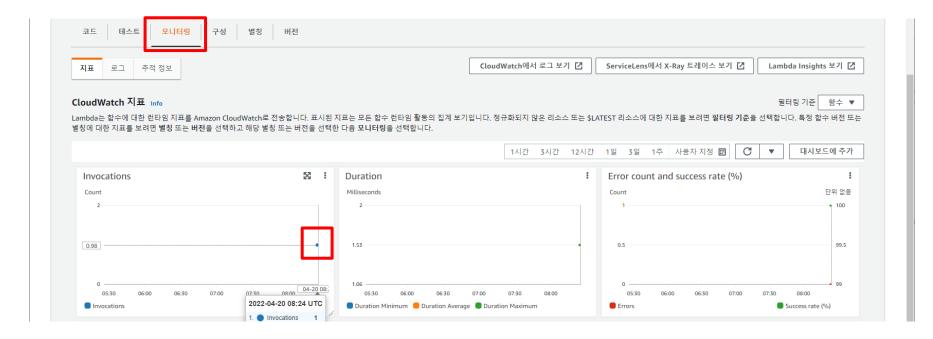
Maybe.. Your path is /[배포 단계]/[함수 이름]

We can make a simple http web server only with console

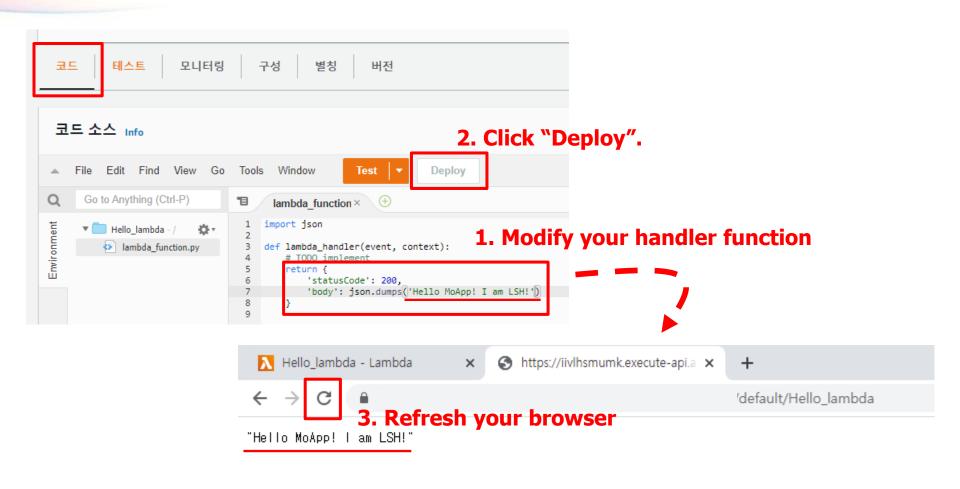


"Hello from Lambda!"

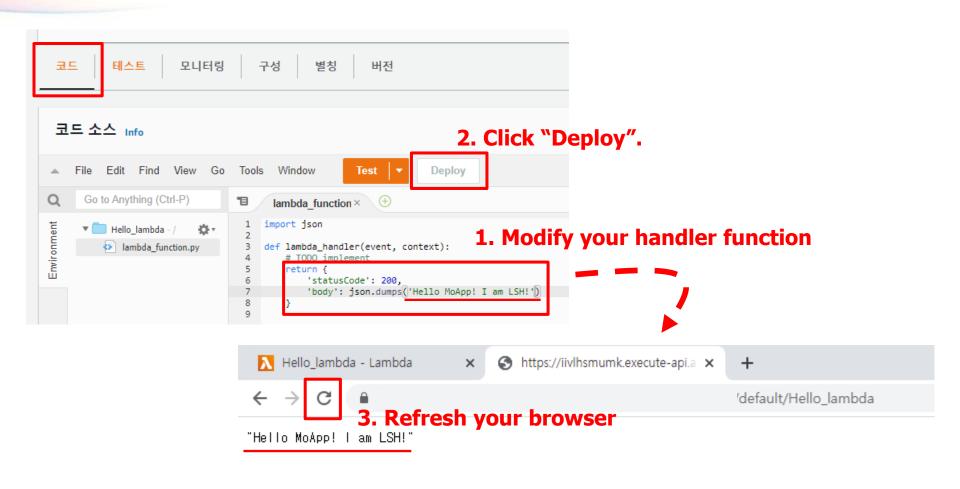
You can send a HTTP request using your browser!



We can make a simple http web server only with console



We can make a simple http web server only with console



We can make a simple http web server only with console

Test application source codes are here:

https://gist.github.com/shlee-627/f7297d184bd21576df3daff143dc595d

Don't forget to add these lines in your project!

```
implementation 'com.squareup.okhttp3:okhttp:4.9.3' ← in build.Gradle (Module: ...)
```

← in AndroidMenifest.xml

We can make a simple http web server only with console

```
@Override
public void onResponse(@NonNull Call call, @NonNull Response response) throws IOException {
    final String res = response.body().string();

    MainActivity.this.runOnUiThread(new Runnable() {
        @Override
        public void run() {
            tv.setText(res);
        }
    });
}
```

Because you retrieve body from response

Simply this String will be retrieved..



Ex2. Add more functions to Lambda

- Add two functions to your handler:
 - Retrieves parameter called 'name' from request
 - Returns JSON string that contains received parameter.

```
lambda function × +
   import json
   def lambda handler(event, context);
      # Get user's Query Parameter named with "name"
       params = event ['quervStringParameters']
                                                                  Get GET Query Parameter, 'name'
       name = params['name'].
       obj = {
          'name' : name
10
11
12
                             json.dumps( ... ) converts python object into json string
13
       print (name)
       return {
15
          'statusCode': 200
                                                                       Set response body with 'name' value
           'bodv': ison.dumps(obi)
17
18
```

event is ... 첫 번째 인수는 이벤트 객체입니다. 이벤트는 처리할 Lambda 함수에 대한 데이터가 포함된 JSON 형식 문서입니다. Lambda 런타임은 이벤트를 객체로 변환한 후 함수 코드에 전달합니다.

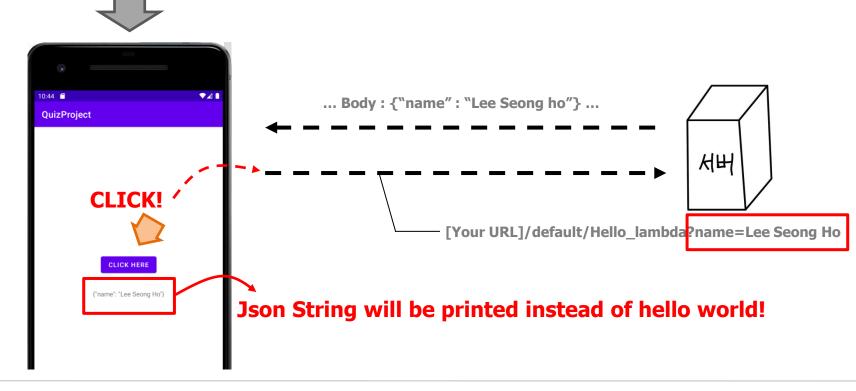
Ex2. Add more functions to Lambda

OkHttpClient cli = new OkHttpClient();

HttpUrl.Builder urlBuilder = HttpUrl.parse(URL).newBuilder();

urlBuilder.addQueryParameter("name", "Lee Seong Ho");

Add this line to add Query Parameter!



Lab Practice – Modify Query Parameter & Resp.

- This week we will make a SIMPLE movie HTTP API server that can handle ONLY one moive.
- Just similar with omdb API, but your server only can handle ONE movie.

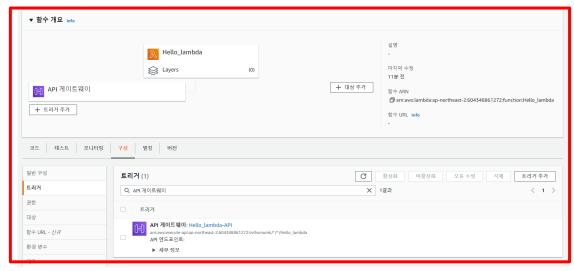


- Your client may send a HTTP GET request with a following query parameter:
 - "t": [movie name]e.g. [your URL]/default/[your handler name]?t=[movie name]
- When your lambda handler receives a request with t=spider man no way home, your server sends a response that contains a JSON string in its body with exact same format with it:

Title : Spider-Man: No Way Home Year : 2021 Released Date : 17 Dec 2021 Runtime : 148 min Genre : Action, Adventure, Fantasy IMDB Rates : 8.5

Lab Practice - Modify Query Parameter & Resp.

- Your server don't have to handle other movies.
 (YOU DO NOT HAVE TO HANDLE EXCEPTIONAL CASES)
- Copies your [lambda_handler].py source codes and pastes it in your notepad. And change your copied code to <student_id>.py.
- Captures your lambda console's "Function Description" (함수 개요):



We <u>WILL NOT</u> care your lambda handler name.

Submit both <student_id>.py and captured images in ICAMPUS with zip file named <student_id>.zip