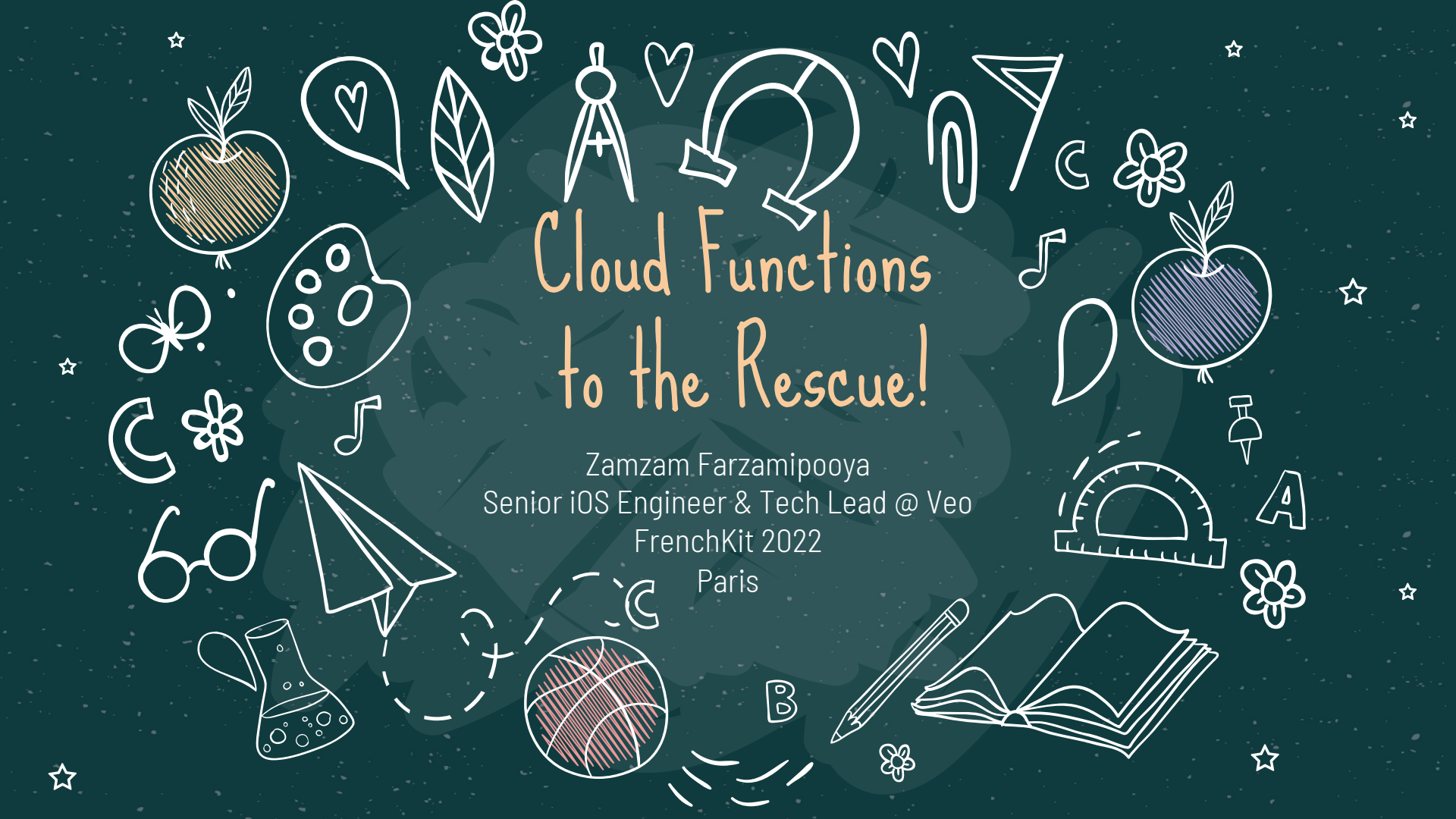


Cloud Functions to the Rescue!

Zamzam.Farzamipooya
Senior iOS Engineer & Tech Lead @ Veo
FrenchKit 2022
Paris



☆
 $\sqrt{123}$

☆
"The functions of a good software is to make
the complex appear to be simple!!"

-Grady Booch



☆
+x÷



Common Mobile Engineer's Pains



"It's JUST calling 4 APIs for loading one page; why are you making such a fuss about it?!"

Number of API Calls



"Can't you just handle that part of the logic client side? we don't have time to add that now!"

Handling business logic



"There is this user settings that needs to be saved, just do it on the client side!"

Keeping local data



How many of you have wished to be able to do some
backend work to avoid doing these things client side?



Usual Blockers



01.

Don't know where to start.

02.

Don't know what tech stack to choose

03.

Don't know how to deploy or maintain a backend project

04.

It all seems way too MUCH work to learn and start





Cloud Functions to the Rescue



Cloud Functions



Serverless framework

Runs on event triggers

Code is stored in GCP

Zero maintenance

Private and secure

Deploy with one line

Integrates with FCM

Can run intensive tasks

Integrates with third-party services and APIs

Cloud Functions V2

Can execute more than one request at a time

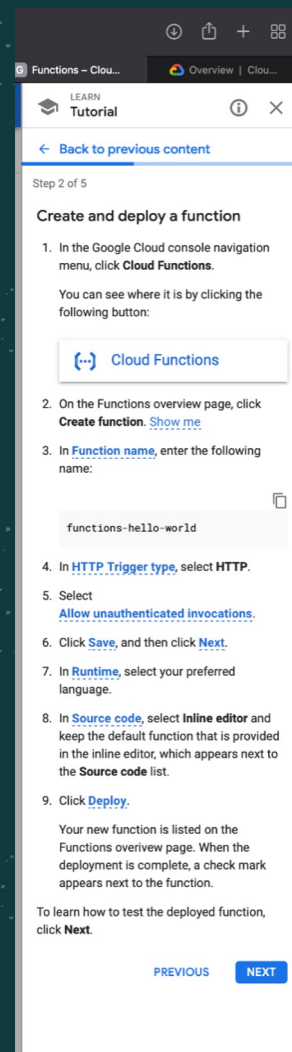
New trigger types like
Crashlytics velocity alerts

Http functions can have a 1 hour time out




Quick Start - Google Cloud Panel

You can make your first function in 5 minutes through Google Cloud Panel!



The screenshot shows a tutorial page titled "LEARN Tutorial" with a "Back to previous content" link. It is "Step 2 of 5" and is titled "Create and deploy a function". The instructions are as follows:

- In the Google Cloud console navigation menu, click **Cloud Functions**. You can see where it is by clicking the following button:

- On the Functions overview page, click **Create function**. [Show me](#)
- In **Function name**, enter the following name:

```
functions-hello-world
```
- In **HTTP Trigger type**, select **HTTP**.
- Select [Allow unauthenticated invocations](#).
- Click **Save**, and then click **Next**.
- In **Runtime**, select your preferred language.
- In **Source code**, select **Inline editor** and keep the default function that is provided in the inline editor, which appears next to the **Source code** list.
- Click **Deploy**.

Your new function is listed on the Functions overview page. When the deployment is complete, a check mark appears next to the function.

To learn how to test the deployed function, click **Next**.

Navigation buttons: **PREVIOUS** and **NEXT**.



Firestore CLI



Create Firebase
project

Install node.js &
Firestore CLI

Initialize your project
with JavaScript or
TypeScript



```
$ npm install -g firebase tools  
$ firebase login  
$ firebase init functions
```



Write Your
Functions



Ship It! Ship It! Ship It!

1

Write your code

Index.ts or index.js
is the heart of your
functions

2

Test it

You can easily run your
functions locally and test it
in the Firebase Local
Emulator Suite

3

Deploy it

You can deploy it with
one line of code!

Project Structure Using TypeScript

Project/

* functions/ # Directory containing functions code

*

* Source/ # Directory containing TypeScript code

* index.ts # Main source file for your code

*



```
6 export const userIsLegal = functions.https
7   .onCall((data, context) => {
```

HTTPS callable functions

```
8   const name = data.name;
9   const familyName = data.familyName;
10  const birthYear = data.birthYear;
```

Data sent from the clients

```
11
12  // Error Handling
13  if (!(typeof name === "string" || name.length === 0) {
14    // Throwing an HttpsError so that the client gets the error details.
15    throw new functions.https.HttpsError("invalid-argument",
16    |   "The function must be called with \"name\" argument");
17  }
```

Error handling

```
18
19  // Business logic
20  const isLegal = hasLegalAge(birthYear);
```

Add your business logic

```
21
22  return {
23    fullName: `${name} ${familyName}`,
24    isLegal: isLegal,
25  };
26  });
```

Return the result



Let's Test It



01. Save your code

Your IDE might not have autosave like Xcode :D



02. `$ cd ../functions`

Navigate to your functions folder



03. `$ npm run serve`

In your `package.json` file you can see this line

```
"serve": "npm run build &&  
firebase emulators:start",
```



Console Log

```
i ui: Emulator UI logging to ui-debug.log
i functions: Watching "/Users/zamzampooya/Documents/Apps/FKCloudFunctions/functions" for Cloud Functions...
✓ functions[us-central1-userIsLegal]: http function initialized (http://localhost:5001/halogen-basis-356610/us-central1/userIsLegal)
```

```
✓ All emulators ready! It is now safe to connect your app.
i View Emulator UI at http://localhost:4042
```

Emulator	Host:Port	View in Emulator UI
Functions	localhost:5001	http://localhost:4042/functions
Firestore	0.0.0.0:8082	http://localhost:4042/firestore

```
Emulator Hub running at localhost:4400
Other reserved ports: 4500
```

Issues? Report them at <https://github.com/firebase/firebase-tools/issues> and attach the *-debug.log files.

Remember this is a local environment. Visit the production version of halogen-basis-356610 in the console.

[View project](#) [Dismiss](#)

Emulator overview

👤 Authentication emulator

Status
Off [🗑](#)

Port number
N/A

[Go to emulator](#)

🔥 Firestore emulator

Status
On [✔](#)

Port number
8082

[Go to emulator](#)

🗄 Realtime Database emulator

Status
Off [🗑](#)

Port number
N/A

[Go to emulator](#)

(↔) Functions emulator

Status
On [✔](#)

Port number
5001

[View logs](#)

📁 Storage emulator

Status
Off [🗑](#)

Port number
N/A

[Storage](#)

🌐 Hosting emulator

Status
Off [🗑](#)

Port number
N/A

✧ PubSub emulator

Status
Off [🗑](#)

Port number
N/A

📦 Extensions emulator

Status
Off [🗑](#)

Port number
N/A

Emulator UI

POST http://localhost:5001/halogen-basis-356610/us-central1/usersLegal

Send

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

Cookies

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

Beautify

```
1 {
2   "data": {
3     "name": "Zamzam",
4     "familyName": "Pooya",
5     "birthYear": 1993
6   }
7 }
```

Test It (With Postman)

Body Cookies Headers (8) Test Results

Status: 200 OK Time: 127 ms Size: 302 B Save Response

Pretty Raw Preview Visualize **JSON**

```
1 {
2   "result": {
3     "fullName": "Zamzam Pooya",
4     "isLegal": true
5   }
6 }
```

Call Functions From Mobile Apps



Call functions via
Https requests



Call functions from
your app with Cloud
Functions SDK

Let's Code



Importing the SDK

```
8 import Foundation
9 import FirebaseFunctions
```

```
11 class CallableFunctionsManager: ObservableObject {
```

```
12     lazy var functions = Functions.functions()
```

```
15     func callFunction(requestModel: IsLegalRequestModel) async throws {
```

```
16         let userIsLegal = functions.httpsCallable("userIsLegal",
17                                                     requestAs: IsLegalRequestModel.self,
18                                                     responseAs: IsLegalResponseModel.self)
```

```
20         let result = try await userIsLegal(requestModel)
```

```
21         print("\(result.fullName) has legal age: \(result.isLegal)")
```

```
22     }
```

```
23 }
24
25 }
```

```
27 struct IsLegalRequestModel: Encodable {
```

```
28     var name: String
```

```
29     var birthYear: Int
```

```
30 }
```

```
32 struct IsLegalResponseModel: Decodable {
```

```
33     var fullName: String
```

```
34     var isLegal: Bool
```

```
35 }
```

Call it like a
normal swift
function

Using Codable models for
Request and Response

metadata.emulator.name="functions"

Apply

Reset

```

22:38:53 I functions Watching "/Users/zamzampooya/Documents/Apps/FKCloudFunctions/functions" for Cloud Functions...
22:38:54 I functions http function initialized (http://localhost:5001/halogen-basis-356610/us-central1/userIsLegal).
22:47:55 I function[us-central1-userIsLegal] Beginning execution of "userIsLegal"
22:47:55 I function[us-central1-userIsLegal] {
  "verifications": {
    "app": "MISSING",
    "auth": "MISSING"
  },
  "logging.googleapis.com/labels": {
    "firebase-log-type": "callable-request-verification"
  },
  "severity": "INFO",
  "message": "Callable request verification passed"
}
22:47:55 I function[us-central1-userIsLegal] Finished "userIsLegal" in ~1s
    
```

View Logs



☆
So far we have
written and
tested our Cloud
Function let's
deploy it!
☆

$\sqrt{123}$

$++\div$



☆
STUDY
HARD!
☆

Deploy with **one line** using CLI

```
$ firebase deploy --only functions
```



When finished you'll see

✓ Deploy complete!

Project Console: <https://console.firebase.google.com/project/halogen-basis-356610/overview>

Check Out Firebase Console to View Your Functions

Functions

Dashboard Usage

Build ^

Authentication

App Check

Firestore Database

Realtime Database

Extensions

Storage

Hosting

Functions

Machine Learning

Remote Config

Cloud Messaging

Release & Monitor ▾

Analytics ▾

Engage ▾

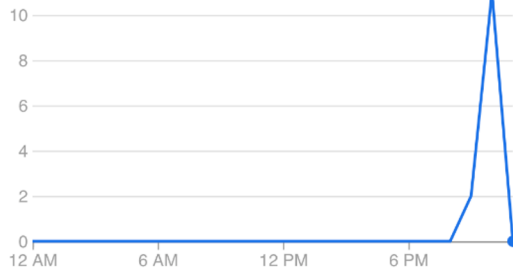
All products

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Pay as you go

Function	Trigger	Version	Requests (24 hrs)	Min / Max Instances	Timeout
function-zi-trial europa-west1	HTTP Request https://europa-west1-halogen-basis-356610.cloudfunctions...	v1	0	0 / 3000	1m
addTeamName us-central1	HTTP Request https://us-central1-halogen-basis-356610.cloudfunctions.n...	v1	0	0 / -	1m
makeShortName us-central1	document.create messages/{documentId}	v1	0	0 / -	1m
userIsLegal us-central1	HTTP Request https://us-central1-halogen-basis-356610.cloudfunctions.n...	v1	13	0 / -	1m

Invocations/second



Additional details

Deployed: 9/25/22, 10:57 PM

Billable instance time: N/A

Language: Node.js 16

Memory: 256 MB

Where to Go From Here

Write functions that work with
Firebase triggers such as Cloud
Firestore 📁

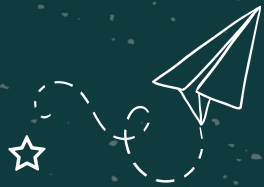
Unit test your functions 🧑💻

Run functions on a
schedule 🕒

Add security rules to
your Cloud Functions or
use App Check for
protecting your API
resources 🔒



Next time you are in a situation where you desperately need a backend engineer's help, just be your own saviour and do it with Cloud Functions!




THANKS!

Do you have any questions?

zamzampooya@gmail.com

@zamzampooya

+45 31605586



CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, and infographics & images by **Freepik**

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