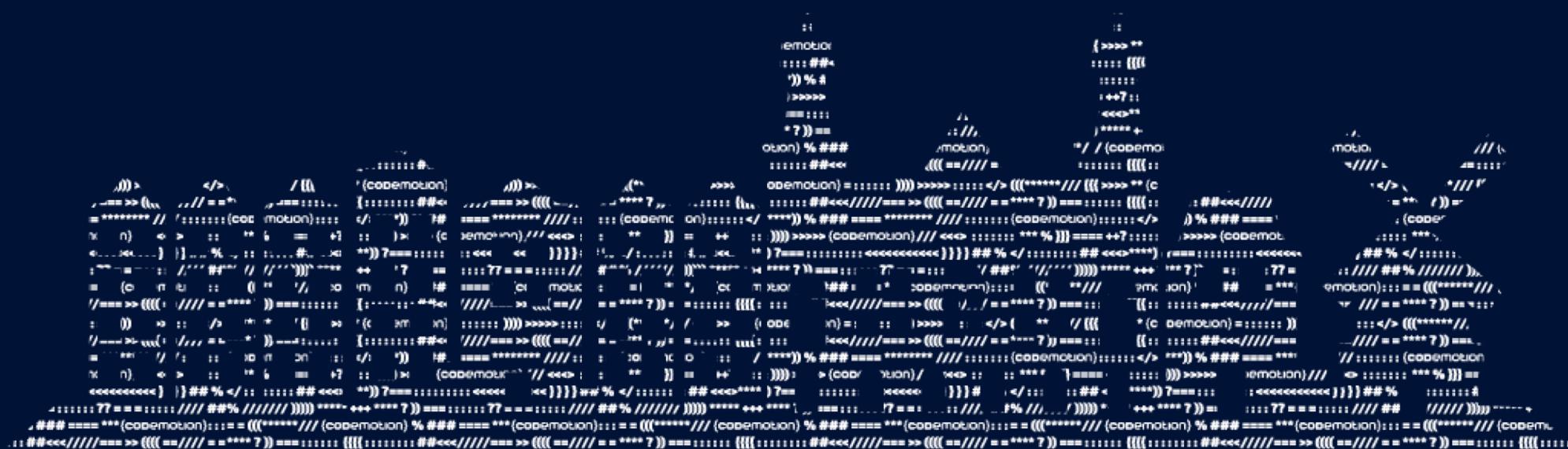


# Keeping your head cool with a serverless voice controlled fan

Paco van Beckhoven

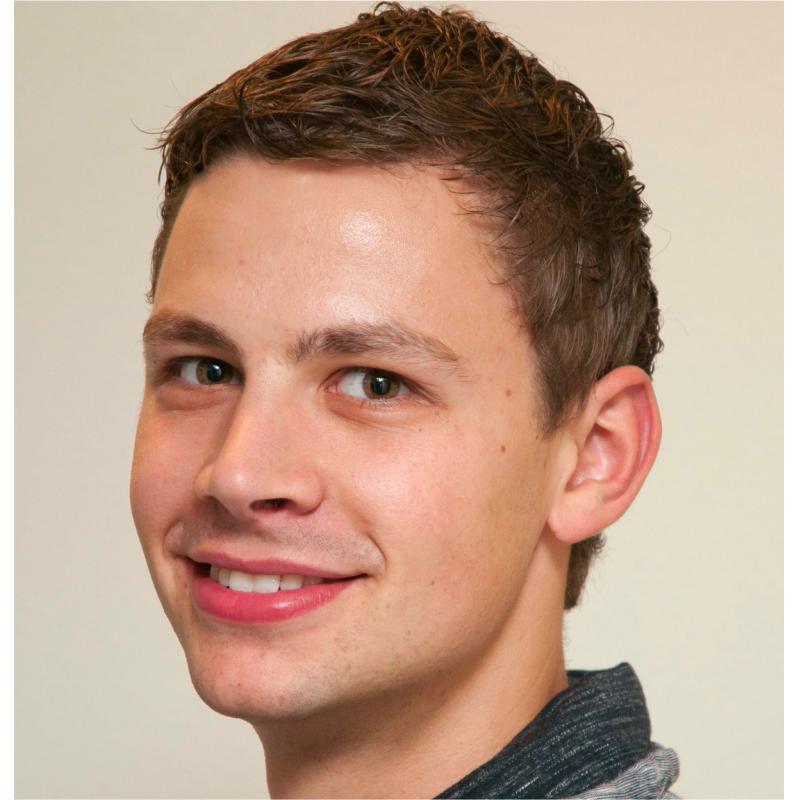


# About me

Full stack developer



Royal  
Flora  
Holland



Paco van Beckhoven

 @DevPaco

# How it all started



# The problem



<https://gifer.com/en/7UBY>

# The problem



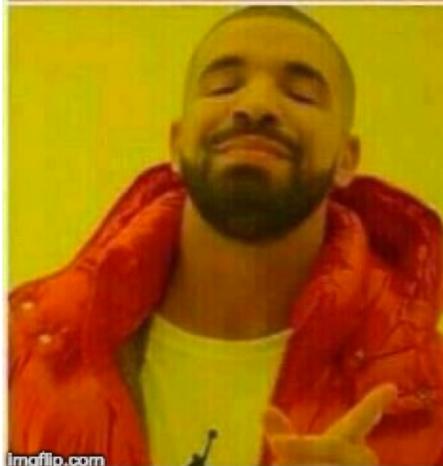
<https://gifer.com/en/96YO>

# The problem



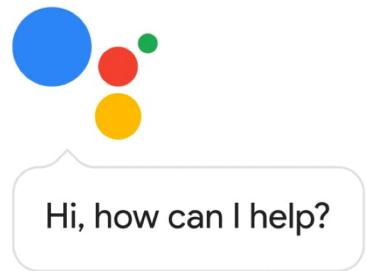
GET  
OUT OF BED

---



SHOUT  
TO THE FAN

# The goal

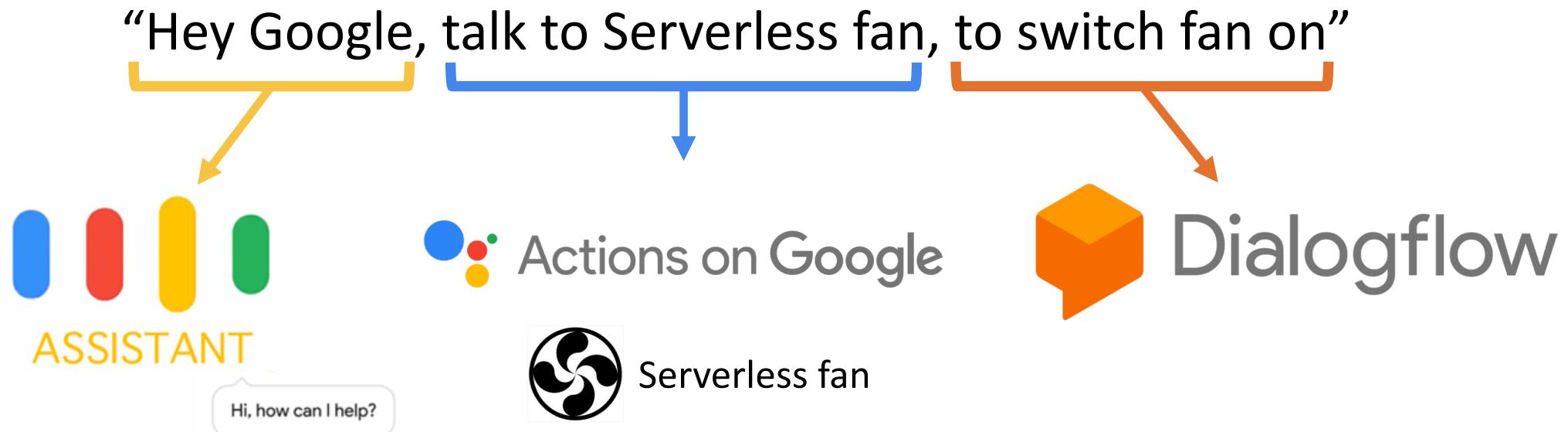


<http://i.imgur.com/f7dGct6.gif>

# What do we need?

- Convert speech to actions
- A fan
- Something to control the fan
- Serverless

# Converting speech to actions



# Conversational User Interfaces



do I need an umbrella today

GUI vs CUI

Mijn weer Nederland Wereldwijd Foto en video

Vinden: 'wind', 'Utrecht', 'Parijs'

De Bilt

Vandaag 6° / 12° NO 3

Morgen 1° / 13° O 2

Dinsdag 5° / 15° Z 2

› 14-dagse verwachting

Geen neerslag verwacht

Nu 12:35 13:05 13:35 14:05 14:35 Zwaar Licht

Meer weer van De Bilt

› Buienradar

› 5-dagse per uur

Uitgebreid overzicht De Bilt

Buienradar Zon Satelliet Temperatuur

12:10

Legenda ^

Afgelopen uur Radar +3 uur Radar +24 uur

No, today is not predicted to rain in Utrecht. It'll be partly cloudy, with a forecast high of 12 and a low of 0.

10°

Partly Cloudy

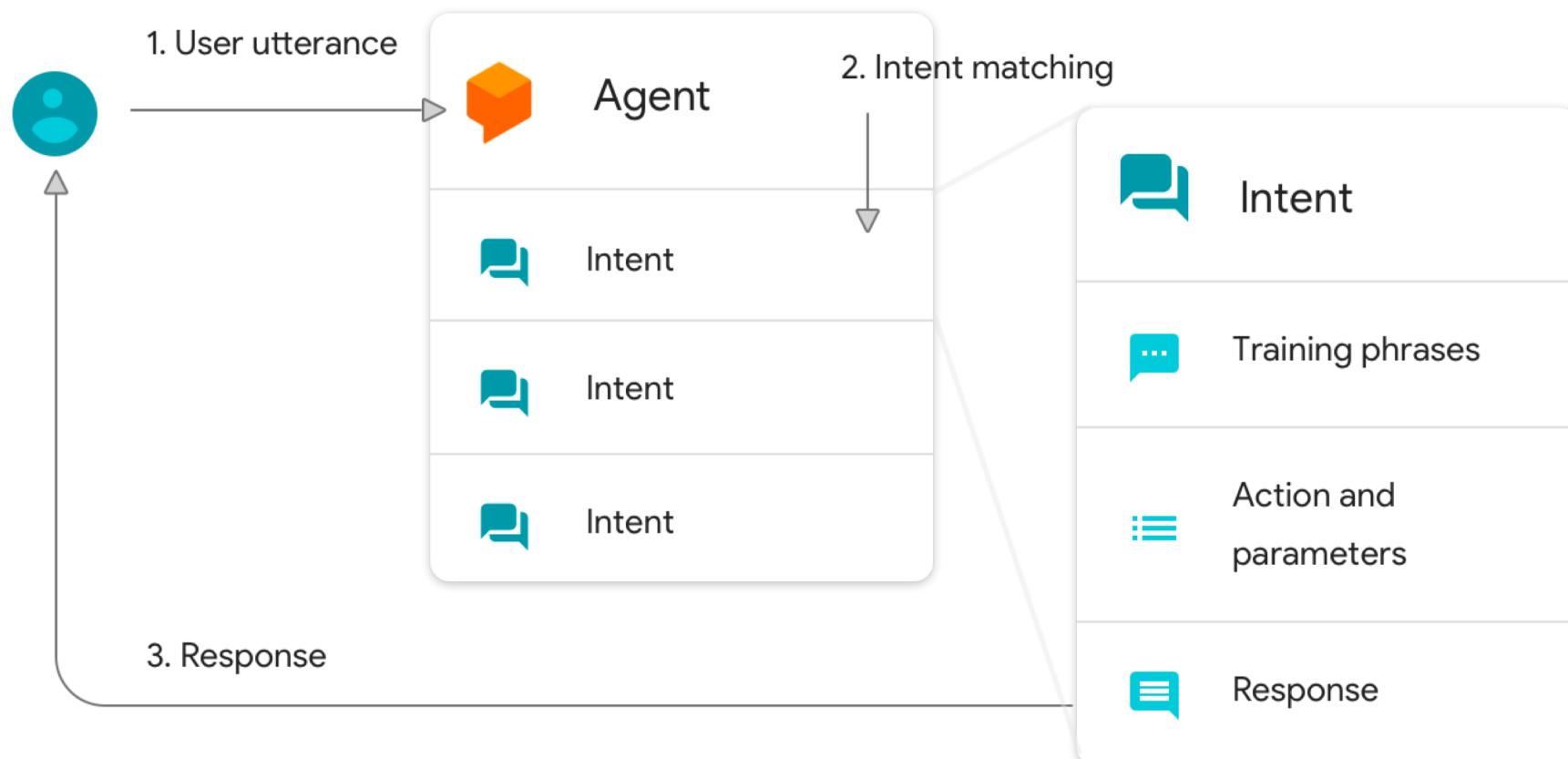
Sunday · Utrecht

High: 12° Low: 0° · Precip: 0%

11° 12° 12° 12°

# Converting speech to actions

“Switch fan on”



# Let's start



Actions on Google



Dialogflow



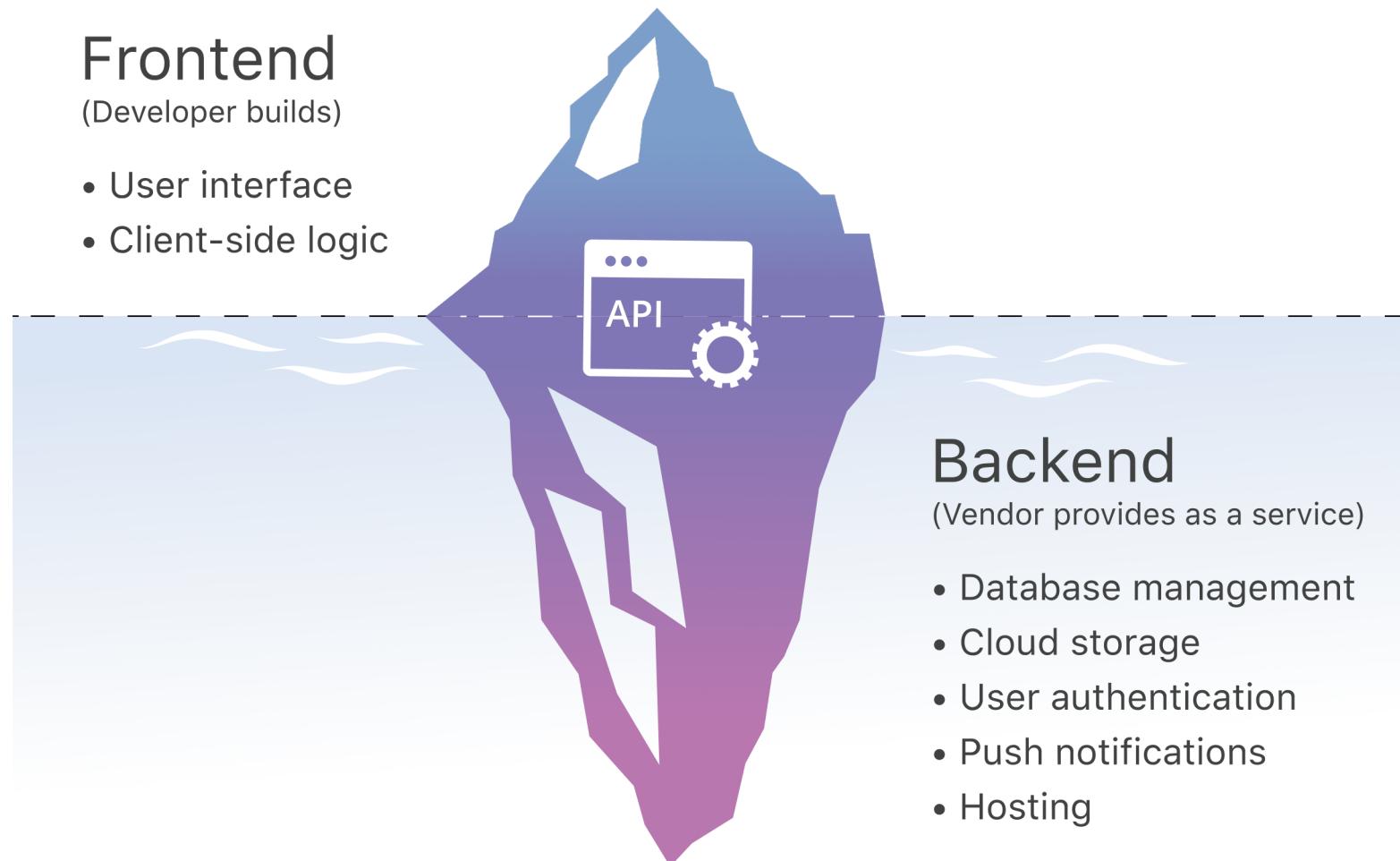
**SHOUT  
TO THE FAN**

# What is serverless?

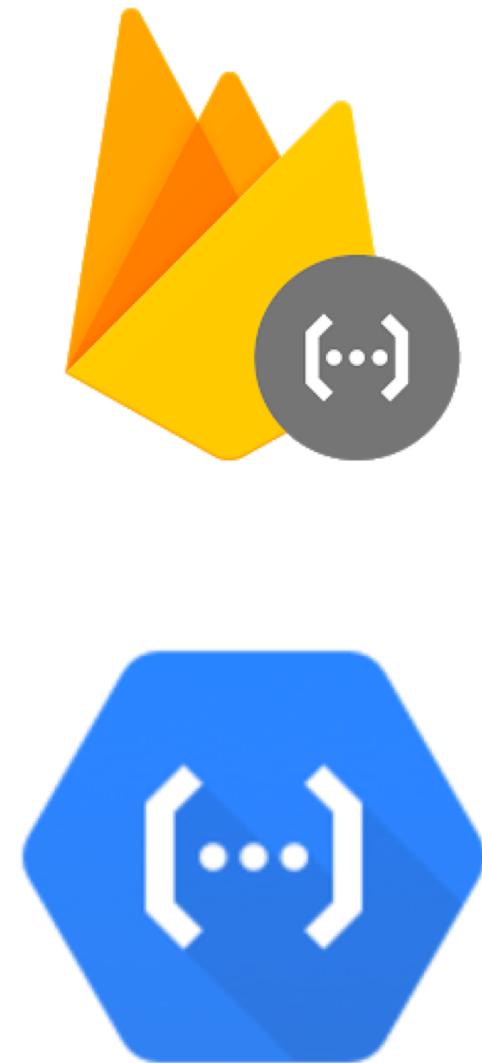


<https://nordicapis.com/>

# Backend as a Service (BaaS)



# Functions as a Service



# Fulfilling the intent

Webhook

DISABLED



Inline Editor (Powered by Cloud Functions for Firebase)

ENABLED



[index.js](#) [package.json](#)



```
1 // See https://github.com/dialogflow/dialogflow-fulfillment-nodejs
2 // for Dialogflow fulfillment library docs, samples, and to report issues
```

# Fulfilling the intent



Dialogflow



Firebase

# The Raspberry pi client

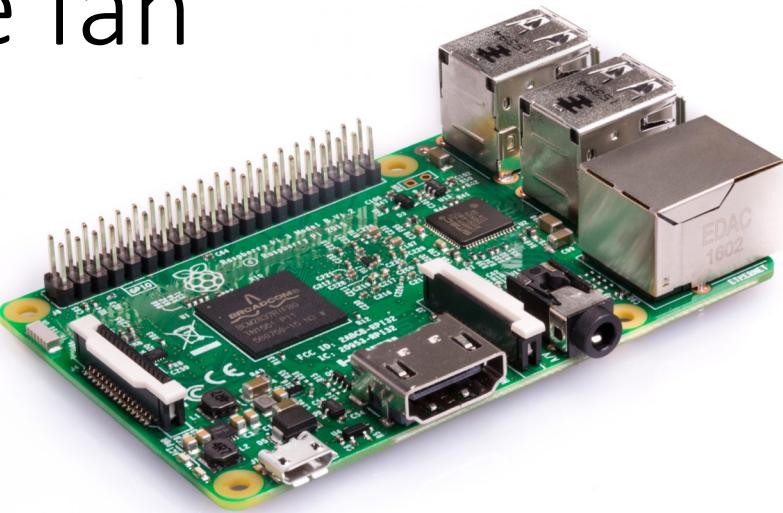
```
const admin = require('firebase-admin');
const credentials = require('./userdata/serviceAccountKey.json');

admin.initializeApp({
  credential: admin.credential.cert(credentials),
  databaseURL: 'https://<application_name>.firebaseio.com/'
});

admin.database().ref("/fan").on("value", function (snapshot) {
  console.log("switching fan " + snapshot.val().state);
  // TODO: Turn the fan on/off
});
```

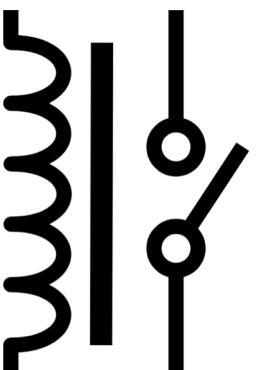
# Controlling the fan

Raspberry Pi



Relay

Electrically operated switch



Pi Model B/B+	
3V3 Power	1 2
5V Power	3 4
5V Power	5 6
Ground	7 8
GPIO14 UART0_TXD	9 10
GPIO15 UART0_RXD	11 12
GPIO18 PCM_CLK	13 14
Ground	15 16
3V3 Power	17 18
GPIO10 SPI0_MOSI	19 20
GPIO9 SPI0_MISO	21 22
GPIO11 SPI0_SCLK	23 24
Ground	25 26
ID_SD I2C ID EEPROM	27 28
Ground	29 30
GPIO12	31 32
Ground	33 34
GPIO16	35 36
GPIO20	37 38
Ground	39 40
Pi Model B+	

# Controlling the pins

```
const rpio = require('rpio');

// Setup pin 40
rpio.open(40, rpio.OUTPUT, rpio.LOW);
// Turn the fan on
rpio.write(40, rpio.HIGH);
```

# Recap

- Google Assistant
- Actions On Google
  - Serverless fan application
- Dialogflow
  - switch\_fan intent with the “turn” parameter
- Firebase
  - Cloud function
  - realtime database
- Pi
  - Firebase client
  - GPIO

# Demo



# Thank you!



<https://github.com/pacbeckh/serverless>

For slides and useful links



[@DevPaco](#)

For questions, feedback, suggestions