FaaS Slack Bot

Intro

Serverless Computing is on the rise. To achieve serverless computing, many companies have released their FaaS products: AWS Lambda, Google Cloud Functions, Azure Functions, and so on.

Recently, JD's TIG released its own Function Platform: Fibonacci. The fib needs some projects to demonstrate its features . Not sensititve to delay, and with large fluctuations in requests number, chatbot is a perfect use case for FaaS. So we started building this bot.

We chose to build a task-oriented bot. Considering the business scenario of JD, we decided to build a shopping chatbot. A simple open-source CLI shopping bot is chosen as the start point. And we use OpenFaaS to turn it serverless.

> Credit to wwyiyi for offer the initial repo.

Overview

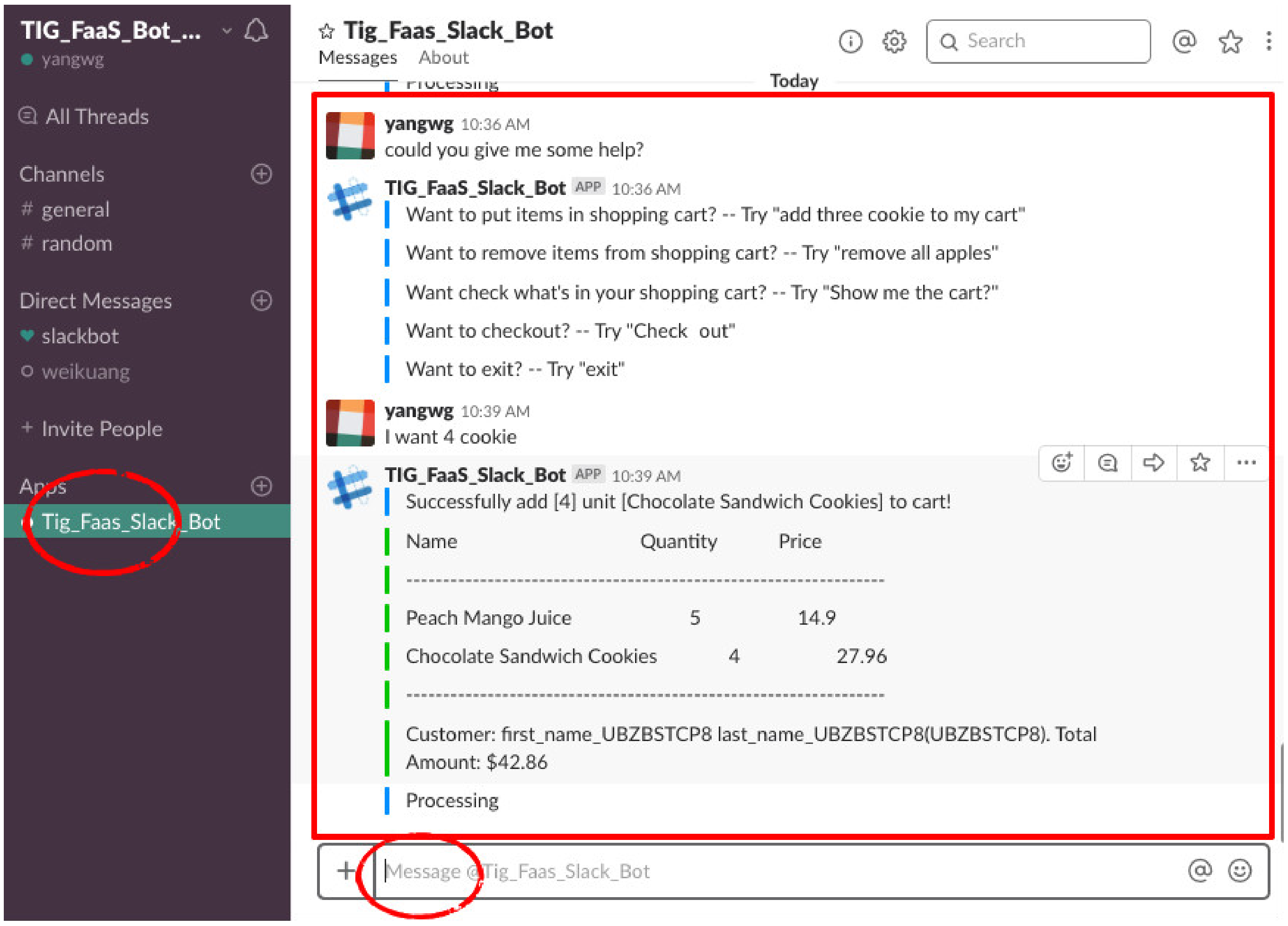
This FaaS Slack Bot built with OpenFaaS, Dialogflow, Slack, and mongoDB.

- **Slack** for input and output chat messages
- **Dialogflow** for Natural Language Understanding(NLU)
- **mongoDB** for data persistence
- **FaaS functions** for processing running logic

It allows the user:

- adding/removing items towards a shopping cart
- view items in the cart
- check out and exit shopping.
- greeting / help

Chat Interface



yangwg 10:36 AM
could you give me some help?

TIG_FaaS_Slack_Bot APP 10:36 AM
Want to put items in shopping cart? -- Try "add three cookie to my cart"
Want to remove items from shopping cart? -- Try "remove all apples"
Want check what's in your shopping cart? -- Try "Show me the cart?"
Want to checkout? -- Try "Check out"
Want to exit? -- Try "exit"

yangwg 10:39 AM
I want 4 cookie

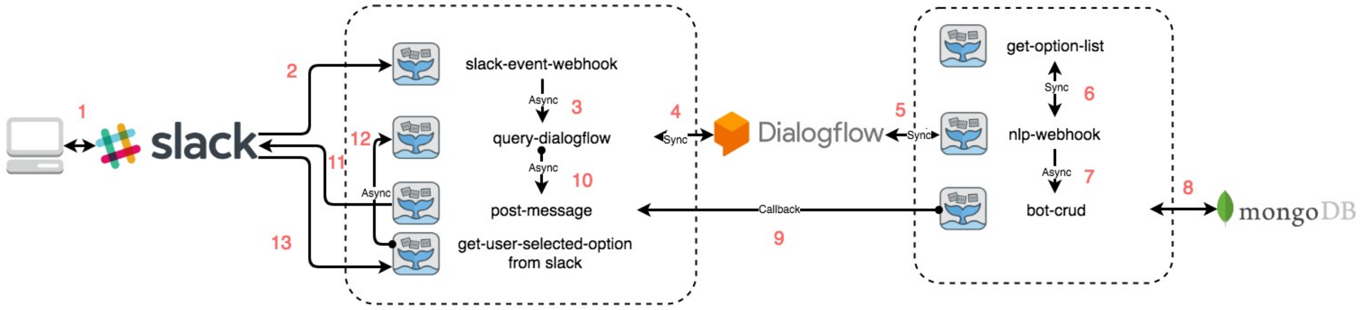
TIG_FaaS_Slack_Bot APP 10:39 AM
Successfully add [4] unit [Chocolate Sandwich Cookies] to cart!

```
Name                          Quantity        Price
----------------------------------------------------------------
Peach Mango Juice                  5              14.9
Chocolate Sandwich Cookies              4              27.96
----------------------------------------------------------------
```

Customer: first_name_UBZBSTCP8 last_name_UBZBSTCP8(UBZBSTCP8). Total Amount: $42.86

Processing

Workflow



Function Introduction

- **slack-event-webhook**: receive events happened in chat interface, like user post message

- **query-dialogflow**: get user-input from an event and send it to Dialogflow
- **nlp-webhook**: get processed intent/parameters/contexts, perform corresponding operations
- **get-option-list**: get options when input contains synonym
- **bot-crud**: data persistence
- **post-message:** post response for user-input as a bot user
- **get-user-selected-options from slack**: handle rich message operation from the user

Workflow Example

Let's take add items for example. What happens after user input `add 36 juice to the cart`?

- Step 1-`Route 1`: User input `add 36 juice to the cart` in the Slack Interface
- Step 2-`Route 2`: Slack sent userinput to FaaS function `slack-event-webhook`
- Step 3-`Route 3`: The webhook judge the message was from user, not the bot, forward this message to function `query_dialogflow`
- Step 4-`Route 4`: `query-dialogflow` initiate an HTTP request to Dialogflow
- Step 5-`Route 5`: Dialogflow process user_input, get intent, extract parameters, send it to function `nlp-webhook`
- Step 6-`Route 6`: Webhook handle the request by intent type. For this input, the intent is `addToCart`, parameter: {quantity: 36, product_name: juice}, `nlp-webhook` ask `get-option-list` what kind of juice the store have?
- Step 7: `get-option-list` check what kind of juice it has, return option list to `nlp-webhook`
- Step 8- `Route 5, 4`: There are 3 kinds of juice, `juice a`, `juice b`, `juice c`. So the webhook return option list, prompt message back to `query-dialogflow`
- Step 9-`Route 10`: `query-dialogflow` send the dialogflow response to `post-message`
- Step 10-`Route 11`: `post-message` post those responses back to slack as a bot user.
- Step 11-`Route 1`: The bot post a drop-down menu, let user select which juice he / she want to buy.
- Step 12-`Route 1`: User selects one juice from the list, for example `juice b`.
- Step 13-`Route 13`: User's select action send to function `get-user-selected-option-from-slack`.
- Step 14-`Route 12`: `get-user-selected-option-from-slack` extract parameters and send a message `I choose number 2` on behalf of the user to `query-dialogflow`
- Step 15-`Route 4, 5`: `query-dialogflow` send a query request to Dialogflow, then dialogflow send the processed message to `nlp-webhook` , Now, the intent is `addToCart-followup` , and know the user want `juice b`, it could get quantity `36` from Dialogflow context. `nlp-webhook` call function `bot-crud`, and send the response. Follow the `Route5, 4, 10, 11, 1`, like steps above.
- Step 16- `Route-7, 9`: webhook ask function `bot-crud` to update cart info, send execute result to callback `post-message`
- Step 17-`Route 11, 1`: `post-message` receives messages from `bot-crud`, post it back to slack chat window.

Other intents follow the same workflow, but with fewer steps.

Guide

How to build & run

Check `Guides/Bot Build & Run Guide`, follow it. You could build and run the bot.

How it work?

Open `Demo/FaaS_Slack_Bot_Demo.MOV`, watch the video.

What message could I input?

Check `Guides/Bot Input Guide`

What learn more about OpenFaaS / Slack / Dialogflow?

Check `Guides/Reference Summary`

Directory / File Description

- `Demo`
  - `FaaS_Bot_yangwg.pptx`: Demo PPT
  - `FaaS_Slack_Bot_Demo.MOV`: Demo Video
- `Fib_Test`
  - `Fibonacci试用记录_Weiguang_Yang回复.docx` : Fib Test Record
- `file_tree.txt`: File tree of the whole project
- `Guides`
  - `Bot Build & Run Guide`: Guide for how to build and run this bot, **Must Read**
  - `Bot Input Guide`: Guide for user input, **Must Read**
  - `Reference Summary`: Summary for related repo / doc / guide / articles
- `README`: **Must Read**
- `tig_faas_bot` : Code Repo, **Must Have**