# Build a Serverless Github Bot in GCP

Franklin E. Diaz

frank378@gmail.com

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**Abstract**

Did you ever wonder how the cool kids get their bots going to manage pull requests in Github? The bots that can comment on Pull Requests, label things, perform other actions that are helpful to human developers? Well so did I, so I assembled one a while back that I want to share with you.

# 1 Build a Serverless Github Bot in GCP

This workshop is meant to be a fun way to learn more about some modern software development technologies. You don't need to have a deep understanding of all parts. Rather, you can follow along from end to end and choose to focus more deeply on any part that holds your attention.

Yes, there are easier ways to do many of the things in this document. It's OK to use those easier ways. Doing things "the hard way" may give deeper understanding and valuable insight. You have to show up to the gym every day and put in the work if you want the results. Same with this.

## 1.1 Outline

add a diagram here that shows the overall workflow

A high level overview of the learning path is as follows:

- Prerequisites
- Review the Python source for the bot.
- Configure Google Cloud account, service user, etc.
- Set up GitHub with a bot account, dev token, and webhook.
- Configure Terraform and deploy the bot.
- Test it out.
- Explore possibilities for extending the functionality.

# 2 Prerequisites

There are some requirements that must be met to successfully complete this workshop. This workshop was developed in a Linux environment, with some testing on Macintosh. You should use a similar environment, or you can use the containerized development environment if you wish. This may be a good option for folks who don't have access to a reliable Linux environment, or may be having issues getting the proper packages installed.

- You will need to install the Google Cloud SDK.
- You will need a Google Cloud account. Here are some instructions to set up a free Google Cloud account
- You need two e-mail accounts for this workshop.
  - The first is used for your personal (existing) Github account.

  - The second e-mail address will be used to create a Github account for your bot.

## 2.1 GNU Autotools

GNU Autotools have been included in the code base for the workshop. Autotools are a well-maintained set of Open Source tools with a gentle learning curve and are included in the distribution of many Open Source packages that we all rely on daily, at least indirectly, and often unknowingly.

The list of tools for using this Autotools configuration paradigm is show in Table 1.

| Tool | Description |
|---|---|
| autoconf | Generates a configure script from configure.ac |
| automake | Generates a system-specific Makefile based on Makefile.am template |
| make | X |

Table 1: Tools used in this project

The image shown in Figure 1 is from [1]. It illustrates the relationship between components mentioned in Table 1.

# 3 Set up Your Development Environment

The dev environment can be configured using the "bootstrap.sh" script and GNU autotools. This process should work well in Linux or Mac environments. There is also a development container that you can build if you are having issues configuring these, wish to run in a different Operating System, etc.

## 3.1 Option 1: Set up on Linux and Mac

1. Clone the Github repository from https://github.com/devsecfranklin/workshop-codemash-2023.
2. In the newly created "workshop-codemash-2023" directory, execute the "bootstrap.sh" script.
3. Next, run the "./configure" command.
4. Finally, run the "make python" command to prepare the necessary Python modules.

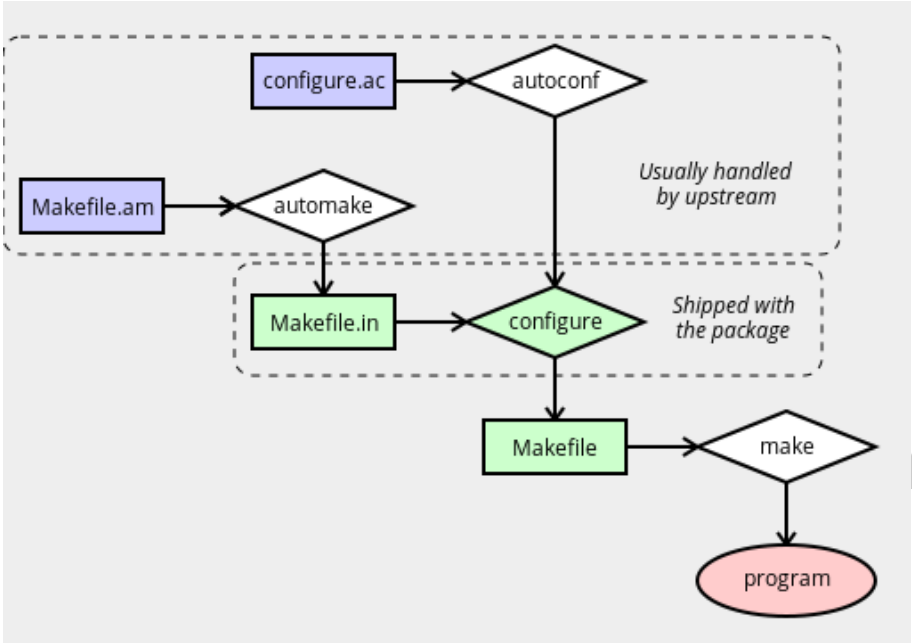


Figure 1: A basic overview of how the main Autotools components fit together.

### 3.2 Option 2: Set up the dev Container

1. Create a new Github account using the second e-mail address.
2. As your "main user", invite the bot user "bot-account" as a collaborator on the repo.
3. Add the Github action to the repository.

## 4 Github Setup

1. Create a new Github account using the second e-mail address.
2. As your "main user", invite the bot user "bot-account" as a collaborator on the repo.
3. Add the Github action to the repository.

You can add a cool icon to the bot account Github profile.

### 4.1 GH Action YAML File

```
name: 'codemash-cloudbot'
on:
- pull_request
env:
PR_NUMBER: ${{ github.event.pull_request.number }}
jobs:
phone-home:
    name: 'codemash-cloudbot'
    runs-on: ubuntu-latest
    steps:
    - name: Set up Cloud SDK
        uses: 'google-github-actions/setup-gcloud@v0'
        with:
        project_id: ${{ secrets.PROJECT_ID }}
        service_account_key: ${{ secrets.GOOGLE_APPLICATION_CREDENTIALS }}
        export_default_credentials: true
    - name: Use gcloud CLI
        run: |
        curl --request POST \
            --header "Content-Type:application/json" \
            --header "Authorization: Bearer $(gcloud auth print-identity-token)" \
            --data "{\"message\": \"Pull request number $PR_NUMBER by \
            $GITHUB_ACTOR on repository $GITHUB_REPOSITORY\", \"pr_number\": \
            \"$PR_NUMBER\", \"user\": \"$GITHUB_ACTOR\", \"repo\": \
            \"$GITHUB_REPOSITORY\", \"ref\": \"$GITHUB_REF\", \"commit_sha\": \
            \"$GITHUB_SHA\"}" \
            \ https://us-central1-gcp-gcs-pso.cloudfunctions.net/codemash-cloudbot
```

## 5 The Python Application

The Python code is meant to run as a "Cloud Function" in GCP. This is a cost-effective way to run code without deploying cloud infrastructure such as dedicated host instances or other cloud infrastructure that must be maintained. We get to run our code and let Google take care of the rest.

## 6 Terraform

## 7 Going a Bit Further

This optional section describes how you can connect your Cloud Function to your Kubernetes cluster to extend the functionality even more.

# 8 Cleanup

docker system prune

# Revision History

| Revision | Date | Author(s) | Description |
|---|---|---|---|
| v0.1 | October 2nd, 2022 | Franklin Diaz | Initial Draft |

## References

[1] Gentoo Authors. The basics of autotools, 2022.