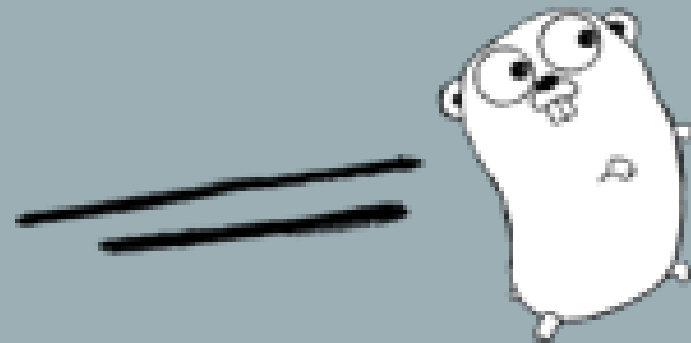# STARTING SERVERLESS WITH GO

STEFAN MEISSNER

ABOUT ME
- STEFAN MEISSNER -

AGENDA

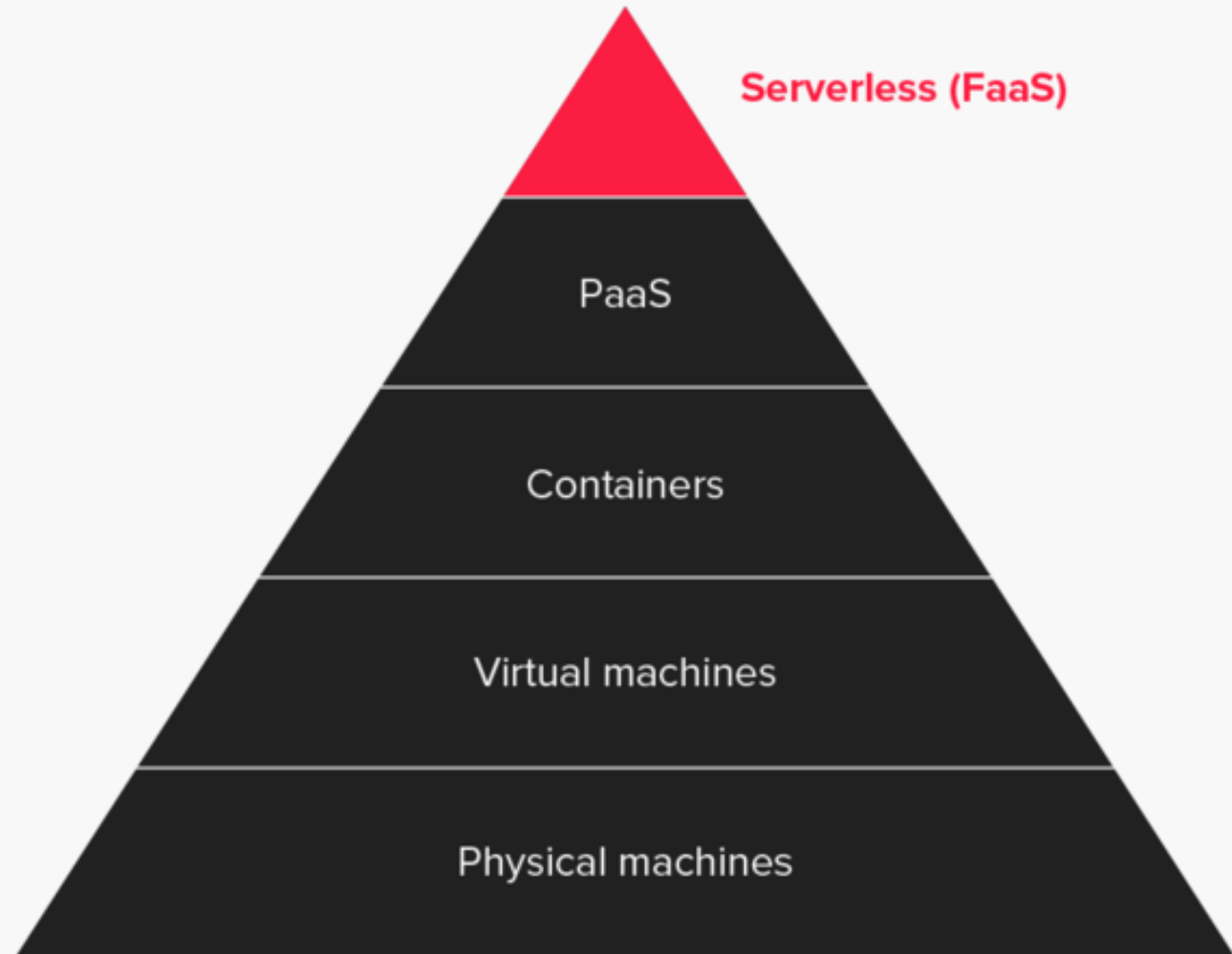**Serverless**

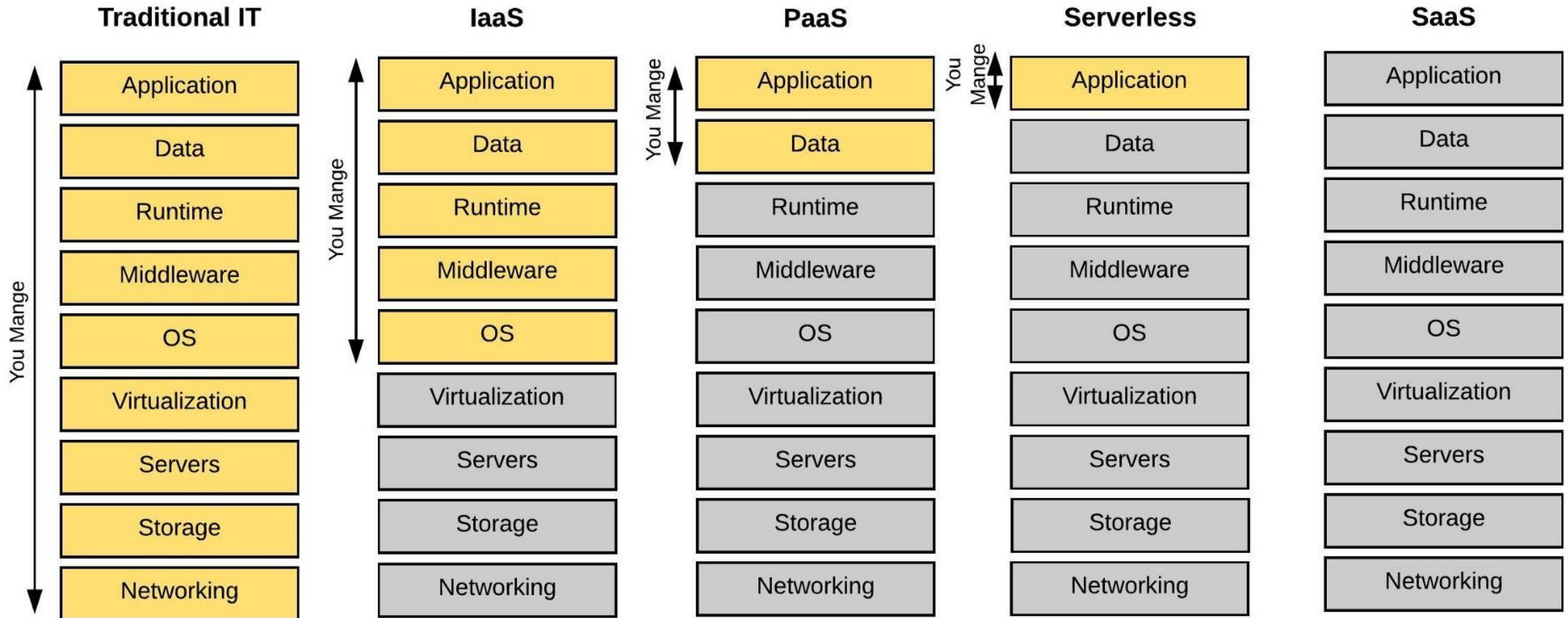**Public Cloud Vendors**

Go!

SERVERLESS
- INTRODUCTION -

**Developers want to create
User Value**

COMPUTING EVOLUTION

Serverless (FaaS)

PaaS

Containers

Virtual machines

Physical machines

© Yos Riady

© Slawomir Dorzak

Traditional IT

You Mange
Application
Data
Runtime
Middleware
OS
Virtualization
Servers
Storage
Networking

IaaS

You Mange
Application
Data
Runtime
Middlewar
OS
Virtualizatio
Servers
Storage
Networking

PaaS

You Mange

Application
Data

Serverless

You Mange

Application
Data

SaaS

Application
Data

---

adrian cockcroft
@adrianco

Follow

If your PaaS can efficiently start instances in 20ms that run for half a second, then call it serverless.

> **Julian Friedman** @doctor_julz
> if you think serverless is different than PaaS then either you or I have misunderstood what "serverless" or "PaaS" means

6:43 AM - 28 May 2016

SERVERLESS COMPUTE MANIFESTO

- Functions are the unit of deployment and scaling.

- No machines, VMs or containers visible in the programming model.

- Permanent storage lives elsewhere.

- Scales per request: User cannot over- or under-provision capacity.

- Never pay for idle (no cold servers/containers or their costs).

- Implicitly fault-tolerant because functions can run anywhere.

- BYOC - Bring Your Own Code.

- Metrics and logging are a universal Right.

Monolithic Application		Microservice		Function
	▷	Microservice	▷	Function
		Microservice		Function
				Function
				Function
				Function
				Function

The Weather Gods High Level Architecture

IBM Bluemix OpenWhisk

Legend:
- OpenWhisk Actions
- External
- Data
- Triggers

Weather Update Trigger

Weather Model

2 Weather Checker

TWC

1 Group Scanner

Cron trigger every 3 minutes

Set flag to check weather for each user location in the group

Cloudant

Weather Collector Trigger

For each user location updated

3 Rain Scanner

Snow Scanner

Wind Scanner

Storm Scanner

Frost Scanner

ETC Scanner

Notification Model

Notification

Notification Trigger

4 Send Notification

Bluemix Notification

Weather Gods

Hi!

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SERVERLESS
- THE GOOD AND THE BAD -

PROS

- Can improve performance
- Cost efficiency
  - Lower operational and development costs
  - Smaller cost to scale
- Reduced time to market and quicker software release
- Focus on code
- Reduces the complexity of software
- Simplifies packaging and deployment and requires no system administration
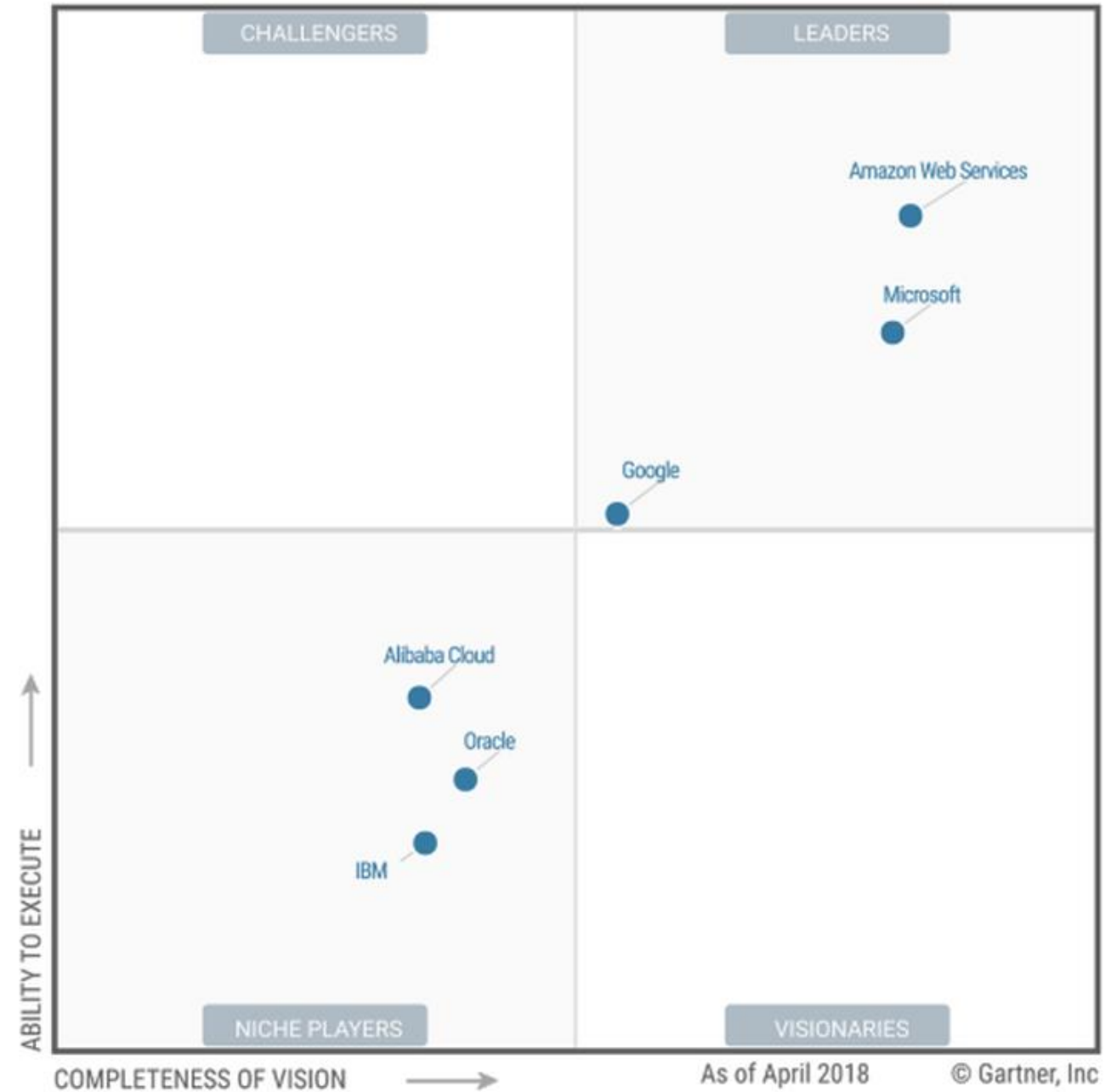
CONS

- Limitation
  - Execution duration
  - Memory
  - Concurrent Execution
- Vendor Lock-In
- Complexity / Distributed Logic
- Additional overhead for function calls
- Cost is unpredictable
- Testing

PUBLIC CLOUD VENDORS

Figure 1. Magic Quadrant for Cloud Infrastructure as a Service, Worldwide

	AWS	Azure	GCP	IBM
FaaS	Lambda	Azure Functions	Google Cloud Functions	IBM Cloud Functions
API Management	API Gateway	API Management	Google Cloud Endpoints	API Connect
Events	….	….	….	….
Storage	….	….	….	….
Database	….	….	….	….
….				

SERVERLESS > FAAS

- AWS maintains one-third of cloud market

- approximately 58% of developers use AWS Lambda as their primary serverless platform

- [AWS Announcing Go Support for AWS Lambda](#)

© Alec Carper

GOOGLE CLOUD PLATFORM - GCP -

- Inline Editor
- Alpha - Go 1.11

```go
func HelloWorld(w http.ResponseWriter, r *http.Request) {
  fmt.Fprintf(w, "Hello, World!")
}
```
HelloWorld

```go
func TestHelloWorld(t *testing.T) {
    req, err := http.NewRequest("GET", "/", nil)
    if err != nil { t.Fatal(err) }
    rr := httptest.NewRecorder()
    handler := http.HandlerFunc(HelloWorld)
    handler.ServeHTTP(rr, req)
    … }
```
Test

```
$ gcloud alpha functions deploy hello \
--entry-point HelloWorld \
--runtime go111 \
--trigger-http
```
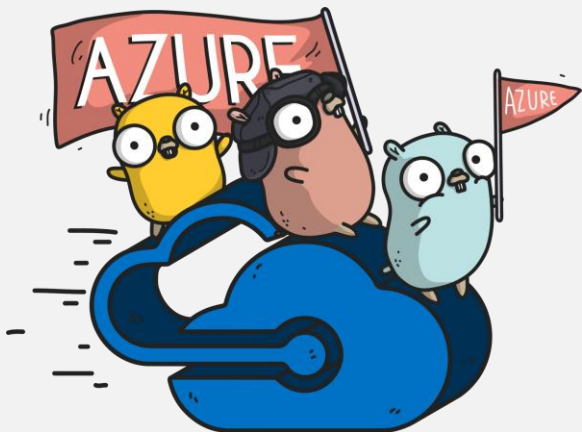CLI Deploy

GCP

- CODE ORGANIZATION -

- $ tree
```
fns
    ├───── config (commonly used module)
    │       ├── config.go
    │       ├── go.mod
    │       └── go.sum
    ├───── hello
    │       ├── fn.go
    │       ├── go.mod
    │       ├── go.sum
    │       └── vendor (contains all dependencies + config)
    │               ├── ...
    │               └── modules.txt
    └───── user
            ├── fn.go
            ├── go.mod
            └── vendor (contains all dependencies + config)
                    ├── ...
                    └── modules.txt
```

https://medium.com/google-cloud/google-cloud-functions-for-go-57e4af9b10da
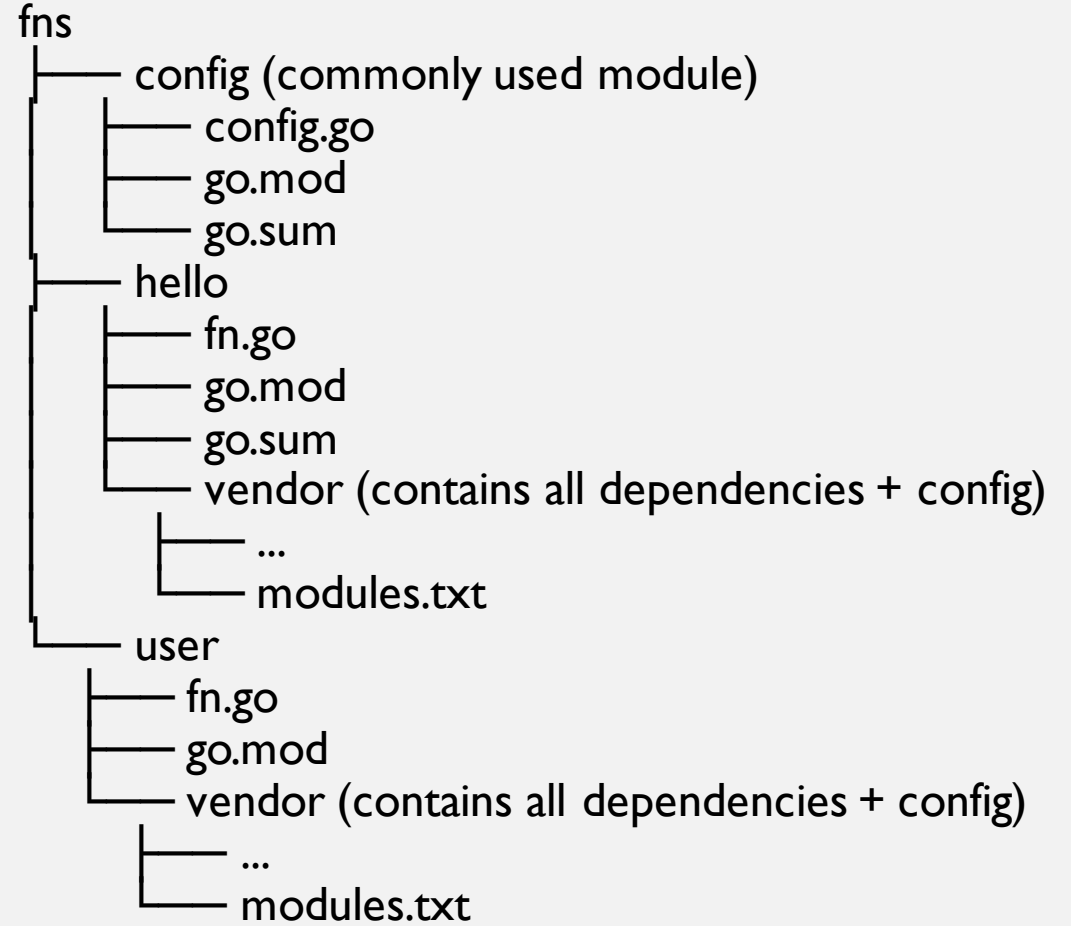
- GO SDK for Azure Services
- Azure Functions doesn't support Go

  => Azure Functions Golang Worker (Docker based)

  => Function App (invoke an abitrary Binary)
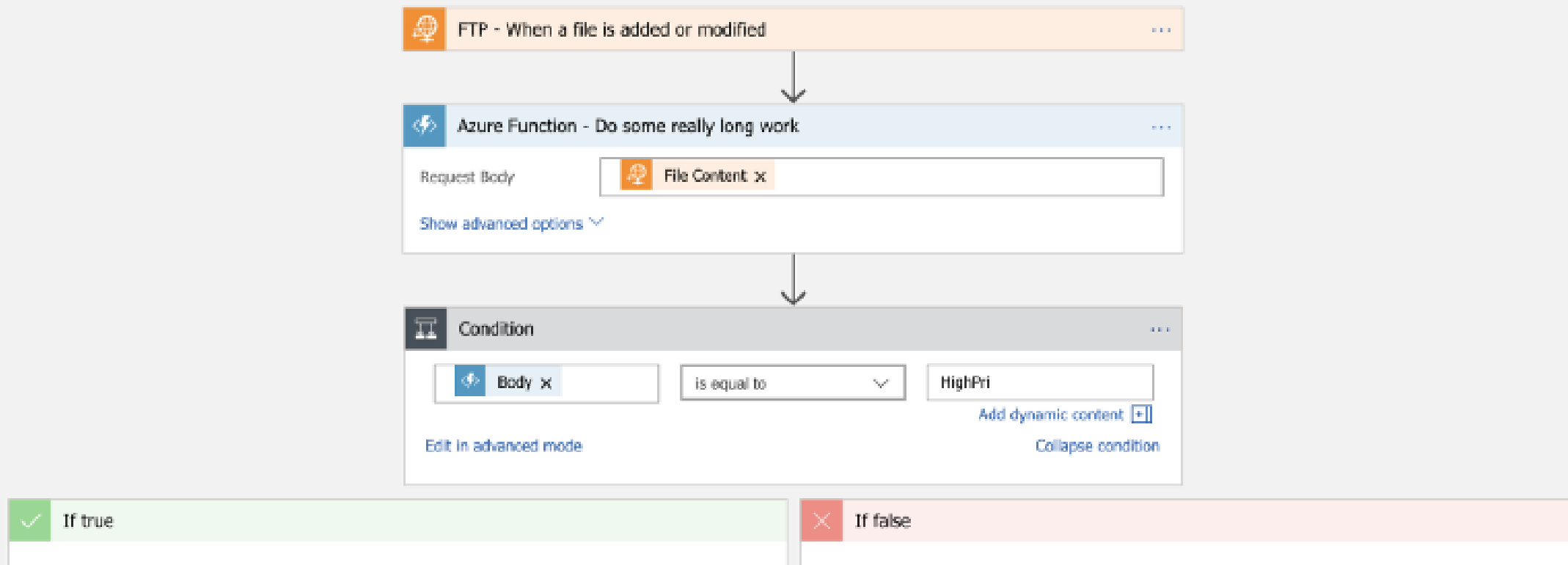
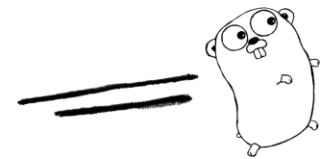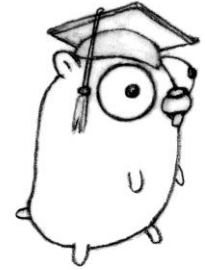## SERVERLESS FRAMEWORKS AND TOOLS

Github - Awesome Serverless

https://github.com/anaibol/awesome-serverless

CNCF.io

Serverless WG

https://github.com/cncf/wg-serverless
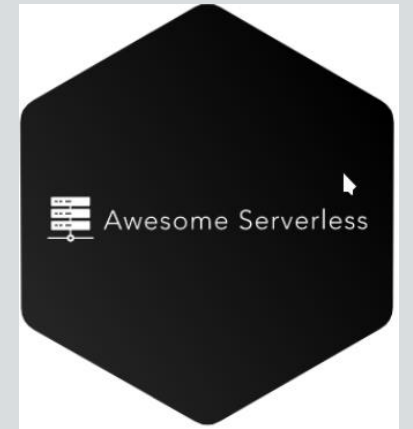
GO AND SERVERLESS

- Go programming idiom is very simple and lean

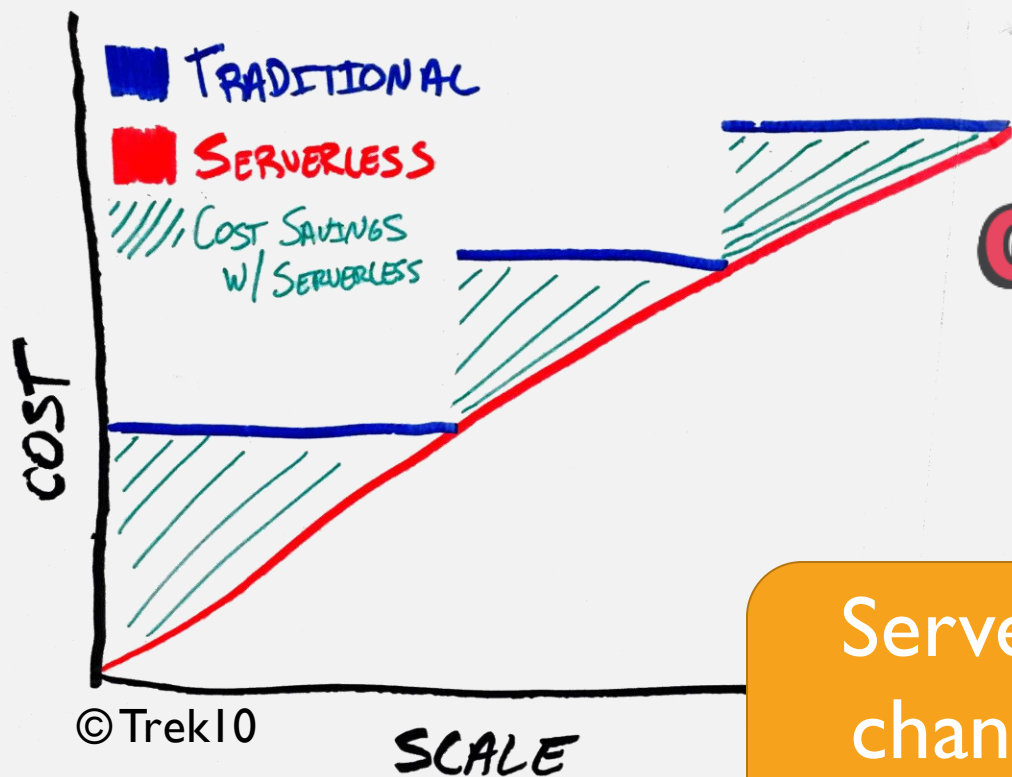- Safety

- Speed

GOING PRODUCTION

Observability

Testing

Debugging

Continuous Delivery

- Rollback
- Versioning
- Configurations
- CI / CD

Q & A

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Gopher Kart