How I became a Go developer

Luca Panziera - The Financial Times

Who I am

Started working for the FT 3 years ago

I was hired as **Java developer**

I spent **10 years** implementing applications in Java

Mainly in computer engineering research projects

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Why Java?

Java is a popular language:

- Many libraries
- Cross-platform
- Garbage collection
- Memory security

What people were doing at the FT when I joined

Implementing the new **Content platform**

Going towards **microservices**...

Each microservice was a **Java application running on a VM** in two FT data centers and AWS.

In parallel…
… **Implementing a hand-rolled “container orchestration framework”**

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One day our software architect said...

WE MUST USE GO!

Why?

Go is efficient!...
And we can implement everything in few milliseconds!

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Let’s take a look at Go…

What is Go?

A Programming Language:

- developed by Google
- announced in November 2009
- Version 1.0 released in March 2012

So… it’s quite new!

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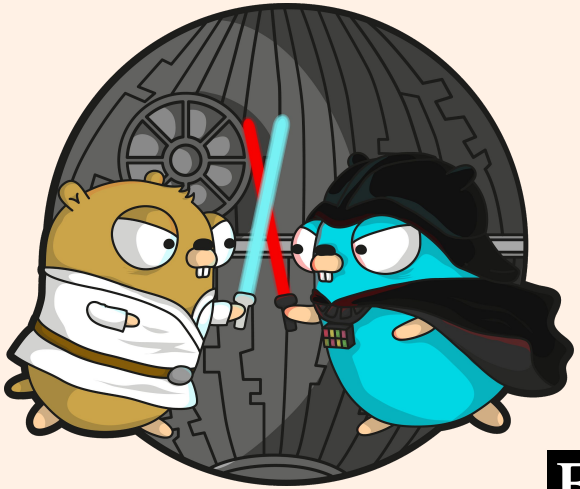
What Go developers had in mind?

- Statically typed and **scalable to large systems** (like Java or C++)
- **Simple and readable**, without excessive boilerplate
- **Not requiring IDEs**, but supporting them well
- Supporting **networking** and **multiprocessing**



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My first reaction to Go

```
import “math”

type Circle struct {
  x, y, r float64
}

func (c *Circle) Area() float64 {
    return math.Pi * c.r * c.r
}
```

Struct instead of Class?!

Methods are functions?!

Is this C?

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Why it looks like C?

Pointers

No overloading:

```
func addInt(a,b int) int { return a + b }
func addFloat64(a,b float64) float64 { return a + b }
```

Very basic data structures: Array, Slice, Map... nothing more

Go is a compiled language

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The reaction of my team...

We must use Go! It's going to make our life!

What the hell is this?

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Actually Go is really cool!

It is more concise… compared to Java…

Java

```
public class Circle {
  private double x, y, r;

  public double getX() { return x; }
  public void setX(double x) { this.x = x; }

  public double getY() { return y; }
  public void setY(double y) { this.y = y; }

  public double getR() { return r; }
  public void setR(double r) { this.r = r; }

  public double area() {
   return Math.PI * r * r;
  }
}
```

Go

```
import “math”

type Circle struct {
  X, Y, R float64
}

func (c *Circle) Area() float64 {
      return math.Pi * c.R * c.R
}
```

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Go is easy to learn

Go Tour

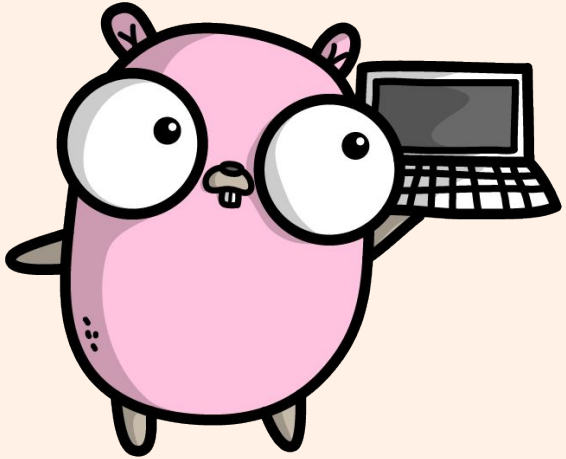
+

Effective Go

+

Bit of practice

After few days



Decent Go developer

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CPU and memory efficiency

- **Java microservice:**
  JSON manipulation,
  9K requests/day,
  340MB memory

- **Go microservice:**
  Database query + data manipulation,
  40K requests/day,
  12MB memory

Save cost of Cloud Services with smaller VM instances

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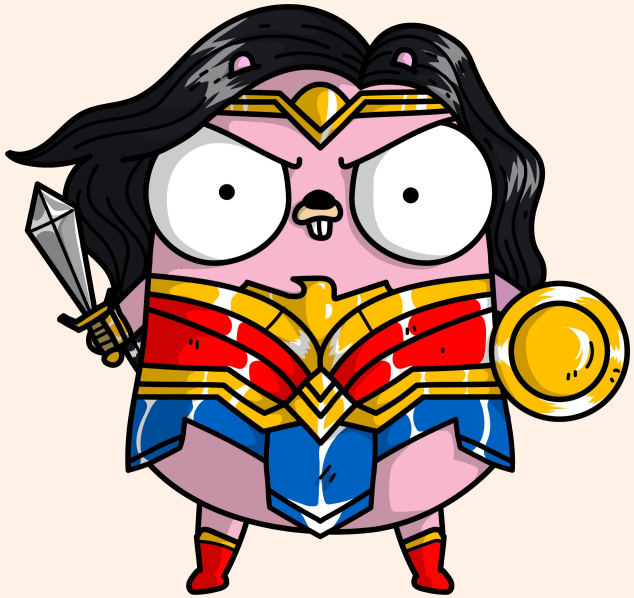
What about memory allocation?!

Memory safety and Garbage collection

```
func brakeSlice() {
    a := []int{1, 2, 3}
    a[5] = 7
}
```

```
panic: runtime error: index out of
range
```



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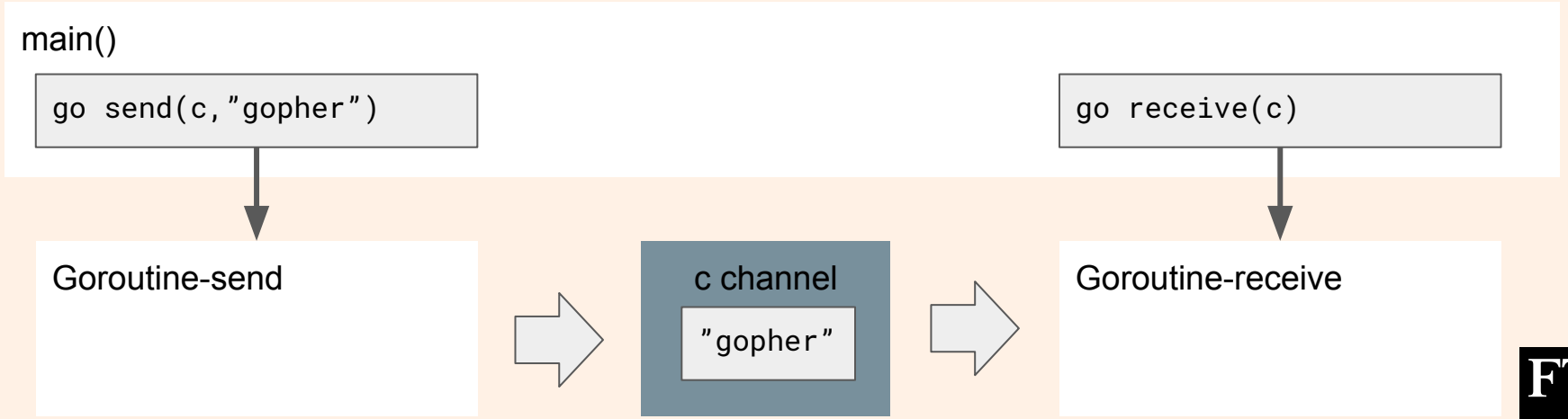
A simple way to handle concurrency

```
func send(c chan string, msg string) {
     for {
          c <- msg
     }
}
```

```
func receive(c chan string) {
     for {
          msg := <-c
          fmt.Println(msg)
     }
}
```



No more Maven hell

Go is a compiled language so...
Fast in compiling and running test (few seconds)

A easy import of libraries with **“dep”**

```
dep init
dep ensure -add github.com/sirupsen/logrus
dep ensure -update

go test ./...

go build
```

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Go sounds amazing… but...

When the team started using Go...

People forgot about code practices!

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Everything in a single file

main.go

Usage of func: line 34

Usage of func: line 232

Impl. of func: line 476

Usage of func: line 675

A good excercise for head bagging

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Code in many files… but without any logic!

user.go

Usage of func

pluto.go

pippo.go

cat.go

record.go

Where is the implementation of func?

meaningless.go

Impl. of func

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Unit tests were not really mature...

Coverage wasn’t great

Difficulties in mocking

Missing Integration tests

Couple of times the worst happened in Production

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OMG… What's the situation now?

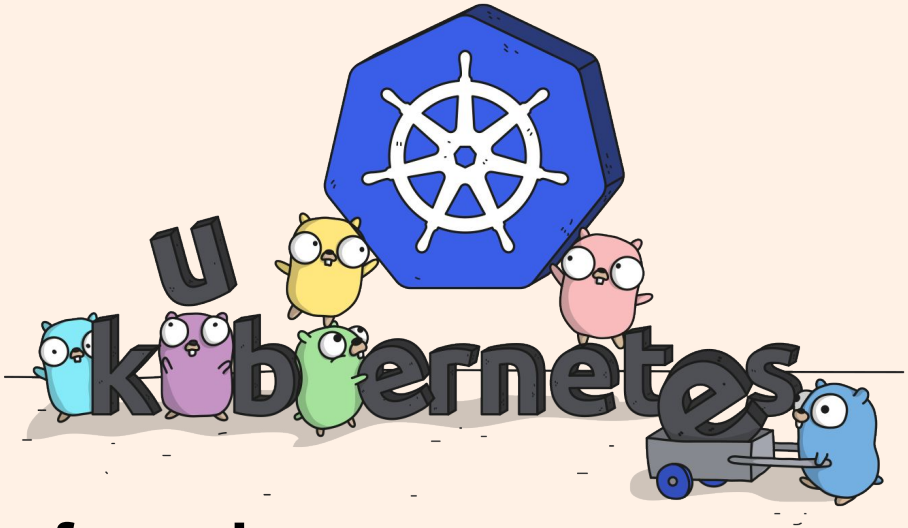
The FT Content platform

After 3 years... The quality of code base improved a lot

A Kubernetes-based platform made of **~150 microservices**

85% of them are implemented in Go

Reduced cost of 80% on AWS



So, **Go has been a success for us!**

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In the world of microservices…

Fast implementation from scratch

Efficiency with network overhead

Go meets this requirements

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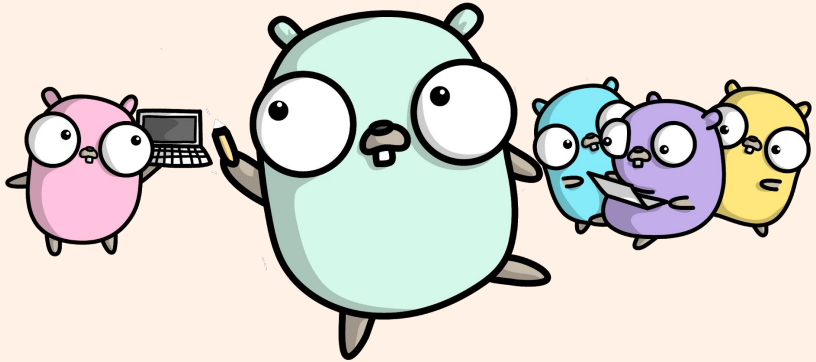
What I learnt by using Go?



Go combines:

- efficiency
- memory safety and garbage collection

A concise programming language

No language boundaries allow you to write excellent code… or total crap

Good sense of the developer is the key (as usual).

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Thank you!

We are hiring!
ft.com/dev/null

@izzyblues83

Credit Ashley McNamara and
https://github.com/ashleymcnamara/gophers for most images.
Credit Renee French for the original gopher concept and design.

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