@MyWebUniversity

Go

Born While Waiting for a C++ Build

main.go

```
func main() {
  go work()
  go work()
  go work()
}
```

Pike · Thompson · Griesemer · goroutines

DOCKER & KUBERNETES RUN ON GO

main.go

```go
package main
import "fmt"

func main() {
    go fmt.Println("salaam")
    fmt.Println("hello")
}
```

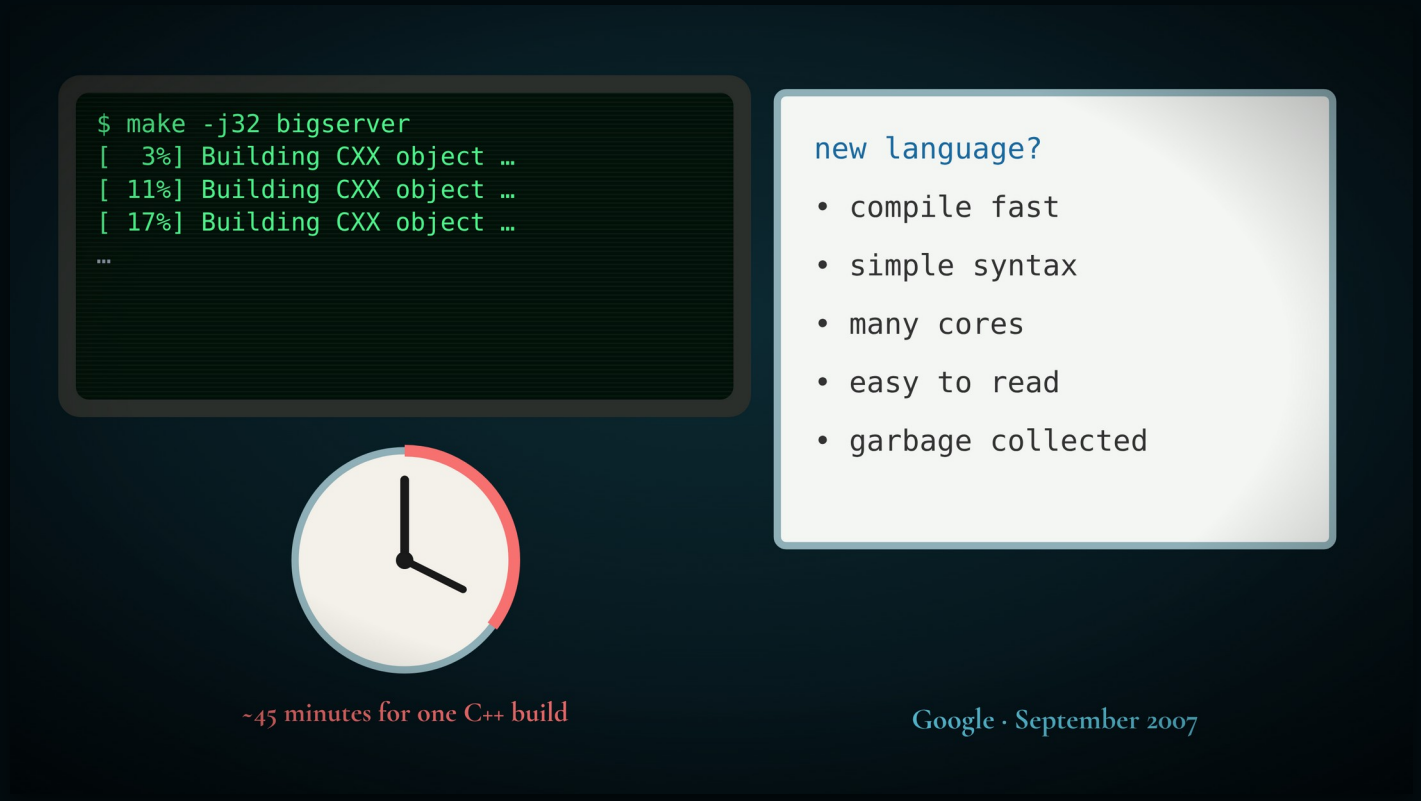
A MYWEBUNIVERSITY STORY

Go

Born While Waiting for a Build

goroutines · Docker · Kubernetes

Waiting for C++



- Sept 2007, Google: waiting ~45 minutes for a C++ build
- Many cores, millions of lines of code
- A new language sketched on a whiteboard

01

Three Legends



- Robert Griesemer: V8, Java HotSpot
- Rob Pike: UNIX, Plan 9 (Bell Labs)
- Ken Thompson: UNIX and the B language

02

Go Is Released



- Nov 10, 2009: open source announcement
- Mar 2012: Go 1.0 + compatibility promise
- “Golang” comes from golang.org; the name is Go

03

Simple on Purpose



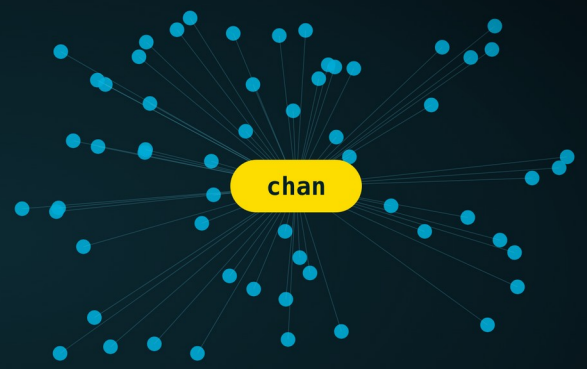
- 25 keywords · no inheritance · gofmt
- Fast compile → one static binary
- Garbage collected · implicit interfaces

04

Goroutines and Channels

workers.go

```
jobs := make(chan int)
results := make(chan int)
for w := 1; w <= 1000; w++ {
    go worker(jobs, results)
}
jobs <- 42      // send
r := <-results  // receive
```



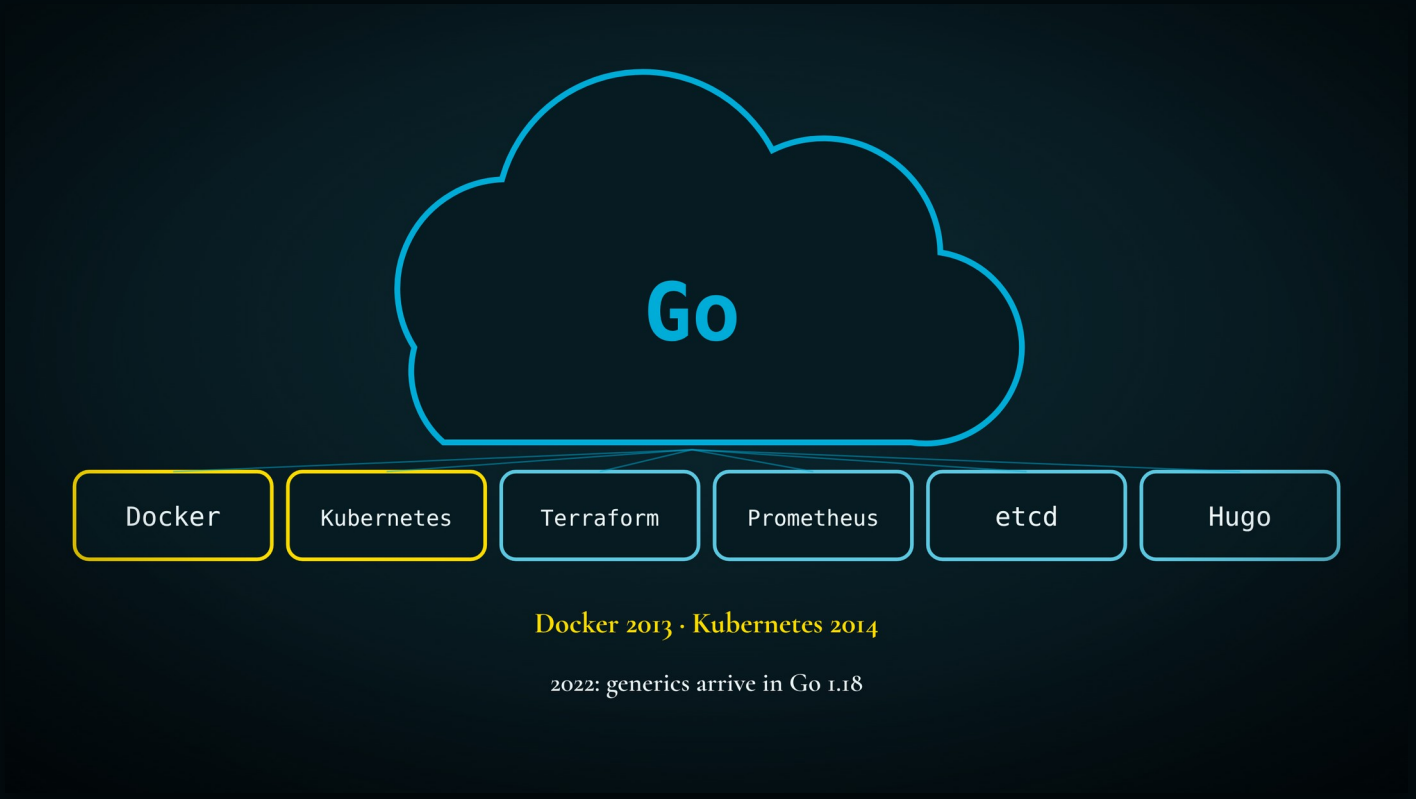
100,000s of light goroutines

> Don't communicate by sharing memory;
>
> share memory by communicating. (CSP · Tony Hoare)

- go f() starts a goroutine
- Channels (from Tony Hoare's CSP)
- Share memory by communicating

05

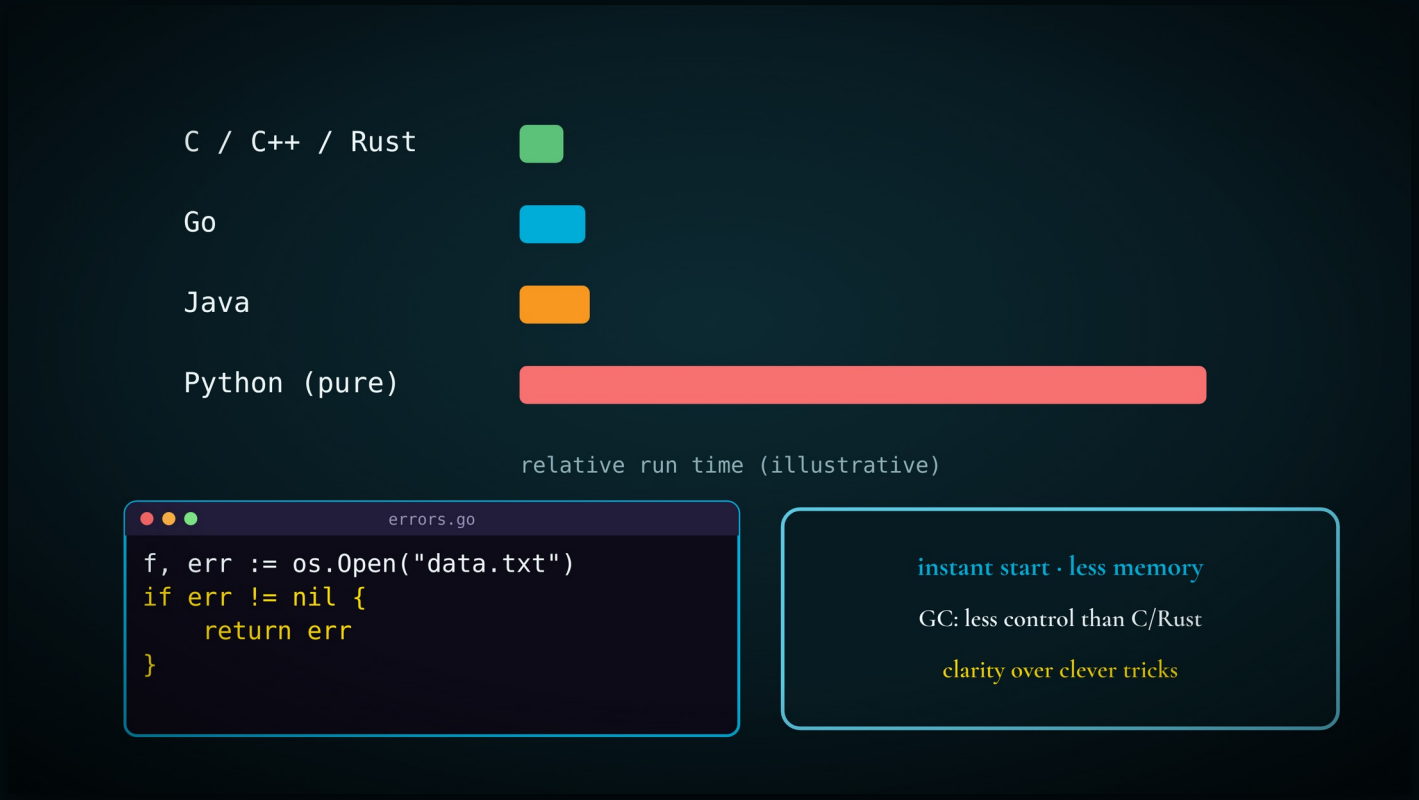
The Language of the Cloud



- Docker (2013) · Kubernetes (2014)
- Terraform · Prometheus · etcd · CLI tools
- 2022: Go 1.18 adds generics

06

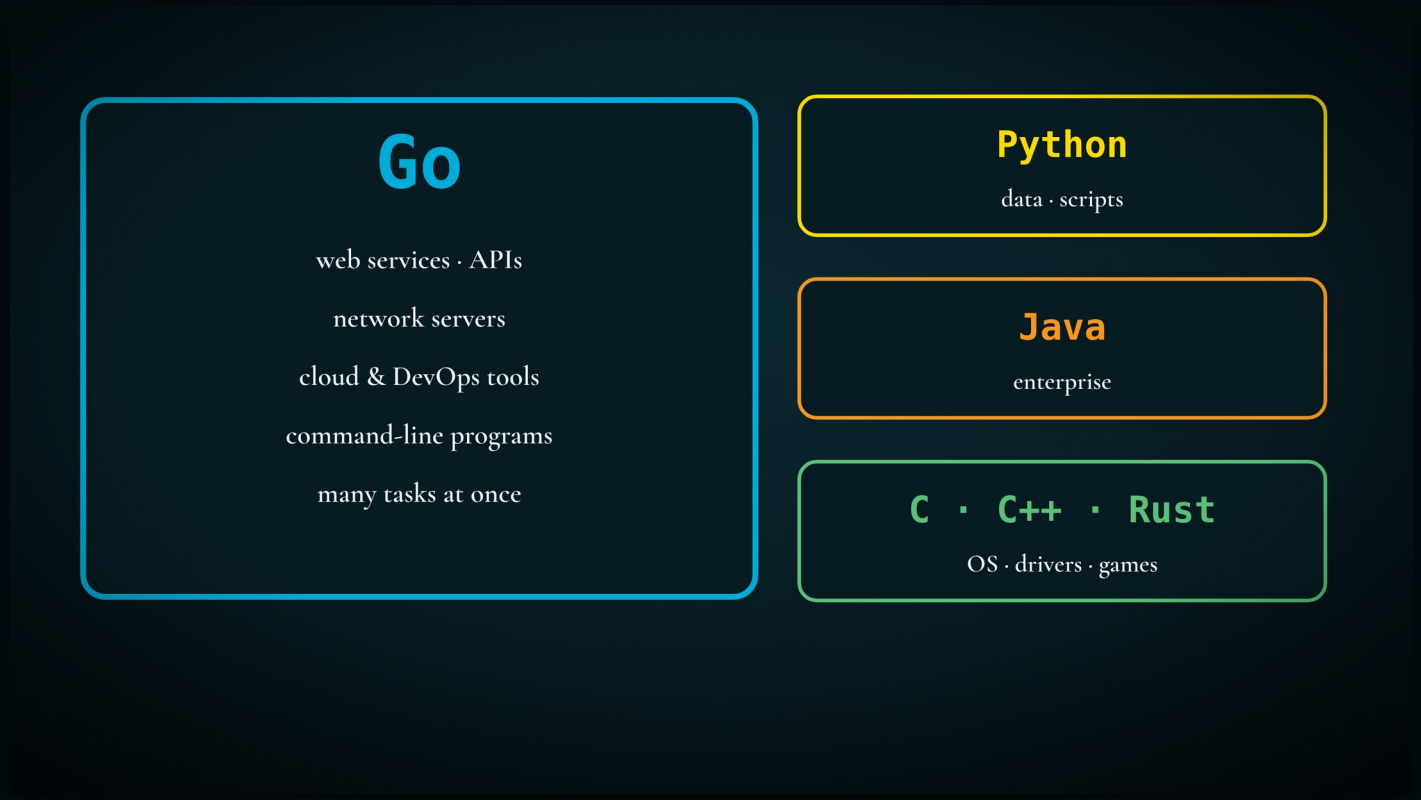
Go Compared



- Usually many times faster than Python
- Often near Java; instant start, less memory
- C/C++/Rust faster (no GC) · verbose if err != nil

07

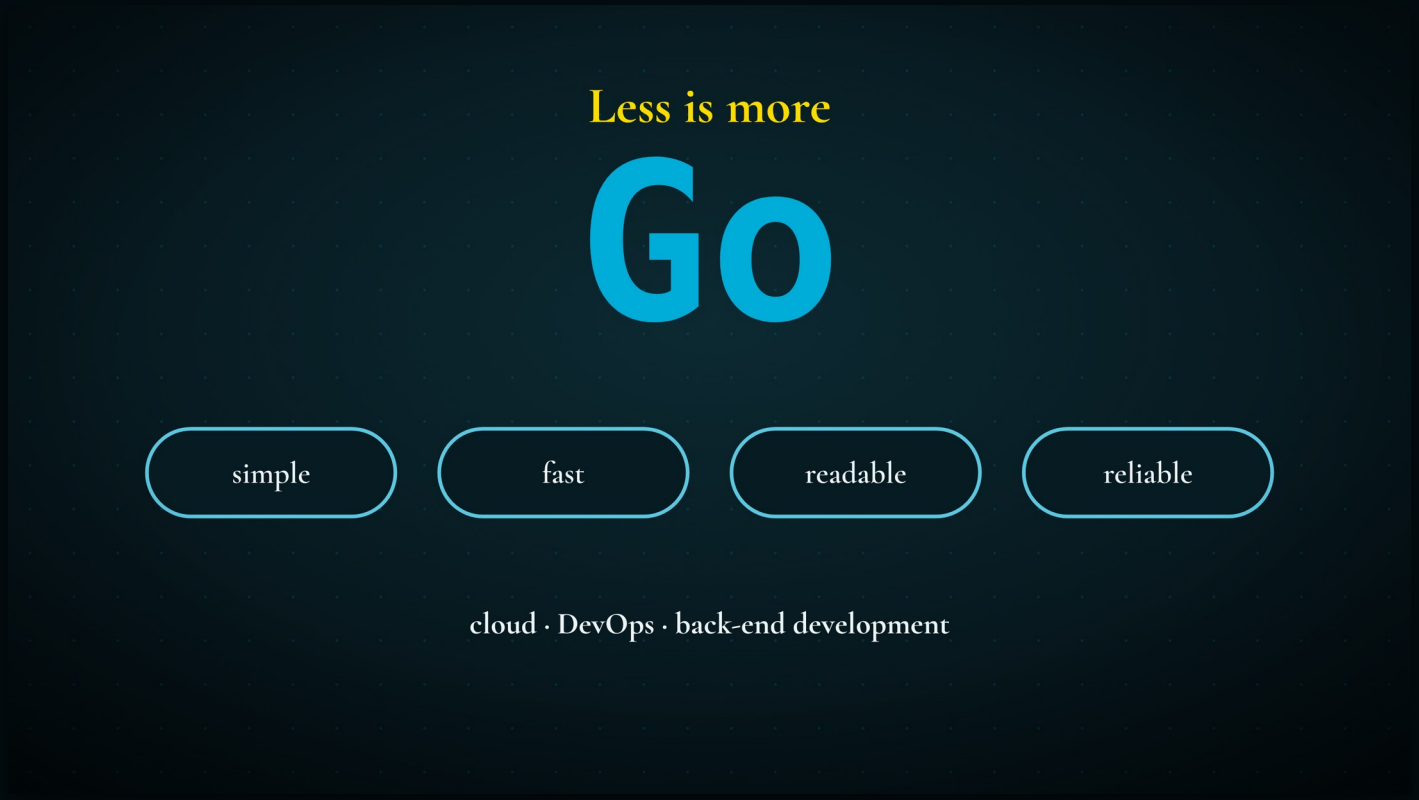
When to Choose Go



- Go: web services, APIs, network servers, cloud tools, CLIs
- Python: data · Java: enterprise
- C / C++ / Rust: OS, drivers, games

08

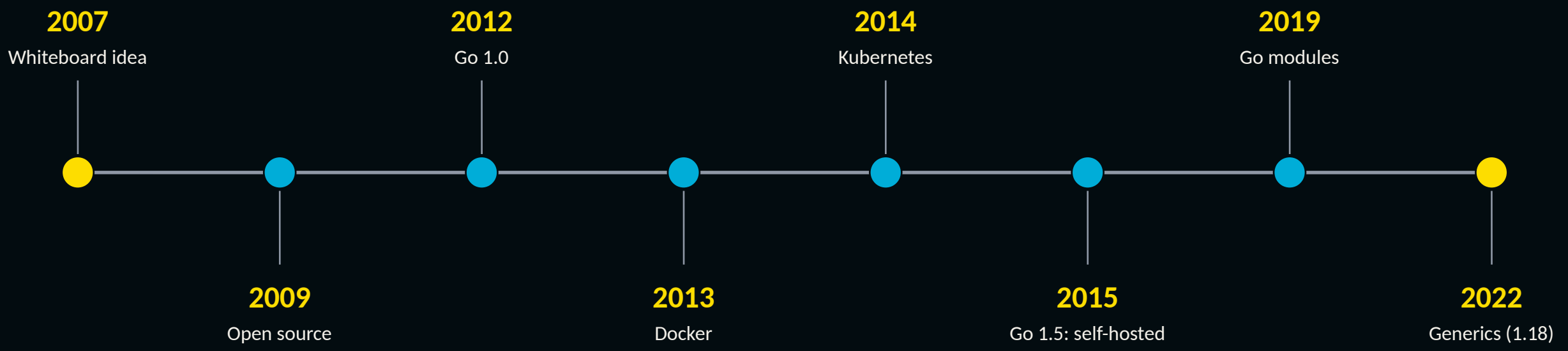
Less Is More



- Less is more
- Simple, fast, readable, reliable
- Great for cloud, DevOps and back end

09

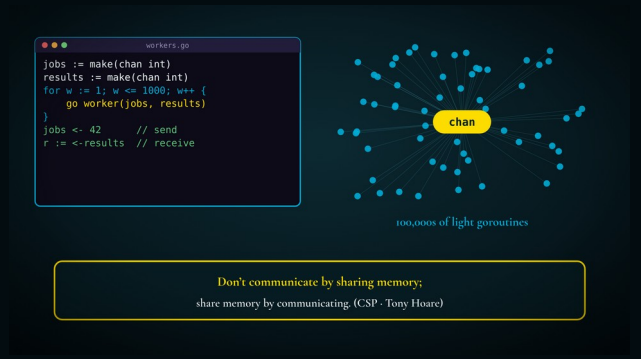
Timeline: 2007 to 2022



Sources and Further Reading

1. Go FAQ: “What is the history of the project?” — go.dev/doc/faq
2. Rob Pike, “Go at Google: Language Design in the Service of Software Engineering” (2012)
3. The Go Blog, “Go version 1 is released” (March 2012) · “Go 1.18 is released” (March 2022)
4. C. A. R. Hoare, “Communicating Sequential Processes” (1978)
5. Photos: Ken Thompson — public domain, via Wikimedia Commons (The Jargon File); Rob Pike — via Wikimedia Commons.





Thank you for watching

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