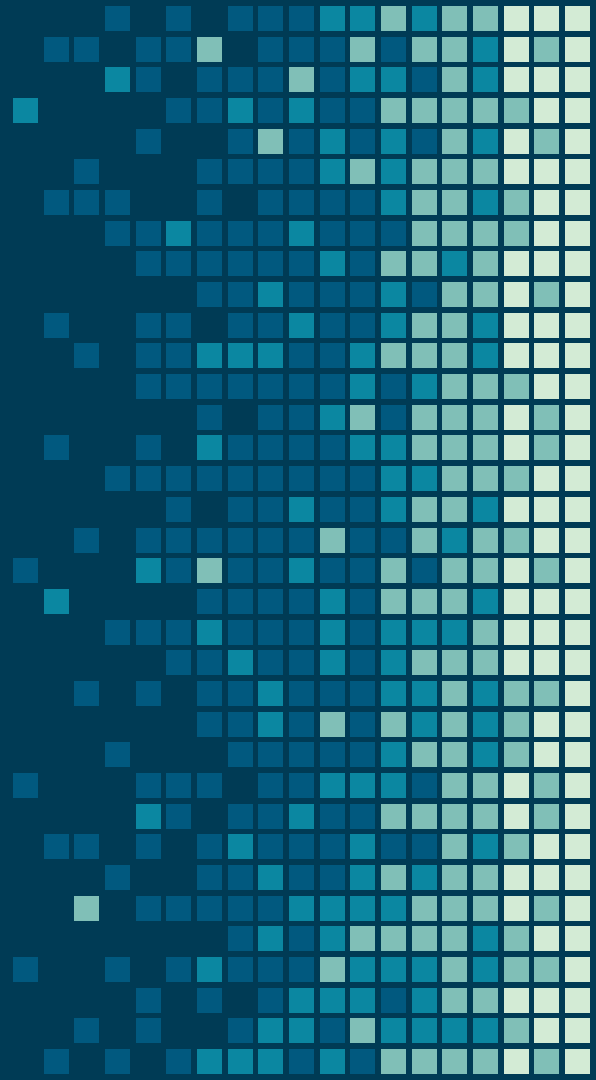


THE STATE OF GO

What's new since Go 1.10



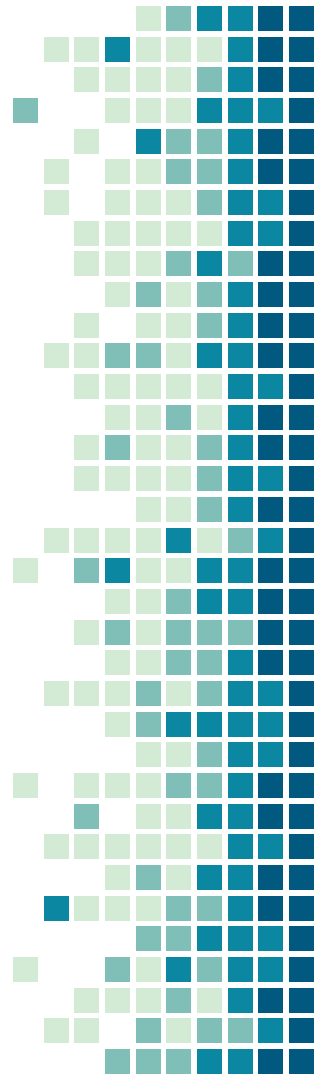
bit.ly/sog-fosdem19



Maartje Eyskens
@maartjeme

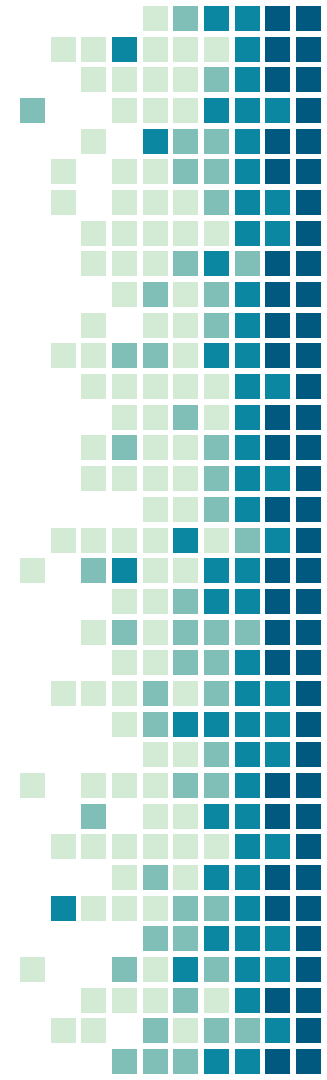


Francesc Campoy
@francesc



What's new since Go 1.10

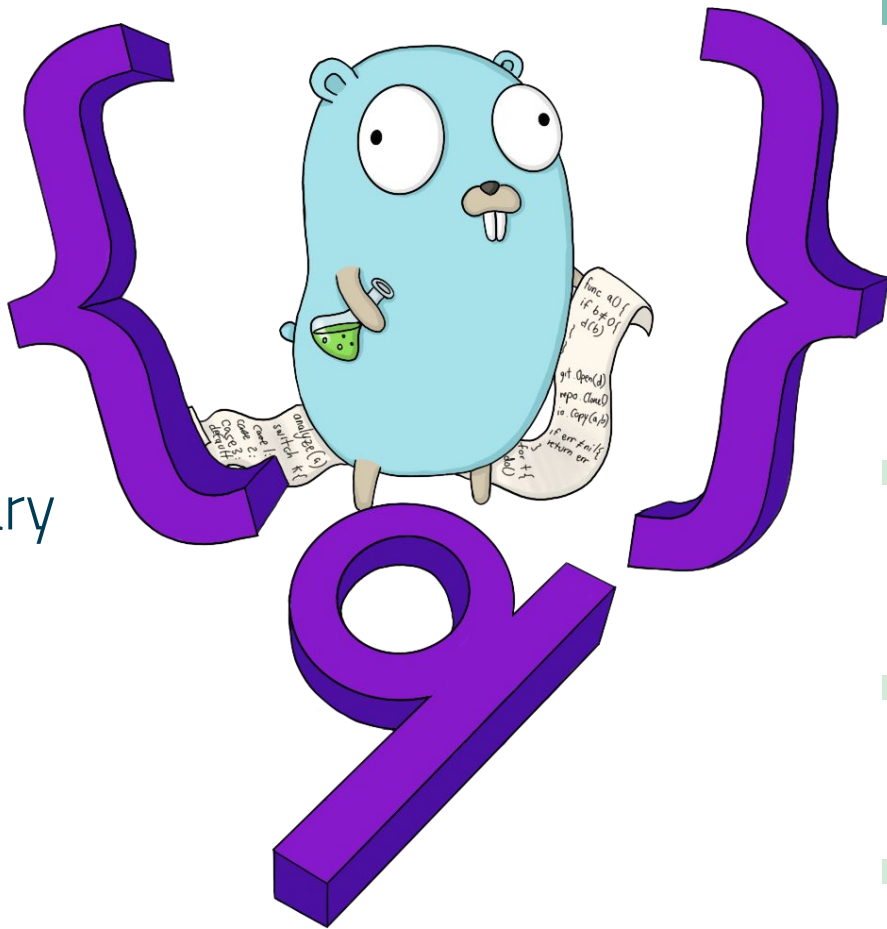
- Go 1.11
 - Released August 24th 2018
- Go 1.12
 - Released ... eventually
 - Go 1.12 beta2 released on January 10th 2019



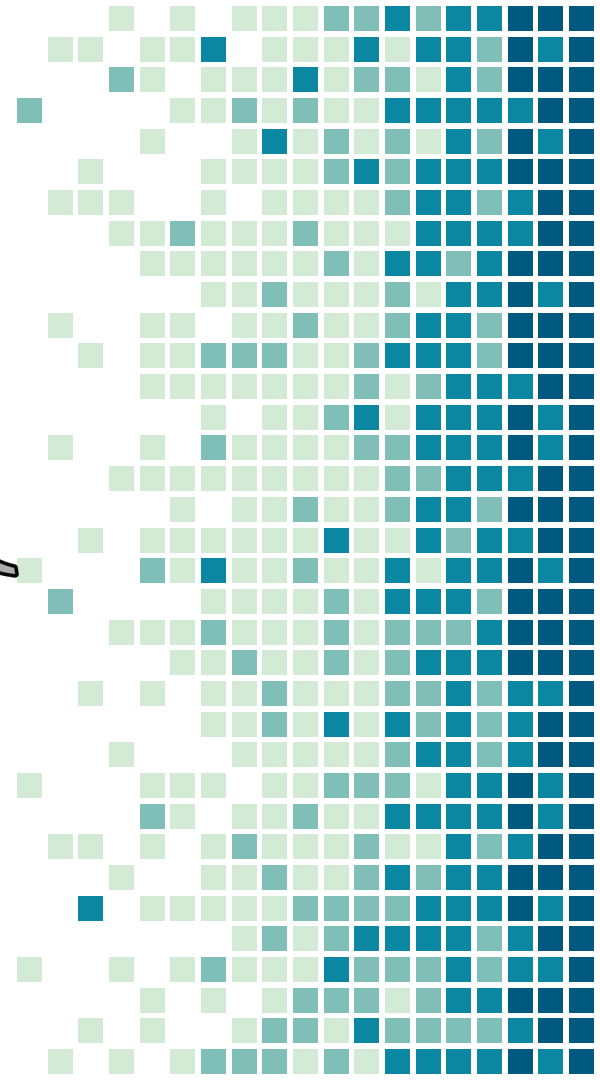
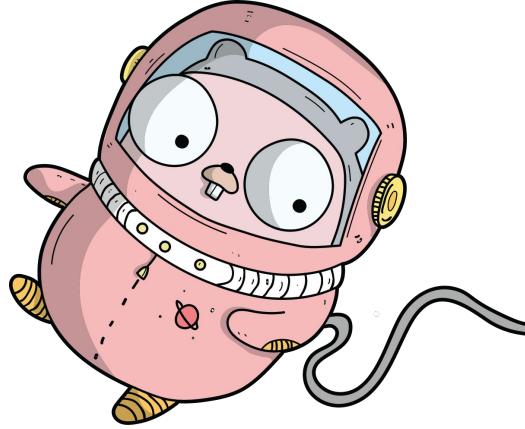
Agenda

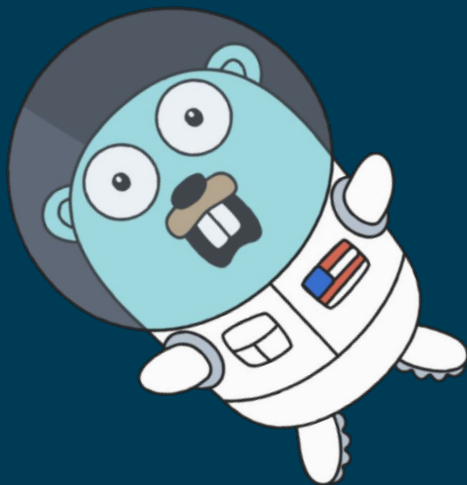
Changes to:

- the language
- the standard library
- the tooling
- the community



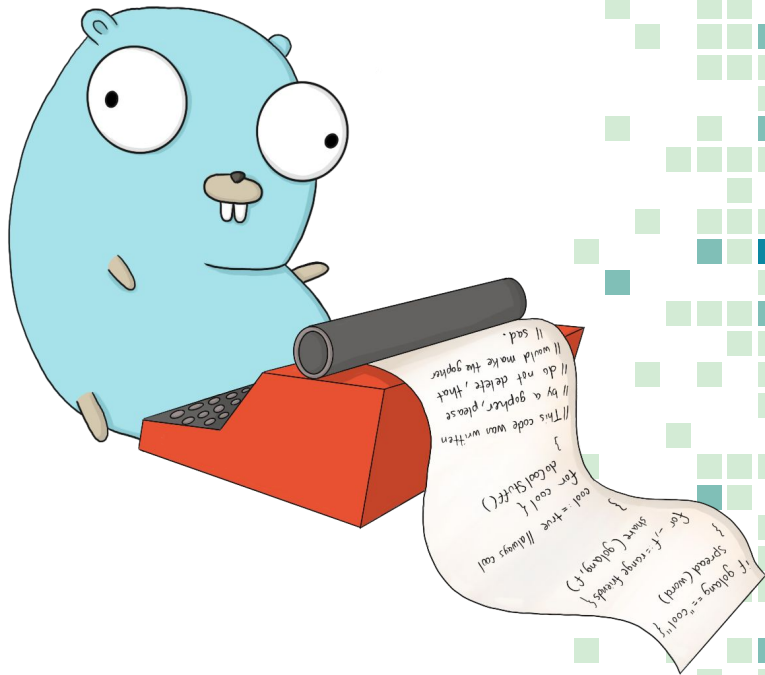
CHANGES TO THE LANGUAGE



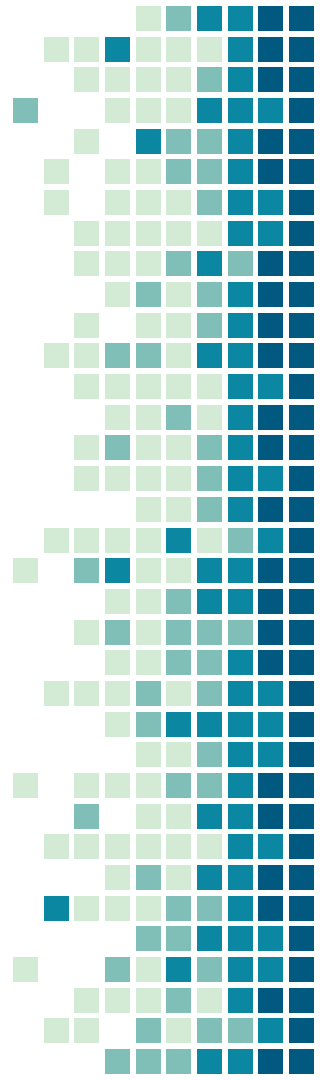


This page is intentionally left *void*

CHANGES TO THE STANDARD LIBRARY



Breaking Changes



html/template

Changed behavior when `typed interface` to an `implicit escaper` function. Previously `<nil>`. Now ignored.

```
func run(v *int) {  
    t := template.Must(template.New("").Parse("{{.}}"))  
    t.Execute(os.Stdout, v)  
}  
  
func main() {  
    run(nil)  
}
```

Before: <nil>;

Now: *nothing**

** or not*

bufio

Reader's `UnreadRune` and `UnreadByte` methods will now return an `error` if they are called `after Peek`.

```
r := bufio.NewReader(strings.NewReader("abcdef"))
r.ReadByte()

b, err := r.Peek(1)
if err != nil {
    log.Fatalf("couldn't peek: %v", err)
}

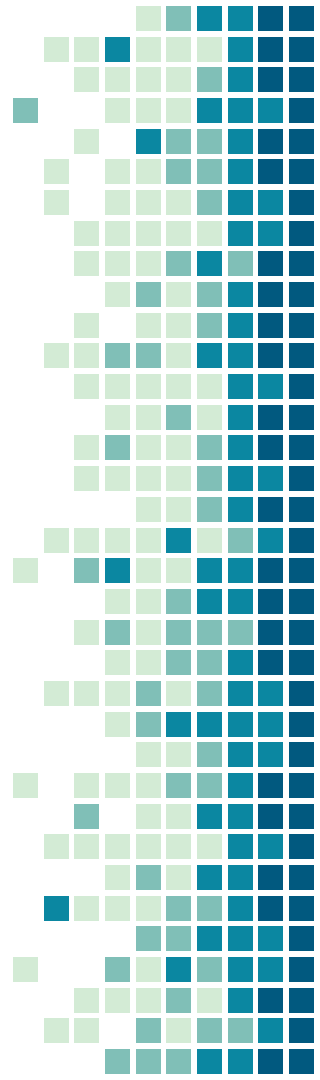
if err := r.UnreadByte(); err != nil {
    log.Fatal(err)
}
```

Before: *nothing*

Now: `bufio: invalid use of UnreadByte`



Other Interesting Changes



templating: assignment

Previously, only variable declaration was possible.

Now, assignment is also supported!

```
var tmpl = `
{{- $v := "init" -}}
{{ if . }} {{ $v = "changed" }} {{ end }}
v: {{ $v }}`

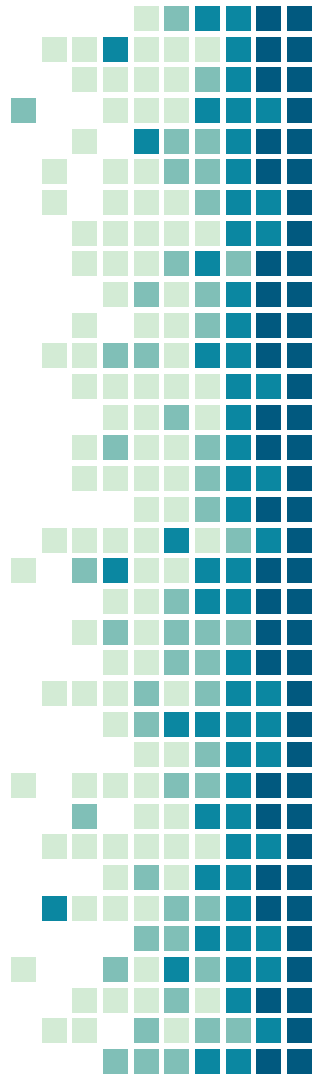
t := template.Must(template.New("").Parse(tmpl))
t.Execute(os.Stdout, false) // v: init
t.Execute(os.Stdout, true)  // v: changed
```

new ReplaceAll functions

`x.Replace(s, a, b, -1) → x.ReplaceAll(s, a, b)`

where x can be:

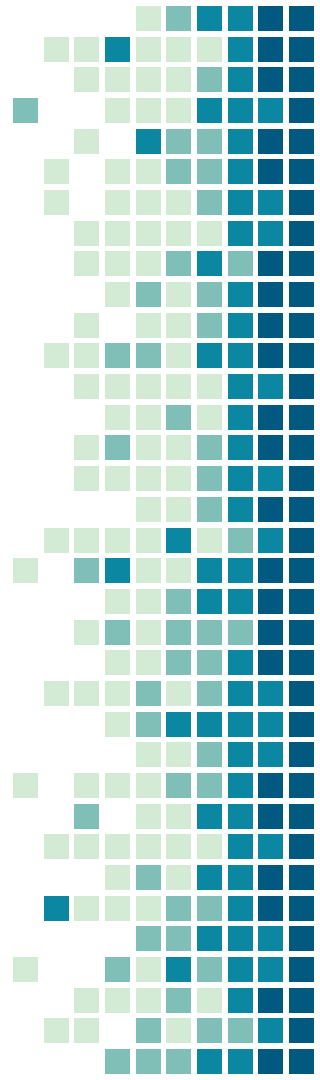
- bytes
- strings



builtin: maps printed sorted

Previously, in order to print a map sorted by keys:

1. Iterate over all the keys
2. Sort them (somehow)
3. Iterate over the sorted keys
4. Print key and value



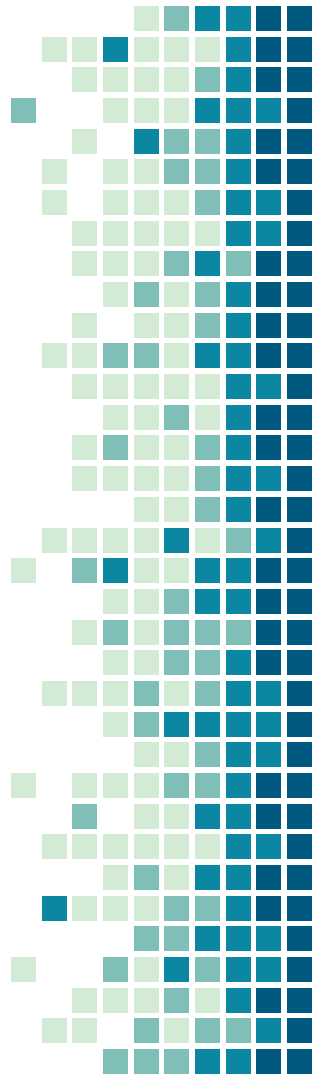
printing a map in order before

```
m := map[string]int{"a": 1, "b": 2, "c": 3}

// obtain all keys
keys := make([]string, 0, len(m))
for k := range m {
    keys = append(keys, k)
}

// sort them
sort.Strings(keys)

// iterate map in order
for _, k := range keys {
    fmt.Println(k, m[k])
}
```

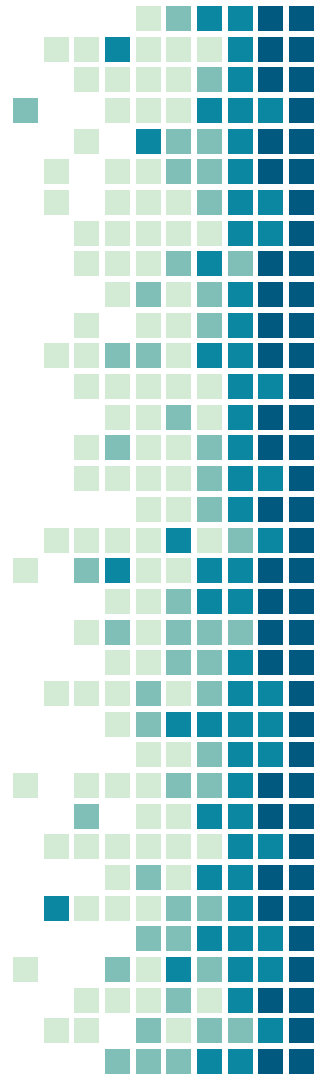


builtin: maps are now printed sorted

Now, in order to print a map sorted by keys:

1. Print the map

WARNING: iteration order is still random.



TLS 1.3 support

- Cipher suites are not configurable (yet?)
- 0-RTT not supported 🥲
- Only if set:

```
package main

import "crypto/tls"

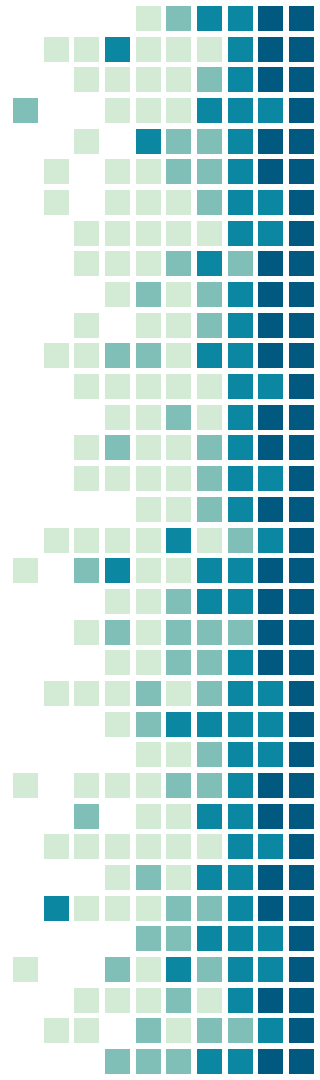
var cfg = tls.Config{
    MaxVersion: tls.VersionTLS13,
}
```

why TLS 1.3?

Without 0-RTT

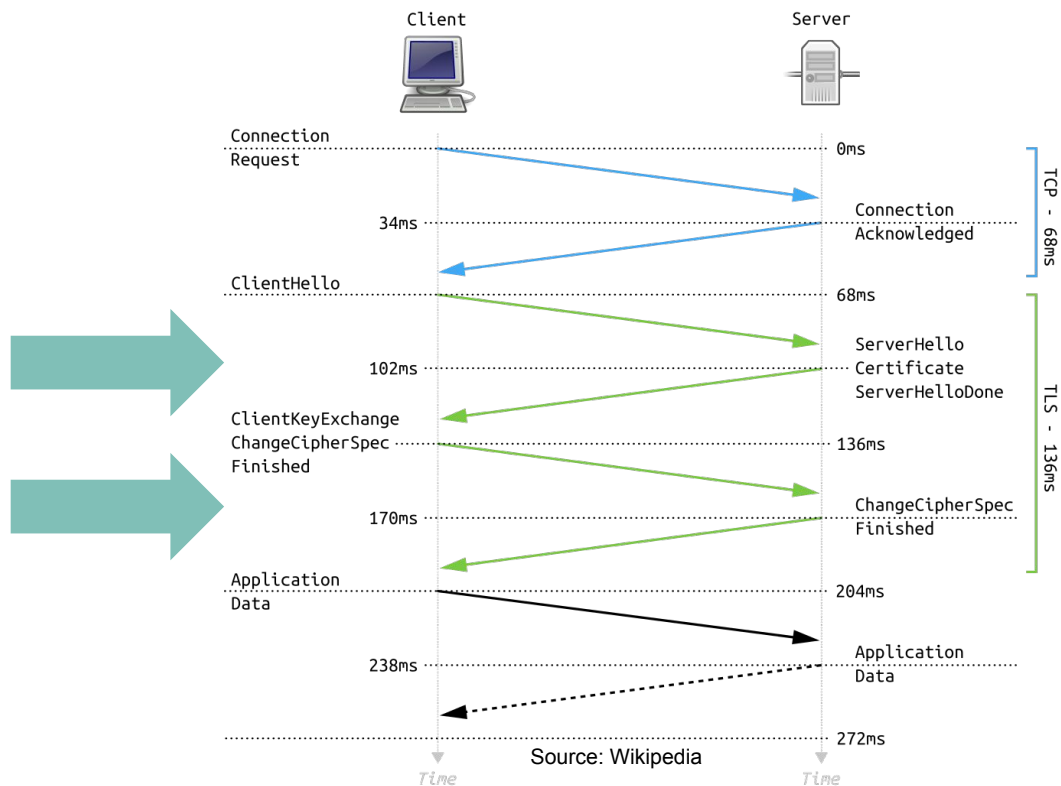
- 1 fewer round trip
- Only secure cipher suites*
- Support in all major browsers

* in January 2019



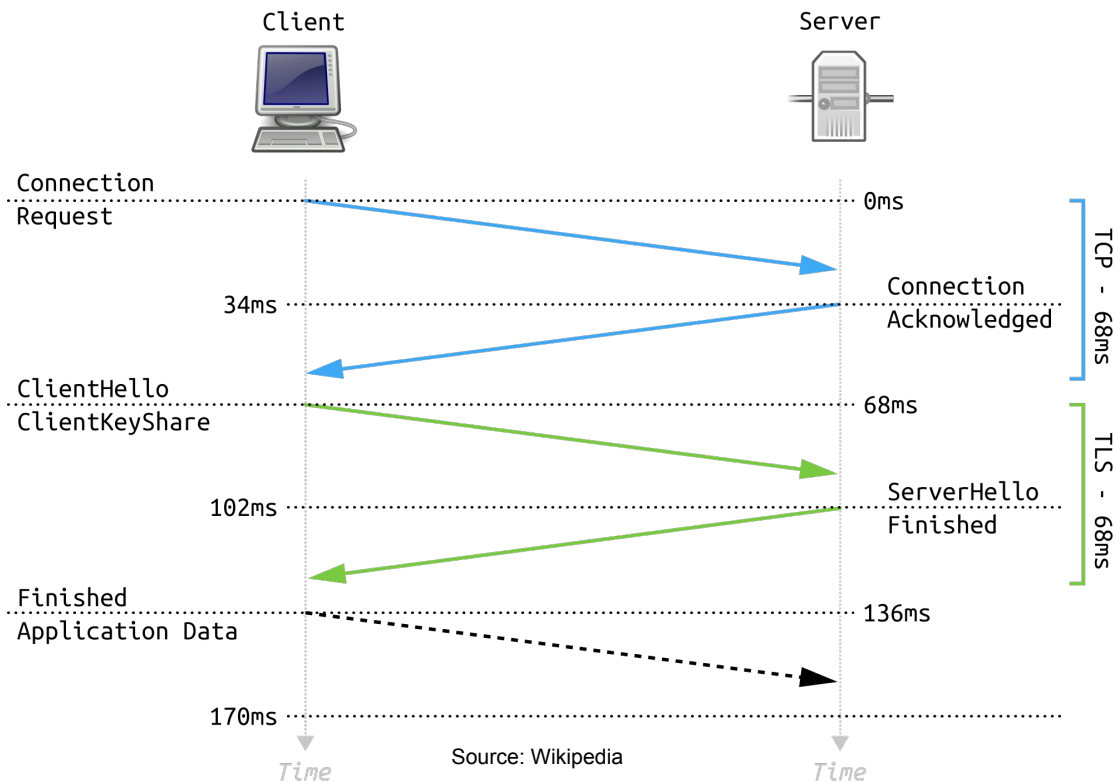
why TLS 1.3? TLS1.2

Without 0-RTT



why TLS 1.3?

Without 0-RTT

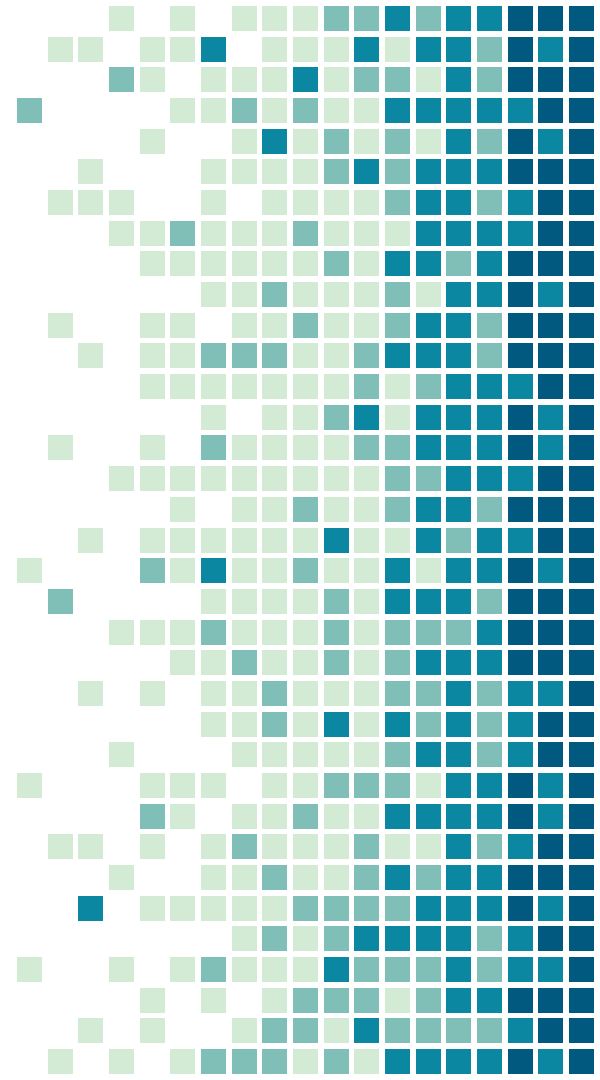
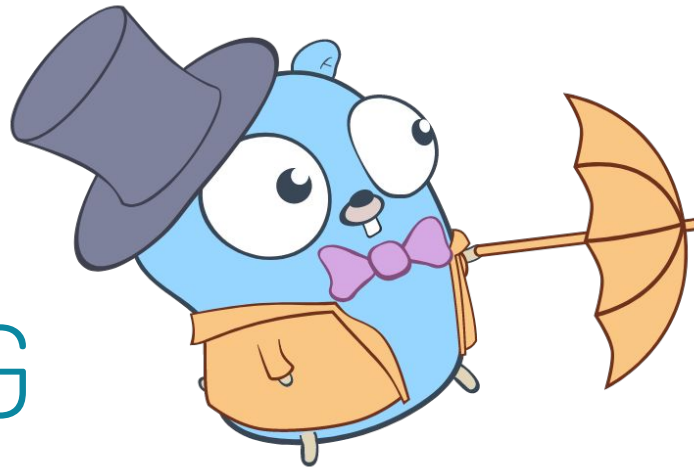


reverse proxy + websockets

The code below now supports websockets!

```
func main() {  
    http.HandleFunc("/", proxy)  
    log.Fatal(http.ListenAndServe(":8080", nil))  
}  
  
func proxy(w http.ResponseWriter, r *http.Request) {  
    u, _ := url.Parse("http://myip.ninja")  
    proxy := httputil.NewSingleHostReverseProxy(u)  
    proxy.ServeHTTP(w, r)  
}
```

TOOLING



go run pkg now works!



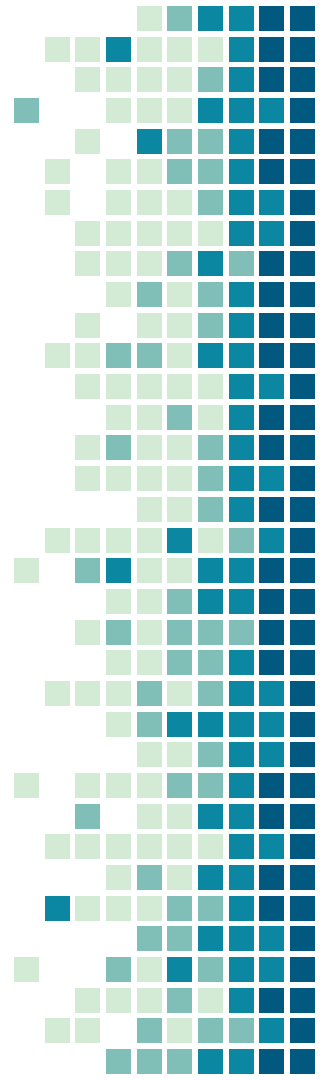
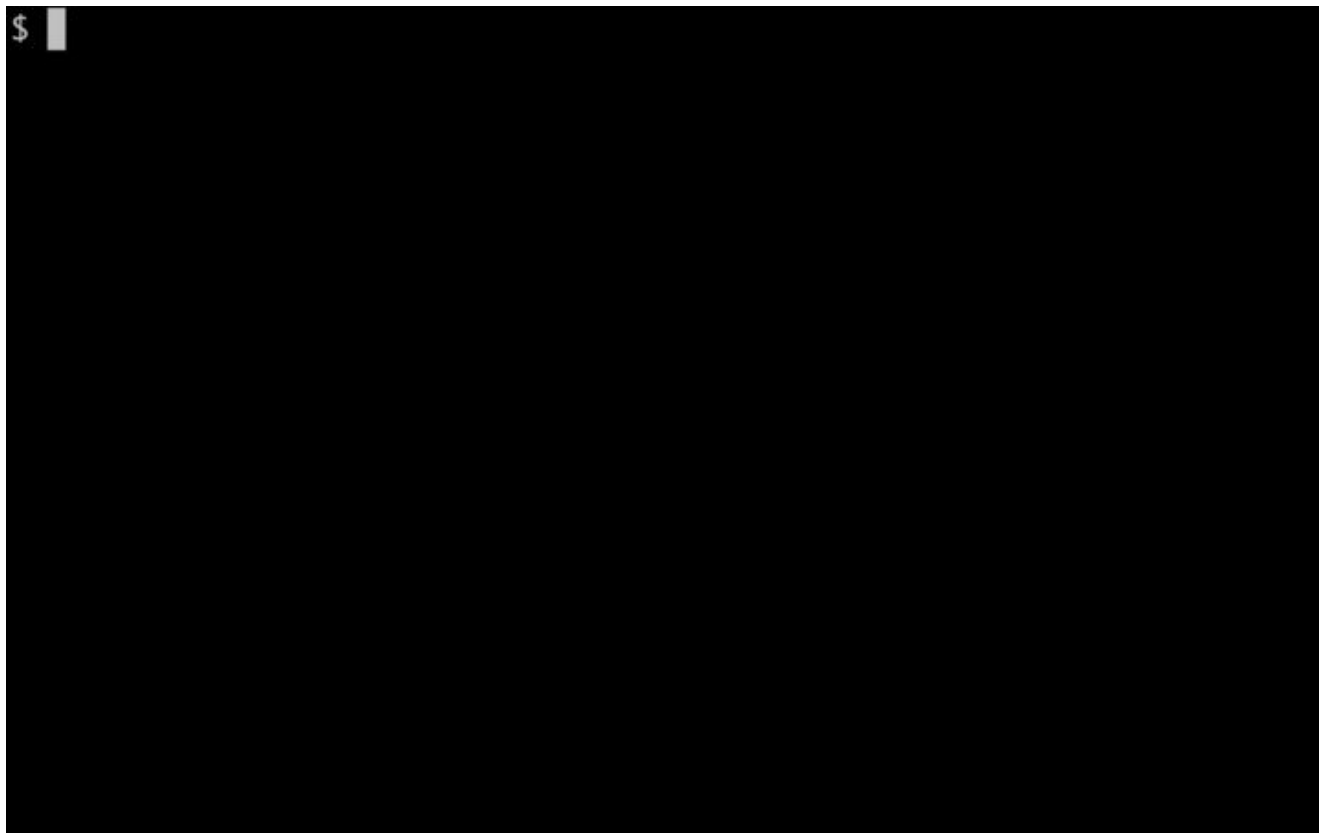
```
$ go run github.com/golang/example/hello  
Hello, Go examples!
```

go run dir now works!



```
$ pwd
/Users/francesc/src/github.com/golang/example/hello
$ go run .
Hello, Go examples!
```

debugger can now run functions



debugger can now run functions

- Delve v1.1.0 only
- No new variables
- All goroutines will continue
- Only when stopped at a safe point
- Only on Linux (MacOS too)



godoc

- godoc CLI is deprecated
- Use go doc
- In 1.12 feature complete with -a11 flag

godoc

- godoc now show version that introduced stuff

type ClientTrace

1.7

ClientTrace is a set of hooks to run at various stages of an outgoing HTTP request. Any particular hook may be nil. Functions may be called concurrently from different goroutines and some may be called after the request has completed or failed.

ClientTrace currently traces a single HTTP request & response during a single round trip and has no hooks that span a series of redirected requests.

See <https://blog.golang.org/http-tracing> for more.

```
type ClientTrace struct {  
    // Got1xxResponse is called for each 1xx informational response header  
    // returned before the final non-1xx response. Got1xxResponse is called  
    // for "100 Continue" responses, even if Got100Continue is also defined.  
    // If it returns an error, the client request is aborted with that error value.  
    Got1xxResponse func(code int, header textproto.MIMEHeader) error // Go 1.11
```

“ *For the addition of features in later point releases, it may be necessary to add fields to exported structs in the API.*

Go 1 and the Future of Go Programs

go vet

- go tool vet is deprecated

Go 1.12

- Detects wrapped `fmt.Printf` errors

```
func wrapper(s string, args ...interface{}) {  
    fmt.Printf(s, args...)  
}  
  
func main() { wrapper("%s", 42) }
```

```
[go-vet] wrapper format %s reads arg #1, but call has 0 args  
wrapper func(s string, vs ...interface{})
```


modules

- an alternative to GOPATH
 - integrated versioning and package distribution
 - details are likely to change
-
- Binary only packages not supported after 1.12
 - No more @ in import path
 - golang.org/x/tools/go/packages



modules



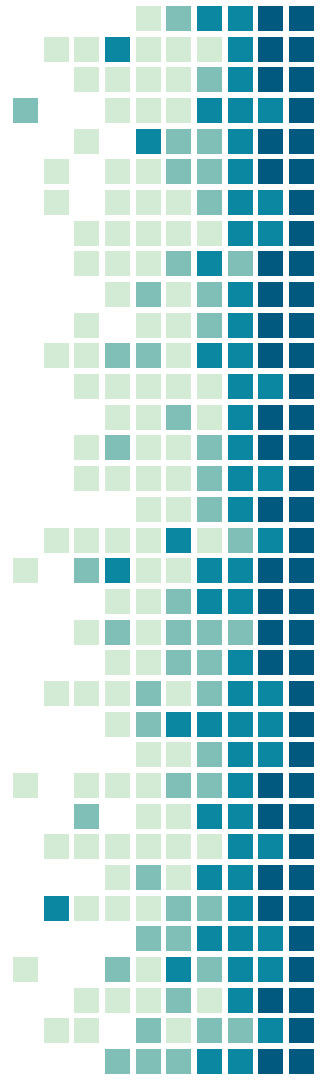
justforfunc.com

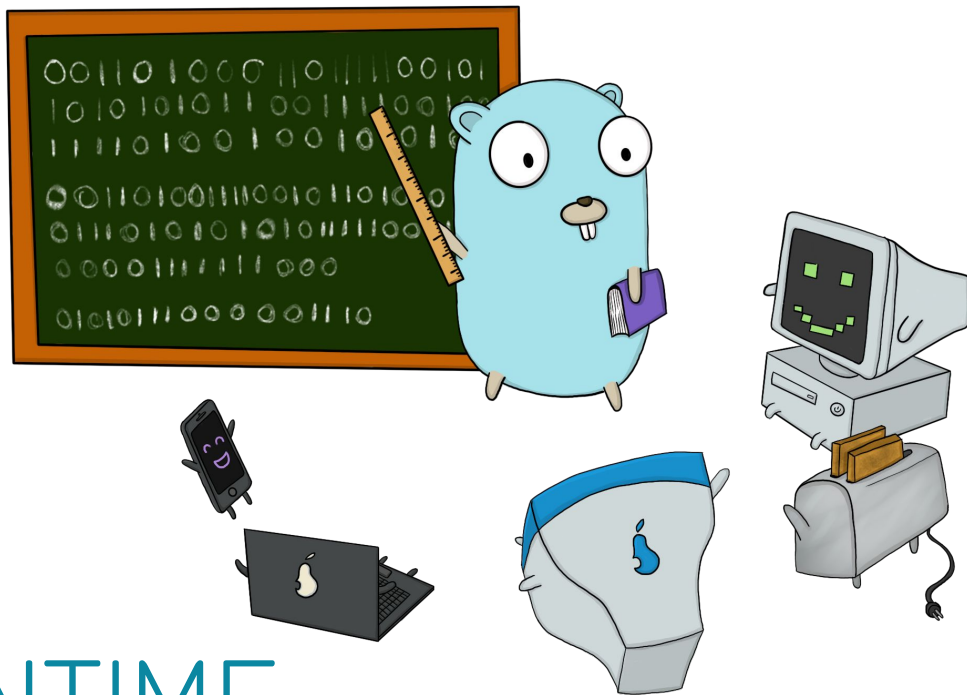
runtime/trace: user annotations

Add custom events to runtime traces.

Documentation: golang.org/pkg/runtime/trace

More: bit.ly/go-udtrace





RUNTIME



PERFORMANCE

Couldn't find anything for 1.12



vielmetti commented on Jun 28, 2018



System under test: Cavium ThunderX (96 cores), Packet c1.large.arm.

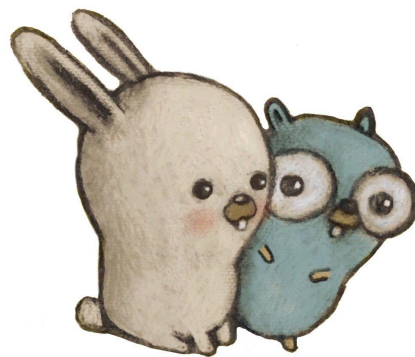
Old is go 1.10.2

New is go 1.11beta1

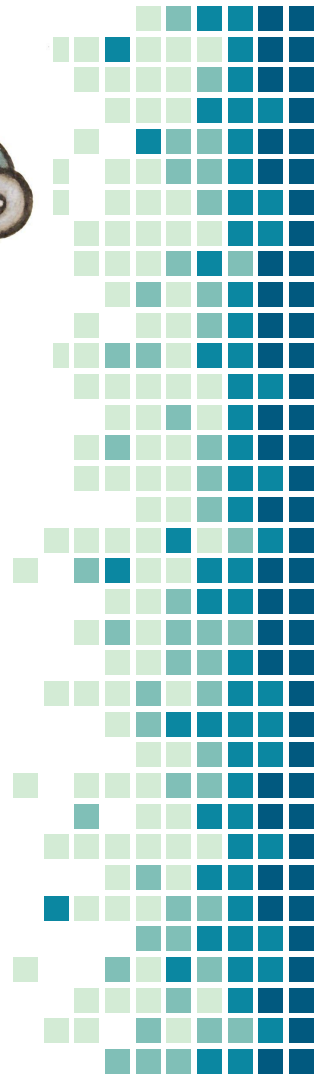
Improvements pretty much across the board.

benchmark	old ns/op	new ns/op	delta
Benchmark_____Pub0b_Payload-96	443	397	-10.38%
Benchmark_____Pub8b_Payload-96	444	410	-7.66%
Benchmark_____Pub32b_Payload-96	584	463	-20.72%

PORTS



- Go 1.11 OpenBSD 6.2 or later
- OpenBSD 6.4 only works on Go 1.11 and later
- Go 1.13 on macOS will require 10.11 or later
- Go 1.12 last release supported on FreeBSD 10.x
- Runtime: arm64 now faster
- windows/arm supports Raspberry Pi3
- RISC-V and GNU/HURD are reserved values 🤔



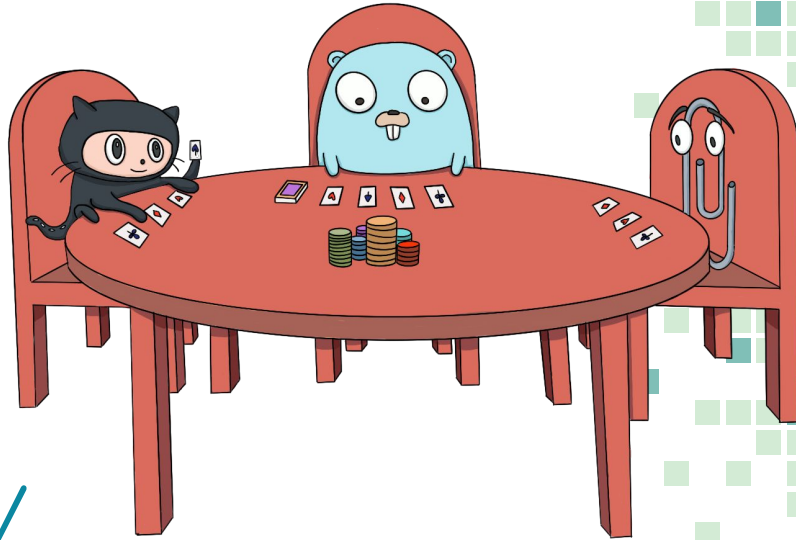
web assembly

- Go can now compile to Web Assembly (wasm)

```
$ GOOS=js GOARCH=wasm go build  
$ profit!
```

More: github.com/golang/go/wiki/WebAssembly

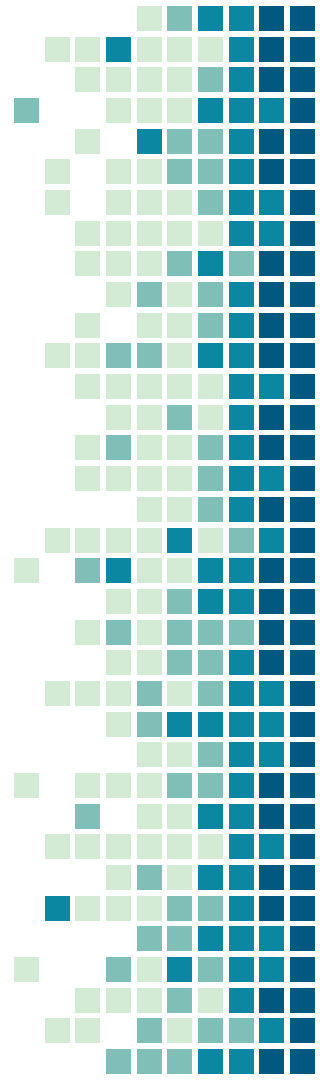
COMMUNITY



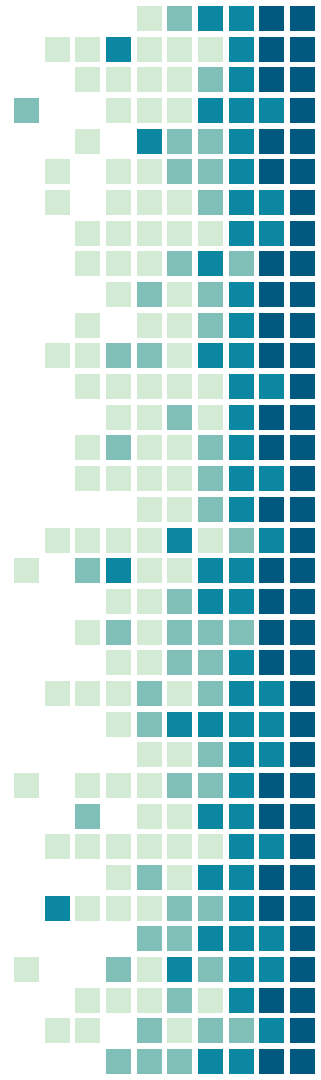
Back in 2014 (five years ago!)



Last year ...



This year ...

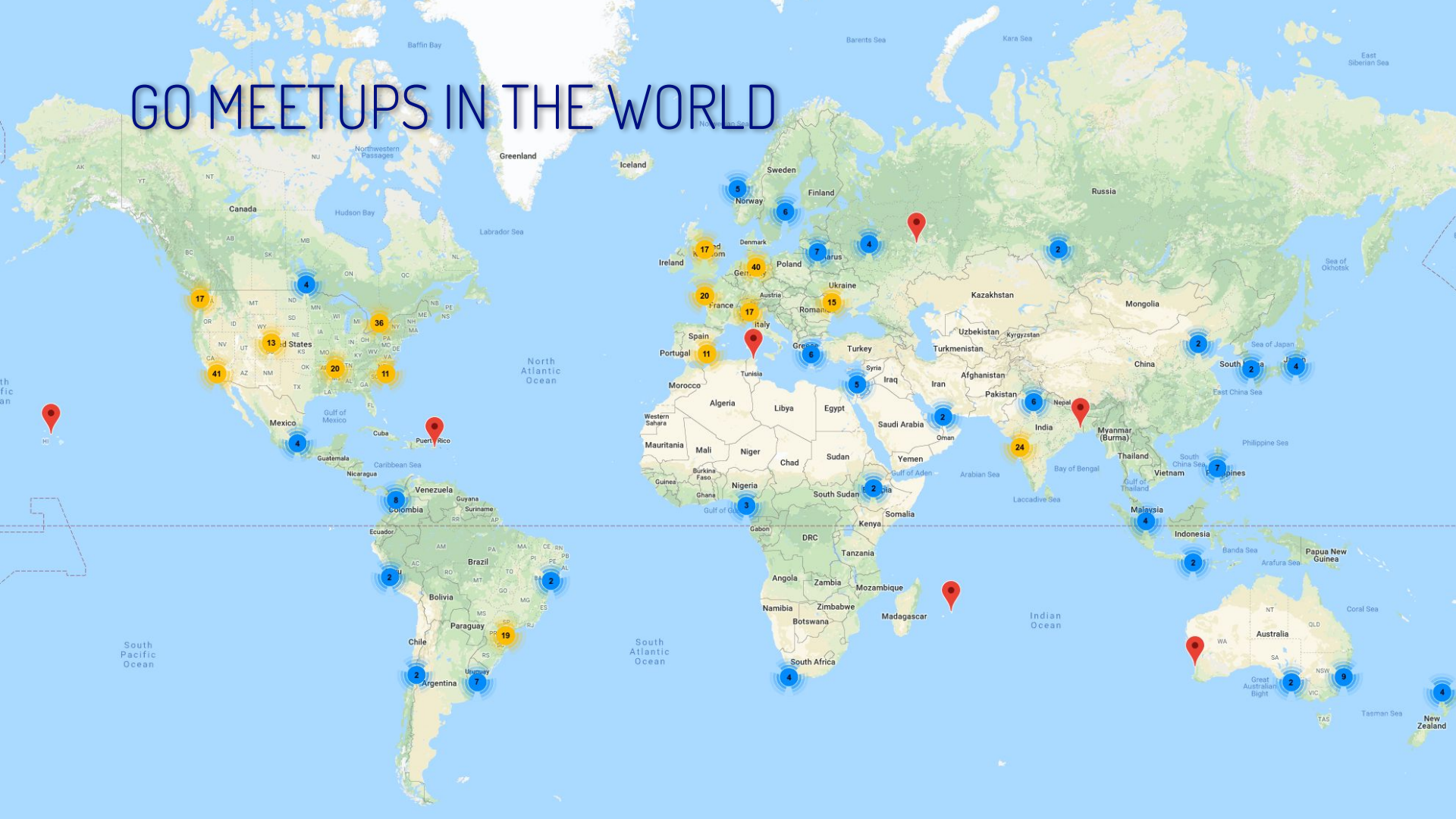


WOMEN WHO GO & GOBRIDGE MEETUPS



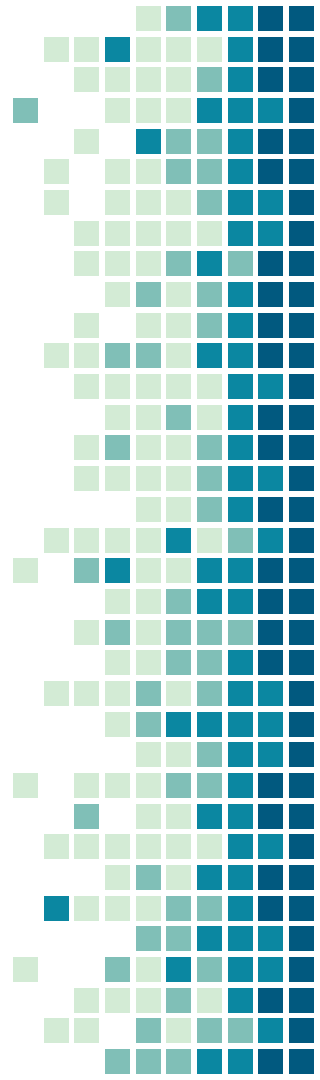
6 more than 2018: 30 chapters now!

GO MEETUPS IN THE WORLD



conferences

- Go Devroom @ FOSDEM 2019 (you are here)
- dotGo: Paris, March 25
- GothamGo: NYC, April 12
- GopherCon Singapore, April 24-26
- GopherCon EU: Tenerife, May 30-June 1
- GoCon Canada: Toronto, May 31
- GopherCon: San Diego, July 24-27



THANKS!

Francesc and
(voiceless) Maartje

