Let's Go !

A brief introduction to Google's new language

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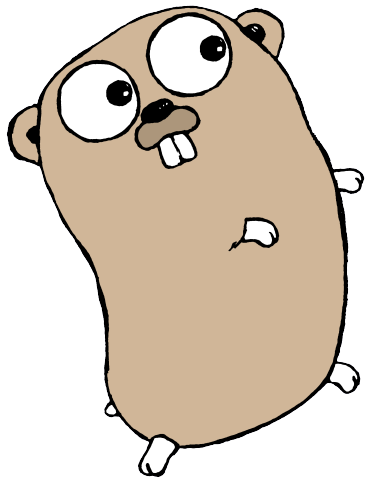
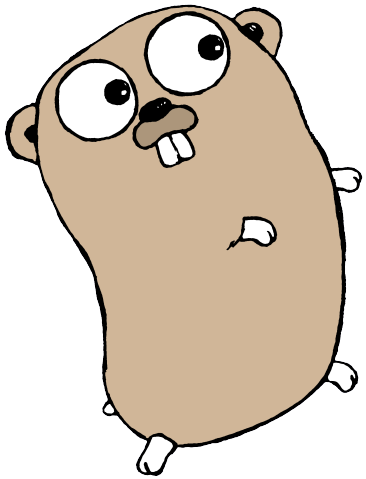
Content - 1/2



Content - 2/2



Motivations

- **Web dev** : fast, efficient, secure, low requirements

- **PHP** : « a fractal of bad design »
- **Python** : too many solutions :
  django, flask, karrigell, nagare, pylons, pyramid, turbogears, web2py, web.py, zope... and Python 3 ?
- **Perl** : not my favourite language
- **Ruby** : (on Rails) last try (2008) was not conclusive
- **Java** : does not suit my needs

- **Other solutions** : what do you suggest ?

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History

Designers

- **Robert Griesemer** (V8 JS Engine, Java HotSpot...)
- **Rob Pike** (Bell Labs, Unix, Plan 9, Inferno, Limbo...)
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Milestones

- Nov. 2009 : new public open source project
- 28-03-2012 : version 1
- 25-04-2012 : version 1.0.1
- 13-06-2012 : version 1.0.2

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Principles

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According to the Go Team

« Here at Google, we believe programming should be **fast**, **productive**, and most importantly, **fun**. That's why we're excited to **open source** an experimental new language called Go. Go combines the development speed of working in a **dynamic language like Python** with the **performance and safety of a compiled language like C** or C++. Typical builds feel instantaneous ; even large binaries compile in just a few seconds. And the compiled code runs **close to the speed of C**. Go lets you move fast. »

–Robert Griesemer, Rob Pike, Ken Thompson, Ian Taylor, Russ Cox, Jini Kim and Adam Langley –11 november 2009

Language - Characteristics

- Compiled language
- Strongly typed (no implicit type conversions)
- Low level (pointers)
- Garbage collector
- Not object-oriented
- No exception management
- Native concurrency support (goroutines and channels)
- Good standard library (Python's spirit)

- UTF-8 support, even in source files (var héhé int = 42)
- braces but implicite semicolons (vicious traps !)
- On the web, seek for « golang »

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Language - SDK

- GNU/Linux, OS X, Windows and FreeBSD (and source)
- BSD license
- Unzip and start coding, no cumbersome install

- **go build** : run the compiler
- **go fmt** : standard code formatting
- **go doc** : browse the doc (web server available)
- **go install** : install a package
- **go get** : download and install a package
- **go test** : lightweight unit-testing

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Language - vs

	Go	C
variables	`var i int`	`int i`
structures	`type st struct {i int` `c byte}`	`struct st { int i;` `char c; };`
loops	`for i:=1; i<=10; i++ {}`	`for (i=1; i<=10; i++) {}`
conditionals	`if i > 0 {} else {}`	`if (i>0) {} else {}`
functions	`func f(in int) int {}`	`int f(int in) {}`

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Language - example 1 of 1337

```
package main

import "fmt"

func swap(a int, b int) (int, int) {
        return b, a
}

func main() {
        fmt.Println(swap(1, 2))
}
```

Language - 1335 examples left

```
func cp(to, from string)
    (written int64, err os.Error) {

    src, err2 := os.Open(from, os.O_RDONLY, 0)
    if err2 != nil { return }
    defer src.Close()
    dst, err2 := os.Open(to, os.O_WRONLY|os.O_CREATE,
                                        0644)
    if err2 != nil { return }
    defer dst.Close()
    return io.Copy(dst, src)
}
```

Language - Examples - Interfaces

```
type T struct { i int }

func (p *T) Get() int { return p.i }
func (p *T) Put(v int) { p.i = v }

var t T

t.Put(2)

fmt.Println(t.Get())
```

Language - Examples - Web

```
package main

import ("net/http"
        "io"
        "code.google.com/p/go.net/websocket")

func EchoServer(ws *websocket.Conn) {
        io.Copy(ws, ws);
}

func main() {
        http.Handle("/echo", websocket.Handler(EchoServer));
        err := http.ListenAndServe(":12345", nil);
        if err != nil {
                panic(err)
        }
}
```

Language - Some packages

Archive/Compress

tar, zip, bzip2, gzip

Crypto/Hash

aes, elliptic, sha1, x509

Net/Web

http, html, cgi, smtp

Encoding

base64, csv, json, xml

Strings

regexp, strconv, unicode

System

os, syscall, syslog

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Gommunity

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www.golang.org

Go Projects

godashboard.appspot.com

Google Group

groups.google.com

Go Lang Community Wiki

code.google.com

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Success stories

- **Canonical** : backend infrastructure
- **BBC World News** : backend for different games
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Conclusion

- Good language for system and network programming
- Young language :
  - How stable is the specification ?
  - Several libraries for one task, no library for another one
  - Enthusiastic community but many projects start and die quickly
- Go is used internally in Google : more precisely ?

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Thank you, any questions ?