go - aka golang

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Objectives of the brown bag

1. why another language
2. golang design characteristics
3. an experience report from a poc
   3.1. goals of the poc
   3.2. some code
   3.3. some demos
4. wrap

Language Design in the Service of Software Engineering

Rob Pike at the SPLASH 2012

(From keynote talk given by Rob Pike at the SPLASH 2012 conference in Tucson, Arizona, on October 25, 2012.)

Conceived in late 2007 as an answer to some of the problems we were seeing developing software infrastructure at Google.

The computing landscape today is almost unrelated to the environment in which the languages being used, mostly C++, Java, and Python, had been created.

The problems introduced by multicore processors, networked systems, massive computation clusters, and the web programming model were being worked around rather than addressed head-on.

Moreover, the scale has changed: today's server programs comprise tens of millions of lines of code, are worked on by hundreds or even thousands of programmers, and are updated literally every day.

To make matters worse, build times, even on large compilation clusters, have stretched to many minutes, even hours.

Go was designed and developed to make working in this environment more productive. Besides its better-known aspects such as built-in concurrency and garbage collection, Go's design considerations include rigorous dependency management, the adaptability of software architecture as systems grow, and robustness across the boundaries between components.

golang design

- A syntax and environment adopting patterns more common in dynamic languages:
  - Concise variable declaration and initialization through type inference (x := 0 not int x = 0;).
  - Fast compilation times
  - Remote package management (go get) and online package documentation (godoc)

golang design

- Distinctive approaches to particular problems:
  - Built-in concurrency primitives: light-weight processes (goroutines), channels, and the select statement.
  - An interface system in place of virtual inheritance, and type embedding instead of non-virtual inheritance.
  - A toolchain that, by default, produces statically linked native binaries w/o external dependencies.

golang design

- A desire to keep the language specification simple enough to hold in a programmer's head, in part by omitting features common to similar languages:
  - no type inheritance
  - no method or operator overloading
  - no circular dependencies among packages
  - no pointer arithmetic
  - no assertions
  - no generic programming

Experience report from poc

Goals of the poc

- Serve “standard” data sets with REST and json
  - Fed’s ACH data
  - ISO country, currency, language
- Not so standard sources:
  - Fed: fixed format text file served on the web
  - ISO country: gotta buy (or scrape from wikipedia)
  - ISO currency: XML served on the web
  - ISO language: pipe-delimited .csv file served on the web

http://www.fededirectory.frb.org/FedACHdir.txt

```
011001234O011000015108261300000000BANK OF NEW YORK MELLON            500 ROSS ST., 154-0960          PITTSBURGH          PA152620000412236333811
011001276O011000015103060800000000ONEUNITED BANK                    3683 CRENSHAW BL                LOS ANGELES         CA900160000877663864811
011001331O011000015106231400000000RBS CITIZENS, NATIONAL ASSOCIATION 1 CITIZENS DRIVE               RIVERSIDE           RI029150000800883422411
011001726O011000015109121300000000THE FIRST NATIONAL BANK OF IPSWICH 625 GEORGE WASHINGTON HWY      LINCOLN             RI028650000401574192011
011001742O011000015107250500000000BANK OF AMERICA, N.A.              PO BOX 27025                    RICHMOND            VA232617025800446013511
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011001962O012100037420803121222203950CATHAY BANK                    RS-14                           ROSEMEAD            CA917700000626582733811
011002343O011000015107180600000000BOSTON PRIVATE BK + TR CO         ATTN: ACH ORPERATIONS           BOSTON              MA021094603617912423111
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ISO-639-2_utf-8

afr||af|Afrikaans|afrikaans

ain|||Ainu|aïnou

aka||ak|Akan|akan

akk|||Akkadian|akkadien

alb|sqi|sq|Albanian|albanais

ale|||Aleut|aléoute

alg|||Algonquian languages|algonquines, langues

alt|||Southern Altai|altai du Sud

amh||am|Amharic|amharique

ang|||English, Old (ca.450-1100)|anglo-saxon (ca.450-1100)

anp|||Angika|angika

apa|||Apache languages|apaches, langues

ara||ar|Arabic|arabe

arc|||Official Aramaic (700-300 BCE); Imperial Aramaic (700-300 BCE)|araméen d'empire (700-300 BCE)

arg||an|Aragonese|aragonais

arm|hye|hy|Armenian|arménien

ISO_3166-1

Afghanistan	AF	AFG	004
Åland Islands	AX	ALA	248
Albania	AL	ALB	008
Algeria	DZ	DZA	012
American Samoa	AS	ASM	016
Andorra	AD	AND	020
Angola	AO	AGO	024
Anguilla	AI	AIA	660
Antarctica	AQ	ATA	010
Antigua and Barbuda	AG	ATG	028
Argentina	AR	ARG	032
Armenia	AM	ARM	051
Aruba	AW	ABW	533
Australia	AU	AUS	036
Austria	AT	AUT	040
Azerbaijan	AZ	AZE	031
Bahamas	BS	BHS	044
Bahrain	BH	BHR	048
Bangladesh	BD	BGD	050

ISO_4217

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                        <Ccy>EUR</Ccy>
                        <CcyNbr>978</CcyNbr>
                        <CcyMnrUnts>2</CcyMnrUnts>
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                <CcyNtry>
```

some code

https://github.com/musicbeat/stddata/blob/master/stddata.go

https://github.com/musicbeat/stddata/blob/master/bank/bankprovider.go

https://github.com/musicbeat/stddata/blob/master/country/countryprovider.go

https://github.com/musicbeat/stddata/blob/master/currency/currencyprovider.go

https://github.com/musicbeat/stddata/blob/master/language/languageprovider.go

https://github.com/musicbeat/stddata-cli/blob/master/stddata-cli.go

demos

demos

go get github.com/musicbeat/stddata

go get github.com/musicbeat/stddata-cli

cd $GOPATH/src/github.com/musicbeat/stddata/currency

go test

cd $GOPATH/src/github.com/musicbeat/stddata-cli

go run stddata-cli.go

browse http://localhost:6060

godoc -http=:6062

browse http://localhost:6062

http://golang.org

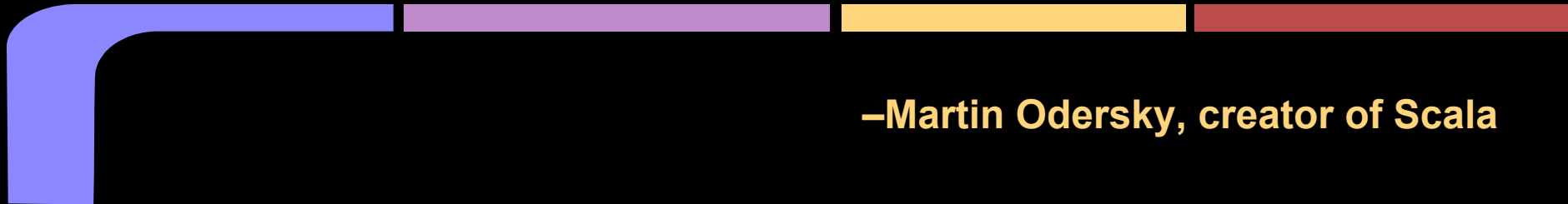
http://en.wikipedia.org/wiki/Go_(programming_language)

https://talks.golang.org/2012/splash.article

https://www.data.gov/developers/apis

References

“I like a lot of the design decisions they made in the [Go] language. Basically, I like all of them.”



–Martin Odersky, creator of Scala