

## IF GOVERNMENT CAN DO IT...

Gareth Rushgrove (@garethr)

Government Digital Service

SOFTWARE DEVELOPMENT

CONFERENCE



## f Government can do it... Technical change in large organisations

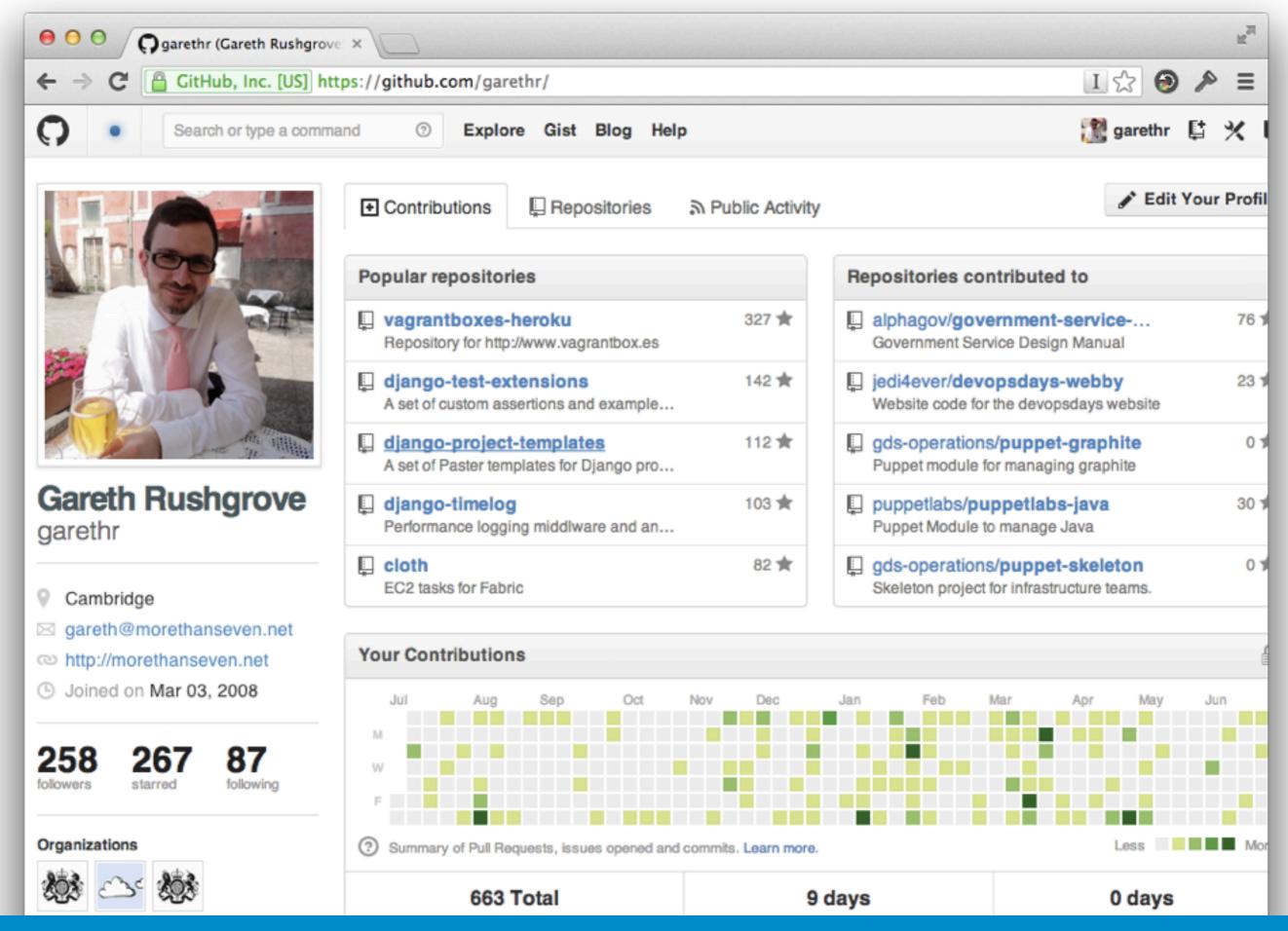
## Who is this person?)

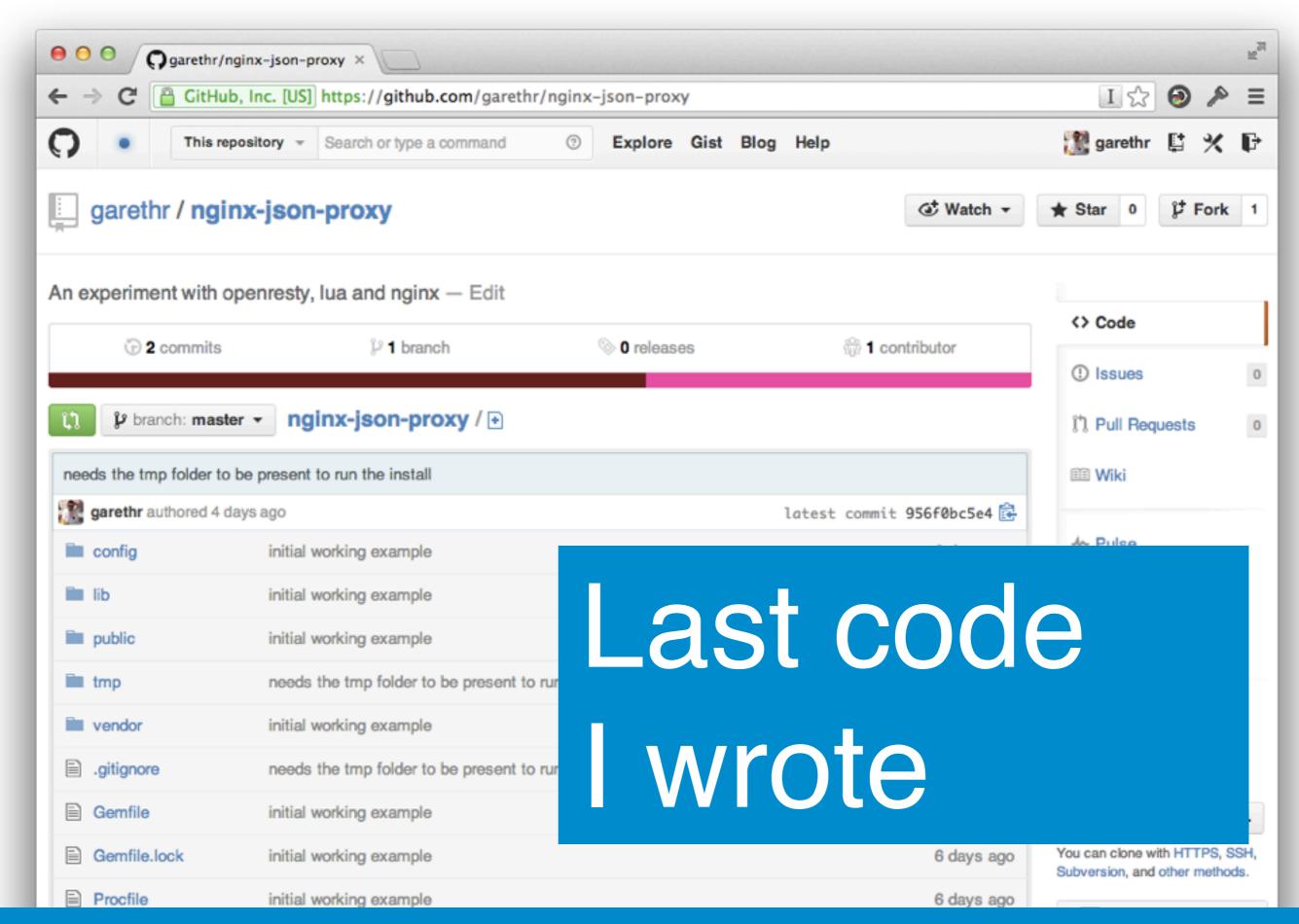


# Gareth Rushgrove Technical Architect Government Digital Service @garethr

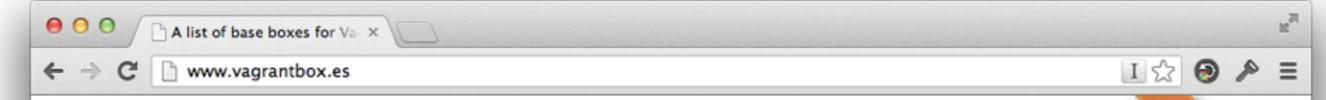












## Vagrantbox.es

Cort The Or Citho

Vagrant is an amazing tool for managing virtual machines via a simple to use command line interface. With a simple vagrant up you can be working in a clean environment based on a standard template.

These standard templates are called base boxes, and this website is simply a list of boxes people have been nice enough to make publicly available.

## Suggest a Box

Do you know of another base box? Send a pull request and we'll add it to the list below.

## **Available Boxes**

To use the available boxes just replace {title} and {url} with the information in the table below.

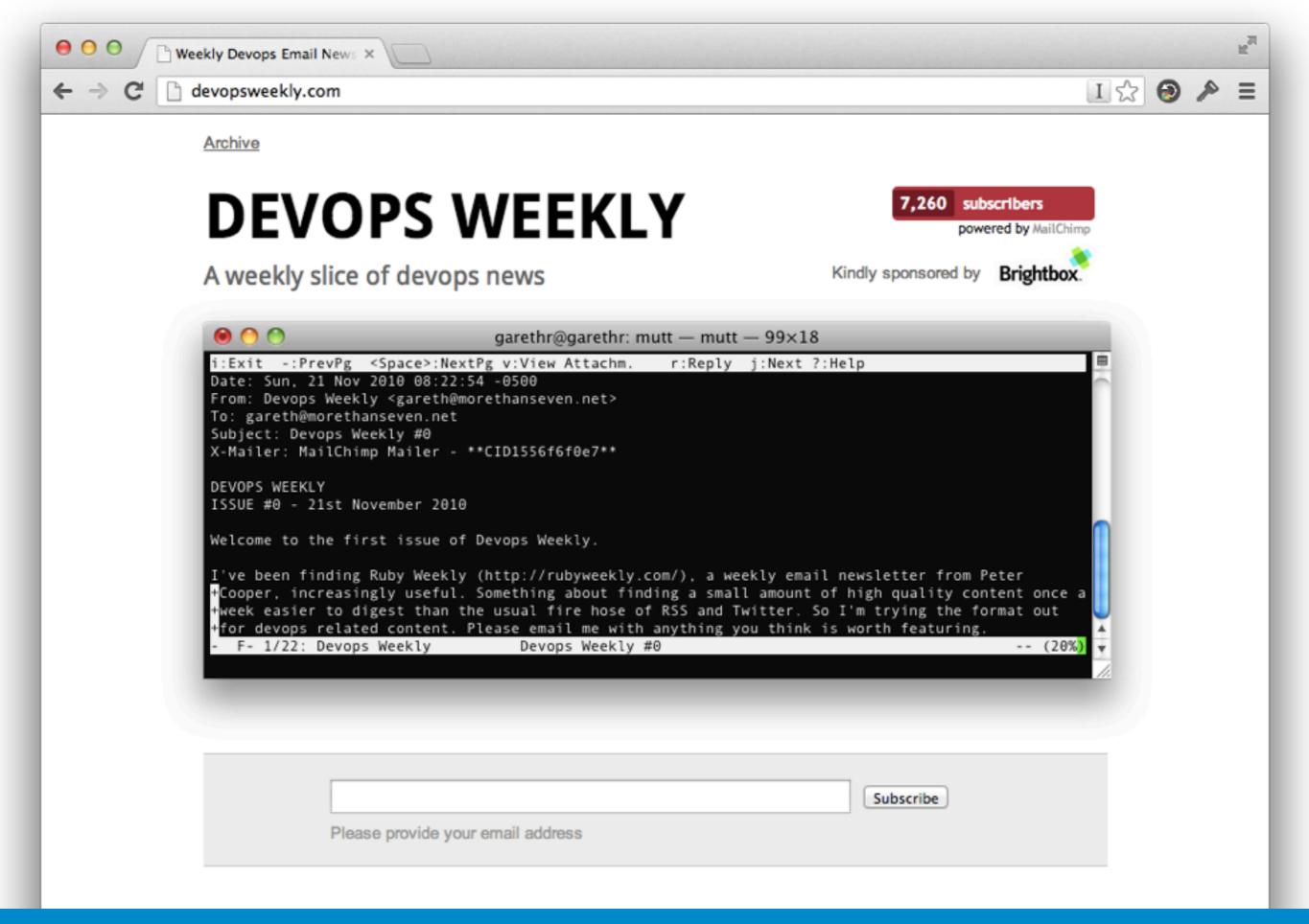
- \$ vagrant box add {title} {url}
- \$ vagrant init {title}
- \$ vagrant up

The list of boxes was last updated on May 18, 2013.

Name
URL

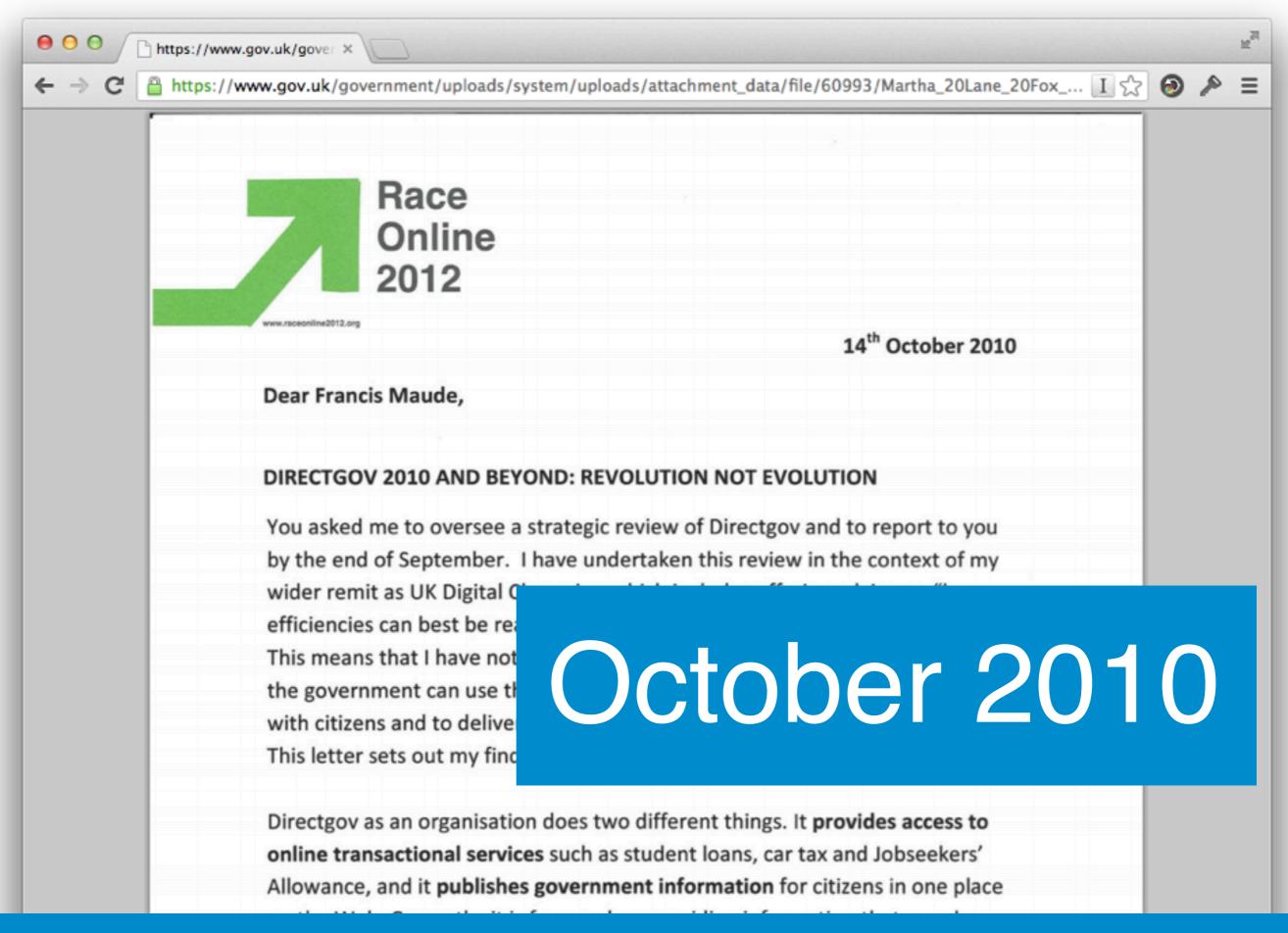
Aegir-up Aegir (Debian Stable 64-bit)

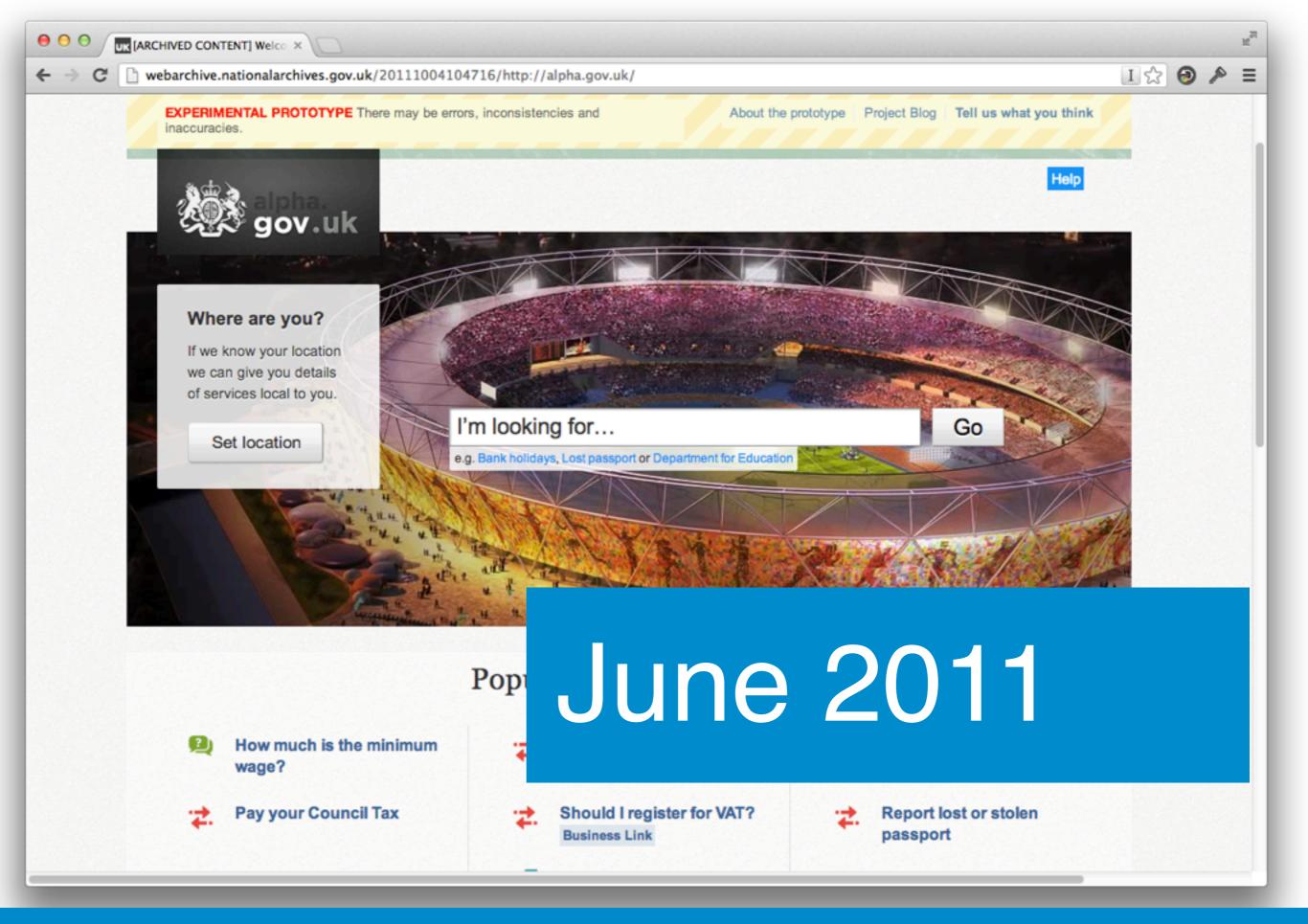
Copy http://ergonlogic.com/files/boxes/aegir-current.box



## Background (A startup in Government)

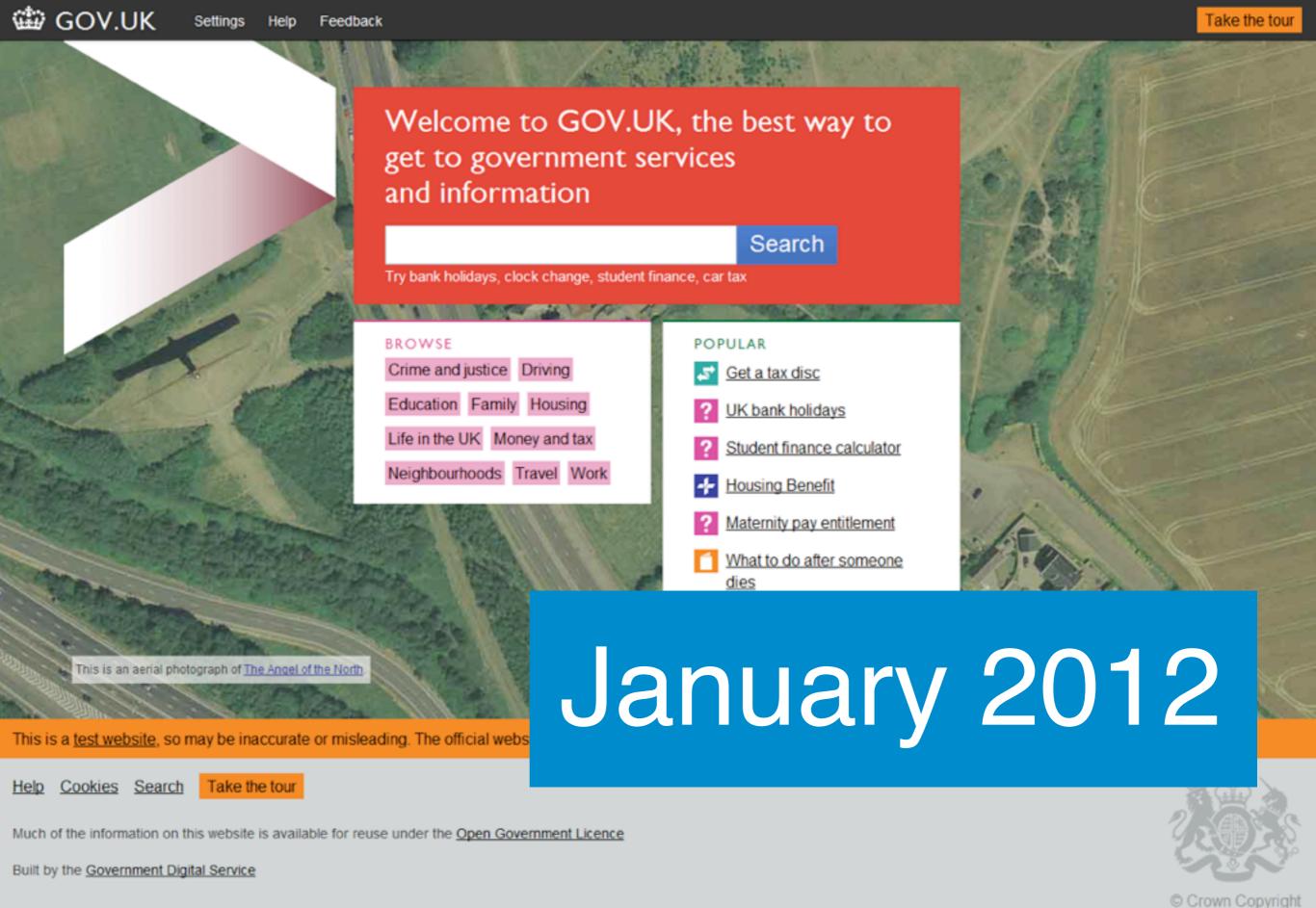






## I joined. Team of about 10 people

August 2011



## 

(Government Digital Service)



## Welcome to GOV.UK

The best place to find government services and information

Simpler, clearer, faster

This website replaces





### Driving and transport

Includes car tax, MOT and driving licences

### Businesses and self-employed

Tools and guidance for businesses

### Passports, travel and living abroad

Includes renewing passports and travel advice by country

### Working, jobs and pensions

Includes holidays and finding a job

### **Benefits**

Includes tax credits, eligibility and appeals

### Employing people

Includes pay, contracts and hiring

### Education and learning

Includes student loans and admissions

### Housing and local services

Owning or renting and council services

## October 2012

Births.

Crime.

Legalp

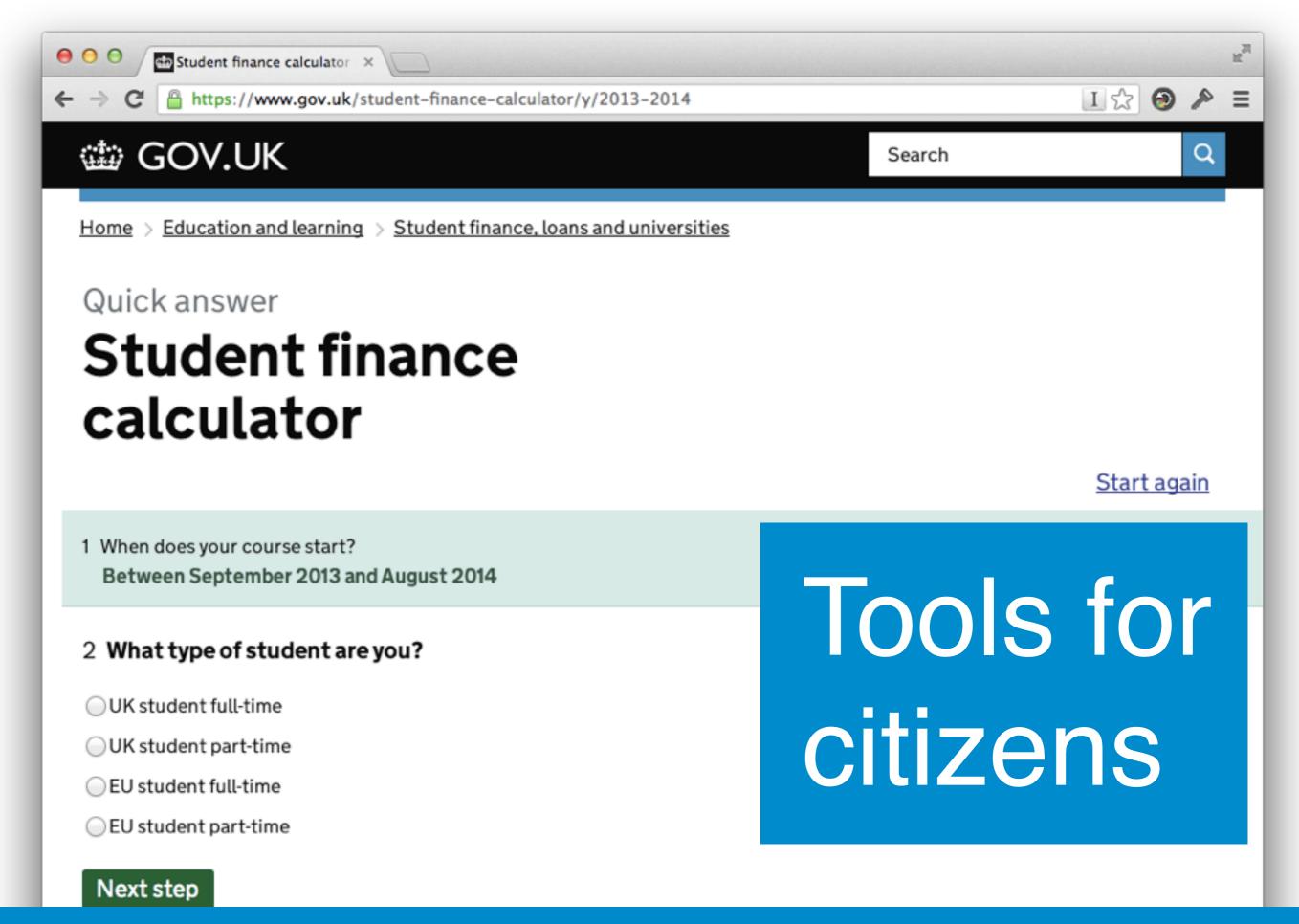
Parent Lasting

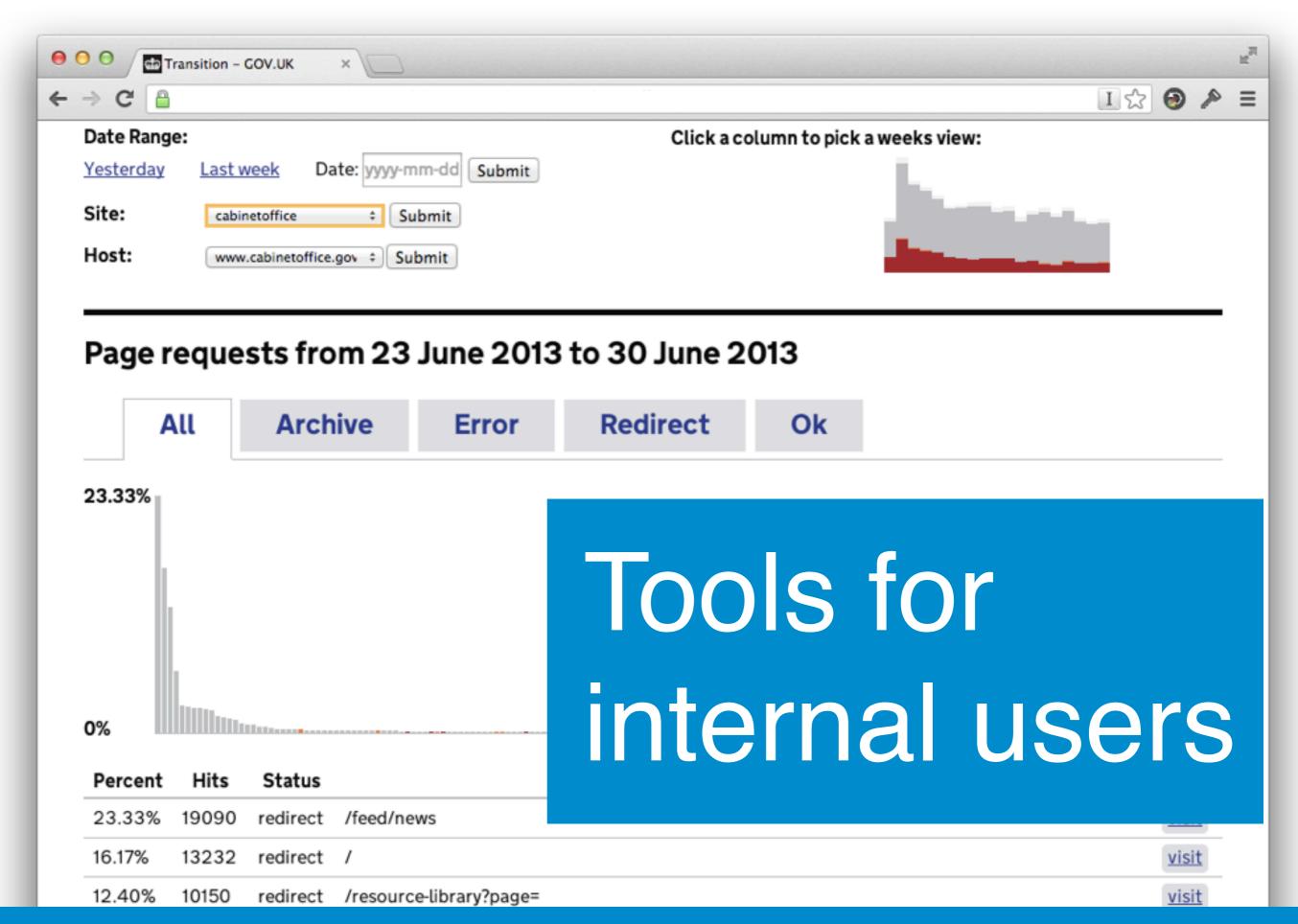
### Inside Government

Government departments, policies and announcements

### Citizenship and living in the UK

Voting, how government works, moving to the UK

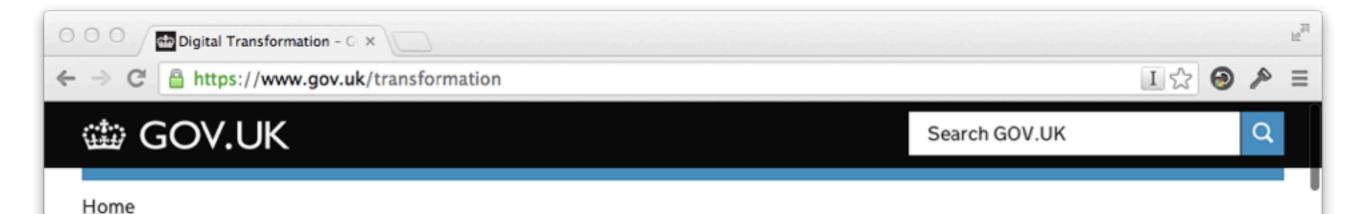




## Award winning

## Organisation of about 250 people

October 2013



## Digital Transformation

Digital services so good people prefer to use them

## Discovery

Finding out what the users

need, what to measure and

what the constraints are

Learn more about the

**Alpha** 

Building a prototype, testing it with users and learning from it Learn more about the alpha phase

Beta

Scaling up and going public Learn more about the beta phase

Live

Learning how to continuously improve the live service Learn more about the live phase

discovery phase

## What

(What is this talk about again?)

## Adopting agile in a large organisation

## 2

## The importance of rapid releases

## 3

## Why auditors love infrastructure as code



# How being open makes everything better

If government can

# Work in an agile with a work in an agile manner (Scaling agile)



## Government Digital Service

## Design Principles

Listed below are our design principles and examples of how we've used them so far. These build on, and add to, our original <u>7 digital principles</u>.

- 1 Start with needs\*
- 2 Do less
- 3 Design with data
- 4 Do the hard work to make it simple
- 5 Iterate. Then iterate again.
- 6 Build for inclusion
- 7 Understand context
- 8 Build digital services, not websites
- 9 Be consistent, not uniform
- 10 Make things open: it makes things better

## Start with the the neds\*

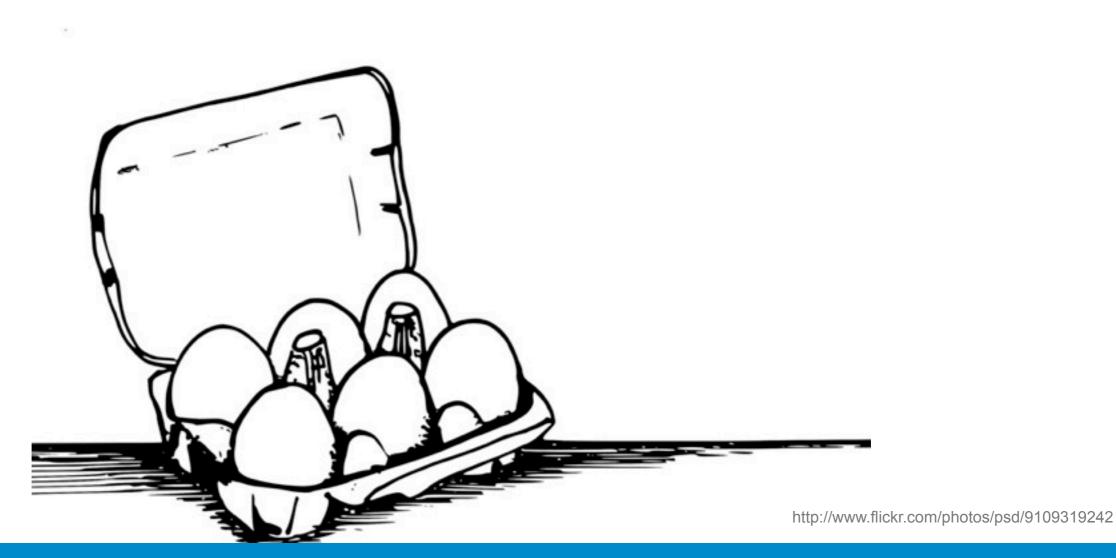


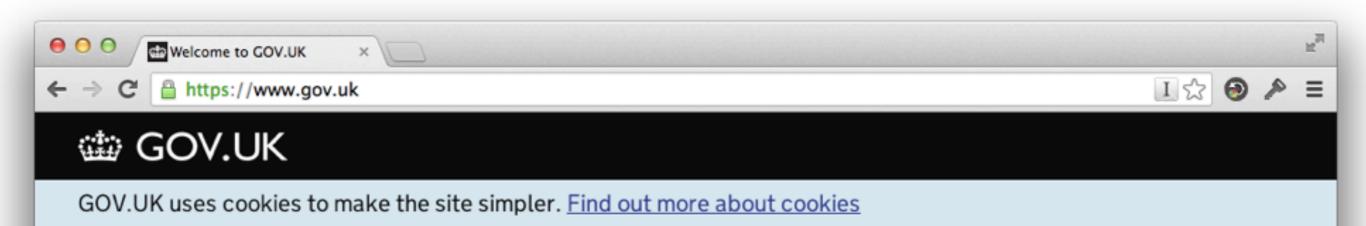
\*user needs, not government needs

## Do the hard work to make it simple



## Do less





## Welcome to GOV.UK

The best place to find government services and information Simpler, clearer, faster

Search GOV.UK

q

### **Contents**

Services and information

Departments and policy

More on GOV.UK

## Services and information

## **Driving and transport**

Includes car tax, MOT and driving licences

## **Employing people**

Includes pay, contracts and hiring

## Working, jobs and pensions

Includes holidays and finding a job

### **Benefits**

Includes tax cr

### Passports, t

Includes renew advice by coun

## project

## Housing and

Owning or renting and council services

Legal processes, courts and the police

Money and tax

Rirths deaths marriages and care

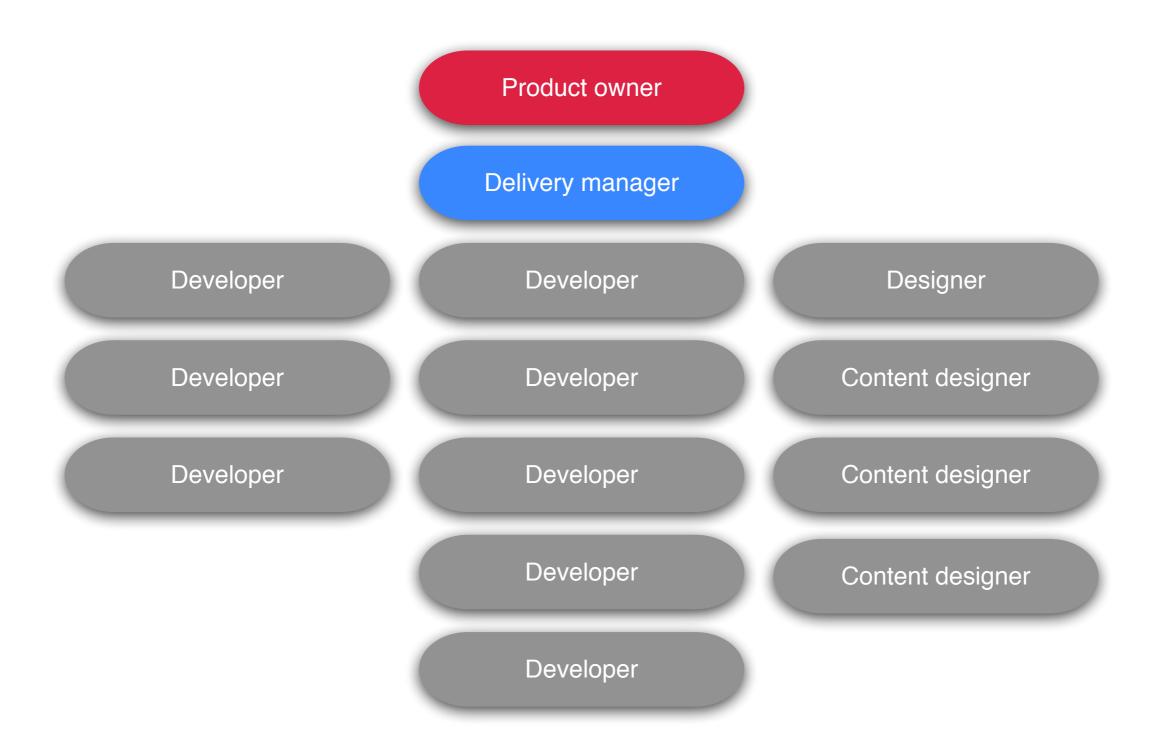
Disabled people

An example

Gareth Rushgrove



### From one team of about 14



### To 140 people in 14 teams

Product owner	Product owner	Product owner	Product owner	Product owner
elivery manager	Delivery manager	Delivery manager	Delivery manager	Delivery manager
Developer	Business analyst	Business analyst	Developer	Business analyst
Developer	Designer	Developer	Developer	Designer
Developer	Developer	Developer	Developer	Developer
Developer	Developer	Developer	Developer	Content designer
Developer	Developer	Developer	Developer	Content designer
	Content designer	Developer		Content designer
	Content designer			Content designer
				Content designer

#### All in about a year

## Web operations team just another product team

Product owner		
Delivery manager		
Web operations		

# With web operations people in other teams when required

Product owner		Product owner
elivery manager		Delivery manager
Developer		Business analyst
Developer		Designer
Developer		Developer
Developer		Web operations
Developer		Content designer
		Content designer
	Web operations	Content designer
		Content designer

# And with developers also working on operations tasks

### Someone in charge

Programme owner

#### Gareth Rushgrove

Information assurance, legal, procurement, programme support

Developer Develo			
Developer Developer Developer			Business analys
Developer Develo			Designer
			Developer
Developer Develo			Content designe
			Content designe
Content d			Content designe
Content d			Content designe
			Content designe
gramme support Programme	amme support Prog	gramme support	Programme sup

#### Gareth Rushgrove

#### Governance

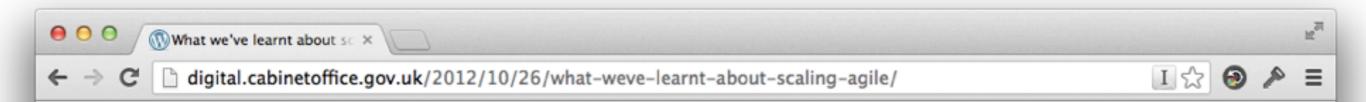


#### Gareth Rushgrove

To an organisation of 250 people, multiple programmes and a portfolio management team



# Now working out how to scale that across multiple organisations



#### Government Digital Service

Home About GDS GDS projects Working at GDS Jobs Cookies GOV.UK

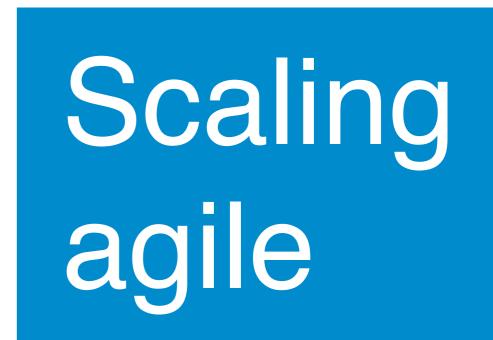
Cabinet Office homepage

#### What we've learnt about scaling agile

by Jamie Arnold on 26/10/2012

Warning: This is a slightly geeky post about agile – the methodology we use to deliver our projects. It therefore features quite a lot of terminology. We hope this will be useful for those of you building projects like these, but if you're just an interested bystander you might want to start with this quick intro to agile.

Well, we did it! We delivered GOV.UK. It was big and hairy and we did it by being agile. The benefits are clear:



Follow us on Twitter



### Things that worked

## Avoiding dependencies

### Understand interfaces

#### People AND software

### Multi-disciplinary teams

### Many small services

## Ability to throw things away

#### Trust

If government can

## Release quickly (Change control is fun)





Richard Stirling

@Rchards



So much good engineering, thought and responsiveness behind GDS being able to release 88 updates in 8 days.

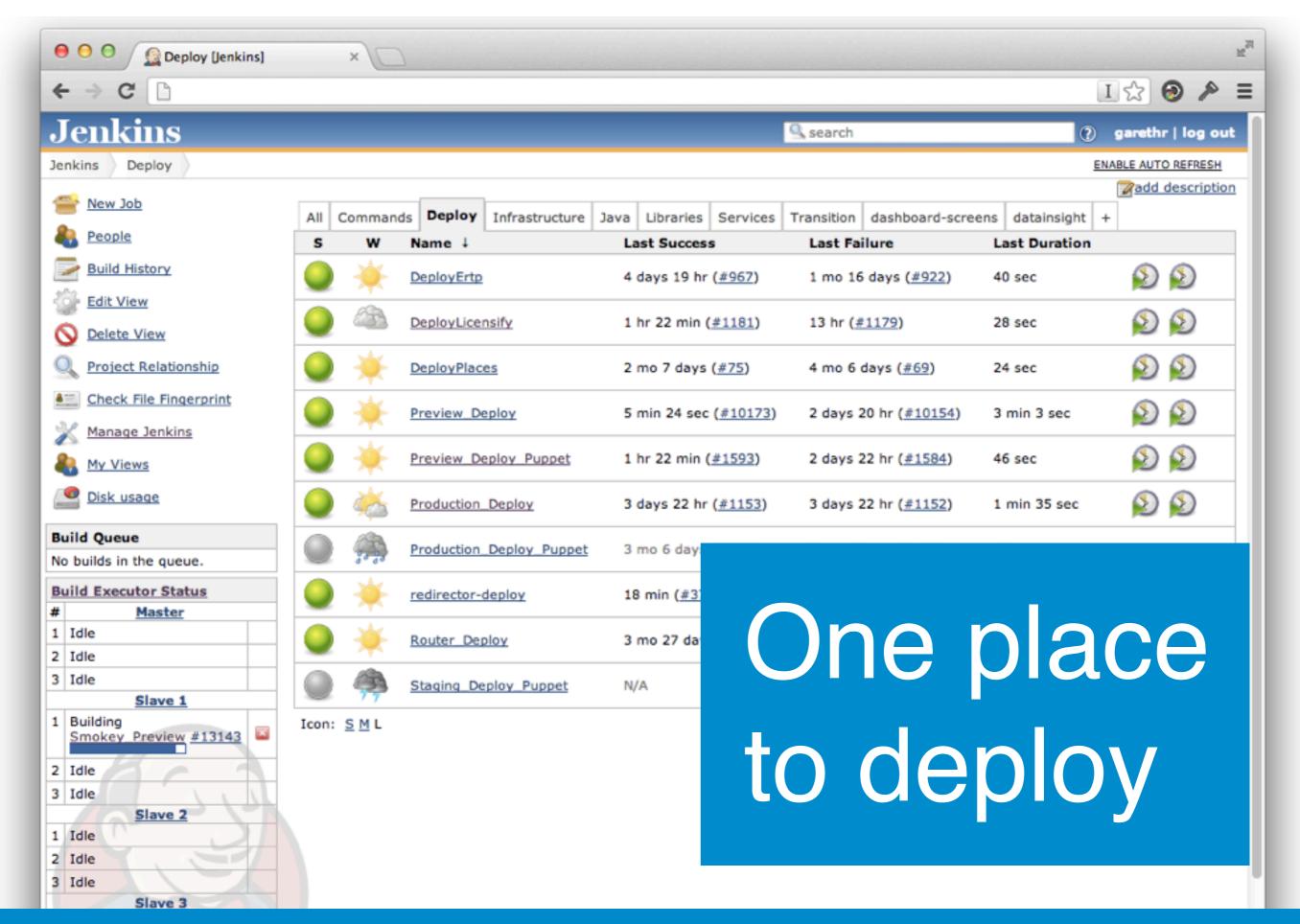


6:10 PM - 24 Oct 12 · Embed this Tweet

# Average about 6 releases a day over first 6 months

We changed less software on the day of launch than probably any day before or since

### One click deploy

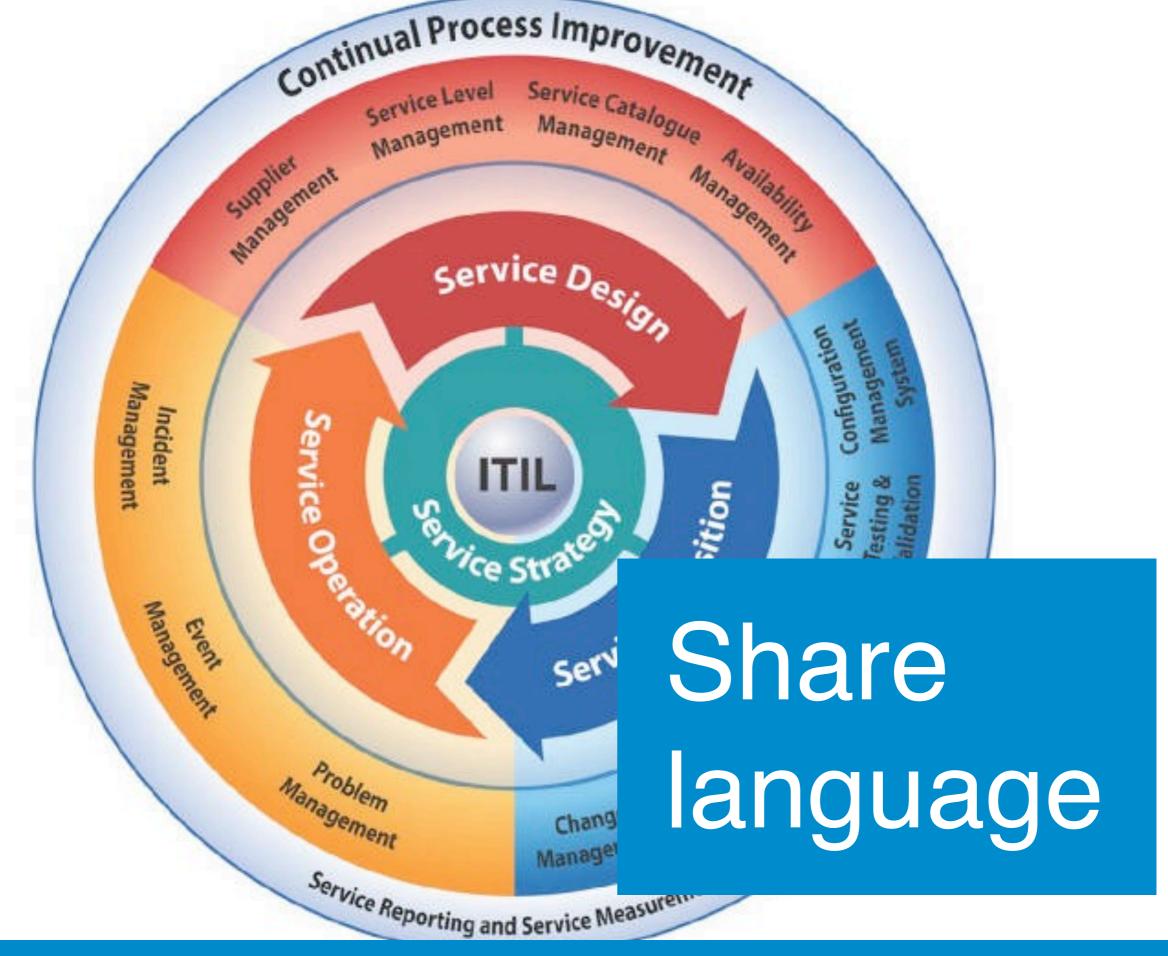


## Zero click deploy for early parts of pipeline

# One click deploy with suitable processes and access controls

## Talk about operations

- 1. Transition planning and support
- 2. Change management
- 3. Asset and configuration management
- 4. Release and deployment management
- 5. Service validation and testing
- 6. Change evaluation
- 7. Knowledge management



### Talk about risk



### Government Digital Service

Home About GDS GDS projects

# Regular releases reduce risk

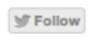
### Regular Releases Red

by Gareth Rushgrove on 02/11/2012

GOV.UK came out of beta just over two weeks ago. In that time we've released over 100 updates. I want to talk a little about how we do that, but mainly to focus on why this approach makes for more stability and less risk for the service.

Before we begin I just want to say thank you to one of our Cabinet Office colleagues whose tweet last week spurred me to write this blog post.





's "This week at GDS" video: bit.ly/15kfBxp 1 day ago

What users in the civil service tell us they want from tech governance

digital.cabinetoffice.gov.uk/2013 /07/04/exp... Blog post by

@ad\_areenway 2 days ago

## Because everyone understands practice

If government can

## Treat everything as code

(The importance of process)

## Configuration management



```
package { 'apache2':
 ensure => latest,
service { 'apache2':
 ensure => running
 provider => upsta
 require => Upsta
Infrastructure
                 as code
```

Higher level abstractions

# Infrastructure not just configuration

```
"role": "client",
"platform": "production",
"class": "backend",
"zone": "backend",
"vm_name": "backend-1",
"ip": "xx.x
```

## Virtual machines

```
require 'rubygems'
require 'nat'
nat do
  snat :interface => "Client Data",
       :original => \{ :ip => "10.0.0.0/xx" \},
       :translated => { :ip => "xx.xx.xx" },
       :desc => "Outbound internet traffic"
 dnat :interface => "Client Data",
       :original => { :ip => "xx.xx.xx", :port => 22 },
       :translated => { :ip => "10
       :desc => "jumpbox-1 SSH"
                                   Virtual
 dnat :interface => "Client Data'
       :original => { :ip => "xx.>
       :translated => { :ip => "1(
                                   networks
       :desc => "jenkins, logging
```

```
require 'rubygems'
require 'firewall'
firewall do
 # internal rules
 rule "ssh access to jumpbox1" do
    source :ip => "Any"
    destination :ip => "xx.xx.xx.xx", :port => 22
 end
 rule "http to backend applications
    source :ip => "Any"
                                     Virtual
    destination :ip => "xx.xx.xx.xx
 end
 rule "https to backend application
```

## firewalls

```
@normal
Scenario: check quick answers load
  When I visit "/vat-rates"
  Then I should see "VAT rates"
```

## Smoke tests and monitoring

```
@high
Scenario: check quick answers load
  When I visit "/vat-rates"
  Then I should see "VAT rates"
```

## Change who responds to issue

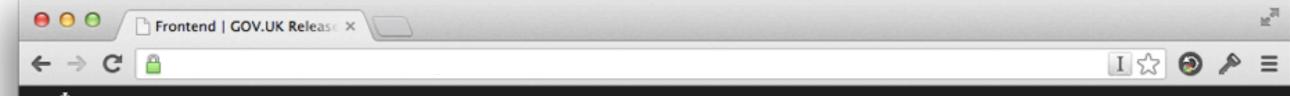
## Reuse audited processes

Code review, pairing, source control, release pipeline, access controls

# Avoiding spreadsheets as a source of truth

## Developers want visibility of deploys

# Organisations want auditability of deploys



GOV.UK Release

Applications

Signed in as Gareth Rushgrove Services -

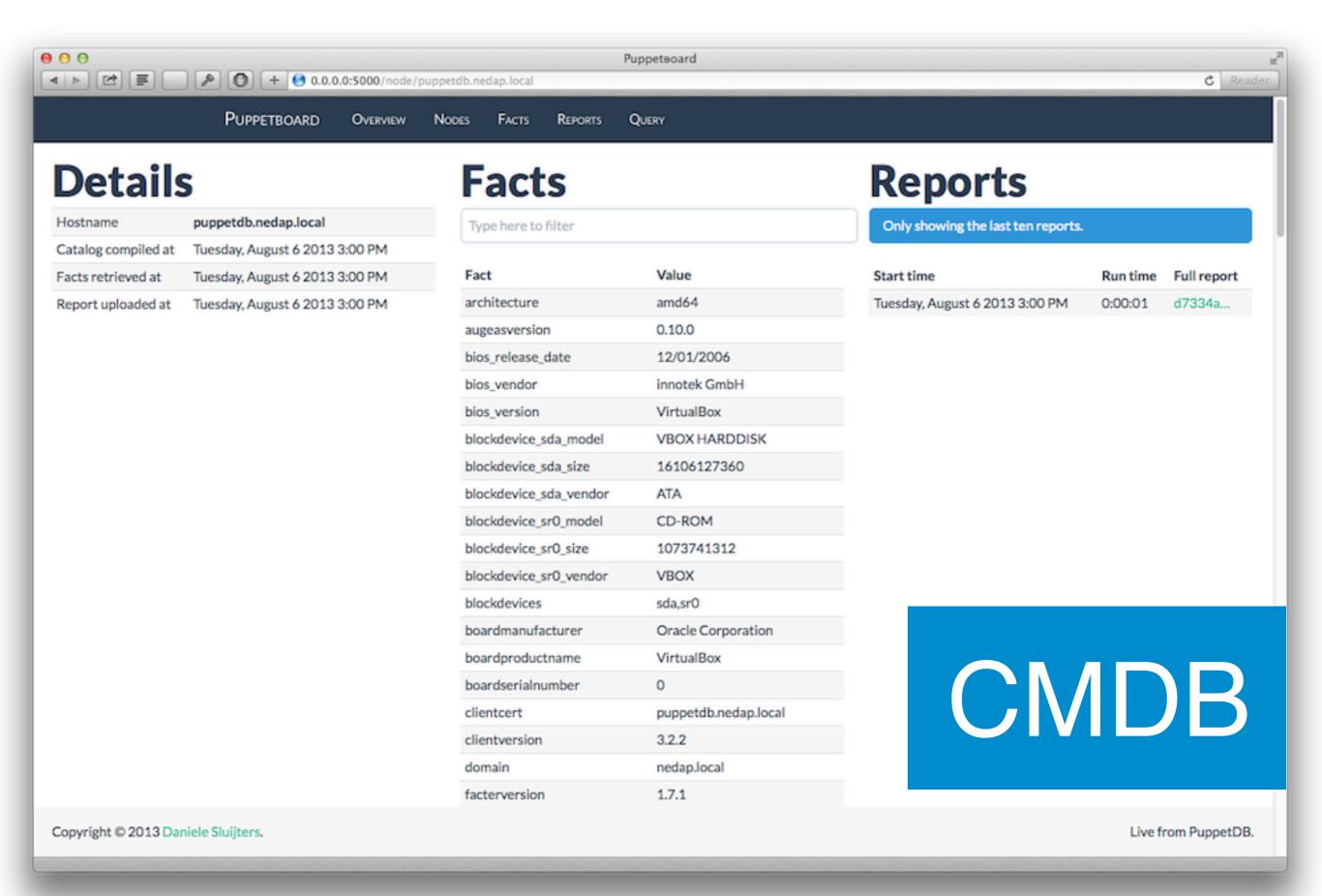
### Frontend (frontend)

https://github.com/alphagov/frontend

Edit

#### **Commit Log**

Deployed to	Tags	Commit	
	release_1287	Cleanup spelling suggestion tests	4623a50ecc885a421d9813d10fee3ac87575f46b
	release_1286 release_1285	Merge pull request #386 from alphagov/correctly_disable_	_cache_in_dev 7a9cd2c5561581f18a7934984b6bfc6fadd4cb49
		Correctly disable the cache in development	c36e7hf9f9736hd3055h9a15209d4a714fc31cd8
	release_1284	Merge pull requ	
	release_1283	Merge pull requ	nowing
		changed destination	
		remove workpla	
		Update homepa  Merge remote b	
staging at 2:12pm - 4 Jul production at 2:36pm - 4 Jul	release_1282 release_1281	Merge remote b	

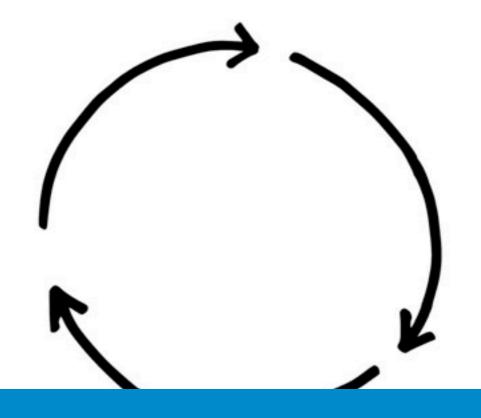


If government can

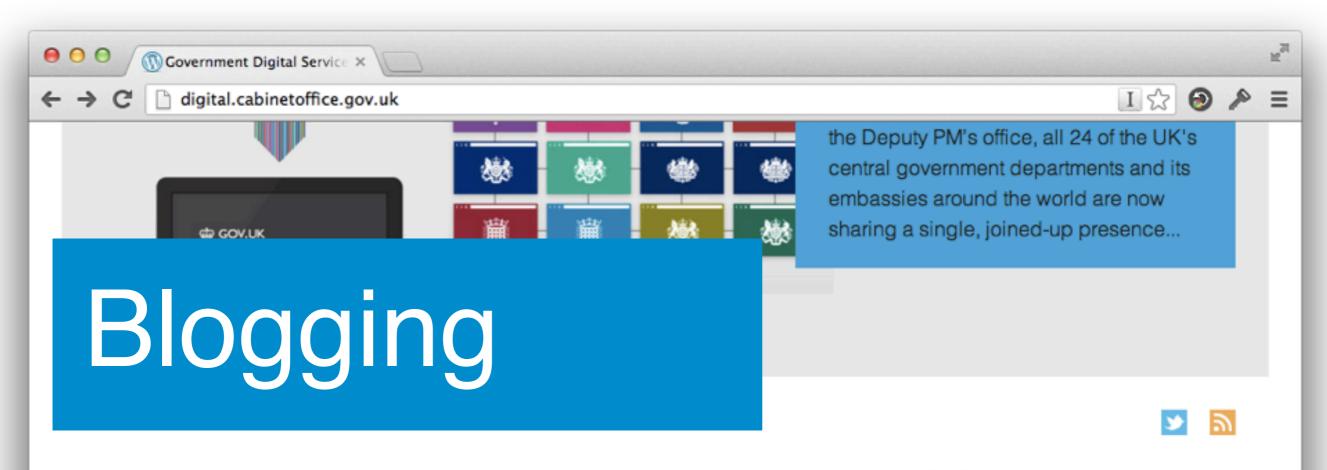
## Work in the open

(The benefits of openness)

# Make things open, it makes them better



http://www.flickr.com/photos/psd/9122642253



Jul 5

#### This week at GDS

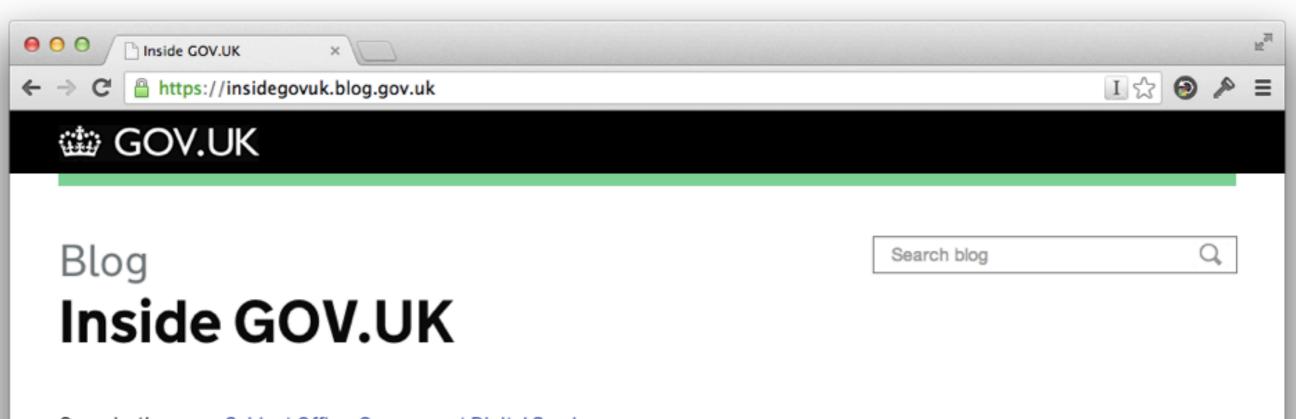


#### @GDSTeam on Twitter

It's Friday afternoon, which means it's time for @MTBracken 's "This week at GDS" video: bit.ly/15kfBxp 1 day ago

What users in the civil service tell us they want from tech governance digital.cabinetoffice.gov.uk/2013 /07/04/exp... Blog post by @ad\_greenway 1 day ago

On our blog read how claimants



Organisations: Cabinet Office, Government Digital Service

Topics: Government efficiency, transparency and accountability

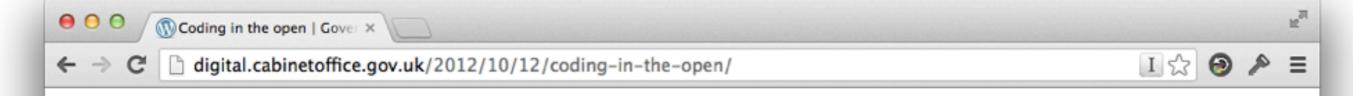
#### 

### Improving browse and navigation

In the last few weeks, we've been taking a look at how people browse and navigate GOV.UK. We've just made a start with some HTML prototypes and research in the usability lab.

Read more





### Government Digital Service

Home About GDS GDS projects Working at GDS Jobs Cookies GOV.UK

Cabinet Office homepage





### Coding in the open

by James Stewart on 12/10/2012

We talk a lot about Open Source at GDS. GOV.UK is built on open software and, to a degree, built as open source software. It's a topic passionately about because it helps us maintain our focus on user helping us to quickly test and iterate software and systems.

The software world has a rich and growing range of tools to build y software on. From operating systems such as GNU/Linux, web serv as Apache or nginx, databases like MySQL, Postgres or MongoDB are there so we don't have to do it all ourselves.

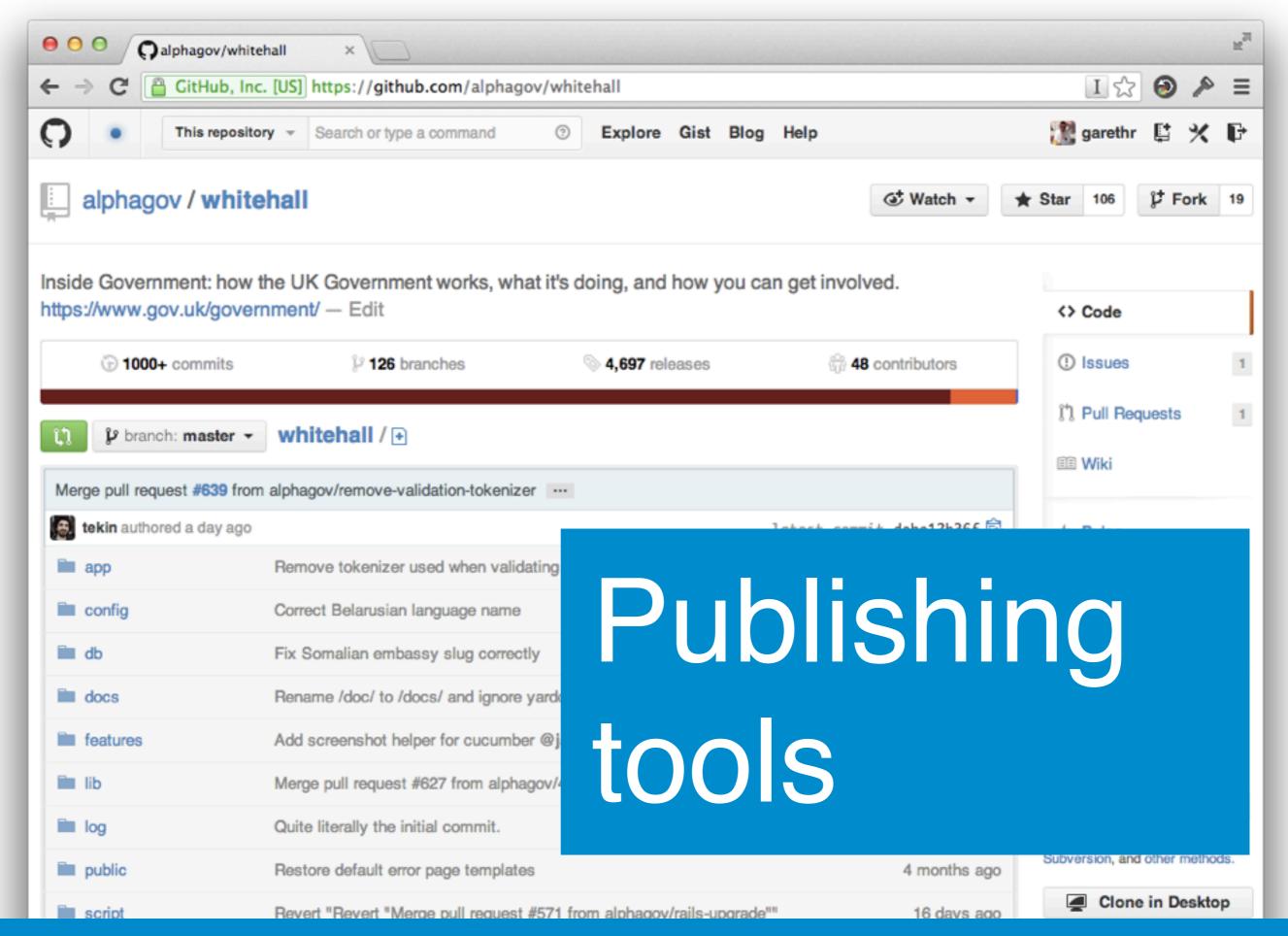
The challenge is often in knowing which of those tools are right for the job you're focussed on

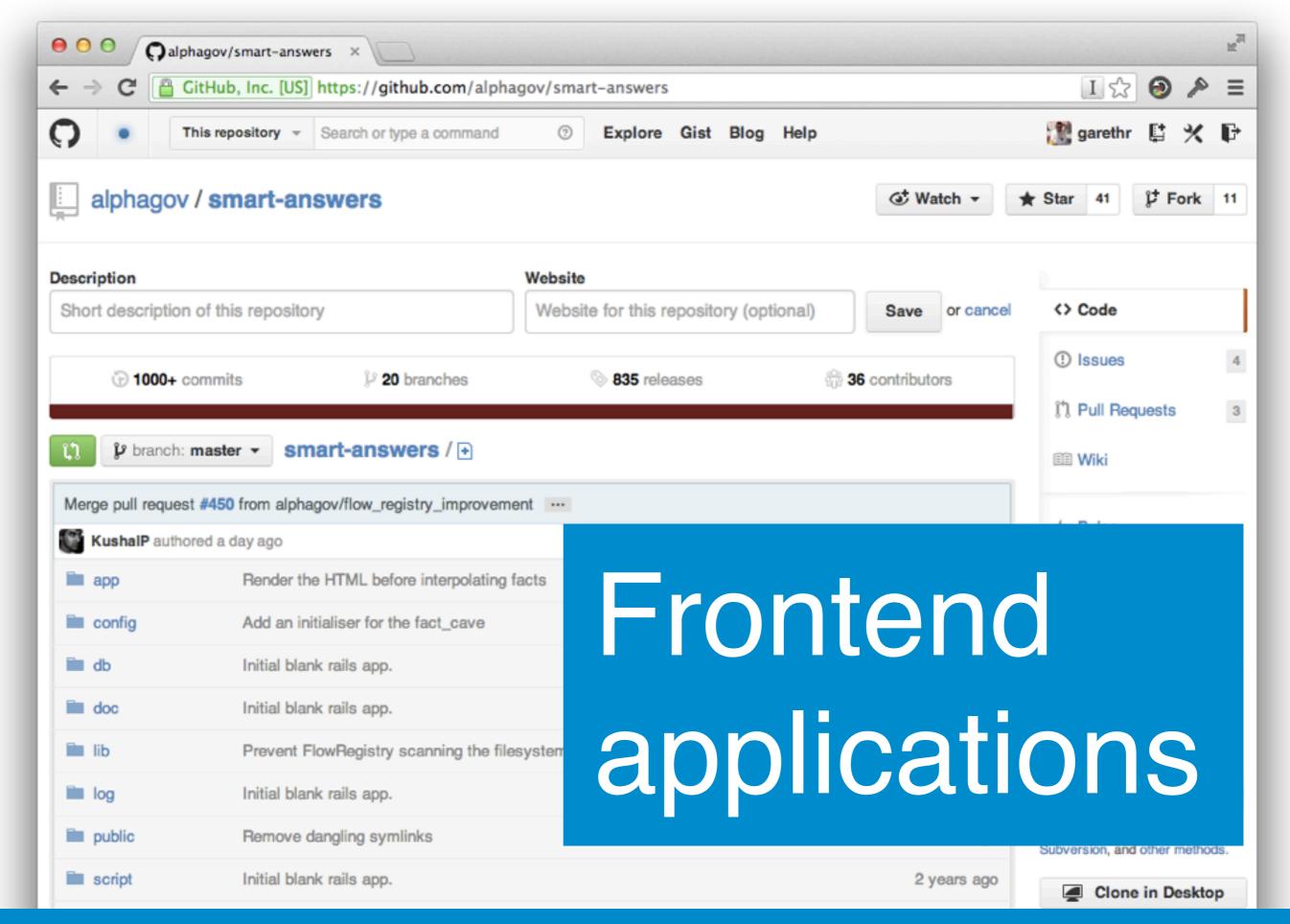
Search the GDS blog

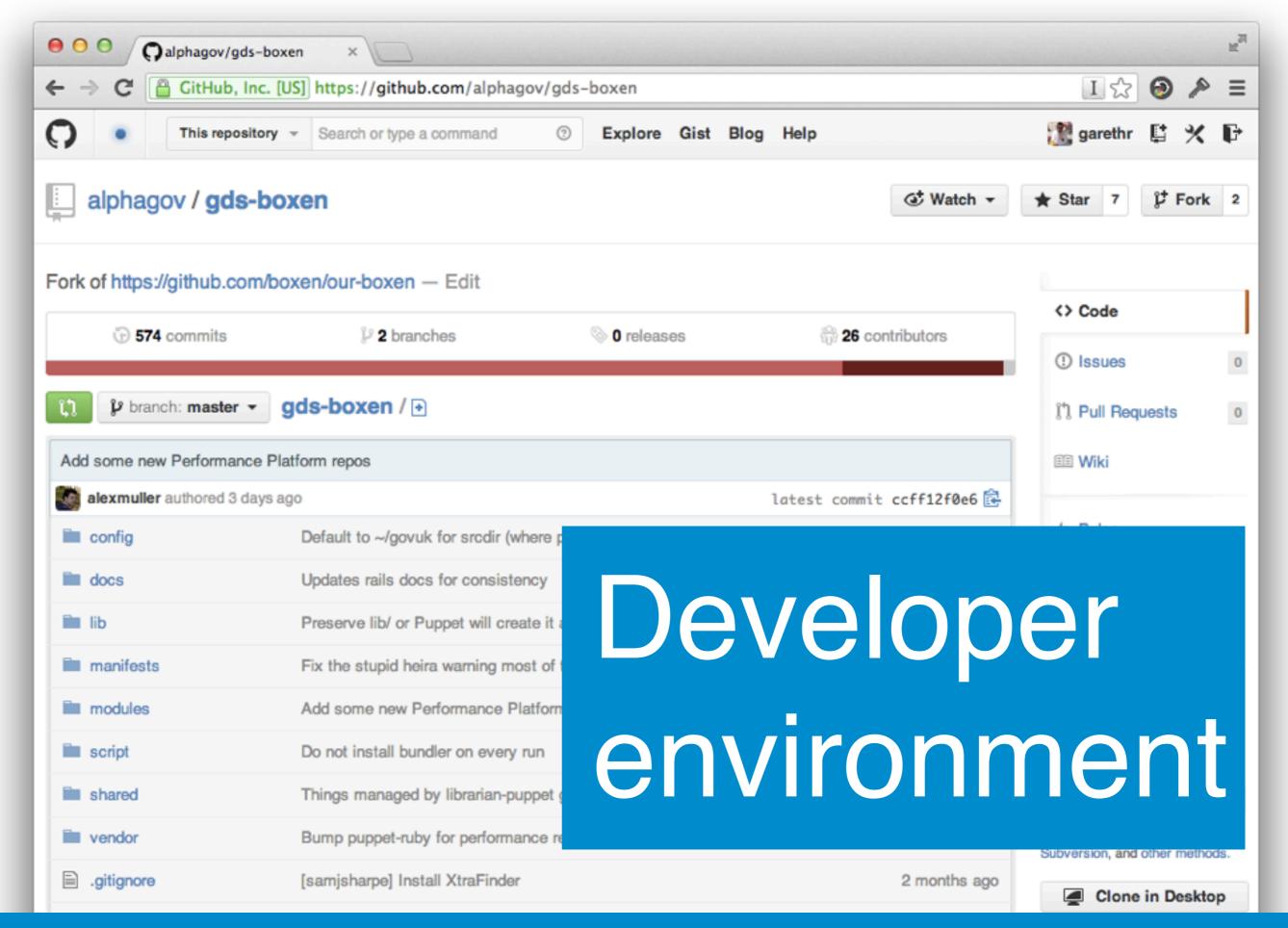
## Coding in the open

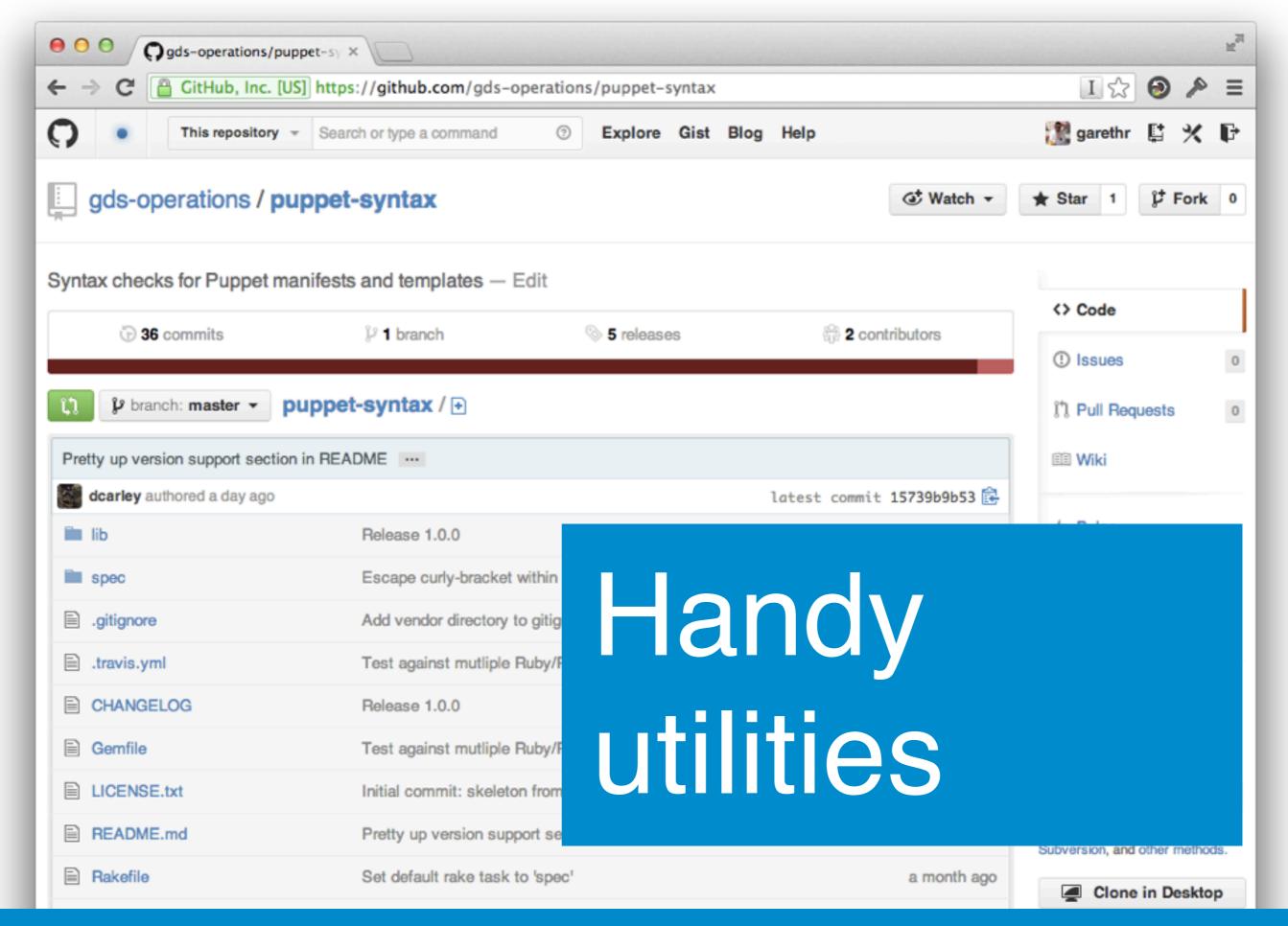
@gdsteam

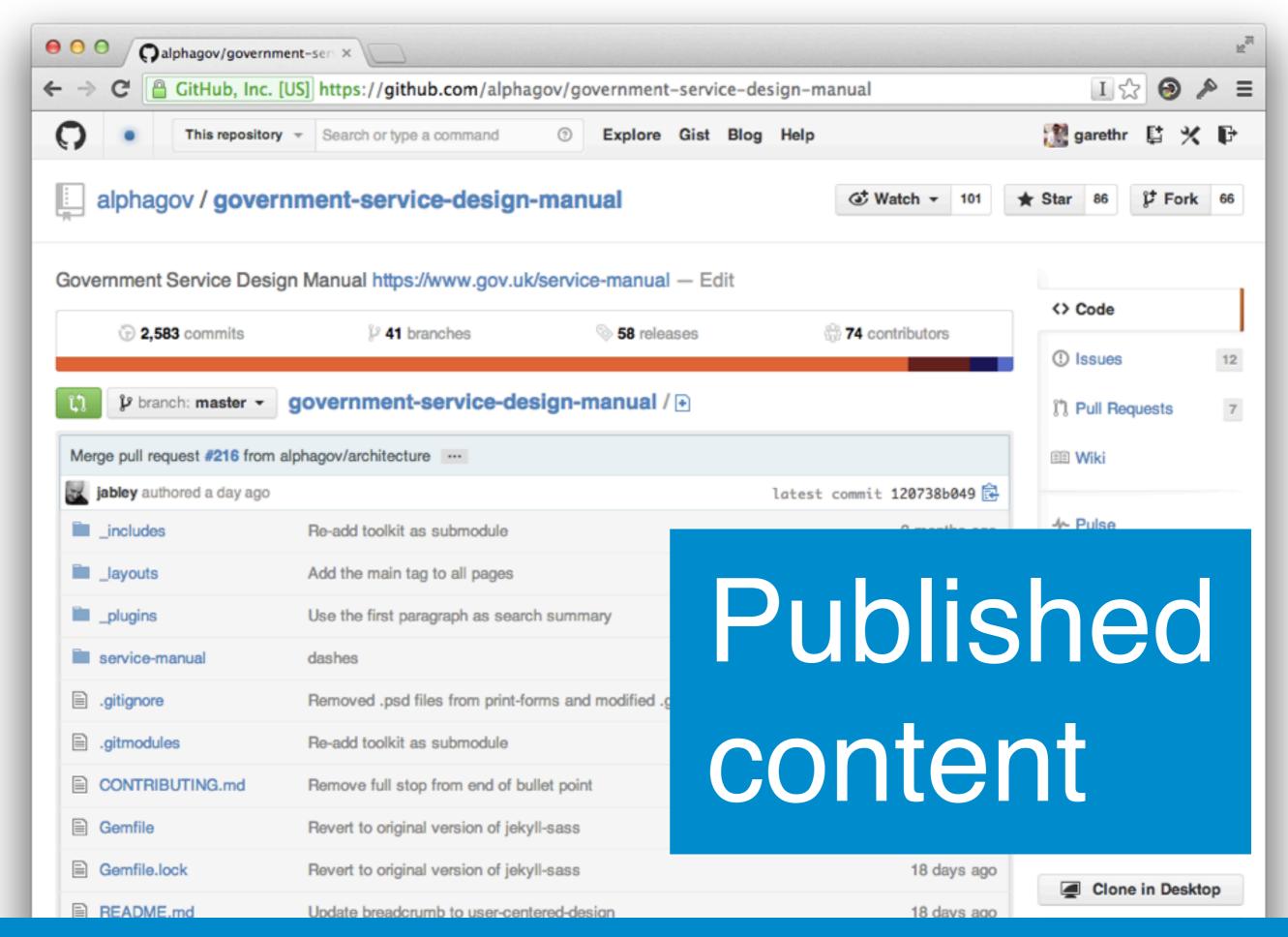
This week our first #openstandards were selected, @liammax writes about it here:

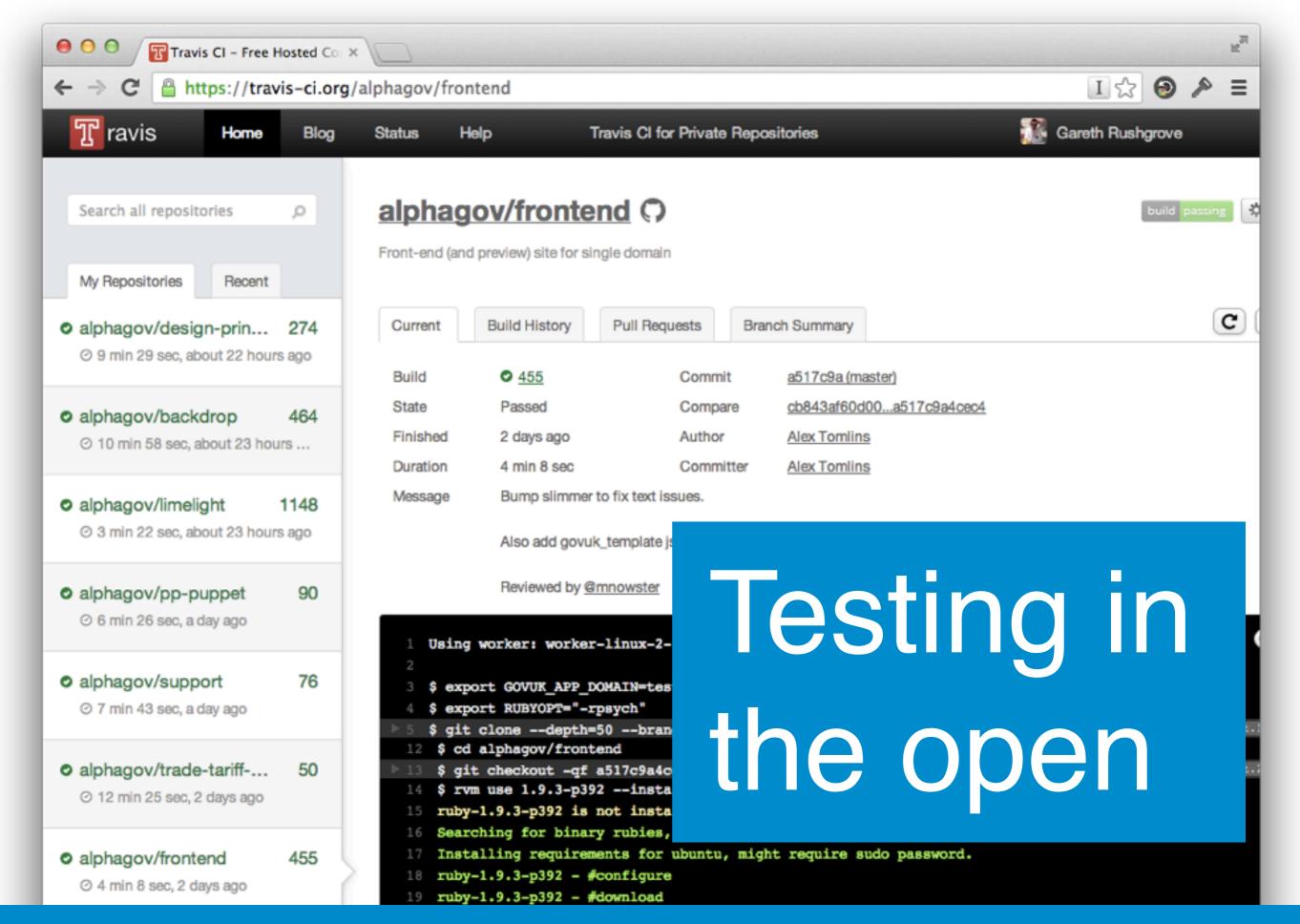


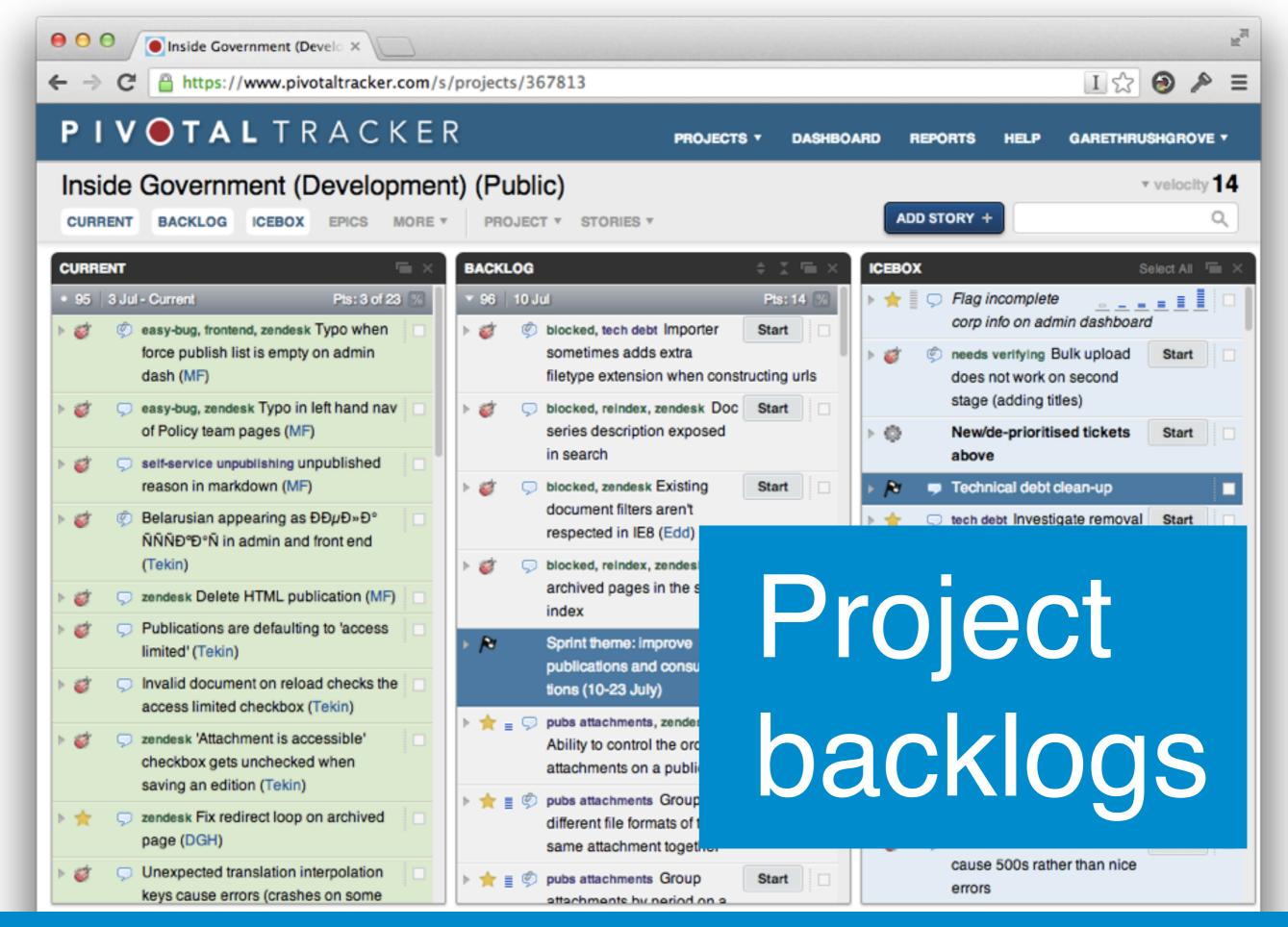


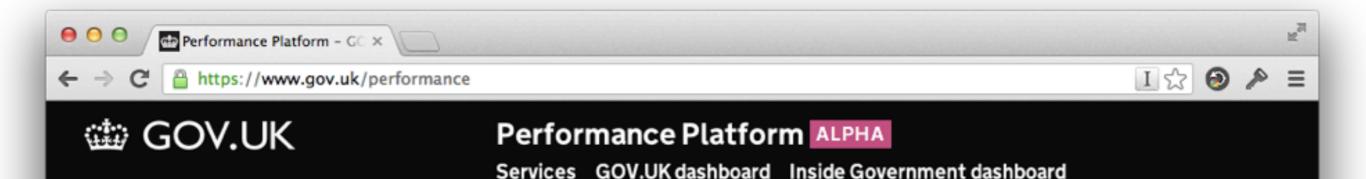












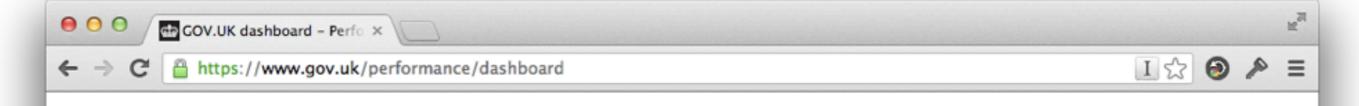
## Welcome to the Performance Platform

Government handles over one and a half billion transactions every year, allowing the exchange of information, money, permission, goods and services. We're using data to improve them.

## Performance data

The Inside Government dashboard measures usage of the Inside Government section of GOV.UK which helps users to find out how government works, what the government is doing, and how you can get involved.



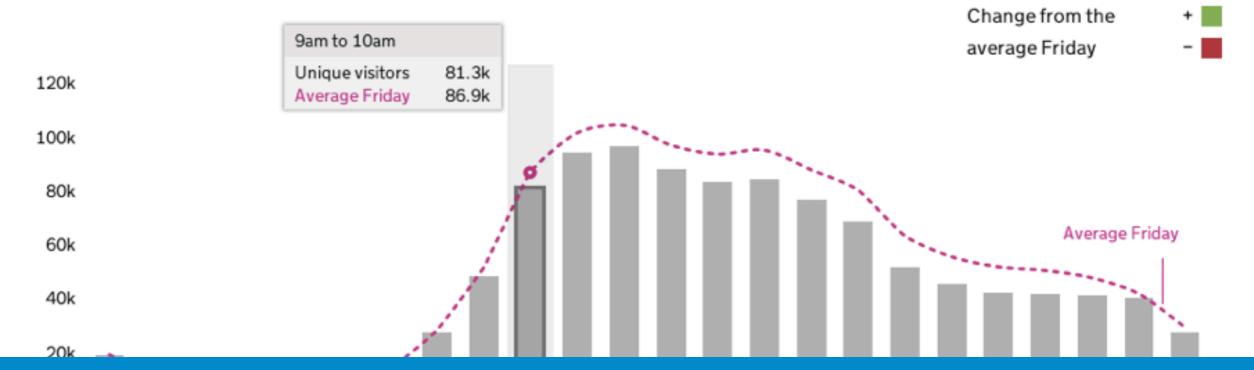


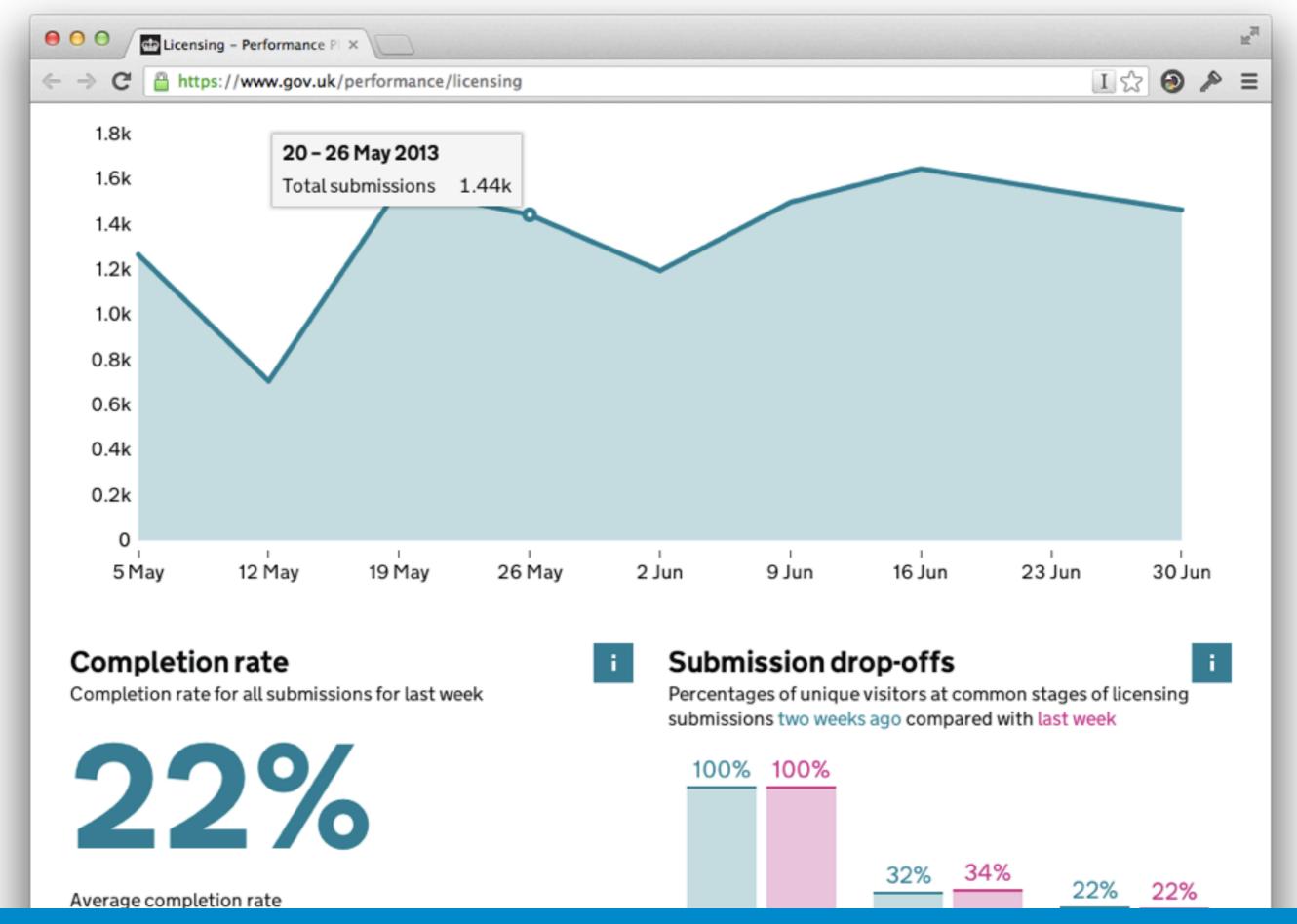
## GOV.UK had 6.34 million visitors last week, an increase of 4% from the week before

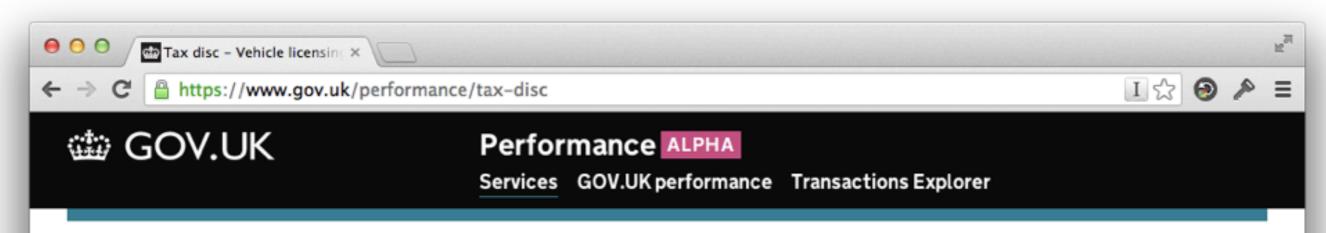
## Web traffic

## GOV.UK's traffic yesterday

Hourly unique visitors on Friday 5 July compared with the average of the last six Fridays







Vehicle licensing Tax disc SORN

## Service performance

## Tax disc

Service provided by the DVLA to relicense vehicles that are kept on public roads. This service does not include first vehicle registrations.

## Users on start page

Users currently on the GOV.UK Tax disc start page

**557** 

users online now

## Customer satisfaction (web)

Average satisfaction score last month

94.7% +1.06%

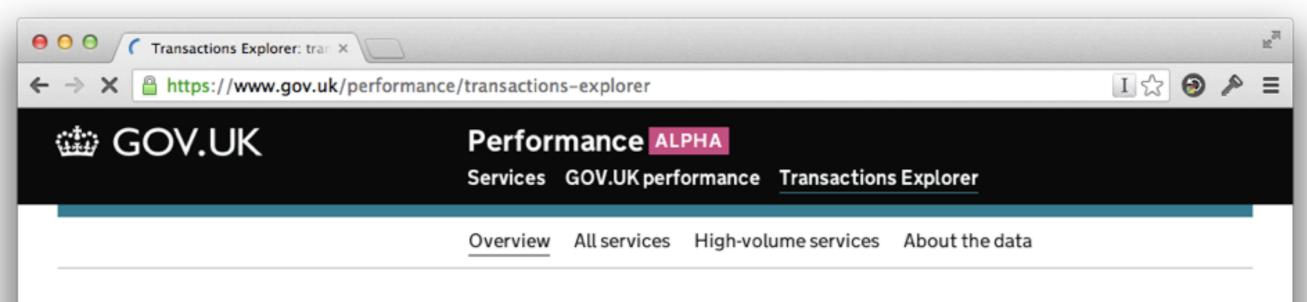
September 2013

August 2013

## Applications by channel

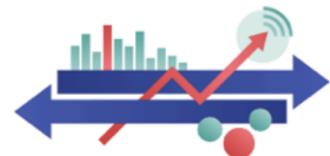
Tax disc applications per month broken down by channel

Last 12 months Total



## **Transactions Explorer**

Illustrating service performance across government



Find a department, agency or service:

e.g. driving licence

Find

**17** 

Departments

713

Services

1.41bn

Transactions per year

About the Transactions Explorer

This is an alpha release of data about the government's transactional services.

The data reveals the breadth of services that departments, agencies and other public bodies provide, and shows the

## Openness inside your organisation



## What did we get from being open?

## Good will

## Validation

## Contributions

## Hiring

## In Summary (Just remember this)

## Devops is about the organisation

The processes in an organisation are based on what is possible

## What is possible is changing all the time

## Find out more (Lots of reading for everyone)



From April 2014, digital services from the government must meet the new Digital by Default Service Standard. Read the standard »



## **Government Service Design Manual**

Build services so good that people prefer to use them

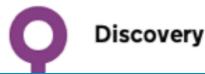
### Think differently about digital delivery

Discover what it means to be part of an agile, userfocused and multidisciplinary team, delivering digital services in government.

Start building digital by default services

### Making a service

Learn about the different phases of service design and get guidance for the phase you're in now.





## **Devops**

Bringing development and operations together

### Contents

Culture

Automation

Measurement

Sharing

Why we do this

Good habits

Warning signs

Many large organisate development, qualismany cases the ove incentives of the differentiation of intercounits may be geogratorganisations or und structures.

Devops is a cultura

Devops is a cultural

out of these frustrations. It is not a methodology or framework, rather some high minded principles and a willingness to break down

# Even contains a definition of devops

## Questions? (and thanks for listening)



# Gareth Rushgrove Technical Architect Government Digital Service @garethr