

Massively scaling Django for a global audience with playdoh

Fred Wenzel

fred@mozilla.com

<http://github.com/fwenzel>

mozilla

Hello
my name is

thread

how we use Django to reach a
massive global audience at Mozilla.

Photo credit: me

mozilla

a different kind of scale

standardization

what's playdoh?

playdoh and you

mozilla

a different kind of scale

standardization

what's playdoh?

playdoh and you

mozilla

mozilla is a
global non-profit
organization
dedicated to
making the Web better

mozilla

How?

mozilla

How?

We make a
web browser for
400+ million people.

mozilla

How?

We make a
web browser for
400+ million people.

it's called Firefox

mozilla

**But we also make
websites.**

mozilla

**But we also make
websites.**

a lot of them.

mozilla

[Register or Log in](#)[Other Applications](#)

ADD-ONS

2,513,897,754 add-ons downloaded

search for add-ons



Categories

- Alerts & Updates
- Appearance
- Bookmarks
- Download Management
- Feeds, News & Blogging
- Games & Entertainment
- Language Support
- Photos, Music & Videos
- Privacy & Security
- Shopping
- Social & Communication
- Tabs
- Web Development
- Other

- Collections
- Dictionaries & Language Packs
- Personas
- Plugins
- Search Tools
- Themes

Build a Firefox Add-on

Find all the tools and resources you need to

What are Add-ons?



Choose from 5000 free extras to make your browser look and function the way you want.



An add-on can be a new time-saving toolbar button, a shortcut to search, a themed look, and more. Add-ons make browsing easier.



Choose add-ons for the way you browse. Install in a few clicks and they stay up to date with easy reminders. Explore and add on now!

[Introduction](#)[Rock Your Firefox](#)[Privacy](#)[Web Development](#)[Travel](#)

Browse Add-ons

[Featured](#)[Popular](#)[Recently Added](#)[Recently Updated](#)

Search Tabs - get Facebook, Gmail™++ on Google

by WebMynd Team

[+ Add to Firefox](#)

Featured

Get search results from your Gmail™, Facebook, Dropbox, LinkedIn accounts and more, on the right-hand side of the Google™ search results page. Add Wikipedia, Twitter and many more to personalize your search as you like it.

83 reviews

55,418 users



Boo.ly Shopping - Best Prices, Coupons & Offers

[+ Add to Firefox](#)

Featured

Collections

Collections are groups of related add-ons that anyone can create and share.



Popular Collections



optimized firefox by Davy Jones

A collection of carefully chosen eclectic addons which extends the power and functionality of Firefox. Subscribe to my collection so as to keep abreast with the development of new and better addons.

[Firefox Help](#)[Want to contribute?
Sign In or Register](#)

Need Help With FIREFOX?

You've come to the right place! Start by searching our site below, or browse our list of popular support articles. If you can't find the answer you need, our community of volunteers are ready to help you find a solution.

 Search Firefox Help

New to Firefox?

[Getting started with Firefox](#)[How to set the home page](#)[Customizing Firefox with add-ons](#)[Pop-up blocker](#)[Updating Firefox](#)

Explore Help Topics

Troubleshooting

- Firefox crashes
- The Adobe Flash plugin has crashed
- Troubleshooting extensions and themes
- Troubleshooting plugins
- Error loading web sites

[Read Troubleshooting](#)

Privacy & Security

- How do I stop websites from tracking me?
- Private Browsing
- Clear Recent History
- How to clear the cache
- Enabling and disabling cookies

Be AWESOME

SUMO
open source support

Did you know that Firefox Help is powered by volunteer superheroes all around the world?

Grab your cape and join us »

**Check your
PLUGINS**

mozilla

Firefox Input Dashboard [Feedback](#) [Themes](#) [Sites](#)

PRODUCT
Firefox 5.0

WHEN
1d 7d 30d

LOCALE
 English (US)
 German



Welcome.
The Creative Collective is a community inspired by the Mozilla idea of participation.

[THE GALLERY](#) [DESIGN CHALLENGE](#) [ABOUT US](#) [THE TOOLKIT](#)

Jetpack
A project to build common browser extensions.

[Home](#) [FAQ](#) [Prototype](#) [Download](#) [Documentation](#)

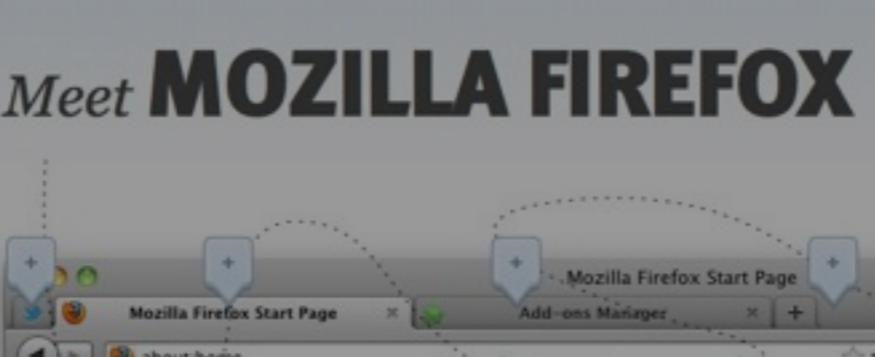
What is Jetpack?



mozilla Firefox

DESKTOP MOBILE ADD-ONS SUPPORT

Meet MOZILLA FIREFOX



Join the FIREFOX 4 TWITTER PARTY

Be part of Team Firefox! Tweet about Firefox 4 with the #fx4 or #fxmobile hashtags and your avatar will join thousands of others from around the world as part of our logo mosaic.

[Tweet](#) 139,223

Who's at the party?
Find a Twitter username



SWMazina wrote Jun 14 2011, 11:43 PM
Now grabbing #Chromerz to see if I can replace Firefox 4 with it. To me, Firefox is the (Win) Vista of Mozilla.

mozilla STUDENT REPS

Projects

Student Reps Guide

Your resource for spreading Firefox and Mozilla at school.



mozilla Drumbeat

Projects People Events

Connect. Share Projects. Hack everything.

Drumbeat is a global community of innovators like you, building a more awesome web and world. Connect with others. Find great projects. Or share your own.

mozilla

About Us Community Map Our Projects

We Believe in an Open Web

And we're dedicated to keeping it free, open and accessible.

Thunderbird

It's all yours! Your language, your add-ons, your inbox.

WEB O' WONDER

HTML5 DESIGN VIDEO WEBGL

MARVELS AWAITS

EXPLORE the AMAZING CREATIONS of the Web! WONDER at FANTASTIC DISCOVERIES from the creators of your browser!

SUBMIT A DEMO!

PROJECT FIREFOX 4 BETA

London Project

WATCH A VIDEO

THAT WAY THIS WAY

mozilla messaging

Thund...

MOZILLA DEVELOPER NETWORK

A comprehensive, usable, and accurate resource for everyone developing for the Open Web.



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mozilla Firefox [DESKTOP](#) [MOBILE](#) [ADD-ONS](#) [SUPPORT](#)

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mozillalicious

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mozilladevnet

mozillamessaging

mozillathunderbird

mozillajetpack

mozilladrumbeat

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mozilla [About Us](#) [Community Map](#) [Our Projects](#)

Every one of them supports a substantial part of our community.

A different kind of scale

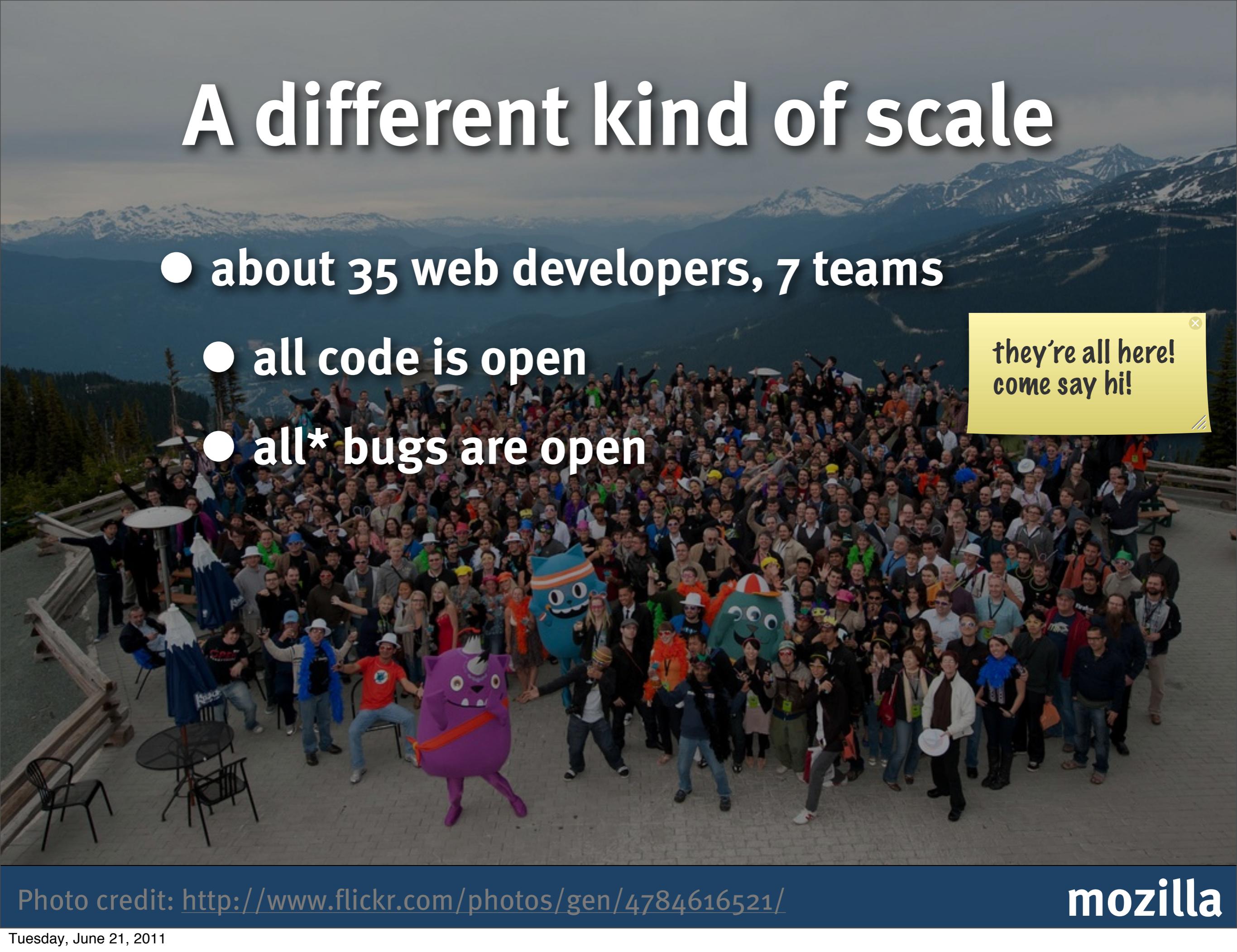


Photo credit: <http://www.flickr.com/photos/gen/4784616521/>

mozilla

A different kind of scale

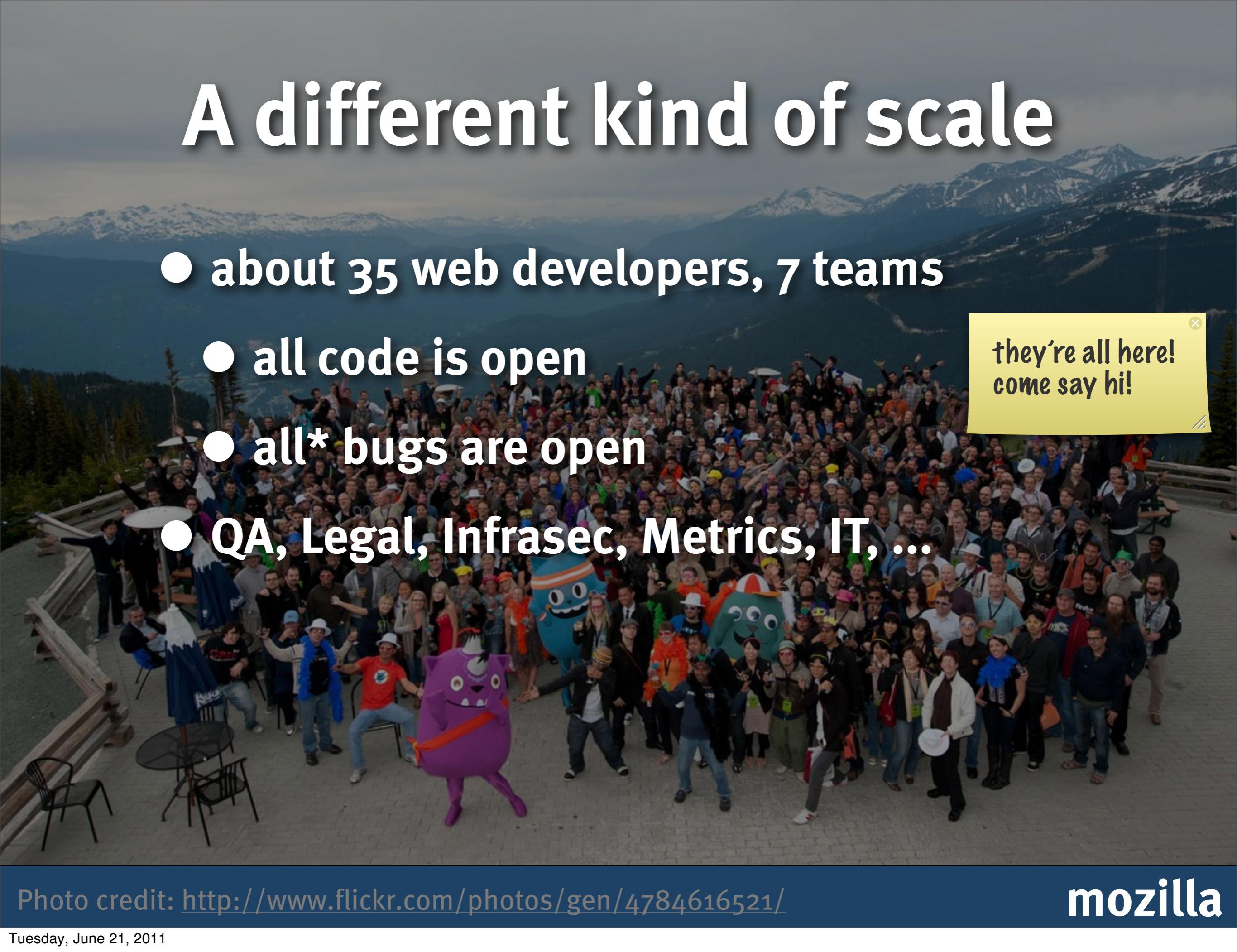
- about 35 web developers, 7 teams
 - all code is open
 - all* bugs are open



they're all here!
come say hi!

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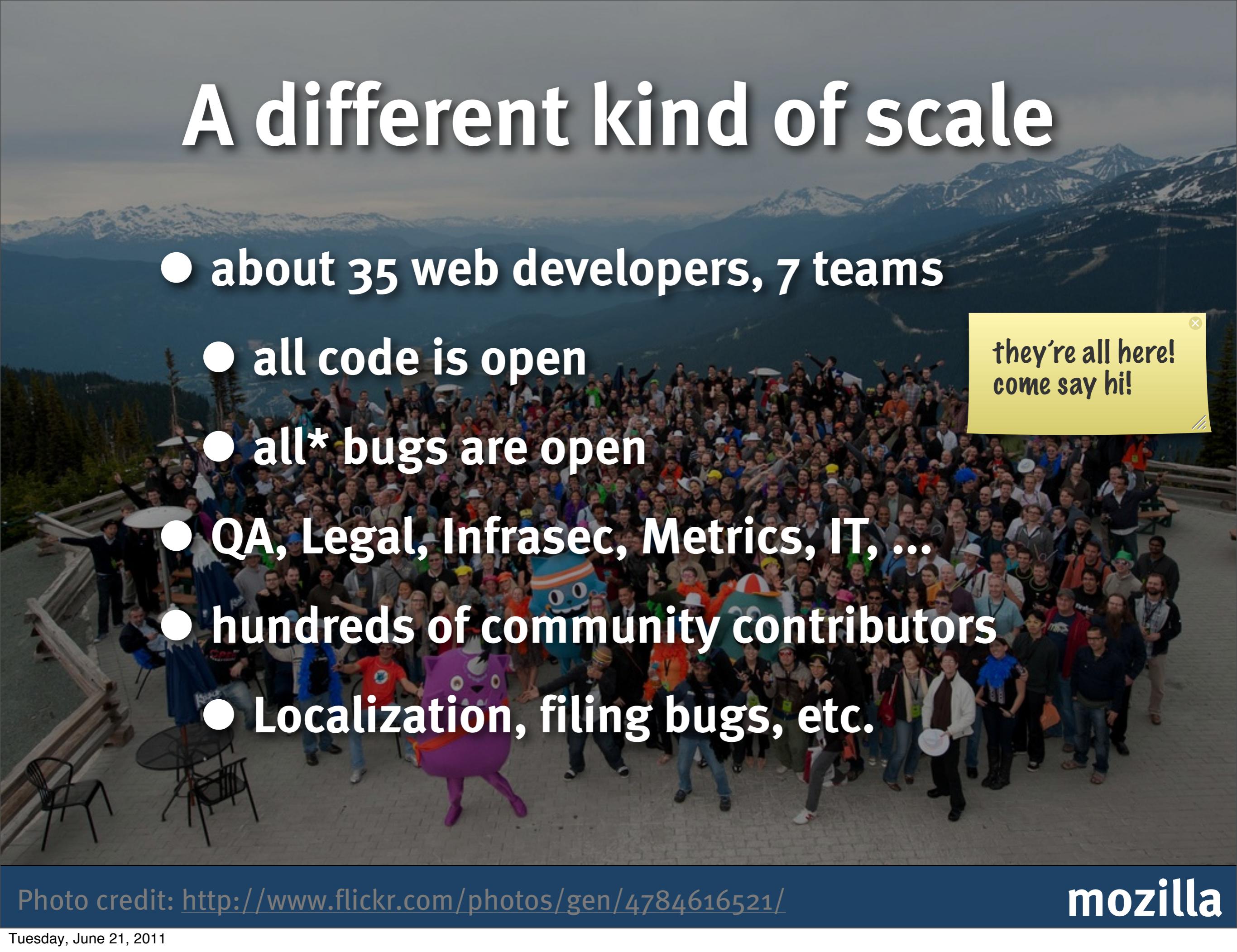
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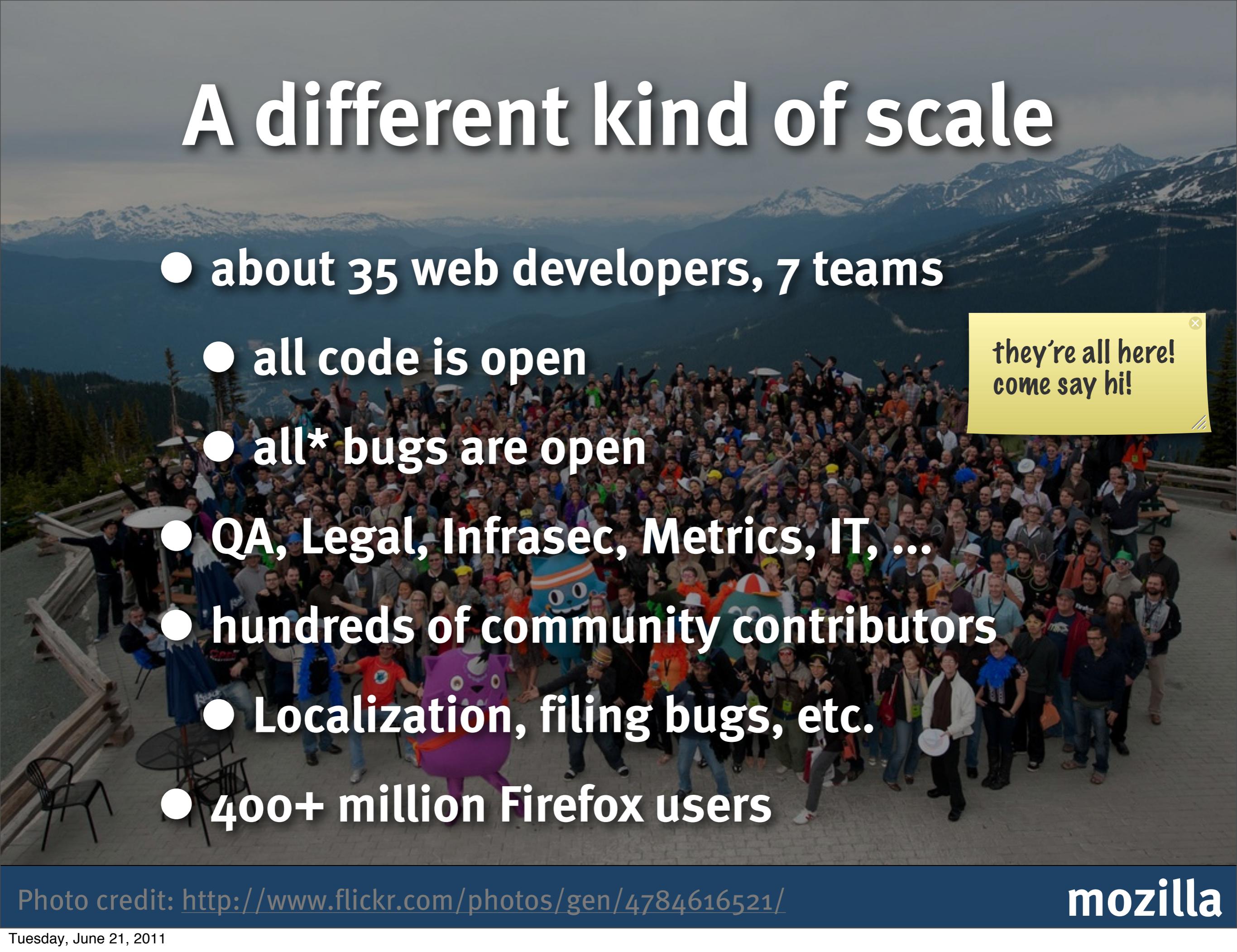
- about 35 web developers, 7 teams
 - all code is open
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- QA, Legal, Infrasec, Metrics, IT, ...
- hundreds of community contributors
 - Localization, filing bugs, etc.

A large crowd of people gathered outdoors, likely at a conference or event, with mountains in the background. A yellow callout bubble in the upper right corner contains the text "they're all here! come say hi!"

they're all here!
come say hi!

A different kind of scale

- about 35 web developers, 7 teams
 - all code is open
 - all* bugs are open
- QA, Legal, Infrasec, Metrics, IT, ...
- hundreds of community contributors
 - Localization, filing bugs, etc.
- 400+ million Firefox users



they're all here!
come say hi!

a different kind of scale

standardization

what's playdoh?

playdoh and you

mozilla

So what (was) the problem?

Variety is not always
the spice of life...

mozilla

So what (was) the problem?



Variety is not always
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So what (was) the problem?



Variety is not always
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mozilla



limited re-use due to
framework differences

source code open, but
people rarely dig up the
gems that are hidden in
there.

A large, weathered wooden wagon wheel with a metal rim and hubcap lies on a set of railroad tracks. The wheel has many spokes and is positioned diagonally across the frame. The background shows gravel and some greenery.

web apps have many things in common

limited re-use due to framework differences

source code open, but people rarely dig up the gems that are hidden in there.

A large, weathered wooden wagon wheel with a metal rim lies on a set of railroad tracks. The wheel has many spokes and a central hub. It is positioned diagonally across the frame, with the tracks running from the top left to the bottom right.

web apps have many things in common

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but it was hard to share

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web apps have many
things in common

limited re-use due to
framework differences

source code open, but
people rarely dig up the
gems that are hidden in
there.

but it was hard to share

so we kept reinventing
the wheel



Product Code:
DL1/3N

Brand: Duracell

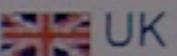
Voltage: 3 v

Dimensions: x
10.8mm
11.6mm

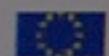
Price: £2.99 (inc. VAT)

Delivery : £1.49 [First
Class Post]
 IN STOCK

We can deliver this
product to:



UK



EU

Rest Of

inch/mm



Standardization Time!

sometime in 2009

AMO outgrew its CakePHP
codebase

time to standardize!

looked at different options,
one came out on top

Photo credit: <http://www.flickr.com/photos/selkovjr/3937003438/>

mozilla

Mozilla <3 Django

- a Python-based **web application framework**
- supports a lot that we need out of the box:
- divides **data/logic/presentation (MVC)**
- **test framework built-in**
- **great docs, active community**
- **Cute mascot!**

keep that <3 in mind
when listening to me
complain about Django

pure Python

doesn't get in your way
(more about that later)

django

Done!

mozilla

Done!

just kidding.

mozilla

a different kind of scale

standardization

what's playdoh?

playdoh and you

mozilla

- We used **Django** as a **standard platform** for
 - › 12 new (and old) projects:

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- We used **Django** as a **standard platform** for
 - › 12 new (and old) projects:
- we wrote some **libraries**
- and **monkey-patched** a little
- and **backported** stuff to existing projects
- and spent too much time doing **routine** stuff
- and not enough on the **actual projects**

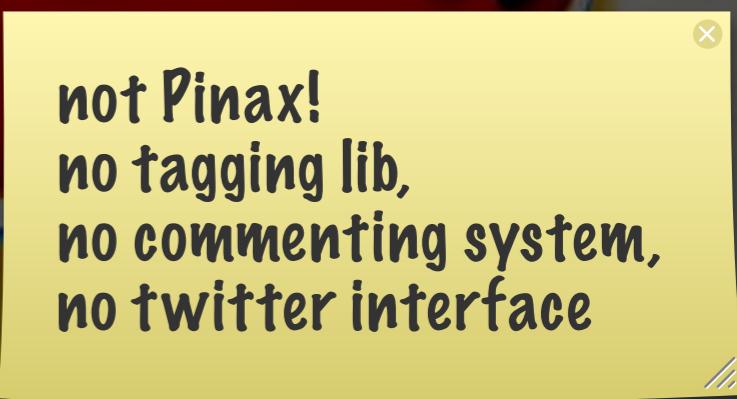
So we built playdoh



not Pinax!
no tagging lib,
no commenting system,
no twitter interface

So we built playdoh

- a web application template:
- Django, plus libraries, plus docs



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So we built playdoh

- a web application template:
 - Django, plus libraries, plus docs
 - grab-bag of low-level libraries

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So we built playdoh

- a web application template:
 - Django, plus libraries, plus docs
 - grab-bag of low-level libraries
 - not a collection of high-level apps

not Pinax!
no tagging lib,
no commenting system,
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Playdoh's focus

- Performance / Scalability
- Localization
- Security
- Development and Deployment Tools

1 goal: setting up a performant, localizable, secure and easily deployable application faster

Photo credit: <http://www.flickr.com/photos/serdal/2530813524/>

mozilla

Scale, scale, scale!

mozilla

Scale, scale, scale!

- Mozilla Add-ons:
- **5 mn** page views / day

mozilla

Scale, scale, scale!

- Mozilla Add-ons:
 - **5 mn** page views / day
- Firefox Input:
 - **30 k** page views / day

mozilla

Scale, scale, scale!

- Mozilla Add-ons:
 - **5 mn** page views / day
- Firefox Input:
 - **30 k** page views / day
- Smallest campaigns:
 - **5 to 10k** page views / day

Minimum server setup

Load Balancer (1+)

Web Servers (2+)

memcached (2)

MySQL (1 + 1)

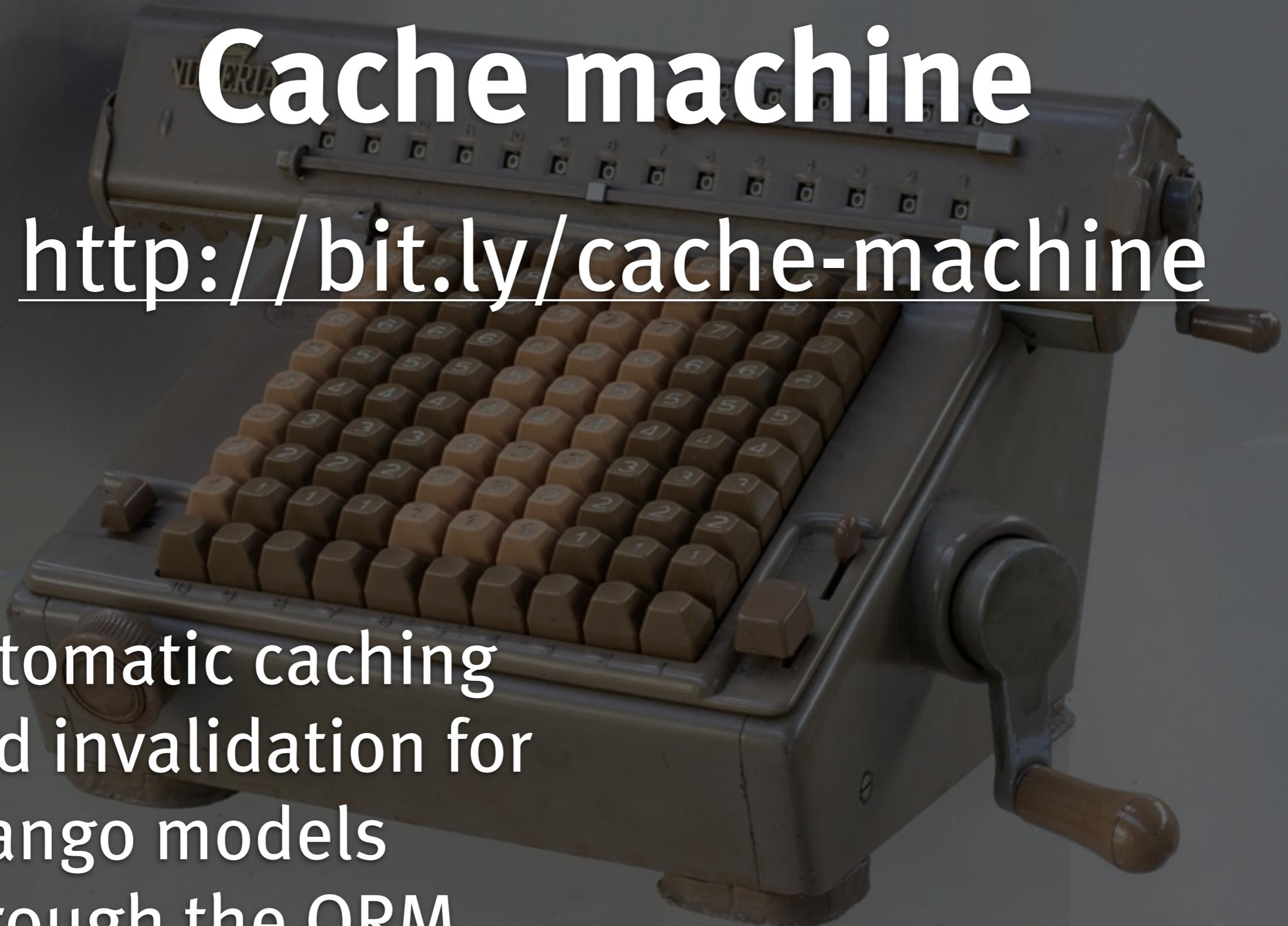
Recently up to
40 servers

on a shared
cluster more
than that

Cache machine

<http://bit.ly/cache-machine>

Automatic caching
and invalidation for
Django models
through the ORM.



```
from django.db import models
import caching.base

class Addon(caching.base.CachingMixin,
            models.Model):
    ...
    status = models.IntegerField()
    objects = caching.base.CachingManager()
```

stores queried objects in memcache.

automatically invalidates cache on
write

A photograph of two light grey t-shirts laid flat on a dark brown wooden surface. The shirts are positioned side-by-side, slightly overlapping. The shirt on the left has its sleeves spread out, while the shirt on the right has its sleeves tucked in. The lighting creates soft shadows and highlights on the fabric.

jingo-minify

<http://bit.ly/jingo-minify>

Concatenates and
minifies JS and CSS
assets

Photo credit: <http://www.flickr.com/photos/sporkist/285802454/>

mozilla

minification and far-future expires

`css-min.css?build=aae2e66`

minified bundle

revision

mozilla

django-multidb-router

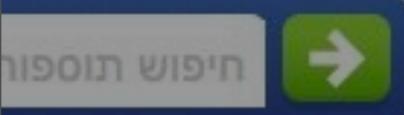
<http://bit.ly/django-multidb-router>

Round-robin master/
slave DB router

Also supports
“pinning”.

Photo credit: <http://www.flickr.com/photos/morgamic/5814317346/>

mozilla



Localization

ADD-ONS



Categories

Games & Entertainment

Shopping

הורדות וניהול קבצים

התאמנה אישית של הממשק

התראות ועדכונים

חברתי ותקשורת

חדשנות, בלוגים ו-RSS

כלי רשות ומפתחים

לשוניות

סימניות

פרטיות ובטחתה

תמונאות

תמייה

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Plugins

מהן תוספות?



סדרלי כלים, ערכות נושא ווסף חיפוש שעודרים
לך לבצע משימות שוטפות.



מעל 5000 תוספות בחינם המאפשרות לך לבצע
התאמנה אישית ולהרחיב את Firefox כך שתאים
לצריך.

הקדמה

עיין בתוספות

Recently Updated

התוסף האחרון

Popular

Featured

Add to Firefox
+
Featured

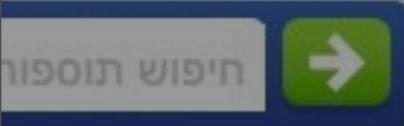
RSS Ticker
by cfinke

RSS Ticker loads your Live Bookmarks and scrolls their entries across your

everything localizable
by default

smooth and unobtrusive

mozilla



Localization

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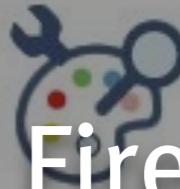
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Firefox 4: 86 languages



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Web Development

Privacy

Rock Your Firefox

הקדמה

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Recently Updated

התוסף האחרון

Popular

Featured

Add to Firefox
Featured

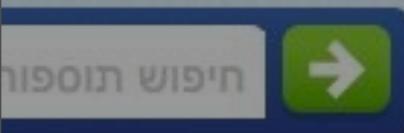
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מבחן תוספות?

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יעין בתוספות

Recently Updated התוסף האחרון Popular **Featured**

Add to Firefox + Featured

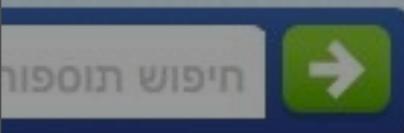
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- LTR and RTL

מhn תוסף?

Firefox 4: **86 languages**

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Add to Firefox +

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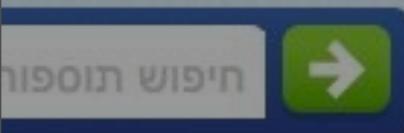
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סימניות

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תמונה

תמייה

שונו

אונס

אקס

אס

Plugins

- Firefox 4: **86 languages**
- Average Mozilla website: **10 - 40 langs**
- LTR and RTL
- all **volunteer-driven**

מבחן תוספות?

היפוך כלים, ערכות נושא ווסף חיפוש שעודרים
לראבלאטן משימות שוטטות.

מעל 5000 תוספות בחינם המאפשרות לך לבצע
התאמת אישית ולהרחב את Firefox כשייאפשר

Web Development Privacy Rock Your Firefox הקדמה

Recently Updated התוסף האחרוןPopular Featured

Add to Firefox +
Featured

RSS Ticker by cfinke

RSS Ticker loads your Live Bookmarks and scrolls their entries across your

עין בתוספות

everything localizable by default

smooth and unobtrusive

mozilla

Django templates

```
{% blocktrans with app=request.APP %}  
Add-ons for {{ app }}  
{% endblocktrans %}
```



Jinja2

<http://jinja.pocoo.org>

```
{{ _('Add-ons for {0}')|f(request.APP) }}
```

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LocaleURLMiddleware

<http://bit.ly/commonware>

<https://addons.mozilla.org/en-US/firefox/>

According to accept-languages header.

- 1) explicit is easier to cache
- 2) explicit is better to link to

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Security

Most valuable asset.
Endangering user data
absolutely unacceptable

all source open
all* bugs open
security by obscurity
won't work

put money where mouth is
AMO, mozilla.org, etc.

Security

● User data and trust

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Security

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- Open Source
- Bug Bounty

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Log In

django-sha2

Email address

<http://bit.ly/django-sha2>

Password

.....

SHA-1 too easily
brute-forceable

Replaces SHA-1
password hashing algo
with **bcrypt/HMAC**.

Log in

→ slows down attacks

→ adds system-local secret

slow offline
dictionary attacks

just stealing DB not enough,
must gain file system access too

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bleach

<http://bit.ly/django-bleach>

An easy, HTML5,
whitelisting HTML
sanitizer.

CAUTION
CLEANING
IN PROGRESS



Photo credit: <http://www.flickr.com/photos/lwr/4674849226/>

mozilla

```
>>> bleach.clean('an <script>evil()</script> example')  
'an &lt;script&ampgtevil()&lt;/script&ampgt example'
```

```
>>> bleach.clean('an <script>evil()</script> example')
```

```
'an &lt;script&gt;evil()&lt;/script&gt; example'
```

```
>>> bleach.linkify('an http://ex.com url')
```

```
'an <a href="http://ex.com" rel="nofollow">http://ex.com</a> url'
```

De{velop,ploy}ment Tools

mozilla

De{velop,ploy}ment Tools

- Testing

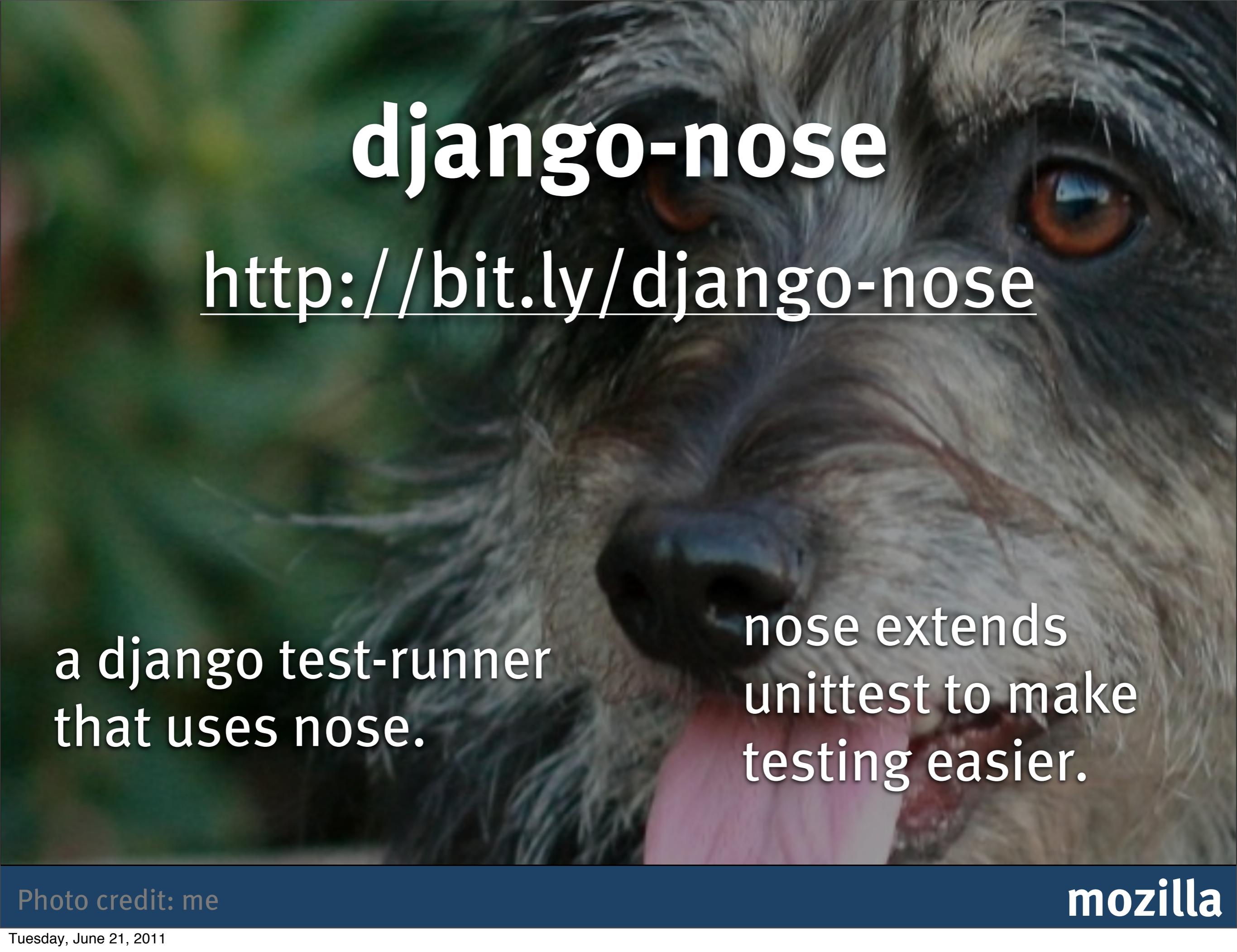
De{velop,ploy}ment Tools

- Testing
- Deployment scripts

De{velop,ploy}ment Tools

- Testing
- Deployment scripts
- Cron jobs, WSGI endpoint, etc.

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A close-up photograph of a dog's face, focusing on its eye and nose. The dog has dark fur and is looking directly at the camera.

django-nose

<http://bit.ly/django-nose>

a django test-runner
that uses nose.

nose extends
unittest to make
testing easier.

django-cronjobs

<http://bit.ly/django-cronjobs>

A simple cron-running
management command

Django management
commands powerful but
a royal pain to write

```
# myapp/cron.py
import cronjobs

@cronjobs.register
def periodic_task():
    pass

# command line:
$ ./manage.py cron periodic_task
...
```

“vendor library”

- pip + virtualenv hard on dozens of servers
- instead, “install” libraries into subdirectory **vendor/**

Photo credit: <http://www.flickr.com/photos/wonderfullycomplex/4271914513/>

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```
# Directories:  
my_project/  
    apps/  
    manage.py  
    ...  
    vendor/  
        lib/python/site-packages/...  
    src/  
        django-sha2/  
        jingo/  
        jingo-minify/  
        ...  
    vendor.pth
```

```
# manage.py  
import site  
  
site.addsitedir('vendor')  
site.addsitedir('vendor/lib/python')
```

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a different kind of scale

standardization

what's playdoh?

playdoh and you

mozilla

Is playdoh for you?

- Yes, if you'd like to make:
 - scalable
 - localizable
 - secure
 - more easily deployable
 - web applications **faster!**

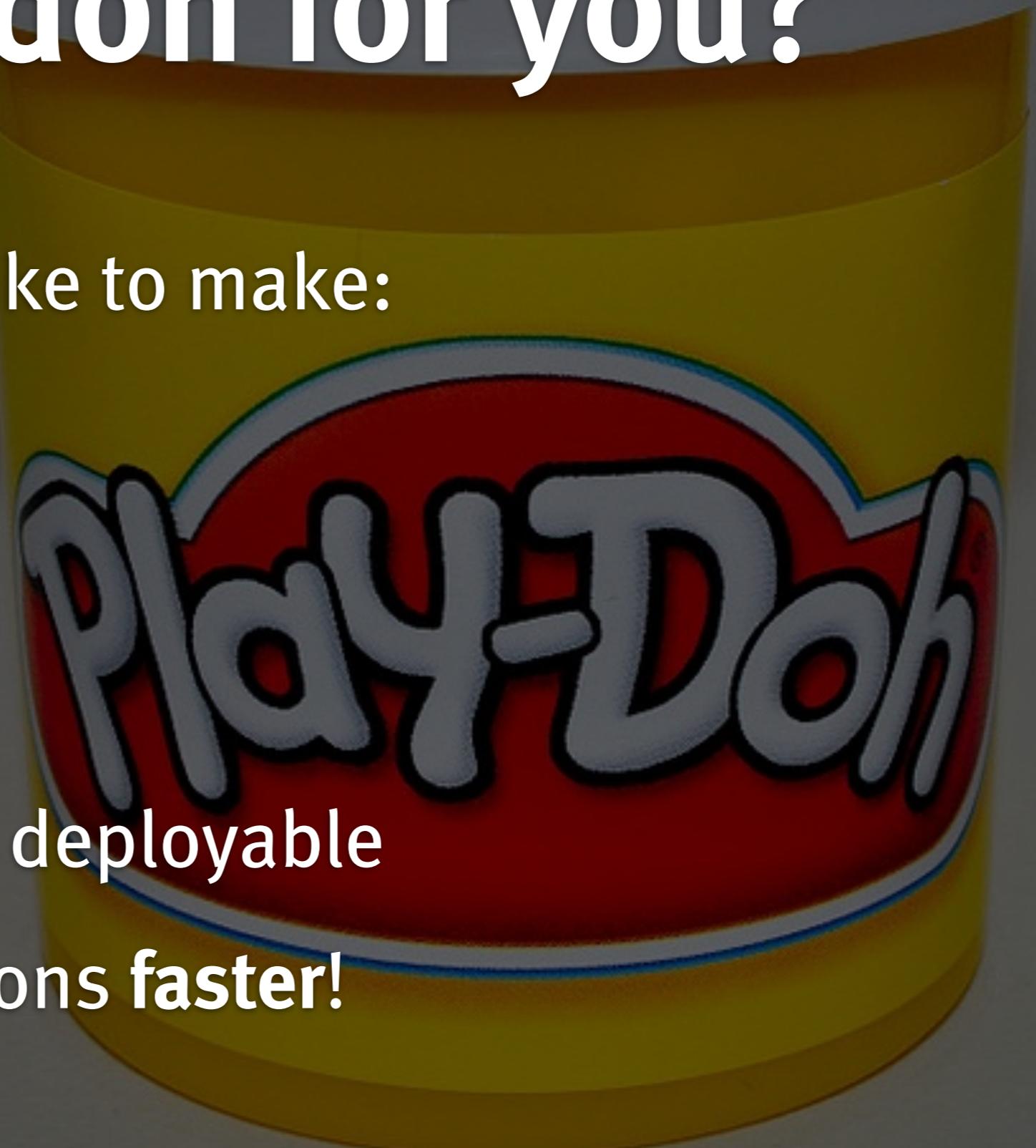


Photo credit: <http://www.flickr.com/photos/giantsqurl/5212700248/>

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or just as inspiration

reusable
components



not all may
suit your
needs

e.g., some components
rely on jinja2 vs. django
templates. Makes
integration harder.

Ready, set, go!

Fork playdoh on github:

<https://github.com/mozilla/playdoh>

Read the docs

<http://playdoh.readthedocs.org>

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Thanks!

The Mozilla Firefox logo is a stylized globe with swirling orange, yellow, and red patterns. It features a blue landmass on the left side.

irc.mozilla.org #webdev

github.com/mozilla/playdoh

pssst: Mozilla is hiring! mozilla.com/careers

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