

Large Django sites at Mozilla

Andy McKay **Mozilla**

A scenic sunset over a snowy mountain landscape. In the foreground, a person in a plaid jacket stands on the right, and another person in a purple jacket stands further down the slope. The sky is filled with warm orange and yellow hues, transitioning into a darker blue at the top. Silhouettes of evergreen trees are scattered throughout the scene.

Vancouver
<http://github.com/andymckay/presentations>

mozilla







Game 3, tonight 2.22am

@andymckay



mozilla

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- About
- Performance

- About
- Performance
- Misc

- About
- Performance
- Misc
- Reuse

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Common Questions

Explore Help Topics

Troubleshooting

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

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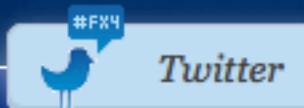
**Check your
PLUGINS**

mozilla

FIREFOX 4 DOWNLOAD STATS[?]



197,165,401



Twitter



Android



Firefox 4 ↓



POWERED BY
 SQLstream

3:10

3:20



mozilla

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ADD-ONS

2,501,592,366 add-ons downloaded

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](#)

Browse under the radar with privacy-protecting add-ons



NoScript

The best security you can get in a web browser! Allow active content to run ...

[+ Add to Firefox](#)

Adblock Plus

Annoyed by adverts?
Troubled by tracking?
Bothered by banners?
Install Adblock ...

[+ Add to Firefox](#)

BetterPrivacy

Ever wondered why you are still tracked though you tried everything to prevent ...

[+ Add to Firefox](#)

Like these? Find more add-ons in the [The Paranoid Kit](#) collection.

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Browse Add-ons

Featured

Popular

Recently Added

Recently Updated



TinEye Reverse Image Search

by TinEye

[Continue to Download →](#)[Featured](#)

Not available for Firefox 6.0a2

TinEye is a reverse image search engine. The plugin adds a right-click menu item that allows you to search for an image to find where it has been published before.

Collections

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



Popular Collections

All code is open:
<https://github.com/jbalogh/zamboni>

All* bugs are open:
<https://bugzilla.mozilla.org>

Convert from
CakePHP (remora)
to Django (zamboni)



Changing one URL at a time from CakePHP to Django

General trend to move
away from PHP and do
more Python and Django

How large?

250k+ add-ons

150 mn views month

500* mn API hits day

* more than that

Lines of code

PHP 40k

Python 18k

Lines of code

PHP 40k

Python 18k

Unit tests 15k

Zeus (3)

CDN

Django, PHP (24)

MySQL (1 +3)

Memcached (3)

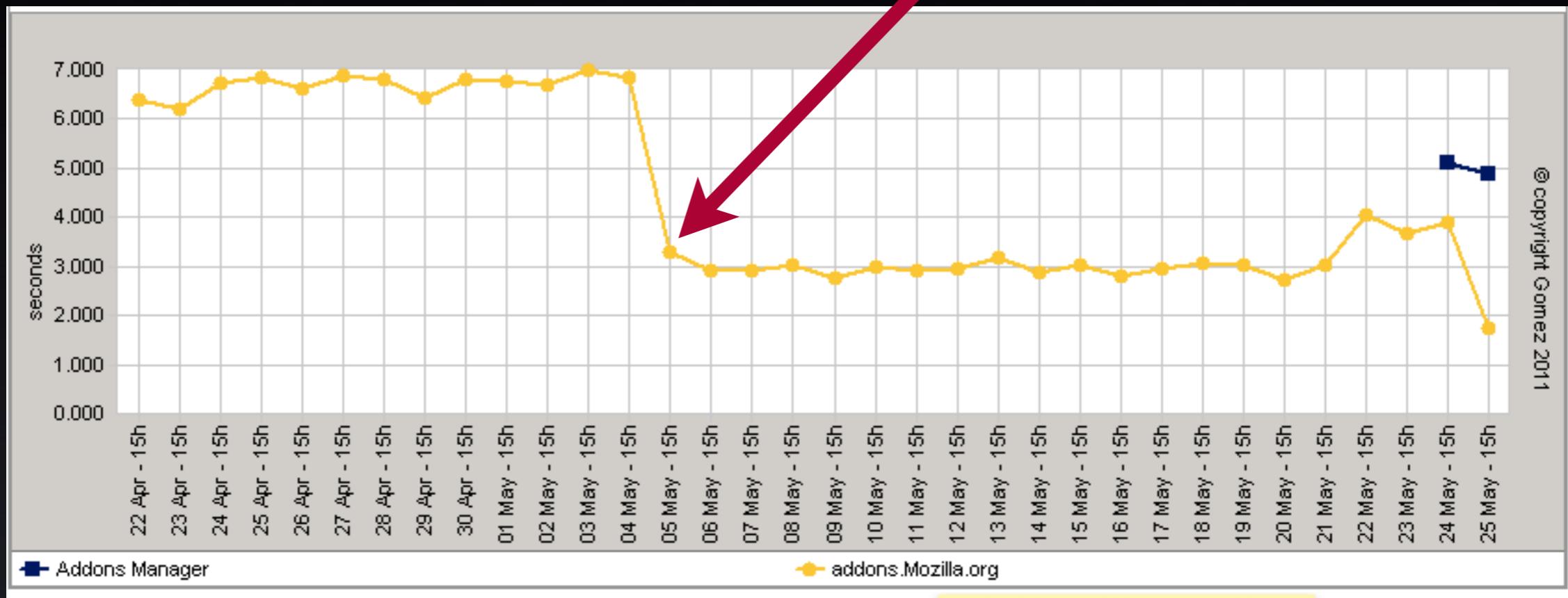
Rabbit MQ (1)

Celeryd (2+)

Redis (1 +1)

Sphinx (3+)

CDN goes live



Transition to:
site-performance

Cache machine

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



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

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



```
>>> Addon.objects.filter(status=public)
>>> len(connection.queries)
13
```

```
>>> Addon.objects.filter(status=public)
>>> len(connection.queries)
13
```

```
>>> Addon.objects.filter(status=public)
>>> len(connection.queries)
13
```

Invalidation

md5('select... a')

[obj 3615]

`md5('select... a')`

`[obj 3615]`

`obj 3615`

`md5('select... a')`

`md5('select... a')`

[obj 3615]

`md5('select... b')`

[obj 3615, obj 1685]

obj 3615

`md5('select... a')`
`md5('select... b')`

Memcached

```
rules = cache.get(3615)
rules.add('select... ')
cache.set(3615, rules)
```

Redis

redis.SADD(3615, ‘select...’)

Home page
20+ addons
400+ sql queries

Add-on

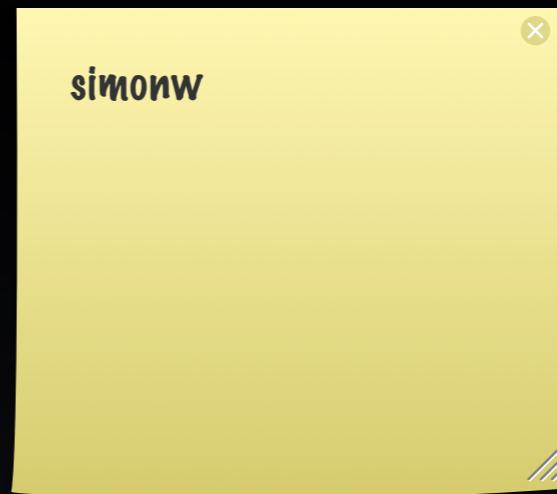
Version

standard answer in
django is select-related

File

django: select_related

<http://bit.ly/select-related>



Transformer

<http://bit.ly/queryset-transform>

```
@staticmethod
def transformer(addons):
    addon_dict = dict((a.id, a) for a in addons)
    vs = filter(None, (a.current_version_id for a in addons))
    versions = list(Version.objects.filter(id__in=vs))
    for version in versions:
        addon_dict[version.addon_id].current_version = version
```

slightly outdated
example

big SQL statements... :(

14313 character

Home page
20+ addons
~14 sql queries

Add-on Version Check

`about:config`  `extensions.update.url`

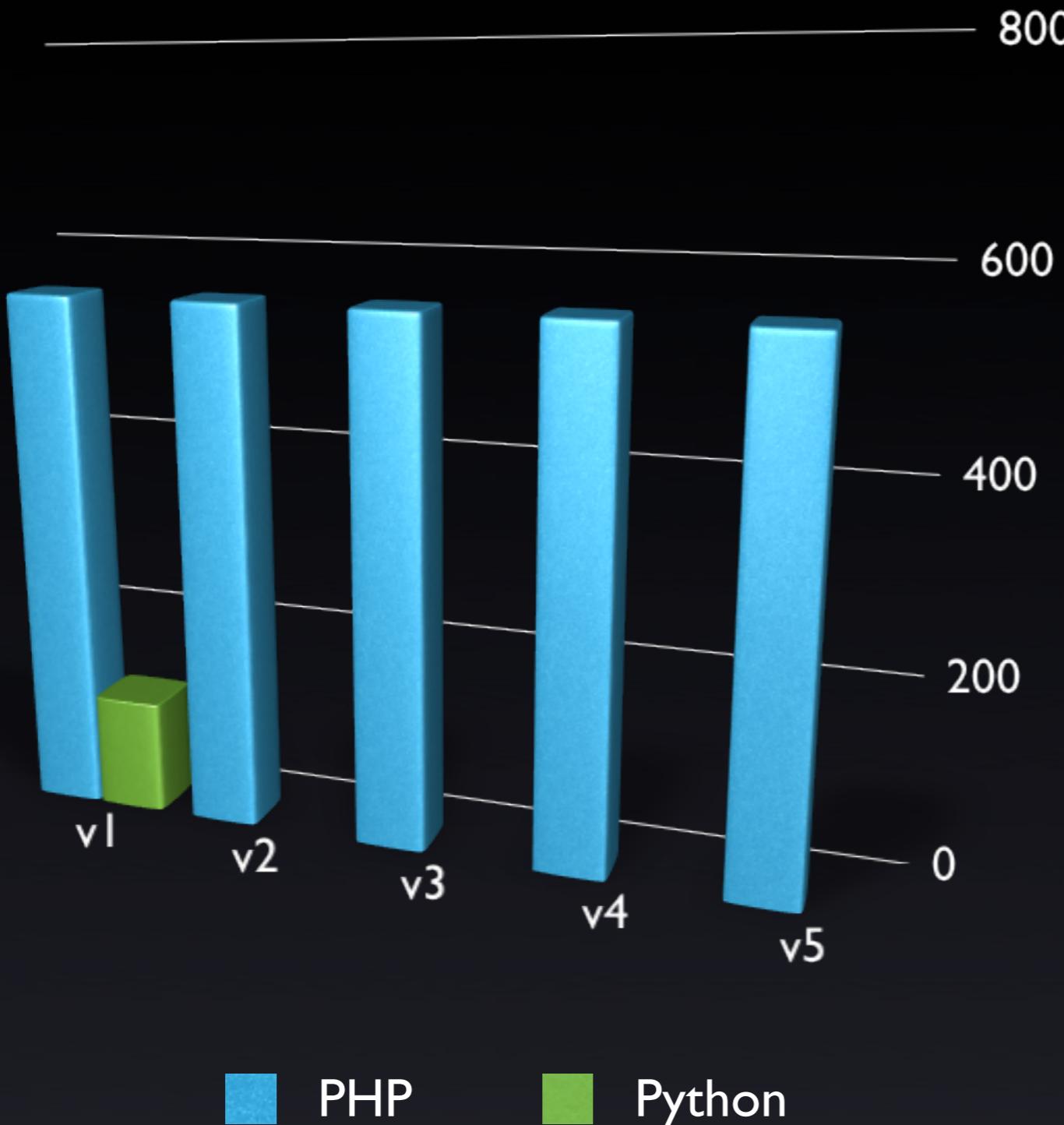
Incoming 8,000 req/sec
Uncached 1,600 req/sec



Incoming 8,000 req/sec
Uncached 1,600 req/sec
PHP 550 req/sec

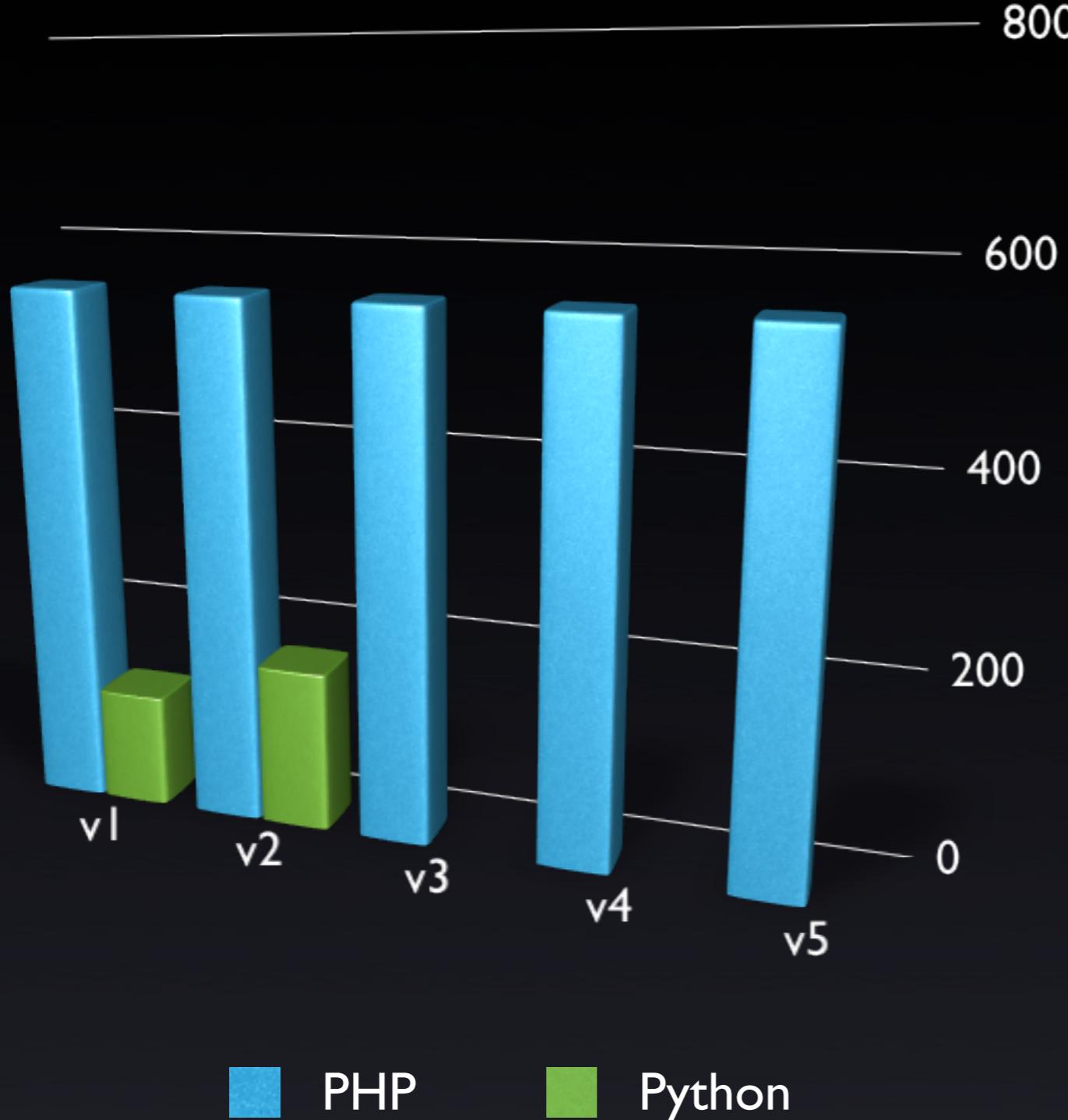


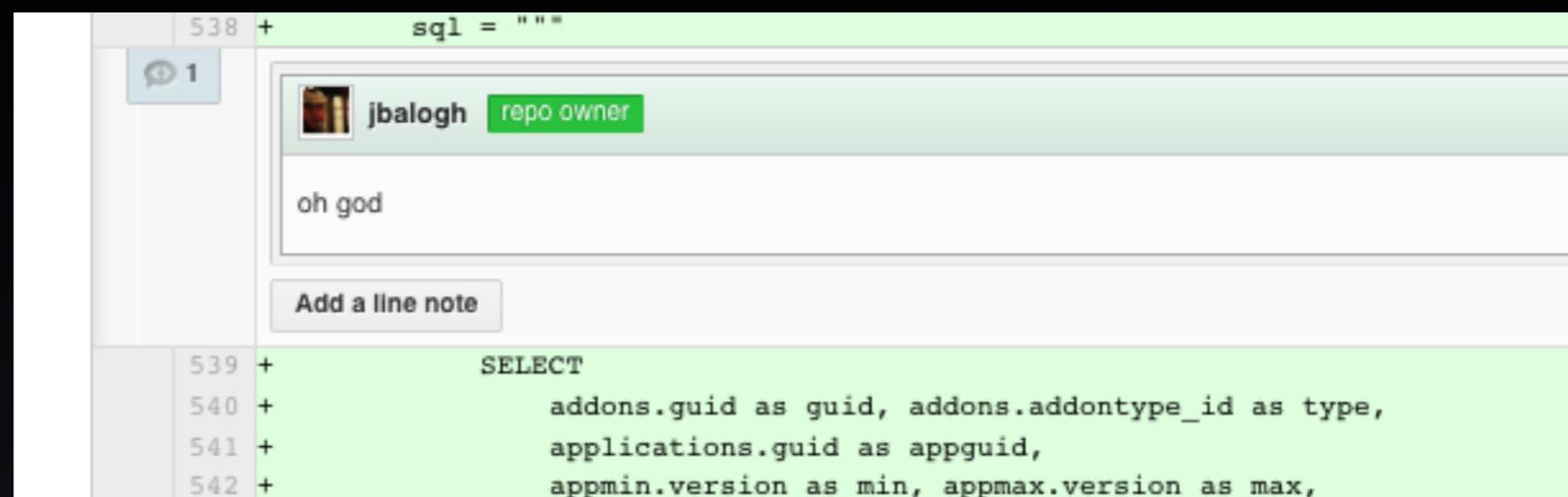
No pages go out until
they are faster



v1
Plain
Django

v2 Min. SQL queries

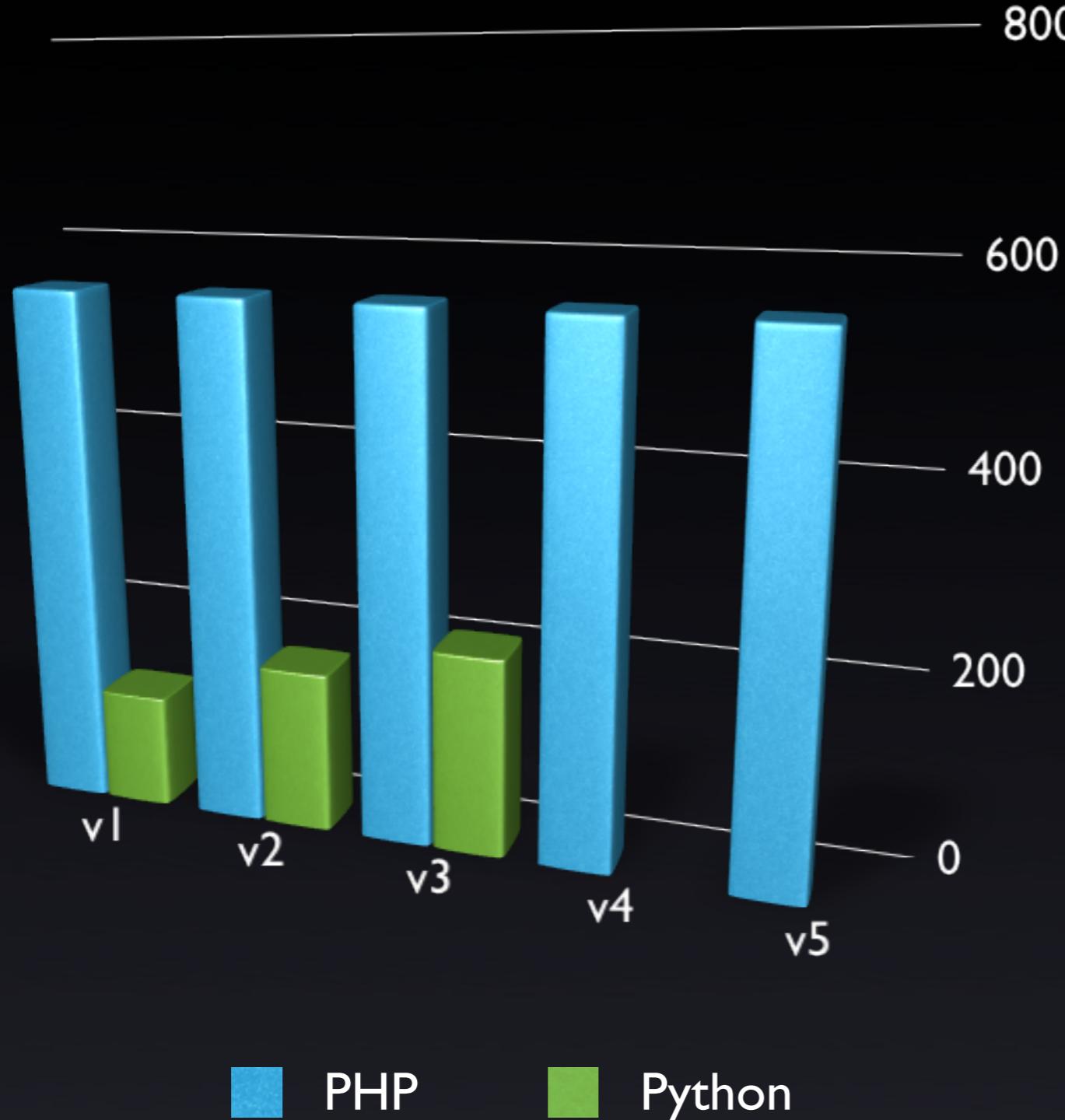




A screenshot of a GitHub pull request interface. At the top, line 538 shows the assignment of a variable `sql` to an empty string. Below this, a note from a user named `jbalogh` (repo owner) is displayed, containing the text "oh god". A button labeled "Add a line note" is visible. The bottom part of the screenshot shows code starting at line 539, which includes a `SELECT` statement with several columns from tables like `addons`, `applications`, and `appmin`.

```
538 +     sql = ""  
1  
jbalogh repo owner  
oh god  
Add a line note  
539 +     SELECT  
540 +         addons.guid as guid, addons.addontype_id as type,  
541 +         applications.guid as appguid,  
542 +         appmin.version as min, appmax.version as max,
```

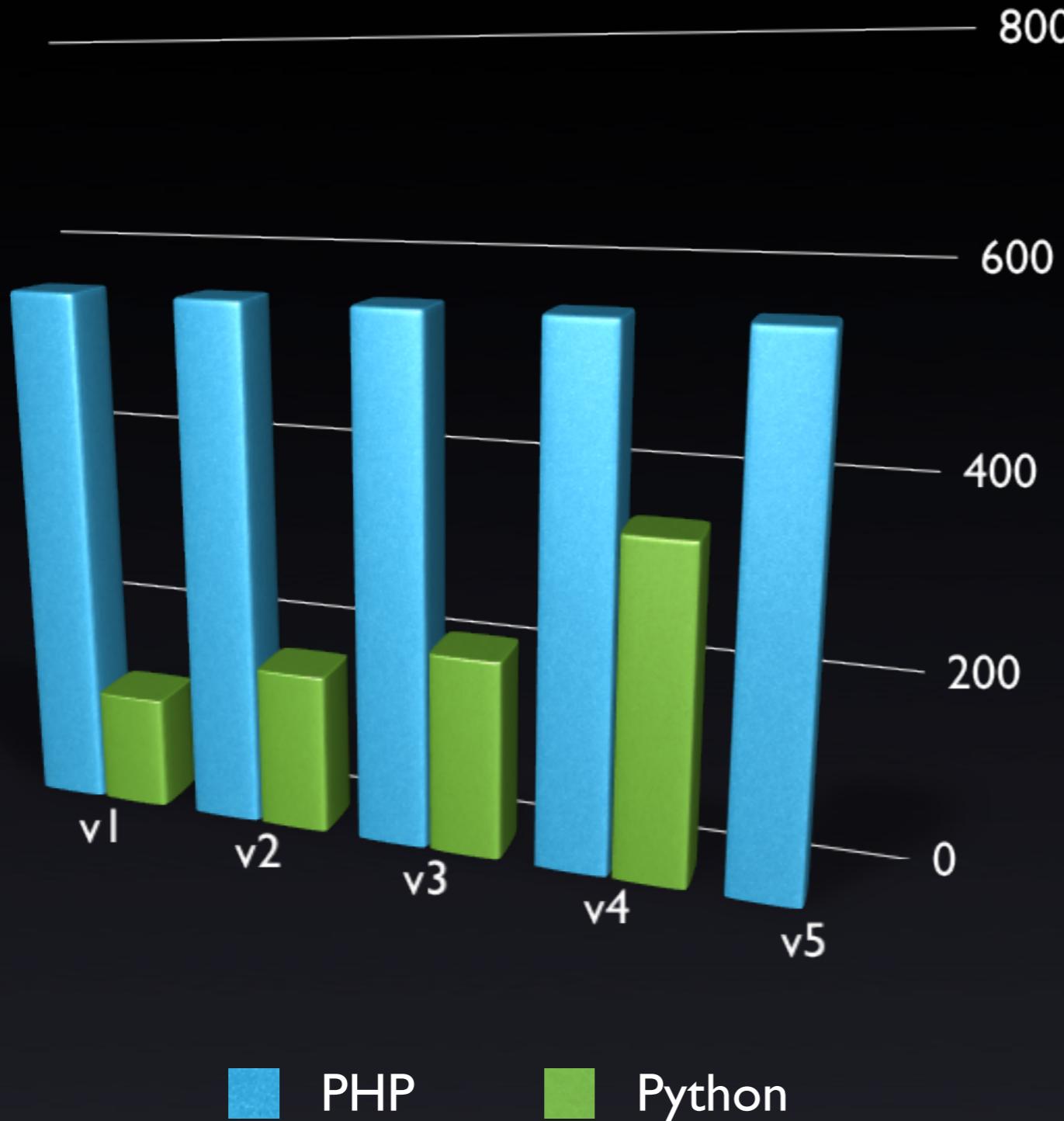
oh god



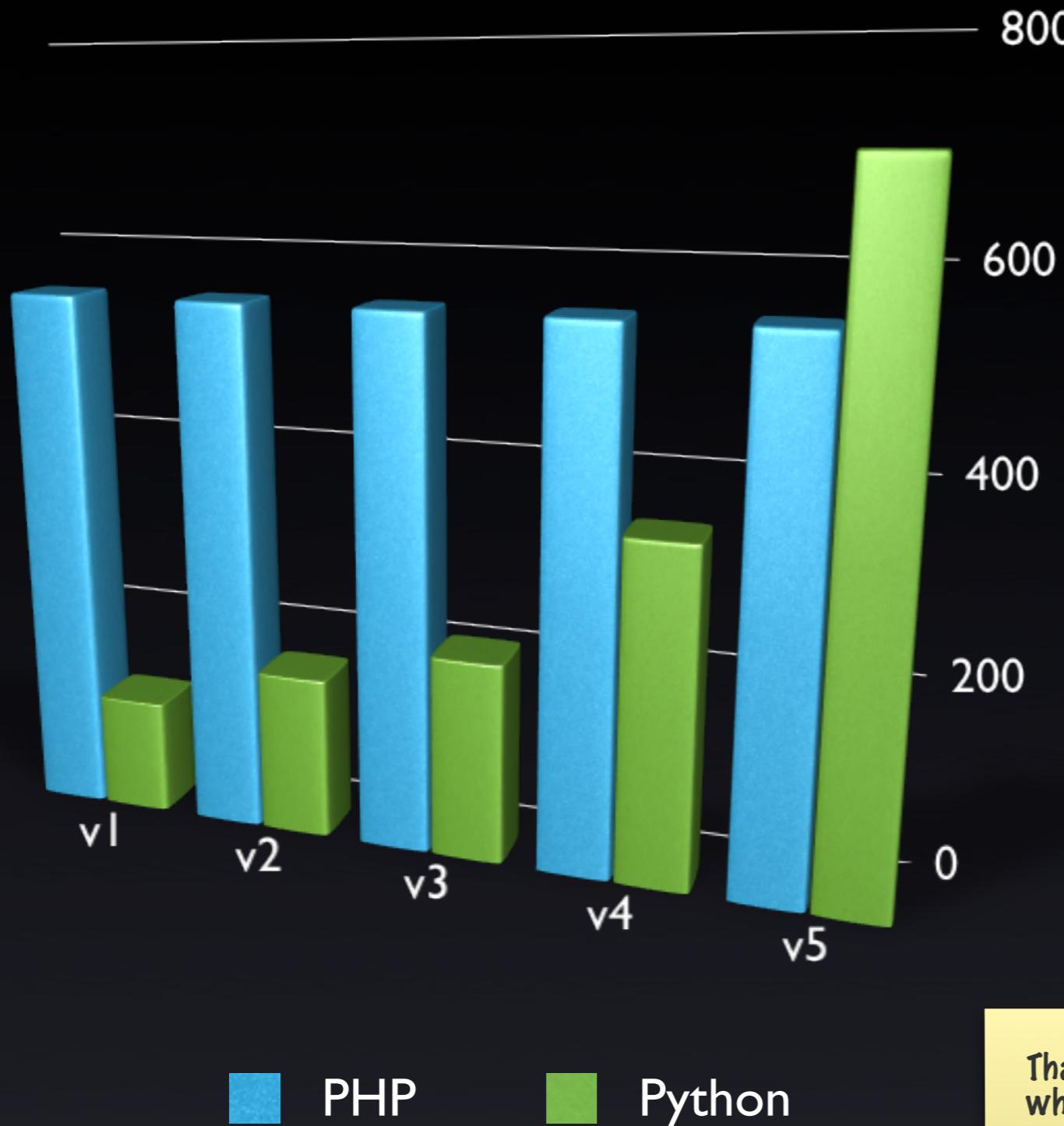
v3 Django and raw SQL

max-requests 200,
actually we hit 210

v4
WSGI
no Django



v5 Pooling, optimised queries



That's 700 req/sec
which translates into

Reducing the SQL queries...
doesn't always help

A close-up photograph of fresh green celery stalks and leaves. The stalks are long, thin, and ribbed, with bright green leaves at the top. The background is dark and out of focus.

Celery

<http://celeryproject.org>

Push things async
email
image processing
add-on validation

specifically fixing data
changes between php
and python

```
from celeryutils import task

@task
def update_tag(tag, **kw):
    tag.update_stat()
```

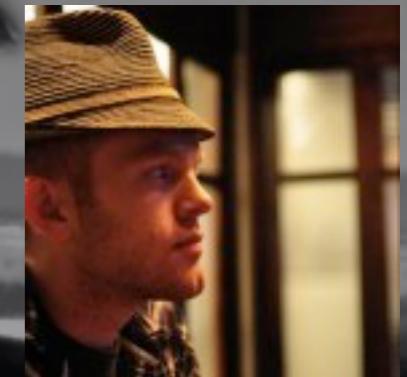
```
from celeryutils import task

@task(rate_limit='60/h')
def update_tag(tag, **kw):
    tag.update_stat()
```

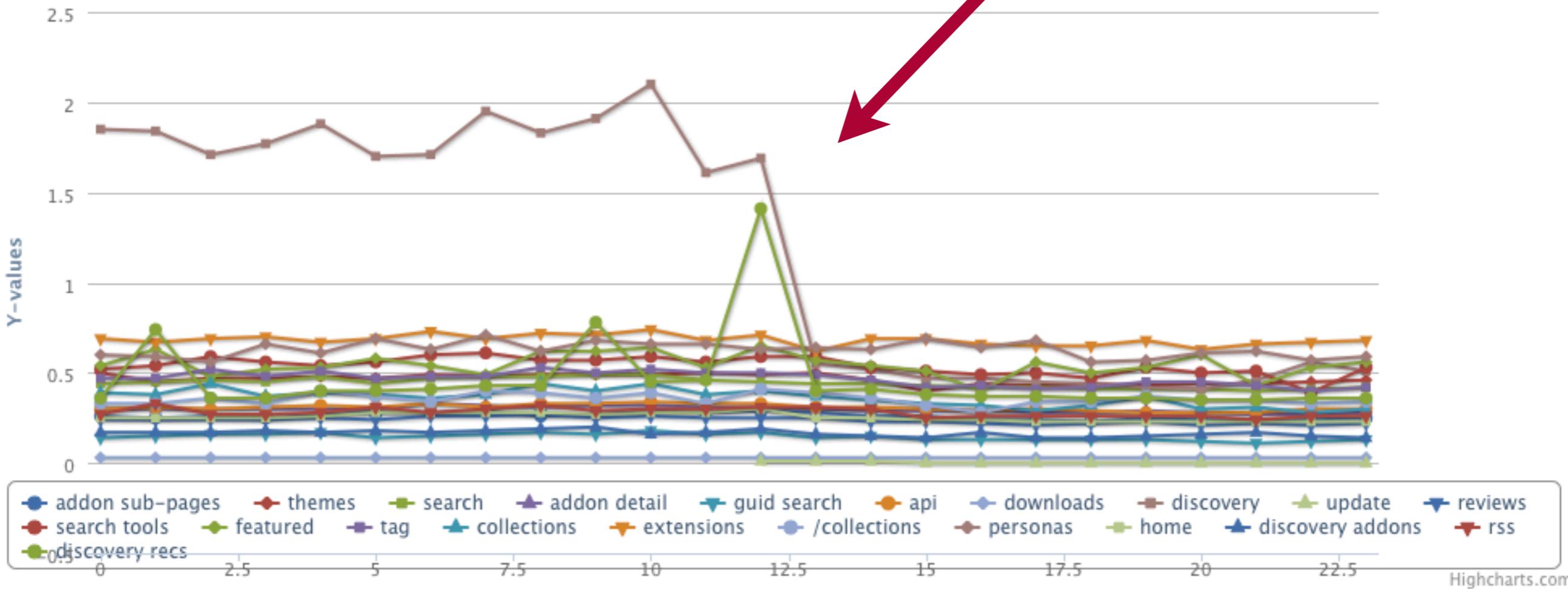
```
from tasks import update_tag  
update_tag.delay(tag)
```

Timing Middleware

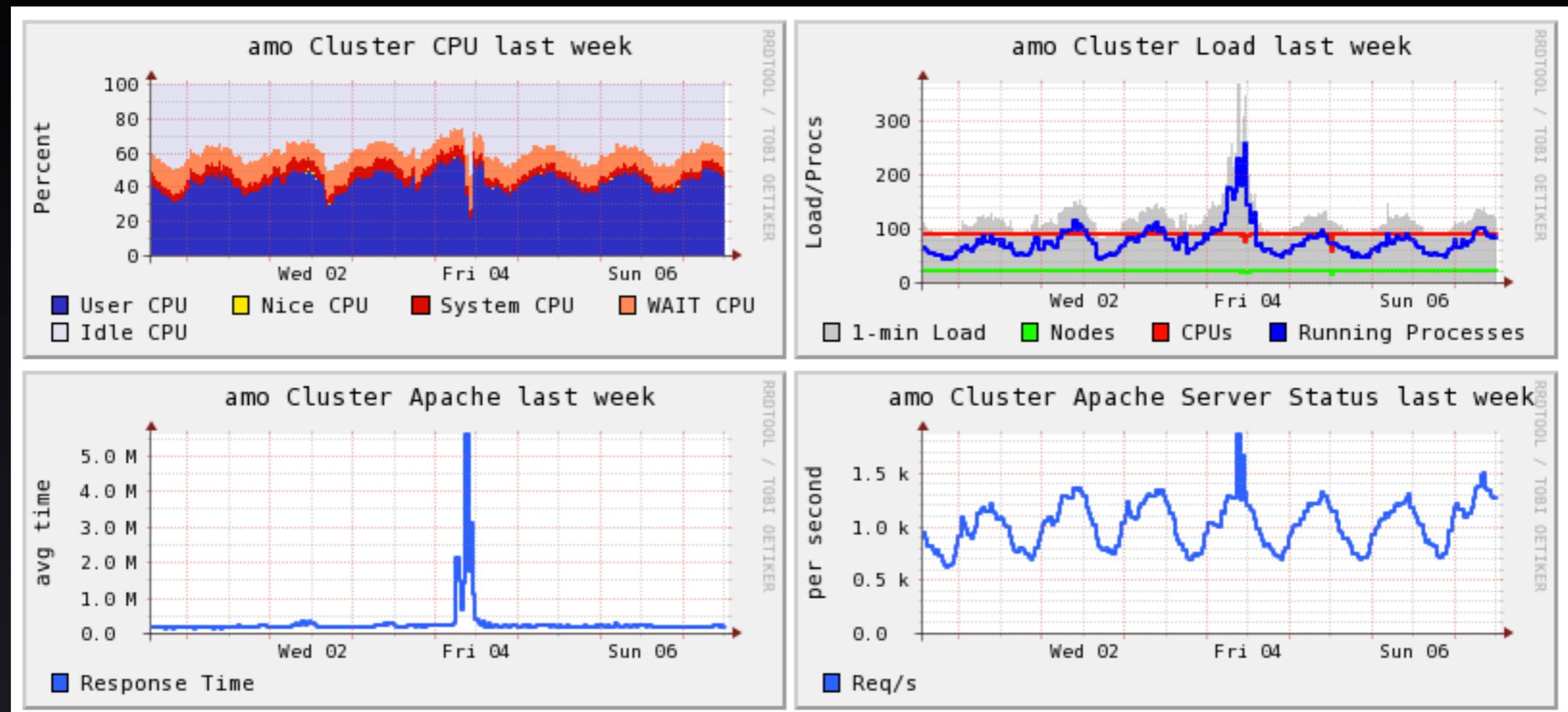
<http://bit.ly/timing-ware>



Page performance for 02-25



Measurement



Graphite and statsd



40+ languages
including rtl





content translated
and
templates

Database strings

```
class Addon(caching.base.CachingMixin,  
models.Model):  
    ...  
    name = models.ForeignKey(Translation)
```

```
addon.name = 'name'  
addon.save()
```

```
addon.name = 'name'  
addon.save()
```

```
addon.name = {'fr': 'la nomme'}  
addon.save()
```



Django

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

Jinja2

<http://jinja.pocoo.org/>

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

Jingo & Jingo minify

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

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

create a build id for each
build

sets a far future expires
django-compress also
does this

mozilla

Far future expires

css-min.css?build=1c0f2d7-4de801b0

Deployment

Server 1
Build 2

Memcache

Server 24
Build 1

memcache prefix

```
CACHE_PREFIX = 'amo:%s:' % build_id
```

```
key = '%s:memoize:%s:%s' %  
(settings.CACHE_PREFIX, ..., ...)
```

Bleach

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



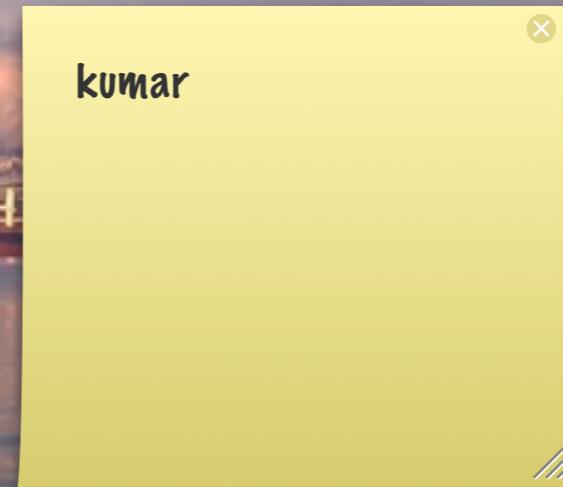
```
>>> bleach.clean('an <script>evil()</script> example')  
'an &lt;script&gt;evil()&lt;/script&gt; example'
```

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

Javascript tests

django-qunit

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



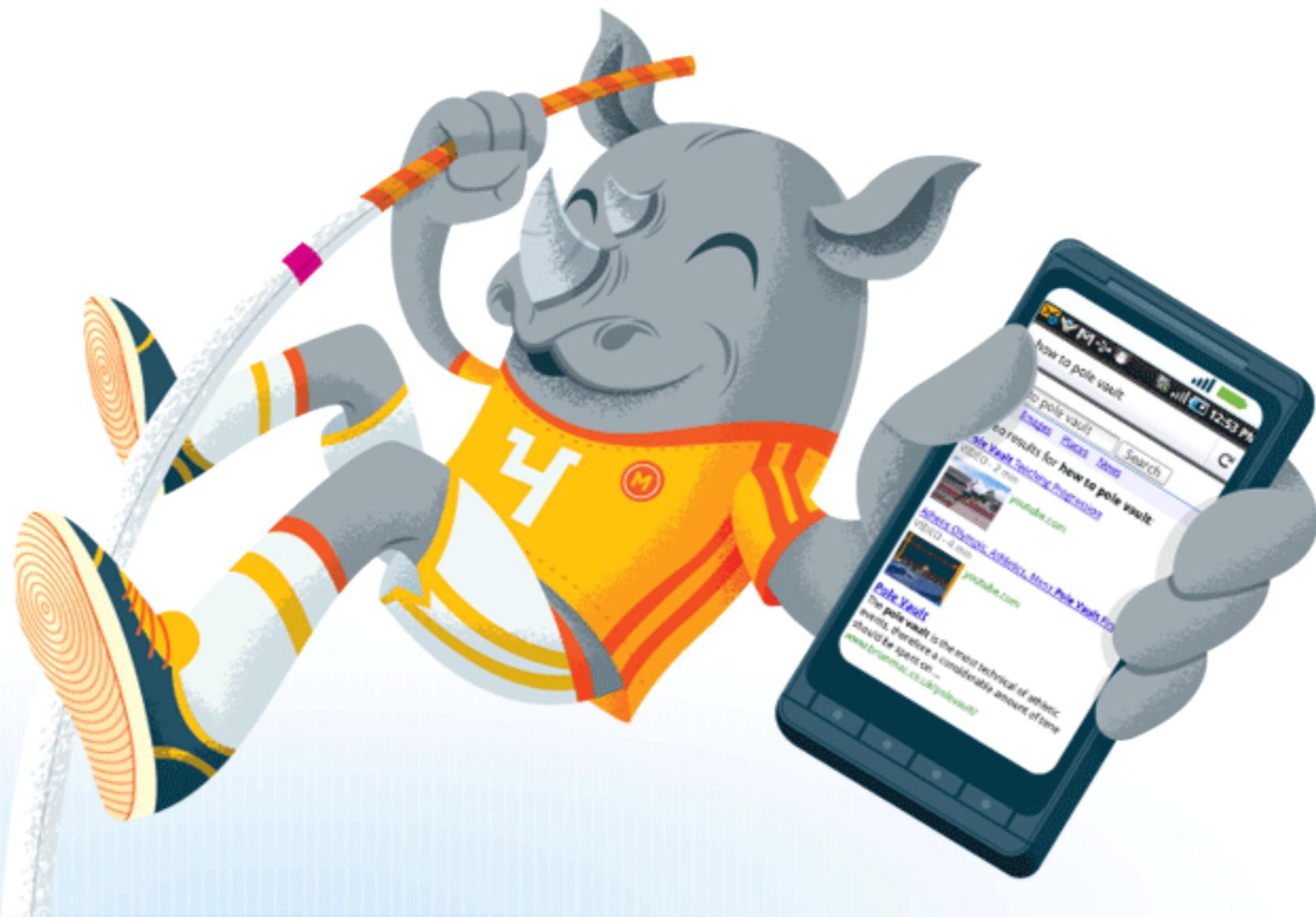
```
test('English', function() {
  z.refreshL10n('en-us');
  equals($('textarea:visible', this.sandbox).text().trim(),
    'Firebug integrates with Firefox to put ' +
    'a wealth of development tools...');
});
```

```
test('Japanese', function() {
  z.refreshL10n('ja');
  equals($('textarea:visible', this.sandbox).text().trim(),
    'Firebug は、Web ページを閲覧中にクリック一つ ' +
    ' で使える豊富な開発ツールを Firefox' +
    ' に統合します。あなたはあらゆる');
});
```



Use ~~Hudson~~Jenkins

<http://bit.ly/jstestnet>





Flake8

<http://bit.ly/flake8>

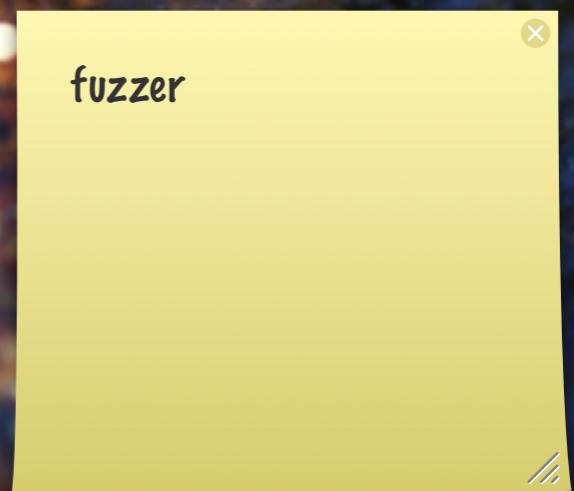
pep 8
py flakes
MacCabe

mozilla

```
~/sandboxes/zamboni(632719) $ flake8 apps/editors/tasks.py  
apps/editors/tasks.py:1: 'datetime' imported but unused  
apps/editors/tasks.py:3: 'stat' imported but unused
```



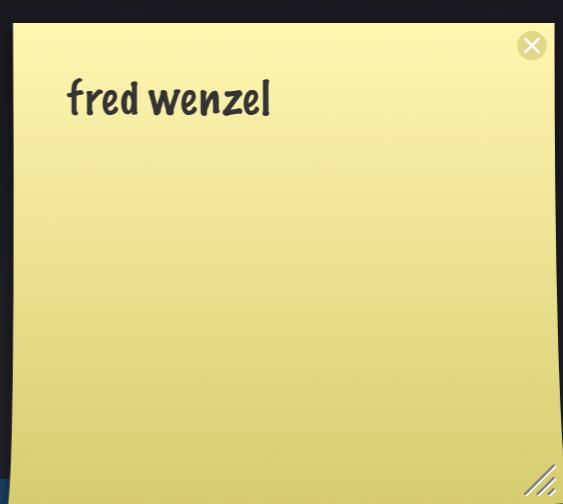
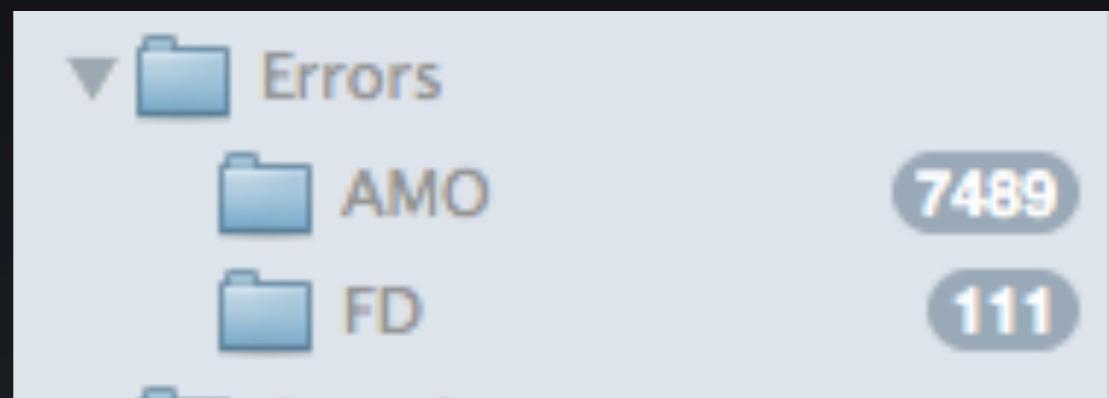
django-quieter-formset prevents 500 errors on forms





django-arecibo

stop the emails!





django-waffle

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

easy feature flag and sample



fred wenzel



Playdoh

<http://bit.ly/mozilla-playdoh>

fred wenzel

mozilla

Celery support
Jinja2 support
Simple migrations

By default:
SHA-512 or bcrypt and hmac
X-Frame-Options: DENY
secure and httponly flags on cookies

fred wenzel

zilla

**Take inspiration from...
but not the best for you**

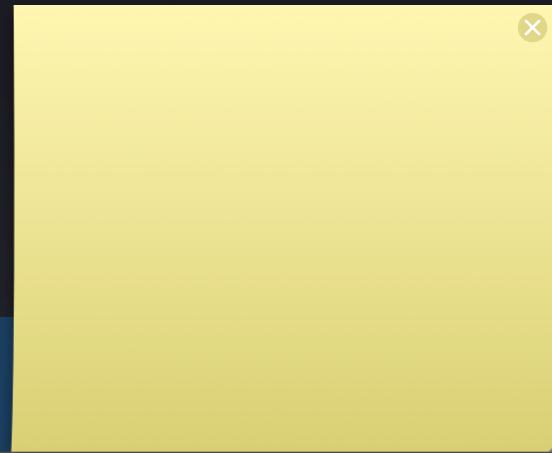
for example jinja2 which
makes integration with
lots of django addons
possible, but a bit harder



django-secure

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

<http://mzl.la/web-app-security>



zilla

Questions?

@andymckay

andym@mozilla.com

andym on irc.freenode.net, irc.mozilla.org