

Inside Lanyrd's Architecture

Andrew Godwin

Web Engineer, Lanyrd

@andrewgodwin

WHO AM I?

Andrew Godwin



Web developer

Systems administrator

Technical architect

Django core developer



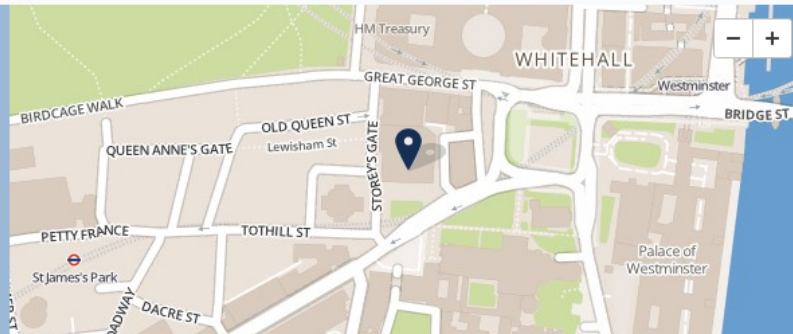
Hello Andrew Godwin

Next event you're attending...

QCon London 2013

4th–8th March 2013
at The Queen Elizabeth II
Conference Centre

You're speaking
AT THIS EVENT



We think you might find these events interesting

HACKED

🇬🇧 [England, London](#)
20th–21st July 2013

Attend Track

Monitorama

🇺🇸 [United States, Boston](#)
28th–29th March 2013

Attend Track

DevOpsDays London 2013

🇬🇧 [England, London](#)
15th–16th March 2013

Attend Track

Ruby Manor 4

🇬🇧 [England, London](#)
6th April 2013

Attend Track

📅 See 120 event suggestions in your calendar

LANYRD: THE EARLY YEARS

The Origin Story

June 2010



2010

2011

2012

2013

August 2010

“ Good music on, an orange juice and some CSS fun in front of me, we have an apartment in Casablanca! (for a week or two anyway :)



@natbat

7:19 pm, 18 August 2010

2010

2011

2012

2013

August 2010

“ We launched lanyrd.com/ ! Go easy on it,
the log files are going a bit nuts,
who knew Twitter was viral?



@simonw

10:52 am, 31 August 2010

2010

2011

2012

2013

August 2010

“ Right... this clearly isn't sustainable. Going to have to switch the site in to read only mode for a few hours, sorry everyone!



@simonw

11:35 am, 31 August 2010

2010

2011

2012

2013

January 2011


Natalie and Simon start three months of YCombinator, in California.

2010

2011

2012

2013



September 2011

Lanyrd closes a \$1.4 million seed funding round, moves back to London.

2010

2011

2012

2013

March 2013

- **Conferences**
- **Profile pages**
- **Emails**
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- **Coverage**
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the social conference directory

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QCon London 2013

International software development conference

4 – 8 MARCH 2013

[London in England](#)

qconlondon.com/london-2013

[View the schedule on Lanyrd](#)

[View the official event schedule](#)

[Save to iCal / iPhone / Outlook / GCal](#)

[@qconlondon](#)

[#QConLondon](#)

[In the QConferences series](#)

lanyrd.com/chhft (short URL)

You're speaking
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Tell others what you hope to get out of this event

138 PEOPLE attending

97 PEOPLE tracking

[TELL YOUR FRIENDS!](#)
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102 speakers



[Gareth Rushgrove](#)

[@garethr](#)
Web geek, GOV.UK



[Phil Calçado](#)

[@pccalcao](#)
SoundCloud



[Jeni Tennison](#)

[@JeniT](#)
Technical Director of the Open Data Institute



[Ward Cunningham](#)

[@WardCunningham](#)
Host of AgileManifesto.org



[Trisha Gee](#)

[@trisha_gee](#)
Driver Developer, 10gen



[Kirk Pepperdine](#)

[@javaperftuning](#)
Expert in Java Performance Tuning, Sun Java Champion



[Jim Webber](#)

[@jimwebber](#)
Chief Scientist at Neo Technology & Co-Author of "Rest in Practice"



[Omer Kilic](#)

[@OmerK](#)
Embedded Systems Engineer and Raspberry Pi fan



[John T Davies](#)

[@jtdavies](#)
CTO and Founder of Incept5

Topics

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Andrew Godwin

Python and Django developer, pilot, and archer. Currently writing shiny things for Lanyrd.

[3 people](#) want to meet you



[Summary](#)

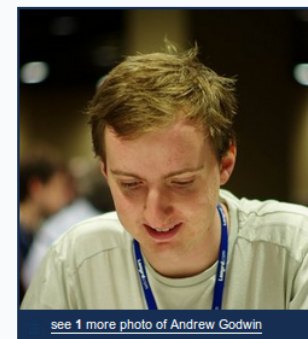
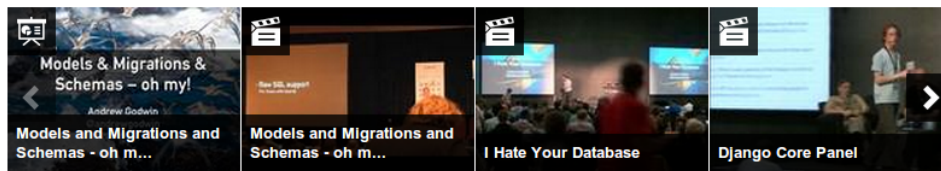
[Upcoming events](#) 5

[Past events](#) 59

[Topics](#) 3

[People](#)

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[see 1 more photo of Andrew Godwin](#)

Upcoming speaking appearances

QCon London 2013

[England, London](#)

4th–8th March 2013

[Inside Lanyrd's Architecture](#), Fri 8th March 11:30am to 12:30pm

DJUGL 2013.1

[England, London](#)

12th March 2013

[What's new in Django 1.5](#)

DjangoCon Europe 2013

[Poland, Warsaw](#)

15th–19th May 2013

Elsewhere on the web

[@andrewgodwin](#) on Twitter

[andrewgodwin](#) on GitHub

[LinkedIn](#) profile

[foursquare](#) profile

[aeracode.org](#)

Session coverage

[14 videos](#)

Most recent added 2 months ago



Edit

YOUR PROFILE



[@andrewgodwin](#)

24 EVENTS
spoken at

39 EVENTS
attended



BROWSE BY YEAR

[2014](#) · [2013](#) · [2012](#) · [2011](#) · [2010](#) · [2009](#) · [2008](#)

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Django conferences



Django events looking for participants

1 [Django event](#) is looking for participants

Stop tracking

THIS TOPIC

You are tracking 'Django'

Worldwide

This will change event suggestions in your calendar and appear on your profile page



Upcoming events 21

Past events 193

Events in 2013 35

MARCH
2013



6th Open Source Days - Dni Wolnego Oprogramowania

Poland, Bielsko-Biala

8th–10th March 2013

AngularJS CSS3 Django JavaScript MongoDB Open Source
SELinux

Attend
Track



PyWaw #22

Poland, Warsaw

11th March 2013

BarCamp Django Programming Python User Groups Warsaw

Attend
Track



DJUGL 2013.1

England, London

You're speaking
AT THIS EVENT

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[Browse and track events by topic](#)

Django coverage

232 videos
Most recent added 1 month ago

166 slide decks
Most recent added 3 weeks ago

4 audio clips
Most recent added 1 year ago

38 write-ups
Most recent added 9 months ago

3 liveblogs
Most recent added 1 year ago

12 handouts
Most recent added 6 months ago

1 photo

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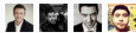
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[Conferences](#)

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Customer Experience Management



The intersection of Experience, Design and Technology. Tracking the Age of the Customer one event at a time.

[Upcoming events](#) 11

[Past events](#) 23

SXSW Interactive 2013

[United States, Austin](#)

8th–12th March 2013

[Online Marketing](#) [SXSW](#) [Social Media](#) [User Experience](#) [Web Design](#) [Web Development](#)



added to guide by [David Baum](#)

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An Event Apart Seattle 2013

Three days of design, code, and content

[United States, Seattle](#)

1st–3rd April 2013

[User Experience](#) [Web Design](#) [Web Development](#) [Web Standards](#)



added to guide by [Johan Högåsen-Hallesby](#)

[Attend](#)

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Breaking Development 2013: Orlando

web design and development for beyond the desktop

[United States, Orlando](#)

8th–10th April 2013

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29 PEOPLE
tracking



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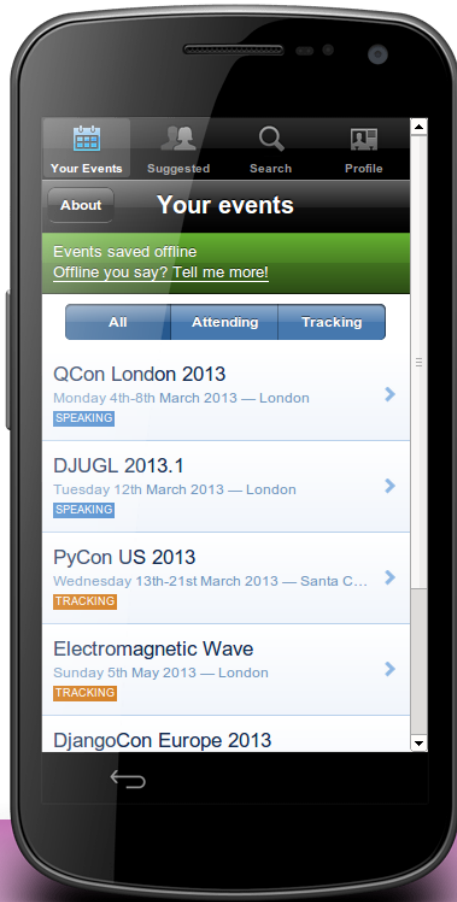
Related topics

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[Web Standards](#)



Lanyrd on the go

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Key dynamic parts:

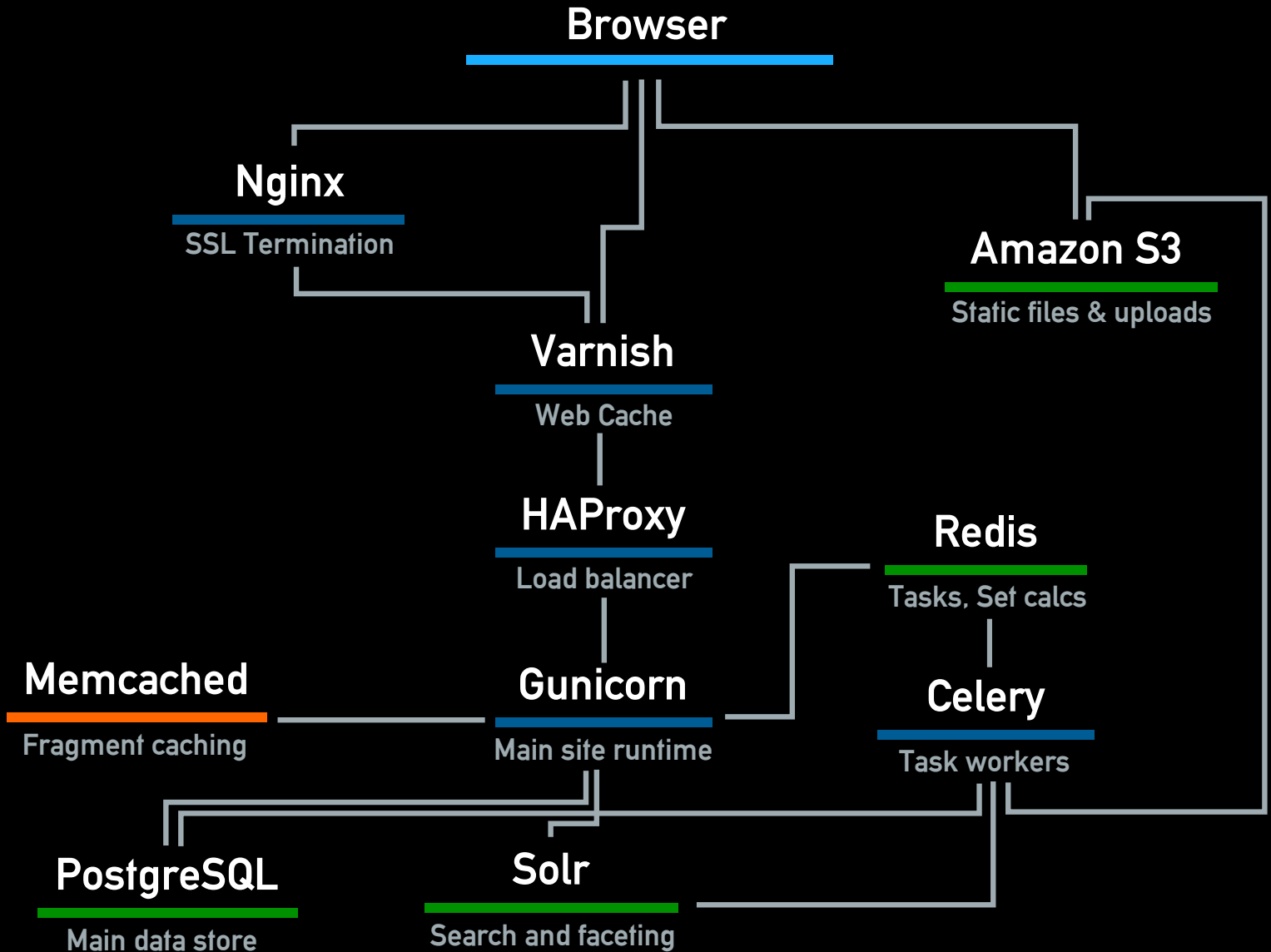
Users tracking/attending events

Users tracking each other

Users tracking topics and guides

THE STACK TODAY

What we run on



django

Lanyrd is almost entirely Django (Python)

Background tasks use Celery, a Django task queue

Management tasks/cron jobs also run inside the framework

The Django application is served by Gunicorn containers

PostgreSQL

Main data store for everything except uploads

We run a master and a replicated slave

Around 80GB of data in five databases

Each server runs on a RAID 1 disk array

Redis

Task queue transport for Celery and tweet listeners

Contains user sets for every conference, user and topic

Used for efficient narrowing of queries before Solr is hit

Solr

Stores conferences, users, sessions and more

Very rich metadata on each item

Heavy use of sharding throughout the site

We run a master and a replicated slave

Varnish

First point of call for all requests

Caches most anonymous requests

Enforces read-only mode if enabled

One used and one hot spare at all times

HAProxy

Sits behind Varnish

Distributes load amongst frontend servers

Re-routes requests during deploys

Two in use at all times, identically configured

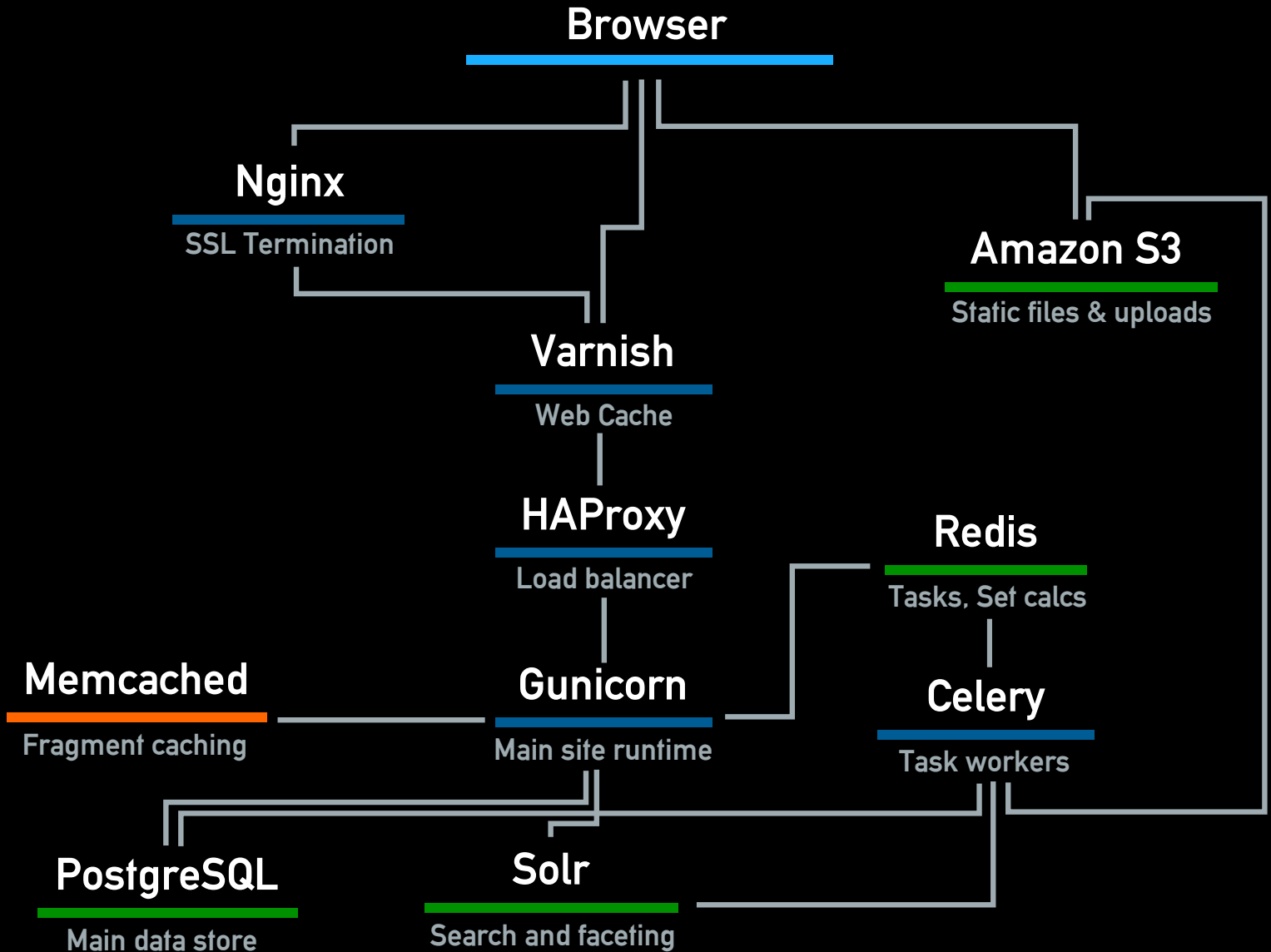
S3

Stores all uploaded files from users

Upload forms post directly to S3

Serves all static assets for the site (images, CSS, JS)

Static assets are versioned with hash to help cache break



THE STACK BEFORE

What we've eliminated

MongoDB

Stored analytics, logs and some other data

Lack of schema meant some bad data persisted

Poor complex query performance

Useful for quick prototyping

MySQL

Primary data store for things not in MongoDB

Very poor complex query performance

No advanced field types

Full database locks during schema changes

A TALE OF TWO DBS

The Great Move of 2012

Amazon EC2 → **Sofflayer**

MySQL → **PostgreSQL**

Why?

Predictable loading means EC2 unnecessary

Better I/O throughput

Both moves required database downtime

How?

Replicate Solr and Redis across to new servers

Enter read-only mode

Dump MySQL data

Convert MySQL dump into PostgreSQL dump

Load PostgreSQL dump

Re-point DNS, proxy requests from old servers

Exit read-only mode

Time in read-only mode: 1 ½ hours

Downtime: 0 hours

CONTENT IS KING

The Advantages of Content

Read-only mode is entirely viable

An hour or two at most

Everyone logged out

Varnish blocks POSTs, caches everything aggressively

Indexing delay is acceptable

Most site views are driven by Solr

1 or 2 minute indexing delay

Some views add in recent changes directly

FEATURE FLAGS

Always be deploying

Continuous Deployment

We deploy at least 5 times a day, if not 20

Nearly all code goes into master or short-lived branches

Anything unreleased is feature flagged

Feature flags

Simple named boolean toggles

Settable by user, user tag, or conference

Can change templates, view code, URLs, etc.


Flag management

| | | |
|----------------|----------------------------|--|
| frontend_tests | Can execute frontend tests | DISABLED Enabled via tags lanyrd-team |
|----------------|----------------------------|--|

User tag management


User Tag: lanyrd-team

[Edit this tag](#)




[Alby Barber](#)
Web Engineer @lanyrd
[Twitter](#) [LinkedIn](#) [GitHub](#)

[Remove](#)




[Andrew Godwin](#)
Python and Django developer, pilot, and archer. Currently writing shiny things for Lanyrd.
[Twitter](#) [GitHub](#) [Facebook](#) [LinkedIn](#) [Email](#)

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[Natalie Downe](#)
Co-founder of Lanyrd, Enthusiastic world explorer and digital creative
[Twitter](#) [LinkedIn](#) [Facebook](#) [Email](#)

[Remove](#)



[Dan Shallcross](#)
Designer at Lanyrd

WHO WROTE THAT? OH, ME

Legacy code & decisions

Technical Debt

It's fine to have some - it can speed things up

A good chunk of ours is gone, some remains

Big schema changes get harder and harder

SMALL AND NIMBLE

The power of small teams

Six people

Six people

2.5

Back-end
developers

1.75

Front-end
developers

1.5

Designers

0.75

System
administrators

0.75

Business
operations

0.5

Mobile
developers

Awareness

Everyone knows everything that's happening

Daily stand-ups

Weekly show-and-tell sessions

Always deployable

Master branch always shippable

Large development behind feature flags

Code review for nastier changes

LESSONS LEARNED

What's important here?

Small and nimble

Continuous deployment and development style allows easy project changing

No long approval processes

Less than ½ hour from report to shipped fix

Content is great

Read-only mode allows less painful downtimes

Heavy caching smooths out our load

Learnable load patterns

Fix it while you can

The bigger you get, the harder a fix

We moved to PostgreSQL just in time

Big schema changes now take days of coding

Six amazing people

You don't need a big team to write a complex product

Communication is absolutely key

Using Open Source well is also crucial

Thank you.

Andrew Godwin

@andrewgodwin

<http://aeracode.org>

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