

# SCALING GILT

From Monolith Ruby App to Distributed  
Scala Micro-Services

QCon - Brooklyn - 2014

Yoni (Jonathan) Goldberg

- GiltDirect, Sale Personalization, Loyalty, SEO, Post-purchase, Login/Registration

- MIT CS BS/Meng | Google | IBM | IDF

- Israel | Brooklyn | Coffee | JS/Node | Arduino | Running | Kite Surfing | Poker

# The lessons and challenges that we had/have with micro-service architecture

**Get  
Shit  
Done.**



# WHAT IS GILT?

Flash Sales Business

Founded in 2007

Top 50 Internet-Retailer

~150 Engineers



# Elements of Style: Workwear

The fundamental pieces for a perfectly polished office wardrobe

[Preview this Sale](#)



### Featured Men's Sales



### Featured Baby & Kids Sales

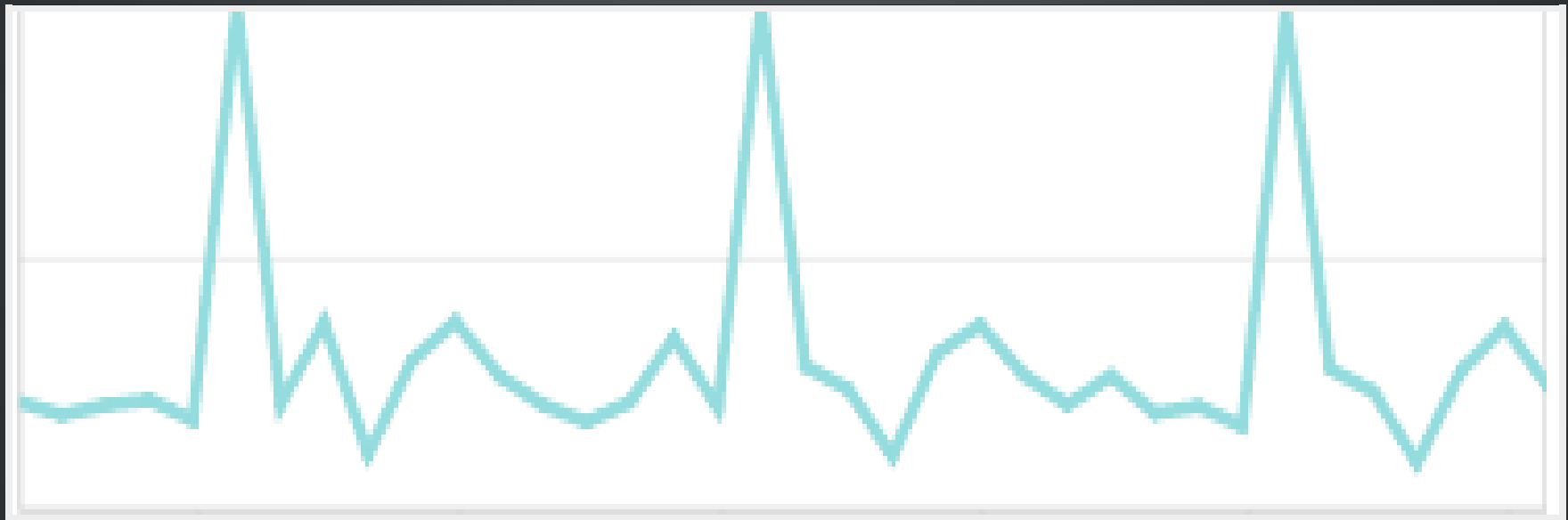


### Featured Home Sales

Winter Coatlet Style — **Join Gilt to find the best brands at up to 60% off**  
Find something new every day for women, men, kids and home. Join and see what inspires you today.

Cleo-ette Case: Organize Your Wardrobe  
[Join Gilt](#)

# ANOTHER WAY TO LOOK AT GILT

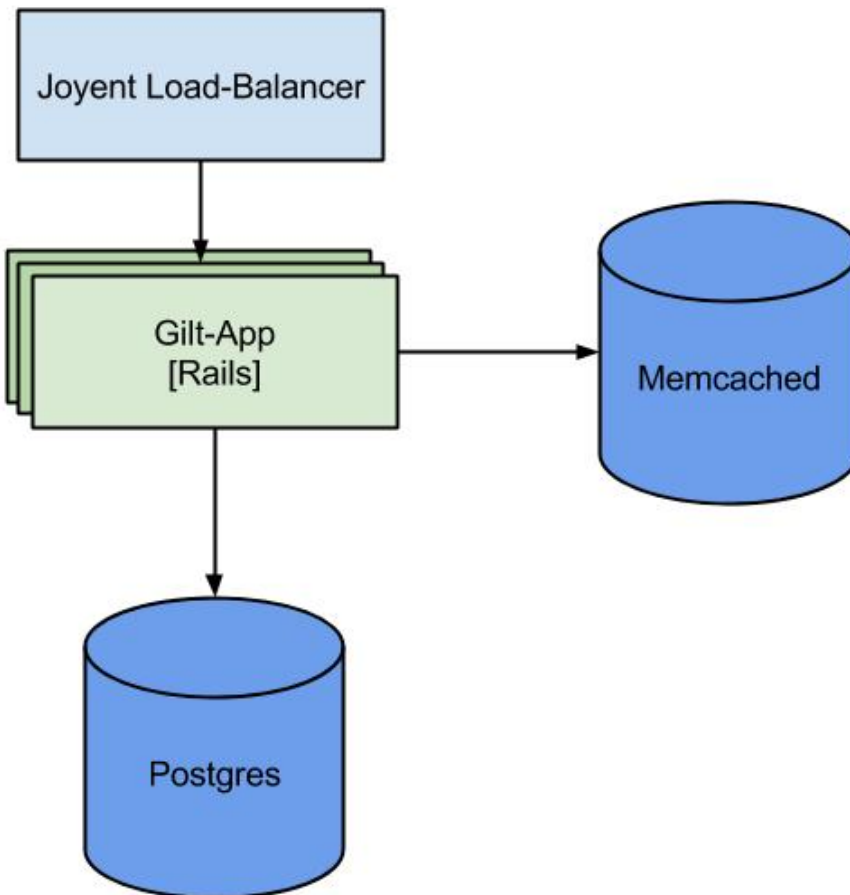


# THE CLASSIC STARTUP STORY

# THE EARLY DAYS

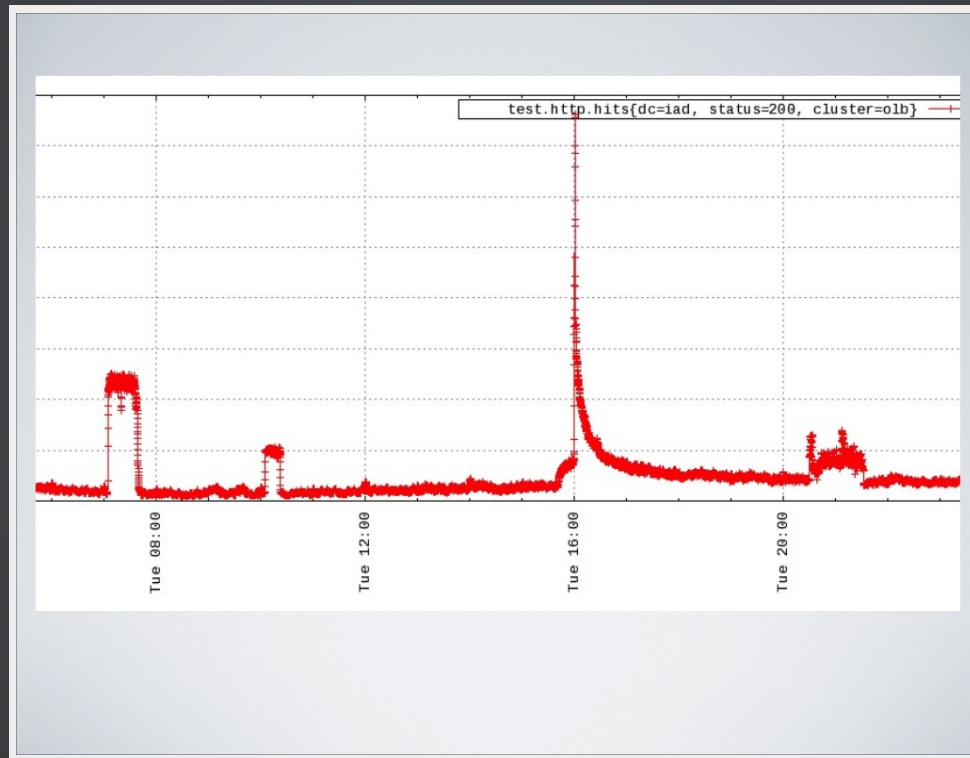
2007 - Ruby on Rails  
the hottest new thing

The goal was to get to market fast





# We were able to handle our traffic pretty well



# UNTIL LOUBOUTIN CAME TO GILT



# TECHNOLOGY PAIN POINTS - 2009

- Spike required to launch 1,000s of ruby processes
- Postgres was overloaded
- Routing traffic between ruby processes sucked

|Note to self| hide from the ruby fans

# DEV PAIN POINTS

- 1000 Models/Controllers, 200K LOC, 100s of jobs
- Lots of contributors + no ownership
- Difficult deployments with long integration cycles
- Hard to identify root causes

**WE NEEDED TO SOLVE  
THE PROBLEM FAST**



# THREE THINGS HAPPENED

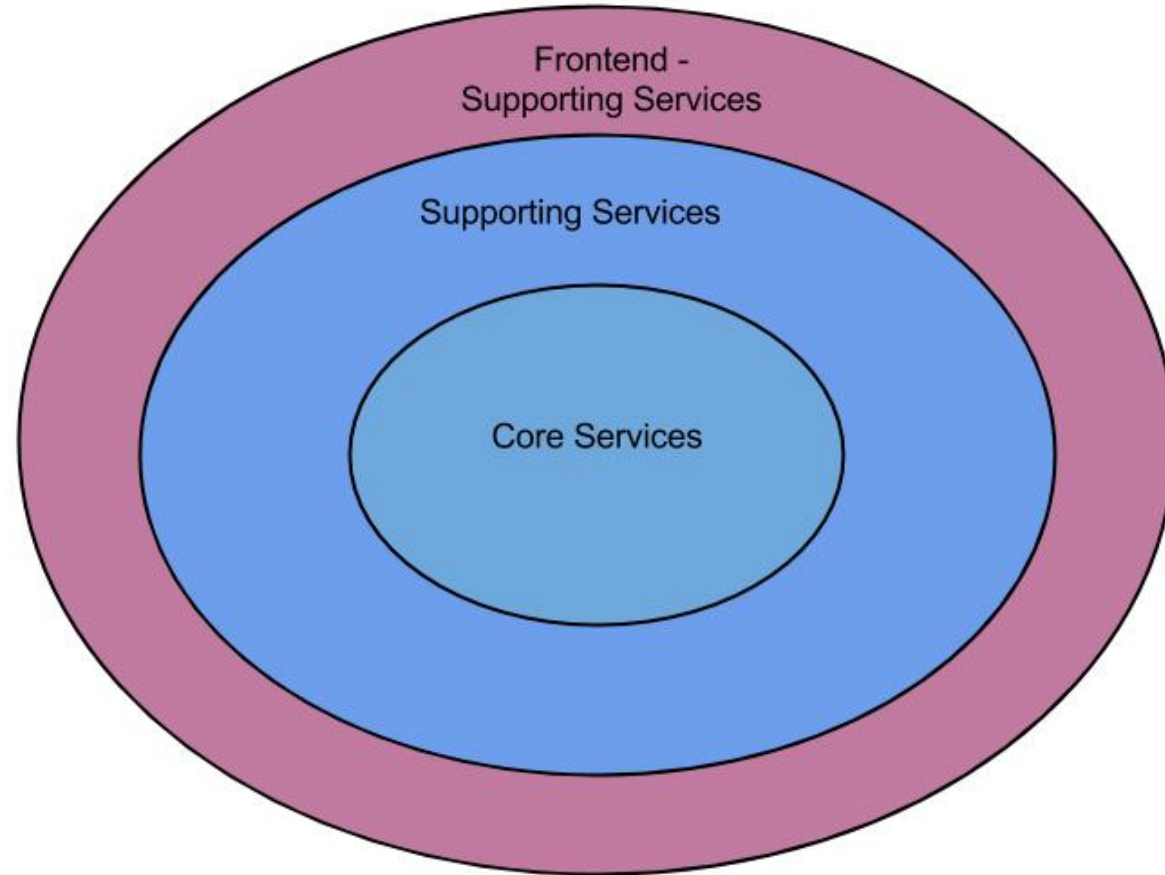
- Started the transition to the JVM
- M(a/i)cro-Service Era Started
- Dedicated data stores

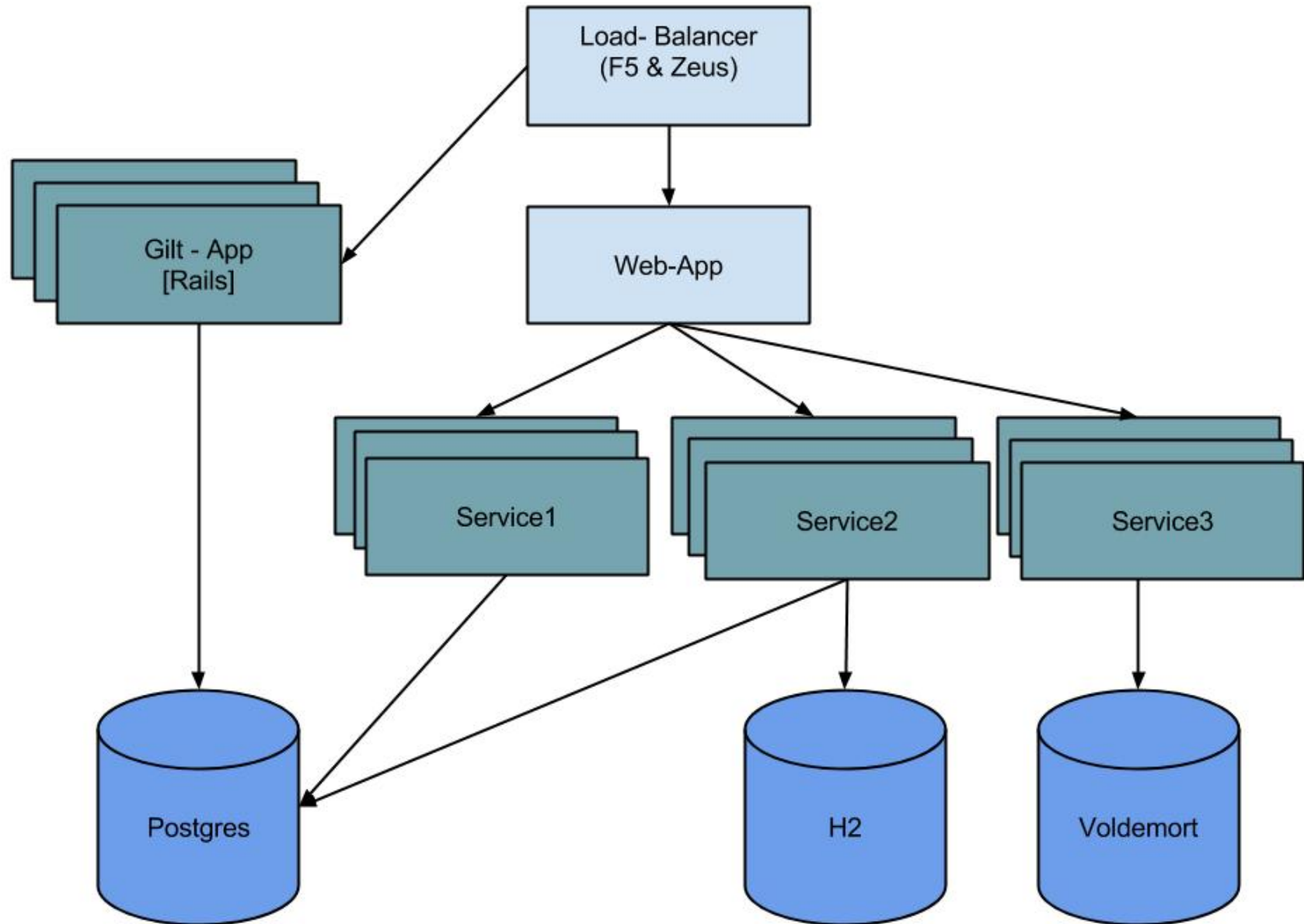


# WHY JVM?

- Widely adopted
- Stable
- Better support for concurrency
- Better GC vs MRI

# FIRST 10 SERVICES





**We solved 90% of our arch scaling  
problem**

**But not the Dev points**

# SOLVED PAIN POINTS

- ~~Spike required to launch 1,000s of ruby processes~~
- ~~Postgres was overloaded~~
- ~~Routing traffic between ruby processes sucked~~

# STILL OPEN PAIN POINTS

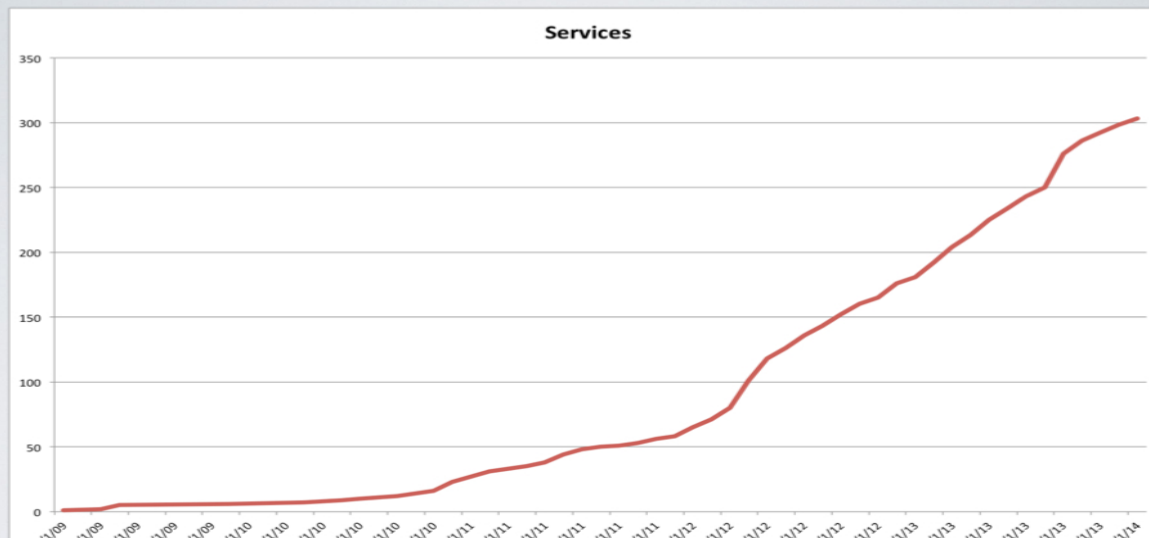
- New services became semi-monolithic
- 1000 Models/Controllers, 200K LOC, 100s of jobs
- Lots of contributors + no ownership
- Difficult deployments with long integration cycles



# WHY WE DOUBLED DOWN ON MICRO-SERVICES

- Empower teams and ownership
- Smaller scope
- Simpler and Easier deployments and rollbacks

# As of last week we have around 400 services in Prod

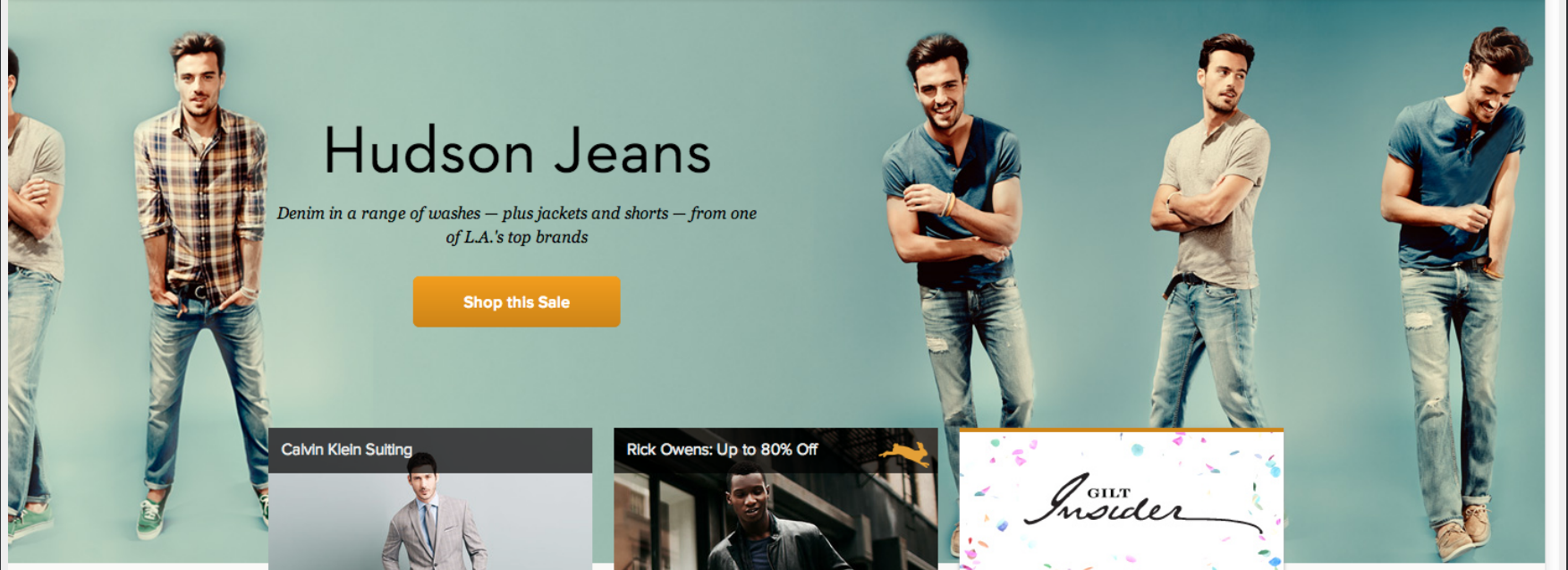


# We began the transition to Scala and Play

## LOSA - Lots Of Small (Web) Apps

Same as micro-services but for web-apps

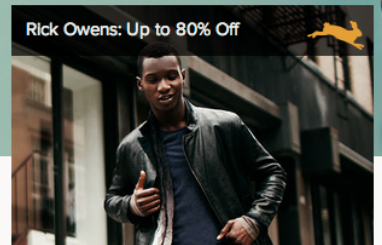
**DEMO**



# Hudson Jeans

Denim in a range of washes — plus jackets and shorts — from one of L.A.'s top brands

[Shop this Sale](#)





WOMEN **MEN** BABY & KIDS HOME CITY TRAVEL

Noir Member Account



Free Shipping for 8 days!



Cart

Search

MEN / Calvin Klein Suiting

SALE ENDS 1 Day, 3 Hours

# Calvin Klein Suiting

Filter Categories

Filter Sizes

Filter Brands

Showing 28 products



Calvin Klein White Label ☆  
Solid Three Piece Suit  
**\$309 Gilt**  
\$575



Calvin Klein White Label ☆  
Check Sportcoat  
**\$309 Gilt**  
\$575

3 Left



Calvin Klein White Label ☆  
Broken Twill Suit  
**\$309 Gilt**  
\$575



MEN / CALVIN KLEIN SUITING / Solid Three Piece Suit

SALE ENDS 1 Day, 3 Hours



Calvin Klein White Label ☆  
Solid Three Piece Suit

~~\$575~~ **\$309** *Gilt*

Size(US (chest)): [Size Chart](#)

True to size

- |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|
| 36s | 38r | 38s | 40r | 40s | 42l |
| 42r | 44l | 44r | 46l |     |     |

Color: blue



Quantity:

[Add to Cart](#) [Add to Waitlist](#)

Good news: You still have 8 days left of free US shipping!

Delivery by 6/13 with Expedited Shipping

GILT  
*Noir*

WOMEN MEN BABY & KIDS HOME CITY TRAVEL

Noir Member Account

Free Shipping for 8 days!

0 Cart

Search

GILT  
*Insider*

POINTS. PERKS. PRESTIGE.

Your Exclusive Perks

21208 points to redeem

Garde Robe  
**Luxury Storage**  
plus a \$500 Gilt Credit  
\$350+ per Month

HelloFresh.com  
**\$40**  
Off Cooking Made Easy  
2,000 pts

Men's Accessories  
Rewards Shop  
(\$25 & Under Value)

Candles  
Rewards Shop  
(\$15 & Under Value)

*Noir*  
Member

You've earned **150711** points to date!

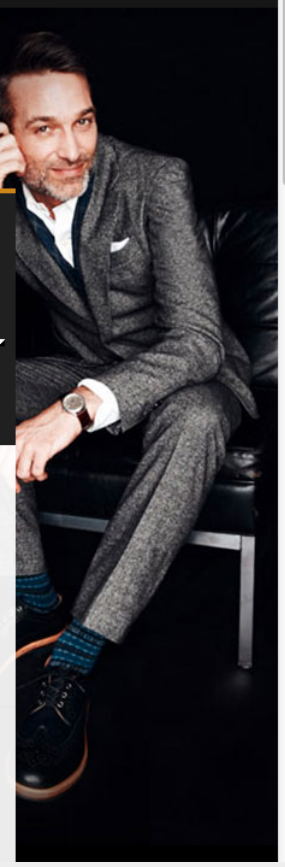
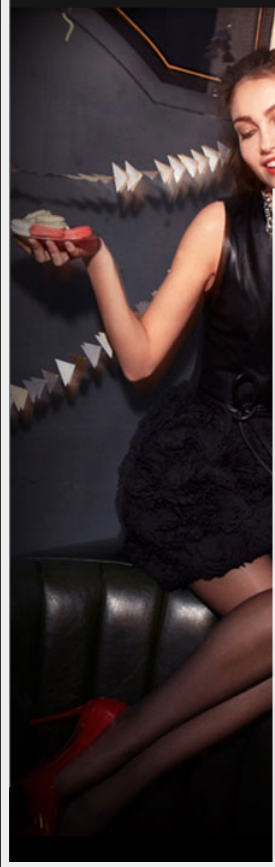
SELECT PREMIER *Noir*

Your VIP Noir Customer Service

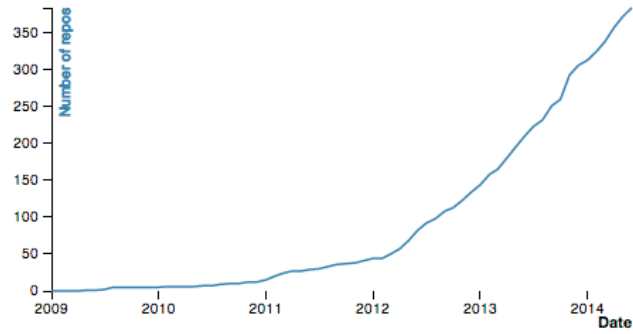
Email: [NoirSupport@gilt.com](mailto:NoirSupport@gilt.com)  
+1877.280.0338

[Terms and Conditions](#)  
[FAQ](#)

Your Noir Benefits



### Gilt: Global Statistics



Number of repositories 385

[View dependency graphs](#)

Search

### Jonathan Goldberg's personal stats

Number of repositories contributed to 38

[View Jonathan Goldberg's repositories](#)

## Repository Statistics

% Commits by top author

# commits

Commons versions

g-s-b versions

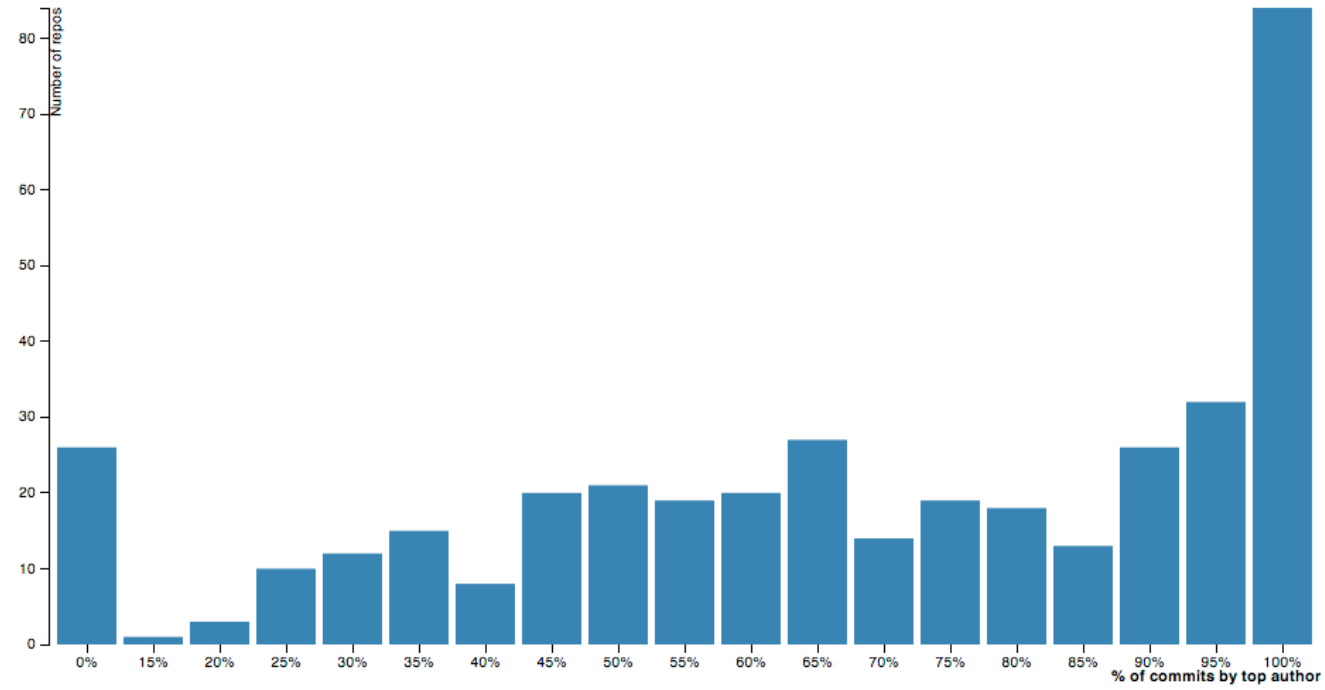
svc-framework versions

# dependencies

# dependents

% of commits correctly reviewed

Request per minute



## Repository Statistics

[% Commits by top author](#)

**# commits**

[Commons versions](#)

[g-s-b versions](#)

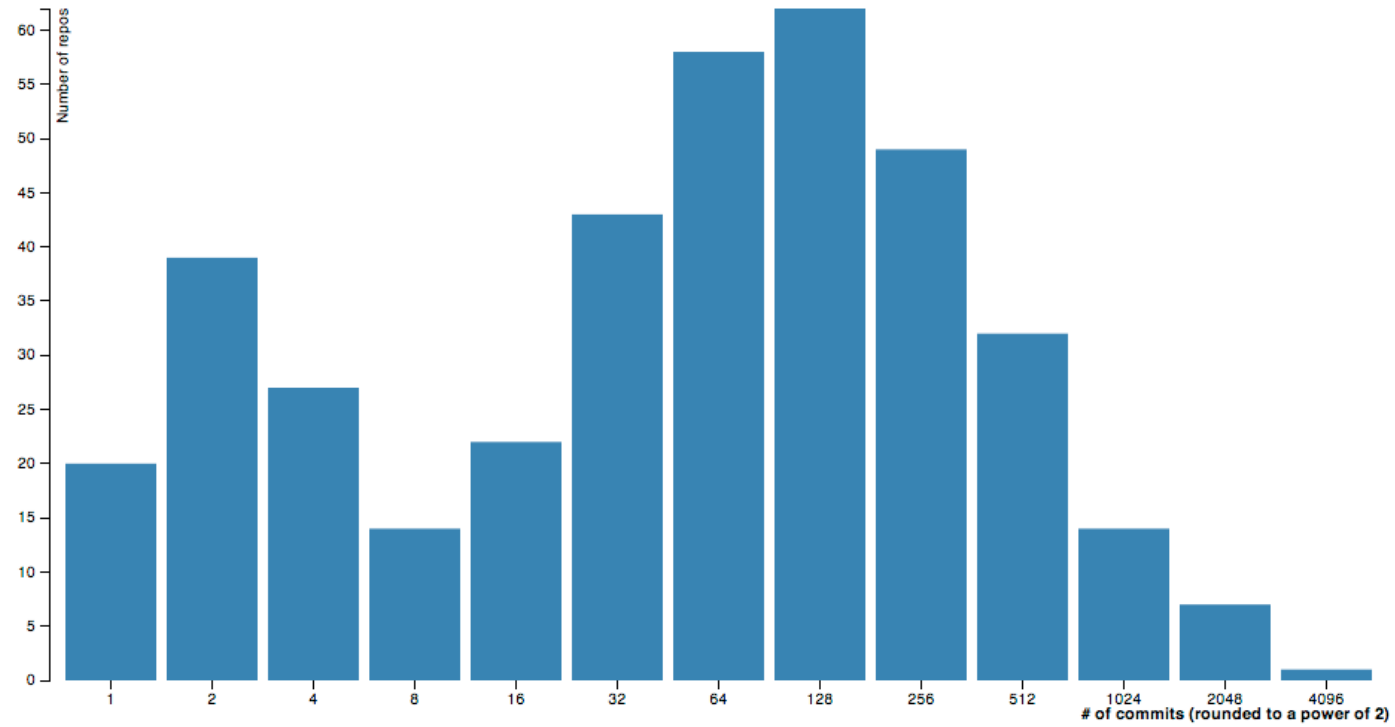
[svc-framework versions](#)

[# dependencies](#)

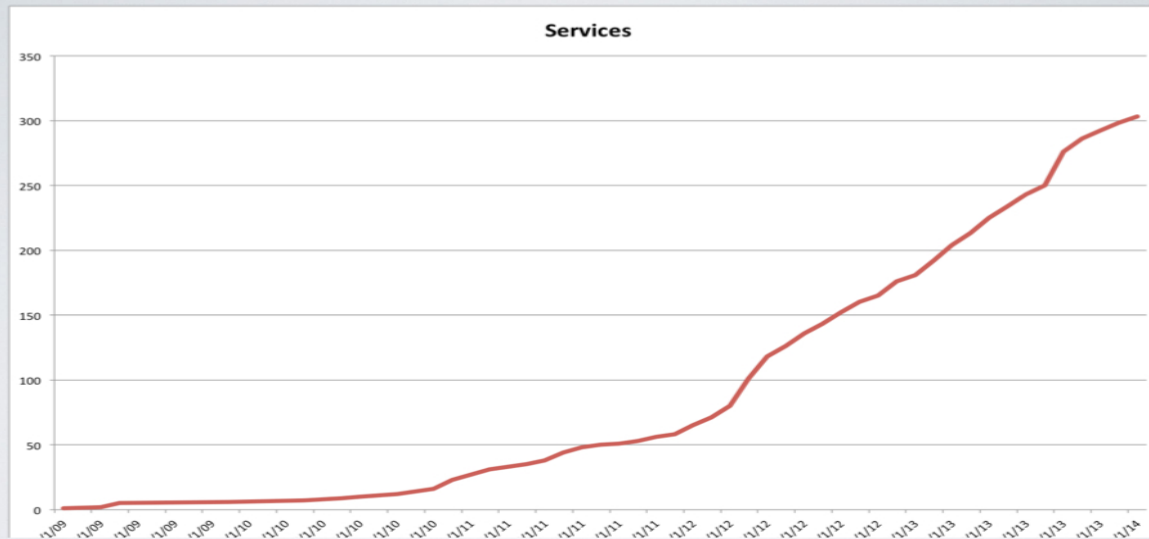
[# dependents](#)

[% of commits correctly reviewed](#)

[Request per minute](#)



# why the increase?



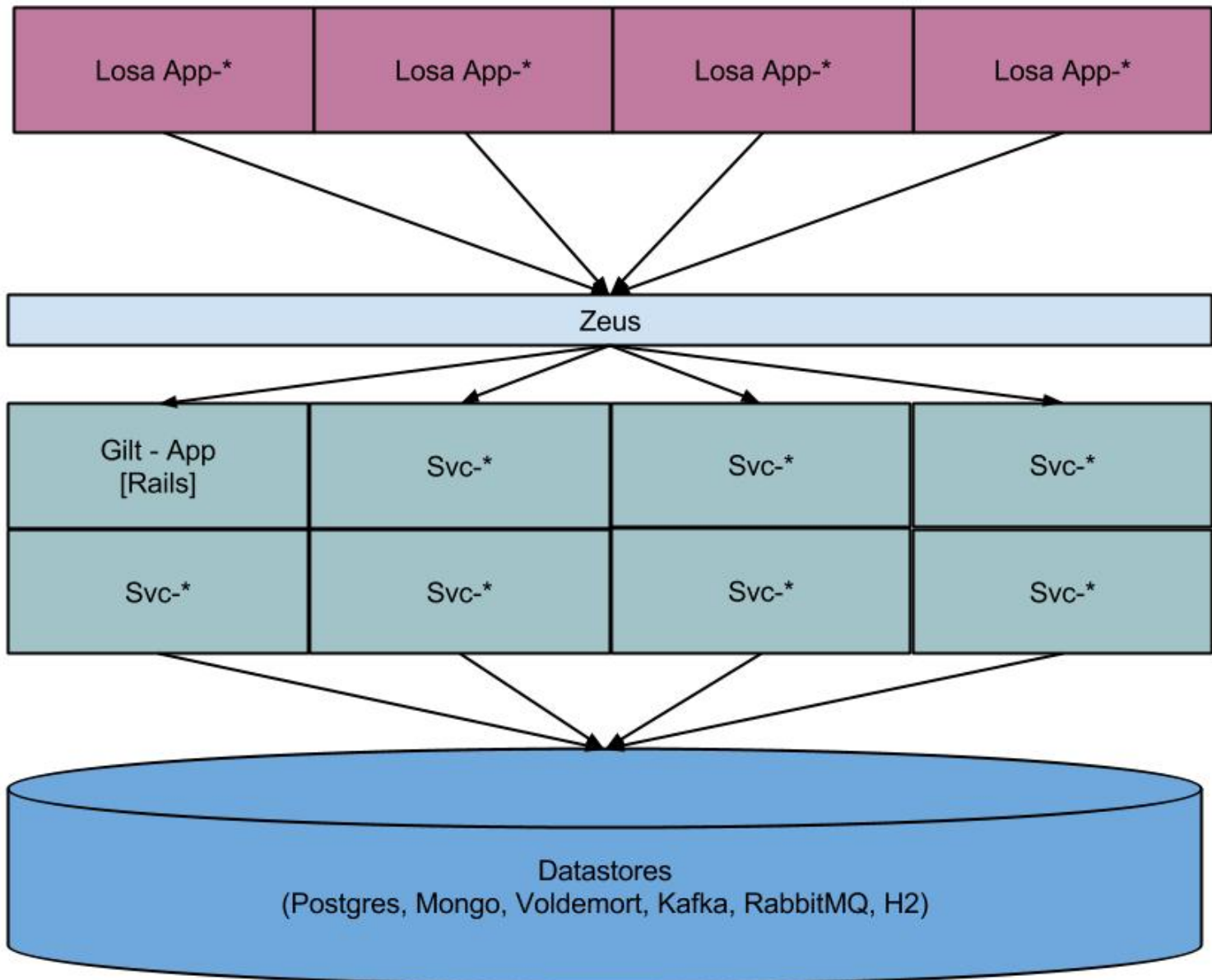


# APP BOOTSTRAP

```
rake bootstrap:admin-web           # Bootstrap a admin web app
rake bootstrap:babylon-docs       # Bootstrap a babylon docs app
rake bootstrap:client-server-core # Bootstrap a client-server core app
rake bootstrap:jersey-java         # Bootstrap a jersey java app
rake bootstrap:jersey-scala        # Bootstrap a jersey scala app
rake bootstrap:play                # Bootstrap a play app
rake bootstrap:play-ui-build       # Bootstrap a play ui build app
rake bootstrap:sbt-library         # Bootstrap a sbt library app
rake bootstrap:schema              # Bootstrap a schema app
```

# HOW TO DEFINE A MICROSERVICE?

Functionality scope  
Number of devs involved



# NEW CHALLENGES

- Deployments and Testing (Functional/Integration)
- Dev/Integration Environments
- Who owns this service!?
- Monitoring

# ON DEPLOYMENTS AND TESTING

*"Testing is HARD" -  
the dev that sits on your left*

# THE CHALLENGES THAT WE FACED:

- Hard to execute functional tests between services
- Frustrating to deploy semi-manually (Capistrano)
- Scary to deploy other teams services



# SBT

- Motivation: Scala adaption
- Complex Scala syntax
- Cool features: ~test, shell, console
- Hard to debug

# GILT-SBT-BUILD

- Simple config for all the services
- Pulls many plugins:  
[nexus, testing, RPMs, run scripts,  
Monitoring, SemVer, ...]
- Custom commands (e.g 'sbt release')

# ION-CANNON + SBT

- Run tests on dedicated Env
- Supports Canary releases
- Easy rollbacks
- Integrated health checks

# IonCannon

Application Search (i.e. admin-ioncannon, product\_service)

Search

Releases ~

Events ~

Production Scanner

## Summary of Latest IonCannon Activities

	Name	Version	State	Targets	Released By	Released At	Deployed At		
+	<a href="#">svc-targeting</a>	1.7.11	in_production		<a href="#">prod_scanner</a>	Sun Jan 12 2014 16:54:12 EST	Sun Jan 12 2014 16:57:29 EST		
+	<a href="#">gilt</a>	3.45.12	in_production		<a href="#">prod_scanner</a>	Sun Jan 12 2014 13:54:16 EST	Sun Jan 12 2014 13:56:38 EST		
+	<a href="#">gilt</a>	3.45.11	in_production		<a href="#">prod_scanner</a>	Sat Jan 11 2014 23:54:27 EST	Sat Jan 11 2014 23:56:42 EST		
+	<a href="#">admin-email-template</a>	0.0.19	in_production		<a href="#">jsanchez@gilt.com</a>	Sat Jan 11 2014 23:42:32 EST	Sat Jan 11 2014 23:51:59 EST		
+	<a href="#">gilt</a>	3.45.10	in_production		<a href="#">prod_scanner</a>	Sat Jan 11 2014 13:54:52 EST	Sat Jan 11 2014 13:56:56 EST		
+	<a href="#">svc-rogue</a>	2.3.0	abandoned	svc5	<a href="#">wchiong@gilt.com</a>	Sat Jan 11 2014 12:43:05 EST			
+	<a href="#">svc-rogue</a>	2.3.0	abandoned	svc5	<a href="#">wchiong@gilt.com</a>	Sat Jan 11 2014 10:23:45 EST			
+	<a href="#">web-mosaic</a>	0.1.56	in_production		<a href="#">rcaloras@gilt.com</a>	Fri Jan 10 2014 17:51:51 EST	Fri Jan 10 2014 18:47:46 EST		
+	<a href="#">svc-ioncannon</a>	0.15.5	faulty		<a href="#">kscaledf@gilt.com</a>	Fri Jan 10 2014 17:20:50 EST			
+	<a href="#">svc-rogue</a>	2.3.0	abandoned	svc5	<a href="#">wchiong@gilt.com</a>	Fri Jan 10 2014 17:18:59 EST			
+	<a href="#">web-mosaic</a>	0.1.56	released		<a href="#">rcaloras@gilt.com</a>	Fri Jan 10 2014 16:21:33 EST			
+	<a href="#">svc-ioncannon</a>	0.15.4	released		<a href="#">kscaledf@gilt.com</a>	Fri Jan 10 2014 15:44:14 EST			

# On Dev/Integration Environments

- The hardware is not strong enough
- No one wants to compile 20 services
- Service Dependencies



# EACH TEAM HAS A STAGING ENV

```
SERVICE_PORTS=[  
    4001, #listing-service  
    8235, #svc-user-set  
    9420, #svc-free-fall  
    7895, #svc-Loyalty  
    8155, #web-loyalty  
    9410, #web inventory status  
    7898, #admin-loyalty  
    7899, #notification  
    7102, #rouge  
    9530, #svc-component
```



# STAGING DIFFICULTIES:

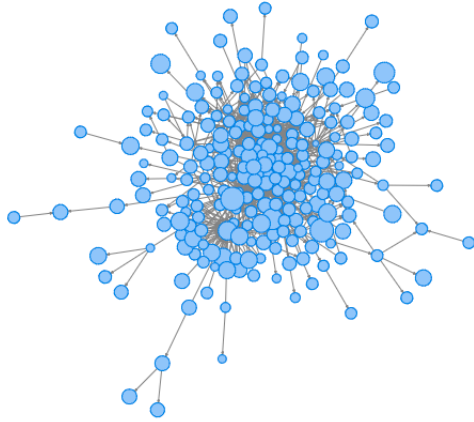
- Hard to keep all the services up to date
- Maxed our staging env capacities
- Requires to have internet connection for some of the services (e.g LOSA-apps)

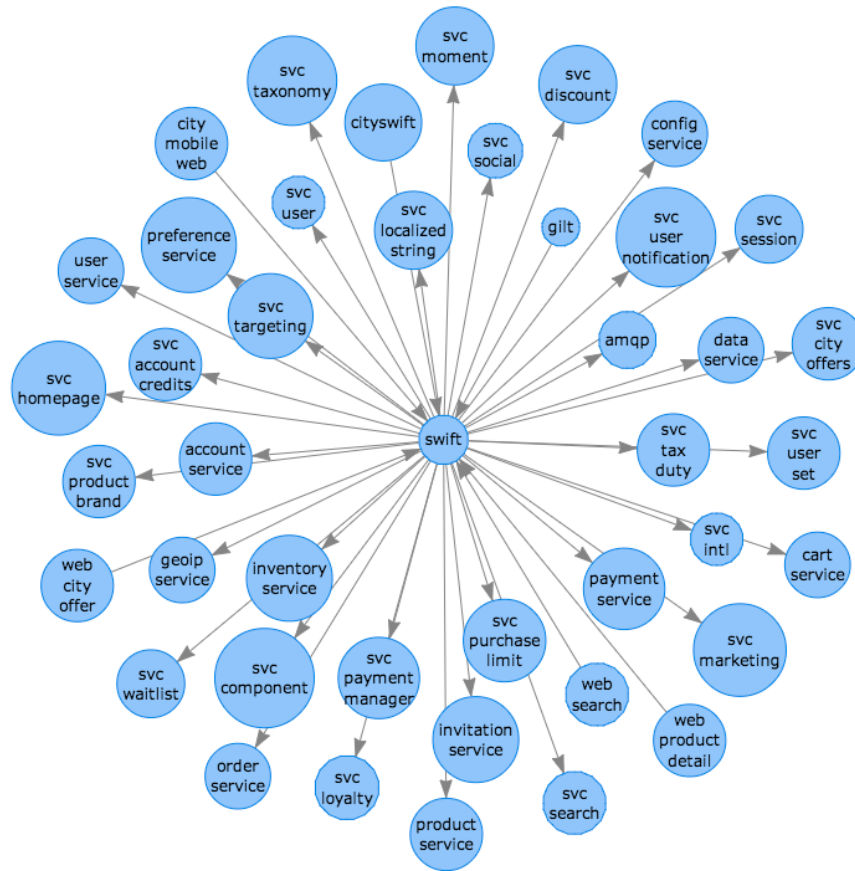
# Dependency Fun [Demo]

Repositories (\* to graph all)

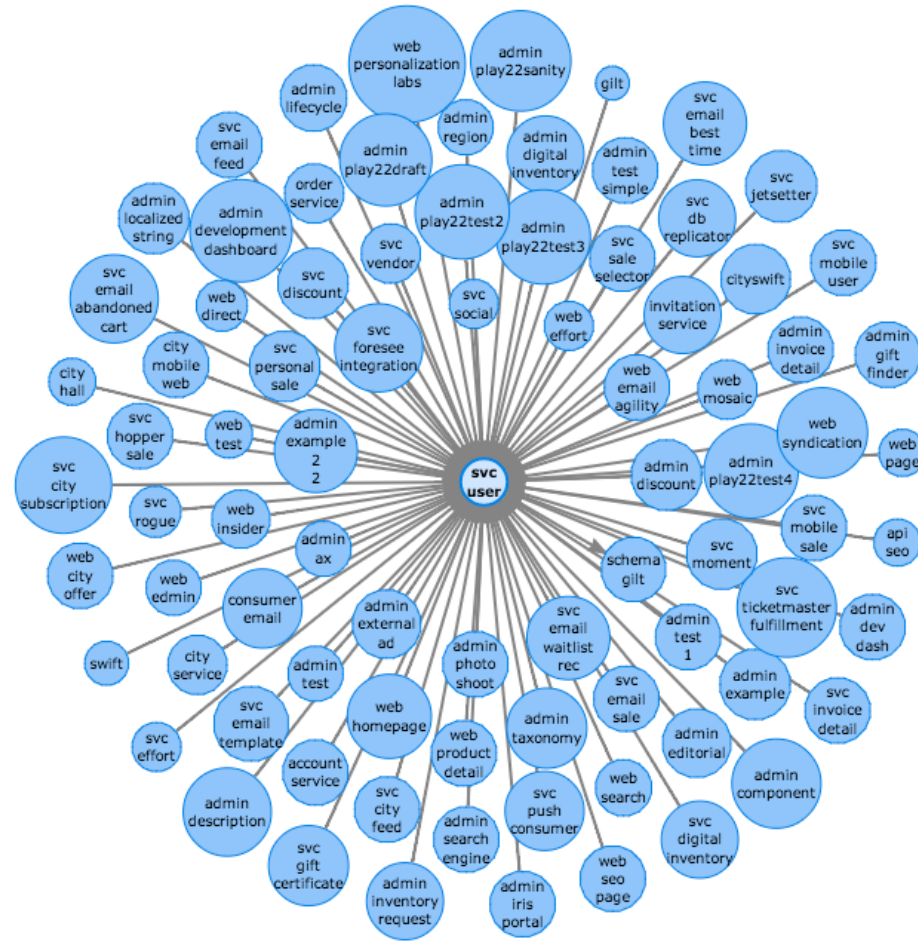
Configure Physics

Generate dependency graph



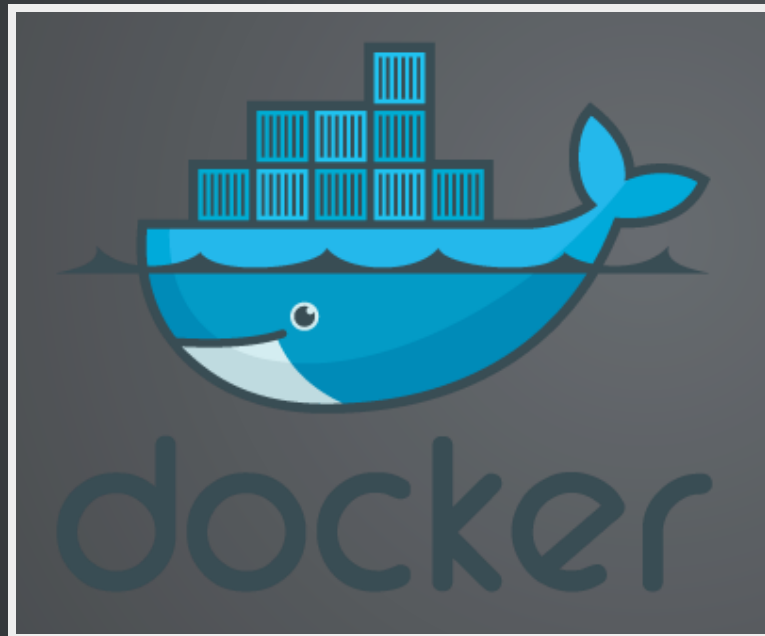


Generate dependency graph



# THE FUTURE

## GO Reactive





# Docker

## An extension to Linux Containers (LXC)

- Decentralization
- Simple Configurations
- Much lighter than a VM
- Immutable
- Supports multiple platforms

# ON OWNERSHIP

*"code stays much longer than people" - SB*

# CODE OWNERSHIP

# CURRENT APPROACH

- Code Review!Code Review!Code Review!
- Team owns services, not individual developers
- Ownership transfer

# {OpenGrok

"A wicked fast source browser"

```
199 base = file("client"),
200 dependencies = clientDependencies,
201 settings = scalaVersionSetting ++ Seq(
202   libraryDependencies ++= clientDeps
203 ) ++ gill.CommonsTestSupport.settings ++ additionalSettings ++ additionalClientSettings,
204 configurations = gill.CommonsTestSupport.configurations ++ additionalConfigurations ++ additionalClientConfigurations
205 )
206 }
207
208 trait ClientServerCoreJobProject extends ClientServerCoreProject {
209   self: ClientServerCoreJobDeps =>
210
211   override lazy val components: Seq[ProjectReference] = Seq(core, server, client, job)
212   lazy val jobDependencies: Seq[ClasspathDep[ProjectReference]] = Seq(server, server % "test->test")
213   lazy val additionalJobSettings: Seq[Setting[_]] = Seq.empty
214   lazy val additionalJobConfigurations: Seq[Configuration] = Seq.empty
215
216   lazy val job = rpmProject(
217     id = "%s-job".format(name),
218     base = file("job"),
219     dependencies = jobDependencies,
220     settings = scalaVersionSetting ++ Seq(
221       libraryDependencies ++= jobDeps,
222       gill.IonCannon.track := ioncannonTrack,
223       gill.RpmKeys.rpmTargetType := gill.RpmTargetType.Job
224     ) ++ additionalSettings ++ additionalJobSettings,
225     configurations = additionalConfigurations ++ additionalJobConfigurations
226   )
227 }
228
229 def clientProject(id: String)
```

```
199 base = file("client"),
200 dependencies = clientDependencies,
201 settings = scalaVersionSetting ++ Seq(
202   libraryDependencies ++= clientDeps
203 ) ++ gill.CommonsTestSupport.settings ++ additionalSettings ++ additionalClientSettings,
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218     base = file("job"),
219     dependencies = jobDependencies,
220     settings = scalaVersionSetting ++ Seq(
221       libraryDependencies ++= jobDeps,
222       gill.IonCannon.track := ioncannonTrack,
223       gill.RpmKeys.rpmTargetType := gill.RpmTargetType.Job,
224       gill.RpmKeys.rpmUser := "web"
225     ) ++ additionalSettings ++ additionalJobSettings,
226     configurations = additionalConfigurations ++ additionalJobConfigurations
227   )
228 }
229
230 def clientProject(id: String)
```

Kevin Scaldeferri Jan 9 1:30 PM  
I guess I expected you were going to do this in GiltRpm, choosing the user based on the rpmTargetType. There's a handful of projects setting the rpmTargetType to Job, but not using ClientServerCoreJobProject, so this won't help them out.

[Reply](#) [Done](#)

Sean Smith Jan 9 5:30 PM

I was debating it, but there was the suggestion that doing it here and have people upgrade to this template might be more straightforward. Of the projects using rpmTargetType of Job, it looks like at least one is using it in error, and most of the rest should actually be upgraded to use the ClientServerCoreJobProject template.

But I can resume my crack at it with GiltRpm, as it would give all those projects the benefit with only upgrading the gill-sbt-build version.

[Reply](#) [Done](#)

Kevin Scaldeferri Jan 9 7:07 PM

The counter argument is that there's at least 2 job projects which aren't bundled with a client-server-core. I don't think we should assume that jobs only come as a package.

[Reply](#) [Done](#)

```
224 ) ++ additionalSettings ++ additionalJobSettings,
225 configurations = additionalConfigurations ++ additionalJobConfigurations
226 }
227 }
228 }
229
230 def clientProject(id: String)
```

Change-Id: I0e7e24da2ea8916f7f7f3a7959ee1a91203edceb

Owner Jonathan Goldberg

Project [schema-gilt](#)

Branch master

Topic

Uploaded Dec 23, 2013 6:51 PM

Updated Jan 6, 2014 12:55 PM

Status Merged

**Commit Message** [Permalink](#)

**POPEYE-2055: adding triggers to validate the conversion of broadcast/hopper/broadcast**

- A trigger that prevents changing the hopper\_sale\_id once a sale started
- A trigger that prevents soft deleting a sale\_hopper\_queue once the sale has been replicated

Change-Id: I0e7e24da2ea8916f7f7f3a7959ee1a91203edceb  
 Reviewed-on: <https://gerrit.gilt.com/32187>  
 Tested-by: jenkins bot <jenkins@hudson.qa.corp.gilt.com>  
 Reviewed-by: Michael Bryzek <mbryzek@gilt.com>

Reviewer	Verified	Code-Review
Jonathan Goldberg		
Miguel Fajardo		
Kevin Hyland		
Anthony Manfredi		
Ryan Martin		
Michael Bryzek		✓
jenkins bot	✓	

► Included in

► Dependencies

Reference Version:  ▾

- Patch Set 1 [c3bd39bbd4dc10a2d03193effe8c8547e107477f](#) (gitweb)
- Patch Set 2 [20a98cb5106eea1800d77a77d8c9d1155bb11dfb](#) (gitweb)
- Patch Set 3 [d7632fd014a39f5d2ddd75c8e822d08ecbf6cbb0](#) (gitweb)
- ▼ Patch Set 4 [e532ac194e4c3f3bb1f3aed86129baf3c99f8ae3](#) (gitweb)

**Author** Jonathan Goldberg <jgoldberg@gilt.com> Dec 23, 2013 6:49 PM

**Committer** Michael Bryzek <mbryzek@gilt.com> Jan 6, 2014 12:55 PM

**Parent(s)** [05700c1e58f9526c4fdd16f2bf680dba8505b265](#) SCHEMAGILT-763: Drop empty, unused shipping cutoff tables

**Download** [checkout](#) | [pull](#) | [cherry-pick](#) | [patch](#) | [SSH](#) | [HTTP](#) | [git fetch ssh://jgoldberg@gerrit.gilt.com:29418/schema-gilt refs/changes/87/32187/4 && git checkout FETCH\\_HEAD](#)

File Path	Comments	Size	Diff	Reviewed
► Commit Message			Side-by-Side	Unified



# DATA OWNERSHIP

# WE TRANSITIONED TO MICRO-DBS

Third of the services have their own  
MongoDB | Postgres | Voldemort

# MANAGE MICRO-RELATIONAL DBS

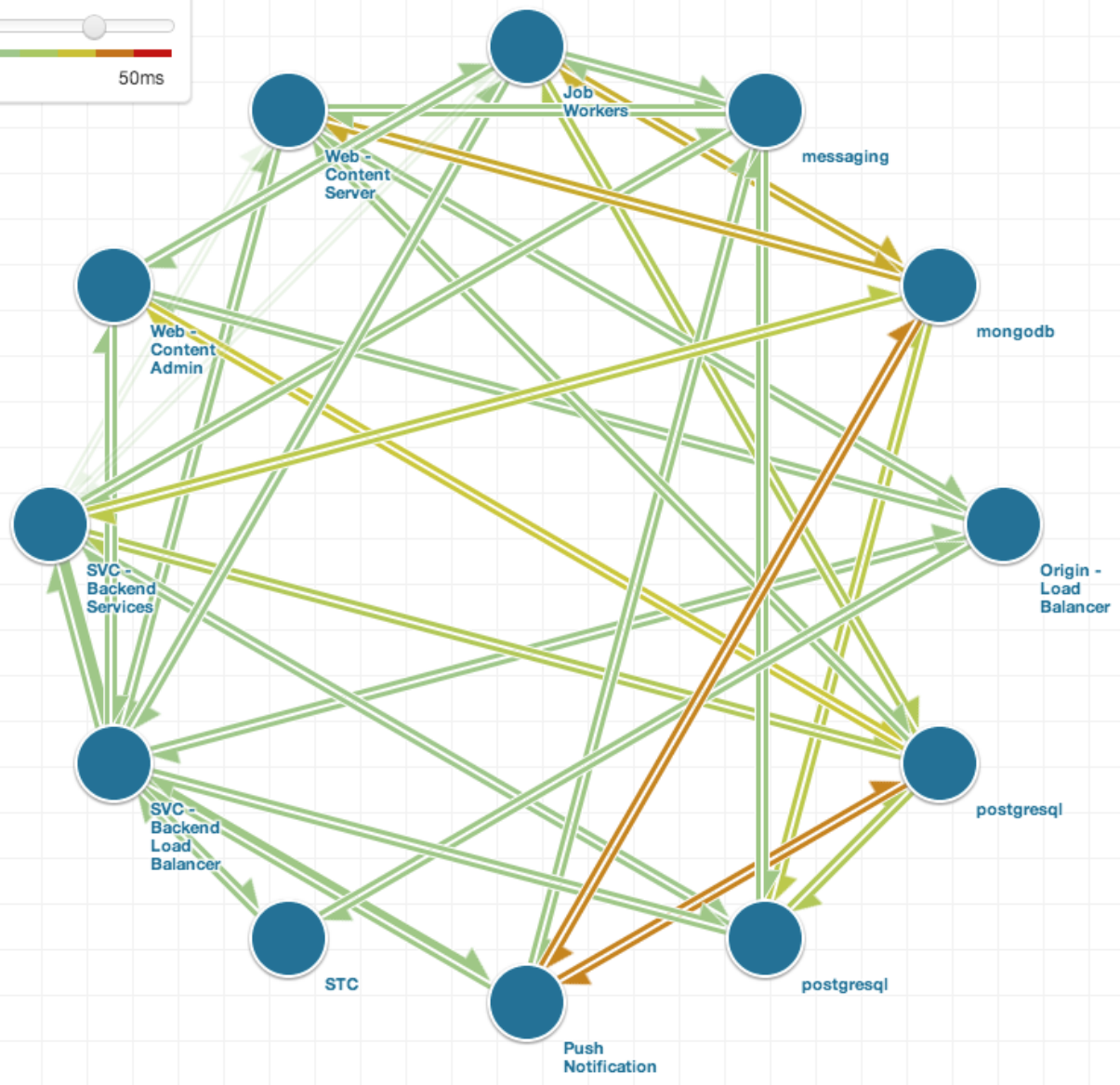
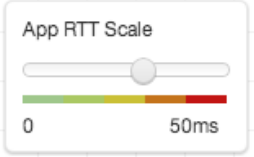
## SCHEMA EVOLUTION MANAGER

[https://github.com/gilt/schema-  
evolution-manager](https://github.com/gilt/schema-evolution-manager)

# PRINCIPLES OF SCHEMA EVOLUTION MANAGER

- Can manage the schema evolutions in a Git repo
- Schema changes are deployed as tar files
- No rollbacks
- Schema changes are required to be incremental

# ON MONITORING

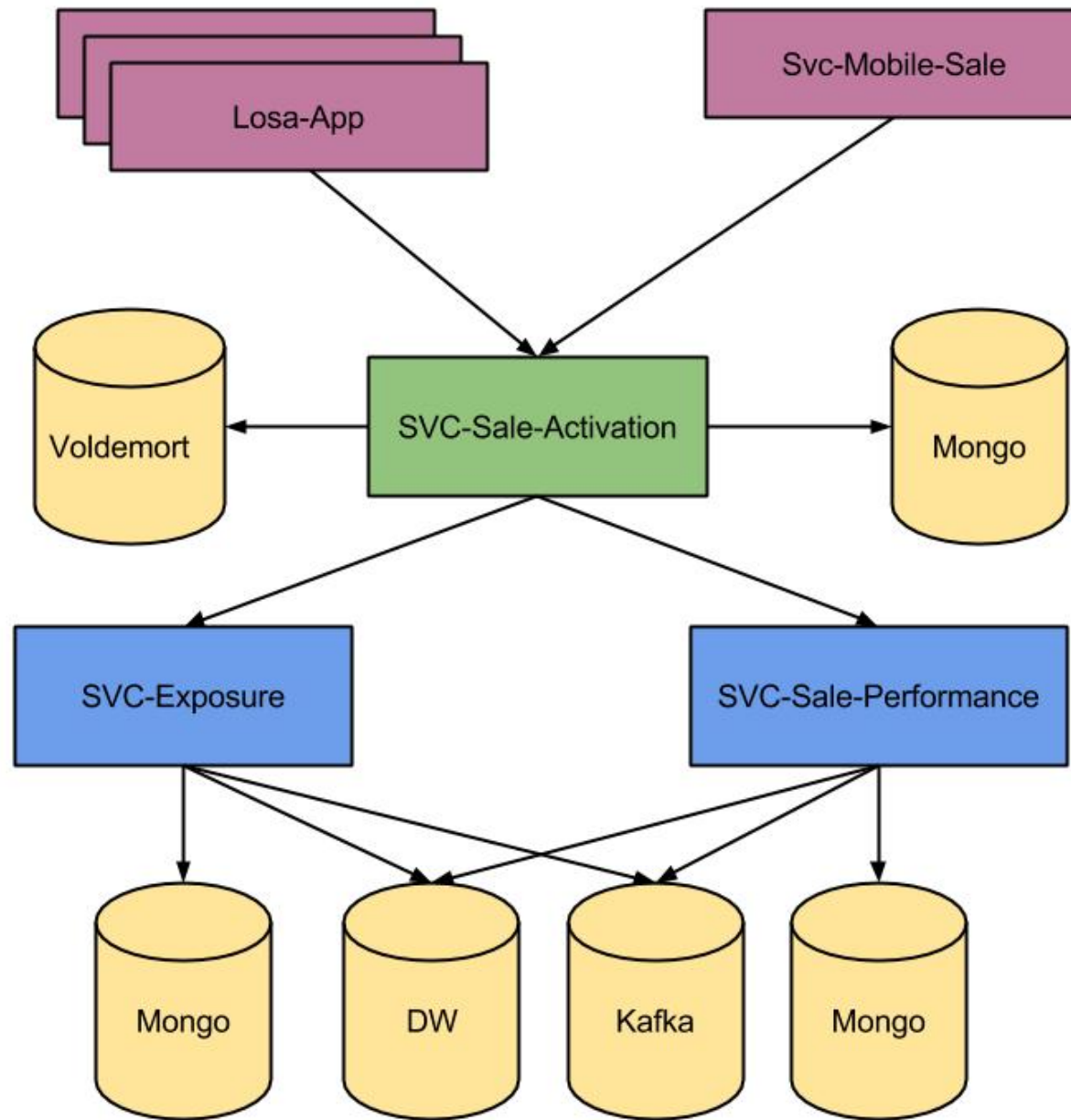


# THE TOOLS WE USE



graphite / openTSDB





Here are some of the greatest things I've mentioned for examples:

# New Relic

Help **giltgroup**  
Ent. App. / Mobile Lib 10

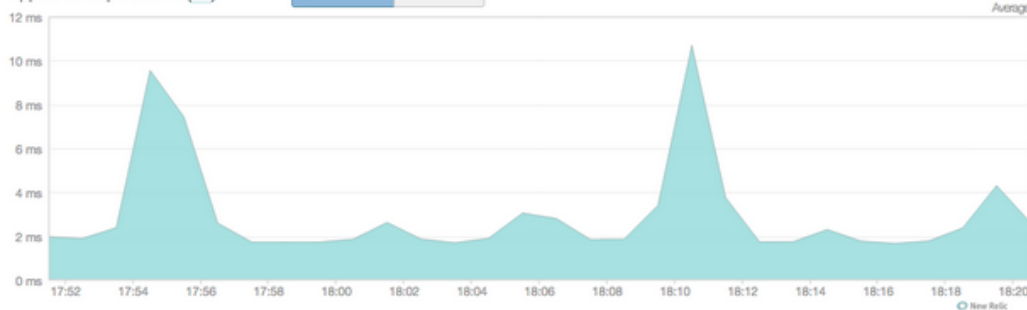
## Applications **svc-exposure**

Monitoring Events Reports Settings

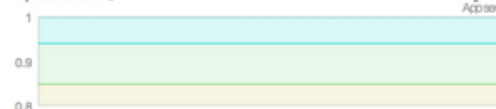
JVMs All JVMs (4) Last 30 minutes Ending now

Transactions Overview Map Web transactions External services JVMs Background tasks Geography Browsers

### App server response time (ms)



### Apdex score



### Throughput (rpm)



### Web transactions

Transaction	App server time
/svc-exposure/1.0/system/has_sale_exposure	2,270 ms
App server traces: <a href="#">2</a> <a href="#">3</a>	
/svc-exposure/1.0/raw/sale_exposure/{userGuid}	2,86 ms
App server traces: <a href="#">0</a> <a href="#">0</a> <a href="#">0</a>	

### Error rate



Compare with yesterday and last week

### Recent events

- TODAY**
- 17:49 ioncannon deployed revision 0.0.44 [Details](#)
- LAST WEEK**
- 20:15 12/04 ioncannon deployed revision 0.0.43 [Details](#)
- 20:14 12/04 ioncannon deployed revision 0.0.43 [Details](#)
- 10:40 12/04 ioncannon deployed revision 0.0.42 [Details](#)
- 9:55 12/04 ioncannon deployed revision 0.0.42 [Details](#)

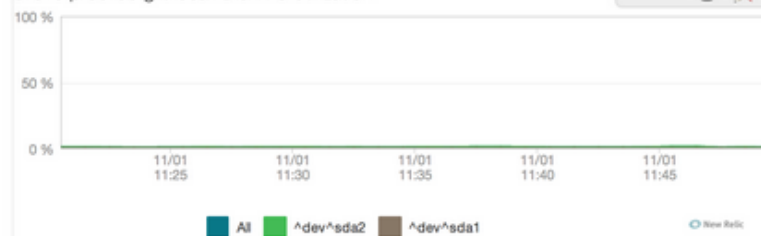
### 4 servers

Server	Apdex	Resp. time	Throughput	Error Rate	CPU usage	Memory
svc1.prod.iad.gilt.local 1 instance	1.00s	1.6 ms	396 rpm	0 %	2 %	2 GB
svc17.prod.iad.gilt.local 1 instance	1.00s	5.96 ms	394 rpm	0 %	3 %	2 GB
svc18.prod.iad.gilt.local	1.00s	2.61 ms	397 rpm	0 %	2 %	2 GB

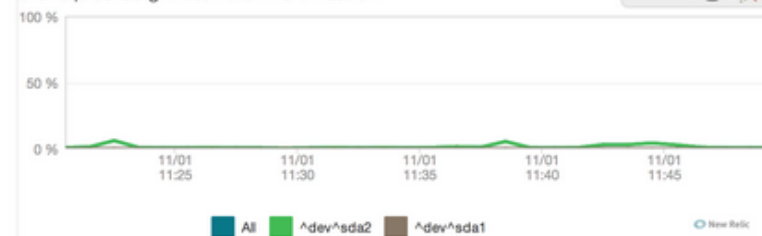
Apps	Response time	Throughput	Errors
Mercury Search Service	0 ms	0 rpm	0.00%
svc-hopper-sale (svc17.prod.iad.gilt.local)	59.8 ms	687 rpm	0.352%
svc-loyalty (svc17.prod.iad.gilt.local)	6.59 ms	3,000 rpm	0%
Preference Service (svc17.prod.iad.gilt.local)	5.41 ms	4,550 rpm	0.0004%
Solr Search Service (svc17.prod.iad.gilt.local)	84.2 ms	337 rpm	0.0791%
Config Service Server (svc17.prod.iad.gilt.local)	64 ms	503 rpm	0%
Syndication Service (svc17.prod.iad.gilt.local)	6.58 ms	300 rpm	0.467%
Seo Service (svc17.prod.iad.gilt.local)	23.1 ms	45.9 rpm	0.0724%
svc-waitlist (svc17.prod.iad.gilt.local)	19.7 ms	214 rpm	0%
svc-cart-activity (svc17.prod.iad.gilt.local)	1.65 ms	3.05 rpm	0.546%
svc-payment-manager (svc17.prod.iad.gilt.local)	66.2 ms	35.9 rpm	0.603%
svc-log-agent (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-user-group (svc17.prod.iad.gilt.local)	11 ms	0.05 rpm	0%
svc-product-category (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-persistent-session (svc17.prod.iad.gilt.local)	8.14 ms	925 rpm	0%
svc-email-feed (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-redemption (svc17.prod.iad.gilt.local)	61.6 ms	0.583 rpm	14.3%
svc-city-external (svc17.prod.iad.gilt.local)	1.7 ms	0.0167 rpm	0%
svc-size-preference (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-product-performance (svc17.prod.iad.gilt.local)	26.7 ms	3.55 rpm	123%
svc-digital-asset-management (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-admin (svc17.prod.iad.gilt.local)	58.8 ms	0.0667 rpm	0%

svc-subscription (svc17.prod.iad.gilt.local)	73.3 ms	0.967 rpm	0%
svc-hashed-user-guid (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-subscription-set (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-publish-message (svc17.prod.iad.gilt.local)	41.6 ms	5 rpm	0%
svc-user-set (svc17.prod.iad.gilt.local)	4.69 ms	3,500 rpm	0.0052%
svc-ip-allocation (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
Data Service (svc17.prod.iad.gilt.local)	18.5 ms	14.6 rpm	0%
svc-homepage (svc17.prod.iad.gilt.local)	21.4 ms	2,850 rpm	0.0006%
svc-admin-authorization (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-vendor (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%
svc-waitlist (svc17.prod.iad.gilt.local)	19.7 ms	214 rpm	0%
svc-cart-activity (svc17.prod.iad.gilt.local)	1.65 ms	3.05 rpm	0.546%
svc-payment-manager (svc17.prod.iad.gilt.local)	66.2 ms	35.9 rpm	0.603%
svc-log-agent (svc17.prod.iad.gilt.local)	0 ms	0 rpm	0%

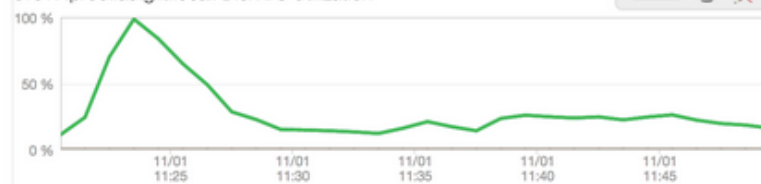
svc15.prod.iad.gilt.local: Disk I/O utilization



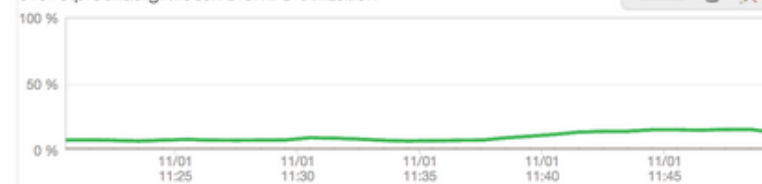
svc16.prod.iad.gilt.local: Disk I/O utilization

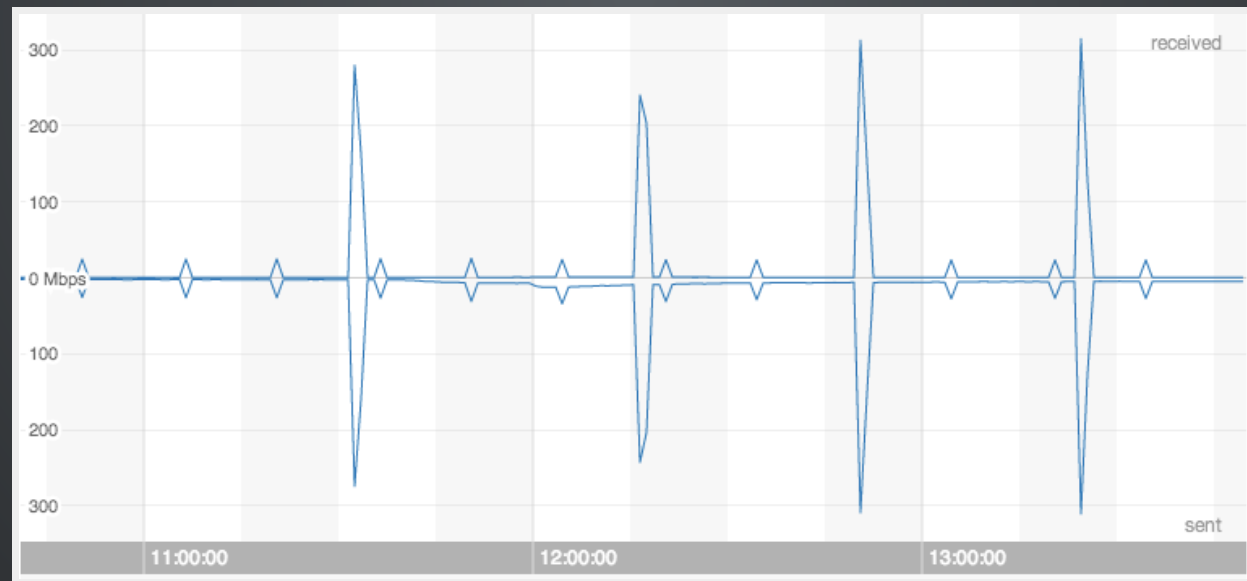
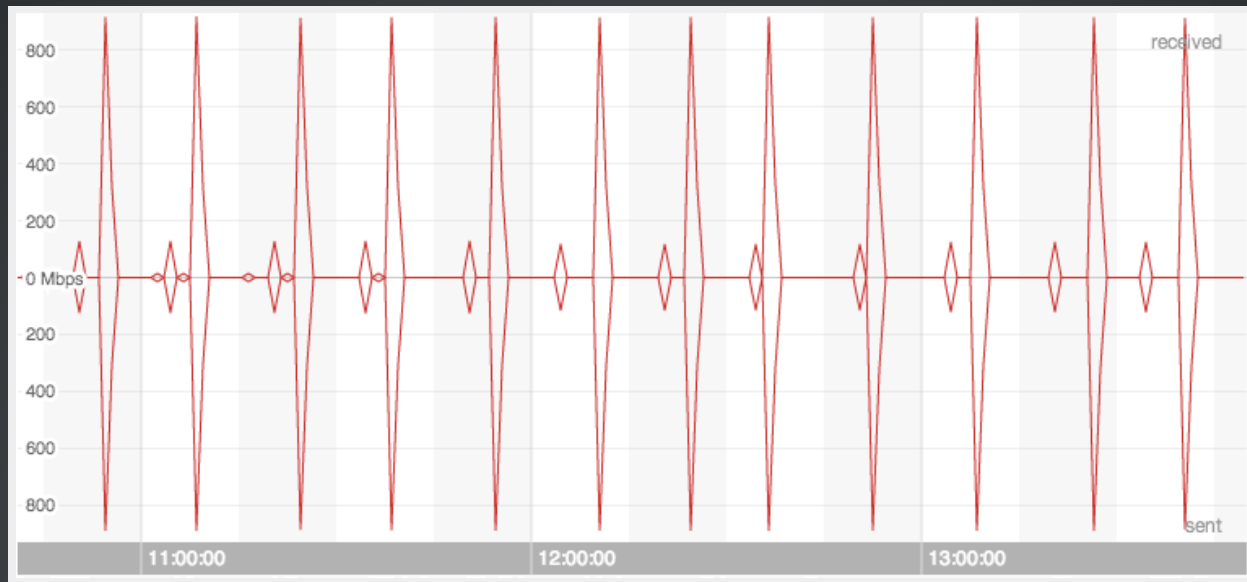


svc17.prod.iad.gilt.local: Disk I/O utilization



svc18.prod.iad.gilt.local: Disk I/O utilization





# Cheat Sheet

- Your organization has > 30 developers
- Deployments and integrations are difficult [You need a team for that]
- You can abstractly separate features and parts of your site
- Special hardware or performance needs for some features



# MAIN TAKEAWAYS

- Simplicity - Do you really need it?
- MicroServices promise works for most cases
- As of 2014 - You will need to invest in Tools
- We feel that it was the right choice for us

**WHAT'S NEXT ?**

**BUILD YOUR NEXT FEATURE  
IN A NEW SERVICE**

# QUESTION TIME

We are hiring...

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**SCALA BREAK**

# Why switch to Scala from Java

- Object-Functional Programming
- Akka
- Immutability that leads to easier concurrency
- Great libraries: like Salat, Scalaz
- Less boilerplate code - e.g Case classes, App
- Scala's Collections

- Traits
- Cake Pattern
- Console
- SBT (in scala, release process)
- Option