



# Case Study - Continuous Deployment at Outbrain

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# Continuous Deployment

- **Outbrain – Few Facts**
- **From Releases to CD**
  - **Culture**
  - **Architecture**
  - **Tools**



**Outbrain enables readers  
to discover the most  
interesting, relevant and  
timely links to stories (paid  
and organic)**



## The Ladder

THE MOST \$100K+ JOBS

## White House defeats recovery chief

By Ed Henry, CNN Senior White House Correspondent  
June 18, 2010 7:07 p.m. EDT

Navy Secretary Ray Mabus has been appointed by Obama to create a plan to help Gulf restoration efforts.

## STORY HIGHLIGHTS

- Environmental group official says Ray Mabus should focus on Gulf 50th anniversary.
- But another calls his appointment great, says "Gulf is in good hands"
- President picked Navy Secretary to create long-term Gulf Coast restoration plan

former governor gave two jobs.

"The president agreed that"

But Cat Lazoff said it will be

"I think our old Lazoff said the person is

Another top Lazoff and part-time be

## RELATED TOPICS

Gulf Coast Oil Spill  
Ray Mabus
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- Obama chooses Navy secretary to lead Gulf recovery efforts
- Day 57: Oil disaster latest developments
- Obama meets with relatives of oil rig blast victims

## We recommend

- Clinton gives Father's Day shout-out to dads, including Bill
- Obama chooses Navy secretary to lead Gulf recovery efforts
- Day 57: Oil disaster latest developments
- Obama meets with relatives of oil rig blast victims

## From around the web

- The Hidden Health Danger of Hand Sanitizers [MainStreet.com](#)
- 27 Bedford County Citizens Inducted Into PA Voter Hall Of Fame [TheStreet](#)
- 8 Things Your Pet Shouldn't Eat [Real Simple](#)
- Windows XP SP2 retirement looms, puts users in tough spot - [Computerworld](#) [Computerworld](#)

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delta.com

MON 6/21/2010

## NewsPulse &gt;

Most popular stories right now

- Chavez asks Interpol to arrest critic [MainStreet.com](#)
- Inmate executed before firing squad [TheStreet](#)
- Anadarko blasts BP for "reckless actions" [Real Simple](#)
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# Widget Customization...

## More from Movies.com



'Mirror Mirror' on the Wall, Which 'Snow White'...



Stephen King's 'The Stand' Poised to Explode on the...



'The Dark Knight Rises' Countdown: The End of the...



Tim Burton and Steven Spielberg Eye New Projects

MOVIES.COM

Watch: 'Breaking Dawn' Premiere, Streaming Live, 5 p.m....

## Around the Web

The Ten Worst Movies Ever Made (Divine Caroline)

Cook a Spanish Tortilla (Home & Garden Ideas)

10 Movies That Predicted the Future (Mainstreet)

PHOTOS: Plot Thickens In Mystery Of Giant Structures In China (The Huffington Post)

Women Dress Inappropriately for Work in Summer, Poll Finds (Fashion Etc.)

What Was Lindsay Lohan Thinking? [PHOTOS] (1025 KCFM - Welcome to KCFM.com)

## DON'T MISS...



Best Fragrance Picks



Best Budget Makeup



BCBG Launches Its First Fragrance in Six Years

## More from CNN Entertainment:



Gosling vs. Cooper: Protests over PEOPLE's Sexiest Man Alive



Demi Moore says she is divorcing Kutcher



Review: 'The Descendants' is a triumph

## From Around the Web



10 Child Stars Who Grew Up To Be Surprisingly Normal (MadameNoire)



News: Kate Middleton Breaks Palace Record (ELLE.com)

## Textos recomendados para você

O que é isso?

08/11/2011

Em clima "stand-up", Pelé cutuca Xuxa, fala sobre Viagra e 1ª vez

18/11/2011

Pelé para Romário: "Já me candidatei a rei e ganhei"

01/11/2011

Carlos Vereza: 'Vi discos voadores e eles sabiam que eram vistos'

## From around the web

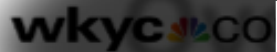
- Overpaid movie actors? Forbes' No. 1 is...
- Jesse James: 'I should have left her'
- Risen from the gutter, he whispers hope to Hollywood's junkies
- Demi Moore and Ashton Kutcher's fighting was 'intense,' says source
- 'Immortals' is No. 1 movie with \$32 million debut
- Obsessions: Lessons we've learned from the 'Twilight' franchise

## From around the web

- My Friends are Spending \$30K on Their Wedding — And I'm Keeping My Mouth Shut (Moneyning.com)
- 9 Things You Can Do to Be Happy in the Next 30 Minutes (Real Simple)
- Economist Who Predicted the 2008 Crash Gives Chilling 2012 Forecast. See the Evidence. (Newsmax.com)
- 10 Tips for Great Posture at Every Age (Health.com)
- Pippa Middleton Shows Lots Cleavage, Susie Bubble's Suitcase and More From Around the Web (Lucky)
- 7 Signs You Should be Single (MadameNoire)

[what's this]





Multi Billion Page Views per month



Note: Outbrain is typically installed on \*every\* article/blog post on each of these sites, immediately under the content

# What is continuous deployment?

Work procedures and culture that allow releasing code to production in very short cycles multiple times a day

```
~ $ svn ci -m"Implementing  
the super-sharp images algo  
#deploy:ImageServer #to:ny
```

"

# What was so bad before ?





# Conclusion

**Reduce Risk:  
Deploy your code Often**



# Conclusion

**Release when you are  
Ready**



# How to do it?

- **Culture**
- **Architecture**
- **Tools**



# HOW



# How does it work?

## Continuously Prioritized Tasks Queues

## Minimize Work In Progress (WIP)





# Continuous Deployment -Culture

## Developers own their tasks



# Continuous Deployment -Culture

Definition of Done:

**Feature was released**  
**Monitoring shows Value**



# **Continuous Deployment - Culture**

## **Focus on Production Environment**



# Continuous Deployment - Culture

- **No Code branches**
- **Frequent commits**
- **Unit testing coverage**
- **Fast**
- **Stable Trunk**



# **Continuous Deployment Themes**

**Deployment - engineering decision**

**Release - marketing decision**





# **Continuous Deployment -Culture**

## **Feature Flags**

# Immune System

**Unit Testing**

**Integration Testing**

**Regression Testing**

**Self Test**

**Monitoring System**

**Alerting**



# Immune System

## Dev-Ops Cooperation



# Continuous Deployment -Culture

**Learn:**

## Take-Ins (Post Mortem)



# Continuous Deployment **Architecture**





# Continuous Deployment

Split the backend to  
**Stand Alone Deployable  
Services**

# Continuous Deployment

## **Build to Tolerate Failures**

# Continuous Deployment

# Tools



# Tools

## Code review



Review Board 1.0.5.1

[All review requests](#) [Groups](#) [Submitters](#)

### Summary: added cassandra self test definition

Updated 2 weeks, 4 days ago

**Submitter:** [Erez Mazor](#)

**Branch:**

**Bugs:**

**Change Number:** None

### Description:

```
(In [56982]) added cassandra self test definition
```

### Testing Done:

# Tools

## Continuous Integration Server

Projects -- TeamCity x Projects -- TeamCity x Document Details x +

[Collapse All](#) | [Expand All](#) 1 build(s) running.

▼ APT (Automatic Production Testing) visibility ▼

▶ APT ▼ Run ...

#25545	Running ▼	No artifacts	No changes ▼	25s left	Stop
#25544	Tests passed: 842, ignored: 32 ▼	No artifacts	No changes ▼	25 Jun 11 23:25 (1m:11s)	

▶ HOURLY APT ▼ Run ...

#4052	Tests passed: 125, ignored: 2 ▼	No artifacts	No changes ▼	25 Jun 11 22:40 (35s)	
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▼ Outbrain visibility ▼

▶ The Super Trunker ▼ Run ...

#6058	Tests passed: 2756, ignored: 111 ▼	No artifacts	nathan (1) ▼	24 Jun 11 15:34 (4m:07s)	
-------	------------------------------------	--------------	--------------	--------------------------	--

▶ Trunk - coverage (no integration testing) ▼ Run ...

#36	Tests passed: 2663, ignored: 110 ▼	Artifacts ▼	Changes (2) ▼	25 Jun 11 12:15 (30m:55s)	
-----	------------------------------------	-------------	---------------	---------------------------	--

▶ Trunk - Integration testing (+ coverage) ▼ Run ...

#755	Tests passed: 2787, ignored: 117 ▼	Artifacts ▼	Changes (2) ▼	25 Jun 11 12:46 (32m:15s)	
------	------------------------------------	-------------	---------------	---------------------------	--

▶ Trunk Deployment ▼ Pending (6) ▼ Run ...

#1505	Tests passed: 1151, ignored: 45 ▼	No artifacts	Changes (2) ▼	23 Jun 11 11:40 (5m:02s)	
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▼ Selenium visibility ▼

▶ Selenium Daily ▼ Pending (2181) ▼ Run ...



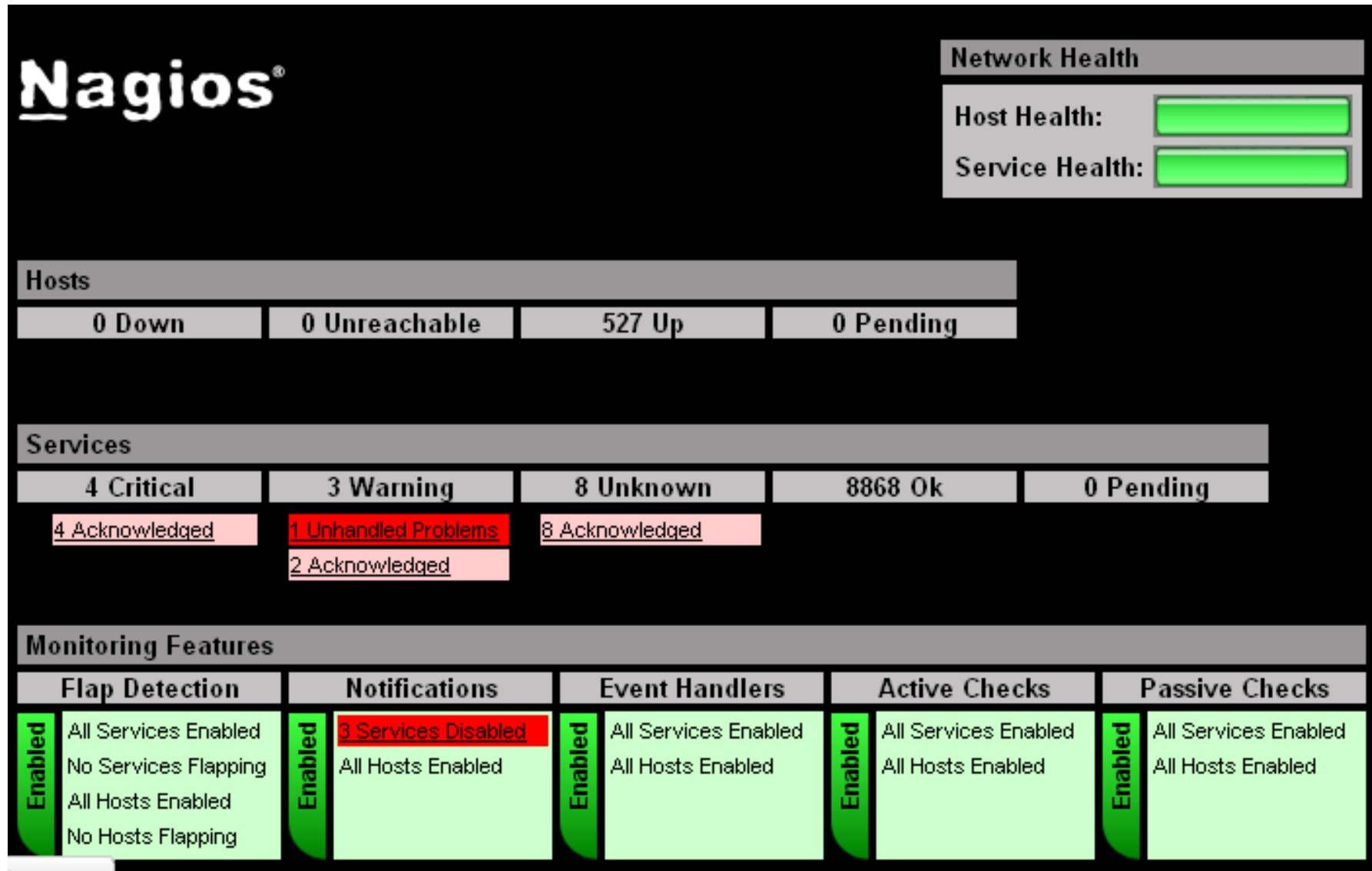
# Tools

## Regression Testing




# Tools

## Monitoring



# Tools

## Log collection and Analysis



# GRAYLOG2

messages streams analytics hosts blacklists settings

users

Show Rules Forwarders Analytics Settings

Quickfilter

## Stream Errors

Click to set description.

Date	Host	Sev.	Facility	Message	
2012-05-20 06:43:01.0	ob1204	Error	user-level	ERROR got exception while sening reschedule Request org.springframework.web.client.HttpServerErrorException: 504 Gateway Time-out  at org.springframework...	
2012-05-20 06:43:01.0	ob1204	Error	user-level	ERROR got exception while sening reschedule Request org.springframework.web.client.HttpServerErrorException: 504 Gateway Time-out  at org.springframework...	
2012-05-20 06:43:01.0	ob1207	Error	user-level	ERROR got exception while sening reschedule Request org.springframework.web.client.HttpServerErrorException: 504 Gateway Time-out  at org.springframework...	
2012-05-20 06:43:00.0	ob1207	Error	user-level	ERROR got exception while sening reschedule Request org.springframework.web.client.HttpServerErrorException: 504 Gateway Time-out  at org.springframework...	
2012-05-20 06:43:00.0	ob1204	Error	user-level	ERROR got exception while sening reschedule Request org.springframework.web.client.HttpServerErrorException: 504 Gateway Time-out  at org.springframework...	
2012-05-20 06:42:59.0	ob1204	Error	user-level	ERROR got exception while sening reschedule Request org.springframework.web.client.HttpServerErrorException: 504 Gateway Time-out  at org.springframework...	

# Tools

## Deployer – Based on Glu

```
~ $ svn ci -m"Implementing  
the super-sharp images algo  
#deploy:ImageServer #to:ny  
"
```



Services: ImageServer,WebStemmer

Tags: test,stg

Version: latest

Who are you? ran

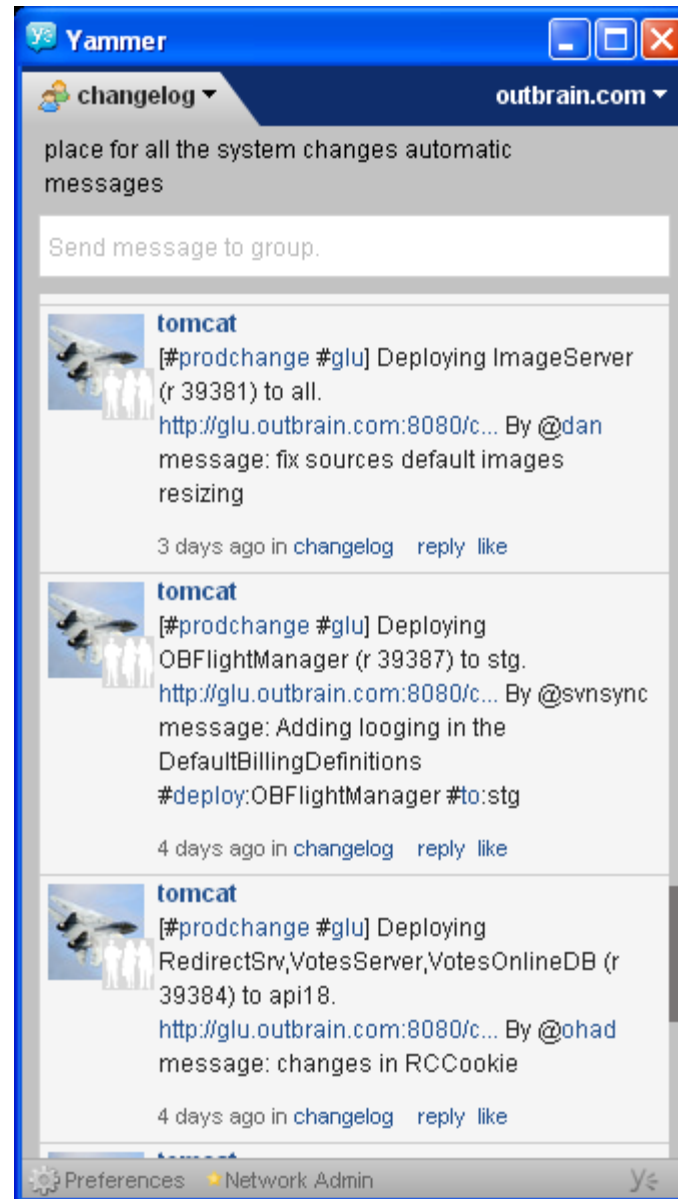
Message: Testing the new image stemming algorithm

Will be used for yammer

Submit To TeamCity

# Tools

## Communication - Yammer



# Tools

## Service monitoring

outbrain

### Service Monitoring

[Test Environment](#)

Service Monitoring				
Service ▲	Valid Machines	Revision Number	Days Since last Release	Errors
▶ AdMarket	2 / 2	57804	6 days	
▶ AdMarketDashboard	2 / 2	58103	4 days	
▲ AdminSite	2 / 2	58115	3 days	
admin1.nydc1.outbrain.com		58115	3 days	
stgweb1.nydc1.outbrain.com		58115	3 days	
▶ AdsEngine	17 / 17	58026	4 days	
▶ AdsReviewer	6 / 6	57875	5 days	
▶ BackendUtils	15 / 15	57244	13 days	
▶ BehavioralEngine	4 / 4	57393	11 - 12	Different versions found between machines
▶ BloggerUtils	6 / 6	57758	6 days	
▶ CacheWarmer	25 / 25	58096	4 - 6	Different versions found between machines
▶ Cassie	1 / 1	57586	9 days	
▶ Categorization	7 / 7	58186	today	Different versions found between machines
▶ CrawlerSpawn	3 / 3	57602	9 days	
▶ DoctorWho	1 / 1	57872	5 days	



# Fun Numbers

- 5-50 production changes a day!!!
- More then 5000 unit tests running in less then 5 minutes.
- More then 8000 regression tests running every hour.
- It takes ~15 minutes from code complete to ~50 machines deployed.

