

CI From the trenches

Julian Simpson, www.build-doctor.com

ESP



Who am I?



What is CI?



<http://flickr.com/photos/oberazzi/318947873>

... members of a team integrate their work frequently ...

Each integration is verified by an automated build
(including test)

Developers

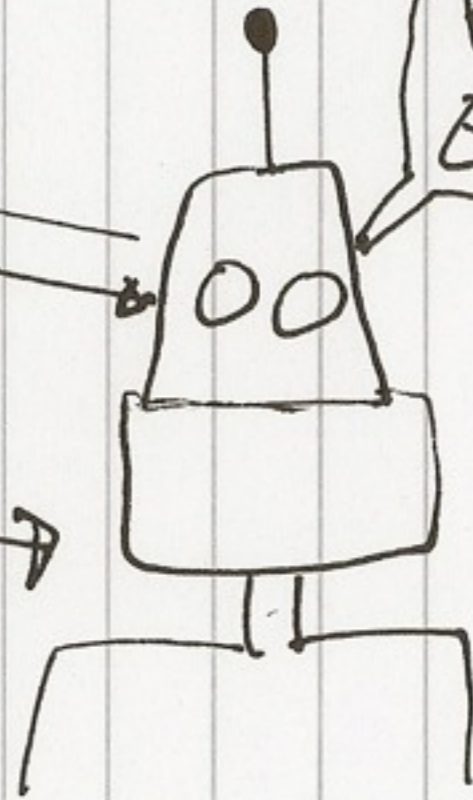


Version Control



or Perforce.
or GIT.

CI Robot



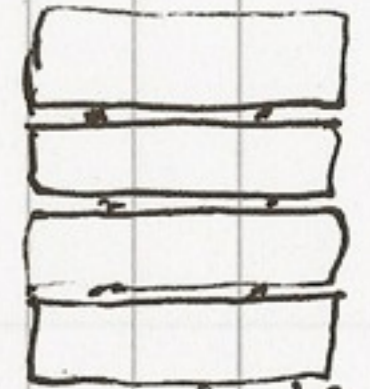
Red build.
Exterminate!

polls

updates

updates

commits



artifacts.



Dashboard Server : muscat.juliansimpson.org



Dashboard


Builds


Administration





Summary

5 project build(s)

 2 project build(s) failed

 3 project build(s) succeeded


 0 project(s) building


 2 project(s) discontinued


 0 project(s) inactive

60% of projects passing

Tools

 [RSS Feed](#)

 [for CCTray](#)

 [for CC-Config](#)

What's this talk about?

Sharing



<http://flickr.com/photos/imagesbyk2/27263706/>

Sharing with a lamp



<http://flickr.com/photos/igb/>

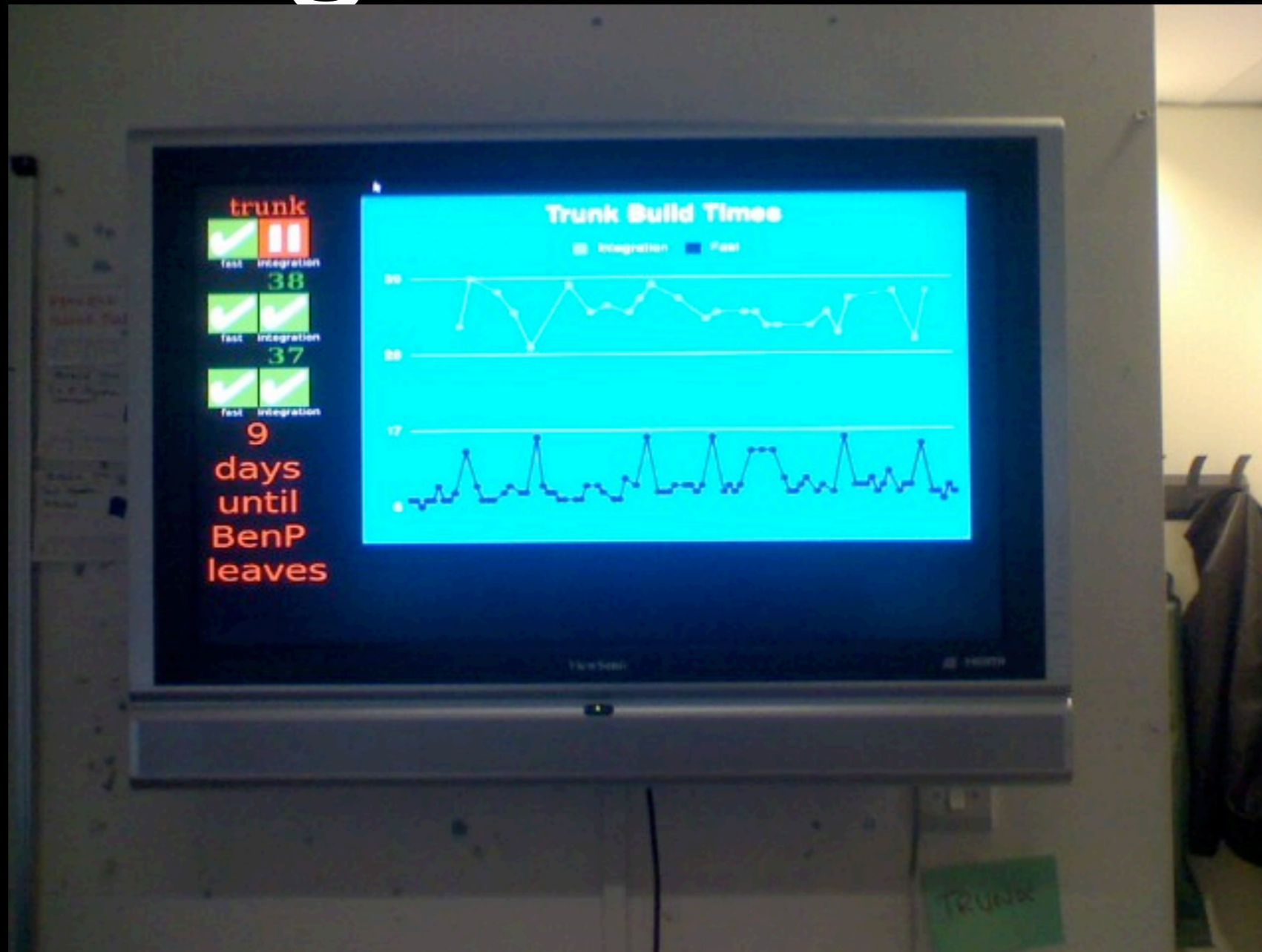
Wednesday, 11 March 2009

Sharing with a rabbit



<http://flickr.com/photos/enfad/>

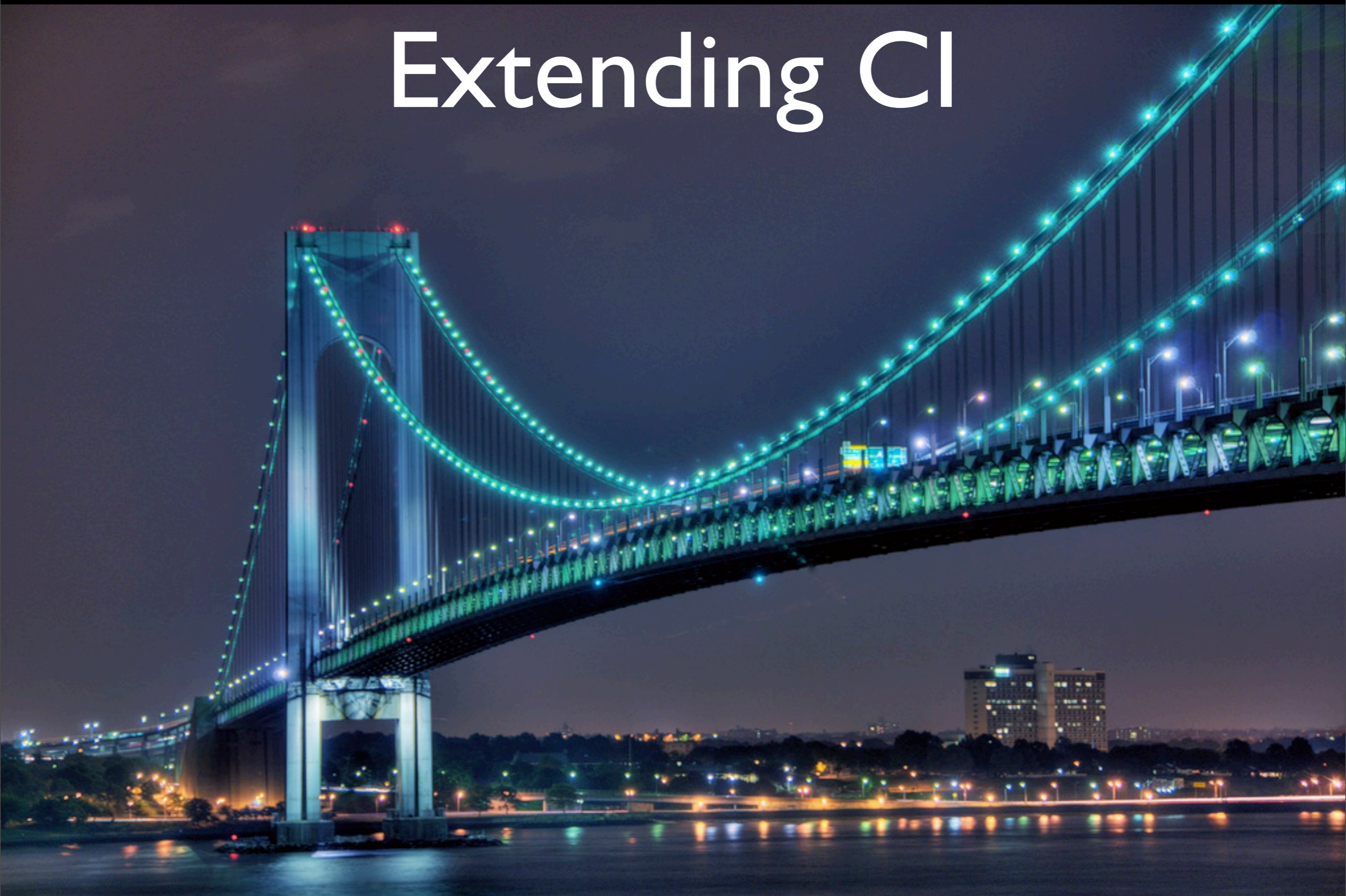
Sharing with a radiator



<http://www.flickr.com/photos/mibgames>

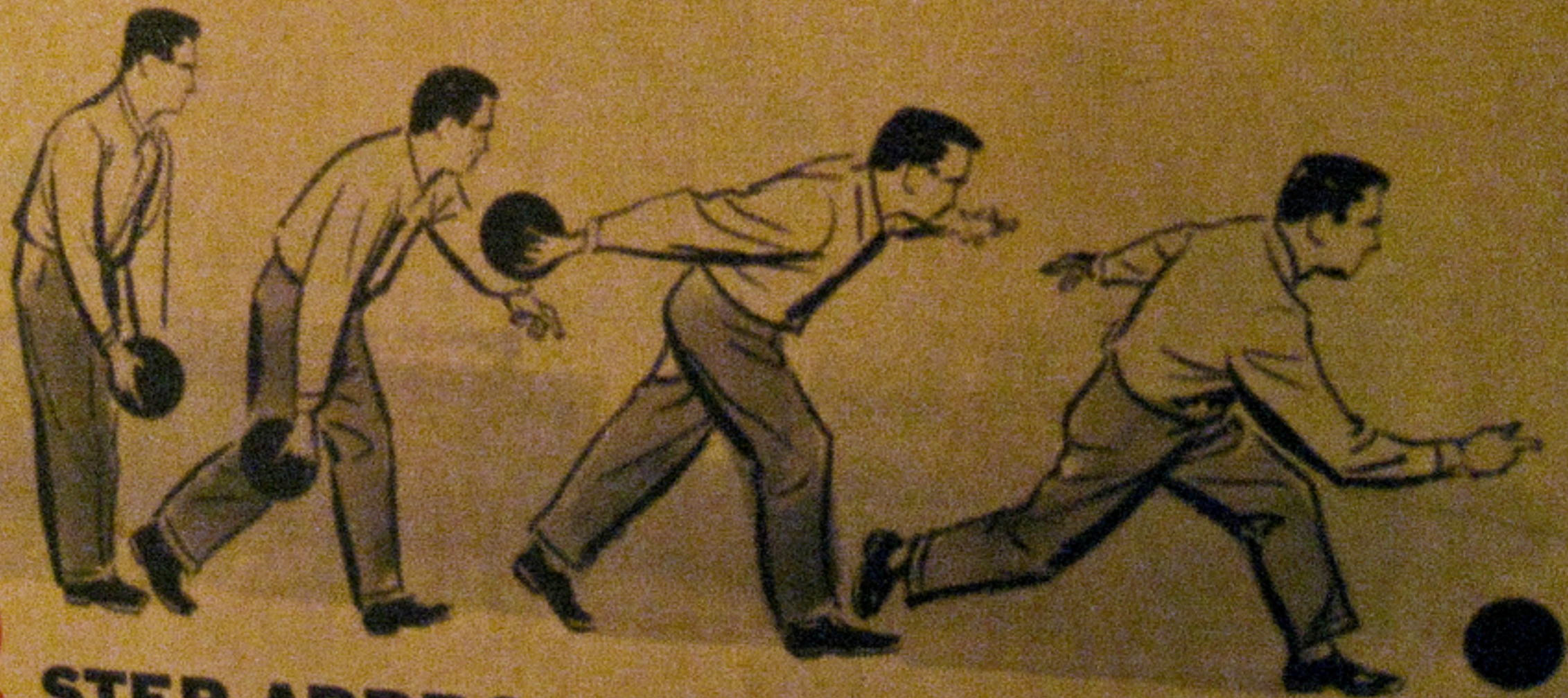
- http://github.com/betarelease/cc_monitor
- <http://code.google.com/p/tattletail/>
- <http://code.google.com/p/bigvisiblecruise/>
- <http://www.nabaztag.com>

Extending CI



<http://flickr.com/photos/yukonblizzard/>

Extending Cl: Release Management



THE **3** STEP APPROACH

<http://flickr.com/photos/adrianclarkmbbs/>

Release Management: Build label

Server : ccweb01.thoughtworks.com

Dashboard

Builds



cce-release-jdk1.6 Passed

Build Time: 12 Aug 2008 08:20 GMT -05:00

Build: build.72

Artifacts

Modifications

Build Log

Tests

Errors and Warnings




















Artifacts

No artifacts found

Release Management: VCS label

WHY
TAG
SUCKS

<http://flickr.com/photos/rbrwr/>

- ▶  build
- ▼  core
 - ▶  branches
 - ▼  tags
 - ▶  ANT_11
 - ▶  ANT_12
 - ▶  ANT_13
 - ▶  ANT_13_B1
 - ▶  ANT_13_B2
 - ▶  ANT_13_B3
 - ▶  ANT_13_MAIN_MERGE4
 - ▶  ANT_14
 - ▶  ANT_14_B1
 - ▶  ANT_14_B2
 - ▶  ANT_141
 - ▶  ANT_141_B1
 - ▶  ANT_15_B1
 - ▶  ANT_15_B2
 - ▶  ANT_15_B3

Release Management: labelled deployable



<http://en.wikipedia.org/wiki/>

Index of /maven2/ant/ant/

[../](#)
[1.4.1/](#)
[1.5/](#)
[1.5.1/](#)
[1.5.2/](#)
[1.5.3-1/](#)
[1.5.4/](#)
[1.6/](#)
[1.6.1/](#)
[1.6.2/](#)
[1.6.3/](#)
[1.6.4/](#)
[1.6.5/](#)
[1.7.0/](#)
[maven-metadata.xml](#)
[maven-metadata.xml.md5](#)
[maven-metadata.xml.sha1](#)

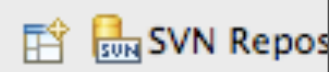
04
04
04
04
04
04
04
04
04
04
04
21
20
04
09

Extending CI: System Deployment

<http://flickr.com/photos/dharrels/>

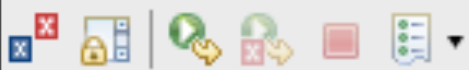
Conway's law in action

```
#!/bin/bash
cd /path/to/your/project && \
jvc clean && \
jvc prod war test.war && \
scp ~/projects/test.war root@remoteserver:/root/uploads \
ssh root@remoteserver "/etc/init.d/tomcat stop" && \
ssh root@remoteserver "rm -rf /usr/local/tomcat/webapps/" \
ssh root@remoteserver "cd /usr/local/tomcat/webapps/ROOT" \
ssh root@remoteserver "/etc/init.d/tomcat start" && \
echo "all done"
```



a Hierar JUnit

after 1.029 seconds



1/1 Errors: 0 Failures: 0

BashTest [Runner: JUnit 3] (1.014 s)

Stack Trace

QuantrixTest.java build.xml BashTest.java 5

```
import java.io.IOException;

public class BashTest extends TestCase {

    public void testBashIsValid() throws Exception {
        Process child = null;

        String command = "/bin/bash -nx src/deploy.sh";
        try {
            child = Runtime.getRuntime().exec(command);
            Thread.sleep(1000);
        } catch (IOException e) {
            fail("invalid bash file");
        } finally {

            assertEquals(0, child.exitValue());

        }
    }
}
```

Outline

import declaration
BashTest
testBashIsValid

Problems @ Javadoc Declaration Console

<terminated> BashTest [JUnit] /System/Library/Frameworks/JavaVM.framework/Versions/1.5.0/Home/bin/java (Ma

Writable

Smart Insert

9 : 1

```
ssh root@remoteserver "/etc/init.d/tomcat stop" && \
```

```
' # <=== NASTY UNMATCHED QUOTE
```

```
ssh root@remoteserver "rm -rf /usr/local/tomcat/webapps/
```

```
ssh root@remoteserver "cd /usr/local/tomcat/webapps/  
ROOT; jar -xvf /root/uploads/test.war" && \
```


Hierar JUnit

1.091 seconds

Errors: 0 Failures: 1

test [Runner: JUnit 3] (1.076 s)

testBashIsValid (1.076 s)

AssertionFailedError: e

test.testBashIsValid(BashTest.j

```

import java.io.IOException;

public class BashTest extends TestCase {

    public void testBashIsValid() throws Exception {
        Process child = null;

        String command = "/bin/bash -nx src/deploy.sh";
        try {
            child = Runtime.getRuntime().exec(command);
            Thread.sleep(1000);
        } catch (IOException e) {
            fail("invalid bash file");
        } finally {

            assertEquals(0, child.exitValue());

        }
    }
}

```

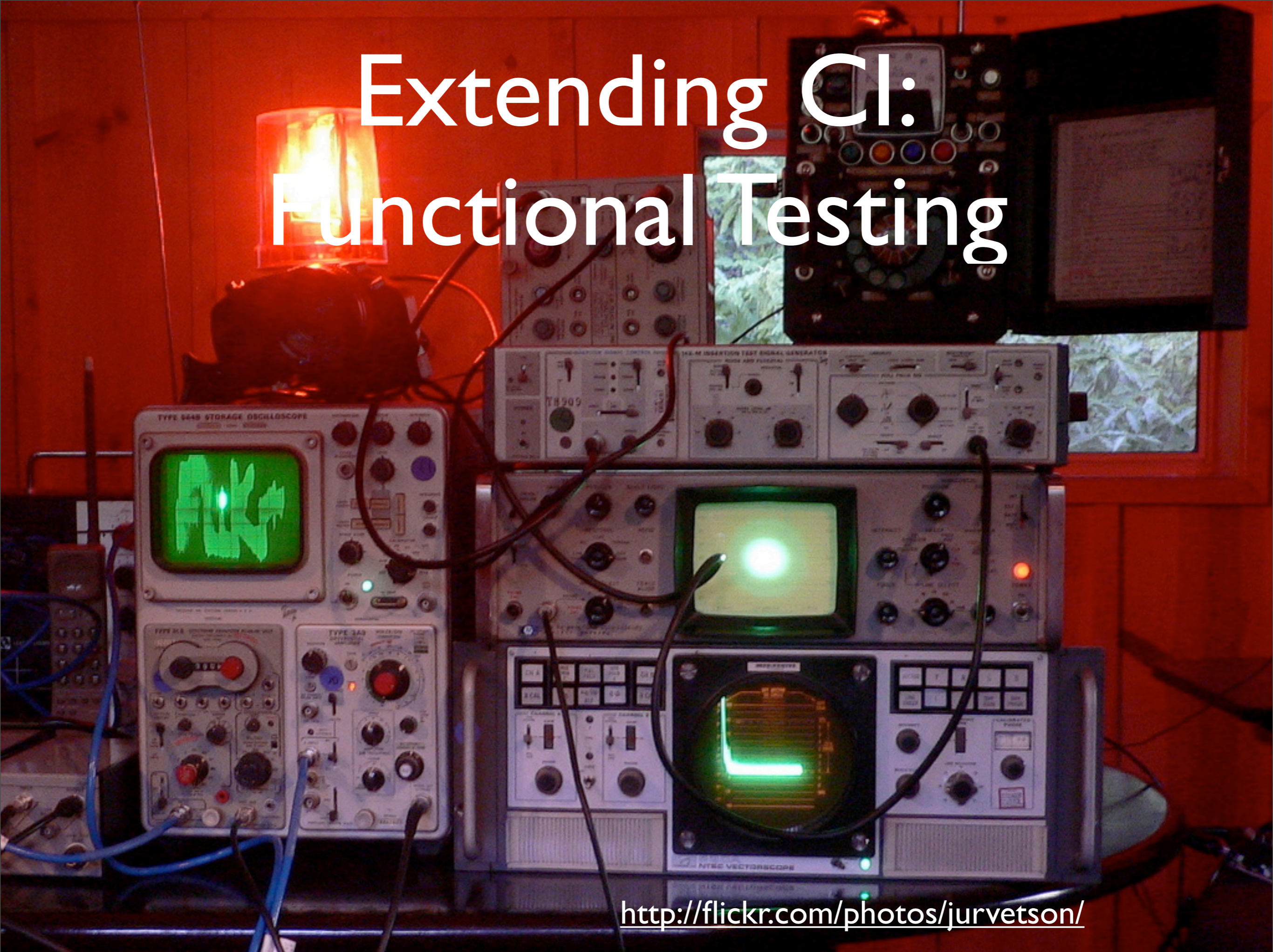
Outline

- import decla
- BashTest
 - testBash

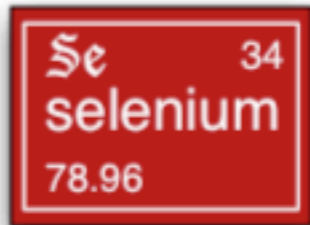
Problems @ Javadoc Declaration Console

<terminated> BashTest [JUnit] /System/Library/Frameworks/JavaVM.framework/Versions/1.5.0/Home/bin/java

Extending CI: Functional Testing



<http://flickr.com/photos/jurvetson/>



Selenium Functional Testing for Web Apps

Open Source From [ThoughtWorks, Inc](#) and Friends

Slow Mode:

Tools

View DOM Show Log

8118d58385354abca9e77f6b35c0c770

Last Four Test Commands:

```
type(css=#meve-basic-info-tab)
click(css=#sa[ oLoad(20000)
getT ext(member[nickname][error])
getT ext(member[surname][error])
```



We are in Auditions 19 Days left

Next stage Finals Heats

Last stage The Finals

Upload a Video | Hello Go Jerry | Ed

BEST VIDEOS

Search

Basic Info

Password

About Me

Q&As

My Networks

My Performances (0)

Upload Video

Basic Information

Email jerry@competitor.com

Extending Cl: Metrics



<http://flickr.com/photos/29225114@N08/>

CheckStyle Audit

Designed for use with [CheckStyle](#) and [Ant](#).

CheckStyle

Summary

| Files | Errors |
|-------|--------|
| 1 | 124 |

Files

Name

[/Users/jsimpson/Documents/workspace/QuantrixRunner/src/test/commandline/QuantrixTest.java](#)

File [/Users/jsimpson/Documents/workspace/QuantrixRunner/src/test/commandline/QuantrixTest.java](#)

Error Description

Line matches the illegal pattern 'trailing whitespace'.

Missing a Javadoc comment.

Line contains a tab character.

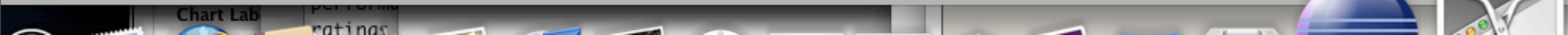
Name 'MODEL_DIR' must match pattern '^s[A-Z][a-zA-Z0-9]*\$'.

Name 'EXPORT_DIR' must match pattern '^s[A-Z][a-zA-Z0-9]*\$'.

Line is longer than 80 characters.

Name 'QUANTRIX_HOME' must match pattern '^s[A-Z][a-zA-Z0-9]*\$'.

one



FindBugs

Bad practice Warnings

Code Warning

Dm net.sourceforge.cruisecontrol.CruiseControlController.halt() invokes System.exit(...), which shuts down the entire vir

DP net.sourceforge.cruisecontrol.launch.Launcher.run(String[]) creates a java.net.URLClassLoader classloader, which sh

Eq net.sourceforge.cruisecontrol.Attribute defines compareTo(Object) and uses Object.equals()

[Bug type EQ_COMPARETO_USE_OBJECT_EQUALS \(click for details\)](#)

In class net.sourceforge.cruisecontrol.Attribute

In method net.sourceforge.cruisecontrol.Attribute.compareTo(Object)

At Attribute.java:[line 63]

Eq net.sourceforge.cruisecontrol.GenericPluginDetail defines compareTo(Object) and uses Object.equals()

Eq net.sourceforge.cruisecontrol.publishers.rss.Item defines compareTo(Item) and uses Object.equals()

[Bug type EQ_COMPARETO_USE_OBJECT_EQUALS \(click for details\)](#)

In class net.sourceforge.cruisecontrol.publishers.rss.Item

In method net.sourceforge.cruisecontrol.publishers.rss.Item.compareTo(Item)

At Item.java:[line 89]

OS net.sourceforge.cruisecontrol.buildloggers.ClearCaseAuditLogger.log(Element) may fail to close stream

[Bug type OS_OPEN_STREAM \(click for details\)](#)

In class net.sourceforge.cruisecontrol.buildloggers.ClearCaseAuditLogger

In method net.sourceforge.cruisecontrol.buildloggers.ClearCaseAuditLogger.log(Element)

Need to close java.io.Reader

Sonar

Dashboard

- Measures drilldown
- Violations drilldown
- Time machine
- Coverage clouds
- Administration



Version 2.1-SNAPSHOT on Feb. 22, 2009 03:12, using profile Nemo rules.

Lines of code

3'352

6 packages
70 classes
552 methods
0.6% duplicated lines

Comments

69.5%

7'643 comment lines

Code coverage

71.1%

205 tests
3.2 sec ▲

Test success

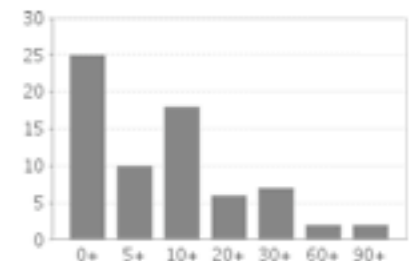
100.0%

0 failures
0 errors

Complexity

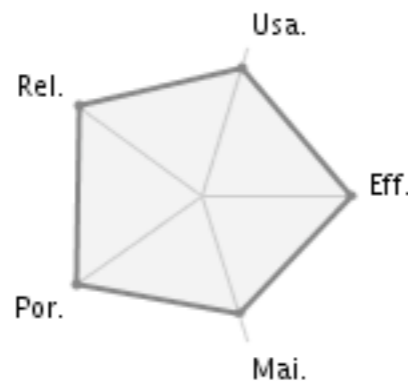
2.4 /method

19.2 /class
1'346 decision points



Rules compliance

67.4% ▼



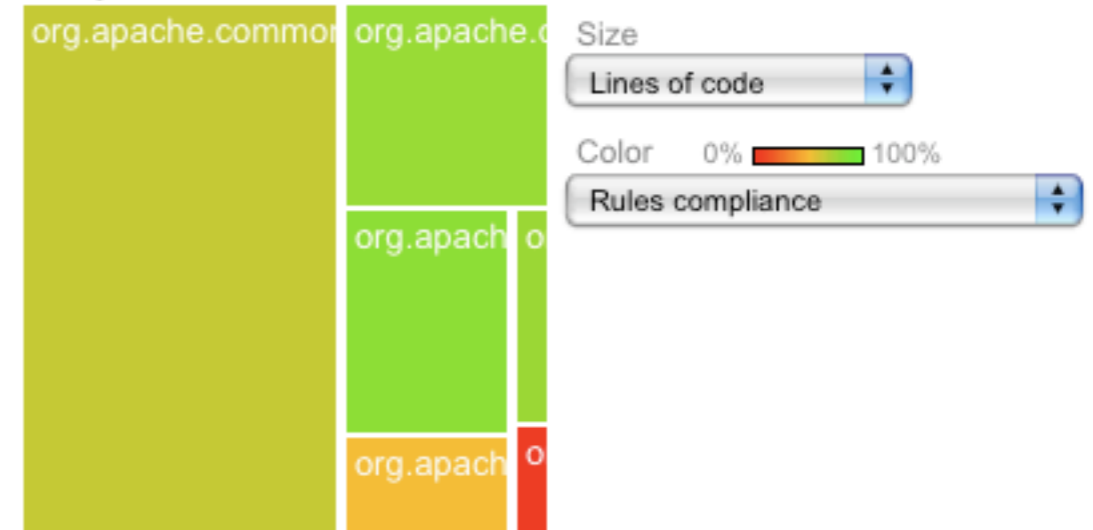
Violations

364 ▲



include opt. rules

Components



Alert



Events

- Feb. 22, 2009 Version 2.1-SNAPSHOT
- Dec. 28, 2008 Version 2.0-SNAPSHOT
- Dec. 21, 2008 Version 1.8.1-SNAPSHOT

- <http://findbugs.sourceforge.net/>
- <http://checkstyle.sourceforge.net/>
- <http://sonar.codehaus.org>
- <http://www.ndepend.com/>
- <http://metric-fu.rubyforge.org/>

Scaling Cl



http://flickr.com/photos/mr_mt_02/

Scaling CI: I/O

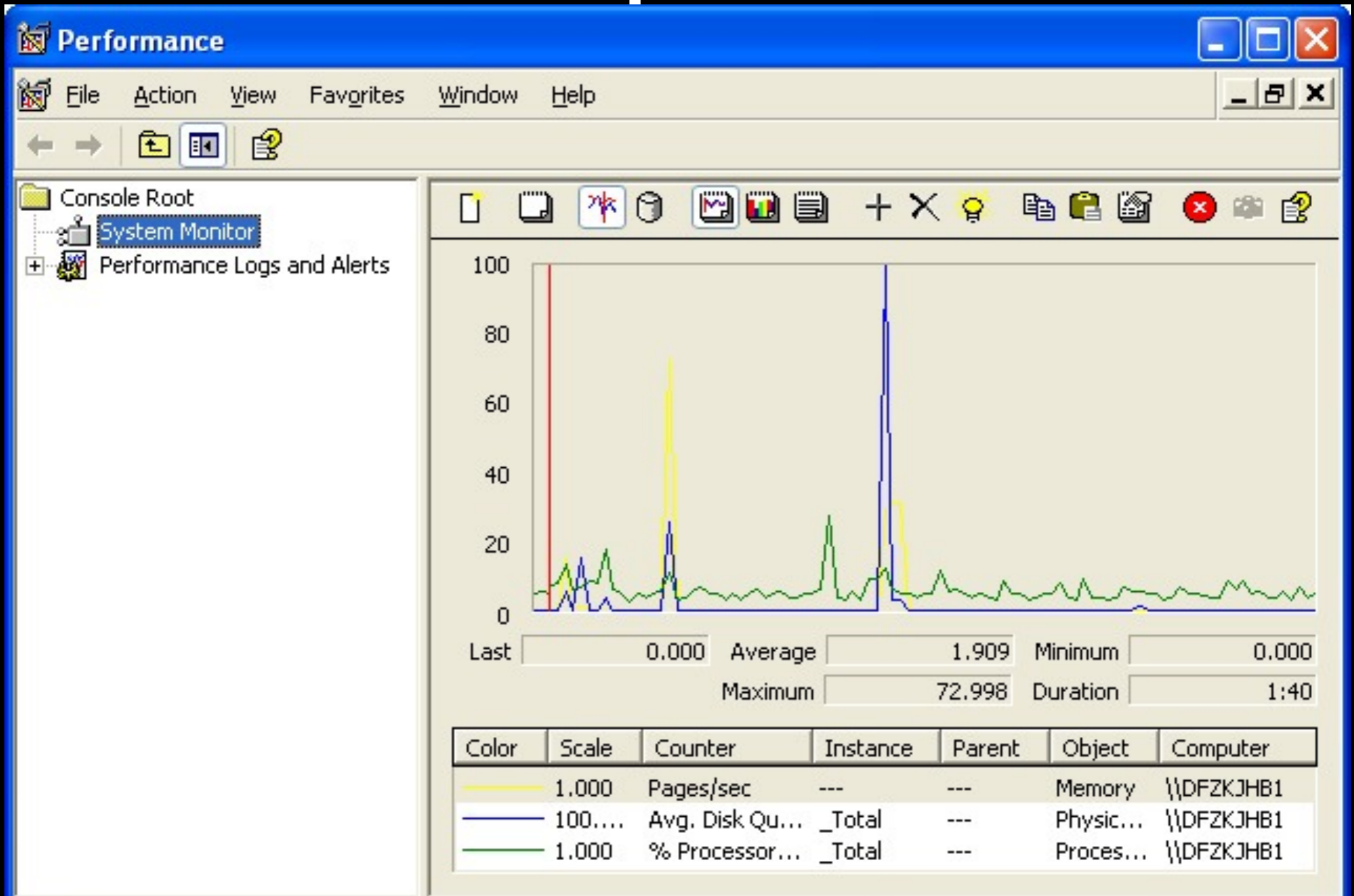


<http://flickr.com/photos/paszczak000/>

iostat -d 5 10

```
julian-simpsons-macbook:~ jsimpson$  
julian-simpsons-macbook:~ jsimpson$  
julian-simpsons-macbook:~ jsimpson$ iostat -d 5 5  
          disk0              disk2              disk3              disk4  
   KB/t  tps  MB/s   KB/t  tps  MB/s   KB/t  tps  MB/s   KB/t  tps  MB/s  
   29.20   3  0.09   60.40   0  0.00   33.17   0  0.00   62.98   0  0.00  
  992.97   7  6.40   0.00   0  0.00   0.00   0  0.00   0.00   0  0.00  
  571.82  25 13.73   0.00   0  0.00   0.00   0  0.00   0.00   0  0.00  
    0.00   0  0.00   0.00   0  0.00   0.00   0  0.00   0.00   0  0.00  
    0.00   0  0.00   0.00   0  0.00   0.00   0  0.00   0.00   0  0.00  
julian-simpsons-macbook:~ jsimpson$  
julian-simpsons-macbook:~ jsimpson$  
julian-simpsons-macbook:~ jsimpson$  
julian-simpsons-macbook:~ jsimpson$
```

Windows perfmon.exe

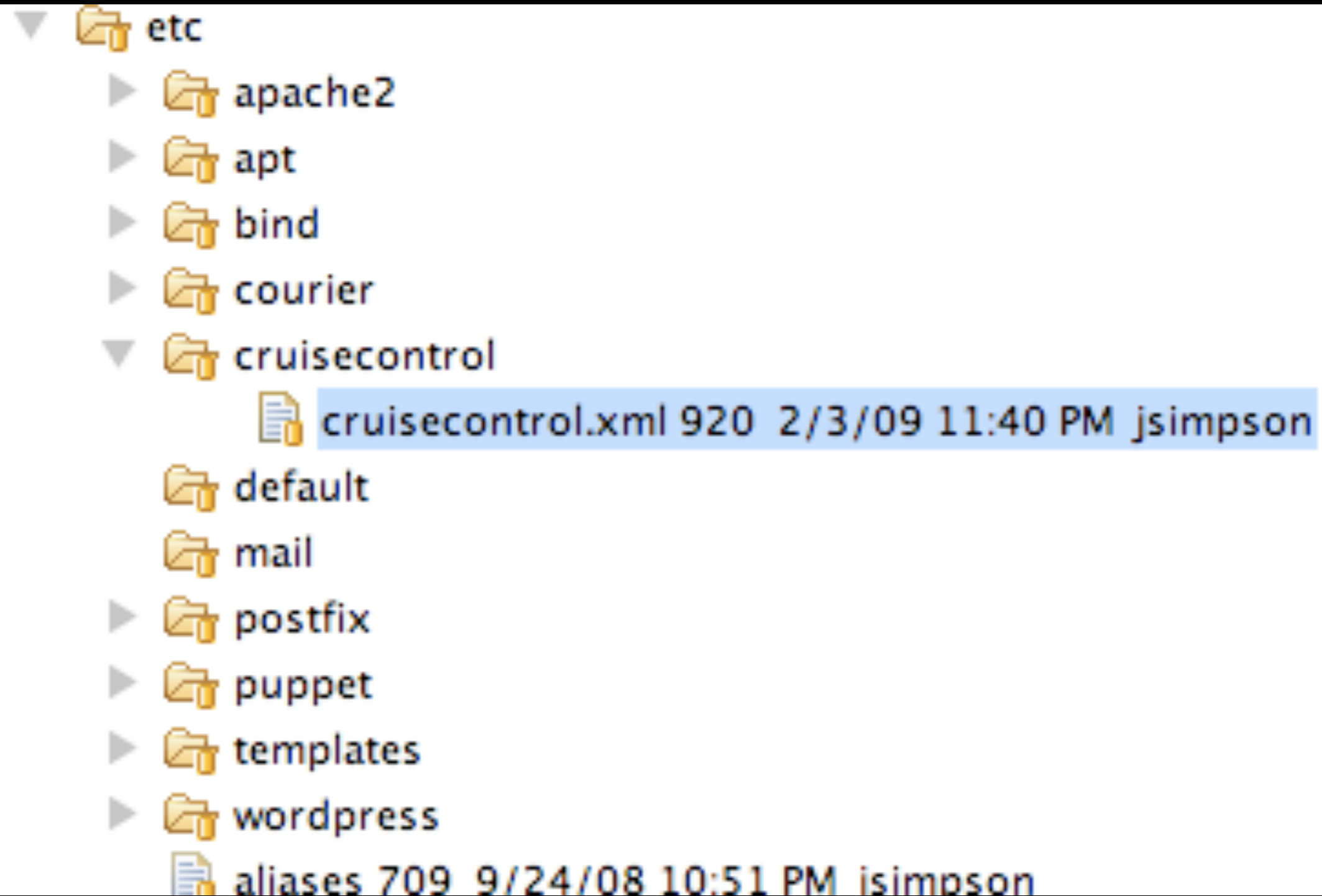


Scaling CI: Security




<http://flickr.com/photos/untitled13/>

Version control



Team City Security



Log in to TeamCity

Version 4.0.2 (build 8222)

Username:

Password:

Remember me

[Register a New User Account](#) or [Login as a Guest](#) [?](#)

Scaling Cl: The Build Pipeline



<http://flickr.com/photos/freewine/>

Pipeline Activity in project X ?

| project X 00 | | | | | |
|--|-----|------|----|--------|-----|
| | dev | | ft | | UAT |
| 1.0.5 revision: ddcf951d0d5e... 2 hours ago by ChrisS & ChrisT | | auto | | manual | |
| 1.0.4 revision: 9b29ca932a59... 6 hours ago by ChrisS & ChrisT | | auto | | manual | |
| 1.0.3 revision: f91420daffbc... 8 hours ago by Chris Turner | | auto | | manual | |
| 1.0.2 revision: 8ef33e52e98c... about 1 day ago by CS & ChrisT | | auto | | auto | |
| 1.0.1 revision: 8ef33e52e98c... about 1 month ago by CS & ChrisT | | auto | | manual | |

Approved by cturner

Scaling Cl: The Church Organ



<http://flickr.com/photos/tisue/>

Summary

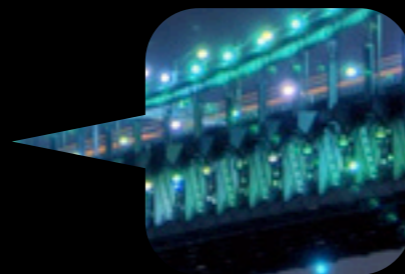
Scaling



Sharing



Extending



Any questions?

<http://flickr.com/photos/chidorian/>

Thanks for listening!

- Other questions?
- <http://www.build-doctor.com>
- medic@build-doctor.com
- <http://twitter.com/simpsonjulian>

