

CI From the trenches

Julian Simpson, www.build-doctor.com



Who am I?

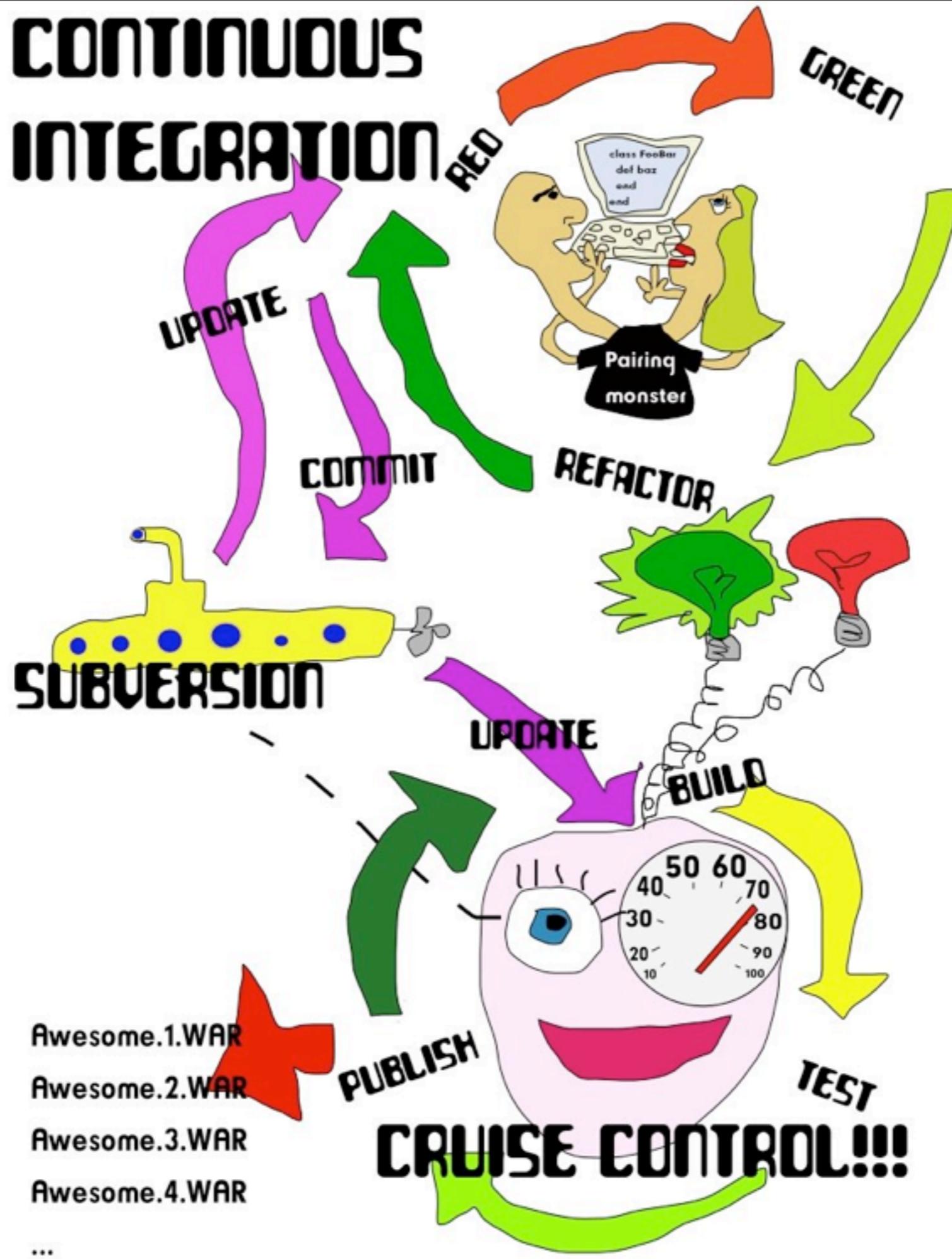


What is CI?

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

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

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



CONTINUOUS INTEGRATION

SUBVERSION

CRUISE CONTROL!!!

- Awesome.1.WAR
- Awesome.2.WAR
- Awesome.3.WAR
- Awesome.4.WAR
- ...



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



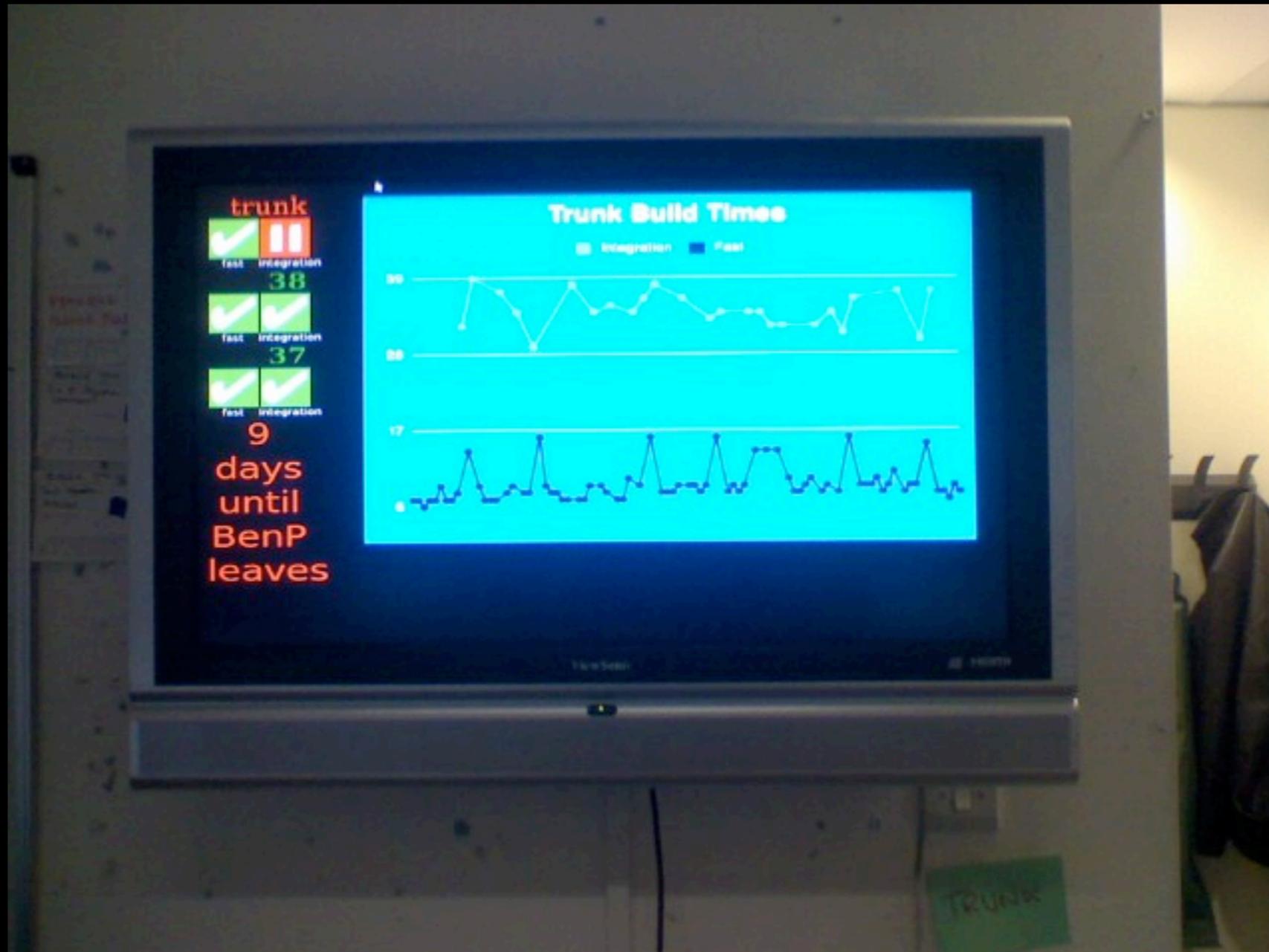
<http://flickr.com/photos/igb/>

Sharing with a rabbit



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

Sharing with a radiator



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

Think like a sysadmin



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

Think like a sysadmin: I/O

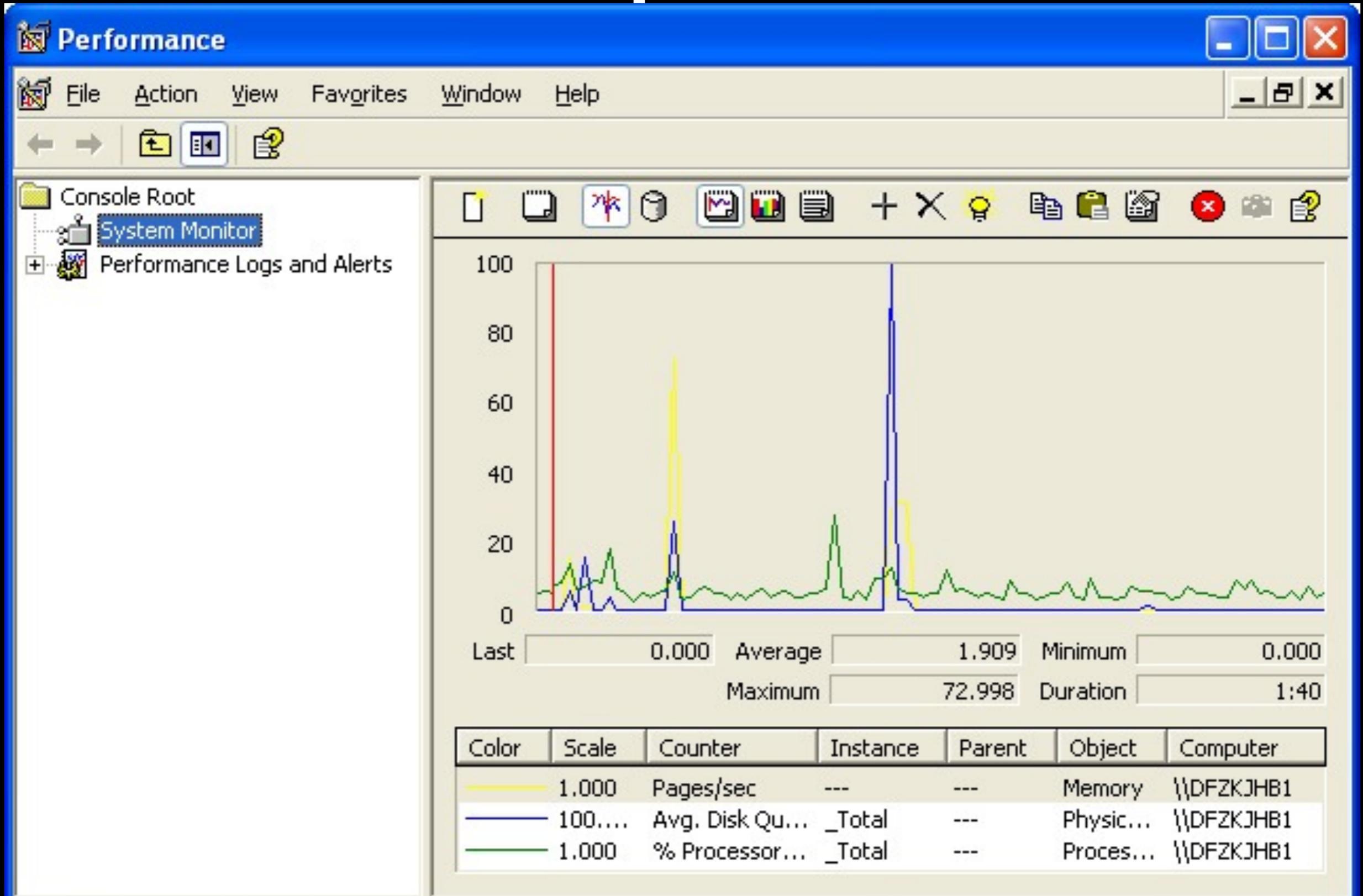


<http://flickr.com/photos/paszczak000/>

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



Think like a sysadmin: Startup

```
Terminal - shirish@Mugglewille-desktop: ~
Edit View Terminal Go Help
Terminal - shirish@Mugglewille... x Terminal - shirish@Mugglewille... x Terminal - shirish@Mugglewille... x Terminal - shirish@Mugglewille... x Terminal - shirish@Mugglewille...

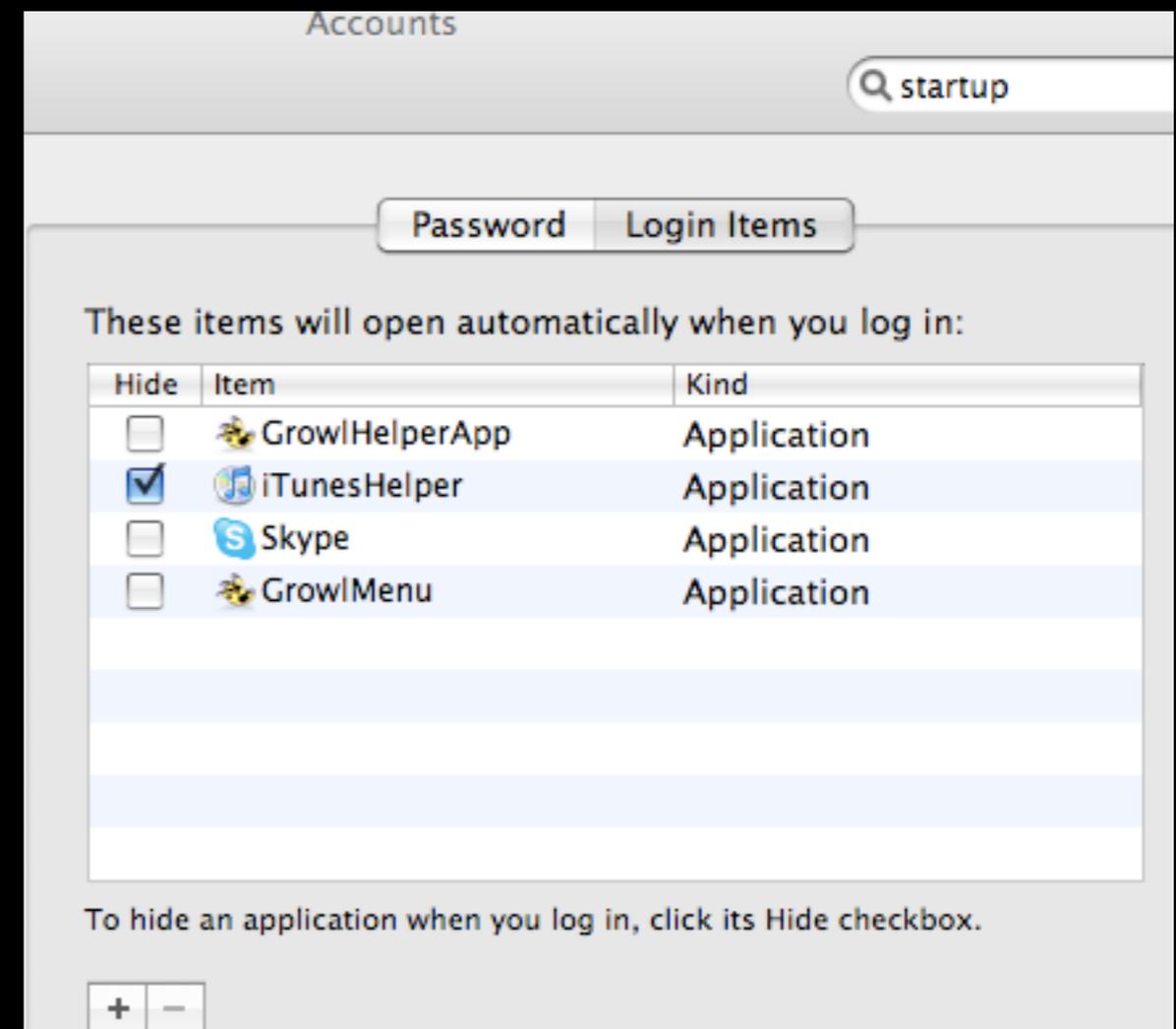
sysV Runlevel Config  -: stop service  =/+ : start service  h: help  q: quit

service  1      2      3      4      5      0      6      S
-----
networkMa$ [X]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
cpi-supp$  [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
cpid       [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
alsa-utils [ ]    [X]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
macron     [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
ocupsd     [X]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
omd        [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
pparmor    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [X]
pport      [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
pd         [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
vahi-dae$  [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
lueetooth  [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]
pinc-cli$  [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
bootlogd   [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
rltty      [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [X]
onsole-s$  [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [ ]    [X]
ron        [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
ups        [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
ous        [ ]    [X]    [X]    [X]    [X]    [ ]    [ ]    [ ]
```

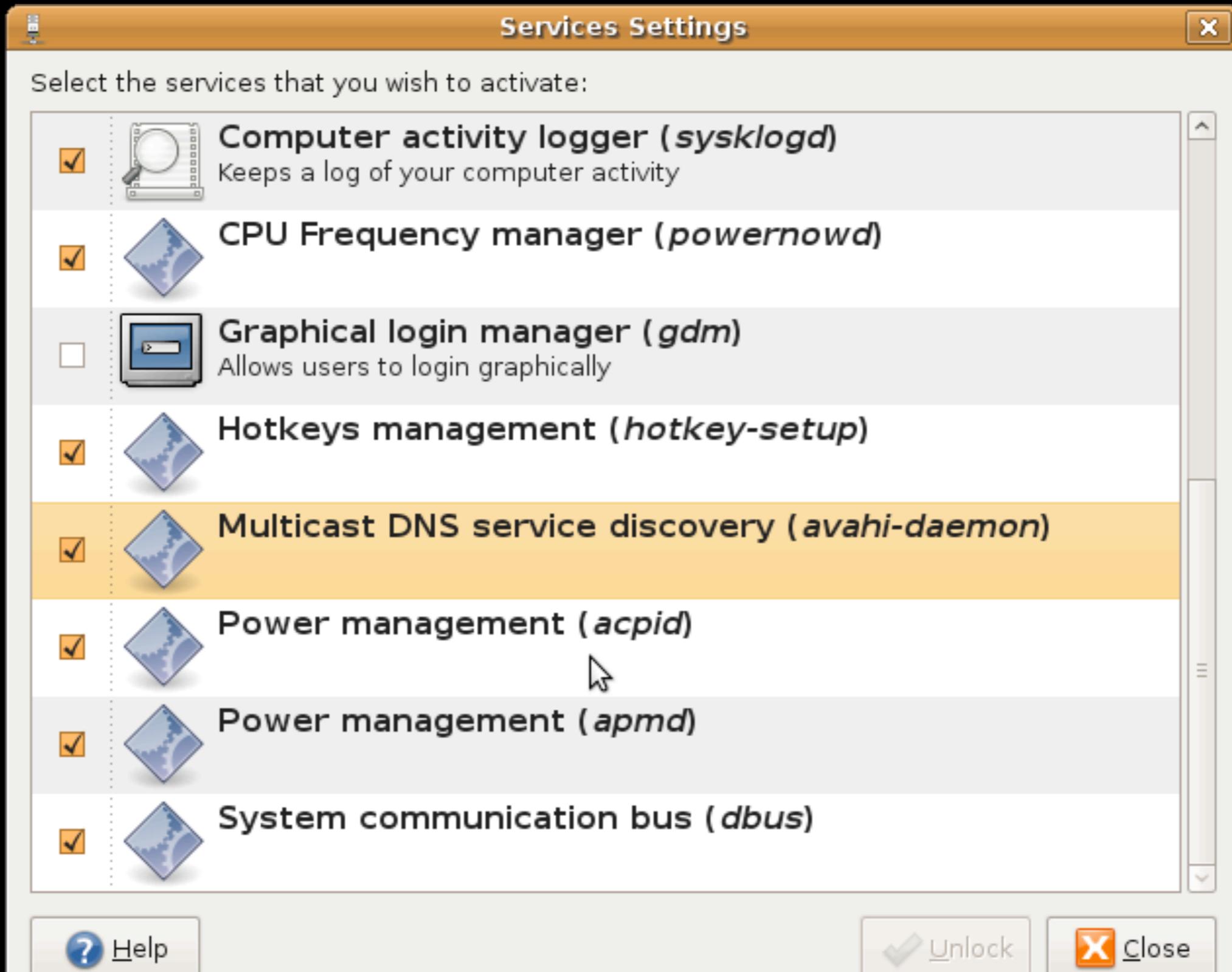
<http://flickr.com/photos/69859207@N00/>

OS X Startups

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple Computer//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>com.apple.autofs</string>
  <key>KeepAlive</key>
  <true/>
  <key>Program</key>
  <string>/usr/libexec/autofs</string>
  <key>ProgramArguments</key>
  <array>
    <string>autofs</string>
  </array>
</dict>
</plist>
```



Ubuntu services

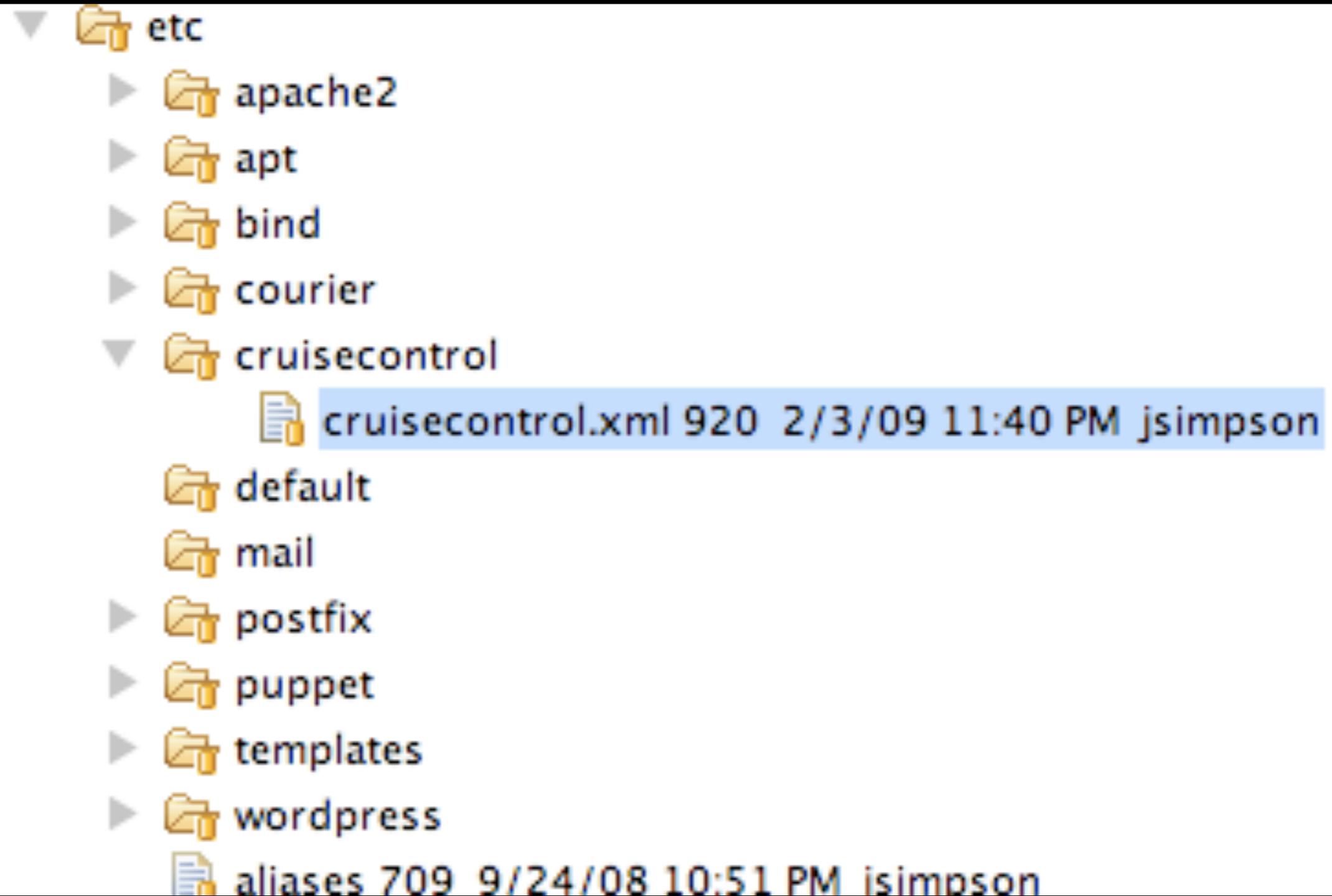


Think like a sysadmin: Security



<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](#) [?](#)

Release Management

The second range finder from the right. If you find that this places you just about at the suggested position (see illustration on deliveries).



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



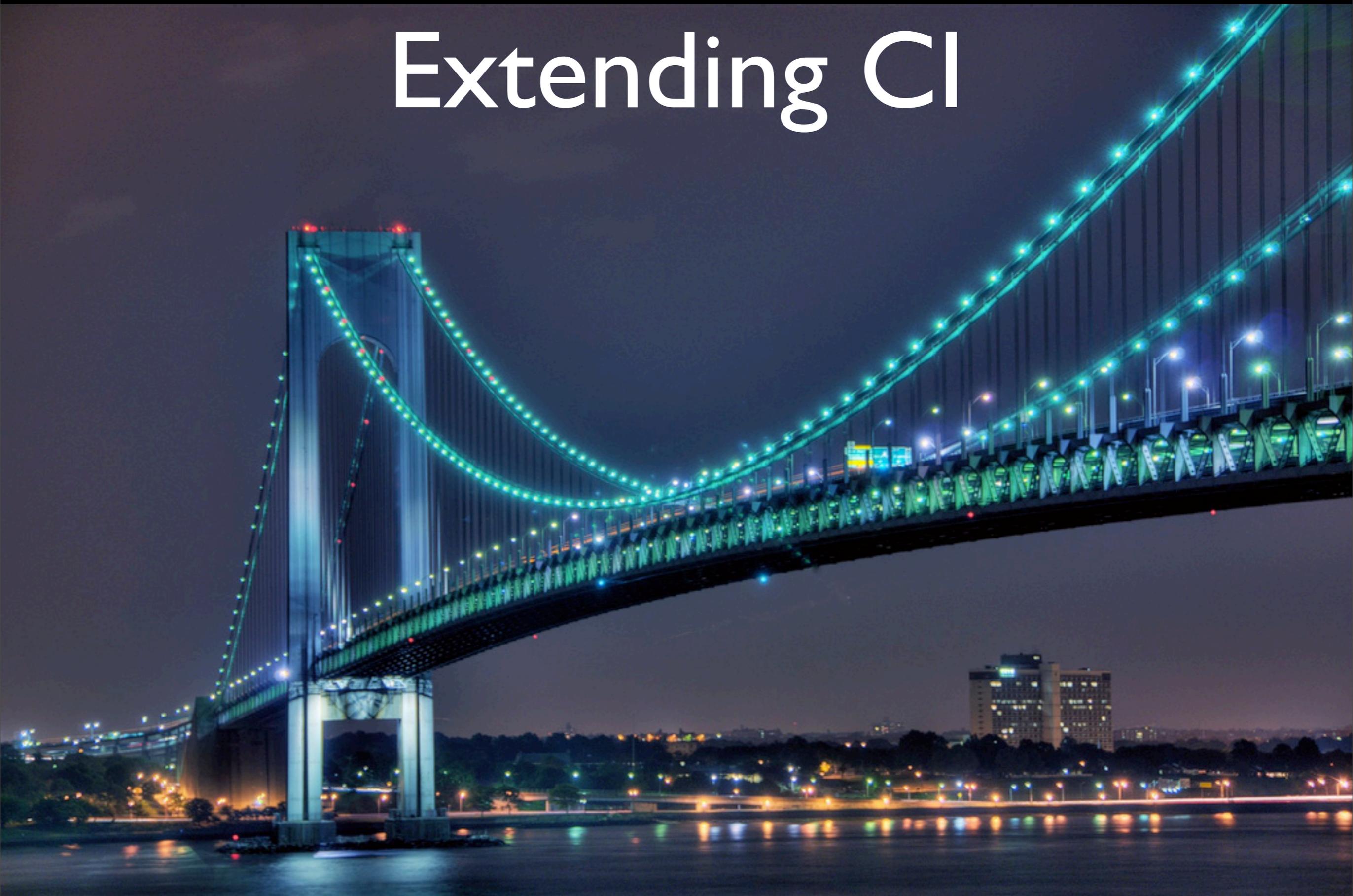
<http://en.wikipedia.org/wiki/>

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
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Extending CI



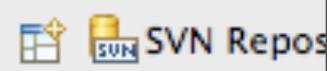
<http://flickr.com/photos/yukonblizzard/>

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

```
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 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

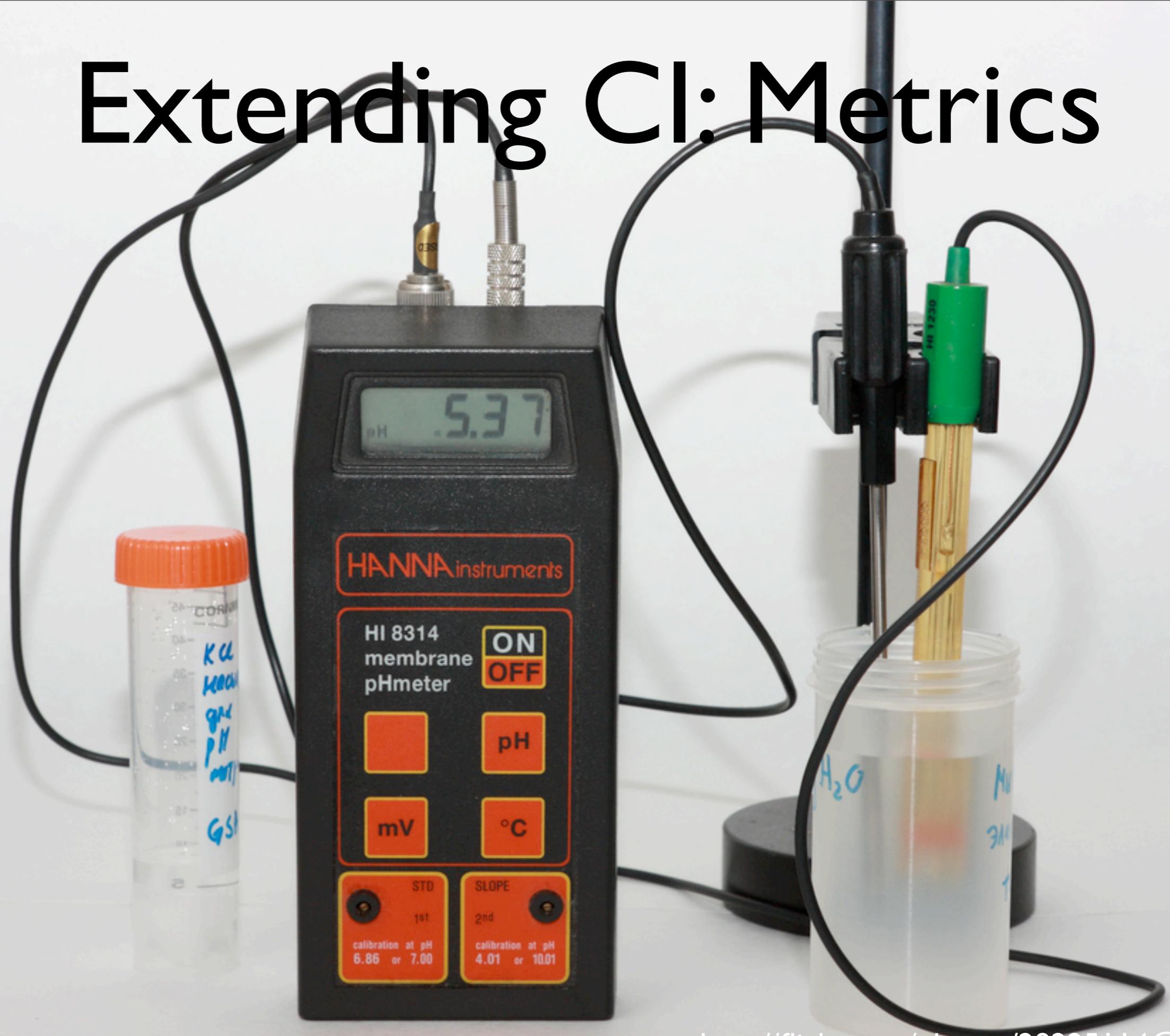
My Performances (0)

Upload Video

Basic Information

Email jerry@competitor.com

Extending Cl: Metrics



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

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

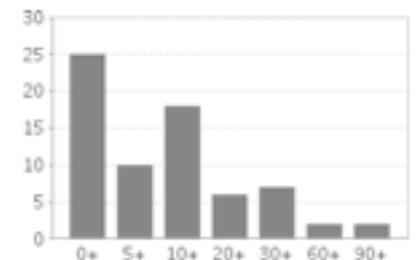
100.0%

0 failures
0 errors

Complexity

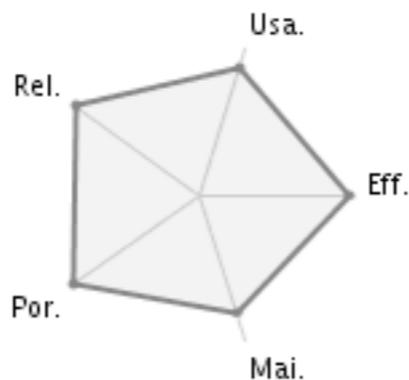
2.4 /method

19.2 /class
1'346 decision points



Rules compliance

67.4% ▼



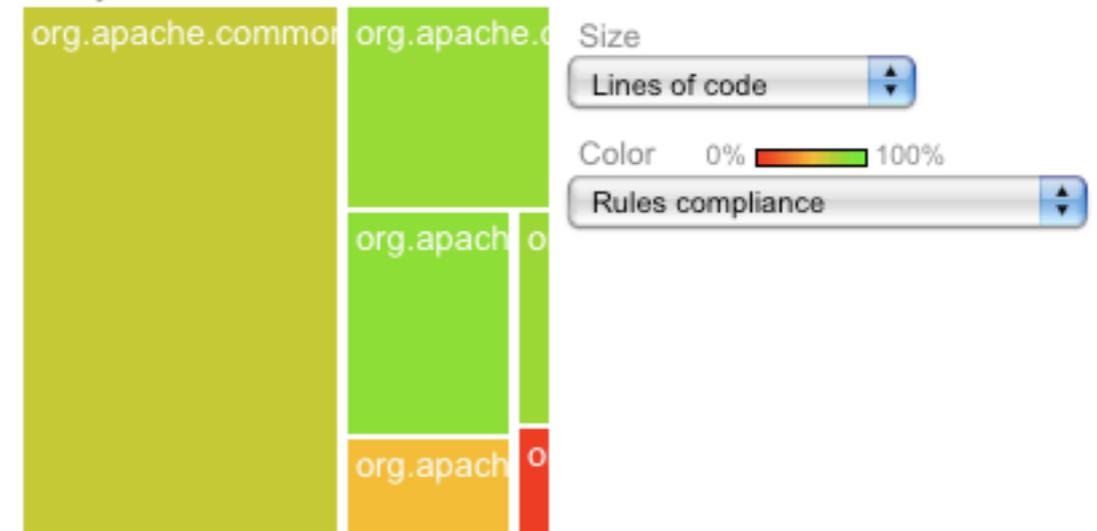
Violations

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

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

Scaling Cl



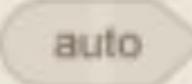
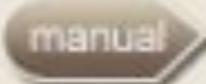
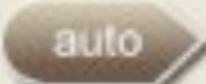
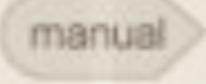
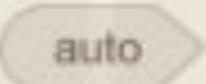
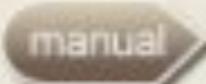
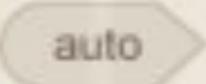
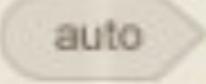
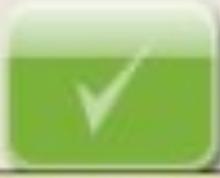
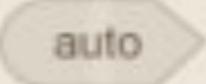
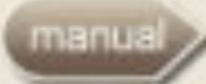
http://flickr.com/photos/mr_mt_02/

Scaling Cl: The Build Pipeline



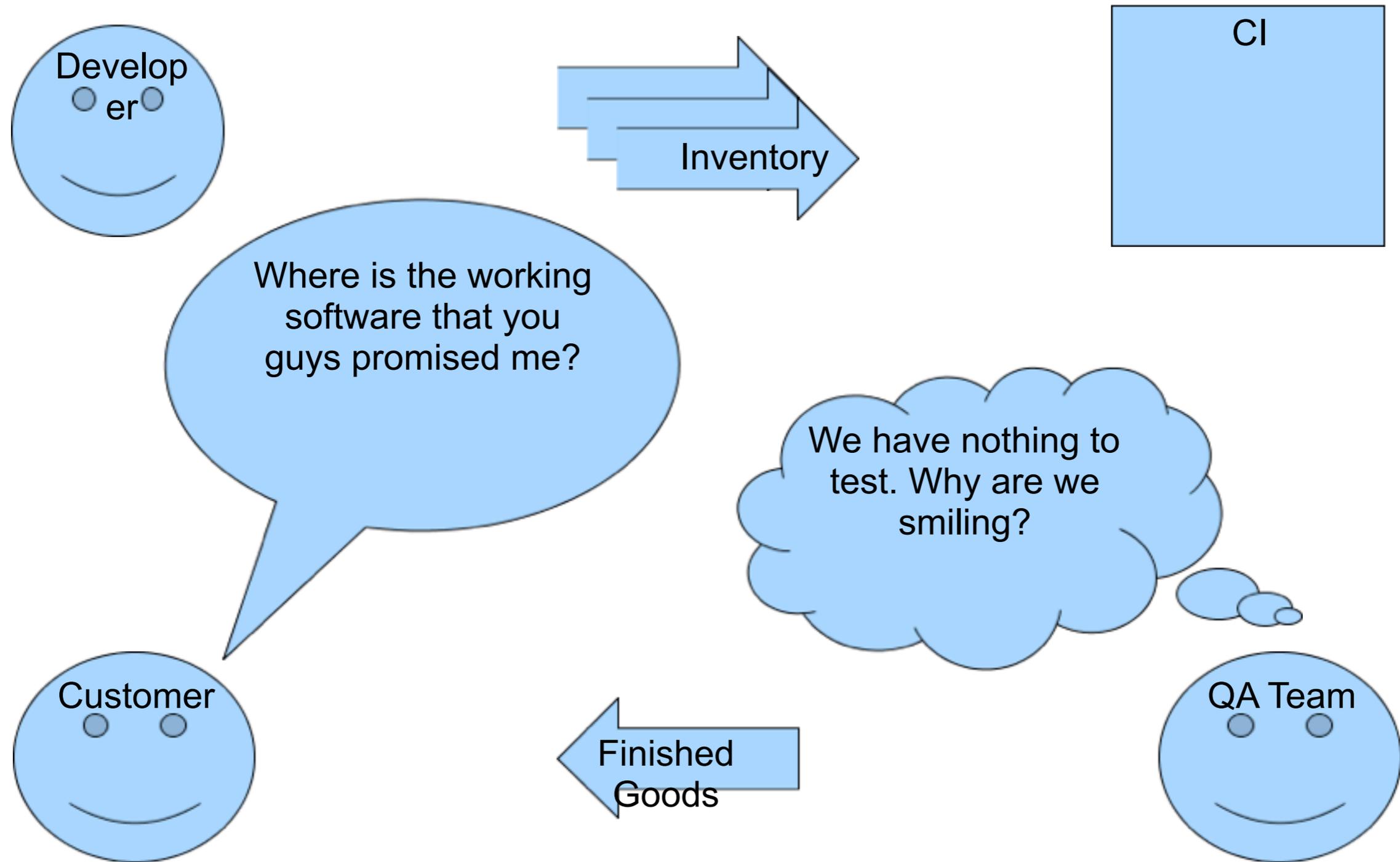
<http://flickr.com/photos/freewine/>

Pipeline Activity in project X

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

Approved by cturner

Bottleneck



Scaling Cl: The Church Organ



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

Summary

Scaling



Releasing



Admin-ing



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>



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