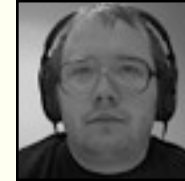




Jenkins Evolutions

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@toomasr

<http://dow.ngra.de/>







Why Evolutions?



Testing



Why Evolutions?



Continuous Integration



Why Evolutions?



Continuous Deployment



Why Evolutions?



- Workflow management
 - Trigger jobs
 - Join jobs
- Building software
- Testing builds
- Propagating DVCS repositories
- Updating website
 - Changelog
 - Documentation
 - Nightly builds
- Release management



Why Evolutions?



- Authentication
- Authorization
- Logging
- Notifications
- Remote machines



Why Evolutions?



  [lr-doc-upload](#) 1 min 27 sec (#16) 3 min 46 sec (#15) 19 sec 



Why Evolutions?



Cron on Steroids



Why Evolutions?



Unopinionated build tool
(via @lusion)



Agenda



● Background

● Stories

- Functional Tests
- Servlet Tests
- Random Thoughts



Background - 2008



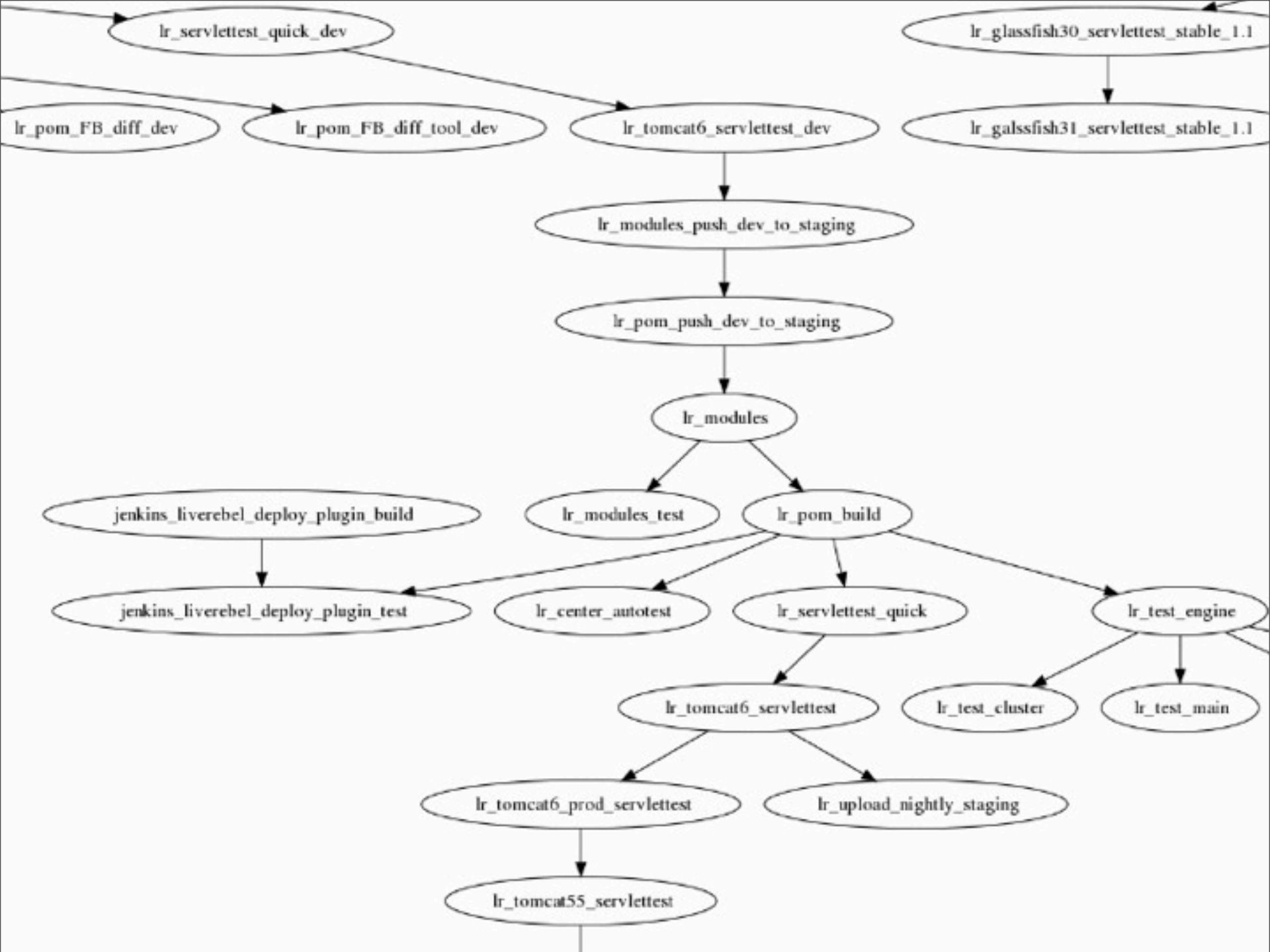
- First installation
- Clicked “Run” when wanted to test stuff

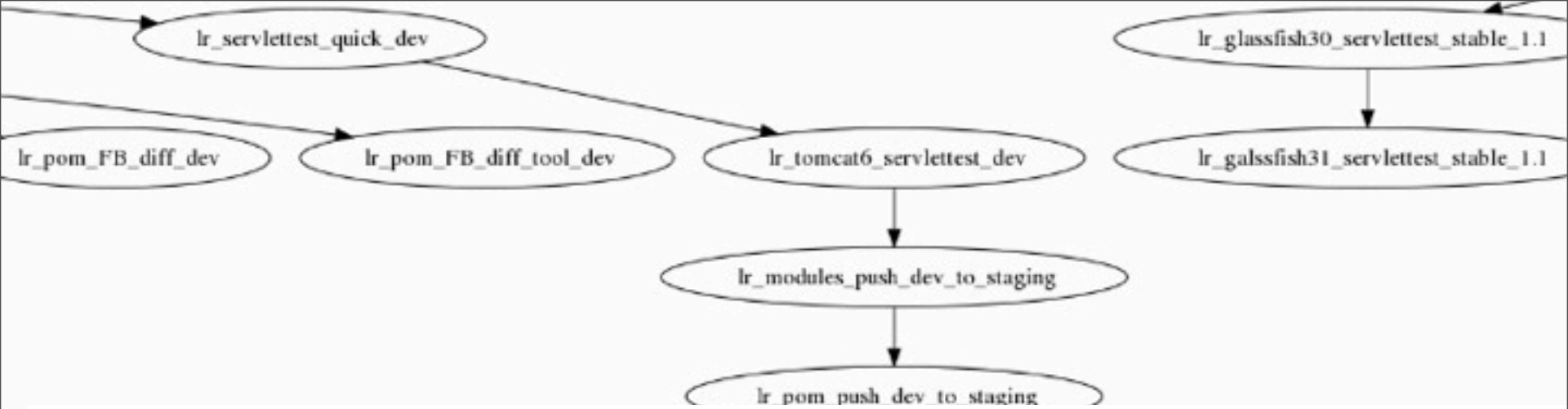


Background - 2012

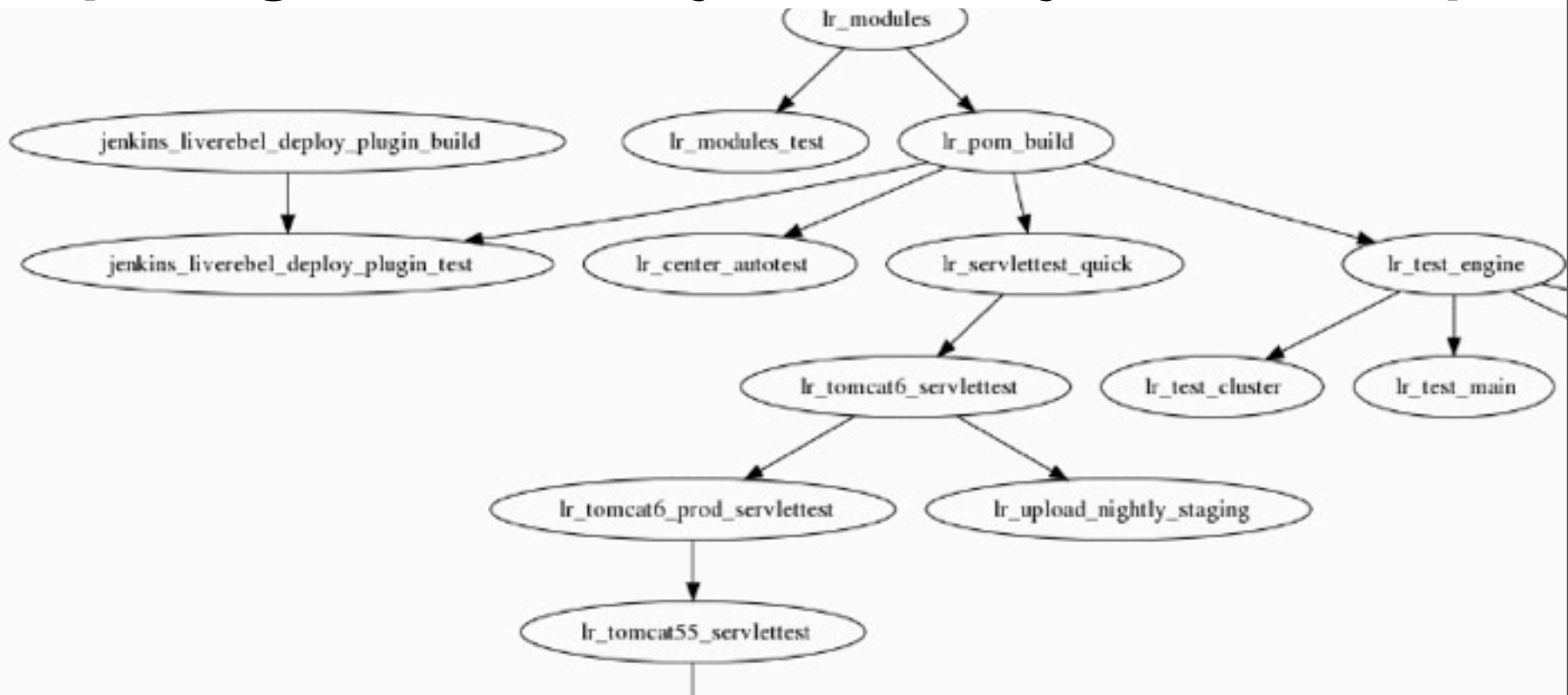
- ~~200~~ 300 jobs
- 5 8 dedicated machines
- Amazon ~7000 instance-hour per month
- 3 in house plugins developed, 2 abandoned
- Custom dashboard (35 x 215 grid)







<https://github.com/jenkinsci/jenkins-scripts>





Story of Functional Tests



JRebel Functional JDK Tests



```
JenkinsDemo.java x
1
2 public class JenkinsDemo {
3     public void foobar() {
4         return;
5     }
6 }
7
```



JRebel Functional JDK Tests



```
Finder Demo.java X
1
2 public class JenkinsDemo {
3     public String foobar() {
4         return "FooBar";
5     }
6 }
7
```



JRebel Functional JDK Tests



● Per JDK

– Per functional test

- Compile couple of classes
- Run some methods and assert
- Recompile couple of classes
- Run some methods and assert
- ...



JRebel Functional JDK Tests



- Which Jenkins feature is the best fit here?



JRebel Functional JDK Tests



Configuration Matrix

JDK

✓ Java 6_24 ✓ Java 6_23 ✓ jrookit_160_05_R27.6.2-20 ✓ jdk1.5.0_20 ✓ jdk1.5.0_11 ✓ cloud-j2sdk1.4.2_10 ✓ cloud-j2sdk1.4.2_17 ✓ cloud-jdk1.5.0_08 ✓ cloud-jdk1.5.0_20 ✓ cloud-jdk1.6.0_14 ✓ cloud-jrookit142_17 ✓ cloud-jrookit_160_05_R27.6.2-20 ✓ cloud-jrookit81sp6_142_10 ✓ cloud-jrookit90_150_06 ✓ cloud-ibm-java-i386-60 ✓ cloud-ibm-java2-i386-50 ✓ cloud-jdk1.7.0-ea-b76 ✓ cloud-jdk1.7.0-ea-b145 ✓ cloud-jdk1.5.0_11 ✓ jrookit_160_24_R28 ✓ jrookit_150_28_R28 ✓ jrookit_150_22 ✓ ibm-java2-142 ✓ Java6 ✓ jdk1.5.0_22



JRebel Functional JDK Tests



- Groovy Script



JRebel Functional JDK Tests



```
ant.javac("destdir":"${buildDir}/${jdkName}/runner",
          "debug":"on",
          "debuglevel":"lines,vars,source",
          "encoding":"utf-8",
          "target":"1.4",
          "source":"1.4",
          "failonerror":"false",
          "srcdir":"${inctestSrcDir}/runner",
          "deprecation":"yes",
          "classpathref":"classpath") {
    include(name:"**/*.java")
}

ant.jar("destfile":"${buildDir}/${jdkName}/runner.jar",
        "compress":"true") {
    fileset("dir":"${buildDir}/${jdkName}/runner")
}
```



JRebel Functional JDK Tests



- How to get test results? Jenkins feature...



JRebel Functional JDK Tests



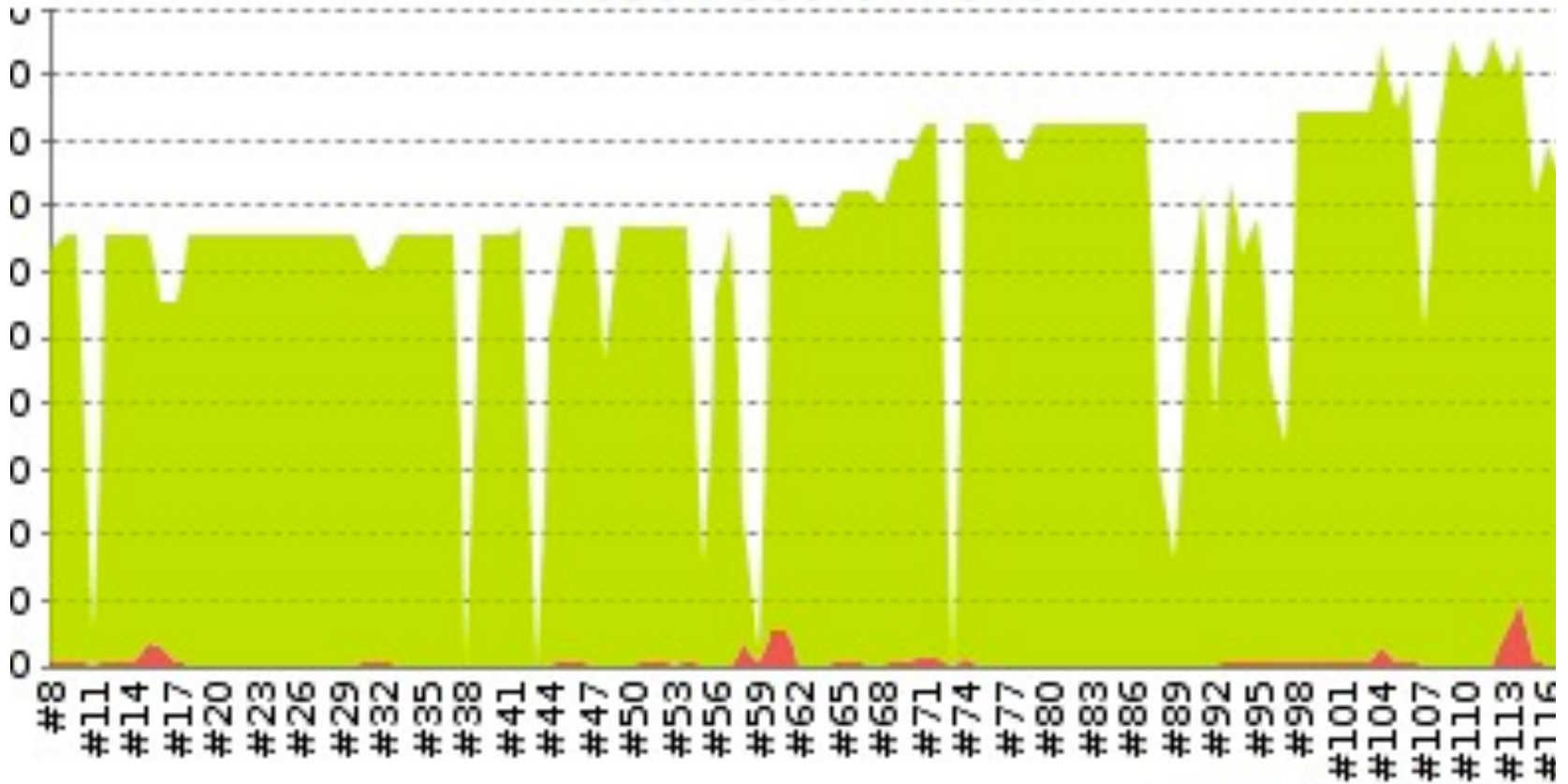
Output JUnit XML!



JRebel Functional JDK Tests



Test Result Trend



(just show failure



JRebel Functional JDK Tests



- Creates about 10 000 new files
- Compile about 1700 Java class files
- Invoke the JVM 550 times



JRebel Functional JDK Tests



Sloooooow



JRebel Functional JDK Tests

- IO

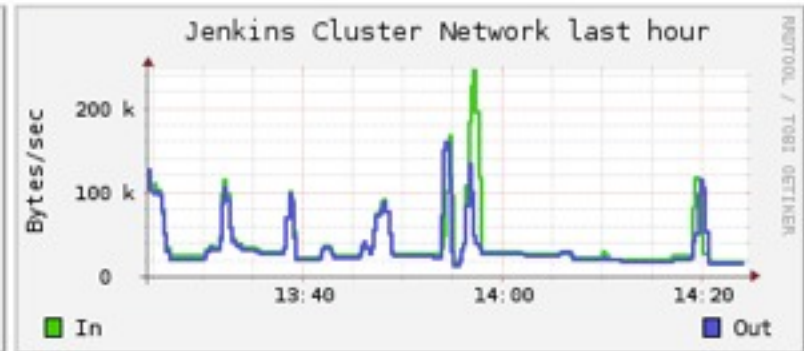
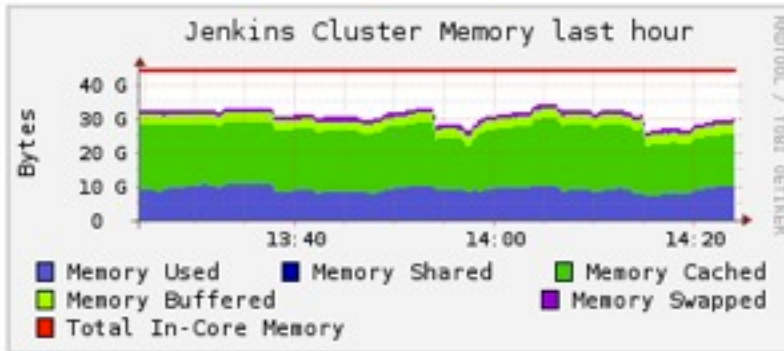
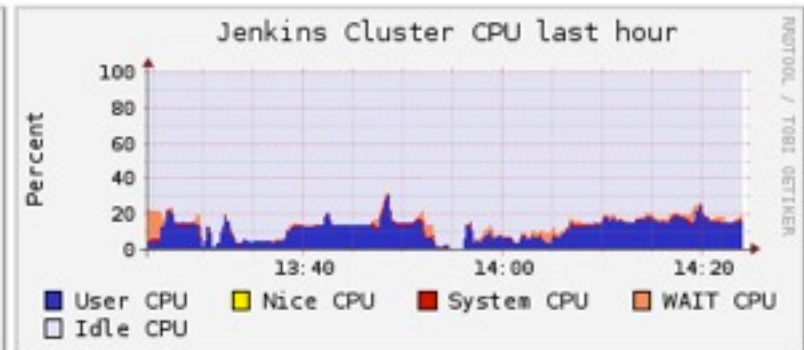
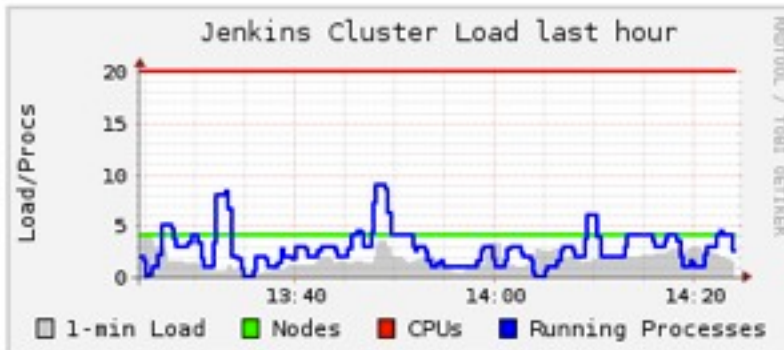
- CPU

- Memory





JRebel Functional JDK Tests





JRebel Functional JDK Tests

- Bare metal

- Cloud

- Bare metal





JRebel Functional JDK Tests



- Cloud
 - 1 small instance per JDK
 - Manual update of AMIs
 - Slow
 - Scales!



JRebel Functional JDK Tests



- Which Jenkins plugin to use?



JRebel Functional JDK Tests



Amazon EC2 Plugin



JRebel Functional JDK Tests



- Which Jenkins plugin to use for results?



JRebel Functional JDK Tests



- Bare metal
 - 8 core & 16GB RAM gaming machines
 - Recycled developer machines
 - Marketing demo machines (iMacs)



JRebel Functional JDK Tests



- SSD
 - 30% gain in time, that's it



Story of Servlet Tests



Servlet tests



- Start a container version
 - Websphere, Weblogic, Glassfish etc.
- Deploy applications
- Test results, reload changes, test results...



Servlet tests



How do you start a
server?



Servlet tests



Duh! With a startup
script!



Servlet Tests – 1 app server, 2 jobs



- Which Jenkins feature to use?



Servlet Tests – 1 app server, 2 jobs



Throttle Concurrent Builds

Multi-Project Throttle Categories

Category Name



Maximum Total Concurrent Builds

Maximum Concurrent Builds Per Node

Delete



Servlet Tests – 1 app server, 2 jobs



Throttle Concurrent Builds

Maximum Total Concurrent Builds



Maximum Concurrent Builds Per Node



Multi-Project Throttle Category

- gae133
- gae142
- geronimo2
- geronimo3
- glassfish2
- glassfish30
- glassfish31
- glassfish3p
- jboss326
- jboss4
- jboss405
- jboss5
- jboss6
- jetty6
- jetty7c
- jetty7e
- lr-center-autotest
- lr-test-cluster-ports
- oc4j10
- oc4j9
- resin30
- resin31
- resin32
- resin40
- tcat
- tcat6r3
- tomcat4
- tomcat50
- tomcat55
- tomcat6
- tomcat6dev
- tomcat6prod
- tomcat706
- was60

Type hierarchy of 'com.zeroturnaround.liverebel.test.engine.server.BaseServer':

- ▼ Object - java.lang
 - ▼ BaseServer - com.zeroturnaround.liverebel.test.engine.server
 - ▼ BaseGlassfish - com.zeroturnaround.liverebel.test.engine.server.glassfish
 - Glassfish30 - com.zeroturnaround.liverebel.test.engine.server.glassfish
 - Glassfish31 - com.zeroturnaround.liverebel.test.engine.server.glassfish
 - ▼ BaseJBoss - com.zeroturnaround.liverebel.test.engine.server.jboss
 - JBoss4 - com.zeroturnaround.liverebel.test.engine.server.jboss
 - ▼ JBoss5 - com.zeroturnaround.liverebel.test.engine.server.jboss
 - JBoss6 - com.zeroturnaround.liverebel.test.engine.server.jboss
 - ▼ BaseJetty - com.zeroturnaround.liverebel.test.engine.server.jetty
 - Jetty5 - com.zeroturnaround.liverebel.test.engine.server.jetty
 - ▼ Jetty6 - com.zeroturnaround.liverebel.test.engine.server.jetty
 - Jetty7 - com.zeroturnaround.liverebel.test.engine.server.jetty
 - ▼ BaseOc4j - com.zeroturnaround.liverebel.test.engine.server.oc4j
 - Oc4j10 - com.zeroturnaround.liverebel.test.engine.server.oc4j
 - Oc4j9 - com.zeroturnaround.liverebel.test.engine.server.oc4j
 - ▼ Tomcat4 - com.zeroturnaround.liverebel.test.engine.server.tomcat
 - ▼ Tomcat55 - com.zeroturnaround.liverebel.test.engine.server.tomcat
 - Tomcat6 - com.zeroturnaround.liverebel.test.engine.server.tomcat
 - Tomcat7 - com.zeroturnaround.liverebel.test.engine.server.tomcat
 - WeblogicDomain - com.zeroturnaround.liverebel.test.engine.server.weblogic
 - WebSphereProfile - com.zeroturnaround.liverebel.test.engine.server.websphere



Servlet Tests



How do you deploy an application?



Servlet Tests



- Start Tomcat
- Copy WAR files to webapps/

- GET /some-url
- Assert
- Update application
- GET /some-url
- Assert



Sloooooow



Servlet Tests

- Memory

- IO

- CPU





Testing Multiple Containers



- Cloud
 - 1 Small instance per Container
 - Need to update AMIs
 - Slow
 - Isolation



Single Machine

- Port Hell

- Memory Limits

- Speed





Story of DVCS



Story of DVCS





Story of DVCS

- Problem
 - Many JDKs
 - Many App Servers
 - Many Servlet Containers





Story of DVCS



- Problem
 - Many JDKs
 - Many App Servers
 - Many Servlet Containers
- Slow feedback cycle



Story of DVCS

- Problem
 - Many JDKs
 - Many App Servers
 - Many Servlet Containers

- Slow feedback cycle





Story of DVCS



- Problem
 - Many JDKs
 - Many App Servers
 - Many Servlet Containers
- Slow feedback cycle
- Difficult to install environments



Story of DVCS



Tests green?

Push to branch/repository

DEV

n tests on N servers
(30 min)

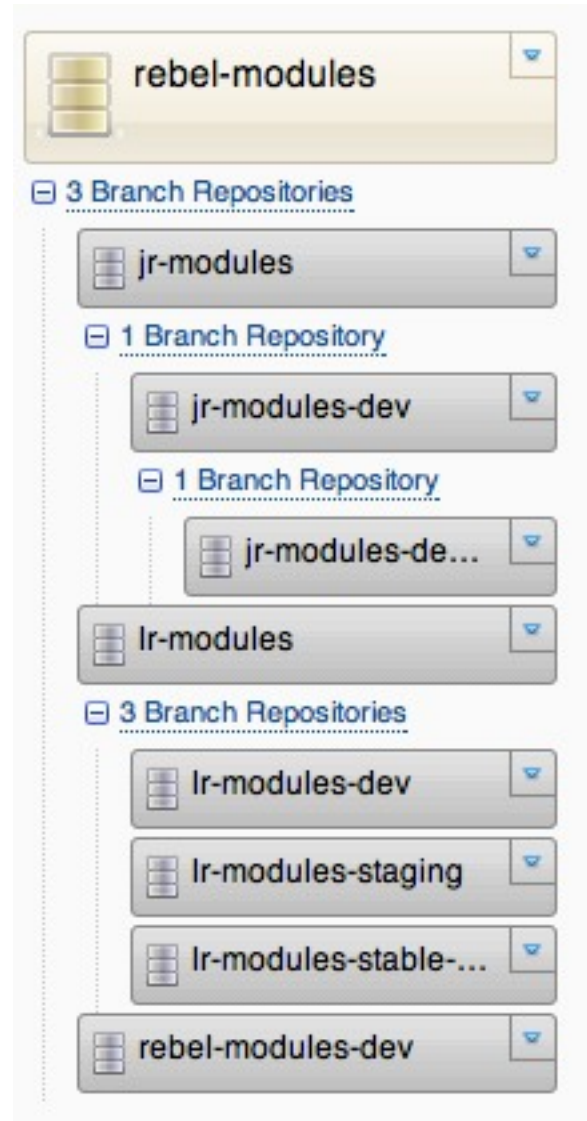


STABLE

m tests on M servers
(3 hours)



Story of DVCS





General stuff



Fight for executors



Optimum utilization



Quick feedback



There is an ~~app~~
plugin for that



Q & A