Sonar

10 METRICS FOR BETTER BUILDS

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matthew.mccullough sonar × Type another tag Bookmarks 29

Display options

28 NOV 10 **Sonar » Sonar has become a Multi-Languages Platform**
EDIT | DELETE — jvm language sonar

25 NOV 10 **Metric definitions - Sonar - Codehaus** — 15
EDIT | DELETE — metrics statistics sonar

Install Sonar - Sonar - Codehaus — 41
EDIT | DELETE — sonar

Sonar in a nutshell - Sonar - Codehaus — 14
EDIT | DELETE — tutorial sonar

19 NOV 10 **Sonatype Blog » Maven 3 and Sonar** — 8
EDIT | DELETE — continuousintegration maven maven3 sonar

[#GRADLE-888] Gradle Integration with Sonar - jira.codehaus.org
EDIT | DELETE — gradle continuousintegration sonar

Sonar » Sonar in the news
EDIT | DELETE — continuousintegration newsevent sonar

[sonar-dev] Sonar 2.5 will start answering the question "What has changed ?" - Freddy Mallet - org.codehaus.sonar.dev - MarkMail

http://delicious.com/matthew.mccullough/sonar

What is this?

Measurements are for managers

measurements are for **managers**

true...

and also for **developers**


sonar
Quality is under control

what measurements?

- Checkstyle
- PMD
- Findbugs
- Cobertura
- Emma
- Clirr
- JaCoCo
- Useless Code
- SQALE
- *20+ others...*

very little plaintext...

org.junit.samples.SimpleTest.txt — surefire-reports

× org.junit.samples.SimpleTest.txt

```
-------------------------------------------------------------------------------
Test set: org.junit.samples.SimpleTest
-------------------------------------------------------------------------------

Tests run: 1, Failures: 1, Errors: 0, Skipped: 0, Time elapsed: 0.002 sec <<<
FAILURE!
org.junit.samples.SimpleTest.testEquals()  Time elapsed: 0 sec  <<< FAILURE!
java.lang.AssertionError: Size expected:<12> but was:<13>
    at org.junit.Assert.fail(Assert.java:91)
    at org.junit.Assert.failNotEquals(Assert.java:645)
    at org.junit.Assert.assertEquals(Assert.java:126)
    at org.junit.Assert.assertEquals(Assert.java:470)
    at org.junit.samples.SimpleTest.testEquals(SimpleTest.java:35)
```

Line: 1 Column: 1 Markdown Soft Tabs: 4

instead, **graphs**

Sonar

http://localhost:9000/

Sonar

Home | Configuration | Log in | Search

Filters
Dependencies
Motion chart

sonar

Projects | Treemap

Alert	Name	Version	Lines of code	Rules compliance	Build date	Links
	Sample Multimodule Java Parent	1.0-SNAPSHOT	48	25.0%	2010-02-05	
	Sample Project - Algorithms	1.0-SNAPSHOT	8	25.0%	2010-10-26	
	Sample Project - Clover Coverage	1.0-SNAPSHOT	8	25.0%	2010-02-05	
	Sample Project - One Dependency	1.0-SNAPSHOT	8	25.0%	2010-10-26	
	Sample Project - Wicket With Unneeded Dependencies	1.0-SNAPSHOT	53	0.0%	2010-10-27	
	babble	1.0.0-SNAPSHOT	156 ▲	67.9% ▼	2010-06-29	
	babble-core	1.0.0-SNAPSHOT	95	57.9%	2010-09-30	

7 results | Alerts feed

and **drill-downs**

Sonar

http://localhost:9000/

Sonar

Home | Configuration | Log in | Search

Filters
Dependencies
Motion chart

sonar

Projects | Treemap

Alert	Name	Version	Lines of code	Rules compliance	Build date	Links
	Apache Log4j	1.2.17-SNAPSHOT	20,638	76.4%	2010-11-25	
	JUnit	4.8.2	6,419 ▲	67.0%	11:28	
	Sample Multimodule Java Parent	1.0-SNAPSHOT	48	25.0%	2010-02-05	
	Sample Project - Algorithms	1.0-SNAPSHOT	8	25.0%	2010-10-26	
	Sample Project - Clover Coverage	1.0-SNAPSHOT	8	25.0%	2010-02-05	
	Sample Project - One Dependency	1.0-SNAPSHOT	8	25.0%	2010-10-26	
	Sample Project - Wicket With Unneeded Dependencies	1.0-SNAPSHOT	53	0.0%	2010-10-27	
	babble	1.0.0-SNAPSHOT	156 ▲	67.9% ▼	2010-06-29	
	babble-core	1.0.0-SNAPSHOT	95	57.9%	2010-09-30	

9 results | Alerts feed

“the creation of clear, understandable visualizations of data is of fundamental importance in all branches of science.

Anne E. Egger, Ph.D.

Visualizing Scientific Data:
An essential component of research

Mechanics

Install, setup, config

Download the zip

current version is 2.7

http://sonarsource.org

Sonar

http://www.sonarsource.org/

Sonar

sonar

Visit SonarSource.com | Plugins | Nemo

Download | Features | Screencasts | Community | Forge | Roadmap | Blog

Put your technical debt under control

Productivity is falling ?
Confess your source code to clean it up !

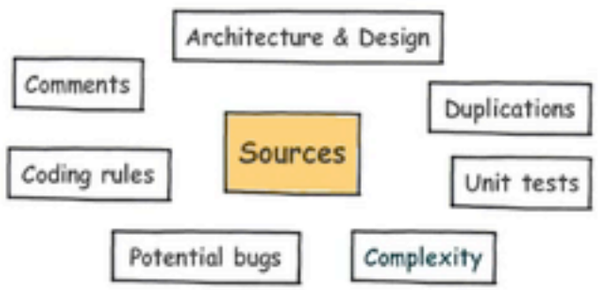
Mission | Platform | Figures

open source

Sonar is an open source project hosted at Codehaus. Download and install your own copy.
Version: **2.4.1** (November 18, 2010), License: LGPL3.

All in one

Sonar is an open platform to manage code quality. As such, it covers the 7 axes of code quality:



Extend with plugins

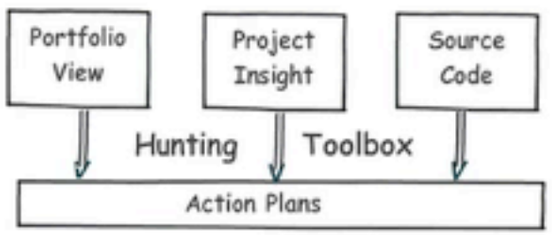
Covering new languages, adding rules engines, computing advanced metrics can be done through a powerful extension mechanism. More than 30 plugins are already available.

Languages covered

Java is built in. Open Source and commercial plugins enable to cover Flex, PHP, PL/SQL, Cobol and Visual Basic 6.

In 3 clicks

Sonar has got a very efficient way of navigating, a balance between high-level view, dashboard, TimeMachine and defect hunting tools. This enables to quickly uncover projects and / or components that are in Technical Debt to establish action plans.



Quality is central

Sonar is a web-based application. Rules, alerts, thresholds, exclusions, settings ... can be configured online. By leveraging its database, Sonar not only allows to combine metrics altogether but also to mix them with historical measures.

Get started

1. Download
2. Unzip and start
3. Analyze projects
4. Ready to improve quality

Sonar in action

To see more, visit Nemo, the online instance of Sonar dedicated to open source projects.

Extend Sonar

- Install plugins
- Integrate to Continuous Integration servers
- Integrate to Eclipse and Intellij Idea

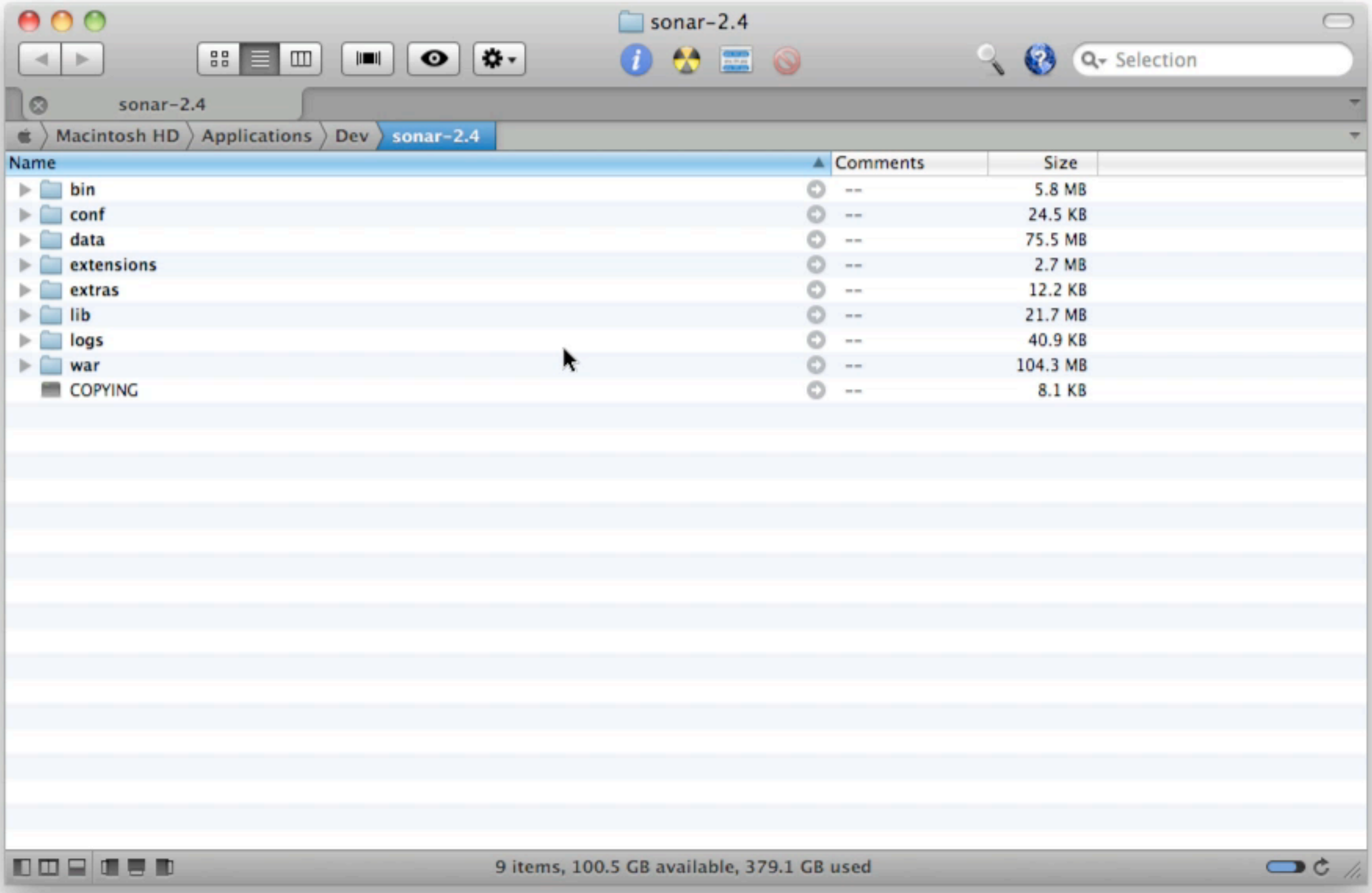
Browse the forge

Powered by SonarSource

SonarSource proposes commercial extensions to cover additional languages and manage portfolios of projects along with Professional services .

http://sonarsource.org

Unpack it


sonar-2.4
Selection
sonar-2.4
Macintosh HD
Applications
Dev
sonar-2.4
Name
Comments
Size
bin -- 5.8 MB
conf -- 24.5 KB
data -- 75.5 MB
extensions -- 2.7 MB
extras -- 12.2 KB
lib -- 21.7 MB
logs -- 40.9 KB
war -- 104.3 MB
COPYING -- 8.1 KB
9 items, 100.5 GB available, 379.1 GB used

Put `$SONAR_HOME/bin` on your path

Type `sonar.sh start`

Terminal — zsh — zsh

```
zeus /Users/mccm06
9 ~ %                                                    11:59:14
```

Database type?

- ✓ Derby

- ✓ Derby
- ✓ Oracle

- ✓ Derby
- ✓ Oracle
- ✓ MySQL

- ✓ Derby
- ✓ Oracle
- ✓ MySQL
- ✓ MS SQL

- ✓ Derby
- ✓ Oracle
- ✓ MySQL
- ✓ MS SQL
- ✓ PostgreSQL

Install Sonar - Sonar - Codehaus

http://docs.codehaus.org/display/SONAR/Install+Sonar

Google

Install Sonar - Sonar - Codehaus

Dashboard › Sonar › ... › Use Sonar › Install Sonar

Browse Log In Sign Up Search

sonar

Search

- Use Sonar
  - Install Sonar
  - Sonar in a nutshell
  - Collect data
  - Customising dashboards
  - Dependency Structure Matrix
  - Update Center
  - Security
  - Architecture rule engine
  - Administration
  - Performances
  - Glossary
  - Metric definitions
- Frequently Asked Questions
- Sonar Plugin Library
- Sonar Eclipse
- Extend Sonar

Install Sonar

Added by Olivier Gaudin, last edited by Freddy Mallet on Nov 17, 2010 (view change)

Tools

Table of content

Sonar requirements

Sonar is a web application and a maven plugin using both a database. This means that most Sonar users interact with Sonar through web browsers from any computer.

Server

Sonar runs on any operating system that support Java and Maven. Those two pieces of software need to be installed first :

- Java Development Kit v1.5 or later
- Maven 2.0.9+, 2.1.+, 2.2.+ or 3.+ (Since Sonar 2.4)

Sonar requires a relational database for storage of measures data. Sonar supports :

- Oracle 10g+

http://docs.sonarsource.org/display/SONAR/Install+Sonar

Analyzing

Measuring the code

```
#To forcefully get a Sonar 2.4, Maven 3 compatible plugin
mvn org.codehaus.mojo:sonar-maven-plugin:2.0-beta-1:sonar
```

```
#...Or if you've never used Sonar before

mvn sonar:sonar
```


PLEASE
Take A
Number
A84

Terminal — zsh — zsh

zsh zsh

```
zeus ~/Documents/Teach/Courses/Sonar/code-to-analyze/junit on m
aster(r4.8.1-92-gd46478d) 1 commit since tracked remotes/origin
/HEAD(r4.8.1-91-g81b50e9)
31 junit:master %                                          20:45:53
```

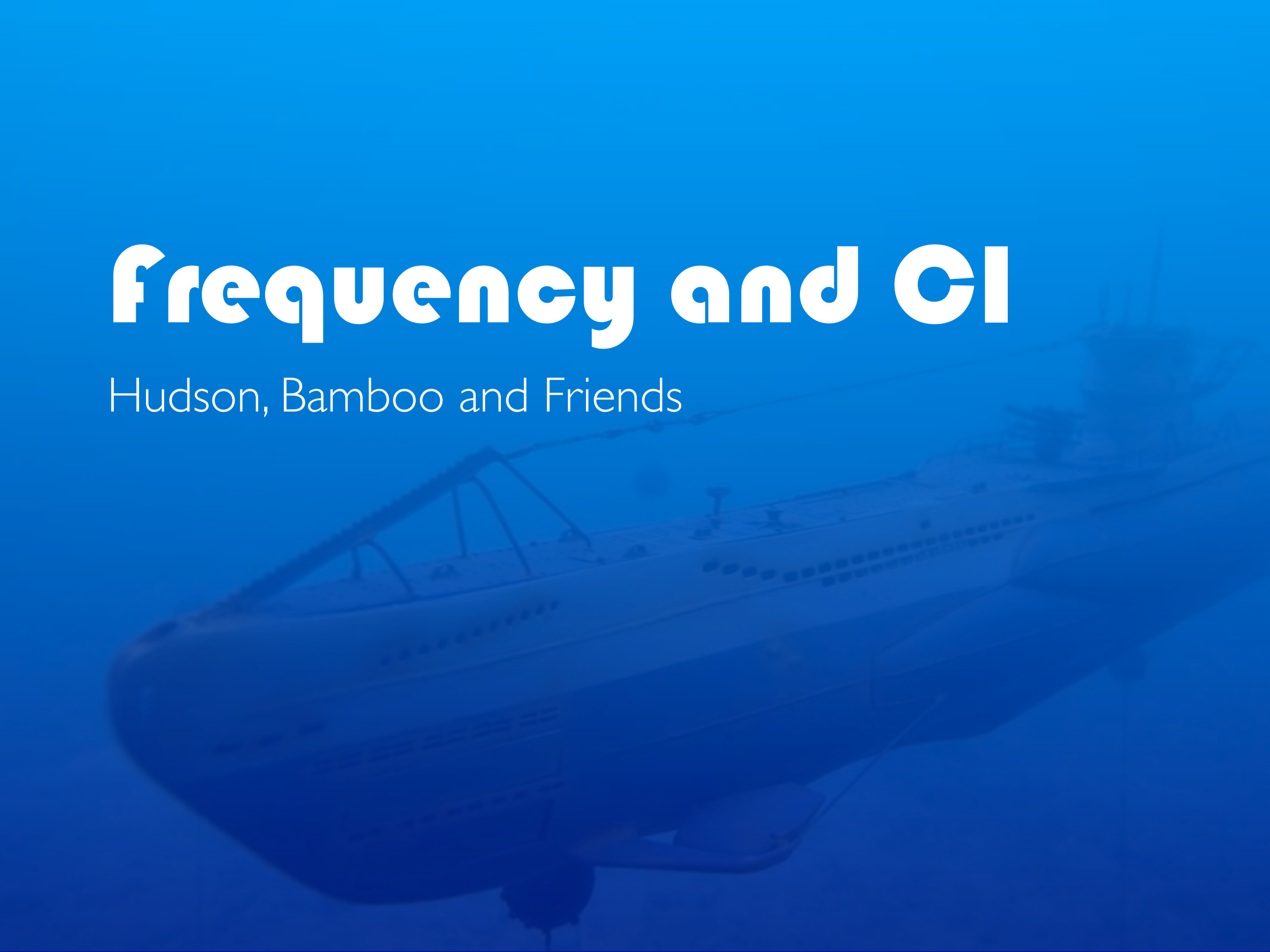
Terminal — zsh — zsh

zsh zsh

```
zeus ~/Documents/Teach/Courses/Sonar/code-to-analyze/junit on m
aster(r4.8.1-92-gd46478d) 1 commit since tracked remotes/origin
/HEAD(r4.8.1-91-g81b50e9)
31 junit:master %                                          20:45:53
```

Frequency and CI

Hudson, Bamboo and Friends



How often?

Not **too** often

But enough to get **good granularity**

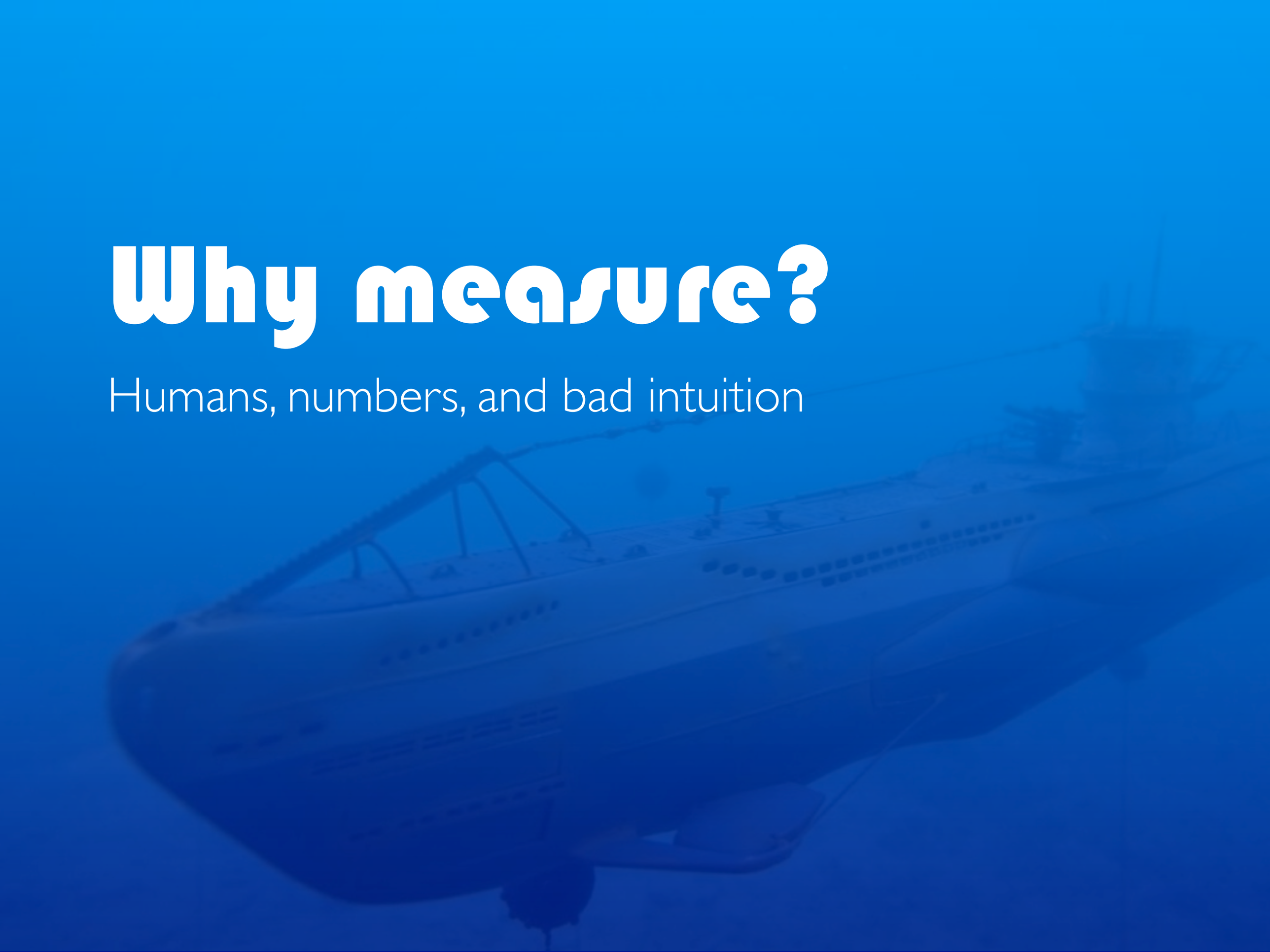
Once per day

Twice per day

(a reasonable **maximum**)

Why measure?

Humans, numbers, and bad intuition



managers **distrust** developers impulses

impulses are **incongruent** with...

our **personal** best interests

our **corporate** best interests

better at **team agility**

better at leveraging **frameworks**

as **bad** as ever choosing "*what next?*"

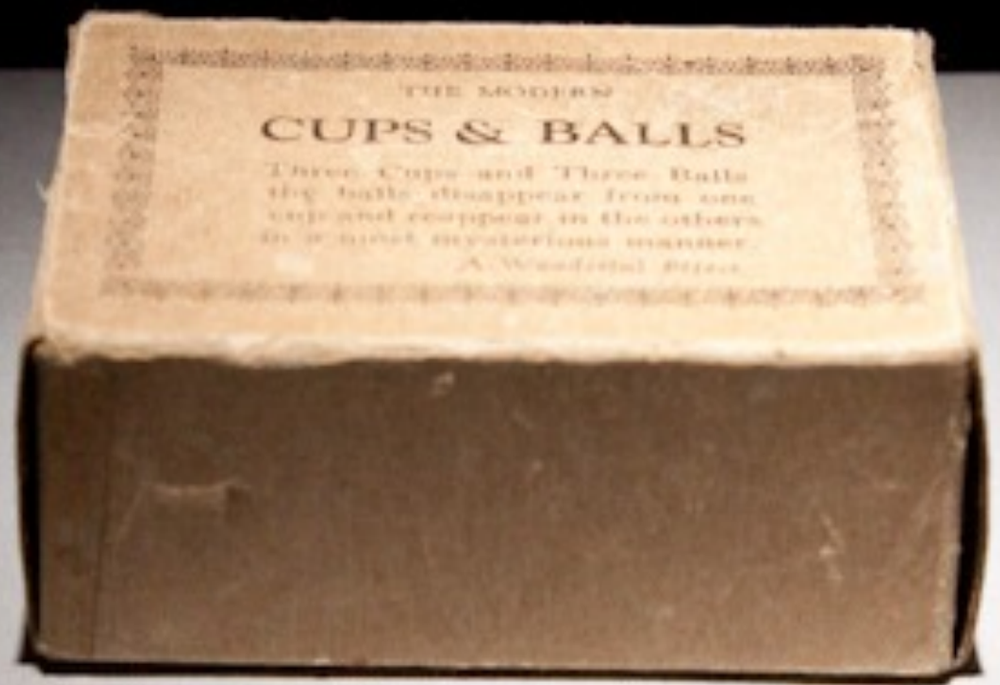
JUnit: What to fix first

1. Tightly coupled classes?
2. Empty if-statements?
3. Test coverage?
4. Magic numbers?

please don't **guess**!

please don't **guess**!

please don't **guess**!



analysis tools can provide the data

"As the performance of the underlying systems improved... our ability to predict the performance of a program has eroded"

— Josh Bloch

Chief Java Architect at Google

measure, **measure**, measure

act on that measurement's implications

measure **again**

tiring

who has time to **glue** the tools together?

automate it!


sonar
Quality is under control

Our Shortcomings

Avoiding common mistakes


sonar
Quality is under control

“**seven** deadly developer sins”

“**seven** deadly developer sins”

- ★ Size / Complexity
- ★ Unit Tests
- ★ Duplication
- ★ Coding Rules
- ★ Potential Bugs
- ★ Architecture
- ★ Comments

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- ★ Comments

- Size / Complexity
- Unit Tests
- Duplication
- Coding Rules
- Potential Bugs
- Architecture
- Comments

The Metrics

Revealing the seven sins

complexity

LCOM4

- Lack of Cohesion Among Method of Class

LCOM4

- Number of "connected components" in a class.
  - Set of related methods and fields.
  - Should be only one such component in each class.
  - If 2 or more components, the class should be split.

Cyclomatic Complexity

- Count of:
  - `if`
  - `for`
  - `while`
  - `case`
  - `catch`
  - `throw`
  - `return (not at end of method)`
  - `&&`
  - `||`
  - `?`

afferent coupling

- How many classes use this one?
- “Inbound links”

efferent coupling

- How many other classes does this one use?
- “Outbound links”

size

lines of code

- One of the few raw dimensions

unit tests

Tests

- Line coverage
- Branch coverage
- % Passing

duplication

Duplication

- Duplicated code blocks
- Refactor into a single method

Unused

- Private methods
- Protected method

coding rules

Code styling

- Selling source code?
- For readability

potential bugs

findbugs

- Rule-based
- Common mistakes
- Risky practices

architecture

Coupling

- Package tangle
  - 2 * (package_tangles / package_edges_weight) * 100

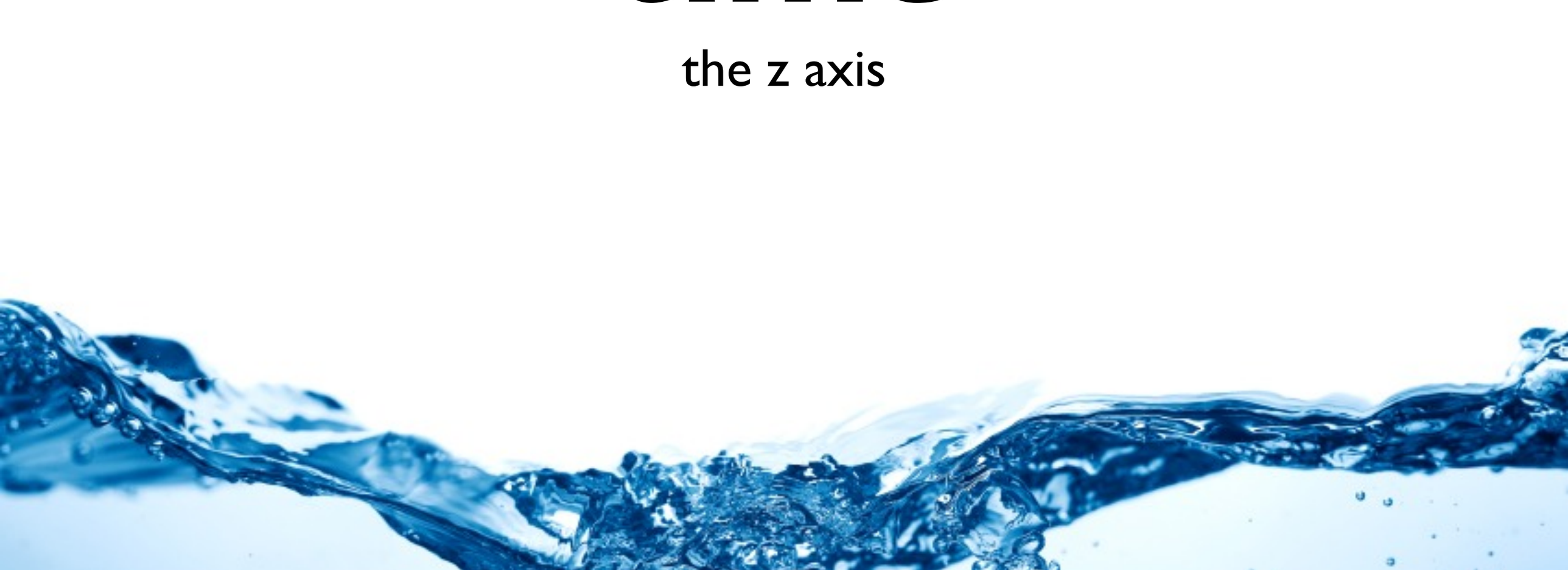
comments

Comments

- Documented functions, classes
- Undocumented APIs
- Commented lines of code

time

the z axis



Timeline

- Uses Google charting

Motion Chart

- Dimensions not visible in numbers

API Changes

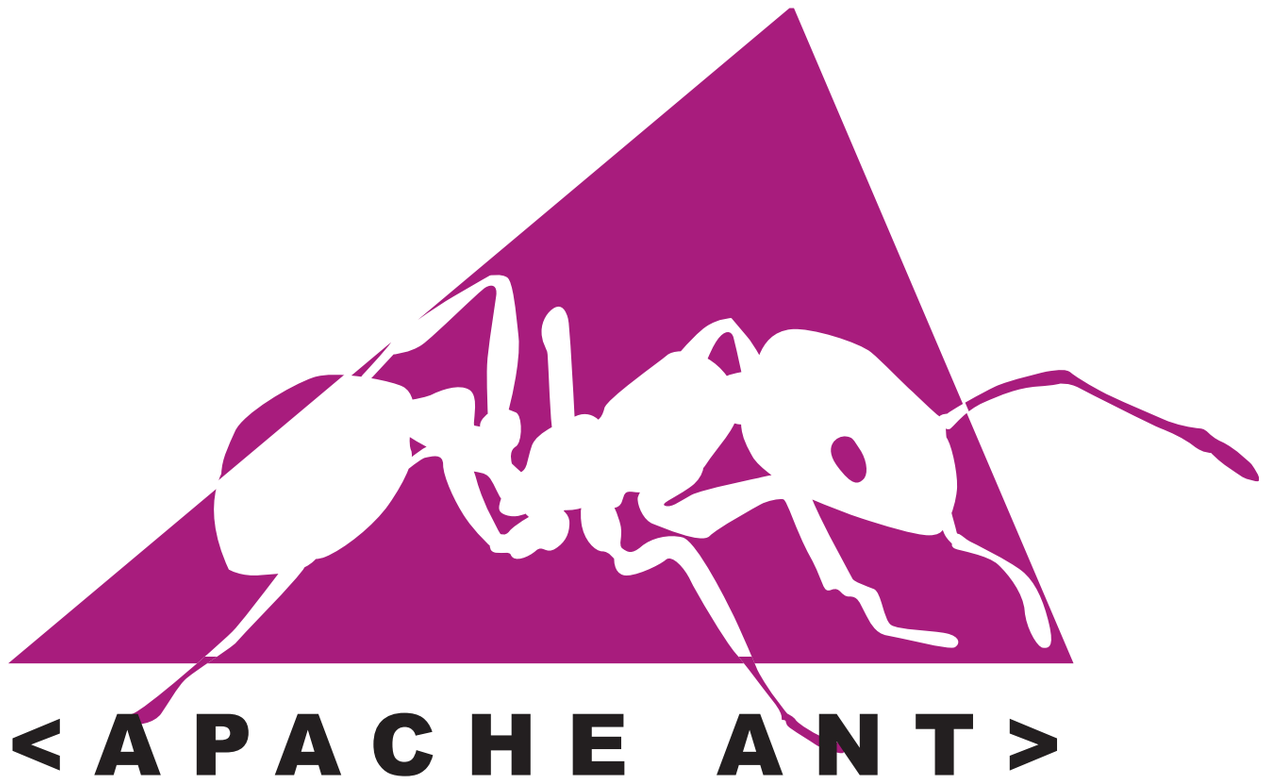
- Backwards compatible APIs
-

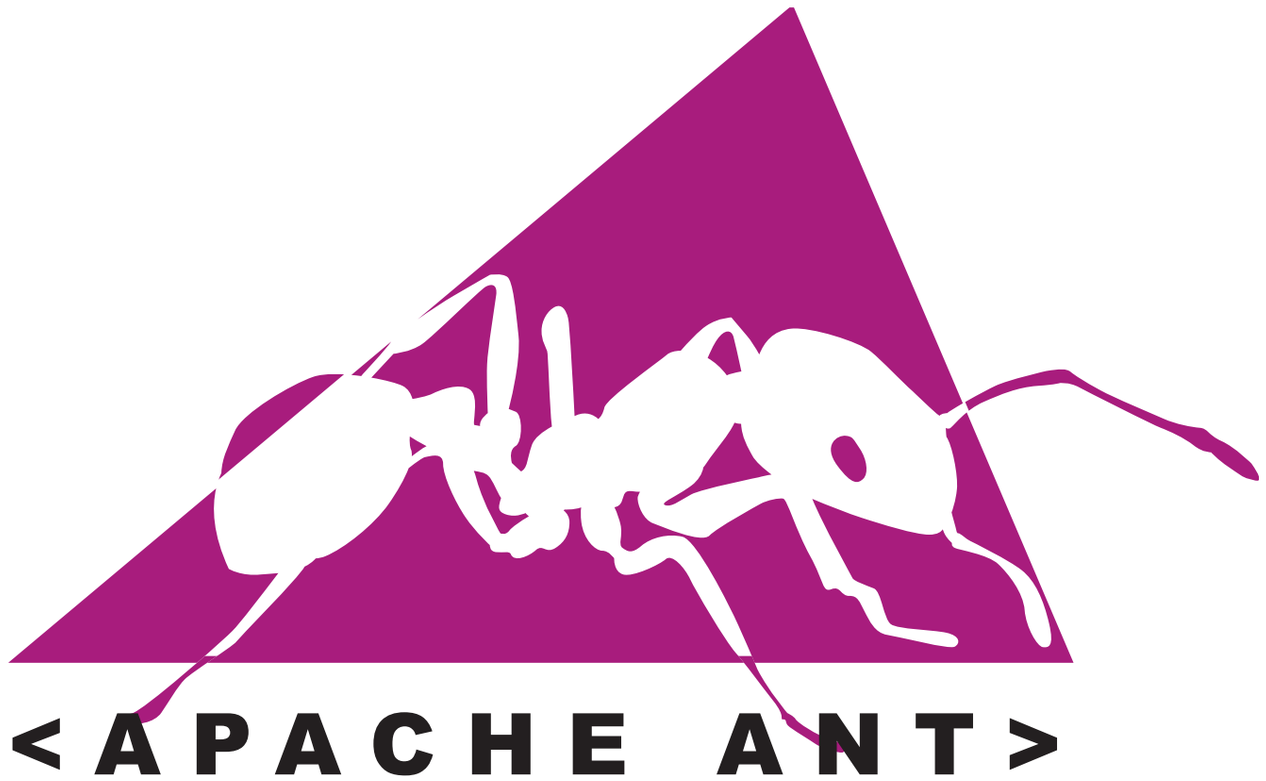
Build tools

maven 2

or

maven 3


<APACHE ANT>



Bootstrap it with a tiny Maven POM

```
<?xml version="1.0"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/
maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>[YOUR.ORGANIZATION]</groupId>
  <artifactId>[YOUR.PROJECT]</artifactId>
  <name>[YOUR PROJECT NAME]</name>
  <version>[YOUR PROJECT VERSION]</version>

  <build>
    <sourceDirectory>[YOUR SOURCE DIRECTORY]</sourceDirectory>
    <outputDirectory>[YOUR CLASSES/BIN DIRECTORY</outputDirectory>
    <plugins>
      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-compiler-plugin</artifactId>
        <configuration>
          <source>1.5</source>
          <target>1.5</target>
          <excludes>
            <exclude>**/*.*</exclude>
          </excludes>
        </configuration>
      </plugin>
    </plugins>
  </build>

  <properties>
    <sonar.dynamicAnalysis>false</sonar.dynamicAnalysis>
  </properties>

</project>
```

Gradle

a better way to build

Gradle

a better way to build

Bootstrap it with a tiny Maven POM

```
<?xml version="1.0"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/
maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>[YOUR.ORGANIZATION]</groupId>
  <artifactId>[YOUR.PROJECT]</artifactId>
  <name>[YOUR PROJECT NAME]</name>
  <version>[YOUR PROJECT VERSION]</version>

  <build>
    <sourceDirectory>[YOUR SOURCE DIRECTORY]</sourceDirectory>
    <outputDirectory>[YOUR CLASSES/BIN DIRECTORY</outputDirectory>
    <plugins>
      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-compiler-plugin</artifactId>
        <configuration>
          <source>1.5</source>
          <target>1.5</target>
          <excludes>
            <exclude>**/*.*</exclude>
          </excludes>
        </configuration>
      </plugin>
    </plugins>
  </build>

  <properties>
    <sonar.dynamicAnalysis>false</sonar.dynamicAnalysis>
  </properties>

</project>
```

Gradle / GRADLE-888

Gradle Integration with Sonar

Log In

View

Details

Type:	New Feature	Status:	Open
Priority:	Major	Resolution:	Unresolved
Affects Version/s:	None	Fix Version/s:	1.0-milestone-2
Component/s:	plugins		

Description:

It would be nice to have gradle integrate with sonar, currently there is no way this can be done. I have tried integrating gradle + hudson + sonar by means of hudson plugin configuration but that just does not work. Please see if this could be done, i would assume it could be big plus.

People

Assignee:	Peter Niederwieser
Reporter:	Pratik Parikh
Votes:	33
Watchers:	19

Dates

Created:	03/Apr/10 6:54 AM
Updated:	Tuesday 11:25 PM

Activity

All | Comments | Work Log | History | Activity

Gregory Boissinot added a comment - 04/Apr/10 5:43 AM

Sonar is deeply coupled with Maven.
Sonar uses Maven plugins for launching metrics tools and it uses the Maven conventions for recording the generated XML files.

It would be great whether Sonar uses Gradle for launching metrics tools and for recording the genrated XML files (In addtion, Gradle makes its possible to use the Maven conventions, and it's easier)

Therefore this issue is not a Gradle issue but a Sonar issue.
I sugget raising a Sonar issue and I suggest closing this Gradle issue.

Hans Dockter added a comment - 17/Apr/10 9:50 AM

As Gregory pointed out, there is not a good way yet to integrate Sonar with Gradle. But it is definitely something we would like to offer at one point once Sonar is a little bit more build tool agnostic.

Jenkins?

install the *Hudson Sonar Plugin*

Dashboard [Hudson]

http://localhost:8080/

Sonar | Dashboard [Hudson]

Hudson

search

Hudson

ENABLE AUTO REFRESH

- New Job
- Manage Hudson
- People
- Build History
- Project Relationship
- Check File Fingerprint
- Query and Trigger Gerrit Patches

add description

Build Queue

No builds in the queue.

Build Executor Status

#	Status
1	Idle
2	Idle

Algorithms | All | +

S	W	Job ↓	Last Success	Last Failure	Last Duration
●	☁	A-GitHub-Sample	13 days (#13)	14 days (#10)	1 min 25 sec
●	☀	GitSCMSample-FromGitHub	18 days (#6)	N/A	23 sec
●	☀	Maven201Showcase-FromGitHub	1 mo 29 days (#4)	N/A	25 sec
●	⛅	Sample01-FromGitHub	18 days (#4)	18 days (#1)	6 min 55 sec
●	⛅	Sample17b-FromLocal	8 mo 9 days (#4)	8 mo 9 days (#1)	6.4 sec
●	☀	Simple-Fresstyle-Echo-to-Sysout	9 mo 6 days (#2)	N/A	2.2 sec
○		Sonar-Test	N/A	N/A	N/A

Icon: S M L

Legend for all for failures for just latest builds

Page generated: Nov 28, 2010 9:13:18 PM Hudson ver. 1.381

Go to "http://localhost:8080/"

setup the *Hudson Sonar Plugin*

Sonar-Test [Hudson]

http://localhost:8080/job/Sonar-Test/

Sonar | Sonar-Test [Hudson]

Hudson

search

Hudson » Sonar-Test

DISABLE AUTO REFRESH

- Back to Dashboard
- Status
- Changes
- Workspace
- Build Now
- Delete Project
- Configure
- Git Polling Log

Build History (trend)

#1 Nov 28, 2010 9:27:56 PM

for all for failures

Project Sonar-Test

add description

Workspace

Recent Changes

Permalinks

- Last build (#1), 11 min ago
- Last failed build (#1), 11 min ago
- Last unsuccessful build (#1), 11 min ago

Page generated: Nov 28, 2010 9:38:59 PM Hudson ver. 1.381

use the *Hudson Sonar Plugin*

Dashboard [Hudson]

http://localhost:8080/

Sonar | Dashboard [Hudson]

Hudson

search

Hudson

DISABLE AUTO REFRESH

- New Job
- Manage Hudson
- People
- Build History
- Project Relationship
- Check File Fingerprint

add description

Build Queue

No builds in the queue.

Build Executor Status

#	Status
1	Idle
2	Idle

Algorithms | **All** | +

S	W	Job ↓	Last Success	Last Failure	Last Duration
●	☁	A-GitHub-Sample	13 days (#13)	14 days (#10)	1 min 25 sec
●	☀	GitSCMSample-FromGitHub	18 days (#6)	N/A	23 sec
●	☀	Maven201Showcase-FromGitHub	1 mo 29 days (#4)	N/A	25 sec
●	⛅	Sample01-FromGitHub	18 days (#4)	18 days (#1)	6 min 55 sec
●	⛅	Sample17b-FromLocal	8 mo 9 days (#4)	8 mo 9 days (#1)	6.4 sec
●	☀	Simple-Fresstyle-Echo-to-Sysout	9 mo 6 days (#2)	N/A	2.2 sec
●	⛈	Sonar-Test	N/A	16 min (#1)	2 min 8 sec

Icon: S M L

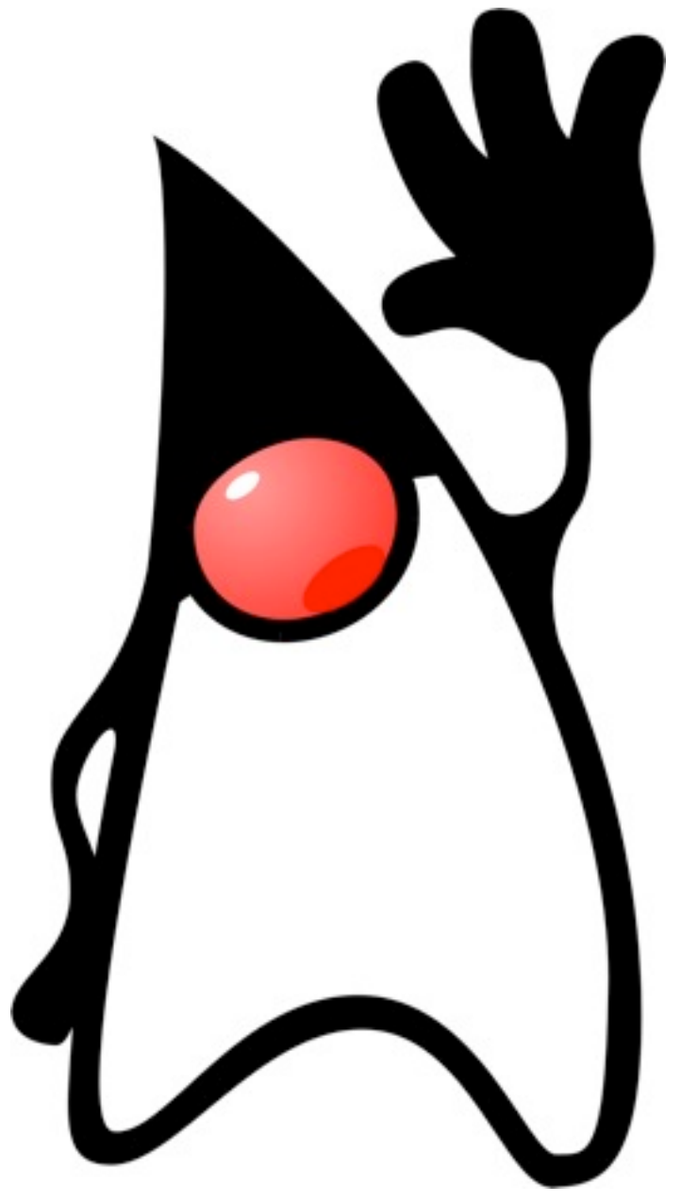
Legend for all for failures for just latest builds

Page generated: Nov 28, 2010 9:44:53 PM Hudson ver. 1.381

Other languages

The JVM and beyond

Sonar works with **Java**



Java

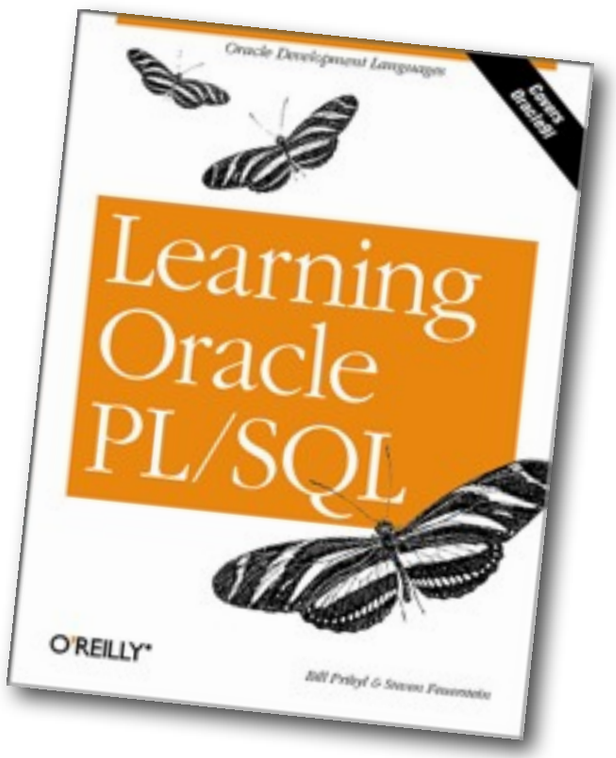
supported out of the box

But not **just** Java

Groovy

```
<?xml version="1.0"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://
www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://
maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/
maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>my.group.id</groupId>
  <artifactId>arifactId</artifactId>
  <version>1.0</version>
  <packaging>pom</packaging>
  <name>The Name of My Project</name>

  <build>
    <sourceDirectory>src/main/groovy</sourceDirectory>
  </build>

  <properties>
    <sonar.language>grvy</sonar.language>
    <sonar.dynamicAnalysis>false</sonar.dynamicAnalysis>
  </properties>
</project>
```

PL/SQL


Oracle Development Languages
Covers Oracle8i!
Learning Oracle PL/SQL
O'REILLY
Bill Pribyl & Steven Feuerstein

worried

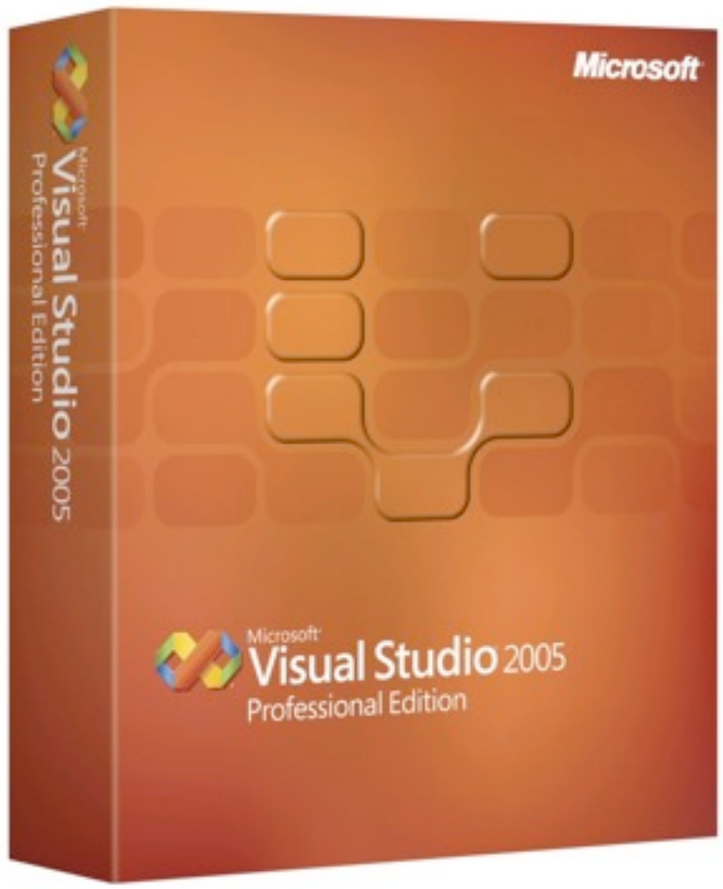
Flex


ADOBE FLEX BUILDER 3
ADOBE FLEX BUILDER 3
Professional Edition
Adobe

PHP


Earn money from the comfort of your home
PHPMyCART
Integrate a shopping cart to your existing web site
PHPMyCART
Integrate a shopping cart to your existing web site
Resell e-commerce software
Take your offline business online

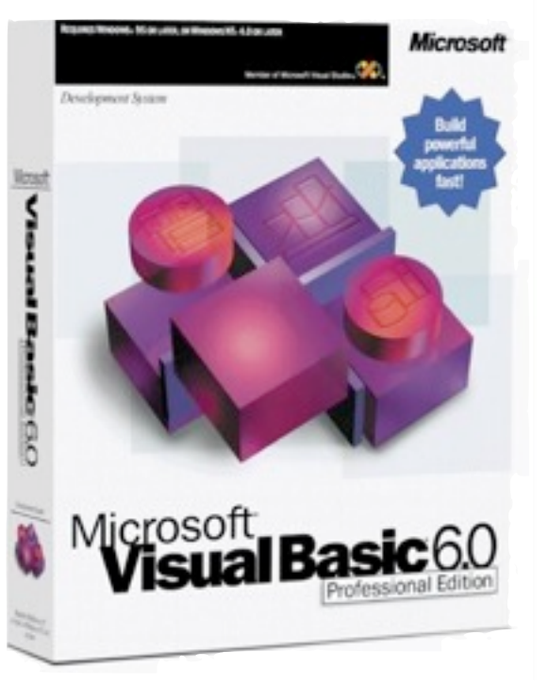
C#


Microsoft
Visual Studio 2005
Professional Edition
Microsoft
Visual Studio 2005
Professional Edition

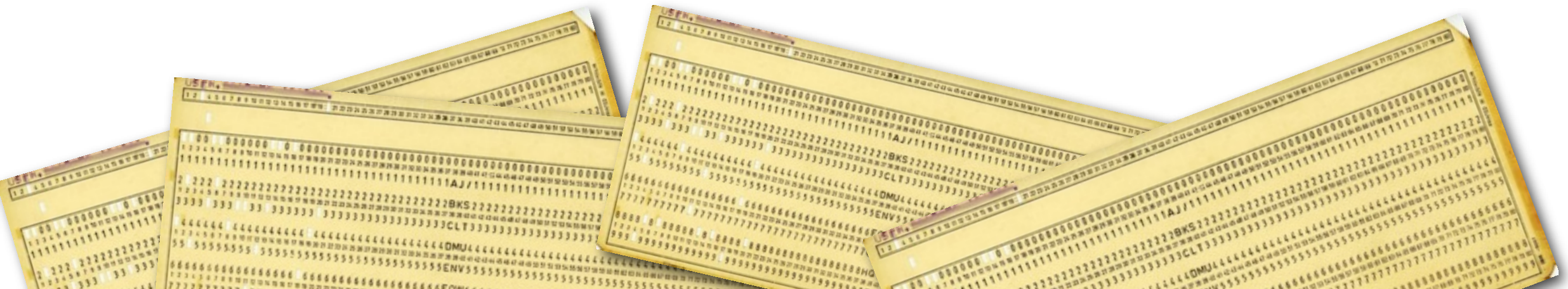
```xml
<?xml version="1.0"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-v4_0_0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.whatever</groupId>
  <artifactId>my-solution</artifactId>
  <version>1.2.3-SNAPSHOT</version>
  <name>My solution</name>
  <packaging>sln</packaging>

  <properties>
    <!-- NOTE : the versions and parameters may be defined as properties
       Prefer this option to the plugin specific configuration as it may be accessible to several plugins
    -->
    <visual.studio.solution>MySolution.sln</visual.studio.solution>
    <visual.test.project.pattern>*.Tests;*Test</visual.test.project.pattern>
    <dotnet.tool.version>4.0</dotnet.tool.version>
    <sonar.language>cs</sonar.language>
  </properties>

  <build>
    <plugins>
      <plugin>
        <groupId>org.codehaus.sonar-plugins.dotnet</groupId>
        <artifactId>maven-dotnet-plugin</artifactId>
        <extensions>true</extensions>
      </plugin>
      <plugin>
        <groupId>org.codehaus.mojo</groupId>
        <artifactId>sonar-maven-plugin</artifactId>
        <configuration>
          <language>cs</language>
        </configuration>
      </plugin>
    </plugins>
  </build>
</project>
```

Seriously.

Visual Basic 6



Cobol



Sonar has become a Multi-Languages Platform

By **Olivier Gaudin** on September 16, 2010 » tags **languages**, **plugins**

At the beginning of this year, Freddy mentioned in the **Sonar roadmap for 2010** that after version 2.0 the main objective was to enable other languages on the Sonar platform through plugins. Nine months later, we have made very good progress on this subject and I wanted to take a chance to report on it.

Java is currently the only language that is built in Sonar Core. This means that when you install the platform, the support for Java is there already. All other languages get supported through plugins. All those plugins are obviously available on the **forge of plugins** with documentation. But here is a slightly different view, based on whether what we call “the 7 deadly sins of the developers” get covered in Sonar for the language :

already. All other languages get supported through plugins. All those plugins are obviously available on the forge of plugins with documentation. But here is a slightly different view, based on whether what we call “the 7 deadly sins of the developers” get covered in Sonar for the language :

	Size & Complexity	Unit Tests	Duplication	Coding Rules	Potential Bugs	Architecture	Comments
Cobol (Commercial)	✓	✗	✓	✓	✗	✗	⚠
Flex (LGPL v3)	⚠	✗	✓	✓	✗	✗	⚠
Groovy (LGPL v3)	⚠	✗	✓	✓	✗	✗	⚠
Java (Built-in)	✓	✓	✓	✓	✓	✓	✓
PHP (LGPL v3)	✓	✓	✓	✓	✗	✗	⚠
PL/SQL (Commercial)	⚠	✗	✓	✓	✗	✗	⚠
VB6 (Commercial)	✓	✗	✓	✓	✗	✗	⚠
Web (Apache 2.0)	✓	✗	✓	✓	✗	✗	⚠
.Net (LGPL v3)	✓	✗	✓	✓	✗	✗	⚠

Plugins

Extending the analysis

manual install of plugins

prior to v2.4

now, a **web UI** for plugins

but first, **log in**...

Sonar

http://localhost:9000/

Sonar

Home | Configuration | Log In | Search

Filters
Dependencies
Motion chart

sonar

Projects | Treemap

Alert	Name	Version	Lines of code	Rules compliance	Build date	Links
	Apache Log4j	1.2.17-SNAPSHOT	20,638	76.4%	2010-11-25	
	JUnit	4.8.2	6,419 ▲	67.0%	2010-11-27	
	Sample Multimodule Java Parent	1.0-SNAPSHOT	48	25.0%	2010-02-05	
	Sample Project - Algorithms	1.0-SNAPSHOT	8	25.0%	2010-10-26	
	Sample Project - Clover Coverage	1.0-SNAPSHOT	8	25.0%	2010-02-05	
	Sample Project - One Dependency	1.0-SNAPSHOT	8	25.0%	2010-10-26	
	Sample Project - Wicket With Unneeded Dependencies	1.0-SNAPSHOT	53	0.0%	2010-10-27	
	Struts 2	2.2.1	101,316 ▼	74.6%	2010-11-27	
	babble	1.0.0-SNAPSHOT	156 ▲	67.9% ▼	2010-06-29	
	babble-core	1.0.0-SNAPSHOT	95	57.9%	2010-09-30	

10 results | Alerts feed

then **plugins**...

Sonar

http://localhost:9000/profiles

Sonar

Home

Configuration | Administrator » Log out | Search

- Quality profiles
- Event categories
- Manual metrics
- Default filters
- Default dashboards
- My profile
- SQALE

SECURITY

- Users
- Groups
- Global roles
- Project roles

SYSTEM

- Settings
- Backup
- System Info
- Update Center

sonar

Restore profile

Java profiles

Create

Name	Rules	Alerts	Projects	Default	Operations
OnlyFindBugs	375	0	2	Set as default	Backup, Rename, Copy, Delete
Sonar way	116	0		✓	Copy
Sonar way with Findbugs	491	0	0	Set as default	Copy
Sun checks	61	0	0	Set as default	Copy

Go to "http://localhost:9000/profiles"

plugins **galore**...

Sonar Plugin Library

37 Added by Freddy Mallet, last edited by Evgeny Mandrikov on Nov 25, 2010 (view change)

Tools

Additional Metrics

Artifact Size - Reports on the size of the artifact generated by projects.

Build Stability - Reports on stability of project build using Continuous Integration engine data.

Clirr - Checks Java libraries for binary and source compatibility with older releases.

Emma - An alternative to Clover and Cobertura to measure coverage by unit tests in Java.

GreenPepper - Collects and reports tests results of executable specifications provided by GreenPepper.

JaCoCo - An alternative to Clover and Cobertura to measure coverage by unit tests in Java.

JIRA Issues - Retrieves and reports the number of project issues from JIRA.

Rules Meter - Gives information on the level of activation of projects quality profiles.

SCM Activity - Collects and reports information on commits using SCM data.

Security Rules - Enables to zoom on security rules violations to keep them under control.

SonarJ - Provides architecture governance features accompanied by metrics about cyclic dependencies and other structural aspects using SonarJ.

Taglist - Generates a report on various tags found in the code, like `@todo` or `//FIXME` tags.

Trac - Retrieves and reports the number of project issues from a Trac instance.

Useless Code - Reports on the number of lines that can be reduced in an application.

Governance

Quality Index - Calculates a global Quality Index based on coding rules, Style, Complexity and Coverage by unit tests.

SIG Maintainability Model - An implementation of the SIG MM to evaluate the maintainability of an application.

SQALE - Quality Model (Commercial) - An implementation of the SQALE Methodology, which supports the evaluation of a software application's source code in the most objective, accurate, reproducible and automated way possible.

Technical debt - Calculates the technical debt on every component of projects with a breakdown by duplications, documentation, coverage, complexity...

Total Quality - Provides an overall measure of the quality of projects linking code quality, design, architecture, and unit testing.

Views - Portfolio Management (Commercial) - Enables aggregation of projects. Projects can be grouped into applications, applications into teams, teams into departments...

IDE

Eclipse - See defects gathered by Sonar directly in Eclipse and fix them on the spot.

IntelliJ IDEA - See defects gathered by Sonar directly in IntelliJ IDEA and fix them on the spot.

Additional Languages

C - The **C plugin** associated to its **set of rules** enables to perform objective and automated C code reviews against pre-defined or home made coding best practices.

Cobol (Commercial) - Enables to perform objective and automated Cobol code reviews against pre-defined or home made coding best practices.

Flex / ActionScript - Enables analysis of ActionScript projects into Sonar.

Groovy - Enables analysis of Groovy projects into Sonar.

PHP - Enables analysis of PHP projects by handling several tools : PHP Unit, PHP Depend, PHPMD and SQLI CodeSniffer.

PL/SQL (Commercial) - Enables analysis and reporting on PL/SQL projects. As an option, the plugin can extract PL/SQL code from Oracle Forms.

Visual Basic 6 (commercial) - Enables to perform objective and automated Visual Basic 6 reviews against coding best practices.

.Net - Provides support for C# projects in Sonar.

Web - Enables analysis of web files in Sonar. Current version targets JSP and JSF.

Visualization / Reporting

Motion chart - Displays projects measures using the super sexy Google Motion Chart Gadget.

PDF Report - Generates a PDF report with the results of projects analysis.

Radiator - Displays measures using a big treemap that can then be explored.

Timeline - Displays measures history using a Google Timeline Chart to replay the past.

Integration

AnthillPro - Enables to configure and launch Sonar analysis from AntHillPro

Bamboo - Enables to configure and launch Sonar analysis from Bamboo, the Atlassian CI engine.

Build Breaker - Makes the build fail if pre-defined alert thresholds are hit.

Crowd - Enables delegation of Sonar authentication to Atlassian Crowd.

Cutoff - Exclude files from analysis based on a cutoff date threshold, to analyze the work done on an existing code base and measure the quality of new code/changes only.

Hudson - Enables to configure and launch Sonar analysis from Hudson CI engine.

LDAP - Enables the delegation of Sonar authentication to an external system. The plugin currently supports LDAP and Microsoft Active Directory.

Piwik - Submits usage of a Sonar instance to a Piwik server.

Twitter - Creates tweet, when project analysed by Sonar.

some are **commercial**

most are **open source**

motion chart...

Sonar

http://nemo.sonarsource.org/?page_id=3

Sonar | Sonar - Spring Security | Sonar - Sonar | Sonar

Home | Configuration | Log In | Search

Filters
- Dependencies
- Motion chart
- Radiator
- Views

sonar

Projects | Open Source Forges | Sonar Plugins

Alert	Name	Lines of code	Technical Debt ratio	Coverage	Duplicated lines (%)	Build date
	MasterProject	6,535,572	14.1%	24.5%	4.4%	02:09
✓	OPS4J Pax Exam (Build POM)	5,390	12.4%	0.0%	0.7%	2010-11-28
⚠	OPS4J Pax Logging (Build POM)	6,902	13.7%	0.0%	0.2%	2010-09-13
✓	OPS4J Pax Reflector (Build POM)	3,105	20.1%	0.0%	1.3%	2010-11-28
✓	OPS4J Pax Scanner (Build POM)	3,084	15.4%	0.0%	0.0%	2010-11-28
⚠	OPS4J Pax Url	4,794	14.3%	0.0%	0.0%	2010-11-28
✓	OPS4J Pax Web	10,998	13.9%	0.0%	1.4%	2010-11-28
✓	ObjectLab Kit	2,449	4.3%	74.1%	0.0%	2010-11-28
⚠	OpenEJB	193,027	19.5%	27.7%	19.9%	2010-09-27
✓	OpenFAST	11,480	11.8%	54.3%	1.7%	2010-11-28
⚠	OpenJPA Parent POM	208,913	22.8%	7.0%	3.5%	2010-11-28
✓	OpenNMS	214,957	8.6%		4.0%	2010-11-28
	Paul Griffiths' C programming examples	1,895	11.7%		17.6%	2010-10-18
✓	PicoContainer Root	46,199	7.8%	67.5%	2.3%	2010-11-28
⚠	Sigmah	63,203	11.1%	26.3%	7.2%	00:22
⚠	Silverpeas Core	213,836	18.8%	4.0%	4.6%	00:46
	Sonar	43,104	7.0%	65.3%	0.0%	01:47
✓	Sonar :: Development Maven Plugin	91	5.1%	83.6%	0.0%	02:12
✓	Sonar :: Update Center	1,981	18.1%	30.2%	0.0%	02:25
	Sonar IDEs	4,911	12.6%	23.4%	0.0%	02:20
✓	Sonatype Nexus Aggregator	71,929	15.6%	0.0%	2.9%	2009-12-08
⚠	Sonatype Plugins Aggregator	10,888	11.4%	14.5%	0.8%	2010-10-04
⚠	Sonatype Spice Aggregator	55,636	13.2%	28.8%	1.8%	2010-11-22
✓	Spring Batch	24,674	3.0%	88.9%	0.7%	2010-11-23
⚠	Spring Security	26,402	2.8%	68.0%	0.2%	2010-10-15
⚠	Spring Web Services	26,675	6.5%	63.7%	2.6%	2010-11-23
✓	Squale Project	95,218	7.7%	12.9%	2.1%	2010-11-23
⚠	Struts 1.3.9	50,080	22.5%	14.7%	20.6%	2010-11-23
⚠	Struts 2	102,303	13.4%	33.5%	2.9%	2010-11-23
⚠	Swizzle	6,550	18.7%	35.5%	0.0%	2010-10-25
✓	Swizzle	6,182	17.0%	46.6%	0.0%	2010-11-23

Google charting engine

web connectivity may be **required**

exposes **coding impacts** over time

Period: Two years Components:

Lin

Coverage

74
72
70
68
66
64

86.5
87
87.5
88
88.5
89
89.5

Color

Complexity /method

2.43
2.42
2.41
2.4

Size

Complexity

6000

Trails

Rules compliance Lin

10/15/10

IDEs

Mapping metrics to the editor

But wait, there's more!


IDEs
ShamWow!


eclipse

Java – junit/src/main/java/org/junit/experimental/theories/Theories.java – Eclipse – /Users/mccm06/Documents/Teach/Courses/Sonar/Sonar-Eclipse-Workspace

Java

Package Explorer

- junit
  - src/main/java
  - src/test/java
  - JRE System Library [J2SE-1.5]
  - Maven Dependencies
  - build
  - doc
  - lib
  - src
  - target
  - acknowledgements.txt
  - build.xml
  - cpl-v10.html
  - done.txt
  - junit.iml
  - junit.ipr
  - junit.iws
  - LICENSE
  - pom.xml
  - README
  - README.html
  - stylesheet.css
  - to-do.txt

Theories.java

```
/**
package org.junit.experimental.theories;

import java.lang.reflect.Field;

public class Theories extends BlockJUnit4ClassRunner {
    public Theories(Class<?> klass) throws InitializationError {
        super(klass);
    }

    @Override
    protected void collectInitializationErrors(List<Throwable> errors) {
        super.collectInitializationErrors(errors);
        validateDataPointFields(errors);
    }

    private void validateDataPointFields(List<Throwable> errors) {
        Field[] fields= getTestClass().getJavaClass().getDeclaredFields();

        for (Field each : fields)
            if (each.getAnnotation(DataPoint.class) != null && !Modifier.isStatic(e
                errors.add(new Error("DataPoint field " + each.getName() + " must b
    }

    @Override
    protected void validateConstructor(List<Throwable> errors) {
        validateOnlyOneConstructor(errors);
    }

    @Override
    protected void validateTestMethods(List<Throwable> errors) {
        for (FrameworkMethod each : computeTestMethods())
            if(each.getAnnotation(Theory.class) != null)
```

Outline

- org.junit.experimental.the
- import declarations
- Theories
  - Theories(Class<?>)
  - collectInitializationError
  - validateDataPointFields(
  - validateConstructor(List
  - validateTestMethods(Lis
  - computeTestMethods()
  - methodBlock(Framewor
  - TheoryAnchor

Problems | Javadoc | Declaration | Hotspots | Measures | Violations | Web | Console

Maven Console

```
11/29/10 10:02:33 AM MST: Maven Builder: AUTO_BUILD
11/29/10 10:50:09 AM MST: Refreshing [/junit/pom.xml]
11/29/10 10:50:09 AM MST: Maven Builder: AUTO_BUILD
11/29/10 10:50:09 AM MST: Refreshing [/junit/pom.xml]
11/29/10 10:50:10 AM MST: Maven Builder: AUTO_BUILD
```

junit


IntellijIDEA

Discover **human**-to-**code** interdependencies

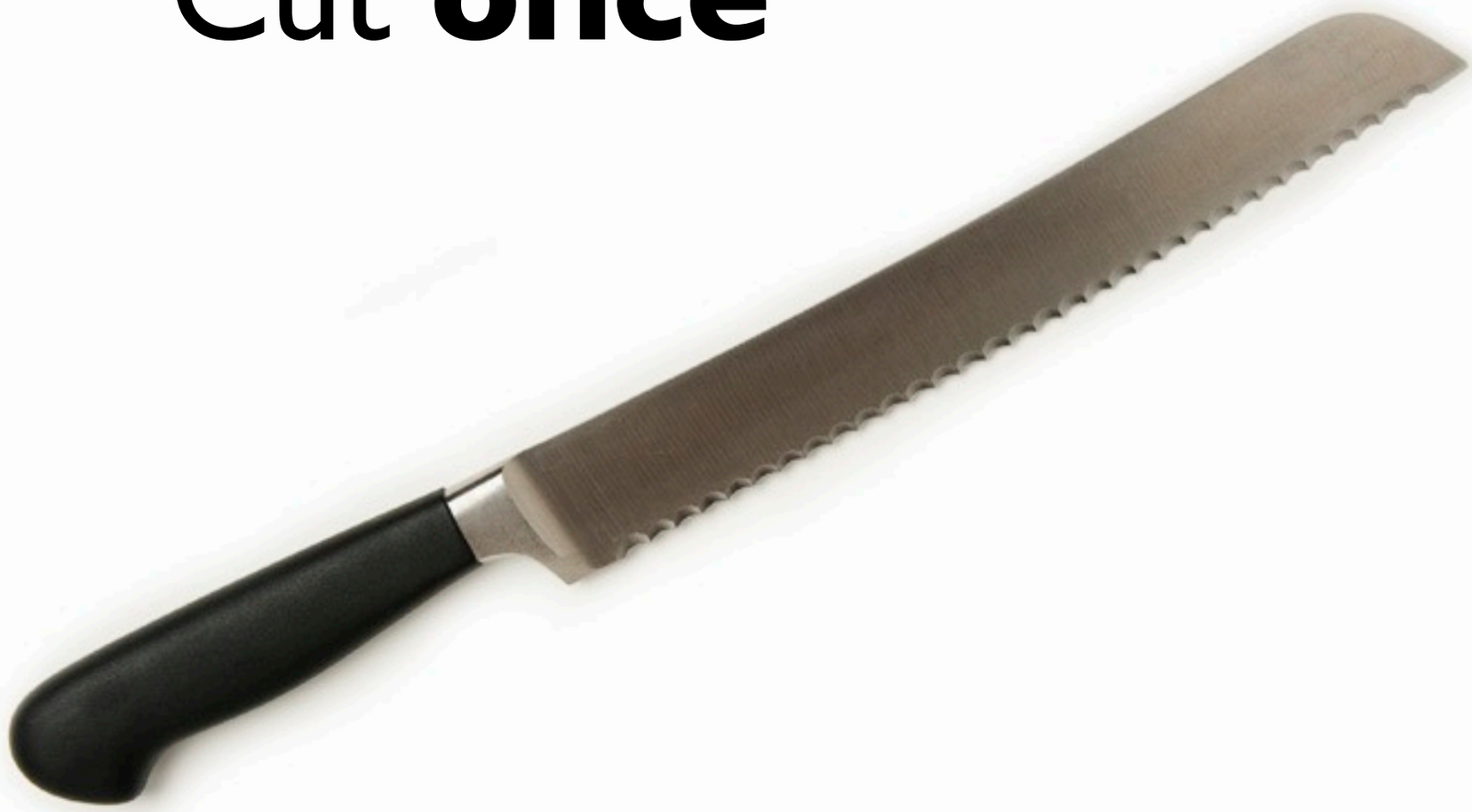
If you **can't** measure it...

can't **prove** you are

spending time **wisely**

Measure **twice**

Cut **once**



Sonar

10 METRICS FOR BETTER BUILDS

Credits

- Punch Card
  http://farm1.static.flickr.com/82/247968267_49cf34e1d5_o.jpg

- Monkeys
  Flickr Creative Commons

- Cups and Balls
  http://www.flickr.com/photos/laanba/4408687132/

- Chocolate Strawberries
  http://www.flickr.com/photos/raggle/3224971811/

- http://iStockPhoto.com

- http://AmbientIdeasPhotography.com