



Menschen. Innovationen. Lösungen.



Statische Code-Analyse für Groovy & Grails mit CodeNarc

gearconf 2011, Stefan Glase

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Software-Entwickler

Java EE, Spring, Groovy, Grails

Trainer und Coach

Sprecher und Autor



Märkte

- Java
- SOA
- ORACLE
- BI/DWH
- Outtasking

Kunden

- Branchenübergreifend
- Über 600 Kunden



Leistungsangebot

- IT-Strategie
- Beratung
- Implementierung
- Betrieb
- Training



Fakten

- Gründung 1990
- 400 Mitarbeiter
- 8 Standorte in D/PL



Agenda

- **Was ist CodeNarc?**
- **CodeNarc Regeln und Regelwerke**
- **CodeNarc im Browser**
- **Eigene CodeNarc Regeln erstellen**
- **Integration in Gradle-basierte Groovy-Anwendungen**
- **Integration in Grails-Anwendungen**
- **Weitere Integrationsmöglichkeiten**
- **Fazit**



Was ist CodeNarc?

Was ist CodeNarc?

**CodeNarc analyzes Groovy code for defects,
bad practices, inconsistencies, style issues
and more.**

<http://codenarc.sourceforge.net/>

Was ist CodeNarc?

- **Aktuelle Version 0.14 (seit heute!)**
- **Bibliothek ist im Maven Central Repository verfügbar**

```
<dependency>  
  <groupId>org.codenarc</groupId>  
  <artifactId>CodeNarc</artifactId>  
  <version>0.13</version>  
</dependency>
```

- **241 Regeln in kategorisierten Regelwerken**
- **Verschiedene Arten von Reports: XML, HTML, Text**
- **Kontakt zu den Entwicklern Chris Mair und Hamlet D'Arcy via Mailing-Liste, BugTracker oder Twitter**

Was ist CodeNarc?

CodeNarc Report

Report title: Sample Project
Date: Mar 5, 2011 10:01:23 PM
Generated with: [CodeNarc v0.13](#)

Summary by Package

| Package | Total Files | Files with Violations | Priority 1 | Priority 2 | Priority 3 |
|---|-------------|-----------------------|------------|------------|------------|
| All Packages | 7 | 4 | - | 9 | 5 |
| org.codenarc/sample/domain | 2 | 1 | - | 2 | 3 |
| org.codenarc/sample/other | 1 | - | - | - | - |
| org.codenarc/sample/service | 4 | 3 | - | 7 | 2 |

Package: org.codenarc.sample.domain

↳ [SampleDomain.groovy](#)

| Rule Name | Priority | Line # | Source Line / Message |
|--------------------------------|----------|--------|---|
| EmptyElseBlock | 2 | 24 | [SRC] else { [MSG] The else block is empty |

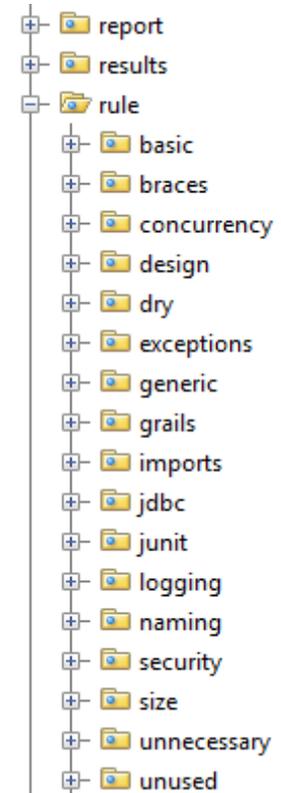
Beispiel HTML-Report



CodeNarc Regeln und Regelwerke

CodeNarc Regeln und Regelwerke

- Regeln (**Rule**) werden zu Regelwerken (**RuleSet**) zusammengefasst und liefern Verstöße (**Violation**) im untersuchten Code (**SourceCode**)
- Analyse des Abstract Syntax Tree (AST) mittels Visitor-Objekten (**AstVisitor**)
 - Inklusive Hilfsklasse **AstUtil** für übliche Operationen auf dem AST
- Erzeugung von Verstößen (**Violation**) mittels einfacher API im **AstVisitor**



CodeNarc Regeln und Regelwerke

■ 241 Regeln... und die Zahl ist stetig wachsend!

ConstantTernaryExpressionRule

RemoveAllOnSelfRule

BigDecimalInstantiationRule

CloneableWithoutCloneRule

SerializableClassMustDefineSerialVersionUIDRule

EqualsAndHashCodeRule

EmptySynchronizedStatementRule

BrokenOddnessCheckRule

EmptySwitchStatementRule

ConsecutiveLiteralAppendsRule

EmptyTryBlockRule

EmptyForStatementRule

BooleanGetBooleanRule

DuplicateCaseStatementRule

EmptyElseBlockRule

EmptyFinallyBlockRule

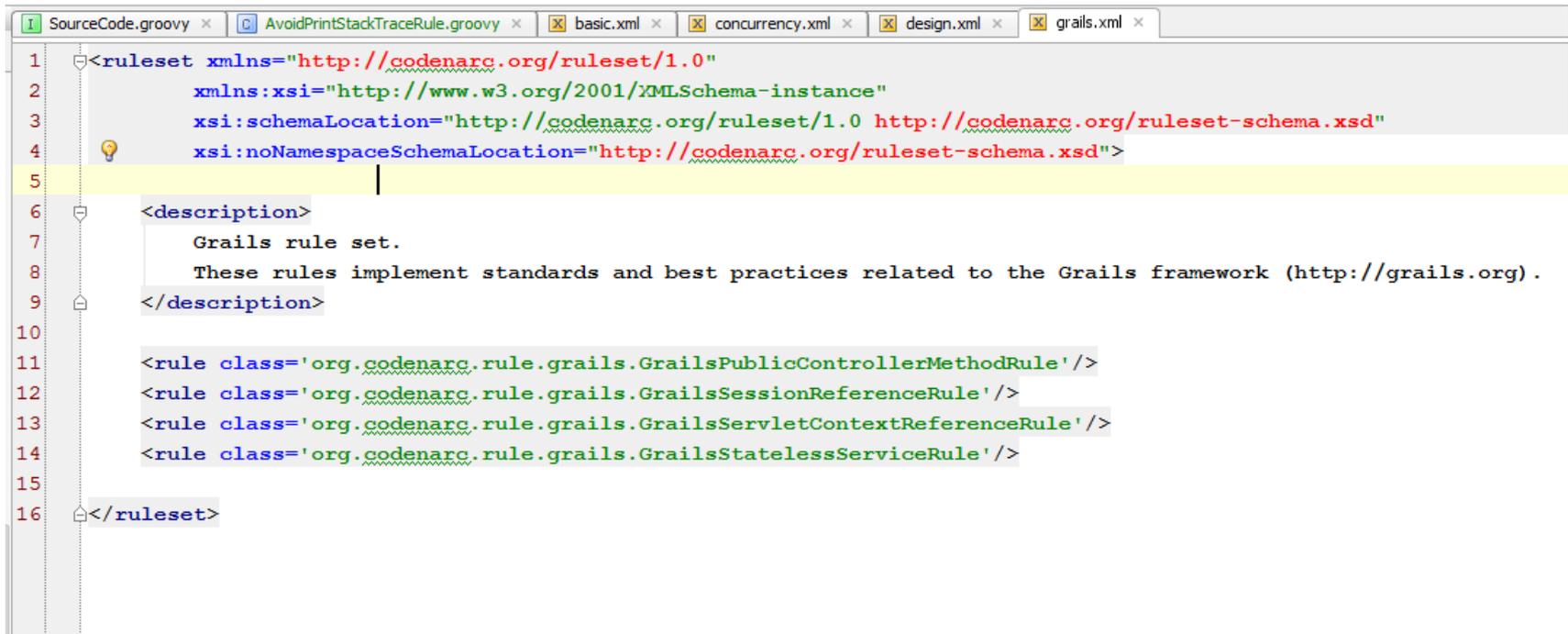
BooleanMethodReturnsNullRule

ConstantIfExpressionRule

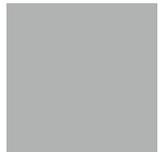
... und viele weitere!

CodeNarc Regeln und Regelwerke

- Regeln liegen in Form von XML-Dokumenten zur einfachen Einbindung und Konfiguration der anzuwendenden Regeln vor



```
1 <ruleset xmlns="http://codenarc.org/ruleset/1.0"
2     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
3     xsi:schemaLocation="http://codenarc.org/ruleset/1.0 http://codenarc.org/ruleset-schema.xsd"
4     xsi:noNamespaceSchemaLocation="http://codenarc.org/ruleset-schema.xsd">
5
6     <description>
7         Grails rule set.
8         These rules implement standards and best practices related to the Grails framework (http://grails.org).
9     </description>
10
11     <rule class='org.codenarc.rule.grails.GrailsPublicControllerMethodRule' />
12     <rule class='org.codenarc.rule.grails.GrailsSessionReferenceRule' />
13     <rule class='org.codenarc.rule.grails.GrailsServletContextReferenceRule' />
14     <rule class='org.codenarc.rule.grails.GrailsStatelessServiceRule' />
15
16 </ruleset>
```



CodeNarc im Browser

CodeNarc im Browser

CodeNarc web console

meetcodenarc.appspot.com

CodeNarc web console

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15



CODENARC
Less Bugs Better Code

Actions > Execute script New script Publish script View recent scripts

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Result Output Stacktrace

Recent scripts

- [Tom-Bot](#) by [HamletDRC](#) 4 days ago with tags [robot](#)
- [GroovyQuiz#8](#) by [HamletDRC](#) 3 months ago with tags [quiz](#)
- [SuppressWarnings.test](#) by [melix](#) 3 months ago with tags [suppresswarnings](#)
- [Sloppy Logging](#) by [HamletDRC](#) 4 months ago with tags [quiz](#)
- [I See Dead Code2](#) by [HamletDRC](#) 4 months ago with tags [quiz](#)
- [I See Dead Code](#) by [HamletDRC](#) 4 months ago with tags [quiz](#)
- [GroovyQuiz #5](#) by [HamletDRC](#) 4 months ago with tags [quiz](#)
- [Effective Groovy](#) by [HamletDRC](#) 4 months ago with tags [quiz](#)
- [Wrong violation with inner classes](#) by [melix](#) 4 months ago with tags [inner class](#)
- [JUnitRules.in 0.12](#) by [HamletDRC](#) 4 months ago with tags [junit 0.12](#)

Console tips

- You can hit Alt-Meta-R to execute the current script without using the execute button.
- You can resize the script view by sliding down the bottom of the line number gutter.

About this site:

- Application deployed on [Google App Engine](#)
- Developed with the [GaeLyk](#) lightweight Groovy toolkit for Google App Engine
- Programmed with [Groovy](#) version 1.7.4
- Code hosted on [GitHub](#) and managed with Git
- Live syntax highlighting provided by [CodeMirror](#)
- Syntax highlighting for sharing provided by [SyntaxHighlighter](#)

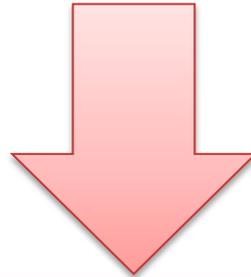
<http://meetcodenarc.appspot.com/>

CodeNarc im Browser

← → ↻ 🏠 meetcodenarc.appspot.com/edit/27001

CodeNarc web console

```
1  def count = 10
2  println "Hello World"
3
4  |
5
6
```



Result Output Stacktrace

```
line: 1 UnusedVariable The variable [count] is not used source: def count = 10
line: 2 Println println should be replaced with something more robust source: println "He
line: 2 UnnecessaryGString The String 'Hello World' can be wrapped in single quotes inste
```



Eigene CodeNarc Regeln erstellen

Eigene CodeNarc Regeln erstellen

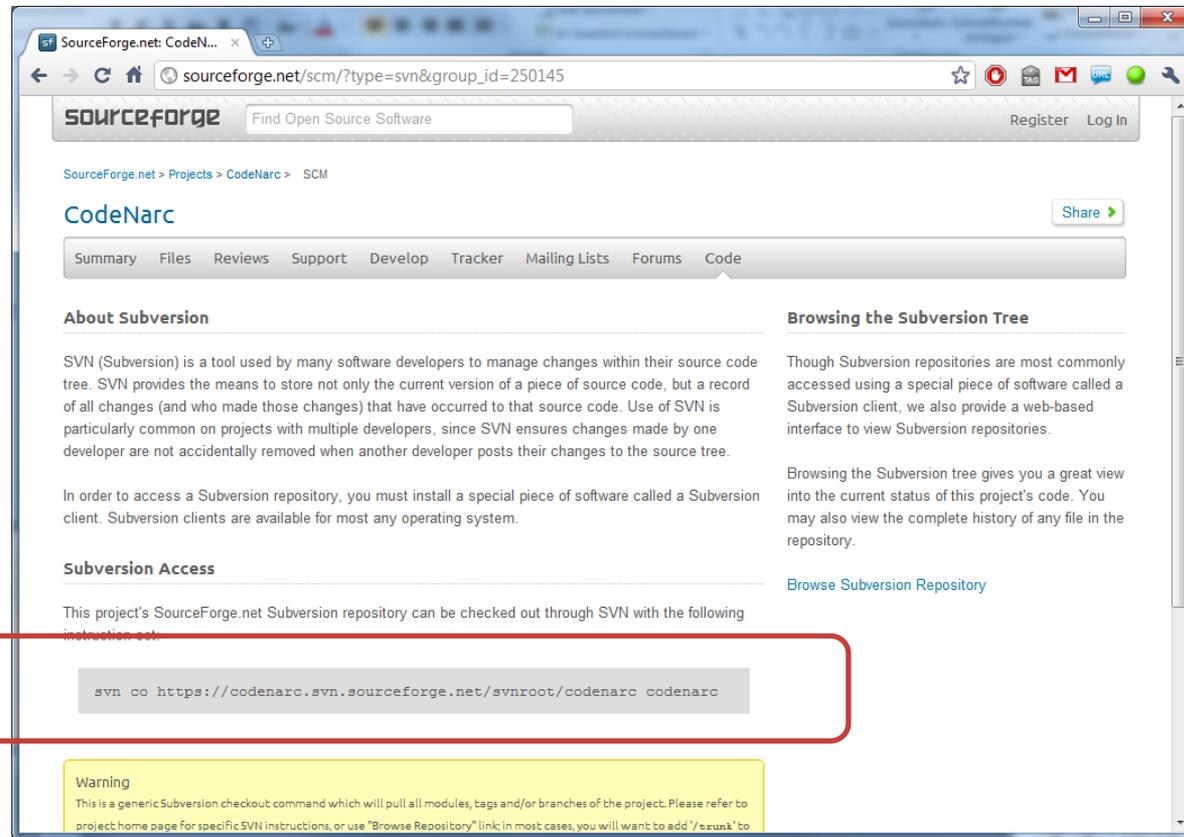


maven

Anforderungen



Eigene CodeNarc Regeln erstellen



Checkout der Sourcen von SourceForge

```
svn checkout https://codenarc.svn.sourceforge.net/svnroot/codenarc codenarc
```

Eigene CodeNarc Regeln erstellen

```
cs. C:\Windows\system32\cmd.exe
[INFO] --- maven-compiler-plugin:2.3.2:compile (default-compile) @ CodeNarc ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- gmaven-plugin:1.3:compile (default) @ CodeNarc ---
[INFO] Compiled 835 Groovy classes
[INFO] --- gmaven-plugin:1.3:generateTestStubs (default) @ CodeNarc ---
[INFO] Generated 320 Java stubs
[INFO] --- maven-resources-plugin:2.4.3:testResources (default-testResources) @ CodeNarc ---
[WARNING] Using platform encoding (Cp1252 actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] Copying 32 resources
[INFO] --- maven-compiler-plugin:2.3.2:testCompile (default-testCompile) @ CodeNarc ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- gmaven-plugin:1.3:testCompile (default) @ CodeNarc ---
[INFO] Compiled 583 Groovy classes
[INFO] --- maven-surefire-plugin:2.7.2:test (default-test) @ CodeNarc ---
[INFO] Tests are skipped.
[INFO] --- maven-jar-plugin:2.3.1:jar (default-jar) @ CodeNarc ---
[INFO] Building jar: D:\Temp\codenarc\trunk\target\CodeNarc-0.14.jar
[INFO] --- maven-install-plugin:2.3.1:install (default-install) @ CodeNarc ---
[INFO] Installing D:\Temp\codenarc\trunk\target\CodeNarc-0.14.jar to D:\Java\maven-repository\org\codenarc\CodeNarc\0.14\CodeNarc-0.14.jar
[INFO] Installing D:\Temp\codenarc\trunk\pom.xml to D:\Java\maven-repository\org\codenarc\CodeNarc\0.14\CodeNarc-0.14.pom
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 18.992s
[INFO] Finished at: Mon Jun 06 15:29:57 CEST 2011
[INFO] Final Memory: 77M/634M
[INFO] -----
```

Bauen des Projektes mit Maven

mvn install

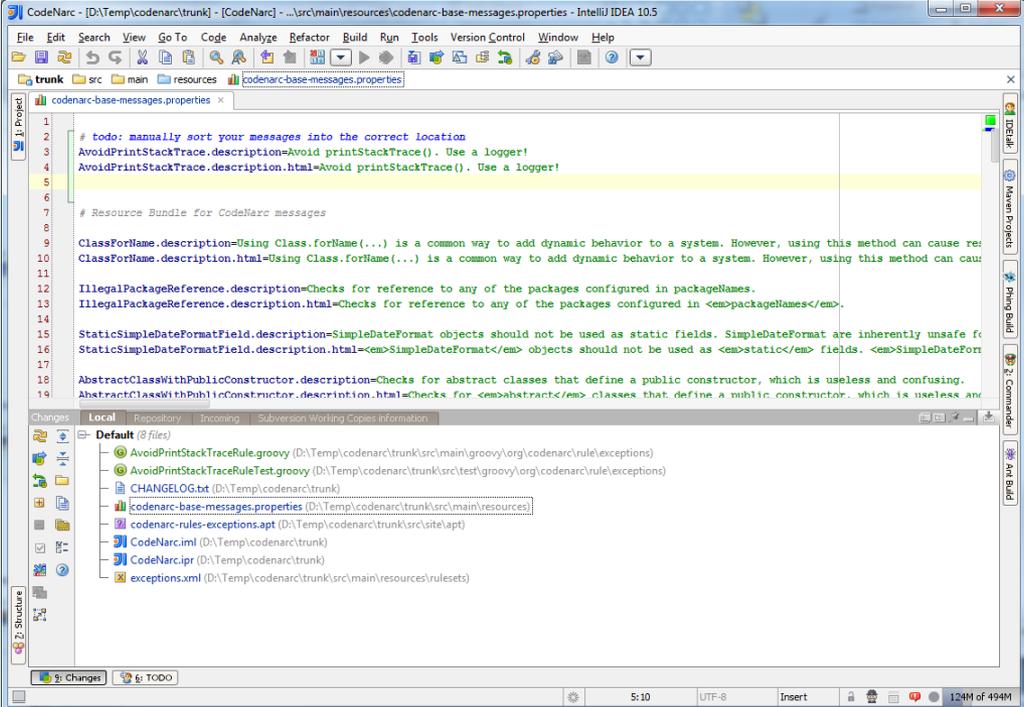
Eigene CodeNarc Regeln erstellen

```
cs. C:\Windows\system32\cmd.exe
D:\Temp\codenarc\trunk>
D:\Temp\codenarc\trunk>
D:\Temp\codenarc\trunk>groovy codenarc.groovy create-rule
Enter your name:Stefan Glase
Enter the rule name:AvoidPrintStackTrace
Enter the rule category. Valid categories are:
basic
braces
concurrency
design
dry
exceptions
generic
grails
imports
jdbc
junit
logging
naming
security
size
unnecessary
unused
exceptions
Enter the rule description:Avoid printStackTrace(). Use a logger!
Created ./src/main/groovy/org/codenarc/rule/exceptions/AvoidPrintStackTraceRule.groovy
Created ./src/test/groovy/org/codenarc/rule/exceptions/AvoidPrintStackTraceRuleTest.groovy
Updated ./src/main/resources/codenarc-base-messages.properties
Updated ./src/main/resources/rulesets/exceptions.xml
Updated ./src/site/apt/codenarc-rules-exceptions.ap
Updated ./CHANGELOG.txt
adding to svn... A      src\main\groovy\org\codenarc\rule\exceptions\AvoidPrintStackTraceRule.groovy
adding to svn... A      src\test\groovy\org\codenarc\rule\exceptions\AvoidPrintStackTraceRuleTest.groovy
Finished

D:\Temp\codenarc\trunk>
D:\Temp\codenarc\trunk>
```

Erstellen der Regel mit CodeNarc eigenem Groovy Script groovy codenarc.groovy create-rule

Eigene CodeNarc Regeln erstellen



The screenshot shows the IntelliJ IDEA 10.5 IDE with the file `codenarc-base-messages.properties` open. The editor displays the following content:

```
1 # todo: manually sort your messages into the correct location
2
3 AvoidPrintStackTrace.description=Avoid printStackTrace(). Use a logger!
4 AvoidPrintStackTrace.description.html=Avoid printStackTrace(). Use a logger!
5
6
7 # Resource Bundle for CodeNarc messages
8
9
10 ClassName.description=Using Class.forName(...) is a common way to add dynamic behavior to a system. However, using this method can cause res
11 ClassName.description.html=Using Class.forName(...) is a common way to add dynamic behavior to a system. However, using this method can cau
12
13 IllegalPackageReference.description=Checks for reference to any of the packages configured in packageName.
14 IllegalPackageReference.description.html=Checks for reference to any of the packages configured in <em>packageName</em>.
15
16 StaticSimpleDateFormat.description=SimpleDateFormat objects should not be used as static fields. SimpleDateFormat are inherently unsafe fo
17 StaticSimpleDateFormat.description.html=<em>SimpleDateFormat</em> objects should not be used as <em>static</em> fields. <em>SimpleDateForm
18
19 AbstractClassWithPublicConstructor.description=Checks for abstract classes that define a public constructor, which is useless and confusing.
20 AbstractClassWithPublicConstructor.description.html=Checks for <em>abstract</em> classes that define a public constructor, which is useless and
```

The IDE interface includes a menu bar (File, Edit, Search, View, Go To, Code, Analyze, Refactor, Build, Run, Tools, Version Control, Window, Help), a toolbar, a project view on the left showing the file structure, and a status bar at the bottom indicating the current time (5:10), encoding (UTF-8), and memory usage (124M of 494M).

Editieren des MessageBundle (korrekte Sortierung)

`src/main/resources/codenarc-base-messages.properties`

Eigene CodeNarc Regeln erstellen

```
void testRuleProperties() {
    assert rule.priority == 2
    assert rule.name == "AvoidPrintStackTrace"
}

void testSuccessScenario() {
    final SOURCE = '''
        println('...')
        printStackTrace(1)
    '''
    assertNoViolations(SOURCE)
}

void testSingleViolation() {
    final SOURCE = '''
        this.printStackTrace()
        printStackTrace()
    '''
    assertTwoViolations(SOURCE,
        2, 'this.printStackTrace', 'Avoid printStackTrace(). Use a logger!',
        3, 'printStackTrace', 'Avoid printStackTrace(). Use a logger!')
}

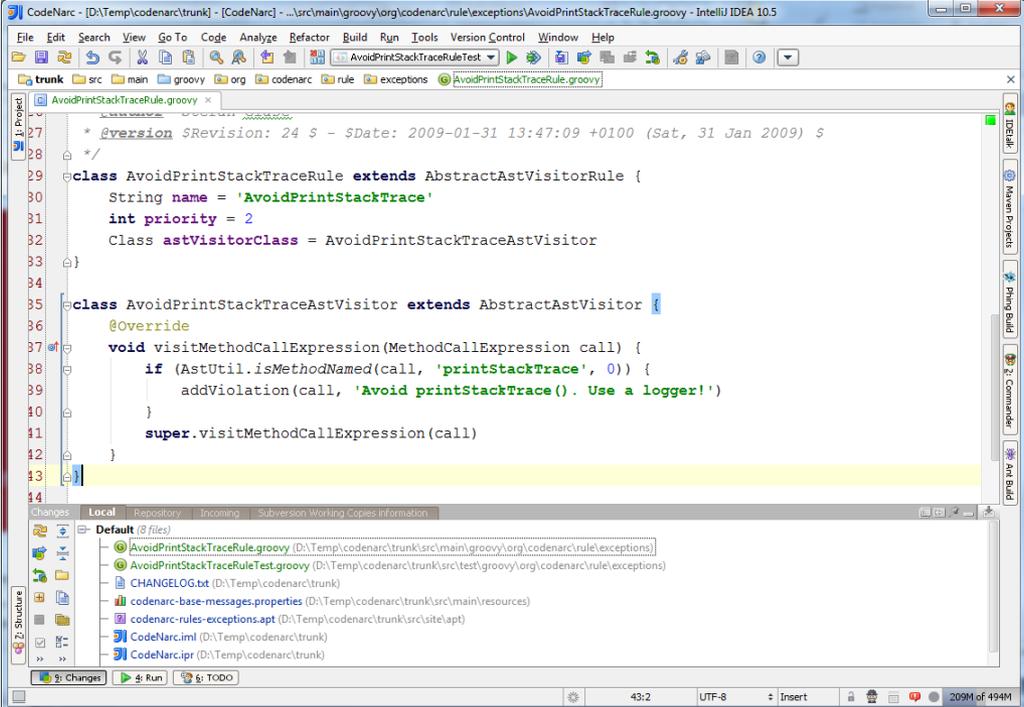
protected Rule createRule() {
```

Run: Done: 5 of 5 Failed: 1 (0,509 s)

```
2011-06-06 16:02:27,791 AvoidPrintStackTraceRuleTest [main] INFO - violations=[]
2011-06-06 16:02:27,792 AvoidPrintStackTraceRuleTest [main] INFO - -----{ AvoidPrintStackTraceRuleTest.tee
java.lang.AssertionError: Expected 2 Violation2
Found:
  Expression: (violations.size() == 2) << Internal calls>
  at org.codenarc.rule.AbstractRuleTestCase.assertTwoViolations(AbstractRuleTestCase.groovy:125) << Internal
  at org.codenarc.rule.exceptions.AvoidPrintStackTraceRuleTest.testSingleViolation(AvoidPrintStackTraceRuleTest.groovy:47)
```

Implementierung des Tests zur Absicherung der Regel
src/test/groovy/org.codenarc.rule.exceptions.AvoidPrintStackTraceRuleTest

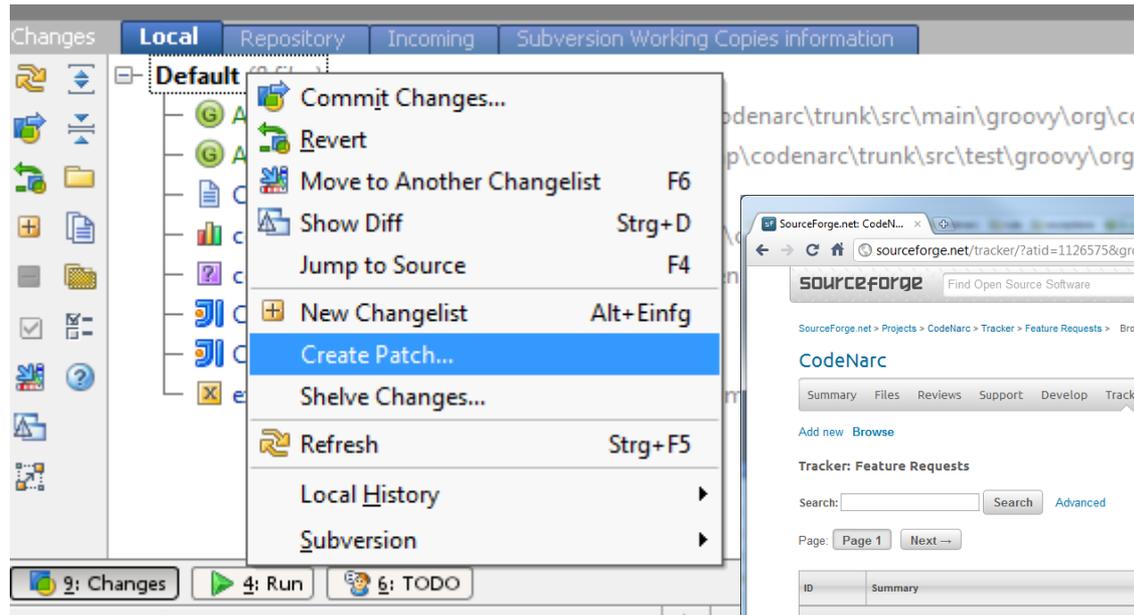
Eigene CodeNarc Regeln erstellen



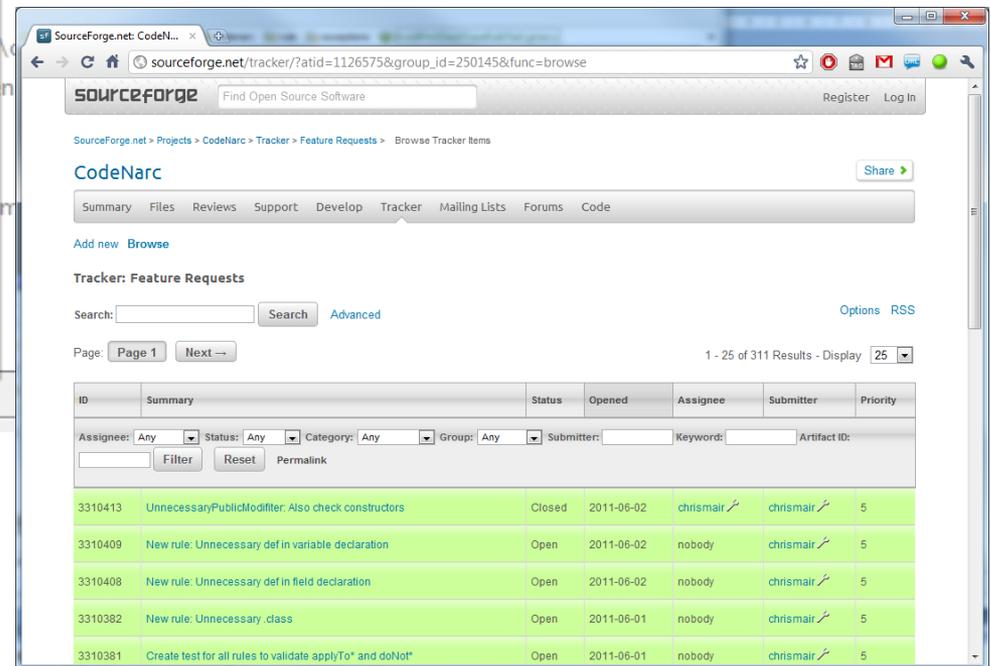
```
CodeNarc - [D:\Temp\codenarc\trunk] - [CodeNarc] - ...\src\main\groovy\org\codenarc\rule\exceptions\AvoidPrintStackTrace.groovy - IntelliJ IDEA 10.5
File Edit Search View Go To Code Analyze Refactor Build Run Tools Version Control Window Help
trunk src main groovy org codenarc rule exceptions AvoidPrintStackTrace.groovy
AvoidPrintStackTrace.groovy x
27 * @version $Revision: 24 $ - $Date: 2009-01-31 13:47:09 +0100 (Sat, 31 Jan 2009) $
28 */
29 class AvoidPrintStackTraceRule extends AbstractAstVisitorRule {
30     String name = 'AvoidPrintStackTrace'
31     int priority = 2
32     Class astVisitorClass = AvoidPrintStackTraceAstVisitor
33 }
34
35 class AvoidPrintStackTraceAstVisitor extends AbstractAstVisitor {
36     @Override
37     void visitMethodCallExpression(MethodCallExpression call) {
38         if (AstUtil.isMethodNamed(call, 'printStackTrace', 0)) {
39             addViolation(call, 'Avoid printStackTrace(). Use a logger!')
40         }
41         super.visitMethodCallExpression(call)
42     }
43 }
44
Changes Local Repository Incoming Subversion Working Copies Information
Default (2 files)
AvoidPrintStackTraceRule.groovy (D:\Temp\codenarc\trunk\src\main\groovy\org\codenarc\rule\exceptions)
AvoidPrintStackTraceRuleTest.groovy (D:\Temp\codenarc\trunk\src\test\groovy\org\codenarc\rule\exceptions)
CHANGELOG.txt (D:\Temp\codenarc\trunk)
codenarc-base-messages.properties (D:\Temp\codenarc\trunk\src\main\resources)
codenarc-rules-exceptions.apt (D:\Temp\codenarc\trunk\src\site\apt)
CodeNarc.iml (D:\Temp\codenarc\trunk)
CodeNarc.ipr (D:\Temp\codenarc\trunk)
43:2 UTF-8 Insert 209M of 494M
```

Implementierung der Regel und des AST-Visitors src/main/groovy/org.codenarc.rule.exceptions.AvoidPrintStackTraceRule

Eigene CodeNarc Regeln erstellen



1. Patch erstellen



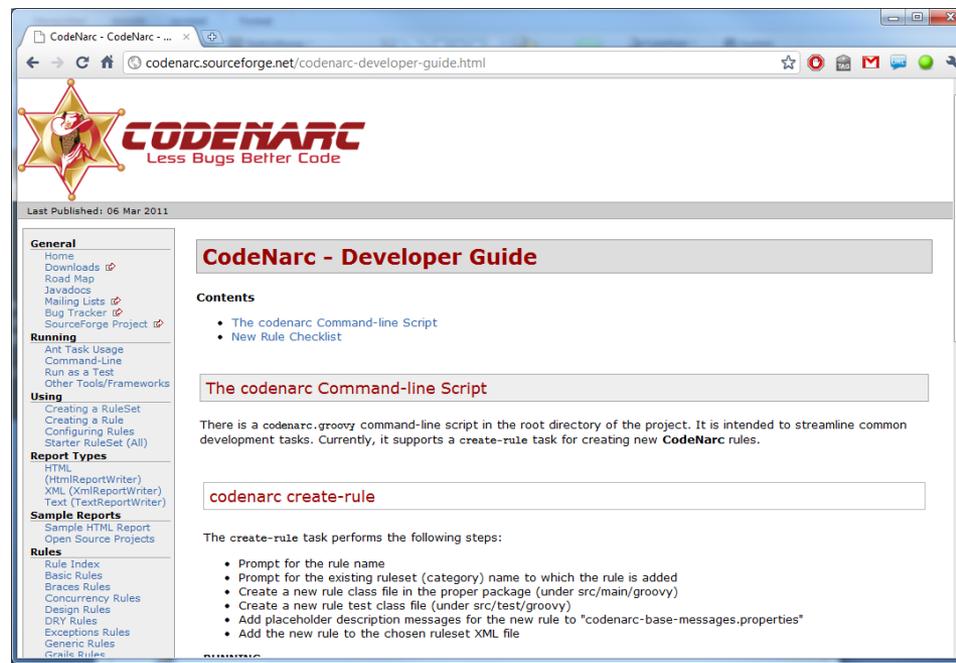
2. Eintrag im BugTracker mit angehängtem Patch erstellen

Bereitstellen der eigenen Regel

Eigene CodeNarc Regeln erstellen

Mehr Informationen für Entwickler auf der CodeNarc Webseite

<http://codenarc.sourceforge.net/codenarc-developer-guide.html>





Integration in Gradle-basierte Groovy-Anwendungen

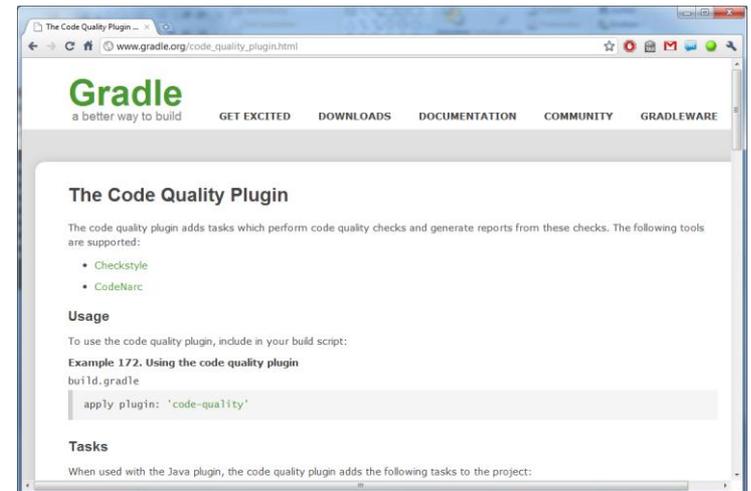
Integration in Gradle-basierte Groovy-Anwendungen

■ CodeNarc ist fest integriert im Gradle Code Quality Plugin

- Gradle 1.0 Milestone 3 enthält CodeNarc 0.13

■ Code Quality Plugin verwendet

- Checkstyle für Java-Code
- CodeNarc für Groovy-Code



- Mehr dazu: http://www.gradle.org/code_quality_plugin.html

Integration in Gradle-basierte Groovy-Anwendungen



Live-Demo... bitte Daumen drücken!



Integration in Grails- Anwendungen

Was ist Grails?

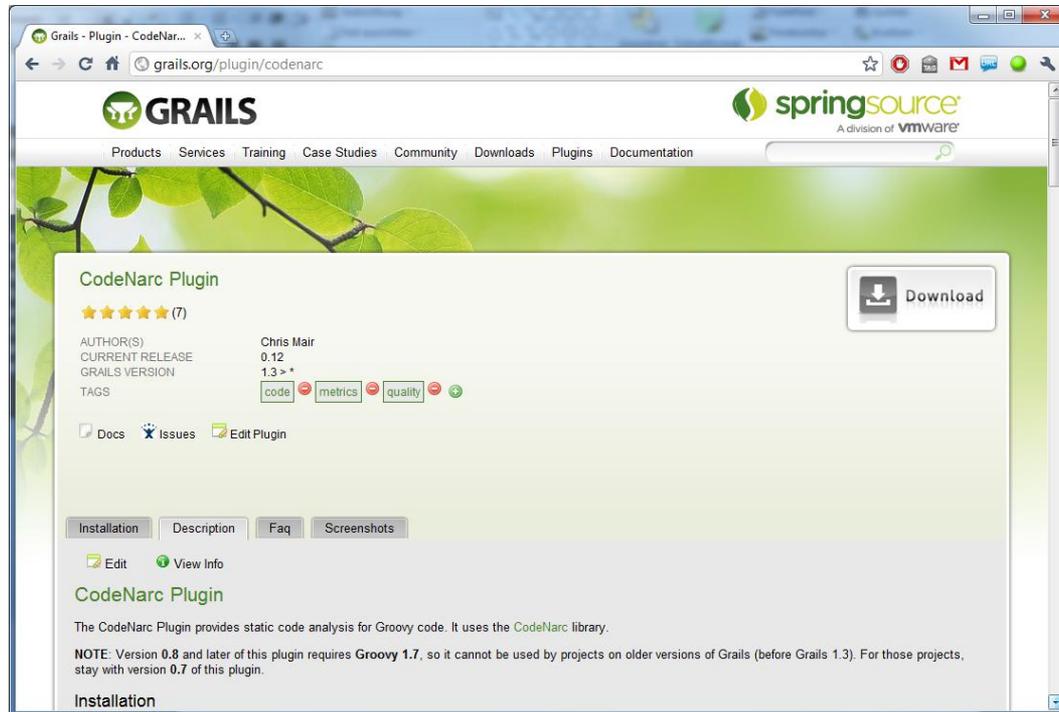


Was ist Grails?

Grails is an advanced and innovative **open source web application platform** that delivers new levels of developer productivity by applying principles like **Convention over Configuration**. Grails helps development teams **embrace agile methodologies**, deliver quality applications in reduced amounts of time, and focus on what really matters: creating high quality, easy to use applications that delight users. Grails naturally complements Java application development since it **is built on Spring** and **based on Groovy**, the leading dynamic language for the Java platform.

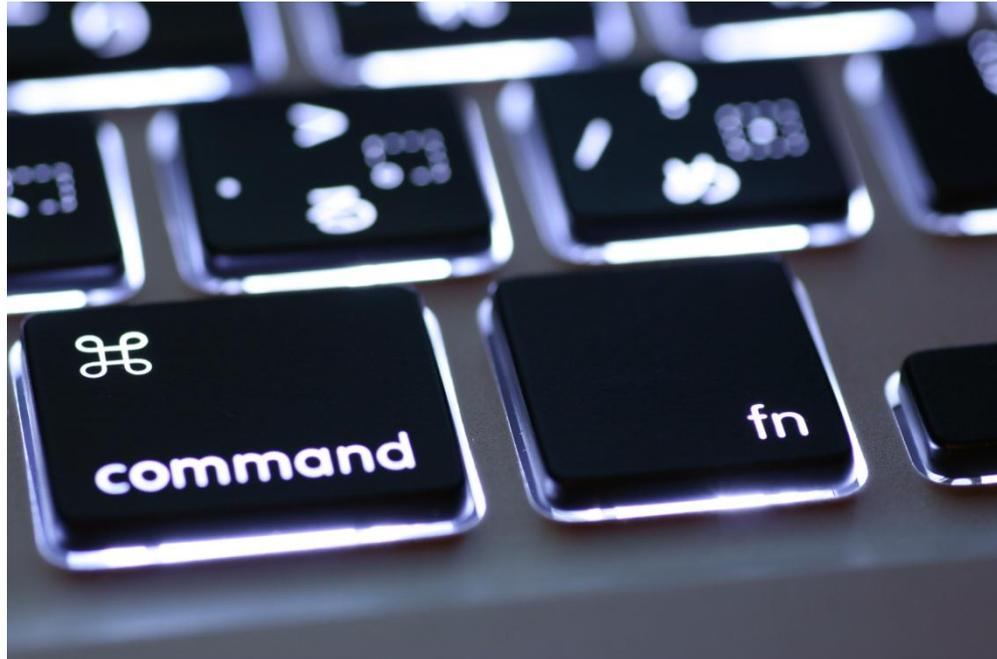
<http://www.springsource.com/developer/grails>

Integration in Grails-Anwendungen



Zur Integration von CodeNarc in Grails existiert das CodeNarc Plugin
<http://grails.org/plugin/codenarc>

Integration in Grails-Anwendungen



Live-Demo... bitte noch einmal Daumen drücken!



Weitere Integrationsmöglichkeiten

Weitere Integrationsmöglichkeiten

■ IDEs

- IntelliJ..... (IDEA CodeNarc Plugin)

■ Application Frameworks

- Grails (Grails CodeNarc Plugin)
- Griffon (Griffon CodeNarc Plugin)

■ Build- und Code-Analyse-Werkzeuge

- Gradle (Gradle Code Quality Plugin)
- Maven (Maven CodeNarc Plugin)
- Hudson/Jenkins (Hudson Violations Plugin)
- Sonar (Sonar Groovy Plugin)

<http://codenarc.sourceforge.net/codenarc-other-tools-frameworks.html>

Fazit



Im Netz...

CodeNarc:

<http://codenarc.sourceforge.net/>

<http://meetcodenarc.appspot.com/>

<http://www.youtube.com/watch?v=ZPu8FaZZwRw>

Beispiele:

<https://github.com/codescape/codenarc-gearconf>

Twitter:

@caseaplace

Fragen und Antworten



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