



10 Years Pattern Testing

Eclipse Demo Camp, 26. Juni 2012, Oliver Böhm

•• **T** •• **Systems** •••••

20002

20003

20004

20005

20006

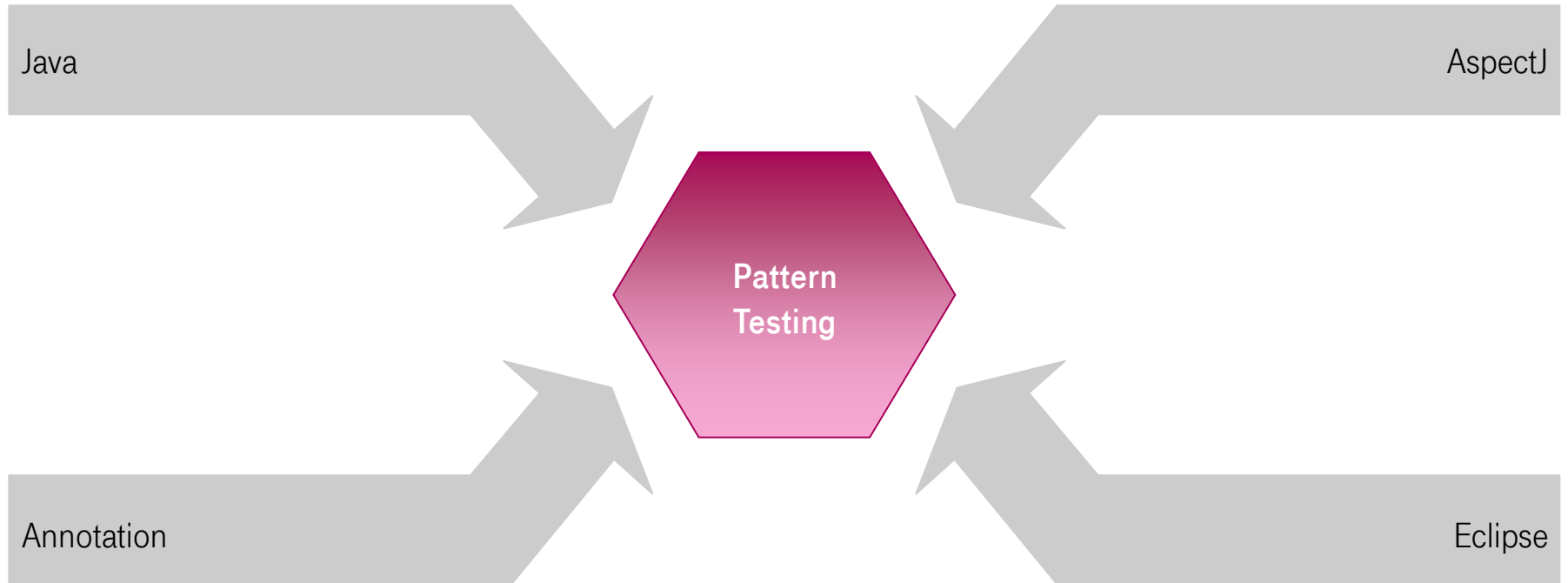
20008

20009

20012

...T...Systems.....

Einflüsse.



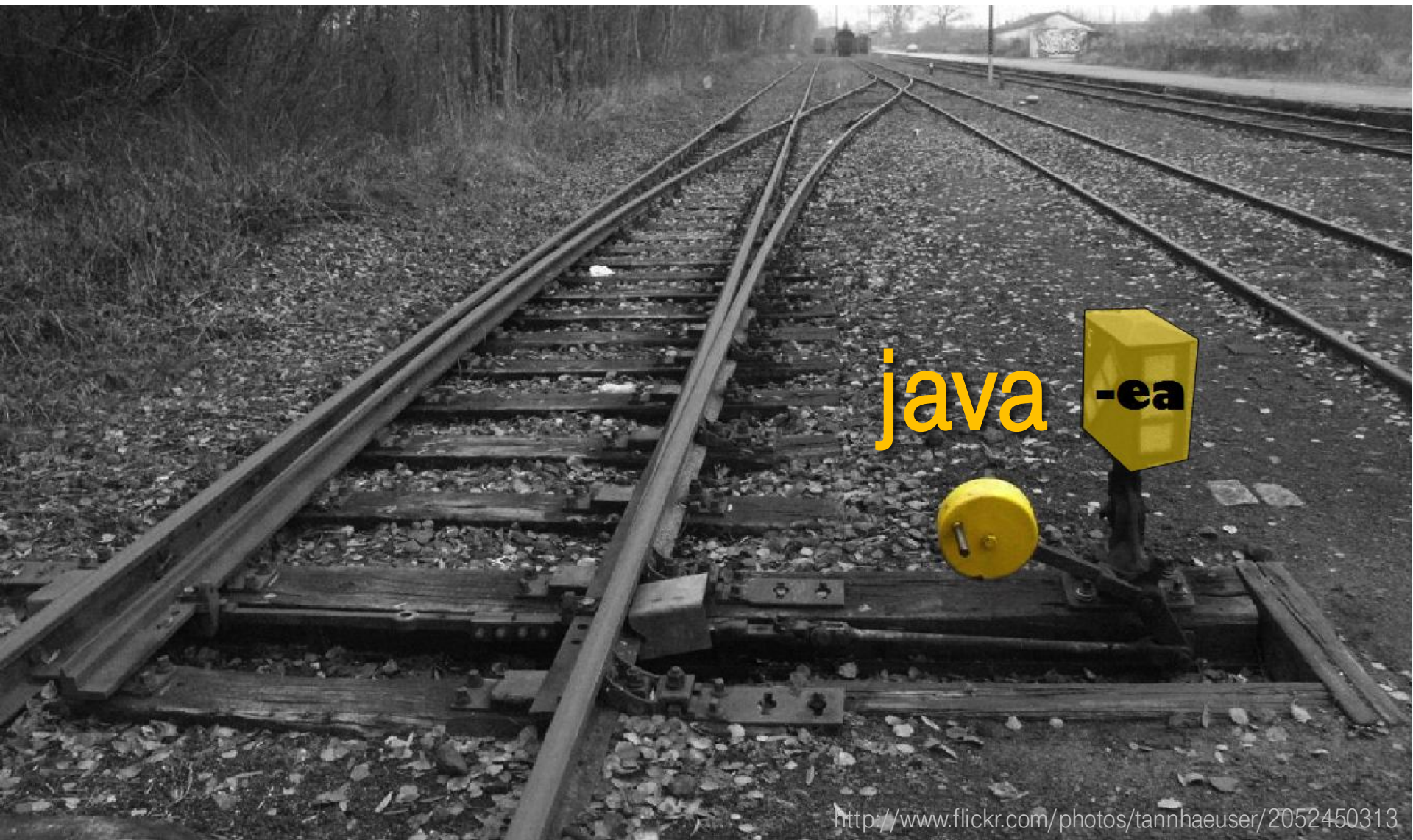


Java
1.4

assert

..T..Systems.....

```
public void ueberweisen(Konto anderesKonto,  
    double betrag) {  
    assert anderesKonto != null : "kein Konto angegeben!";  
    this.abheben(betrag);  
    anderesKonto.einzahlen(betrag);  
}
```

<http://www.flickr.com/photos/tannhaeuser/2052450313>

.. T .. Systems ..

aspectj 1.0

Project Leads



- Adrian Colyer

Committers



- Andrew Clement
- Adrian Colyer

Committers Emeritus



- Mik Kersten

Supporting Organizations



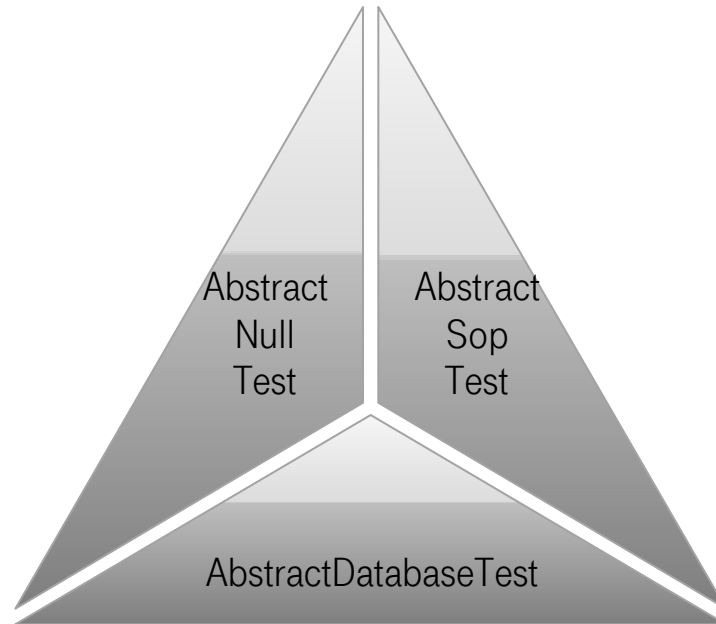


Pattern Testing

<http://www.flickr.com/photos/nickwheeleroz/2469056619>

.. **T** .. Systems ..

Proof of Concept



AbstractNullTest.aj

```
public abstract aspect AbstractNullTest {  
  
    public abstract pointcut applicationCode();  
  
    before() : (execution(public * *..*(*, ..)) && applicationCode()) {  
        assertArgsNotNull(thisJoinPoint);  
    }  
  
    private static void assertArgsNotNull(final JoinPoint joinPoint) {  
        Object[] args = joinPoint.getArgs();  
        for (int i = 0; i < args.length; i++) {  
            assert args[i] != null : "arg" + i + " is null";  
        }  
    }  
}
```

AbstractDatabaseAspect.aj

```
public abstract aspect AbstractDatabaseAspect {  
  
    public abstract pointcut applicationCode();  
  
    pointcut forbiddenCalls() :  
        call(public * java.sql..*(..)) ||  
        call(public * javax.sql..*(..));  
  
    declare error: applicationCode() && forbiddenCalls() :  
        "It is not allowed to use the JDBC API from here";  
  
}
```




Aspect-oriented programming is the next big thing and will begin to show up in some form or another in many projects.

Swenson, Editor's Choice Award 2003

2004



AspectWerkz 1.0

Plain Java AOP

- weiteres AOP-Framework für Java
- Weaving möglich
 - zur Build-Time (Bytecode-Modification)
 - über Class-Loading
 - zur Runtime
- von BEA unterstützt

Beispiel

```
/**
 * @Before call(int sample.Pi.getPiDecimal(int)) &&
 * withincode(int sample.main(String[]))
 */
public void invocationCounter(JoinPoint joinPoint)
    throws Throwable {
    MethodSignature signature =
        (MethodSignature) joinPoint.getSignature();
    CacheStatistics.addMethodInvocation(
        signature.getName(),
        signature.getParameterTypes()
    );
}
```

AspectJ 1.2

Neuerungen

- Weaving-Zeiten halbiert
- ajdoc wieder hinzugefügt

ajdoc

AbstractNullPointerTrap - Mozilla Firefox

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

← patterntesting.sour ☆ ↻ Google 🔍 🏠

All Classes

- [AbstractDe](#)
- [AbstractNul](#)
- [Deprecated](#)
- [Deprecated](#)
- [NotNullAspe](#)
- [NullPointer](#)
- [PublicForTe](#)

before

before () : invalidNullParameter..

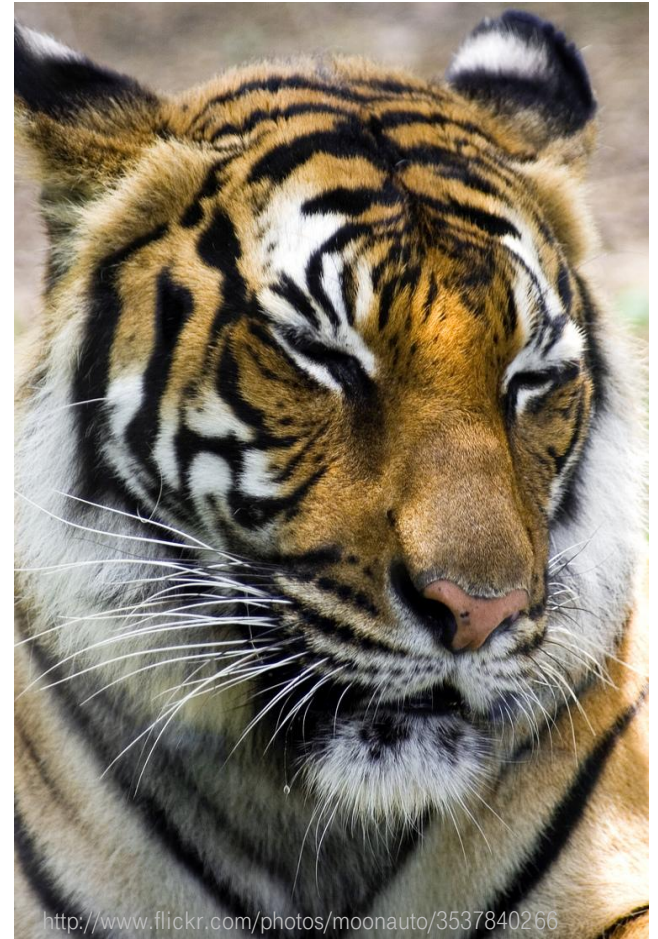
If a (null) parameter is detected something is wrong with the application code. Inner classes will be skipped because they are handled different by the compiler (for private static inner classes it adds an additional argument for the default constructor. But this additional argument is always null).

Advises: [patterntesting.check.runtime..](#)

afterReturning

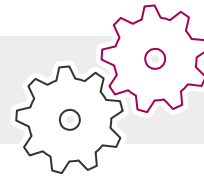
Java 5

- **Generics**
- vereinfachte Iteration
- Enums
- Autoboxing
- import static
- varargs
- java.util.concurrent
- **Annotationen**



Beispiel für Annotationen

```
/** deprecated */  
  
/**  
 * @deprecated  
 */  
public void auszahlen(double betrag) {  
    this.kontostand -= betrag;  
}
```



```
@Deprecated  
  
@Deprecated  
public void auszahlen(double betrag) {  
    this.kontostand -= betrag;  
}
```

Beispiel für Annotationen: EJB 3.0

```
import javax.ejb.Stateless;

@Stateless
public class CalculatorBean {

    public int add(int a, int b) {
        return a + b;
    }

}
```

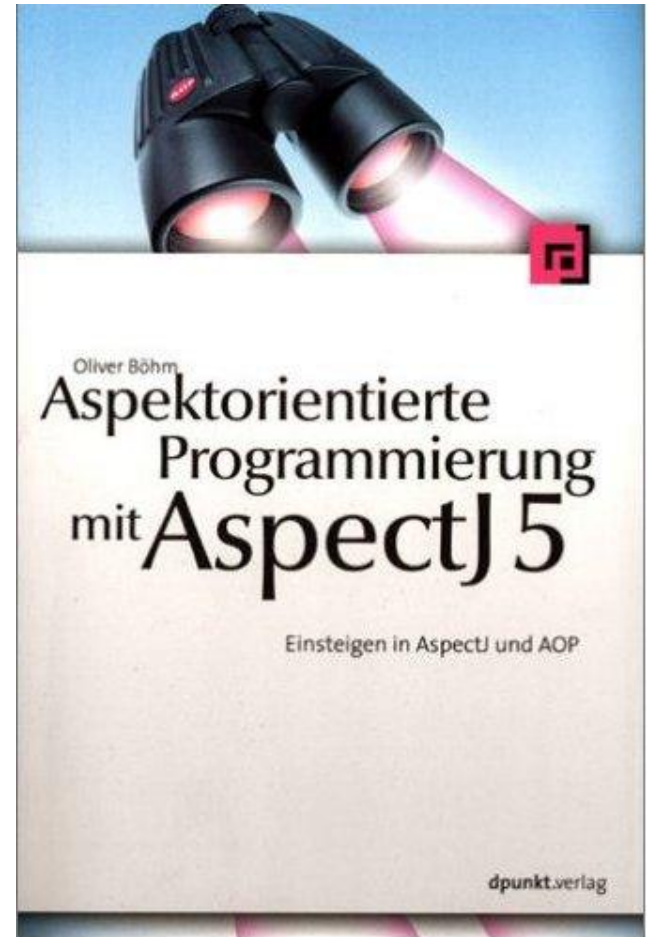
2005

..T..Systems.....

AspectJ 5

- Merge mit AspectWerkz
 - CTW (inkr. Compiler)
 - LTW (aop.xml)
- Unterstützung von Annotationen

```
before(): execution(* @Deprecated *.*.*(..)) {  
    log.warn("deprecated: " + thisJoinPoint);  
}
```



AbstractNullTest.aj 2.0

```
public aspect NullPointerTrap extends AbstractNullPointerTrap {  
    public pointcut applicationCode() :  
        within (*..*)  
        && !execution(@NullArgsAllowed * *..*(*, ..));  
}
```

@NullArgsAllowed

```
@NullArgsAllowed
```

```
public void print(final Date outputDate) {  
    if (outputDate != null) {  
        System.out.println("Datum: " + outputDate);  
    }  
    System.out.println("Kontostand: " + this.kontostand);  
}
```

2006

..T..Systems.....

EJB 3.0

```
import javax.ejb.Stateless;

@Stateless
public class CalculatorBean {

    public int add(int a, int b) {
        return a + b;
    }

}
```

2008

2008

AspectJ 5

28.1.
0.5.0



Ja
n.

Fe
b.

M
är
z

Ap
ril

27.4.
0.5.1



M
ai

Ju
ni

Ju
li

A
u
g.

S
e
p.

O
kt
.

5.10.
0.6.0



No
v
.

3.11.
0.6.1



D
ez
.

Better IOExceptions

12.12.
0.8.0



@NullArgsAllowed

@LogRuntimeException



2009

..T..Systems.....



Your Code

Samples

Concurrent

Exception

Check.RT

Check.CT

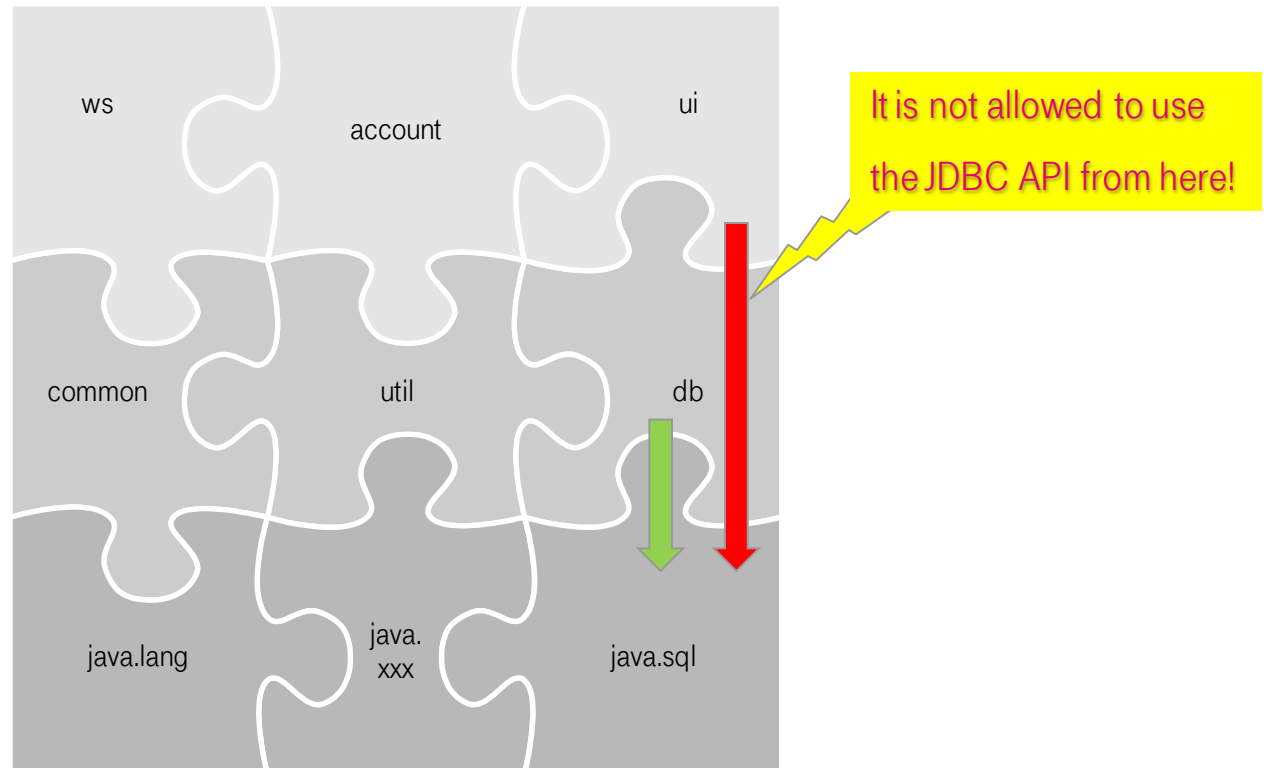
Tools

Runtime

PatternTesting Runtime



PatternTesting Check.CT



java.lang.AssertionError: **User LoginService.login(String, String) returns null!**

...

at sample.jfs2010.LoginService.login(LoginService.java:62)

at sample.jfs2010.web.LoginServlet.doPost(LoginServlet.java:26)

...



```
public static User login(String name, String passwd)
    throws IOException {
    User user = null;
    URL url = getLoginURL(name);
    HttpURLConnection connection = url.openConnection();
    int rc = connection.getResponseCode();
    if (rc != 404) {
        user = new User(name);
    }
    return user;
}
```

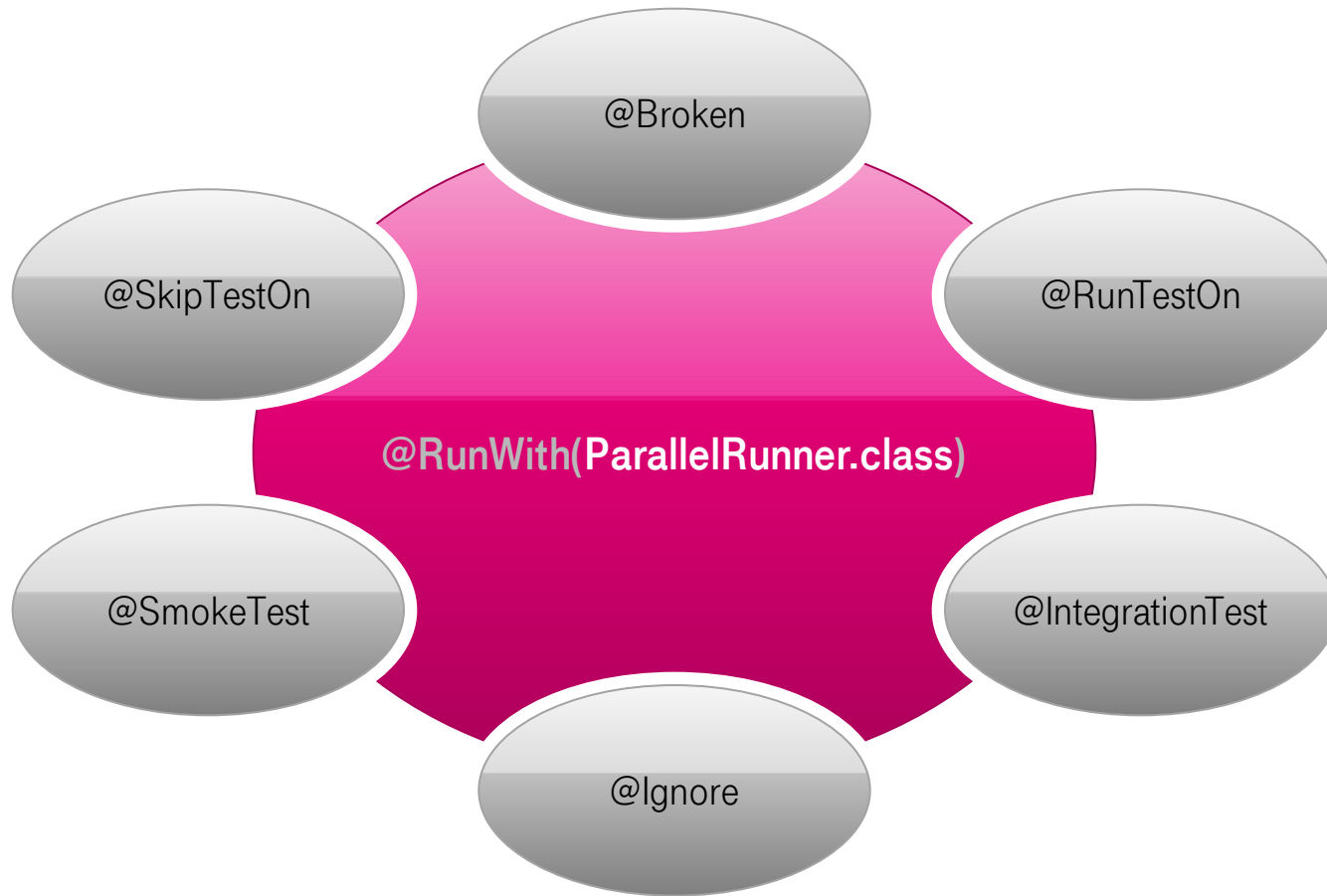
PatternTesting Exception

```
socket = new Socket(host, port);
```



ConnectException:
Connection to myhost:4711 refused

PatternTesting Concurrent



PatternTesting Samples



samples-intro

- Einstieg
 - pure Java
 - Testen / JUnit
 - @Broken & Co.
- Beispiel f. Doku in Wiki
- Rot13



samples-jfs2010

- Mafioso-Bank-Portal
- präsentiert JFS 2010
- Fallstudie
- s. Java Aktuell 3/2010



samples-misc

- Beispiele querbeet
- Doku-Ersatz
- Integrations-Tests

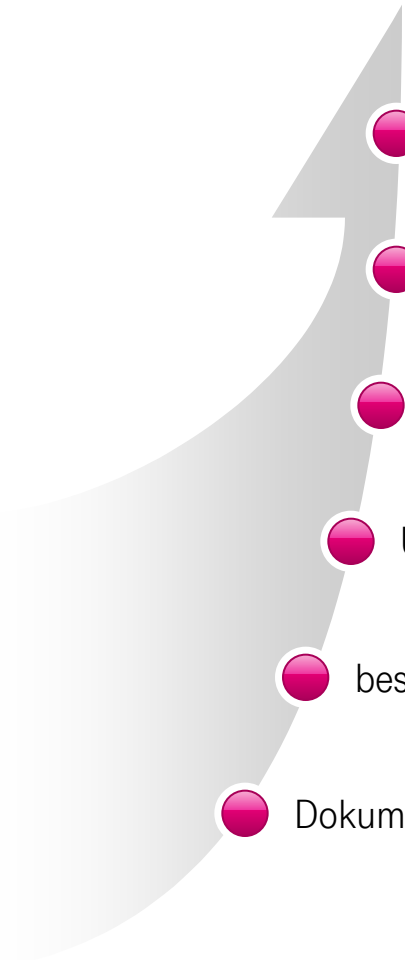
Einbindung




```
<dependency>  
  <groupId>org.patterntesting</groupId>  
  <artifactId>patterntesting-rt</artifactId>  
  <version>1.2.10-YEARS</version>  
</dependency>
```


2013

Pipeline

- 
- unterstützte JUnit-Versionen (4.5 – 4.10) ✓
 - (Parallel)ProxyRunner ✓
 - ParallelSuite ✓
 - Unterstützung IBM-VM (z.B. ClasspathMonitor) ✓
 - bessere SQLExceptions
 - Dokumentation



Veranstaltungshinweis:

21. September

PechaKucha Abend 2012

<http://jugs.org/2012-09-21.html>

Weitere Infos: <http://patterntesting.org>
<http://oli.blogger.de>

Oliver.Boehm@T-Systems.com

T-Systems