

# NWDI enhancement through open source

Example:

Hudson usage in an NWDI-based environment

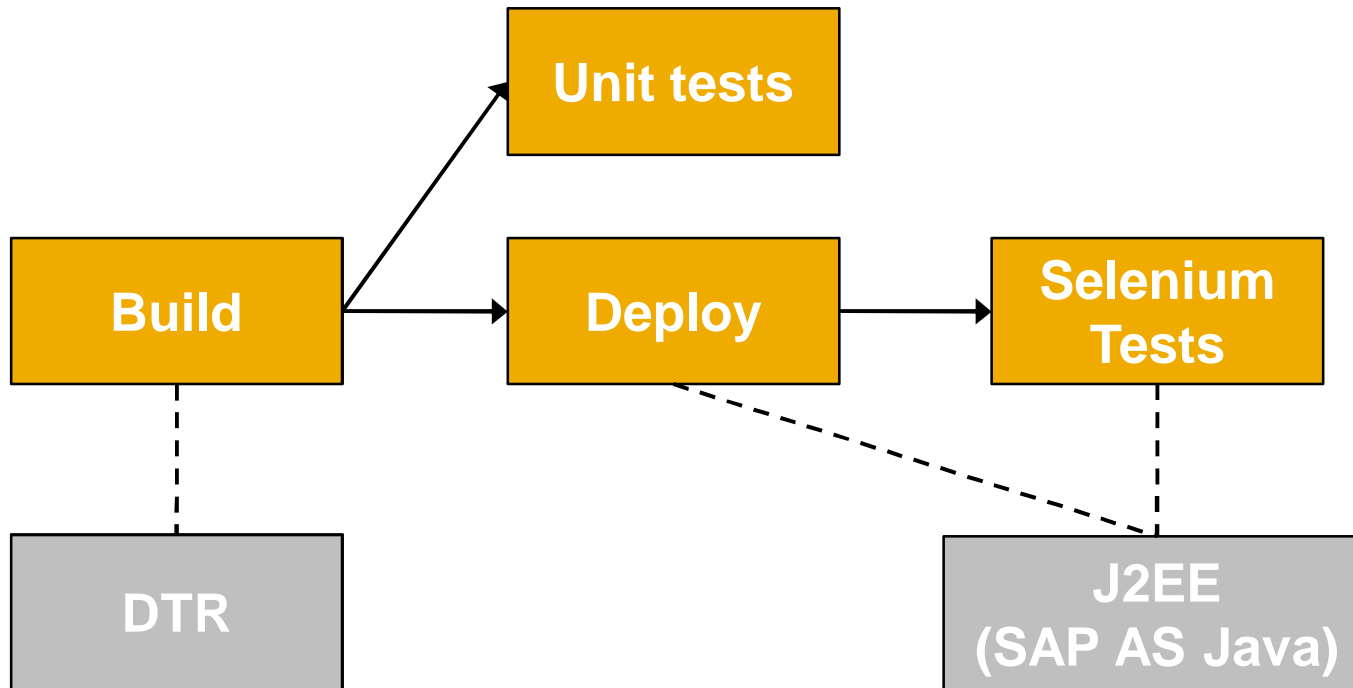
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# „Your use case“







- You develop a Java application that is based on the NetWeaver development infrastructure
- You want to follow a continuous integration approach
  - As soon as a developer commits a change the integration of the change should be started: build, unit test, deployment and UI test should automatically be performed with the code delta
  - If one of the steps fails, it should be reported
  - Status (and trend) should be visible and transparent for the whole project
  - You would also like to include static code analysis, like filtering for compiler warnings, or even integrate with a Sonar
  - And you want only one single system that does all this
- Solution: integrate the NWDI in a Hudson system

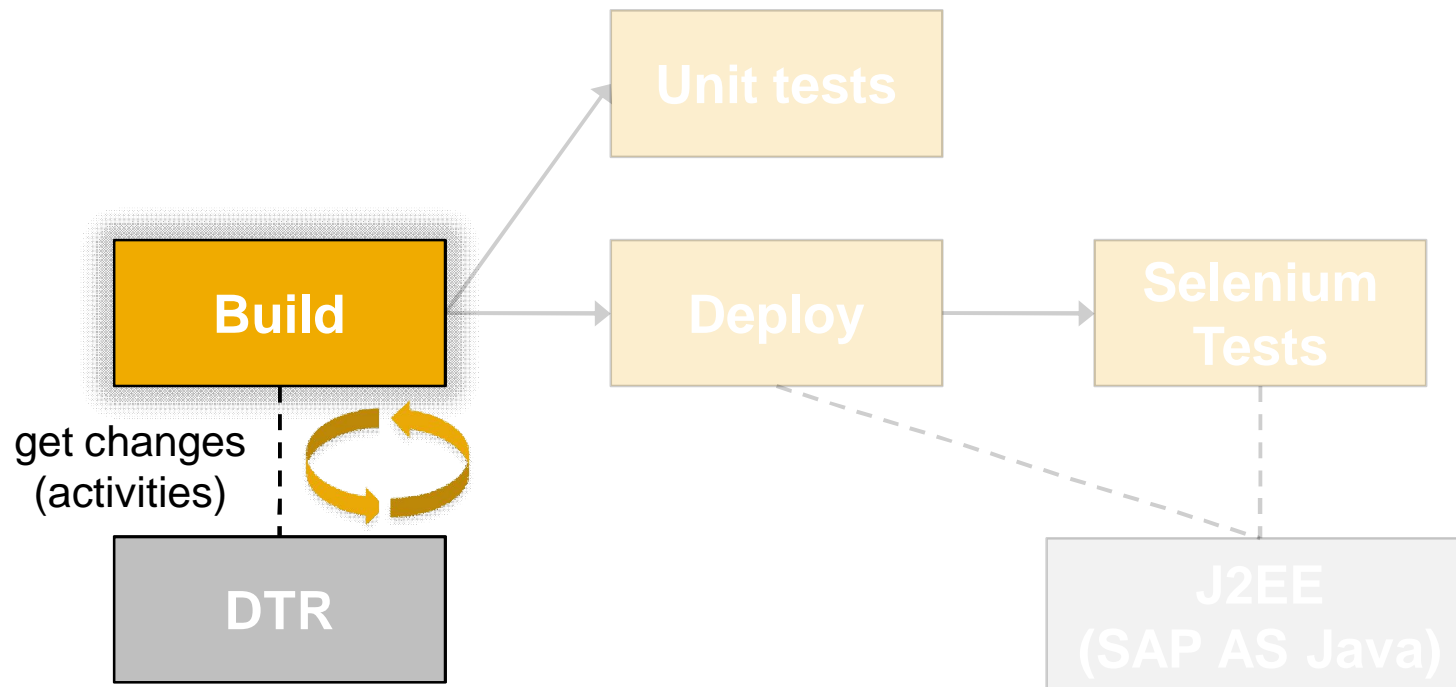
# The big picture



## Legend

-  A logical step in the continuous integration cycle that needs to be automated on Hudson
-  A system that is part of the NWDI and needs to be integrated to perform the step
-  Step execution flow: A→B means „if A finished successfully, B should be started“
-  Connection / integration point between Hudson and the NWDI

# Build



- DTR plugin
  - Asks DTR periodically for changes and start if changes are found
  - Synchronizes changes from DTR
- Build script
  - Builds software component, produces an sca file as output (just as CBS does)
- JLin
  - Executed within the build (like on CBS), JLin plugin can publish html report

# Build



- [Status](#)
- [Changes](#)
- [Console Output \[raw\]](#)
- [Polling Log](#)
- [DTR Label](#)
- [Compiler Warnings](#)
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## Build #3417 (Feb 17, 201



[Build Artifacts](#)



Output: SCA file



**Summary Of Changes - [View Details](#)**

**WDF CHHI removal of assembly part** by [redacted] on Thu, :  
Description:



[Started by an SCM change](#)



Compiler Warnings: [309 warnings](#).



Task Scanner: [496 open tasks](#) in 2,041 workspace files.



# JLin integration



[Jlin Report](#)



[Last Successful Artifacts](#)



[Recent Changes](#)

## Upstream Projects

[WEC20SP dev ADMIN CLEAN SAP-WEC-FRW](#)

## Downstream Projects

[WEC20SP dev HMWECFWRK](#)

[WEC20SP dev SAP-WEC](#)

[Back to Hudson](#)

[summary](#)

JLin run 2011-05-04 10:57:48

| Number of Messages              |        |        |        |       | Global Metrics               |                  |        |                   |         |
|---------------------------------|--------|--------|--------|-------|------------------------------|------------------|--------|-------------------|---------|
| Test                            | Prio 1 | Prio 2 | Prio 3 | Total | Test                         | Metric           | Sum    | Average Std. dev. | Min Max |
| Cloneable Test                  | 0      | 0      | 3      | 3     | Arguments per method         | arguments        | 0.88   | 1.03              | 10      |
| Compiler                        | 0      | 0      | 802    | 802   | Cyclomatic Complexity Metric | complexity       | 2.18   | 2.75              | 63      |
| EmptyStatement                  | 0      | 0      | 37     | 37    | Global Counters              | Classes          | 2081   |                   |         |
| IncompleteEnumSwitch            | 0      | 0      | 5      | 5     | Global Counters              | Comment Lines    | 95969  |                   |         |
| JDK 1.4 - 1.5                   | 0      | 0      | 2      | 2     | Global Counters              | Lines of Code    | 190373 |                   |         |
| Incompatibilities               | 0      | 0      | 1011   | 1011  | Global Counters              | Methods          | 19009  |                   |         |
| Naming Conventions              | 0      | 0      | 1      | 1     | Global Counters              | Whitespace Lines | 76107  |                   |         |
| NoEffectAssign                  | 0      | 0      | 3      | 3     | Inheritance Hierarchy Depth  | hierarchydepth   | 1.75   | 1.49              | 7       |
| NonStaticAccessToStatic         | 0      | 0      | 1      | 1     | Max nesting level per method | nestinglevel     | 0.63   | 1.1               | 13      |
| Serialization                   | 0      | 0      | 3      | 3     | Methods per class            | methods          | 9.11   | 13.13             | 224     |
| Simplify Boolean                | 0      | 0      | 31     | 31    | Statements per method        | statements       | 4.38   | 8.54              | 220     |
| Switch Test                     | 0      | 0      | 162    | 162   |                              |                  |        |                   |         |
| Unneeded Object Creation        | 0      | 0      | 14     | 14    |                              |                  |        |                   |         |
| UnusedImport                    | 0      | 0      | 29     | 29    |                              |                  |        |                   |         |
| UnusedLocalVariable             | 0      | 0      | 226    | 226   |                              |                  |        |                   |         |
| UnusedPrivateMember             | 0      | 0      | 53     | 53    |                              |                  |        |                   |         |
| UnusedThrownException           | 0      | 0      | 72     | 72    |                              |                  |        |                   |         |
| Wait only in synchronized loops | 0      | 0      | 87     | 87    |                              |                  |        |                   |         |
| Total                           | 0      | 0      | 2539   | 2539  |                              |                  |        |                   |         |

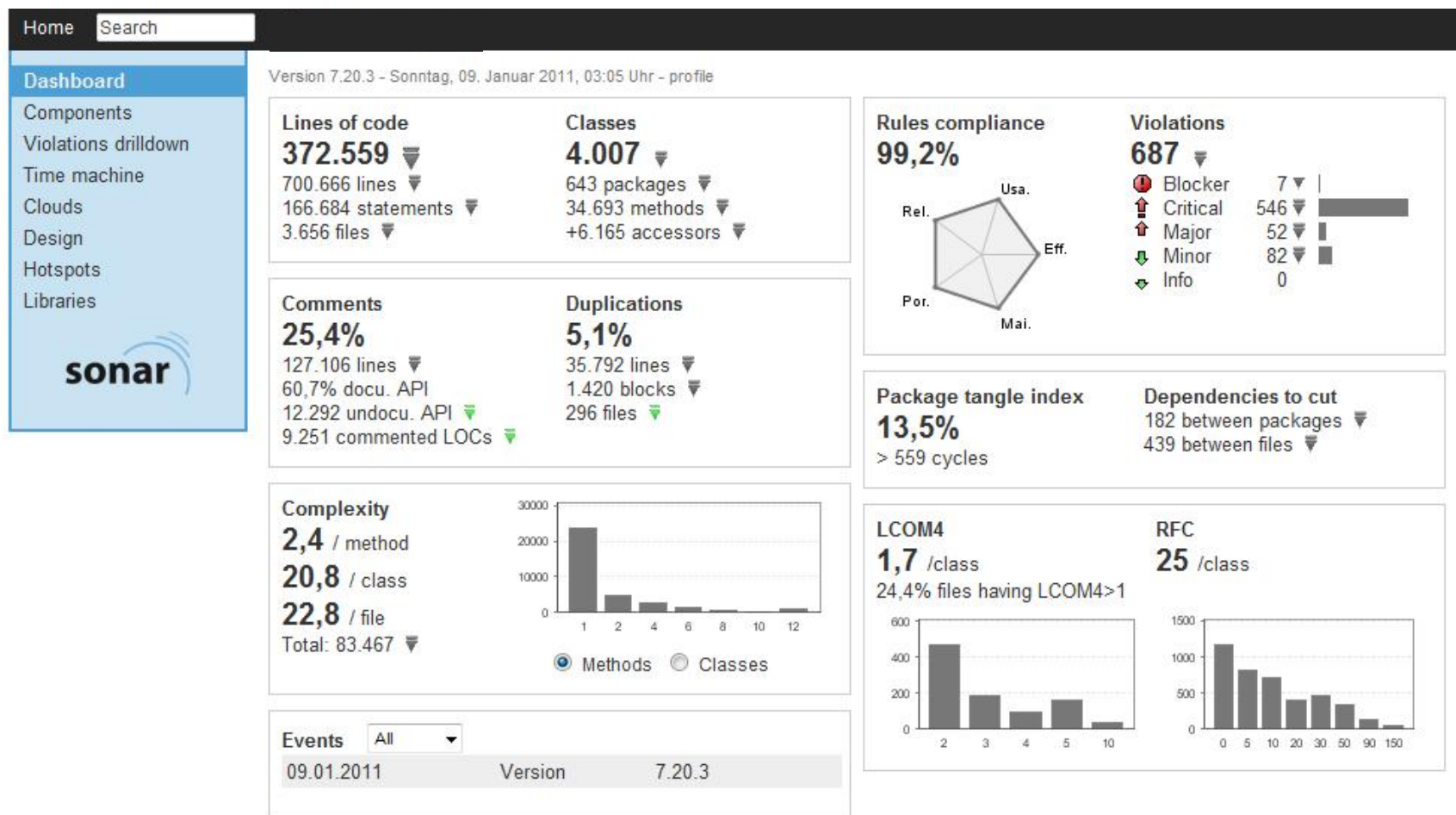
Projects:

| Project  | Prio 1 | Prio 2 | Prio 3 | Total |
|----------|--------|--------|--------|-------|
| jlin     | 0      | 0      | 0      | 0     |
| sap.com~ | 0      | 0      | 1      | 1     |
| sap.com~ | 0      | 0      | 8      | 8     |
| sap.com~ | 0      | 0      | 0      | 0     |
| sap.com~ | 0      | 0      | 1      | 1     |
| sap.com~ | 0      | 0      | 8      | 8     |
| sap.com~ | 0      | 0      | 1      | 1     |
| sap.com~ | 0      | 0      | 32     | 32    |

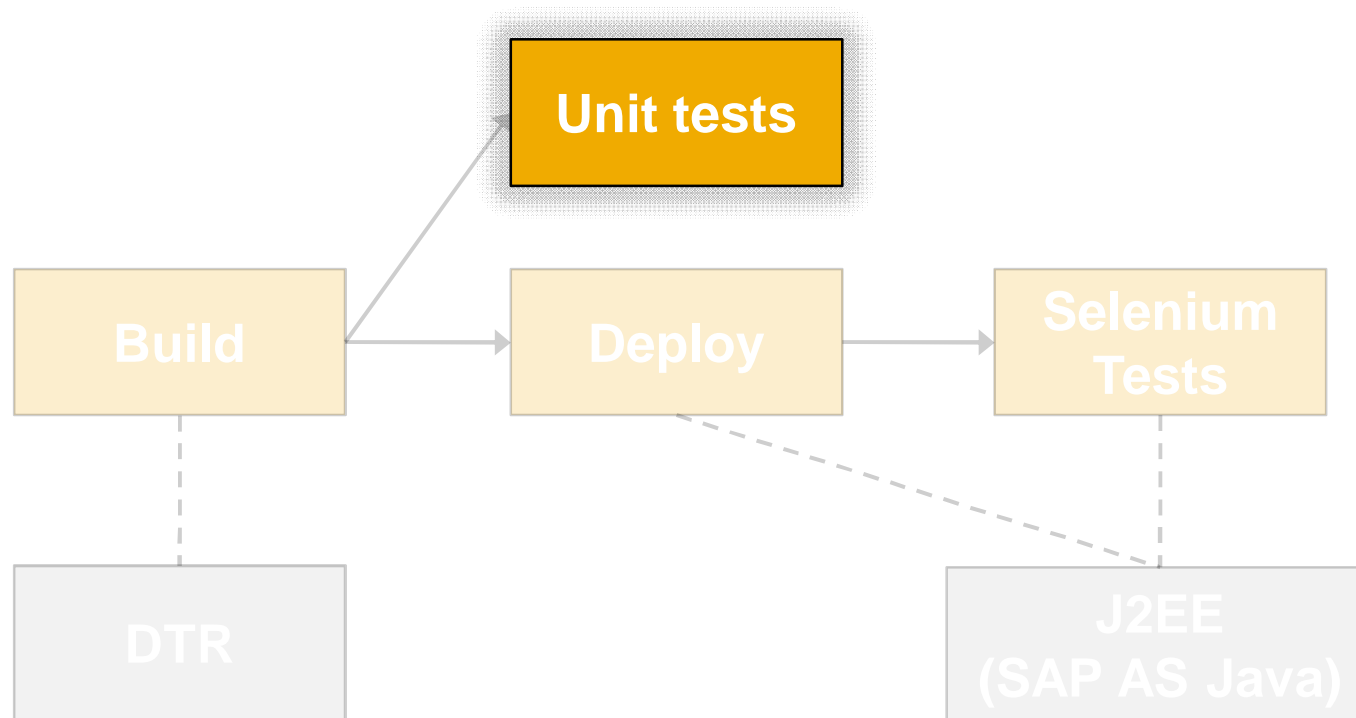
# Sonar integration



- Sonar plugin generates POM structure out of the SC that can be consumed by Sonar server



# Unit tests



- No specific plug-in required
  - Technically the unit tests are executed as part of the build (directly supported by NWDI, v7.30+)
  - Test results and trend chart can be displayed using the common JUnit publisher
- Unit tests can either be included in the productive DCs or in depending DCs
- Approach in the example project: unit tests not in productive DCs, but in depending DCs
  - Unit tests DCs have dependency on the productive DCs
  - The unit tests are organized in a “HOME” SC that is built after the productive SC was built



# Unit tests



- [Back to Project](#)
- [Status](#)
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## **Build #3453 (17.02.2011 12:18:28)**



[Build Artifacts](#)



**Summary Of Changes - [View Details](#)**

**WDF CHHI temporarily change unit test by [redacted] on Thu, 1**

Description:

Changes in dependency

1. [WCAdev dev SAP-WEC](#) #3417 → #3418 ([detail](#))



Started by upstream project [WCAdev dev SAP-WEC](#) build number [3418](#)



[Test Result](#) (no failures)

## Upstream Builds

[WCAdev dev HMWECFWRK](#) #123

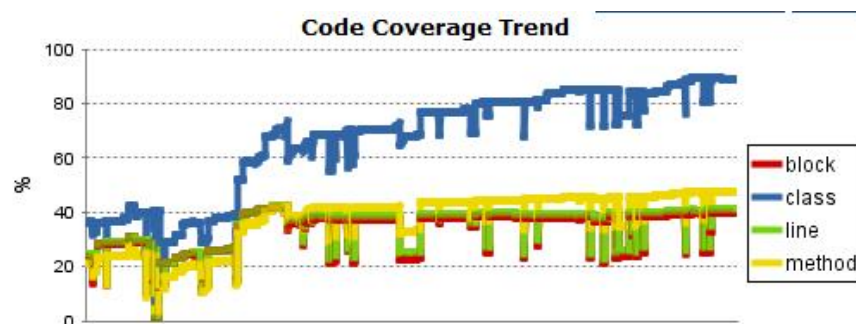
[WCAdev dev SAP-WEC](#) #3421



# Code coverage integration

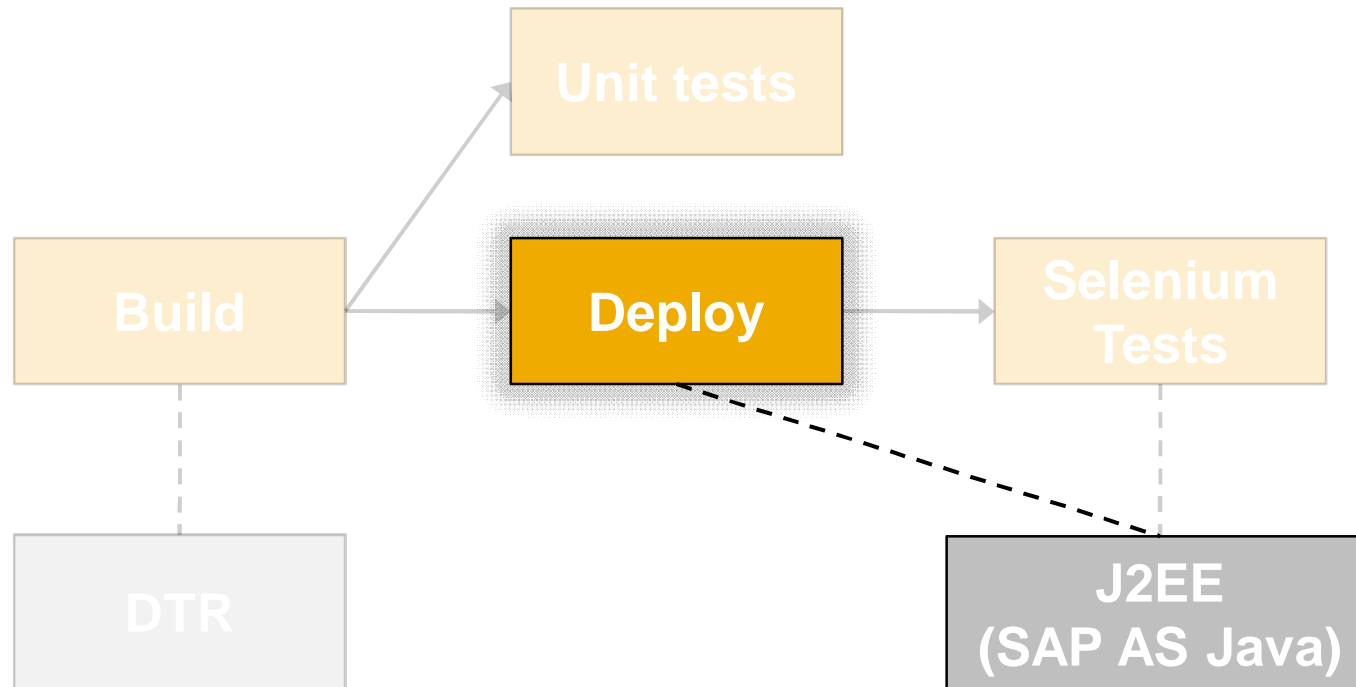


- Emma used to integrate coverage measurement during test execution
  - Build infrastructure extension is used for this (rather NWDI-specific than Hudson specific)
  - Emma can directly create an HTML report that can be published on Hudson using the common HTML publisher



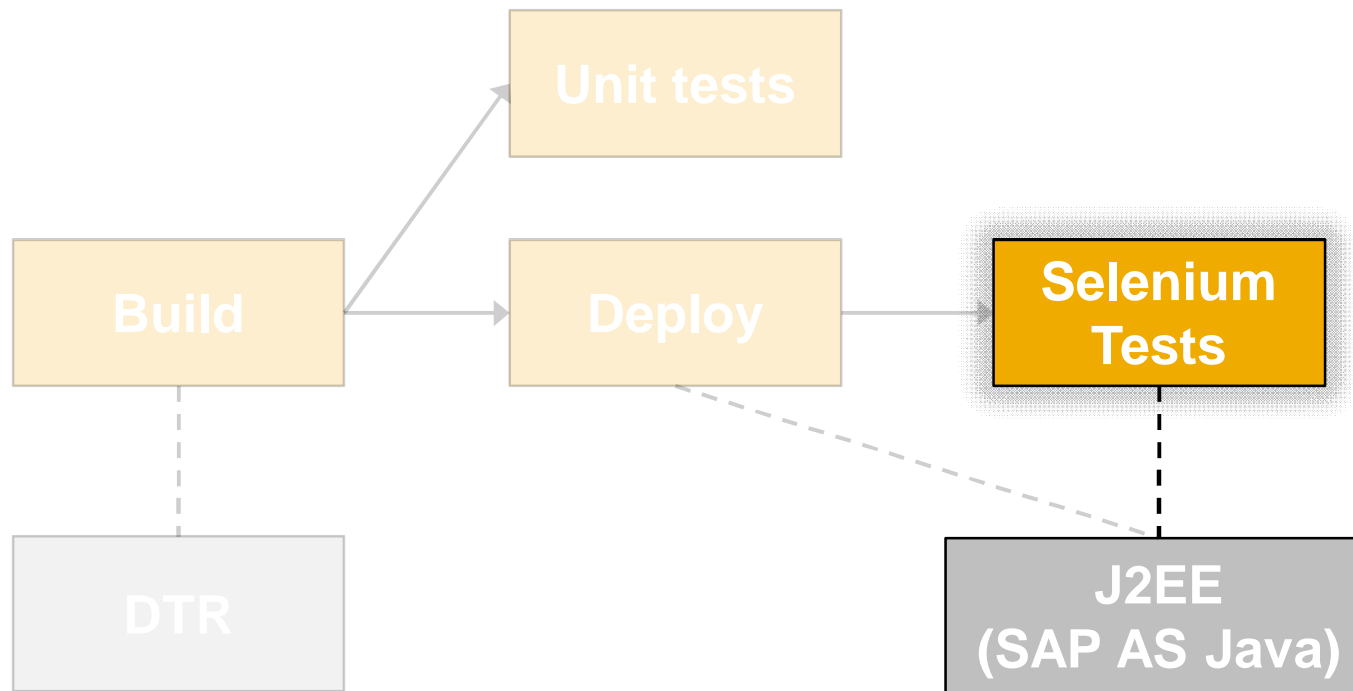
```
if (metaData.hasField("HANDLE_ITEM") && !" ".equals(messageRecord.getString("HANDLE_ITEM"))) {
    refTechKey = JCoHelper.getTechKey(messageRecord, "HANDLE_ITEM");
}
else if (metaData.hasField("HANDLE") && !" ".equals(messageRecord.getString("HANDLE"))) {
    refTechKey = JCoHelper.getTechKey(messageRecord, "HANDLE");
}
else if (metaData.hasField("OBJECT") && !" ".equals(messageRecord.getString("OBJECT"))) {
    refTechKey = JCoHelper.getTechKey(messageRecord, "OBJECT");
}
else if (metaData.hasField("EXTNUMBER") && !" ".equals(messageRecord.getString("EXTNUMBER"))) {
    refTechKey = JCoHelper.getTechKey(messageRecord, "EXTNUMBER");
}
else if (metaData.hasField("POSNR") && !" ".equals(messageRecord.getString("POSNR"))) {
    refTechKey = JCoHelper.getTechKey(messageRecord, "POSNR");
}
}
```

# Deploy



- Deployment plugin
  - Takes the SCA files as input and deploys to SAP AS Java
  - Records deploy log to console output
- Emma integration
  - Script instruments the whole SCA file before deployment → coverage report can be generated for browser tests

# Selenium integration



- Selenium (formatted as JUnit test) used for browser tests
- Ant script takes care of execution
  - Configuration using Ant properties like target URL, browser environment, ...
- Load balancing using Selenium grid → browser instances running VM cloud
  - TestNG used for parallel execution of JUnit tests
- Test results are JUnit reports → can be published by common JUnit publisher
  - Selenium supports screenshots, Ant script links them directly on the test results on Hudson
- Coverage trend + detailed coverage integrated with Emma

# Selenium integration



## Selenium Grid Hub 1.0.8-SNAPSHOT

[Documentation](#) | [FAQ](#)

### Available Remote Controls

| Host                       | Port | Environment |
|----------------------------|------|-------------|
| vecrmrc4.dhcp.wdf.sap.corp | 5556 | *firefox3   |
| vecrmrc4.dhcp.wdf.sap.corp | 5555 | *firefox3   |
| vecrmrc7.dhcp.wdf.sap.corp | 5555 | *firefox3   |
| vecrmrc7.dhcp.wdf.sap.corp | 5556 | *firefox3   |
| vecrmrc7.dhcp.wdf.sap.corp | 5557 | *firefox3   |
| vecrmrc7.dhcp.wdf.sap.corp | 5558 | *firefox3   |
| vecrmrc8.dhcp.wdf.sap.corp | 5555 | *firefox3   |
| vecrmrc8.dhcp.wdf.sap.corp | 5556 | *firefox3   |
| vecrmrc8.dhcp.wdf.sap.corp | 5557 | *firefox3   |
| vecrmrc8.dhcp.wdf.sap.corp | 5558 | *firefox3   |

### Active Remote Controls

| Host                        | Port | Environment |
|-----------------------------|------|-------------|
| vecrmrc10.dhcp.wdf.sap.corp | 5540 | *firefox3   |
| vecrmrc10.dhcp.wdf.sap.corp | 5541 | *firefox3   |
| vecrmrc1.dhcp.wdf.sap.corp  | 5560 | *firefox3   |
| vecrmrc1.dhcp.wdf.sap.corp  | 5561 | *firefox3   |
| vecrmrc1.dhcp.wdf.sap.corp  | 5562 | *firefox3   |
| vecrmrc1.dhcp.wdf.sap.corp  | 5563 | *firefox3   |
| vecrmrc3.dhcp.wdf.sap.corp  | 5570 | *firefox3   |
| vecrmrc3.dhcp.wdf.sap.corp  | 5571 | *firefox3   |
| vecrmrc3.dhcp.wdf.sap.corp  | 5572 | *firefox3   |
| vecrmrc3.dhcp.wdf.sap.corp  | 5573 | *firefox3   |
| vecrmrc4.dhcp.wdf.sap.corp  | 5557 | *firefox3   |
| vecrmrc4.dhcp.wdf.sap.corp  | 5558 | *firefox3   |

# Selenium integration



Selenium Remote Control v2.0 [a1] - Mozilla Firefox

chrome://src/content/RemoteRunner.html?sessionId=54d2696f4f094aad8353a8e0a8d37fd7&multiWindow=true&baseUrl=https%3A%2F%

Selenium Functional Testing for Web Apps  
Open Source From [ThoughtWorks and Friends](#)

Show Log  Slow Mode

54d2696f4f094aad8353a8e0a8d37fd7

**Command History:**

```
isElementPresent (content:fMyA:pAd:iSA:adddayinc:CityId)
type (content:fMyA:pAd:iSA:adddayinc:CityId, Walldorf)
isElementPresent (content:fMyA:pAd:iSA:adddayinc:StateMenu)
click (content:fMyA:pAd:iSA:adddayinc:StateMenu)
isElementPresent (link=Baden-Wuerttemberg)
```

ERP\_B2C\_WDFST1 : User | - Mozilla Firefox

https://vecrmaut05.dhcp.wdf.sap.corp:50001/main/user/AccountInfo/master.jsf?pageType=R&wec-appid=ERP\_B2C\_WDFST1&nc

Advanced Search View Cart

**MY ACCOUNT**  
My Account > Account Profile

- Transactions
  - Orders
- Account Settings
  - Account Profile
  - Change Password
  - Checkout Profile
- Personalization
  - Views

**LOGON DETAILS**

User Name: eco\_add\_do\_not\_chang

Customer ID: 304474

**CONTACT DETAILS**

Title\*: Mr.

First Name\*: Kai

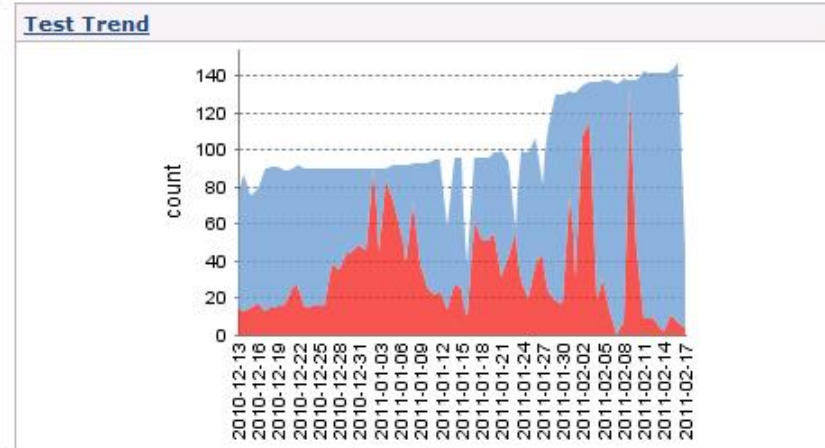
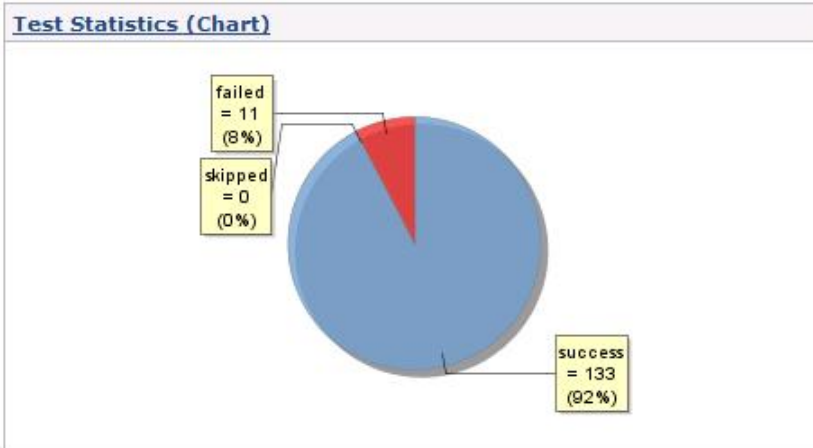
Middle Name: C.

Last Name\*:

E-Mail Address\*:

Baden-Wuerttemberg

# Selenium integration



### Test Statistics (Grid)

| Job  | Success    |            | Failed    |           | Skipped  |           | Total      |
|--|------------|------------|-----------|-----------|----------|-----------|------------|
|  | #          | %          | #         | %         | #        | %         | #          |
| <a href="#">RegressionTests_MON_All</a>          | 33         | 89%        | 4         | 11%       | 0        | 0%        | 37         |
| <a href="#">RegressionTests_STI_ST3</a>          | 15         | 94%        | 1         | 6%        | 0        | 0%        | 16         |
| <a href="#">RegressionTests_WDF_ST1</a>          | 29         | 91%        | 3         | 9%        | 0        | 0%        | 32         |
| <a href="#">RegressionTests_WDF_ST2</a>          | 3          | 100%       | 0         | 0%        | 0        | 0%        | 3          |
| <a href="#">RegressionTests_WDF_ST3</a>          | 10         | 100%       | 0         | 0%        | 0        | 0%        | 10         |
| <a href="#">RegressionTests_WDF_ST5_5Threads</a> | 43         | 93%        | 3         | 7%        | 0        | 0%        | 46         |
| <b>Total</b>                                     | <b>133</b> | <b>92%</b> | <b>11</b> | <b>8%</b> | <b>0</b> | <b>0%</b> | <b>144</b> |

# Monitoring status: EMail



- Emails are sent when builds/tests fail or when an issue is fixed (job switches back to successful)
- Templates to assemble an individual email that provides much more details than the standard emails
  - Written in Jelly
  - Requires Email-ext plugin
- Modular concept
  - Re-use and combine snippets for Header, Change set, Log snippet, ...



# Monitoring: Sample emails



Header block: display general information

## WCAdev\_dev\_DEPLOY\_VECRMAUT10: FAILURE

**Trigger:** Started by user XXXX  
**Date:** Thu, 17 Feb 2011 09:56:04 +0100  
**URL:** [http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/WCAdev\\_dev\\_DEPLOY\\_VECRMAUT10/837/](http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/WCAdev_dev_DEPLOY_VECRMAUT10/837/)

### CHANGES SINCE LAST NOT FAILED EXECUTION

#### CHANGES IN PROJECT WCAdev\_dev\_SAP-WEC

*No changes*

#### CHANGES IN PROJECT WCAdev\_dev\_SAP-WEC-FRW

*No changes*

Change set: show which changes/committers potentially caused the failure

### LOG SNIPPET

[\(click here to see the unparsed log\)](#)  
...truncated 46 line(s)..  
Feb 17, 2011 9:56:20 AM Error: All Items Already Deployed Validation Exception during deployment phase [AllItemsAlreadyDeployedValidationException],cause=[ASJ.dpl\_dc.003456 All batch items are marked as AlreadyDeployed because of Version check.]  
Feb 17, 2011 9:56:20 AM Error: Deployment Items status: [  
----- Sorted Items -----  
...truncated 188 line(s)...

Log snippet: show error details, highlight parts that might indicate the root cause

# Monitoring: Sample emails



## RegressionTests\_WDF\_ST1: UNSTABLE

**Trigger:** Started by upstream project "WCAdev\_dev\_DEPLOY\_VECRMAUT05" build number 989  
**Date:** Thu, 17 Feb 2011 07:45:28 +0100  
**URL:** [http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/RegressionTests\\_WDF\\_ST1/927/](http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/RegressionTests_WDF_ST1/927/)

### CHANGES SINCE LAST SUCCESSFUL EXECUTION

#### CHANGES IN PROJECT BuildSeleniumTestDC

*No changes*

#### CHANGES IN PROJECT WCAdev\_dev SAP-WEC

*Build 3415:*

**XXXXX:** [STI3: UM CSN 0000886940 2011](#)

**Changed files:**

/DCs/sap.com/wec/comm/mc/user/ui/\_comp/src/sap/user/ui/views/user/login/login-view.xhtml

#### CHANGES IN PROJECT WCAdev\_dev SAP-WEC-FRW

*No changes*

### FAILED TESTS SUMMARY

#### AddressesTestCaseERP.testMandatoryAddressFieldsData (age=1):

[AddressesTestCaseERP.testMandatoryAddressFieldsData] TEST SETUP FAILED: TIMEOUT while waiting for Element:   
&apos;contentHeader:acHd:mCHO\_msglnk&apos;; after 90641 ms, Screenshot:   
[http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/RegressionTests\\_WDF\\_ST1/927/artifact/log/2011-02-17\\_07-49-10\\_ERP\\_B2C\\_WDFST1\\_AddressesTestCaseERP.testMandatoryAddressFieldsData.png](http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/RegressionTests_WDF_ST1/927/artifact/log/2011-02-17_07-49-10_ERP_B2C_WDFST1_AddressesTestCaseERP.testMandatoryAddressFieldsData.png)

#### AddressesTestCaseERP.testChangeAddressData (age=1):

[AddressesTestCaseERP.testChangeAddressData] TEST SETUP FAILED: TIMEOUT while waiting for Element:   
&apos;//a[@id=&apos;content:fMyA:cBS&apos;];/span/b/i&apos;; after 10609 ms, Screenshot:   
[http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/RegressionTests\\_WDF\\_ST1/927/artifact/log/2011-02-17\\_07-49-14\\_ERP\\_B2C\\_WDFST1\\_AddressesTestCaseERP.testChangeAddressData.png](http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/RegressionTests_WDF_ST1/927/artifact/log/2011-02-17_07-49-14_ERP_B2C_WDFST1_AddressesTestCaseERP.testChangeAddressData.png)

# Monitoring: Sample emails



## WCAdev\_dev\_DEPLOY\_VECRMWCA: FAILURE

**Trigger:** Started by upstream project "WCAdev\_dev\_SAP-WEC" build number 3,378  
**Date:** Tue, 15 Feb 2011 17:27:14 +0100  
**URL:** [http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/WCAdev\\_dev\\_DEPLOY\\_VECRMWCA/2560/](http://vecrmhuds.dhcp.wdf.sap.corp:8080/hudson/job/WCAdev_dev_DEPLOY_VECRMWCA/2560/)

### CHANGES SINCE LAST NOT FAILED EXECUTION

#### CHANGES IN PROJECT WCAdev\_dev\_SAP-WEC

*Build 3370:*

**XXXXXX:** [WDF help text payment service provider](#)

**Changed files:**

/DCs/sap.com/wec/comm/mc/payment/md/\_comp/src/sap/payment/md/wcf\_resources.xlf

#### CHANGES IN PROJECT WCAdev\_dev\_SAP-WEC-FRW

**No changes**

### LOG SNIPPET

[\(click here to see the unparsed log\)](#)

```
...truncated 20 line(s)...  
#0: http://vecrmwca.dhcp.wdf.sap.corp:50000 is not reachable (HTTP Response Code : 503). Waiting 5  
seconds and trying again  
#1: http://vecrmwca.dhcp.wdf.sap.corp:50000 is not reachable (HTTP Response Code : 503). Waiting 5  
seconds and trying again  
#2: http://vecrmwca.dhcp.wdf.sap.corp:50000 is not reachable (HTTP Response Code : 503). Waiting 5  
seconds and trying again  
FATAL: http://vecrmwca.dhcp.wdf.sap.corp:50000 still not reachable after 0 minute(s) 15 second(s)  
←[8mha:AAAAWB+LCAAAAAAAAAABb85aBtbiIQSmjNKU4P08vOT+vOD8nVc8DzHWtSE4tKMnMz/PLL0ldFVf2c+b/lb5MDAwVRQxSaBqc  
and-latches] Releasing all the locks  
...truncated 4 line(s)...
```

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