

# **Coordinated Testing with a Test-Server**

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## Who are we?

- ▶ Carsten Härle, straighttec GmbH
  - ▶ Experience in OO and Smalltalk since 1986
  - ▶ Products and Services
    - ▶ IT-Consulting, software development, Training and Coaching for OO, XP, Automated Testing
    - ▶ Specialized in Smalltalk
    - ▶ Product „beno“ – IT-Administration und Teaching Solution for Schools, Dolphin Smalltalk XP 5, Microsoft Certified Product
- ▶ Thorsten Seitz
  - ▶ Experience in Smalltalk since 1999

## Automated Testing in an Ideal World

- ▶ Very fast test case execution
  - ▶ Before releasing code, all (relevant) test cases can be executed in a reasonable time (some minutes)
- ▶ Perfect distributed knowledge
  - ▶ Every developer can fix every failing test case introduced by code changes
- ▶ Repair of test cases can be done quickly
- ▶ For code published to repository, all tests pass at all times

## Automated Testing in the Real World

- ▶ Execution time: Test Case execution can take several hours, especially when GUI tests, database or external resources are involved.
- ▶ Knowledge: The developer who can fix the test case best cannot do it immediately because of other tasks.
- ▶ Repair time: Repairing test cases can take a considerable time in large projects.
- ▶ Failing test cases in the repository are normal

## Broken test cases in an XP process

- ▶ Broken code: Can be part of agreed XP process:
  - ▶ Write test cases first for new requirements and publish
  - ▶ Write test cases for detected defects and publish
  - ▶ New Test cases will fail first.
  - ▶ Task for next delivery of the system is to make all tests green.
- ▶ Need tool which keeps track of current state of test cases and assists in coordinating developers.

## The Test Server Tool

- ▶ A central server which keeps track of all test cases, the test case results and code versions.
- ▶ Developers can dynamically register with the server.
- ▶ Developers execute test cases with a test client which delivers the results to the server.
- ▶ The global state of all test cases is distributed back to all developers
- ▶ Automatic reloading of the latest code and test cases.
- ▶ Keep track of the code versions for the executed test cases

# Screen Shot: Test Server / Client

Test Server (HAL-LT4)

Release: 7.5.0    Update Now    Load Bundles    Build Stripped Images    Show Build Info    Load    Save    Show Clients    top    Update Testcases    Minimieren

Test Suite	Ergebnis	aktuell	Aktualisiert	Tester	Dauer	GFD-Z Gesamt	ausgecheckt
Reference Versions		ja	14:07:03			(7.5.0-4.0-0.6,UweKolb)	Server
Local Versions (Server)		ja	14:07:03			(7.5.0-4.0-0.6,UweKolb)	Image
DAVIT : Object : TestCases deepEquals	(36)					--	
DAVIT : RSMStream : Testfaelle	(4)					--	
DAVIT Testframework : DVTTestCase : regression-test	(10)					--	
DAVIT Testframework : DVTTestCaseCollection : regression-test	(3)					--	
DAVIT Testframework : DVTTestCaseResult : regression-test	(3)					--	
GFD-Z : ZZZBahnhofGleis : Testfaelle	(1)					--	
GFD-Z WVVK : ZDFDruckdatenvorschauComponent : Testfaelle	(2)					--	
GFD-Z WVVK : ZDFDruckdatenvorschauComponent : Testfaelle	(2)					--	
SBF2 : SGBGrundbremstafel : Testfaelle	(2)					--	
SBF2 : SIBBuchfahrplan : Testfaelle Gleisigkeitswechsel	(2)					--	
SBF2 : STBGeschwindigkeitsstufenReduzierer : Testfaelle	(6)					--	
SBF2 : STHBefahrbarkeit : test cases	(3)					--	
SBF2 : STHBrstStrabschZuordnung : test cases	(2)					--	
SBF2 : STHGleis : test cases	(6)					--	
SBF2 : STHGleiskante : test cases	(2)					--	
SBF2 : STHStrecke : test cases	(9)					--	
SBF2 : SZAKopterzeugerFuerTest : Testfaelle	(1)					--	
ZZZ Datenstrukturen : ZZZCollectionCursor : Testfaelle	(6)					--	

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## Demo

- ▶ Show Test Server
- ▶ Show Test Client
- ▶ Execute single test suite
- ▶ Modify code: Test server flags test cases not executed with latest code versions



# Screen Shot: Some executed tests

Test Server (HAL-LT4)

Release: 7.5.0    Update Now    Load Bundles    Build Stripped Images    Show Build Info    Load    Save    Show Clients    top    Update Test Suites

Test Suite	Ergebnis	aktuell	Aktualisiert	Tester	Dauer	GFD-Z Gesamt	ausgecheckt
Reference Versions		ja	14:44:00			(7.5.0-4.0-0.6,UweKolb)	Server
Local Versions (Server)		ja	14:44:00			(7.5.0-4.0-0.6,UweKolb)	Image
DAVIT : Object : TestCases deepEquals	passed	ja	14:45:11	hal-It4-carstenhaerle-w7501w7501	2 sec	(7.5.0-4.0-0.6,UweKolb)	
DAVIT : RSMStream : Testfaelle	(4)					--	
DAVIT Testframework : DVTTestCase : regression-test	(10)					--	
DAVIT Testframework : DVTTestCaseCollection : regression-test	(3)					--	
DAVIT Testframework : DVTTestCaseResult : regression-test	(3)					--	
GFD-Z : ZZZBahnhofGleis : Testfaelle	passed	ja	14:45:16	hal-It4-carstenhaerle-w7501w7501	2 sec	(7.5.0-4.0-0.6,UweKolb)	
GFD-Z WVK : ZDFDruckdatenvorschauComponent : Testfaelle	(2)					--	
GFD-Z WVK : ZDFDruckdatenvorschauComponent : Testfaelle	(2)					--	
SBF2 : SGBGrundbremstafel : Testfaelle	(2)					--	
SBF2 : SIBBBuchfahrplan : Testfaelle Gleisigkeitswechsel	(2)					--	
SBF2 : STBGeschwindigkeitsstufenReduzierer : Testfaelle	(6)					--	
SBF2 : STHBefahrbarkeit : test cases	passed	ja	14:45:21	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STHBtrstStrabschZuordnung : test cases	(2)					--	
SBF2 : STHGleis : test cases	(6)					--	
SBF2 : STHGleiskante : test cases	(2)					--	
SBF2 : STHStrecke : test cases	(9)					--	
SBF2 : SZAKopferzeugerFuerTest : Testfaelle	(1)					--	
ZZZ Datenstrukturen : ZZZCollectionCursor : Testfaelle	(6)					--	

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# Screen Shot: One test suite not with recent code

Test Server (HAL-LT4)

Release: 7.5.0    Update Now    Load Bundles    Build Stripped Images    Show Build Info    Load    Save    Show Clients    top    Update Test Suites

Test Suite	Ergebnis	aktuell	Aktualisiert	Tester	Dauer	GFD-Z Gesamt	ausgecheckt
Reference Versions		ja	14:18:59			(7.5.0-4.0-0.6,UweKolb)	Server
Local Versions (Server)		ja	14:18:59			(7.5.0-4.0-0.6,UweKolb)	Image
DAVIT : Object : TestCases deepEquals	passed	ja	14:20:07	hal-It4-carstenhaerle-w7501w7501	2 sec	(7.5.0-4.0-0.6,UweKolb)	
DAVIT : RSMStream : Testfaelle	passed	ja	14:19:59	hal-It4-carstenhaerle-w7501w7501	2 sec	(7.5.0-4.0-0.6,UweKolb)	
DAVIT Testframework : DVTestCase : regression-test	passed	nein	14:21:52	hal-It4-carstenhaerle-w7501w7501	1 sec	4.0-0.6,UweKolb)-image	
DAVIT Testframework : DVTestCaseCollection : regression-t	passed	ja	14:20:13	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
DAVIT Testframework : DVTestCaseResult : regression-test	passed	ja	14:20:32	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
GFD-Z : ZZZBahnhofGleis : Testfaelle	passed	ja	14:15:21	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
GFD-Z WVK : ZFDDruckdatenvorschauComponent : Testfaelle	passed	ja	14:20:48	hal-It4-carstenhaerle-w7501w7501	3 sec	(7.5.0-4.0-0.6,UweKolb)	
GFD-Z WVK : ZFDDruckdatenvorschauComponent : Testfaelle	passed	ja	14:20:35	hal-It4-carstenhaerle-w7501w7501	3 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : SGBGrundbremstafel : Testfaelle	passed	ja	14:20:43	hal-It4-carstenhaerle-w7501w7501	0 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : SIBBuchfahrplan : Testfaelle Gleisigkeitswechsel	passed	ja	14:20:42	hal-It4-carstenhaerle-w7501w7501	6 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STBGeschwindigkeitsstufenReduzierer : Testfaelle	passed	ja	14:20:43	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STHBefahrbarkeit : test cases	passed	ja	14:15:07	hal-It4-carstenhaerle-w7501w7501	2 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STHBrstStrabschZuordnung : test cases	passed	ja	14:20:45	hal-It4-carstenhaerle-w7501w7501	0 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STHGleis : test cases	passed	ja	14:20:50	hal-It4-carstenhaerle-w7501w7501	0 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STHGleiskante : test cases	passed	ja	14:20:45	hal-It4-carstenhaerle-w7501w7501	0 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STHStrecke : test cases	passed	ja	14:20:44	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : SZAKopferzeugerFuerTest : Testfaelle	passed	ja	14:20:51	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
ZZZ Datenstrukturen : ZZZCollectionCursor : Testfaelle	passed	ja	14:20:49	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	

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## Coordinated Test Case Repair

- ▶ The Test Server stores test case results with failure causes. Every developer can easily retrieve results.
- ▶ Developers can exclusively check out test suites for repair. Checked out suites are not executed automatically.
- ▶ Demo
  - ▶ Change test case to fail and execute test
  - ▶ Retrieve results
  - ▶ Check out, Repair and execute again

# Screen Shot: Failed and Checked out Suites

Test Server (HAL-LT4)

Release: 7.5.0    Update Now    Load Bundles    Build Stripped Images    Show Build Info    Load    Save    Show Clients    top    Update Test Suites

Test Suite	Ergebnis	aktuell	Aktualisiert	Tester	Dauer	GFD-Z Gesamt	ausgecheckt
Reference Versions		ja	14:48:53			(7.5.0-4.0-0.6,UweKolb)	Server
Local Versions (Server)		ja	14:48:53			(7.5.0-4.0-0.6,UweKolb)	Image
DAVIT : Object : TestCases deepEquals	failed (1)	nein	14:48:00	hal-It4-carstenhaerle-w7501w7501	2 sec	4.0-0.6,UweKolb)-image	hal-It4-carstenhaerle-w7501w7501
DAVIT : RSMStream : Testfaelle	(4)					--	
DAVIT Testframework : DVTTestCase : regression-test	(10)					--	
DAVIT Testframework : DVTTestCaseCollection : regression-t	(3)					--	
DAVIT Testframework : DVTTestCaseResult : regression-test	(3)					--	
GFD-Z : ZZZBahnhofGleis : Testfaelle	passed	ja	14:45:16	hal-It4-carstenhaerle-w7501w7501	2 sec	(7.5.0-4.0-0.6,UweKolb)	
GFD-Z WVK : ZDFDruckdatenvorschauComponent : Testfaelle	(2)					--	
GFD-Z WVK : ZDFDruckdatenvorschauComponent : Testfaelle	(2)					--	
SBF2 : SGBGrundbremstafel : Testfaelle	(2)					--	
SBF2 : SIBBuchfahrplan : Testfaelle Gleisigkeitswechsel	(2)					--	
SBF2 : STBGeschwindigkeitsstufenReduzierer : Testfaelle	(6)					--	
SBF2 : STHBefahrbarkeit : test cases	passed	ja	14:45:21	hal-It4-carstenhaerle-w7501w7501	1 sec	(7.5.0-4.0-0.6,UweKolb)	
SBF2 : STHTrstStrabschZuordnung : test cases	(2)					--	
SBF2 : STHGleis : test cases	(6)					--	
SBF2 : STHGleiskante : test cases	(2)					--	
SBF2 : STHStrecke : test cases	(9)					--	
SBF2 : SZAKopterzeugerFuerTest : Testfaelle	(1)					--	
ZZZ Datenstrukturen : ZZZCollectionCursor : Testfaelle	(6)					--	

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## Automatic Parallized Test Execution

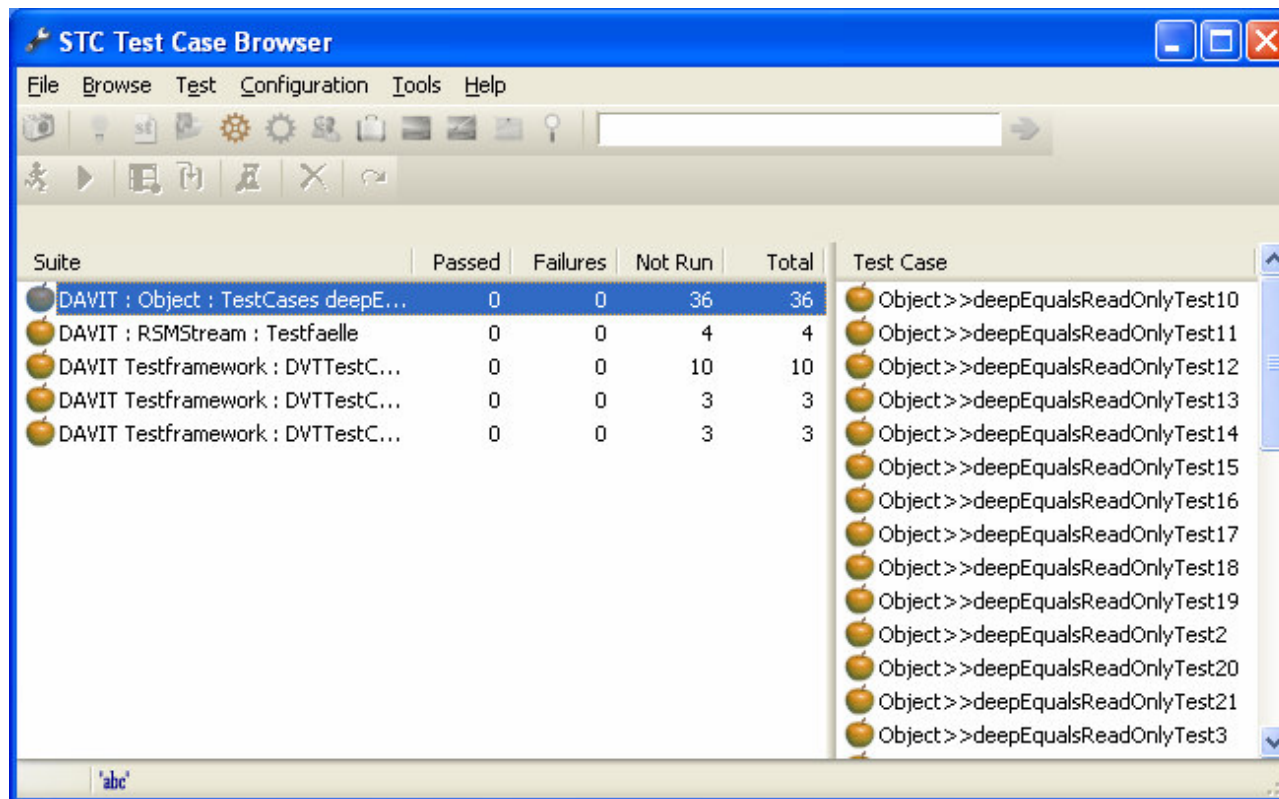
- ▶ Test clients can be put into an „automatic execution“ mode:
  - ▶ Automatically retrieve test suites to be executed
  - ▶ Execute test cases and submits results to test server
  - ▶ Automatically check out suites, so that suites are not executed by more than one test client
- ▶ Demo
  - ▶ Automatically execute test cases from one client
  - ▶ Client „stand by“ and automatic execution mode

## Current Tool status

- ▶ Internal customer project tool.
- ▶ Uses VisualWorks and OpenTalk
- ▶ Supports test cases of TestMentor (GUI) and internal test case framework

# Work in Progress

- ▶ New implementation for various platforms: Dolphin, SUnit





## Work in progress and future ideas

- ▶ Independent server, higher interoperability
- ▶ Support for SUnit and other test frameworks
- ▶ Gather more statistic data like
  - ▶ Code coverage
  - ▶ Dependency detection between test suites and production code
  - ▶ Heuristics for optimized test suite execution sequence
  - ▶ History of execution results (when did the test last pass?)
  - ▶ Identifying non-deterministic test cases
- ▶ Clients for several Smalltalk platforms
- ▶ Clients for other IDEs (like Java, Eclipse, .NET)



## Contact

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