Gestern lief's doch noch

Muss ich heute wirklich schon wieder alles testen?

Forschungsergebnisse & eigene Erfahrungen mit Test-Impact-Analyse

Dr. Elmar Juergens

CQSE

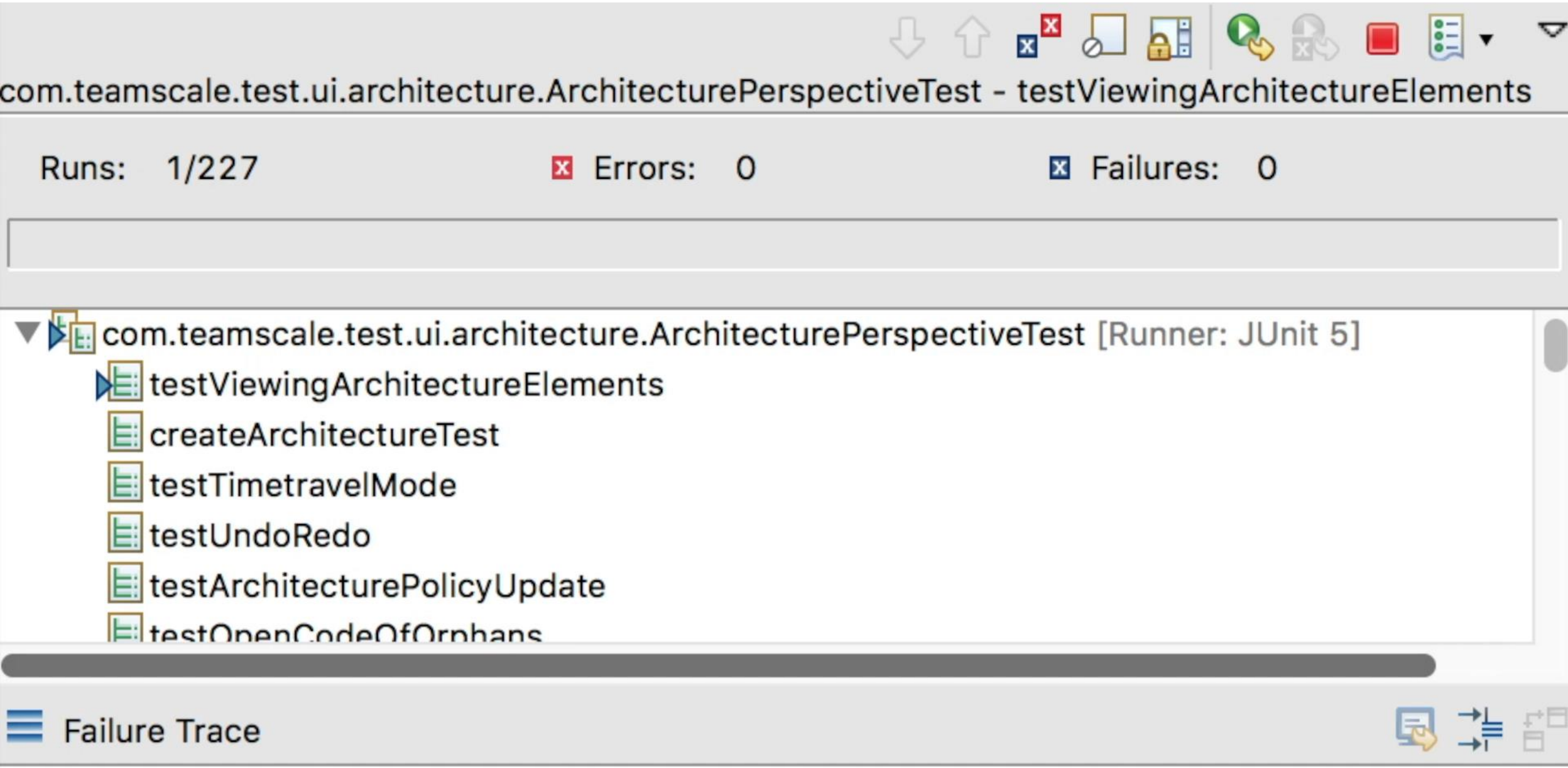
Über Mich

Forschung

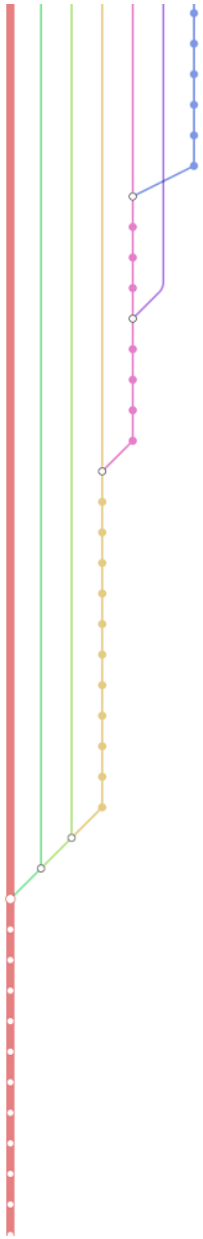
- Test-Gap-Analyse, Defect Prediction, …
- PC Mitglied von MSR, ICPC, ICSE, …

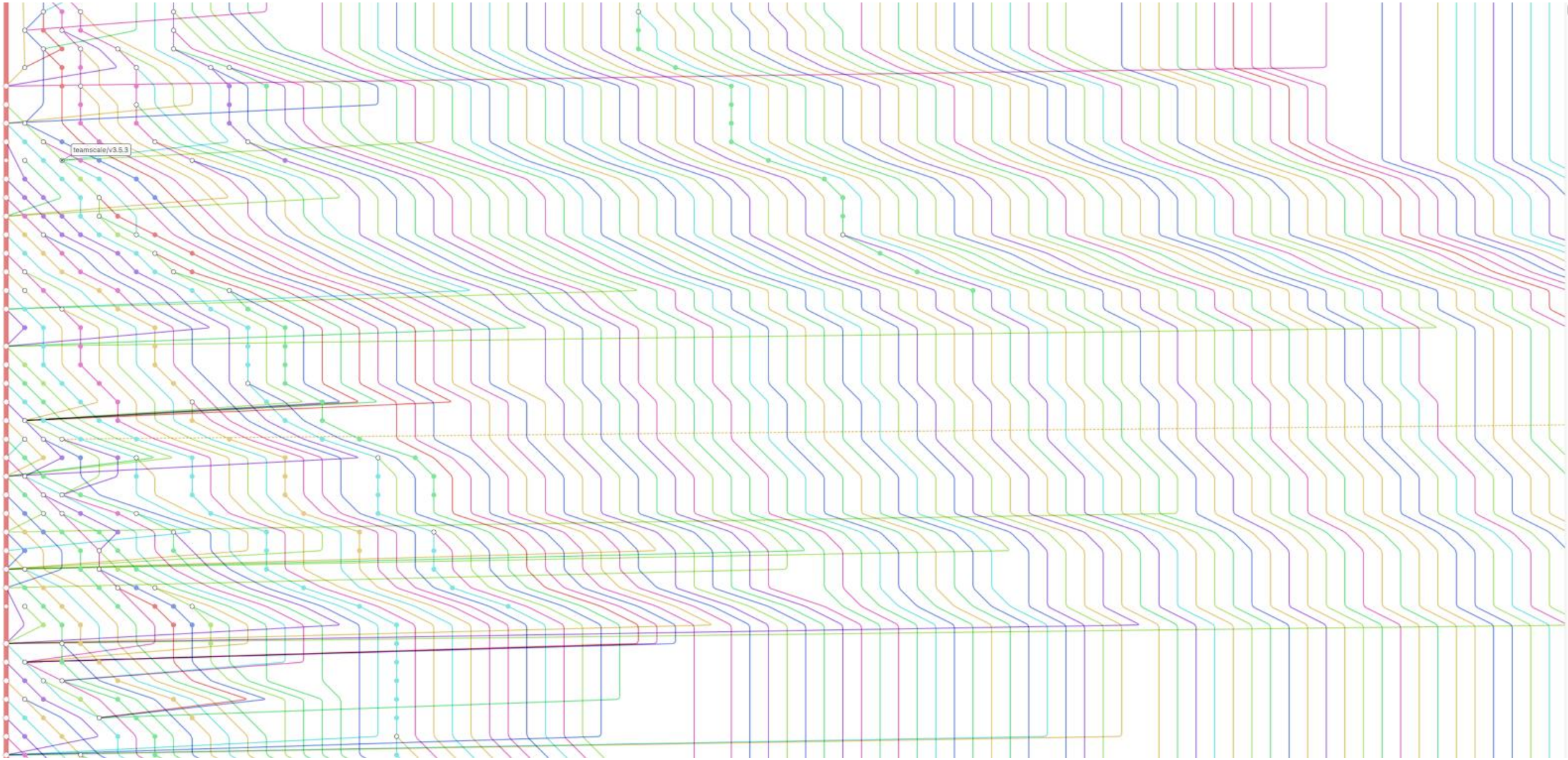
Beratung

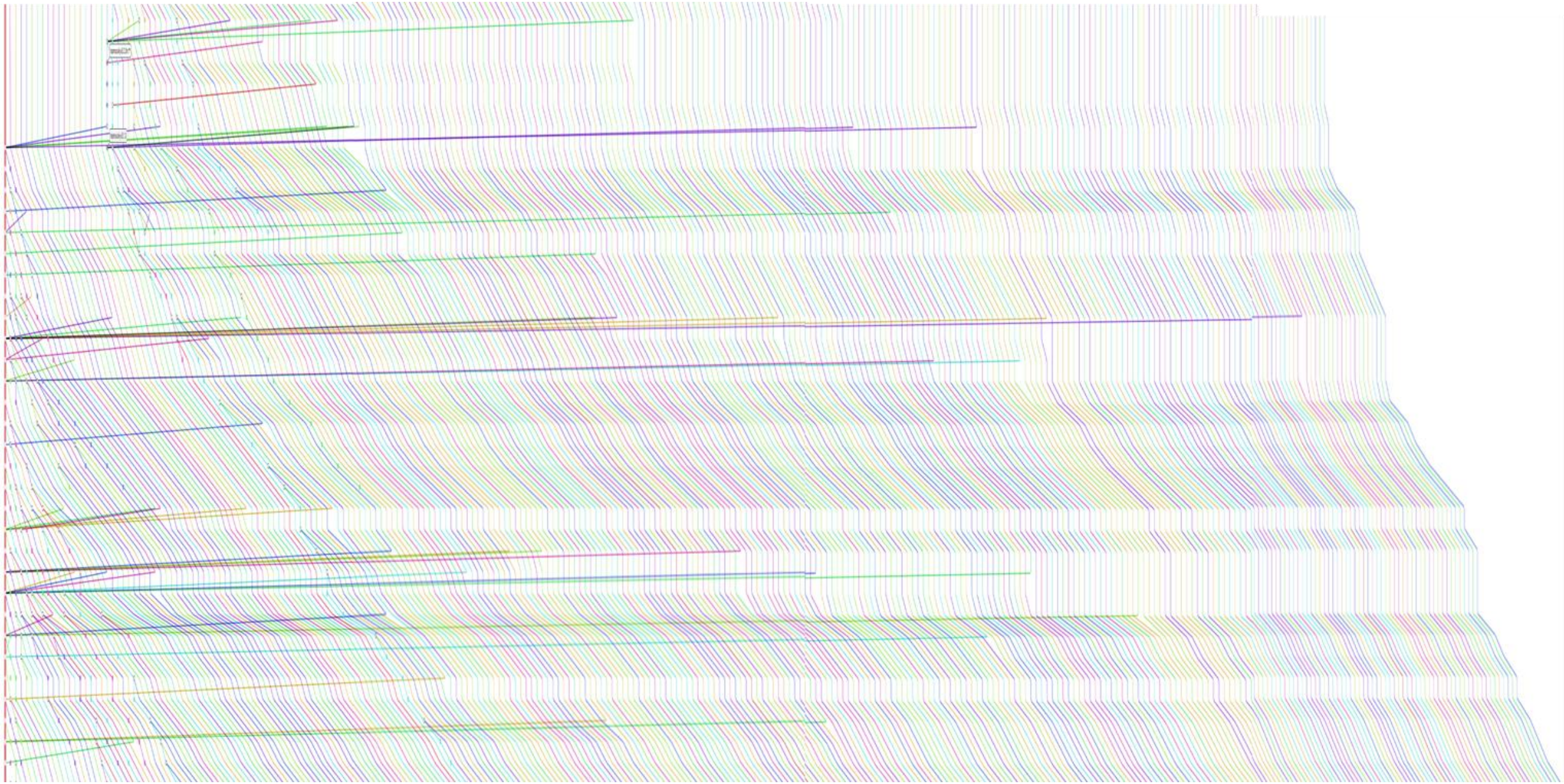
- Gründer und Mitglied der Geschäftsleitung
- Qualitäts-Bewertung & Qualitäts-Controlling

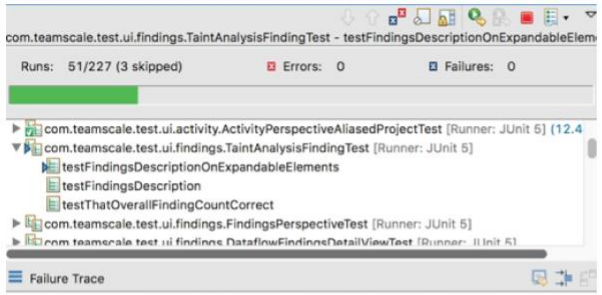

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testViewingArchitectureElements
Runs: 1/227
Errors: 0
Failures: 0
com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
testViewingArchitectureElements
createArchitectureTest
testTimetravelMode
testUndoRedo
testArchitecturePolicyUpdate
Failure Trace

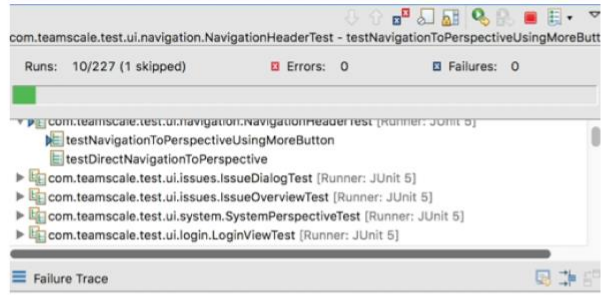
https://www.technica-engineering.de/produkte/bts-body-electronic-test-system/

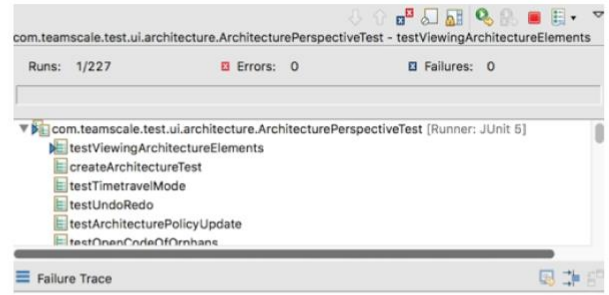


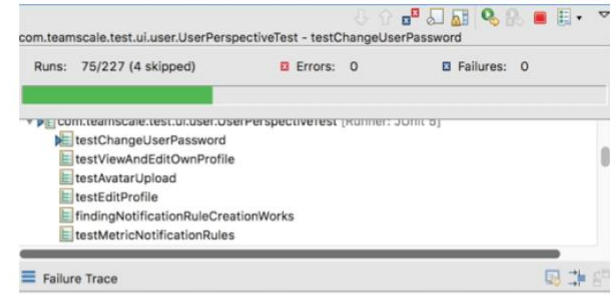

teamscale/v3.5.3

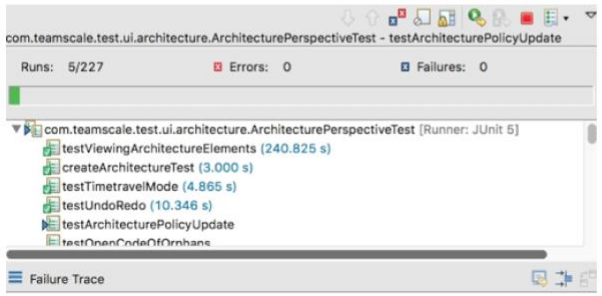


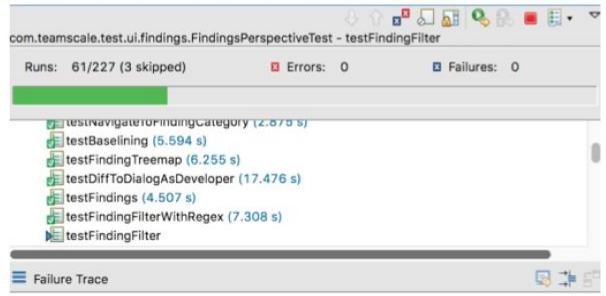

com.teamscale.test.ui.findings.TaintAnalysisFindingTest - testFindingsDescriptionOnExpandableElem
Runs: 51/227 (3 skipped)
Errors: 0
Failures: 0
com.teamscale.test.ui.activity.ActivityPerspectiveAliasedProjectTest [Runner: JUnit 5] (12.4
com.teamscale.test.ui.findings.TaintAnalysisFindingTest [Runner: JUnit 5]
testFindingsDescriptionOnExpandableElements
testFindingsDescription
testThatOverallFindingCountCorrect
com.teamscale.test.ui.findings.FindingsPerspectiveTest [Runner: JUnit 5]
Failure Trace

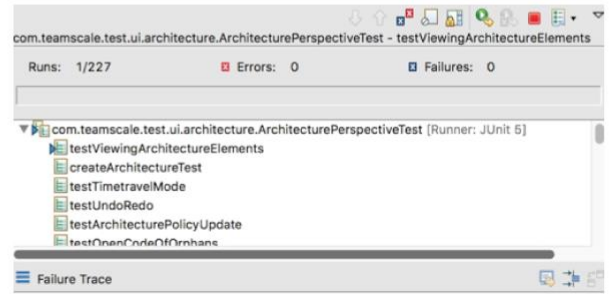

com.teamscale.test.ui.navigation.NavigationHeaderTest - testNavigationToPerspectiveUsingMoreButt
Runs: 10/227 (1 skipped)
Errors: 0
Failures: 0
testNavigationToPerspectiveUsingMoreButton
testDirectNavigationToPerspective
com.teamscale.test.ui.issues.IssueDialogTest [Runner: JUnit 5]
com.teamscale.test.ui.issues.IssueOverviewTest [Runner: JUnit 5]
com.teamscale.test.ui.system.SystemPerspectiveTest [Runner: JUnit 5]
com.teamscale.test.ui.login.LoginViewTest [Runner: JUnit 5]
Failure Trace

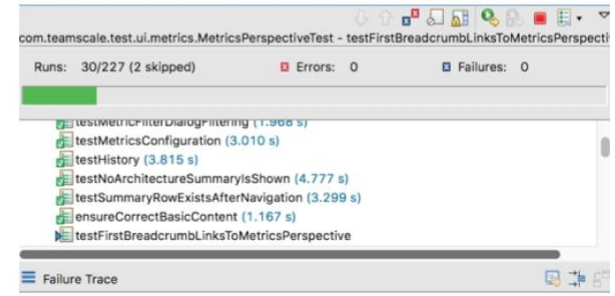

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testViewingArchitectureElements
Runs: 1/227
Errors: 0
Failures: 0
com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
testViewingArchitectureElements
createArchitectureTest
testTimetravelMode
testUndoRedo
testArchitecturePolicyUpdate
Failure Trace

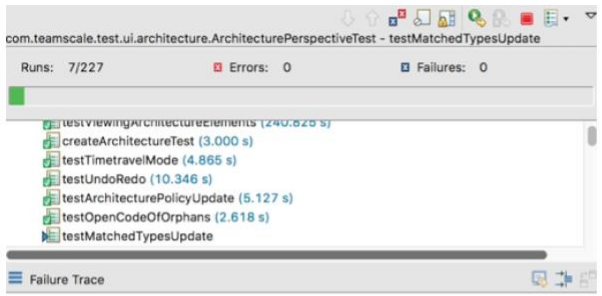

com.teamscale.test.ui.user.UserPerspectiveTest - testChangeUserPassword
Runs: 75/227 (4 skipped)
Errors: 0
Failures: 0
testChangeUserPassword
testViewAndEditOwnProfile
testAvatarUpload
testEditProfile
findingNotificationRuleCreationWorks
testMetricNotificationRules
Failure Trace

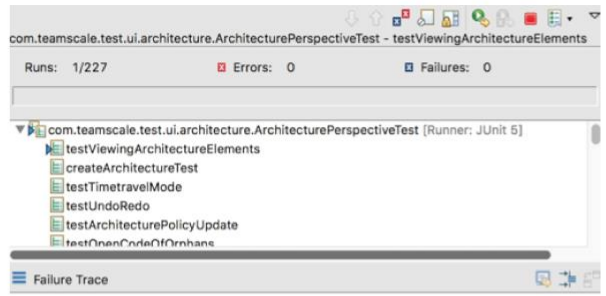

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testArchitecturePolicyUpdate
Runs: 5/227
Errors: 0
Failures: 0
com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
testViewingArchitectureElements (240.825 s)
createArchitectureTest (3.000 s)
testTimetravelMode (4.865 s)
testUndoRedo (10.346 s)
testArchitecturePolicyUpdate
Failure Trace

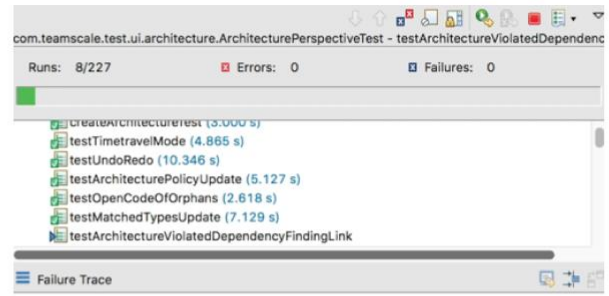

com.teamscale.test.ui.findings.FindingsPerspectiveTest - testFindingFilter
Runs: 61/227 (3 skipped)
Errors: 0
Failures: 0
testBaselining (5.594 s)
testFindingTreemap (6.255 s)
testDiffToDialogAsDeveloper (17.476 s)
testFindings (4.507 s)
testFindingFilterWithRegex (7.308 s)
testFindingFilter
Failure Trace

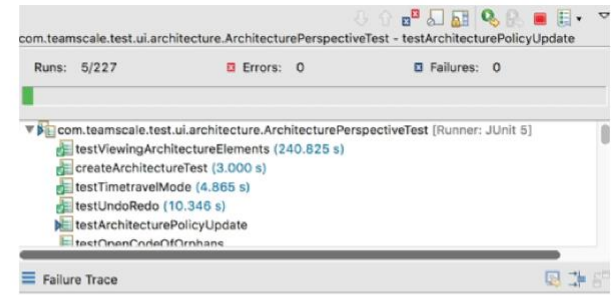

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testViewingArchitectureElements
Runs: 1/227
Errors: 0
Failures: 0
com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
testViewingArchitectureElements
createArchitectureTest
testTimetravelMode
testUndoRedo
testArchitecturePolicyUpdate
Failure Trace

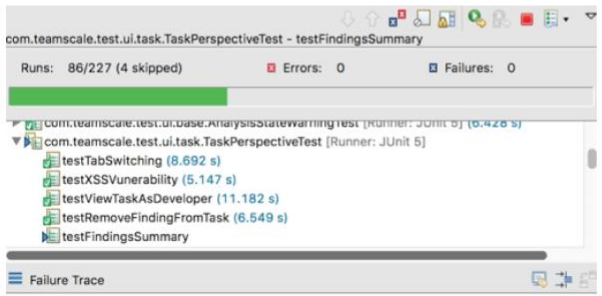

com.teamscale.test.ui.metrics.MetricsPerspectiveTest - testFirstBreadcrumbLinksToMetricsPerspecti
Runs: 30/227 (2 skipped)
Errors: 0
Failures: 0
testMetricsConfiguration (3.010 s)
testHistory (3.815 s)
testNoArchitectureSummaryIsShown (4.777 s)
testSummaryRowExistsAfterNavigation (3.299 s)
ensureCorrectBasicContent (1.167 s)
testFirstBreadcrumbLinksToMetricsPerspective
Failure Trace

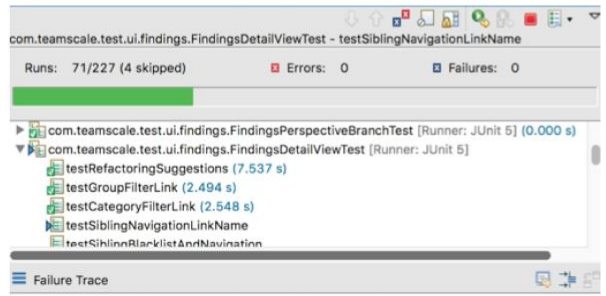

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testMatchedTypesUpdate
Runs: 7/227
Errors: 0
Failures: 0
createArchitectureTest (3.000 s)
testTimetravelMode (4.865 s)
testUndoRedo (10.346 s)
testArchitecturePolicyUpdate (5.127 s)
testOpenCodeOfOrphans (2.618 s)
testMatchedTypesUpdate
Failure Trace

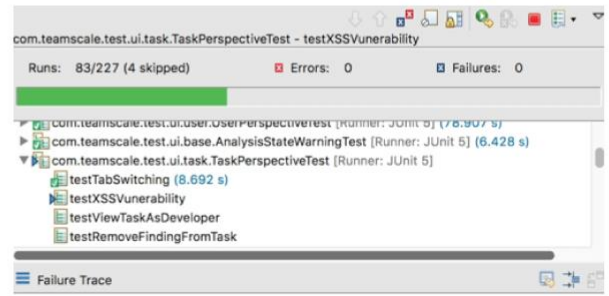

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testViewingArchitectureElements
Runs: 1/227
Errors: 0
Failures: 0
com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
testViewingArchitectureElements
createArchitectureTest
testTimetravelMode
testUndoRedo
testArchitecturePolicyUpdate
Failure Trace

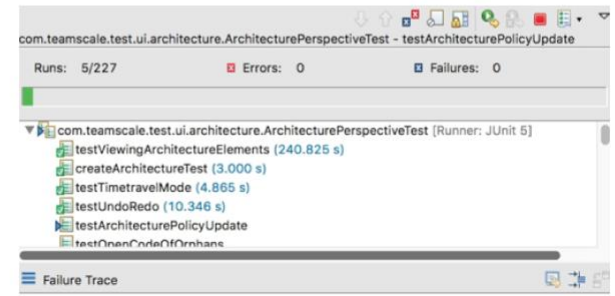

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testArchitectureViolatedDependenc
Runs: 8/227
Errors: 0
Failures: 0
testTimetravelMode (4.865 s)
testUndoRedo (10.346 s)
testArchitecturePolicyUpdate (5.127 s)
testOpenCodeOfOrphans (2.618 s)
testMatchedTypesUpdate (7.129 s)
testArchitectureViolatedDependencyFindingLink
Failure Trace

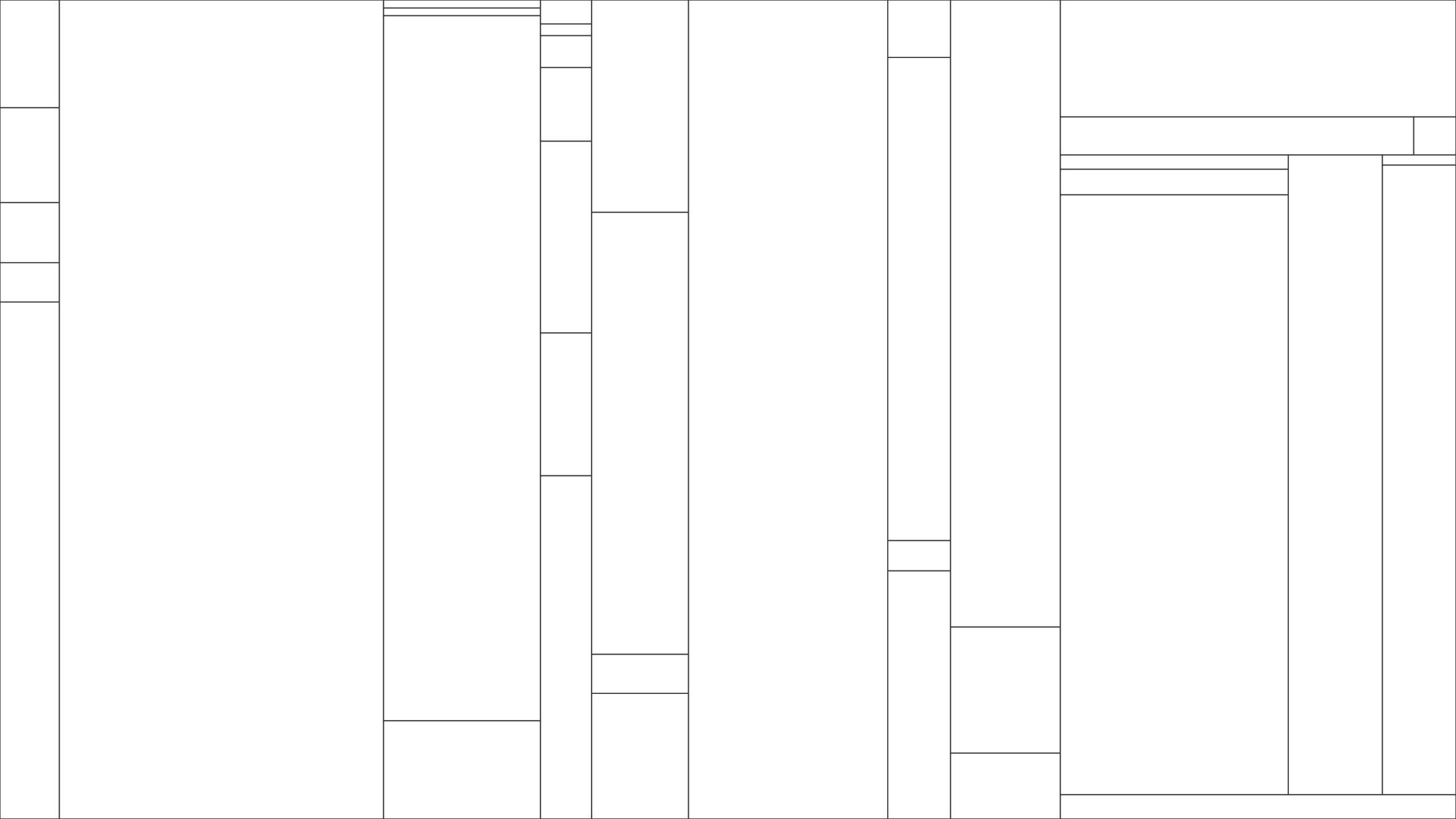

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testArchitecturePolicyUpdate
Runs: 5/227
Errors: 0
Failures: 0
com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
testViewingArchitectureElements (240.825 s)
createArchitectureTest (3.000 s)
testTimetravelMode (4.865 s)
testUndoRedo (10.346 s)
testArchitecturePolicyUpdate
Failure Trace

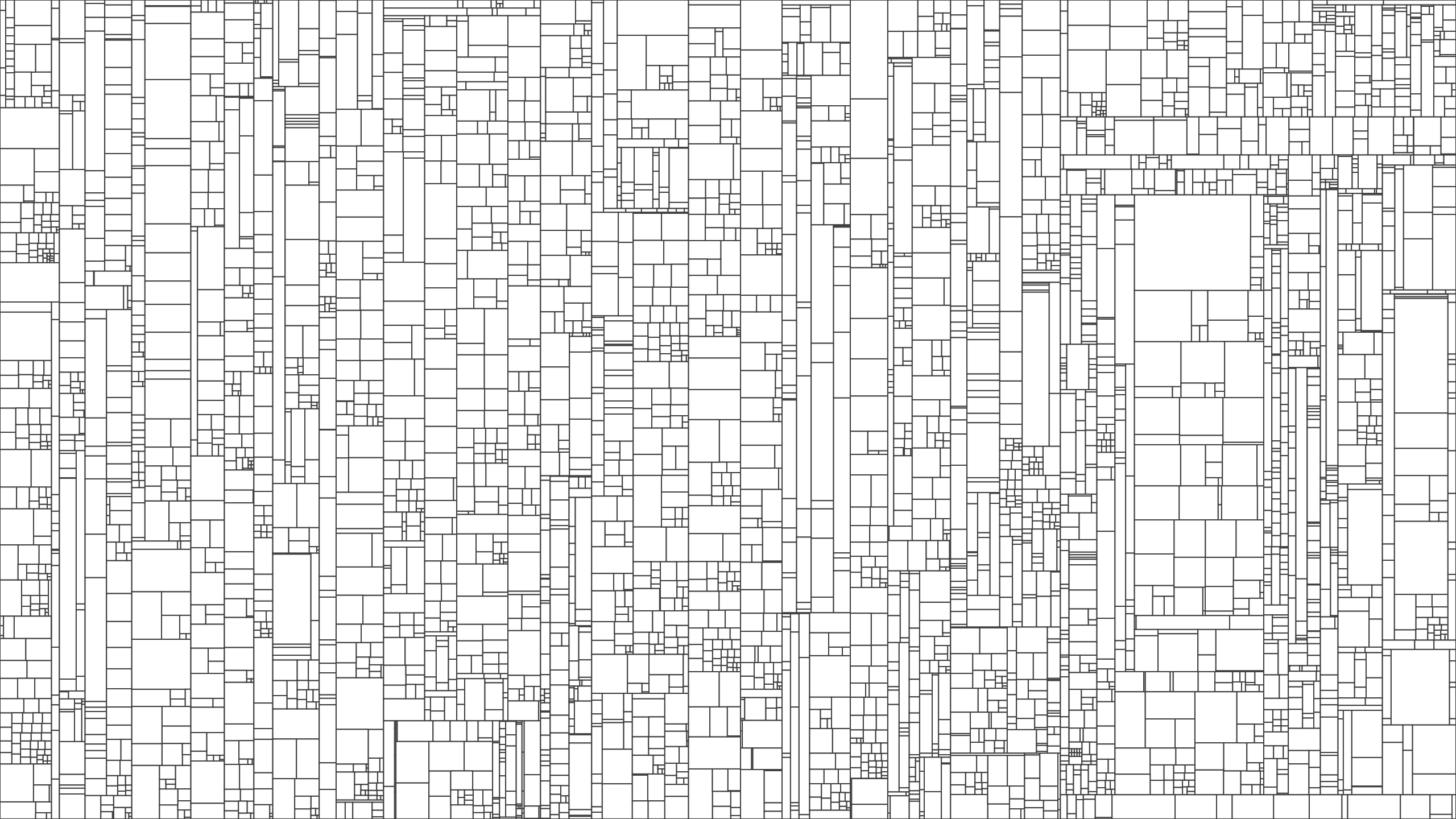

com.teamscale.test.ui.task.TaskPerspectiveTest - testFindingsSummary
Runs: 86/227 (4 skipped)
Errors: 0
Failures: 0
com.teamscale.test.ui.task.TaskPerspectiveTest [Runner: JUnit 5]
testTabSwitching (8.692 s)
testXSSVunerability (5.147 s)
testViewTaskAsDeveloper (11.182 s)
testRemoveFindingFromTask (6.549 s)
testFindingsSummary
Failure Trace

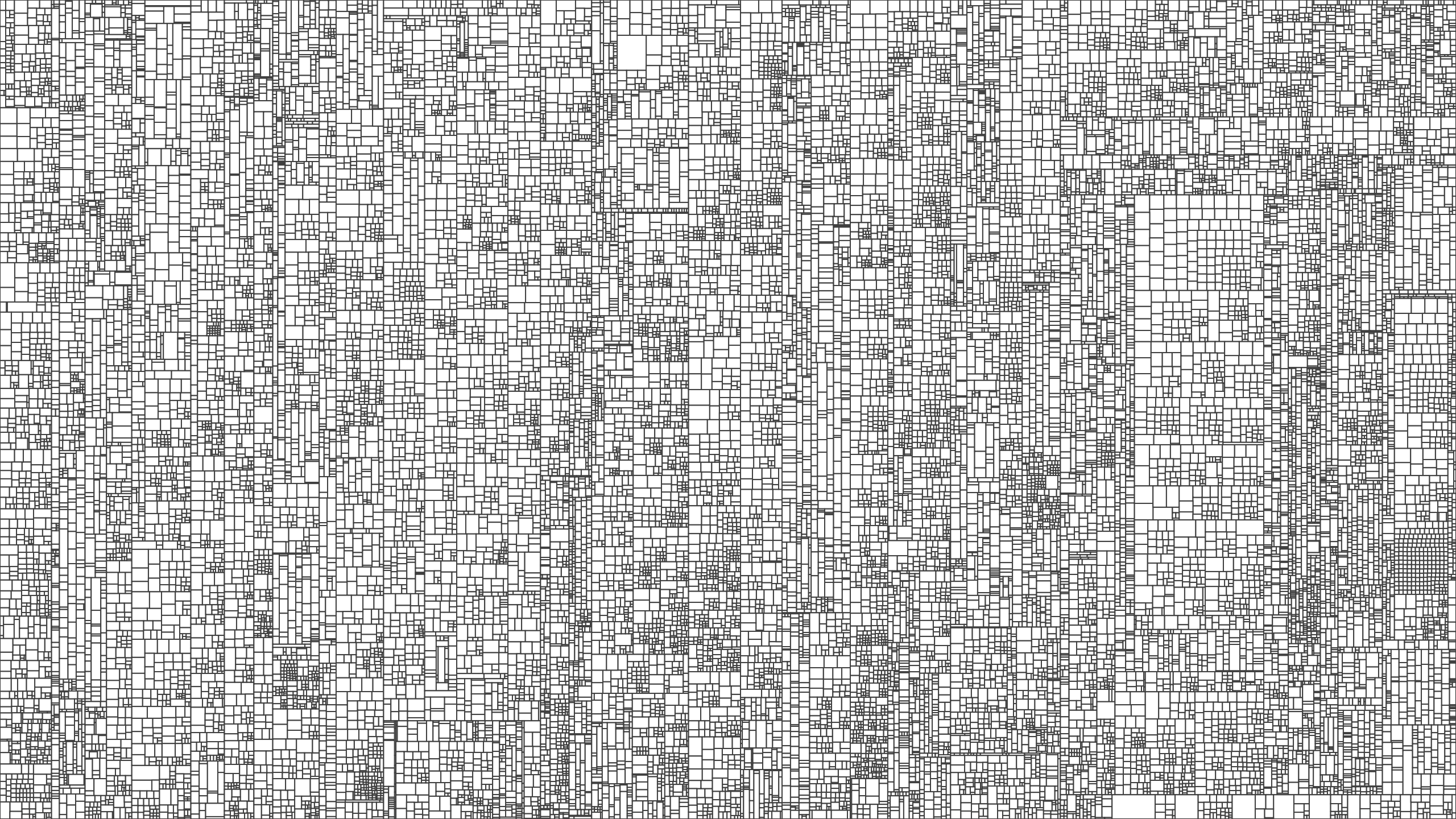

com.teamscale.test.ui.findings.FindingsDetailViewTest - testSiblingNavigationLinkName
Runs: 71/227 (4 skipped)
Errors: 0
Failures: 0
com.teamscale.test.ui.findings.FindingsPerspectiveBranchTest [Runner: JUnit 5] (0.000 s)
com.teamscale.test.ui.findings.FindingsDetailViewTest [Runner: JUnit 5]
testRefactoringSuggestions (7.537 s)
testGroupFilterLink (2.494 s)
testCategoryFilterLink (2.548 s)
testSiblingNavigationLinkName
Failure Trace

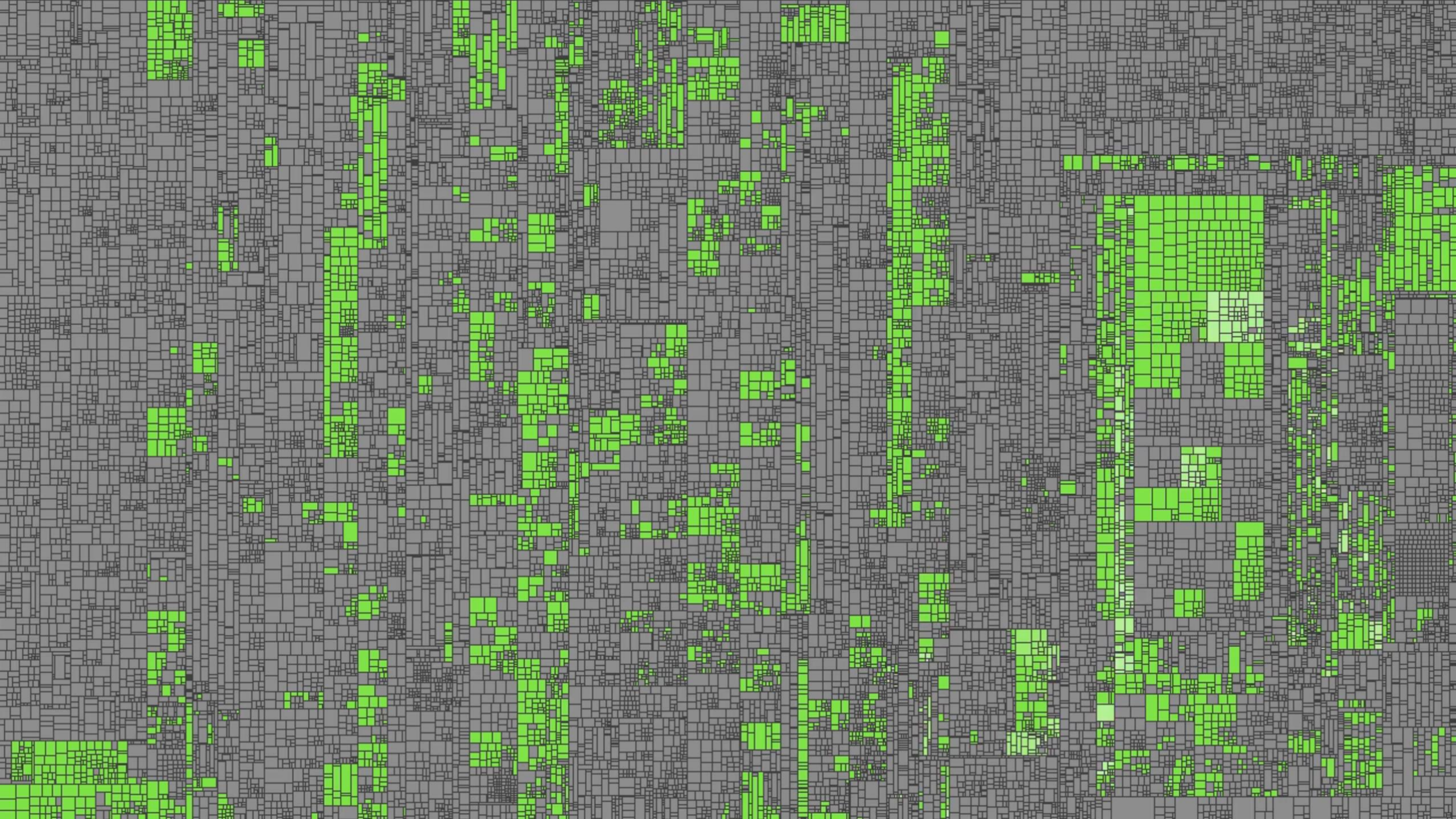

com.teamscale.test.ui.task.TaskPerspectiveTest - testXSSVunerability
Runs: 83/227 (4 skipped)
Errors: 0
Failures: 0
com.teamscale.test.ui.base.AnalysisStateWarningTest [Runner: JUnit 5] (6.428 s)
com.teamscale.test.ui.task.TaskPerspectiveTest [Runner: JUnit 5]
testTabSwitching (8.692 s)
testXSSVunerability
testViewTaskAsDeveloper
testRemoveFindingFromTask
Failure Trace

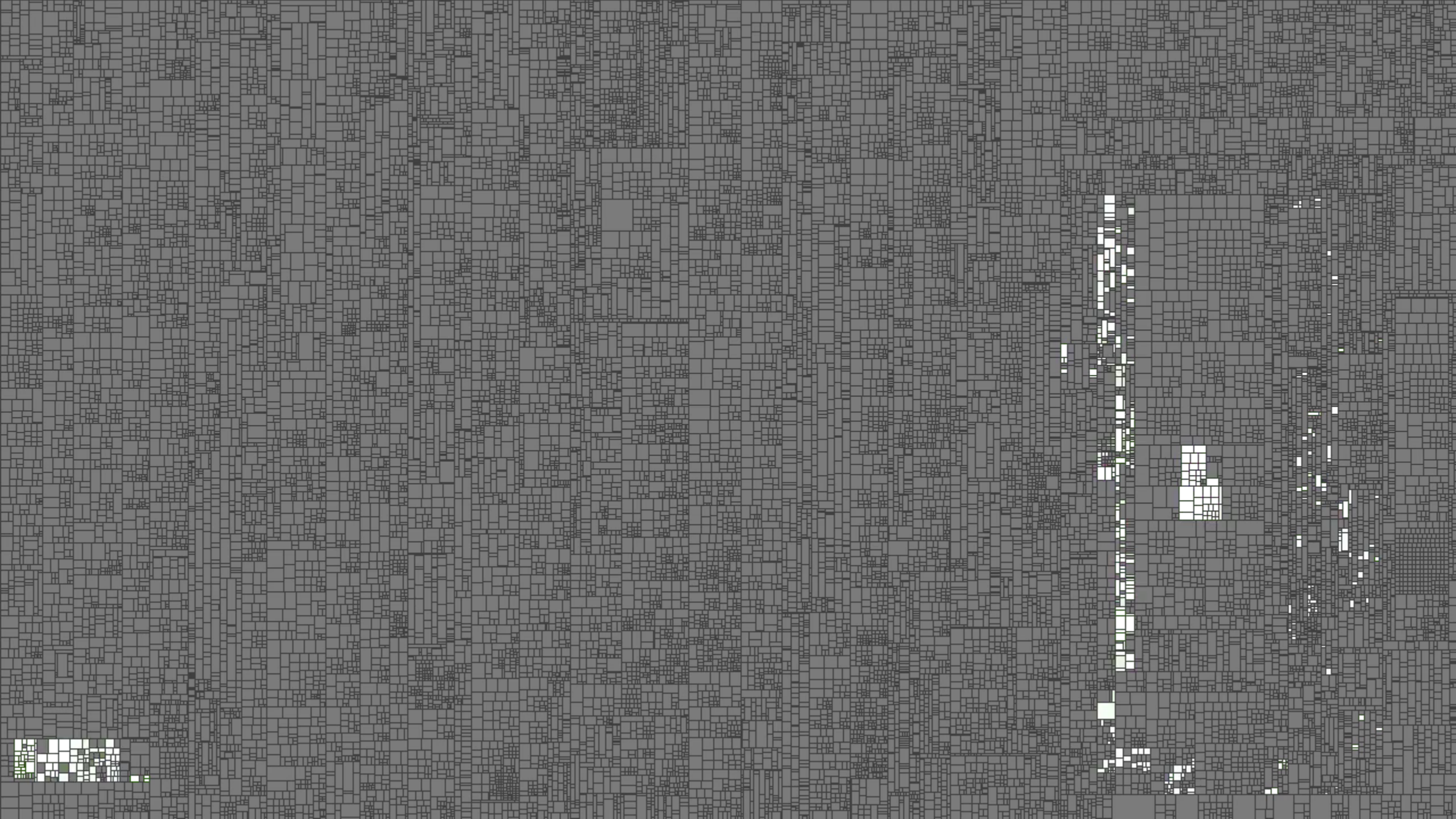

com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testArchitecturePolicyUpdate
Runs: 5/227
Errors: 0
Failures: 0
com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
testViewingArchitectureElements (240.825 s)
createArchitectureTest (3.000 s)
testTimetravelMode (4.865 s)
testUndoRedo (10.346 s)
testArchitecturePolicyUpdate
Failure Trace











Teamscale / TS-10829

Data Flow Analysis can not handle java lambdas (logs many errors currently)

Edit | Comment | Assign | More | Back to New | Export

Details

Type:	Bug	Status:	DONE (View Workflow)
Priority:	High	Resolution:	Green
Component/s:	Backend	Fix Version/s:	Teamscale 4.3
Labels:	dataflow java		
Affected Version:	master		
Merge Request:	https://git.cqse.eu/cqse/teamscale/merge_requests/2734		
PDash Task:	#4886		

Description

Analysis profile: Java
Repository: JabRef, start revision 9efd23b71871747fe5e18e915e637891d7e55b6d

```
ERROR : An error occurred while trying to construct a CFG for function 'null' in element src/main/java/net/sf/jabref/exporter/layout/format/DOI
[STATEMENT: lambda expression: null (lines 33-33)
]
Tokens: doi . getURL ( )
Occurred in src/main/java/net/sf/jabref/exporter/layout/format/DOICheck.java:32-32 (com.teamscale.index.dataflow.DataFlowFindingsSynchronizer.c
org.conqat.engine.core.core.ConQATException: Could not find any rule that applies to the following entity list:
[STATEMENT: lambda expression: null (lines 33-33)
]
Tokens: doi . getURL ( )
Occurred in src/main/java/net/sf/jabref/exporter/layout/format/DOICheck.java:32-32
        at org.conqat.engine.sourcecode.dataflow.heuristics.ControlFlowCreator.findApplicableRule(ControlFlowCreator.java:164)
        at org.conqat.engine.sourcecode.dataflow.heuristics.ControlFlowCreator.transformOneStep(ControlFlowCreator.java:139)
        at org.conqat.engine.sourcecode.dataflow.heuristics.ControlFlowCreator.transform(ControlFlowCreator.java:92)
[...]

ERROR : An error occurred while trying to construct a CFG for function 'null' in element src/main/java/net/sf/jabref/exporter/layout/format/DOI
[STATEMENT: lambda expression: null (lines 31-31)
]
Tokens: doi . getDOI ( )
Occurred in src/main/java/net/sf/jabref/exporter/layout/format/DOIStrip.java:30-30 (com.teamscale.index.dataflow.DataFlowFindingsSynchronizer.c
org.conqat.engine.core.core.ConQATException: Could not find any rule that applies to the following entity list:
```

People

Assignee:	Andreas Sewe
	Assign to me
Reporter:	Rainer Niedermayr
QA-Contact:	Alexander von Rhein
Votes:	2 Vote for this issue
Watchers:	3 Start watching this issue

Dates

Created:	24/Nov/16 8:35 AM
Updated:	4 days ago
Resolved:	08/May/18 12:42 PM

Time Tracking

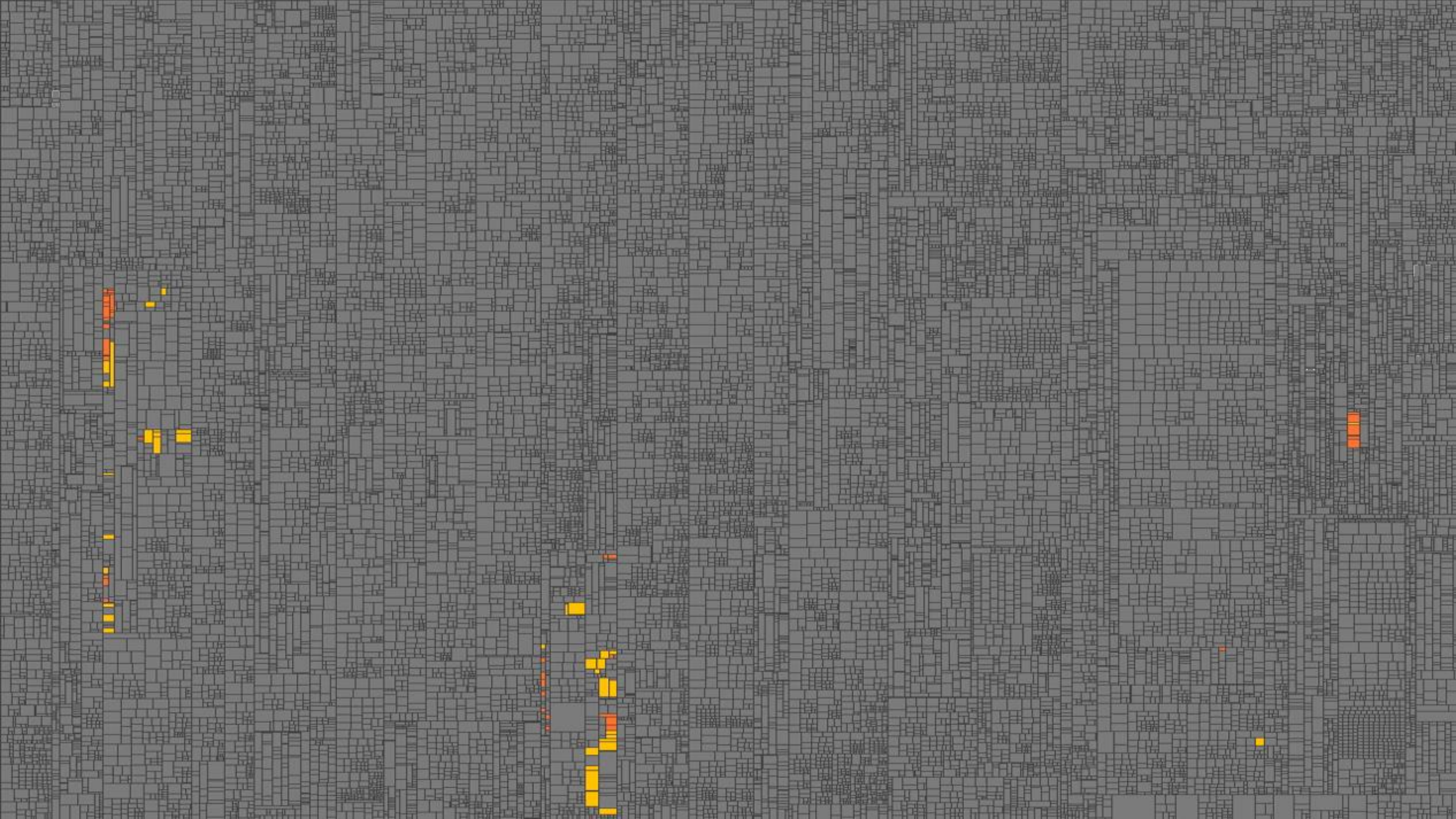
Estimated:	Not Specified
Remaining:	0m
Logged:	4d 1h 57m

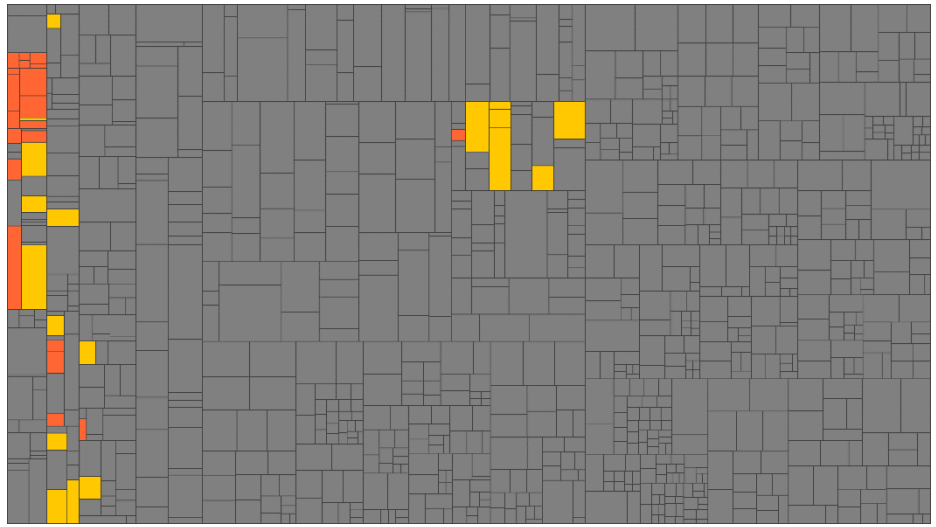
Agile

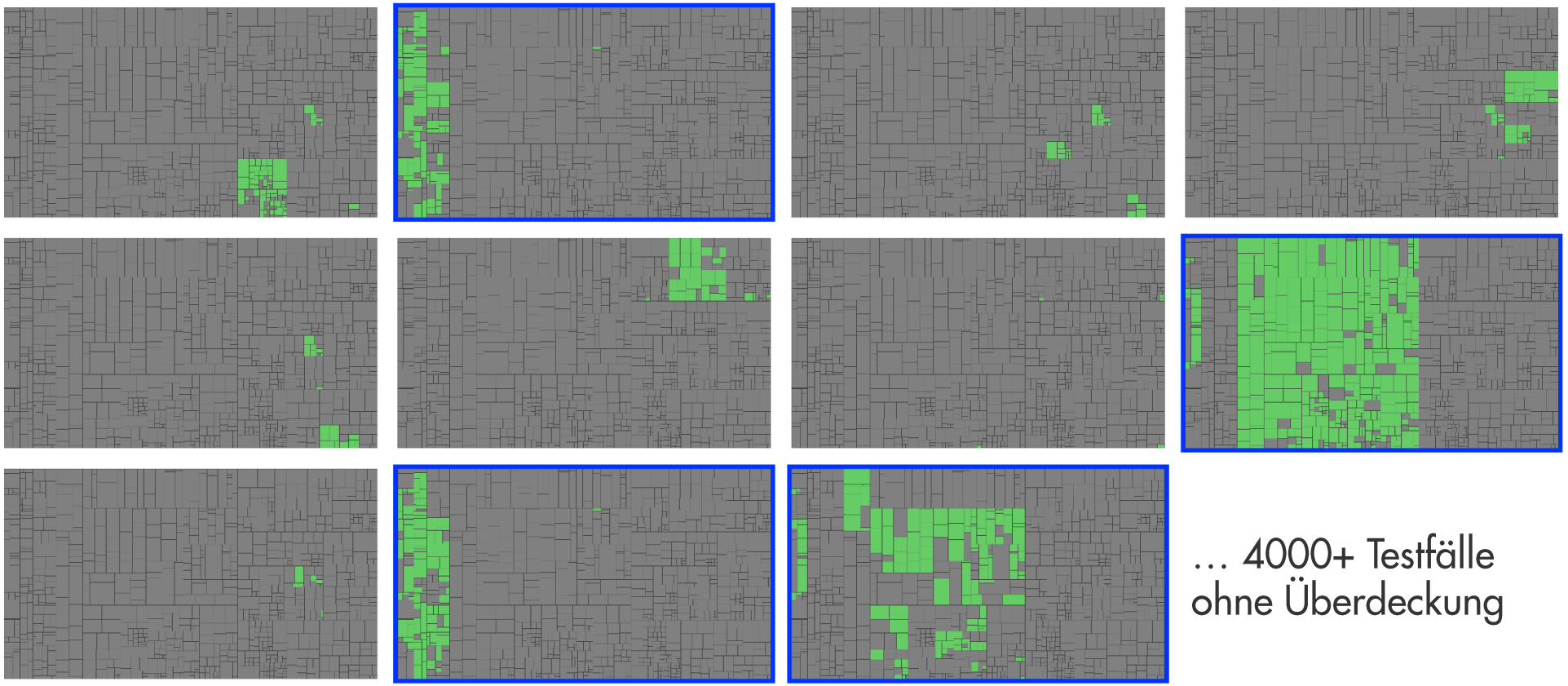
View on Board

Gitlab CI

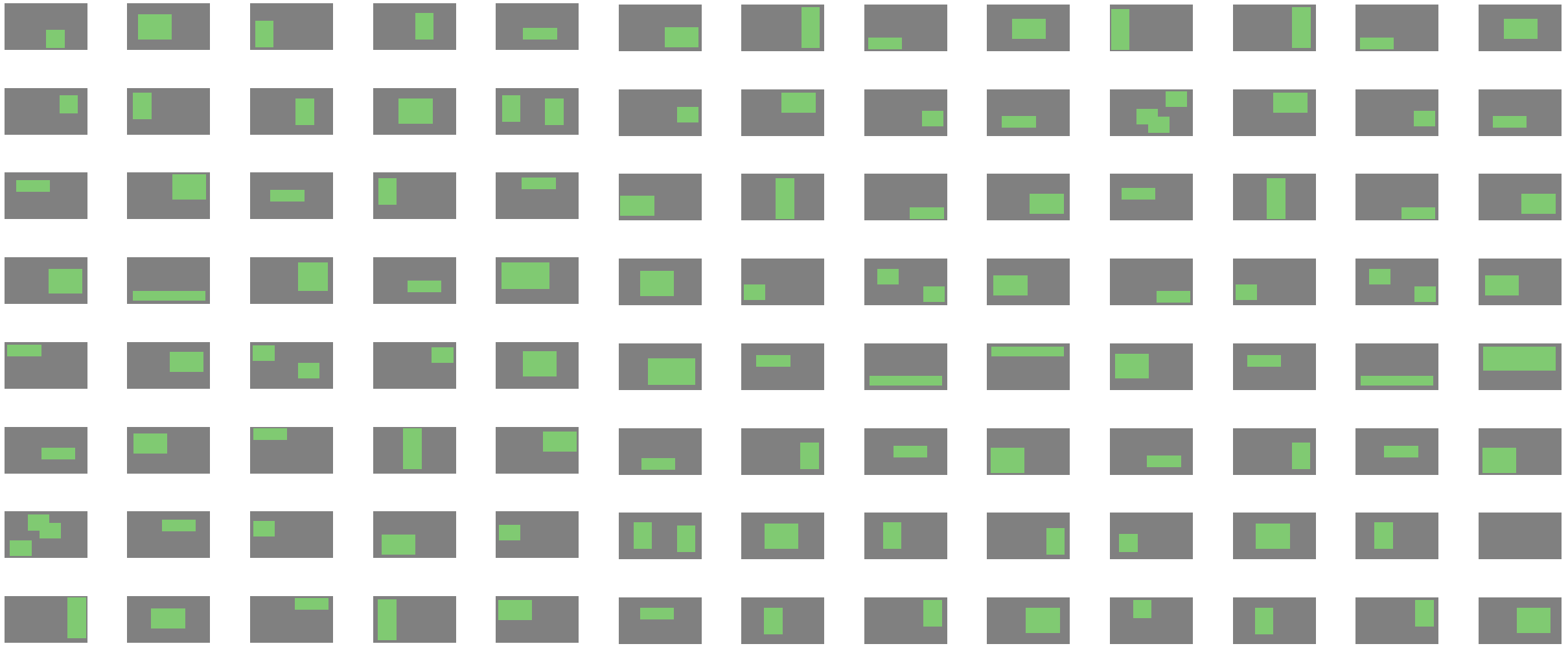
Projects | More



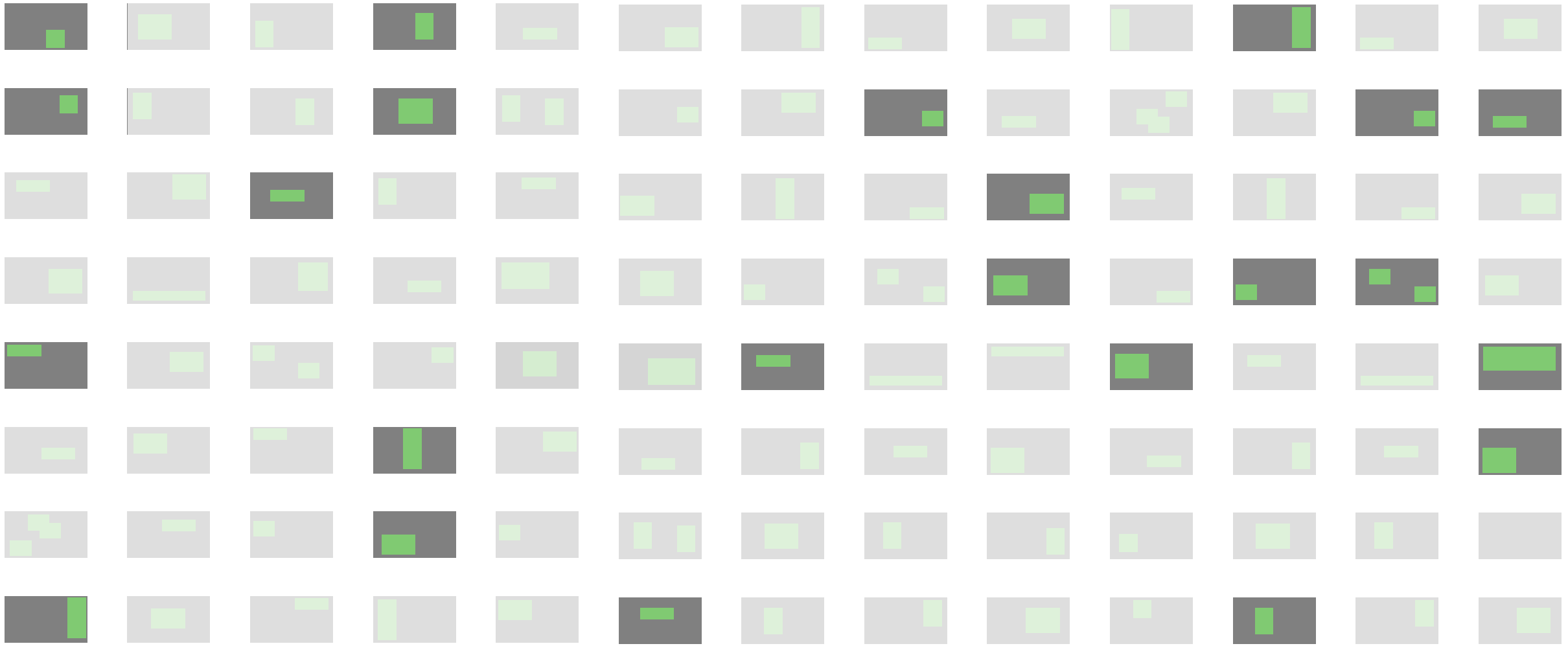




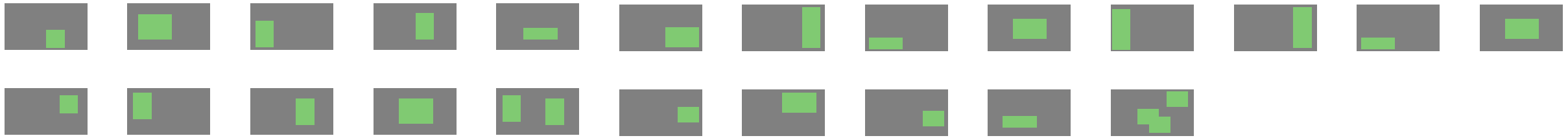
… 4000+ Testfälle
ohne Überdeckung



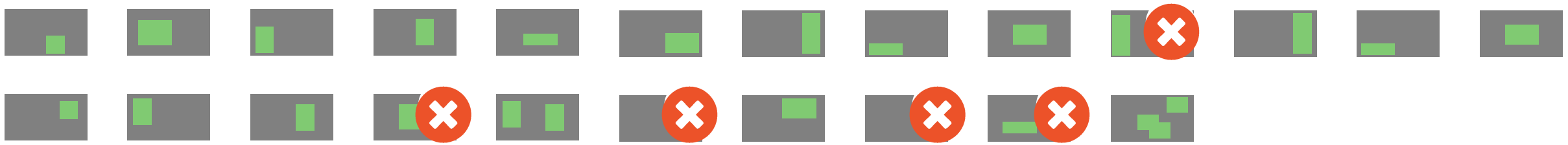
Schritt 1: Selektion betroffener Testfälle



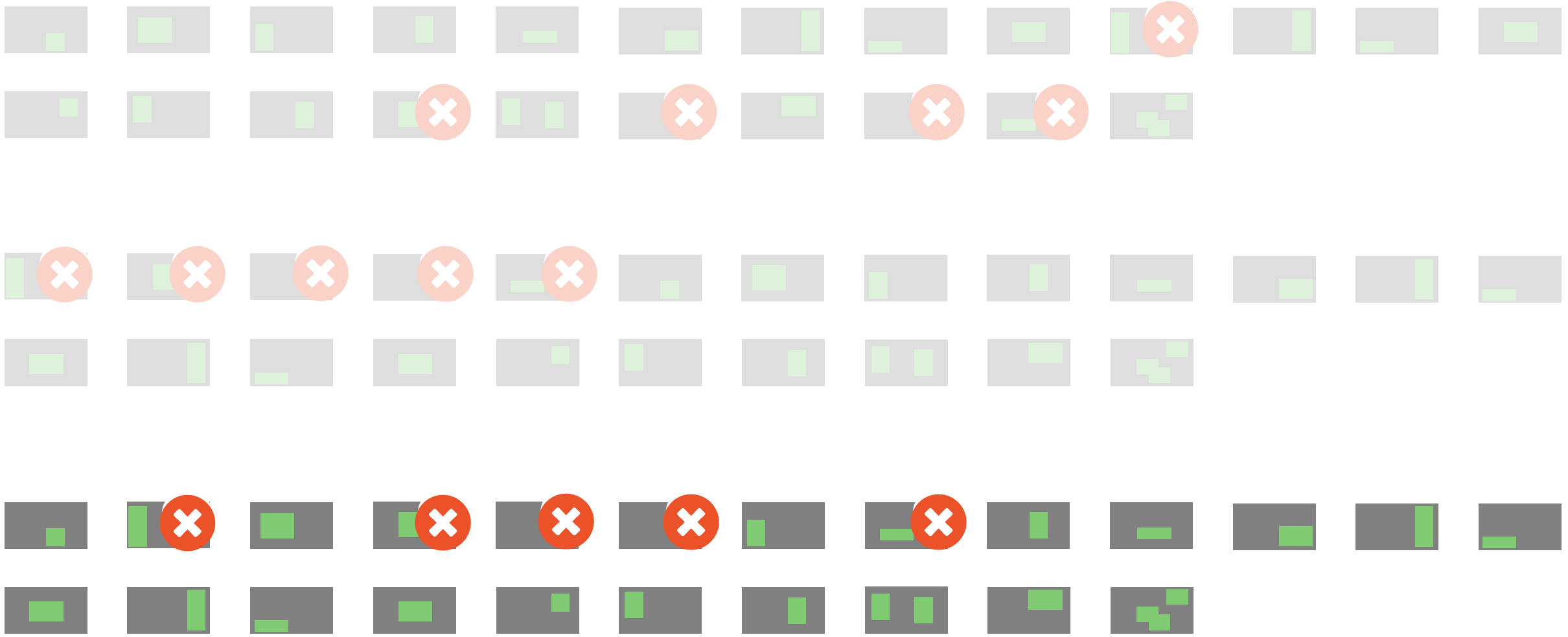
Schritt 1: Selektion betroffener Testfälle

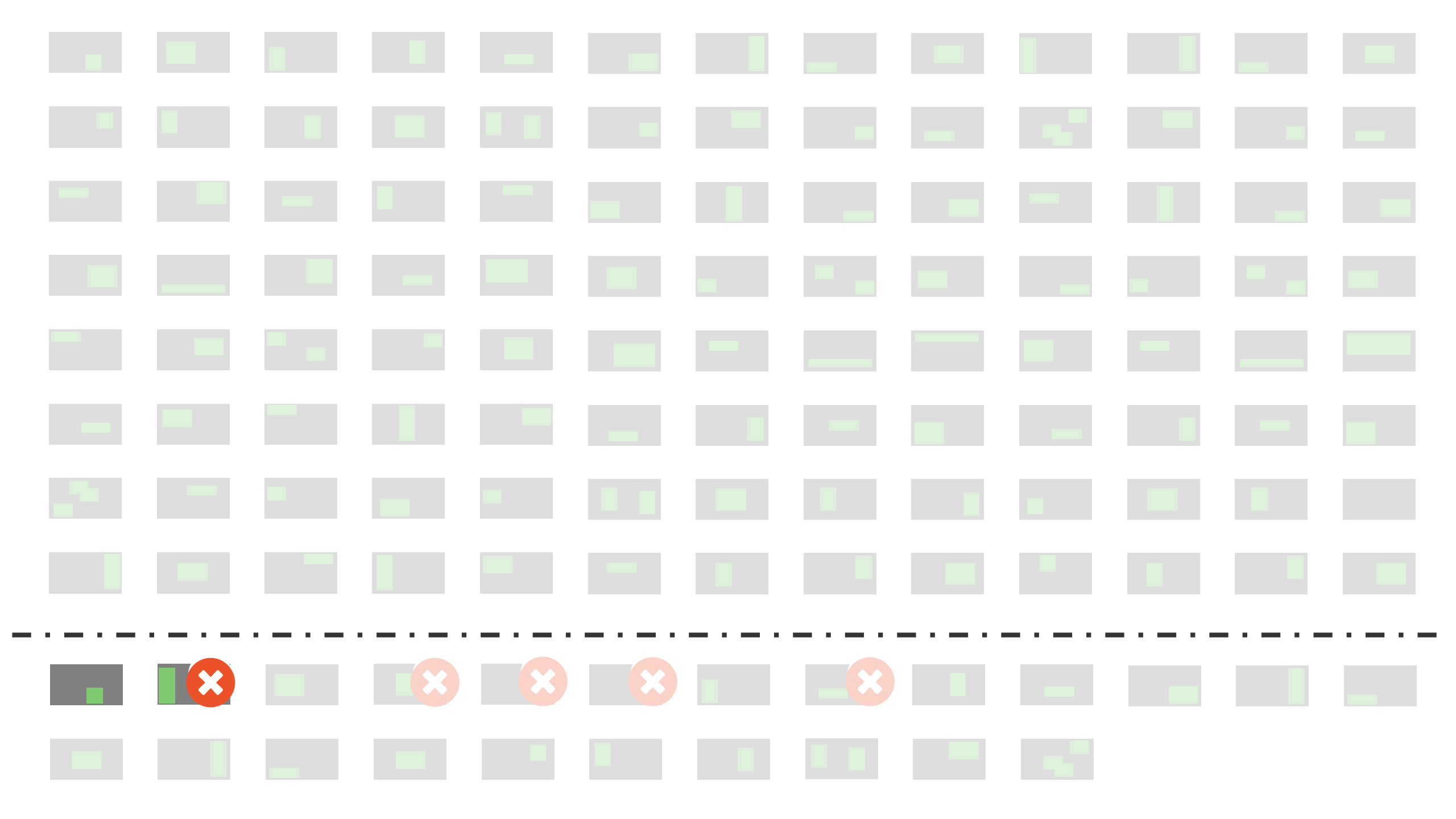


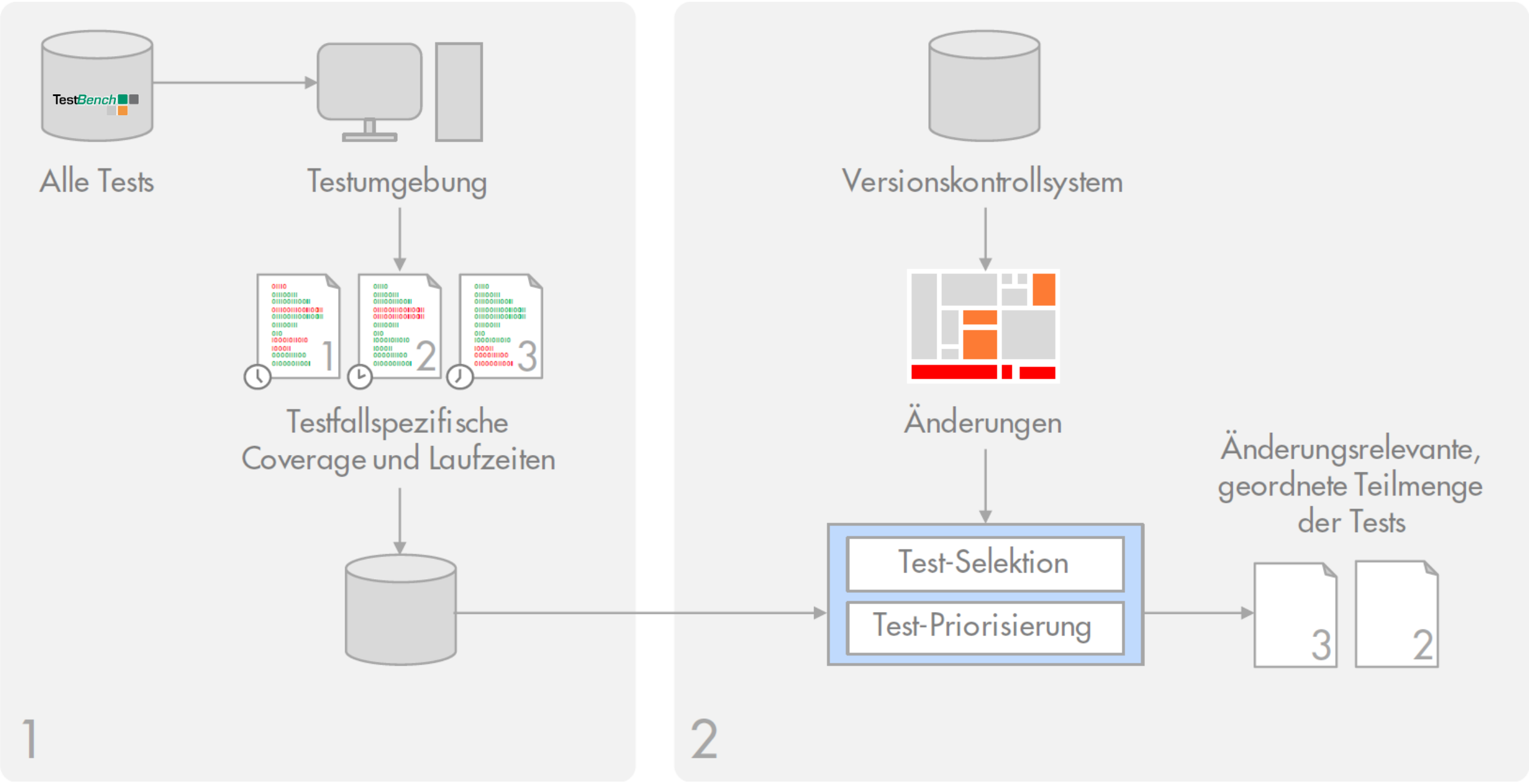
Schritt 2: Priorisierung selektierter Testfälle



Schritt 2: Priorisierung selektierter Testfälle






TestBench
Alle Tests
Testumgebung
1
2
3
Testfallspezifische
Coverage und Laufzeiten
Versionskontrollsystem
Änderungen
Test-Selektion
Test-Priorisierung
Änderungsrelevante,
geordnete Teilmenge
der Tests
3
2
1
2

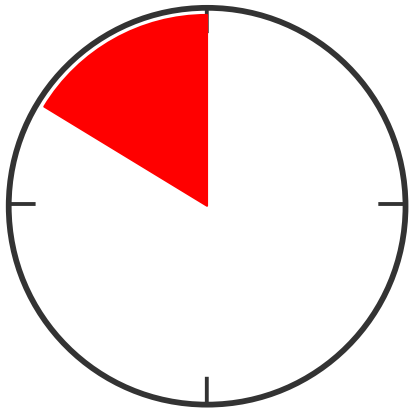
Grenzen von Test-Impact-Analyse

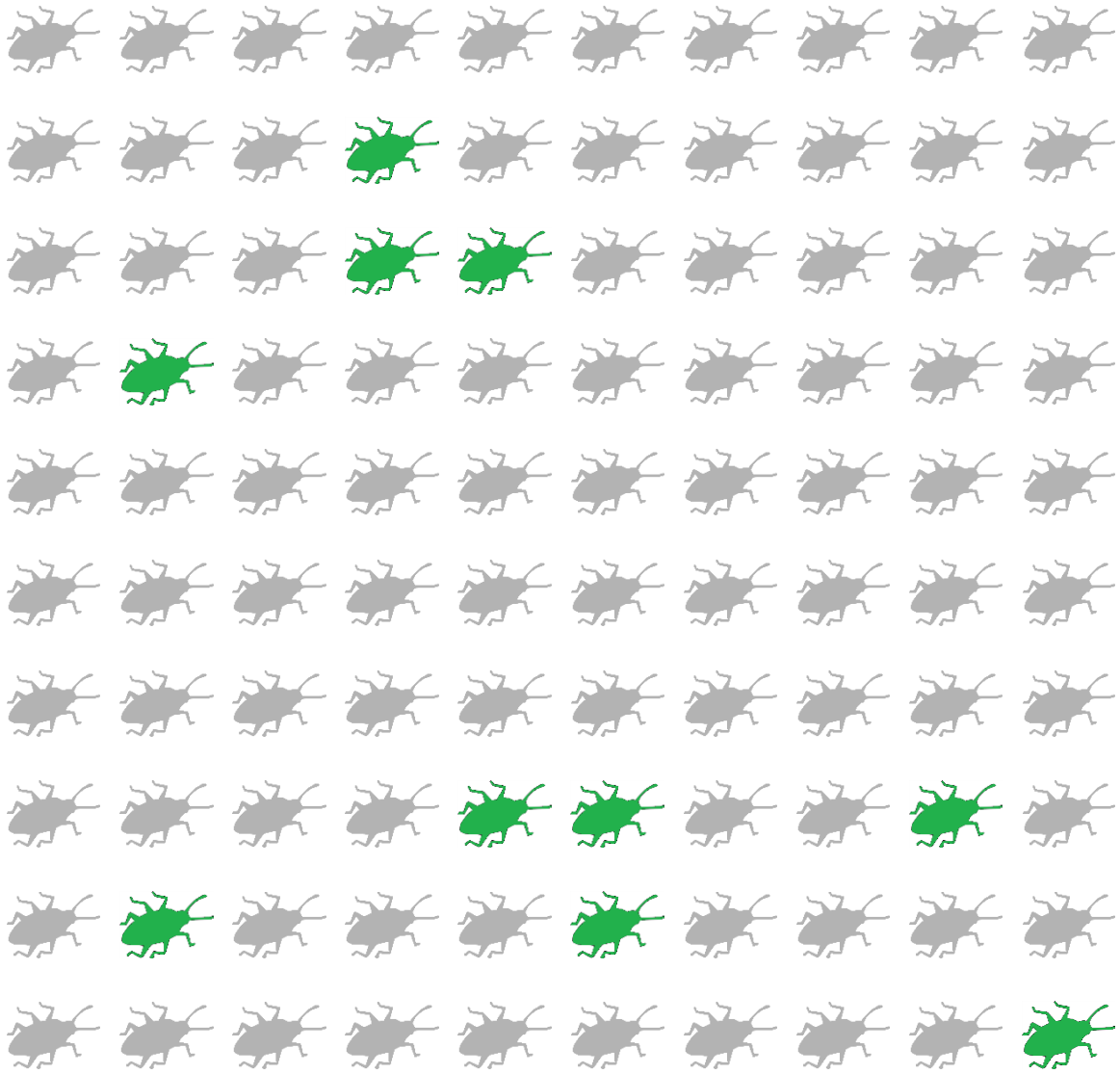
- Manche Änderungen betreffen alle Tests
  - Änderungen von Konfigurationsinformation
  - Änderungen an Testdaten

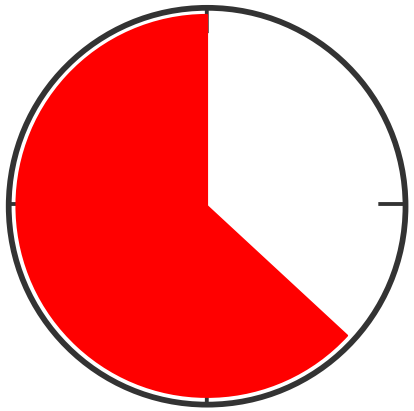
- Wenn sich die Tests selbst ändern, müssen sie erneut ausgeführt werden

- Es gibt keine Garantie, dass die selektierten Tests alle Fehler finden

⇒ In regelmäßigen Abständen alle Tests ausführen
⇒ Hält testfallspezifische Coverage-Daten aktuell







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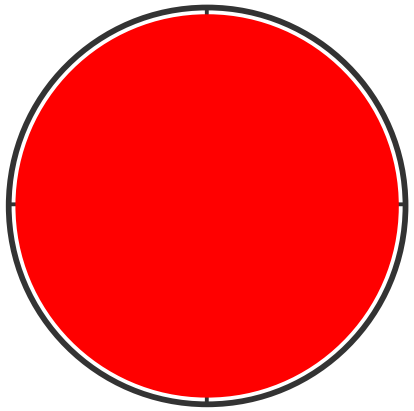

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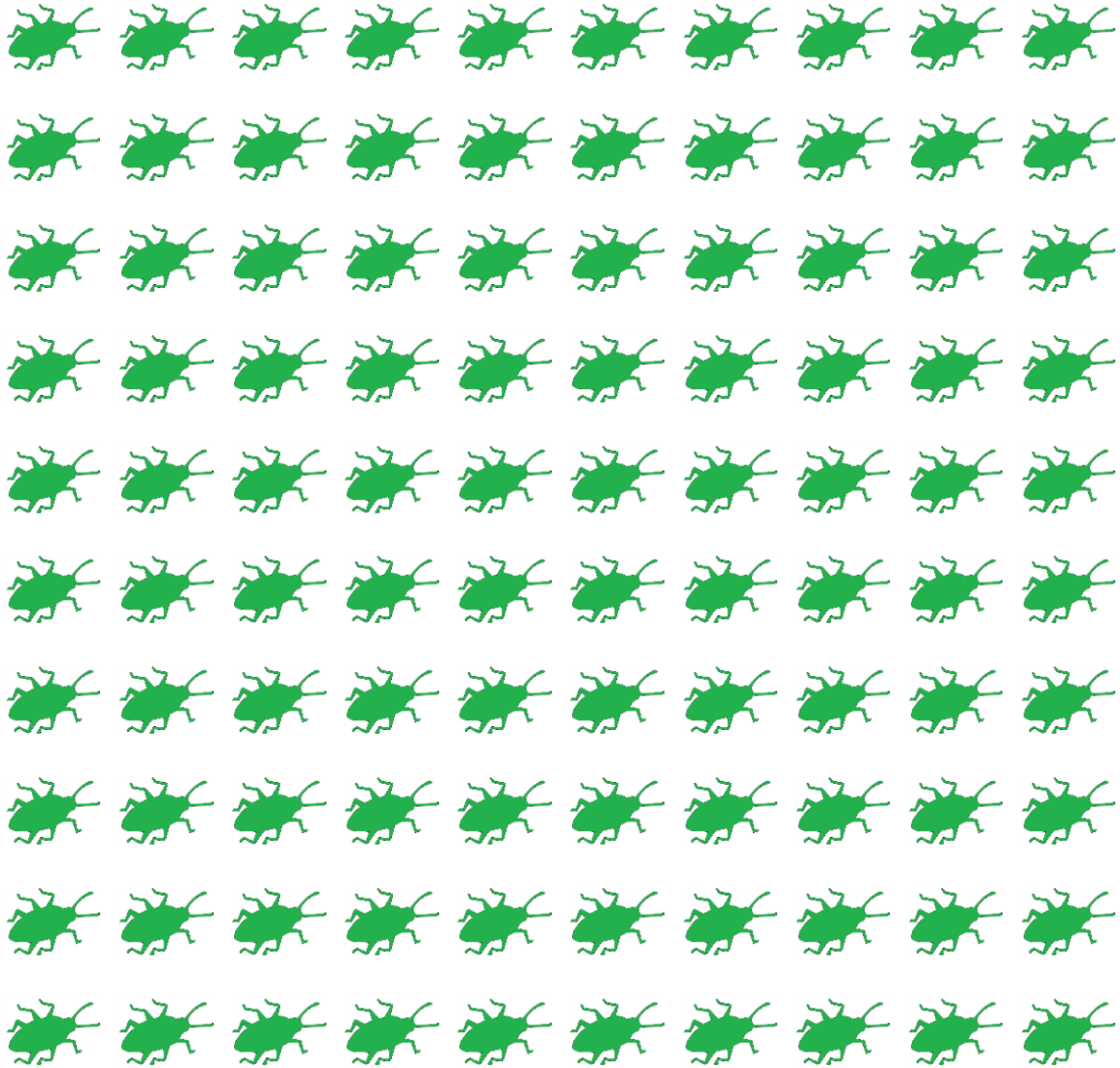


Einsparung durch Ausführung der impacted Tests

	Laufzeit (ms)		
Studienobjekt	Alle Tests	Impacted Tests	Ersparnis
Apache Commons Collections	25.277		
Apache Commons Lang	24.987	3.111	87,55%
Apache Commons Math	160.391	114.042	28,90%
Histone Template Engine 2	34.603	32.204	6,93%
JabRef	119.849	40.721	66,02%
Joda-Time	20.782	1.297	93,76%
Lightweight-Stream-API	1.523	480	68,48%
LittleProxy	155.334	150.406	3,17%
OkHttp	96.671	76.457	20,91%
RxJava	464.018	170.575	63,24%
Symia Commons Math Parser	528	528	0,00%
Teamscale	1.249.088	196.684	84,25%

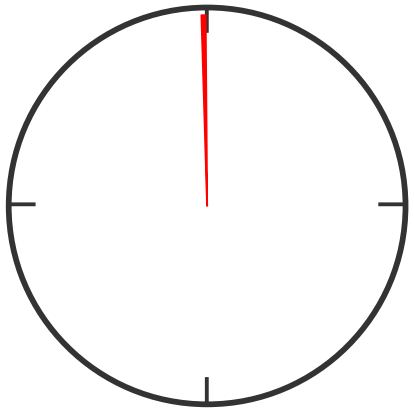
Einsparung bei Erkennung aller fehlschlagenden Tests schwankt stark

PROZENTUALER ANTEIL ERKANNTER FEHLERHAFTER SYSTEMVERSIONEN NACH ANTEIL TESTZEIT

Studienobjekt	1%	2%	5%	10%
Apache Commons Collections	84,25	96,58	99,83	100,00
Apache Commons Lang	94,23	96,43	98,49	99,31
Apache Commons Math	80,20	85,92	91,55	92,96
Histone Template Engine 2	88,46	88,46	88,46	88,46
JabRef	95,71	95,71	95,71	95,71
Joda-Time	98,10	98,61	99,11	99,87
Lightweight-Stream-API	60,76	90,73	94,74	97,25
LittleProxy	74,29	77,14	80,00	80,00
OkHttp	90,70	90,70	90,70	96,51
RxJava	91,89	94,59	94,59	94,59
Symia Commons Math Parser	78,46	86,15	89,23	89,23
Teamscale	91,86	95,93	96,57	96,57

Einsparung bei Erkennung erster fehlschlagender Test sehr stabil!

1%



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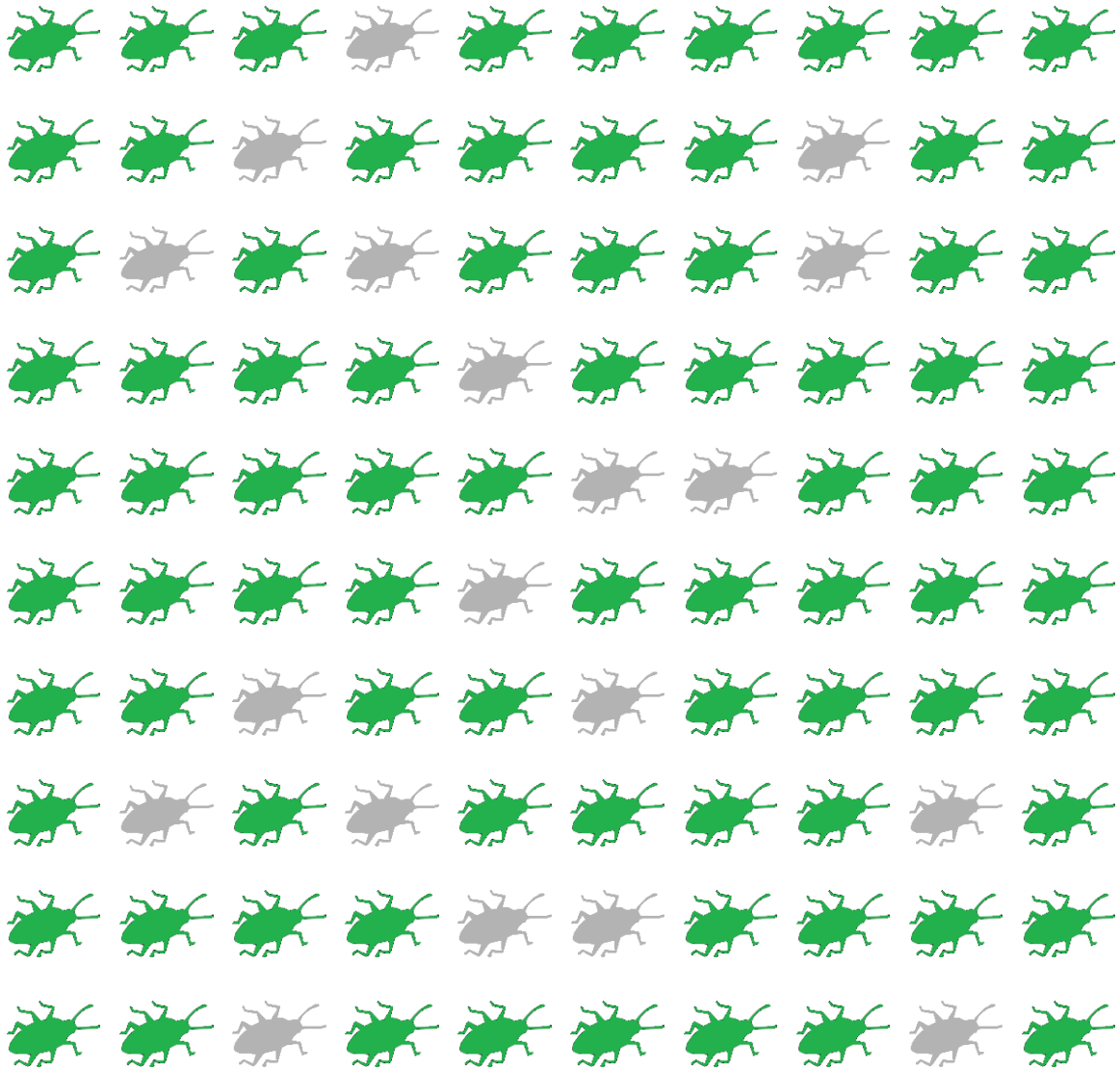

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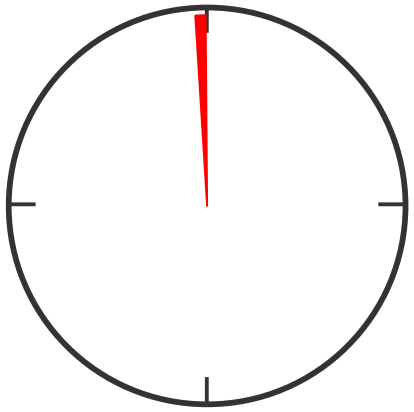
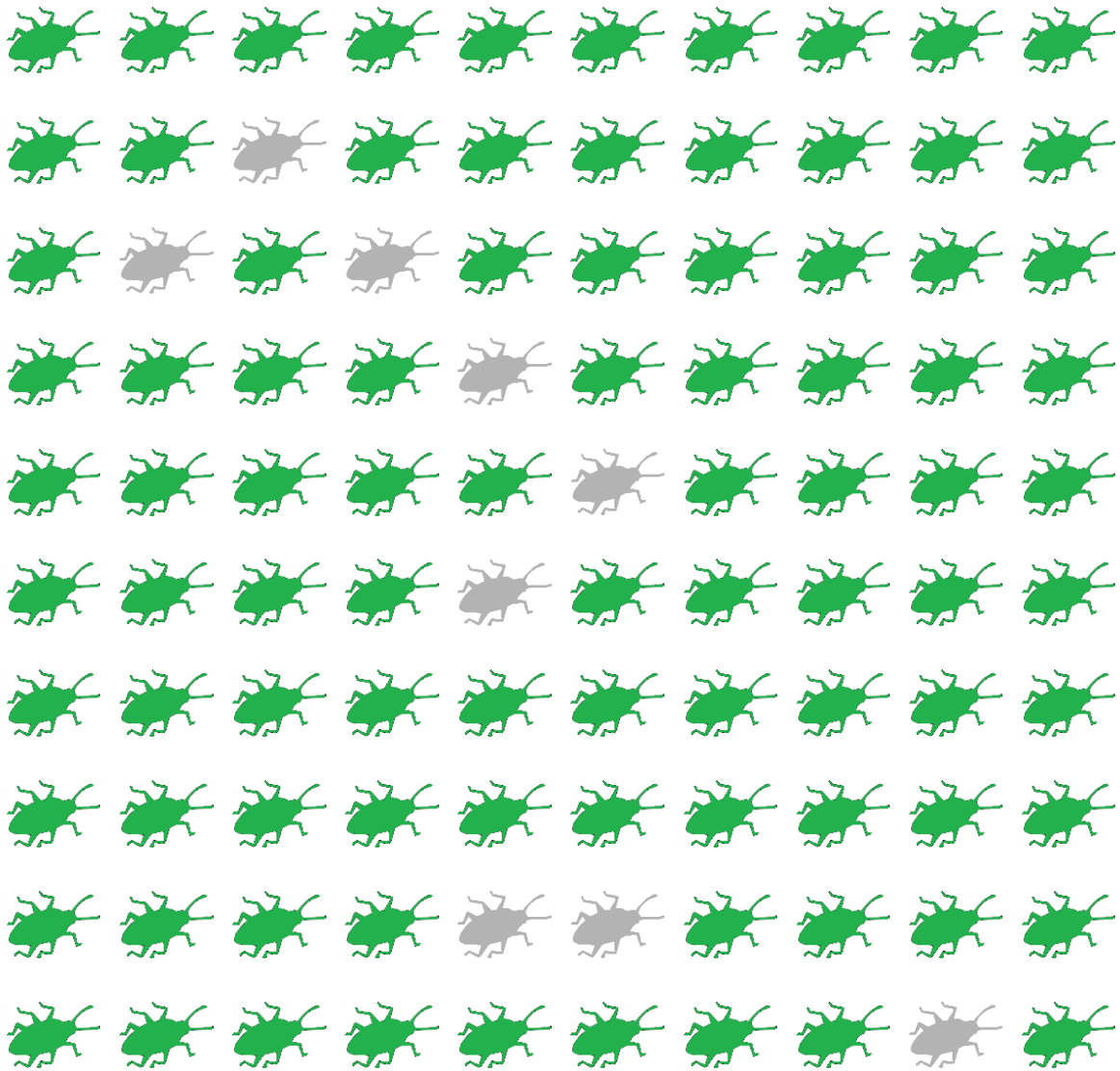
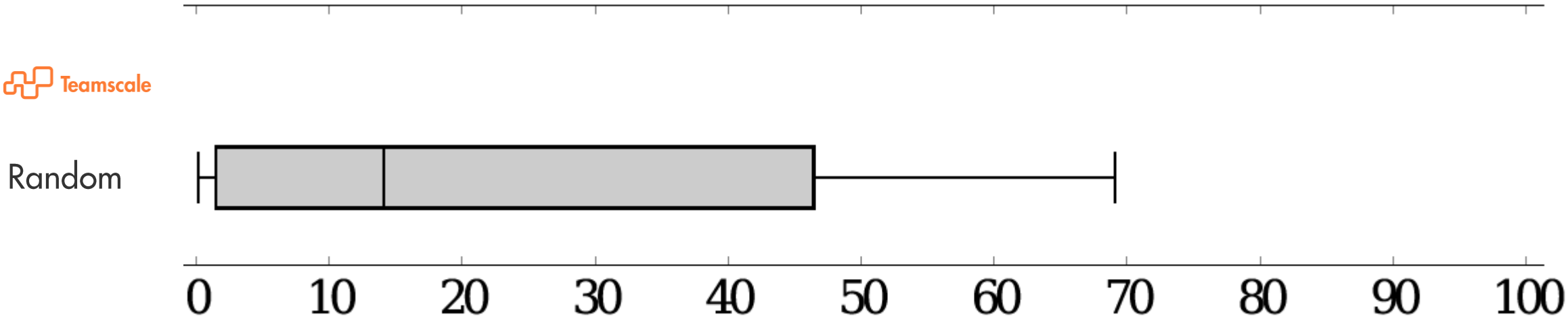
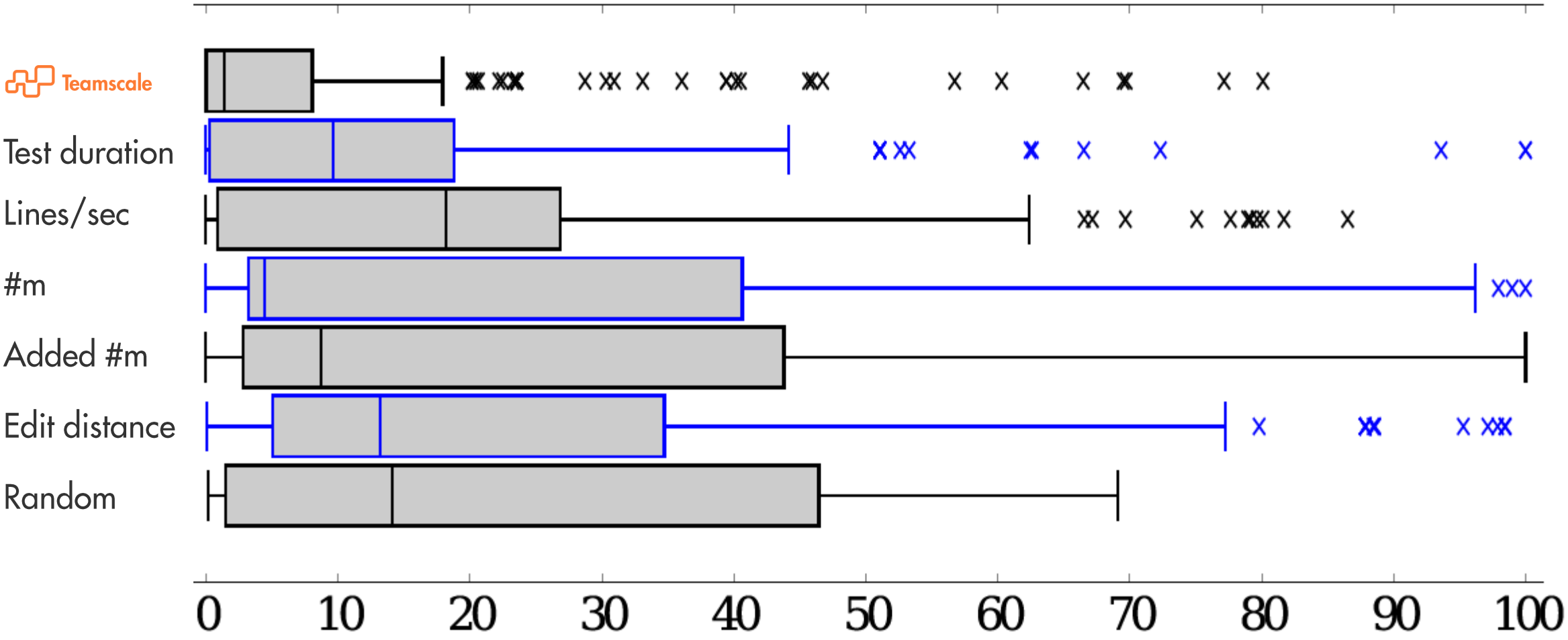


90%



Teamscale



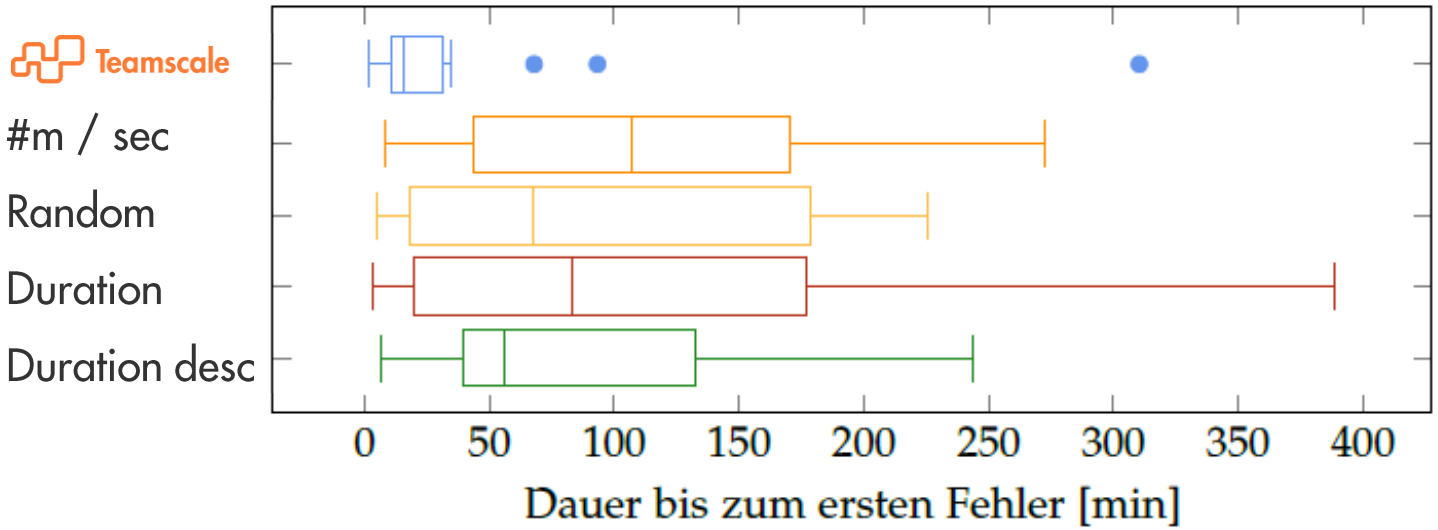

Teamscale
Test duration
Lines/sec
#m
Added #m
Edit distance
Random
0
10
20
30
40
50
60
70
80
90
100

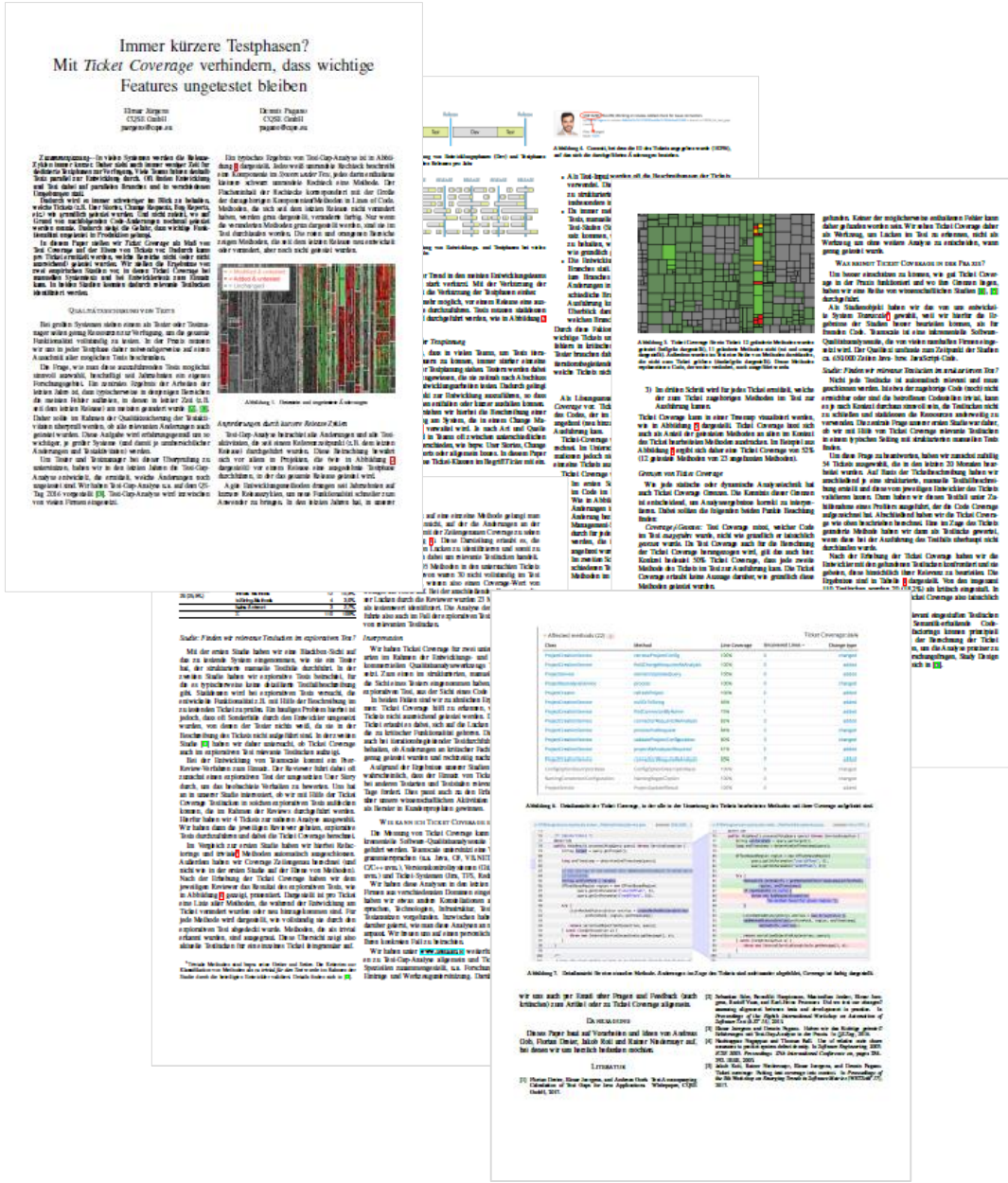
https://www.technica-engineering.de/produkte/bts-body-electronic-test-system/

?

Evaluierung im HIL-Test

https://www.technica-engineering.de/produkte/bts-body-electronic-test-system/

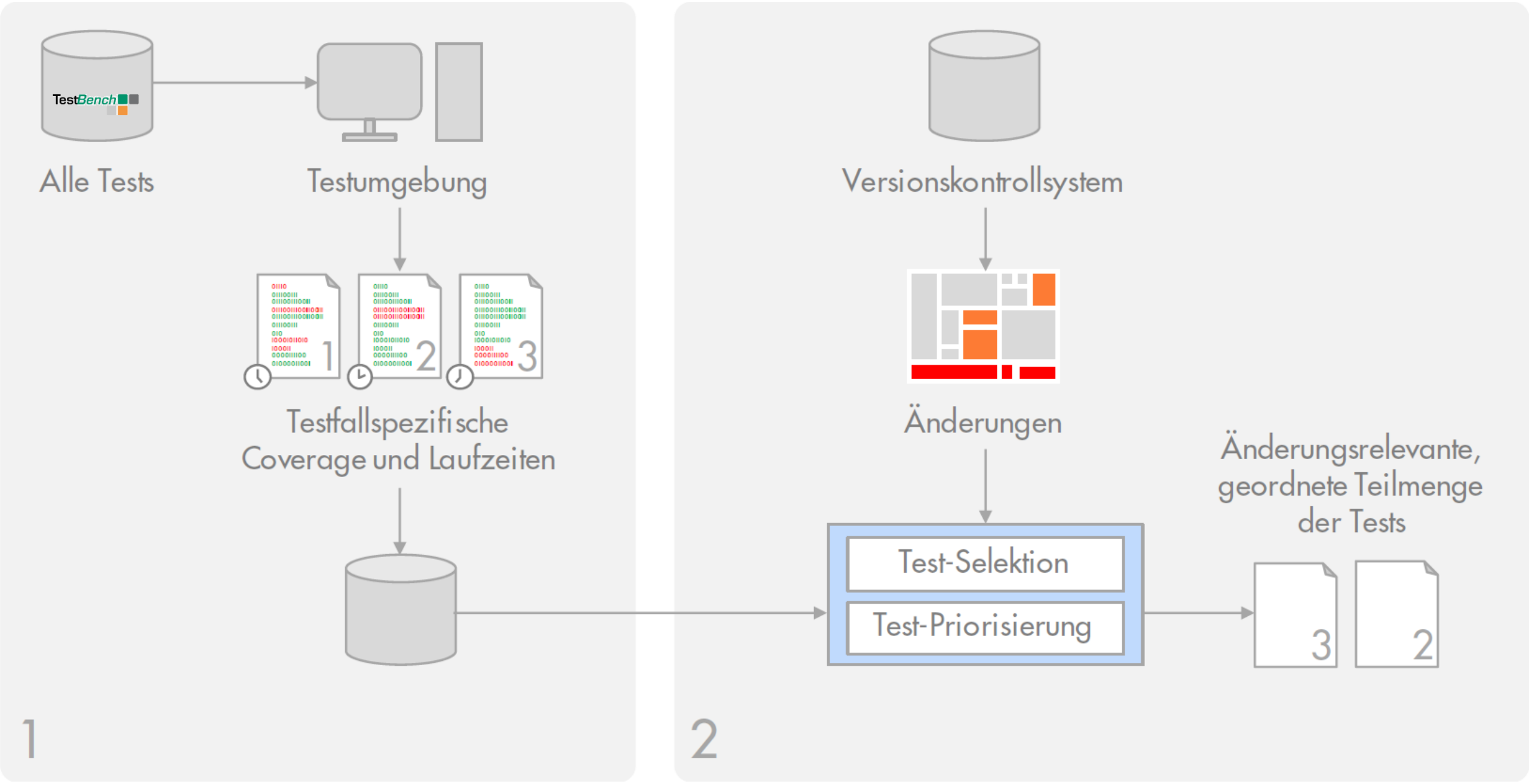


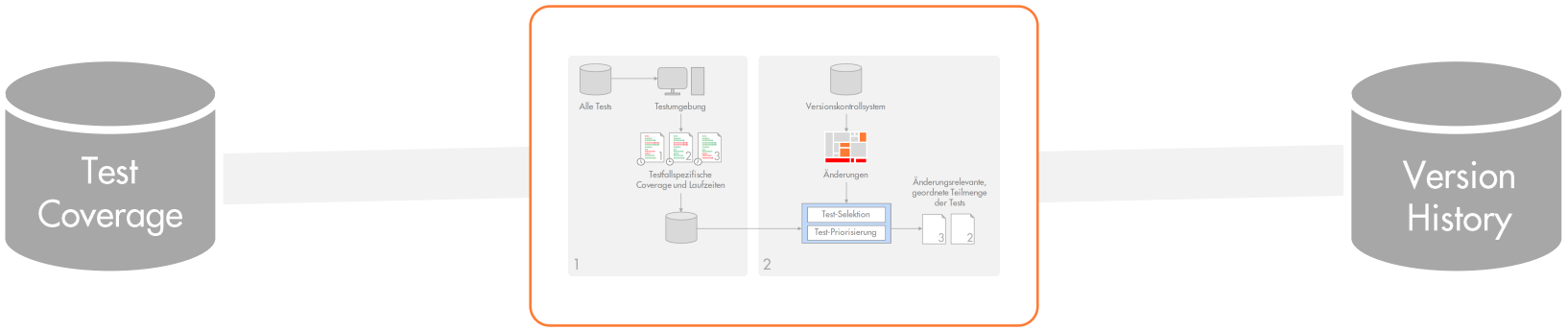


Immer kürzere Testphasen?
Mit *Ticket Coverage* verhindern, dass wichtige Features ungetestet bleiben

Elmar Jürgens
CQSE GmbH
jurgens@cqse.eu

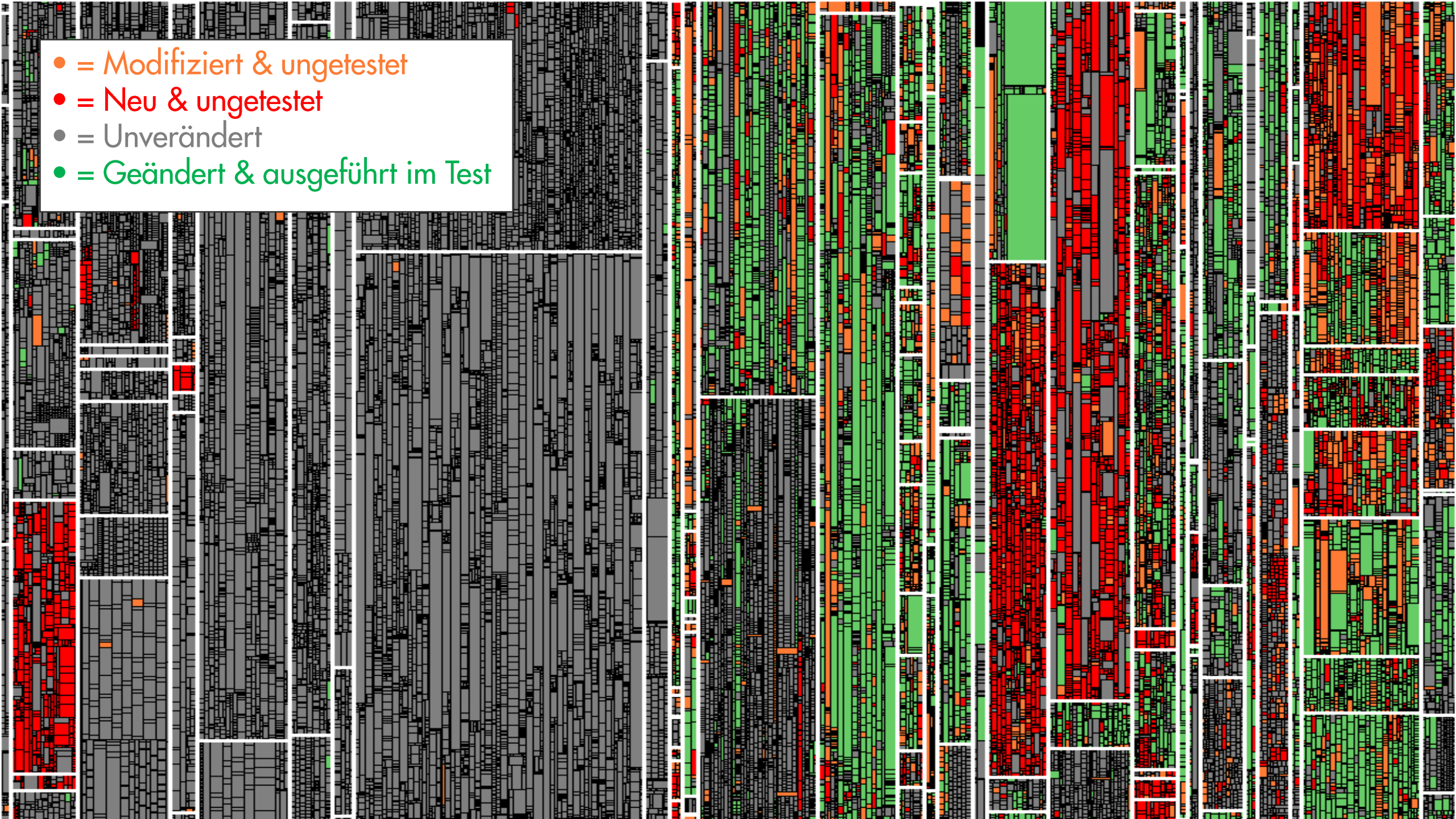
Dennis Pagano
CQSE GmbH
pagano@cqse.eu

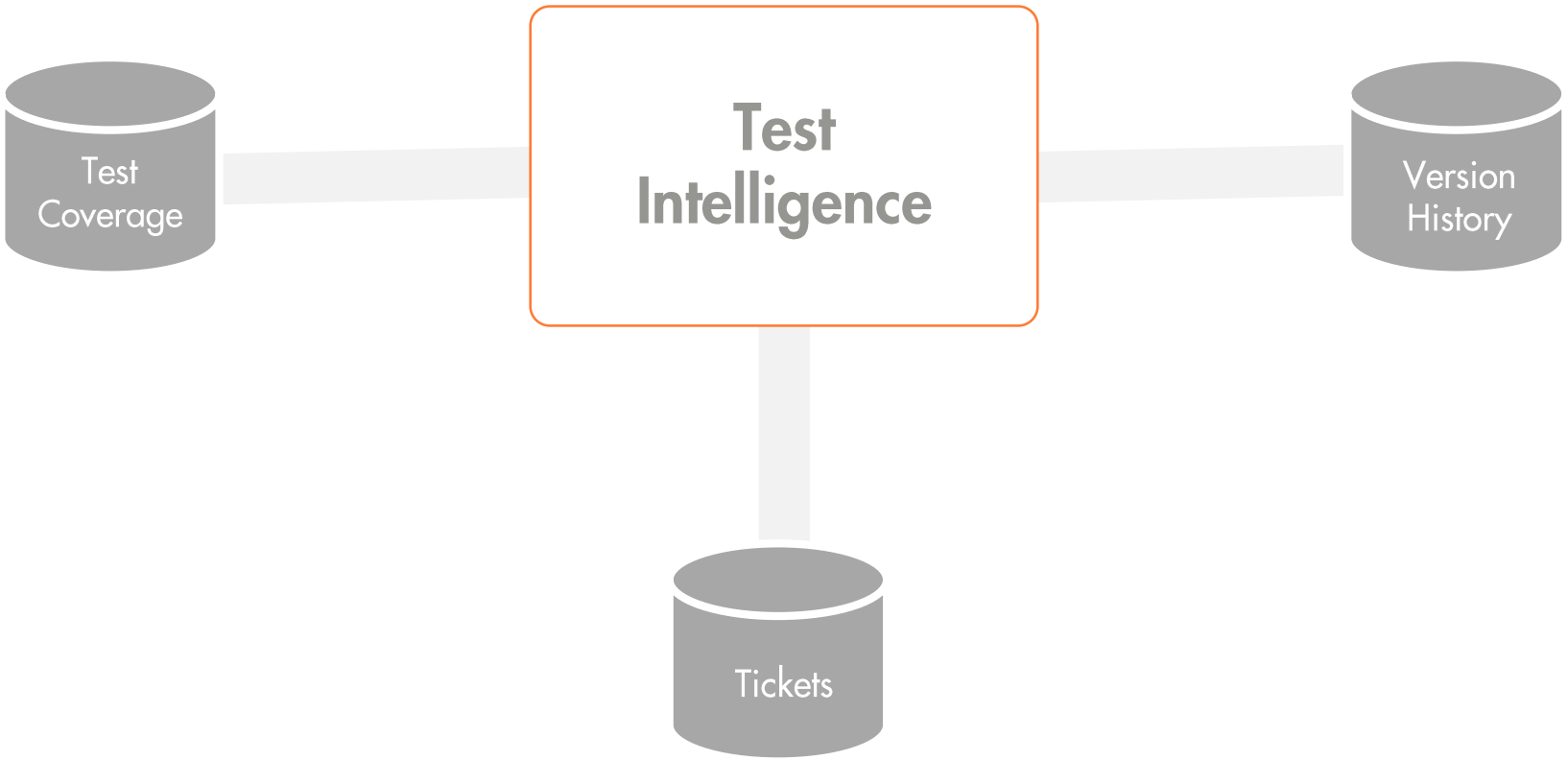

TestBench
Alle Tests
Testumgebung
1
2
3
Testfallspezifische
Coverage und Laufzeiten
Versionskontrollsystem
Änderungen
Test-Selektion
Test-Priorisierung
Änderungsrelevante,
geordnete Teilmenge
der Tests
3
2
1
2


Test
Coverage
Alle Tests
Testumgebung
1
2
3
Testfallspezifische
Coverage und Laufzeiten
Versionskontrollsystem
Änderungen
Änderungsrelevante,
geordnete Teilmenge
der Tests
Test-Selektion
Test-Priorisierung
3
2
1
2
Version
History


Test
Coverage
Teamscale
Version
History


Test
Coverage
Test
Intelligence
Version
History


• = Modifiziert & ungetestet
• = Neu & ungetestet
• = Unverändert
• = Geändert & ausgeführt im Test


Test
Coverage
Test
Intelligence
Version
History
Tickets

Issue #	Subject			Test Gap
TS-10549	Undo/Redo for web-based architecture editor	Done		0%
TS-10784	Fix long method finding in TaintAnalysisRunner	Done		0%
TS-10923	Implement metric 'Nesting Depth' for Simulink	Done		29%
TS-11364	External findings are not registered during first upload	Done		14%
TS-11942	Manual test coverage upload during development	Done		43%
TS-12050	Tool for transferring findings blacklists and tasks	Done		50%
TS-12262	Cannot set or alter alias without reanalysis	Done		0%
TS-13151	Fetch parent relationship of TFS work items	Done		0%

Issue #	Subject		Test Gap
TS-14421	Get rid of TestGapSynchronizer block	Done	0%
TS-14733	Remove Dataflow blocks	Done	22%

Done **Issue TS-14733 - Remove Dataflow blocks**

Creator: (on Apr 06 2018 19:44)

Last update: Aug 24 2018 09:32

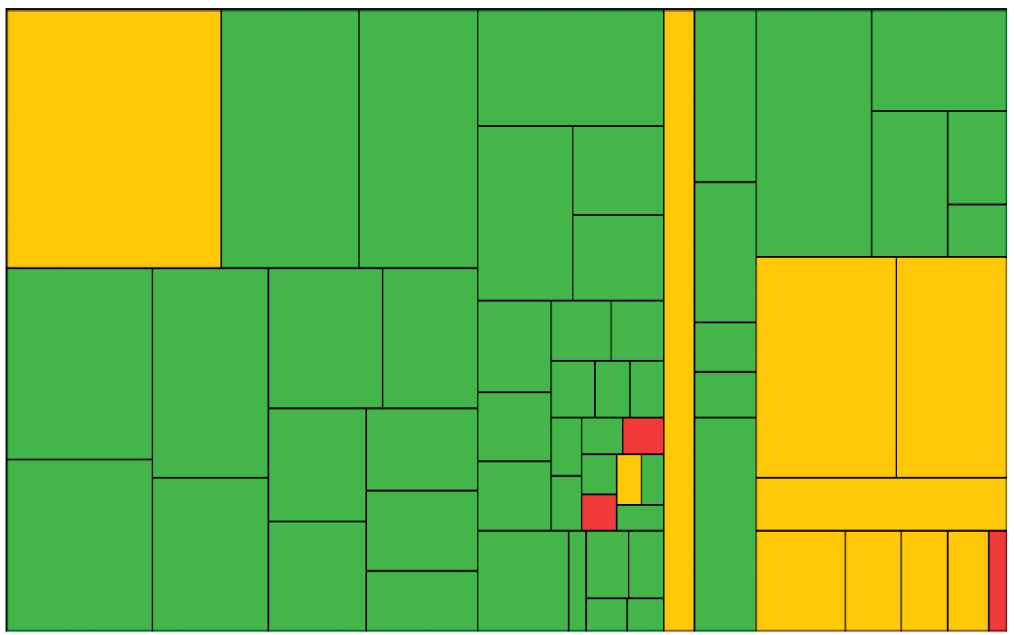
Assignee:

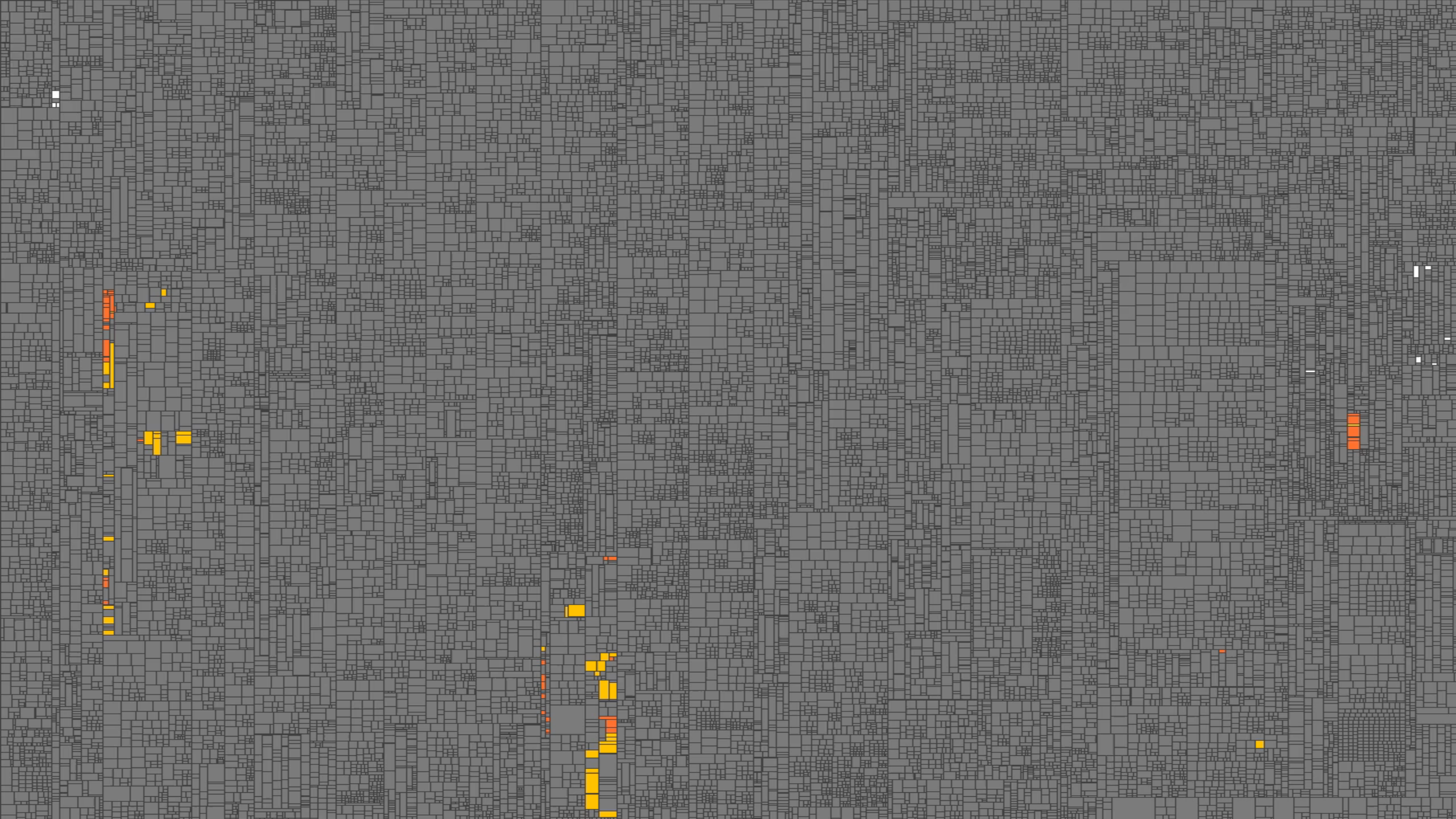
Project	Type	Priority	Resolution	Fix Version
TS	Maintenance	Normal	Green	Teamscale 4.5

Component	Labels	Affected Version	Customer	Customer Issue
Backend	Performance			

Epic Name	Freshdesk URL	Merge Request
		https://git.cqse.eu/cqse/teamscale/3621

Aug 15 2018 12:37–Now | Test Gap: 22%





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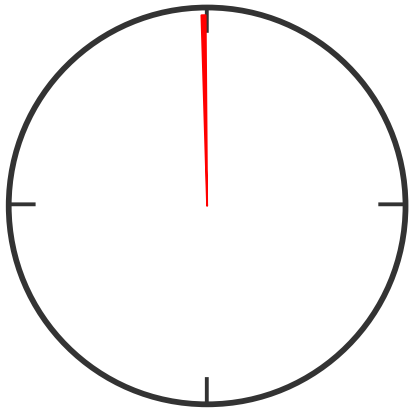

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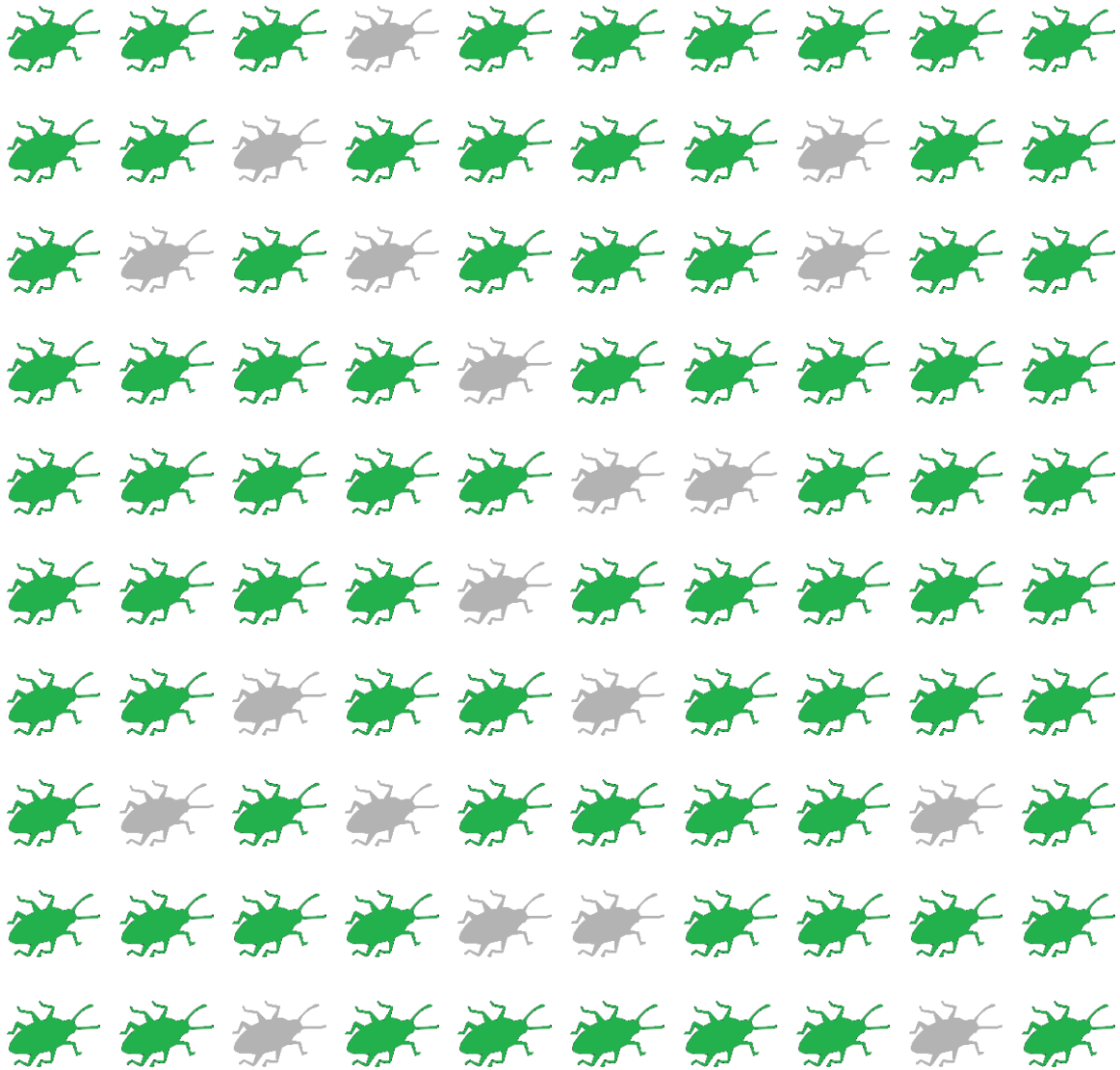

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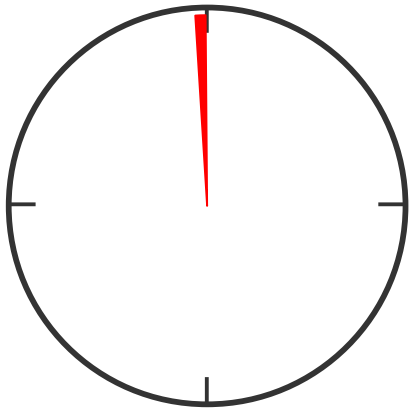

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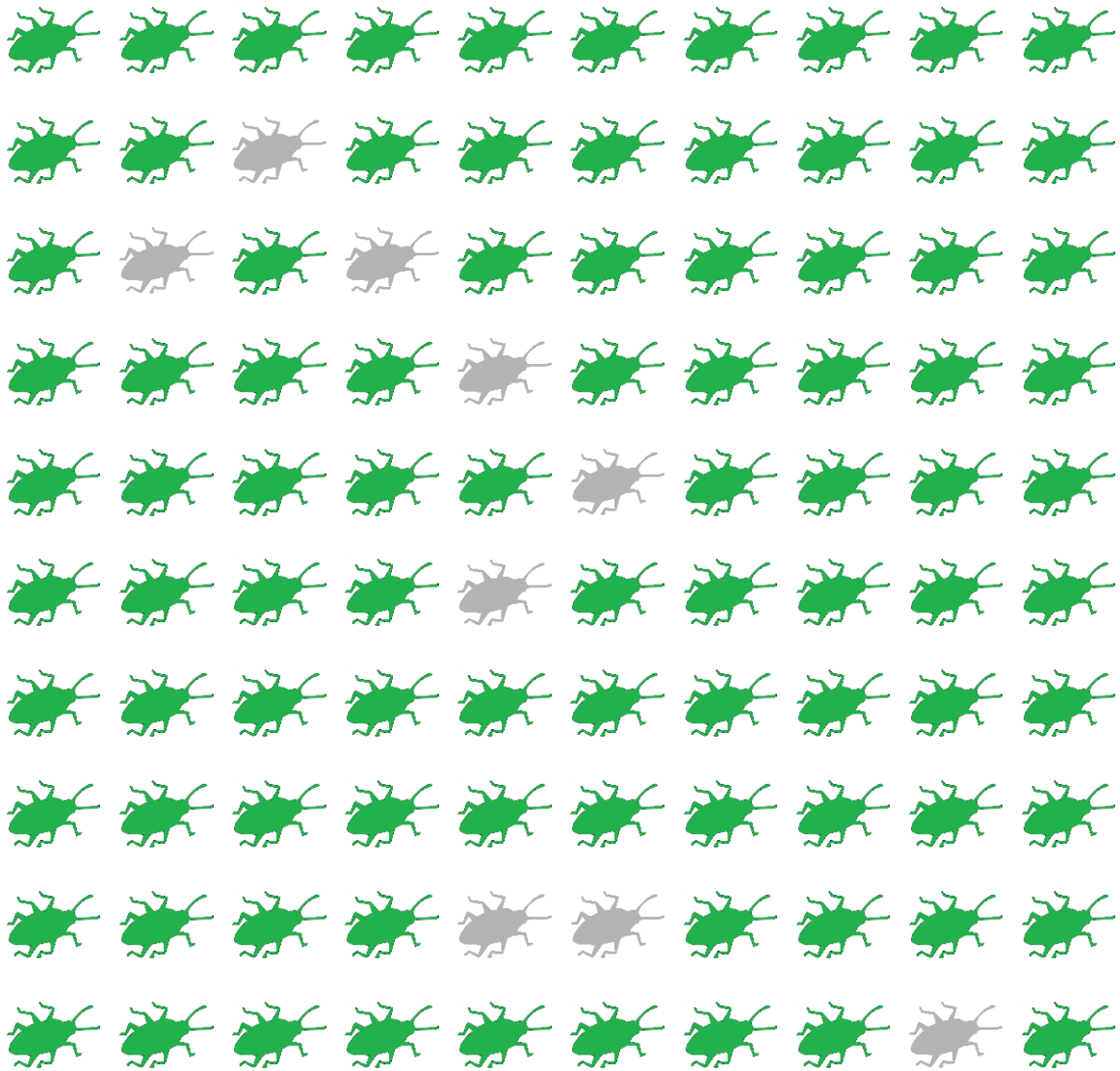

Kontakt – Ich freue mich auf Diskussionen ☺

Dr. Elmar Jürgens · juergens@cqse.eu · +49 179 675 3863

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85748 Garching bei München
www.cqse.eu

CQSE