

Test-Impact-Analysis

How to Find New Bugs 100x Faster

About Me

Researcher

- Test-Gap-Analysis, Defect Prediction, ...
- PC Member of MSR, ICPC, ICSE, ...



Founder

- CQSE GmbH



Gesellschaft für Informatik


- Junior Fellow







com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest - testViewingArchitectureElements

Runs: 1/227

 Errors: 0

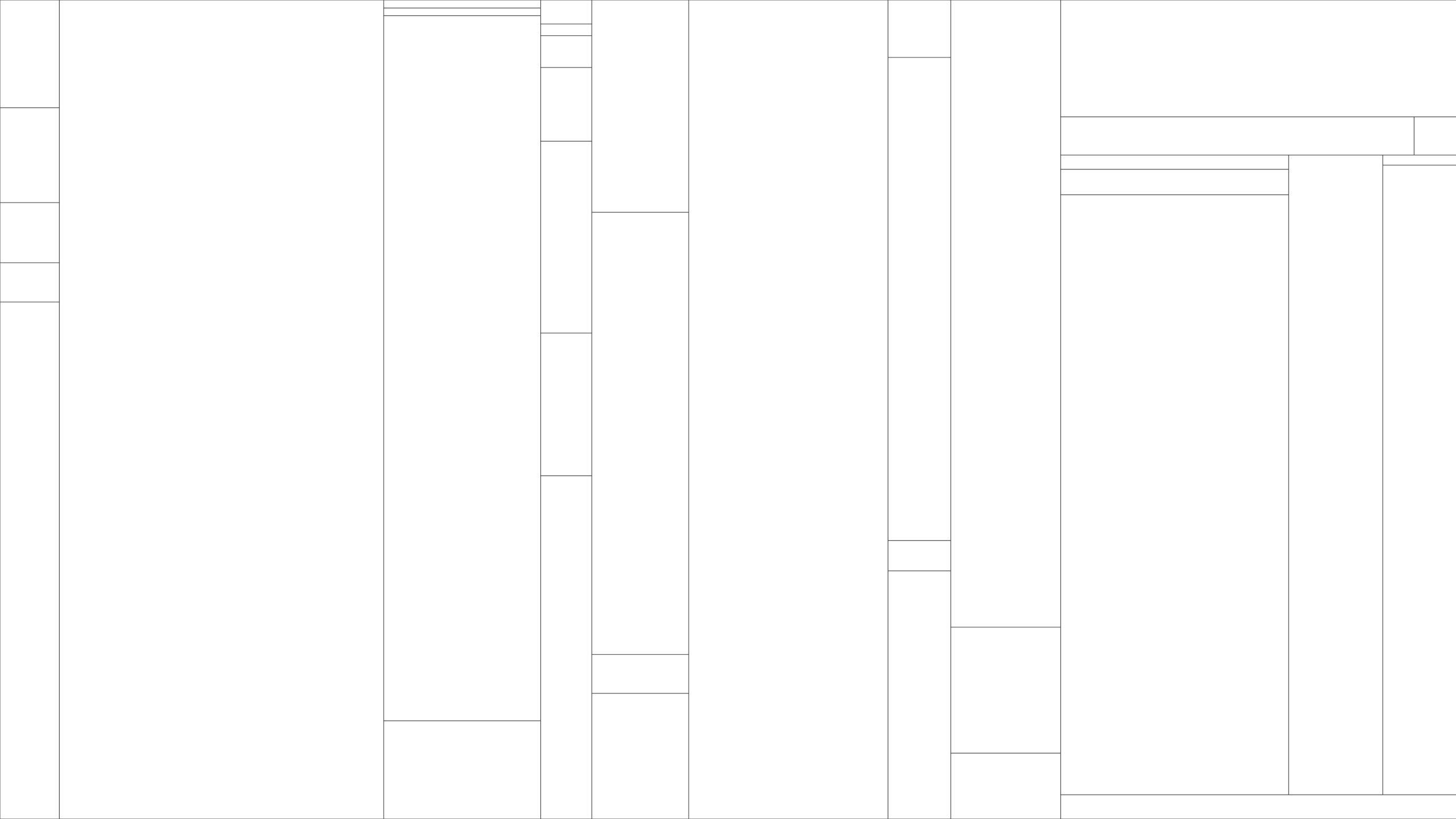
 Failures: 0

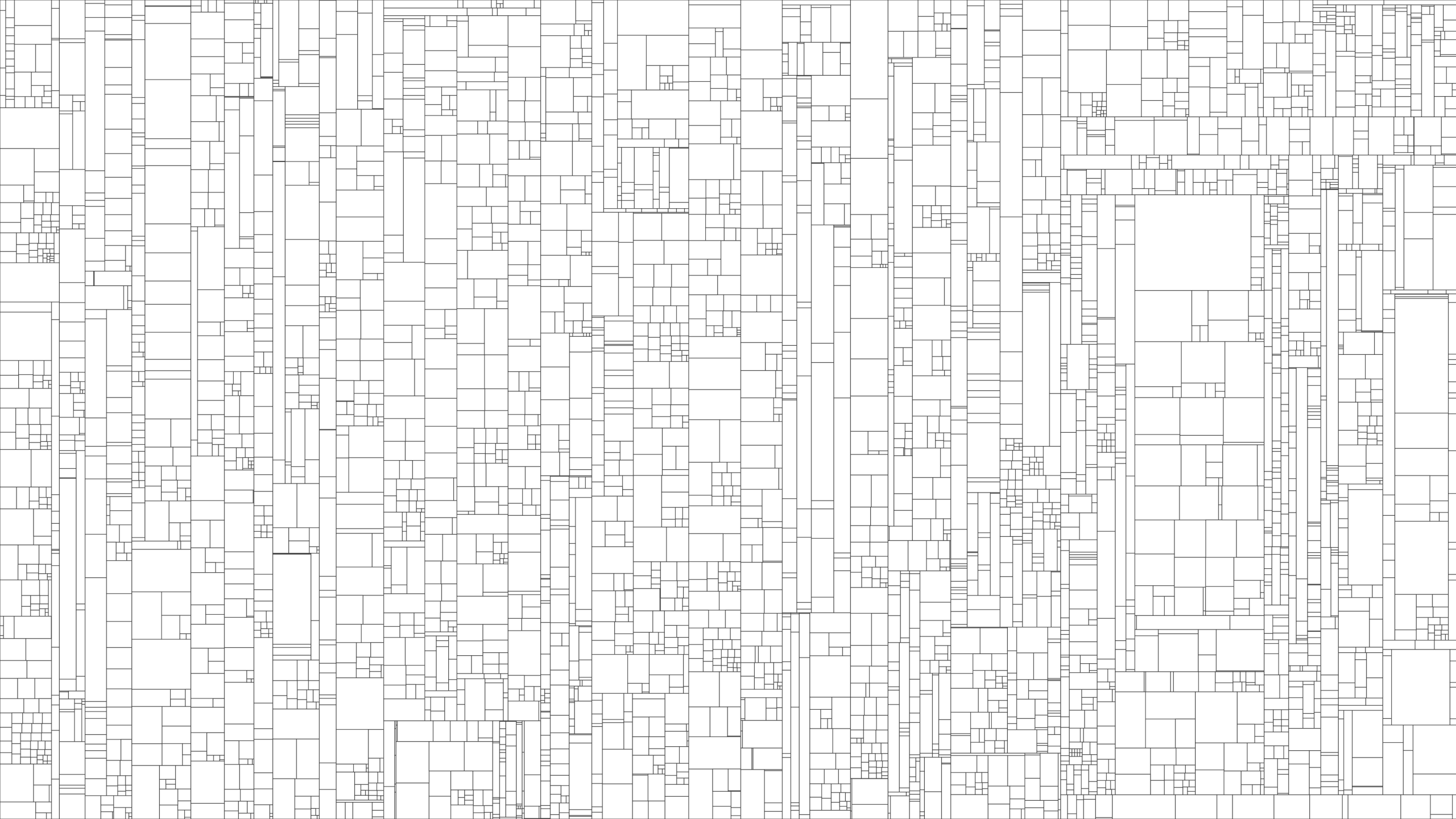
- ▼  com.teamscale.test.ui.architecture.ArchitecturePerspectiveTest [Runner: JUnit 5]
 -  testViewingArchitectureElements
 -  createArchitectureTest
 -  testTimetravelMode
 -  testUndoRedo
 -  testArchitecturePolicyUpdate
 -  testOpenCodeOfOrphans

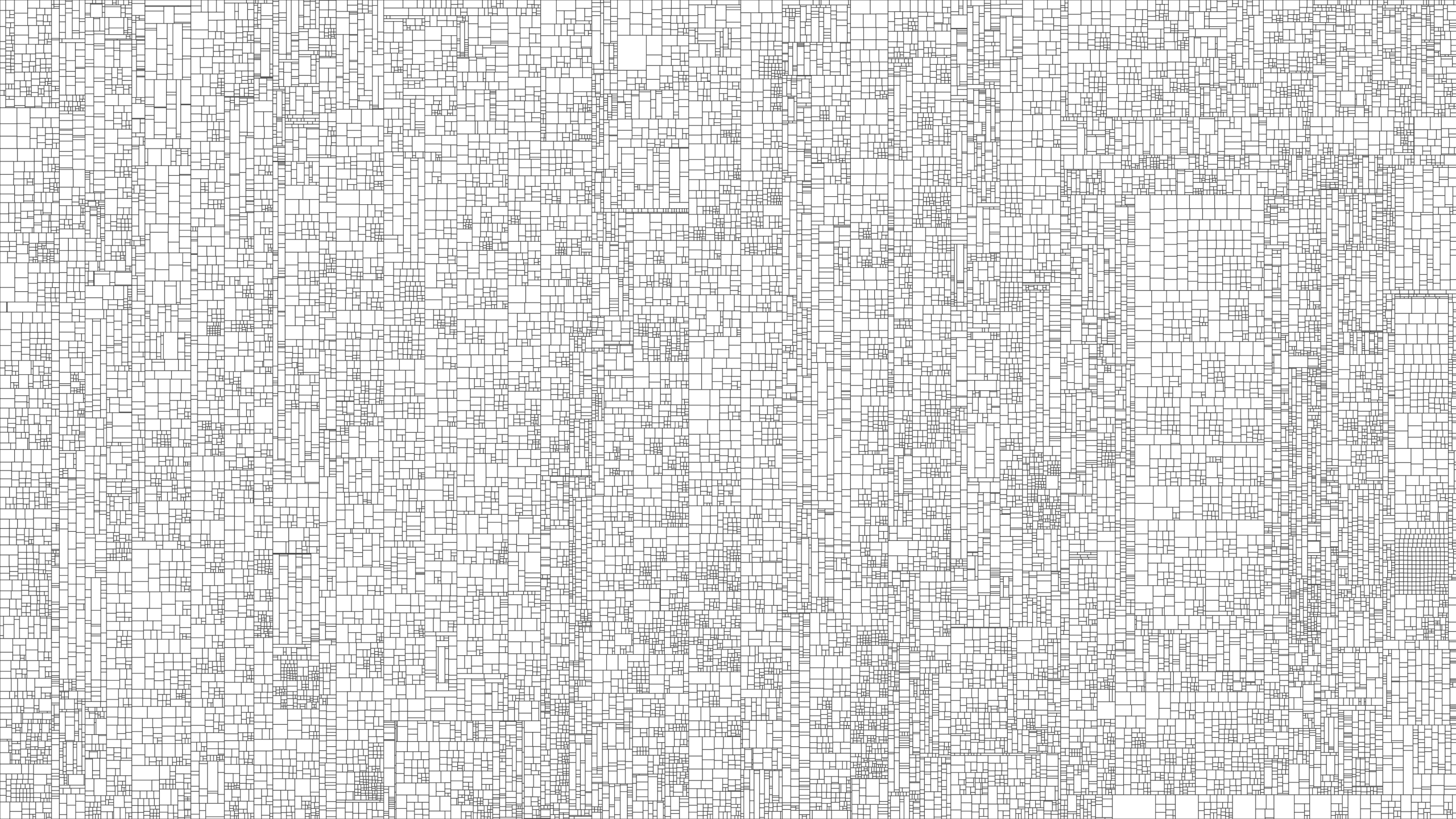
 Failure Trace

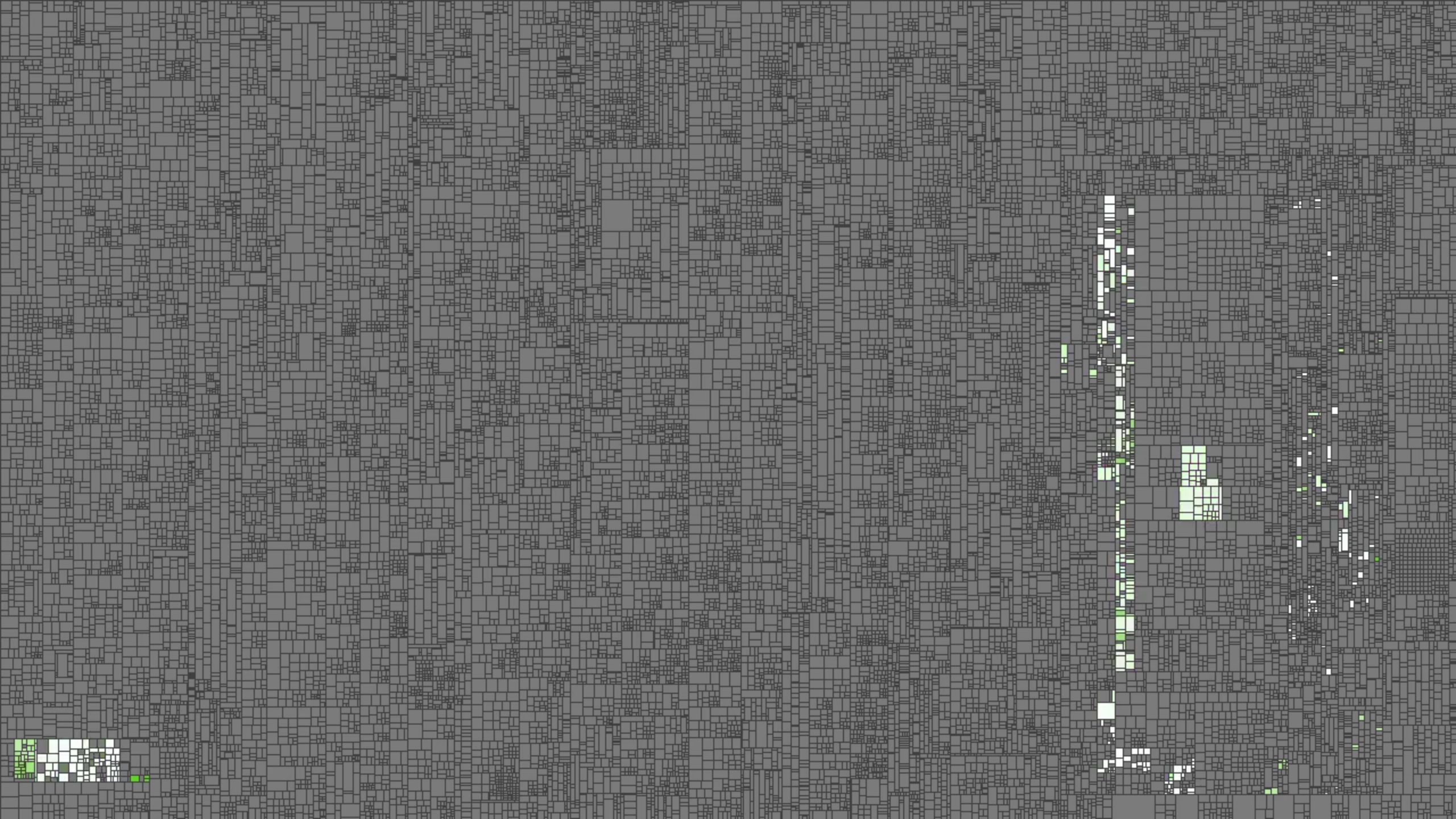


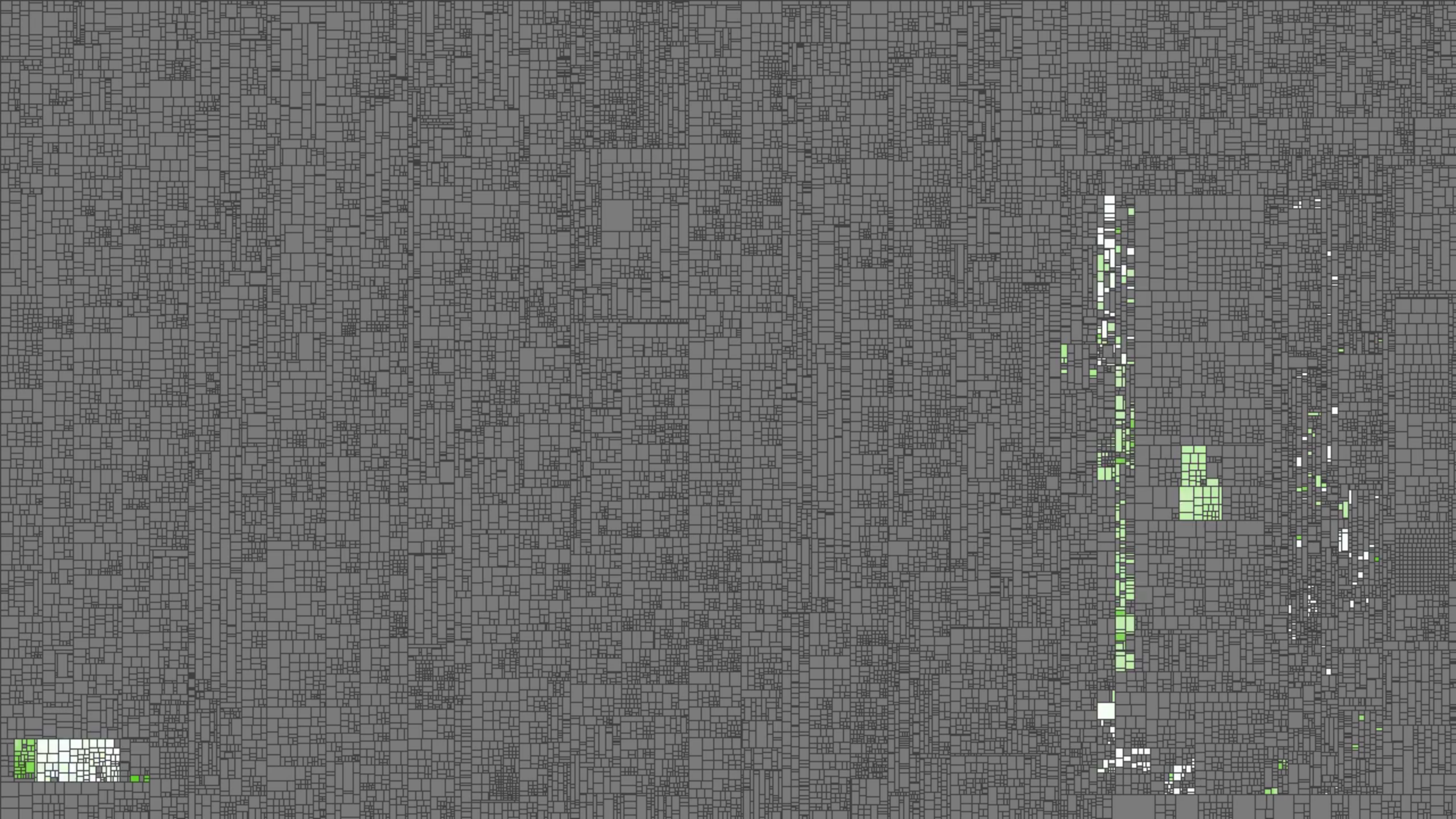


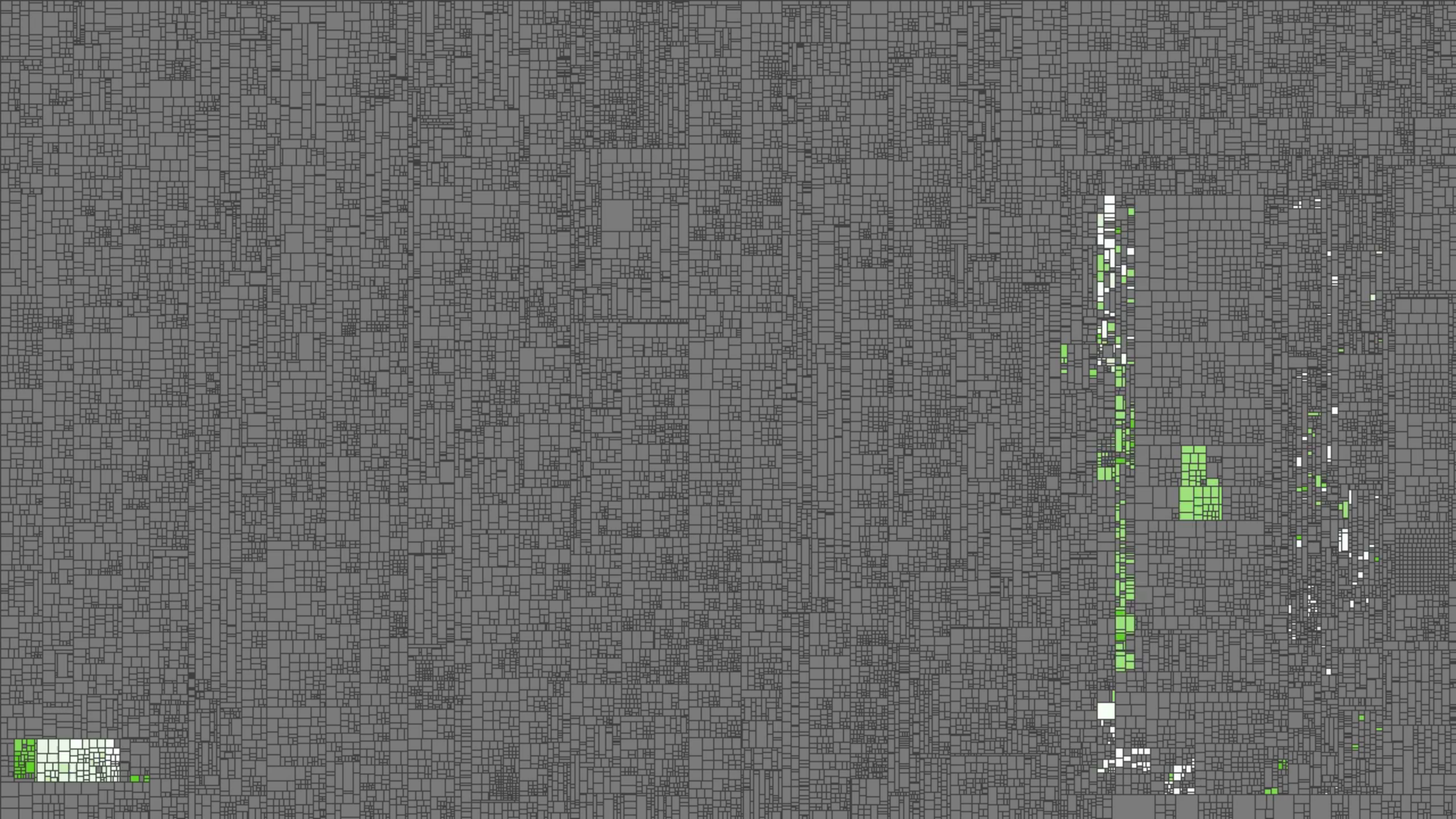


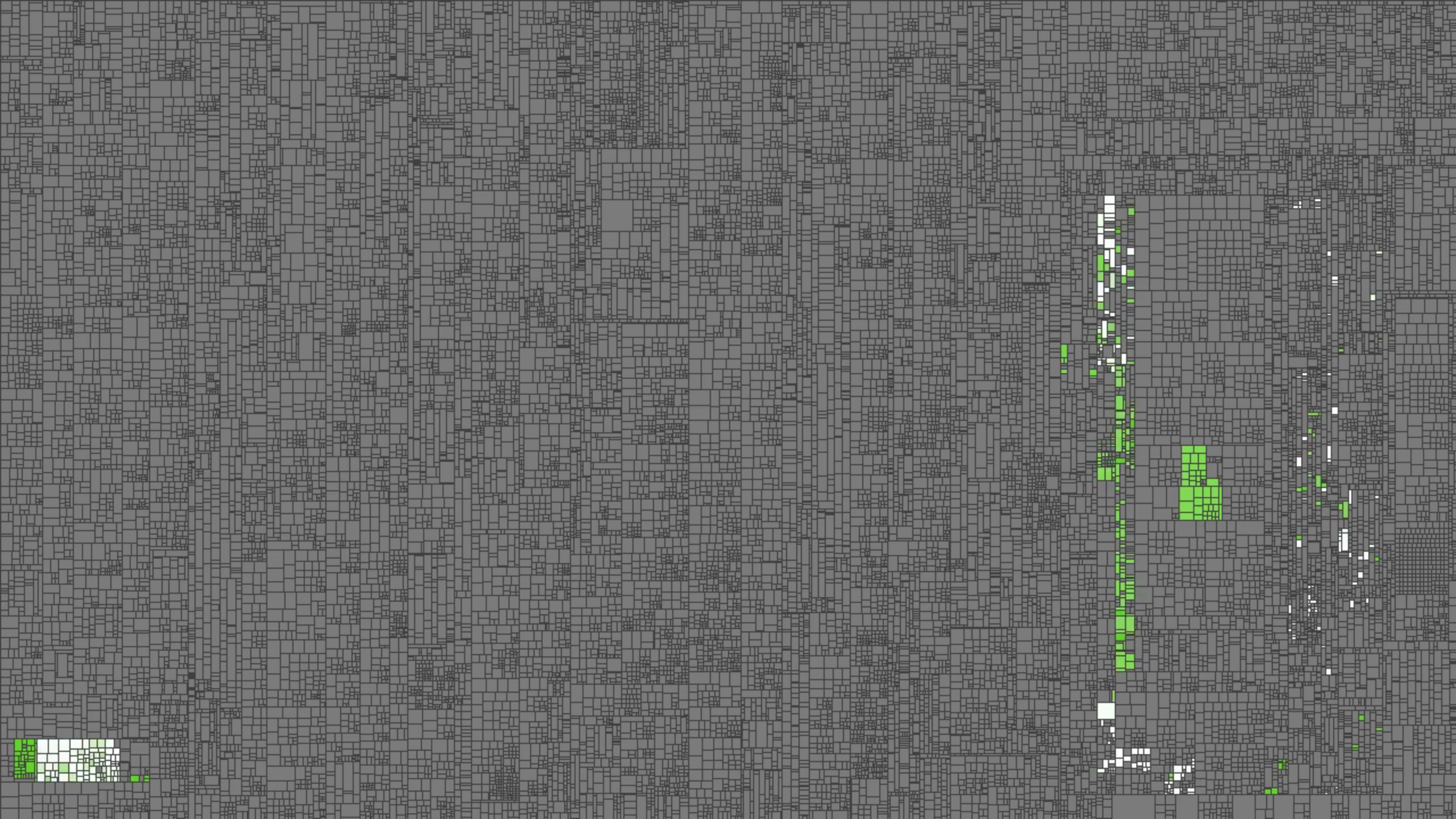


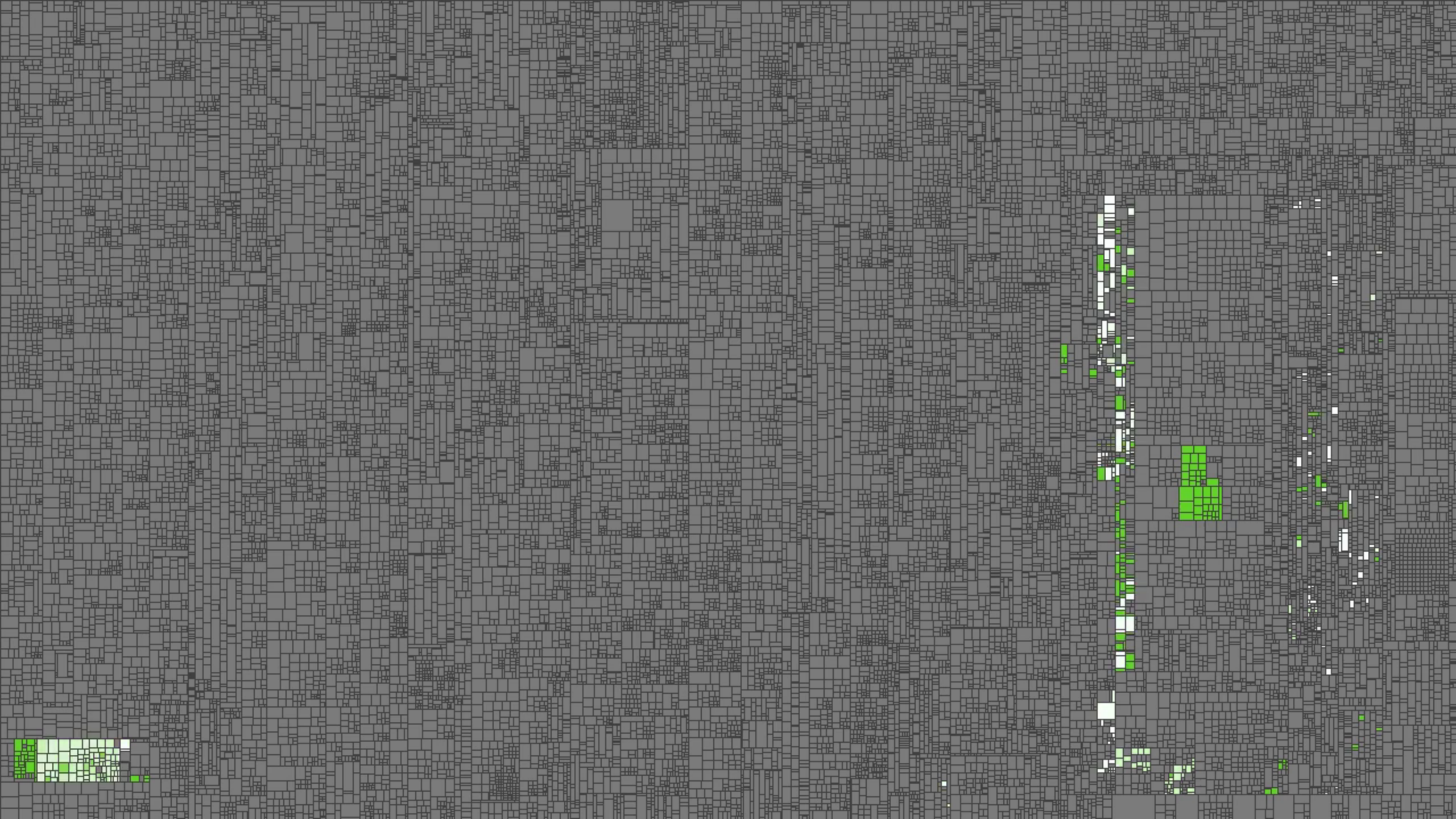


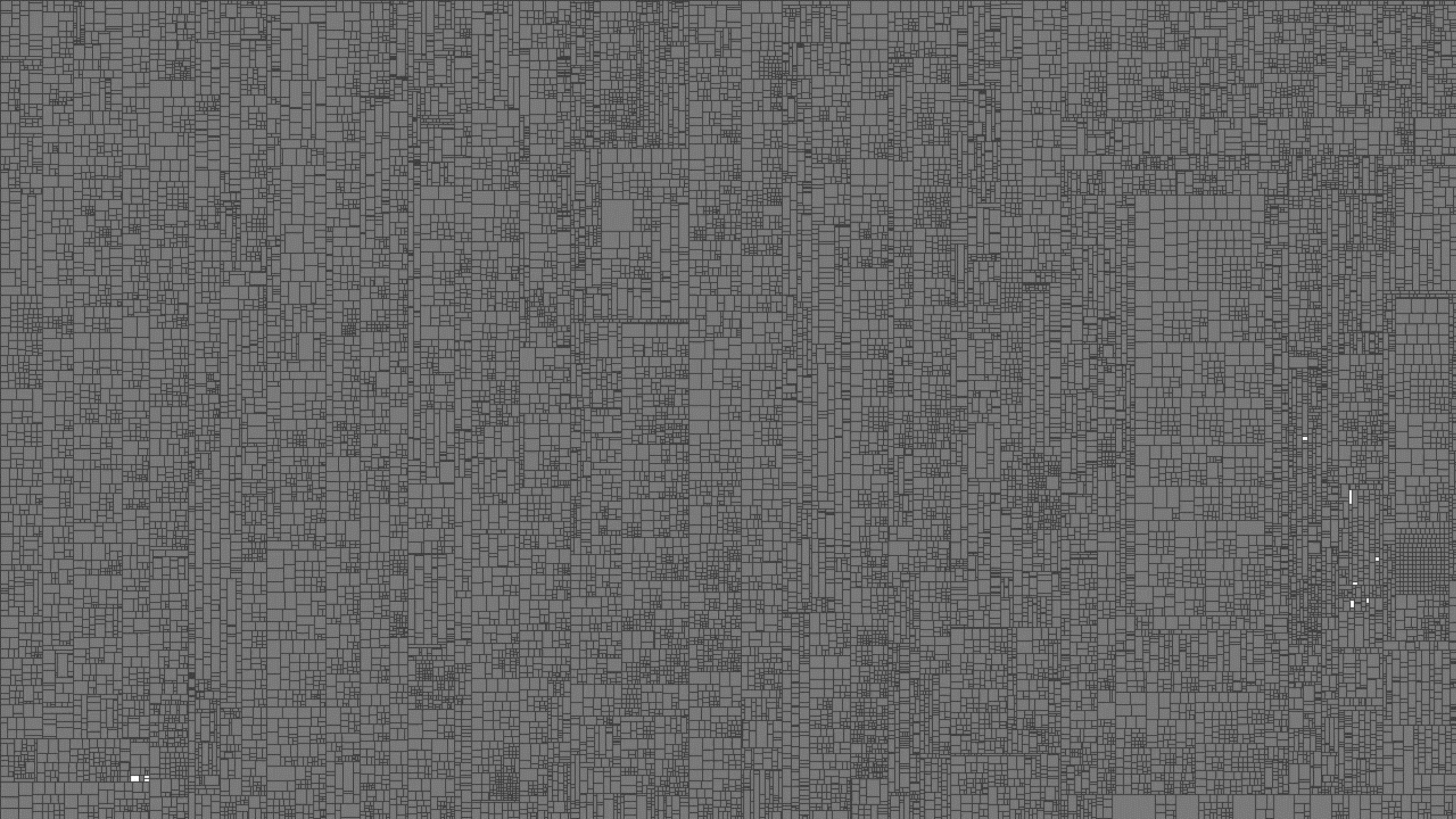














Data Flow Analysis can not handle java lambdas (logs many errors currently)

- Edit
- Comment
- Assign
- More ▾
- Back to New



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		

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

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:
  
```

Dates

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

Time Tracking

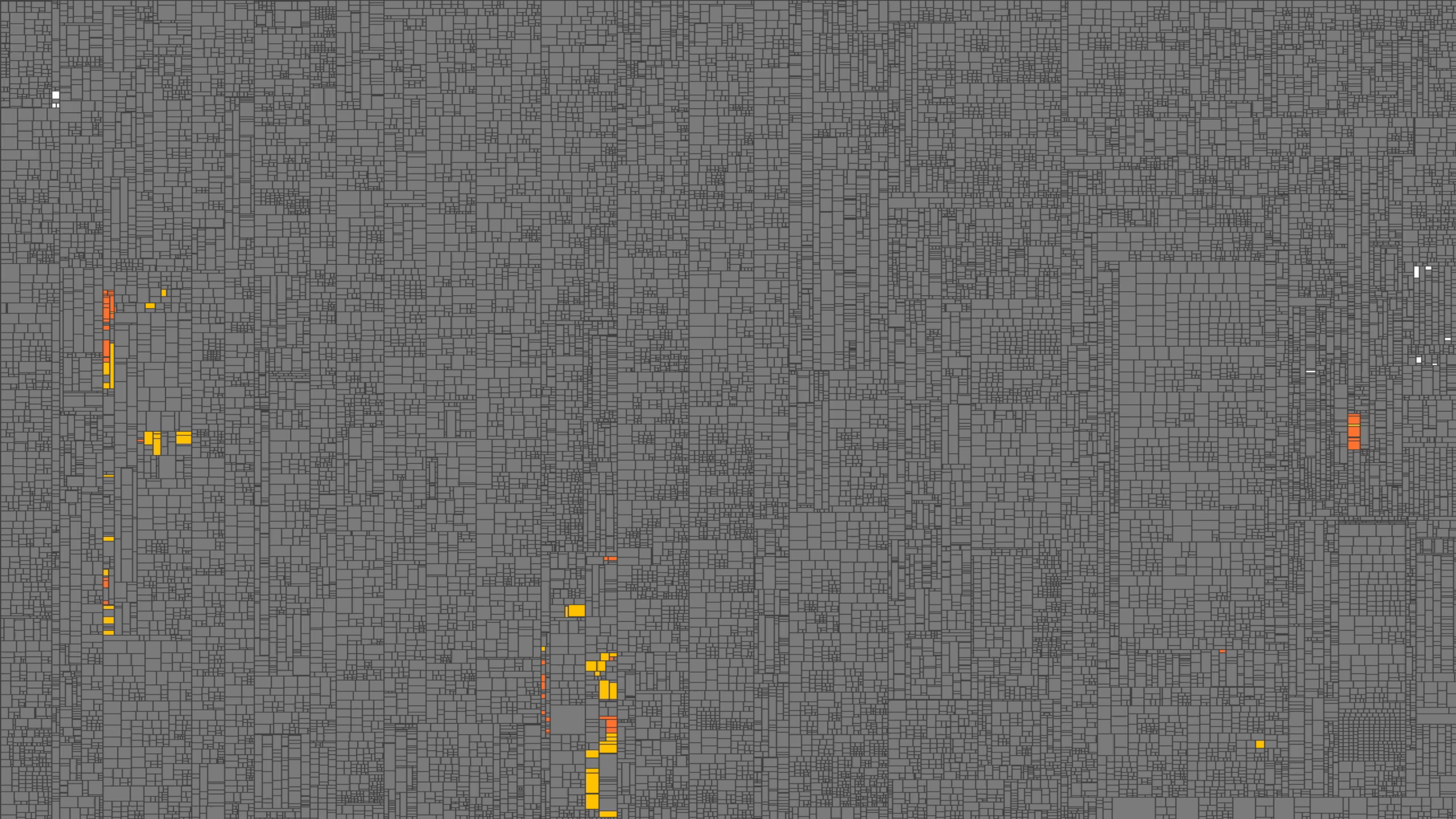
Estimated:	<div style="width: 100%; height: 10px; background-color: #ccc;"></div> Not Specified
Remaining:	<div style="width: 100%; height: 10px; background-color: #ccc;"></div> 0m
Logged:	<div style="width: 100%; height: 10px; background-color: #4CAF50;"></div> 4d 1h 57m

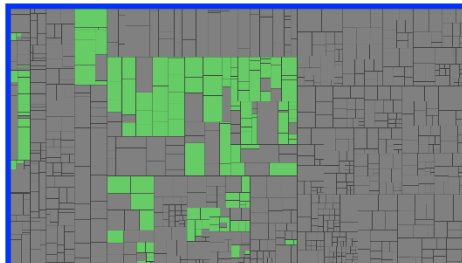
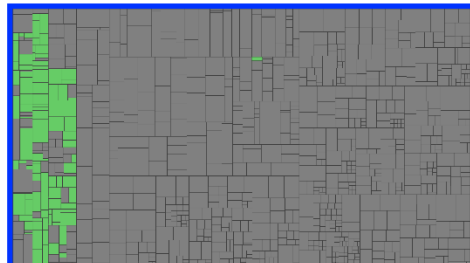
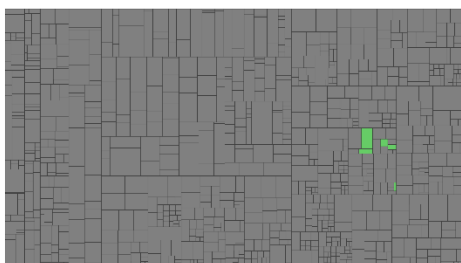
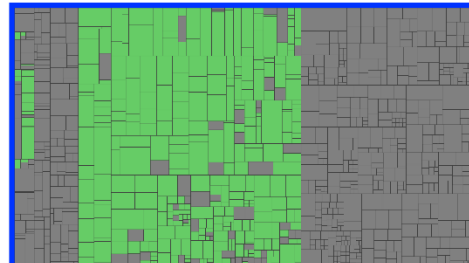
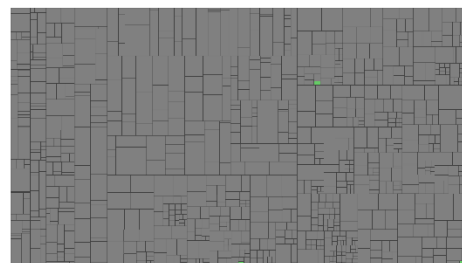
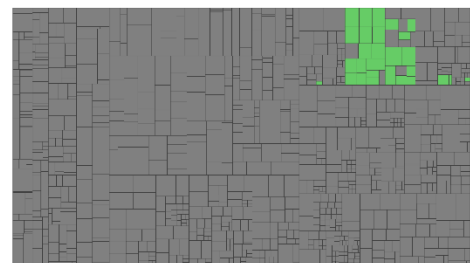
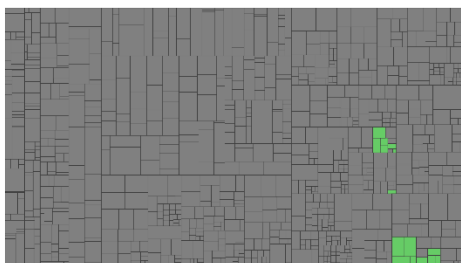
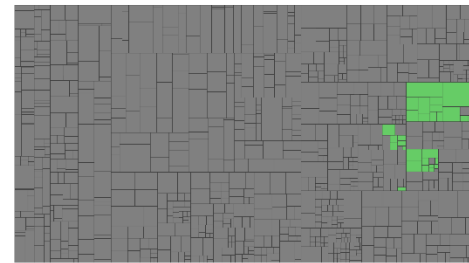
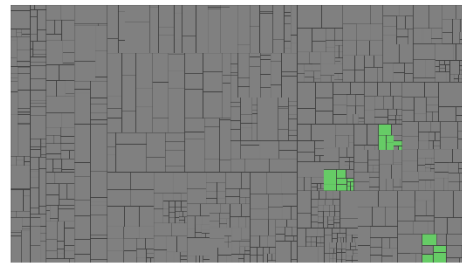
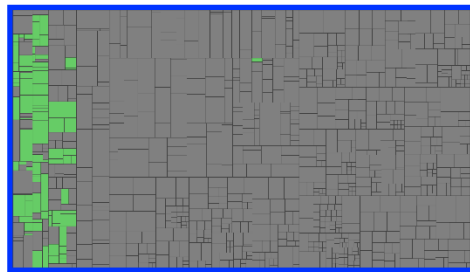
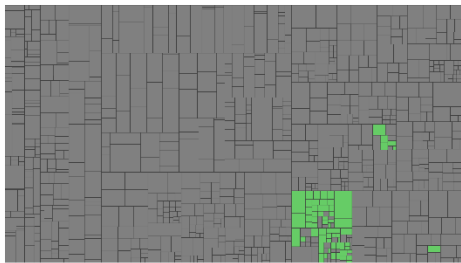
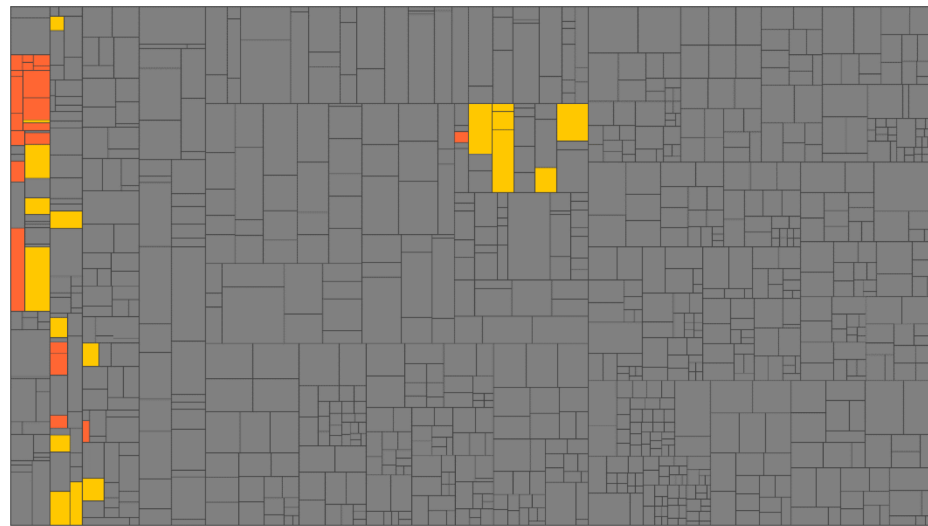
Agile

[View on Board](#)

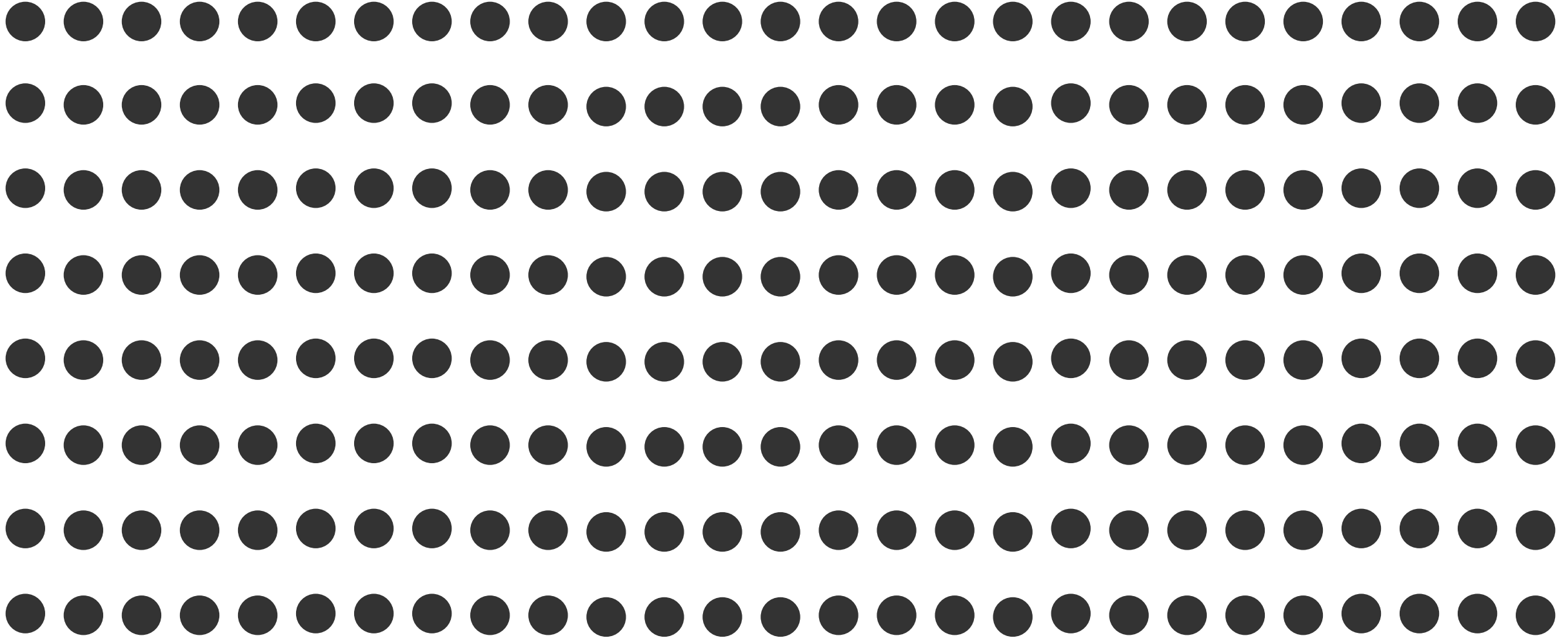
Gitlab CI

Projects ▾
More ▾
⋮

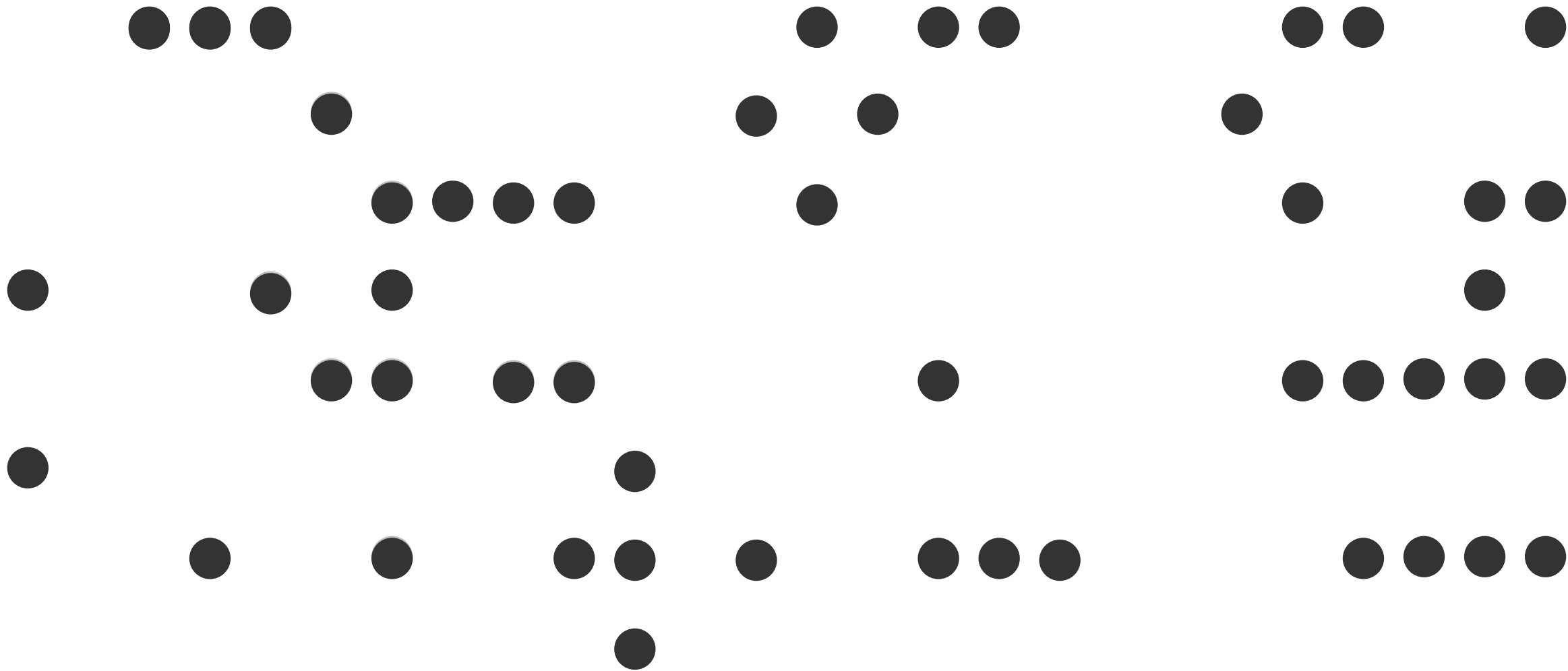




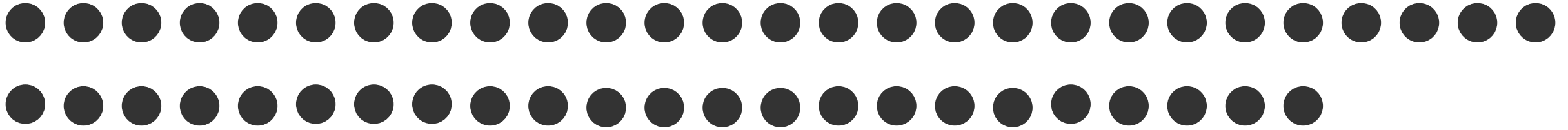
... 1000+ Test cases
that do not cover
changes

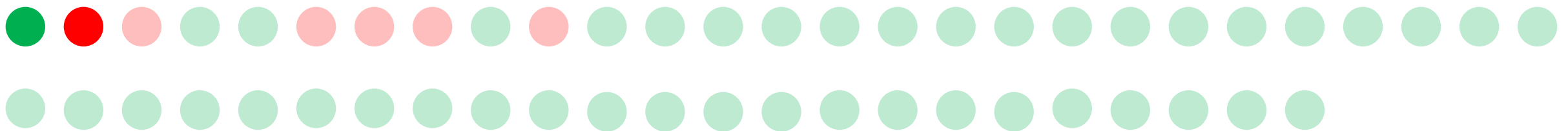
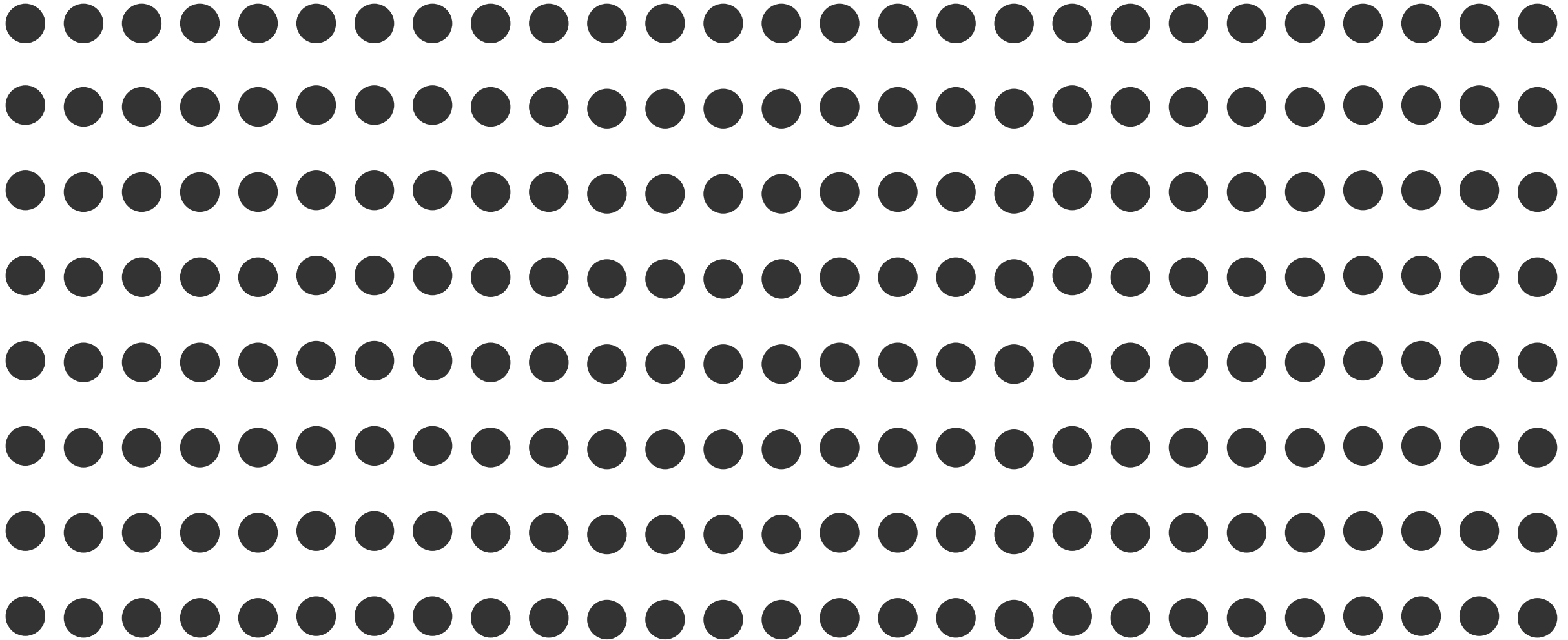


Step 1: Select Impacted Tests



Step 1: Select Impacted Tests



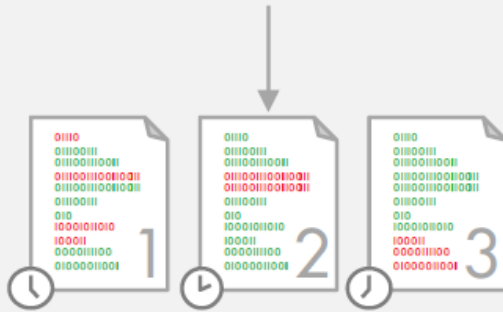




All tests

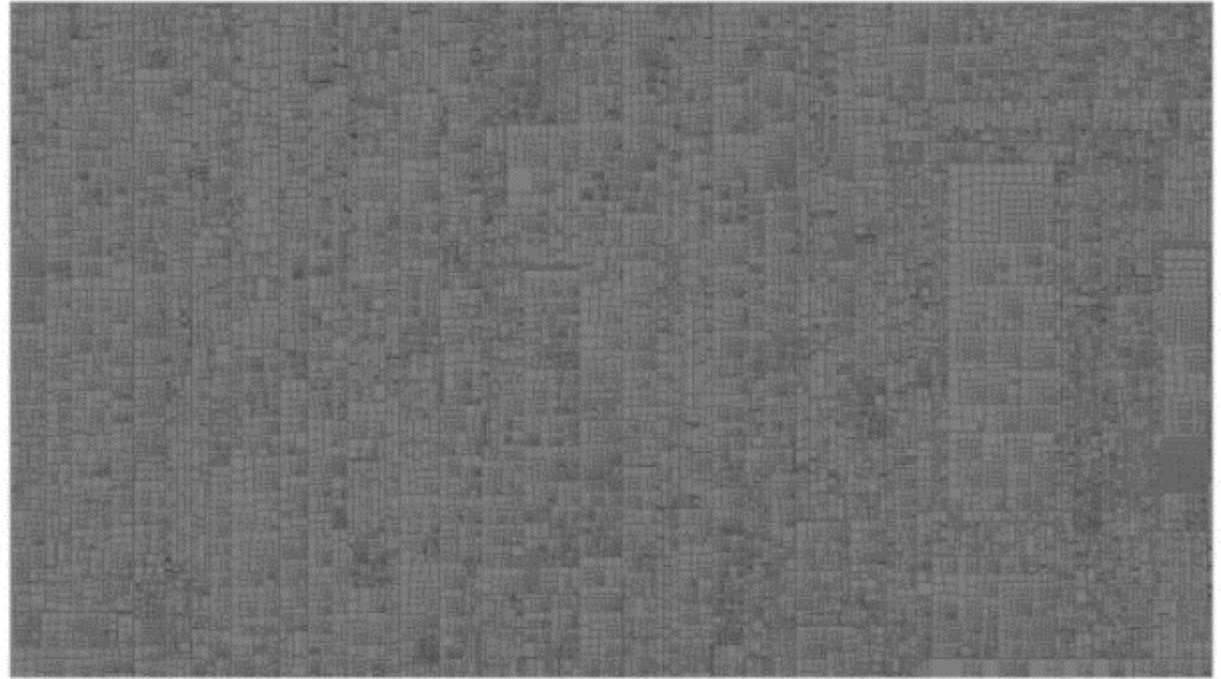


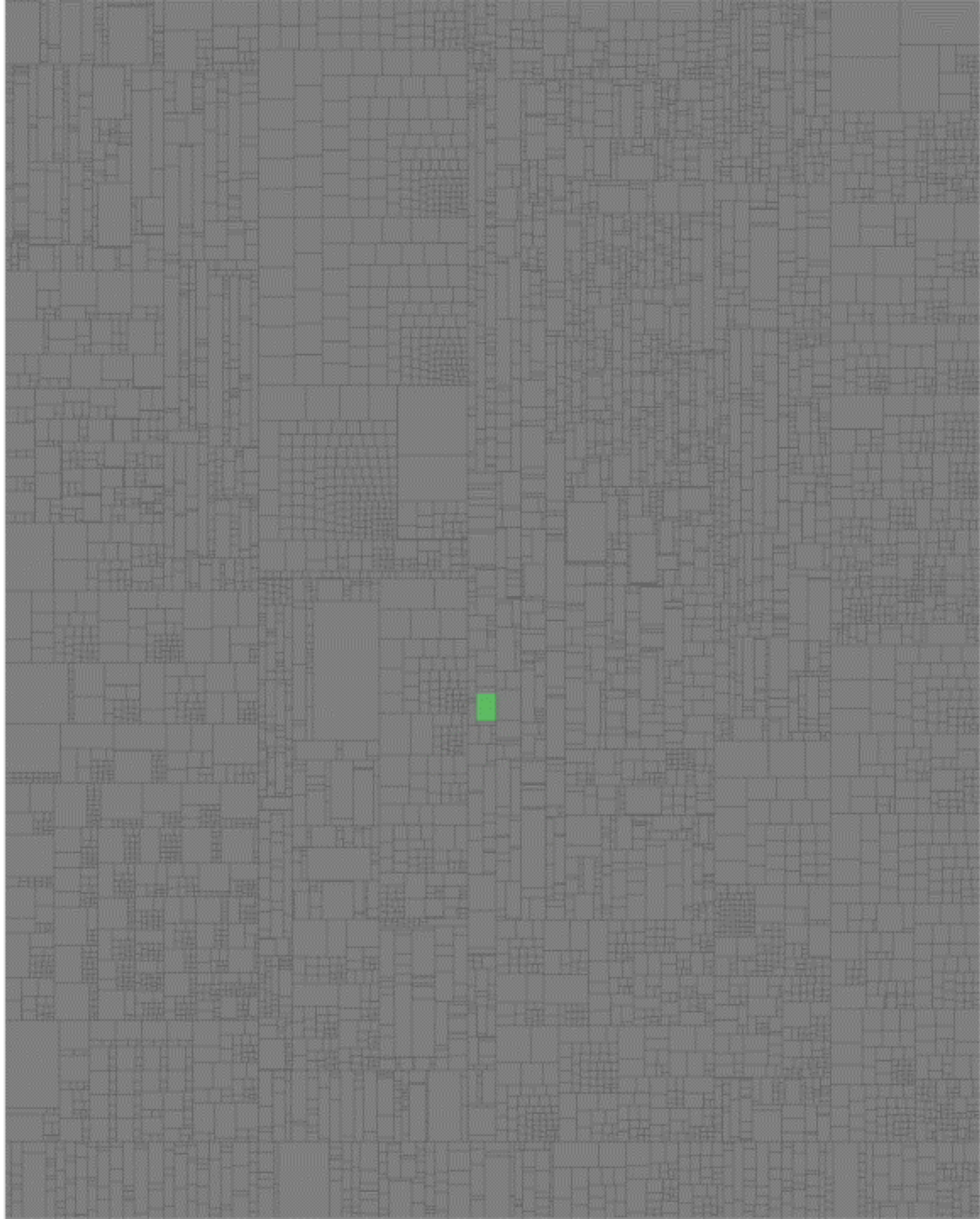
Test environment



Test case specific
coverage and runtime





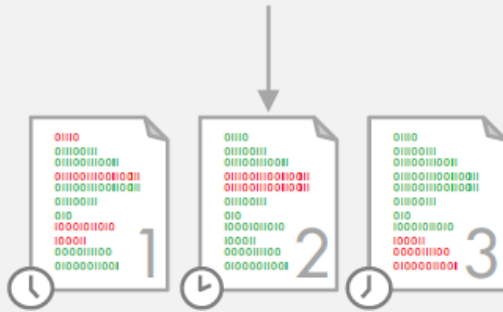




All tests



Test environment



Test case specific
coverage and runtime

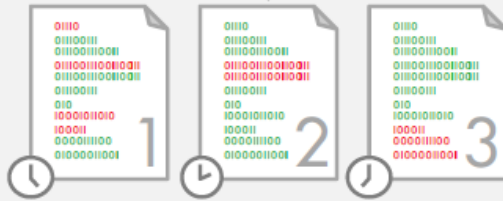




All tests



Test environment



Test case specific
coverage and runtime



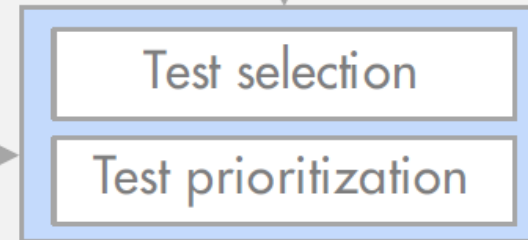
1



Version control system



Changes



2



All tests



Test environment



Test case specific coverage and runtime



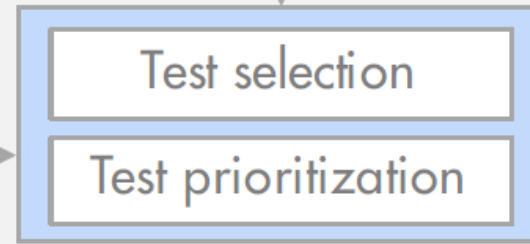
1



Version control system



Changes



Sorted subset of tests relevant for the changes



2

Limitations of Test-Impact-Analysis

- Some Changes affect all tests...
 - to configuration information
 - to test data
- If Tests themselves change, they must be re-executed
- There is no guarantee, that selected tests find all existing bugs

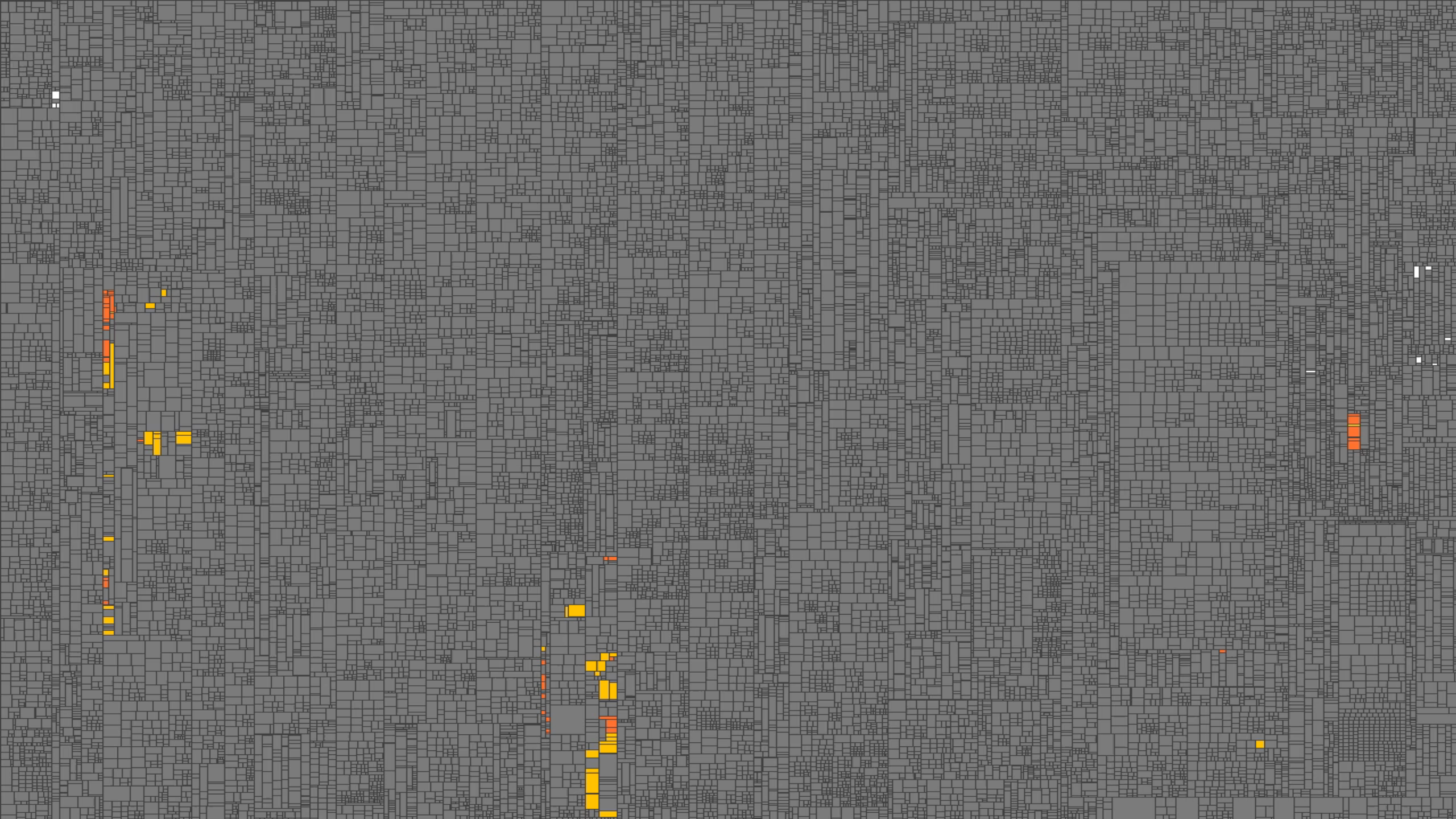
⇒ Execute *all* tests regularly (benefit: keeps coverage info up to date)

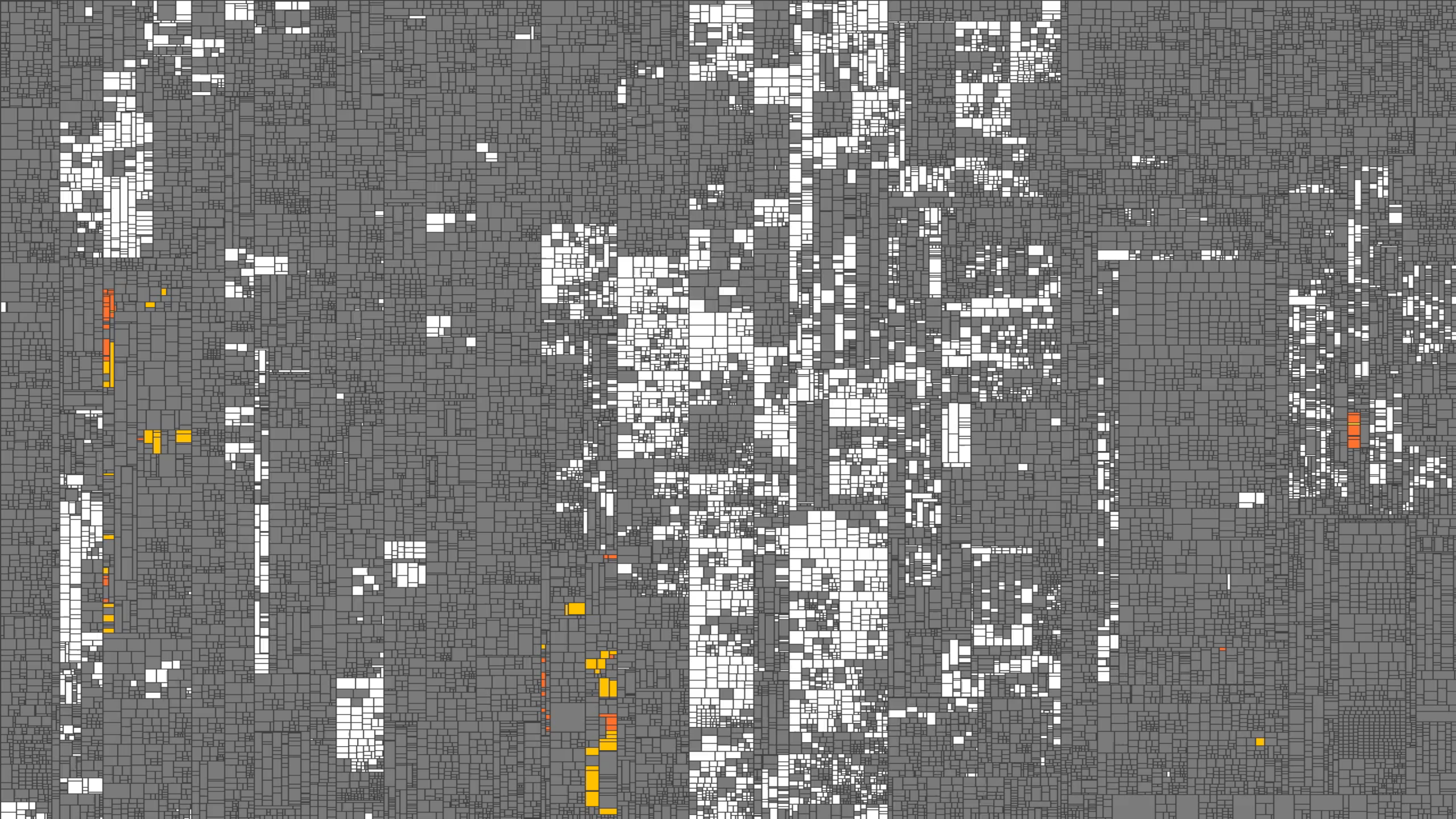


TIME-SAVINGS DUE TO EXECUTION OF IMPACTED TESTS ONLY

Study Object	Execution Time (ms)		Saving
	All Tests	Impacted Tests	
Apache Commons Collections	25,277		
Apache Commons Lang	24,987		
Apache Commons Math	160,391		
Histone Template Engine 2	34,603		
JabRef	119,849		
Joda-Time	20,782		
Lightweight-Stream-API	1,523		
LittleProxy	155,334		
OkHttp	96,671		
RxJava	464,018		
Symia Commons Math Parser	528		
Teamscale	1,249,088		

If only selection gets performed, time savings vary strongly





PERCENTAGE OF FAULTY SYSTEM VERSIONS DETECTED BY EXECUTION
TIME LIMIT

Studienobjekt	1%	2%	5%	10%
Apache Commons Collections				
Apache Commons Lang				
Apache Commons Math				
Histone Template Engine 2				
JabRef				
Joda-Time				
Lightweight-Stream-API				
LittleProxy				
OkHttp				
RxJava				
Symia Commons Math Parser				
Teamscale				

PERCENTAGE OF FAULTY SYSTEM VERSIONS DETECTED BY EXECUTION
TIME LIMIT

Studienobjekt	1%	2%	5%	10%
Apache Commons Collections	84.25			
Apache Commons Lang	94.23			
Apache Commons Math	80.20			
Histone Template Engine 2	88.46			
JabRef	95.71			
Joda-Time	98.10			
Lightweight-Stream-API	60.76			
LittleProxy	74.29			
OkHttp	90.70			
RxJava	91.89			
Symia Commons Math Parser	78.46			
Teamscale	91.86			

PERCENTAGE OF FAULTY SYSTEM VERSIONS DETECTED BY EXECUTION
TIME LIMIT

Studienobjekt	1%	2%	5%	10%
Apache Commons Collections	84.25	96.58		
Apache Commons Lang	94.23	96.43		
Apache Commons Math	80.20	85.92		
Histone Template Engine 2	88.46	88.46		
JabRef	95.71	95.71		
Joda-Time	98.10	98.61		
Lightweight-Stream-API	60.76	90.73		
LittleProxy	74.29	77.14		
OkHttp	90.70	90.70		
RxJava	91.89	94.59		
Symia Commons Math Parser	78.46	86.15		
Teamscale	91.86	95.93		

PERCENTAGE OF FAULTY SYSTEM VERSIONS DETECTED BY EXECUTION
TIME LIMIT

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

Time Savings very stable across systems!



80% of faulty builds discovered in 1% test time

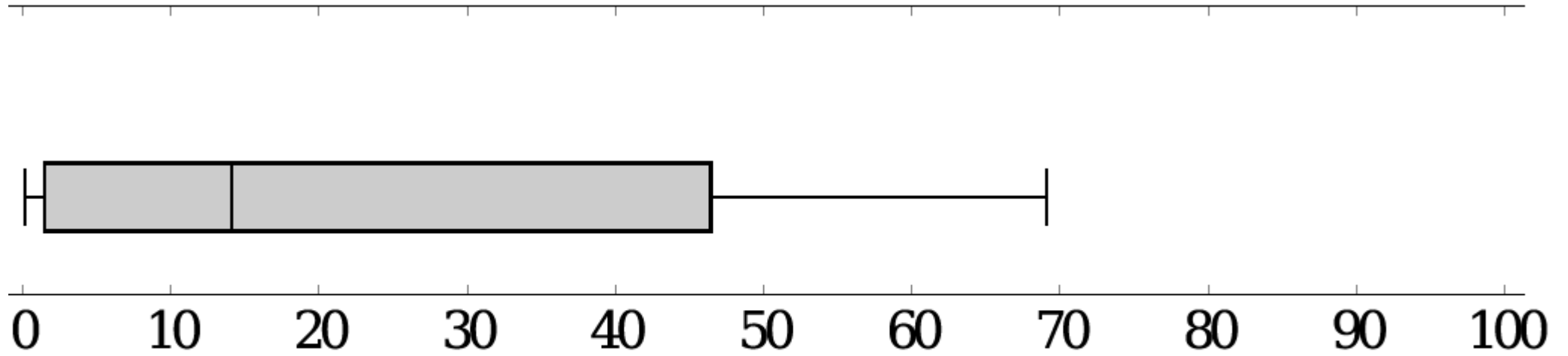
90% of faulty builds discovered in 2% test time





 Teamscale

Random





Test duration

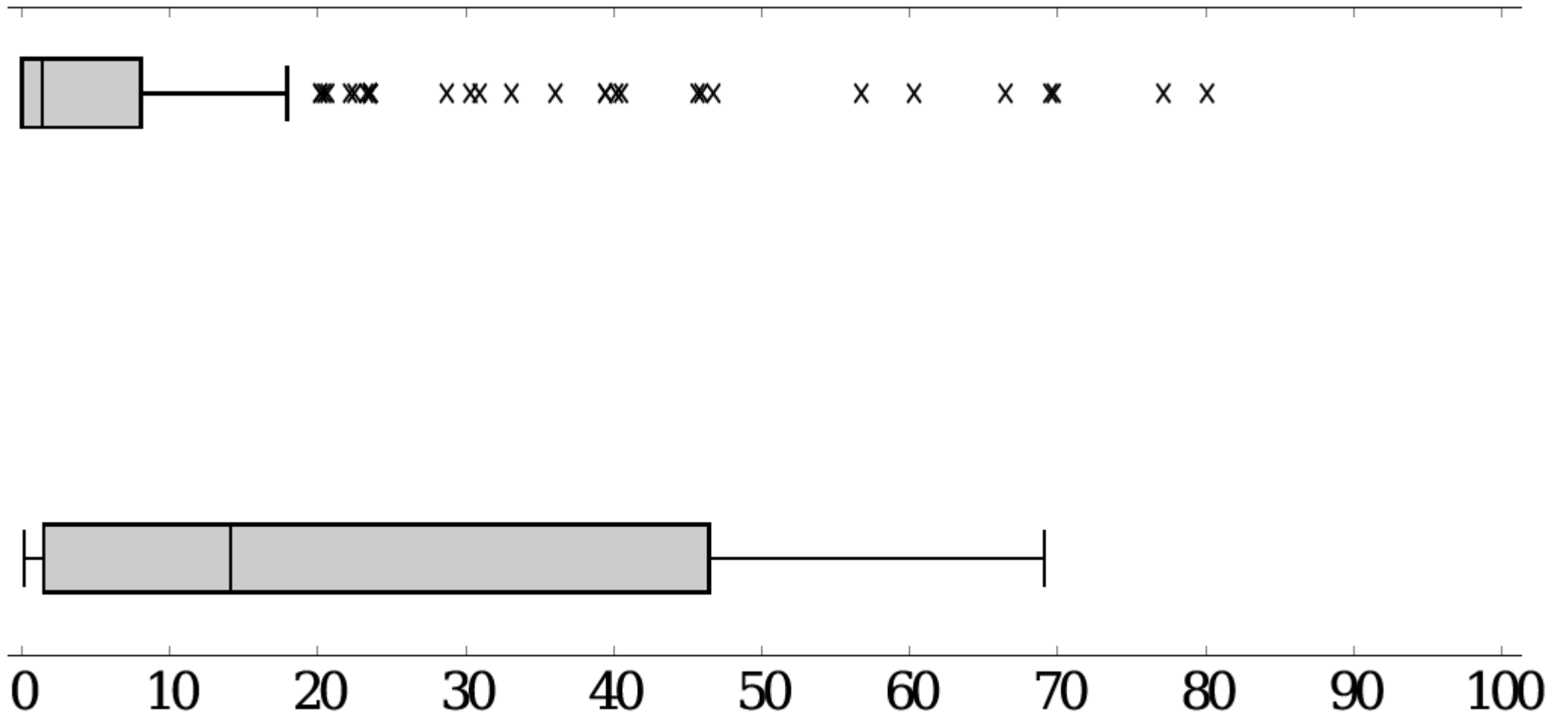
Lines/sec

#m

Added #m

Edit distance

Random





All tests



Test environment



Test case specific coverage and runtime



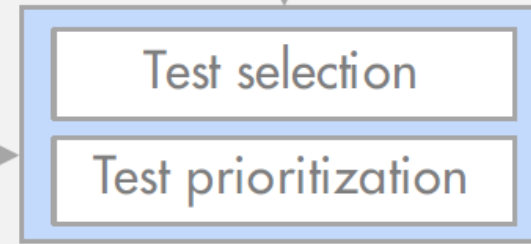
1



Version control system



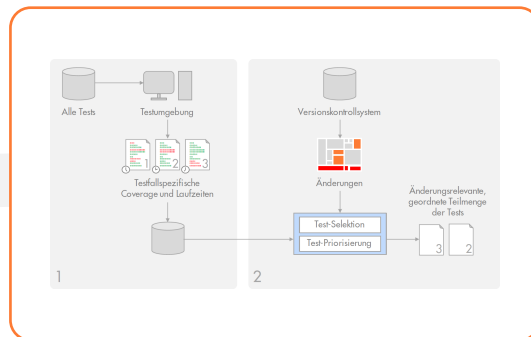
Changes

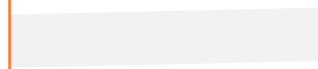
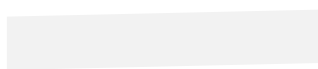


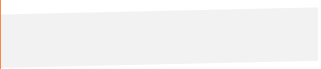
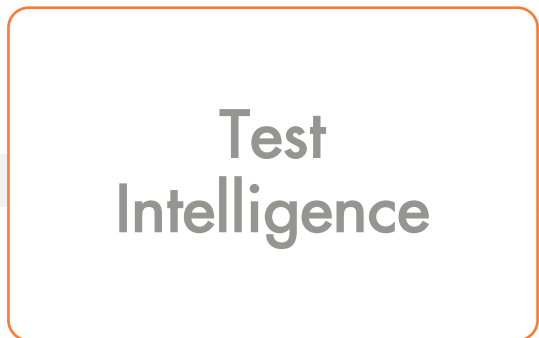
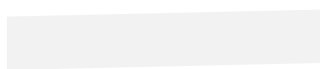
Sorted subset of tests relevant for the changes

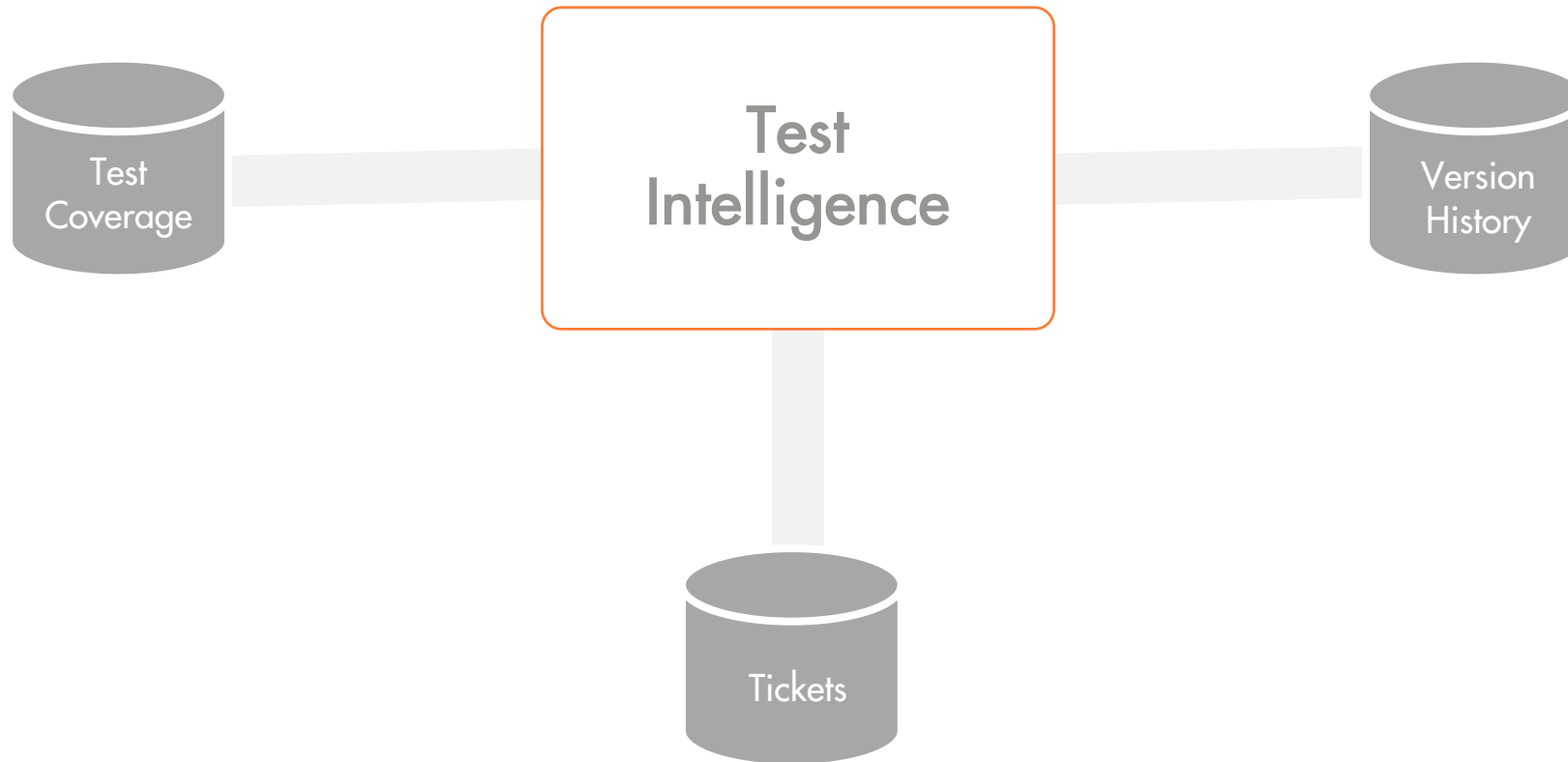


2

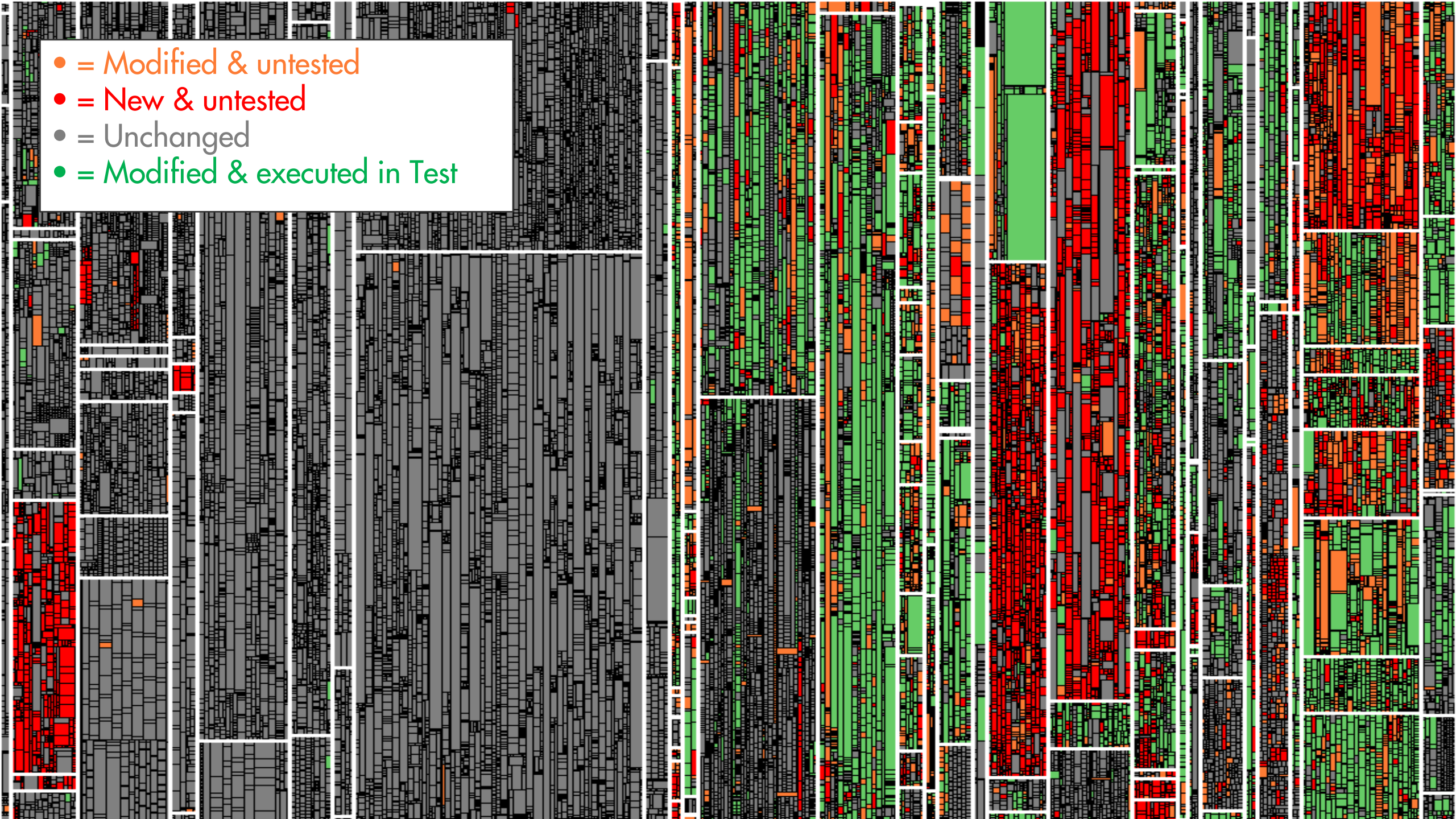











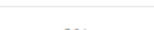


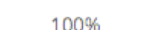
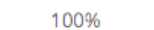







- = Modified & untested
- = New & untested
- = Unchanged
- = Modified & executed in Test



Issue #	Subject	Ticket Coverage
TS-13689	Undo/Redo for web-based architecture editor	70% 
TS-13701	Implement metric 'Nesting Depth' for Simulink	35% 
TS-13704	Fix long method finding in TaintAnalysisRunner	100% 
TS-13714	External findings are not registered during first upload	100% 
TS-13727	Manual test coverage upload during development	100% 
TS-13731	Tool for transferring Finding Blacklists and Tasks (w/ Findings) between instances	100% 
TS-13734	Cannot set/alter alias without reanalysis	100% 
TS-13735	Fetch parent relationship of TFS Work Items	100% 
TS-13742	Show data timestamp in project analysis warning	100% 
TS-13766	Get rid of ESLintFindingsSynchronizer and TSLintFindingsSynchronizer blocks	76% 
TS-13769	Show summary row in test perspective > issue view	0% 
TS-13772	Get rid of TestGapSynchronizer block	100% 
TS-13775	Remove Dataflow Blocks	67% 
TS-13778	Remove structuring block	100% 
TS-13779	Get rid of Bootstrap Wells	100% 

Done **Issue TS-15286 - Allow upload of backups to S3 storage**

Creator:  Andreas Sewe (on May 23 2018 16:00)

Last update: May 29 2018 15:54

Parent: [Issue TS-14733](#)

Assignee:  Andreas Sewe

project	Type	Priority	Resolution	Fix Version	Component
TS	Feature	Normal	Green	Teamscale 4.3	Backend
Affected Version	Customer	Customer Issue	Epic Name	Freshdesk URL	
Merge Request				PDash Task	QA-Contact
https://git.cqse.eu/cqse/teamscale/merge_requests/2963/					kinnen

Description

This is part of TS-14733. Initial goal for 4.3 (as the feature freeze is soon) is to support special `{{s3}}` URI as *Path to backup.zip*.

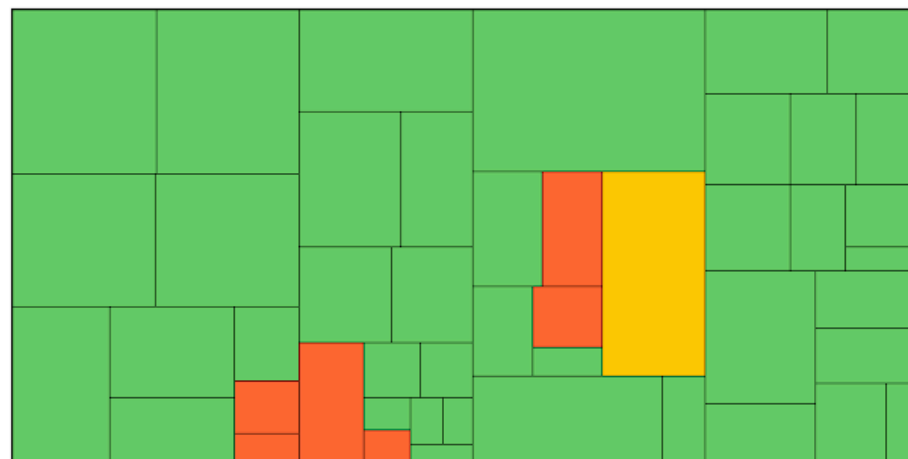
Credentials can be stored either in the URI or (if possible) under *Admin > Settings > System Accounts*.

⌵ Affected files (15)

⌴ Test Gap Treemap

May 28 2018 13:40–now | Test Gap: 14.89%

Coverage sources: All



Associated repository changes (7)



Merge branch 'cr/15286_allow_backups_to_s3' into 'master'
CR#15286 Allow upl...

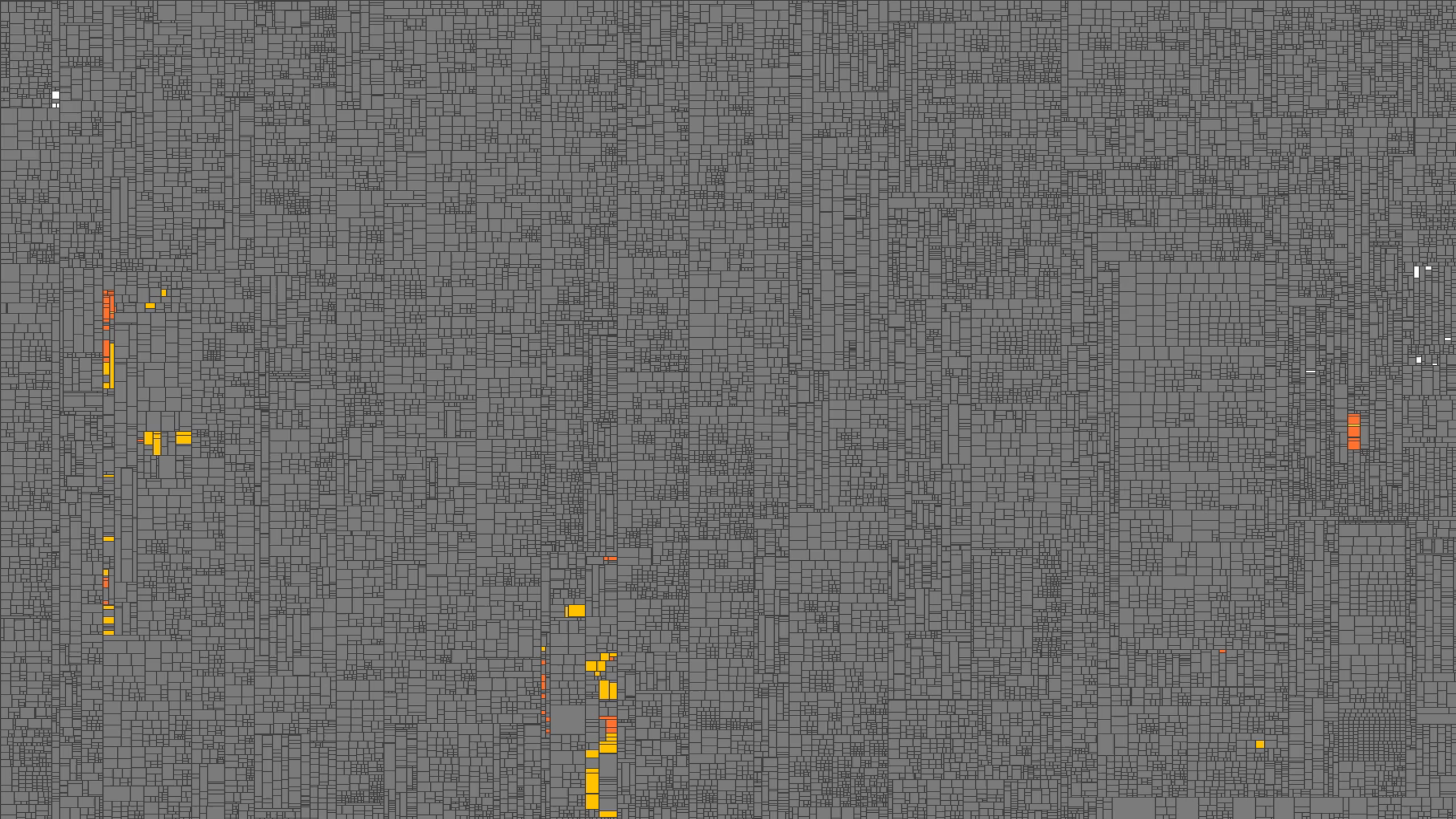
May 29 2018
15:54

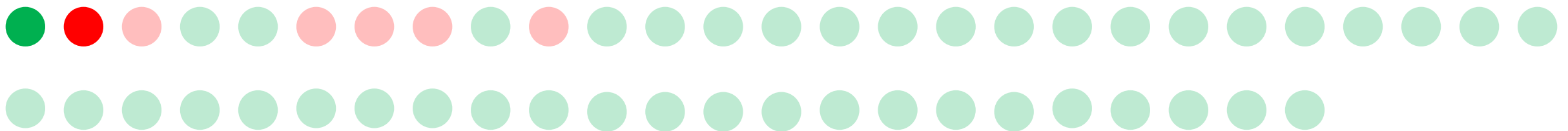
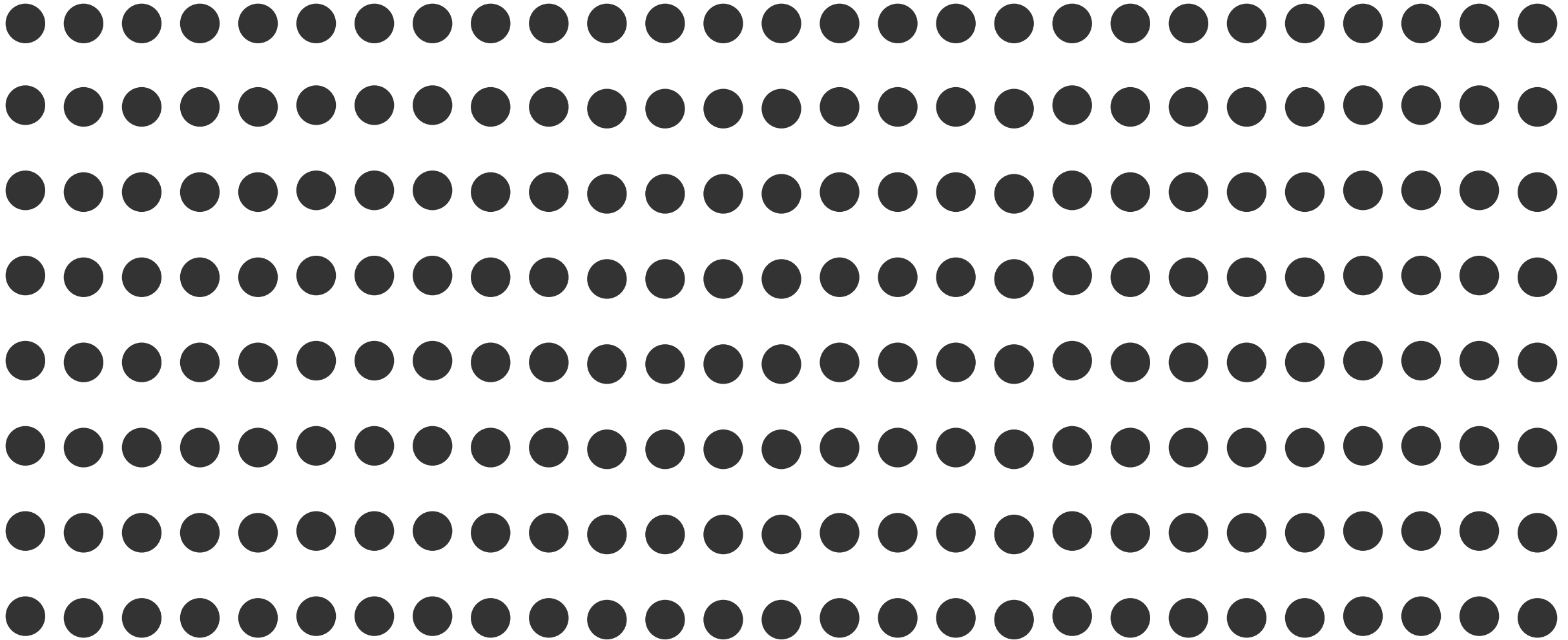
by Thomas Kinnen in revision 23d333c8 in branch master (Gitlab)

Merged from [cr/15286_allow_backups_to_s3](#) 0 2

Files: 7 added, 3 changed, 1 deleted

Findings: 0 4







80% of faulty builds discovered in 1% test time

90% of faulty builds discovered in 2% test time



Contact – Looking Forward to Discussions 😊



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

CQSE GmbH
Lichtenbergstraße 8
85748 Garching bei München
www.cqse.eu

