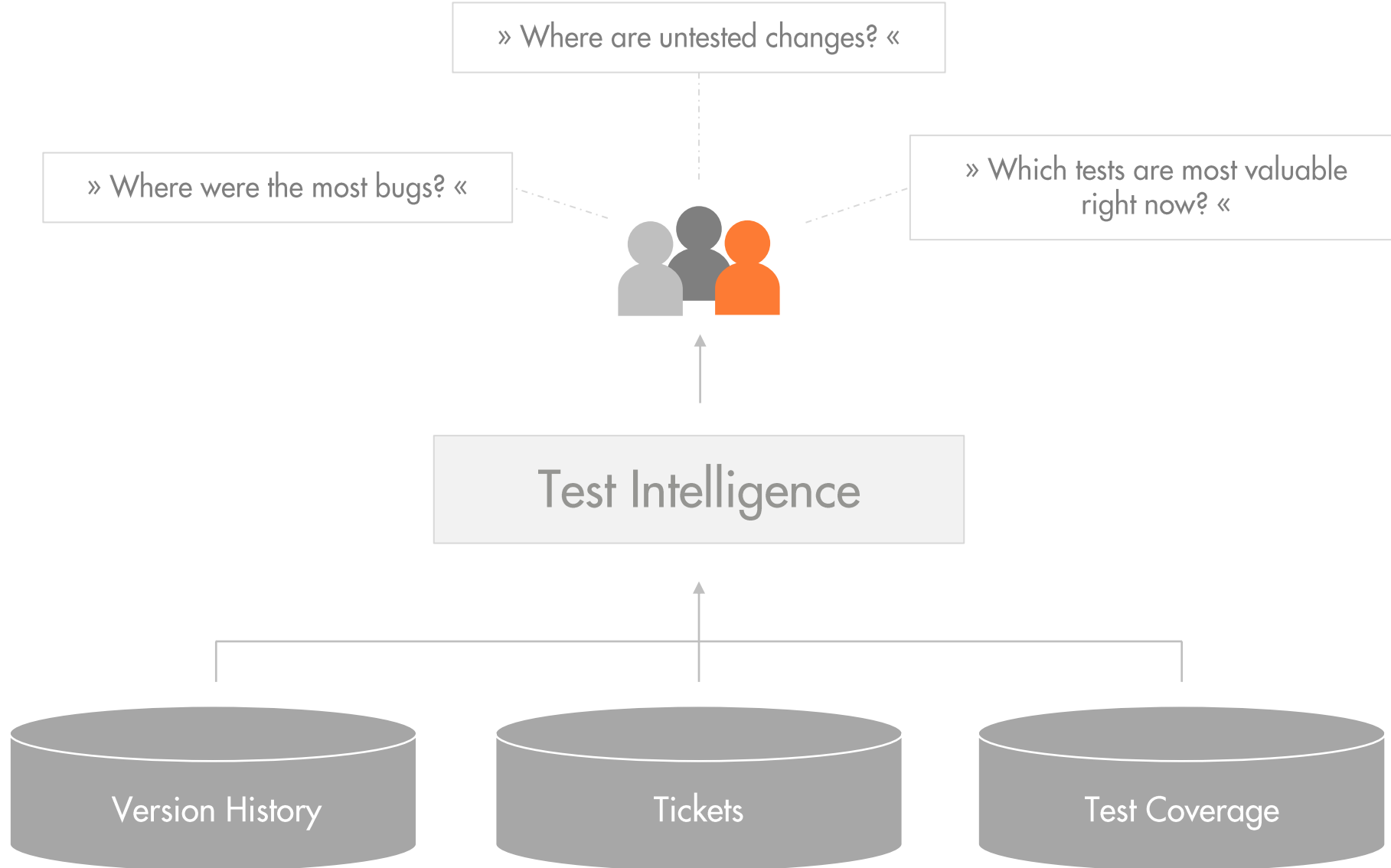


Test Intelligence for Developers

Dr. Elmar Jürgens

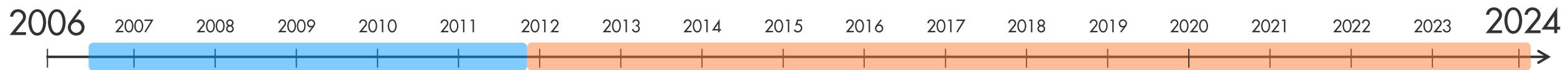


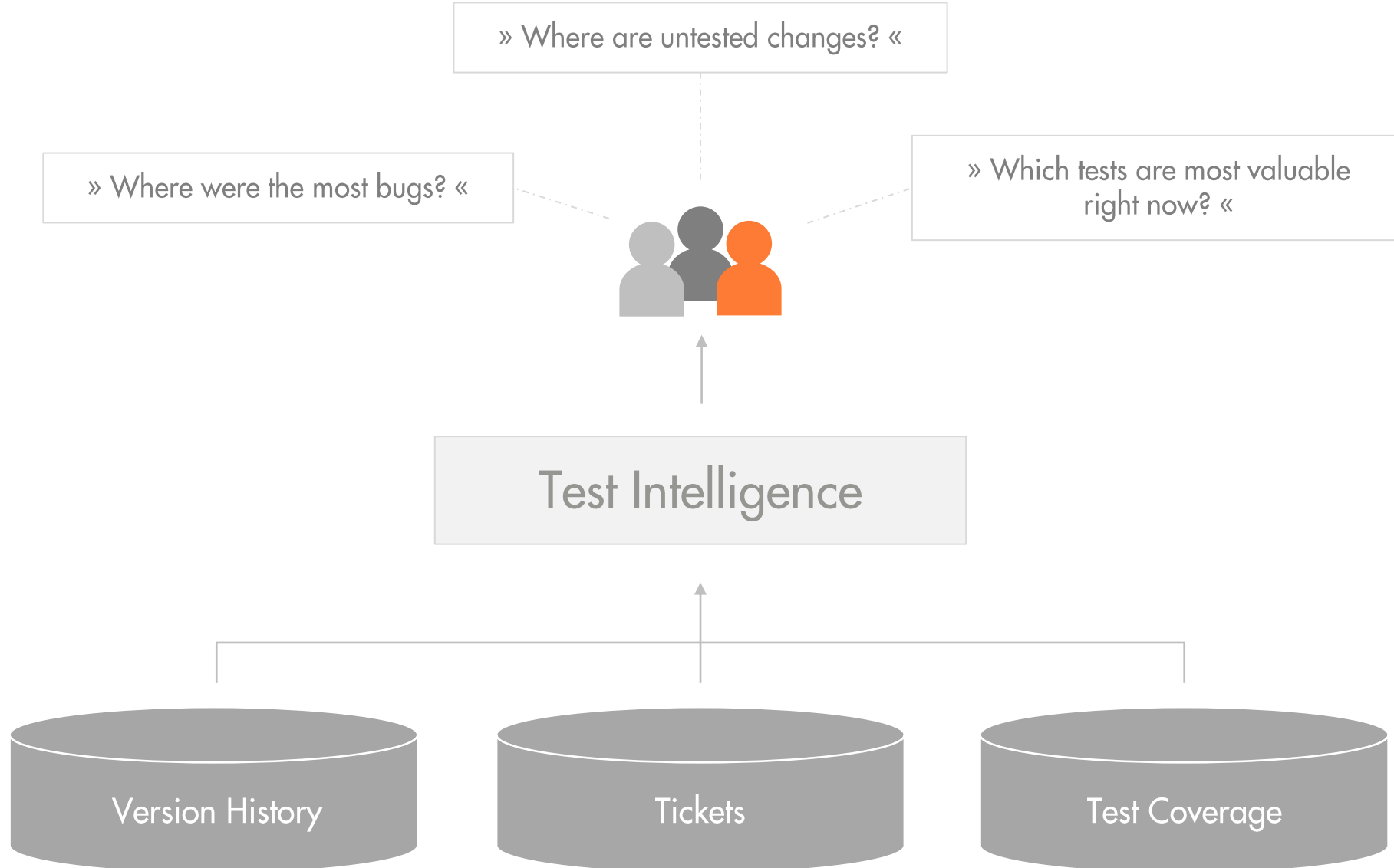


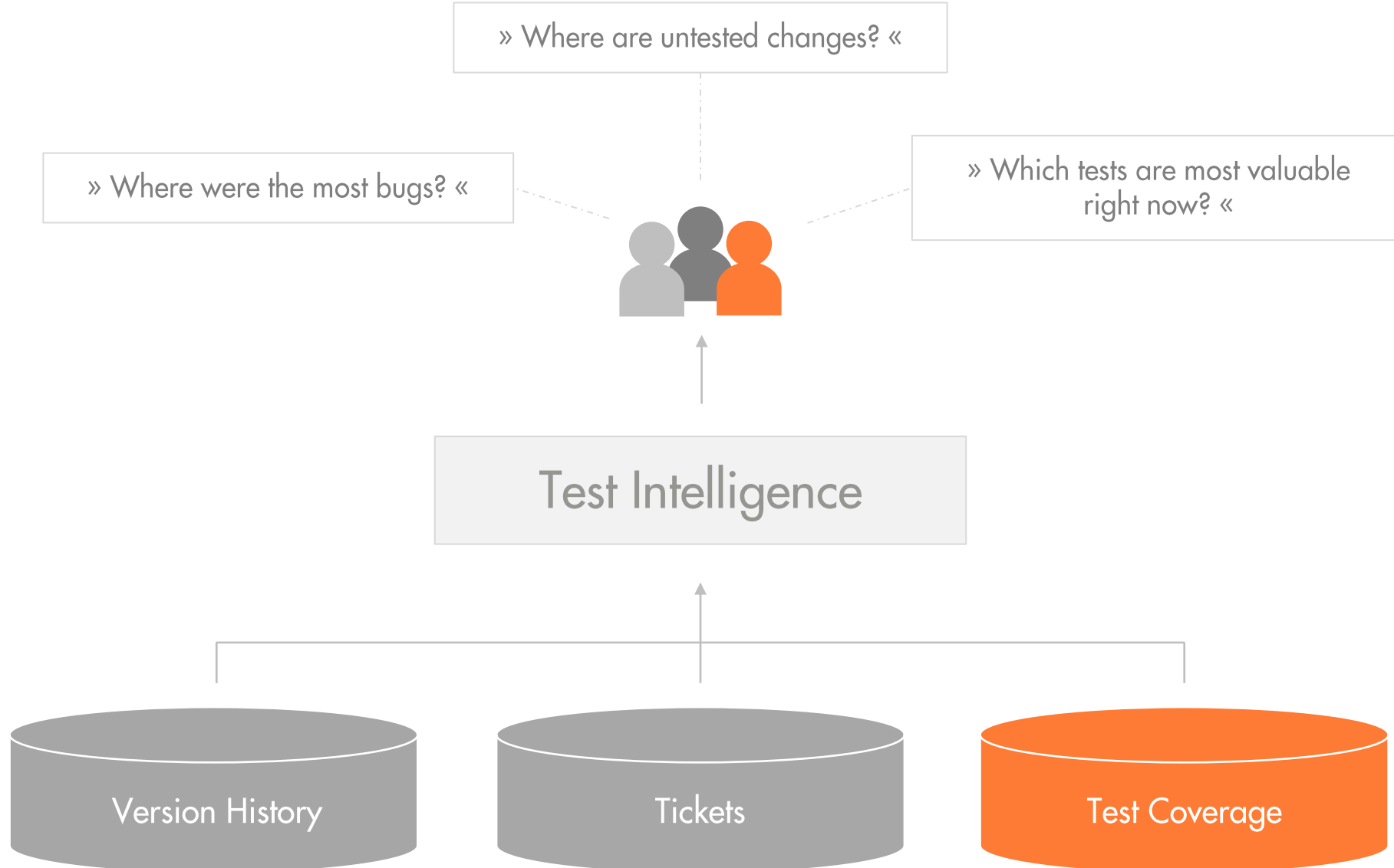




CQSE





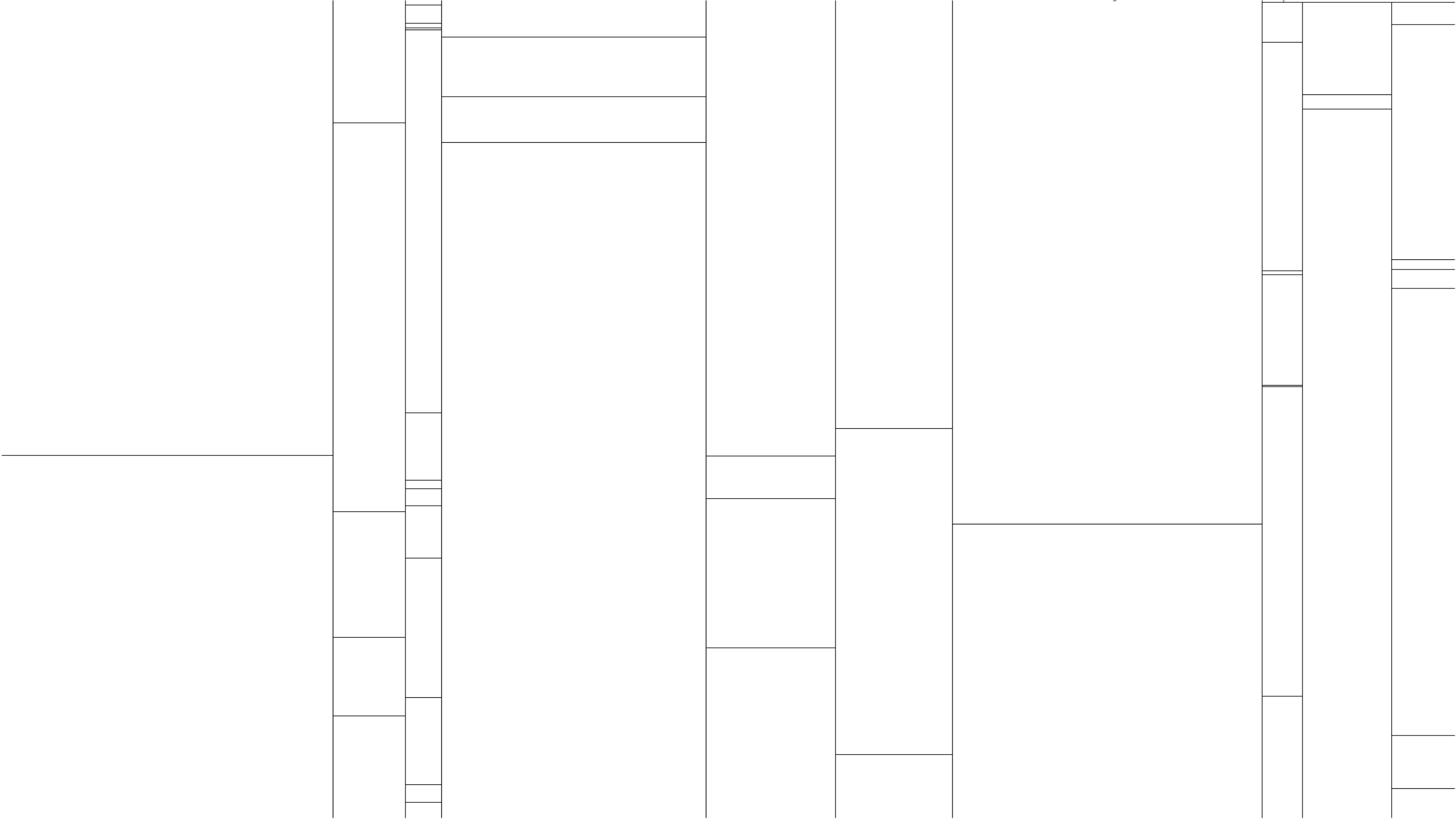


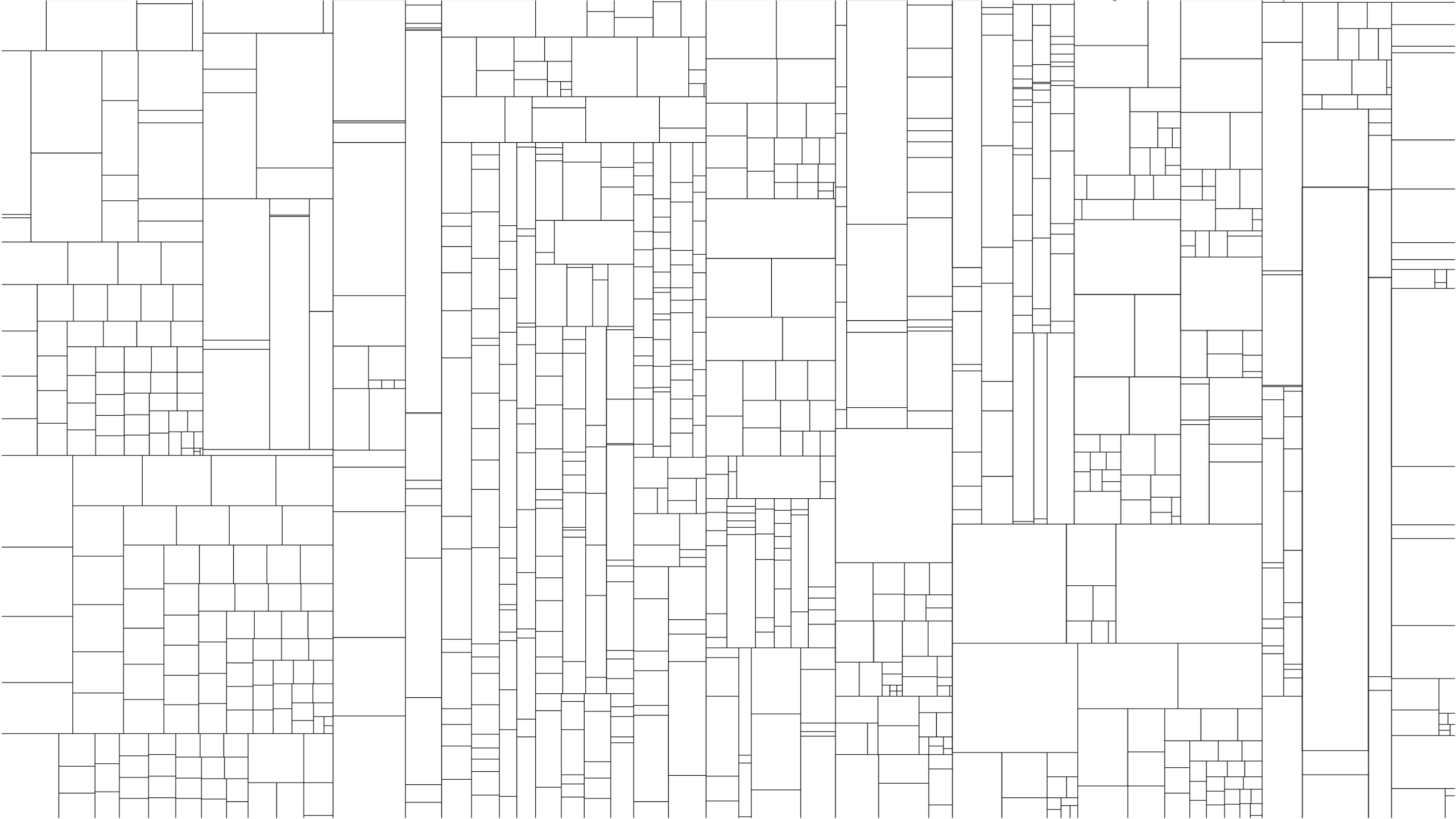


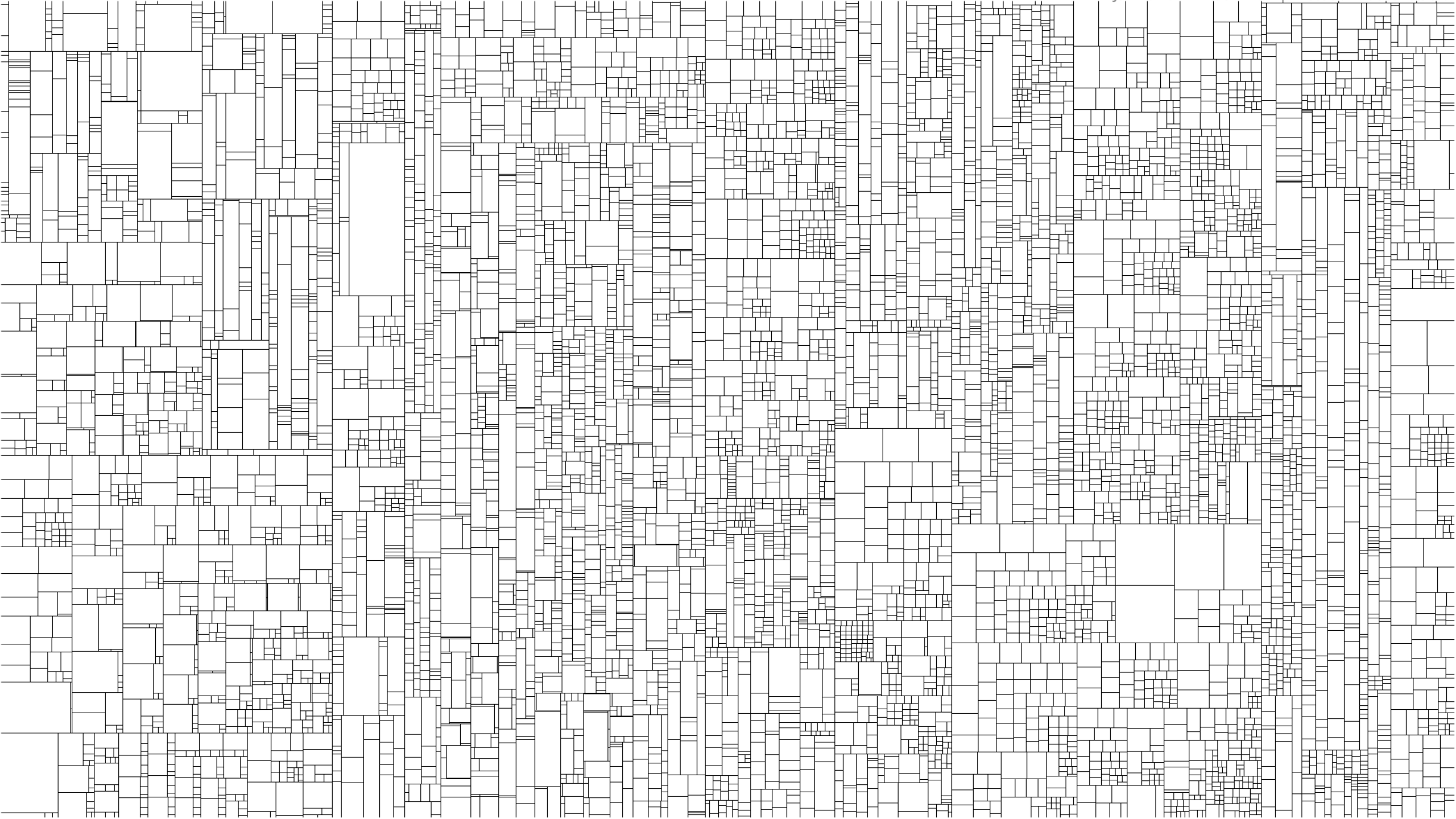
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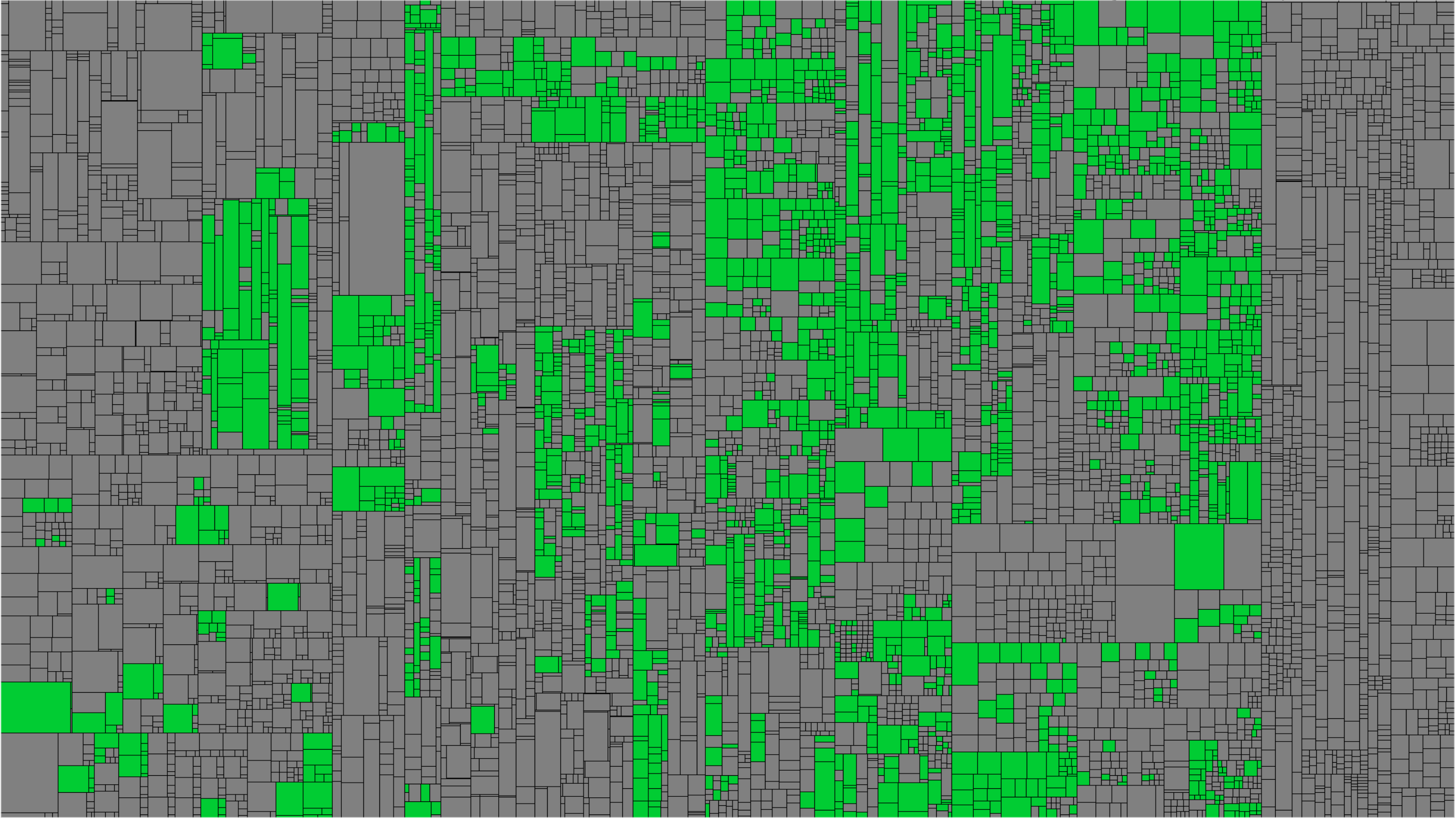
114
115    private static void createAndShowGUI(String[] args) {
116        assert calledOnEDT() : threadInfo();
117
118        Messages.setMsgHandler(new GUIMessageHandler());
119
120        // GlobalKeyboardWatch.showEventsSlowerThan(100, TimeUnit.MILLISECONDS);
121
122        Theme theme = Themes.DEFAULT;
123        // if a LaF was set from the command line, then don't override it
124        if (System.getProperty("swing.defaultlaf") == null) {
125            theme = AppPreferences.loadTheme();
126            Themes.install(theme, false, true);
127        }
128
129        int uiFontSize = AppPreferences.loadUIFontSize();
130        String uiFontType = AppPreferences.loadUIFontType();
131
132        Font defaultFont = UIManager.getFont("defaultFont");
133        if (defaultFont != null) { // if null, we don't know how to set the font
134            if (uiFontSize != 0 || !uiFontType.isEmpty()) {
135                Font newFont;
136                if (!uiFontType.isEmpty()) {
137                    newFont = new Font(uiFontType, Font.PLAIN, uiFontSize);
138                } else {
139                    newFont = defaultFont.deriveFont((float) uiFontSize);
140                }
141
142                FontUIResource fontUIResource = new FontUIResource(newFont);
143                UIManager.put("defaultFont", fontUIResource);
144
145                if (theme.isNimbus()) {
146                    UIManager.getLookAndFeel().getDefaults().put("defaultFont", fontUIResource);
147                }
148            }
149        }
150
151        var pw = PixelitorWindow.get();
152        Dialogs.setMainWindowInitialized(true);
153
154        // Just to make 100% sure that at the end of GUI
155        // initialization the focus is not grabbed by
156        // a textfield and the keyboard shortcuts work properly
157        FgBgColors.getGUI().requestFocus();
158
159        TipsOfTheDay.showTips(pw, false);
160
161        MouseZoomMethod.load();
162        PanMethod.load();
163
164        // The IO-intensive preloading of fonts is scheduled
165        // to run after all the files have been opened,
166        // and on the same IO thread
167        openCLFilesAsync(args)
168            .exceptionally(throwable -> null) // recover
169            .thenAcceptAsync(v -> afterStartTestActions(), onEDT)
170            .thenRunAsync(Utils::preloadFontNames, onIOThread)
171            .exceptionally(Messages::showExceptionOnEDT);
172    }
173

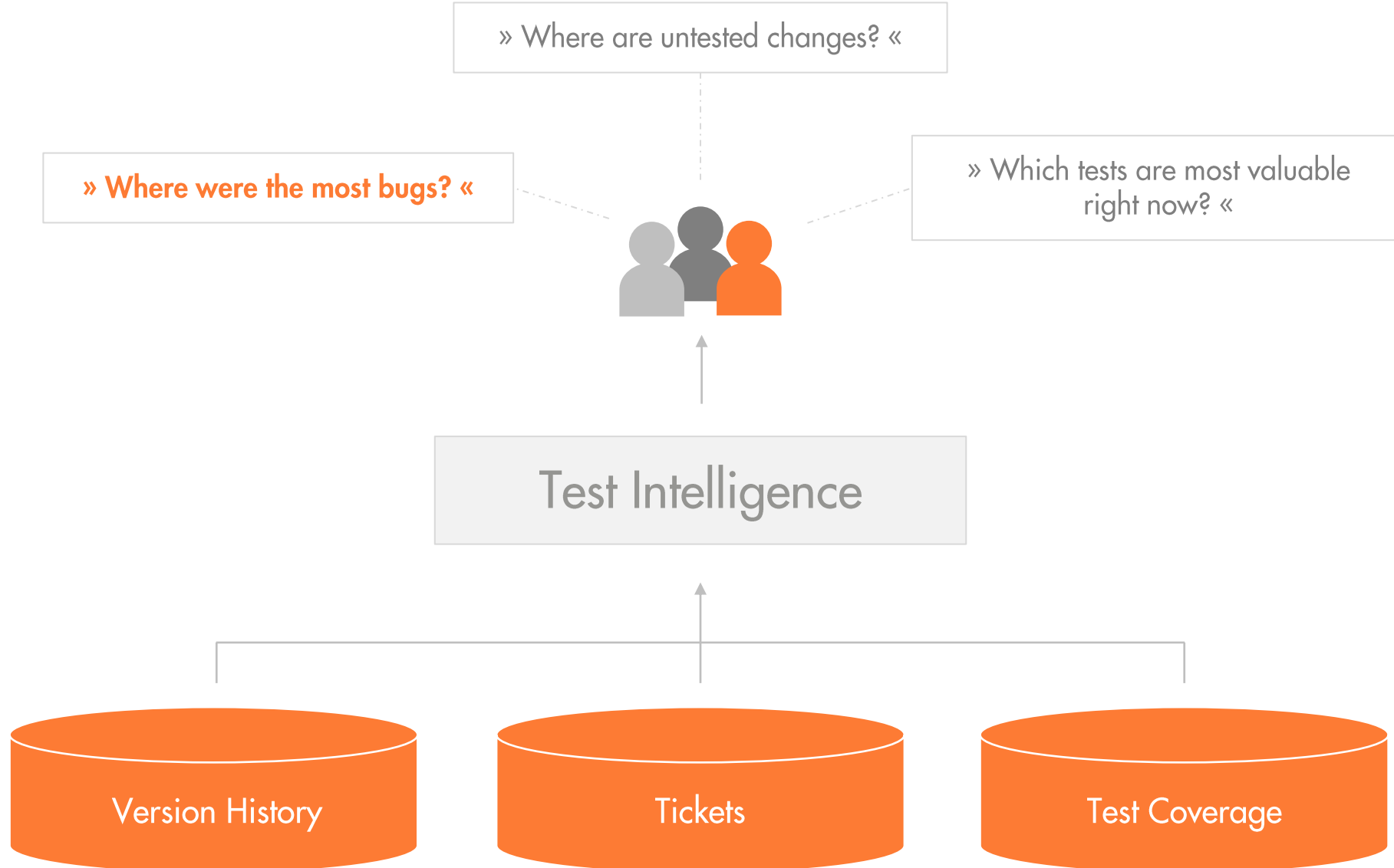
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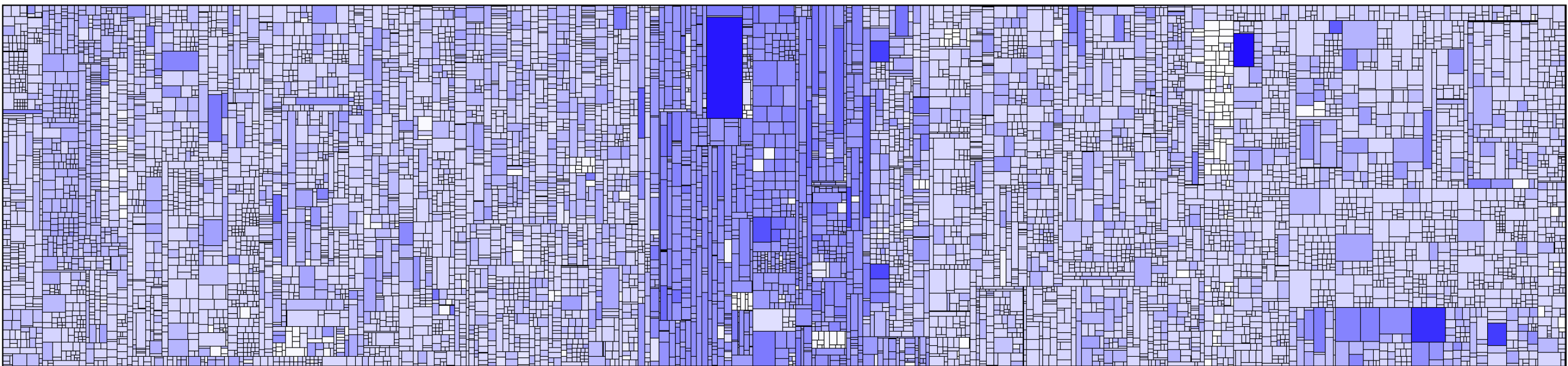


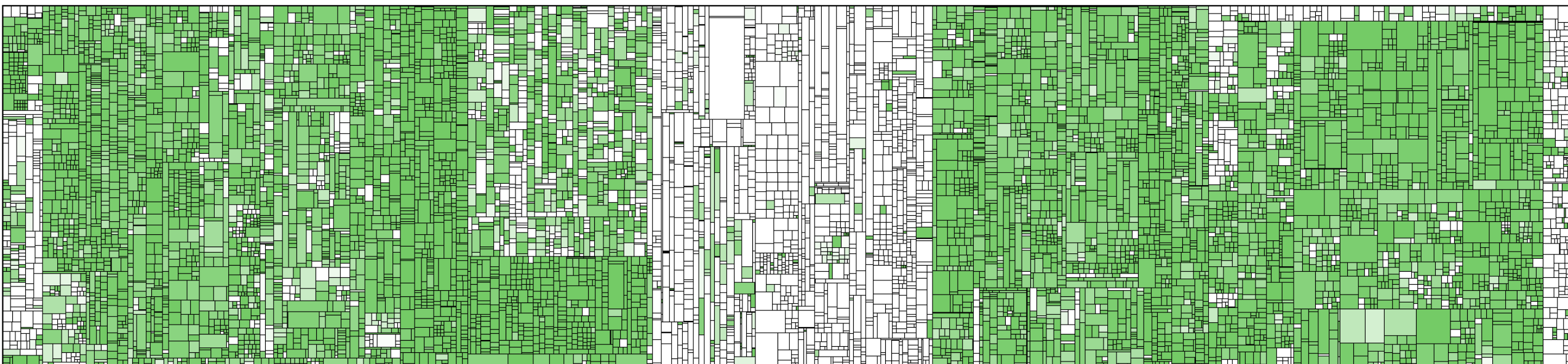


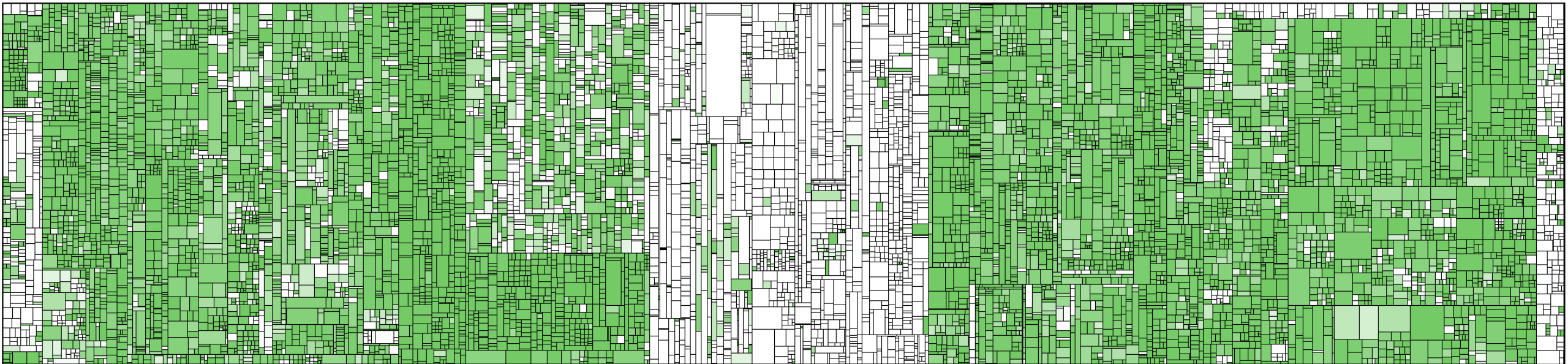
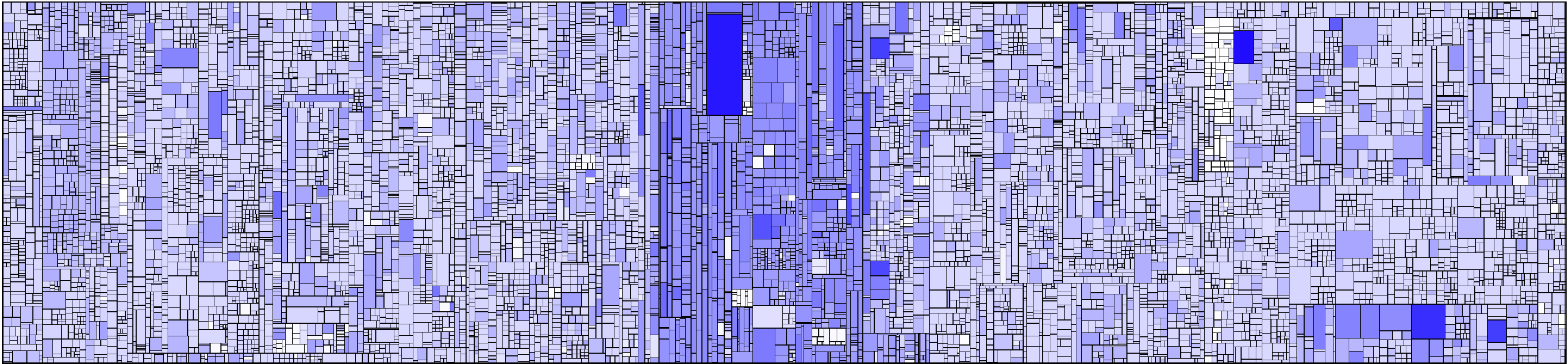


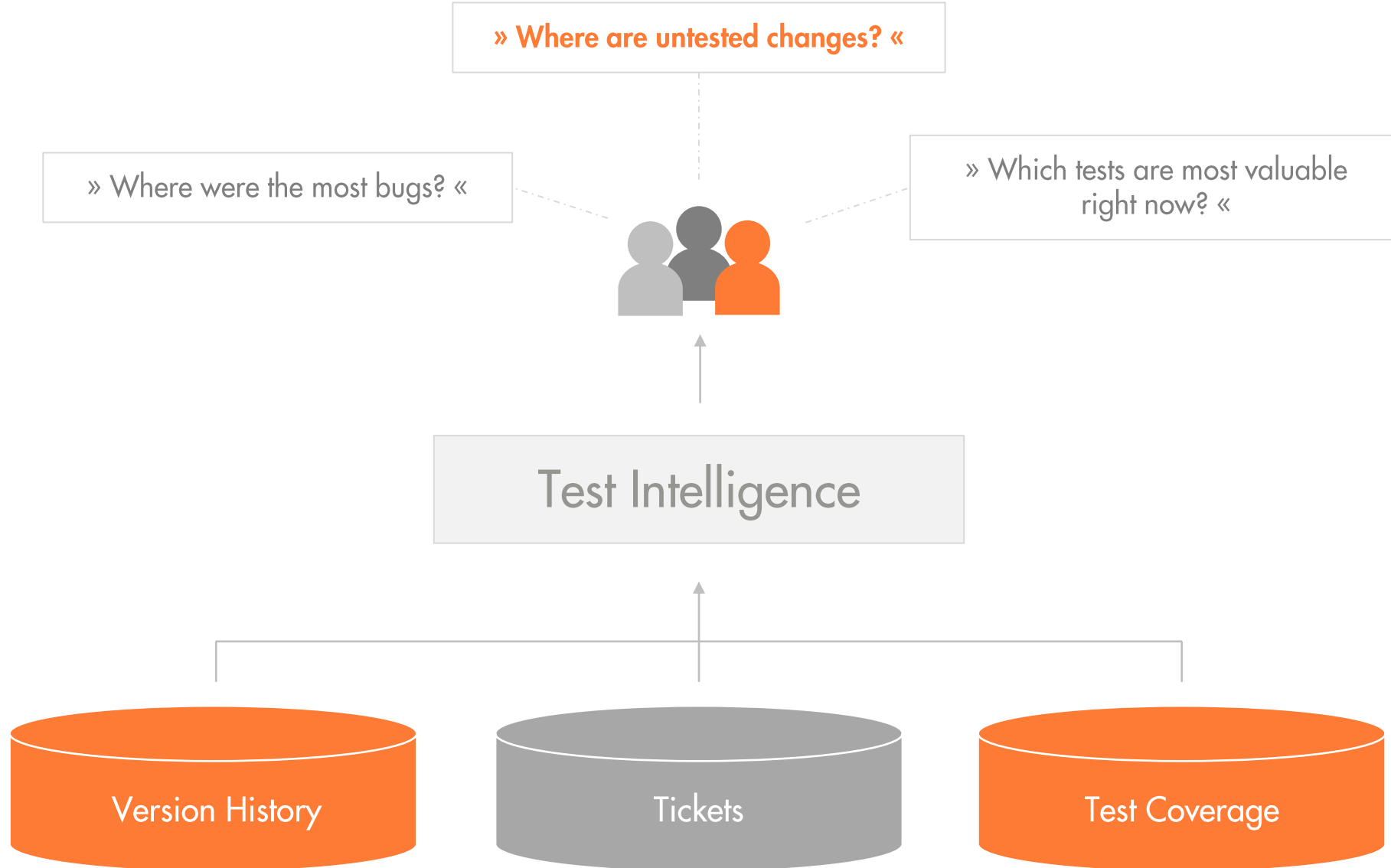




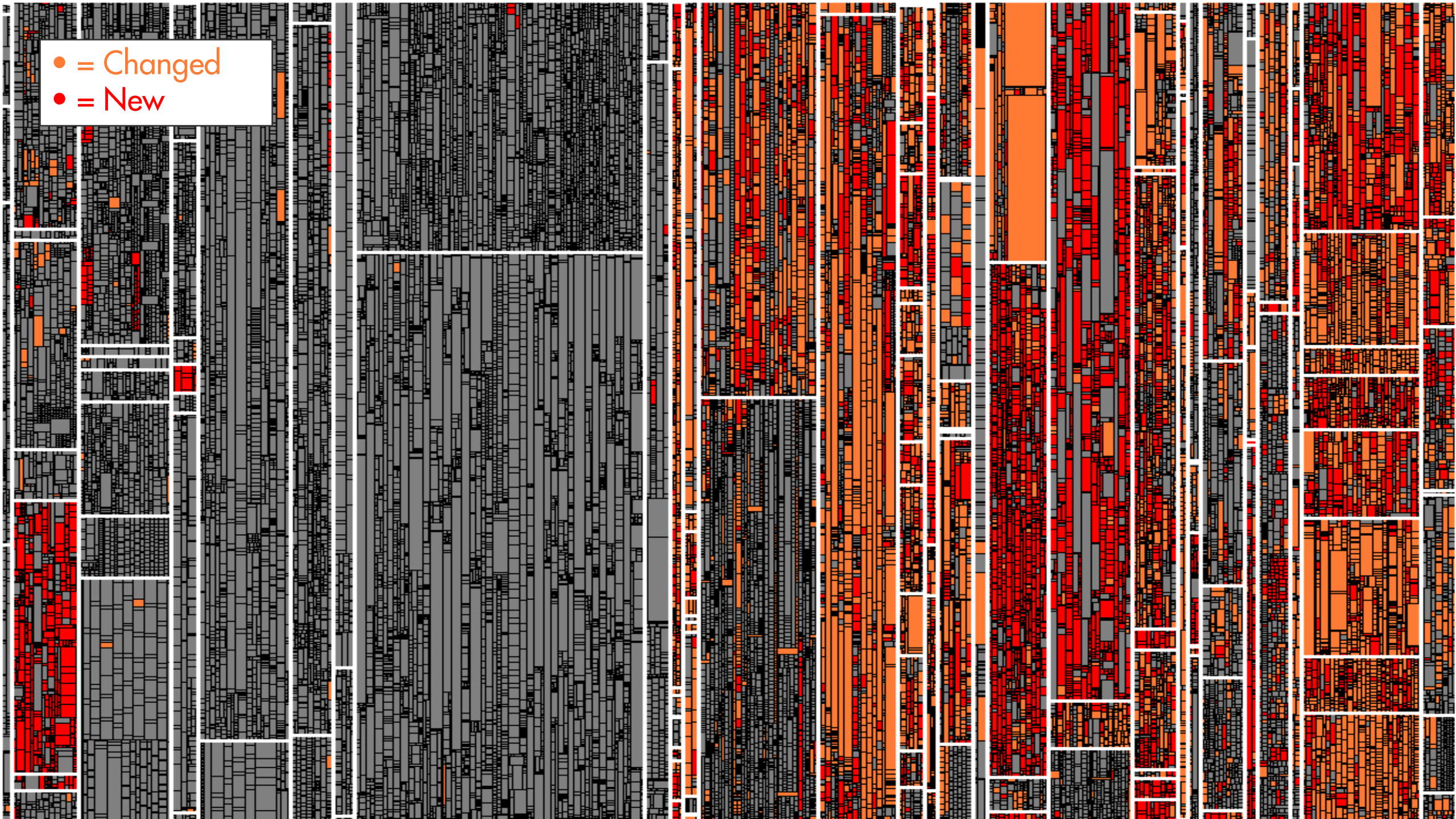




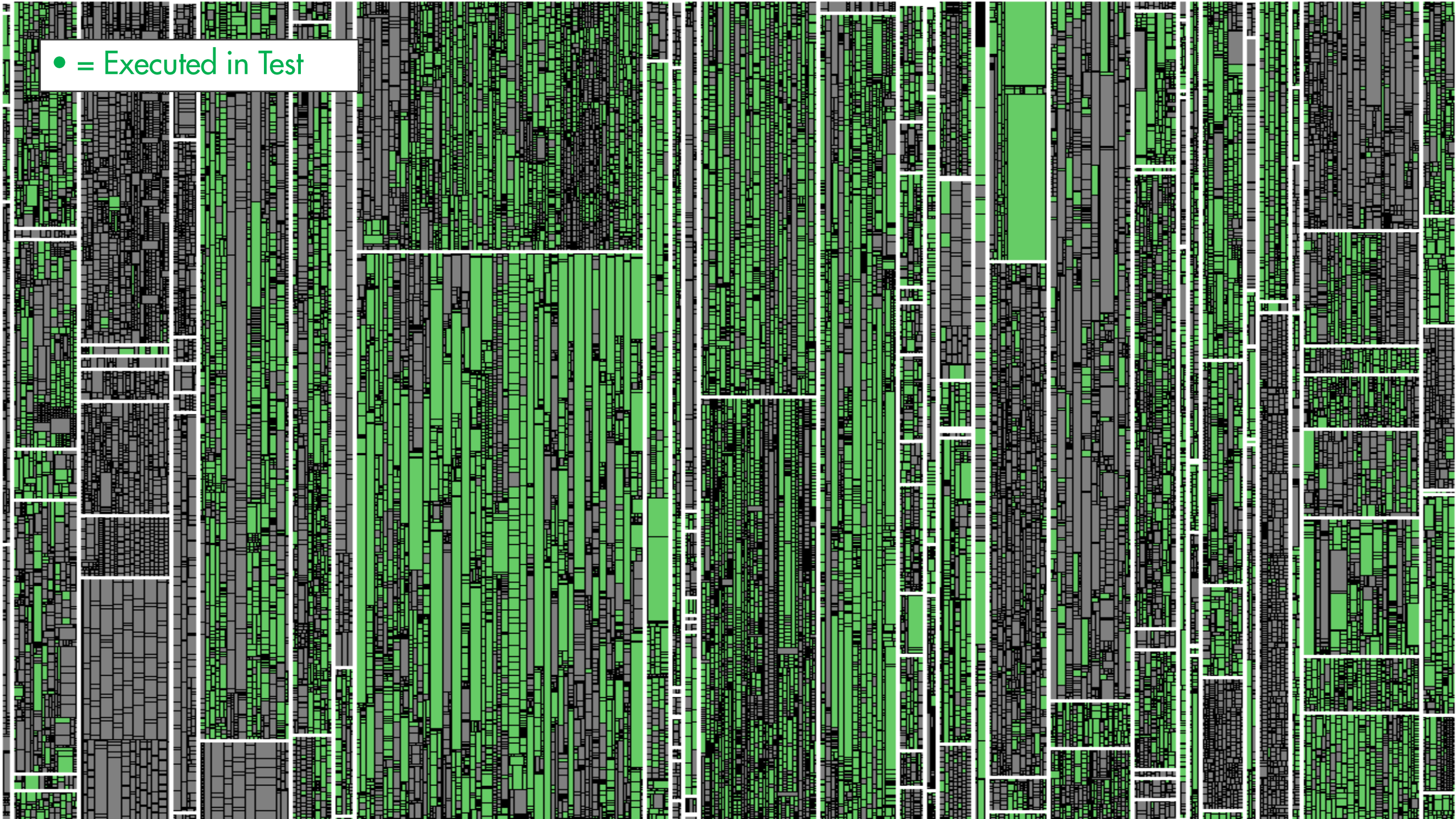




- = Changed
- = New

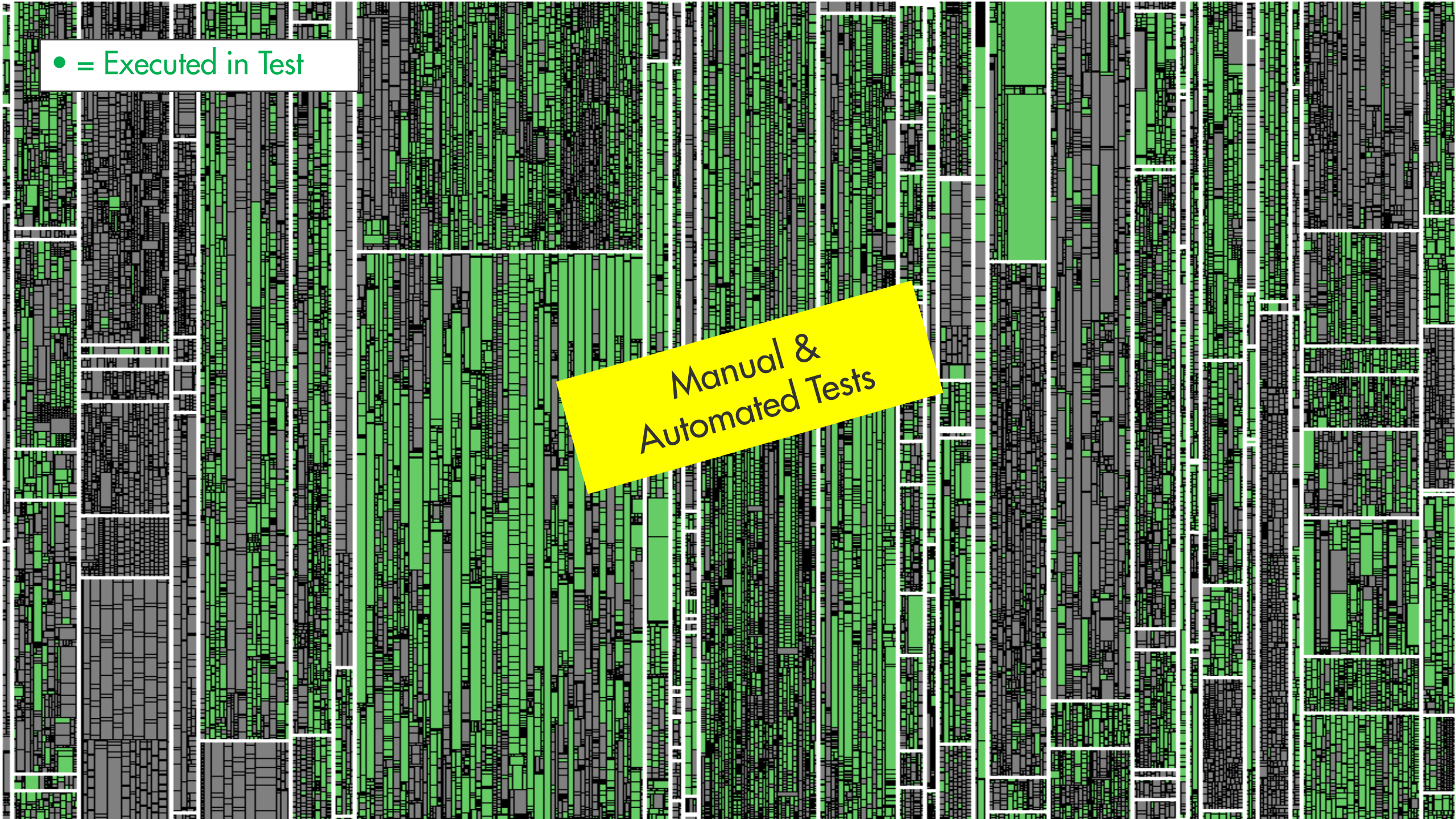


• = Executed in Test

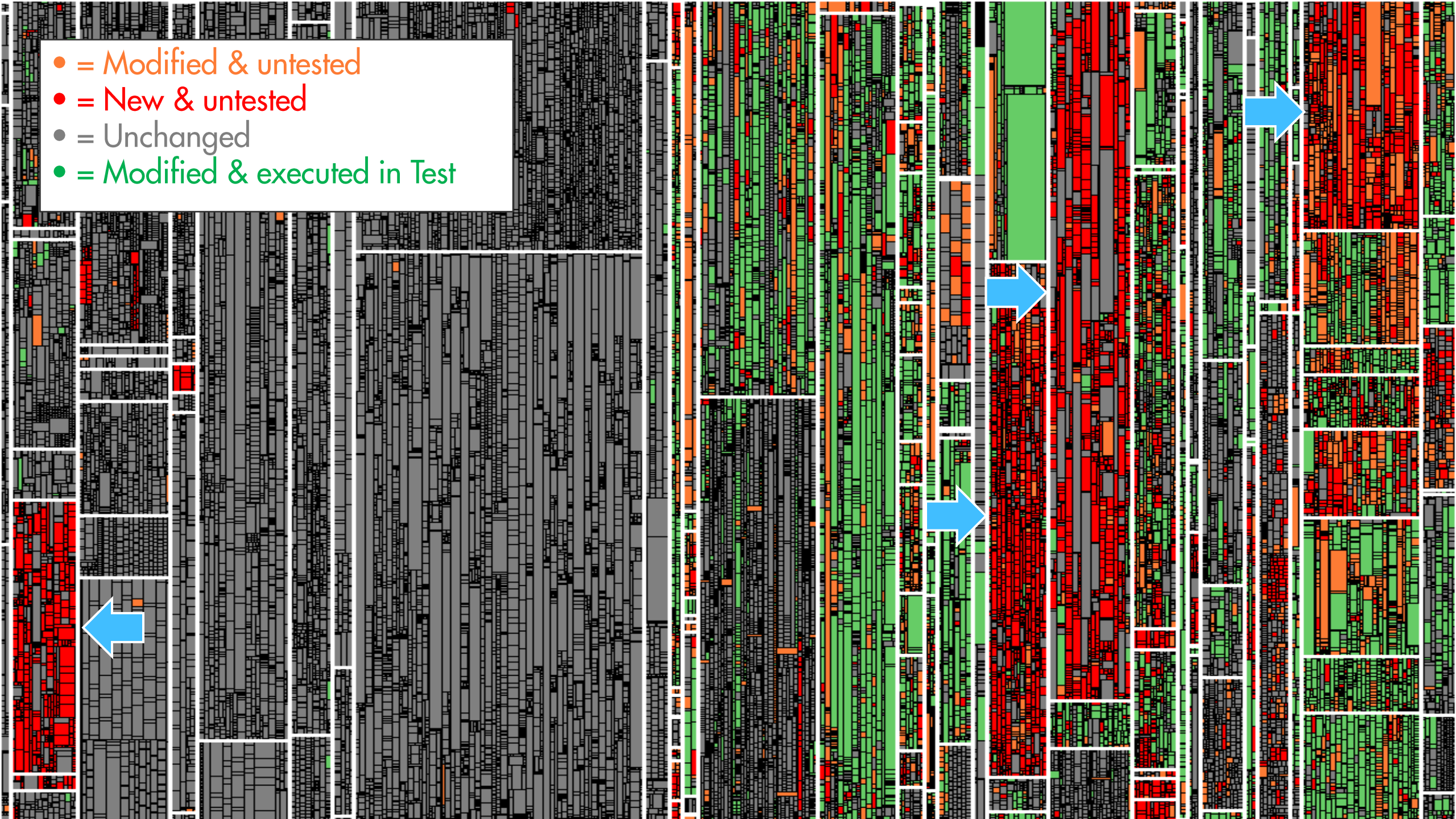


• = Executed in Test

Manual &
Automated Tests



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



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%

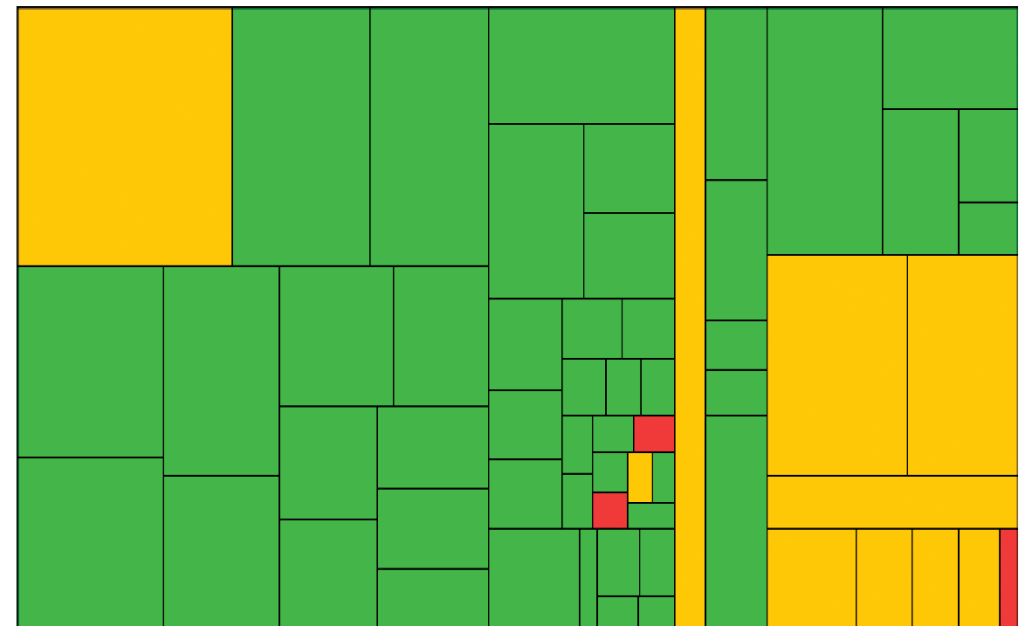
Done **Issue TS-14733 - Remove Dataflow blocks**

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		

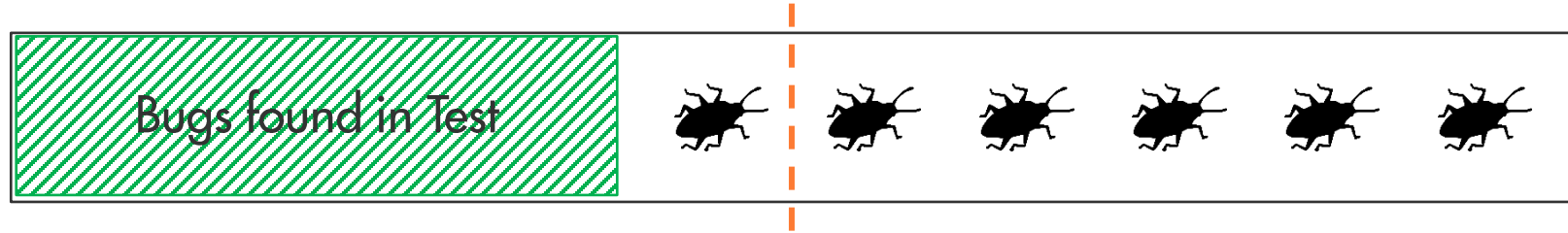
Aug 15 2018 12:37–Now | Test Gap: 22%



Reduced Production Bugs = **50%**

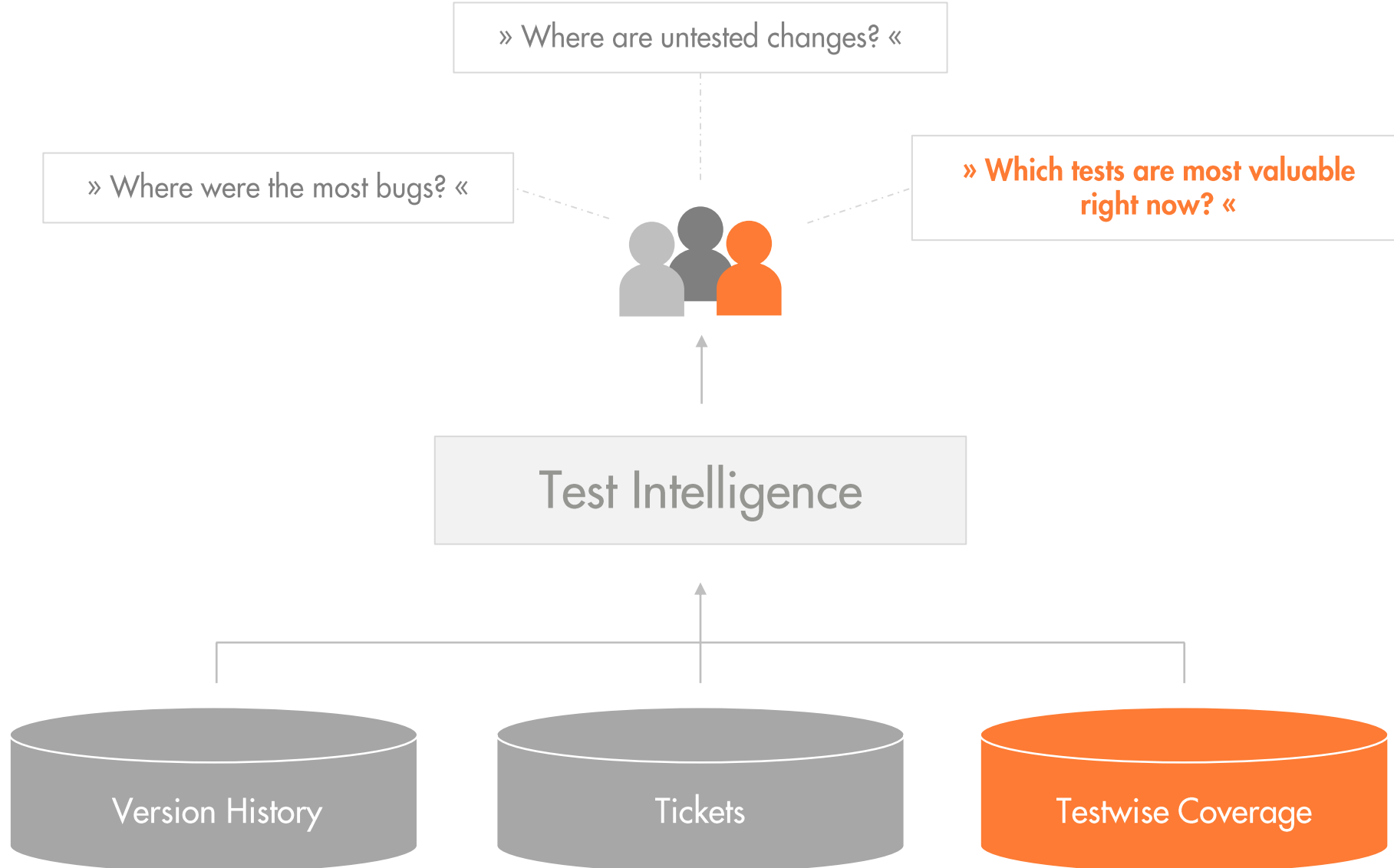
Test-Gap-Analysis reduced production bugs in the applications of Munich Re by ½

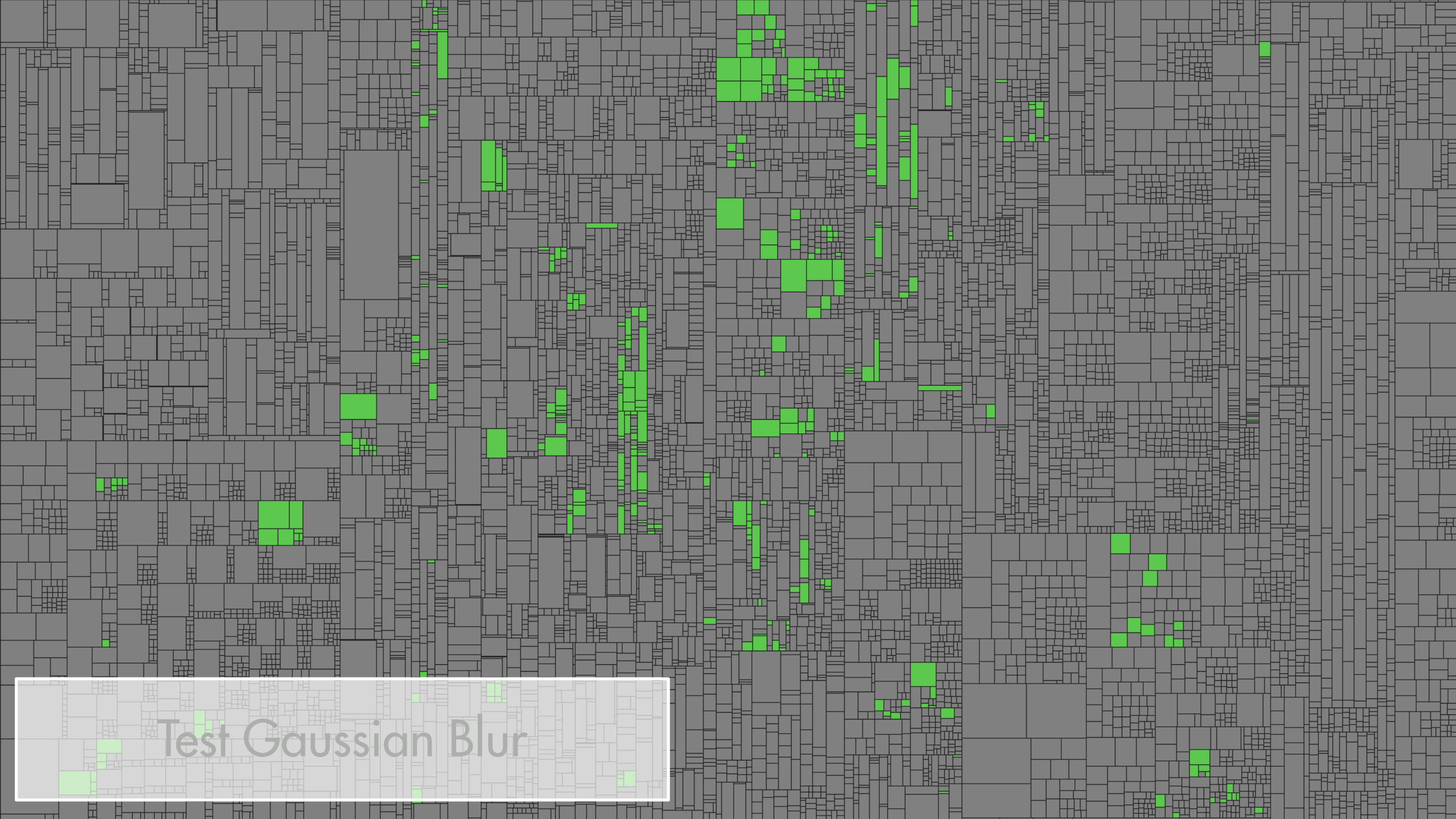
%Remaining Bugs = 60%



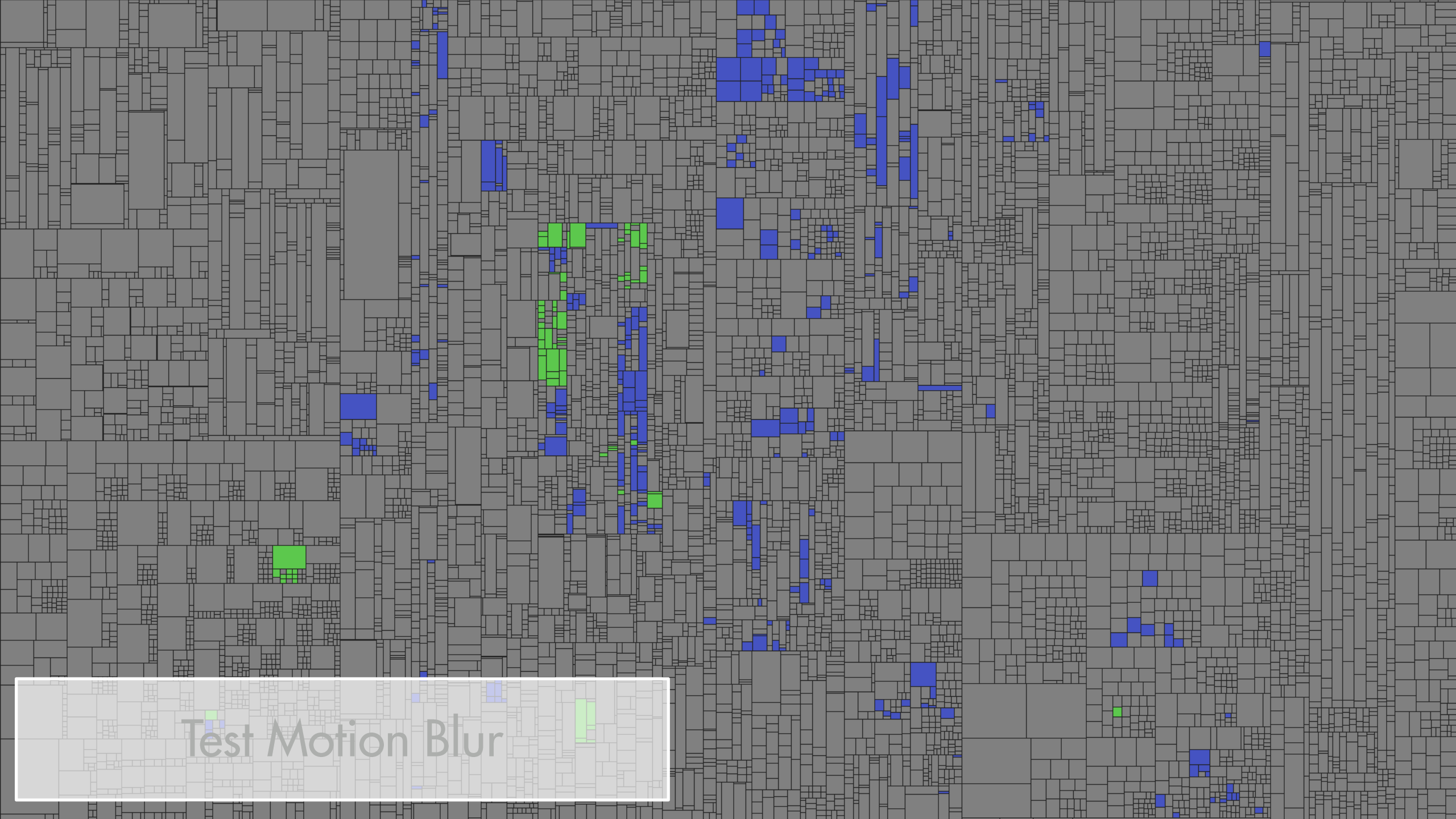
%Remaining Bugs = 28%



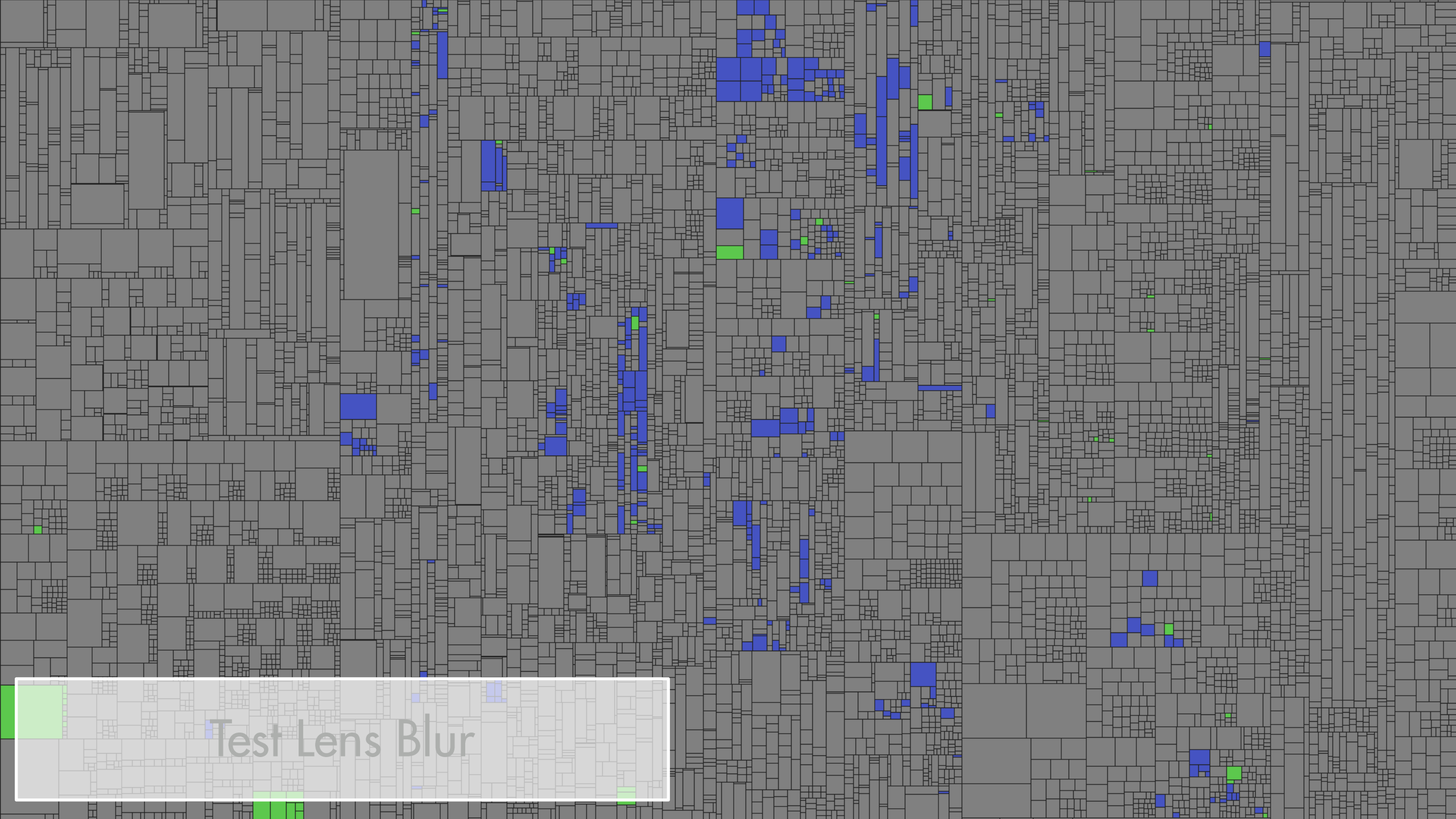




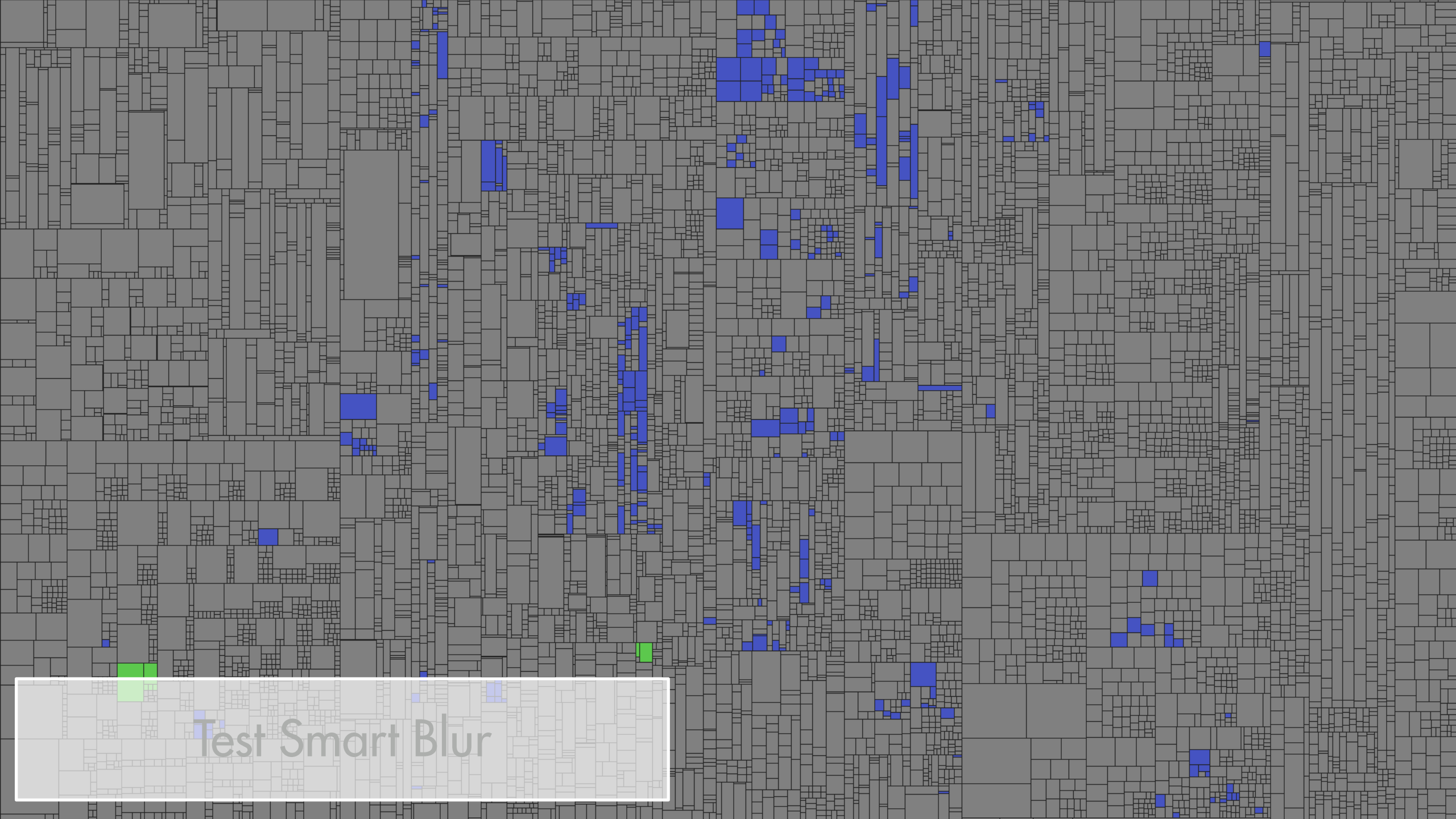
Test Gaussian Blur



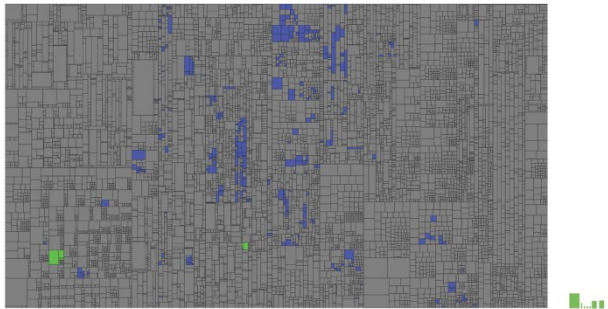
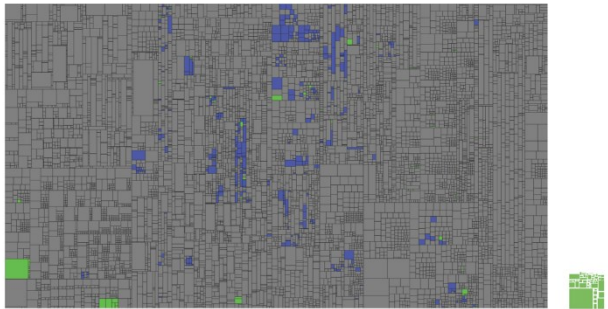
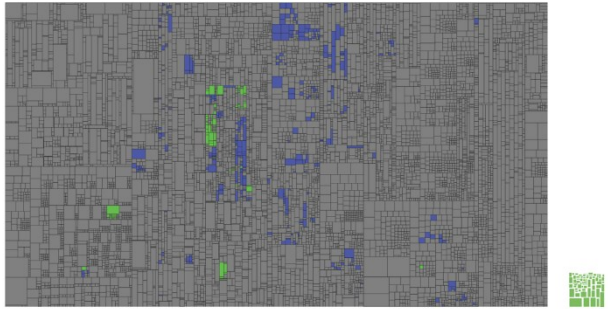
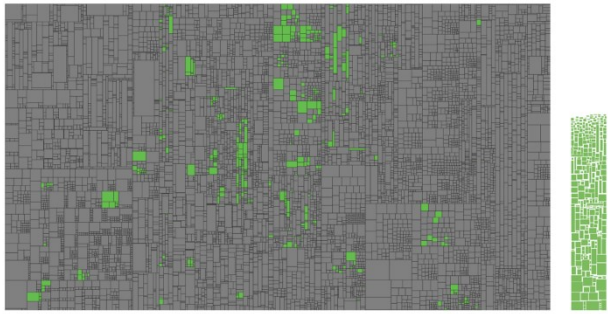
Test Motion Blur



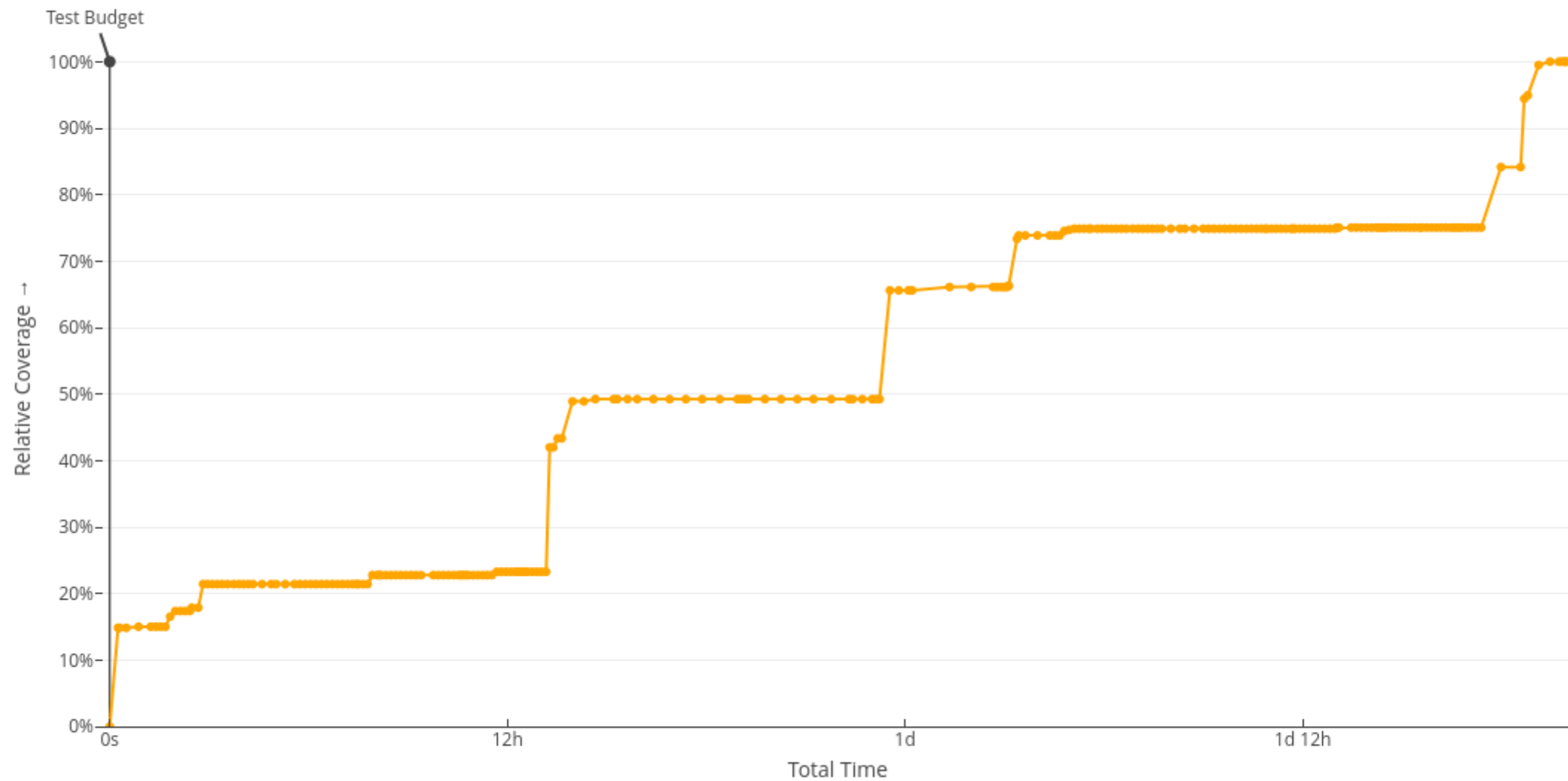
Test Lens Blur



Test Smart Blur



Coverage over Time ?

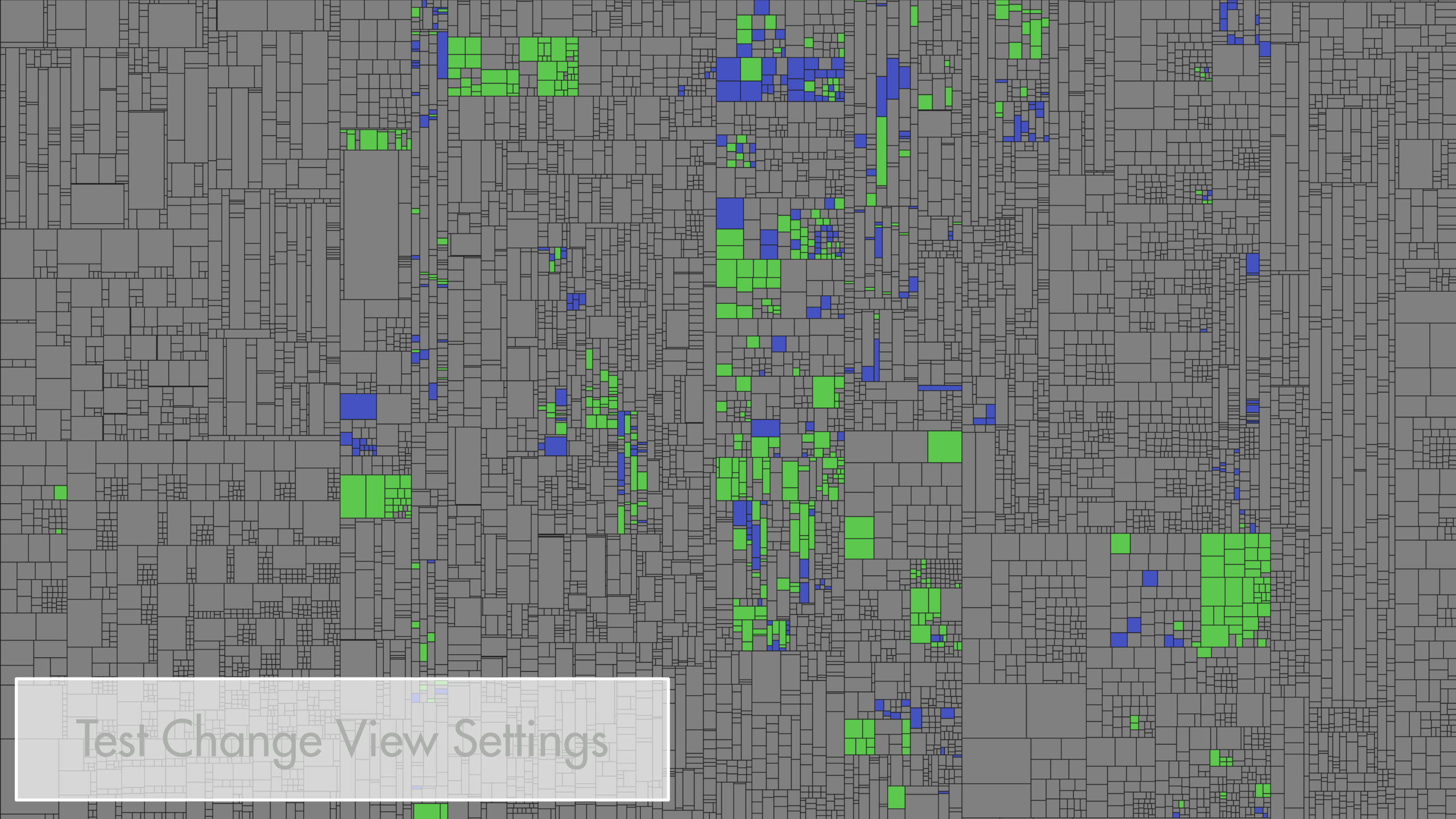


Results for Test Query & Budget Restriction

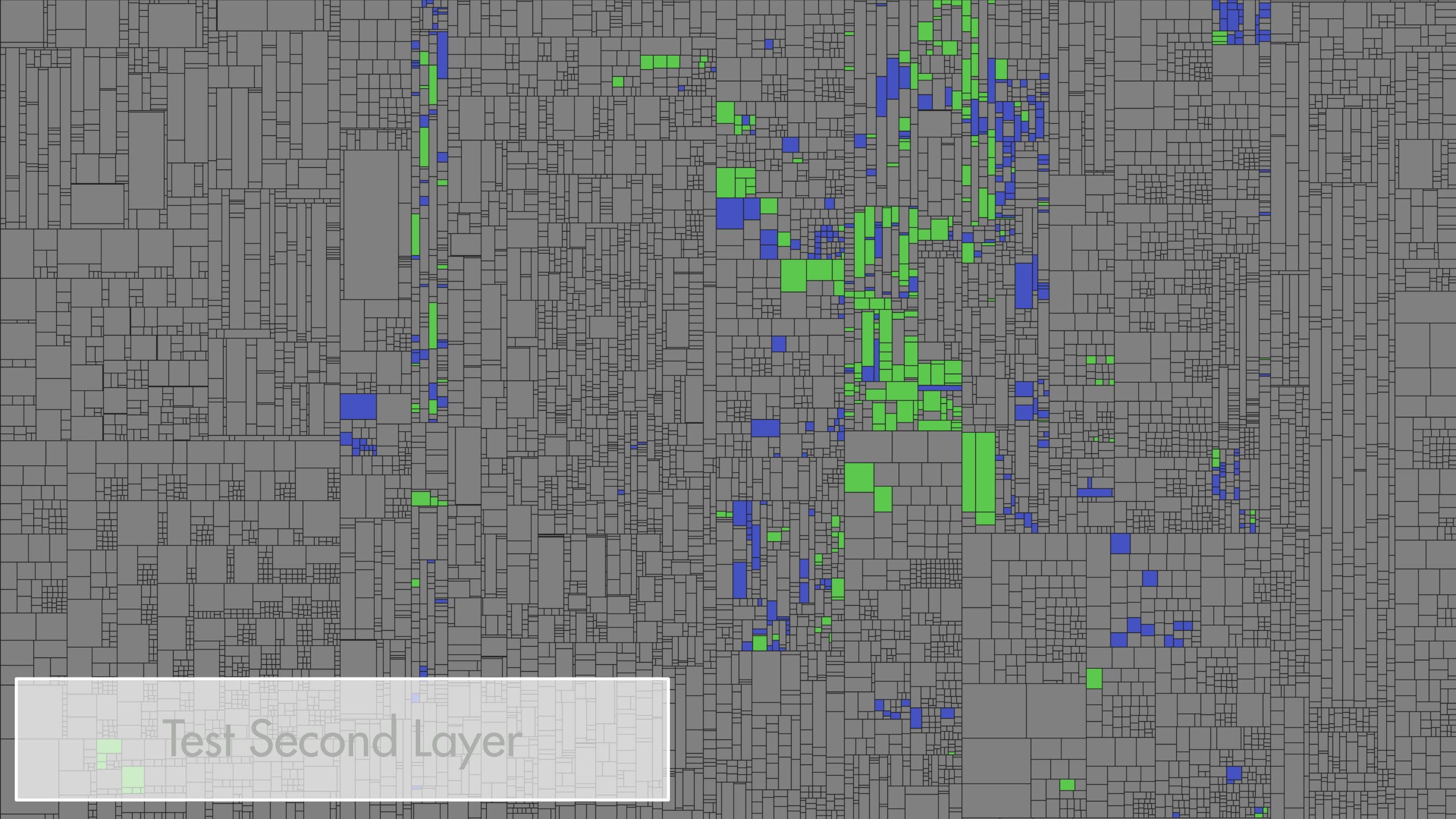
Relative Coverage: 0%, Selected Tests: 0 out of 236 (0%)



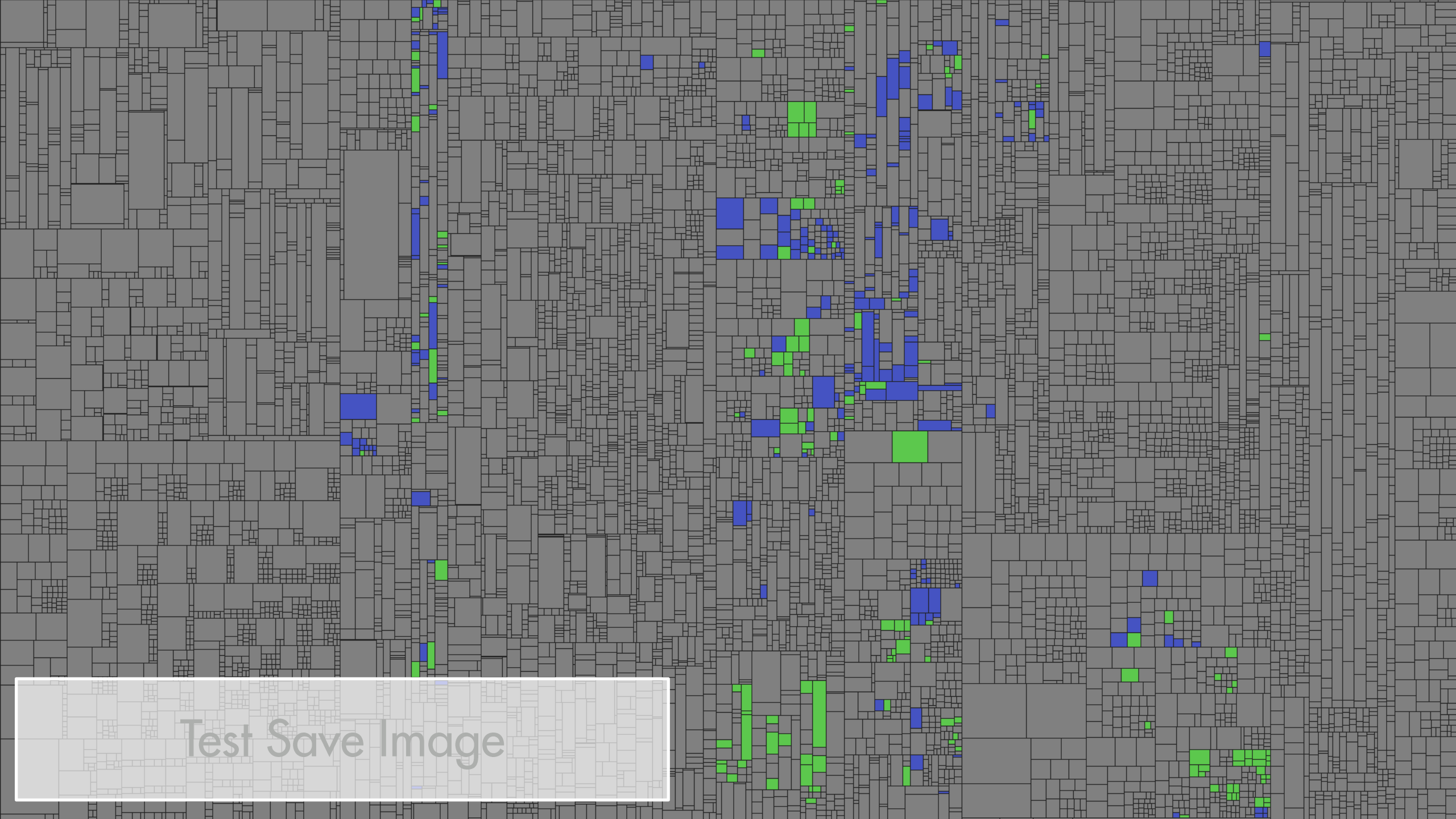
Test Create and Modify
Selection



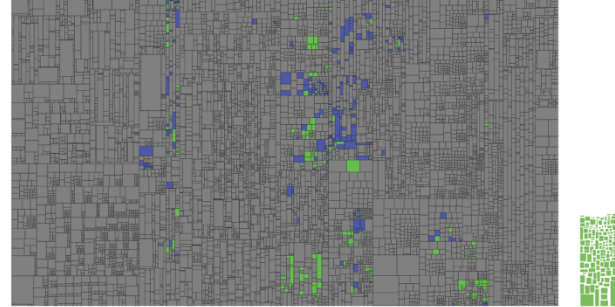
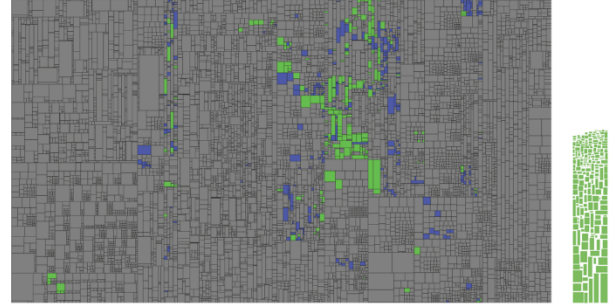
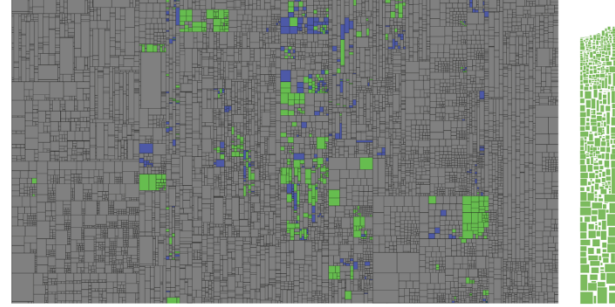
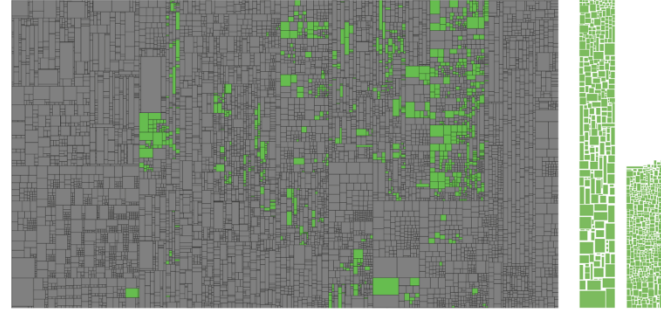
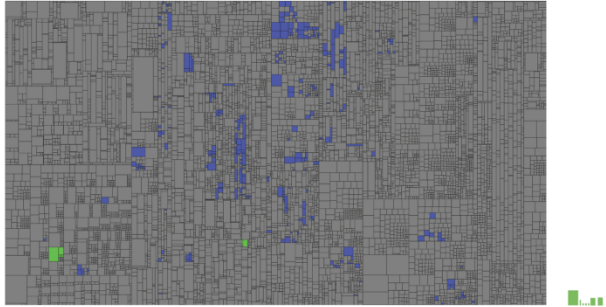
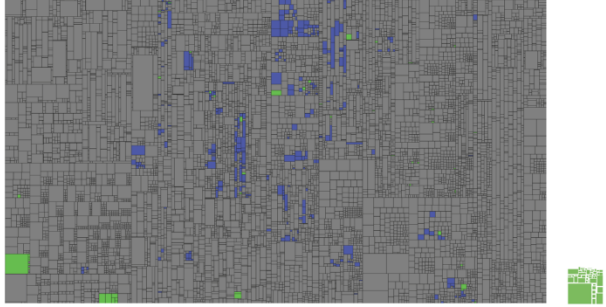
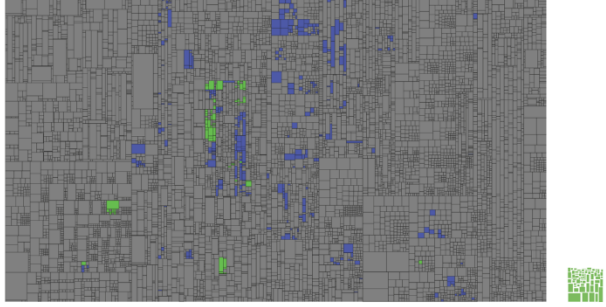
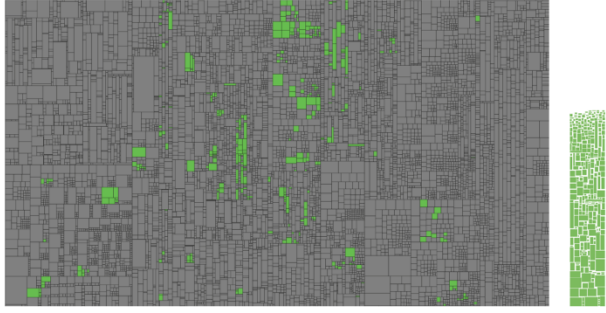
Test Change View Settings



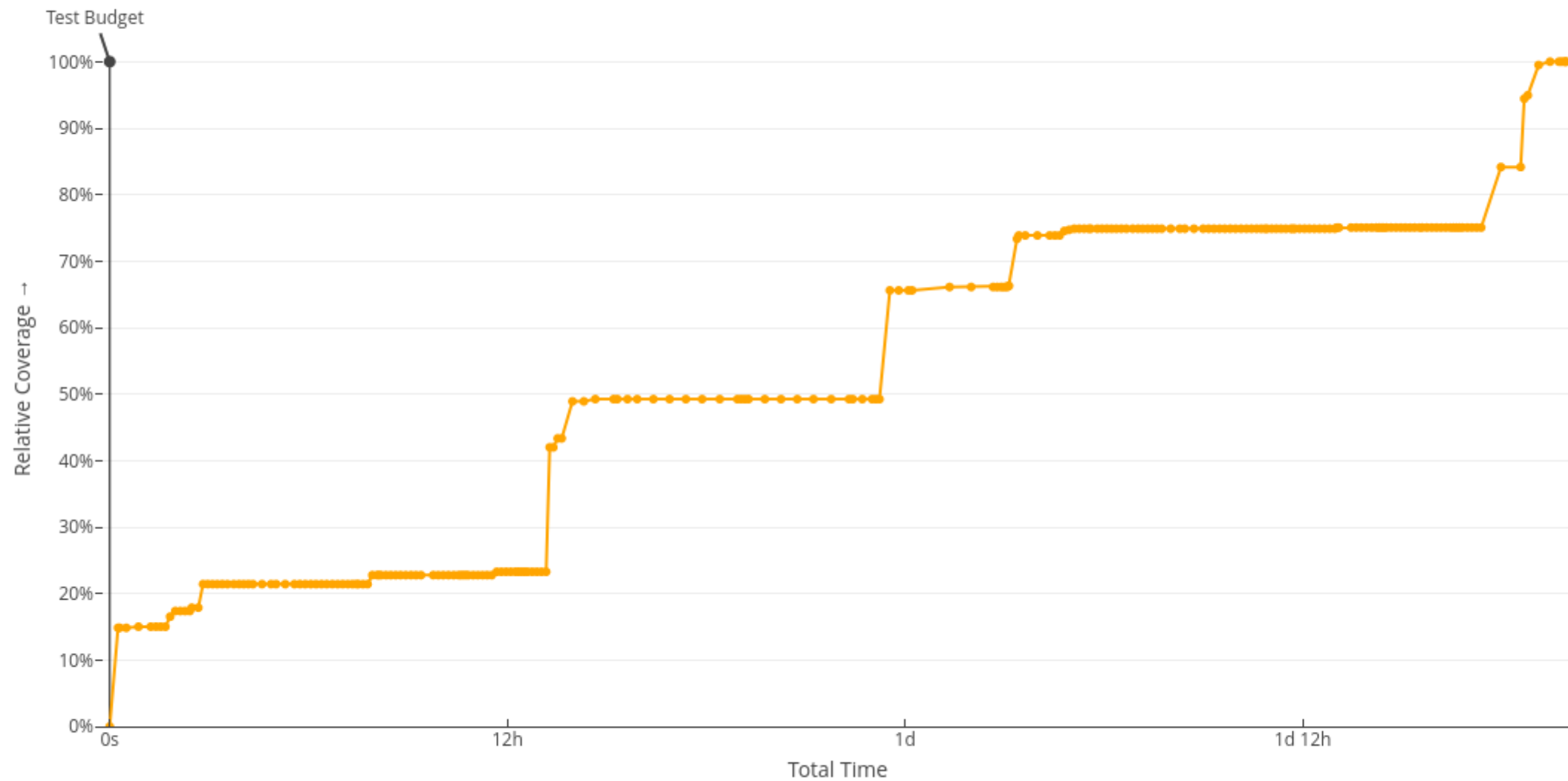
Test Second Layer



Test Save Image



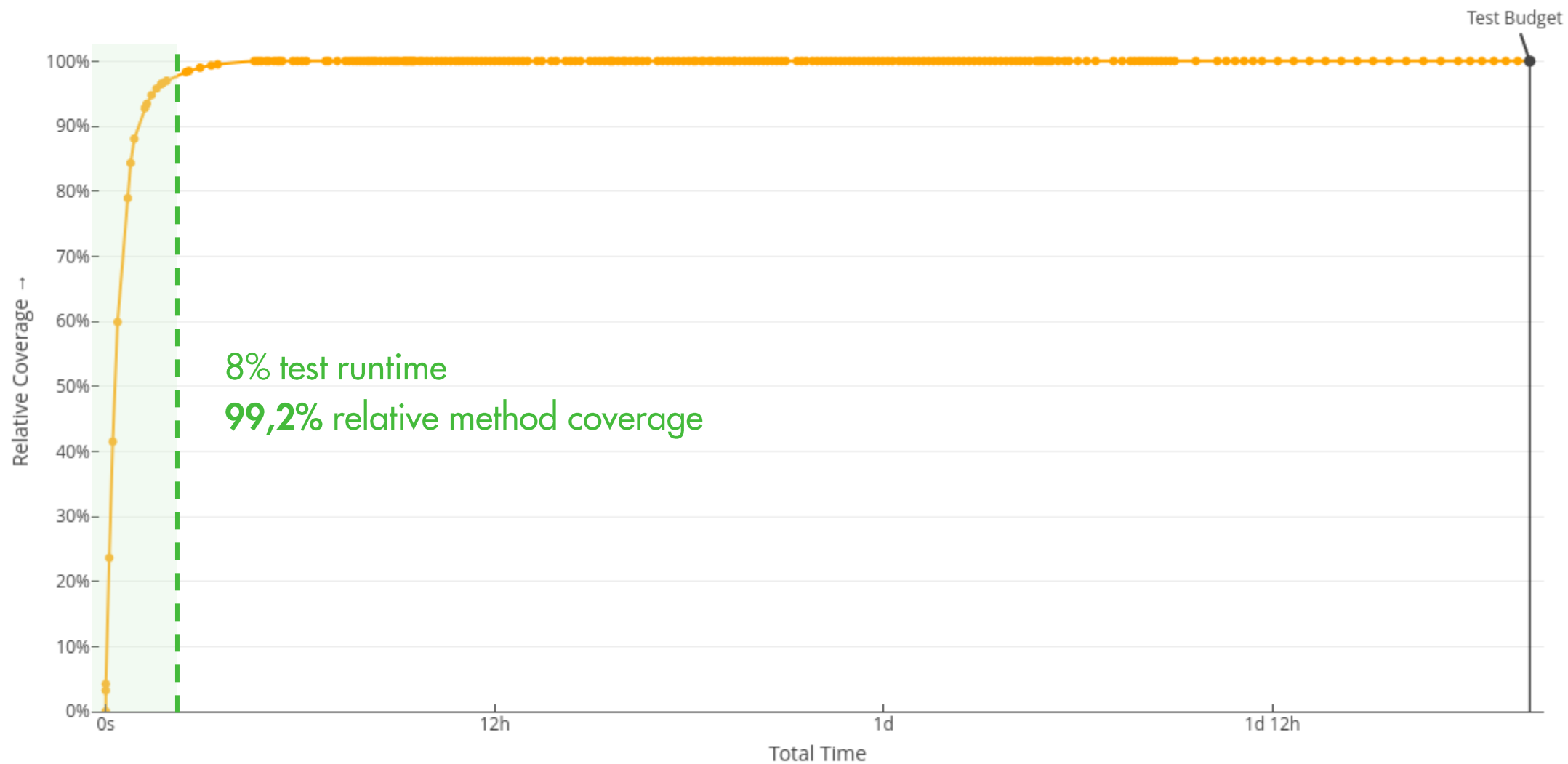
Coverage over Time ?



Results for Test Query & Budget Restriction

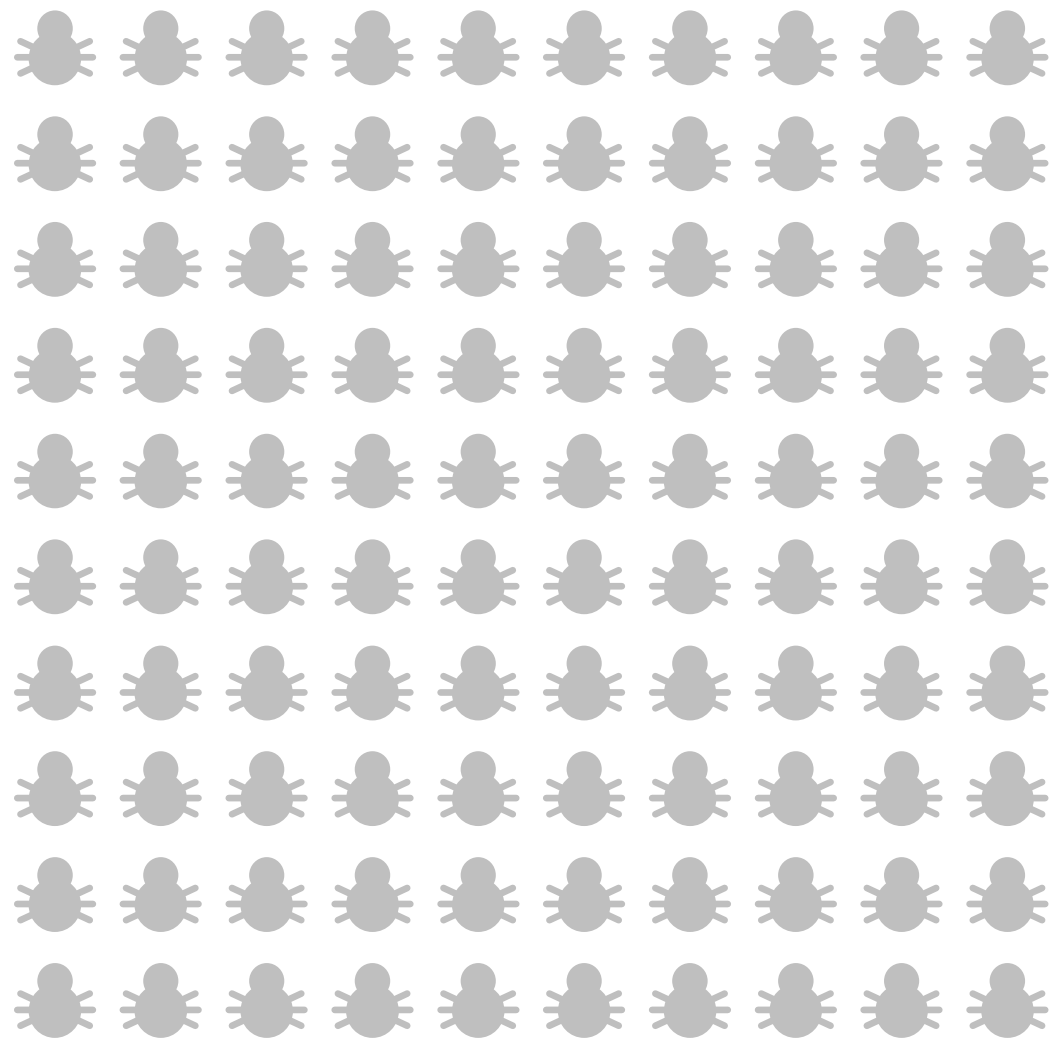
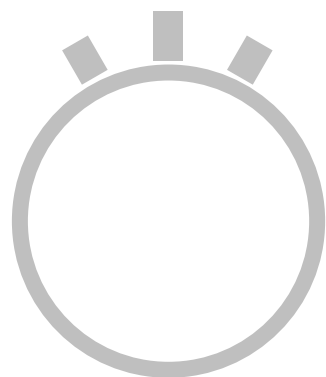
Relative Coverage: 0%, Selected Tests: 0 out of 236 (0%)

Coverage over Time ?

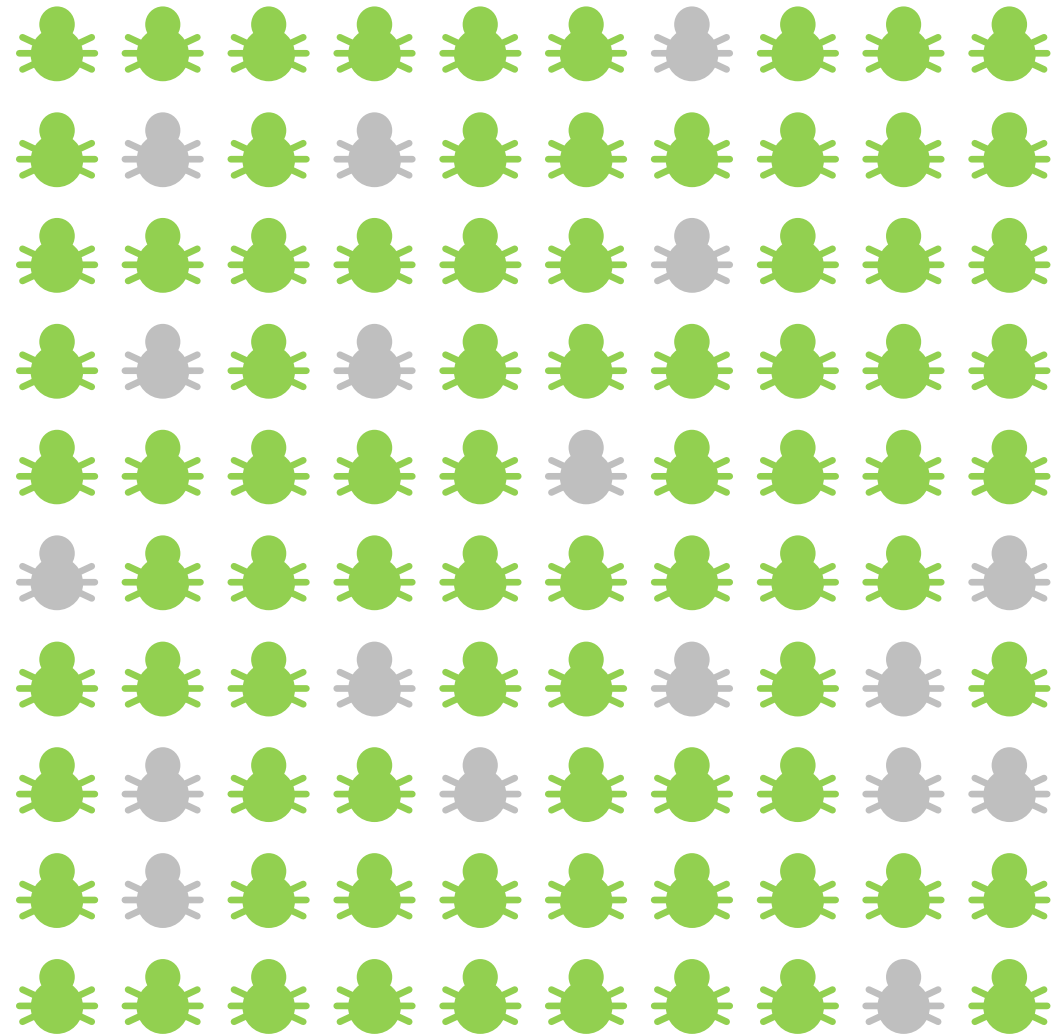


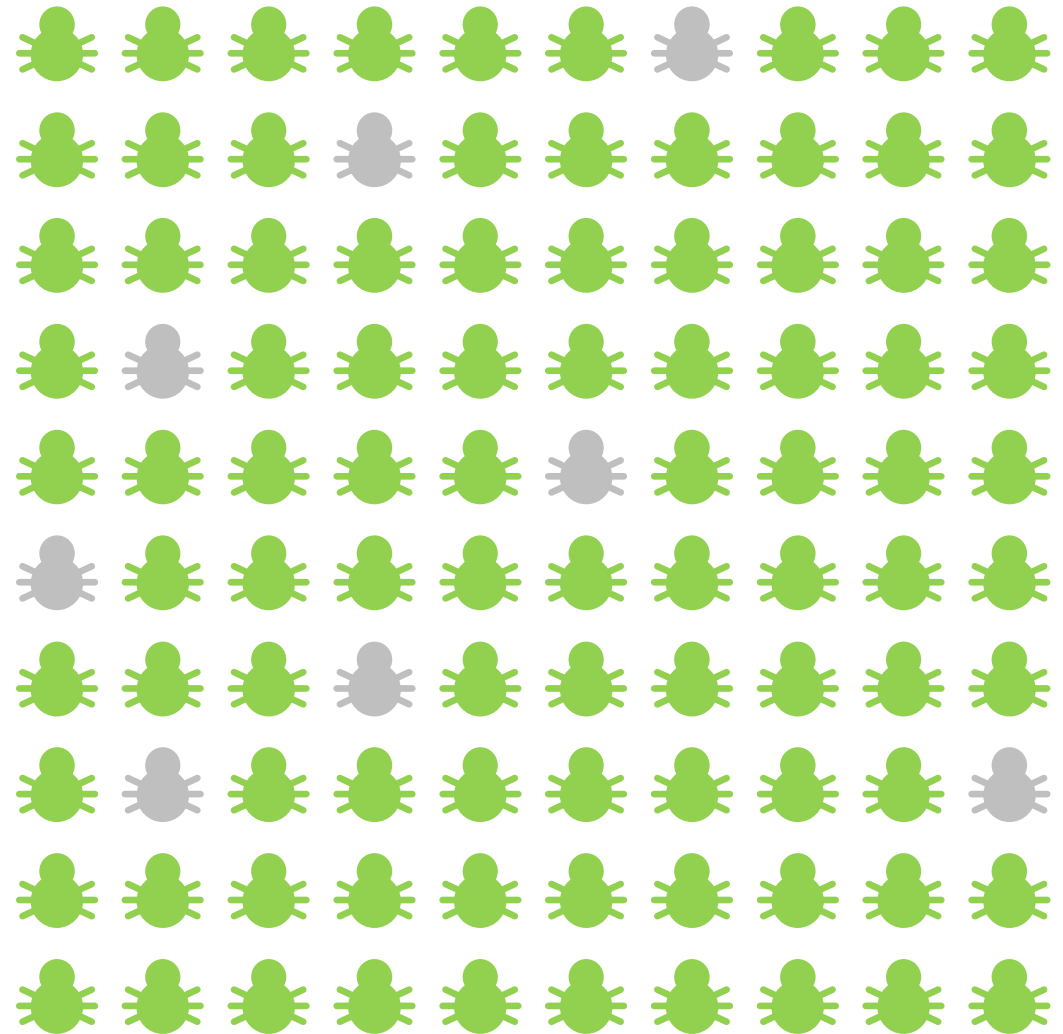
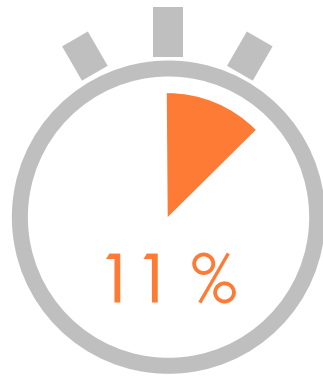
Results for Test Query & Budget Restriction

Relative Coverage: 100%, Selected Tests: 236 out of 236 (100%)









Pareto-Testliste in the CI

Before: nightly „Re-run all“

Feedback late next day



During the day 1 h test budget or „pareto test list“

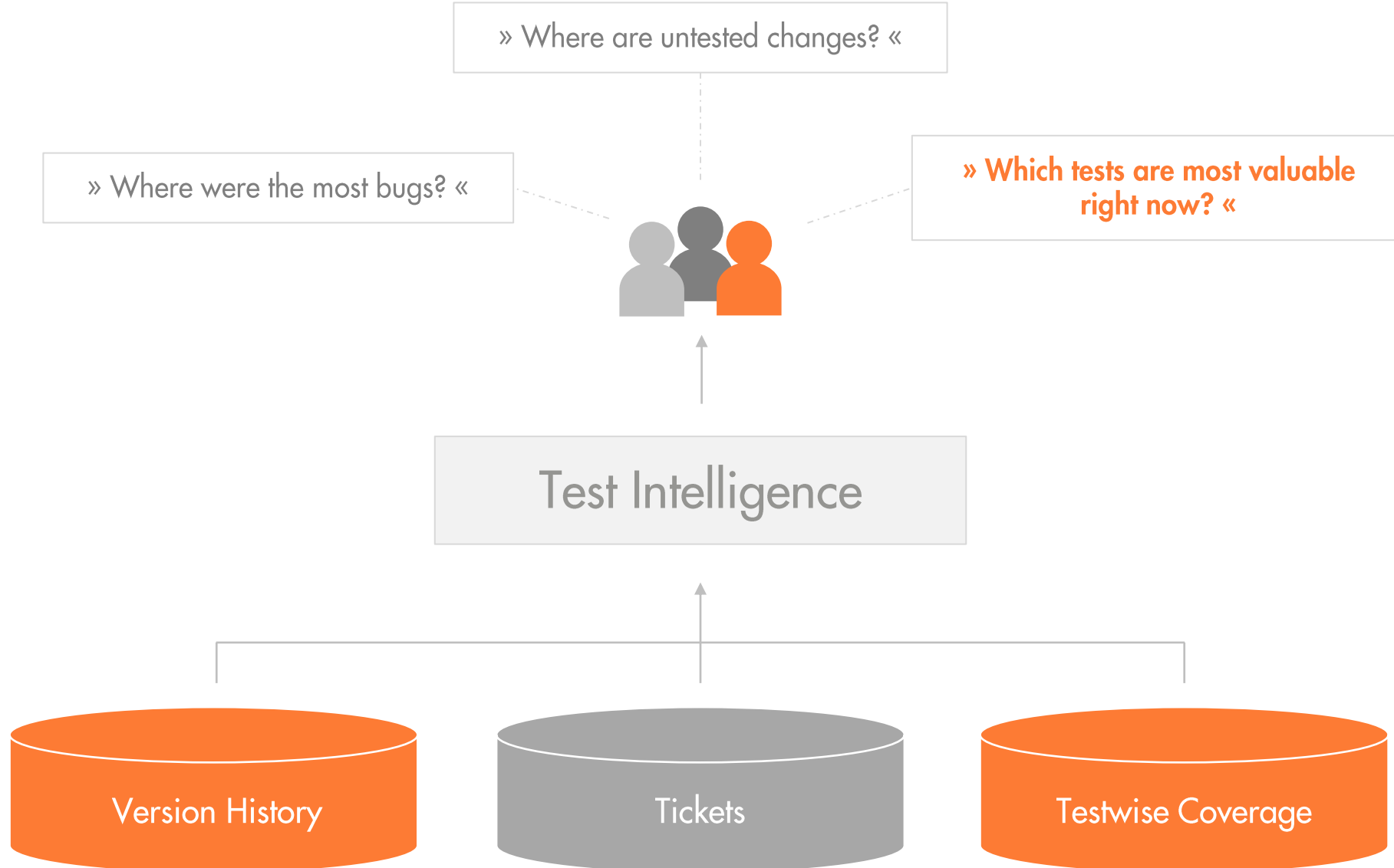


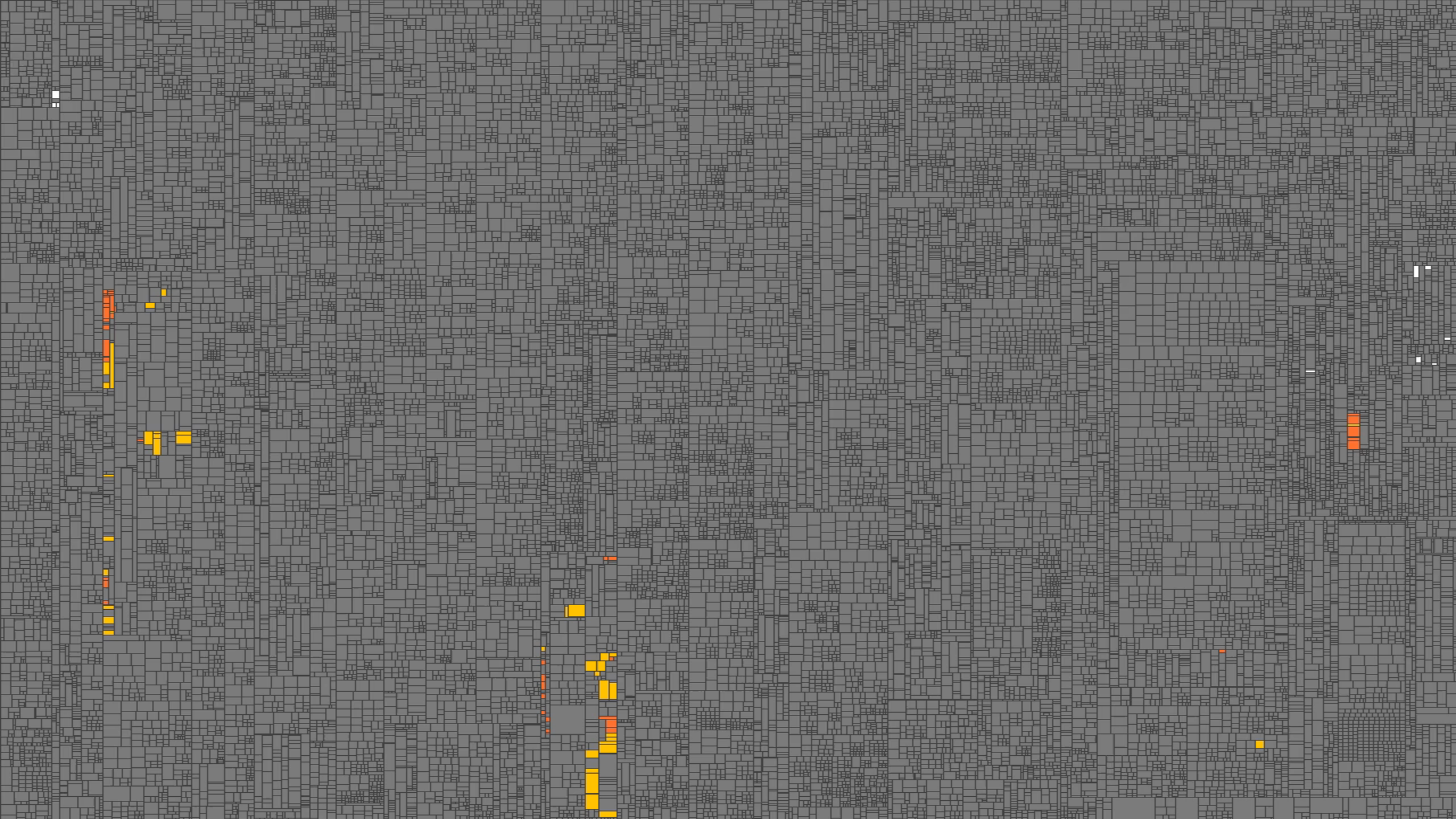
Nightly: „Re-run all“

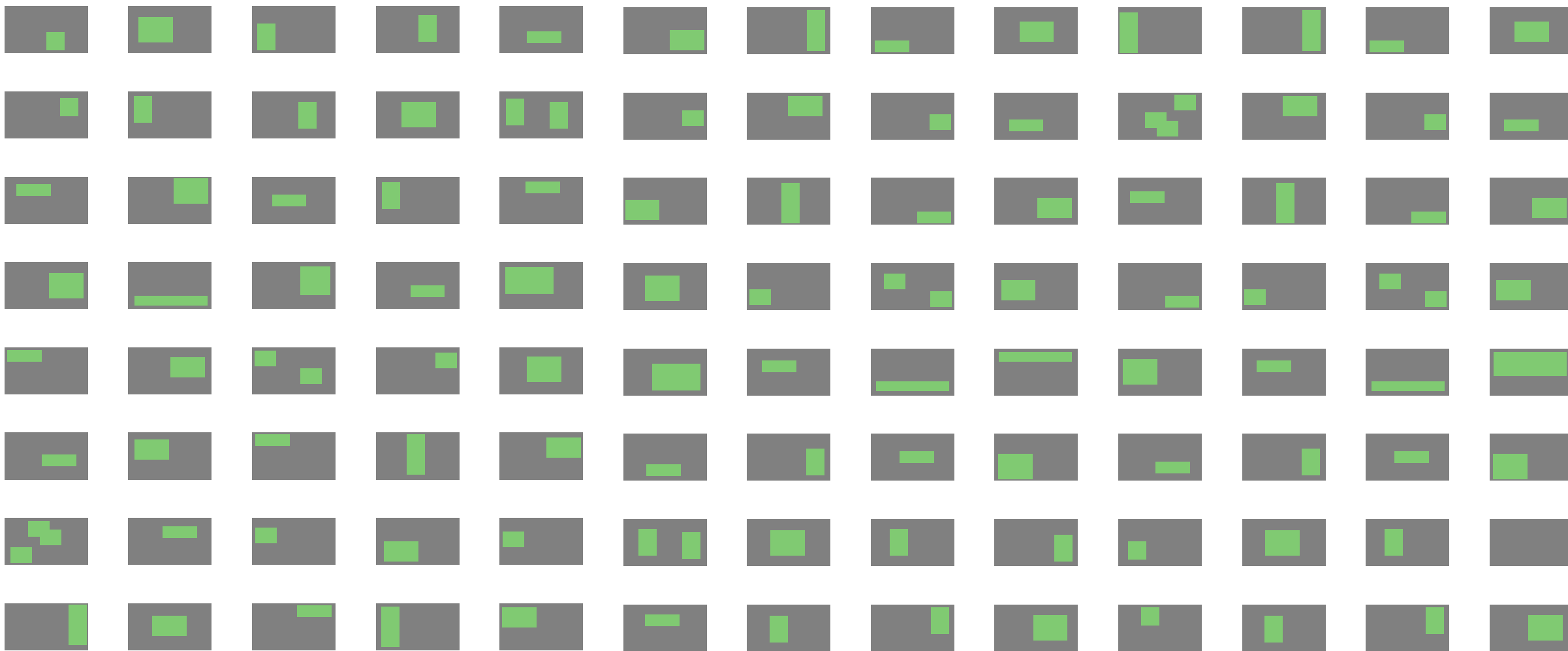


With only 5% test
time budget, we find
**70% of failing
commits**





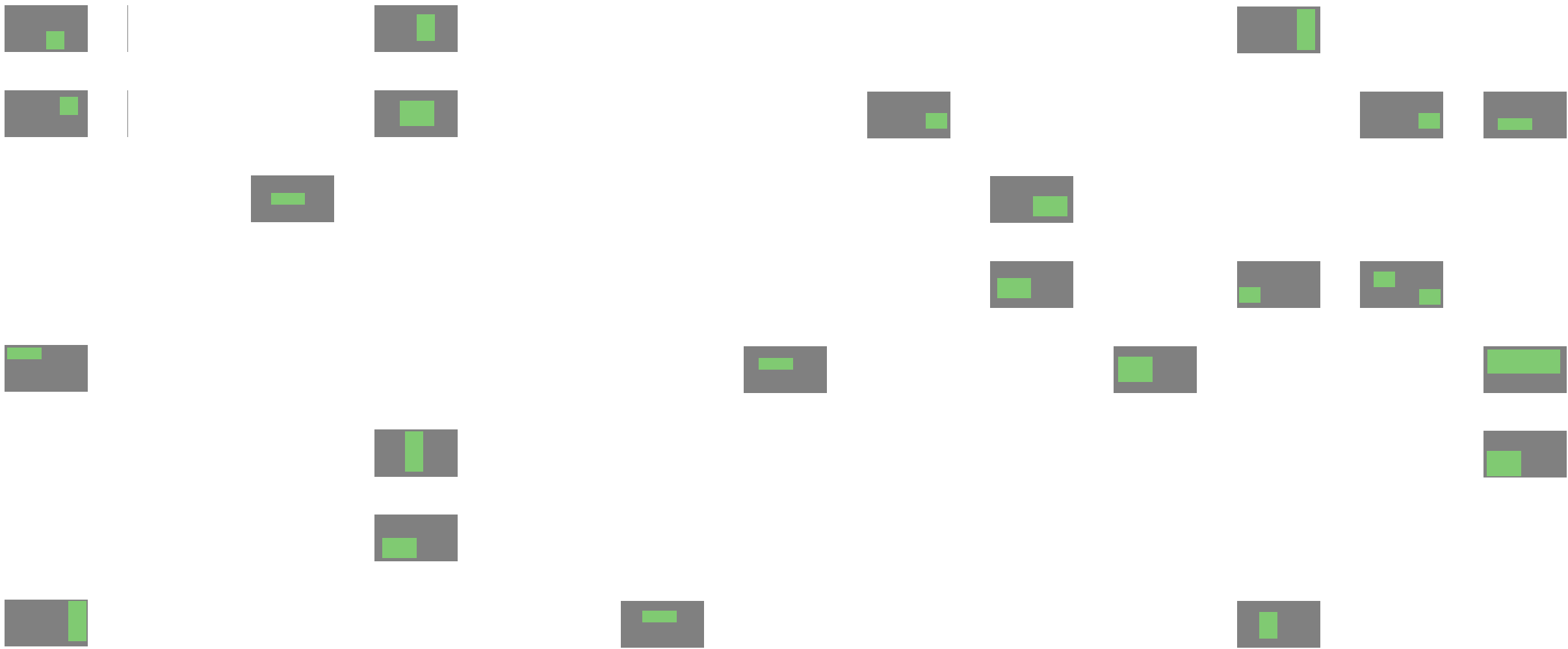




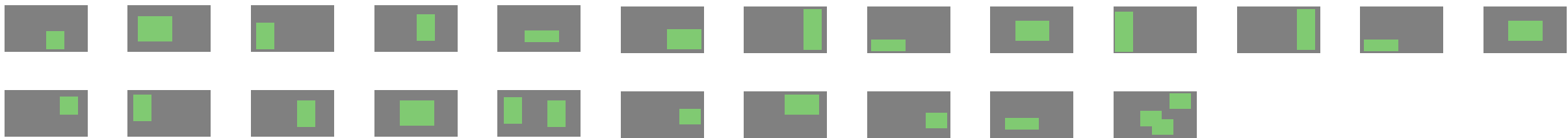
Step 1: Selection of Impacted Tests

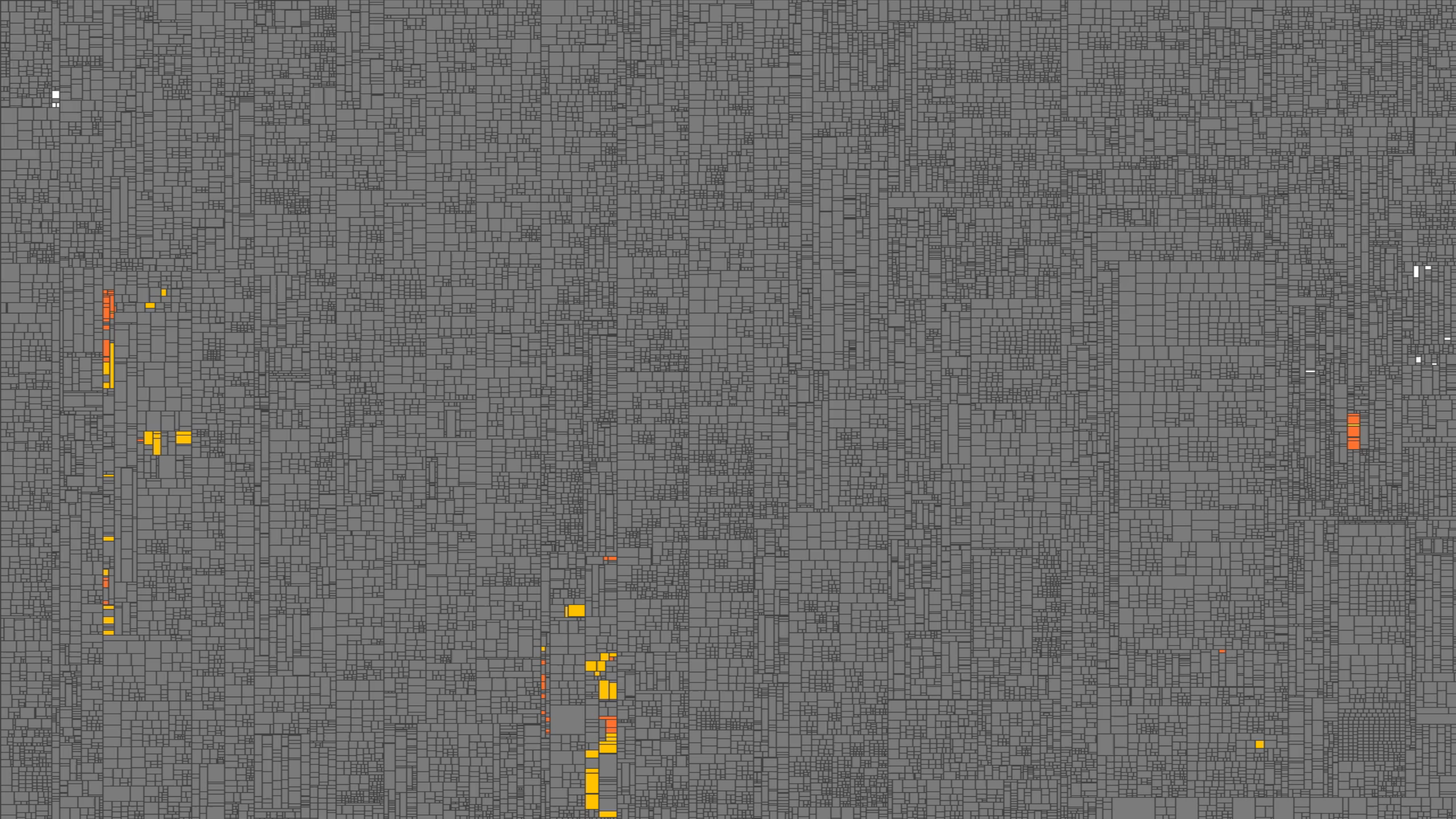


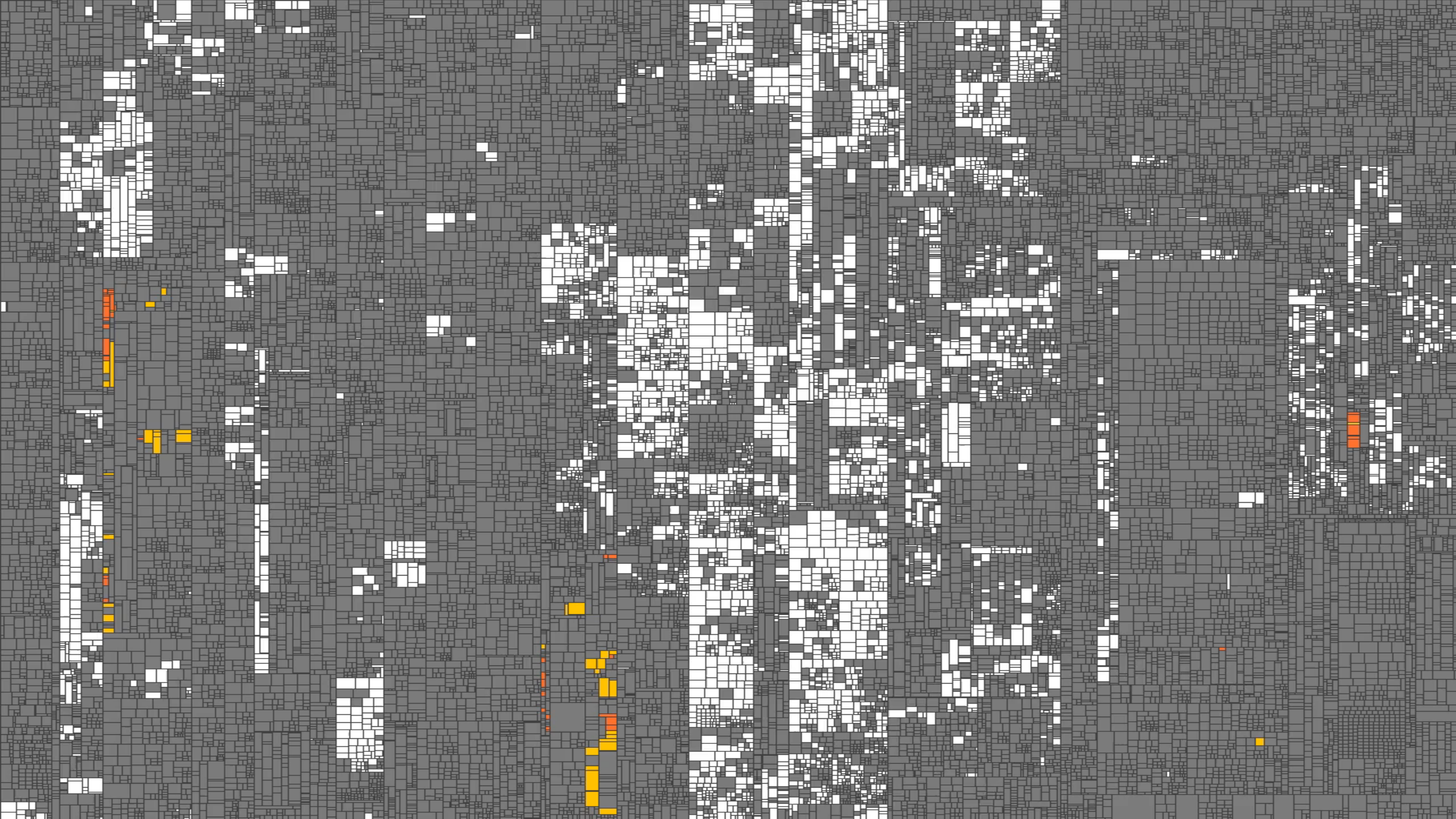
Step 1: Selection of Impacted Tests



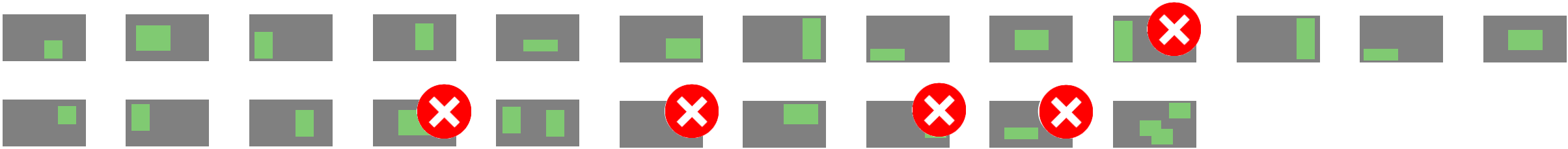
Step 1: Selection of Impacted Tests





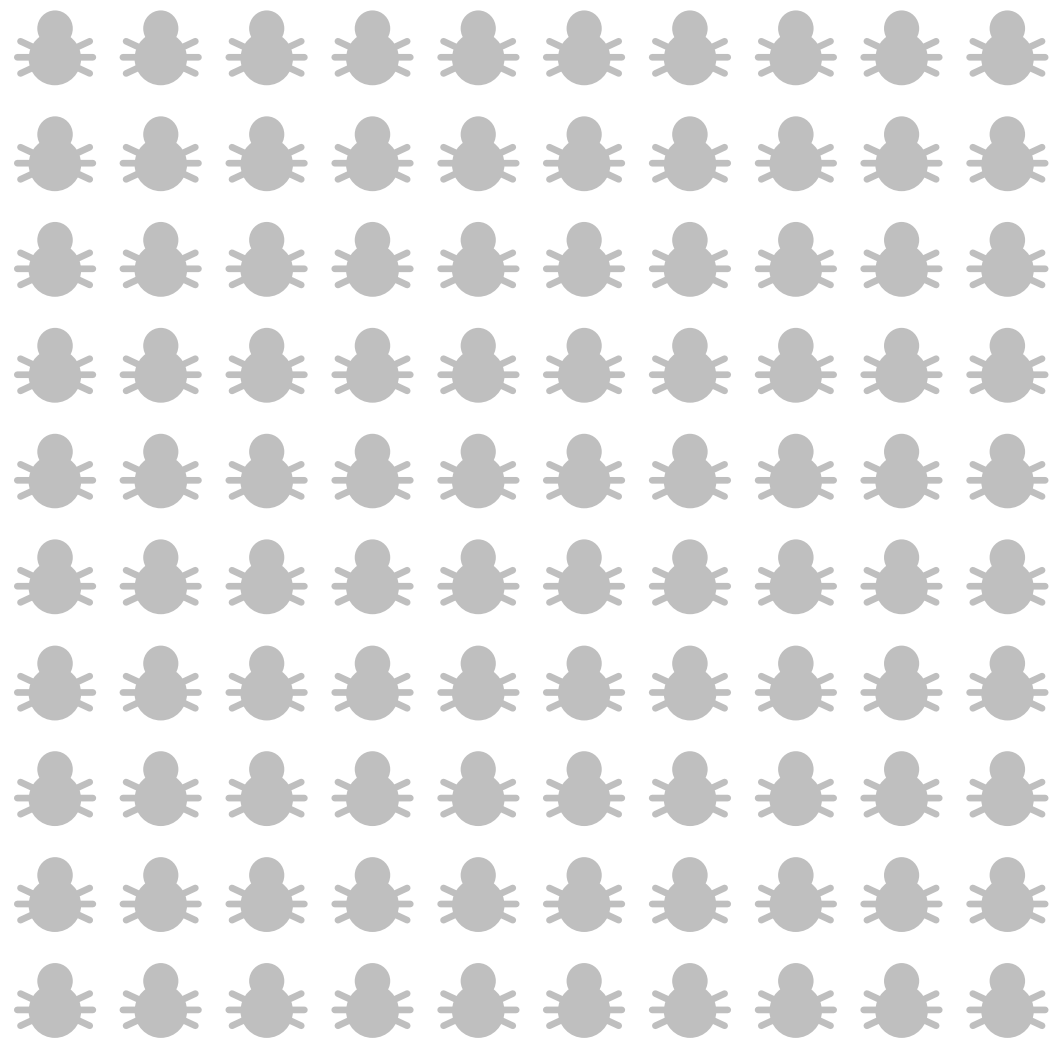
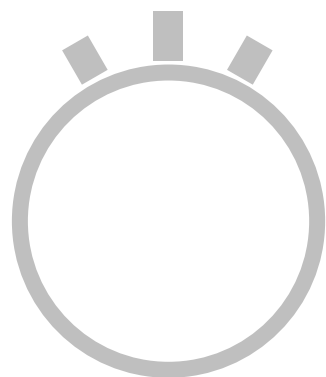


Step 2: Prioritization of Impacted Tests



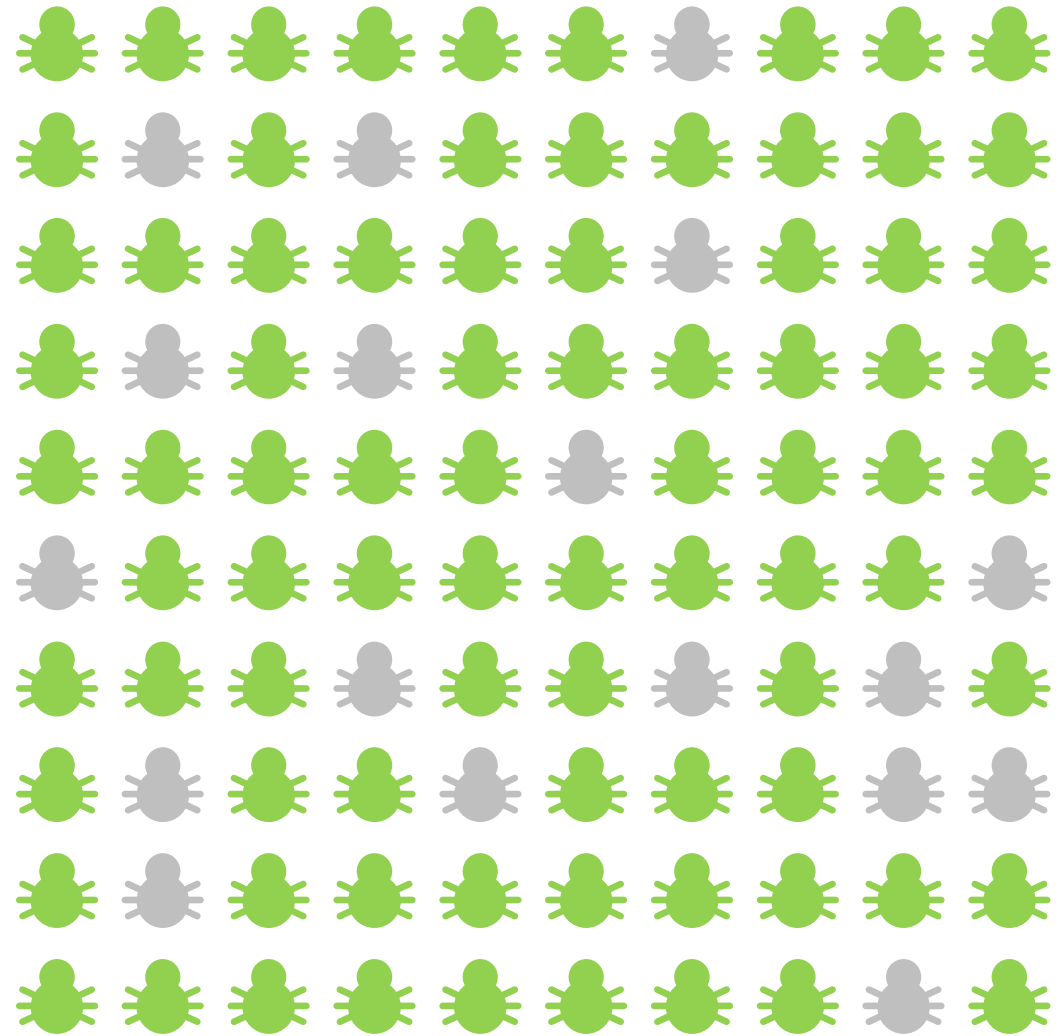
Step 2: Prioritization of Impacted Tests

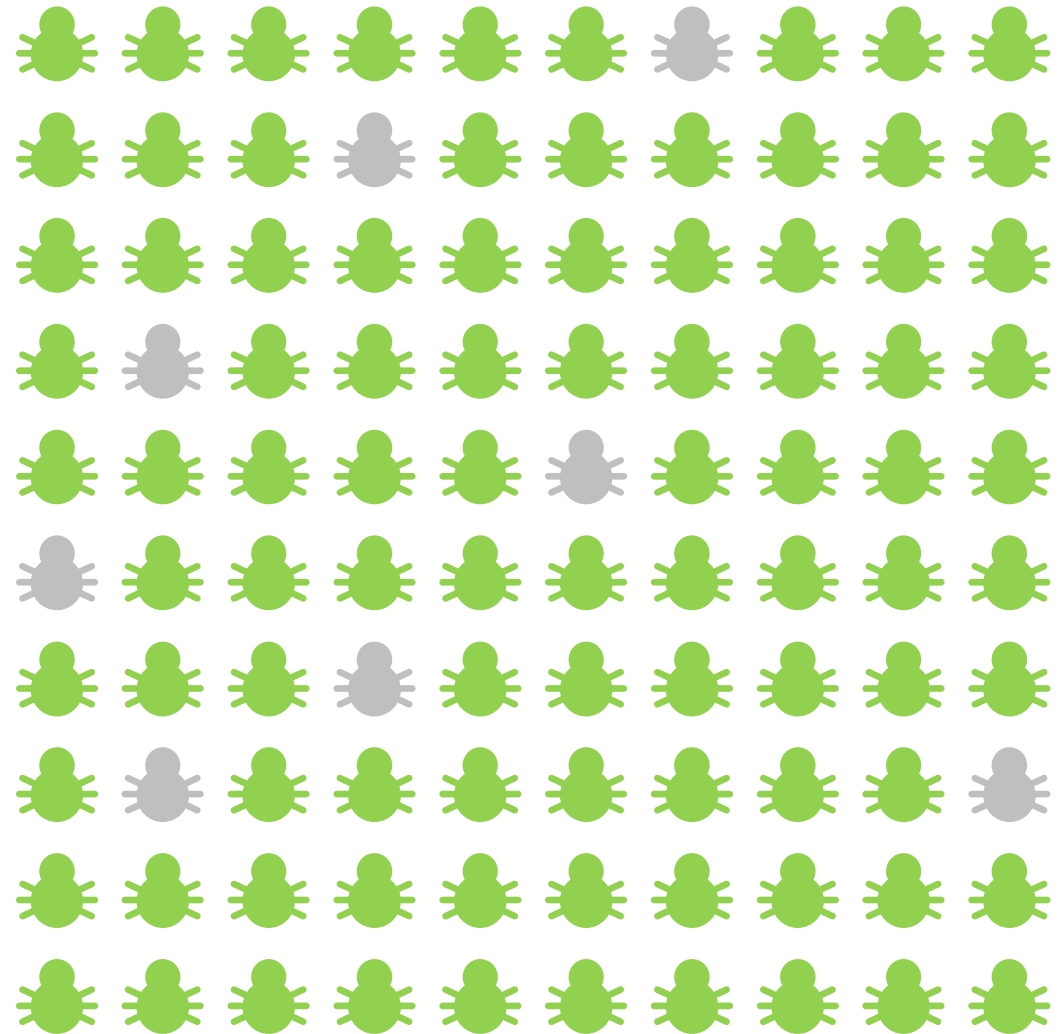






80 %





Test Impact Analysis @ Dolby Germany



Before

Test runtimes of 3-12h through large parameter combination space.



Goal

Test feedback from the CI in less than 10 minutes.



With TIA

Since the introduction of test impact analysis years ago, test feedback always arrives within 10 minutes, although the number of tests increased 57% since.

Test-Impact-Analysis

Test selection **w.r.t. code changes**

90% of bugs found in 2% time

Requires continuous recording of coverage and tight integration with test automation framework.

Higher speedup & higher effort

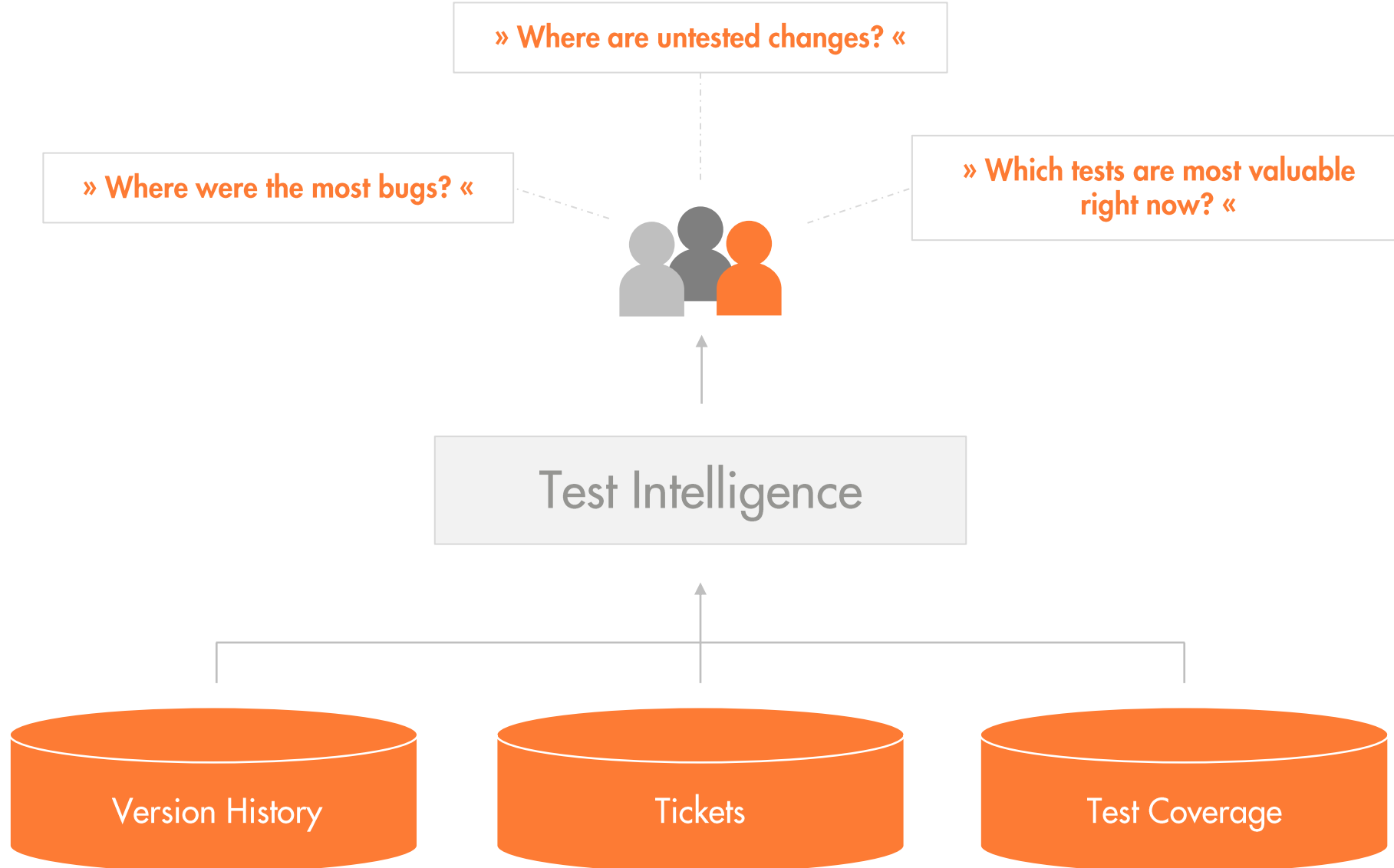
Pareto-Optimization

Tests selection **independent of** code changes

90% of bugs found in 11% time

Record coverage once (per quarter)

Smaller effort & higher applicability



Summary

The data in your repos can help us find more bugs in less time.

Test intelligence analyses are a toolbox. There are many useful tools, but they must be actively integrated into your processes.

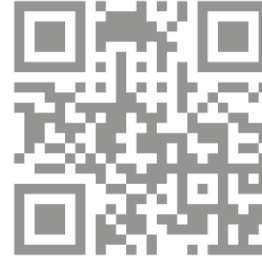
I am happy to talk about if and how they could fit into your context.

Test Gap Analysis

Reveal Untested Changes in Source Code



September, 25
10:30-12:00 CEST
tmscl.me/tga-249-euro



Fast Feedback From Long-Running Tests

Test Selection for Ever-Growing Test Suites



October, 23
10:30-12:00 CEST
tmscl.me/ts-24-10-euro





tmscl.me/coffee-elmar