

Reinventing Quality

Software-Qualität auf das nächste Level bringen



Test Intelligence

Auf Basis der eigenen Daten mehr Fehler in weniger Zeit finden

Dr. Elmar Juergens
CQSE GmbH

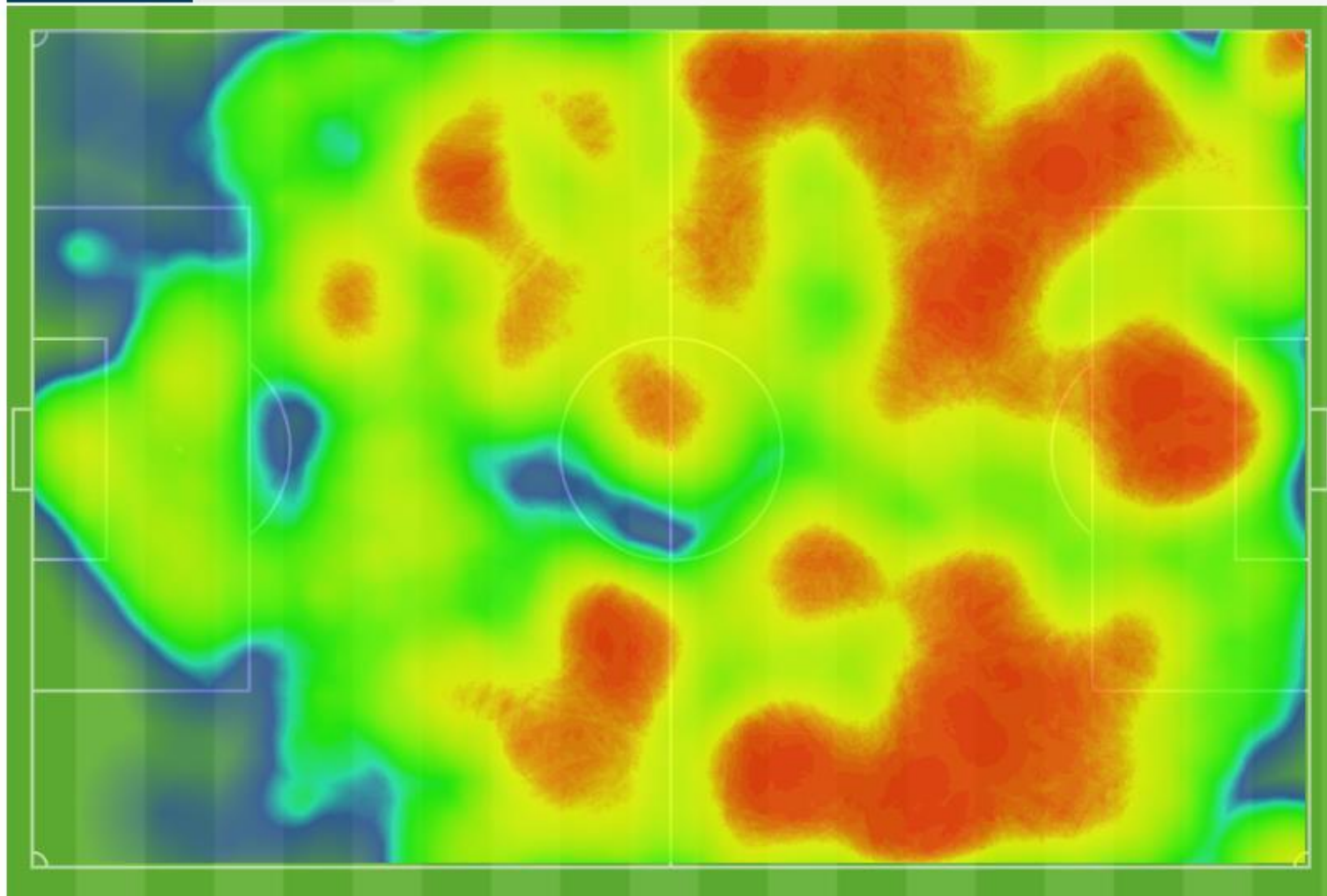




FC Bayern München

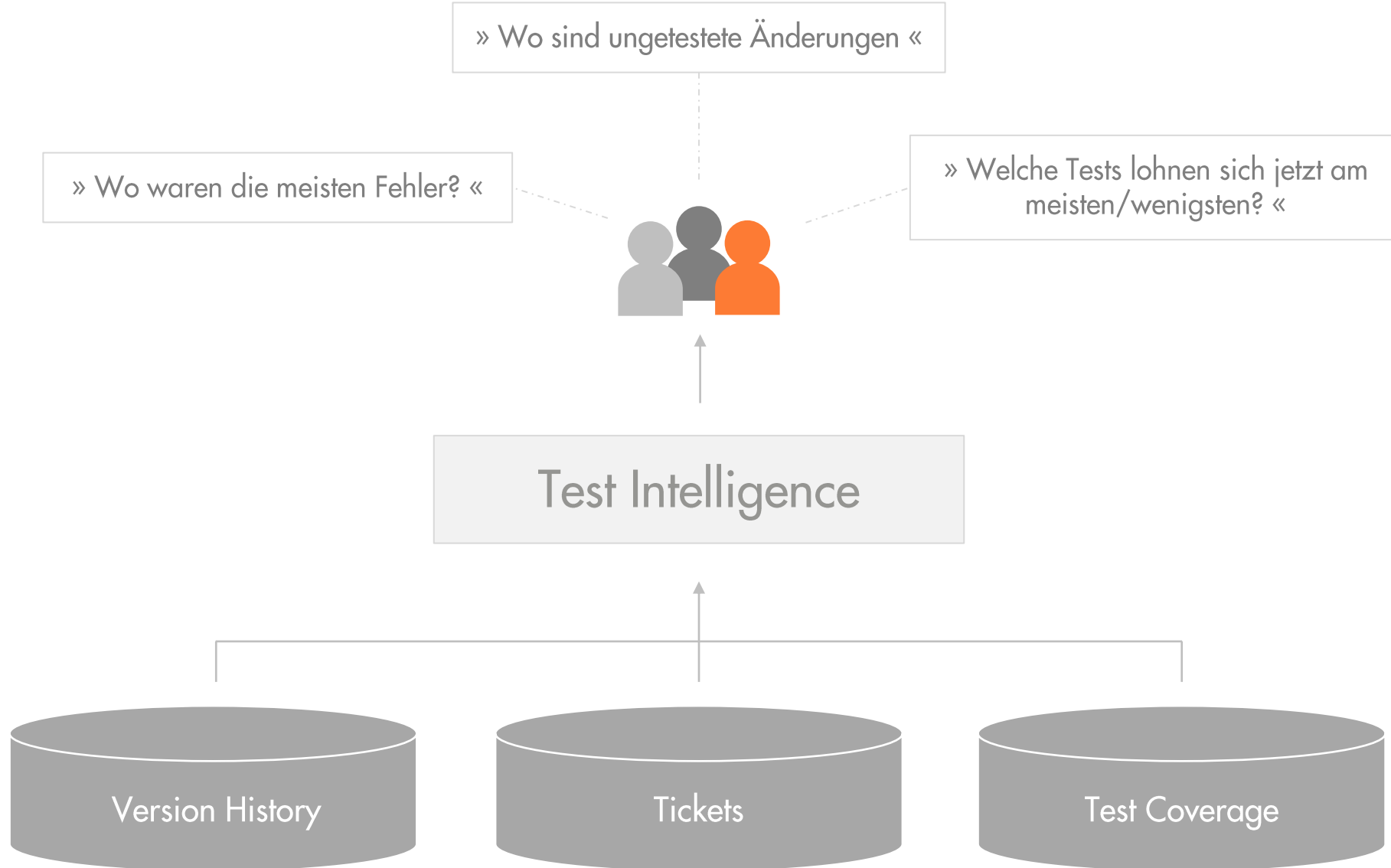
- FC Bayern München
- TW 1 Manuel Neuer
- AW 21 Lucas Hernández
- AW 5 Benjamin Pavard
- AW 4 Niklas Süle
- AW 27 David Alaba
- MF 29 Kingsley Coman
- MF 10 Leroy Sané
- MF 25 Thomas Müller
- MF 6 Joshua Kimmich
- MF 18 Leon Goretzka
- ST 13 Eric Maxim Choupo-Moting
- Einwechselfspieler
- 17 Jérôme Boateng
- 19 Alphonso Davies

Heatmap Touchmap



Paris Saint-Germain

- Paris Saint-Germain
- TW 1 Keylor Navas
- AW 5 Marquinhos
- AW 31 Colin Dagba
- AW 22 Abdou Diallo
- AW 3 Presnel Kimpembe
- MF 23 Julian Draxler
- MF 27 Idrissa Gueye
- MF 10 Neymar
- MF 15 Danilo Pereira
- MF 11 Ángel Di María
- ST 7 Kylian Mbappé
- Einwechselfspieler
- 25 Mitchel Bakker
- 18 Moise Kean
- 21 Ander Herrera
- 12 Rafinha

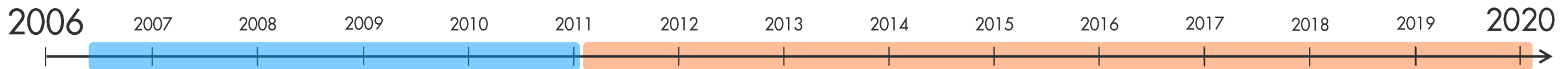


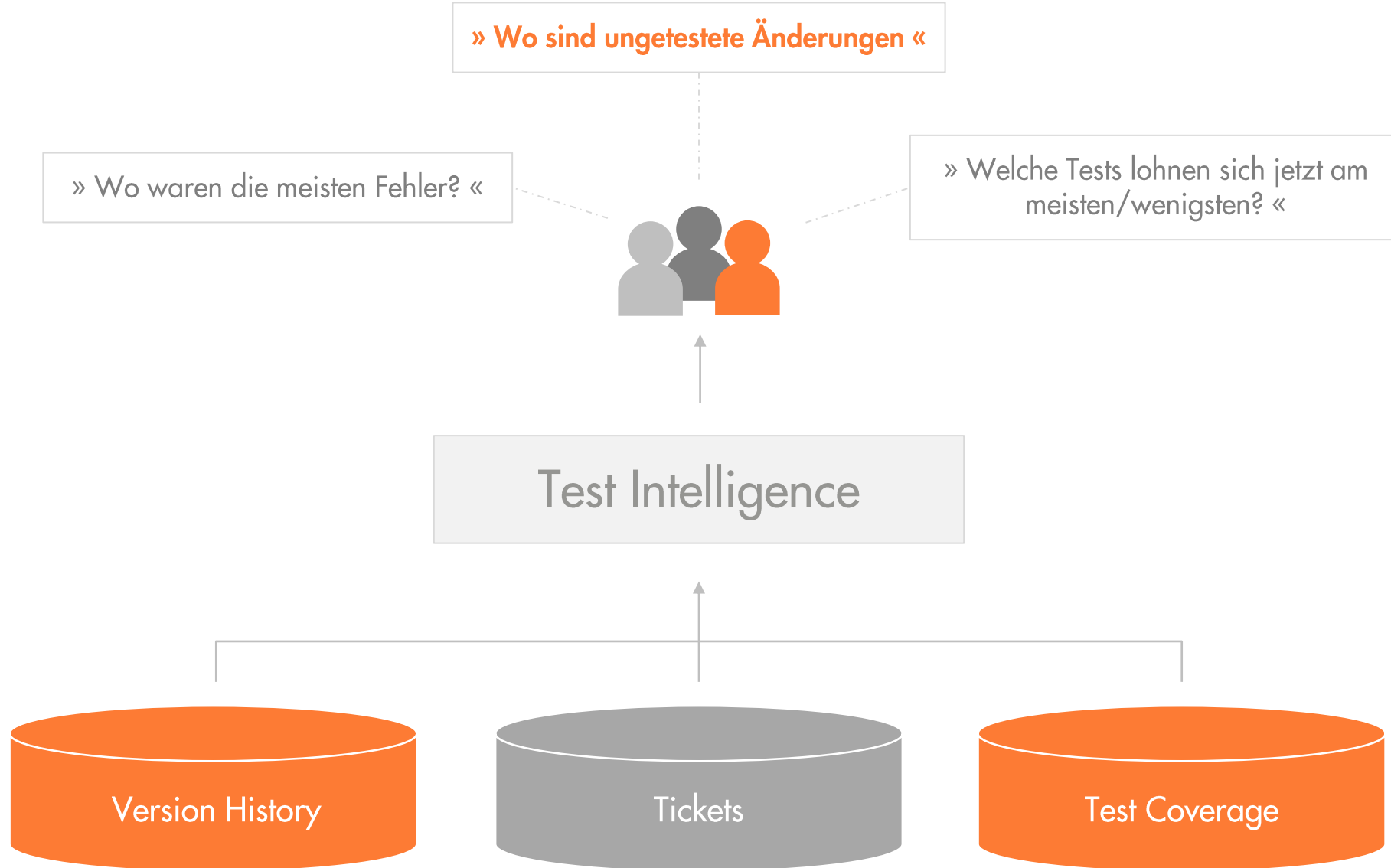


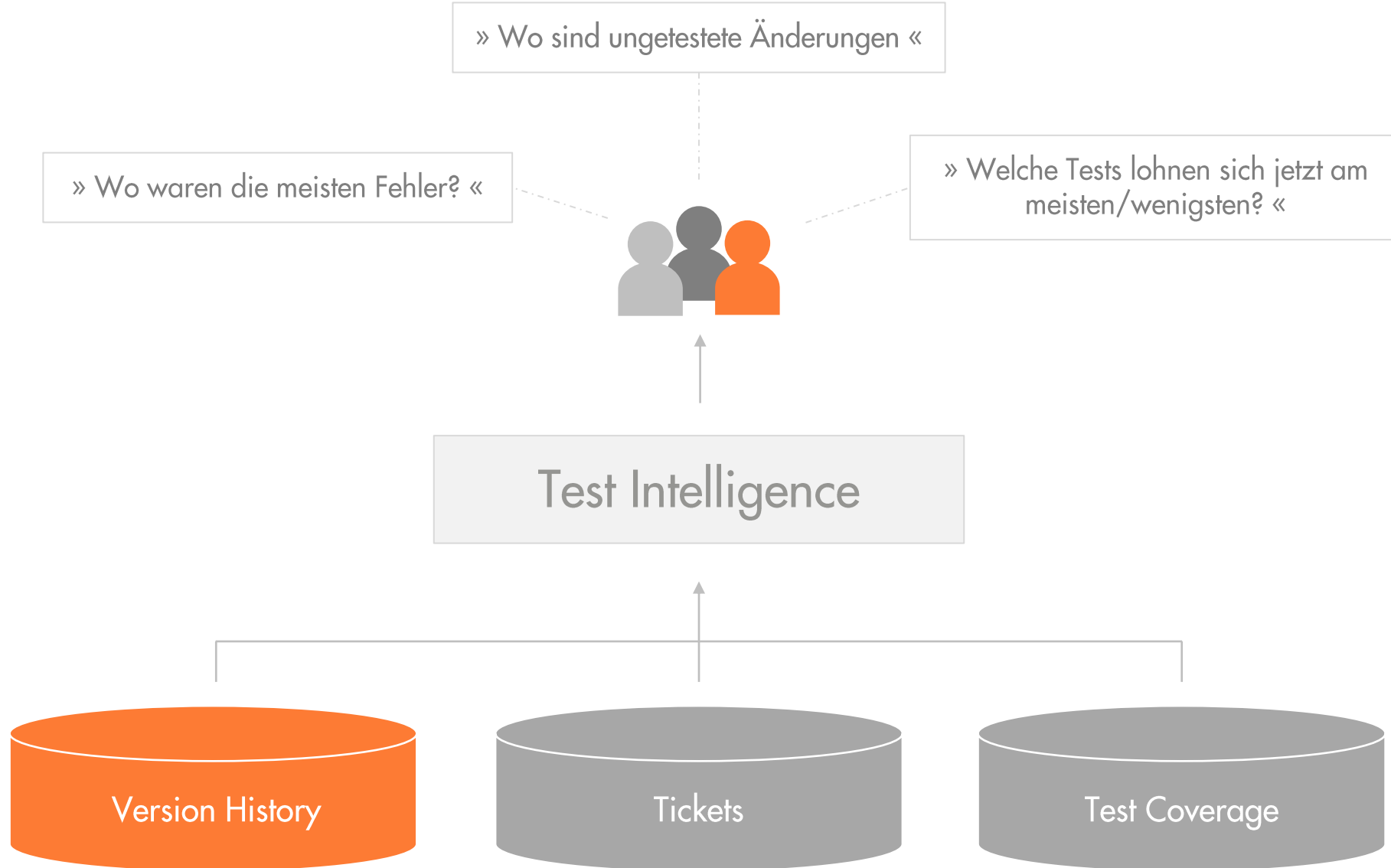
TUM



CQSE







```

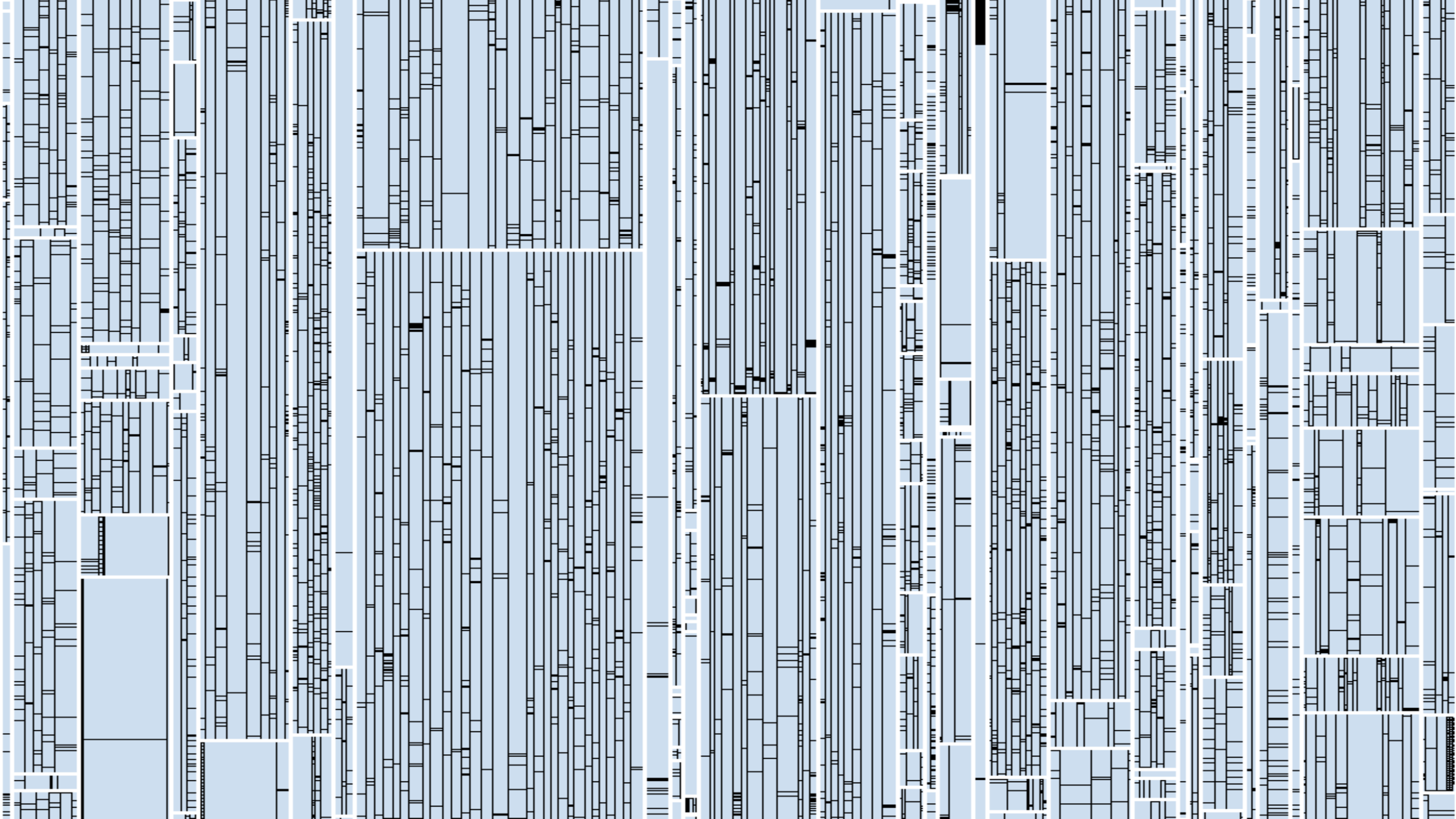
23
24
25
26 /* package */class NamespaceRenames {
27
28     /** Maps from old name fragment to new name fragment */
29     public Set<ImmutablePair<String, String>> namespaceRenames = new HashSet<
30
31     /**
32      * Computes a rename rule from an old and a new namespace name based on a
33      * type name correspondence. <code>
34      * For name1 = a.oldnamespace.b.c.D and name2 = a.newnamespace.b.c.D, res
35      * </code>
36      * */
37     public static ImmutablePair<String, String> computeRenameRule(
38         String fqTypeName1, String fqTypeName2, String separator) {
39
40         if (fqTypeName1.equals(fqTypeName2)) {
41             return null;
42         }
43
44         String commonSuffix = StringUtils.longestCommonSuffix(fqTypeName1,
45             fqTypeName2);
46         if (StringUtils.isEmpty(commonSuffix)) {
47             return null;
48         }
49
50         int separatorPosition = commonSuffix.indexOf(separator);
51         if (separatorPosition != -1) {
52             commonSuffix = commonSuffix.substring(separatorPosition);
53         }
54
55         String from = StringUtils.stripSuffix(commonSuffix, fqTypeName1);
56         String to = StringUtils.stripSuffix(commonSuffix, fqTypeName2);
57
58         return new ImmutablePair<String, String>(from, to);
59     }
60
61
62
63
64

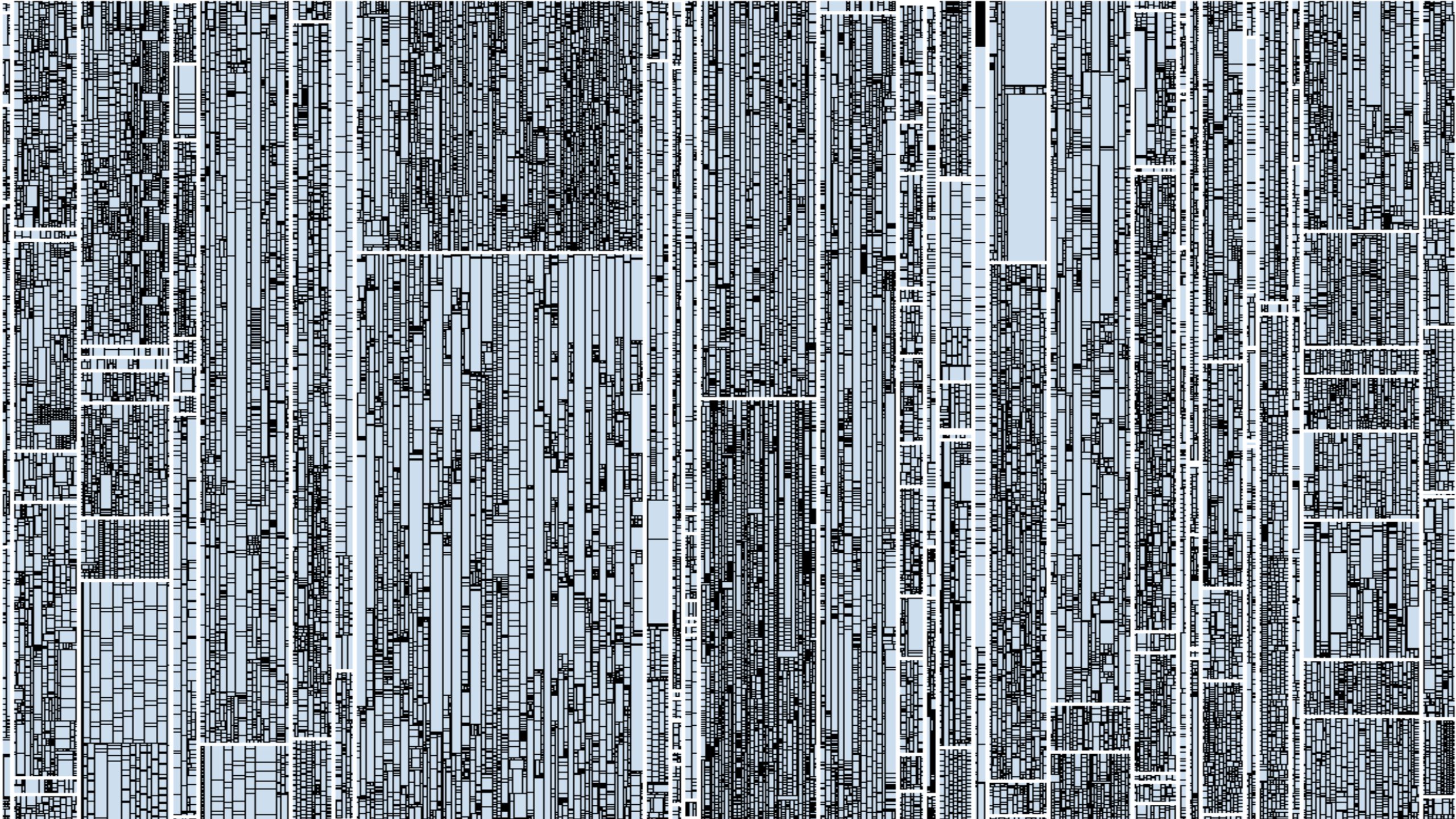
```

```

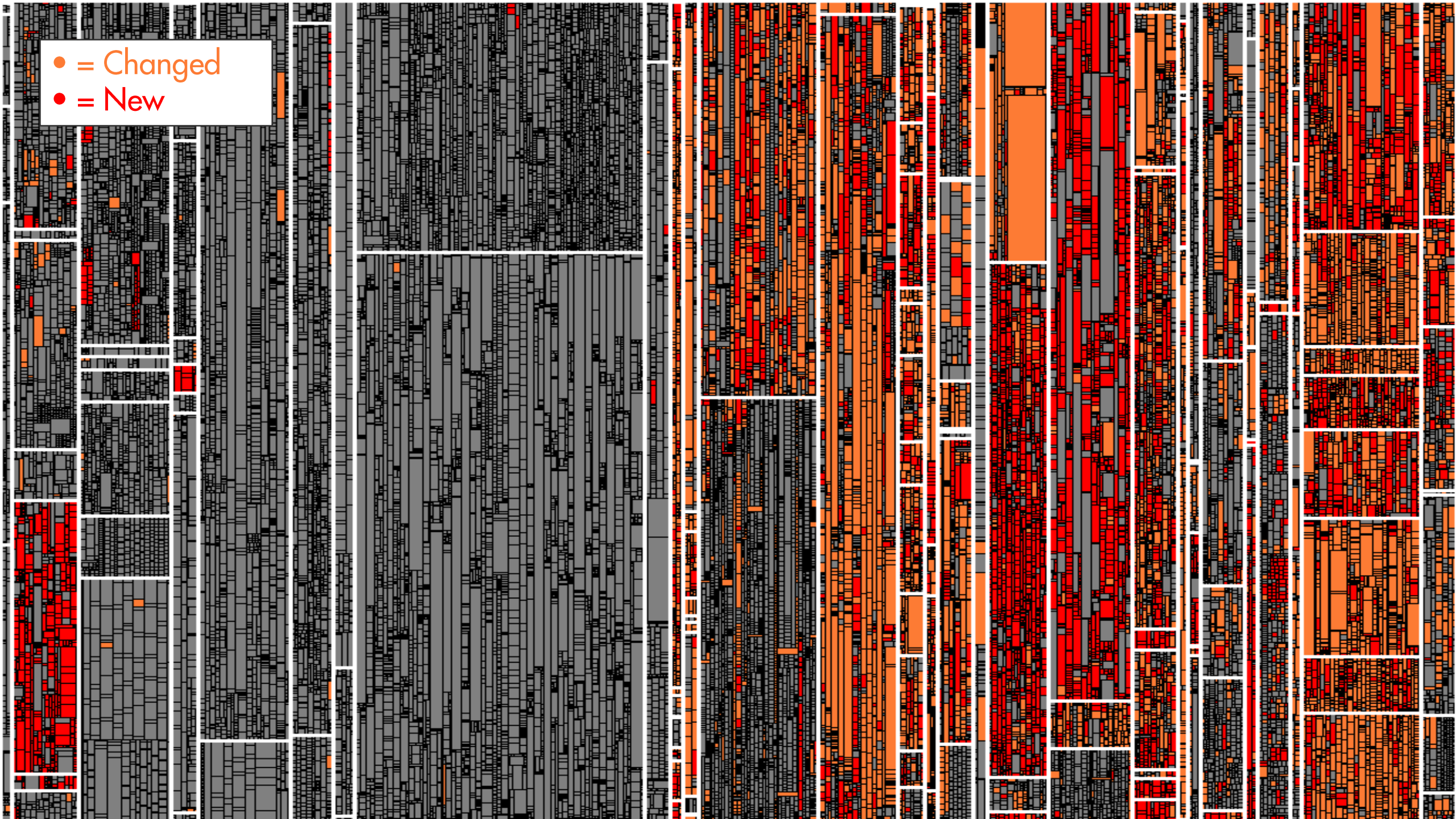
24
25
26 /* package */class NamespaceRenames {
27
28     /** Maps from old name fragment to new name fragment */
29     public Set<ImmutablePair<String, String>> namespaceRenames = new Has
30
31     // TODO (LH) Doc vs. method name : 'Compute' vs. 'find'
32     /**
33      * Computes a rename rule from an old and a new namespace name based
34      * type name correspondence. <code>
35      * For name1 = a.oldnamespace.b.c.D and name2 = a.newnamespace.b.c.D
36      * </code>
37      * */
38     // TODO (LH) Please reflect in identifier names that they refer to
39     // namespaces
40     public static ImmutablePair<String, String> findRenameRule(String na
41         String name2, String separator) {
42
43         if (name1.equals(name2)) {
44             return null;
45         }
46
47         // TODO (LH) Looks like StringUtils is missing a 'longestCommon
48         String commonSuffix = reverse(StringUtils.longestCommonPrefix(
49             reverse(name1), reverse(name2)));
50         if (StringUtils.isEmpty(commonSuffix)) {
51             return null;
52         }
53
54         int separatorPosition = commonSuffix.indexOf(separator);
55         if (separatorPosition != -1) {
56             commonSuffix = commonSuffix.substring(separatorPosition);
57         }
58
59         // TODO (LH) Please reflect in identifier names that these are
60         // namespaces
61         String from = StringUtils.stripSuffix(commonSuffix, name1);
62         String to = StringUtils.stripSuffix(commonSuffix, name2);
63
64         return new ImmutablePair<String, String>(from, to);
65

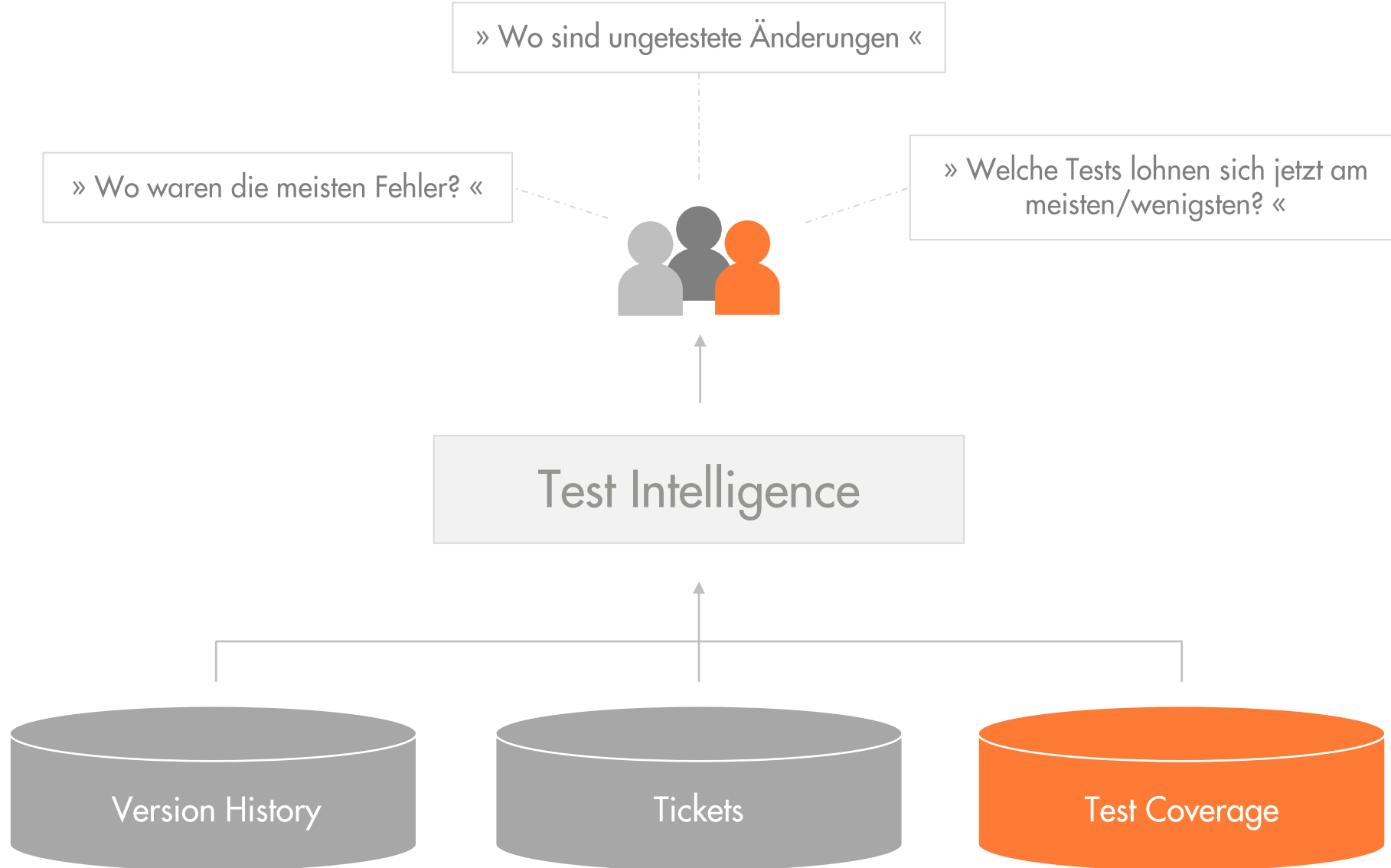
```



- = Changed
- = New

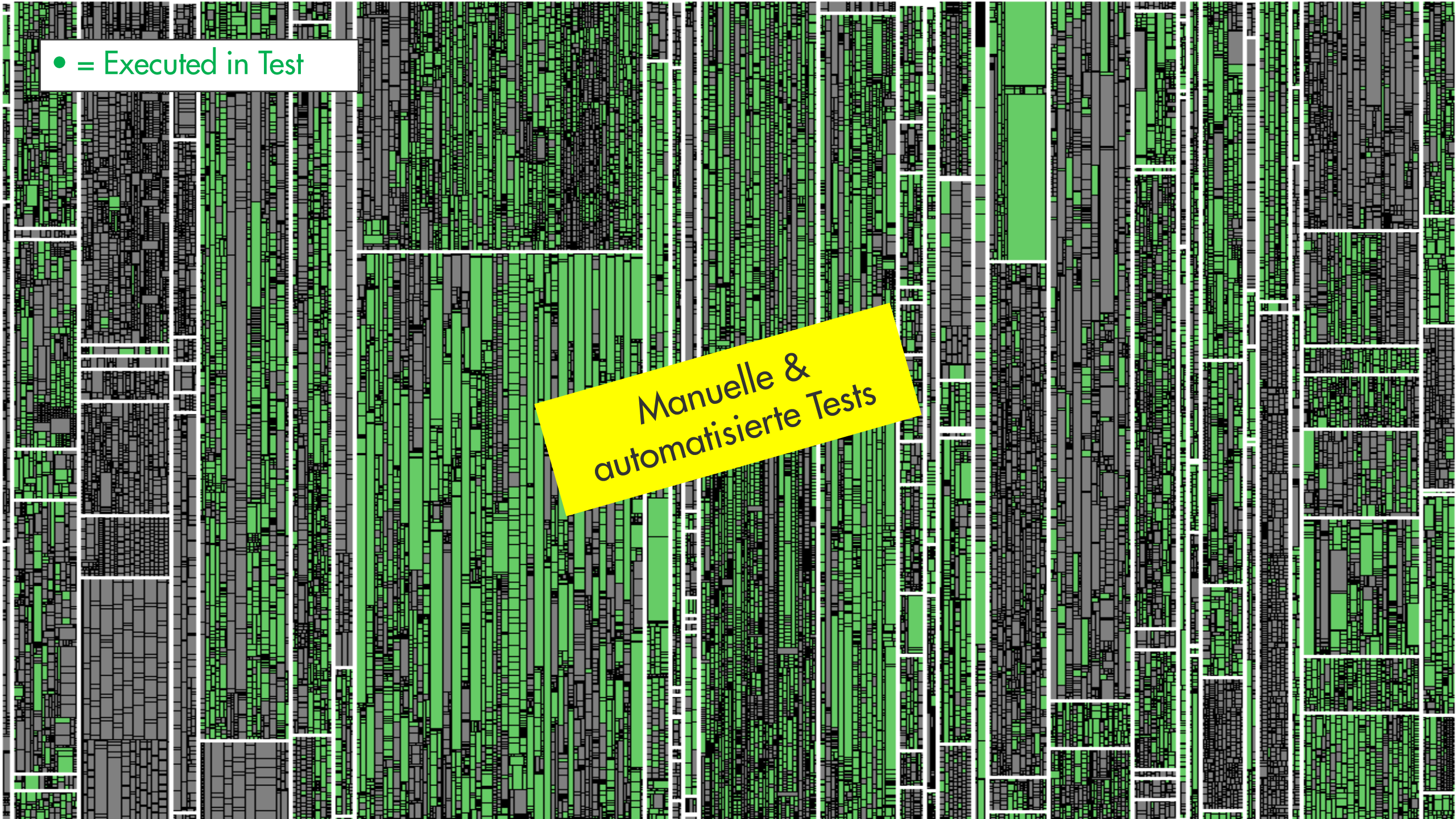


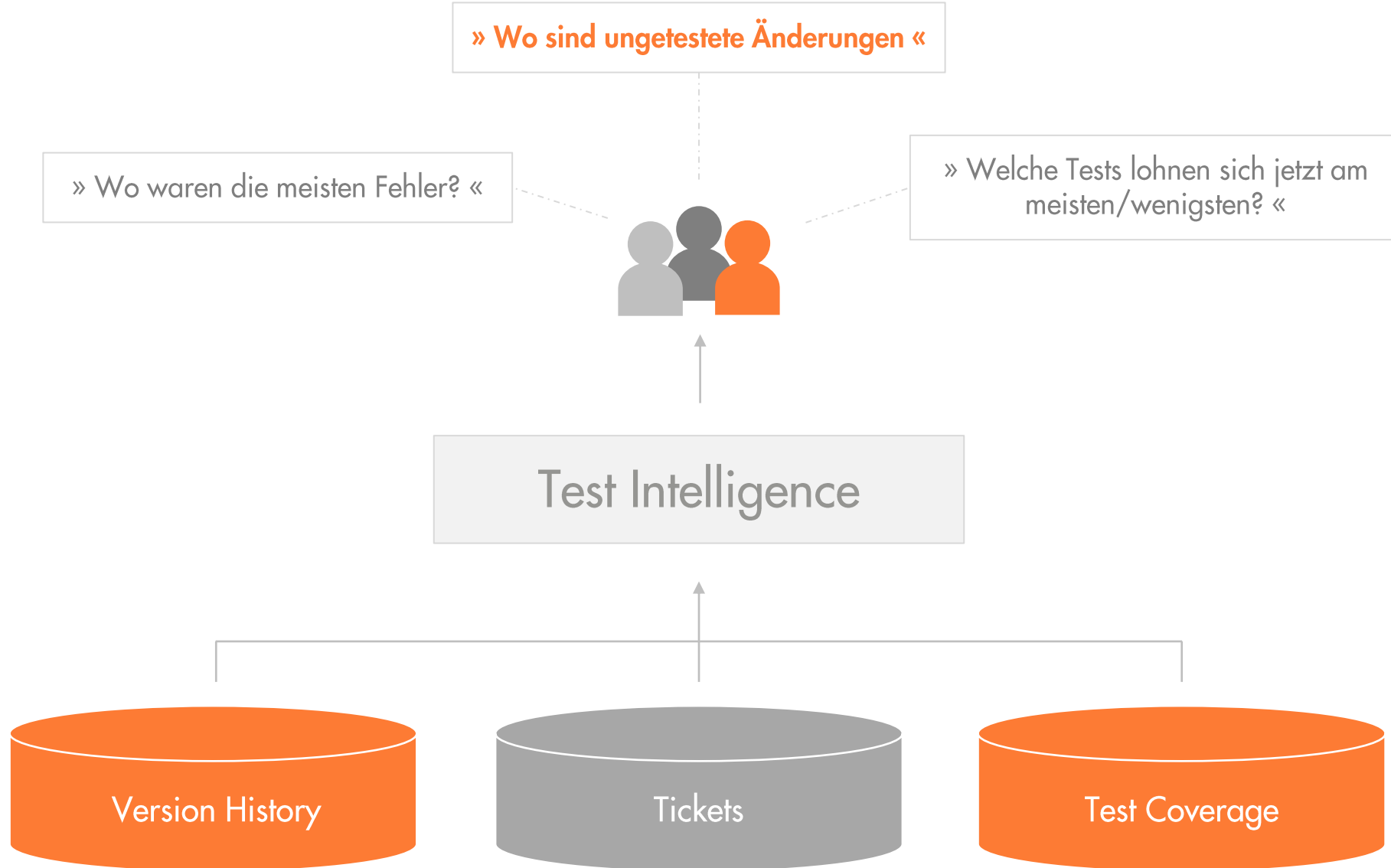


```
1  protected void calculateIndirectAmbiguities() {
2      Map<NucleotideCompound, List<NucleotideCompound>> equivalentMap = new HashMap<>>();
3
4      List<NucleotideCompound> ambiguousCompounds = new ArrayList<NucleotideCompound>();
5      for (NucleotideCompound compound : getAllCompounds()) {
6          if (!compound.isAmbiguous()) {
7              continue;
8          }
9          ambiguousCompounds.add(compound);
10     }
11
12     for (NucleotideCompound sourceCompound : ambiguousCompounds) {
13         Set<NucleotideCompound> sourceConstituents = sourceCompound.getConstituents();
14         for (NucleotideCompound targetCompound : ambiguousCompounds) {
15             Set<NucleotideCompound> targetConstituents = targetCompound.getConstituents();
16             if (targetConstituents.containsAll(sourceConstituents)) {
17                 NucleotideCompound lcSourceCompound = toLowerCase(sourceCompound);
18                 NucleotideCompound lcTargetCompound = toLowerCase(targetCompound);
19                 checkAdd(equivalentMap, sourceCompound, targetCompound);
20                 checkAdd(equivalentMap, sourceCompound, lcTargetCompound);
21                 checkAdd(equivalentMap, targetCompound, sourceCompound);
22                 checkAdd(equivalentMap, lcTargetCompound, sourceCompound);
23                 checkAdd(equivalentMap, lcSourceCompound, targetCompound);
24                 checkAdd(equivalentMap, lcSourceCompound, lcTargetCompound);
25             }
26         }
27     }
28
29     for (NucleotideCompound key : equivalentMap.keySet()) {
30         List<NucleotideCompound> vals = equivalentMap.get(key);
31         for (NucleotideCompound value : vals) {
32             addEquivalent((C) key, (C) value);
33             addEquivalent((C) value, (C) key);
34         }
35     }
36 }
```

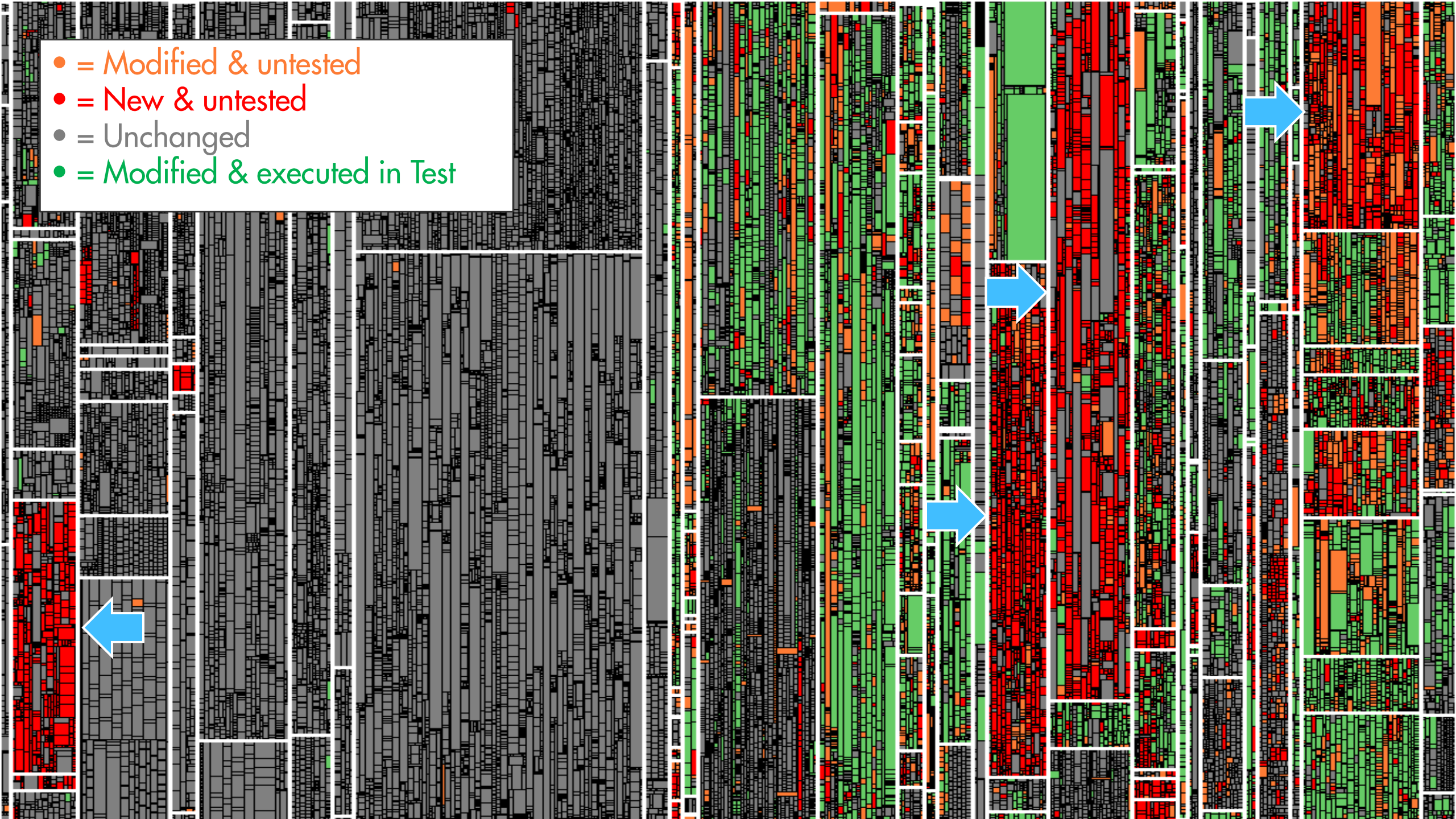
● = Executed in Test


















Manuelle &
automatisierte Tests










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




Issue # ▼	Subject	Done		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% 

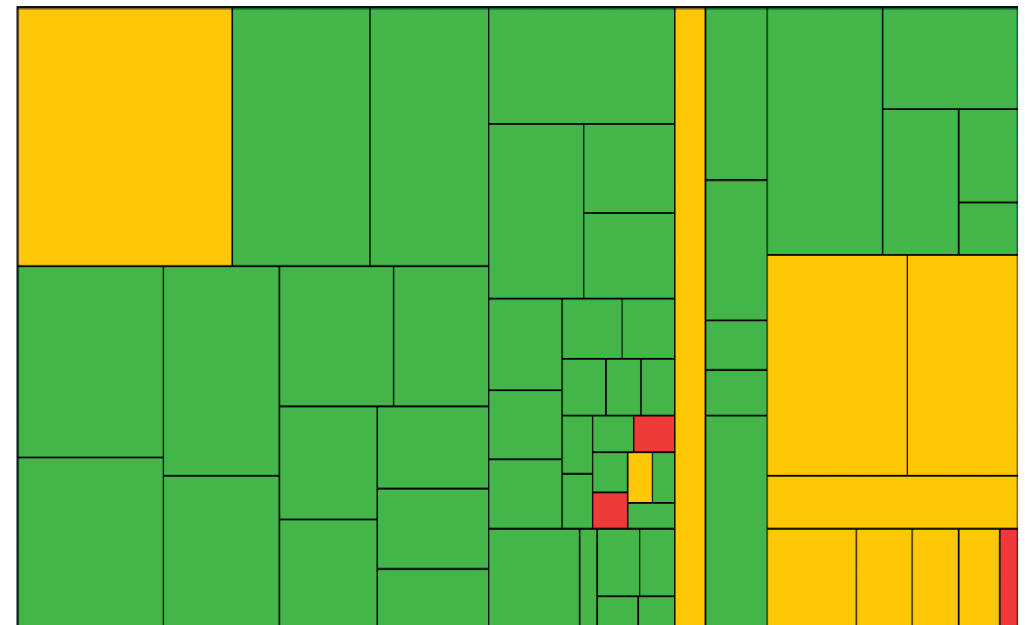
Done Issue TS-14733 - Remove Dataflow blocks

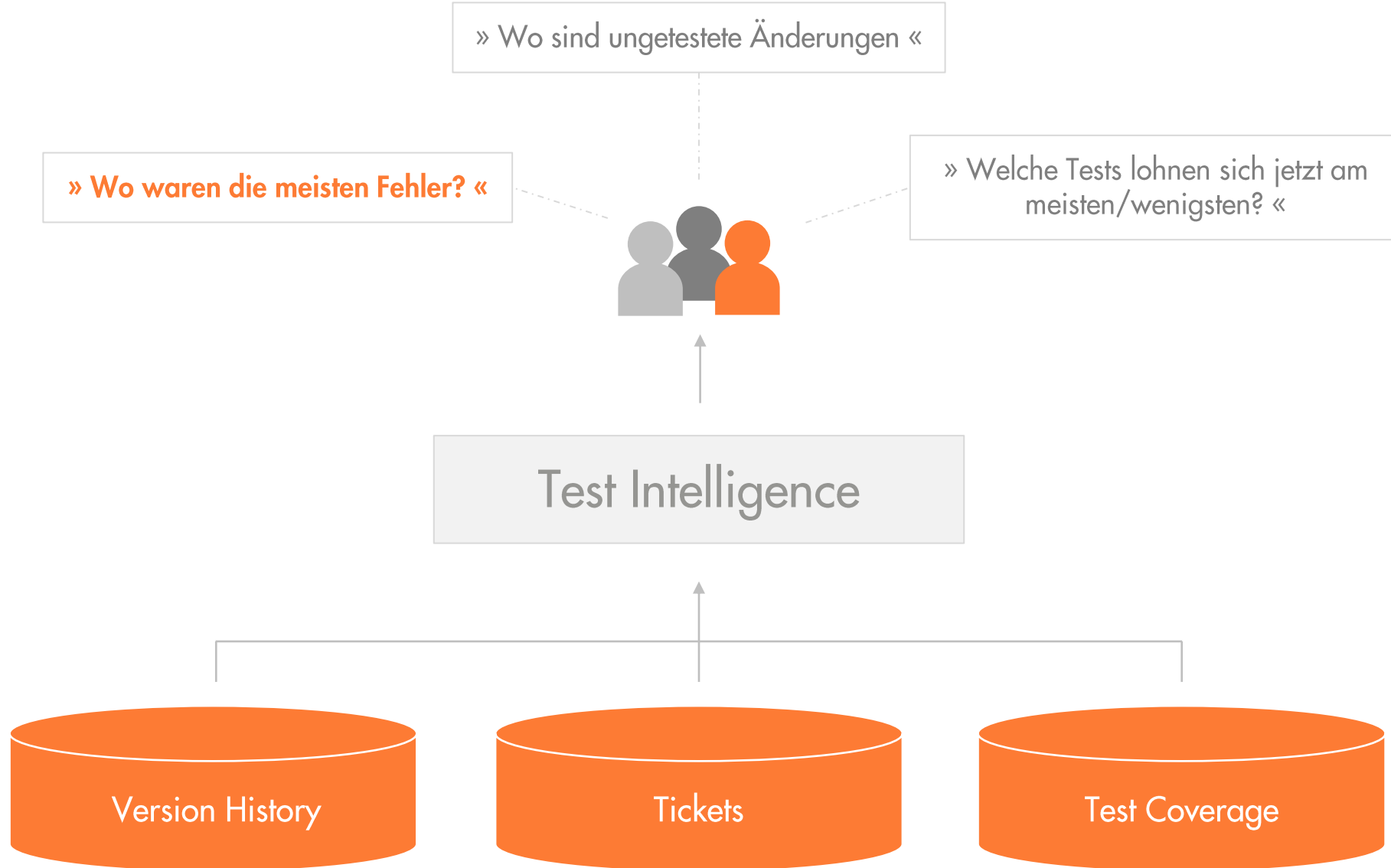
Creator:  (on Apr 06 2018 19:44) Last update: Aug 24 2018 09:32

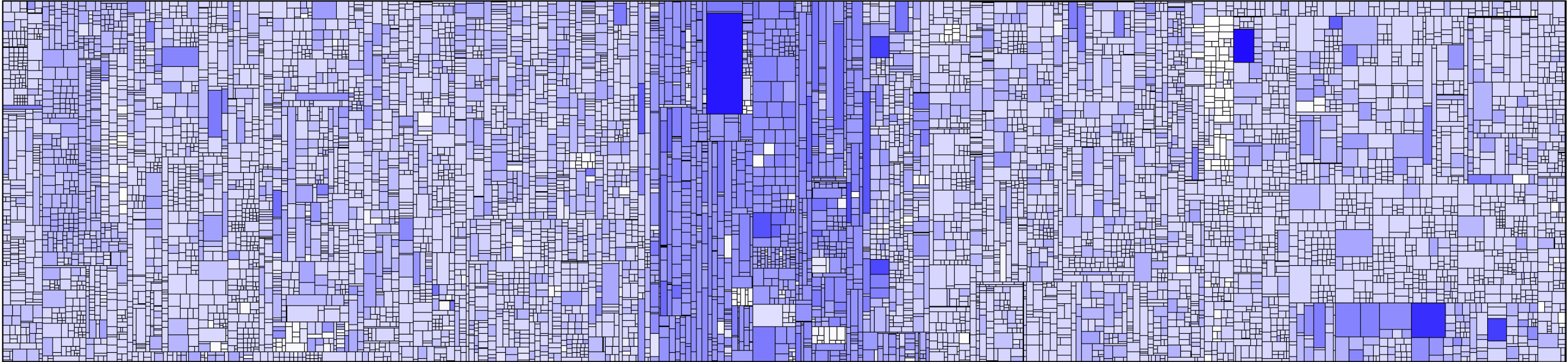
Assignee: 

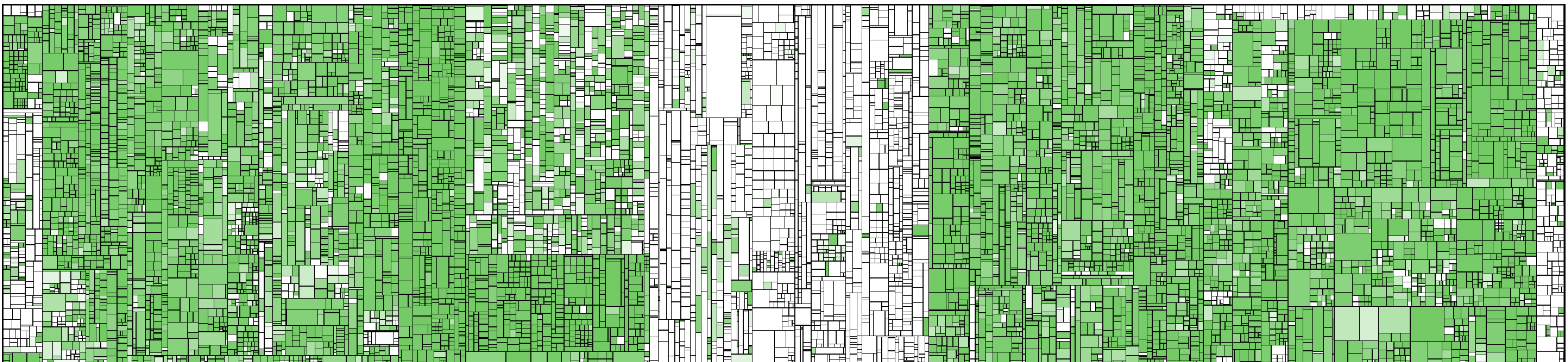
Project	Type	Priority	Resolution	Fix Version
TS	Maintenance	Normal	Green	Teamscale 4.5
Component	Labels	Affected Version	Customer	Customer Issue
Backend	Performance			
Epic Name	Freshdesk URL	Merge Request		
		https://git.cqse.eu/cqse/teamscale/3621		

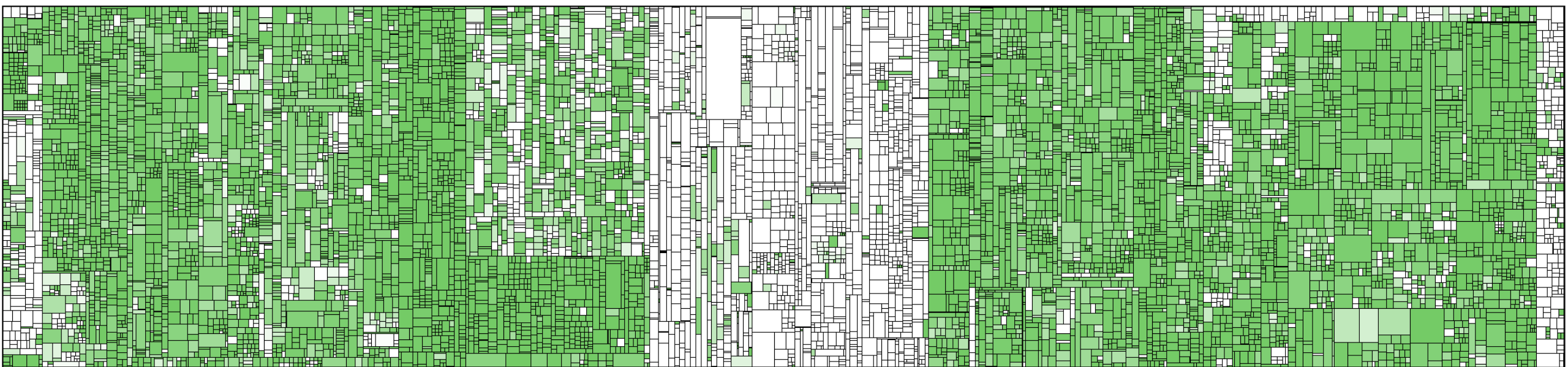
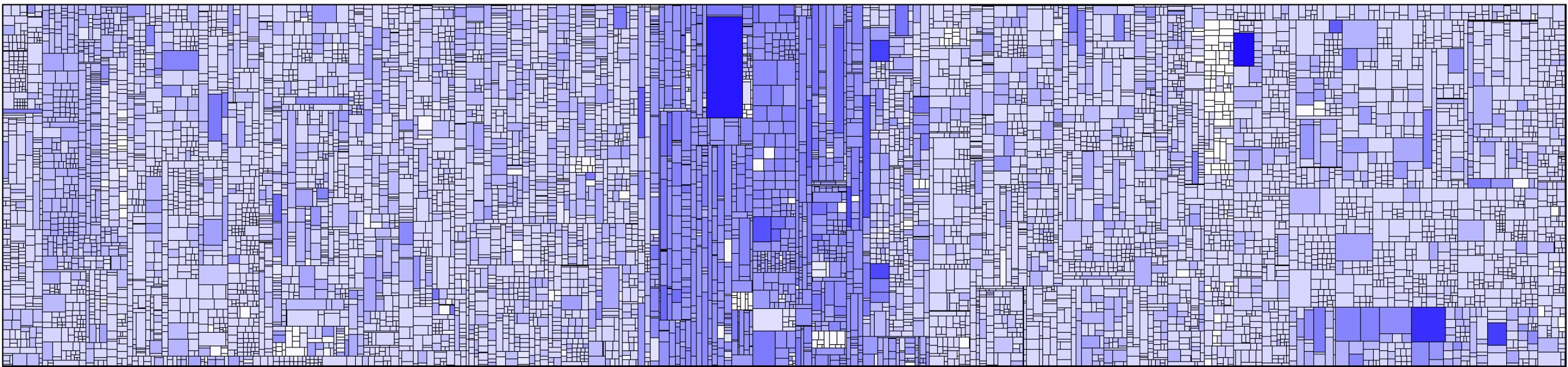
Aug 15 2018 12:37–Now | Test Gap: 22%

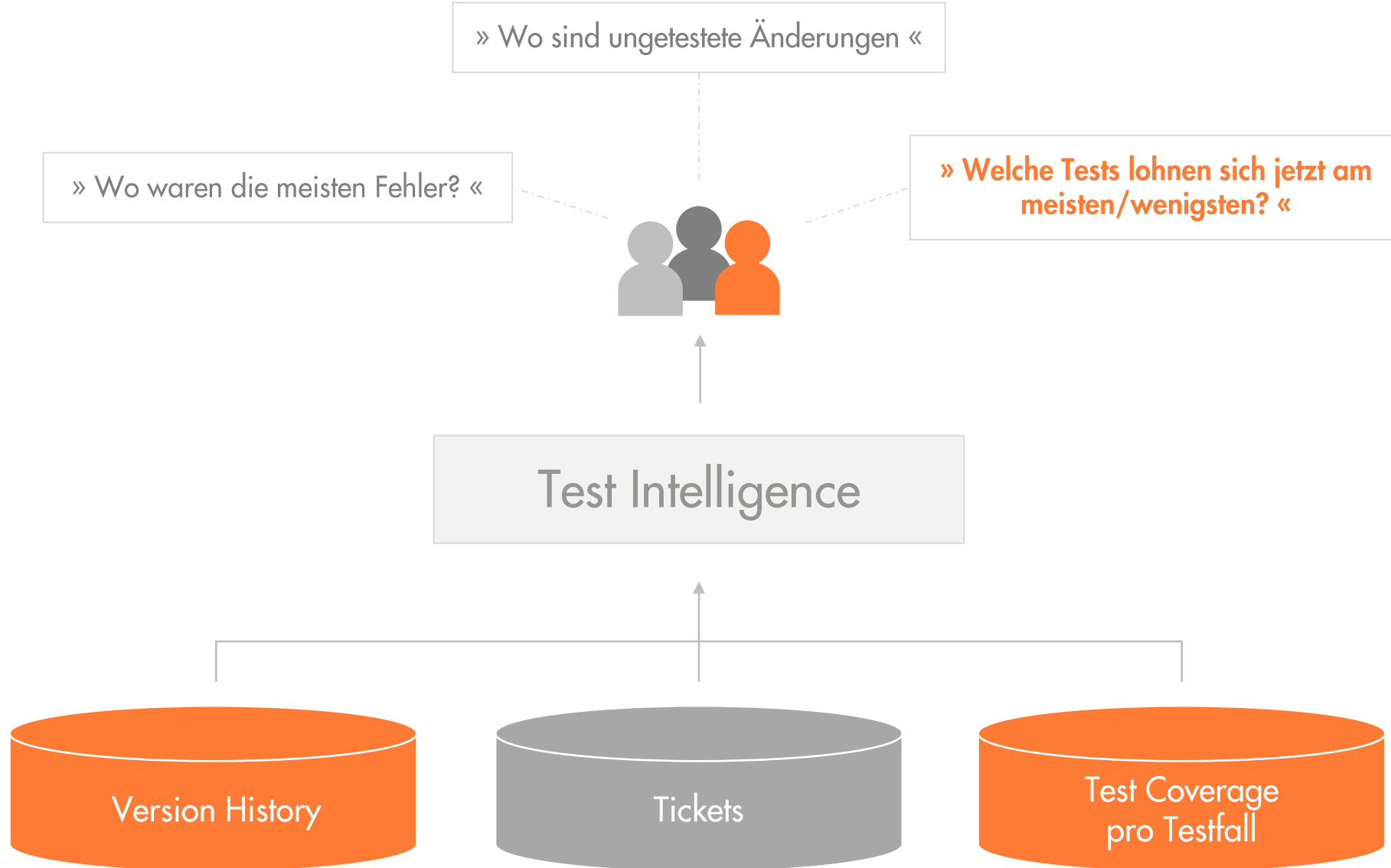


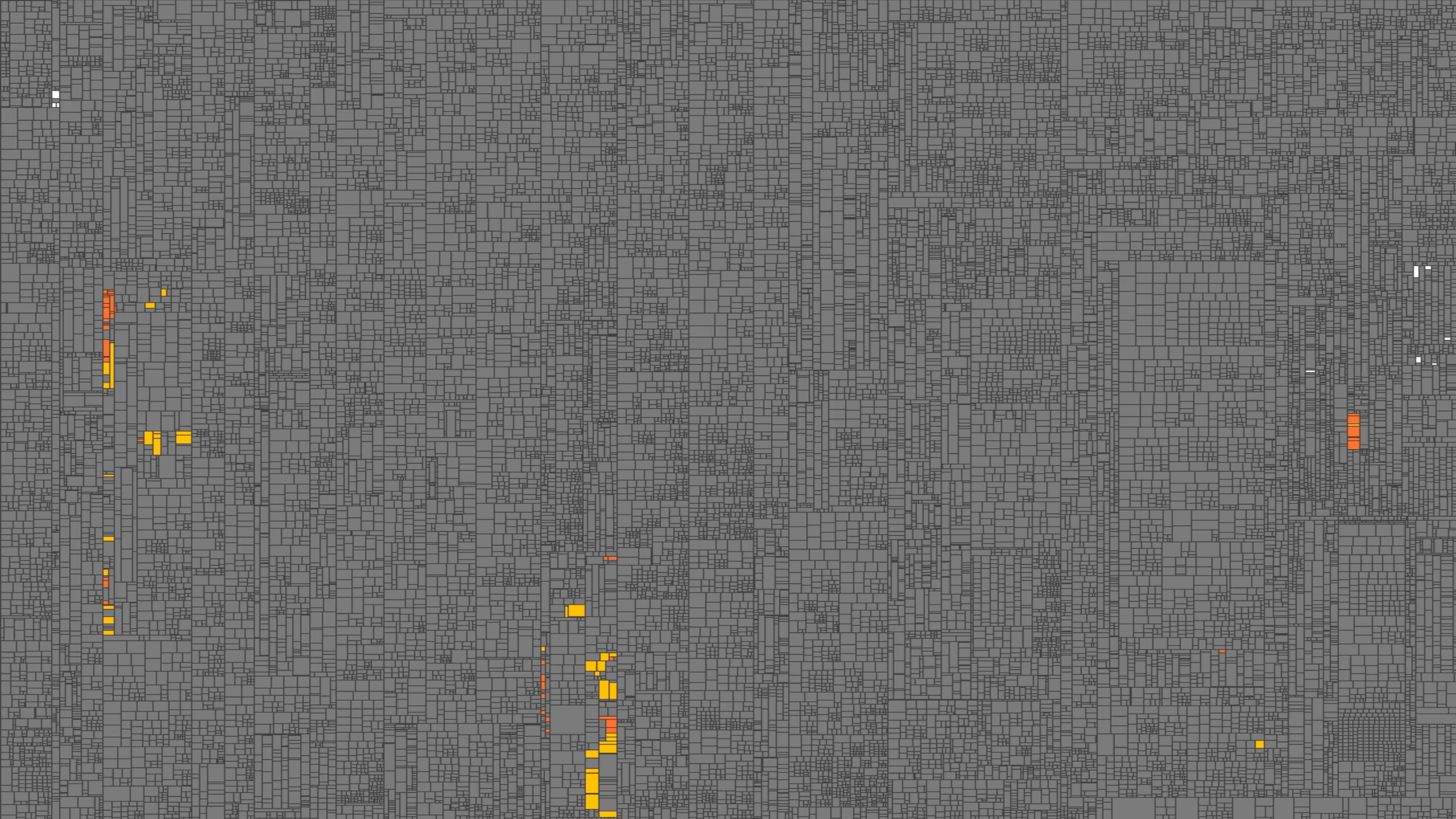


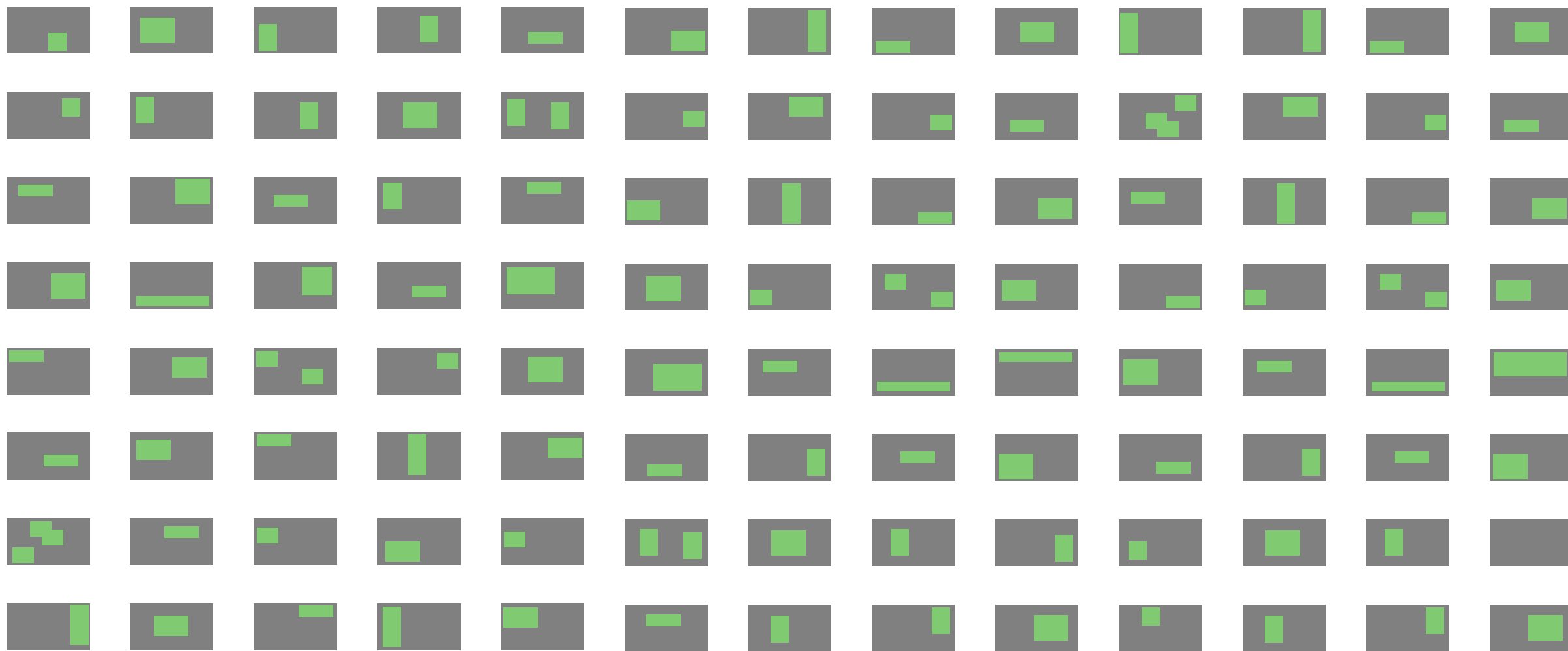








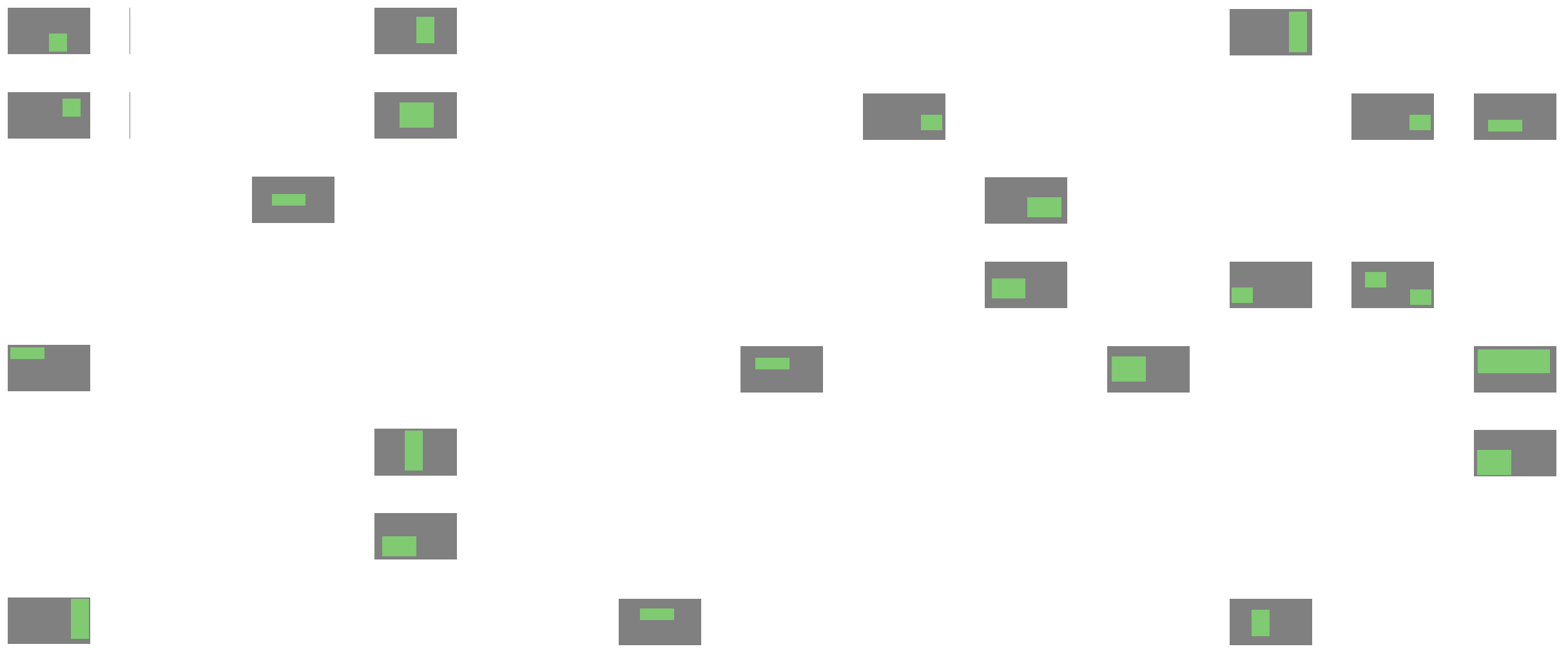




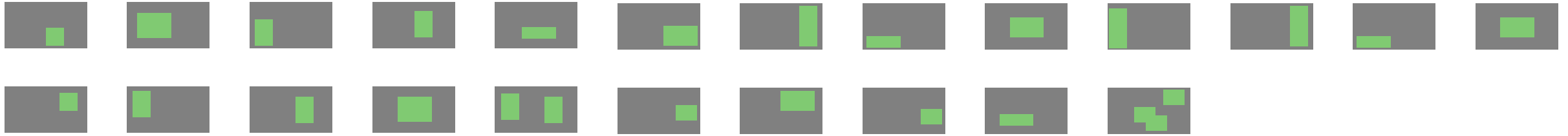
Schritt 1: Selektion betroffener Testfälle



Schritt 1: Selektion betroffener Testfälle



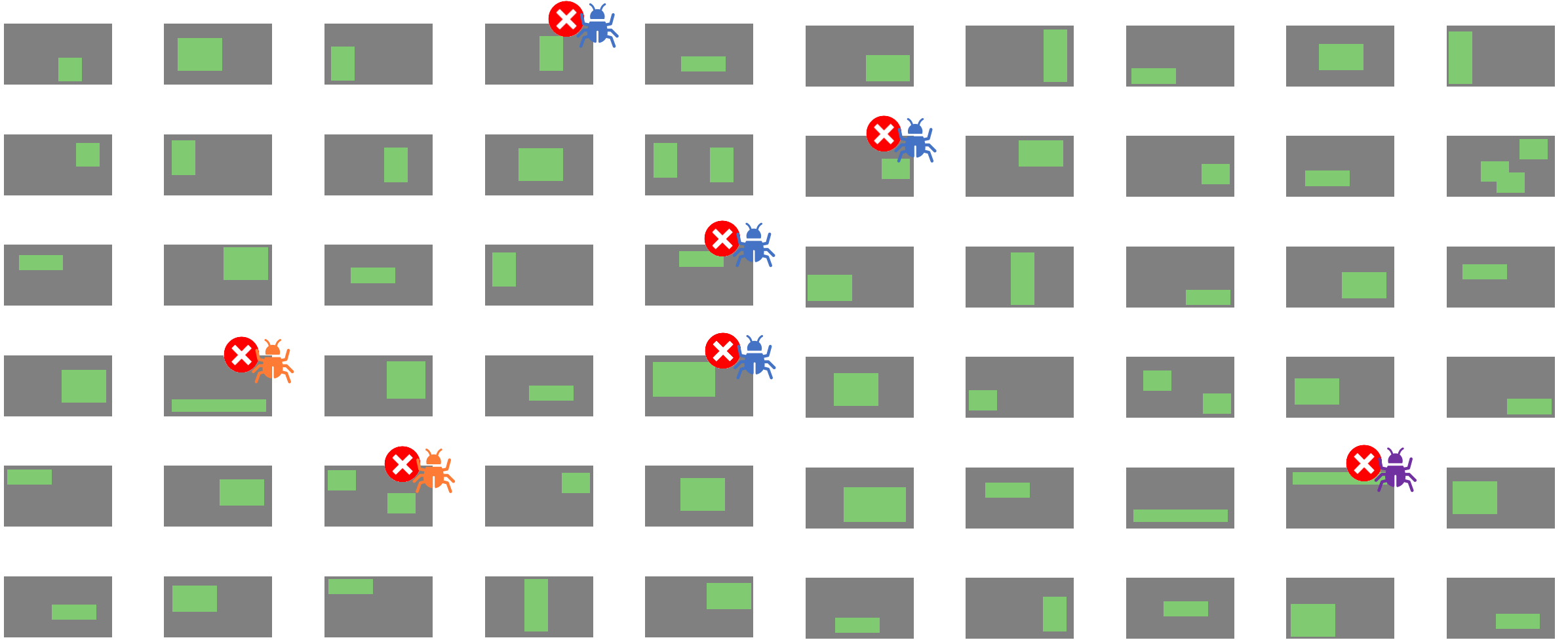
Schritt 1: Selektion betroffener Testfälle

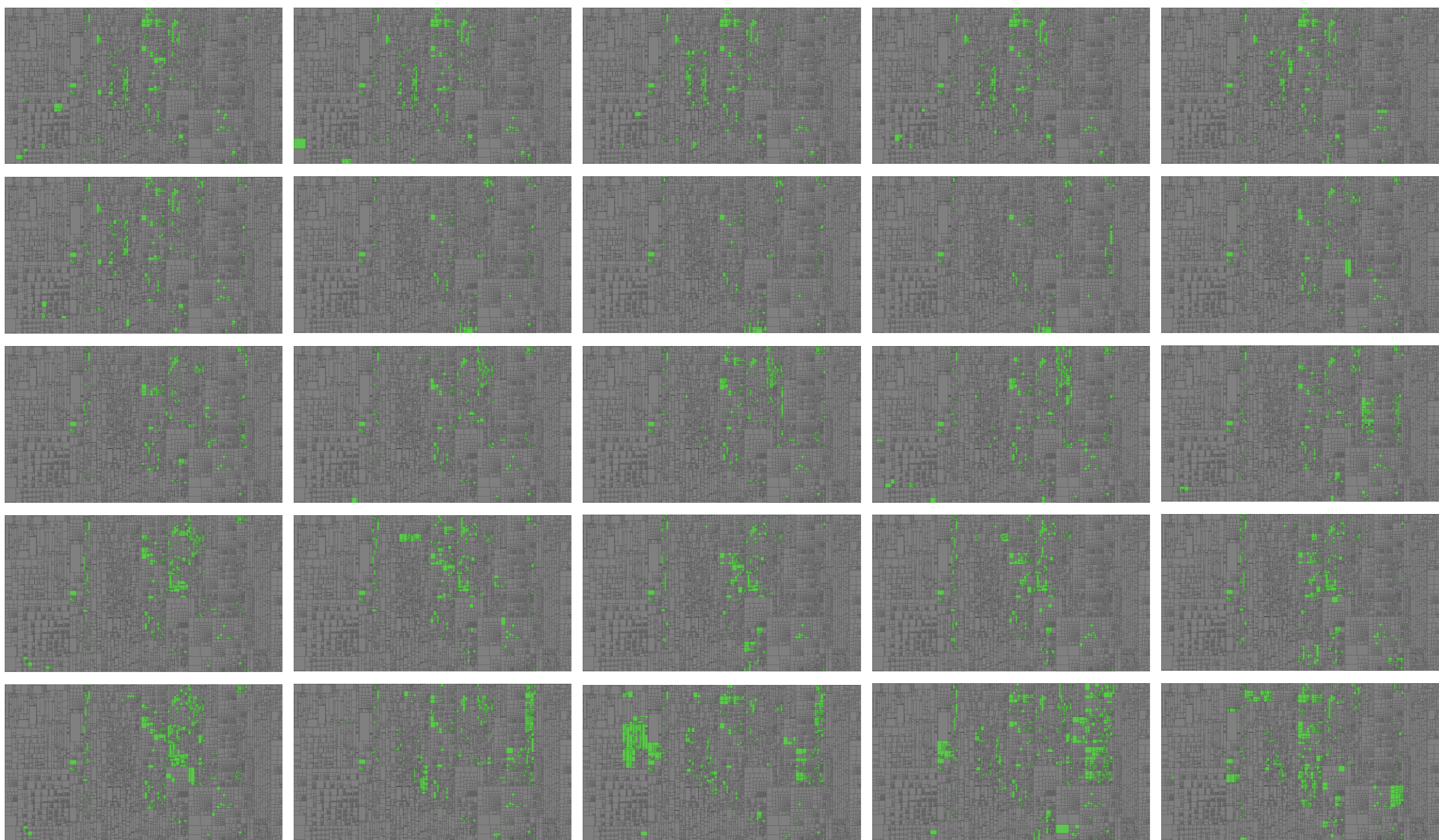


Schritt 2: Priorisierung selektierter Testfälle



Geht das auch einfacher?





Dashboard

Activity

Findings

Metrics

Test Gaps

Files

Components

Issues

Unlinked Changes

Pareto Ranking

Quality Control

Architecture

Delta

Project Configuration

Pareto Ranking

Switch to query language

Show tests from:

Batch TestsNightly

GeVo TestsNightly

KettentestsNightly

Name

Duration

> 0s

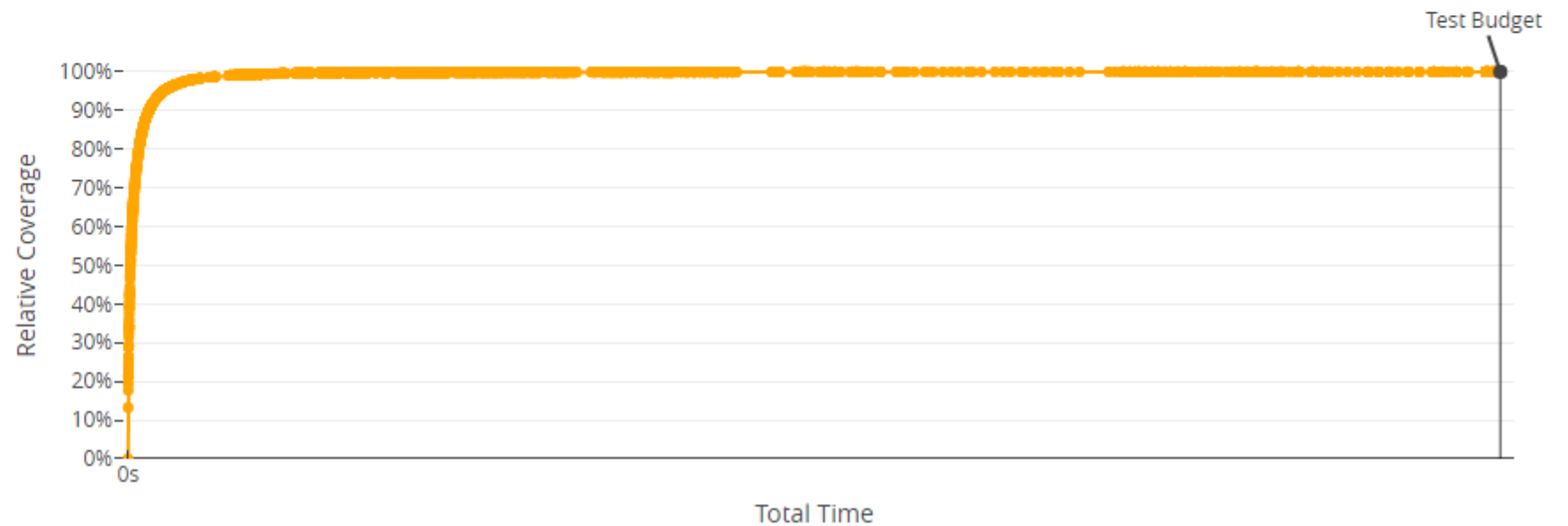
Result

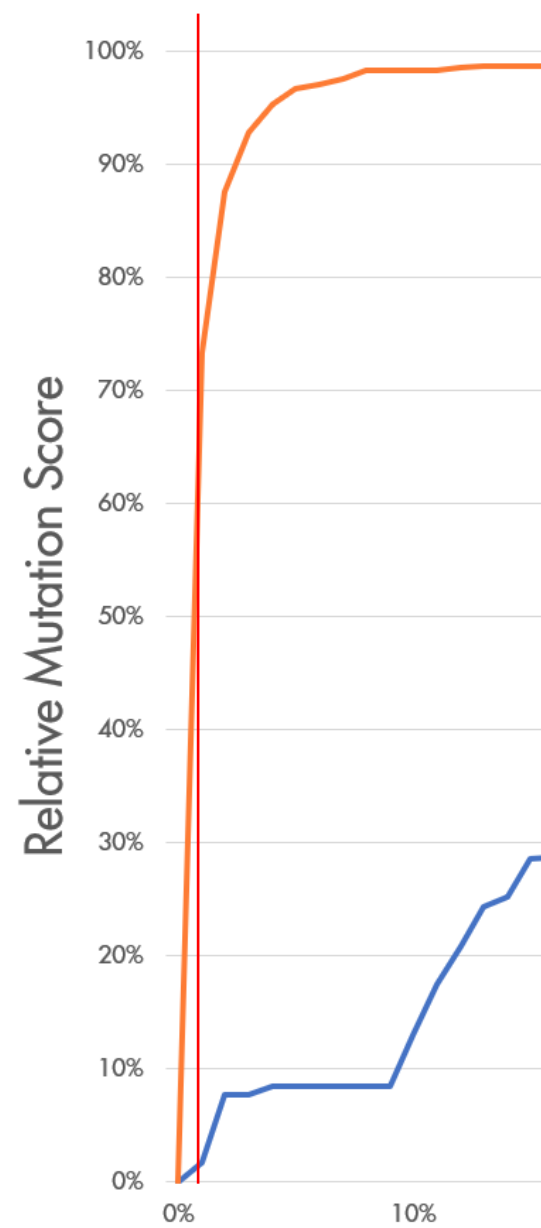
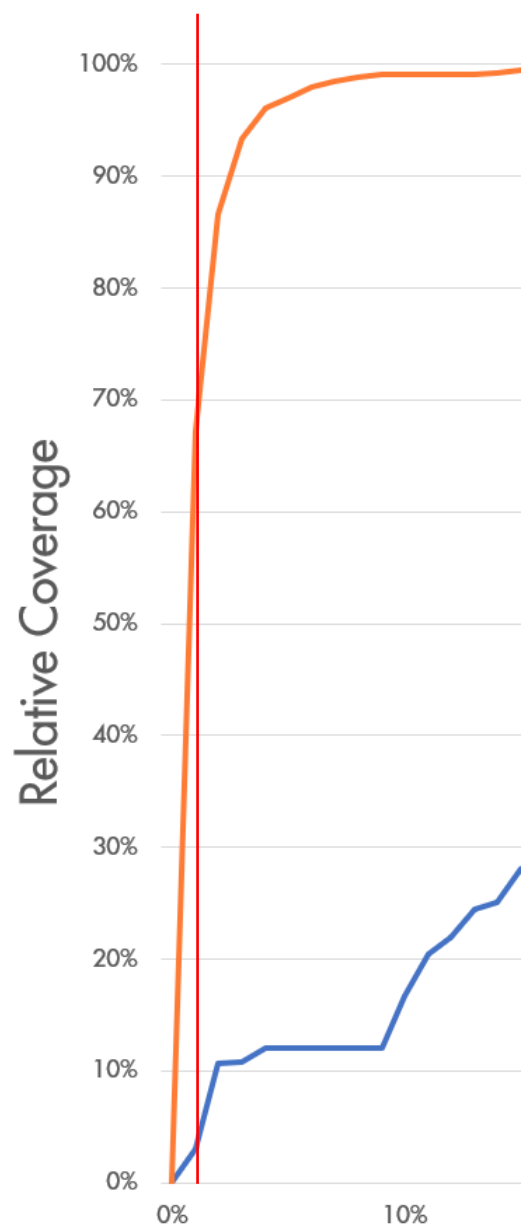
All results

+ Save query

Compute Ranking

Pareto Ranking computes a subset of the selected tests that **maximises test coverage** for the given time budget.





Test-Impact-Analyse

Tests werden für jeden Lauf **passend zu Änderungen** ausgewählt

90% der Mutanten in 2% der Zeit

Erfordert kontinuierliche Messung der Coverage und Integration der Test-Auswahl in die CI / Testautomatisierung.

Stärkere Beschleunigung des Feedbacks (bei höherem Aufwand)

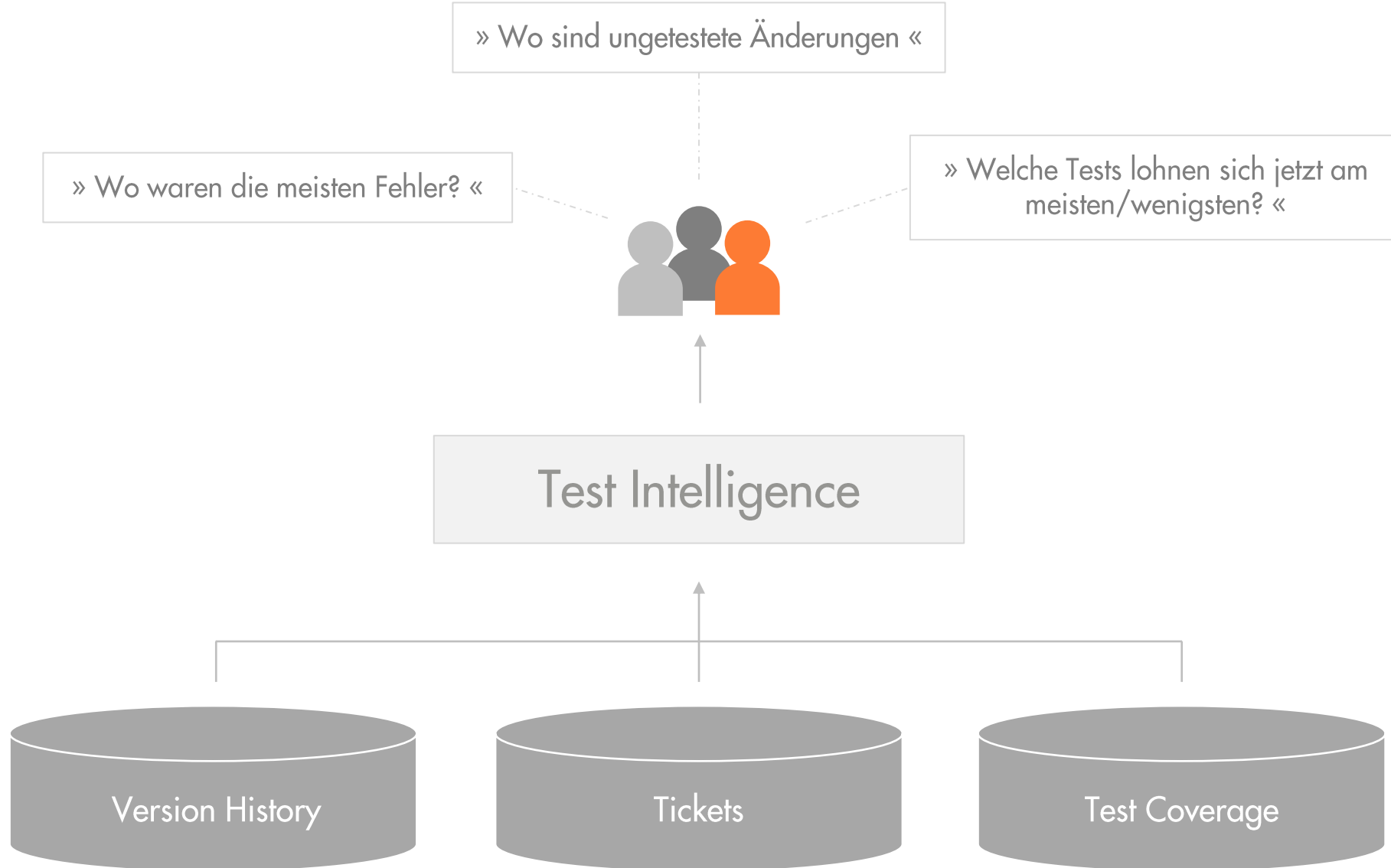
Pareto-Optimierung

Tests werden **unabhängig von Änderungen** ausgewählt

90% der Mutanten in 11% der Zeit

Einmalige Messung der Coverage reicht aus.

Viel geringerer Aufwand



Test-Gap-Analyse

Ungetestete Änderungen im Quelltext aufdecken



16. Oktober
10:30-12:00 Uhr

cqse.eu/tga-22-10-qs22t



19. November
17:00-18:30 Uhr

cqse.eu/tga-22-11-qs22t



Schnelles Feedback trotz langsamer Tests

Testselektion für historisch gewachsene Test-Suites



26. Oktober
10:30-12:00 Uhr

cqse.eu/ts-22-10-qs22t



30. November
17:00-18:30 Uhr

cqse.eu/ts-22-11-qs22t



Kontakt – Ich freue mich auf Fragen 😊



Dr. Elmar Jürgens

juergens@cqse.eu

+49 179 675 3863



CQSE GmbH
Centa-Hafenbrädl-Str 59
81249 München
www.cqse.eu

CQSE