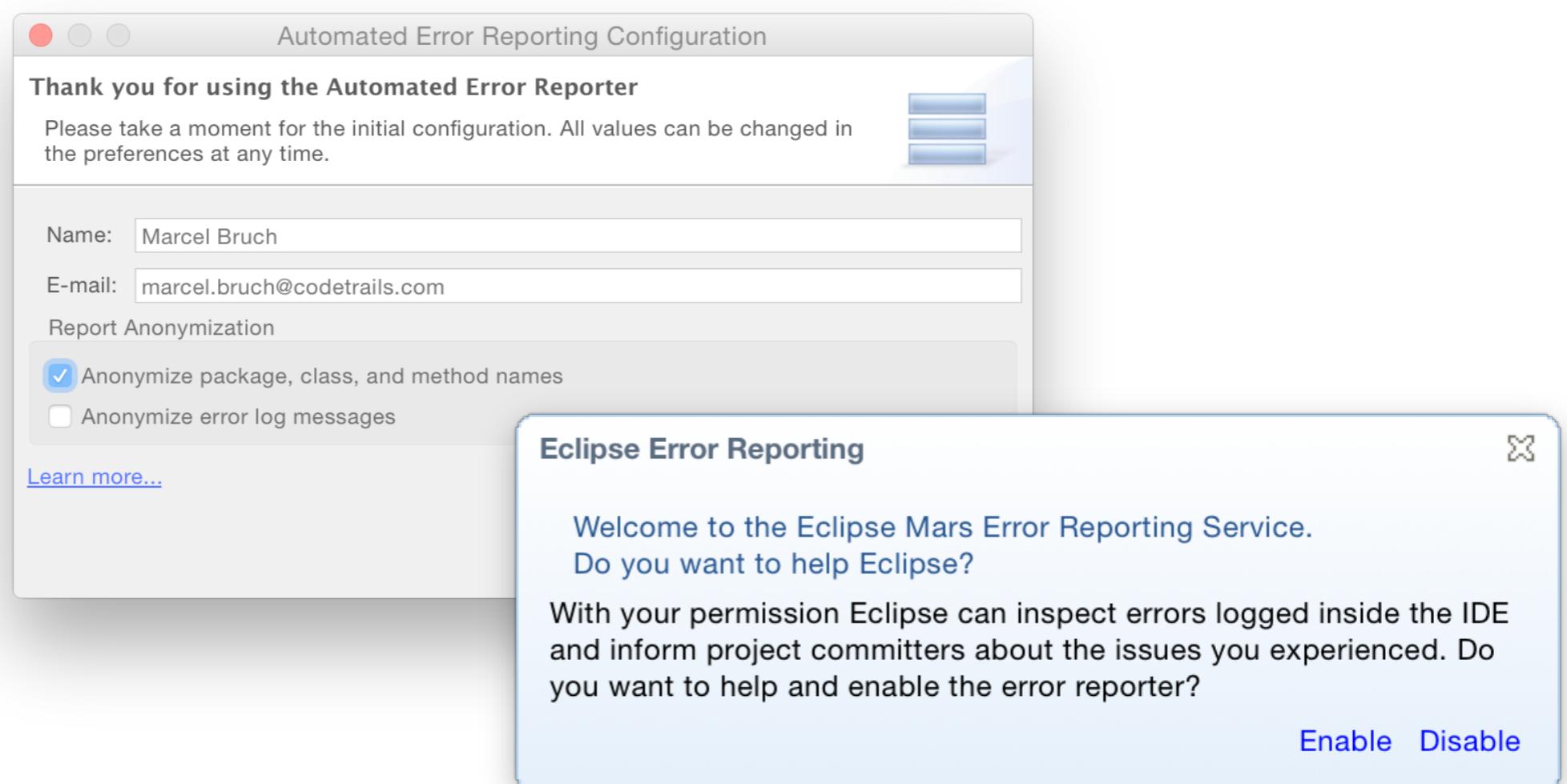


Because you can't fix what you don't know is broken...



About me



marcelbruch

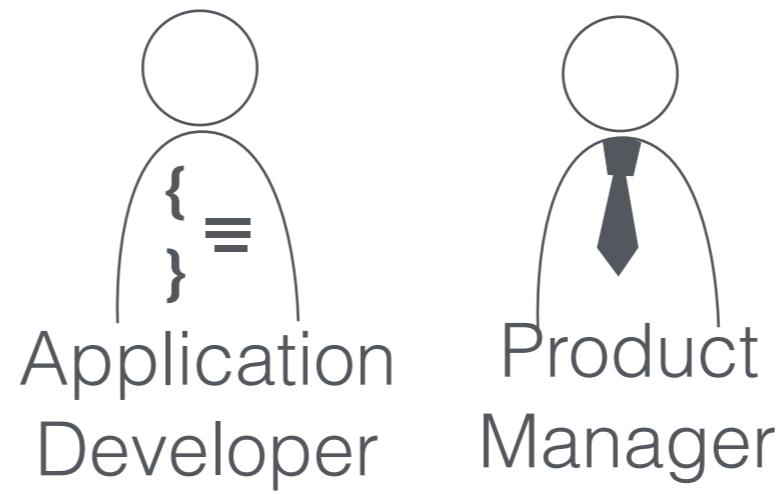


@marcelbruch

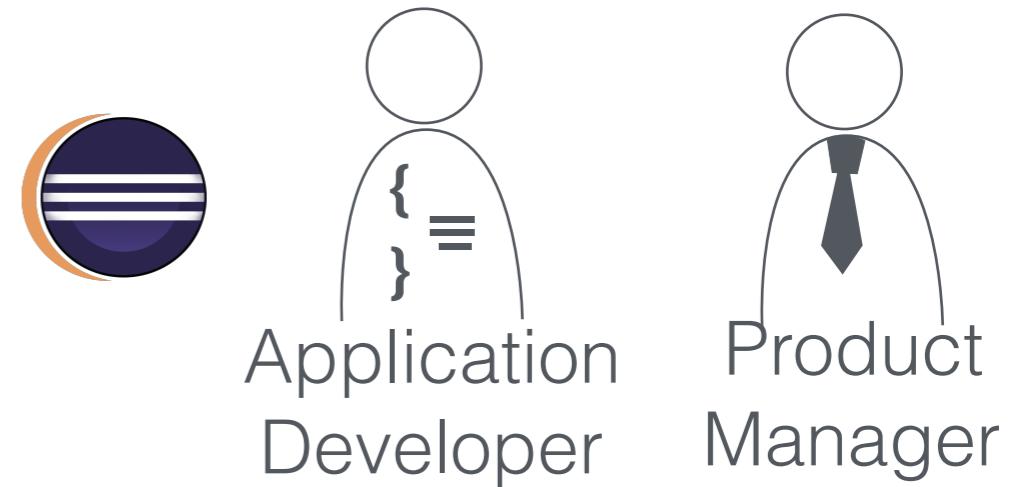
- Initiator of the Automated Error Reporting Initiative
- Project Lead of Eclipse Code Recommenders
- Eclipse Committer since 2010
- Plug-in Developer for 10+ years (Eclipse 2.1)
- Member of the Eclipse Architecture Council
- Co-Lead of Java User Group Darmstadt
- CEO of Codetrails

- **Passion to improve developers day-to-day work with intelligent and practical tools - mostly using Data Mining on Big (Software Engineering) Data.**

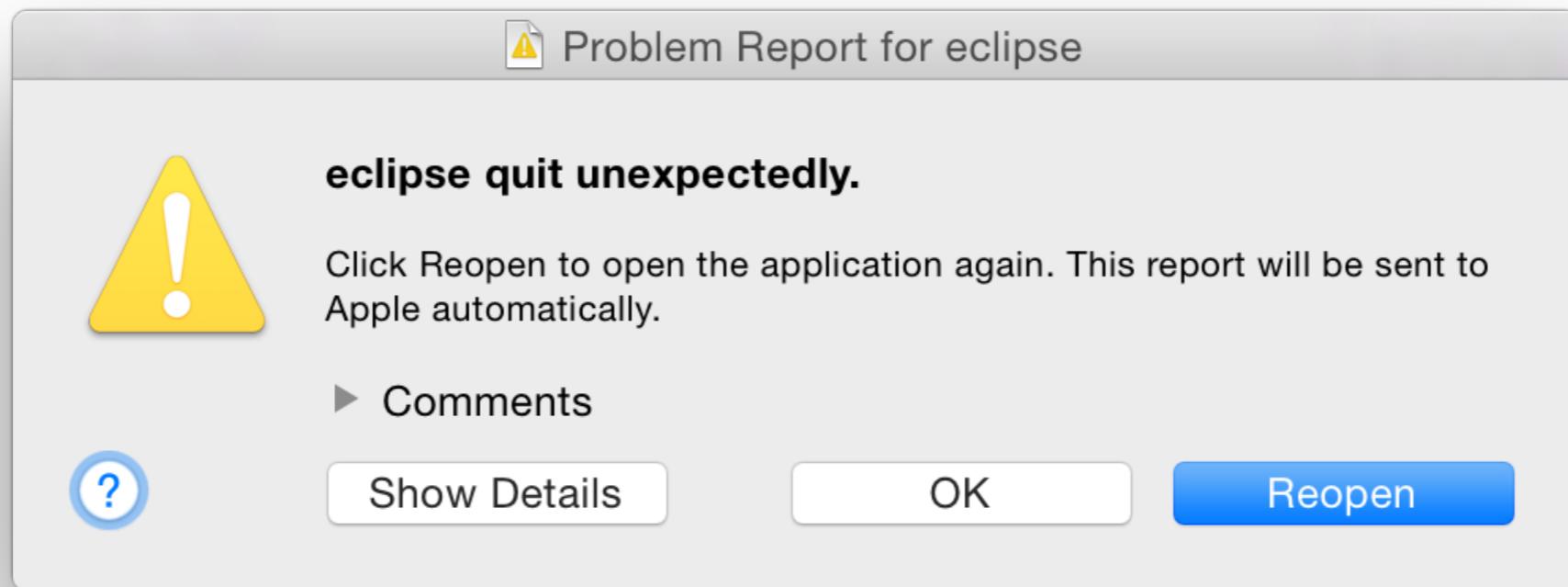
Adding a new character to the plot



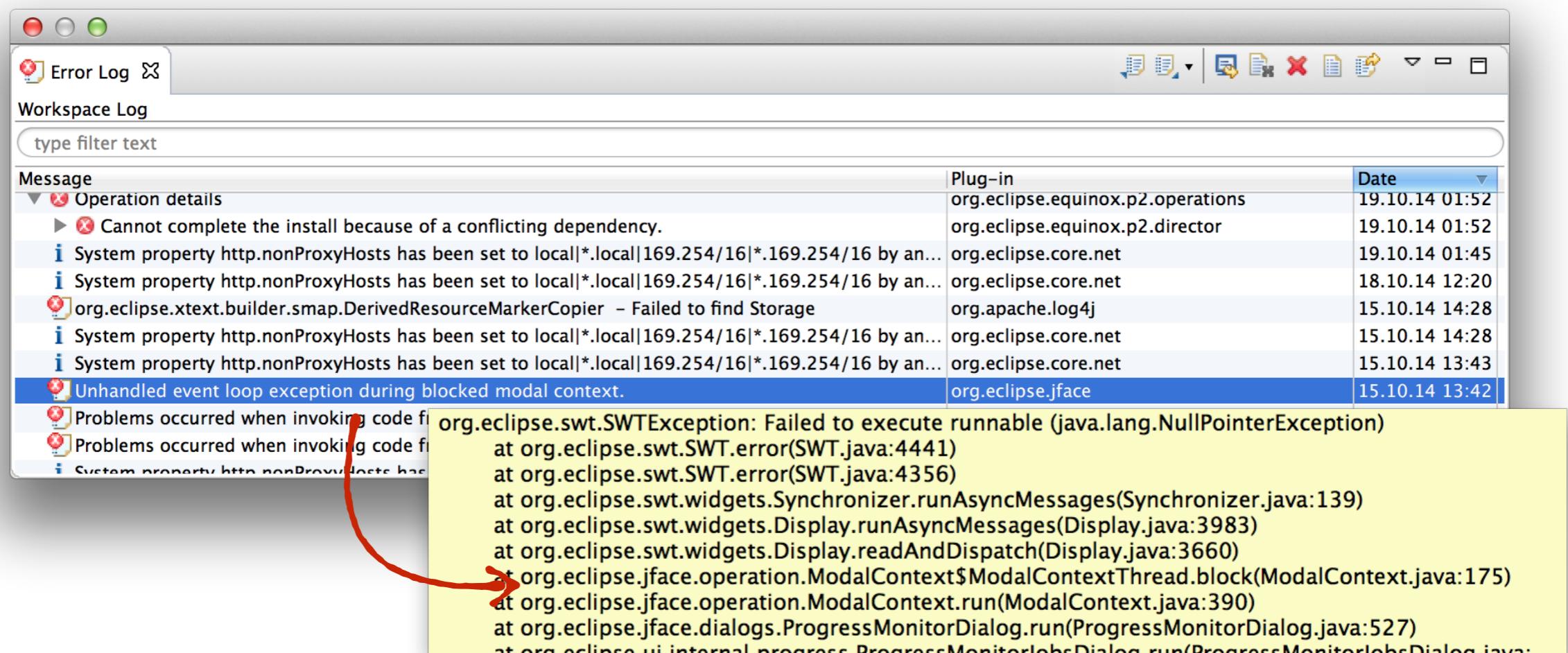
Imagine the following situation...



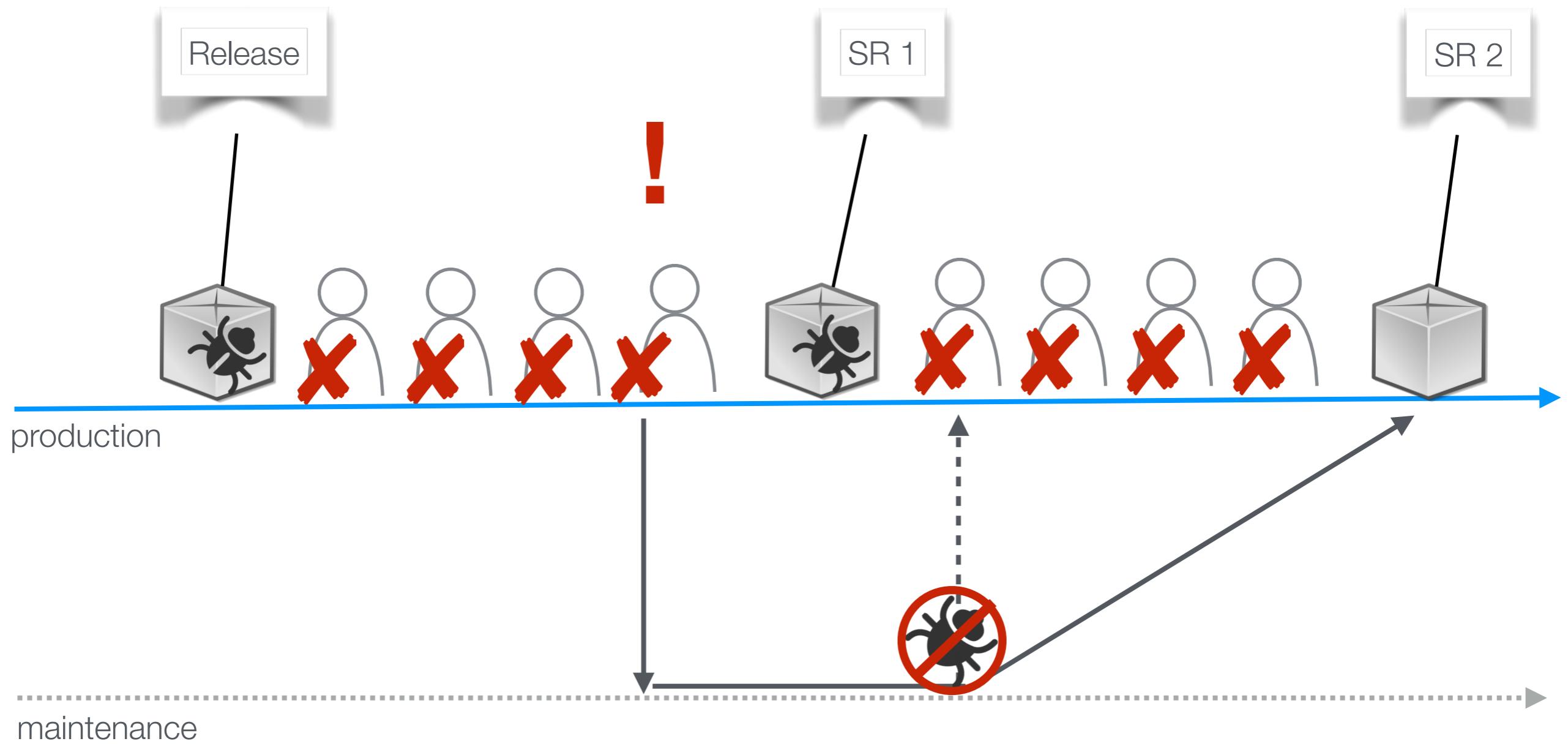
But when the user starts the app...



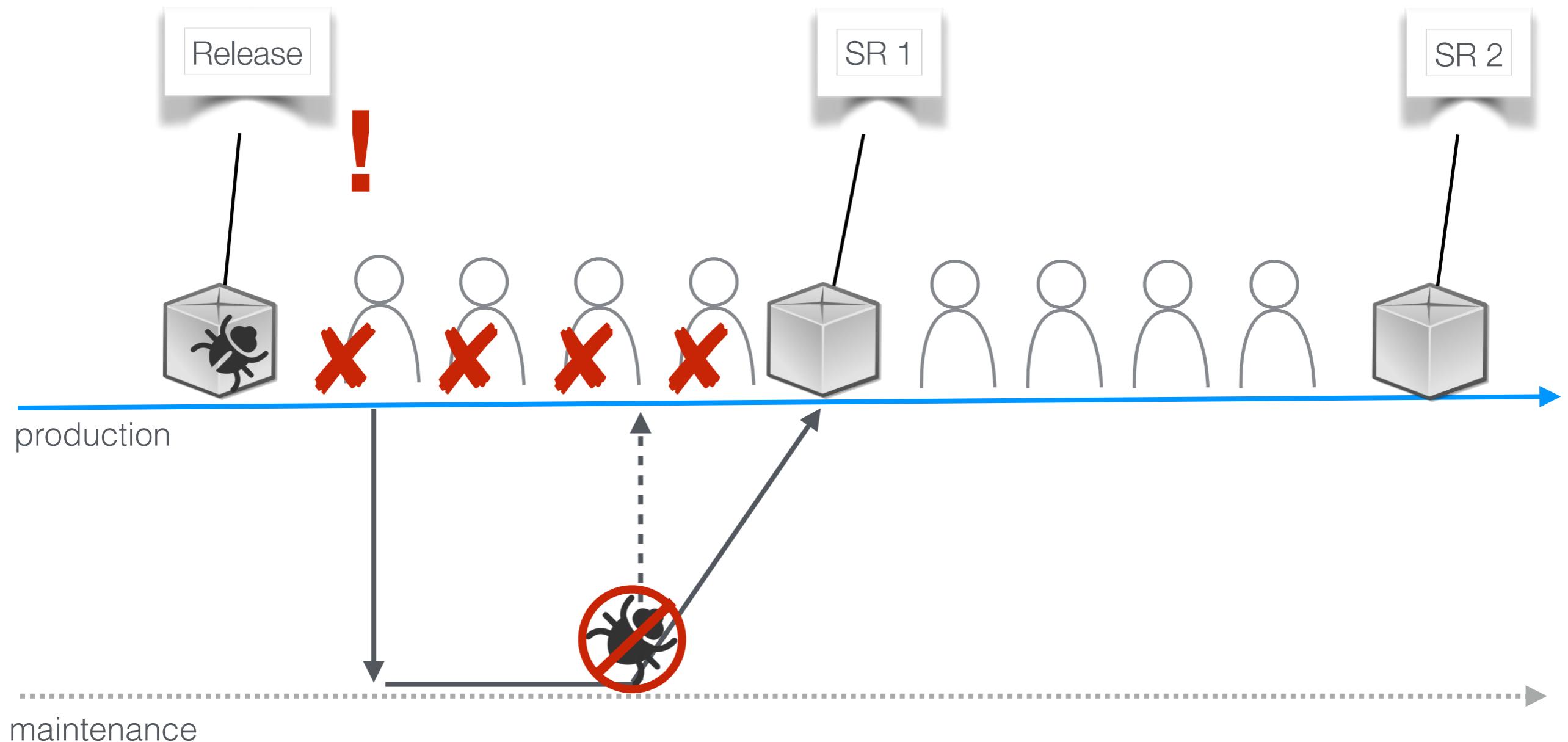
In the logs you'd find...



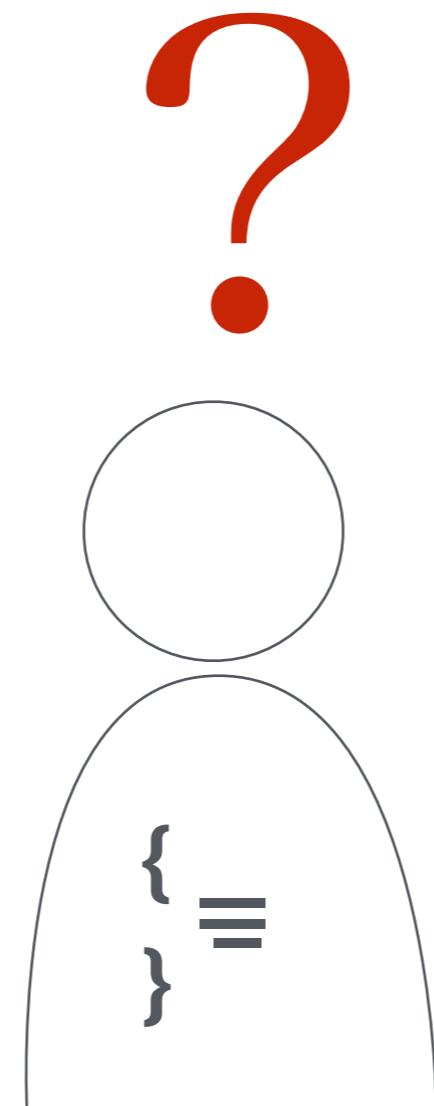
The tragedy of manual error reports



The tragedy of manual error reports



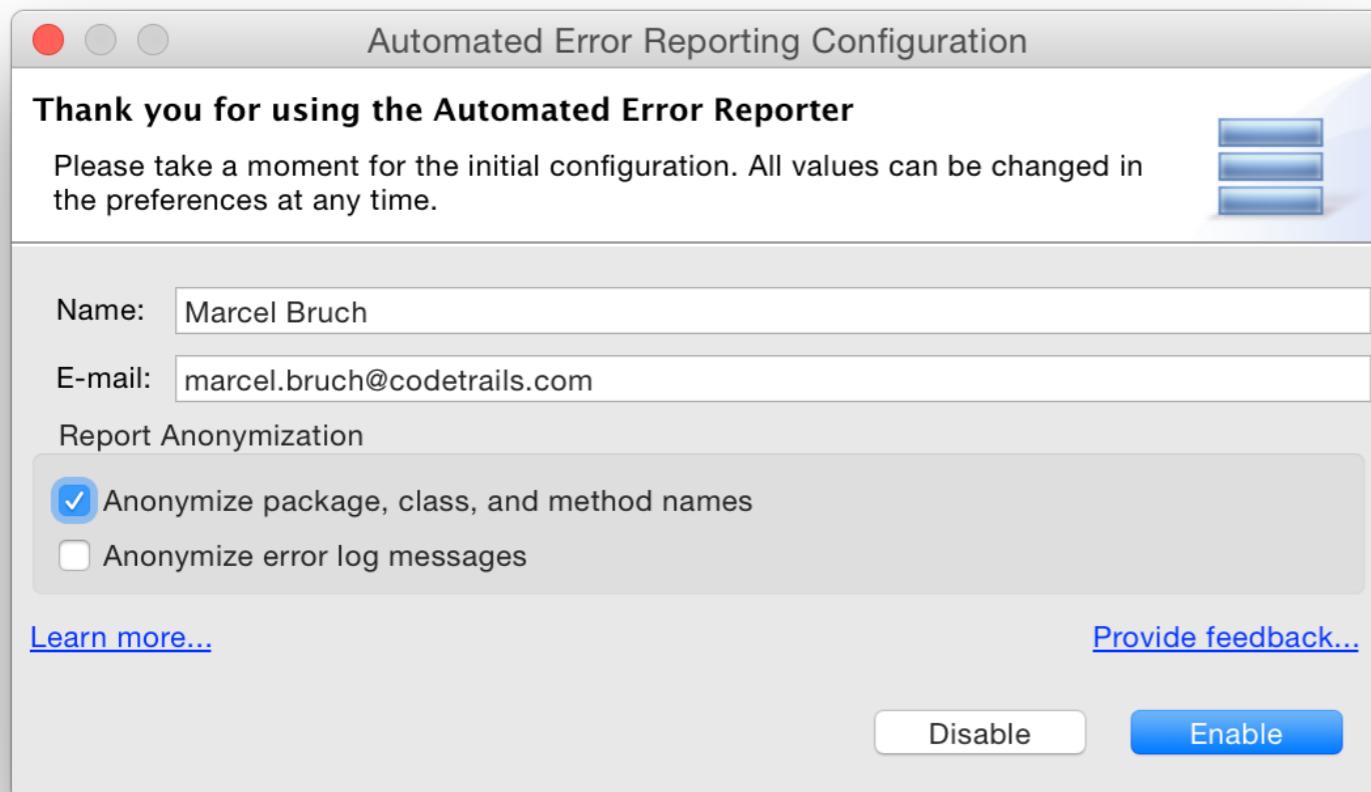
What can we do?



Application Developer

The Automated Error Reporting Initiative

Live Demo



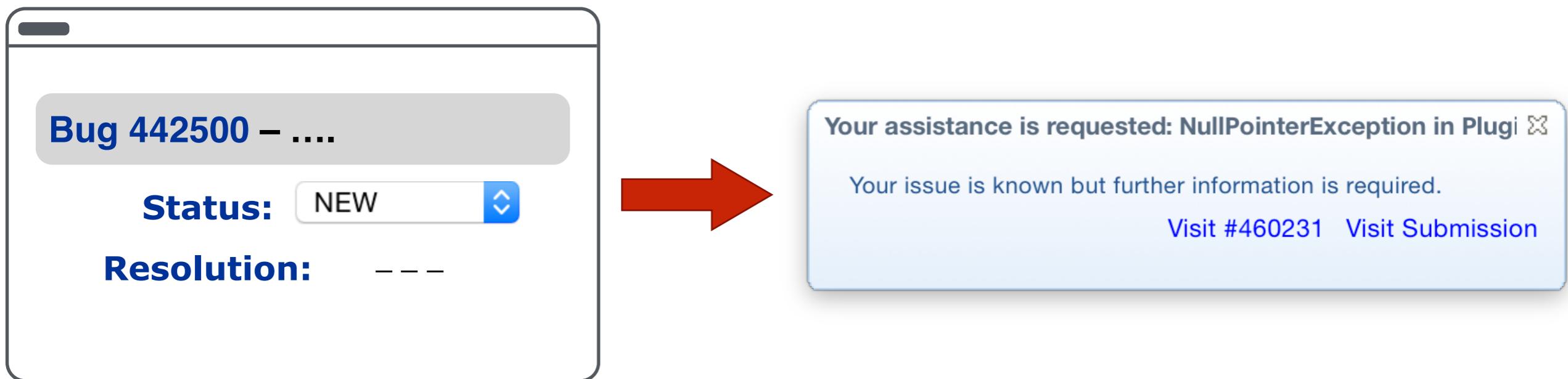
„Keep users informed about your progress...“

About server responses, Bugzilla, and immediate feedback

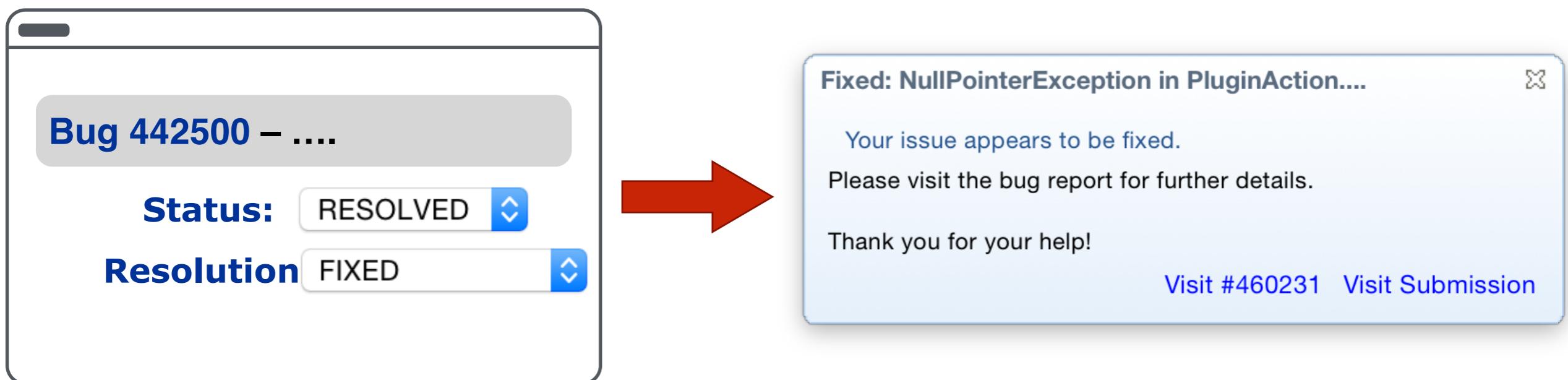
Not yet tracked problems...



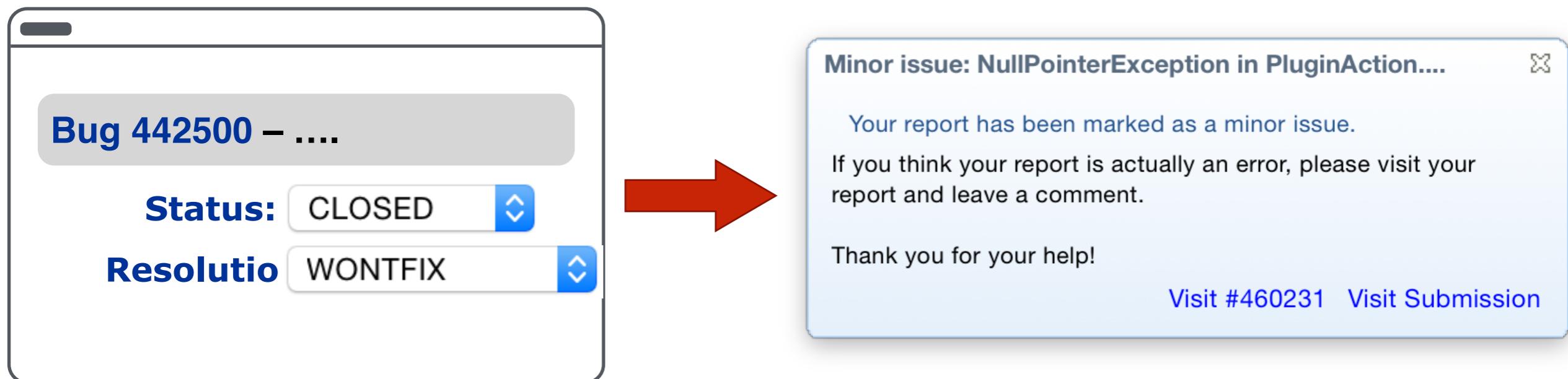
Committees needinfo...



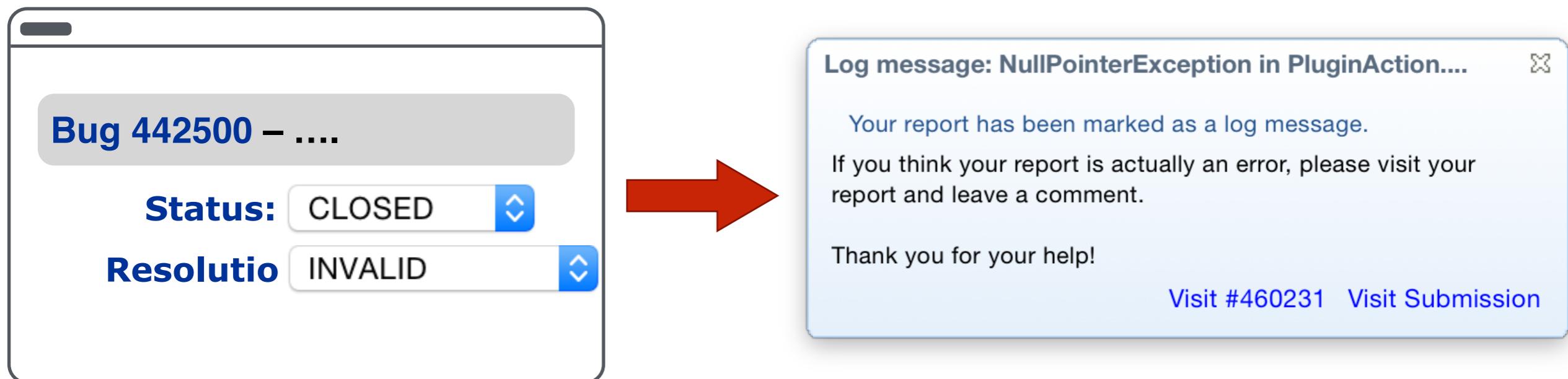
Fixed...



Won't Fix...



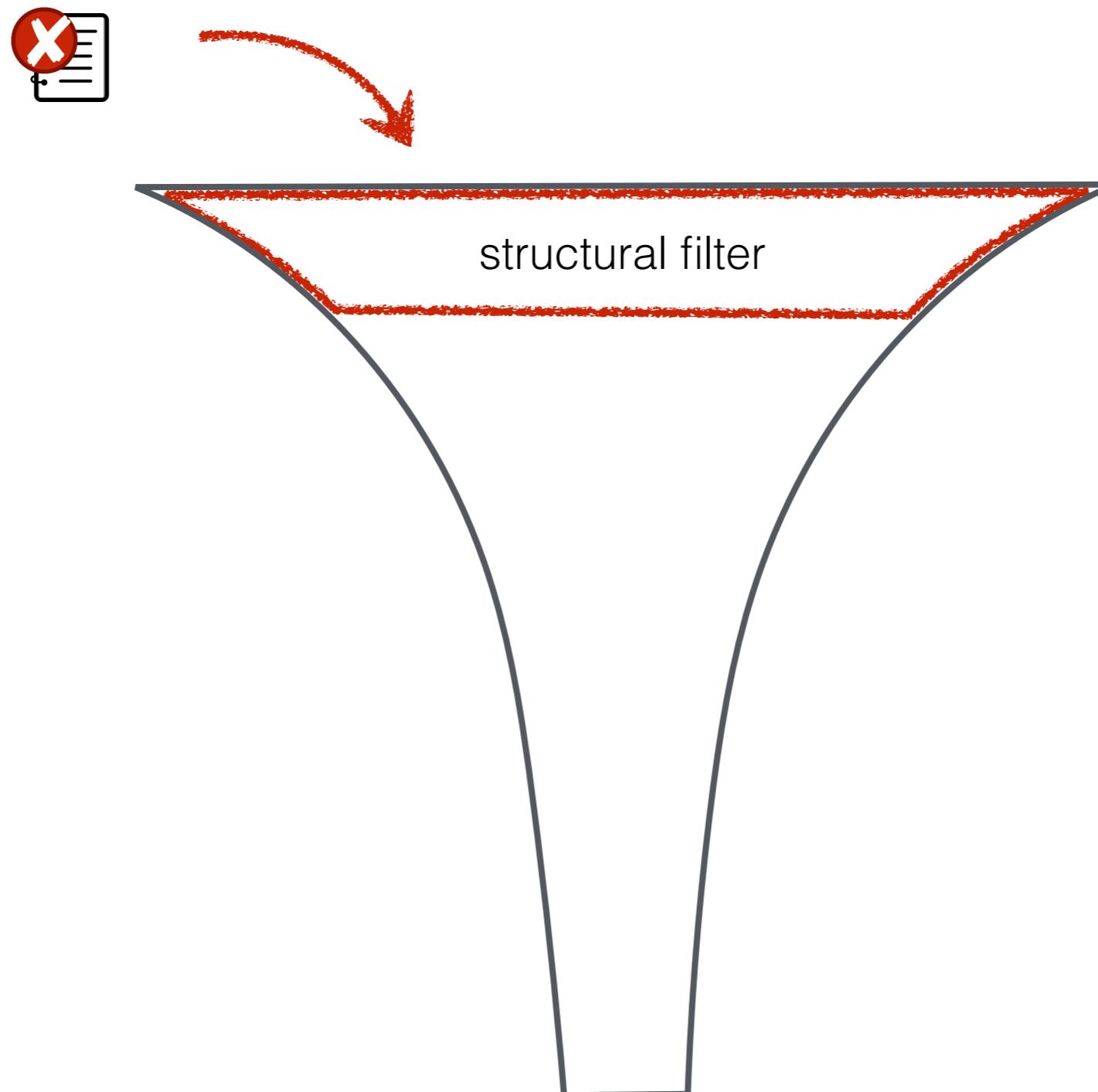
Invalid (aka log messages)



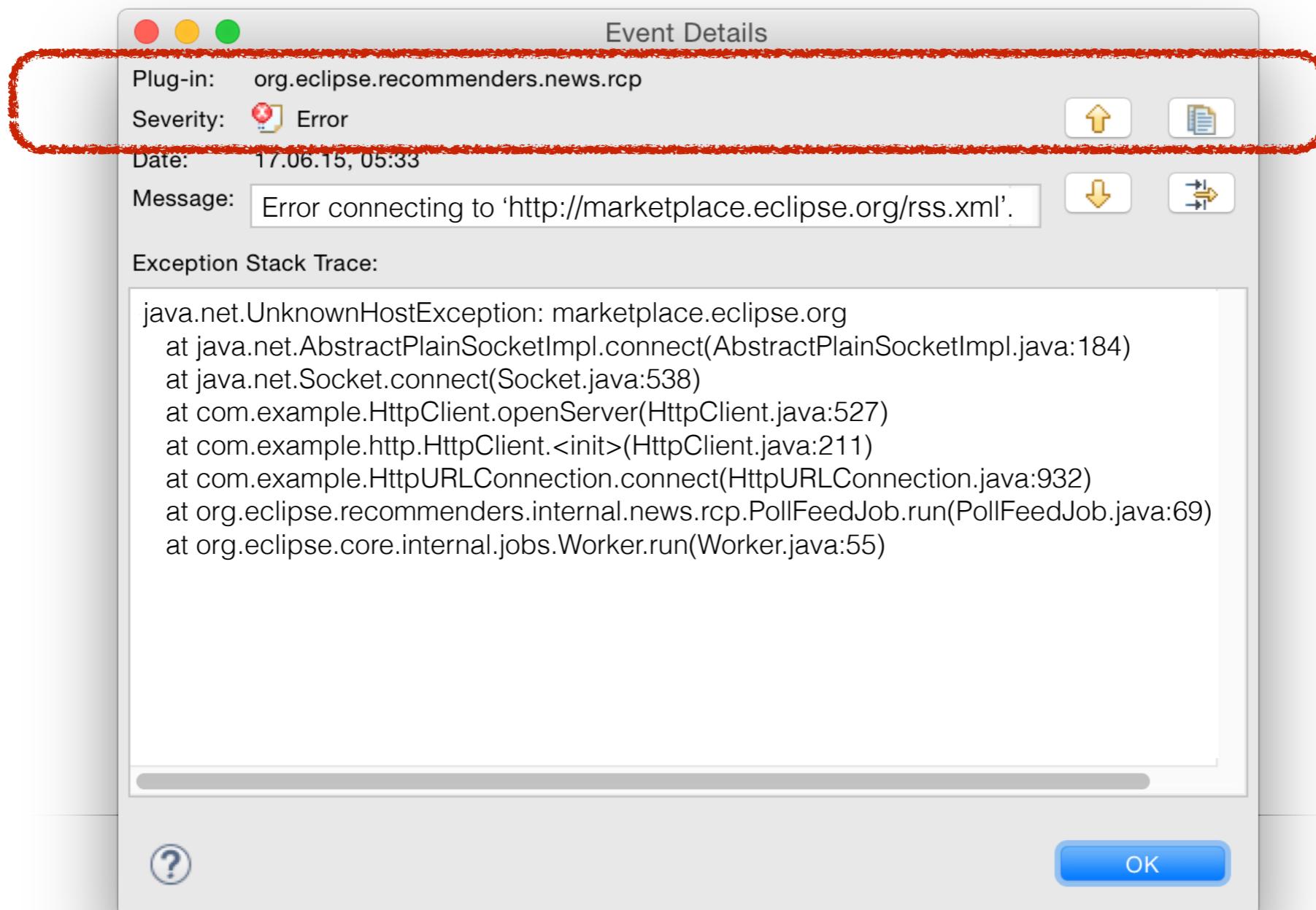
really

Do we send **all errors** to Eclipse...?

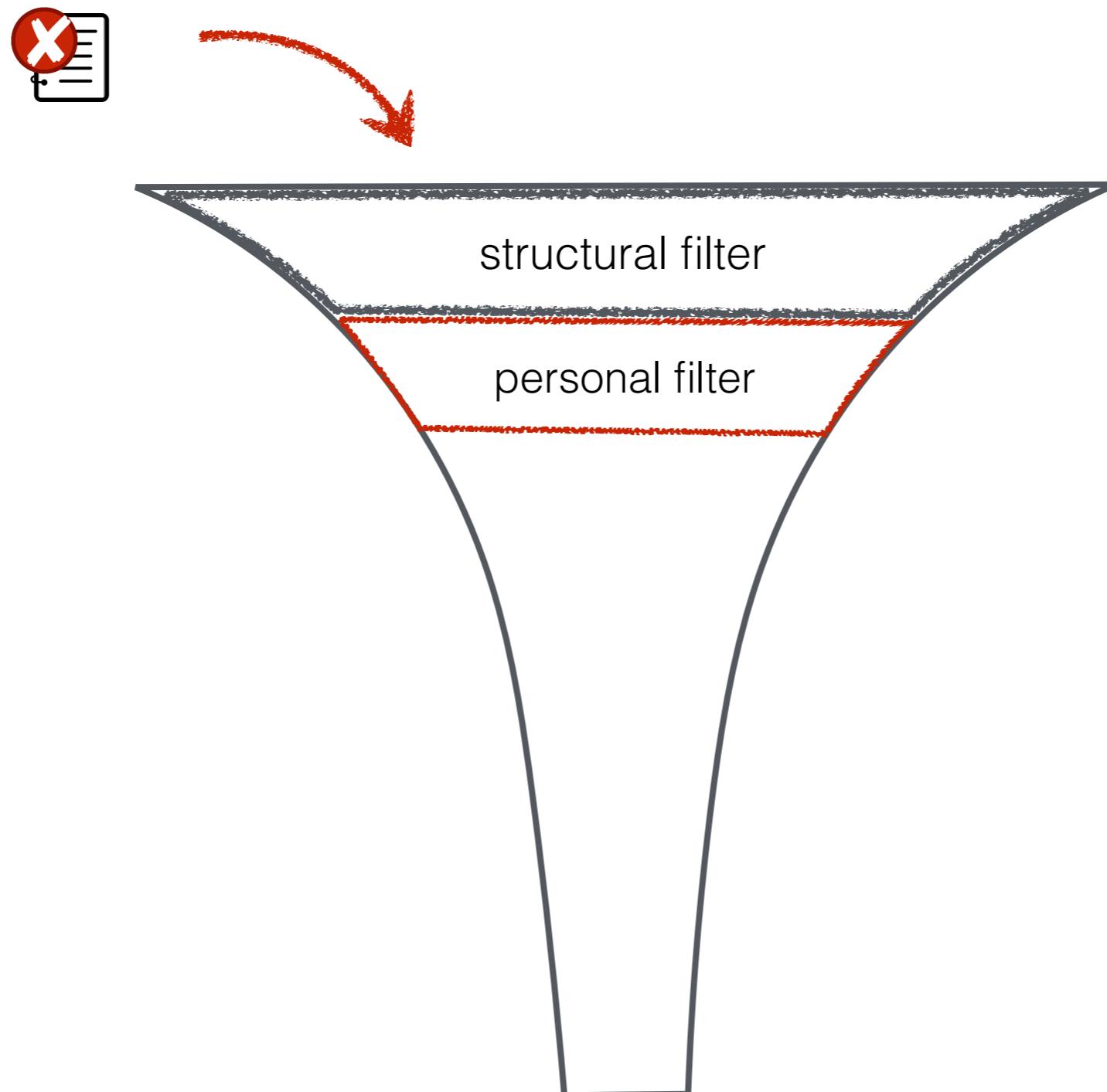
The error reporting funnel



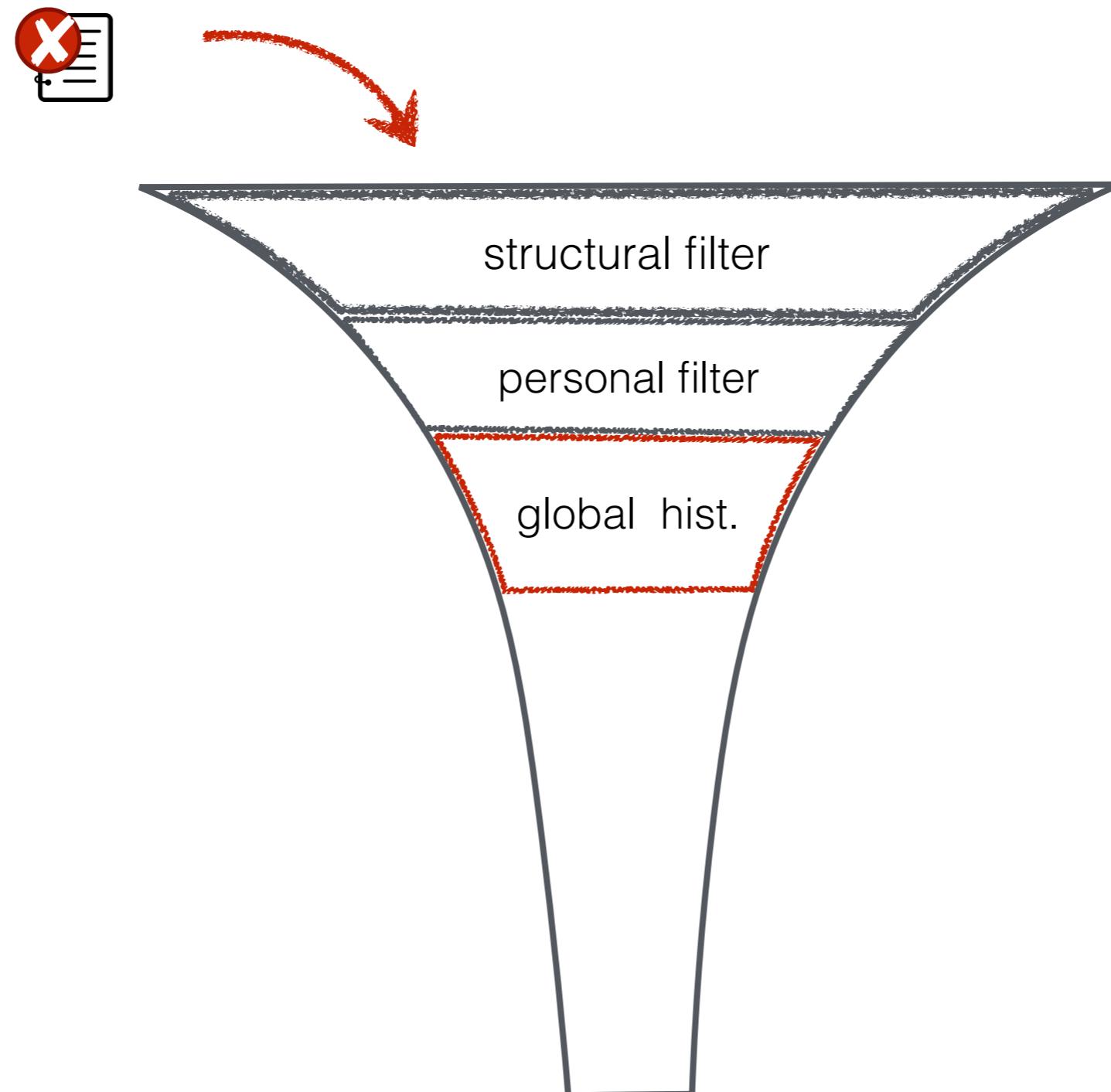
#1: Structural Filtering



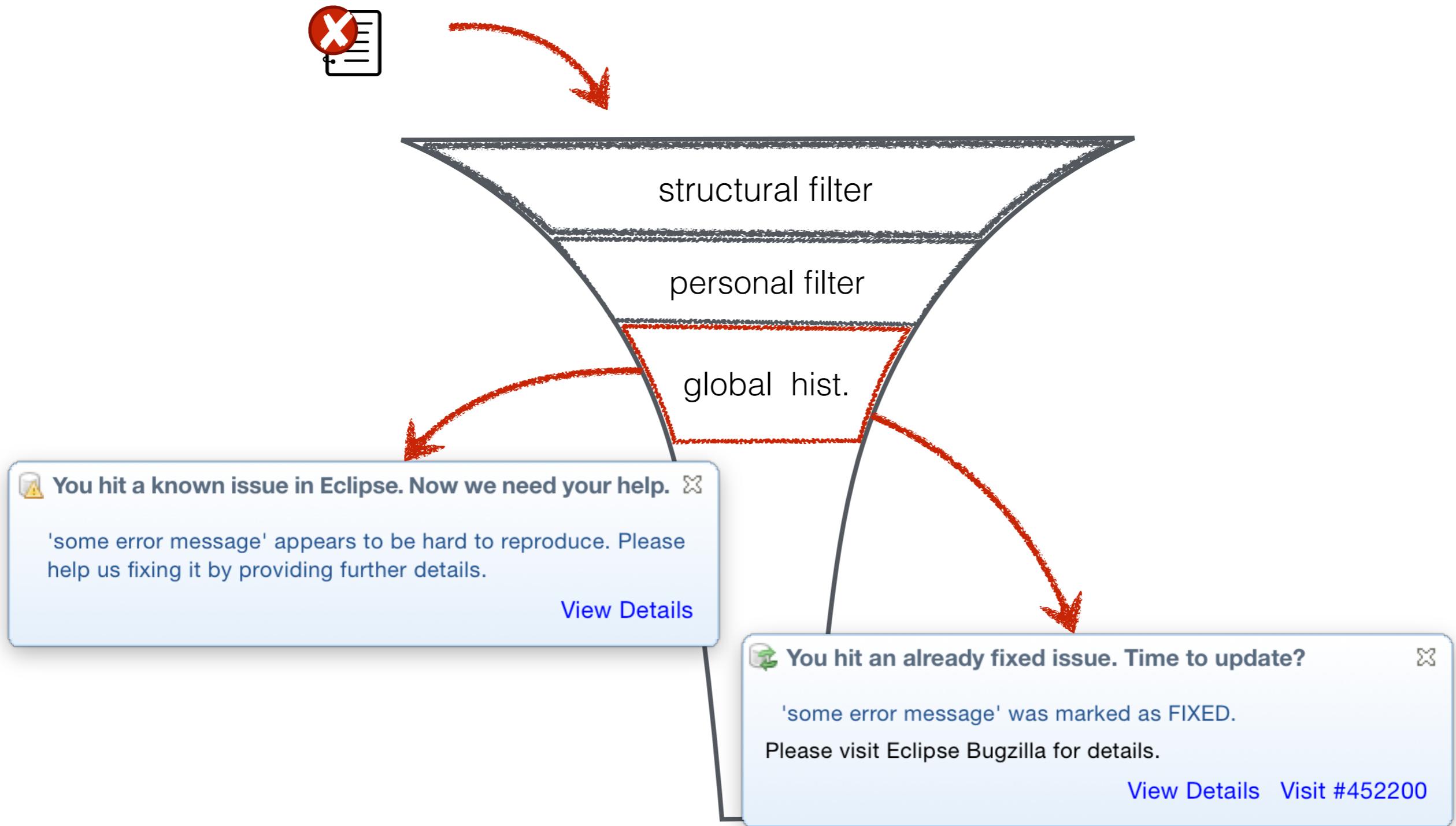
#2: Did I already sent this?



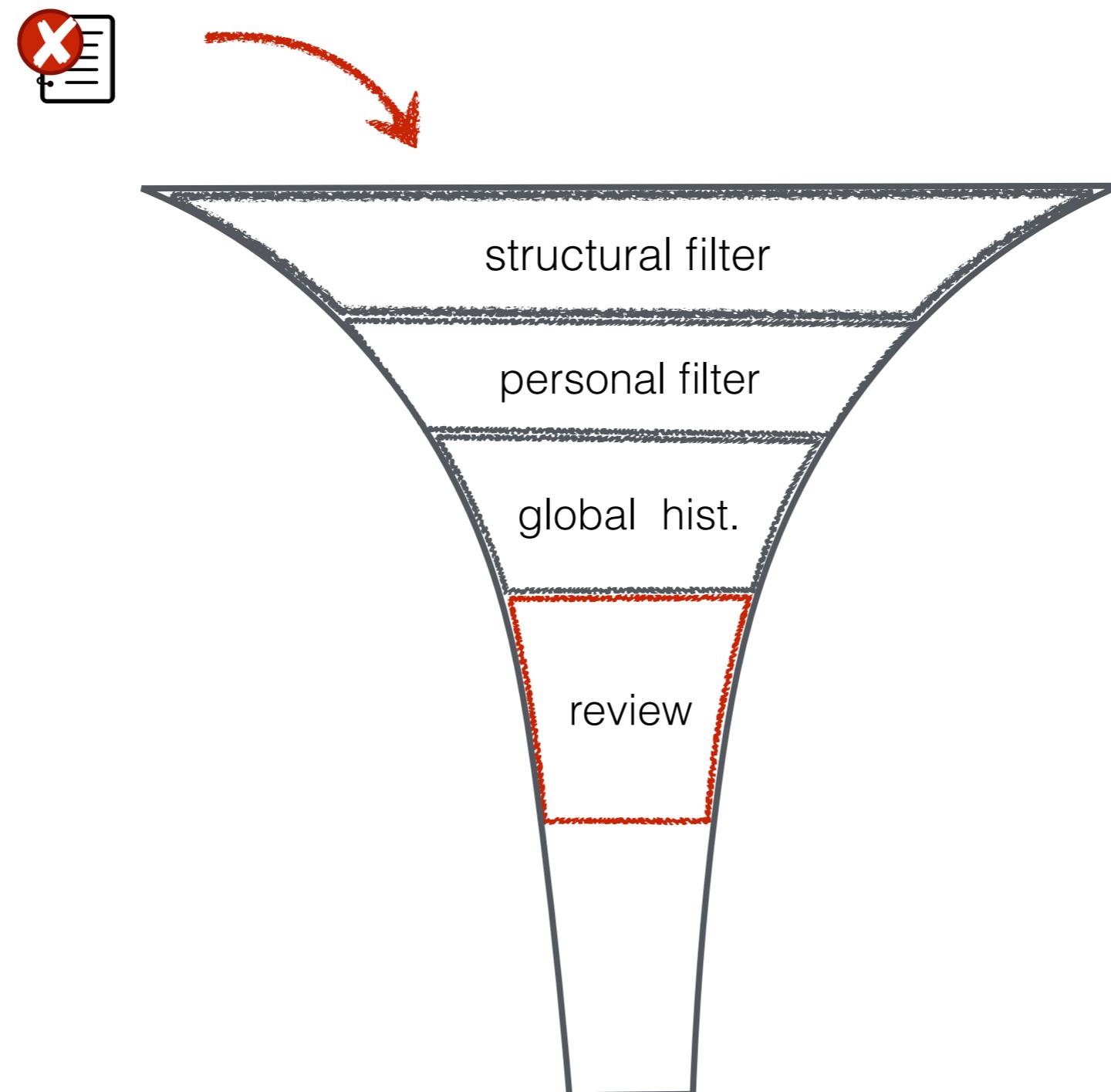
#3: Did anyone else sent this?



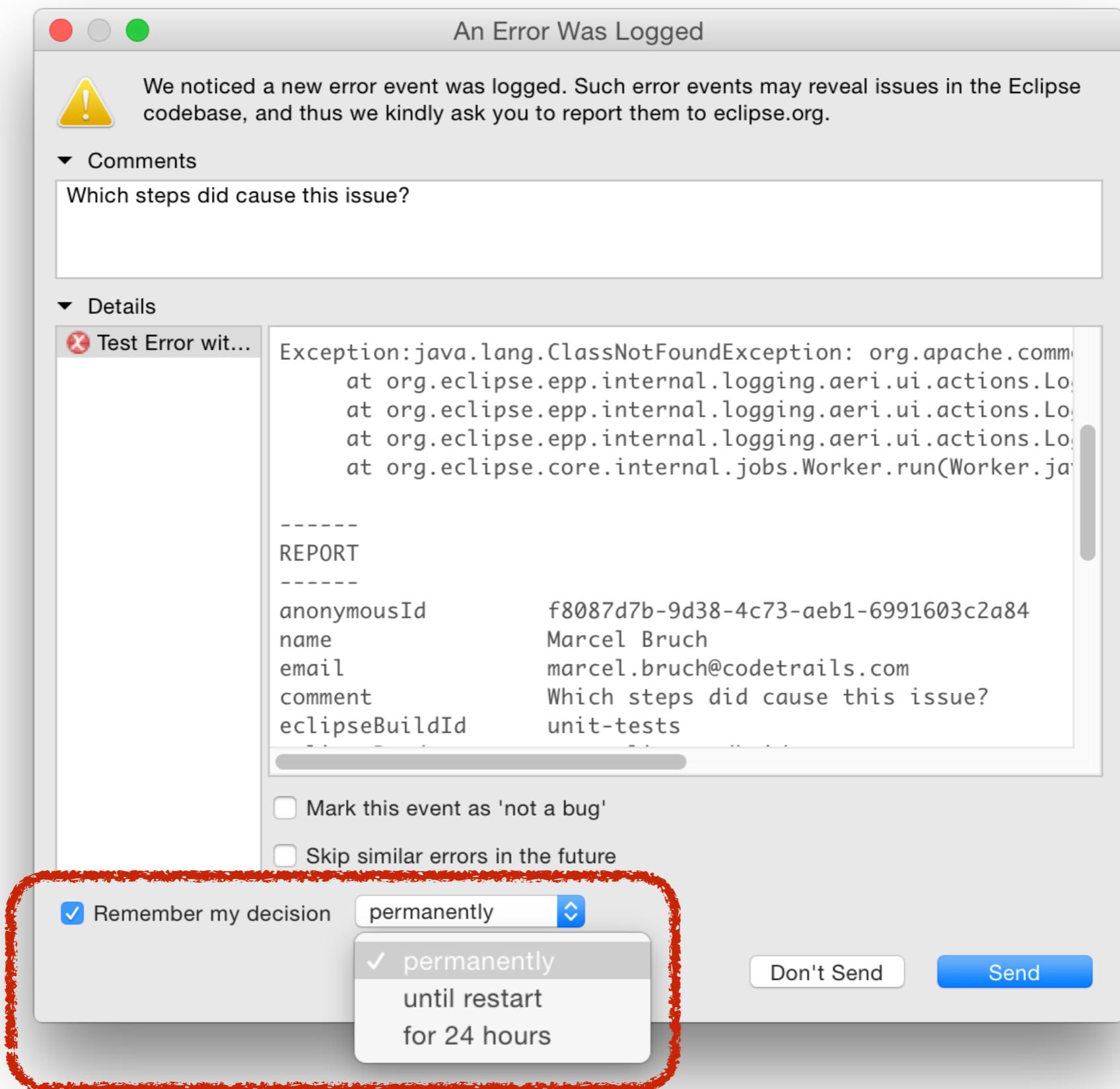
If you hit a known issue...



#4: Review



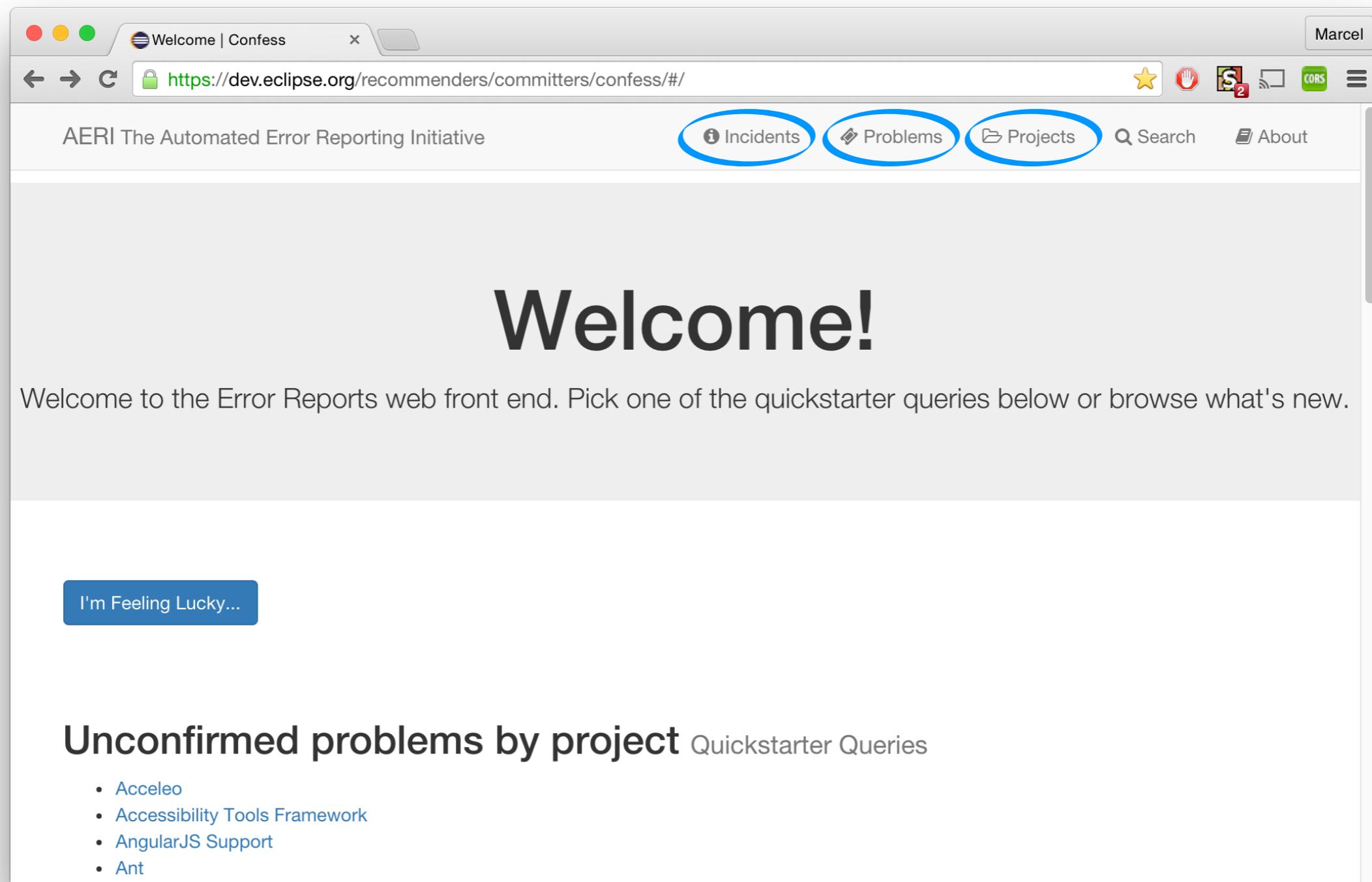
#4: Review



Walkthrough through the committer front-end

The server side

The core concepts



The committer front-end

The screenshot shows a web browser window with the following details:

- Title Bar:** Search | Confess, Marcel
- Address Bar:** https://dev.eclipse.org/recommenders/committers/confess/#/problems/?kinds=NORMAL&showMuted... (with a lock icon)
- Page Header:** AERI The Automated Error Reporting Initiative, Incidents, Problems, Projects, Search, About
- Main Content:** A large heading "Problems" followed by a table of errors.
- Table Headers:** Summary, Kind, Incidents, Reporters, Bugzilla, Created On, Modified On
- Table Data:** A list of error entries with columns for kind, count, reporter count, bugzilla link, creation date, and modification date. Examples include "[jst] NullPointerException in J2EEDeployableFactory.resourceChanged (297)" with 60 incidents and "[m2e,wst] CoreException in ValidatorExtensionReader.process (86)" with 9 incidents.
- Page Navigation:** Results: 306 pages - 3057 elements, a page navigation bar with links from 1 to 10, and ellipsis.

Creating bug reports

New Bug Report | Confess

https://dev.eclipse.org/recommenders/committers/confess/#/problems/5589244be4b08735226aa9d4/details

Home Details Triage Configure Similar Incidents

Problem Summary

Problem Id: 5589244be4b08735226aa9d4 [Edit](#)

Summary: NullPointerException in LauncherUtilsStatusHandler.selectWorkspaceField (74)

Projects: Plug-in Development Environment

Watchers: 1

Email	When
cedric.brun@obeo.fr	CC_LIST_ON_CREATION

Reporters: 1

Anonymous Id
8a78fb03-87cd-46ed-950c-327afddc93ce

Potential Duplicates: * [refresh](#)

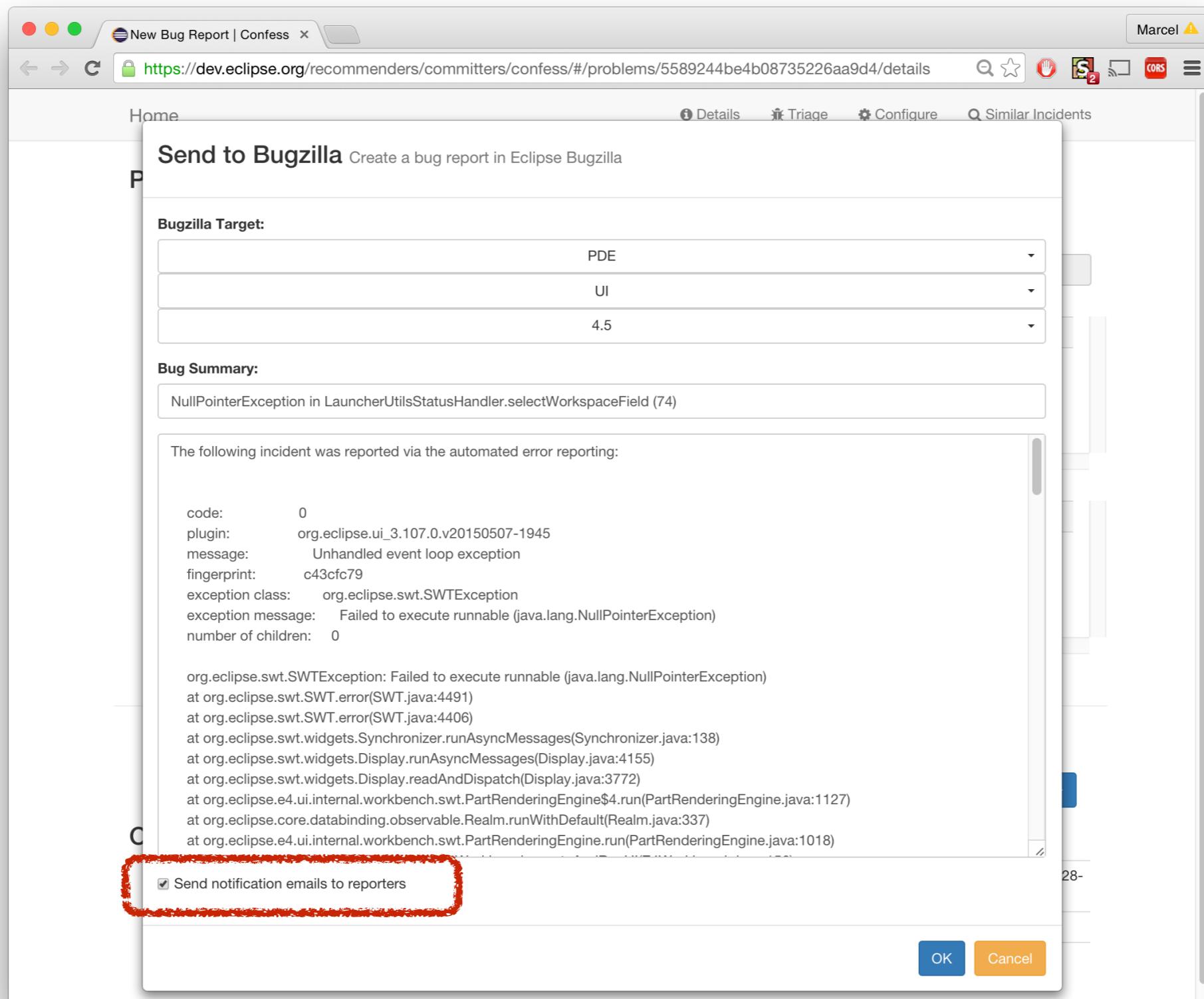
Opening Incident All details as submitted by user 8a78fb03-87cd-46ed-950c-327afddc93ce.

Environment:	Id:	Eclipse:
	5589244be4b08735226aa9d3 Edit	org.eclipse.epp.package.modeling.product 0700
Created on:	15-06-23 11:18:03	OSGi:
		Windows7 6.1.0, x86_64, win32
Kind:	NORMAL	Java:
		1.7.0_01-b08

Quick Actions ▾

- Create bug report
- Close as log message
- Go to triage page

Creating bug reports



Notifying committers

Project Alerts

The screenshot shows a web browser window for 'Project Code Recommenders' at the URL <https://dev.eclipse.org/recommenders/committers/confess/#/projects/54bbe780bee88...>. The page title is 'AERI The Automated Error Reporting Initiative'. The top navigation bar includes links for 'Incidents', 'Problems', 'Projects', 'Search', and 'About'. A user profile 'Marcel' is visible in the top right. The main content area is titled 'Alerts' with the subtitle 'Configure how and when Confess informs you about new and updated problems.' A modal dialog is open, labeled 'Weekly Normal Problems Digest for Recommenders'. It contains sections for 'Conditions' (minimum 1 distinct reporter) and 'Problem kind' (NORMAL, OOME, SOE). The 'Actions' section, highlighted with a red border, lists three options: 'Bugzilla' (unchecked), 'Weekly Digest Email' (checked), and 'Daily Digest Email' (checked). Below the actions is a list of email addresses: 'recommenders-dev@eclipse.org' with a delete icon, and a placeholder 'Enter email address...' with an 'Add' button.

Alerts Configure how and when Confess informs you about new and updated problems.

Label: Weekly Normal Problems Digest for Recommenders

Conditions
Minimum numbers of distinct reporters: 1

Problem kind: NORMAL X OOME X SOE X

Actions - Automatically executed (once) when above conditions are met

- Bugzilla** - Create Bugzilla bugs for every problem when above conditions are met
- Weekly Digest Email** - Notify developers listed below by weekly emails.
- Daily Digest Email** - Notify developers listed below by daily emails about every problem that met above conditions the first time

recommenders-dev@eclipse.org

Enter email address...

Weekly or daily email digests

The screenshot shows an email client window titled "Weekly Normal Problems Digest". The message is from "Eclipse Error Reports Bot" to "Recommenders developer discussions" and "Weekly Normal Problems Digest". It is dated "Today 14:40" and has a "EE" status indicator. The message body starts with "Hi," and provides instructions for managing problems in Bugzilla. It includes a link to "error-reports-inbox@eclipse.org" for questions. Below this, there are two sections: "Top new problems (last 7 days)" and "Top unresolved, active problems (last 7 days)". Each section contains a table with columns for Problem, Reporters, and Bug.

Eclipse Error Reports Bot

To: Recommenders developer discussions
Weekly Normal Problems Digest

Today 14:40

EE

Hi,

this is the weekly digest for Code Recommenders. The status of all problems on this list is open. Items on this list may already be tracked in Bugzilla but were not closed yet. To **remove** a item from this list, you can either (i) set the status of its associated bug to resolved, verified, or closed or (ii) mark it as log message in the reporter's web ui.

If you have any questions about this report, please send an email to error-reports-inbox@eclipse.org

Top new problems (last 7 days):

Problem	Reporters	Bug
1. NullPointerException in BinaryTypeBinding.getMethods (1191)	2	469460 N
2. ArrayIndexOutOfBoundsException in AssistParser.popElement (1912)	1	469471 N
3. NullPointerException in BinaryTypeBinding.resolveType (160)	1	-
4. StandInException in PrivacySettingsService.store (147)	1	-

Top unresolved, active problems (last 7 days):

Problem	Reporters	Bug
1. OperationCanceledException in CompletionEngine.checkCancel (1683)	46	459172 U
2. ClassNotFoundException in BundleLoader.findClassInternal (423)	25	466885 N
3. ClassNotFoundException in BundleLoader.findClassInternal (432)	5	467950 N
4. LogTraceException in AbstractCompletionSessionProcessor.applied (191)	3	467798 N
5. LogTraceException in RepositoriesgetRepository (104)	2	469016 N

$e = mc^2 \rightarrow \text{errors} = (\text{more code})^2$

Some fun facts

Disclaimer

Don't draw preliminary conclusions!
Please consult your personal statistican...

How many Mars users?



450 simrel committers



1200 eclipse committers

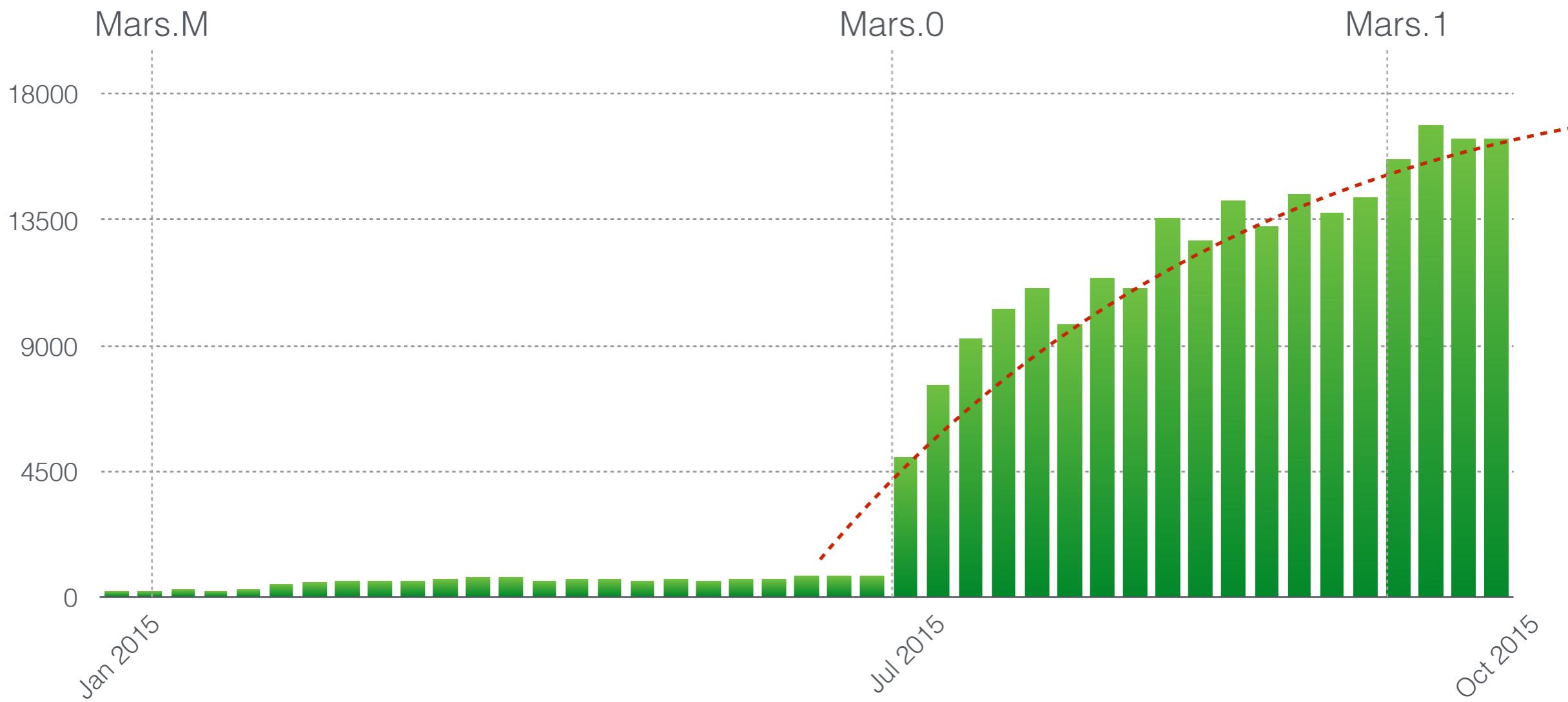


~150.000 error reporters

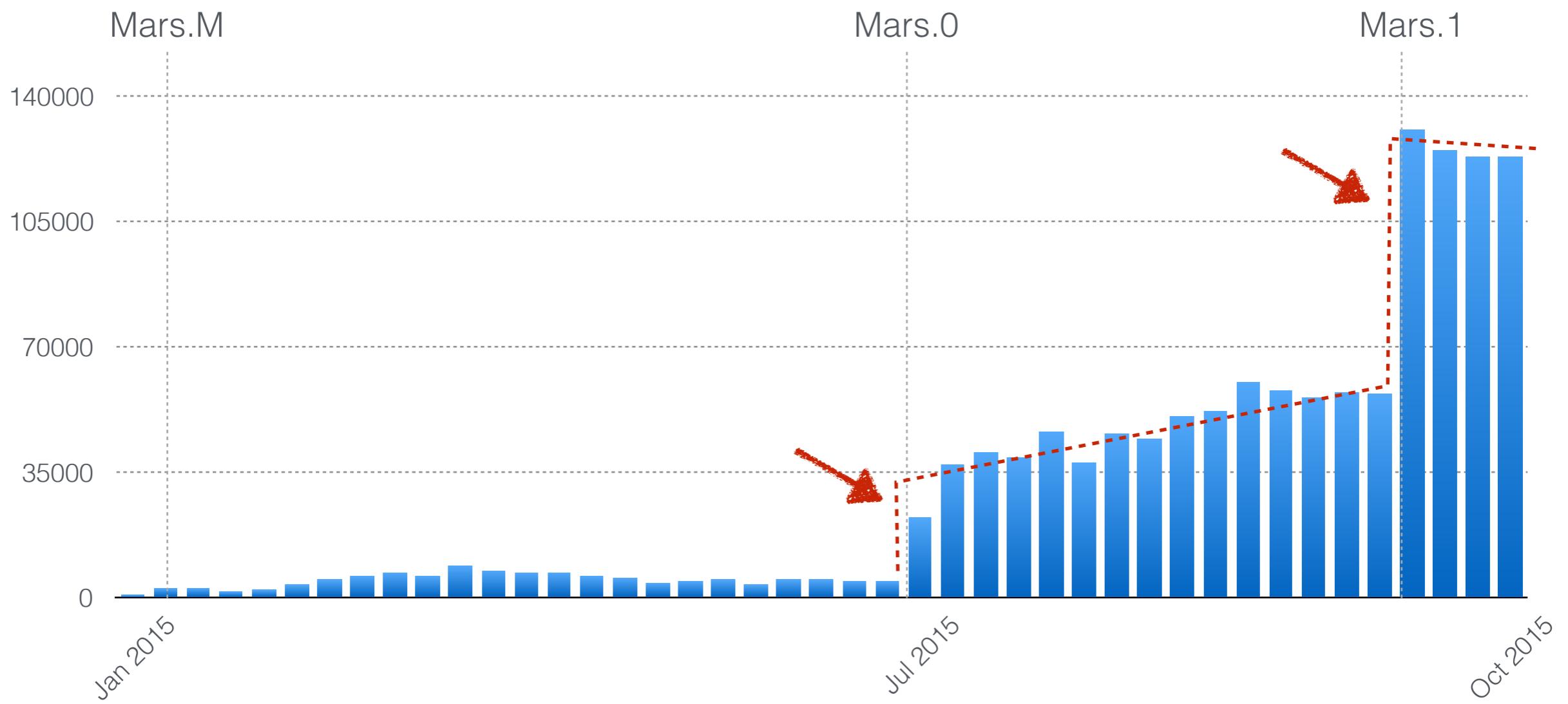


Mars Users?

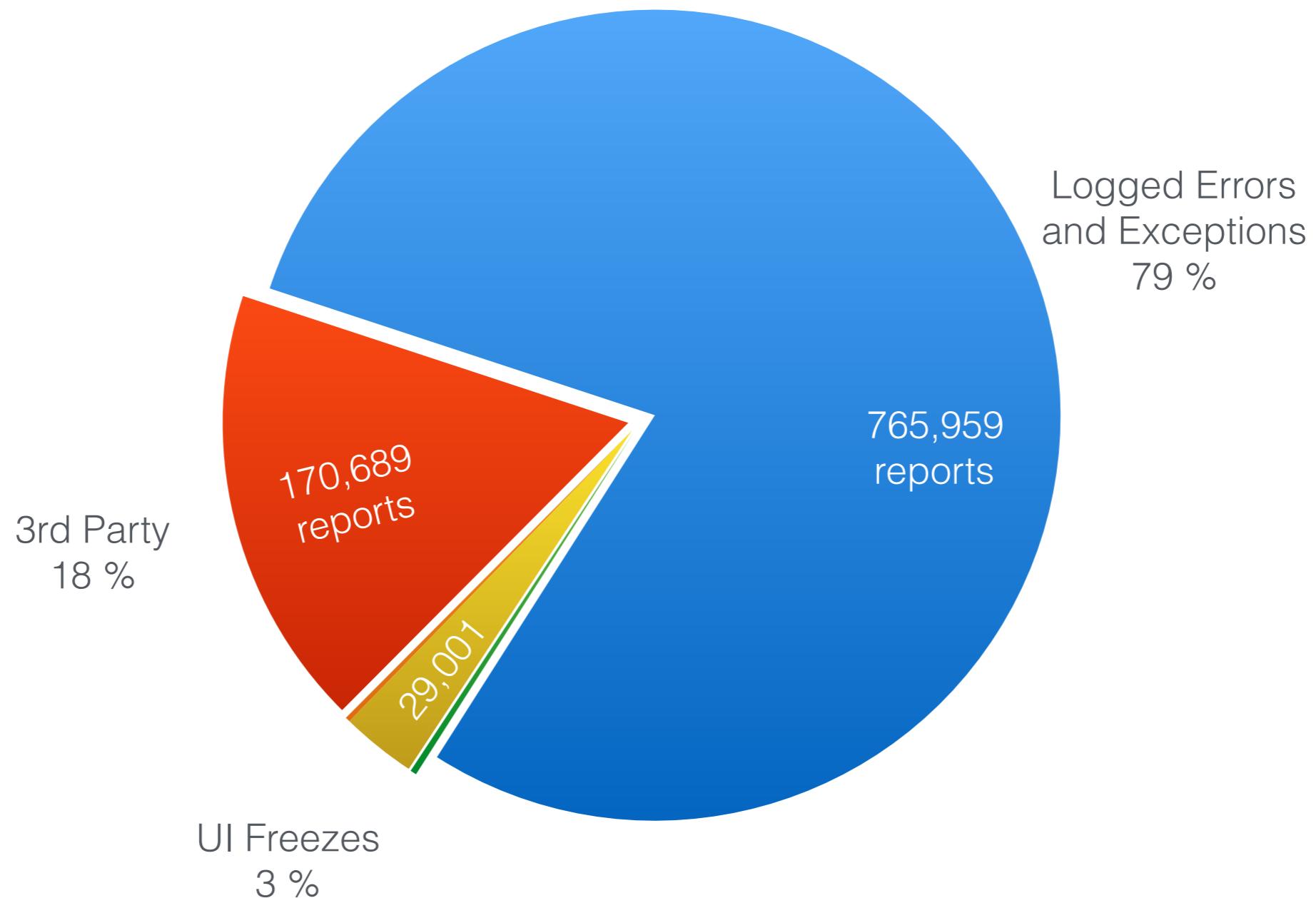
Error reporters per week



When do they report?



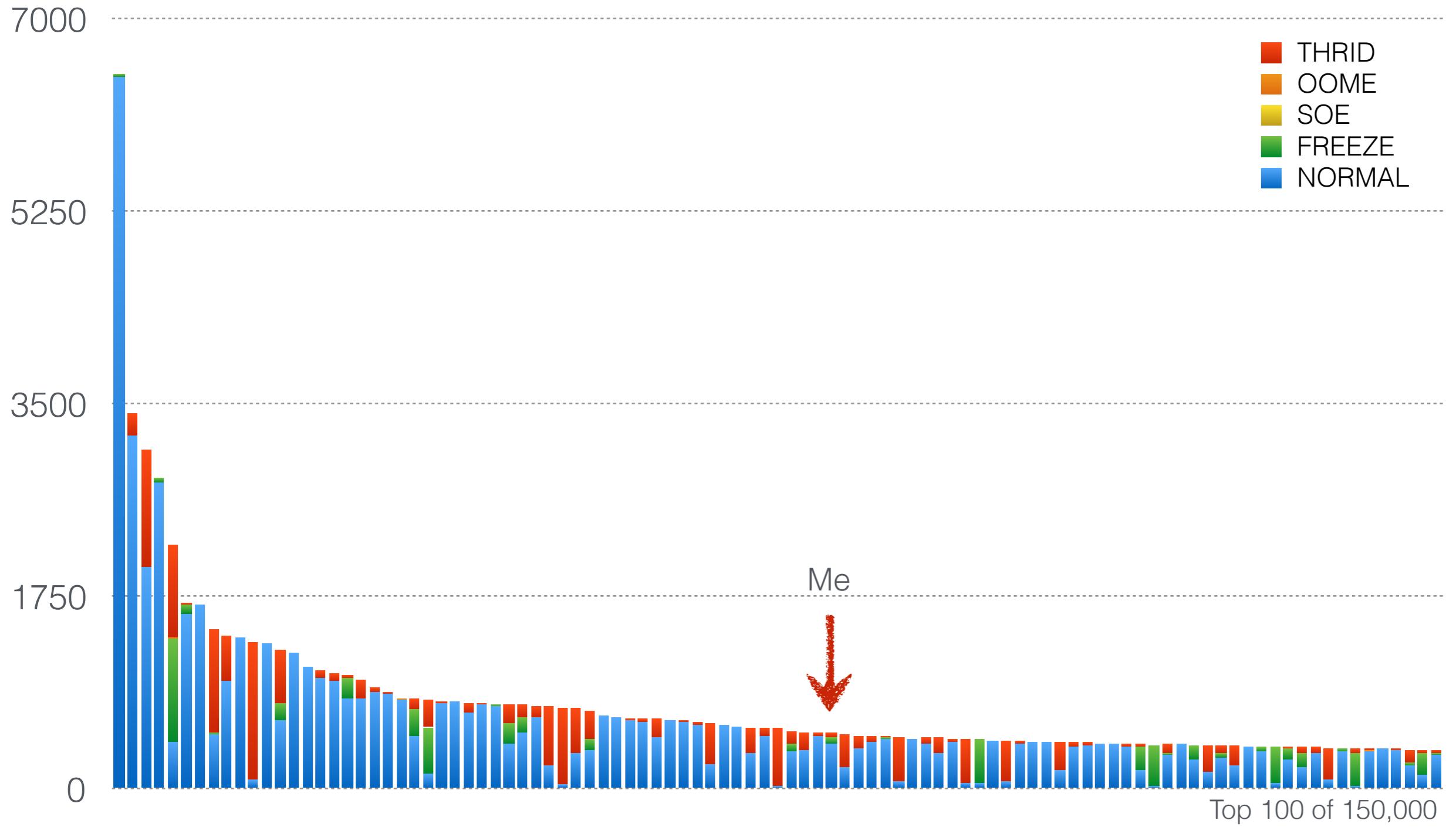
What kinds of errors do users report?



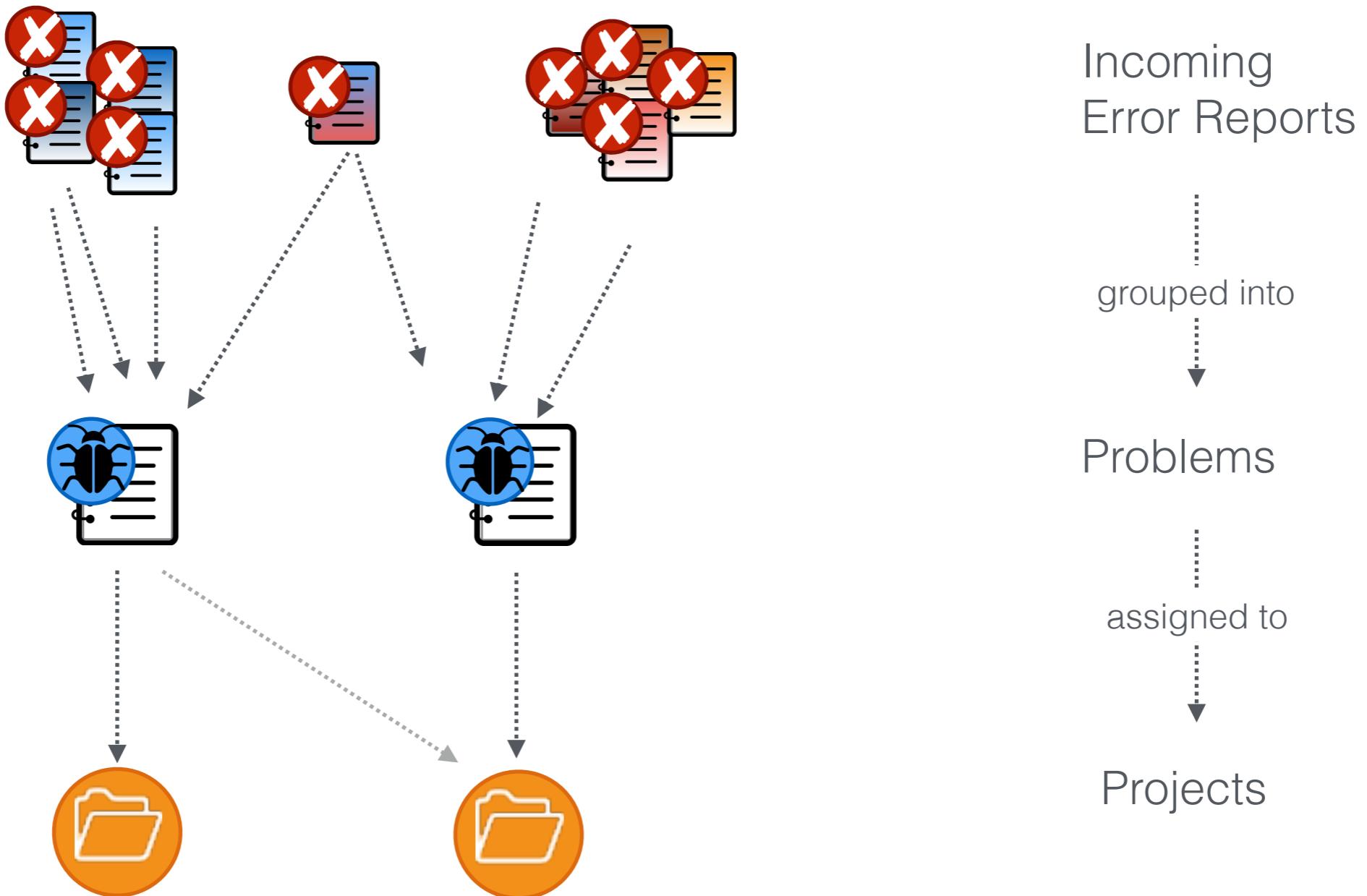
How hard do they suffer?



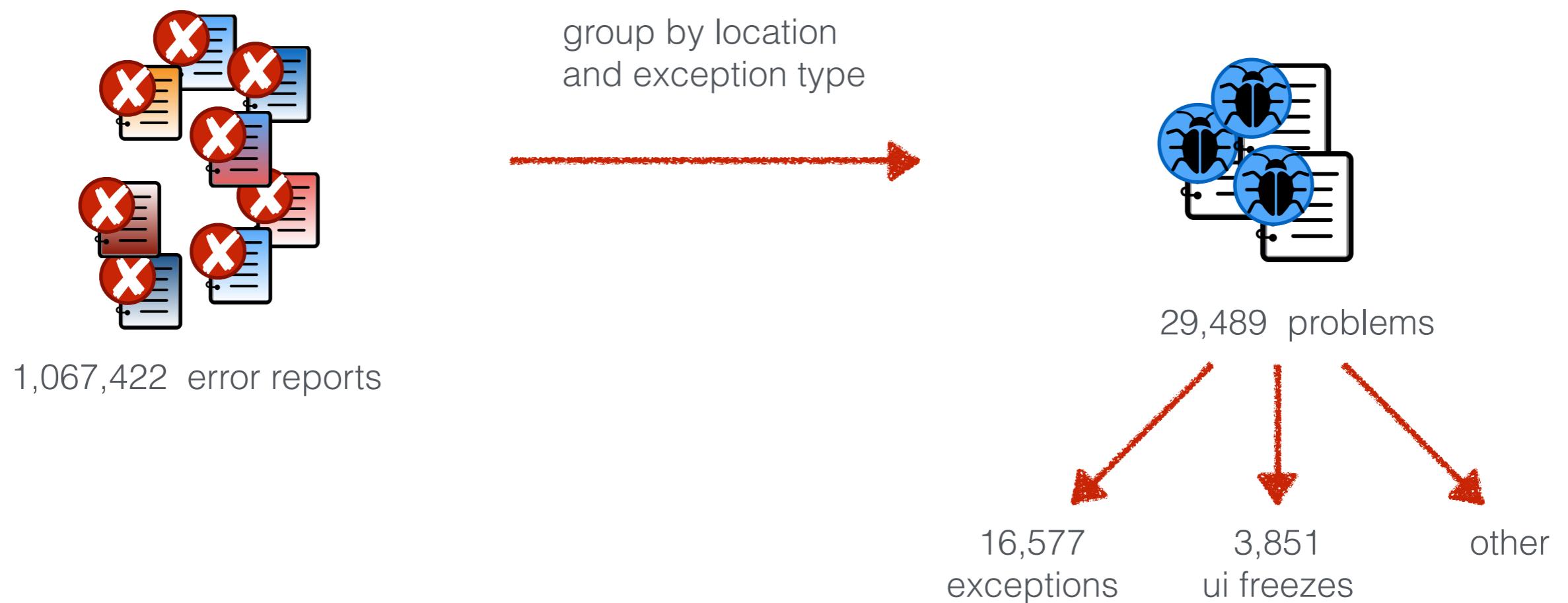
The suffering top 100



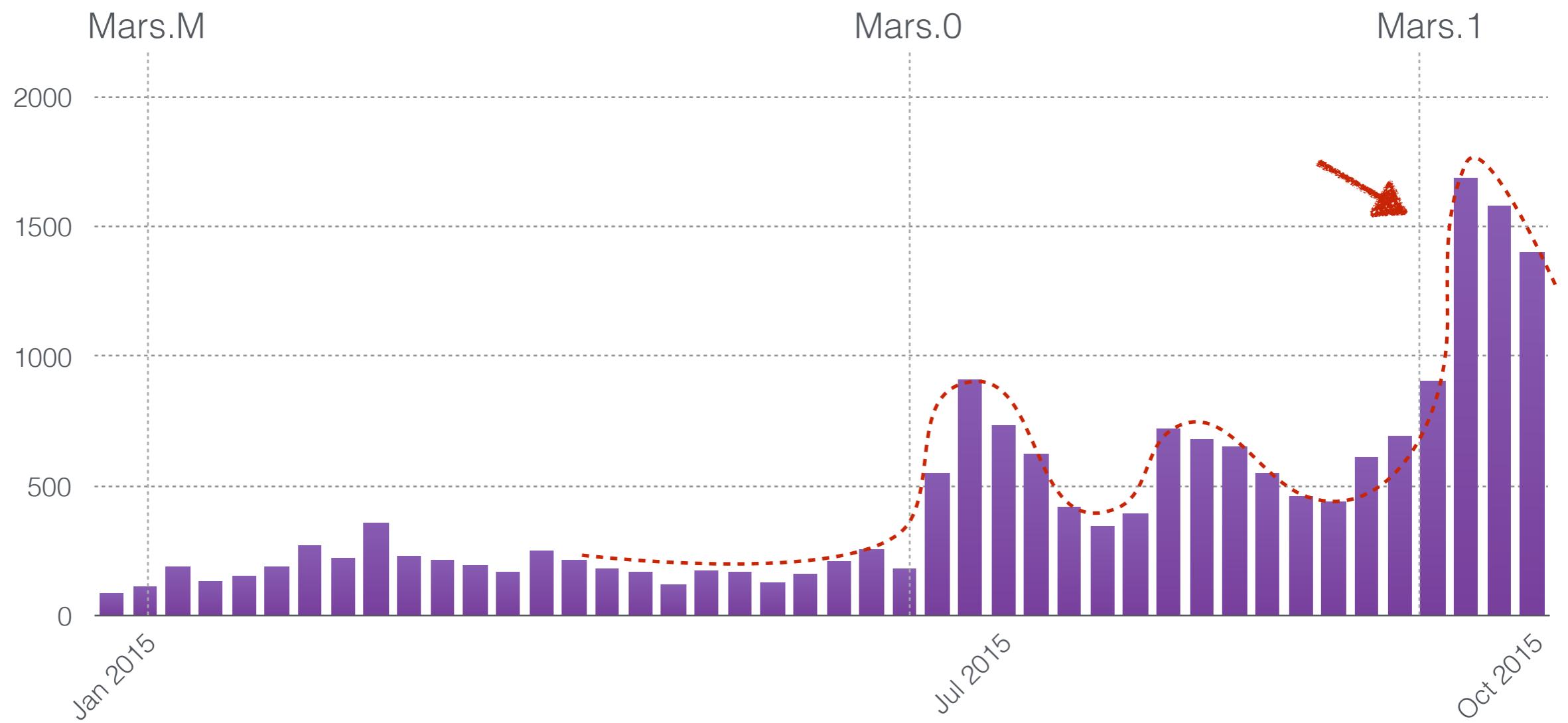
Excursion on duplicate detection



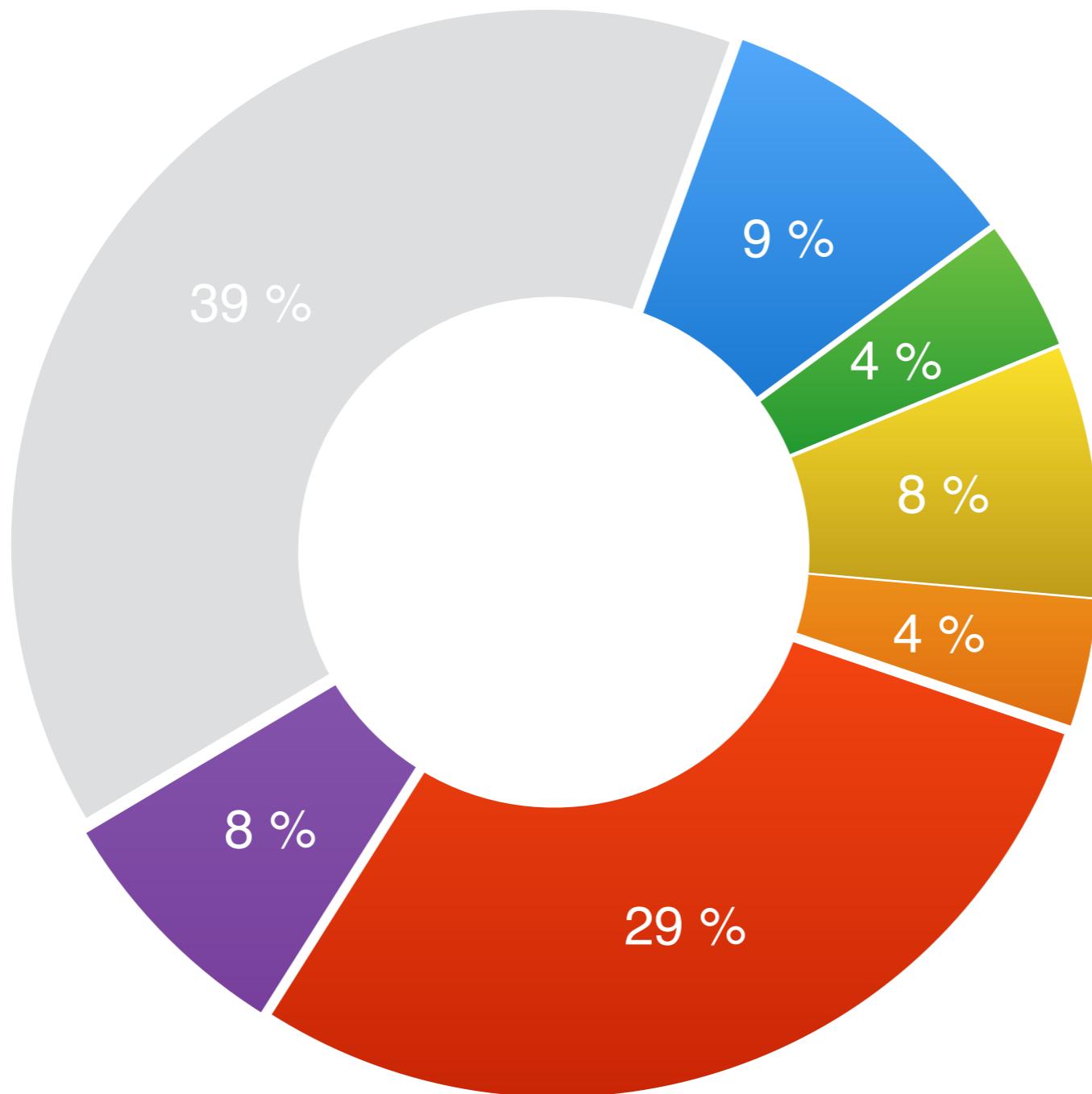
Effect of grouping errors by location



First-time appearance of a problem

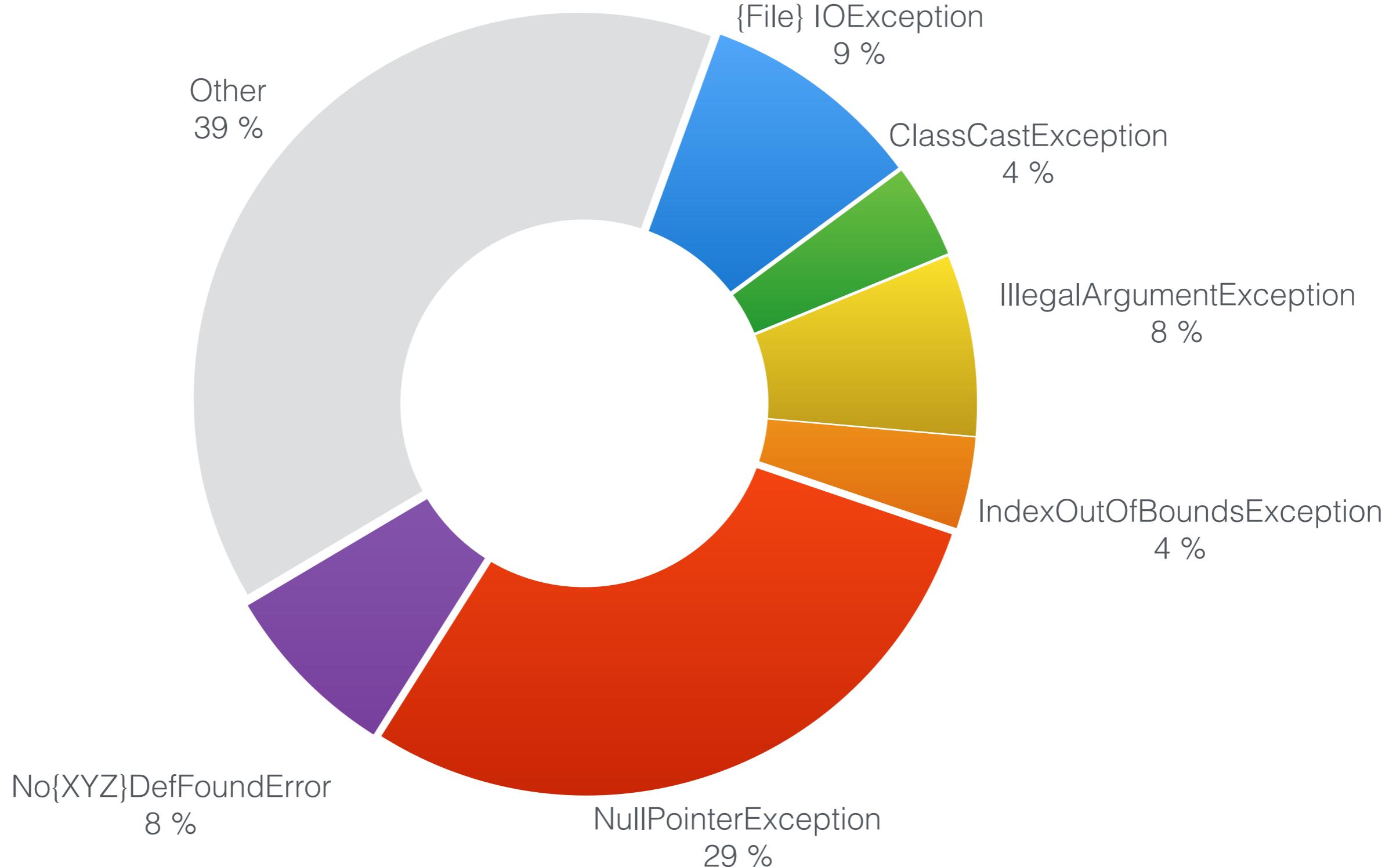


What are the most 'popular' exceptions?



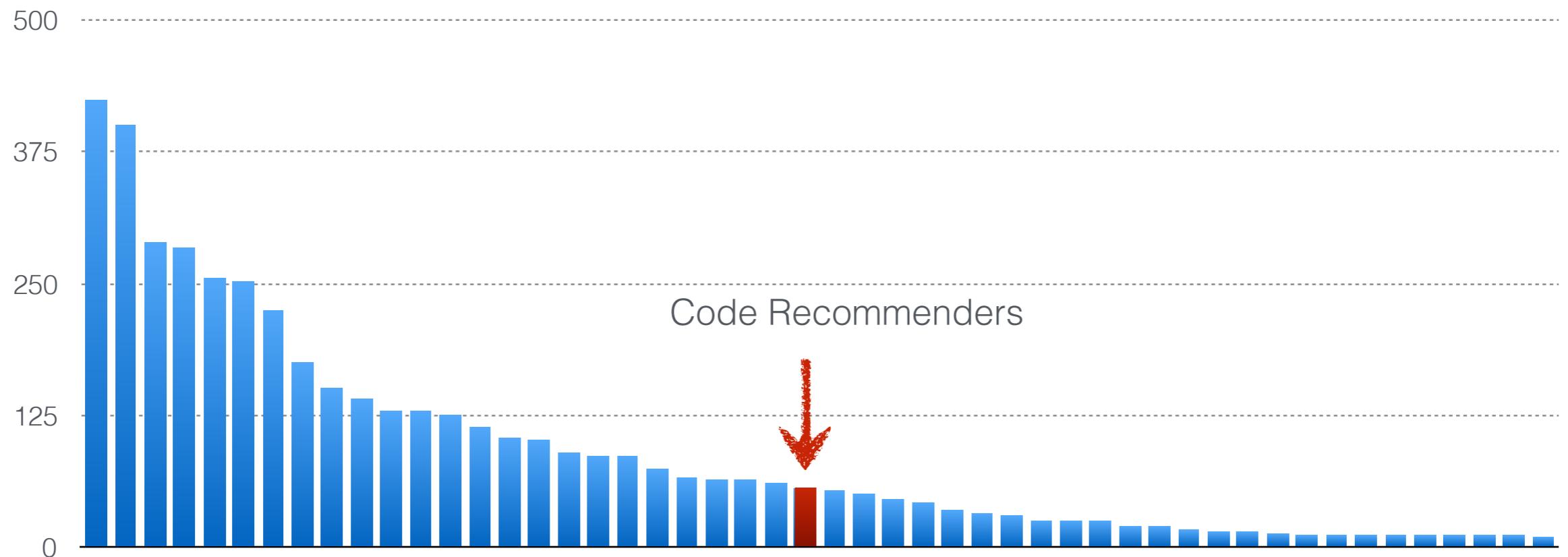
What are the most ,popular' exceptions?

by unique location in source code



NullPointerExceptions by Projects

Statisticians, note: Projects **automatically** marked as „being responsible“ fixing these NullPointerExceptions but does not mean the NPE happened in their code.



Tip: Enable null analysis

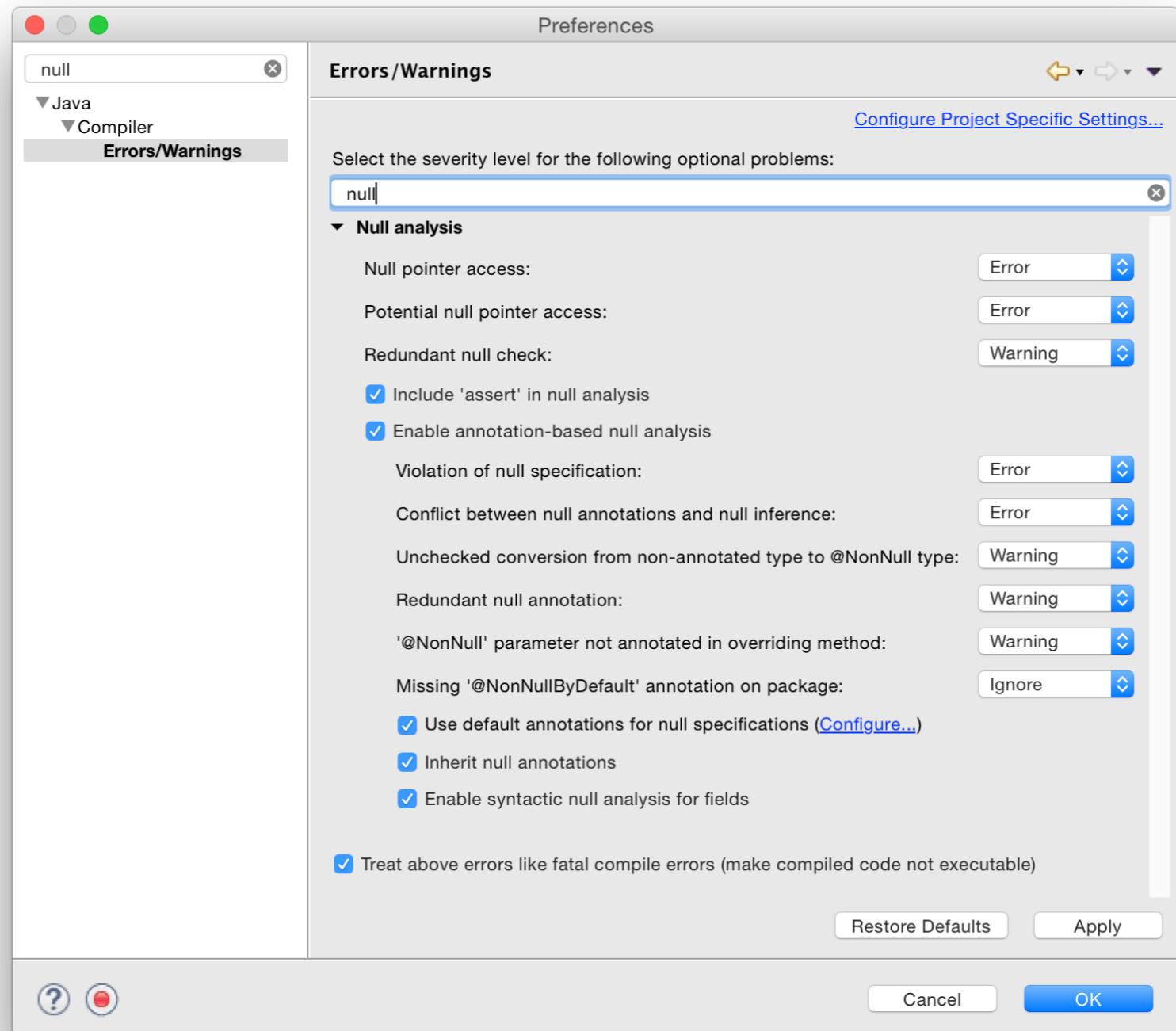
```
@Override  
protected void run(@Nullable List<Incident> slice)  
{  
  
    for (Incident incident : slice) {
```



Potential null pointer access: The variable slice may be null at this location

Press 'F2' for focus

JDT offers a lot...



Tip: Never return null

Use `java.util.Optional` or `com.google.common.base.Optional` instead

```
@Override  
public Optional<String> getReason() {  
    return Optional.ofNullable(cause);  
}
```

Oh Class, Were Art Thou?

Use proper **import** ranges and define **uses** on your exports to get rid of {Class | Method | Field} DefNotFoundErrors, LinkageErrors, and some ClassCastException. OSGI needs that information to work properly...

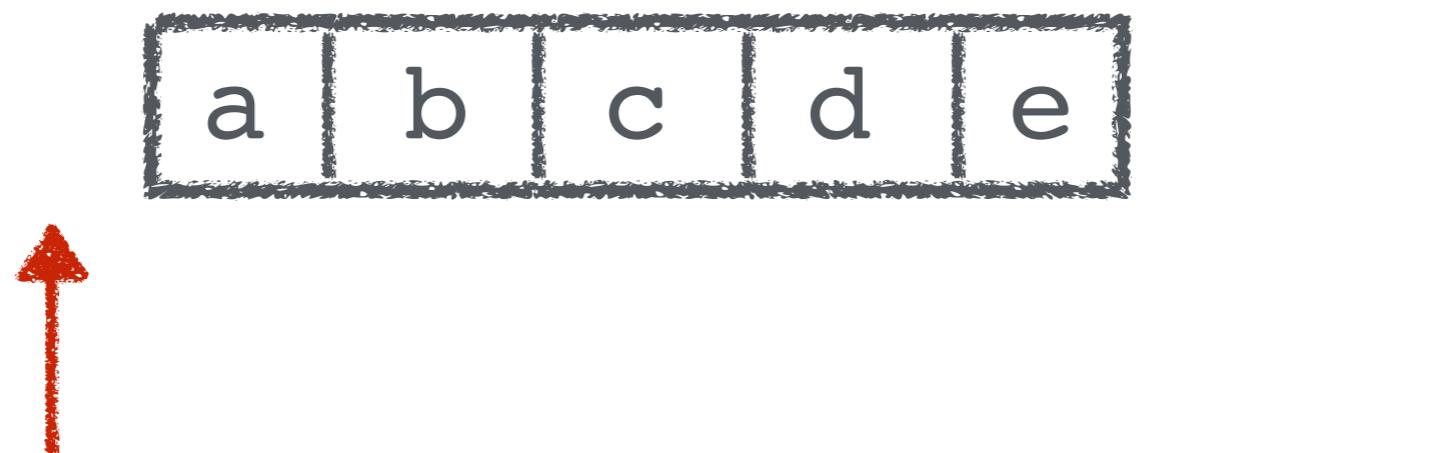
Import-Package:

```
com.google.common.annotations;version="[15.0.0,16.0.0)",
```

Export-Package: org.eclipse.recommenders.utils;

```
uses:= "org.osgi.framework,  
org.eclipse.core.runtime,  
com.google.common.base,  
com.google.common.collect"
```

Index out of bounds?



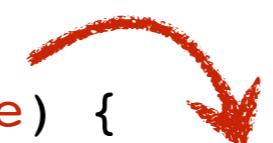
-1 and `array.length` do not work. No matter how often you try...

There is no tool support for this. Just unit tests and code that tries to fail gracefully.

Tip: If error messages are not helpful...

10% of all logged errors do not contain stack traces.

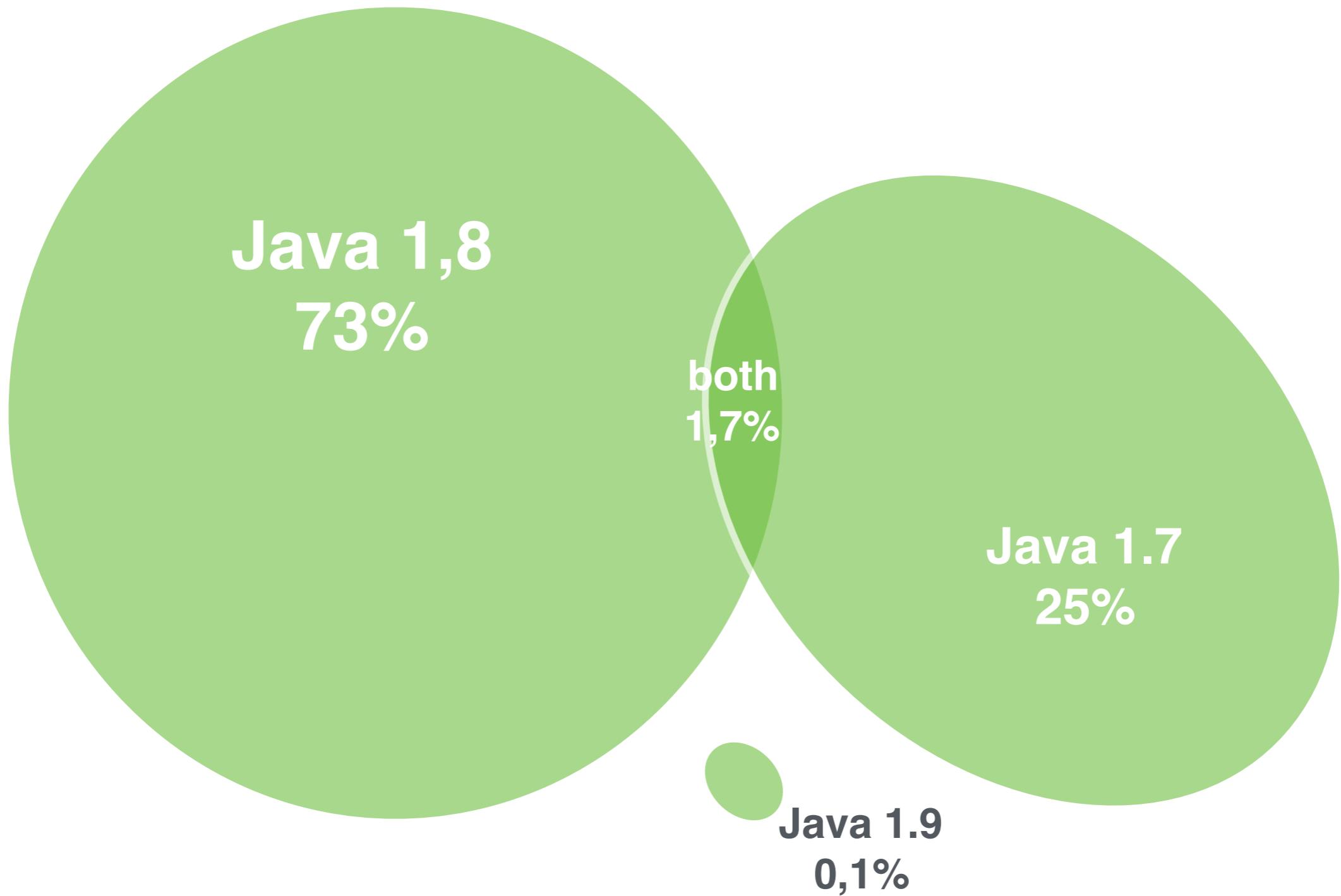
```
try {
    // ...
} catch (Exception e) {
    log("An error occurred", e);
}
```



```
try {
    // ...
} catch (Exception e) {
    log("Invalid argument {}", value, e);
}
```

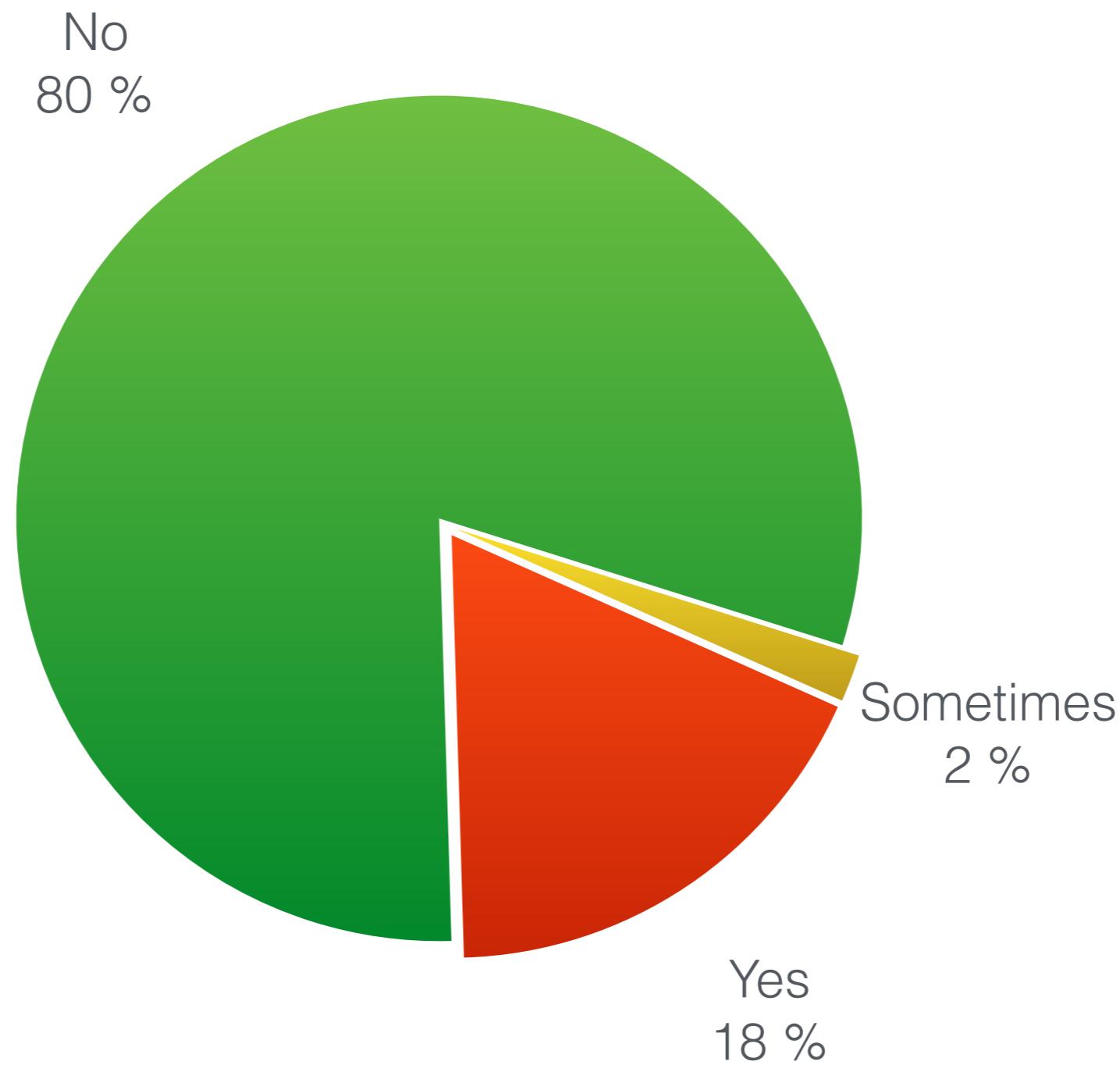
Are your users ready for Java 8?

Which VM do users run the Eclipse IDE with?



Do people anonymize their messages?

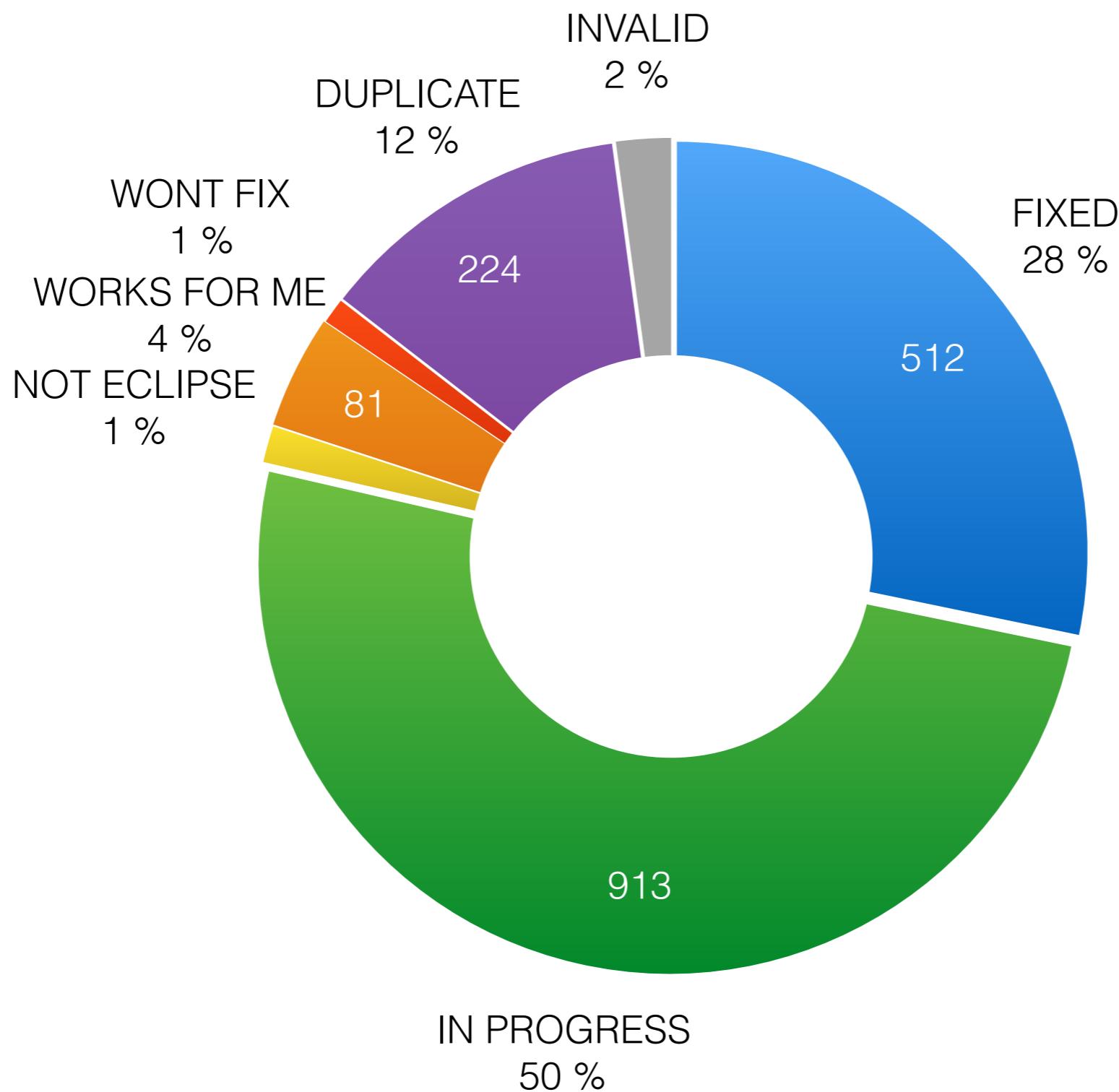
Are you concerned that your exception message may reveal sensitive data?



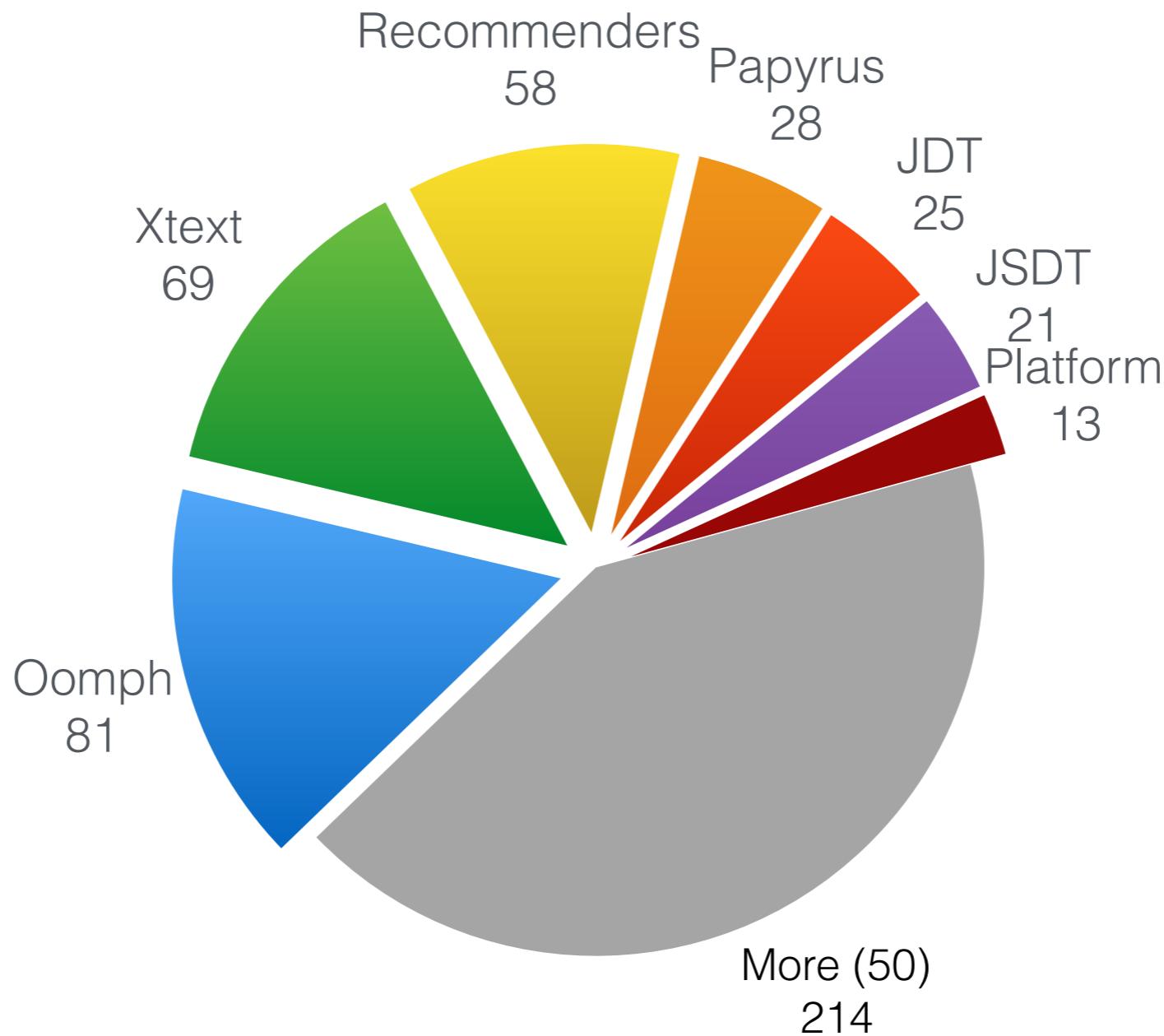
Speak plain: Does it work?

Bugfixing Rates

Overall Bugzilla Statistic

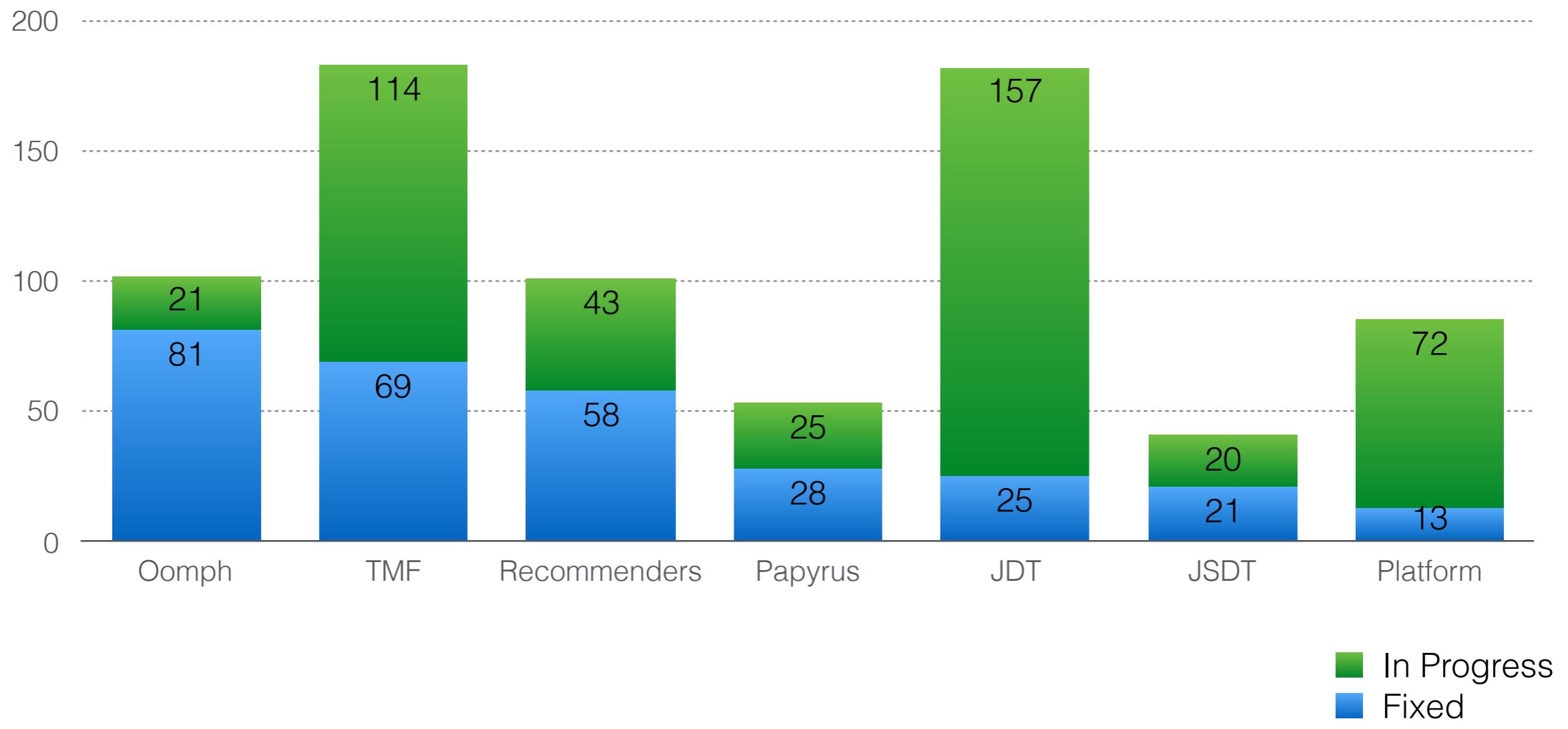


Fixed bugs by projects



Bugzilla

In progress & fixed bugs



TL;DR

Since January 2015 **149,115** users
reported **1,067,422** logged errors
with **526,942** unique stack traces
which dupe detection grouped into **16,577** problems in Eclipse code
and **3,851** ui freezes
of which committers created **1,913** Bugzilla bugs
and fixed **512** to date.

But we are not quite done yet...

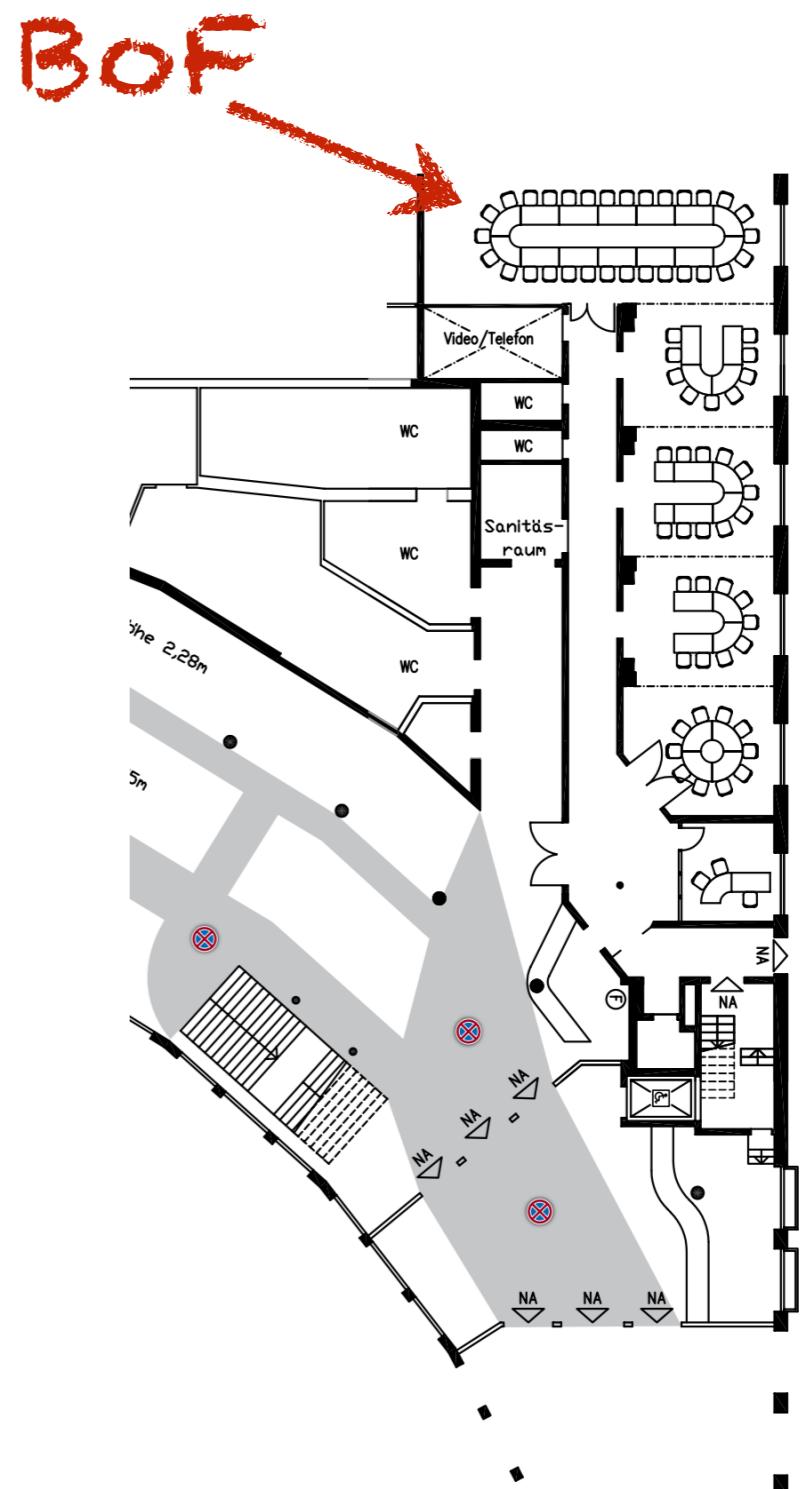
Future Work?

To be decided tonight.

Join the **AERI BoF tonight at 20:00**
in Seminarraum 5, Ground Floor.

The BoF session will have a walk-through
through the committer UI.

Committer discussions how error reporting
should evolve for Neon.





eclipsecon Europe

Ludwigsburg, Germany, 3 - 5 November 2015

Evaluate the sessions at www.eclipsecon.org

+1

0

-1

How to reach EPP Logging

- **Code:** Check out the [EPP Logging Oomph profile](#)
- **Wiki:** <https://wiki.eclipse.org/EPP/Logging>
- **Manual:** <https://dev.eclipse.org/recommenders/community/confess/#/about>
- **Forum:** <https://www.eclipse.org/forums/index.php/f/69/>
- **Bugzilla:** <https://bugs.eclipse.org/bugs/buglist.cgi?component=logging&product=EPP>
- **Mail:** error-reports-inbox@eclipse.org

Credits

- Daniel Haftstein, Codetrails – Eclipse client conception and implementation
- Marcel Bruch, Codetrails – Server-side conception and implementation
- Webmasters, Eclipse Foundation – Eclipse server infrastructure & integration
- **Thanks to many early adopters and committers providing feedback**

Contact Us

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email: marcel.bruch@codetrails.com

Gefördert durch:



aufgrund eines Beschlusses
des Deutschen Bundestages