

Mining Trends of Library Usage



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Let's switch to the newest!

Library: log4j

Newest version: log4j 1.2.15

Best version? No!

Why don't people always switch to the newest version?

the newest version has defects

“lots of work” to switch from an older one to the new one

“until TranQL can handle derby 10.2”

Early Adopters vs. Late Followers



Always update to the **newest**.

Ready to **take the risks**.



Switch **only** if necessary.

Consider which is the **best**.

Which is the best library version to use?



The wisdom of the crowd

*The more people use a specific library version,
the higher its usage is recommended.*

The Crowd



250 real-life Apache Java projects

Analyzed period of two years (2007 - 2009)

450 different external library versions

The Analysis (Maven)

```
<project>
...
<dependencies>
  <dependency>
    <groupId>servlet-api</groupId>
    <artifactId>javax.servlet</artifactId>
    <version>2.3</version>
    ...
  </dependency>
  ...
</dependencies>
...
</project>
```

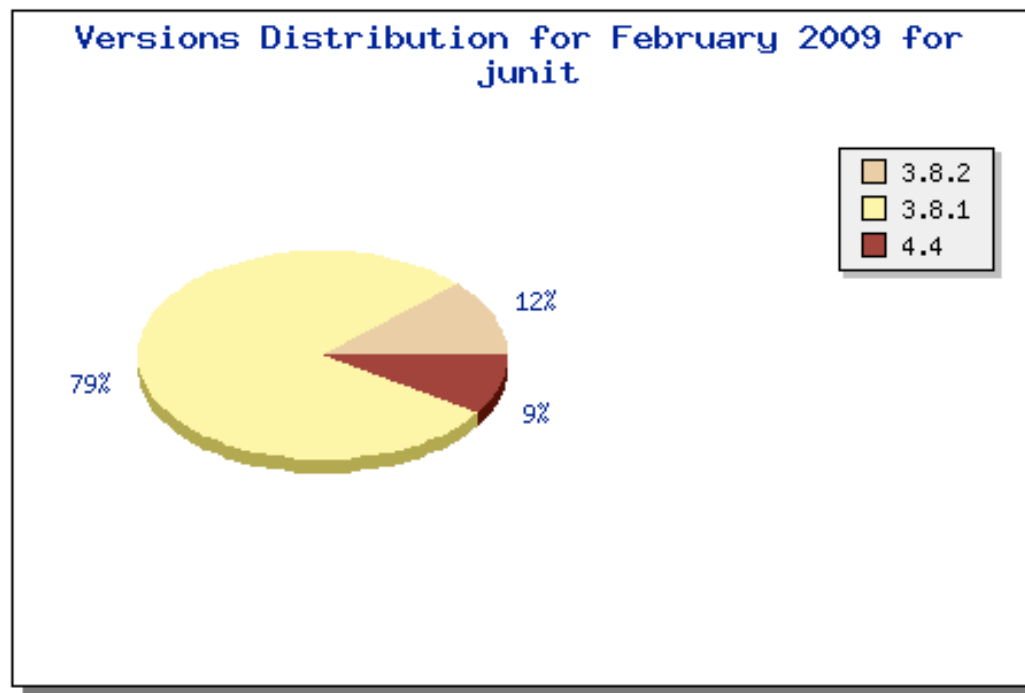
pom.xml excerpt

- Maven - the leading open-source project management tool for Java projects.
- Library dependencies are stored in the meta information files.
- The project meta data is represented by Maven's *Project Object Model*.

Which is the best library version to use?

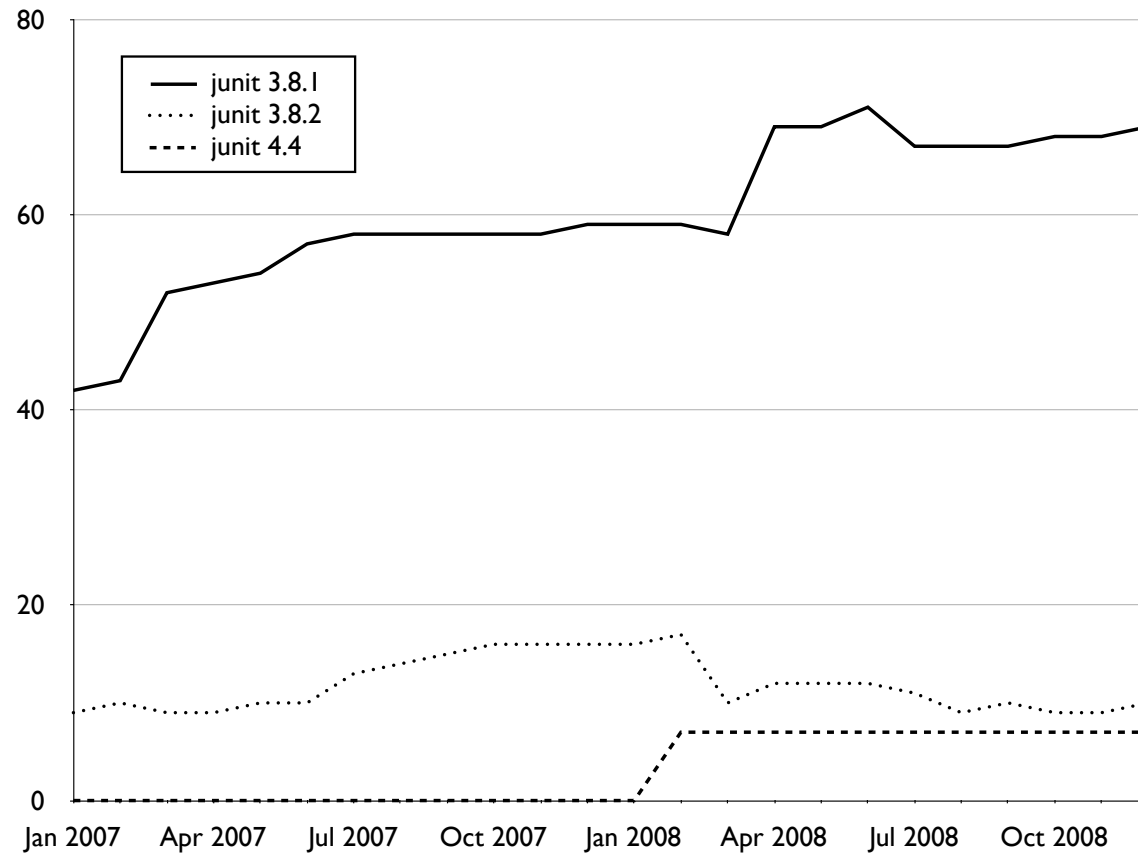
- Which is the most popular library version right now?
- What is the usage trend of a particular library version?
- Have people ever switched back from a newer library version to an older one?

Which is the most popular library version right now?



AKTARI: <http://www.st.cs.uni-saarland.de/softevo/aktari.php>

What is the usage trend?



AKTARI: <http://www.st.cs.uni-saarland.de/softevo/aktari.php>

Have people switched back?

Library version	Switching back to an older version %
junit 3.8.1	0%
log4j 1.2.15	57%
servlet-api 2.5	10%

AKTARI: <http://www.st.cs.uni-saarland.de/softevo/aktari.php>

Could AKTARI have warned against using log4j 1.2.15?

Current popularity:	0%
Usage trend:	
Switched back from:	57%

Who can use this info?

Library Users

75% said Yes!

“which version to use?”

Library Developers

“which version was successful?”

Conclusions

- Learned from the crowd.
- Developed a technique that warns against dangerous trends.
- Realized the technique into a web-based tool called AKTARI.

Feedback Questions

- Learned from the crowd.
 - How big of a crowd is enough?
- Developed a technique that warns against dangerous trends.
 - When do we know enough to issue a warning?
- Realized the technique into a web-based tool called AKTARI.
 - Can this be done for other languages but Java?

Debate Question

In what other software evolution scenarios can the *wisdom of the crowd* be used?