The Evolution of an Open Source Project Exemplified using Eclipse Theia

Mark Sujew

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Introductions

Mark Sujew



- Software Engineer
- Mainly working on Open-Source Software

langium

THEIA

Project

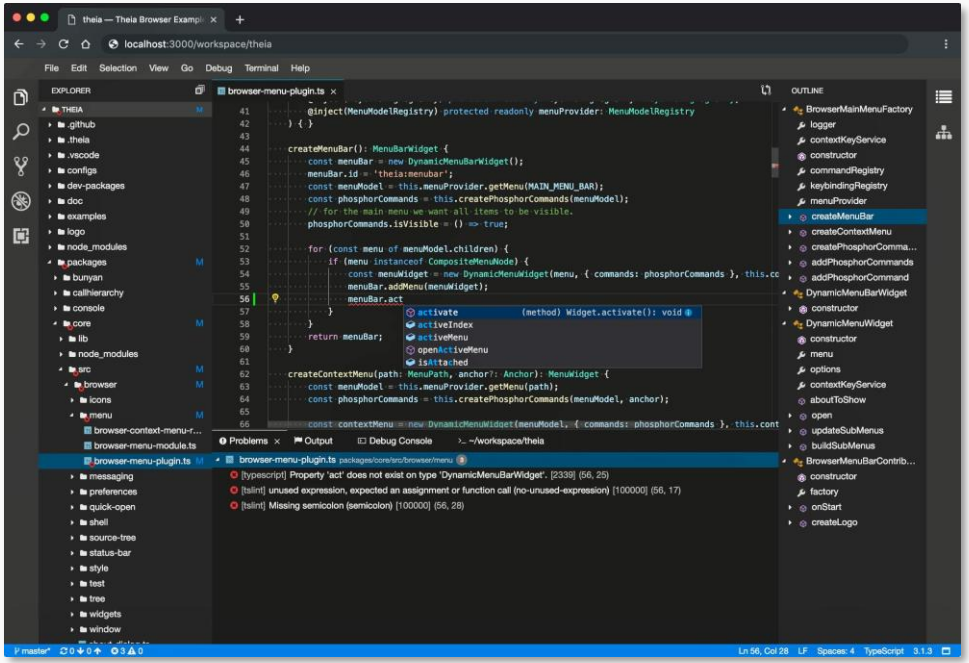
- Starting a project
- Requirements
- Members and contributors

Technical

- Software Evolution
- Complexity
- Metrics

Requirements

- General Purpose Web IDE
- High Extensibility
- Customization / Branding



17.5k stars 2.3k forks

Just One of Many…

Getting started with Theia
- Jonas Helming

Tue.
10:45



Theia News and Noteworthy
- Thomas Mäder

Tue.
12:30



Theia Architecture Overview
- Jonas Helming

Wed.
14:30



Adopting Theia
- Paul Maréchal

Wed.
15:15



Evolution of Theia
- Mark Sujew

Wed.
16:15



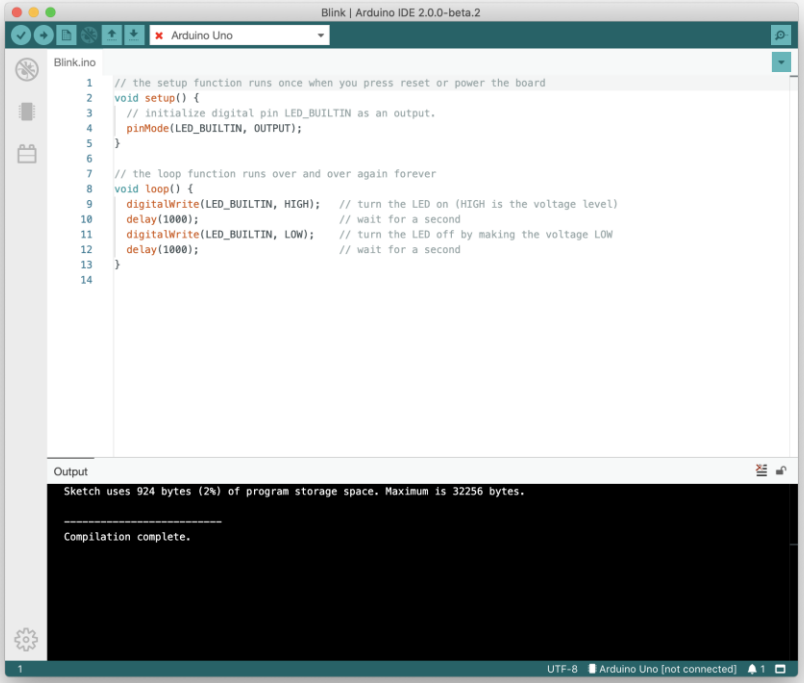
Theia.cloud
- Simon Graband

Wed.
17:00

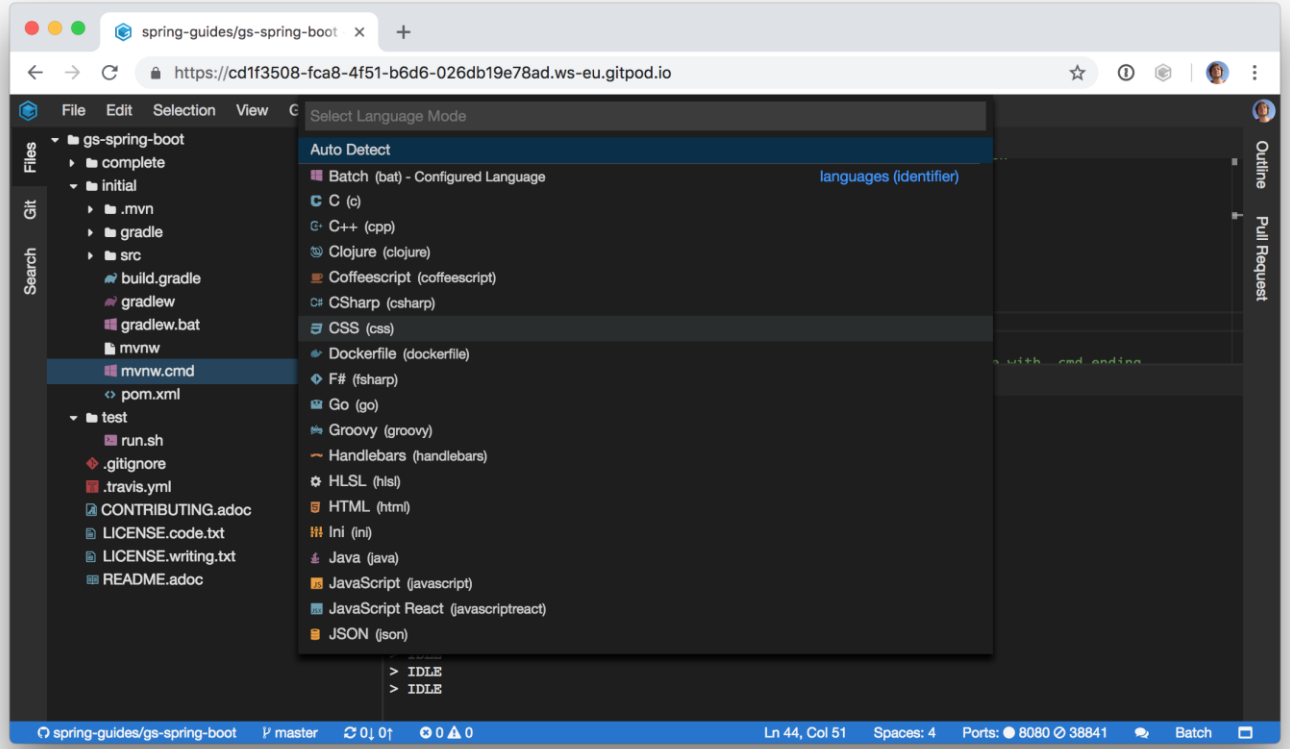


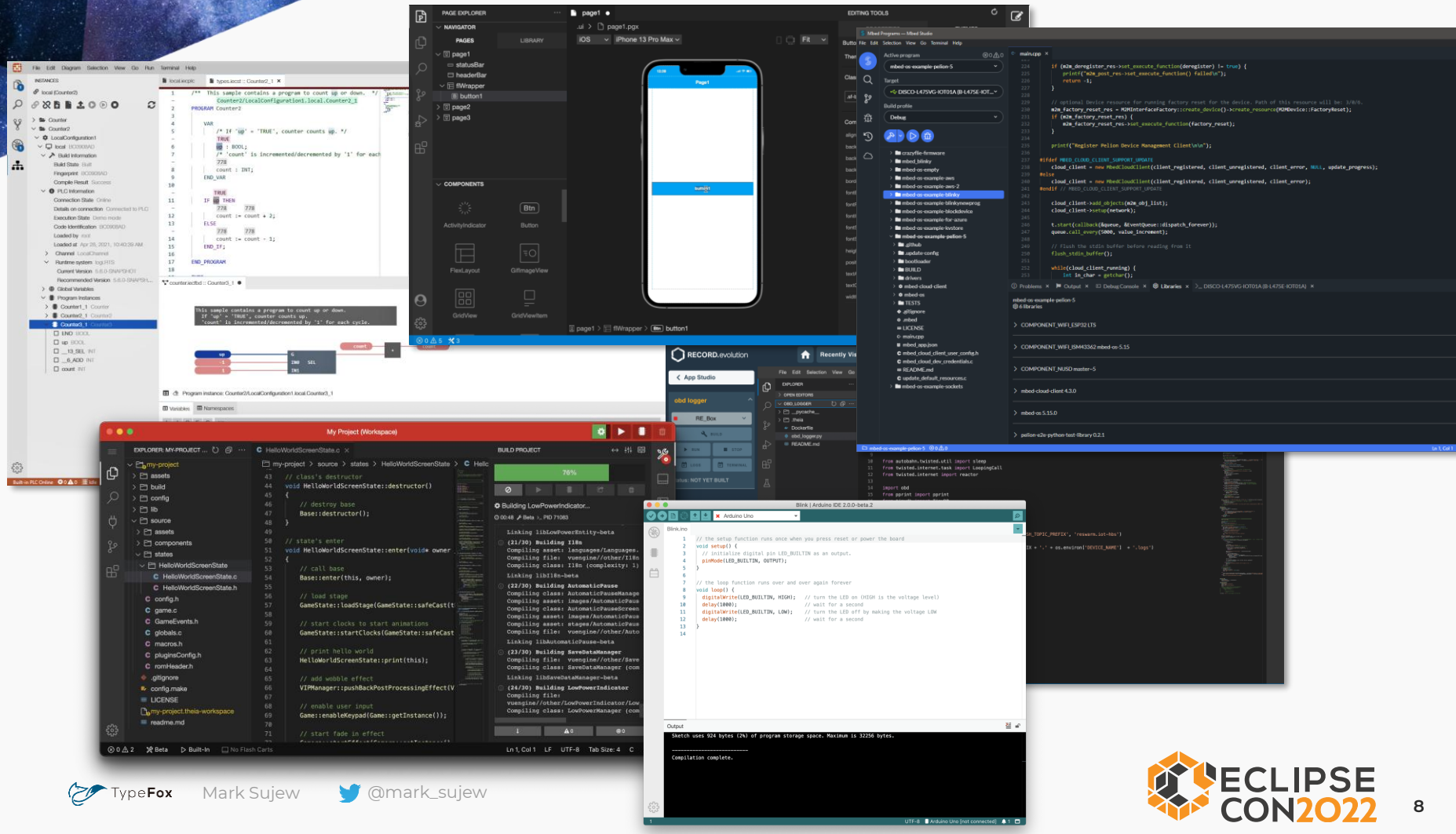
TypeFox and Theia

- Satisfying customer demands
- Leaving Java for TypeScript
- Replacing Eclipse RCP
- Acquiring new customers

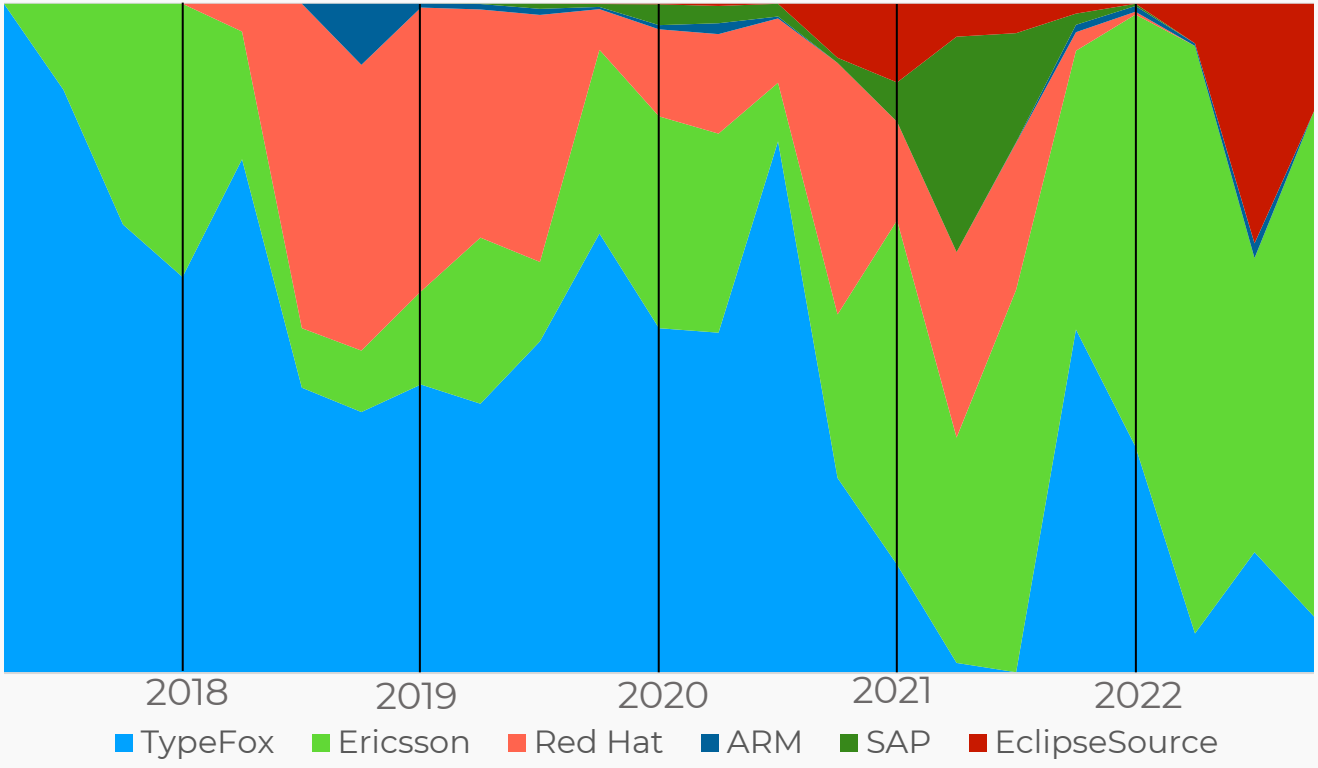


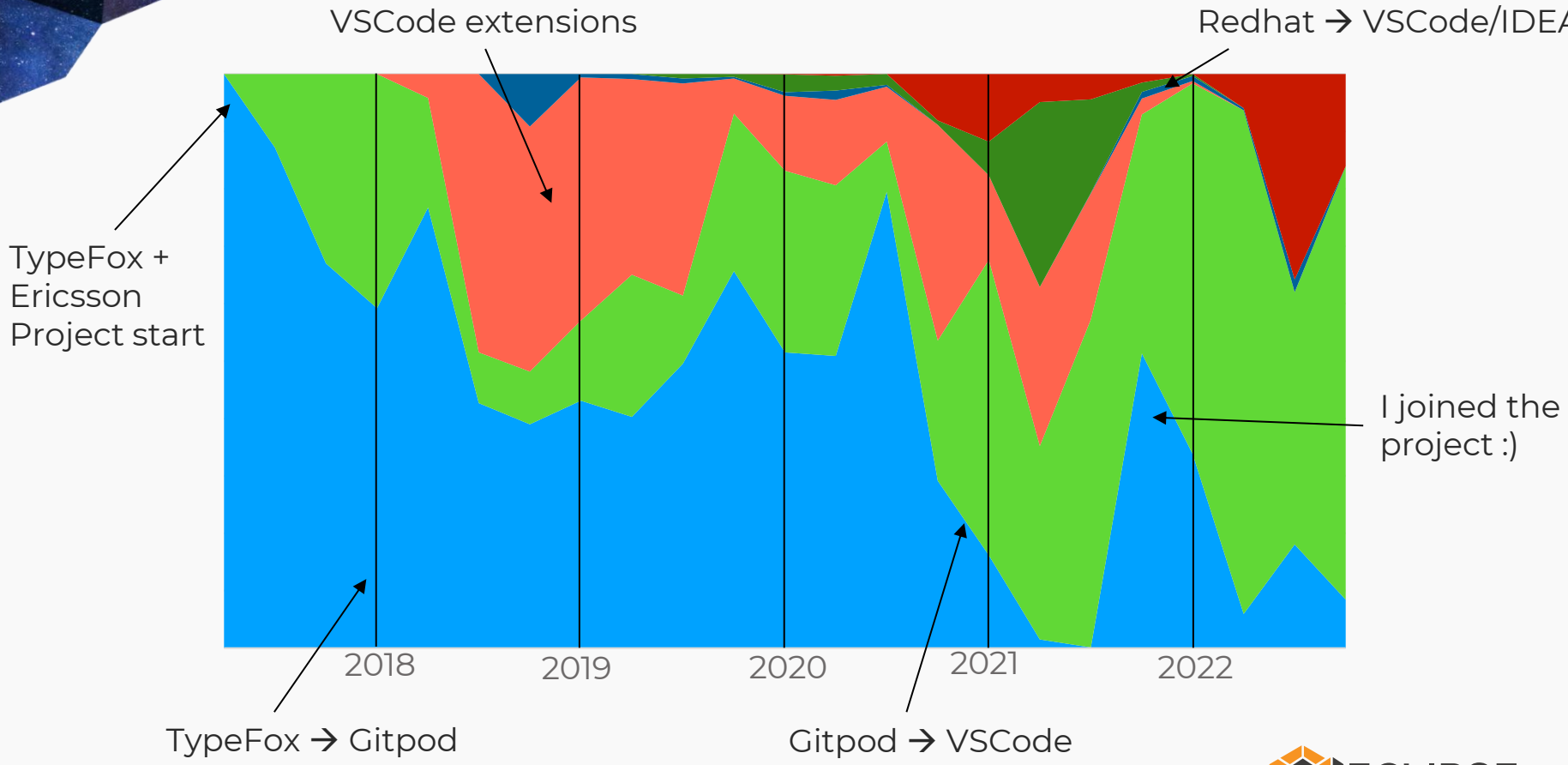
Gitpod in 2018





Major Contributors Over Time



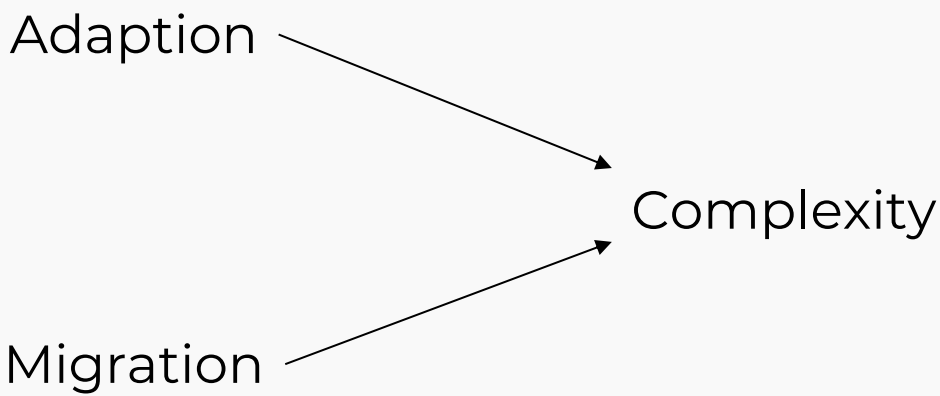

VSCode extensions
Redhat → VSCode/IDEA
TypeFox + Ericsson Project start
I joined the project :)
2018
2019
2020
2021
2022
TypeFox → Gitpod
Gitpod → VSCode

Software Evolution

Software Evolution

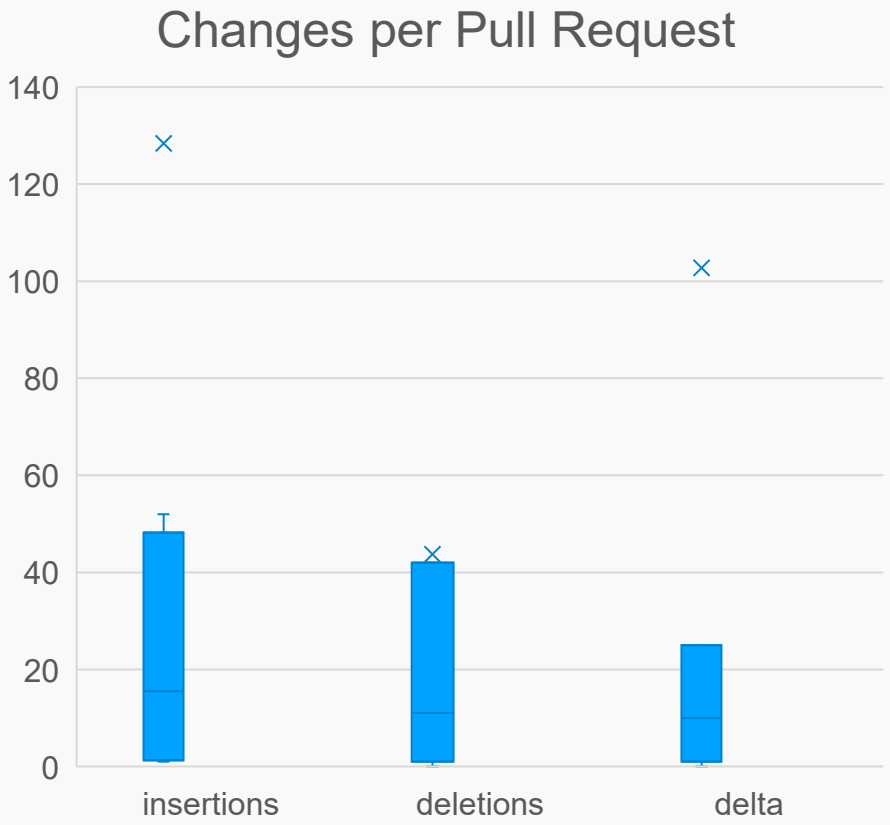
- New user requirements emerge
- Users *will* find bugs
- Dependencies change, become outdated
- Successful Software *needs* Maintenance

Software Evolution



Adaption

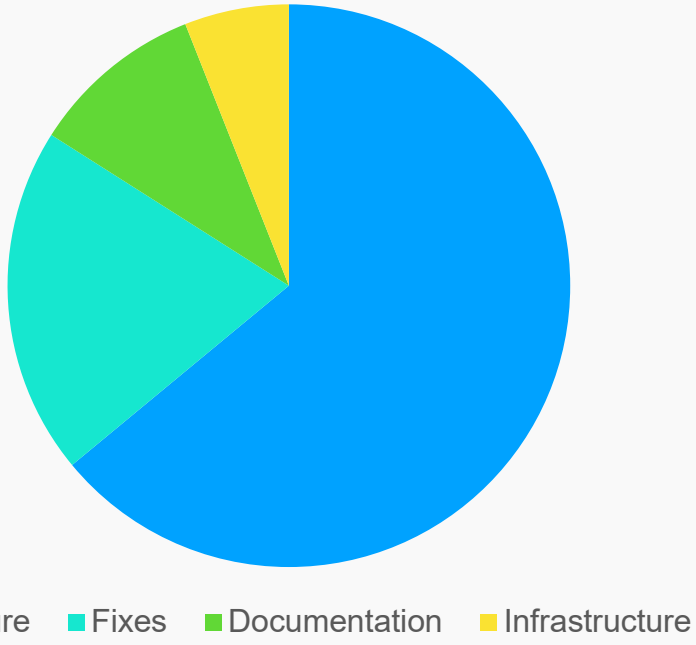
- Monthly update cycle
- ~50 merged pull requests per month
- ~8 breaking changes per update



Colin's Recent PRs

Integrate Memory Inspector in Theia repository #11394	+6,605 −41
Refactor PluginMenuContributionHandler #11290	+1,949 −1,561
Implement missing API for vscode.typescript-language-features@1.62.3 #11083	+1,890 −315
Implement Disassembly View and InstructionBreakpoints #11186	+1,377 −31
Implement safe plugin uninstallation #11084	+752 −215

Adaption



~50 Pull Requests /Month

Migration

- Monthly dependency updates
- Platform updates
- Seldom UI layout data migrations
- VSCode extension API updates (?)











Complexity Metrics

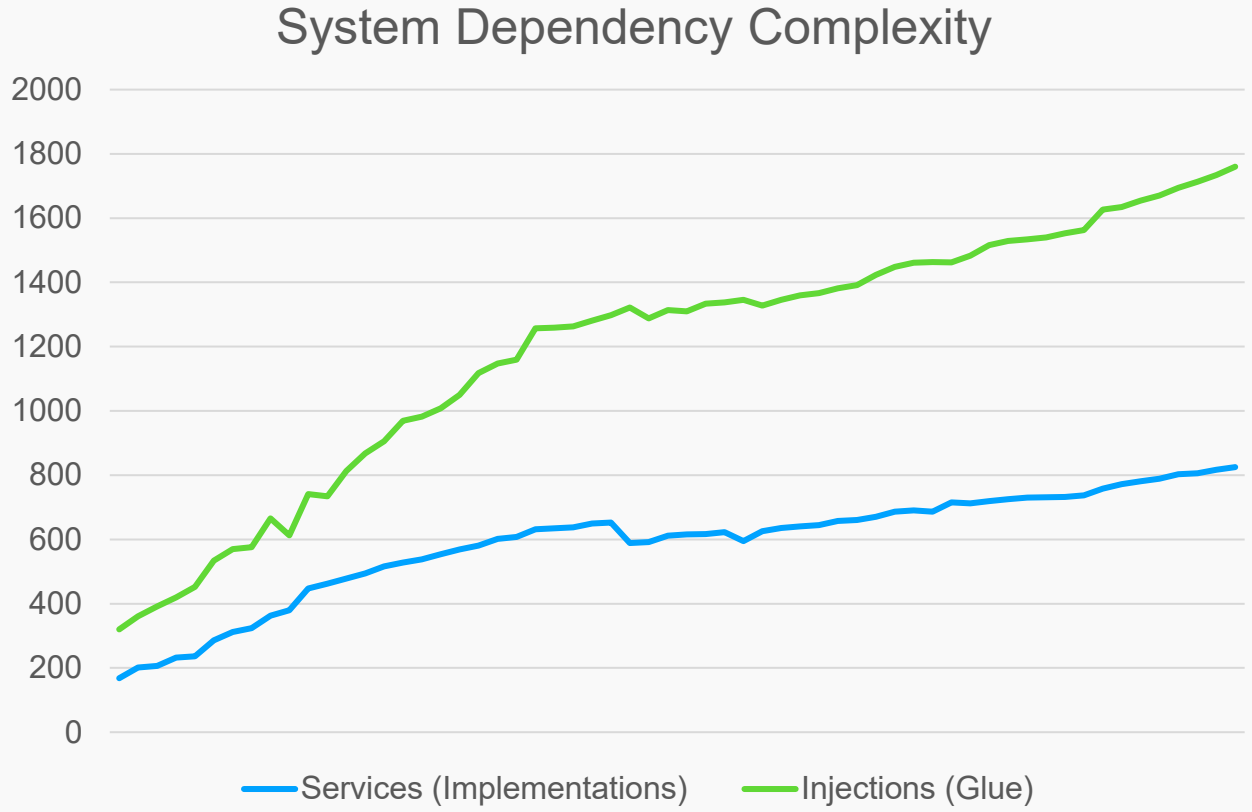
- Halstead Metrics
- McCabe's Cyclomatic Complexity
- Code Shape
- Lines of Code

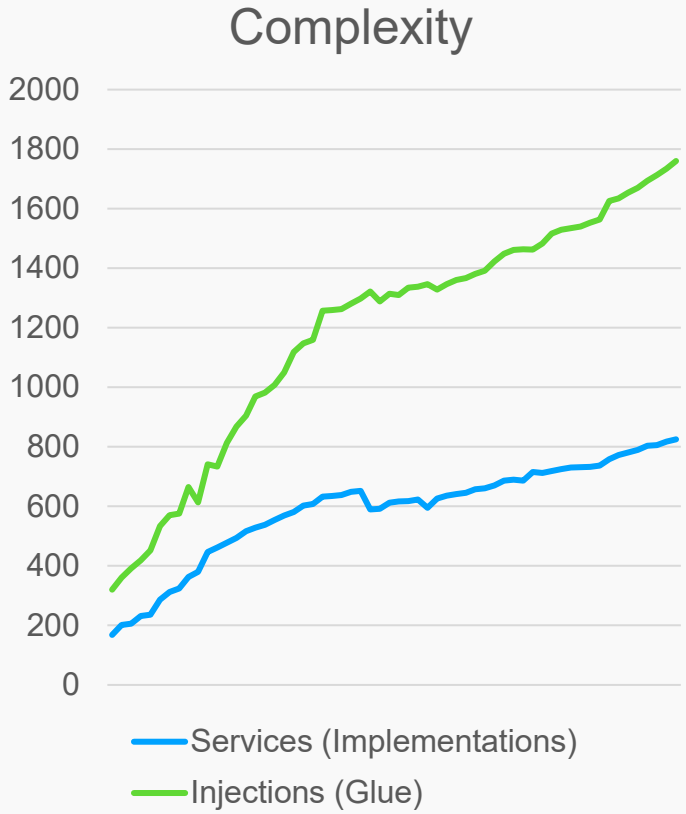


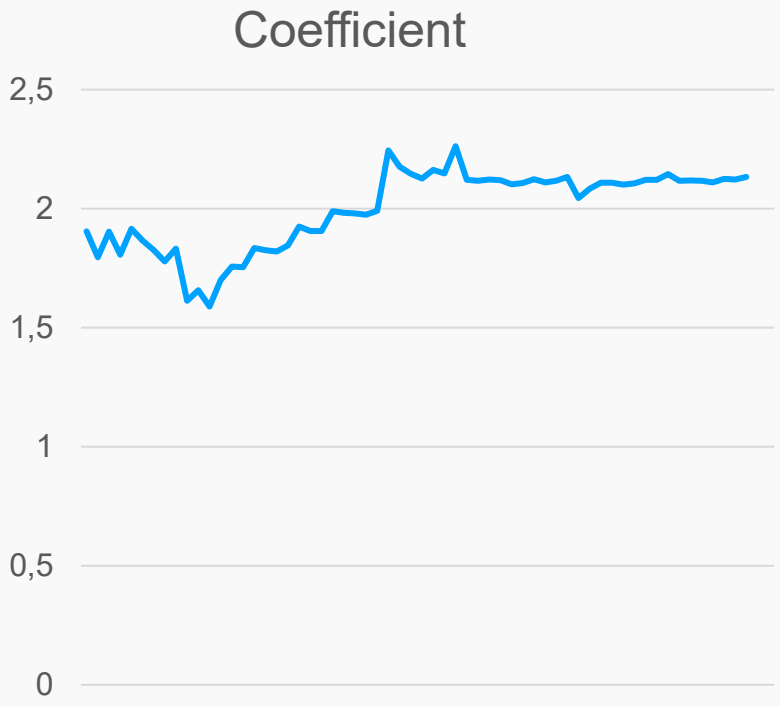
Glue – the Dark Matter of Software



– Marcel Weiher


System Dependency Complexity
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Services (Implementations)
Injections (Glue)


Complexity
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Services (Implementations)
Injections (Glue)


Coefficient
2,5
2
1,5
1
0,5
0

Little Glue Code

- Theia is split into packages
- Each package is well modularized
- Less glue due to abstraction

Conclusion

Questions