

How do Features Interact With Architecture?



Simon
Friedel



Sebastian
Böhm



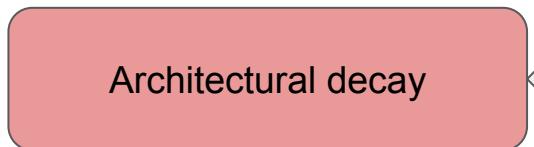
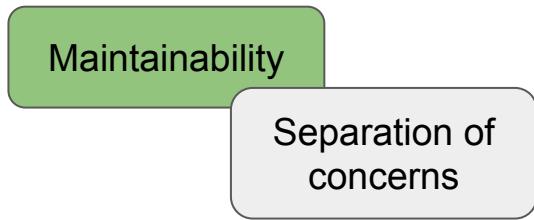
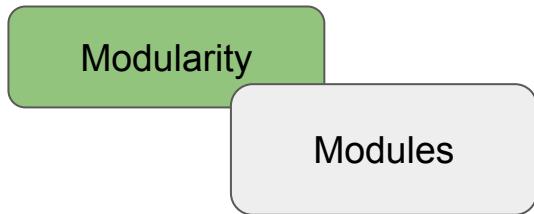
Florian
Sattler



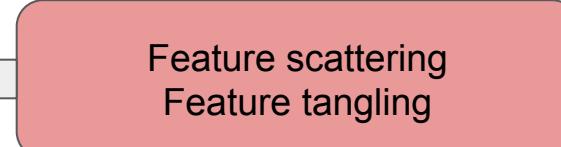
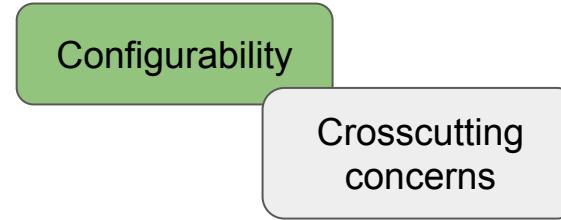
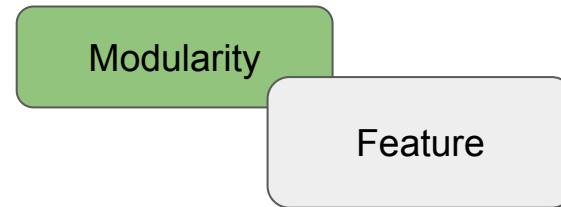
Sven
Apel

Saarland University

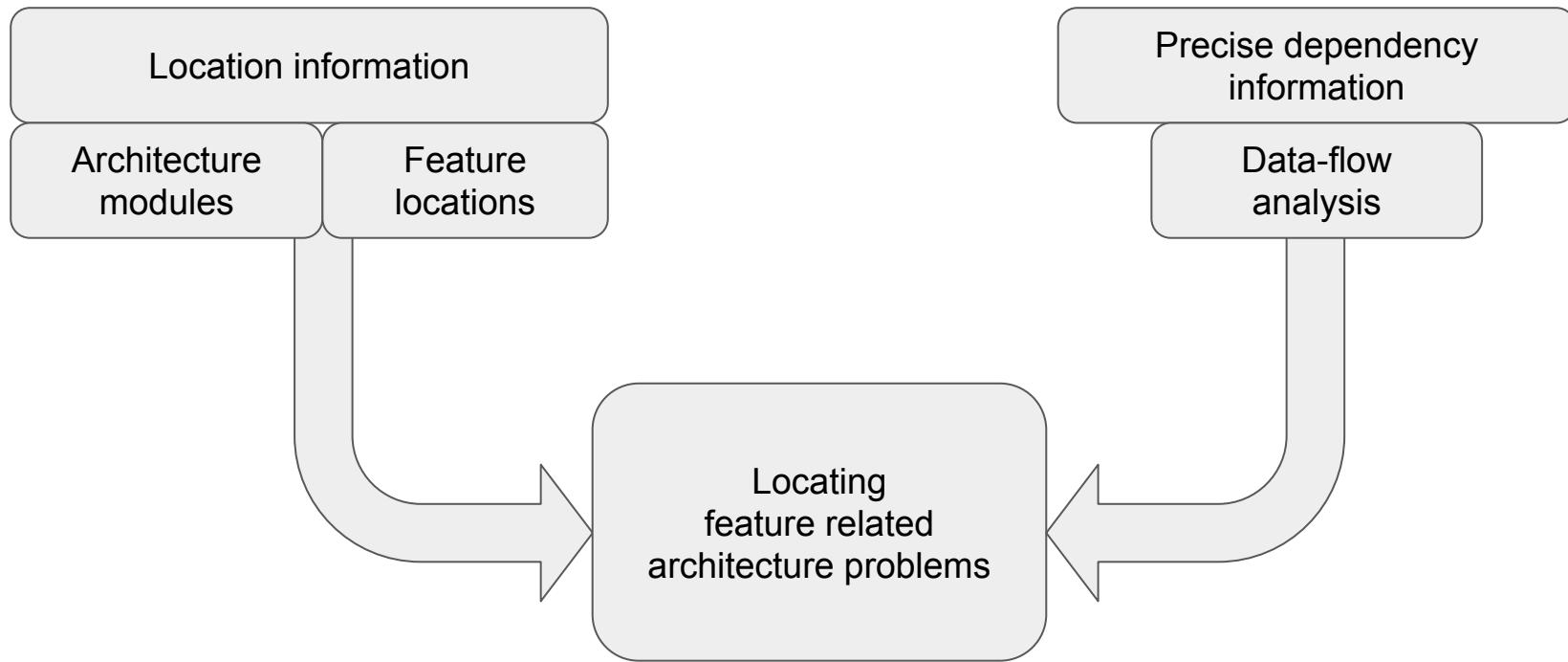
Architecture



Variability



Feature Induced Architectural Smells



Resulting RQs

1 How do feature implementations affect dependencies between architecture modules?

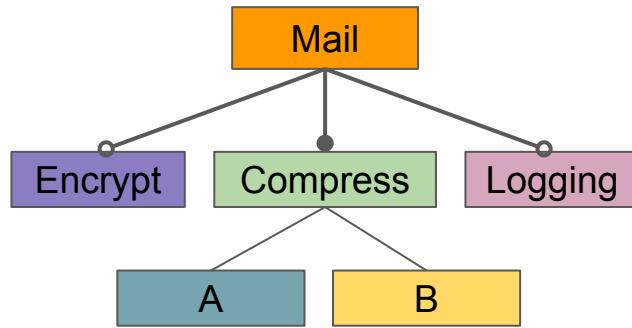
- ❖ Do features give rise to dependencies?
- ❖ How to distinguish between problematic and unproblematic dependencies?

2 What kind of features are most often associated with architecture smells?

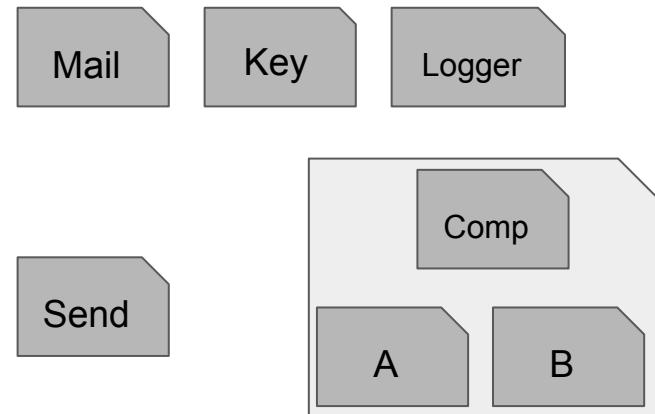
- ❖ When is an architectural smell associated with a feature?
- ❖ Is there a difference between utility and functionality features?
- ❖ Are scattered features more likely to be associated with architecture smells?



Two Models

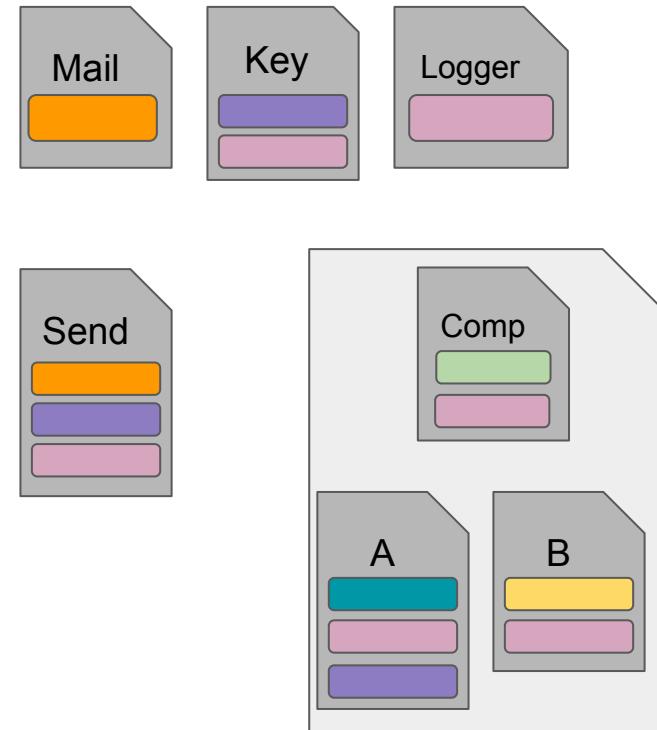
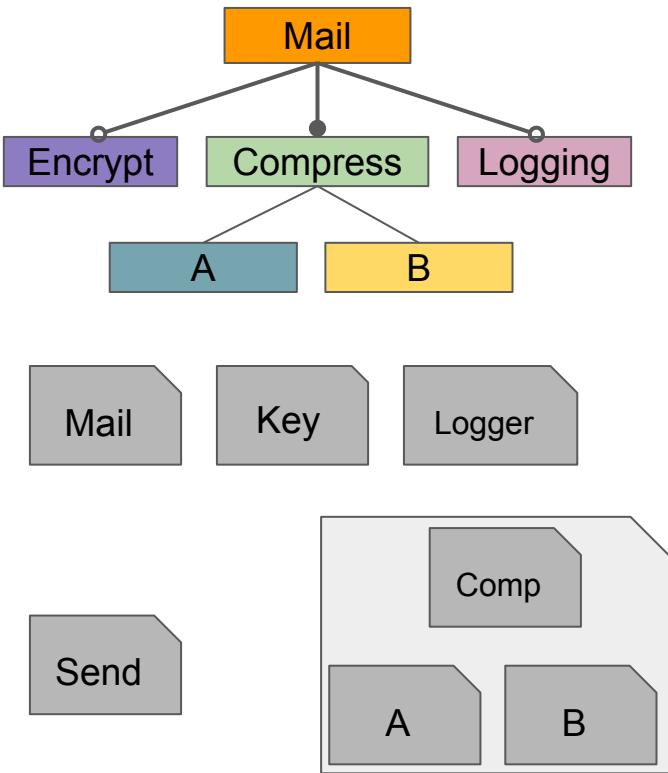


Feature Model

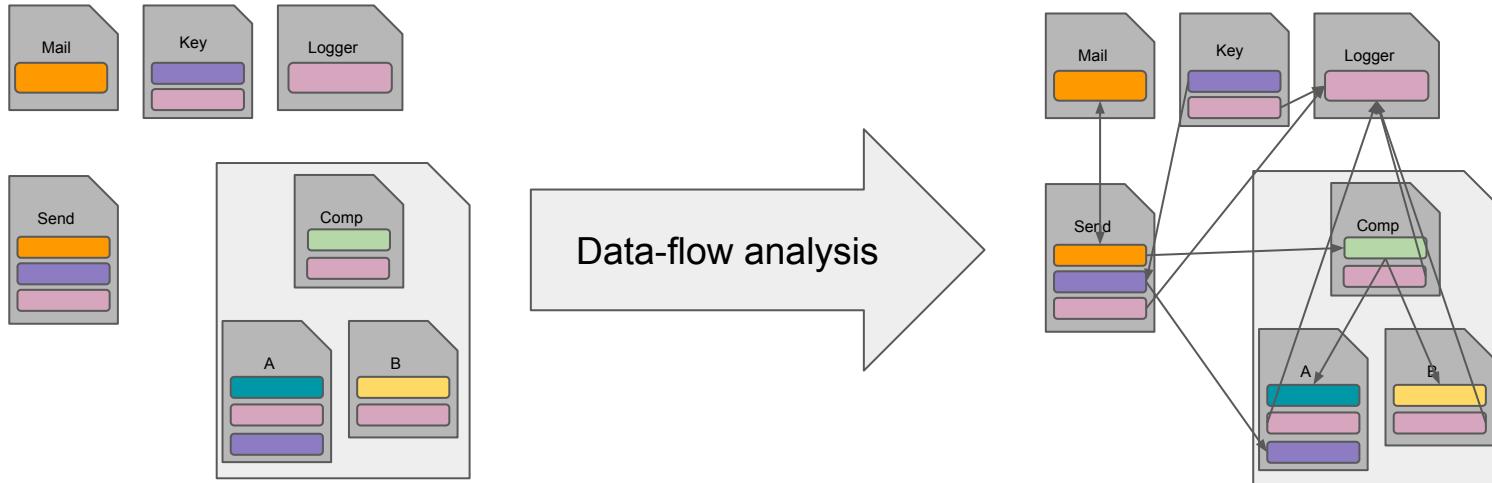


Architecture Model

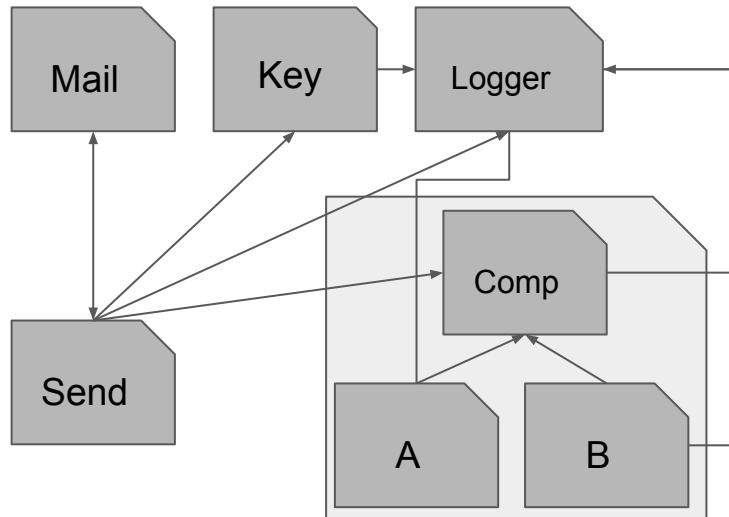
Combining the Viewpoints



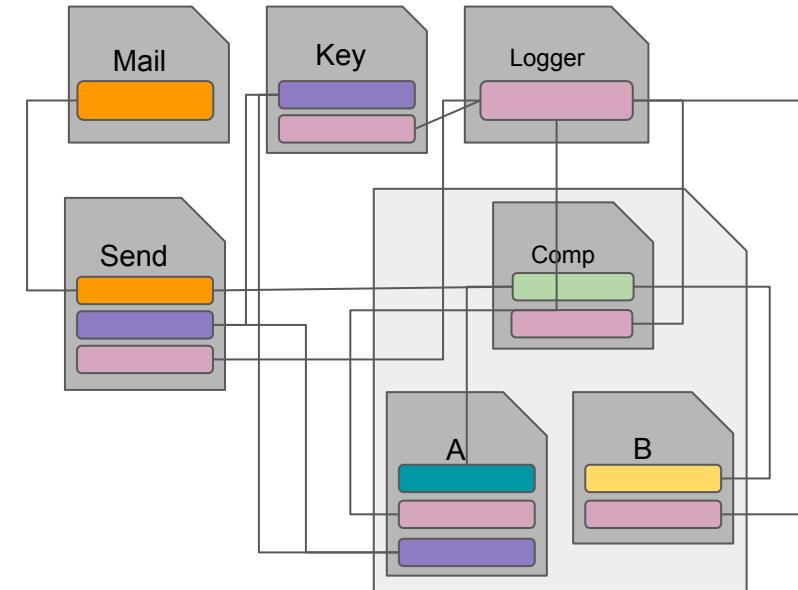
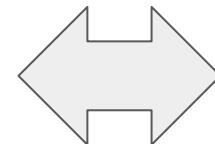
Extracting dependencies



Identifying Architectural Problems

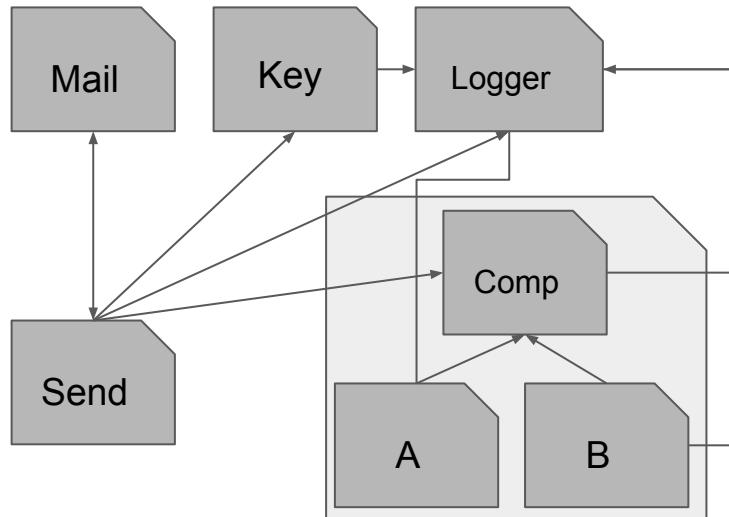


Intended architecture

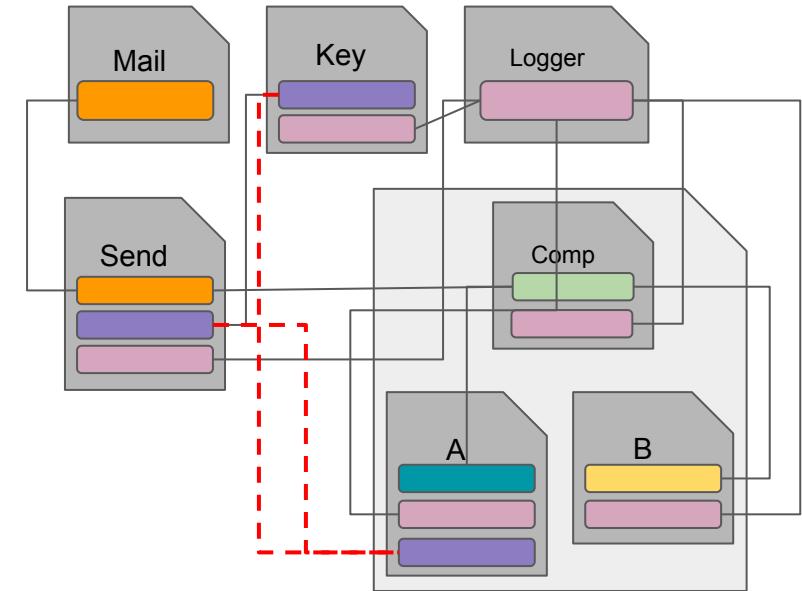
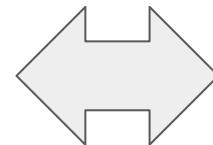


Data-flow dependencies

Identifying Architectural Problems



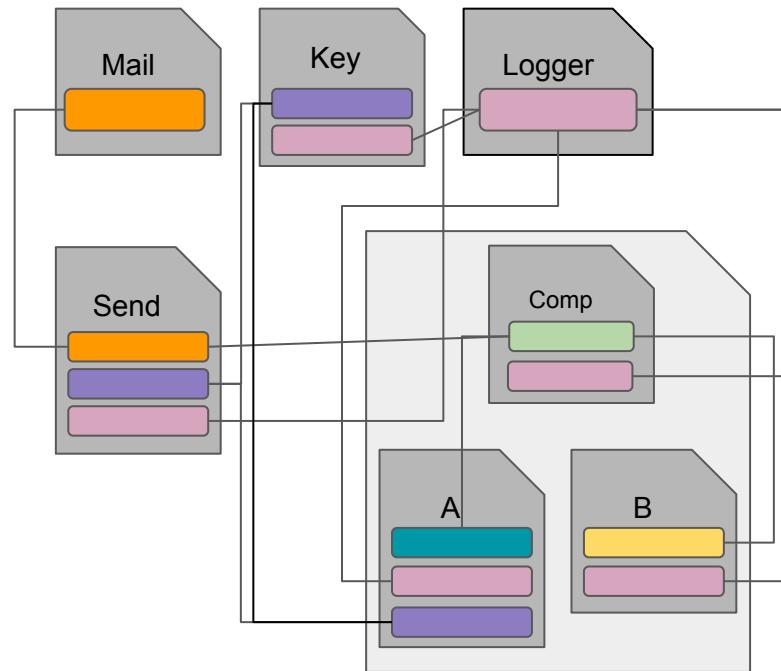
Intended architecture



Data-flow dependencies

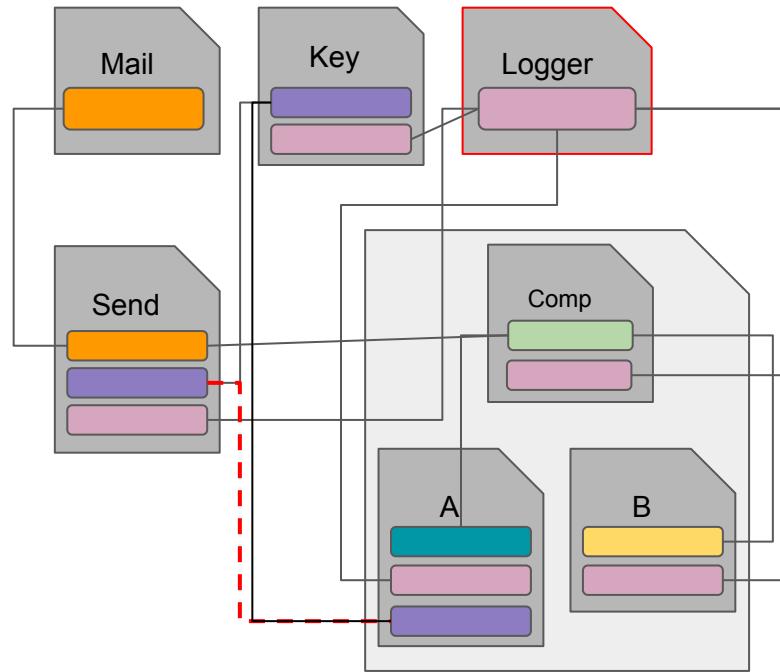
Identifying Architectural Problems

Using architectural anti patterns



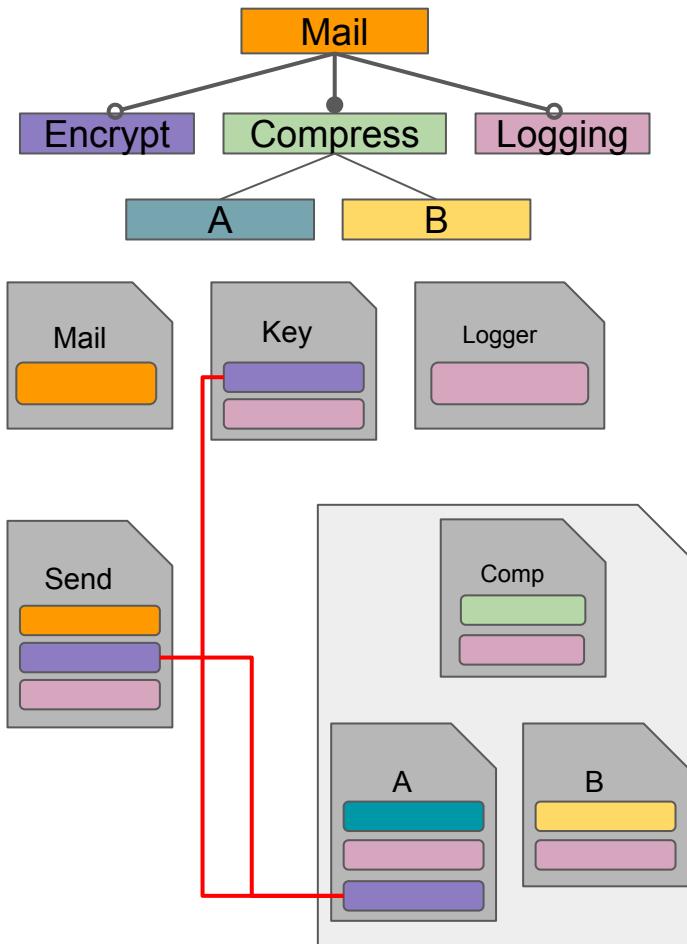
Identifying Architectural Problems

Using architectural anti patterns



The role of Features

Encrypt causes the problematic data-flow

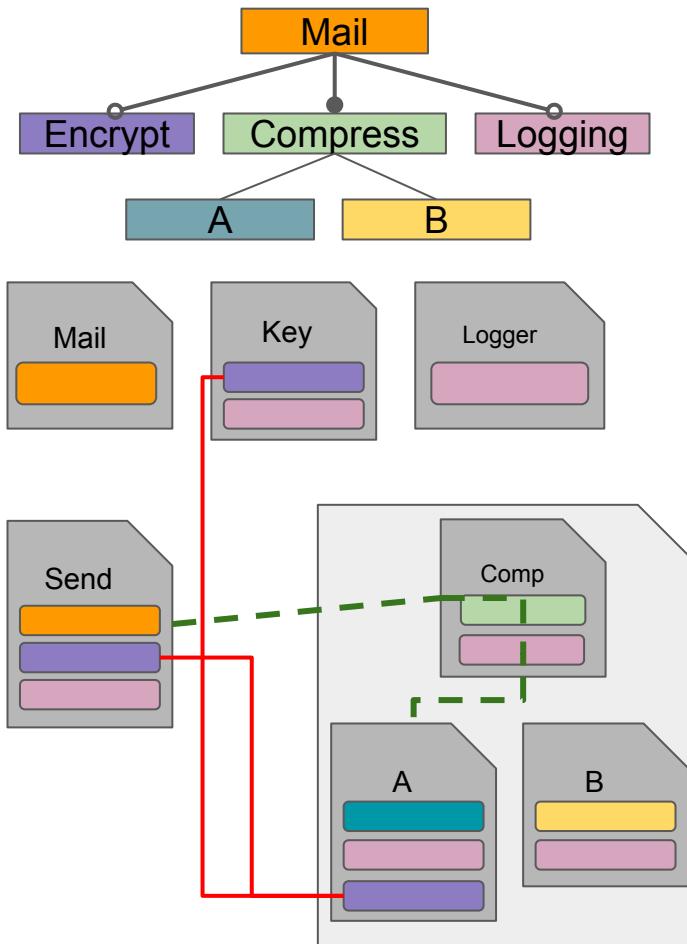


The role of Features

Encrypt causes the problematic data-flow

Bypasses interface Comp

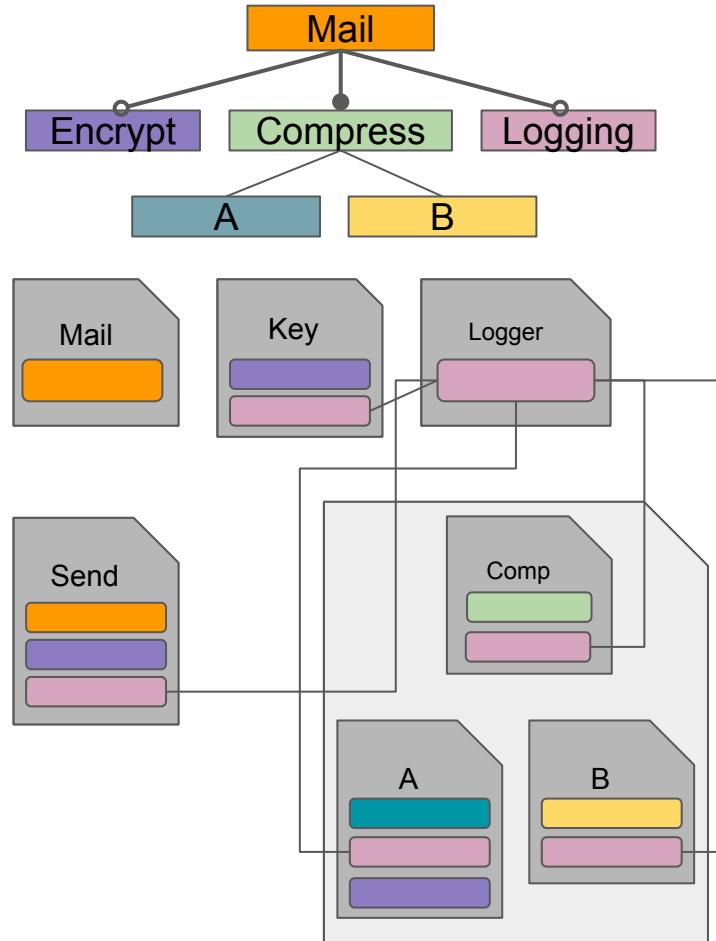
Scattered implementation



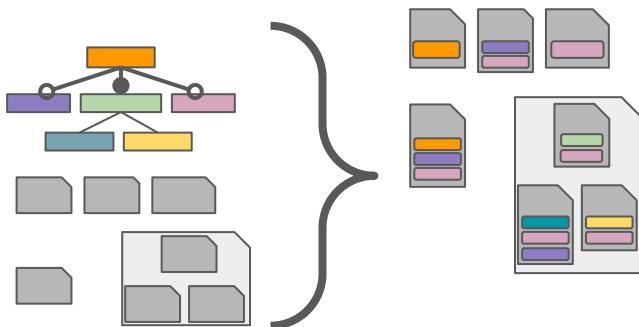
The role of Features

Scattered implementation

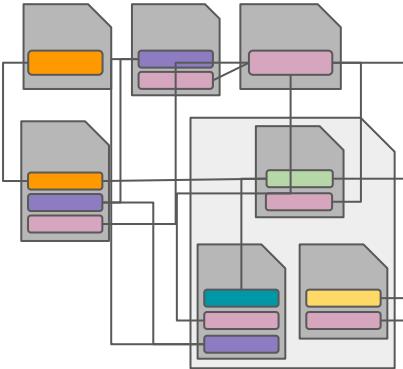
Logging regions aggregate data to the logger



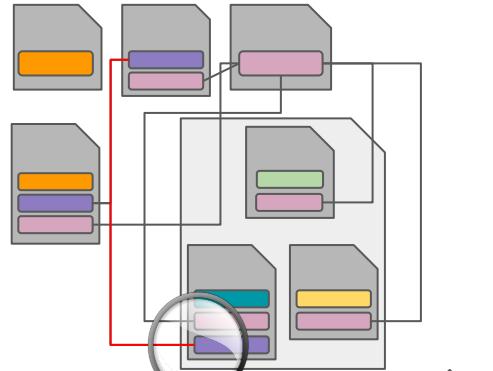
Process



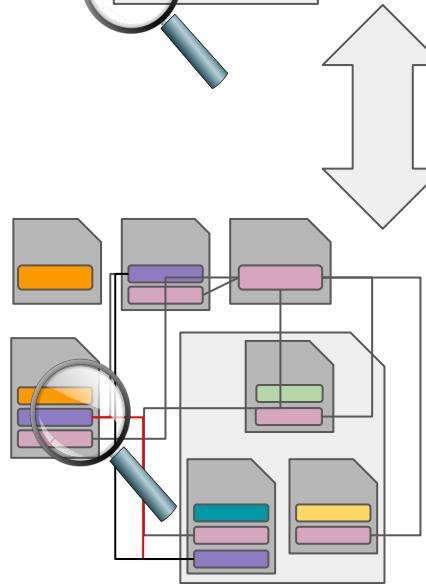
Data-Flow analysis



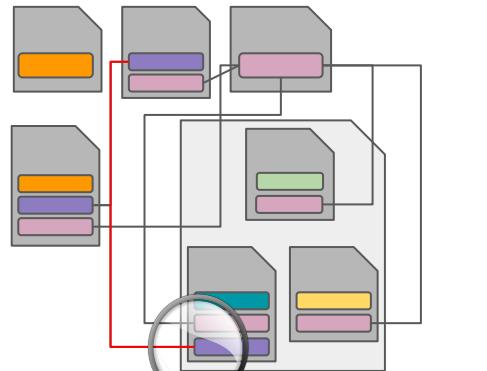
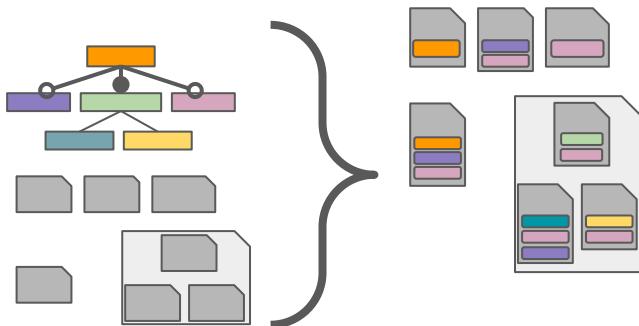
Ground Truth



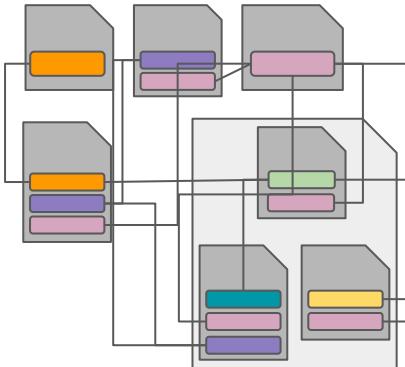
Anti Patterns



Process



Data-Flow analysis



Ground truth?

Anti patterns

