Applied Static Analysis

Modular Analyses

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> If you find any issues, please directly report them: GitHub

Problem statement

> The result of analyses can be improved by complementary information (e.g. information derived by other analysis)

- Integrating different analyses is challenging
  - it should be possible to reason about each analysis' correctness individually
  - it should be possible to determine the impact of individual analyses on the overall performance and precision
  - inter-analysis cyclic dependencies need to be identified and handled in a precise and sound manner
  - running all analyses always will not scale; analyses should only be executed when required

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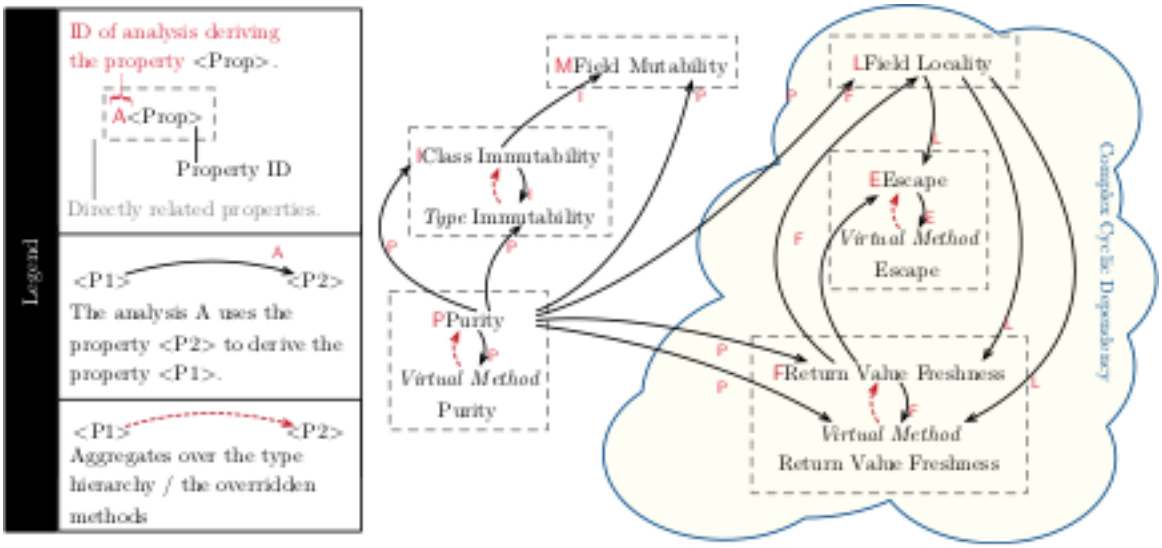
Example of inter-analysis dependencies



The image is taken from [1].

Techniques and approaches to modularize and integrate individual analyses

- Attribute grammars
- (Declarative) (Datalog/Prolog) based approaches
- OPAL's fixed point computations framework
- ...

References

1. Lattice Based Modularization of Static Analyses; M. Eichberg, F. Kübler, D. Helm, M. Reif, G. Salvaneschi and M. Mezini; SOAP 2018, ACM↩