Retrofitting Software for Defense-in-Depth

Challenges:

- Retrofit legacy software with a combination of security mechanisms optimally via automated methods.
- Validate and verify the retrofitting transformations for security.

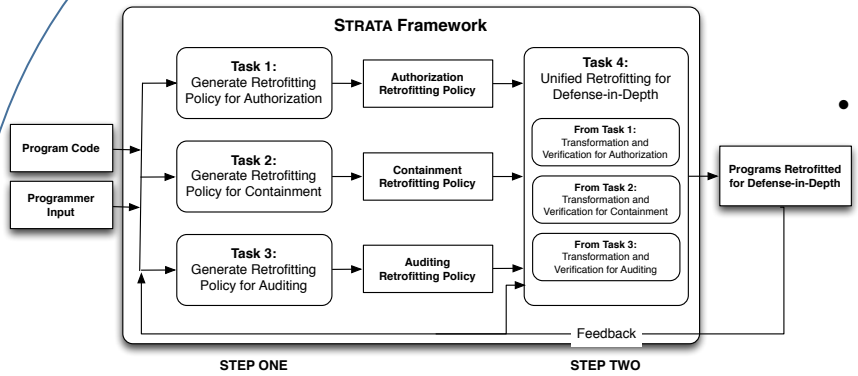

Figure 1: STRATA framework related to project tasks

The STRATA Framework aims to aid programmers in designing *retrofitting policies* that can then be *applied in an unified manner* to produce *optimized and validated security code*.

Solution:

- Use declarative *retrofitting policies* to generate code for privilege separation, authorization, and auditing.
- Generate minimal and validated security code to enforce expected policies.

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Scientific Impact:

- Improve algorithms for automated privilege separation, authorization, and auditing, including integration and validation.
- Learn how to balance security and performance across defenses systematically.

Broader Impact:

- Exploring how programmers retrofit security into their programs.
- Goal is an open-source tool-chain to retrofit programs to enforce expected policies.
- Integrating tool use into coursework and plan for summer school on retrofitting software.