Whip: Higher-Order Contracts for Modern Services

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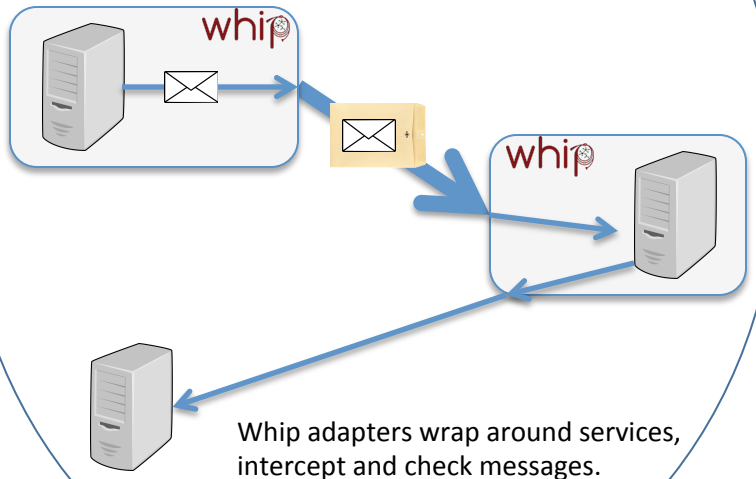
Challenge:

- ***Microservices*** increasingly popular
- But simple protocols used by microservices can't capture **higher-order properties** of services

whip
contracts for microservices



Whip adapters wrap around services, intercept and check messages. Messages between adapters are "enhanced" with info about the origins of contract assertions.

Solution:

- **Whip**: higher-order contract system
- Language agnostic
- Black box: contracts enforced based only on messages
- Transparent
- Partial deployment
- Decentralized
- Proofs of transparency and blame correctness

Scientific Impact:

- Higher-order behavioral contracts for distributed applications
  - Without heavyweight/ monolithic middleware
- Foundation to investigate application-level trust and security in distributed applications

Broader Impact:

- Facilitate correct microservices
  - Including debugging across multiple services
- Microservices broadly used
  - Netflix, Google, Amazon, Twitter, …

SHF: Small: Higher-order Contracts for Distributed Applications
Award number 1421770
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