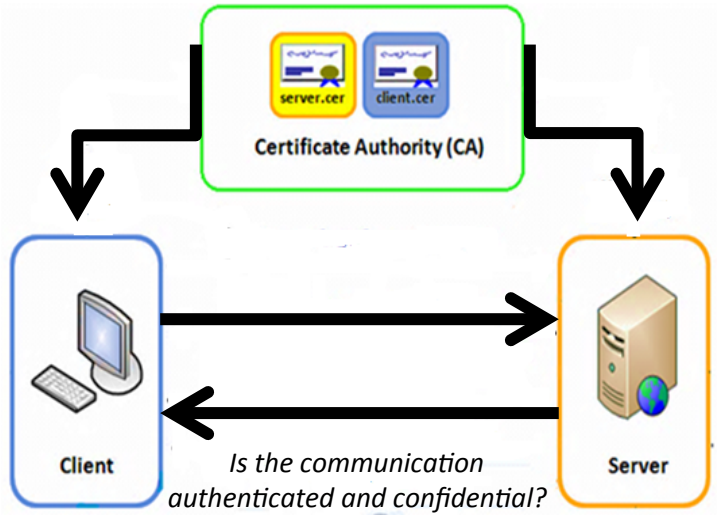
Blameworthy Programs: Accountability via Deviance and Causal Determination

Challenges:

- What contracts are needed to express and verify interesting security properties?
- How can we enforce them?
- How can we attribute blame based on a notion of actual cause?



Scientific Impact: The project develops:

- A language for distributed computing and contracts
- Formal definition of actual cause for interactive systems
- A blame semantics for accountability based on actual cause

Solution:

- Logic and language-based methods for deviance and causal determination
- Contracts specified using session types, dynamic monitoring of communication

Distributed security mechanisms ensure global security properties when individual programs follow their local contracts. Violations occur when programs deviate from their contracts. We investigate how to detect a violation and determine the programs to be held accountable for the violation.

Broader Impact:

- Applications include security mechanisms such as public key infrastructure and reference monitors
- Dynamic monitoring is promising for legacy systems because components are written in different programming languages

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