Remarks on Authorization and Accountability in DIG Projects

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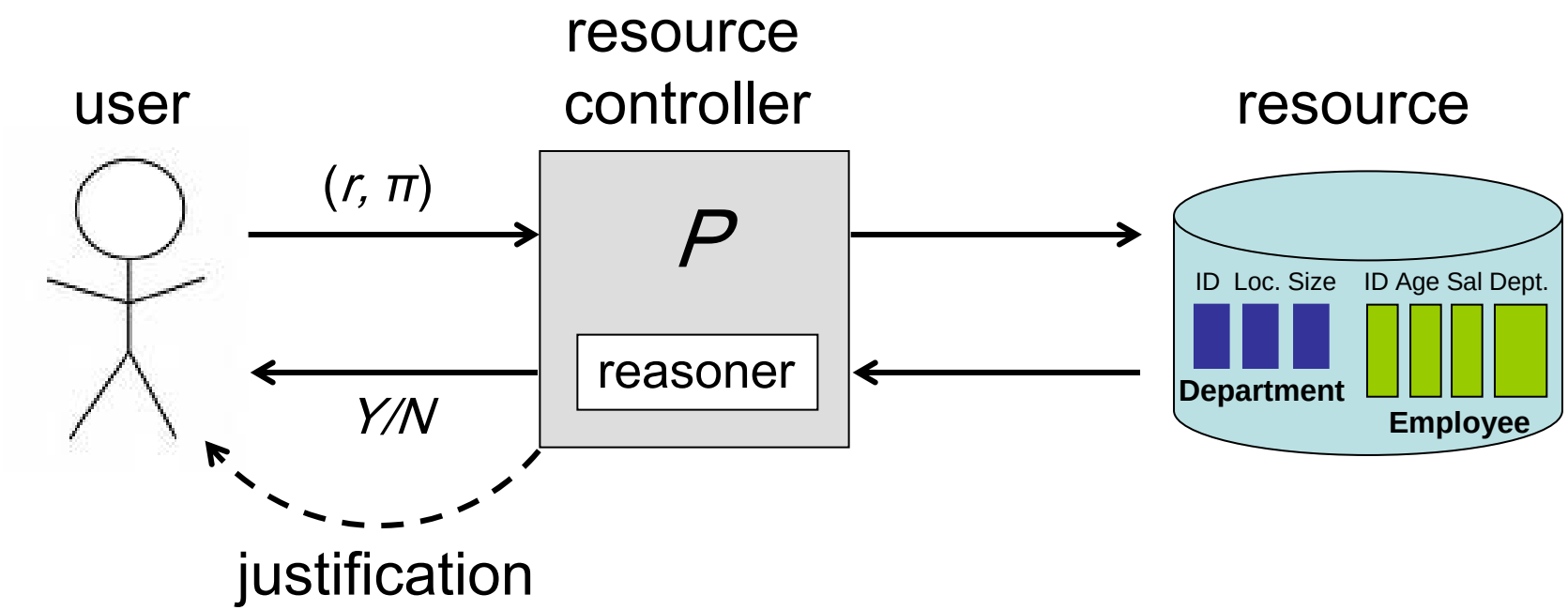
Standard Authorization



Authorization Research

- Technical challenges
  - Policy languages and query languages
  - Logic for and reasoning about compliance
  - Human-readable justifications
  - Evidence-based policy revision
- This is a ***preventive*** approach to policy compliance: Actions that cannot be ***authorized before the fact*** should be prevented.

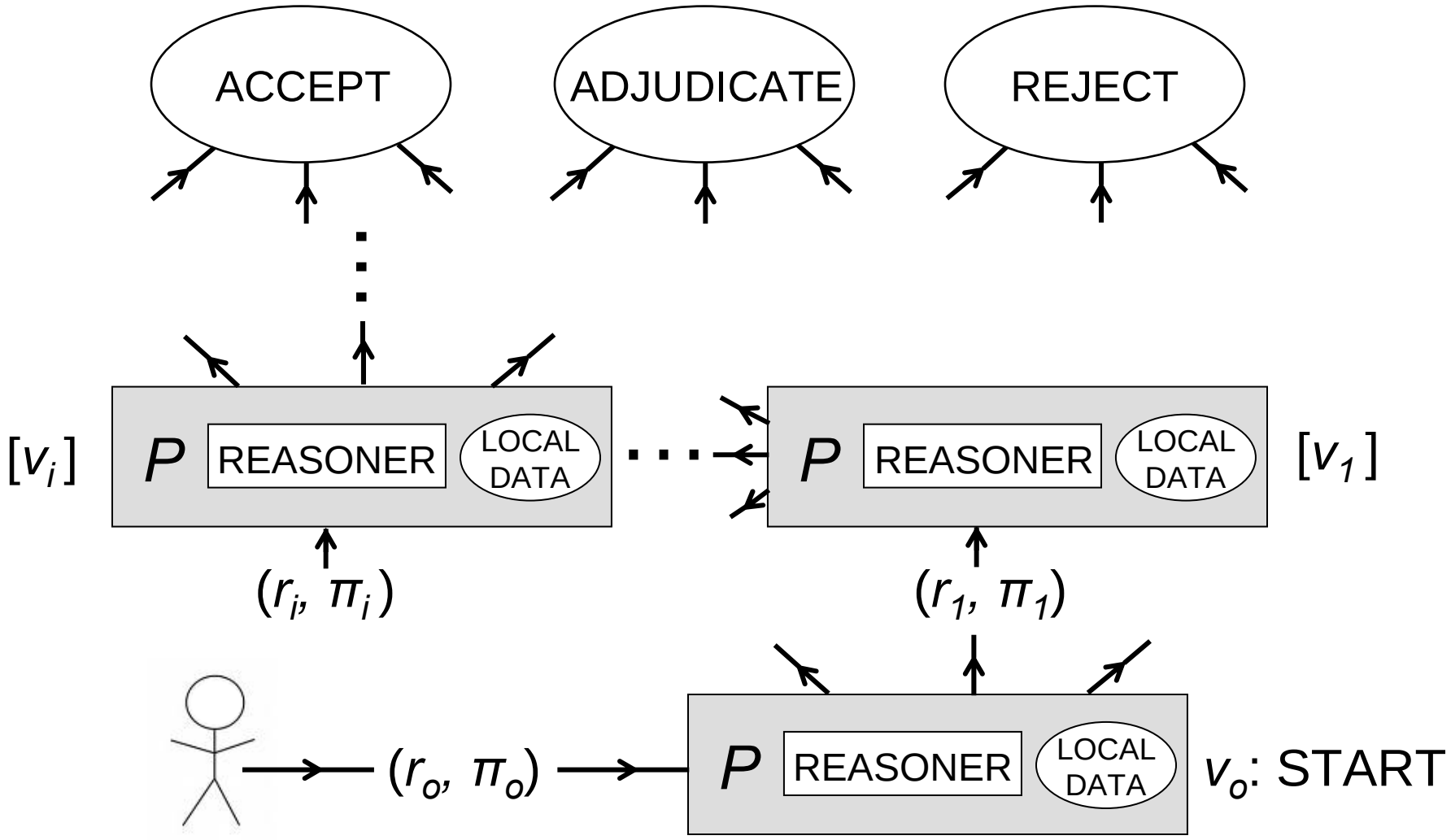
Prevention is Inadequate

- Examples
  - Emergency medical
  - Battlefield
  - Counter-terrorism and law enforcement
  - Retail banking
  - Web crawling
- Reasons
  - Complex, hard-to-formulate policies
  - Inaccessible proofs of compliance
  - Computationally expensive decision procedures

Examples in DIG Projects

- Logging, analysis, and revision of policies and queries
  - Policy assurance in PIR
  - Data exchange in Fusion Centers
- Flagging but not stopping non-compliant actions
  - Policy-aware mashups
  - License validation in Creative Commons
  - Social-web privacy
- Similar experiences with policy compliance in earlier DIG projects: TAMI (NSF), PAW (NSF), and E2ESA (IARPA)

Multistage Authorization



Two Properties of “Accountable Systems”?

- Finite number of steps to a decision:

  For all requests (r_0, π_0) and all policies P, all execution paths are finite and end at a terminal node.

- Best effort to authorize:

  For all (r_i, π_i), all policies P, and all non-terminal nodes v_i, if there is a path to the ACCEPT node, then $[(r_{i+1}, \pi_{i+1}), v_{i+1}]$ must be a next hop on one such path.