Automatic Trust Negotiation

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Quick Facts of Logic / Deductive Language.

- **Predicates:** $p$ and $q$
  - *True, False*

- Is $p \lor q \iff \neg(\neg p \land \neg q)$?
  - Yes!
  - With “logical NOT” and “logical AND” You can make any logic statement.

- **Positive Rules or Horn clause.**
  - No NOT Statement
  - Only “Logical AND”
Demo of PROTUNE

- http://policy.l3s.uni-hannover.de:9080/policyFramework/protune/demo.html
No Registration Needed: How to use Declarative Policies and Negotiation to access Sensitive Resources on the Semantic Web.

Rita Gavriloaie,
Wolfgang Nejdl,
Daniel Olmedilla,
Kent E. Seamons
Marianne Winslett
Overview

- Problem
- Solution
- Trust Negotiation
- Guarded Distributed Logic Programs
- “PeerTrust” execution environment.
- Application Scenario.
Problems In Web

- Resource Access
  - Registration, Login/Password
    - No Automation

- Trust based on Shared Information of Service
  - One Way of Trust.
    - Two Way Trust / Conditional Disclosure.
    - Multiple Levels of Trust.
    - Validity of Information, No Standards.
Proposal/Solution:

- Policy based access control.
- Automated Trust negotiation.
Trust Negotiation

- Digital Credentials.
  - Credential Issuer
    - X.509 certificates
    - Anonymous credentials/ Zero Knowledge
      - Simplest Form.
    - Signed XML statements.
Trust Negotiation Vs Traditional Trust

- Mutual Trust with Digital credentials.
- Resources protected by ACL
  - Includes Services, Roles, Credentials. Policies, Capabilities.
- Equivalent Peer to Peer Trust.
Goal

- Resource “R” and Credentials “C”.
- \( R \Rightarrow C_1 \ AND \ C_2 \ldots \ AND \ C_k \)
PeerTrust Guarded Distributed Logic Program

- PeerTrust Logic Program
- Distributed Logic Program
- Guarded Logic Program
PeerTrust Logic Program

- Its Horn’s Clause.
- No Negative Rules.
Distributed Logic Program

- References to Other Peers.
  - Issuer argument
    - Delegation of the Rule Evaluation to the Peer/Third Party. (Like RPC – Remote Procedure Call)
    - Nested References (Like Nested RPC).
    - Attached to Evaluation part of String.
  - Requester argument
    - Nested References.
    - Attached to Result Part of String.
Distributed Logic Program

- Local Rules
  - ACL rules
  - Party specific rules
  - Cached rules ➔ (Needs Signed Rules)

- Signed Rules
  - Rules can be signed.
  - Reference Rules Should/Must be signed.
Guards
- Precedence Order of Rules
- In Parallel Logic Programming Systems.

Public and Private Predicates
- Object Oriented Rules.
Fig. 3. Negotiation between Alice and E-Learn
Execution Environment

- Dynamic Policy for each resource.
  - Act on Meta-Data
- Security Infrastructure.
Conclusion

- The problem of explicit registration is solved.
- Guarded Distributed Logic Programs is Developed.
A Flexible Policy-Driven Trust Negotiation Model

Dé Coi, J. L. and Olmedilla, D.
Overview

- Problem
- Negotiation Requirements
- Negotiation Model
- Conclusion
Problem

- Numerous Trust Negotiation Software
  - Dissimilar Features
  - Dissimilar scenarios

- Need for a Generic Model.
## Negotiation Requirements

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<td>Actors +</td>
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<td>Explanation -</td>
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Negotiation Model

- **Policy**
  - Set of Rules
  - No Negation applied to any predicate

- **Negotiation Message**
  - Policy
  - Notifications

- **Negotiation History**
  - To provide an explanation.
Negotiation Model

- Negotiation State Machine
  - To identify the next steps.

- Bilateral Negotiation
  - No Empty Negotiations. Empty = No New Info.
  - Monotonic: Any Other Rules added will not change from False to True.
Conclusion

- Summarized the Main features any Trust Negotiation Software Should follow.
Discussion

- Semi Automatic Negotiations?
  - Users Will Have Better Control
    - But It will be visible to user and How easy would be the Usability?

- No Usability Tests done?
  - What could be the possible Usability tests?
THANK YOU