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# Automatic Trust Negotiation



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Rajesh Gangam

<http://people.cs.vt.edu/~gangamra/index.html>

# Quick Facts of Logic /Deductive Language.

- *Predicates:  $p$  and  $q$* 
  - *True, False*
- *Is  $p$  OR  $q \Leftrightarrow NOT( (NOT p) AND (NOT q))$  ?*
  - Yes!
  - With “logical NOT” and “logical AND” You can make any logic statement.
- Positive Rules or Horn clause.
  - No NOT Statement
  - Only “Logical AND”

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# Demo of PROTUNE

- <http://policy.l3s.uni-hannover.de:9080/policyFramework/protune/demo.html>

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# No Registration Needed: How to use Declarative Policies and Negotiation to access Sensitive Resources on the Semantic Web.



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

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# Overview

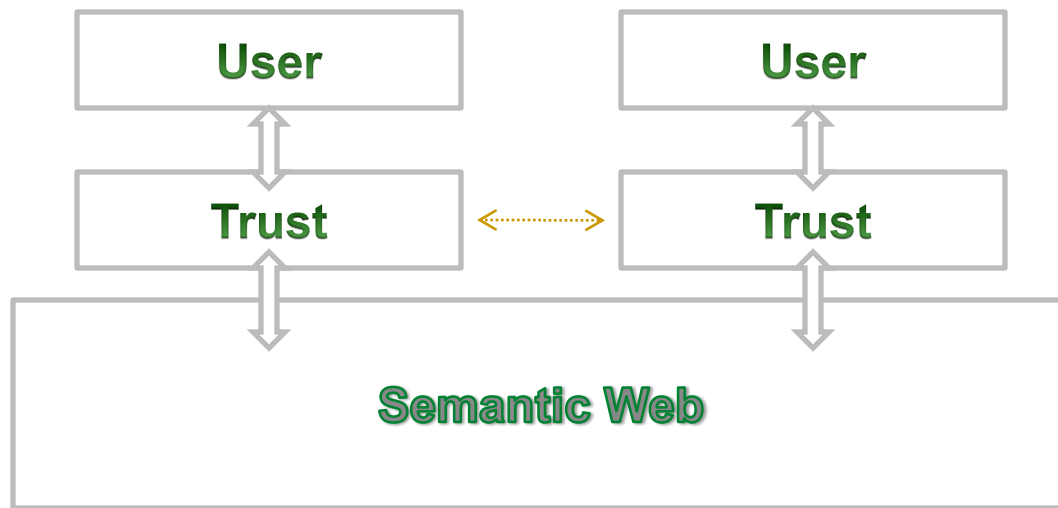
- Problem
- Solution
- Trust Negotiation
- Guarded Distributed Logic Programs
- “*PeerTrust*” execution environment.
- Application Scenario.

# 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”.
- $R \Rightarrow C_1 \text{ AND } C_2 \dots \text{ AND } C_k$

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# PeerTrust Guarded Distributed Logic Program

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

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# 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.

# Guarded Logic

- 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



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# Execution Environment

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

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# Conclusion

- The problem of explicit registration is solved.
- Guarded Distributed Logic Programs is Developed.

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# A Flexible Policy-Driven Trust Negotiation Model

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Dè Coi, J. L. and Olmedilla, D.

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# Overview

- Problem
- Negotiation Requirements
- Negotiation Model
- Conclusion

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# Problem

- Numerous Trust Negotiation Software
  - Dissimilar Features
  - Dissimilar scenarios
  
- Need for a Generic Model.

# Negotiation Requirements

## Negotiation

Actors +

External Actions +

Notifications +

Local Actions +

Action Selection Function +

Policy

Policy Filtering -

Termination Algorithm -

Explanation -

# 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..



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# Conclusion

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

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# 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?

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**THANK YOU**