Handling Dynamic Organizational Change with Community-Based Policy Management

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Outline

- Background on CBPM
- Rich-client interface design
- Dynamic Spectrum Allocation Use-Case
- Initial Usability Evaluation
- Future work
Community-based management background

- Essentially a **Meta-policy Management** Framework
- Community: grouping abstraction instead of e.g. roles
CBPM principles

- Divides Policy specification authority into a hierarchy of Communities
- Communities make policy authoring decisions within the envelop of authority granted to them
  - Resource management authority delegated from General to Specific levels
- Community members deal with localised policy set
- Community structure forms a progressively grounded model of the organisational structures involved
CBPM main features

- Fine grained control over the distribution of authority
- Collaborative decision making
- Management of organisational change
Rich-Client UI design

- Using CBPM principles
- Implementation
  - Java
  - Eclipse GMF (Graphical Modeling Framework)
  - Jboss Rules (drools) Rule Engine
- Use-Case
  - Dynamic Spectrum Access (DSA) using Software/Cognitive Radios
    - Potential for spectrum to be allocated on a needs basis
GMF-based Policy Engineering User Interface
Policy Authoring Template
UI features

- Drag ‘n Drop UI
- Easy to grasp hierarchy of authority
- Automatic conflict detection
- Assisted conflict resolution
UI usability evaluation

- Dynamic Spectrum Access Scenario
  - DSA Policy Specification
  - Policy conflict detection/resolution

- Participants
  - 10 volunteers
    - UML proficient
    - Little knowledge of Policy Based Systems
  - Experiment lasted ~30 mins
  - Users asked to create a Community structure based on the DSA scenario, write policies, detect conflict and resolve conflict
  - Filled in a questionnaire
UI usability evaluation contd.

- Results
  - 90% thought the interface was easy to use
  - Area with most difficulty
    - Writing policies
      - A little prior knowledge of policy based management was beneficial
  - Area with least difficulty
    - Creating and understanding Communities
  - Things to improve
    - Conflict notification system
    - Use constrained menus for policy authoring
    - ...

Future Work

- Experiment with more complex scenarios
  - feedback signals, trouble tickets
- Add Semantic Reasoning part
  - Use Semantically-enhanced Resource trees
- Further integration with CBPM Policy Decision Service
- Use semiotic analysis to analyse weak spots / areas where the users had difficulties
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