A Domain Specific Language for Usage Management

Christopher C. Lamb, Pramod A. Jamkhedkar, Mathew P. Bohnsack, Viswanath Nandina, Gregory L. Heileman

Department of Electrical and Computer Engineering
University of New Mexico

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Outline

1. Introduction

2. Design

3. Implementation

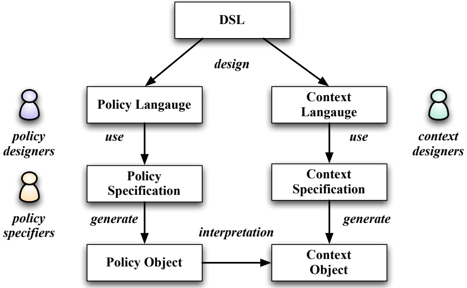
4. Application

Introduction

Intro content

Design — Notional Use

Notional Use:



- *DSL* — Domain specific language
- *Policy Language* — Language elements specific to *policy*
- *Context Language* — Language elements specific to *context*
- *Policy Specification* — Actual specification of policy
- *Context Specification* — Specification of context requirements
- *Policy Object* — An object embodying policy created from the DSL
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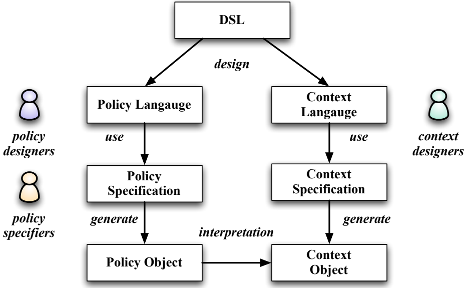

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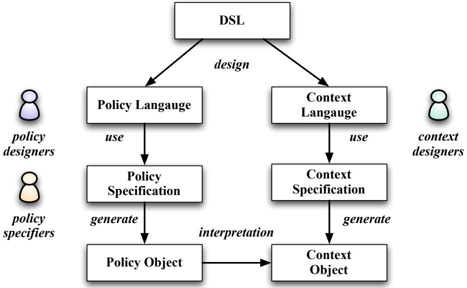

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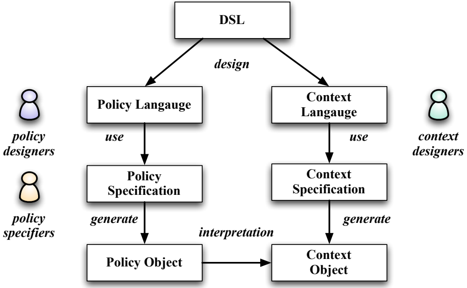

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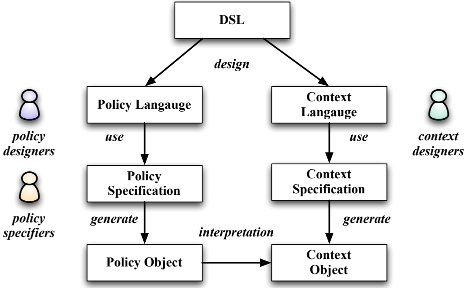

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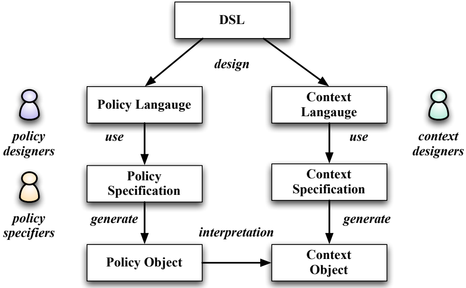

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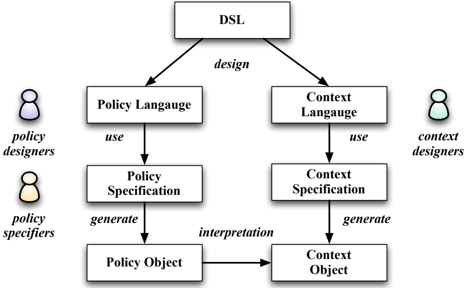

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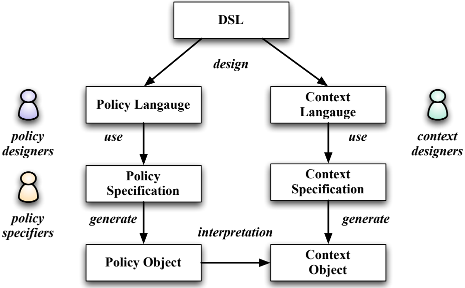

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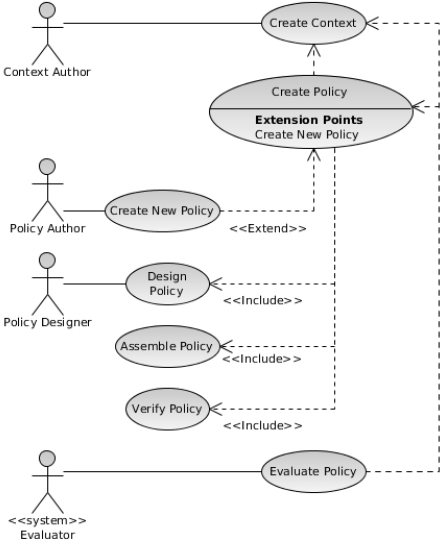

- *Create Context* — Prior to creating a policy, the context in which that policy will be evaluated must be defined.
- *Create Policy* — A designer creates a new type of policy, embodied by specific extension elements or semantic constraints over existing elements. An author will use these to create an instance of a policy.
- *Evaluate Policy* — The policy is evaluated with a context.

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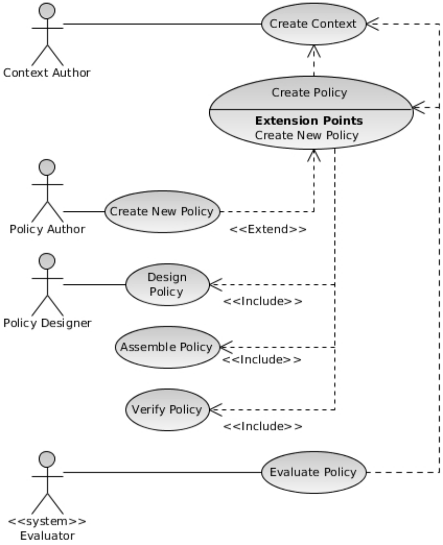

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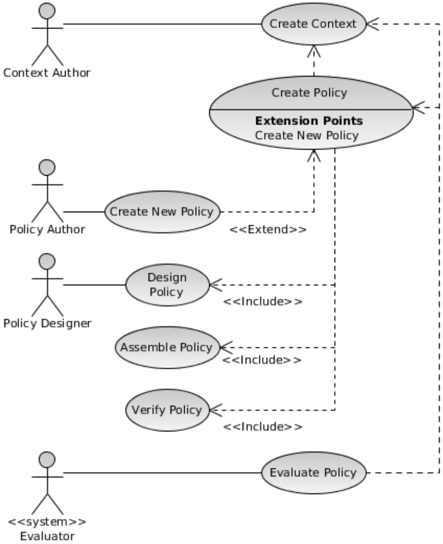

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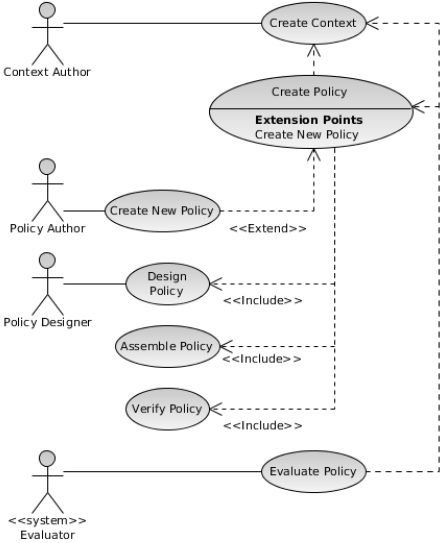

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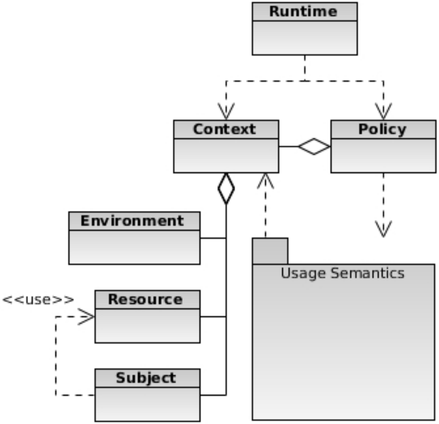

The *Runtime* accesses and activates a *policy* and manages a *context* to which the policy is given a reference.

The *context* has access to information about the *environment*, *resource* managed, and the *subject* using the *resource*.

Interactions are described by specific *usage semantics* embodied in the *policy*.

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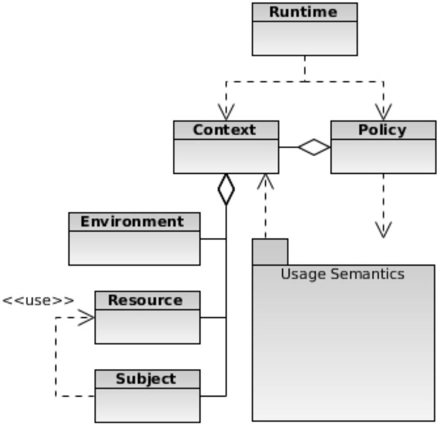

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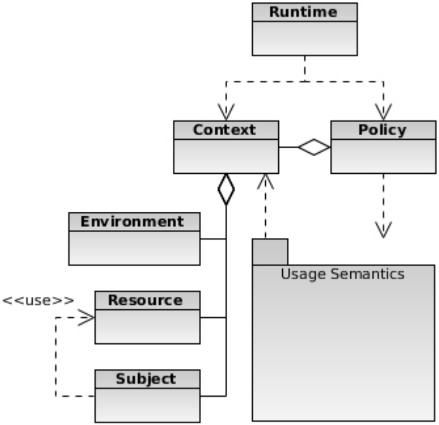

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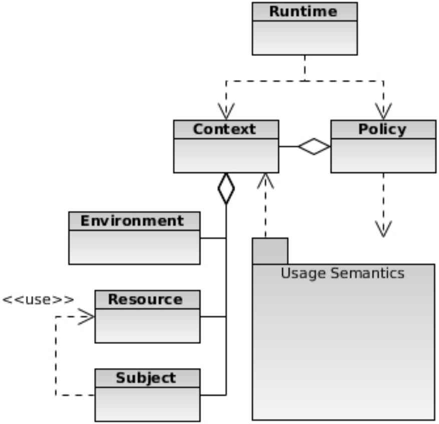

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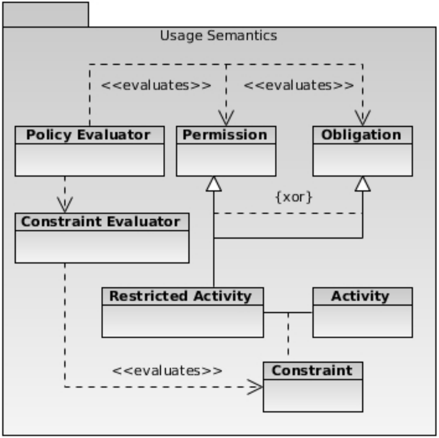

A *policy evaluator* examines and rectifies both *permissions* and *Obligations*.

A *restricted activity* is a specialization of either a *permission* or *obligation*, and is associated with a specific *activity*.

The association between an *activity* and a *restricted activity* is embodied by a *constraint*, which is evaluated by a *constraint evaluator*.

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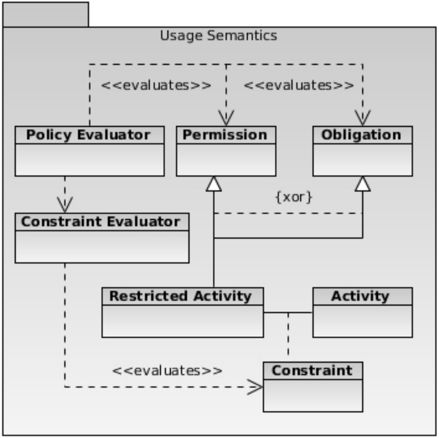

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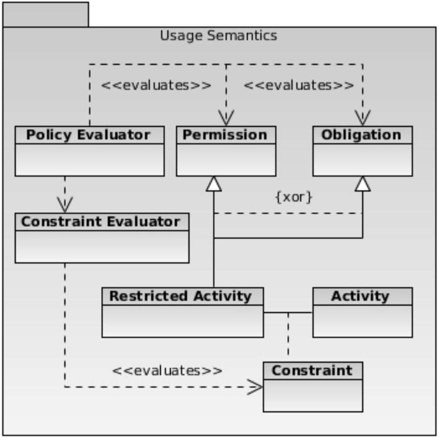

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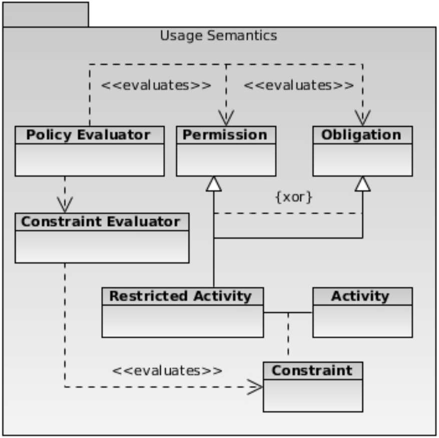

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Implementation

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Application

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Sample — Thing