



Toward Integration of Policies into DSMLs

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Motivation

- Take a **Domain-Specific Modeling Language (DSML)**.
- Take an Event-Condition-Action (ECA) Policy language (**feature**) not previously foreseen during the language *design* phase.
- Update the language to support policies.

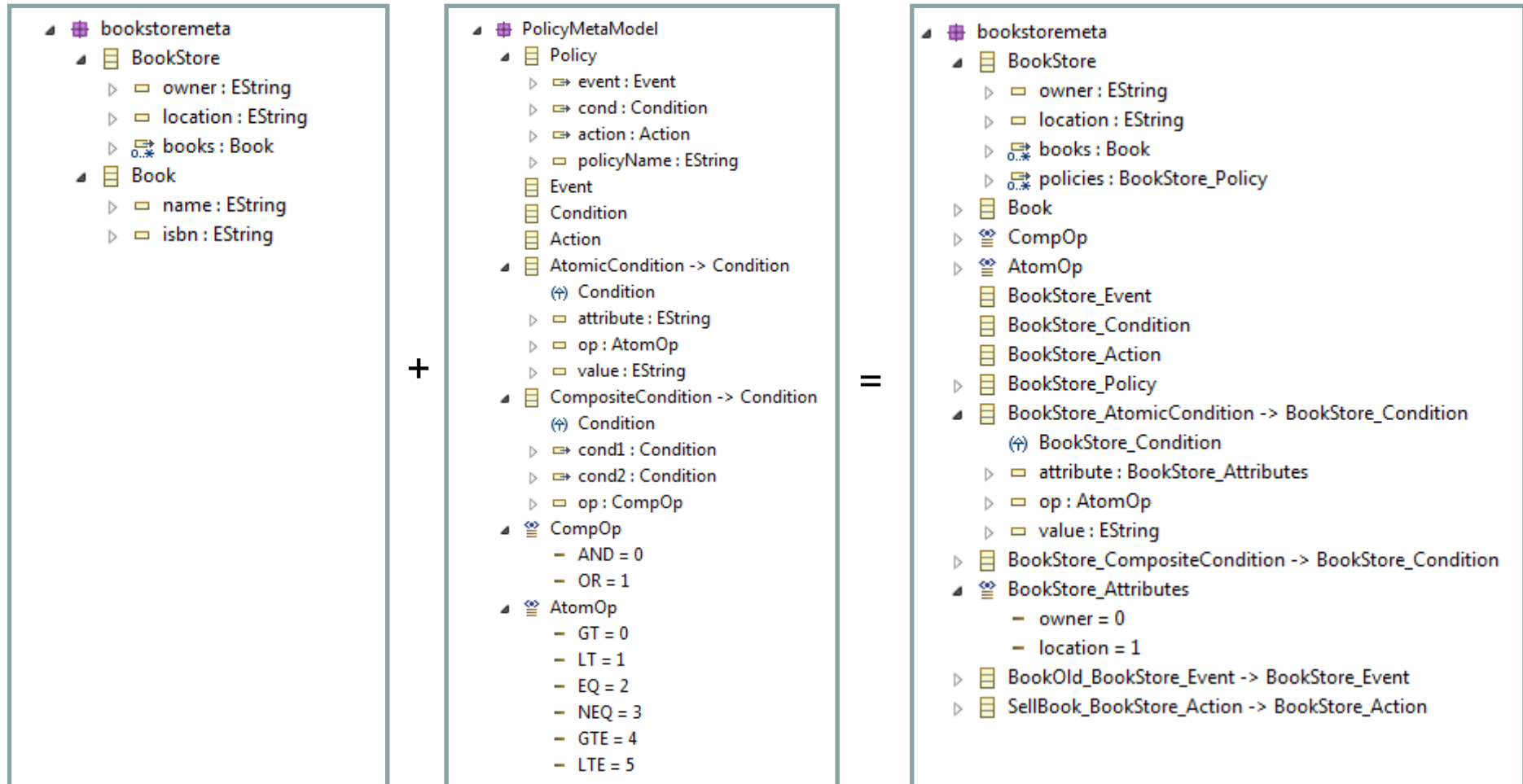


Motivation

- Adding policies to a DSML requires:
 - Knowledge of policies
 - Modification of the existing language meta-model



Motivation



DSML Meta-Model

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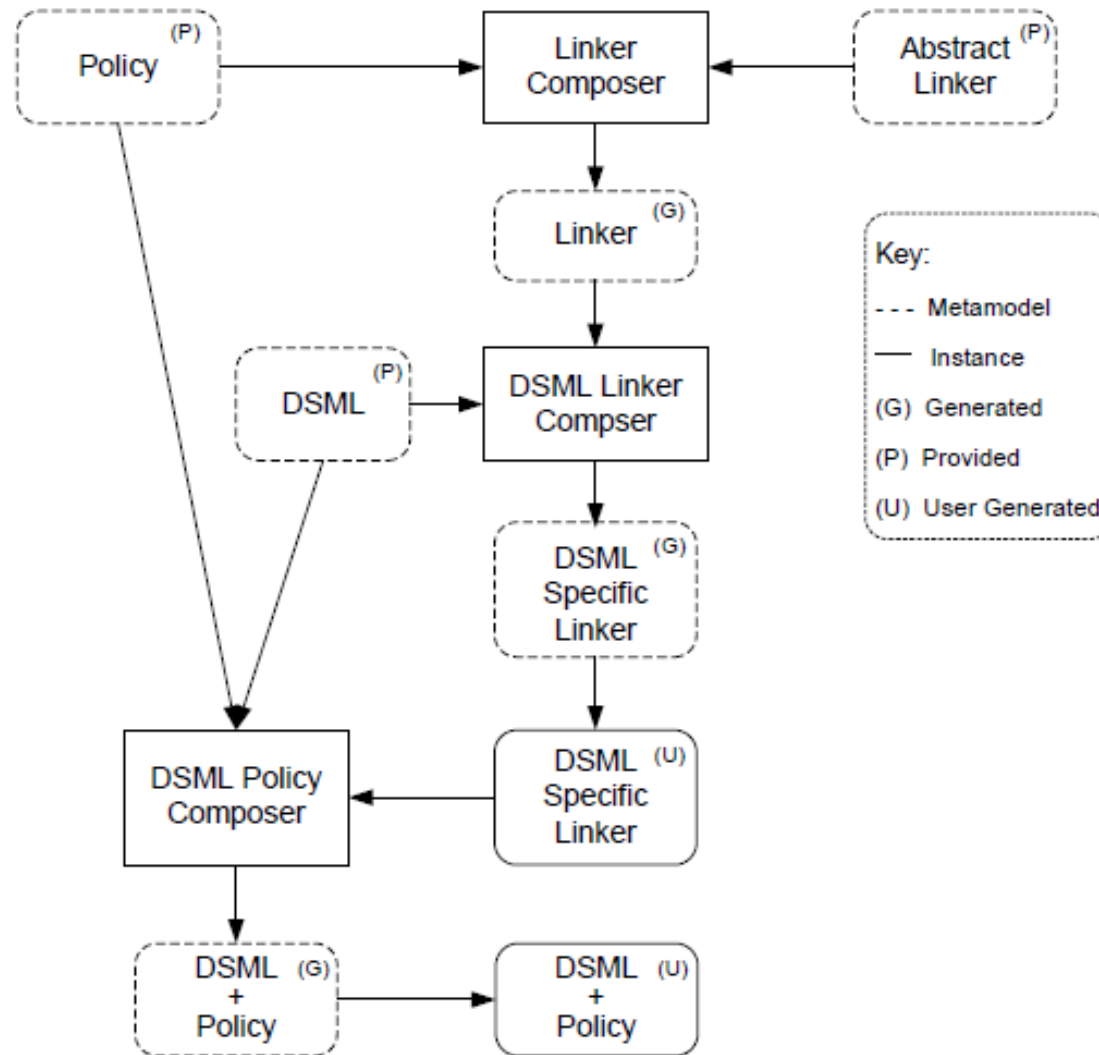
Policy Language
Meta-Model

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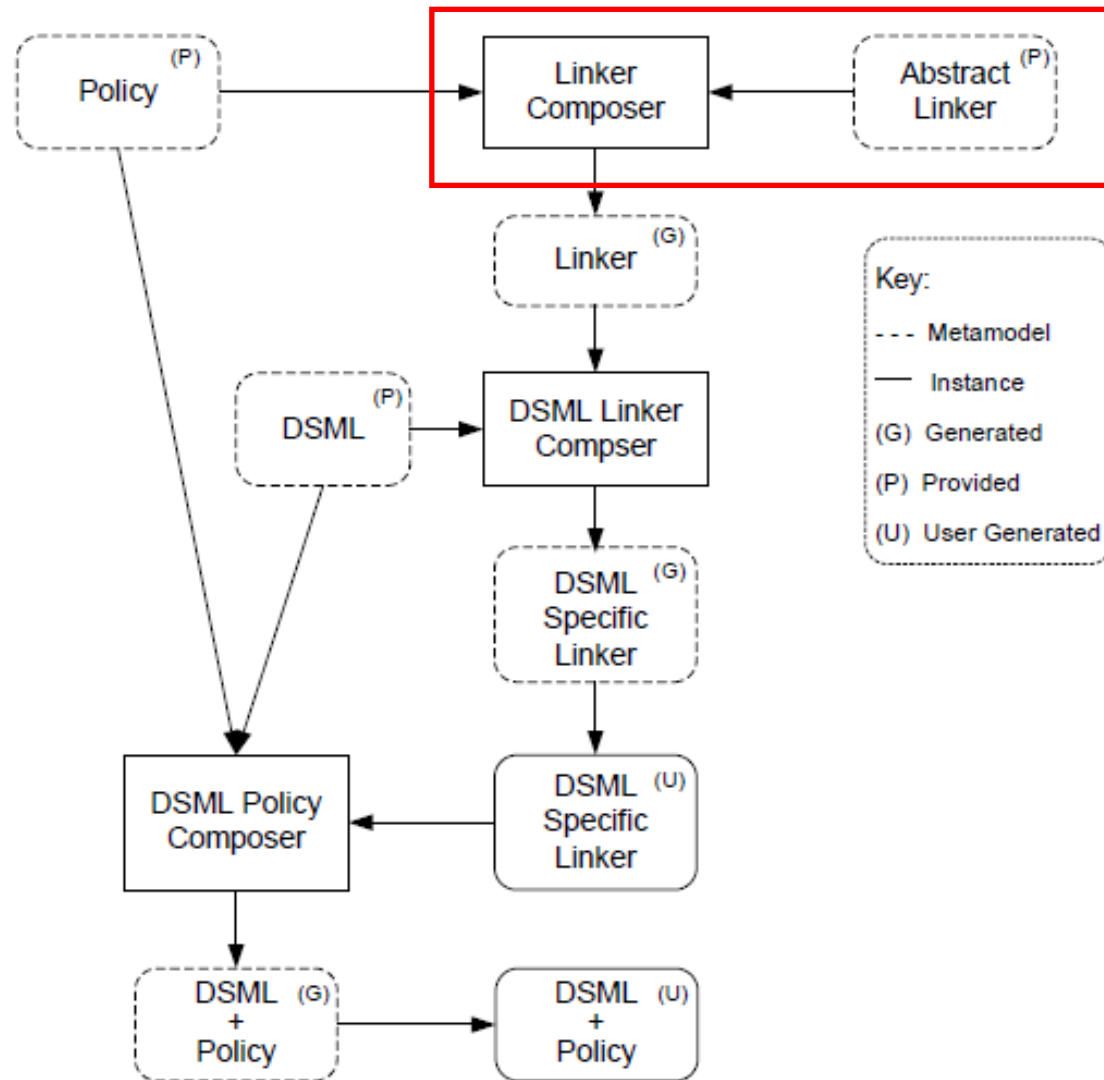
Updated DSML Meta-
Model



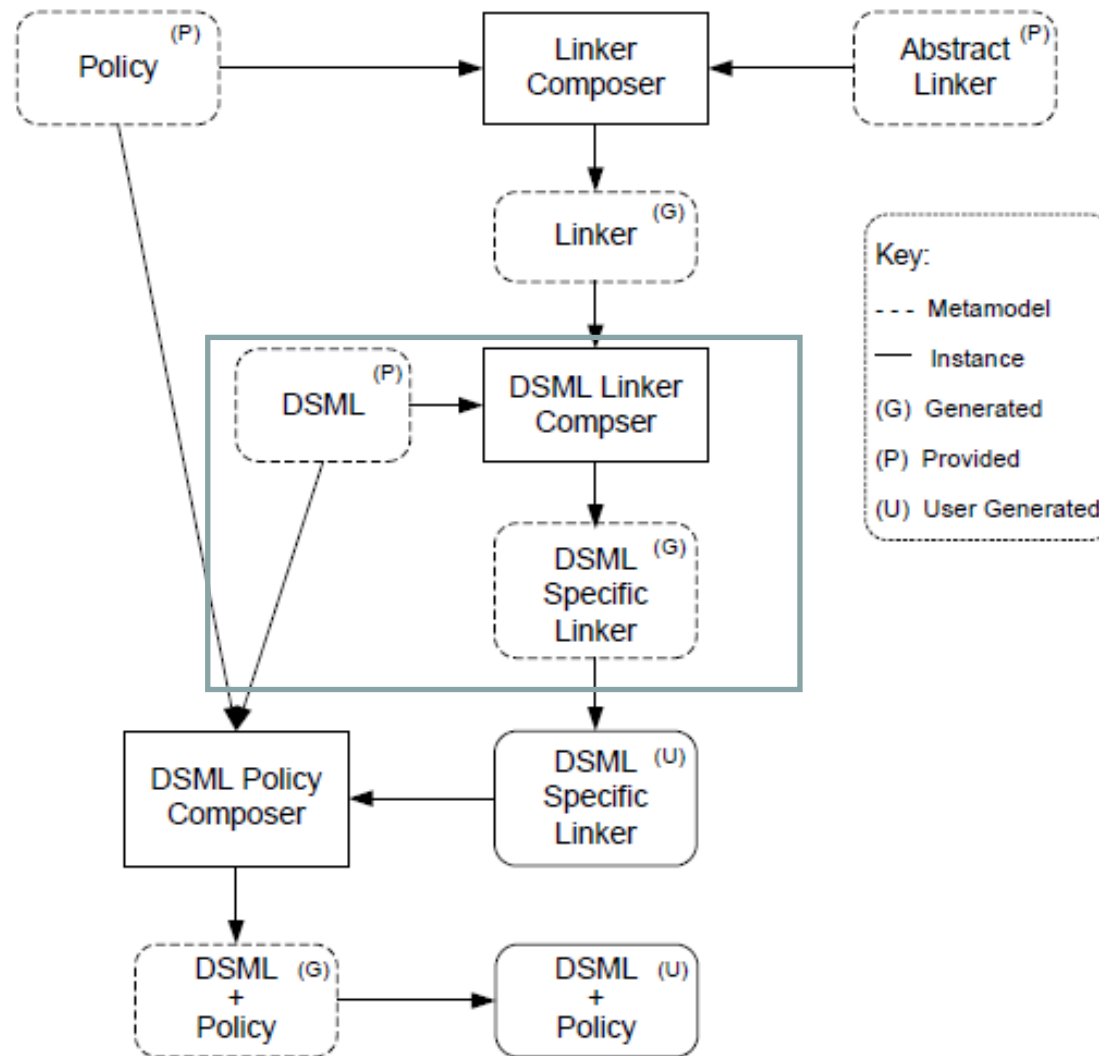
Approach



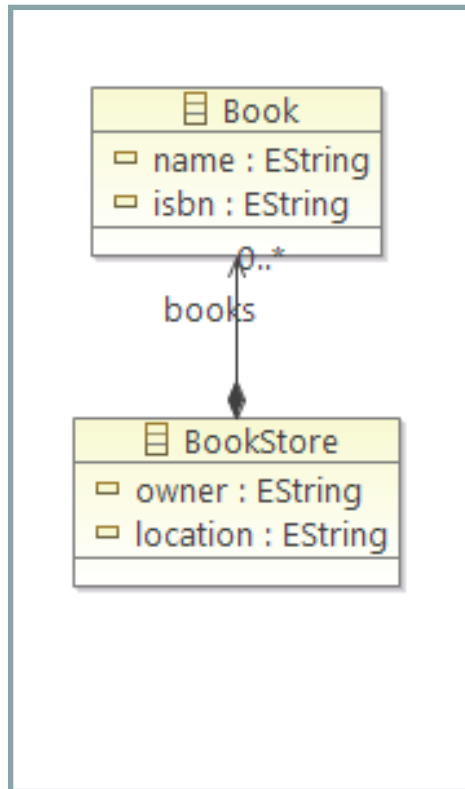
Approach



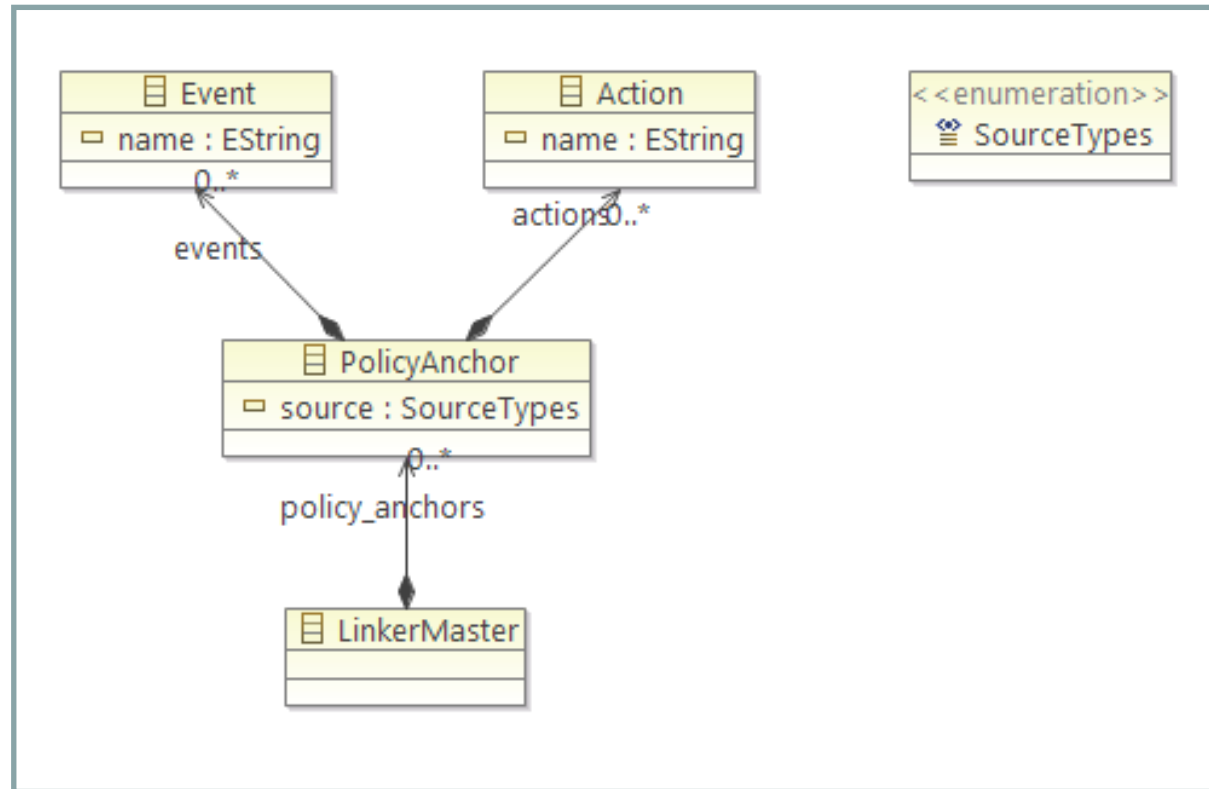
Generate DSML-Specific Linker



Meta Models



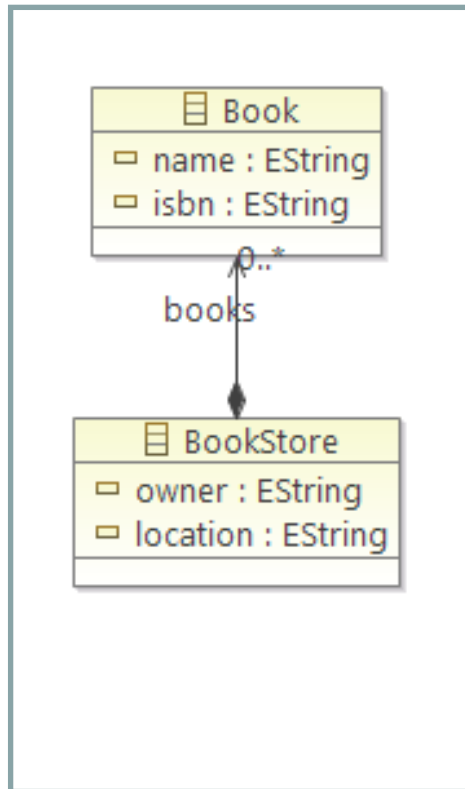
Book Store Meta-Model



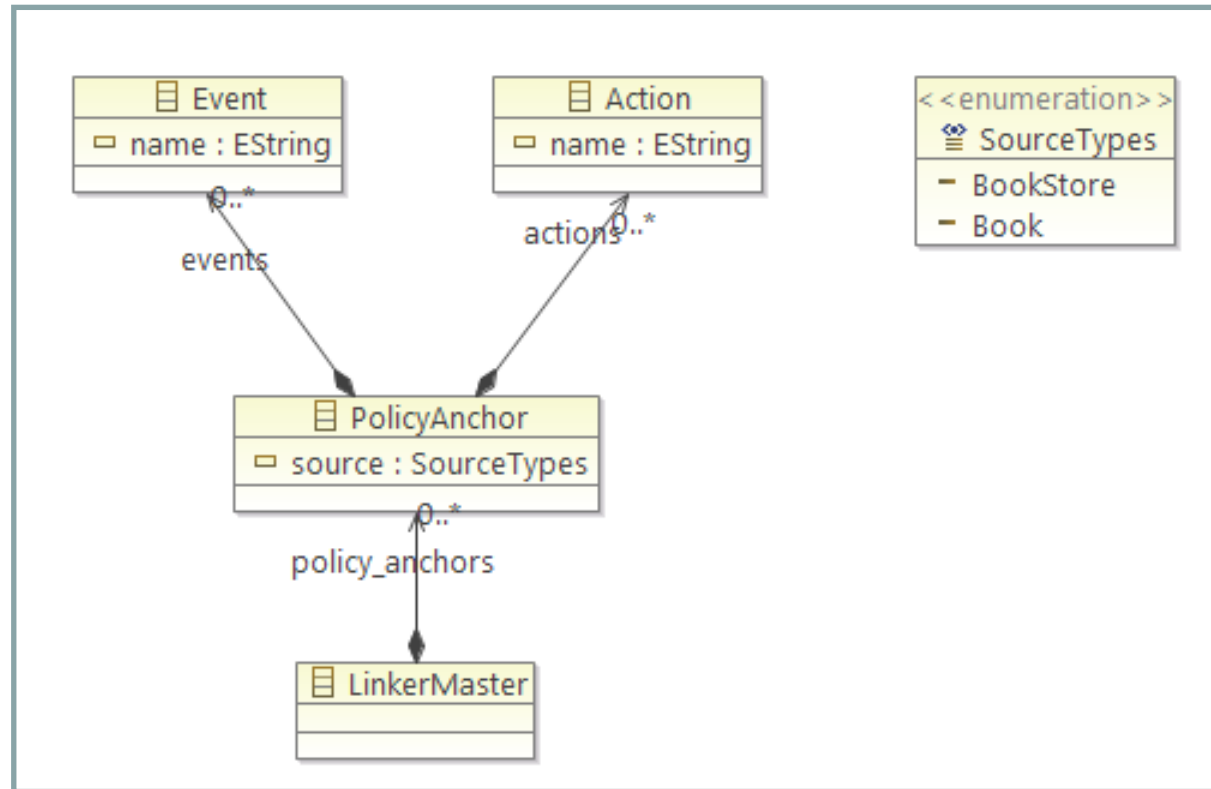
Domain Linker Meta-Model



DSML-Specific Linker (Final)



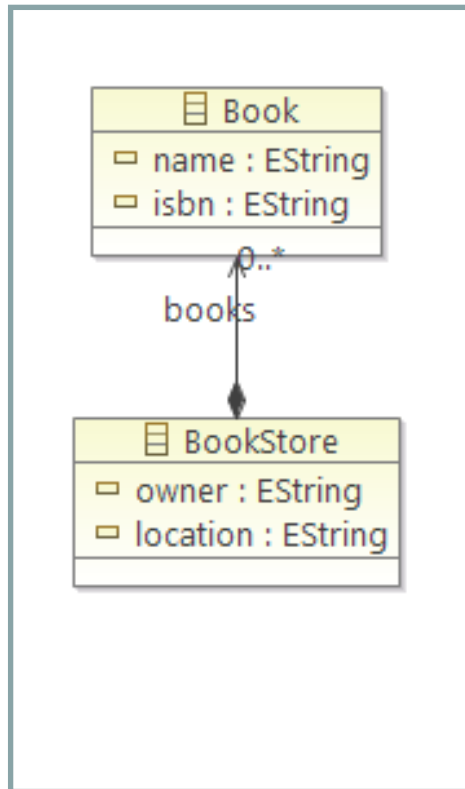
Book Store Meta-Model



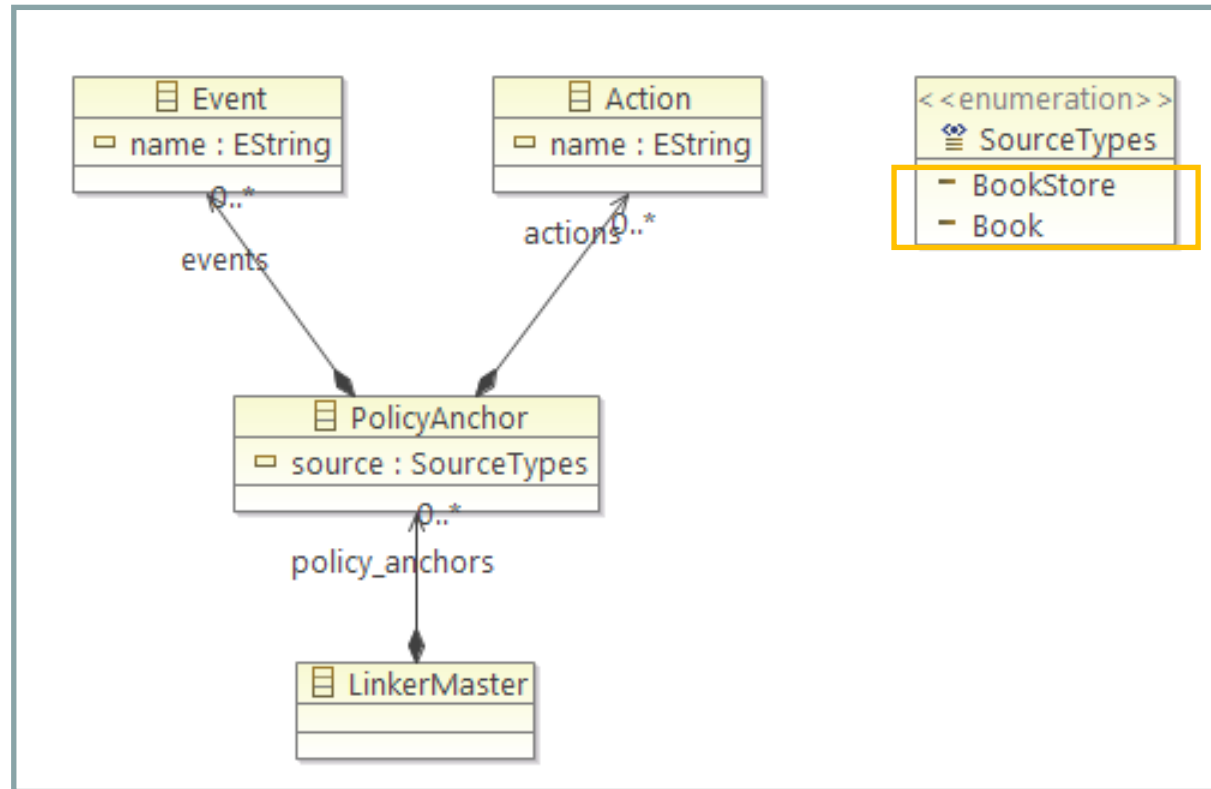
Domain Linker Meta-Model



DSML-Specific Linker (Final)



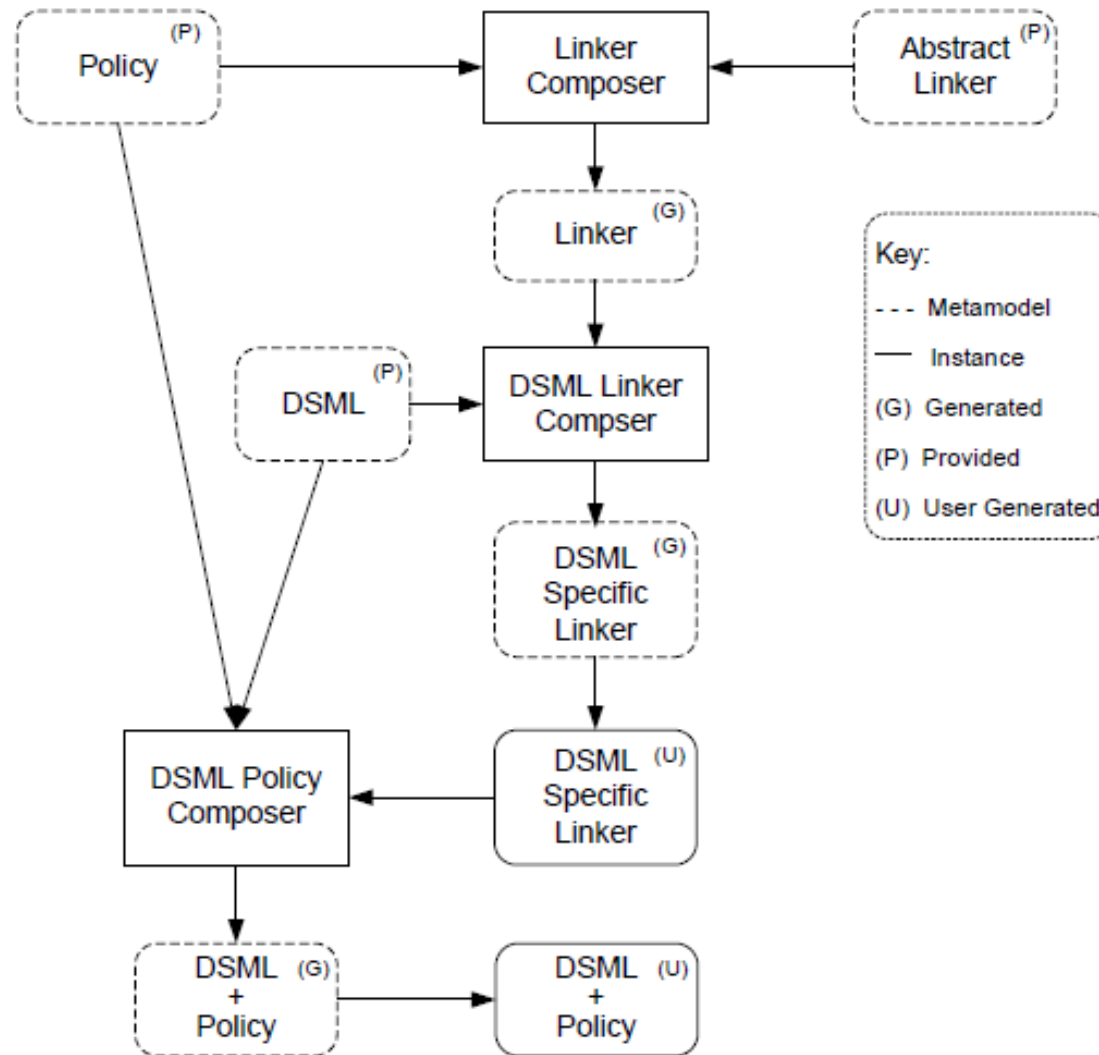
Book Store Meta-Model



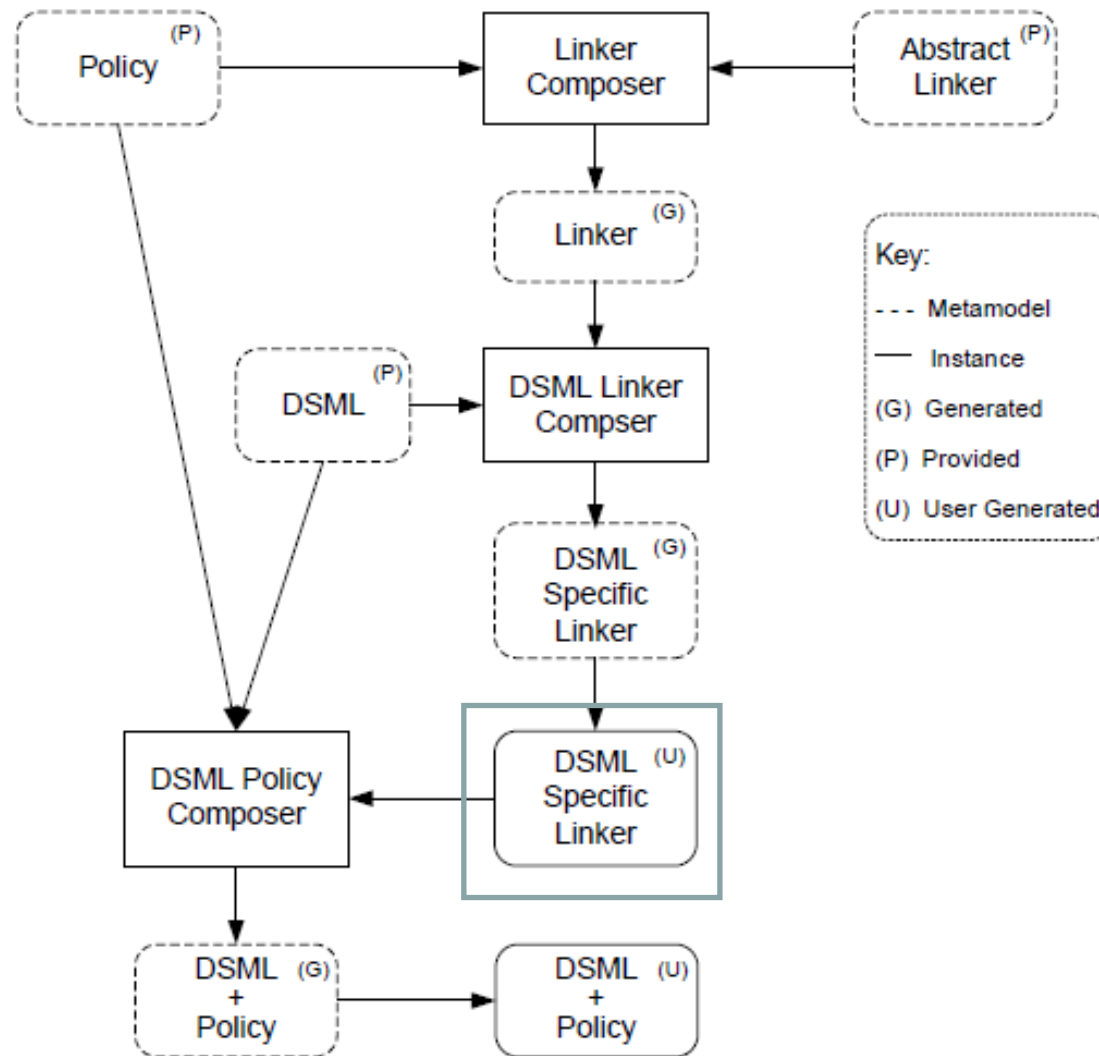
Domain Linker Meta-Model



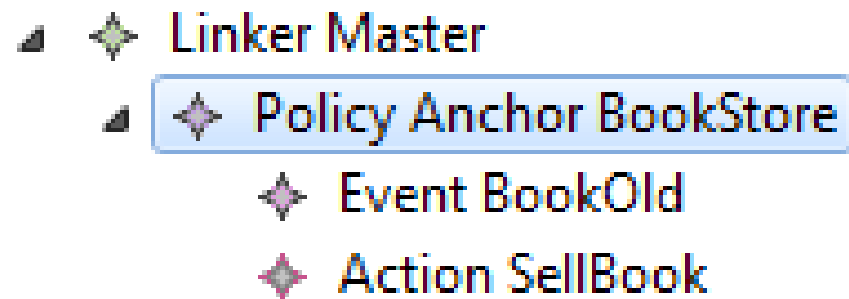
Approach



Generate DSML-Specific Linker



DSML-Specific Linker Instance

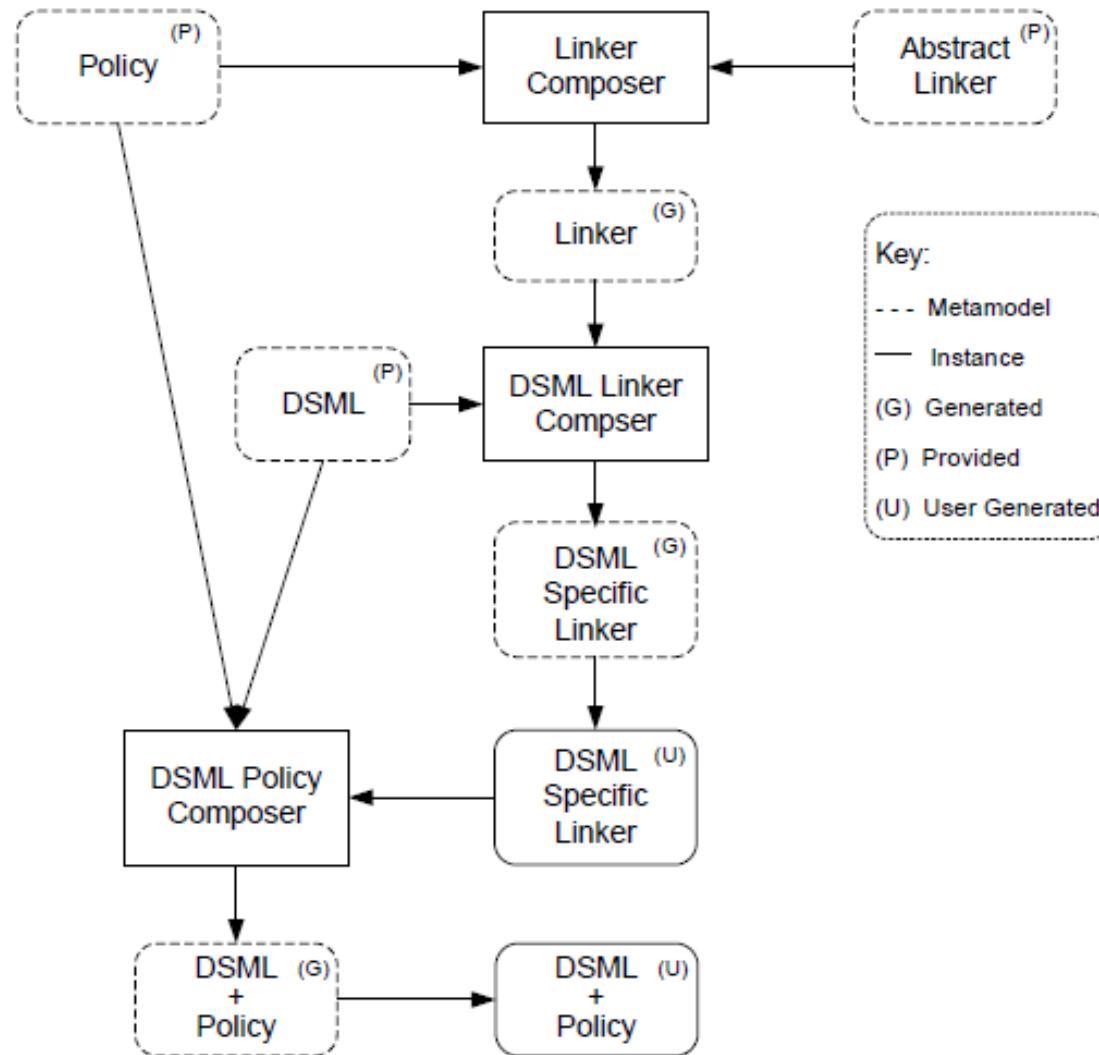


User specifies:

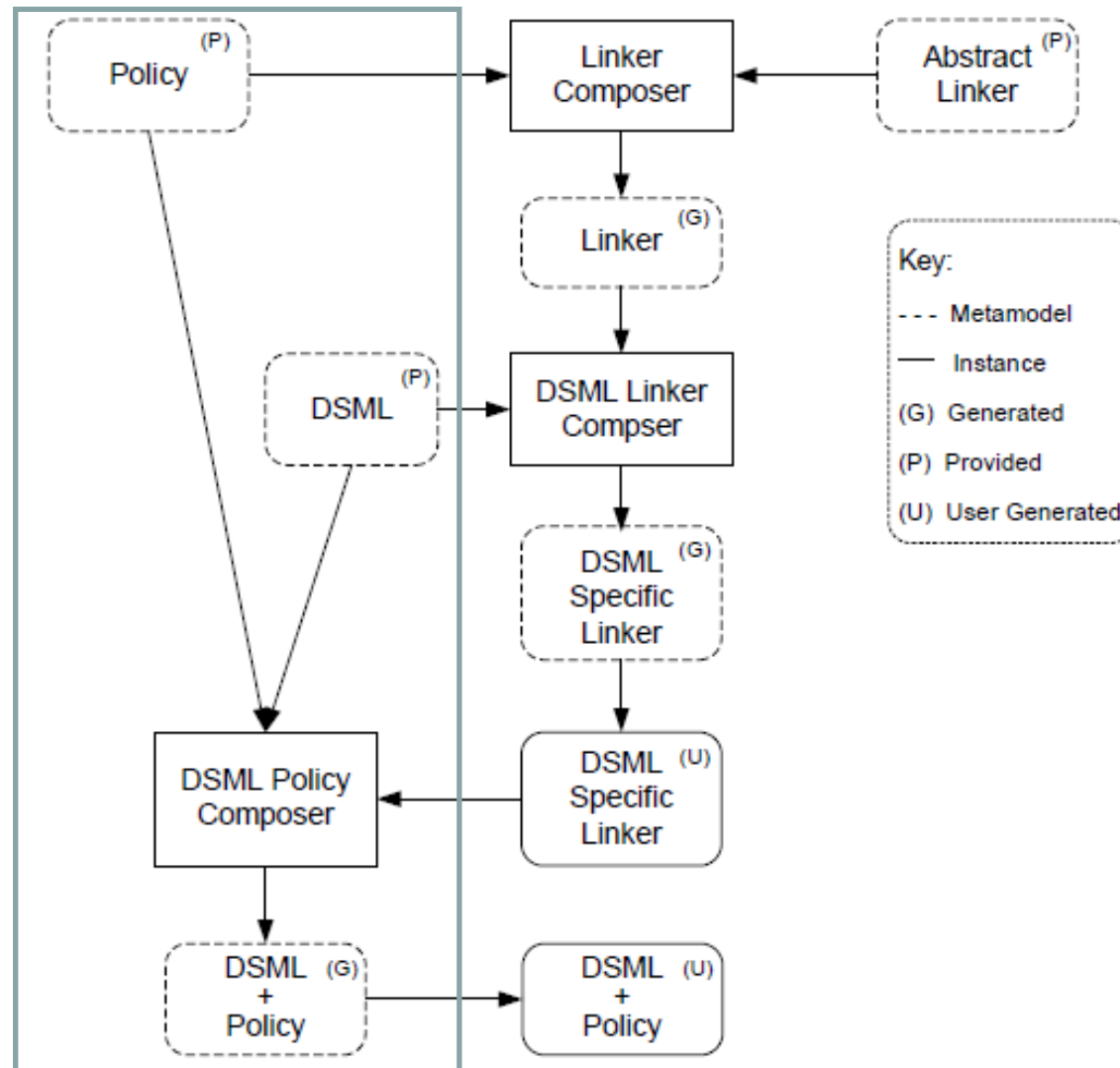
- Which nodes have policies.
- Which events that node responds to.
- Which actions are supported by that node.

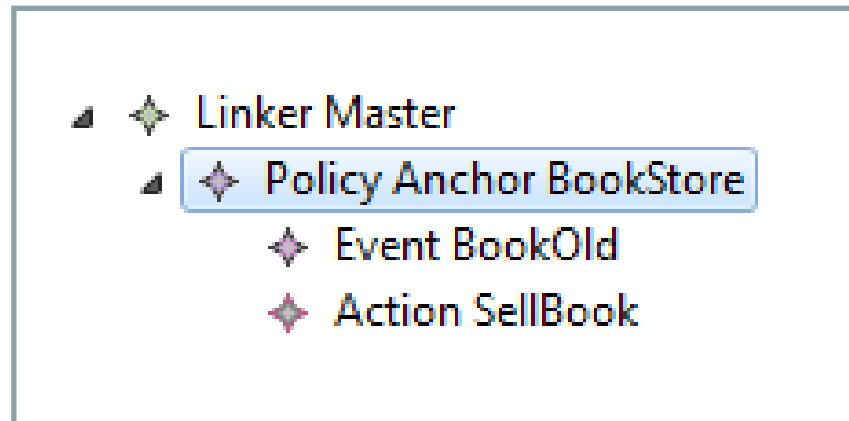
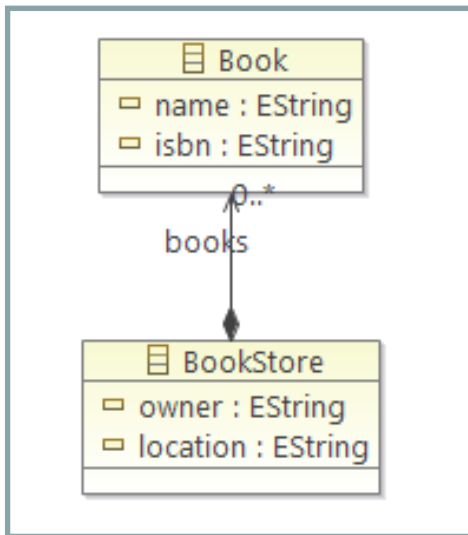


Approach



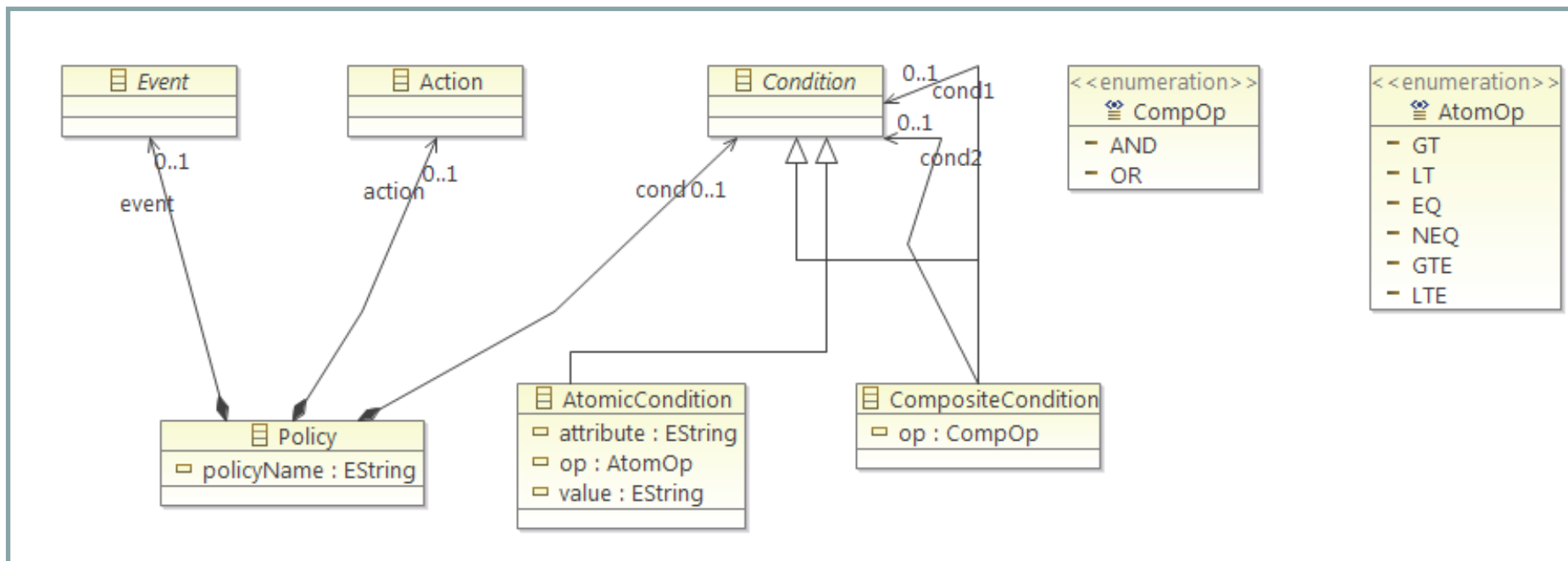
Generate DSML-Policy Meta





DSML Linker Instance

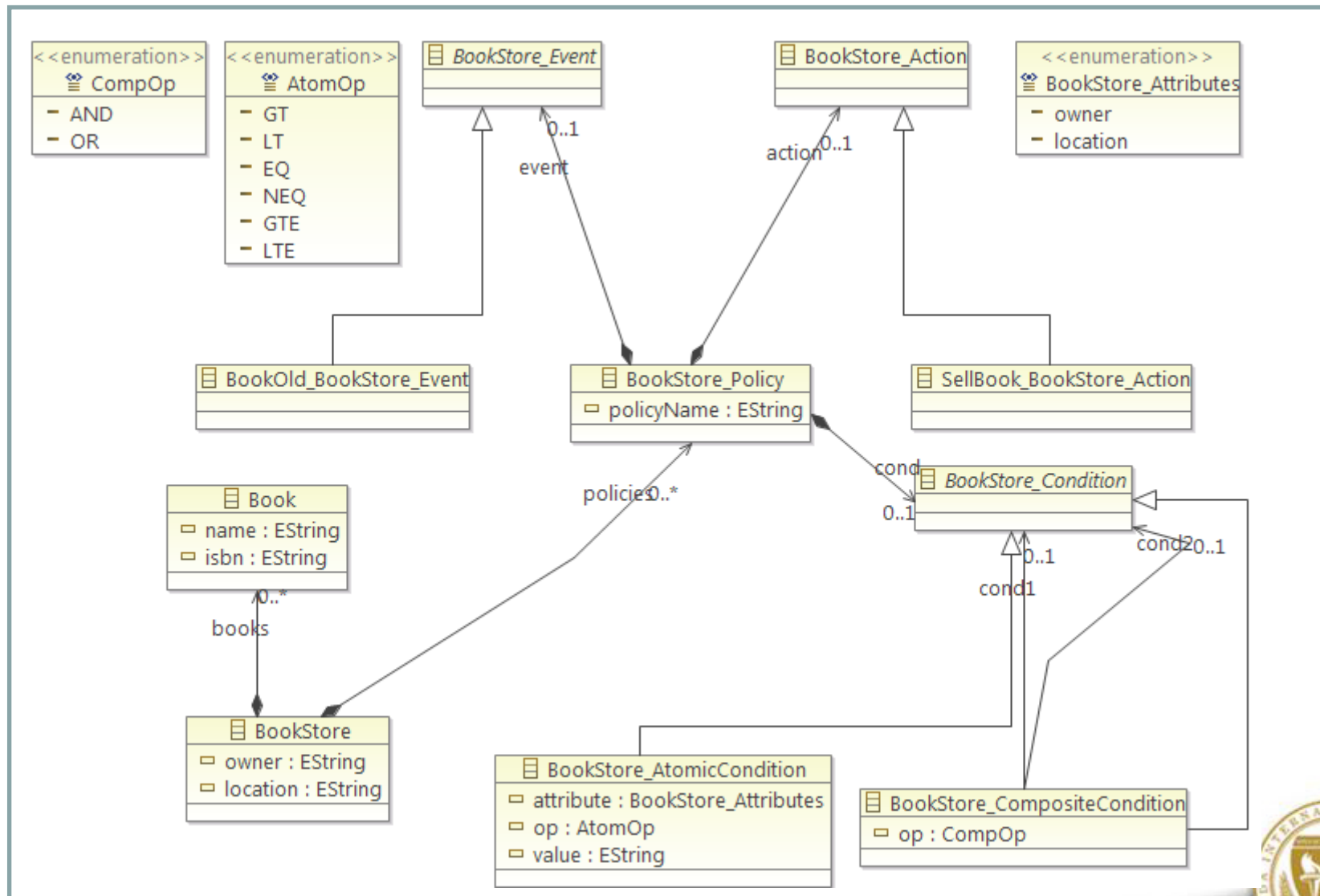
Book Store Meta-Model



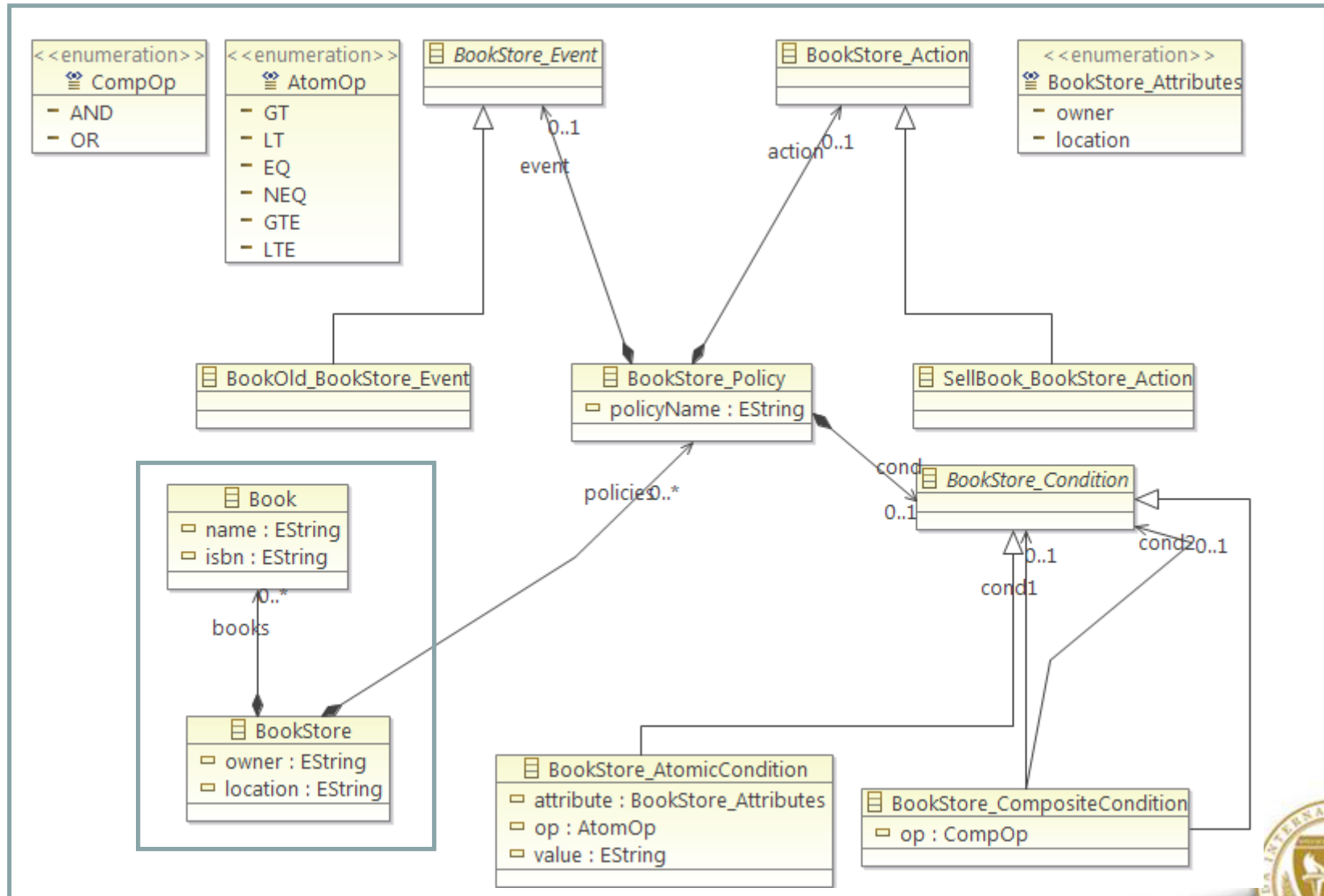
Policy Language Meta-Model



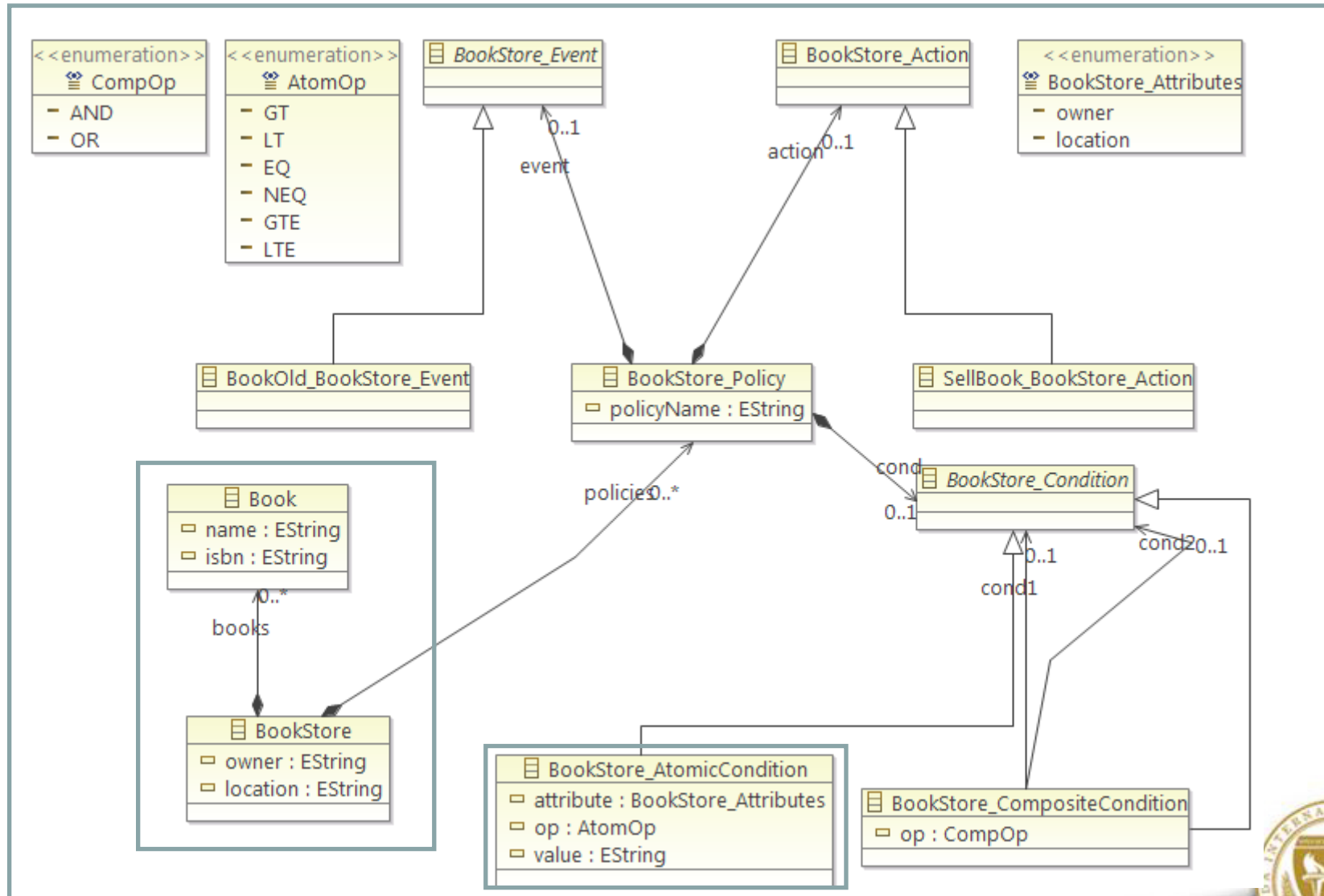
Updated DSML Meta-Model



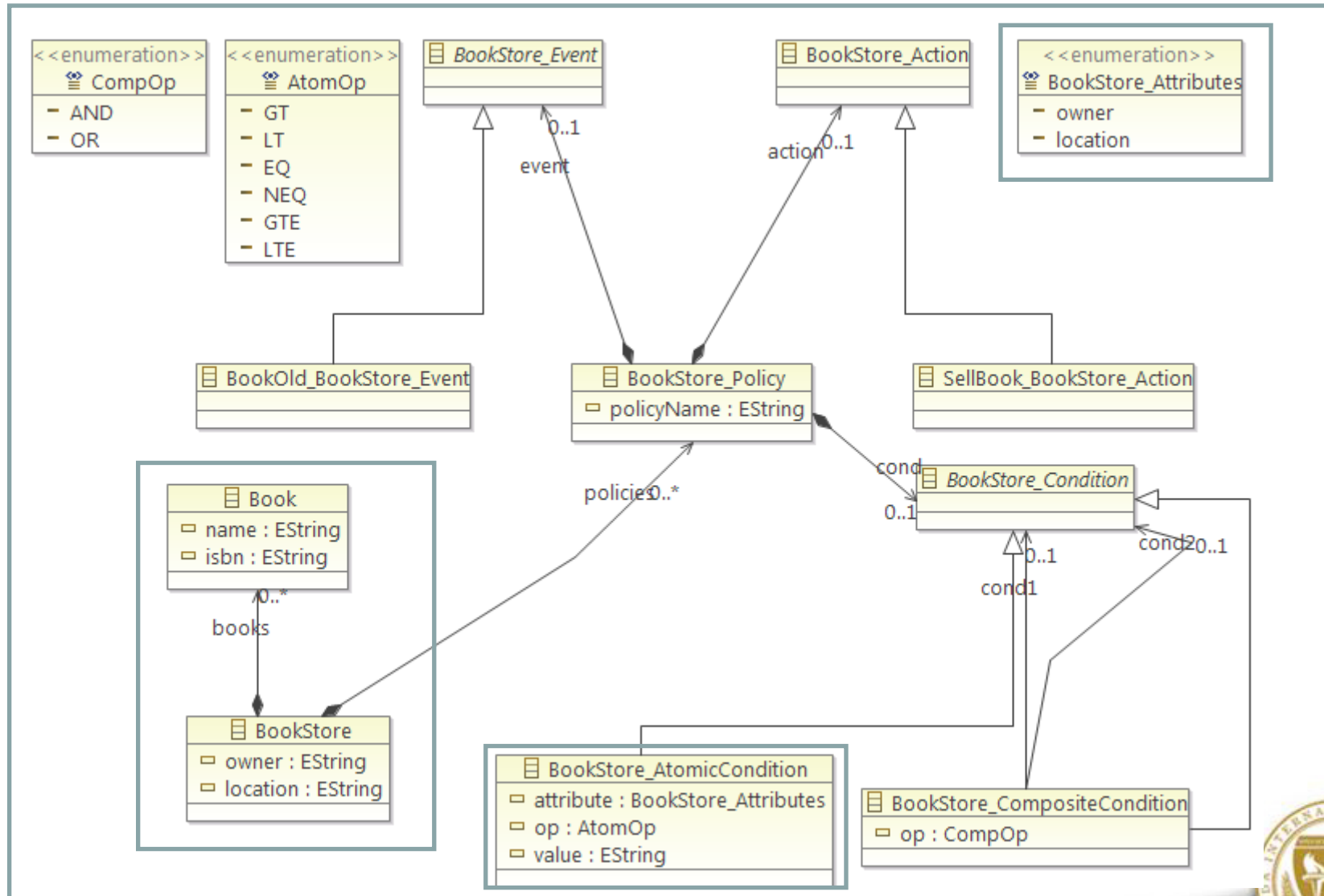
Updated DSML Meta-Model



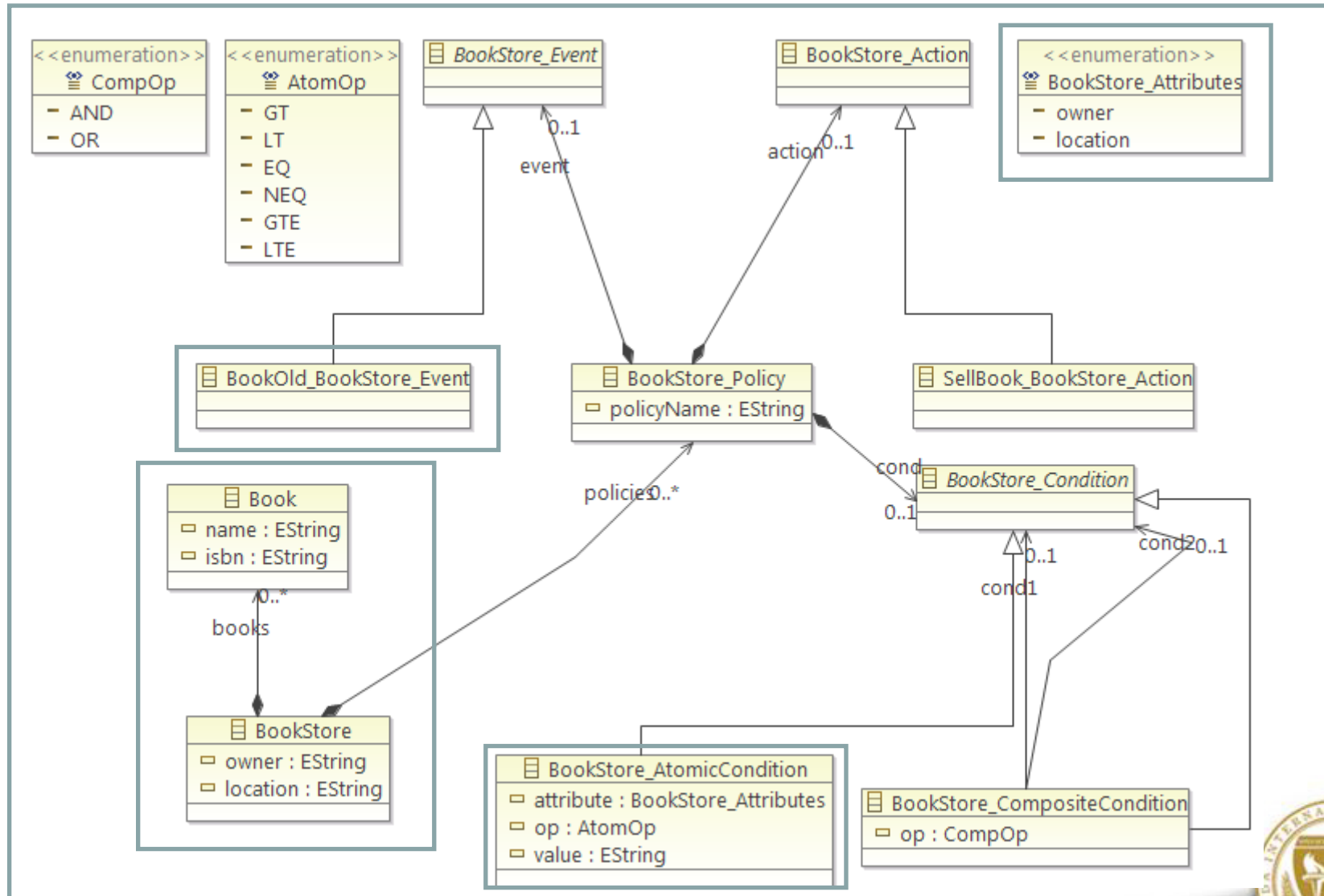
Updated DSML Meta-Model



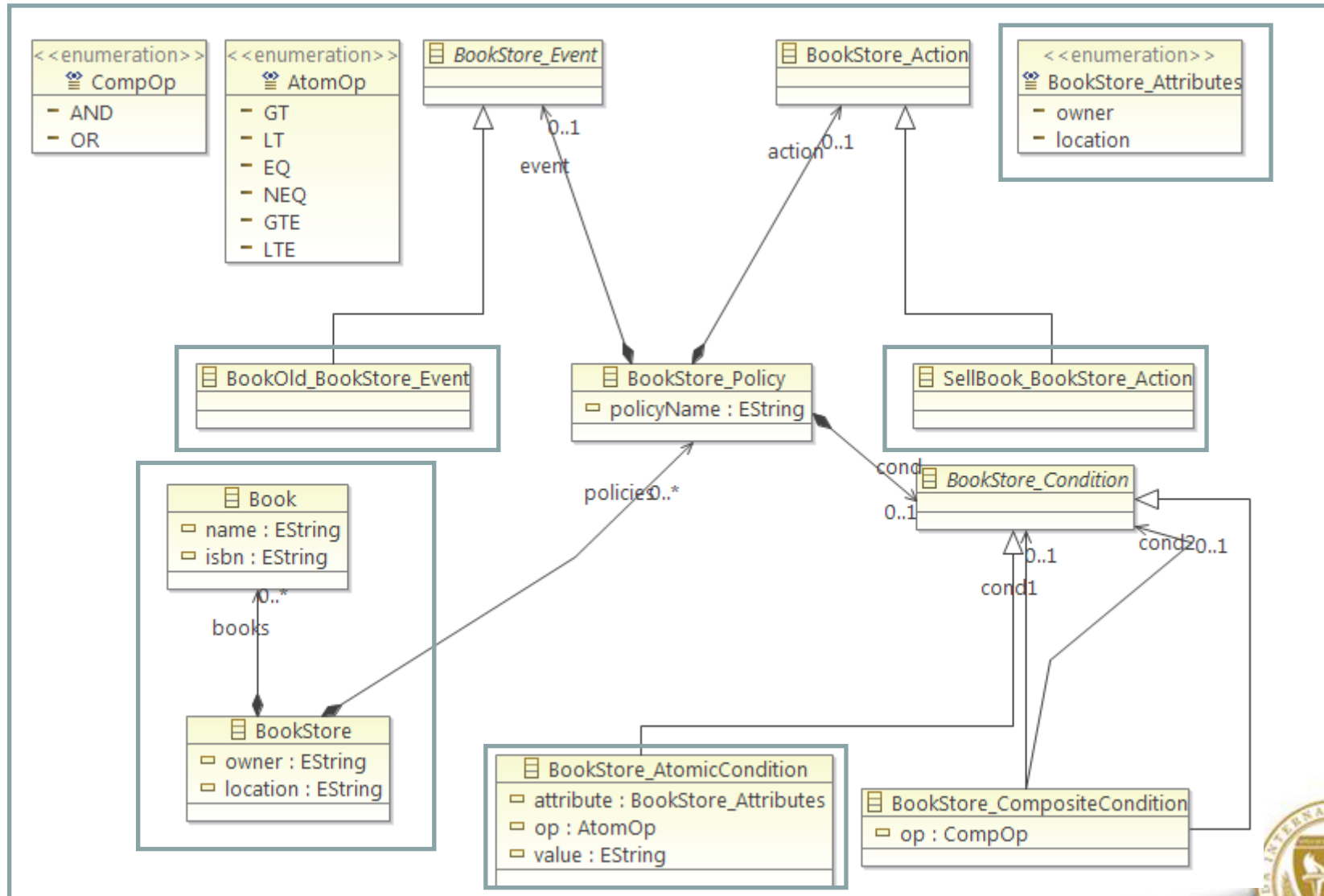
Updated DSML Meta-Model



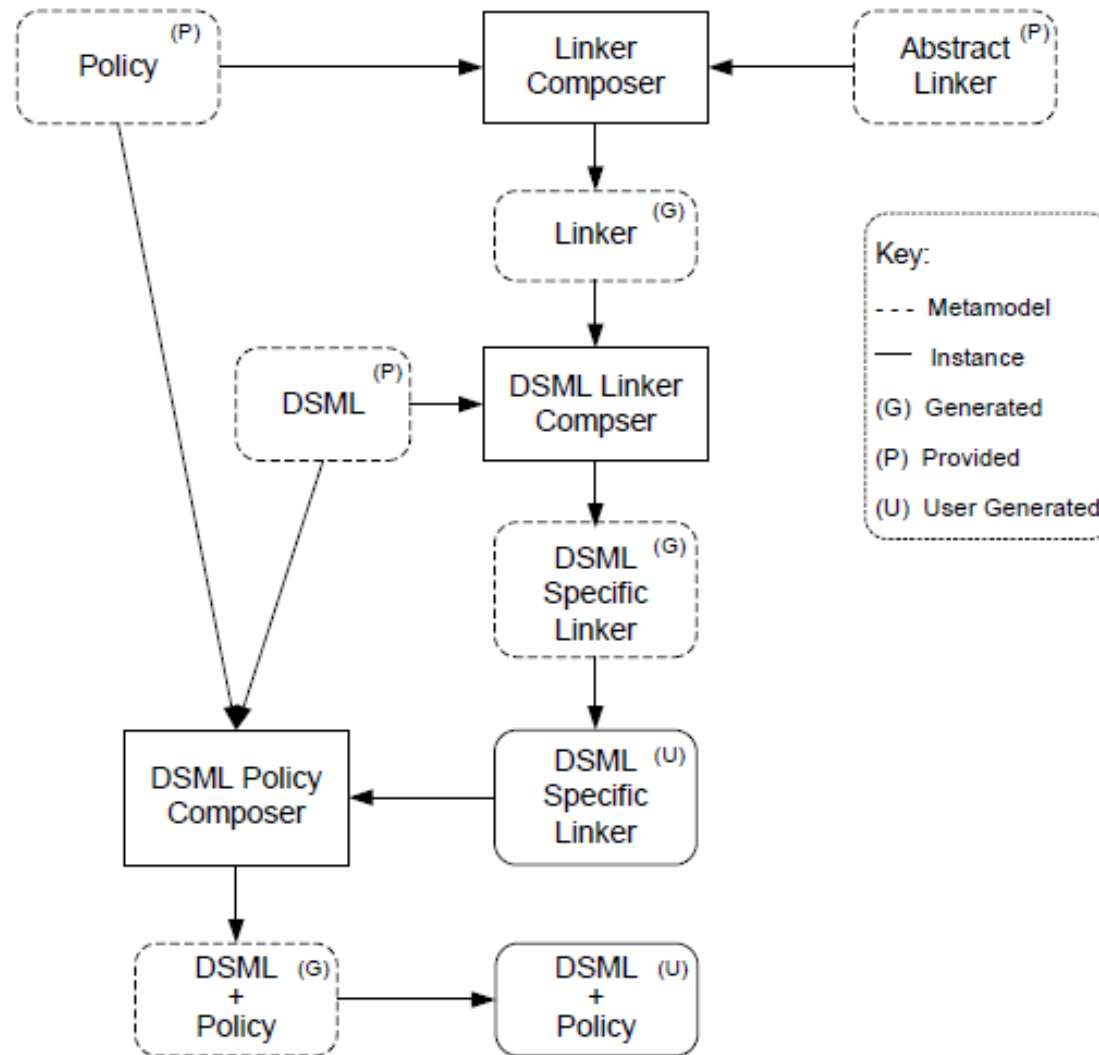
Updated DSML Meta-Model



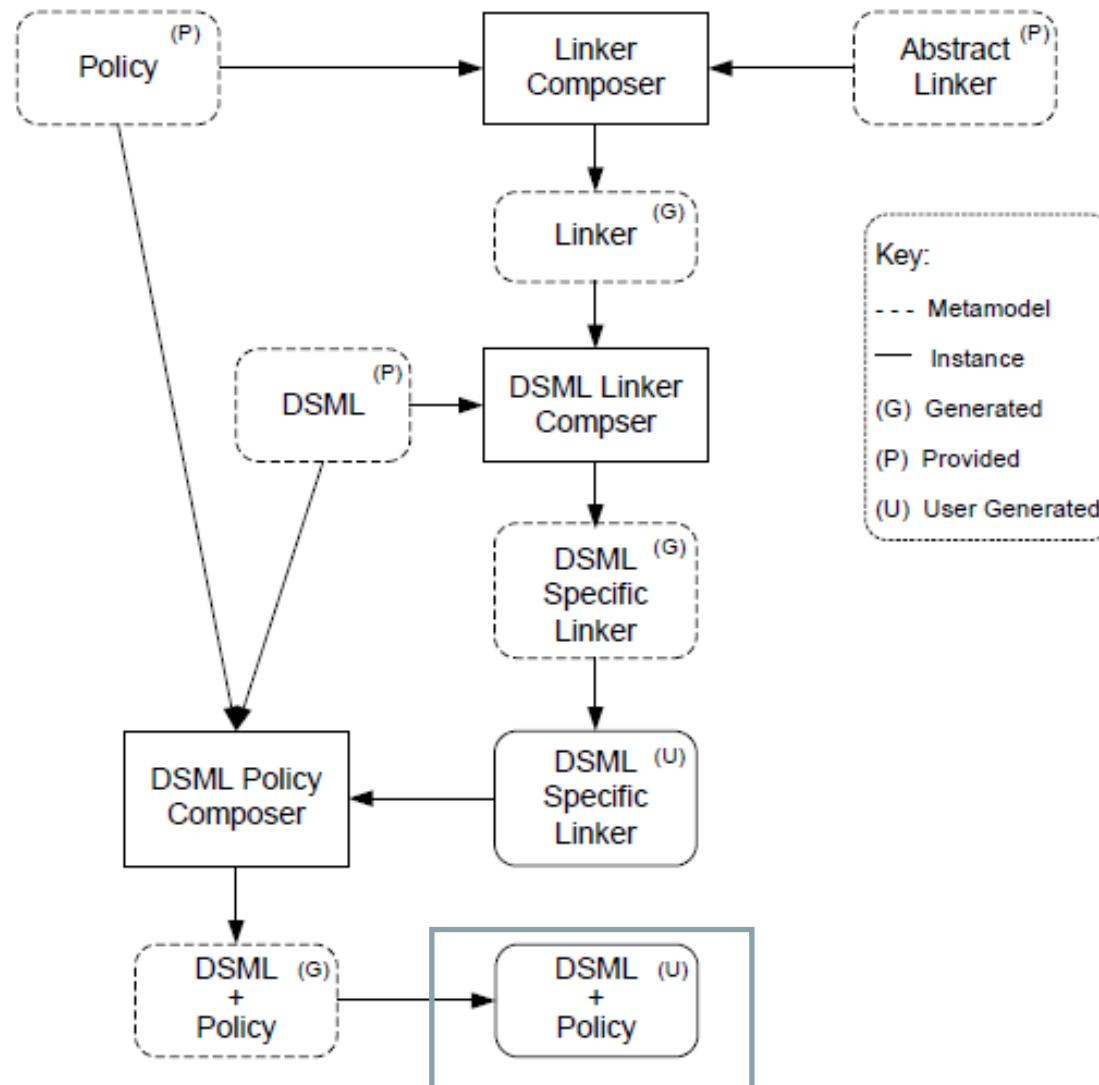
Updated DSML Meta-Model



Approach



Generate DSML-Policy Meta

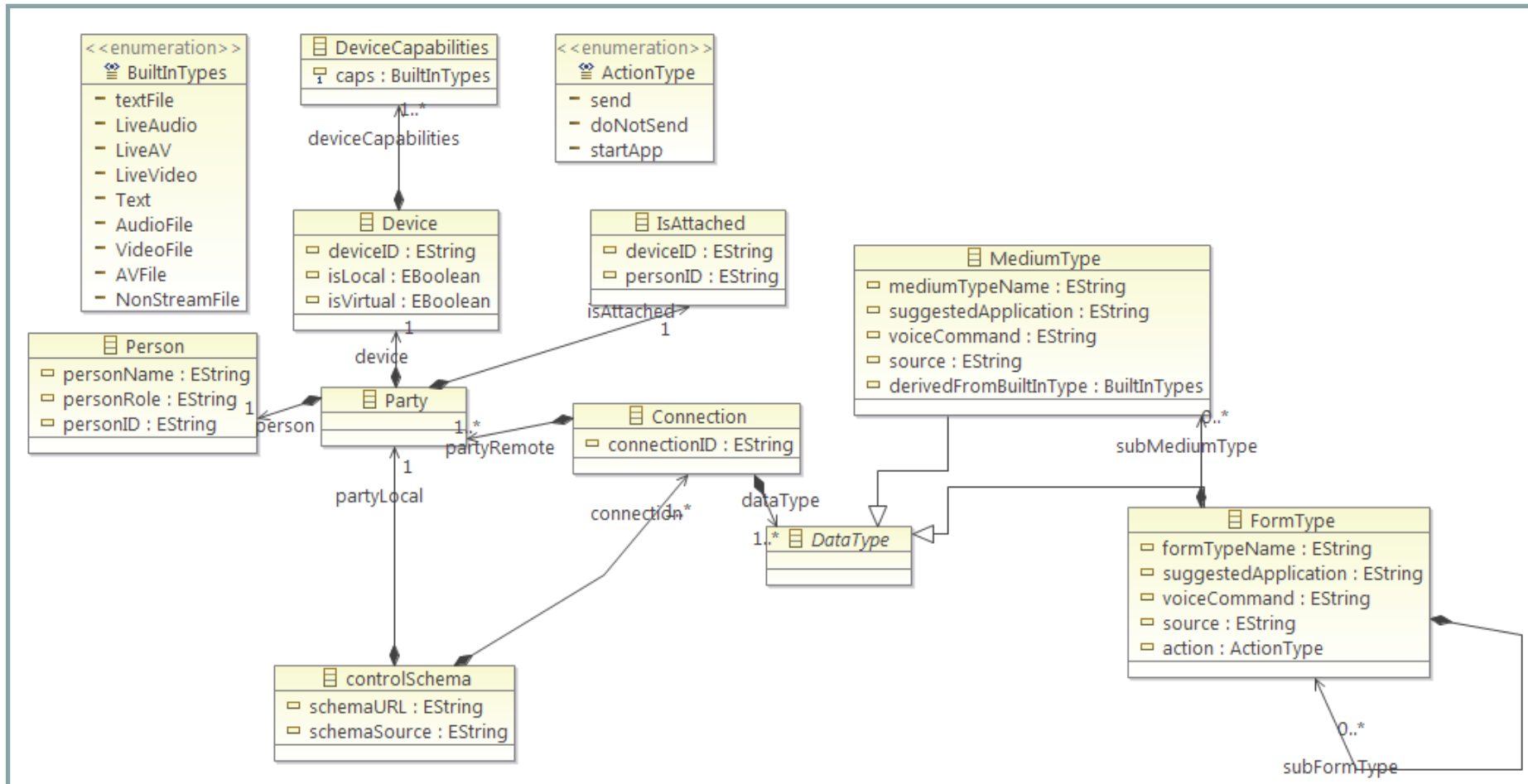


Updated DSML - Instance

- ▲ ◆ Book Store
 - ◆ Book - Great Expectations
 - ▲ ◆ Book Store Policy - BookOldPolicy
 - ◆ Book Old Book Store Event
 - ◆ Book Store Atomic Condition location
 - ◆ Book Store Action



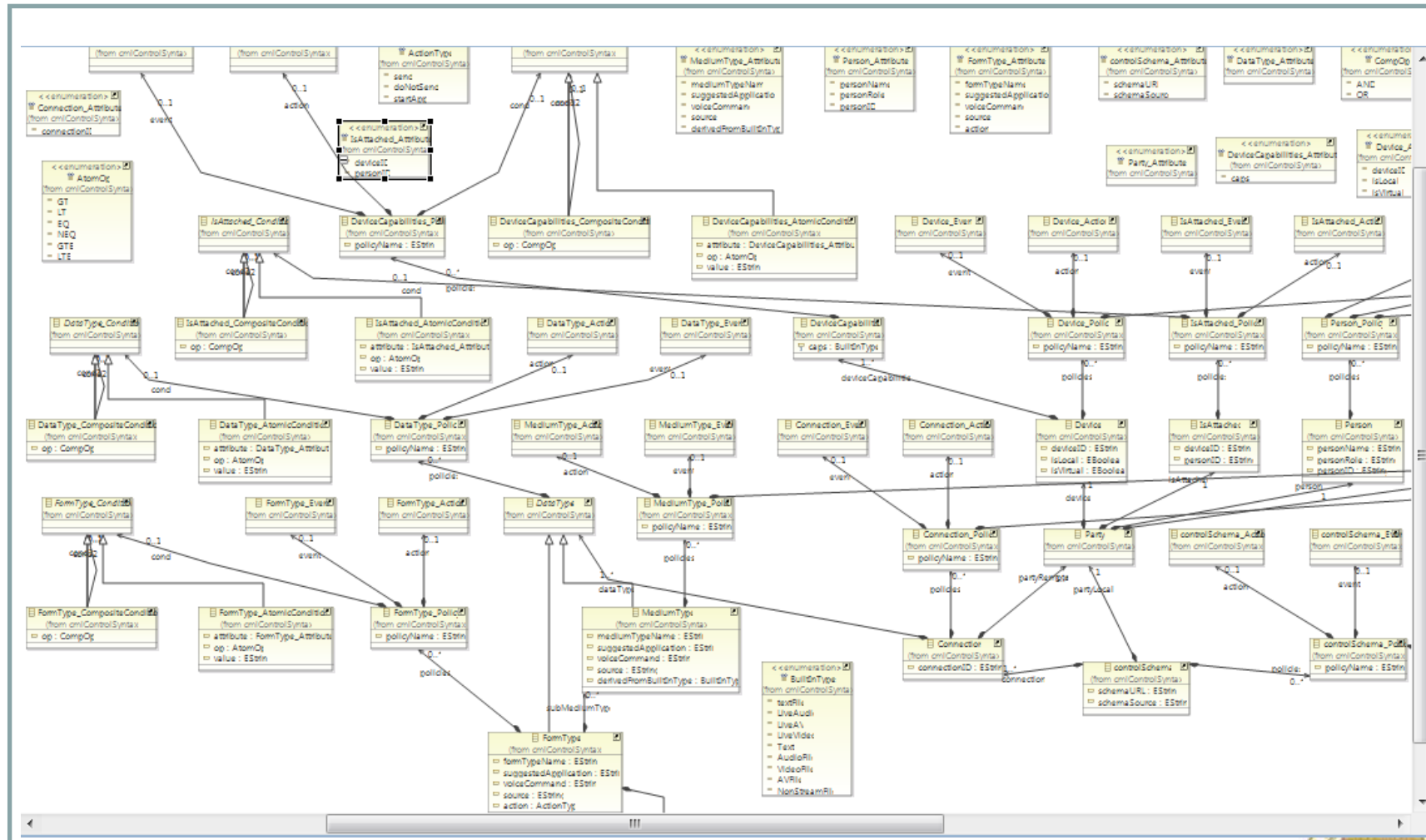
Other Applications - CML



Communication Modeling Language Meta-Model



Final CML With Policies - Portion



References

- [1] M. Allison, A. A. Allen, Z. Yang, and P. J. Clarke. A software engineering approach to user-driven control of the microgrid. In In Proceedings of the 23rd International Conference on Software Engineering and Knowledge Engineering (SEKE), pages 59{64, 2011.
- [2] M. D. D. Fabro, J. Bezivin, F. Jouault, E. Breton, and G. Gueltas. Amw: a generic model weaver. In Proceedings of the 1ere Journee sur l'Ingenierie Dirigee par les Modeles (IDM05), 2005.
- [3] R. France, F. Fleurey, R. Reddy, B. Baudry, and S. Ghosh. Providing support for model composition in metamodels. In Proceedings of the 11th IEEE International Enterprise Distributed Object Computing Conference, pages 253{, Washington, DC, USA, 2007. IEEE Computer Society.



Questions

