**Goal**

Develop a Modeling and Simulation Platform for patient Health Information Systems (HIS)

Platform is suitable for
- modeling and model-based integration of Patient Portals (PP) providing access to Electronic Medical Records (EMR) and Health Information Systems (HIS)
- performing security and privacy analysis using model verification and simulation-based testing
- providing mapping to standard SOA execution platforms

**Application System**

*MyHealth @ Vanderbilt (MHAV)*

- Patient Portal
- > 25,000 users
- Provides a set of (web-based) services
  - Secure messaging with doctors
  - Access to lab results
  - Scheduling of appointments
  - Access to billing info
  - Personalized literature

**Approach**

Developing Domain-Specific Abstractions

1) Developing Domain-Specific Modeling Languages (DSML) for Patient Portals
   - by casting EMR/HIS onto Service-Oriented Architectures (SOA) defined by the OASIS and the WC3 family of standards (BPEL4WS, XACML, WSDL)
2) Building the models
   - capturing the key elements of operation
3) Model translation
   - interpretation of models
4) Execution and simulation of models, workflows with an execution engine

**Benefits**

Following Model-Based Design principals
- Separation of the low level implementation details from the high level abstractions
- Matching SOA modeling abstractions with the HIS domain
- Simulation of operation

**Integration and Simulation**

Domain specific modeling abstractions expressed in formally defined DSMLs

**Future Work**

Work in progress
- Building tools for
  - Policy Validation
  - Dynamic Policy Verification
  - Temporal nature of expressions
  - Model Translator