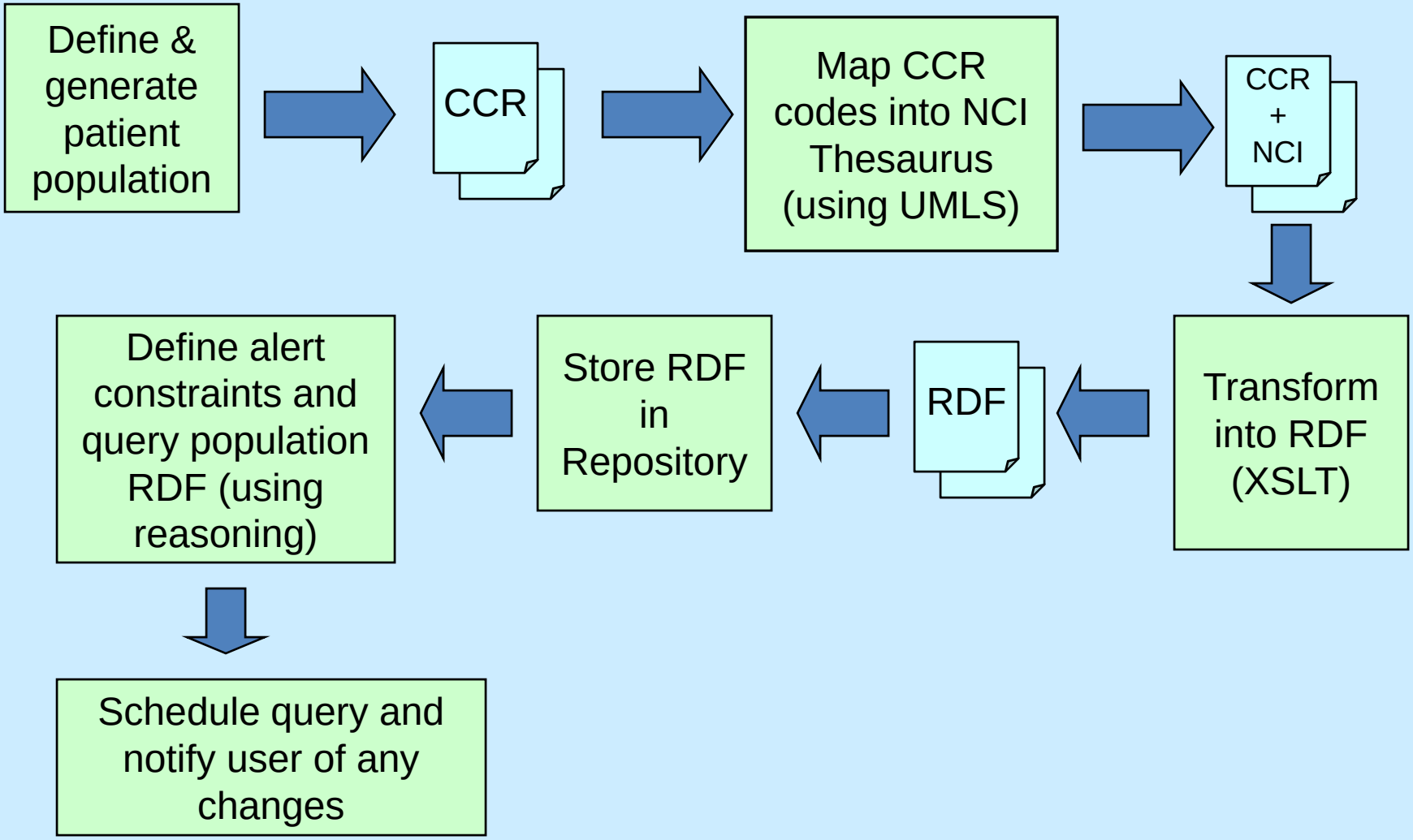
CCR/NCI Thesaurus Demo:
Semantic Web Reasoning Over Clinical Data

VectorC, LLC

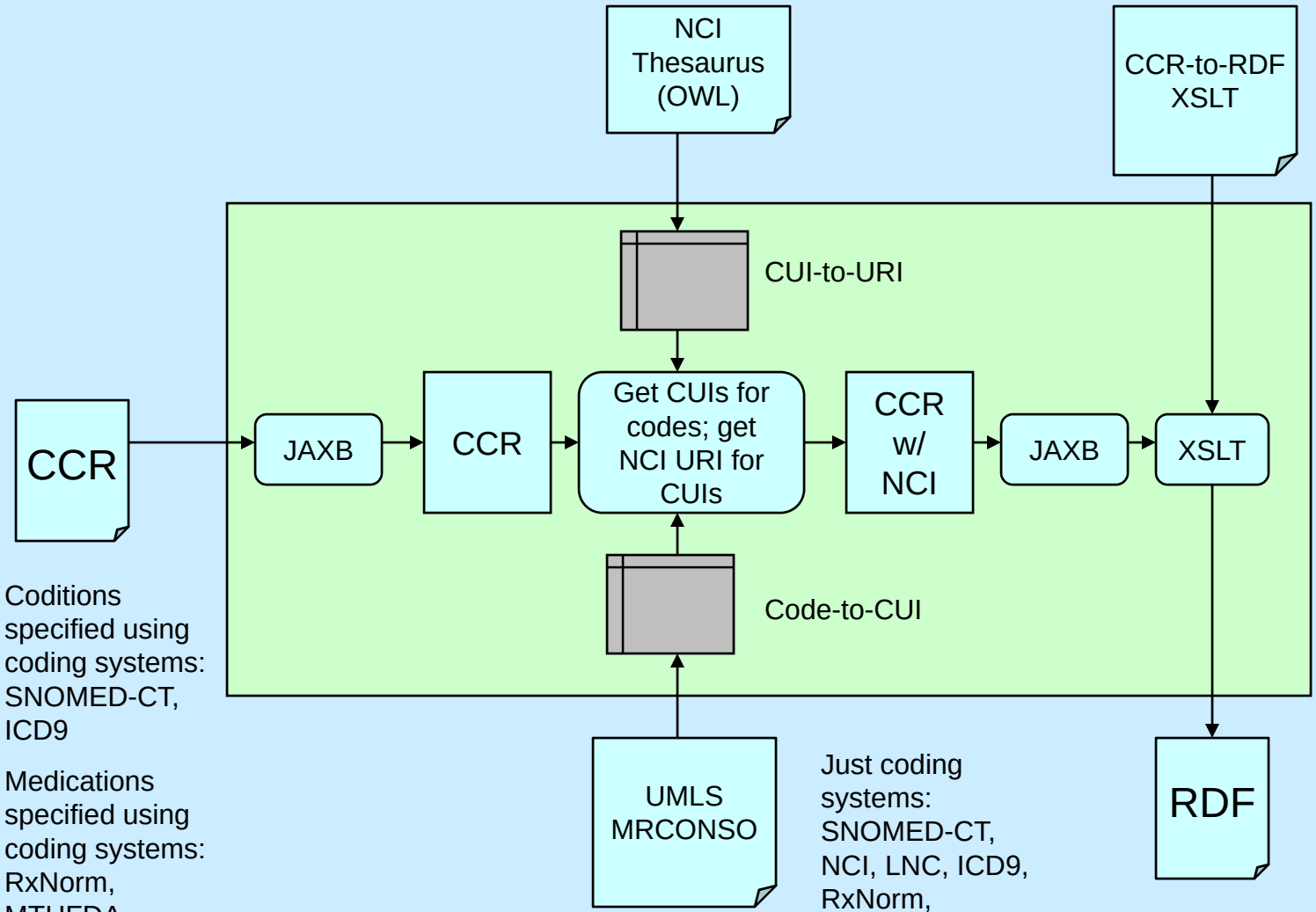
CCR/NCI Thesaurus Demo

- Semantically enabled medical demo built using VectorC's Semantic Service Bus.
- Features:
  - Ontology-driven generation of test patient data.
  - Mapping from Continuity of Care Record documents (XML) to RDF.
  - Mapping from CCR coding systems (e.g. SNOMED-CT, RxNorm, etc.) to OWL classes via UMLS.
  - Retrieval of patient subsets based on medications/conditions via execution of SPARQL queries with subsumption reasoning against NCI Thesaurus.
  - Use of scheduling logic to notify users when there are changes to the identified patient population

CCR/NCI Demo Workflow



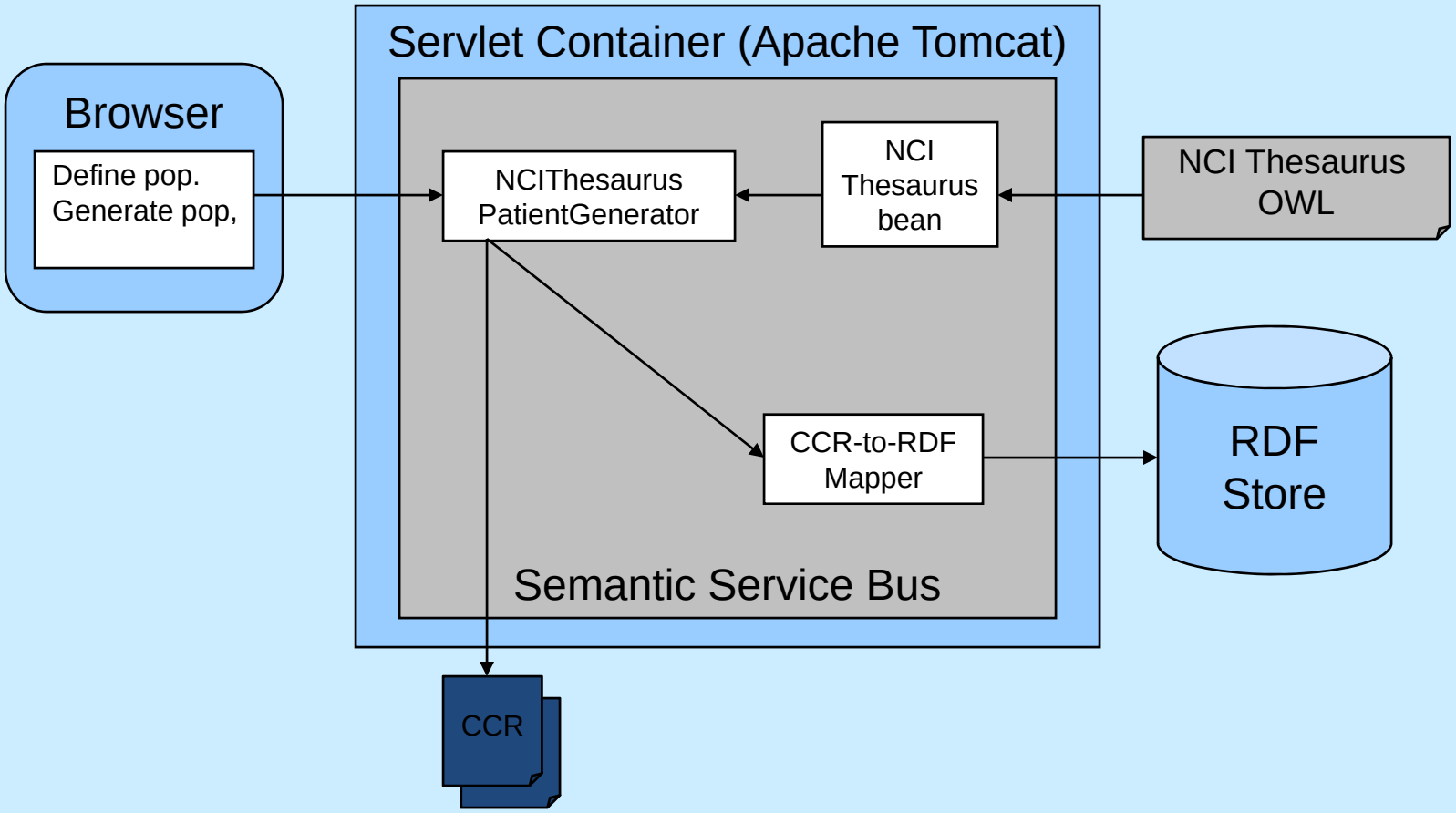
CCR-to-RDF Transformation



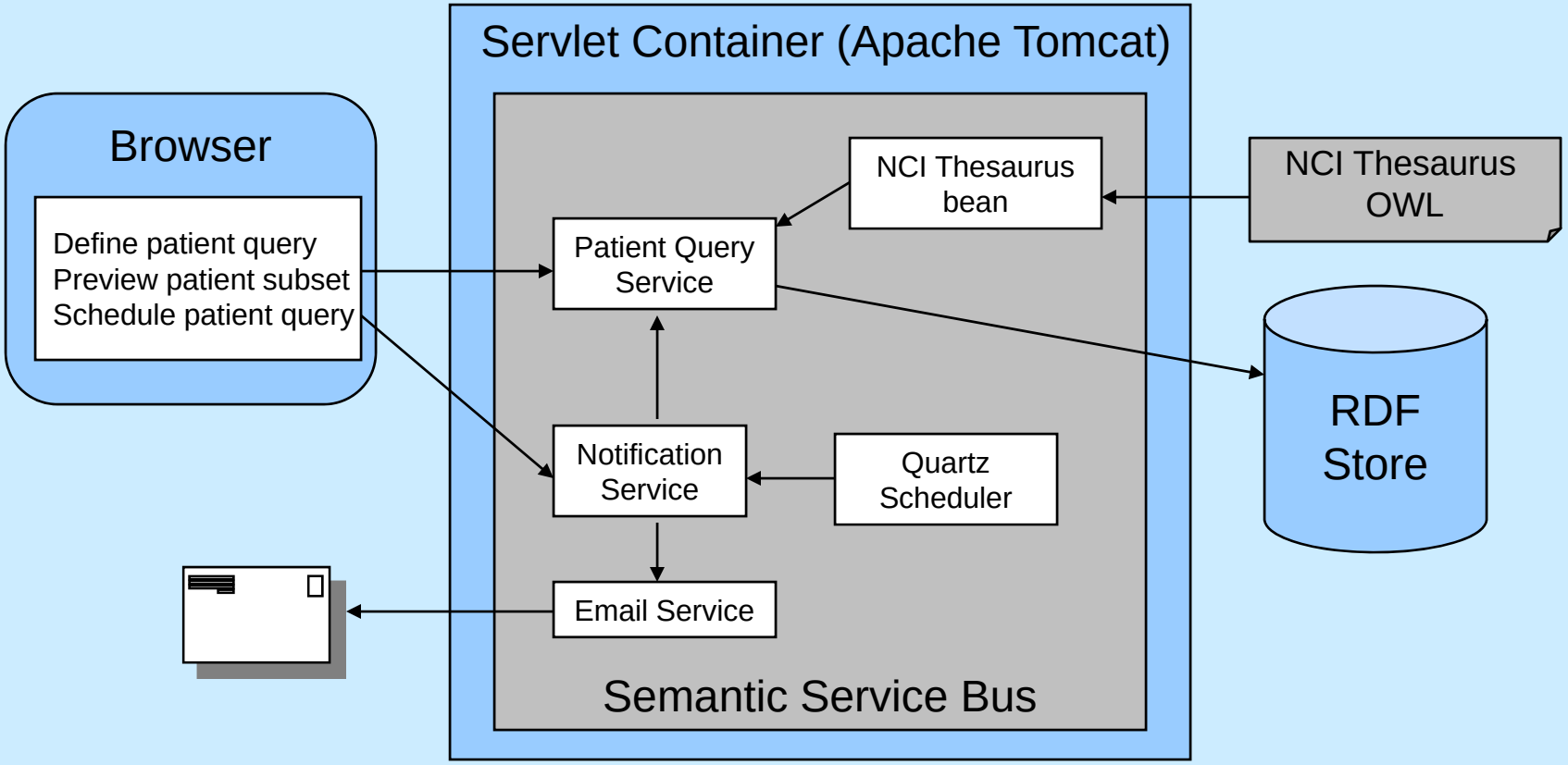
Alert Example: Cardio/COX2

- Scenario: Find patients that have experienced a myocardial infarction and are taking Rofecoxib.
- Variations that benefit from NCI Thesaurus subsumption reasoning:
  - Myocardial Infarction & Cyclooxygenase Inhibitor (catches all COX2, including Celecoxib)
  - Myocardial Infarction & Enzyme Inhibitor (any potentially broader category interactions?)
  - Cardiovascular Disorder & Rofecoxib (misdiagnosed heart attack).

CCR/NCI Demo: Patient Generator



CCR/NCI Demo: Query Preview/Schedule



Extensions for a “Real” App

- Integrate other data sources/destinations (inpatient/ outpatient/ insurance/ non-medical/etc.):
  - Relational databases (can be viewed as RDF via relational-to-RDF tools)
  - XML data (retrieved via a web service, etc.). Mapped to RDF via a XSLT approach, etc.
  - Other (email, JMS, legacy application, etc.).
- Support reasoning against a more comprehensive terminology (e.g. SNOMED-CT mapped to OWL 2 EL)
- Etc.