OWL-S Issues

DAML Web Services Coalition

Presented by:
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http://www.daml.org/services/
Top-level Outline

• Language status (25 min.)
  – OWL-S Status & Evolution (David Martin)
  – New features of process model; surface language (Mark Burstein)
• Security extensions (Tim Finin) (20)
• Supporting products (Katia Sycara) (10)
  – Tools, demos, use cases
• Outreach & uptake (Katia) (10)
  – Standardization efforts & strategies
  – Users, workshops, books, papers
• Open issues & challenges (David) (10)
• Roadmap for language evolution (David) (15)
  – Transition to SWSL
Profile: Issues

• Relationship to Process Model may need further clarification
• OWL is well suited to characterizing & classifying services
• But greater expressiveness needed for many things (contracting & negotiation)
Process Model: Issues

- Polymorphism of parameters
- Functional Data Transform (with dataflow)
- Exceptions
- Synchronization constructs
- Grid / OGSA tie in
- Execution traces
- Process control (lifecycle) / monitoring
- Mixed process vs. separate
- Multiparty interactions; process visibility
  - Cross role interaction style
  - More explicit messaging
Grounding: Issues

Issue: update for WSDL 2.0 (when final)
  – May generate new WSDL requirements
    (e.g. for conditional outputs)
  – Mismatch of “service”; no match for WSDL faults

• OWL / WSDL Mapping mechanisms
  – XSLT works, but not transparent
  – Put more mapping info in the grounding ontology (?)
  – Interesting issues around direct use of OWL in WSDL specs
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Roadmap

• Finalize 1.1 (June)
• OWL-S Note (?)
• Transition to SWSL
• SWSL Note: September 2004
Transition to SWSL

• OWL-S Profile + Atomic Process + Grounding, enhanced with Rules
• Replace/extend the OWL-S composite Process model with concepts from the core of PSL
• Convergence with “high-level” languages
  – F-Logic + HiLog + CTR
The Why and How of Near-term Impact in SWS’s

• Policies in Security/Trust, Contracts, Advertising, Monitoring
  – Combine rules + ontologies in LP
  – Extend OWL-S profile

• Verification of process properties, compatibility, and enactment
  – Combine ordering constraints with pre-conditions/effects as in PSL
  – Extend OWL-S grounded atomic processes
  – Longer term: (semi-)automated composition
“Divide and Conquer”

Key observation: LP better for some things, FOL for other things

1. “SCAMP”: Identify short-term deliverable in space of negotiation, contracts, matchmaking
   - One starting point: OWL-S profile
   - Using LP basis

2. Identify short-term deliverable in space of specifying process-related aspects of web services
   - Starting points: partial spec of process sequencing (Singh event algebra?) + pre-condition/effect
   - How: Using FOL basis

3. “Bridge”: Identify a core conceptual ontology that
   - Can support activities of the first two bullets
   - Can be specified in LP
   - Can be specified in FOL
SCAMP drill down: Goals of Version 1

• Develop upper and middle ontology in selected areas
• Policy specification and enforcement
  – TRUST: policies for security, access, privacy
  – Contracts: pricing, delivery, cancellations, non-performance
  – Monitoring: task of enforcing policies, policies for dealing with non-compliance, exceptions
  – Borrow from ebXML, EDI, XACML, P3P, LegalXML,…??
• Simple advertising/discovery
  – E.g., based on keywords and simple ontology
  – More complex dynamic discovery not focus of version 1
• “Data Mapping”: not a focus for version 1
  – Larger than just semantic web services
  – Other groups working on it – XML, U Wash, …
  – Will wait for dust to settle; can be incorporated
Process modeling drill-down:

Goals for Version 1

- Need: mechanism for blending different aspects of SWS
  - World-modifying actions
  - Activity ordering constraints
    - More abstract than OWL-S 1.0 process model, Petri nets, automata
- Goal: Ontology/language that permits specifying properties of services, incorporating the above
  - Primary application: Verifying properties, compatibility
  - Later: other analysis; optimization; auto-composition; monitoring
- Minimum requirements
  - Selected components of PSL-(outer)core
  - At least as powerful as Singh’s event algebra
  - Pre-conditions and effects
- Deliverable:
  - Technical document with proposal and rationale
  - One or more exemplary use cases
Conceptual Core Ontology: Drill-down for Version 1

- **Challenge**
  - LP approach “good” for policies and contracts
  - FOL approach “good” for axiomatization

- **Goal:** Provide a single ontology to support these and other specification/reasoning paradigms
  - Perhaps specify using set-theoretic formalism
    - “Easy for layman to understand”
  - Should be axiomatizable in FOL
  - Should be specifiable in LP
  - If we succeed, then both FOL and LP can build out from the common basis

- **Starting point**
  - PSL-(outer)-core: exists mapping to set-theoretic formulation

- **Deliverable:** ????
The End

- www.daml.org/services
  - www.daml.org/services/owl-s
  - www.daml.org/services/swsl
  - www.daml.org/services/swsa
- Ontologies, docs, examples
- Community:
  Publications, tools, use cases
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1. “SCAMP”: Identify short-term deliverable in space of negotiation, contracts, matchmaking
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Requirement: That (1.) and (2.) interoperate
SCAMP drill down: Goals of Version 1

- **Key foci**
  - Policy specification and enforcement
    - Trust: policies for security authorization, access, privacy/confidentiality
    - Contracts: pricing, delivery, refunds, cancellations, non-performance, …
      - Contract agreements, proposals, requests for proposals, advertisements
    - Monitoring: task of enforcing policies (e.g., for trust or contracts), policies to handle exceptions & non-compliance (compare results to promises)
    - Borrow from ebXML, EDI, XACML, P3P, LegalXML,…??
  - Start from spirit and particulars of OWL-S Profile
  - Choosing good rule language
    - RuleML with extensions, e.g., ontology import/incorporation (DLP OWL and later OO with default inheritance), HiLog, and F-Logic syntax.
    - Need a surface syntax
      - Framework for negotiation

- **Primary deliverable**: technical document - proposal & rationale
- **Later deliverable**: illustrative application scenario examples
- **Defer**: Complex discovery/matchmaking
- **Defer** “data mapping”
SCAMP drill down: Goals, cont.’d

• Develop upper and middle ontology in selected areas
• Simple advertising/discovery
  – E.g., keywords, simple ontology, partial contracts
  – More complex dynamic discovery not focus of version 1
• “Data Mapping”: not a focus for version 1
  – Larger than just semantic web services
  – Other groups working on it – XML, U Wash, …
  – Will wait for dust to settle; can be incorporated
SCAMP drill down: Goals of Version 1

• Key foci
  – Base on OWL-S profile ontology for now
  – Policy specification and enforcement
    • TRUST: policies for security, access, privacy
    • Contracts: pricing, delivery, cancellations, non-performance
    • Monitoring: task of enforcing policies, policies for dealing with non-compliance, exceptions
    • Borrow from ebXML, EDI, XACML, P3P, LegalXML,…??
  – Choosing good rule language
    • RuleML with extensions?
    • Need a surface syntax
  – Framework for negotiation

• Primary deliverable: technical document with proposal and rationale

• Note: Advertising, “data mapping” deferred
Conceptual Core Ontology:
Drill-down for Version 1

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• Starting point
  – PSL-(outer)-core: exists mapping to set-theoretic formulation

• Deliverable: ????