OWL-S /SWSL Briefing

DAML Web Services Coalition

Presented by:
David Martin (SRI)

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
DAML Services Coalition

**BBN:** Mark Burstein*

**CMU:** Katia Sycara*, Massimo Paolucci*, Naveen Srinivasan

**De Montfort University:** Monika Solanki

**Maryland / College Park:** Bijan Parsia, Evren Sirin

**Nokia:** Ora Lassila

**SRI:** David Martin*

**Stanford KSL:** Deb McGuiness

**Southampton:** Terry Payne*

**Univ. of Toronto:** Sheila McIlraith*

**USC-ISI:** Jerry Hobbs

**Vrije Universiteit Amsterdam:** Marta Sabou

**Yale:** Drew McDermott*

*Contributor to these slides*
Top-level Outline

- Language status
  - OWL-S 1.1
    - Profile, Process Model, Grounding: Overview, recent evolution, next steps for each
    - Release status

- Security extensions
- Supporting products
- Outreach & uptake
- Open issues & challenges
- Roadmap for language evolution
OWL-S Objectives

Fuller automation of service use by agents

Ideal: full-fledged use of services never before encountered:
  Discovery, selection, composition, invocation, monitoring, ..

Useful in the “real world”

Compatible with industry standards
Incremental exploitation

Enable reasoning/planning about services
  e.g., On-the-fly composition

Integrated use with information resources
Ease of use; powerful tools
Upper Ontology of Services

Ontology images compliments of Terry Payne, University of Southampton
Service Profile: “What does it do?”

High-level characterization/summary of a service

Used for

• Populating service registries
  • A service can have many profiles
• Automated service discovery
• Service selection (matchmaking)

One can derive:

• Service advertisements
• Service requests
Service Profile: Styles of use

• Class hierarchical yellow pages
  – Implicit capability characterization
  – Arrangement of attributes on class hierarchy
  – Can use multiple inheritance
  – Relies primarily on “non-functional” properties

• Process summaries for planning purposes
  – More explicit
  – Inputs, outputs, preconditions, effects
  – Less reliance on formal hierarchical organization
  – Summarizes process model specs
  – Relies primarily on functional description
Profile: Recent Evolution

• DLization
  – Now editable using Protege

• (otherwise, stable)
Upper Ontology of Services
Process Model: “How does it work?”

Process
- Interpretable description of service provider’s behavior
- Tells service user how and when to interact (read/write messages)

& Process control
- Ontology of process state; supports status queries
- (stubbed out at present)

• Used for:
  - Service invocation, planning/composition, interoperation, monitoring

• All processes have
  - Inputs, outputs, preconditions and effects
  - Function/dataflow metaphor; action/process metaphor

• Composite processes
  - Control flow
  - Data flow
Service Model / Process Model
Process Model: Recent Evolution

- DLization
- Expression language
- Conditionalizing outputs and effects
- *Perform* construct
- Dataflow and bindings
- Surface syntax
Upper Ontology of Services
Service Grounding: “How to access it”

- Implementation specific
- Message formatting, transport mechanisms, protocols, serializations of types
- Service Model + Grounding give everything needed for using the service
- Builds upon WSDL
OWL-S / WSDL Grounding

OWL-S

Process Model

Atomic Process

Operation

Resources/Concepts

Inputs / Outputs

Message

Binding to SOAP, HTTP, etc.

WSDL
OWL-S / WSDL Grounding (cont’d)
Grounding: Recent Evolution

• DLization
Review: Upper Ontology of Services
DAML-S/OWL-S Path of Evolution

Release 0.5 (May 2001)
  Initial Profile & Process ontologies

Release 0.6 (December 2001)
  Refinements to Profile & Process; Resources ontology

Release 0.7 (October 2002)
  Initial DAML-S/WSDL Grounding;
  Profile, Process Model refinements; more complete examples

Release 0.9 (May 2003)
  Grounding: greater generality, flexibility
  Initial work on expressing conditions, security
  More community support (contributions pages)

Release 1.0 (October 2003)
  DAML-S ➔ OWL-S completed
  Processes-as-instances
  New IOPE classes
  Initial version of surface syntax
  Profile reorganization

Release 1.1 (June 2004)
  Completion of features required for coherence of process model

Transition to SWSL
1.1 Release

• Under construction
  – Core ontology files mostly done
  – Examples under revision
  – Not all documentation is complete

• Not yet announced
  – Release scheduled for June 4

www.daml.org/services/owl-s/1.1
Top-level Outline

• Language status
  – OWL-S 1.1
    • Profile, Process Model, Grounding: Overview, recent evolution, next steps for each
    • Release status

• Security extensions

• Supporting products

• Outreach & uptake

• Open issues & challenges

• Roadmap for language evolution
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