



Communication Working Group



Objectives / Activity

- Composition of a set of existing communication technologies (such as FIPA-ACL, FIPA-SL, KIF, DAML+OIL for example) into a coherent communication framework
- Gather communication requirements from activities across the Agentcities network
- Provide “user-guide” style documentation for communication in the Agentcities Network.



Re-factoring Current Activity

- Long term Activity
 - Coherent communication framework
 - Modular language/formalism use
- Short/Medium Term Goals
 - We have a *really* preliminary draft
 - This should be updated significantly over the next month or so
 - Work-program for this area – identify primary challenges



Communication

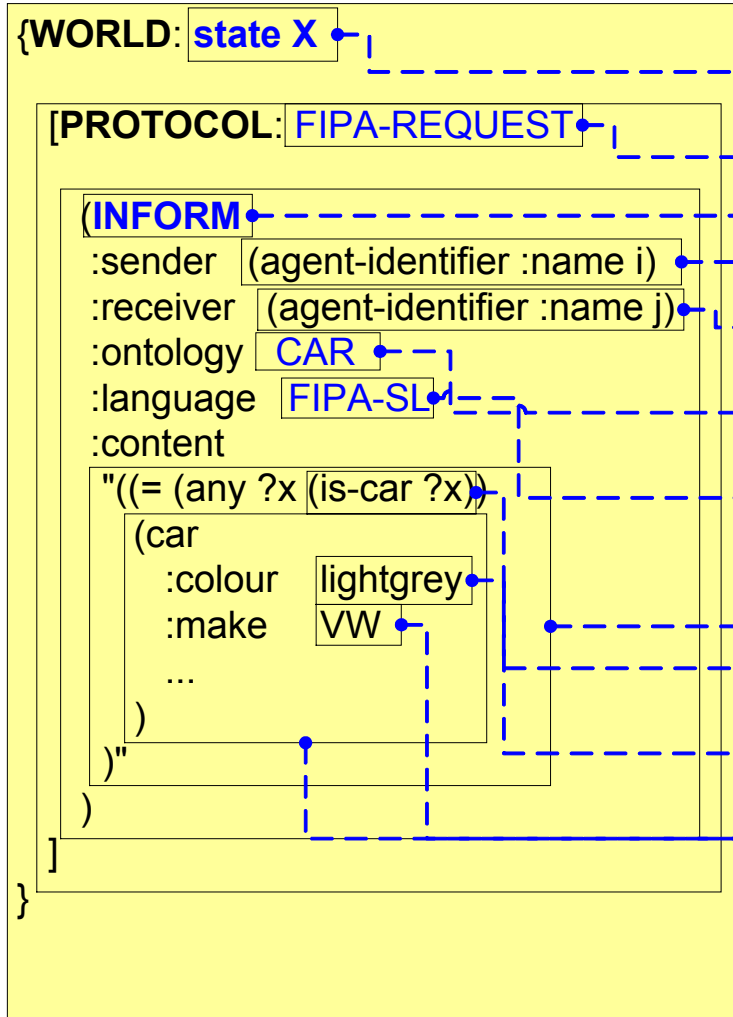
- Communication is
 - Two or more systems interacting (signaling to one another*)
- “Useful” communication
 - Unambiguous shared meaning of interaction (*)
 - Creates shared understanding between systems
 - Potentially changing the state of the world (an “action”)
- Implicit v’s Explicit semantics
 - Explicit: formal shared description of meaning
 - Implicit semantics: coded into the end systems
 - Explicit semantics are essential for flexible interactions, dynamic worlds, open systems – they underpin reasoning about communication

Level	Description	Example
Conversation	Sequence of communicative acts related to a particular topic	Communicating about buying and eating an apple
Communicative Act	Communication about a piece of content	Requesting somebody to perform the action of...
Content Expression	Description of states of the world over objects	Expressing the action of eating an apple
Ontology	Description of objects in the domain	Meaning of "apple" and "eat"
Syntax	Representation of Content	HTML, JPG, SQL
Protocol	Data exchange protocol (ISO layer 7)	HTTP, GIIOP, SMTP
Transport	Physical transport and low level transport protocols (ISO layers 1-6)	Optical Fiber, TCP-IP etc.

Using the Semantics?

INSTANCE

MEANING



"World State" (Predicate Logic)

"Request Protocol" (AUML)

"FIPA-ACL" (FIPA-SL)

Agent Ontology? / Frames

"Ontologies" (DAML+OIL)

"Languages" (DAML+OIL)

"SL" (FIPA-SL)

"Functions" (Java)

"Colour" (OntoLingua)

"Car" (DAML+OIL)

Meaning of the whole?



Where we are now (technically)

- Context
 - No model
 - Jones / Sergot / Pitt
- Protocol
 - AUMML sequence diagrams
- ACL
 - Without the formal modal logic semantics
- Content Language
 - ANSI KIF or FIPA-SL
- Ontology Language
 - DAML+OIL
 - Extensions to capture functions
- Reasoning is still a long way off.

Steps to Reach for Communication

■ Step one:

- Formalisms to describe (off line) the meanings of constrained classes interactions (and hence determine their consequences) incorporating formalisms from all levels – supporting system design.
- Systems have very fixed interaction patterns

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■ Step two:

- Formalisms can be used generatively in narrow ranges to enable flexibility to creep into interactions

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■ Step three:

- Agents can reason about the meaning (and impact) of arbitrary messages in the subset of formalisms it is familiar with.

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■ Step four:

- Universal languages for arbitrary system-system interaction.

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Collaboration Points

- **Inputs**

- Language standard
- Content standards
- Semantic models

- **Outputs**

- Use cases
- Ontology resources
- Technology requirements & feedback
- Best practice guides



More Information

- <http://www.agentcities.org/Activities/WG/>