FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA ACL Message Representation in XML Specification

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Foreword

The Foundation for Intelligent Physical Agents (FIPA) is an international organization that is dedicated to promoting the industry of intelligent agents by openly developing specifications supporting interoperability among agents and agent-based applications. This occurs through open collaboration among its member organizations, which are companies and universities that are active in the field of agents. FIPA makes the results of its activities available to all interested parties and intends to contribute its results to the appropriate formal standards bodies where appropriate.

The members of FIPA are individually and collectively committed to open competition in the development of agent-based applications, services and equipment. Membership in FIPA is open to any corporation and individual firm, partnership, governmental body or international organization without restriction. In particular, members are not bound to implement or use specific agent-based standards, recommendations and FIPA specifications by virtue of their participation in FIPA.

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FIPA is a non-profit association registered in Geneva, Switzerland. As of June 2002, the 56 members of FIPA represented many countries worldwide. Further information about FIPA as an organization, membership information, FIPA specifications and upcoming meetings may be found on the FIPA Web site at http://www.fipa.org/.

Contents

1 Scope

This document deals with message transportation between inter-operating agents and also forms part of the FIPA Agent Management Specification [FIPA00023]. It contains specifications for:

- Syntactic representation of ACL in XML form (see [W3Cxml]).

2 XML ACL Representation

This document defines the message transport syntax for an XML based representation of ACL. It should be noted that some grammatical information is expressed in the comments of the DTD. These additions are normative aspects of the definition even though they are not checked by the XML parser.

2.1 Component Name

The name assigned to this component is:

```
fipa.acl.rep.xml.std
```

2.2 Syntax

```
<!-- Document Type: XML DTD
     Document Purpose: Encoding of FIPA ACL messages in XML
     (see [FIPA00067]) and http://www.fipa.org/)
     Last Revised: 2002/05/10 -->

<!-- Possible FIPA Communicative Acts. See [FIPA00037] for a
     full list of valid performatives. -->
<!ENTITY    %communicative-acts             "accept-proposal
                                           | agree
                                           | cancel
                                           | cfp
                                           | confirm
                                           | disconfirm
                                           | failure
                                           | inform
                                           | not-understood
                                           | propose
                                           | query-if
                                           | query-ref
                                           | refuse
                                           | reject-proposal
                                           | request
                                           | request-when
                                           | request-whenever
                                           | subscribe
                                           | inform-if
                                           | inform-ref
                                           | proxy
                                           | propagate">

<!-- The FIPA message root element, the communicative act is
     an attribute - see below and the message itself is a list
     of parameters. The list is unordered. None of the elements
     should occur more than once except receiver. -->
<!ENTITY    %msg-param                      "receiver
                                           | sender
                                           | content
                                           | language
                                           | encoding
                                           | ontology
                                           | protocol
                                           | reply-with
                                           | in-reply-to
                                           | reply-by
                                           | reply-to
                                           | conversation-id
```

```
                                          | user-defined">

<!ELEMENT   fipa-message                  ( %msg-param; )*>

<!-- Attribute for the fipa-message - the communicative act itself and
     the conversation id (which is here so an ID value can be used). -->
<!ATTLIST   fipa-message                  act ( %communicative-acts; ) #REQUIRED
                                          conversation-id ID #IMPLIED>

<!ELEMENT   sender                        ( agent-identifier )>

<!ELEMENT   receiver                      ( agent-identifier+ )>

<!-- The message content.
     One can choose to embed the actual content in the message,
     or alternatively refer to a URI which represents this content. -->
<!ELEMENT   content                       ( #PCDATA )>
<!ATTLIST   content                         href CDATA #IMPLIED>

<!-- The content language used for the content.
     The linking attribute href associated with language can be used
     to refer in an unambiguous way to the (formal) definition of the
     standard/fipa content language. -->
<!ELEMENT   language                      ( #PCDATA )>
<!ATTLIST   language                        href CDATA #IMPLIED>

<!-- The encoding used for the content language.
     The linking attribute href associated with encoding can be used
     to refer in an unambiguous way to the (formal) definition of the
     language encoding. -->
<!ELEMENT   encoding    ( #PCDATA )>
<!ATTLIST   encoding      href CDATA #IMPLIED>

<!-- The ontology used in the content.
     The linking attribute href associated with ontology can be used
     to refer in an unambiguous way to the (formal) definition of the
     ontology. -->
<!ELEMENT   ontology                      ( #PCDATA )>
<!ATTLIST   ontology                        href CDATA #IMPLIED>

<!-- The protocol element.
     The linking attribute href associated with protocol can be used
     to refer in an unambiguous way to the (formal) definition of the
     protocol. -->
<!ELEMENT   protocol                      ( #PCDATA )>
<!ATTLIST   protocol                        href CDATA #IMPLIED>

<!ELEMENT   reply-with                    ( #PCDATA )>
<!ATTLIST   reply-with                      href CDATA #IMPLIED>

<!ELEMENT   in-reply-to                   ( #PCDATA )>
<!ATTLIST   in-reply-to                     href CDATA #IMPLIED>

<!ELEMENT   reply-by                        EMPTY>
<!ATTLIST   reply-by                        time CDATA #REQUIRED
                                            href CDATA #IMPLIED>

<!ELEMENT   reply-to                      ( agent-identifier+ )>

<!ELEMENT   conversation-id               ( #PCDATA )>
<!ATTLIST   conversation-id                 href CDATA #IMPLIED>

<!ELEMENT   agent-identifier              ( name,
                                            addresses?,
```

```
                                                resolvers?,
                                                user-defined* )>

<!ELEMENT   name                                EMPTY>

<!-- An id can be used to uniquely identify the name of the agent.
     The refid attribute can be used to refer to an already defined
     agent name, avoiding unnecessary repetition. Either the id
     OR refid should be specified, (both should not be present at the
     same time). -->
<!ATTLIST   name                                id ID #IMPLIED
                                                refid IDREF #IMPLIED>

<!ELEMENT   addresses                         ( url+ )>

<!ELEMENT   url                                 EMPTY>
<!ATTLIST   url                                 href CDATA #IMPLIED>

<!ELEMENT   resolvers                         ( agent-identifier+ )>

<!ELEMENT   user-defined                      ( #PCDATA )>
<!ATTLIST   user-defined                        href CDATA #IMPLIED>
```

3 References

[FIPA00023] FIPA Agent Management Specification. Foundation for Intelligent Physical Agents, 2000.
http://www.fipa.org/specs/fipa00023/

[FIPA00037] FIPA Communicative Act Library Specification. Foundation for Intelligent Physical Agents, 2000.
http://www.fipa.org/specs/fipa00037/

[FIPA00067] FIPA Agent Message Transport Service Specification. Foundation for Intelligent Physical Agents, 2000.
http://www.fipa.org/specs/fipa00067/

[W3Cxml] Extensible Mark-up Language (XML) 1.0 Recommendation. World Wide Web Consortium, 1998.
http://www.w3c.org/TR/REC-xml

4 Informative Annex A — ChangeLog

4.1 2002/11/01 - version D by TC X2S

Page 2, line 63: Improved readability of the XML

Page 2, line 86: **Extended the `msg-params` definition to allow user-defined fields**

Page 2, line 104: Changed the cardinality of `receiver` definition to one or more (+)

Page 3, line 166: Changed the cardinality of `reply-to` definition to one or more (+)