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2 **FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS**

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5 # FIPA ACL Message Representation
6 # in XML Specification

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| Document title | FIPA ACL Message Representation in XML Specification | | |
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| Contact | fab@fipa.org | | |
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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.

The FIPA specifications are developed through direct involvement of the FIPA membership. The status of a specification can be either Preliminary, Experimental, Standard, Deprecated or Obsolete. More detail about the process of specification may be found in the FIPA Document Policy [f-out-00000] and the FIPA Specifications Policy [f-out-00003]. A complete overview of the FIPA specifications and their current status may be found on the FIPA Web site.

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
```

```
110                                                       | user-defined">
111
112   <!ELEMENT   fipa-message                ( %msg-param; )*>
113
114   <!-- Attribute for the fipa-message - the communicative act itself and
115        the conversation id (which is here so an ID value can be used). -->
116   <!ATTLIST   fipa-message                act ( %communicative-acts; ) #REQUIRED
117                                           conversation-id ID #IMPLIED>
118
119   <!ELEMENT   sender                      ( agent-identifier )>
120
121   <!ELEMENT   receiver                    ( agent-identifier+ )>
122
123   <!-- The message content.
124        One can choose to embed the actual content in the message,
125        or alternatively refer to a URI which represents this content. -->
126   <!ELEMENT   content                     ( #PCDATA )>
127   <!ATTLIST   content                     href CDATA #IMPLIED>
128
129   <!-- The content language used for the content.
130        The linking attribute href associated with language can be used
131        to refer in an unambiguous way to the (formal) definition of the
132        standard/fipa content language. -->
133   <!ELEMENT   language                    ( #PCDATA )>
134   <!ATTLIST   language                    href CDATA #IMPLIED>
135
136   <!-- The encoding used for the content language.
137        The linking attribute href associated with encoding can be used
138        to refer in an unambiguous way to the (formal) definition of the
139        language encoding. -->
140   <!ELEMENT   encoding    ( #PCDATA )>
141   <!ATTLIST   encoding     href CDATA #IMPLIED>
142
143   <!-- The ontology used in the content.
144        The linking attribute href associated with ontology can be used
145        to refer in an unambiguous way to the (formal) definition of the
146        ontology. -->
147   <!ELEMENT   ontology                    ( #PCDATA )>
148   <!ATTLIST   ontology                    href CDATA #IMPLIED>
149
150   <!-- The protocol element.
151        The linking attribute href associated with protocol can be used
152        to refer in an unambiguous way to the (formal) definition of the
153        protocol. -->
154   <!ELEMENT   protocol                    ( #PCDATA )>
155   <!ATTLIST   protocol                    href CDATA #IMPLIED>
156
157   <!ELEMENT   reply-with                  ( #PCDATA )>
158   <!ATTLIST   reply-with                  href CDATA #IMPLIED>
159
160   <!ELEMENT   in-reply-to                 ( #PCDATA )>
161   <!ATTLIST   in-reply-to                 href CDATA #IMPLIED>
162
163   <!ELEMENT   reply-by                     EMPTY>
164   <!ATTLIST   reply-by                     time CDATA #REQUIRED
165                                            href CDATA #IMPLIED>
166
167   <!ELEMENT   reply-to                    ( agent-identifier+ )>
168
169   <!ELEMENT   conversation-id             ( #PCDATA )>
170   <!ATTLIST   conversation-id             href CDATA #IMPLIED>
171
172   <!ELEMENT   agent-identifier           ( name,
173                                            addresses?,
```

```
174                                             resolvers?,
175                                             user-defined* )>
176
177 <!ELEMENT    name                            EMPTY>
178
179 <!-- An id can be used to uniquely identify the name of the agent.
180     The refid attribute can be used to refer to an already defined
181     agent name, avoiding unnecessary repetition. Either the id
182     OR refid should be specified, (both should not be present at the
183     same time). -->
184 <!ATTLIST    name                            id ID #IMPLIED
185                                             refid IDREF #IMPLIED>
186
187 <!ELEMENT    addresses                       ( url+ )>
188
189 <!ELEMENT    url                             EMPTY>
190 <!ATTLIST    url                             href CDATA #IMPLIED>
191
192 <!ELEMENT    resolvers                       ( agent-identifier+ )>
193
194 <!ELEMENT    user-defined                    ( #PCDATA )>
195 <!ATTLIST    user-defined                    href CDATA #IMPLIED>
196
```

## 197  **3   References**

198  [FIPA00023]      FIPA Agent Management Specification. Foundation for Intelligent Physical Agents, 2000.
199                   `http://www.fipa.org/specs/fipa00023/`
200  [FIPA00037]      FIPA Communicative Act Library Specification. Foundation for Intelligent Physical Agents, 2000.
201                   `http://www.fipa.org/specs/fipa00037/`
202  [FIPA00067]      FIPA Agent Message Transport Service Specification. Foundation for Intelligent Physical Agents, 2000.
203                   `http://www.fipa.org/specs/fipa00067/`
204  [W3Cxml]         Extensible Mark-up Language (XML) 1.0 Recommendation. World Wide Web Consortium, 1998.
205                   `http://www.w3c.org/TR/REC-xml`
206

207 # 4 Informative Annex A — ChangeLog

208 ## 4.1 2002/11/01 - version D by TC X2S

209 Page 2, line 63: Improved readability of the XML
210 **Page 2, line 86**: **Extended the `msg-params` definition to allow user-defined fields**
211 **Page 2, line 104:** **Changed the cardinality of `receiver` definition to one or more (+)**
212 **Page 3, line 166:** **Changed the cardinality of `reply-to` definition to one or more (+)**
213

214 ## 4.2 2002/12/03 - version E by FIPA Architecture Board

215 Entire document: Promoted to Standard status
216