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FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

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FIPA ACL Message Representation in XML Specification

Document title	FIPA ACL Message Representation in XML Specification		
Document number	XC00071D	Document source	FIPA TC Agent Management
Document status	Experimental	Date of this status	2002/11/01
Supersedes	FIPA00024		
Contact	fab@fipa.org		
Change history	See <i>Informative Annex A — ChangeLog</i>		

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18 <http://www.fipa.org/>
19 Geneva, Switzerland

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20 **Foreword**

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22 industry of intelligent agents by openly developing specifications supporting interoperability among agents and agent-
23 based applications. This occurs through open collaboration among its member organizations, which are companies and
24 universities that are active in the field of agents. FIPA makes the results of its activities available to all interested parties
25 and intends to contribute its results to the appropriate formal standards bodies where appropriate.

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30 participation in FIPA.

31 The FIPA specifications are developed through direct involvement of the FIPA membership. The status of a
32 specification can be either Preliminary, Experimental, Standard, Deprecated or Obsolete. More detail about the process
33 of specification may be found in the FIPA Document Policy [f-out-00000] and the FIPA Specifications Policy [f-out-
34 00003]. A complete overview of the FIPA specifications and their current status may be found on the FIPA Web site.

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

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46 **1 Scope**

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

- 49
- 50 • Syntactic representation of ACL in XML form (see [W3Cxml]).

51

52 2 XML ACL Representation

53 This document defines the message transport syntax for an XML based representation of ACL. It should be noted that
 54 some grammatical information is expressed in the comments of the DTD. These additions are normative aspects of the
 55 definition even though they are not checked by the XML parser.
 56

57 2.1 Component Name

58 The name assigned to this component is:

59
 60 fipa.acl.rep.xml.std
 61

62 2.2 Syntax

```

63 <!-- Document Type: XML DTD
64     Document Purpose: Encoding of FIPA ACL messages in XML
65     (see [FIPA00067]) and http://www.fipa.org/)
66     Last Revised: 2002/05/10 -->
67
68 <!-- Possible FIPA Communicative Acts. See [FIPA00037] for a
69     full list of valid performatives. -->
70 <!ENTITY    %communicative-acts
71           | "accept-proposal
72           | agree
73           | cancel
74           | cfp
75           | confirm
76           | disconfirm
77           | failure
78           | inform
79           | not-understood
80           | propose
81           | query-if
82           | query-ref
83           | refuse
84           | reject-proposal
85           | request
86           | request-when
87           | request-whenever
88           | subscribe
89           | inform-if
90           | inform-ref
91           | proxy
92           | propagate">
93
94 <!-- The FIPA message root element, the communicative act is
95     an attribute - see below and the message itself is a list
96     of parameters. The list is unordered. None of the elements
97     should occur more than once except receiver. -->
98 <!ENTITY    %msg-param
99           | "receiver
100          | sender
101          | content
102          | language
103          | encoding
104          | ontology
105          | protocol
106          | reply-with
107          | in-reply-to
108          | reply-by
109          | reply-to
110          | conversation-id

```

```

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

```

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

196 **3 References**

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

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

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

203 [W3Cxml] Extensible Mark-up Language (XML) 1.0 Recommendation. World Wide Web Consortium, 1998.
204 <http://www.w3c.org/TR/REC-xml>
205

206 4 Informative Annex A — ChangeLog

207 4.1 2002/11/01 - version D by TC X2S

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