

FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Nomadic Application Support Monitor Agent Specification

Document title	FIPA Nomadic Application Support Monitor Agent Specification		
Document number	OC00062D	Document source	FIPA Nomadic Application Support
Document status	Obsolete	Date of this status	2001/08/10
Supersedes	None		
Contact	fab@fipa.org		
Change history			
2000/08/04	Document made obsolete by FIPA00014		
2001/08/10	Line numbering added		

© 2000 Foundation for Intelligent Physical Agents - <http://www.fipa.org/>

Geneva, Switzerland

Notice

Use of the technologies described in this specification may infringe patents, copyrights or other intellectual property rights of FIPA Members and non-members. Nothing in this specification should be construed as granting permission to use any of the technologies described. Anyone planning to make use of technology covered by the intellectual property rights of others should first obtain permission from the holder(s) of the rights. FIPA strongly encourages anyone implementing any part of this specification to determine first whether part(s) sought to be implemented are covered by the intellectual property of others, and, if so, to obtain appropriate licenses or other permission from the holder(s) of such intellectual property prior to implementation. This specification is subject to change without notice. Neither FIPA nor any of its Members accept any responsibility whatsoever for damages or liability, direct or consequential, which may result from the use of this specification.

19 **Foreword**

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

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

30 The FIPA specifications are developed through direct involvement of the FIPA membership. The status of a
31 specification can be either Preliminary, Experimental, Standard, Deprecated or Obsolete. More detail about the process
32 of specification may be found in the FIPA Procedures for Technical Work. A complete overview of the FIPA
33 specifications and their current status may be found in the FIPA List of Specifications. A list of terms and abbreviations
34 used in the FIPA specifications may be found in the FIPA Glossary.

35 FIPA is a non-profit association registered in Geneva, Switzerland. As of January 2000, the 56 members of FIPA
36 represented 17 countries worldwide. Further information about FIPA as an organization, membership information, FIPA
37 specifications and upcoming meetings may be found at <http://www.fipa.org/>.

38 **Contents**

39	1	Scope	1
40	2	Monitor Agent Ontology	2
41	2.1	Object Descriptions.....	2
42	2.1.1	Service Description.....	2
43	2.2	Function Descriptions	2
44	2.2.1	Request Monitoring Information	3
45	2.2.2	Subscribe to Changes	3
46	3	Examples	4
47	4	References.....	7
48			

48 **1 Scope**

49 This document is part of the FIPA specifications and deals with agent middleware to support applications in nomadic
50 environment. This specification also forms part of the FIPA Nomadic Application Support Specification [FIPA00066] and
51 contains specifications for:

52

53 Monitor Agent (MA) functionality.

54

54 2 Monitor Agent Ontology

55 2.1 Object Descriptions

56 This section describes a set of frames that represent the classes of objects in the domain of discourse within the
57 framework of the FIPA-Nomadic-Application ontology.

58
59 The following terms are used to describe the objects of the domain:

60
61 **Frame.** This is the mandatory name of this entity that must be used to represent each instance of this class.

62
63 **Ontology.** This is the name of the ontology, whose domain of discourse includes the parameters described in the
64 table.

65
66 **Parameter.** This is the mandatory name of a parameter of this frame.

67
68 **Description.** This is a natural language description of the semantics of each parameter.

69
70 **Presence.** This indicates whether each parameter is mandatory or optional.

71
72 **Type.** This is the type of the values of the parameter: Integer, Word, String, URL, Term, Set or Sequence.

73
74 **Reserved Values.** This is a list of FIPA-defined constants that can assume values for this parameter.
75

76 2.1.1 Service Description

77 This type of object represents the description of each service registered with the DF.
78

Frame	service-description			
Ontology	FIPA-Nomadic-Application			
Parameter	Description	Presence	Type	Reserved Values
name	The name of the service.	Mandatory	String	fipa-mts-monitor
type	The type of the service.	Mandatory	String	fipa-ma
ontology	A list of ontologies supported by the service.	Optional	Set of String	FIPA-Nomadic-Application
protocol	A list of interaction protocols supported by the service.	Optional	Set of String	
properties	A list of properties that discriminate the service.	Optional	Set of property	

79

80 2.2 Function Descriptions

81 The following tables define usage and semantics of the functions that are part of the FIPA-Nomadic-Application
82 ontology.

83
84 The following terms are used to describe the functions of the FIPA-Nomadic-Application domain:

85
86 **Function.** This is the symbol that identifies the function in the ontology.

87
88 **Ontology.** This is the name of the ontology, whose domain of discourse includes the function described in the
89 table.

90
91 **Supported by.** This is the type of agent that supports this function.

92
93
94
95
96
97
98
99
100
101
102
103

Description. This is a natural language description of the semantics of the function.

Domain. This indicates the domain over which the function is defined. The arguments passed to the function must belong to the set identified by the domain.

Range. This indicates the range to which the function maps the symbols of the domain. The result of the function is a symbol belonging to the set identified by the range.

Arity. This indicates the number of arguments that a function takes. If a function can take an arbitrary number of arguments, then its arity is undefined.

104 **2.2.1 Request Monitoring Information**

Function	qos-information
Ontology	FIPA-Nomadic-Application
Supported by	MA
Description	An agent asks for quality of service information from an MA using the FIPA-Query interaction protocol (see [FIPA00027]). The agent may specify either a communication channel or transport protocol to request quality of service information from.
Domain	comm-channel / transport-protocol, qos (see [FIPA00065])
Range	qos
Arity	2

105

106 **2.2.2 Subscribe to Changes**

Function	qos-notification
Ontology	FIPA-Nomadic-Application
Supported by	MA
Description	An agent subscribes to notifications about changes to the quality of service from an MA using the FIPA-Subscribe interaction protocol (see [FIPA00035]).
Domain	comm-channel, qos, change-constraints / time-constraints
Range	qos
Arity	3

107

108

3 Examples

1. An MA registers with a DF (see [FIPA00023]):

```

111 (request
112   :sender
113     (agent-identifier
114       :name ma@foo.com
115       :addresses (sequence http://foo.com/acc))
116   :receiver (set
117     (agent-identifier
118       :name df@foo.com
119       :addresses (sequence http://foo.com/acc)))
120   :language FIPA-SL0
121   :protocol FIPA-Request
122   :ontology FIPA-Agent-Management
123   :content
124     (action
125       (agent-identifier
126         :name df@foo.com
127         :addresses (sequence http://foo.com/acc))
128       (register
129         (df-agent-description
130           :name
131             (agent-identifier
132               :name ma@foo.com
133               :addresses (sequence http://foo.com/acc))
134           :services (set
135             (service-description
136               :name fipa-mts-monitor
137               :type fipa-ma
138               :ontology (set FIPA-Nomadic-Application))))))))

```

2. An agent wants to know the current round-trip time of communication channel named GPRS:

```

142 (query-ref
143   :sender
144     (agent-identifier
145       :name agent@foo.com
146       :addresses (sequence http://foo.com/acc))
147   :receiver (set
148     (agent-identifier
149       :name ma@bar.com
150       :addresses (sequence http://bar.com/acc)))
151   :ontology FIPA-Nomadic-Application
152   :language FIPA-SL2
153   :protocol FIPA-Query
154   :content
155     (iota ?x
156       (qos-information
157         (comm-channel
158           :name GPRS)
159         (qos
160           :rtt
161             (time-value
162               :direction Inbound
163               :value ?x))))))

```

165 3. An agent wants to know the current throughput of WAP MTP (see [FIPA00076]):

```
166 (query-ref
167   :sender
168     (agent-identifier
169       :name agent@foo.com
170       :addresses (sequence http://foo.com/acc))
171   :receiver (set
172     (agent-identifier
173       :name ma@bar.com
174       :addresses (sequence http://bar.com/acc)))
175   :ontology FIPA-Nomadic-Application
176   :language FIPA-SL2
177   :protocol FIPA-Query
178   :content
179     (iota ?x
180       (qos-information
181         (transport-protocol
182           :name fipa.mts.mtp.wap.std)
183         (qos
184           :throughput
185             (rate-value
186               :direction Outbound
187               :value ?x))))))
```

190 4. An agent wants to get notifications about the quality of service every time the throughput drops below 1 Mbits/s or
191 goes above 2 Mbits/s:

```
192 (subscribe
193   :sender
194     (agent-identifier
195       :name ma@bar.com
196       :addresses (sequence http://bar.com/acc))
197   :receiver (set
198     (agent-identifier
199       :name agent@foo.com
200       :addresses (sequence http://foo.com/acc)))
201   :ontology FIPA-Nomadic-Application
202   :protocol FIPA-Subscribe
203   :language FIPA-SL2
204   :content
205     (iota ?x
206       (qos-notification
207         (comm-channel
208           :name GSM)
209         (qos
210           :throughput
211             (rate-value
212               :direction Outbound
213               :value ?x))
214         (change-constraint
215           :value
216             (or
217               (<
218                 (qos
219                   :throughput
220                     (rate-value
221                       :unit Mbits/s
222                       :value 1
223                       :direction Outbound))))
224               (>
225                 (qos
226                   :throughput
```

```
228         (rate-value
229           :unit Mbits/s
230           :value 2
231           :direction outbound)))))))))
232
```

232 **4 References**

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

235 [FIPA00027] FIPA Query Interaction Protocol Specification. Foundation for Intelligent Physical Agents, 2000.
236 <http://www.fipa.org/specs/fipa00027/>

237 [FIPA00035] FIPA Subscribe Interaction Protocol Specification. Foundation for Intelligent Physical Agents, 2000.
238 <http://www.fipa.org/specs/fipa00035/>

239 [FIPA00065] FIPA Nomadic Application Support Ontology Specification. Foundation for Intelligent Physical Agents,
240 2000.
241 <http://www.fipa.org/specs/fipa00065/>

242 [FIPA00066] FIPA Nomadic Application Support Specification. Foundation for Intelligent Physical Agents, 2000.
243 <http://www.fipa.org/specs/fipa00066/>

244 [FIPA00076] FIPA Agent Message Transport Protocol for WAP Specification. Foundation for Intelligent Physical
245 Agents, 2000.
246 <http://www.fipa.org/specs/fipa00076/>