

FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Request Interaction Protocol Specification

Document title	FIPA Request Interaction Protocol Specification		
Document number	SC00026H	Document source	FIPA TC Communication
Document status	Standard	Date of this status	2002/12/03
Supersedes	None		
Contact	fab@fipa.org		
Change history	See <i>Informative Annex A — ChangeLog</i>		

© 1996-2002 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.

21 **Foreword**

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

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

32 The FIPA specifications are developed through direct involvement of the FIPA membership. The status of a
33 specification can be either Preliminary, Experimental, Standard, Deprecated or Obsolete. More detail about the process
34 of specification may be found in the FIPA Document Policy [f-out-00000] and the FIPA Specifications Policy [f-out-
35 00003]. A complete overview of the FIPA specifications and their current status may be found on the FIPA Web site.

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

39 **Contents**

40	1	FIPA Request Interaction Protocol	1
41	1.1	Explanation of the Protocol Flow	1
42	1.2	Exceptions to Protocol Flow	2
43	2	References	4
44	3	Informative Annex A — ChangeLog	5
45	3.1	2002/11/01 - version G by TC X2S	5
46	3.2	2002/12/03 - version H by FIPA Architecture Board	5

1 FIPA Request Interaction Protocol

The FIPA Request Interaction Protocol (IP) allows one agent to request another to perform some action.

The representation of this protocol is given in *Figure 1* which is based on extensions to UML 1.x. [Odell2001]. This protocol is identified by the token `fipa-request` as the value of the `protocol` parameter of the ACL message.

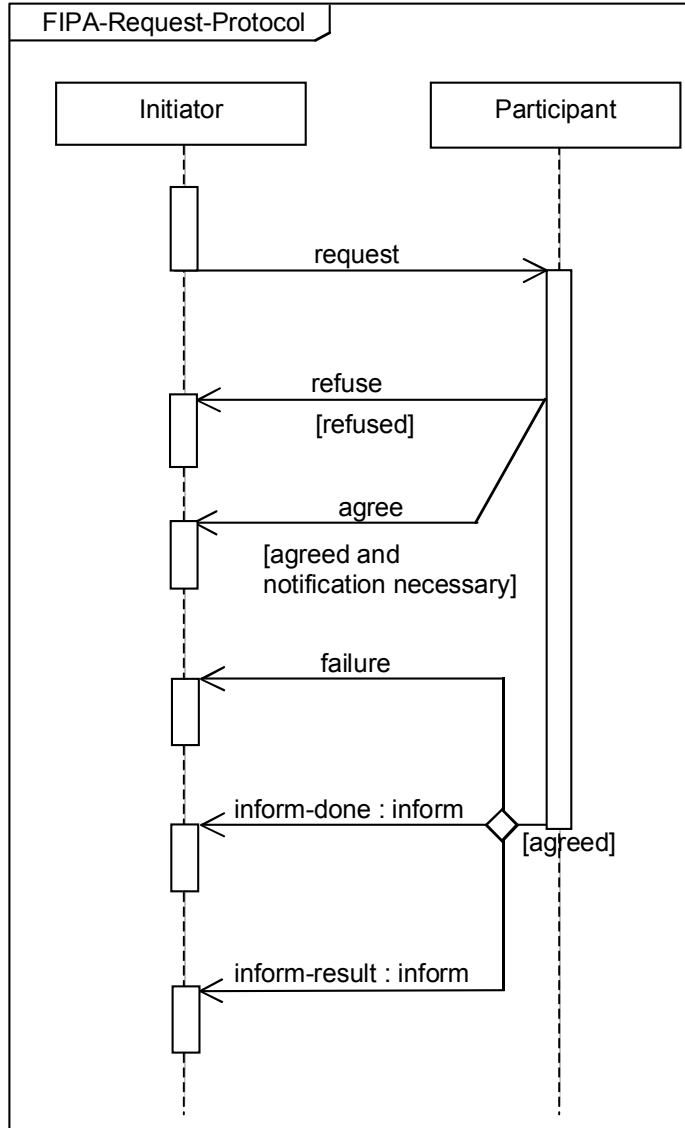


Figure 1: FIPA Request Interaction Protocol

1.1 Explanation of the Protocol Flow

The FIPA Request Interaction Protocol (IP) allows one agent to request another to perform some action. The Participant processes the request and makes a decision whether to accept or refuse the request. If a refuse decision is made, then "refused" becomes true and the Participant communicates a `refuse`. Otherwise, "agreed" becomes true.

If conditions indicate that an explicit agreement is required (that is, "notification necessary" is true), then the Participant communicates an `agree`. The `agree` may be optional depending on circumstances, for example, if the requested

64 action is very quick and can happen before a time specified in the `reply-by` parameter. Once the request has been
 65 agreed upon, then the Participant must communicate either:

- 66
- 67 • A `failure` if it fails in its attempt to fill the request,
- 68
- 69 • An `inform-done` if it successfully completes the request and only wishes to indicate that it is done, or,
- 70
- 71 • An `inform-result` if it wishes to indicate both that it is done and notify the initiator of the results.
- 72

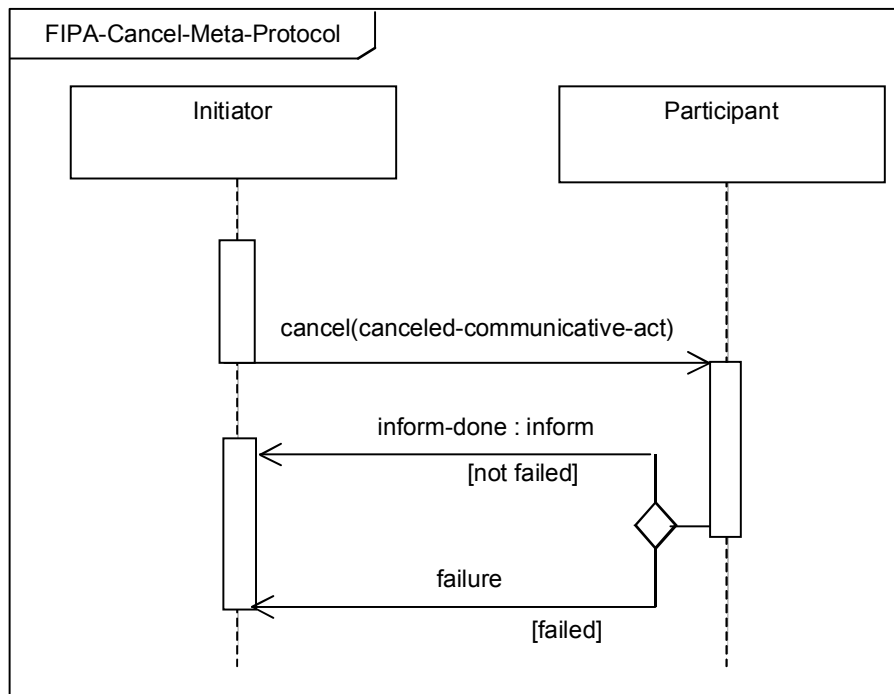
73 Any interaction using this interaction protocol is identified by a globally unique, non-null `conversation-id` parameter,
 74 assigned by the Initiator. The agents involved in the interaction must tag all of its ACL messages with this conversation
 75 identifier. This enables each agent to manage its communication strategies and activities, for example, it allows an
 76 agent to identify individual conversations and to reason across historical records of conversations.

78 **1.2 Exceptions to Protocol Flow**

79 At *any* point in the IP, the receiver of a communication can inform the sender that it did not understand what was
 80 communicated. This is accomplished by returning a `not-understood` message. As such, *Figure 1* does not depict a
 81 `not-understood` communication as it can occur at any point in the IP. The communication of a `not-understood`
 82 within an interaction protocol may terminate the entire IP and termination of the interaction may imply that any
 83 commitments made during the interaction are null and void.

84

85 At any point in the IP, the initiator of the IP may cancel the interaction protocol by initiating the meta-protocol shown in
 86 *Figure 2*. The `conversation-id` parameter of the cancel interaction is identical to the `conversation-id` parameter
 87 of the interaction that the Initiator intends to cancel. The semantics of `cancel` should roughly be interpreted as meaning
 88 that the initiator is no longer interested in continuing the interaction and that it should be terminated in a manner
 89 acceptable to both the Initiator and the Participant. The Participant either informs the Initiator that the interaction is done
 90 using an `inform-done` or indicates the failure of the cancellation using a `failure`.



92 **Figure 2: FIPA Cancel Meta-Protocol**

93
94

95 This IP is a pattern for a simple interaction type. Elaboration on this pattern will almost certainly be necessary in order to
96 specify all cases that might occur in an actual agent interaction. Real world issues such as the effects of cancelling
97 actions, asynchrony, abnormal or unexpected IP termination, nested IPs, and the like, are explicitly not addressed here.
98

99

2 References

100
101
102
103
104

[Odell2001] Odell, James, Van Dyke Parunak, H. and Bauer, B., *Representing Agent Interaction Protocols in UML*. In: Agent-Oriented Software Engineering, Ciancarini, P. and Wooldridge, M., Eds., Springer, pp. 121-140, Berlin, 2001.
<http://www.fipa.org/docs/input/f-in-00077/>

105 3 Informative Annex A — ChangeLog

106 3.1 2002/11/01 - version G by TC X2S

- 107 Page 1, Figure 1: The communication labeled `inform-ref` was changed to `inform-result` for clarity; the
108 purpose of this communication is to inform the initiator of a result and `inform-result`
109 implies `inform-done`
- 110 Page 1, Figure 1: The `not-understood` communication was removed
- 111 Page 1, Figure 1: Reworked the protocol flow to make the `agree` optional which also involved changing the
112 exclusive-or with the `agree` to a different AUML notation
- 113 Page 1, Figure 1: To conform to UML 2, the protocol name was placed in a boundary, `x` is removed from the
114 diamonds (`xor` is now the default) and the template box was removed
- 115 Page 1, line 41: Reworked and expanded the section description of the IP
- 116 Page 1, line 50: Added a new section on Explanation of Protocol Flow
- 117 Page 1, line 50: Reworked and expanded the section on Exceptions of Protocol Flow to incorporate a meta-
118 protocol for cancel
- 119 Page 1, line 50: Added a paragraph explaining the `not-understood` communication and its relationship with
120 the IP
121

122 3.2 2002/12/03 - version H by FIPA Architecture Board

- 123 Entire document: Promoted to Standard status
124