

FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Subscribe Interaction Protocol Specification

Document title	FIPA Subscribe Interaction Protocol Specification		
Document number	SC00035H	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>		

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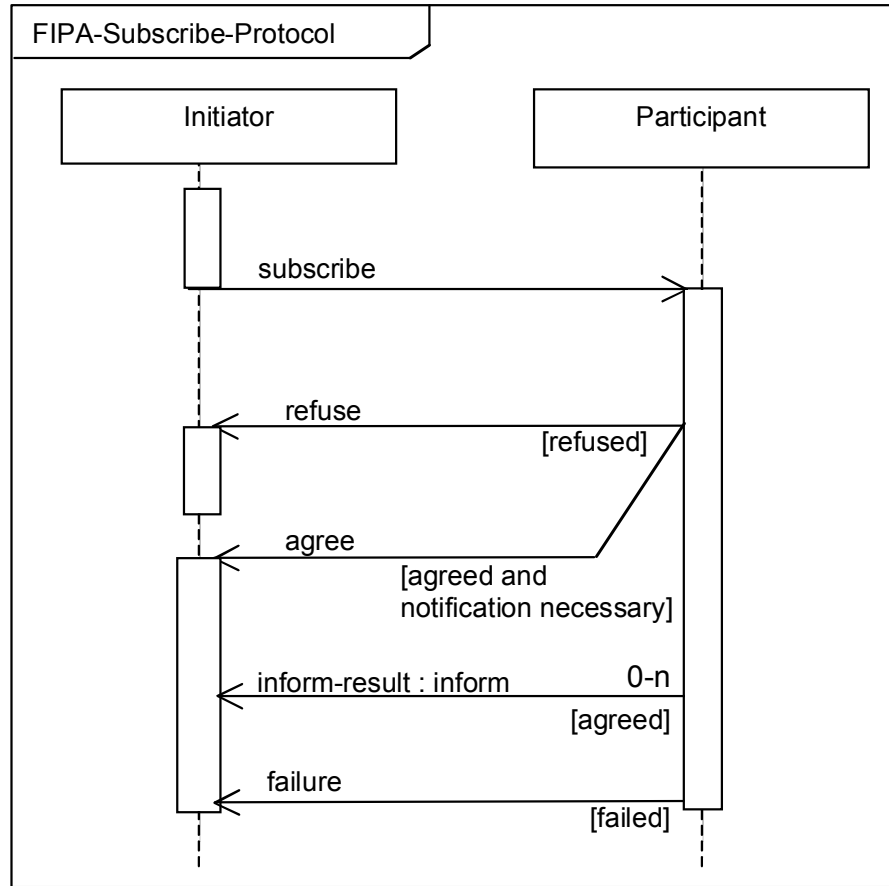
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47 **1 FIPA Subscribe Interaction Protocol**

48 The FIPA Subscribe Interaction Protocol (IP) allows an agent to request a receiving agent to perform an action on
 49 subscription and subsequently when the referenced object changes.

50
 51 The representation of this IP is given in *Figure 1* which is based on an extension of UML 1.x. [Odell2001]. This protocol
 52 is identified by the token `fipa-subscribe` as the value of the `protocol` parameter of the ACL message.
 53



54
 55
 56 **Figure 1: FIPA Subscribe Interaction Protocol**
 57

58 **1.1 Explanation of the Protocol Flow**

59 The Initiator begins the interaction with a `subscribe` message containing the reference of the objects in which they are
 60 interested. The Participant processes the `subscribe` message and makes a decision whether to accept or refuse the
 61 query request. If the Participant makes a `refuse` decision, then “`refused`” becomes true and the Participant
 62 communicates a `refuse`. Otherwise, “`agreed`” becomes true.

63
 64 If conditions indicate that an explicit agreement is required (that is, “`notification necessary`” is true), then the Participant
 65 communicates an `agree`. The `agree` may be optional depending on circumstances, for example, if the requested
 66 action is very quick and can happen before a time specified in the `reply-by` parameter.

67
 68 In a successful response, the Participant replies with an `inform-result` communication with the content being a
 69 referring expression to the subscribed objects. The Participant continues to send `inform-result` messages as the
 70 objects denoted by the referring expression change. If at some point after the Participant agrees, it experiences a

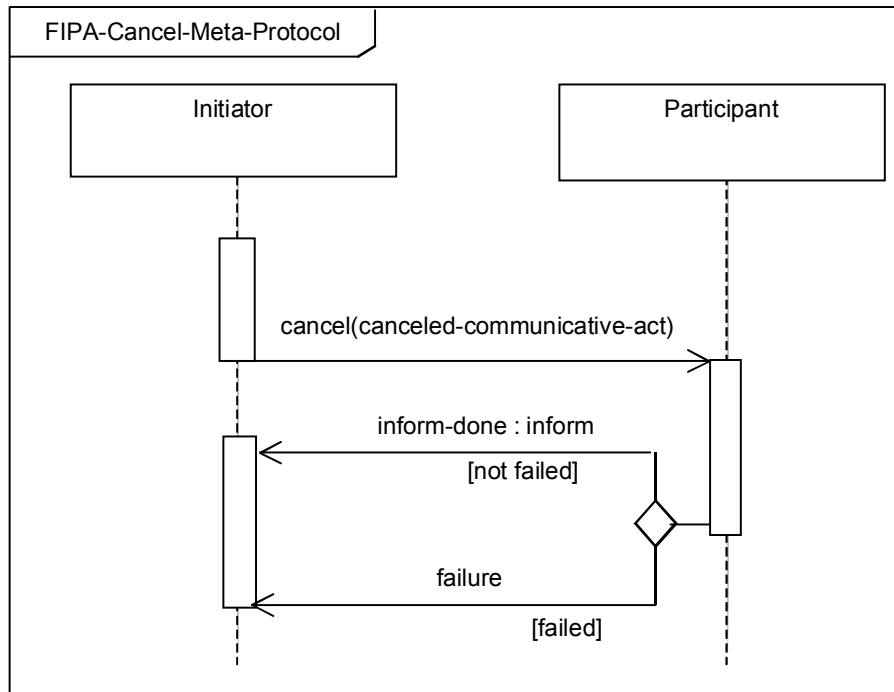
71 failure, then it communicates this with a `failure` message, which also terminates the interaction. Otherwise, the
 72 interaction may be terminated by the Initiator using the cancel meta-protocol as described in Section 1.2.
 73

74 Any interaction using this interaction protocol is identified by a globally unique, non-null `conversation-id` parameter,
 75 assigned by the Initiator. The agents involved in the interaction must tag all of its ACL messages with this conversation
 76 identifier. This enables each agent to manage its communication strategies and activities, for example, it allows an
 77 agent to identify individual conversations and to reason across historical records of conversations. Additionally,
 78 because it may be important to preserve the sequence of the `inform-result` messages, it is important that the
 79 message transport used for this IP preserve the ordering of messages.
 80

81 **1.2 Exceptions to Interaction Protocol Flow**

82 At *any* point in the IP, the receiver of a communication can inform the sender that it did not understand what was
 83 communicated. This is accomplished by returning a `not-understood` message. As such, *Figure 1* does not depict a
 84 `not-understood` communication as it can occur at any point in the IP. The communication of a `not-understood`
 85 within an interaction protocol may terminate the entire IP and termination of the interaction may imply that any
 86 commitments made during the interaction are null and void.
 87

88 At any point in the IP, the initiator of the IP may cancel the interaction protocol by initiating the meta-protocol shown in
 89 *Figure 2*. The `conversation-id` parameter of the cancel interaction is identical to the `conversation-id` parameter
 90 of the interaction that the Initiator intends to cancel. The semantics of cancel should roughly be interpreted as meaning
 91 that the initiator is no longer interested in continuing the interaction and that it should be terminated in a manner
 92 acceptable to both the Initiator and the Participant. The Participant either informs the Initiator that the interaction is done
 93 using an `inform-done` or indicates the failure of the cancellation using a `failure`.
 94



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

96 This IP is a pattern for a simple interaction type. Elaboration on this pattern will almost certainly be necessary in order to
 97 specify all cases that might occur in an actual agent interaction. Real world issues such as the effects of cancelling
 98 actions, asynchrony, abnormal or unexpected IP termination, nested IPs, and the like, are explicitly not addressed here.
 99
 100
 101

102 **2 References**

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

105 [Odell2001] Odell, James, Van Dyke Parunak, H. and Bauer, B., *Representing Agent Interaction Protocols in UML*.
106 In: Agent-Oriented Software Engineering, Ciancarini, P. and Wooldridge, M., Eds., Springer, pp. 121-
107 140, Berlin, 2001.
108 <http://www.fipa.org/docs/input/f-in-00077/>
109

110 **3 Informative Annex A — ChangeLog**

111 **3.1 2002/11/01 - version G by TC X2S**

- 112 Page 1, Figure 1: The *not-understood* communication was removed
- 113 Page 1, Figure 1: Reworked the protocol to insert an optional *agree*
- 114 Page 1, Figure 1: Deleted the explicit cancel from the protocol diagram because it has been moved to the meta-
115 protocol section
- 116 Page 1, Figure 1: Added guards to the diagram to indicate that the protocol may be terminated by reaching the
117 end of the conversation-length
- 118 Page 1, Figure 1: To conform to UML 2, the protocol name was placed in a boundary, *x* is removed from the
119 diamonds (*xor* is now the default) and the template box was removed
- 120 Page 1, line 42: Reworked and expanded the section description of the IP
- 121 Page 1, line 54: Added a new section on Explanation of Protocol Flow
- 122 Page 1, line 54: Reworked and expanded the section on Exceptions of Protocol Flow to incorporate a meta-
123 protocol for cancel
- 124 Page 1, line 54: Added a paragraph explaining the *not-understood* communication and its relationship with
125 the IP
- 126

127 **3.2 2002/12/03 - version H by FIPA Architecture Board**

- 128 Entire document: Promoted to Standard status
- 129