FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Request Interaction Protocol Specification

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http://www.fipa.org/
Geneva, Switzerland

Foreword

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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.

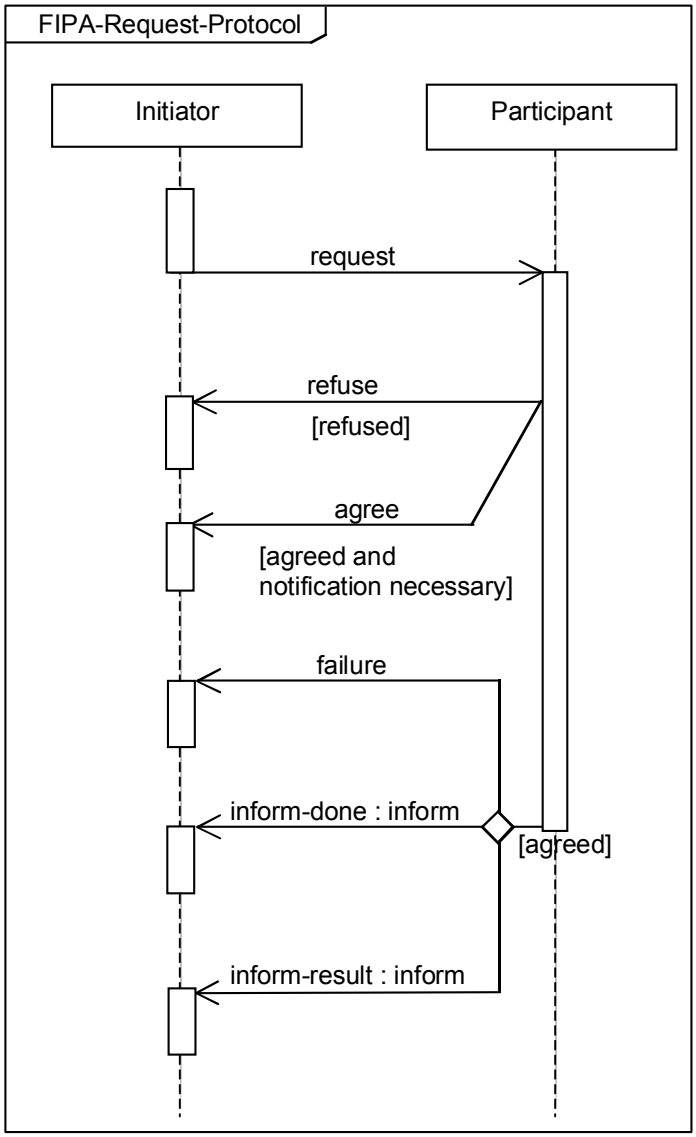

Figure 1: FIPA Request Interaction Protocol

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

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

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

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

1.2 Exceptions to Protocol Flow

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

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

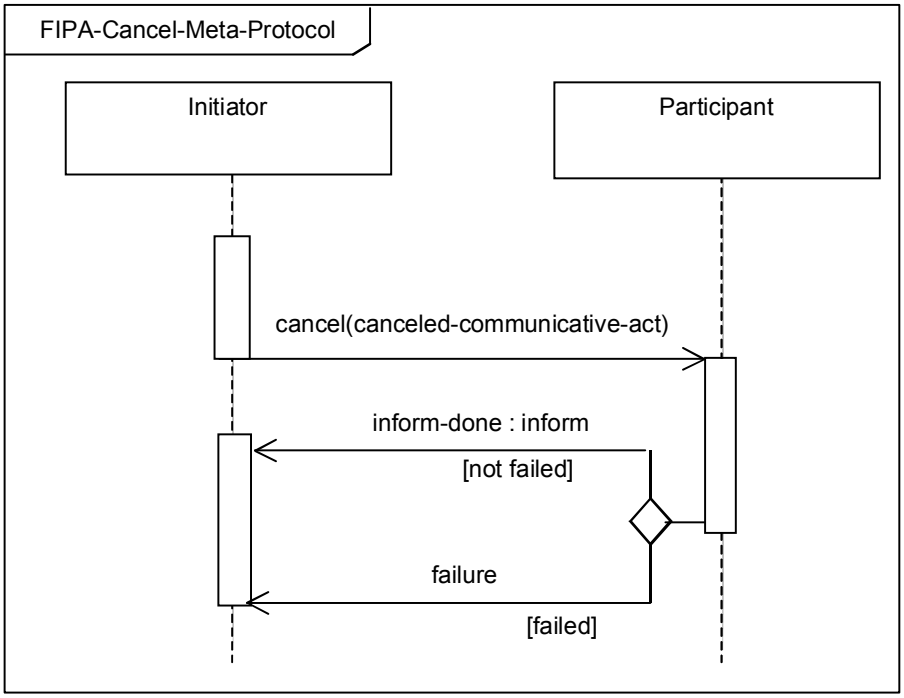

Figure 2: FIPA Cancel Meta-Protocol

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

2 References

[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/

3 Informative Annex A — ChangeLog

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

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