

FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Brokering Interaction Protocol Specification

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19 **Foreword**

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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.

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29 participation in FIPA.

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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.

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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/>.

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42 1 FIPA Brokering Interaction Protocol

43 The concept of an information brokerage has been widely used in mediated systems and in multi-agent systems in
44 particular (for example, see [Finin97]). The FIPA Brokering Interaction Protocol (IP) is designed to support these
45 brokerage interactions in multi-agent systems.

46
47 Generally speaking, a broker is an agent which offers a set of communication facilitation services to other agents using
48 some knowledge about the requirements and capabilities of those agents. A typical example of brokering is one in
49 which an agent can request a broker to find one or more agents who can answer a query. The broker then determines a
50 set of appropriate agents to which to forward the query, sends the query to those agents and relays their answers back
51 to the original requestor. The use of brokerage agents can significantly simplify the task of interaction with agents in a
52 multi-agent system. Additionally, brokering agents also enable a system to be adaptable and robust in dynamic
53 situations, supporting scalability and security control at the brokering agent.

54
55 The FIPA Brokering IP is a macro IP, because the *proxy* communicative act (see [FIPA00037]) for brokerage embeds a
56 communicative act as its argument and so the IP for the embedded communicative act is also embedded in this IP.
57 When the embedded communicative act includes some actions that would be done by the agents determined by broker
58 agents, then this IP would be extended for notifying the result of the actions.

59
60 The broker agent should record some of the ACL parameters (see [FIPA00061]), for example, `:conversation-id`,
61 `:reply-with` and `:sender`, of the received *proxy* message to forward back the replying message to the
62 corresponding original agent (the sender of the *proxy* message).

63
64 The representation of this IP is given in *Figure 1*.
65

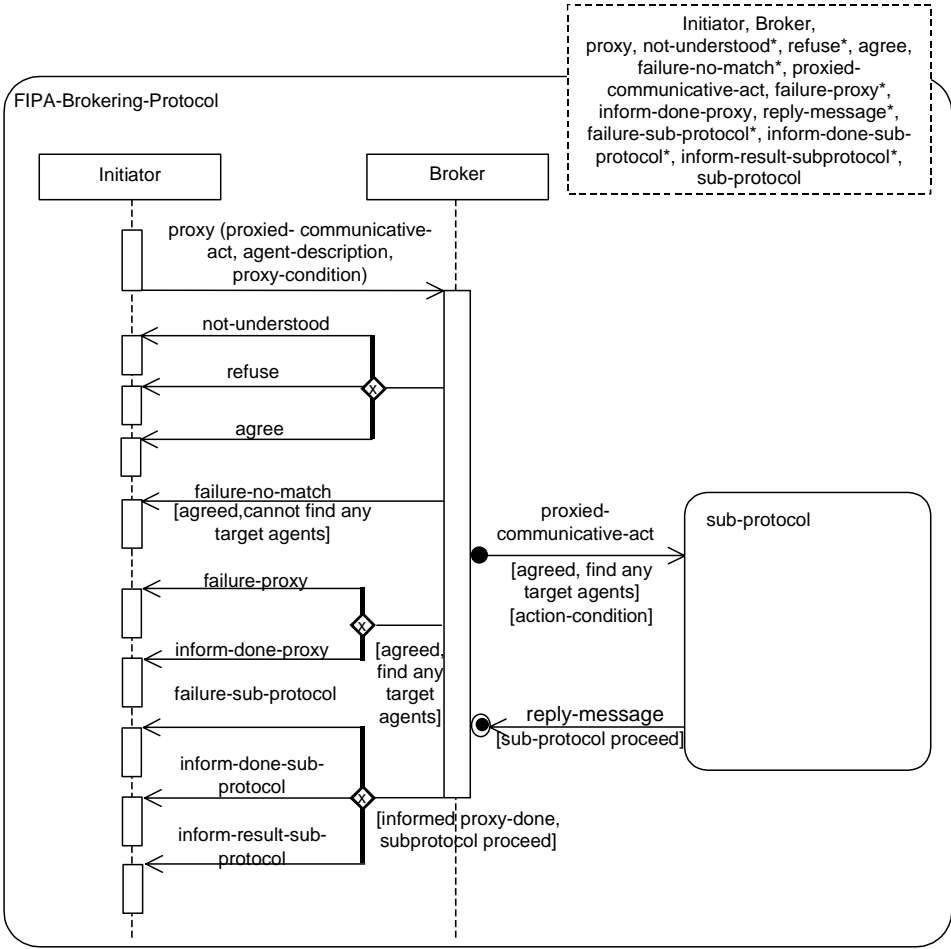


Figure 1: FIPA Brokering Interaction Protocol

1.1 Exceptions to Interaction Protocol Flow

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 of cancelling actions, asynchrony, abnormal or unexpected IP termination, nested IPs, and the like, are explicitly not addressed here.

2 References

- [Finin97] Finin, T. Labrou, Y. and Mayfield, J., KQML as an Agent Communication Language. In: Software Agents, Bradshaw, J. (editor), MIT Press, 1997.
- [FIPA00037] FIPA Communicative Act Library Specification. Foundation for Intelligent Physical Agents, 2000.
<http://www.fipa.org/specs/fipa00037/>
- [FIPA00061] FIPA ACL Message Structure Specification. Foundation for Intelligent Physical Agents, 2000.
<http://www.fipa.org/specs/fipa00061/>