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FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

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FIPA English Auction Interaction Protocol 4 Specification

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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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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 English Auction Interaction Protocol

43 In the FIPA English Auction Interaction Protocol (IP), the auctioneer seeks to find the market price of a good by initially
44 proposing a price below that of the supposed market value and then gradually raising the price. Each time the price is
45 announced, the auctioneer waits to see if any buyers will signal their willingness to pay the proposed price. As soon as
46 one buyer indicates that it will accept the price, the auctioneer issues a new call for bids with an incremented price. The
47 auction continues until no buyers are prepared to pay the proposed price, at which point the auction ends. If the last
48 price that was accepted by a buyer exceeds the auctioneer's (privately known) reservation price, the good is sold to that
49 buyer for the agreed price. If the last accepted price is less than the reservation price, the good is not sold

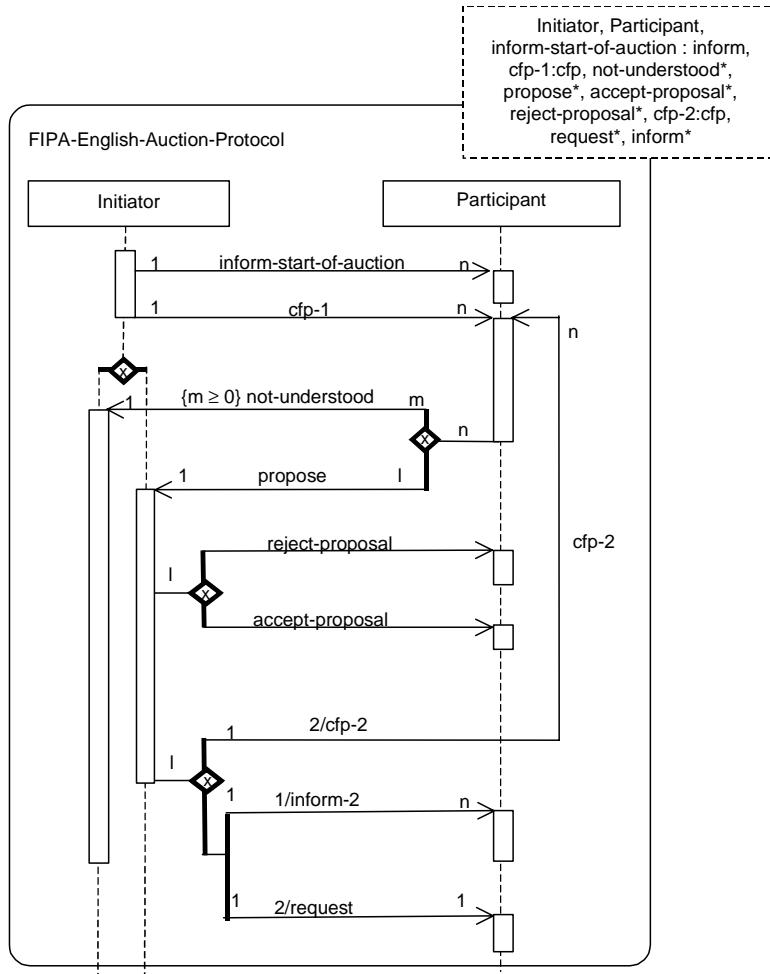
50
51 In *Figure 1*, the auctioneer's calls, expressed as the general *cfp* act (see [FIPA00037]), are multicast to all participants
52 in the auction. For simplicity, only one instance of the message is portrayed. Note also that in a physical auction, the
53 presence of the auction participants in one room effectively means that each acceptance of a bid is simultaneously
54 broadcast to all participants and not just the auctioneer. This may not be true in an agent marketplace, in which case it
55 is possible for more than one agent to attempt to bid for the suggested price. Even though the auction will continue for
56 as long as there is at least one bidder, the agents will need to know whether their bid (represented by the *propose* act -
57 see [FIPA00037]) has been accepted. Hence the appearance in the IP of the *accept-proposal* (see [FIPA00037]) and
58 *reject-proposal* acts (see [FIPA00037]), despite this being implicit in the English Auction process that is being modelled.

59
60 Note that the proposals that are submitted by the bidders primarily concern the bidding process. In response to a *cfp* to
61 submit bids to purchase a good X, a proposal would be something of the order: "I propose that the bidding level be
62 raised to purchase price Z and I assert that I am able to pay Z for X." This allows the auctioneer to be confident that the
63 bidder can indeed pay the price without committing to actually paying it until the auctioneer specifically requests X (at
64 price Z) from the winning bidder.

65
66 At the end of the IP, the auctioneer will typically enter a *request* IP (see [FIPA00026]) with the winning bidder to
67 complete the auction transaction.

68
69 The representation of this IP is given in *Figure 1*.

70

**Figure 1:** FIPA English Auction Interaction Protocol71
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74**75 1.1 Exceptions to Interaction Protocol Flow**

76 This IP is a pattern for a simple interaction type. Elaboration on this pattern will almost certainly be necessary in order to
 77 specify all cases that might occur in an actual agent interaction. Real world issues of cancelling actions, asynchrony,
 78 abnormal or unexpected IP termination, nested IPs, and the like, are explicitly not addressed here.
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80 2 References

- 81 [FIPA00026] FIPA Request Interaction Protocol Specification. Foundation for Intelligent Physical Agents, 2000.
82 <http://www.fipa.org/specs/fipa00026/>
- 83 [FIPA00037] FIPA Communicative Act Library Specification. Foundation for Intelligent Physical Agents, 2000.
84 <http://www.fipa.org/specs/fipa00037/>