

FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Proxy Communicative Act Specification

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Contents

1 Scope..... 1
2 Proxy 2
3 References..... 4

1 Scope

This document specifies the Proxy communicative act which is compliant to [FIPA00037] requirements.

2 Proxy

Summary	The sender wants the receiver to select target agents denoted by a given description and to send an embedded message to them.
Content	A tuple of a descriptor, that is, a referential expression, that denotes the target agents, an ACL communicative act, that is, an ACL message, to be performed to the agents, and a constraint condition for performing the embedded communicative act, for example, the maximum number of agents to be forwarded, etc.
Description	<p>The sending agent informs the recipient that the sender wants the receiver to identify agents that satisfy the given descriptor, and to perform the embedded communicative act to them, that is, the receiver sends the embedded message to them.</p> <p>On performing the embedded communicative act, the <code>:receiver</code> parameter is set to the denoted agent and the <code>:sender</code> parameter is set to the receiver of the <i>proxy</i> message. If the embedded communicative act contains a <code>:reply-to</code> parameter (for example, in the recruiting case with <i>fipa-recruiting</i> in the <code>:protocol</code> parameter), it should be preserved in the performed message.</p> <p>In the case of a brokering request, that is, the <code>:protocol</code> parameter is set to <i>fipa-brokering</i>, the brokerage agent (the receiver of the <i>proxy</i> message) must record some parameters, such as <code>:conversation-id</code>, <code>:reply-with</code>, <code>:sender</code>, etc., of the received <i>proxy</i> message to forward back the reply message(s) from the target agents to the corresponding requester agent (the sender of the <i>proxy</i> message).</p>
Formal Model	$\langle i, \text{proxy}(j, \text{Ref } x \delta(x), \langle j, \text{cact} \rangle, \phi) \rangle \equiv$ $\langle i, \text{inform}(j, I_i((\exists y) (B_j (\text{Ref } x \delta(x) = y) \wedge \text{Done}(\langle j, \text{cact}(y) \rangle, B_j \phi)))) \rangle$ $\text{FP} : B_i \alpha \wedge \neg B_i (Bif_j \alpha \vee Uif_j \alpha)$ $\text{RE} : B_j \alpha$ <p>Where:</p> $\alpha = I_i((\exists y) (B_j (\text{Ref } x \delta(x) = y) \wedge \text{Done}(\langle j, \text{cact}(y) \rangle, B_j \phi)))$ <p>Agent <i>i</i> wants <i>j</i> to perform the embedded communicative act to the denoted agents (<i>y</i>) by <i>Ref x δ(x)</i>.</p> <p>Note: $\langle j, \text{cact} \rangle$ in the proxy message is the ACL communicative act, that is, the ACL message, without a <code>:receiver</code> parameter. <i>Ref x δ(x)</i> is one of the referential expressions: $\text{!}x \delta(x)$, any $x \delta(x)$ or all $x \delta(x)$.</p> <p>Two types of proxy can be distinguished. We will call the type of proxy defined above <i>strong</i>, because it is a feasibility precondition of <i>j</i>'s communicative act to <i>y</i> that <i>j</i> satisfies the feasibility preconditions of the proxied communicative act. So, if <i>i</i> proxies an inform of the proposition ? to <i>y</i> via <i>j</i>, <i>j</i> must believe ? before it sends the proxied inform message to <i>y</i>.</p> <p>In addition, we could define <i>weak-proxy</i>, where we do not suppose that <i>j</i> is required to believe ?. In this case, <i>j</i> cannot directly inform <i>y</i> of ?, because <i>j</i> does not satisfy the feasibility preconditions of inform. In this case, <i>j</i> can only inform <i>y</i> that the original sender <i>i</i> has the intention that the inform of ? should happen. More generally, a <i>weak-proxy</i> can be expressed as an instance of proxy where the action $\langle j, \text{cact}(y) \rangle$ is replaced by $\langle j, \text{inform}\langle y, I_i \text{Done}(\langle i, \text{cact}(y) \rangle) \rangle \rangle$.</p>

Example	<p>Agent <i>i</i> requests agent <i>j</i> to do recruiting and request a video-on-demand server to send "SF" programs.</p> <pre>(proxy :sender i :receiver j :content ((iota ?x (registered (:agent-description (:name ?x) (:service-description (:service-name video-on-demand)))))) (request :sender j :content (action (send-program (:category "SF"))) :ontology vod-server-ontology :language FIPA-SL :protocol fipa-request :reply-to i :conversation-id request-vod-1) true) :language FIPA-SL :ontology brokerage-agent :protocol fipa-recruiting :conversation-id vod-brokering-1 ...)</pre>
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3 References

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