

FOUNDATION FOR INTELLIGENT PHYSICAL AGENTS

FIPA Propagate Communicative Act Specification

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1 Scope

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

2 Propagate

Summary	The sender intends that the receiver treat the embedded message as sent directly to the receiver, and wants the receiver to identify the agents denoted by the given descriptor and send the received <i>propagate</i> message to them.
Content	A tuple of a descriptor, that is, a referential expression, denoting an agent or agents to be forwarded the <i>propagate</i> message, an embedded ACL communicative act, that is, an ACL message, performed by the sender to the receiver of the <i>propagate</i> message and a constraint condition for propagation, for example, timeout.
Description	<p>This is a compound action of the following two actions. First, the sending agent requests the recipient to treat the embedded message in the received <i>propagate</i> message as if it is directly sent from the sender that is, as if the sender performed the embedded communicative act directly to the receiver. Second, the sender wants the receiver to identify agents denoted by the given descriptor and to send a modified version of the received <i>propagate</i> message to them, as described below.</p> <p>On forwarding, the <i>:receiver</i> parameter of the forwarded <i>propagate</i> message is set to the denoted agent(s) and the <i>:sender</i> parameter is set to the receiver of the received <i>propagate</i> message. The sender of the embedded communicative act of the forwarded <i>propagate</i> message is also set to the same agent as the <i>propagate</i> message's sender.</p> <p>This communicative act is designed for delivering messages through federated agents by creating a chain (or tree) of <i>propagate</i> messages. An example of this is instantaneous brokerage requests using a <i>proxy</i> message (see [FIPA00052]) or persistent requests by a <i>request-when</i> message (see [FIPA00058]) embedding a <i>proxy</i> message.</p>
Formal Model	$\langle i, \text{propagate}(j, \text{Ref } x \delta(x), \langle i, \text{cact} \rangle, \phi) \rangle \equiv \langle i, \text{cact}(j) \rangle;$ $\langle i, \text{inform}(j, I_i((\exists y) (B_j (\text{Ref } x \delta(x) = y) \wedge \text{Done}(\langle j, \text{propagate}(y, \text{Ref } x \delta(x), \langle j, \text{cact} \rangle, \phi) \rangle, B_j \phi)))) \rangle$ <p>FP: $\text{FP}(\text{cact}) \wedge B_i \alpha \wedge \neg B_i (B_i f_j \alpha \vee \text{Uif}_j \alpha)$</p> <p>RE: $\text{Done}(\text{cact}) \wedge B_j \alpha$</p> <p>Where:</p> $\alpha = I_i((\exists y) (B_j (\text{Ref } x \delta(x) = y) \wedge \text{Done}(\langle j, \text{propagate}(y, \text{Ref } x \delta(x), \langle j, \text{cact} \rangle, \phi) \rangle, B_j \phi)))$ <p>Agent <i>i</i> performs the embedded communicative act to <i>j</i>: $\langle i, \text{cact}(j) \rangle$ and <i>i</i> wants <i>j</i> to send the <i>propagate</i> message to the denoted agent(s) by $\text{Ref } x \delta(x)$.</p> <p>Note: $\langle i, \text{cact} \rangle$ in the <i>propagate</i> message is the ACL communicative act. that is, the ACL message, without a <i>:receiver</i> parameter. $\text{Ref } x \delta(x)$ is one of the referential expressions: $\text{!}x \delta(x)$, $\text{any } x \delta(x)$ or $\text{all } x \delta(x)$.</p>

Example	<p>Agent <i>i</i> requests agent <i>j</i> and its federating other brokerage agents to do brokering a video-on-demand server agent to obtain "SF" programs.</p> <pre> (propagate :sender i :receiver j :content ((iota ?x (registered (:agent-description (:name ?x) (:service-description (:service-name agent-brokerage)))))) (proxy :content ((iota ?y (registered (:agent-description (:name ?y) (:service-description (:service-name video-on-demand)))))) (request :content (action (send-program (:category "SF"))) :ontology vod-server-ontology :protocol fipa-request ...) true) :ontology brokerage-agent-ontology :conversation-id vod-brokering-2 :protocol fipa-brokering ...) (hop-limit 5)) :ontology brokerage-agent-ontology :hop-count 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/>
- [FIPA00052] FIPA Proxy Communicative Act Specification. Foundation for Intelligent Physical Agents, 2000.
<http://www.fipa.org/specs/fipa00052/>
- [FIPA00058] FIPA Request When Communicative Act Specification. Foundation for Intelligent Physical Agents, 2000.
<http://www.fipa.org/specs/fipa00058/>