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LASEC: A Localized Approach To Service Composition In Pervasive Computing Enviornments

Abstract

Pervasive computing environments (PvCE) are embedded with interconnected smart devices which provide users with services desired. As the service composition environment may be dynamic and large scale, centralized service composition algorithm is usually inefficient due to message cost.In this localized service composition algorithm (LASEC), UIOs collaborate with each other in a bottom-up, localized manner to compose required service without requiring global knowledge.

The proposed localized service composition algorithm (LASEC) in the given paper, UIOs collaborate with each other in a bottom-up, localized manner to compose required service without requiring global knowledge. To solve the problem of blind compositions in LASEC, we propose a novel mechanism called Alien-information-based Acknowledging (A-Ack), in which a UIO decides on collaborating with another UIO only after obtaining some additional information from the collaboration candidate. Specifically,this information refers to ability of a given UIO to compose another part of the service. Proposed LASEC is message-efficient and quality-guaranteed. Extensive simulations of LASEC as well as existing decentralized and pull-based centralized algorithms have been conducted. The results show the relatively low communication cost and composition time of LASEC.