MAT: a Mobile Agent System for Supporting Autonomous Mobile Agents

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Mobile Agent Template (MAT) is a mobile agent system that is under study and development at the Institute of Computing Technology, Chinese Academy of Sciences and sponsored by the University of Wollongong, Australia. MAT is not an alternative to other mobile agent systems, but is an agent system that can provide the autonomy to mobile agents. MAT tries to support new Web applications, such as the mobile computation, by autonomous and mobile agents. Mobile Thread Programming Model (MTPM), Distributed Task Plan (DTP) and Active State Space (ASS) are integral components on which MAT is constructed. Integration of these three components provides agents with an autonomous work mode and an autonomy-supporting execution environment. In this paper, we define autonomies of agents in the context of mobility and propose our autonomous theories, which are autonomous workflow, asynchronous and localised interactions, and a virtual supporting environment. This paper also outlines current implementation mechanisms of MAT including architecture, program paradigm, distributed task planning and communications. The main contributions of this research are that: (1) workflows are adopted as agents’ working modes; (2) a goal-directed and dynamic task planning is used to deal with the heterogeneity and dynamism of networks; and (3) a virtually platform-independent environment is constructed to provide mobile agents with asynchronous, anonymous and fully localised interactions. The innovation of this research is to provide a new solution for novel Web applications such as mobile computations by using MAT.

Keywords: autonomous agent, mobile agent system, distributed supporting environment, thread migration