Towards a Mobile Enterprise Framework

Andry Rakotoinirainy†††, Seng Wai Loke†, Arkady Zaslavsky††
†††CRC for Distributed Systems Technology, University of Queensland
Level 7, General Purpose, The University of Queensland, QLD 4072, Australia
andry@dstc.edu.au

†CRC for Distributed Systems Technology, Monash University
††School of Computer Science and Software Engineering
Monash University, Caulfield VIC 3145, Australia
swloke@dstc.monash.edu.au,A.Zaslavsky@csse.monash.edu.au

The RM-ODP Enterprise Language comprises concepts, rules and structures for the specification of a community, where a community comprises objects (human, software, or combinations thereof) formed to meet an objective. The Enterprise Language focuses on the purpose, scope and policies of the community, where an enterprise policy is a set of rules with a particular objective related to the community’s purpose described as obligations, prohibitions, and permissions.

We see the language as providing useful concepts for high-level modelling of a distributed system. But the language does not address or model mobility related issues. Although engineering or system level adaptation aims to provide mobility transparency to the enterprise level, our working hypothesis is that in many cases, decisions about reacting and adapting to changes in the mobile environment could best be made at the enterprise level, where enterprise-wide activities, services, goals, and policies are visible and could be considered. For instance, new objects could move into the enterprise (perhaps from other enterprises) or existing objects could leave the enterprise, i.e. the community membership changes, and some roles could be occupied by more objects, and others by fewer objects. There might be a need to create new roles as new components enter. Moreover, existing policies might not make sense due to changes effected by mobility. An object could have been assigned its initial role because its capabilities matched its role. However, as the object has moved, its resources might now have changed, and it might now be situated in an environment which further limits (or increases) its capabilities (e.g., Quality of Service (QoS) changes in connectivity or wrong location), so that the object is now unable to occupy that role or could occupy some other role. Hence, object-to-role re-assignment might be needed, or policies constraining the behaviour of the roles would have to be inhibited or inhibited policies now activated. The change in the capabilities of objects could also lead to revision of the enterprise’s objectives.

In order to enable adaptations of the enterprise’s objectives, structure, policies and roles, we are designing a conceptual architecture with a process-oriented view of roles and policy adaptation mechanisms. Mobile enterprise objects interact with the rest of the community via processes called role-proxies. The role-proxies provide services to the objects, monitors the activities and environment of the objects, and perform adaptations where necessary. For example, in the event of a disconnection, (some of) the obligations on the object might be delegated to the object’s agent which acts on behalf of the object during disconnection. The agent (with partial authorization) might be unable to fulfill all obligations of the object, and so some policies might be relaxed.

The broader context of this work is a Mobile Enterprise Architecture Description Language (MEADL) that features adaptation involving policies for handling effects in the mobile environment such as disconnections, dynamic changes in enterprise membership, and fluctuations in Quality of Service.†

†The work reported in this paper has been funded in part by the Co-operative Research Centre Program through the Department of Industry, Science & Tourism of the Commonwealth Government of Australia.