Mobility Management in Publish/Subscribe Middleware

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ABSTRACT

In this research work, a survey on Mobility issues in Publish/Subscribe (P/S) Middleware and their applications was carried out. Publish/subscribe is appearing as a communication paradigm matching well with highly dynamic distributed applications characterized by reconfigurability, flexibility, and scalability. Nevertheless, very few efforts tackle dynamic modifications in the topology of the P/S distributed dispatching infrastructure despite such events represent a basic confrontation in mobile computing scenarios. In this paper, the authors clarify the mobility’s issues in the context of publish-subscribe middleware and survey solutions and protocols suggested by several research groups.

Keywords: Ad Hoc Networking, Mobile Computing, Mobility, Mobility Management, Publish/Subscribe Middleware

INTRODUCTION

The design of publish-subscribe middleware, illustrated in Figure 1, is posed to several challenges due to mobility. The most obvious one is possibly that the system’s topology, commonly supposed static by existing systems, at present becomes dynamic and calls for toleration of the continual reconfigurations caused by the movement of mobile nodes. This may have different effect, depending on the scenario of mobility.

In many situations, mobility is delegated to the system’s periphery. Examples include nomadic scenarios when traveling, or commuting from home to office. In such cases, the user disconnects from one network and reconnects to a different one. Hence the node accesses the network from another point; nevertheless the user maintains the access to the network thanks to specific protocols (e.g., VPN). Analogous studies and protocols treat the modification of the network access point, such as Mobile IP (Perkins, 2002) by preserving the connectivity transparently at the network level. Hence, in both of these scenarios, only the users are mobile, thus, the infrastructure of the network is stable.

Analogous concepts can be implemented into the publish/subscribe architecture by considering the clients as the end nodes, while the brokers represent the routers of the system. Similar concepts are applied with the exhibition

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