Implementing Integrated Services of Networked Home Appliances Using Service Oriented Architecture [*]

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ABSTRACT

This paper presents a method to implement integrated services of networked home electric appliances, which provide more convenient and comfortable living for home users. The conventional methods generally employ a home server to achieve the integrated services. The server controls all the networked appliances in a centralized manner. However, as the number of sophisticated appliances increases, the centralized server suffers from the concentration of load, as well as a decline in the reliability and interoperability. To cope with this problem, we adopt the service-oriented architecture (SOA) for the implementation of the integrated services. In the proposed framework, the appliances export own features as services, and autonomously execute the exported services one another. Thus, the appliances are loosely coupled via the exported services without any centralized home server, which enables more flexible, balanced and reliable integrated services. We first present a framework to design and implement the integrated services based on SOA, and then illustrate a prototype system developed with Web services. We also define three kinds of metrics (i.e., reliability, workload, and coupling), and conduct a comparative evaluation between the proposed and the previous systems.