Distributed Service Development in Personal Area Networks

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This paper presents the detailed description of the Middleware for Application Interconnection in Personal Area Networks (MAIPAN), which is designed to ease distributed service development for mobile and nomadic environment. This middleware provides a uniform computing environment for distributed applications that operate in dynamically changing personal area networks (PANs). MAIPAN hides the physical scatteredness and device configuration of the PAN and presents its capabilities as a single computer towards the applications. The solution provides easy set-up of PAN-wide applications utilizing multiple devices and allows transparent redirection of ongoing data flows when the configuration of the PAN changes. The proposed middleware interconnects services offered by applications running on different devices by creating virtual channels between the input and output outlets of the applications. Channels can be reconfigured when configuration or user needs change. In
contrast to the approaches found in the literature, MAIPAN is a solution where session transfer, dynamic session management are tightly integrated with strong and intuitive access control security. A prototype implementation demonstrates the capabilities of the middleware.

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