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Abstract
Nowadays, based on the changes of system load during run time to dynamically adjust system resources is not easy to reach. This thesis proposes an active mobile system. In the system, a running application may self-decide to migrate itself, due to reasons such as heavy local system load, to another light-loaded platform and go on its services. The trigger of migration activities is application-oriented and the services of application shall continue without interruption. We also discuss techniques of software migration and mobile IP in this article, and implement a prototype to identity the feasibility and benefits of the active mobile system.
The active mobile system is implemented on the Hot-swap System HS2, which we like to focus on embedded system applications. HS2 modularizes all system software as well as applications to independent modules which communicate each other only with message passing IPC. With functions of the user interface of the remote Hot-swap console, modules can be dynamically uploaded, downloaded, and hot-swapped without ceasing the system. With the abilities of on-line system software insertion and deletion, the system gains not only advantages of software optimization, dynamic maintenance, software reuse, but also load balance in a group of embedded systems. By the character of independent software modules, we implement a mechanism of mobile IP. The mechanism frees the server software to roaming around a group of platforms, without connection interruption and providing transparent services to clients.
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