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Abstract
In the world of developing an embedded system, the development phases always play an important role for a product to success. We proposed a dynamic and modularized system kernel architecture for embedded systems. Under the architecture, the kernel modules can be downloaded and uploaded via network communications. With the ability of dynamic replacement of kernel modules, the kernel software can be on-line upgraded. In addition, the hardware/software reuse, load balance and some other features can be easily achieved, those being difficult to implement in the traditional embedded systems. Because the kernel objects are configured with an on-line manner, the proposed kernel could be very adaptable to most target systems, easing modification of system software, and making more competitive in the product market.

With the rapid development of network, a trend emerged for embedded systems to go toward network integration. So, for a modern kernel of embedded systems, the network ability is currently quite essential. In this thesis, we discussed and implemented a prototype of modularized kernel system, which is called mOS. In the system, we also developed a high compatible TCP/UDP stack, which is controlled by the kernel and keeps efficiency for the network environment.
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