Abstract

Embedded Linux became a dominant choice in the embedded entertainment and mobile systems. Their adoption in widely used control applications is the second phase of their embedded market domination. One of the most important criteria of the control RTOS is their determinism/overhead ratio. Actually, many extensions exist to bring real-time capability into the
Linux kernel. On the other hand standard computer architecture become widely adopted in the embedded market, with a large variety of performances and power requirement.

In this paper, we study the impact of timing enhancement offered by various real-time Linux kernel extensions and their impact into the overall system performance. The obtained results are compared with the standard and server kernels performances.

We used for our study a multi-core Intel® based architecture since we considered the trend of the embedded control market for this kind of architectures.

In our work we studied two metrics to reflect the performance of the studied kernel that are latency and throughput. Such work can be used to orient the adoption of real-time Linux extension for a given hardware architecture to reach control application requirements.

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**Index Terms**

Computer Science | Operating Systems

**Key words**

Real-time Linux | Xenomai
LowLatency | PREEMPT-RT

control applications