



February 16, 2011

International Journal of Distributed Sensor Networks
Editor
Prof. Cem Ersoy

Dear Prof. Ersoy,

A new revised version of the manuscript "A Comprehensive Approach to Power Management in Embedded Systems", initially submitted to the International Journal of Distributed Sensor Networks on September 2010 and resubmitted on January 2011, has just been uploaded through Hindawi manuscript system. Below you can find replies to each individual reviewer.

Reviewer 4

Remarks

The author added experimental results of the C-MAC and the AD-ZRP for showing idea related to WSNs. They show interesting results, but the author just explains these schemes. How to be integrated these schemes to EPOS? How to be related with API for saving energy?

Reply

Thank you for your constructive suggestions. Both paragraphs, the one about C-MAC and the one about AD-ZRP, were rephrased to include explicit references to the PM strategies discussed along the paper.

Reviewer 2

Remarks

The paper was extended by two additional examples showing the suitability of the approach for sensor networks. Although the paper is still not FOCUSED on sensor networks, it shows that the technique may be used within sensor networks. Unfortunately, the abstract and the conclusions are identical to the original submission. Both sections should be adjusted according to the additional examples. Additionally, the reference mentioned by the second reviewer was not correctly embedded: The approach presented by the authors does not deal with PCs. As I understood, the approach focuses on embedded soft real-time systems. The issue that you call "developer knowledge" (i.e. the schedule of several tasks) is tried to be identified automatically by the approach mentioned in [19]. Hence, you should have a deeper look into that paper and compare it directly to your approach (they focus only on soft real-time, so there is an obvious difference but they do not need any additional developers knowledge).

Reply

Thank you for your constructive suggestions. The decision not to narrow the paper's scope to focus only on WSN was explained in the previous reply, however, I must apologize for not having adjusted abstract and conclusion accordingly. This new version addresses these two points explicitly.

In respect to the approach presented in [19], I believe that, just like the proposals in Grace-OS, ECOS, and Niu's (m,k)-scheduler, it can be deployed together with the mechanisms presented here straightforwardly. In the revised version, I stress I/O as the critical component that is missing in many other related works. DVS-based approaches assume regular (or somehow predictable) execution patterns and assume also that CPU time can be directly correlated to energy consumption. From WSN, for example, we know that channel contention may lead to energetically expensive cycles that cannot be accounted from their execution time.

Application's exception handling (like the trigger thread in the paper) is also usually hard to account from CPU usage. This is explained across section IV: initially in the second paragraph, then on the third topic of the subsequent list and then through related works. Explicitly discussing the autocorrelation clustering DVS technique proposed in [19] would fit better in a paper about DVS-based scheduling. Here we sustain that both aspects of power management are needed and must be deployed together (top paragraph, page 10, second column).

Reviewer 1

I apology for mistyping Petri Nets. It has been fixed.

Sincerely,



Antônio Augusto Fröhlich