Contribution ID: **46**   Type: **not specified**

Power and Thermal management MC

The Power Management and Thermal Control microconference is about all things related to saving energy and managing heat. Among other things, we care about thermal control infrastructure, CPU, and device power-management mechanisms, energy models, and power capping.

This year has been mainly focused on the maintenance of the frameworks, resulting in cleanups setting up the scene for more improvements and connecting the user space to the kernel:

- Thermal thresholds have been finished: https://patch.msgid.link/20240923100005.2532430-2-daniel.lezcano@linaro.org
- Thermal library and thermal engine skeleton taking benefit of thresholds: https://patch.msgid.link/20241022155147.463475-5-daniel.lezcano@linaro.org
- Performance QoS RFC has been posted: https://lore.kernel.org/all/20250505161928.475030-1-daniel.lezcano@linaro.org/

Embedded systems with very high performances and a higher integration, automotive systems with lifespan and reactivity constraints, push the PM frameworks to their limits.

Big topics to be addressed:

- A performance QoS has been sent as an RFC. It apparently needs more discussion as the approach seems to not satisfy all the parties. This framework is needed to allow the user space to interact with the performance on different devices via a unified interface and co-exist with the kernel decisions.
- The generalization of the telemetry on embedded systems to capture the energy, the power, and the temperature at high rate. How can the kernel use these data and for what ?
- In the context of electric vehicles, power management is important to insure the largest life span of the hardware. Some operation modes, like the sentry mode, challenge several bricks of the power management like resume from suspend time.
- The energy model can no longer be static in the kernel and must be dynamically adjusted. Depending on the running scenario, there can be a significant gap between the computed and real power consumption, leading to inappropriate kernel decisions.
- Embedded systems are looking for a multi suspend states mechanism like a system-wide C-state. It requires more discussion, which were already initiated at the last LPC.
- The sensor aggregation did not reach a consensus because there is a different perception on the goal of the aggregation and its usage, resulting in a different implementation

Key attendees:

- Rafael J. Wysocki
- Lukasz Luba
- Vincent Guittot
- Saravana Kannan

- Sriniva Pandruvada
- Ulf Hansson
- Deepti Jaggi
- Prasad Sodagudi
- Manaf Meethalavalappu Pallikunhi
- Tudor Ambarus
- Amit Kucheria
- Srinivas Kandagatla

Primary author: LEZCANO, Daniel (Linaro)

Co-author: WYSOCKI, Rafael (Intel Open Source Technology Center)

Presenter: LEZCANO, Daniel (Linaro)