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Resolve and standardize early access to hardware for automotive industry with Linux

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The automotive industry has been admirer of safeOS or realtime OS like QNX, Integrity, FreeRTOS as it gives them faster boot times, realtime predictable access to hardware, but the trends are changing as more and more OEMs now are migrating to Linux as high level operating systems.

Unfortunately, Linux still hasn't resolved few key use cases required for automotive industry, due to which the SOC manufacturers have built heterogeneous architectures with MCU cores doing safety and time critical applications running FreeRTOS and Microprocessors running Linux for general purpose use cases.

The use cases for low end display cluster, rear-view camera, low end driver monitoring, two-wheeler cluster and time critical industrial HMI's require:

- Getting audio tone on speakers within 500 msec from boot.
- Early animated display of needles and graphics on panel with/without GPU involved with in 1000 sec from boot.
- Sending CAN response within < than 100 msec from boot.
- Early wake up response on Ethernet with in 150 msec from boot.
- Camera stream to screen (glass to glass) within 500 msec from boot.
- and more ...

The solution industry has found with heterogeneous processors is not scalable, is not standardized (no open standards to follow) and not Linux friendly (for Linux late attach to MCU).

The objective of this session is to :

- a) Deep dive into exact problems and the current solutions and how we migrate the current RTOS based solutions to switch to Linux only based solutions.
- b) How we standardize the "Linux late attach" with heterogeneous SOC.
- c) Bring together the automotive OEM, SOC manufacturers and Linux kernel and user space maintainers to define "Linux automotive" standards, harden & improvise the Linux kernel & drivers to meet the key performance requirements.

We would like conclude the session with an invitation to industry wide expertise, to set up a consortium / an open forum with a focused project for the above listed automotive use cases in Linux foundation or open source projects like ELISA.

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