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Beyond the Demo Kernel: Mapping BSPs to Mainline

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BSPs are the essential starting point for new silicon: they demonstrate that hardware works and provide enough software to get products moving.

But BSPs rarely evolve.

Once the kernel they are based on ages, their value declines rapidly unless their features are carried upstream.

The ultimate objective is to bring an entire BSP upstream: many BSPs contain IP blocks already supported in mainline through other SoCs, and the SoC itself may already be partially upstream.

By identifying which parts overlap with existing upstream code, which parts are already integrated, and which remain vendor-only, stakeholders gain a clear map of what is still missing and what must be done to achieve full integration.

This talk explores strategies to analyze and track BSP and make it evolve.

We will look at source and history comparisons with mainline, using code fingerprinting and fuzzy matching to distinguish true features from backports and refactors.

We will also consider build artifact and ABI checks: by comparing images, modules, and DTBs across BSP and upstream builds, it is possible to filter out unused code and focus on the parts that actually matter.

The goal is not only to determine whether a BSP feature has landed upstream, but also to evaluate how BSPs can be sustained, reused, and fully integrated beyond their initial demo role.

Primary author: CARMINATI, Alessandro

Presenter: CARMINATI, Alessandro

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