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Reducing Android Boot Times: Evaluating Proactive File Prefetching

Proactive file prefetching has proven effective in reducing system boot times. This presentation details the evaluation of a prefetch solution for Android, inspired by its successful deployment on ChromeOS. We analyze its performance impact through Perfetto traces, confirming notable boot time reductions. The core of the implementation involves a two-phase "Record and Replay" process, and we will discuss the key integration challenges encountered on low memory devices.

Furthermore, we extend this investigation to virtualized environments, presenting I/O trace analysis for integrating the prefetch into a Debian OS running on the Android Virtualization Framework (AVF). We conclude by outlining next steps, focusing on continuous record/replay mechanisms and the utilization of new kernel tracepoints for enhanced observability.

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