

Identifying Sources of OS Noise

Monday, August 24, 2020 10:10 AM (25 minutes)

This topic focuses on identifying sources of operating system “noise”, primarily for polling mode latency-sensitive applications on Linux. What do we mean by operating system noise? We mean things external to an application that can affect execution of the application in a negative way, usually meaning a delay in execution causing missed deadlines. The intent here is to identify the most common noise generators and stimulate discussion on techniques for mitigating them.

Noise is not a new topic for Linux and especially the Linux PREEMPT_RT community, but over the years the performance parameters have changed. Instead of a single system being deployed to run a single real-time application with max latency thresholds of 100 microseconds, we now see one system with hundreds of cores deployed to service a mix of realtime and non-realtime applications. Some of the realtime application thresholds are in the low-double digit microsecond range. As tolerances decrease, the acceptable ceiling for noise must also decrease. A delay of 15 μ S might have been acceptable when the max latency was 100 μ S, but when max latency is 20 μ S, 15 μ S is entirely unacceptable. We need to come up with ways to wall-off these low-latency applications and protect them from sources of noise.

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Session Classification: Real-time MC

Track Classification: Real-time MC