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NVIDIA's Approach for Achieving ASIL B Qualified Linux

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In recent years, a common trend in the safety-critical industry has been determining whether a general-purpose, open-source OS like Linux can be used in safety-critical products and certified to standards like ISO 26262.

This talk presents a safety integrity qualification approach for Linux—comprising the Linux kernel, user space libraries (e.g. libc), and user-space components (e.g. init processes)—up to ASIL B per ISO 26262:2018. Linux is treated as a SEooC within an assumed architecture supporting defined safety use cases. These use cases address kernel safety functions and technical safety requirements designed to mitigate kernel-related hazards.

To satisfy these safety requirements, additional measures are introduced using both avoidance and monitoring mechanisms. These can be implemented within the Linux kernel or externally. This allows the qualification effort to focus on specific kernel areas or, preferably, external components—rather than the entire kernel.

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