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Recursive read deadlocks and Where to find them

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lockdep (the deadlock detector in the Linux kernel) is a powerful tool to detect deadlocks, and has been used for a long time by kernel developers. However, when comes to read/write lock deadlock detections, lockdep only has limited support. Another thing makes this limited support worse is some major architectures (x86 and arm64) has switched or is trying to switch its rwlock implementation to queued rwlock. One example is we found some deadlock cases that happened in kernel but we could not detect it with lockdep.

To improve this situation, a patchset to support read/write deadlock detection in lockdep has been post to lkml and got to its v6. Although it got several positive feedbacks, some details about the reasoning of the correctness and other things still need more discussion.

This topic will give a brief introduction on rwlock related deadlocks (recursive read deadlocks) and how we can tweak lockdep to detect them. It will focus on the detection algorithm and its correctness, but also some implementation details.

This topic will provide the opportunity to discuss the reasoning and the overall design with some core lock developers, along with the opportunity to discuss the usage scenarios with potential users. The expected result is we have a cleaner plan on upstreaming this and more developers get educated on how to use this to help their work.

I agree to abide by the anti-harassment policy

Yes

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