

- **Gabriel Parmer** • 14 days ago

Happy to answer any questions here. I know this is a lot of information. You can find the talk for later viewing on youtube as well, and am happy to discuss here or via email. Thanks for taking the time to watch!

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- **Regan Robertson** **Mod** • 14 days ago

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- **Renato Levy** • 14 days ago

As Gernot said, I am looking forward to this...

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Todd Humiston • 14 days ago

Welcome back and thank you for joining this session of Thoughts, Challenges, and the Center of Excellence!

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Gernot • 14 days ago

Just lost audio

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Gabriel Parmer Gernot • 14 days ago

I still hear it...

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Jerry Dussault Gernot • 14 days ago

My audio seems fine.

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Todd Humiston Gernot • 14 days ago

Good audio here as well

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Gernot Gernot • 14 days ago

I wish bloody Apple would get their Bluetooth stacks right one of those years. Seems to be getting worse with each release of macOS...

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Jason H Li • 14 days ago

This is great! Just wondering if this seL4 MCS is something similar to what Gernot is doing/delivering. Can't wait to try out some MCS stuff.

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Gabriel Parmer Jason H Li • 14 days ago • edited

The MCS stuff is 100% Gernot's group's work (Anna Lyons' thesis). I'm just outlining it, talking about the historical context, and providing a perspective on the trade-offs involved.

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Jason H Li Gabriel Parmer • 14 days ago

Thanks for the education!

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Gernot Jason H Li • 14 days ago

Yes, what Gabe described is our MCS kernel that's presently in verification, and will eventually replace the present default mainline

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Gernot • 14 days ago

I agree that having to sort the replenishment queue is a pain (for verification and WCET analysis). I don't think that your issue with priorities is a real problem. Shared servers are primarily for mutual exclusion, and in CS101 we have all learnt that your critical sections should be short.

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Gabriel Parmer Gernot • 14 days ago

Agreed, but this implies that servers are pretty limited in their functionality. I think it is reasonable to say: servers must be short, and should be very careful with transitive invocations. It is a limited programming model.

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Gernot Gabriel Parmer • 14 days ago

I don't really think it limits the programming model. Your (logically) shared server needs to be structured to have short critical sections (which is good practice) and these are broken out into separate shared threads.

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Regan Robertson Mod • 14 days ago

This presentation goes a few minutes longer, but we will start the next presentation immediately, and you won't miss any content.

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Gernot • 14 days ago

Forcing servers to be concurrent is definitely distasteful, I have to say. This is forcing policy on userland, and it's a policy you usually don't want.

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Gabriel Parmer Gernot • 14 days ago

Yeah, it is a big limitation. We removed that in the stack management paper (cited earlier), but then we have the end-to-end challenges of serialization. No perfect solution yet.

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Gernot Gabriel Parmer • 14 days ago

Also, the kernel having to manage stacks is policy in the kernel, which I disagree with. But I guess it's the same policy in the end

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Gabriel Parmer Gernot • 14 days ago

That same paper removed that constraint. Composite never did in-kernel stack management (like pebble).

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Gernot • 14 days ago

Fiasco quietly abandoned their lock-free design (to no surprise of mine)...

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Gabriel Parmer Gernot • 14 days ago

They still have many aspects of it. They have full RCU in the kernel!!! But they did back off in some ways, for sure. In the end, the system is so complex in so many ways, that it is likely reasonable they added the complexity of full RCU.

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Gernot • 14 days ago

Great talk, Gabe, mandatory listening for our students.
But **please**, it's ess-ee-ell-four ;-)

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Gabriel Parmer Gernot • 14 days ago

I know, I know. I saw the proper pronunciation **after** I recorded ;-(

Next time, I'll do better!!

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Renato Levy Gernot • 14 days ago

that's a hard fight esse-ee-el-4 8^)

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Ihor Kuz • 14 days ago

Great presentation!

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Nick Spinale • 14 days ago

Excellent, thanks for this presentation!