1. Where does Julia Cartwright work?

National Instruments

2. What is PREEMT_RT?

Linux has been designed as a general purpose operating System and there for not well optimized for reel time operations. However, PREEMT_RT is a patch that enables Linux for real-time operations.

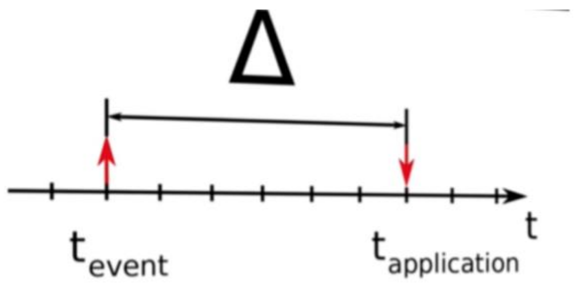
3. What is mixed criticality?

Usually, separate hardware, besides the Linux hardware, get used for performing real time tasks. Mixed criticality describes the cannels needed to define the communication between both hardware.

4. How can drivers misbehave?

Systems that run PREEPT_RT are sharing the kernel, scheduler and device stack therefore the drivers can misbehave

5. What is Δ in Figure 1

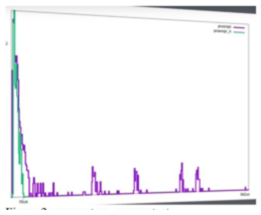


The Delta is the time delay from an interrupt or timer accruing till the actual execution of the real time process

6. What is Cyclictest[2]?

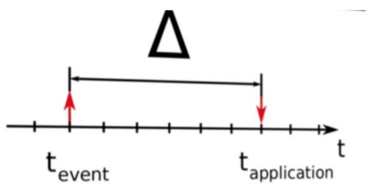
It is a simple test file to determine the Delta time. It takes a time stamp t0 and sleeps for a fixed duration (10ms). Than takes a second time stamp t1 when the tread is woken up. The delta is the time difference between t0 and t1minus the fixed duration (10ms).

7. What is plotted in Figure 2?



the purple is the distebution of main line preemt setting in a main line kernel vs the green with the PREEMT_RT patch applied. So you can see its actual real time.

8. What is dispatch latency? Scheduling latency?

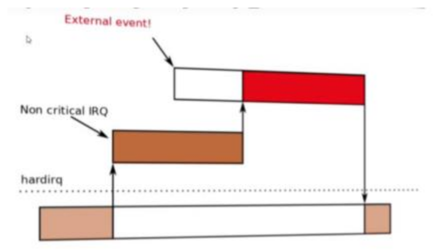


Basically the delta value shown in the figure can be divided into the dispatch latency and Scheduling latency. Dispatch latency is the amount of time it takes for the hardware to fire until the interrupt actually wakes up and passed to the scheduler. The scheduling latency is the amount of time it takes to pass the task from the scheduler to the CPU to finally execute it.

9. What is mainline?

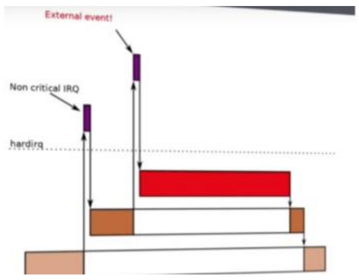
One main contributor in mainline are long term interrupts handlers are executed in hard irq context they are implicitly executed with interrupts disable.

10. What is keeping the External event in Figure 3 from starting?



The non-critical IRQ that got executed before

11. Why can the External event in Figure 4 start sooner?



Little code is executed (purple in the figure) and waking up the necessary threads