KernelShark 1.0

What's new, and what's coming?

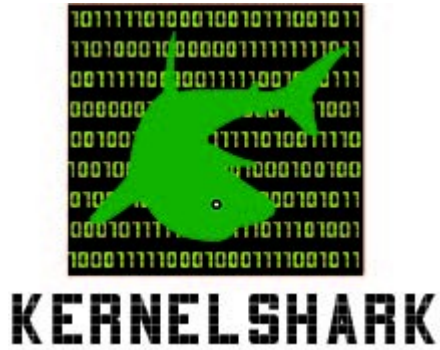
Steven Rostedt
9/26/2018

vmware

Correction:

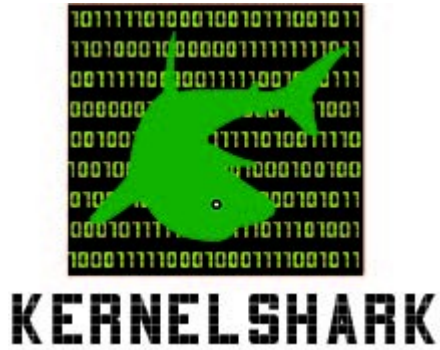
- KernelShark 1.0 was suppose to be released in August
- Still not out yet
- Why?
  - Prototype was written first to get a good idea about the new design
  - The patches were broken up and reviewed in sets
  - Lots of updates were done (we want to get it right!)
    - Rewrite of designs
    - Breaking it up showed better ways to get things done
  - Went on tangents
    - Oh, we could do this too...
    - We are now at: “Just add a TODO comment, and we’ll comeback later”

What is KernelShark?



What is KernelShark?

- It is a graphical interface to trace-cmd



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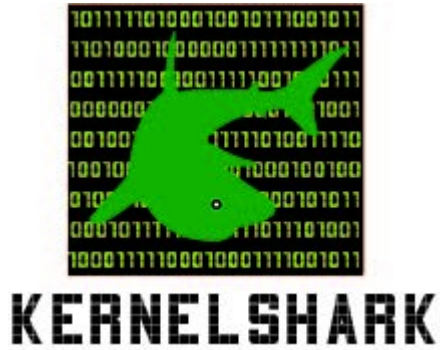

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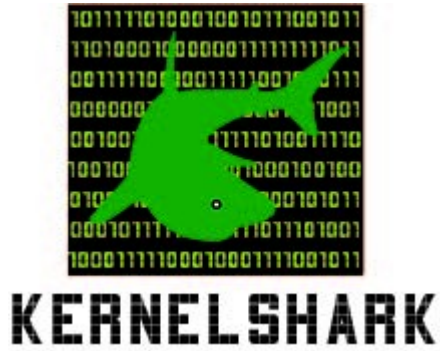
- What is trace-cmd?
  - A command line interface to ftrace



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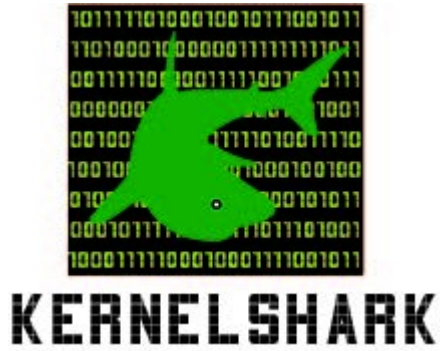
- What is ftrace?



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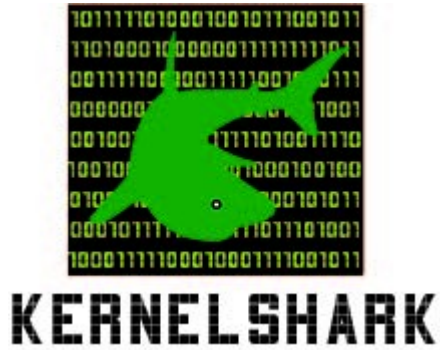
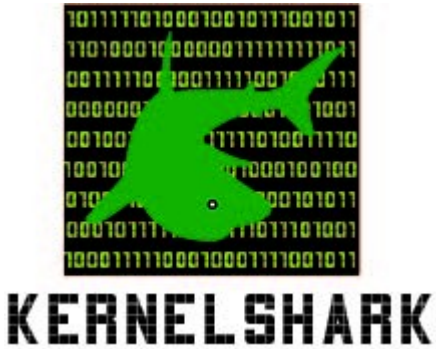


- It is a graphical interface to trace-cmd
- What is trace-cmd?
  - A command line interface to ftrace
- What is ftrace?
  - The official tracing infrastructure of the Linux kernel
  - See any of my other tracing talks

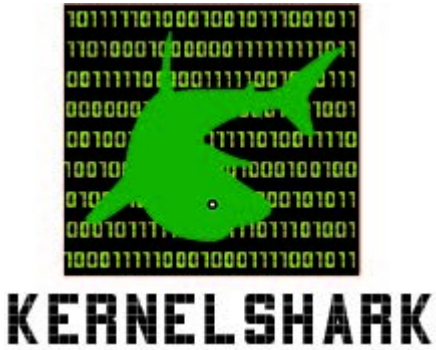
Why update KernelShark?



- Current Version 0.2
  - Written in GTK+ 2.0
  - Needs an update to GTK+ 3.0

  - New version written in Qt (Pronounced “cute”, I am told)
  - Was written as an “idle task”
    - Worked on it between projects
    - A couple of days at a time (may be months between)
  - Now have a full time employee (thanks to VMware)
  - Can make it much more flexible

Why update KernelShark?



- Current Version 0.2
  - Written in GTK+ 2.0
  - Needs an update to GTK+ 3.0
    - Did not want to rewrite again when GTK+ 4.0 comes out
  - New version written in Qt (Pronounced “cute”, I am told)
  - Was written as an “idle task”
    - Worked on it between projects
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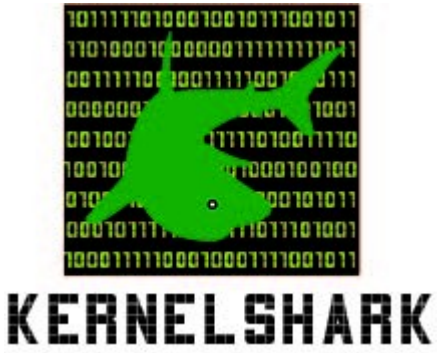
Why was KernelShark created?

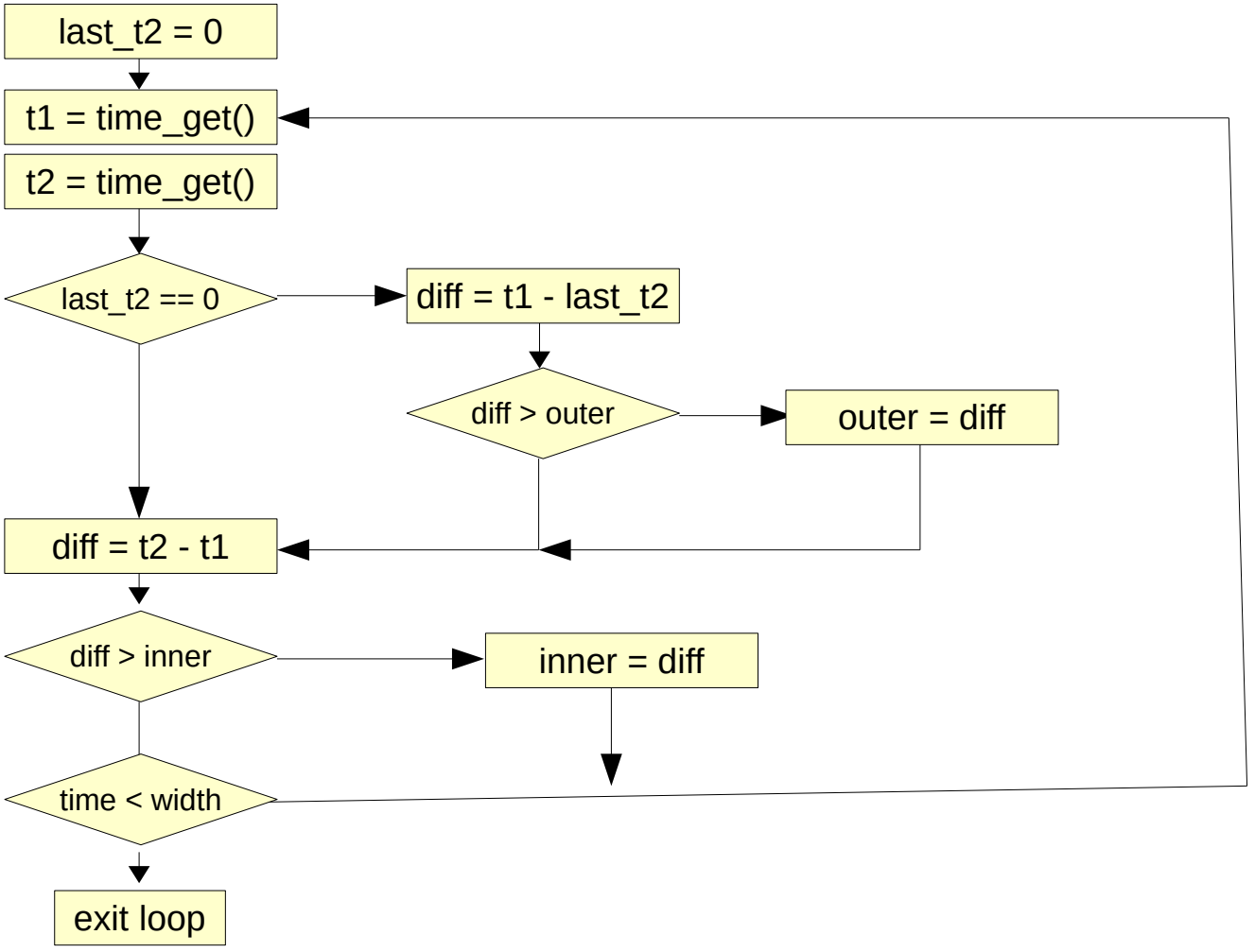


- trace-cmd can collect a large amount of data
- Hard to visualize from looking at text
- Real example:
  - cyclictest (jitter detecting program) had 250us latency on RT kernel
    - On a totally idle machine (only running cyclictest!)
  - hwlat reported the latency
    - But the HW vendor did not believe it
  - Used trace-cmd to find demonstrate the issue
  - Showed the HW latency with trace-cmd

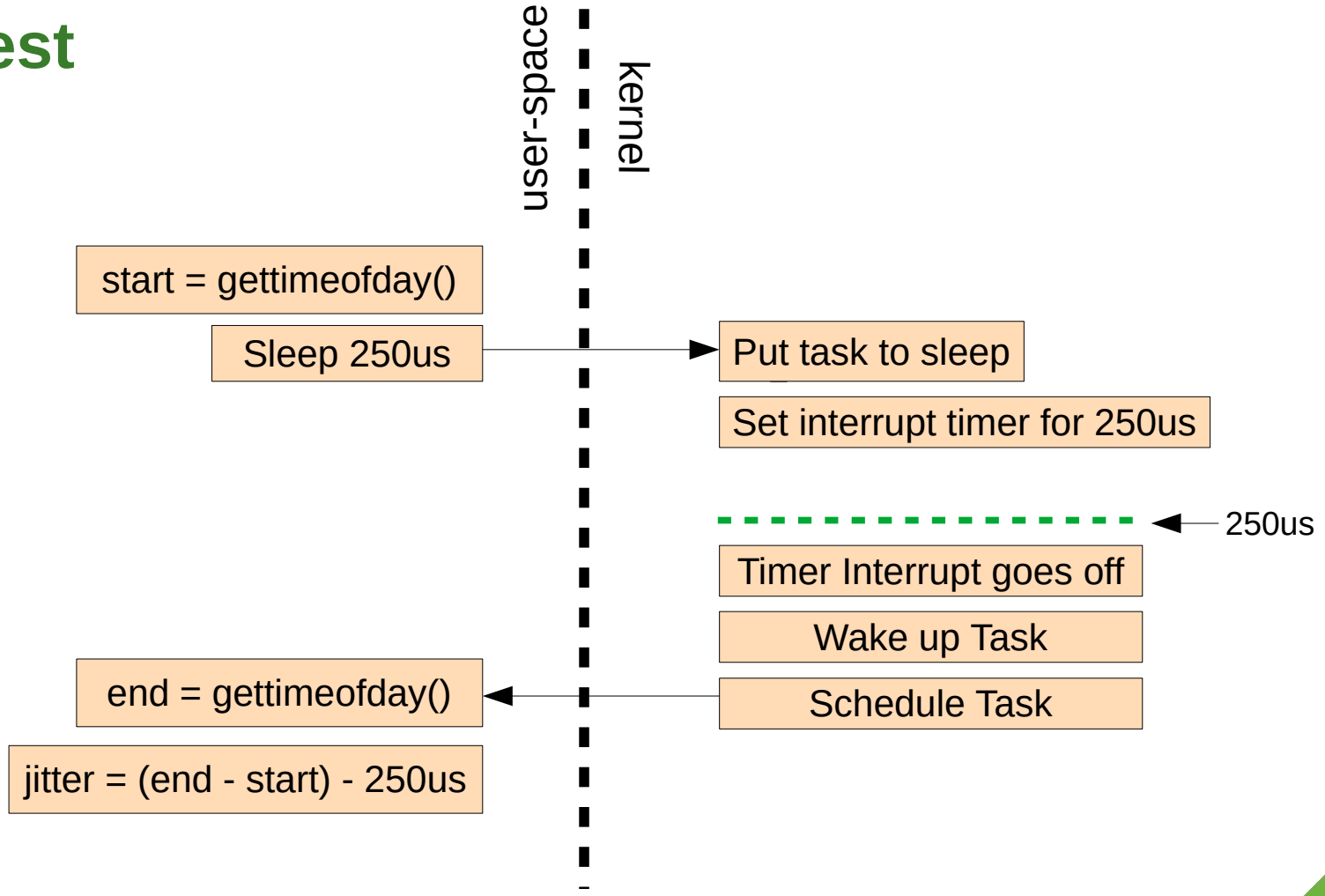
Cyclictest

(Recap for those not at Embedded Recipes)

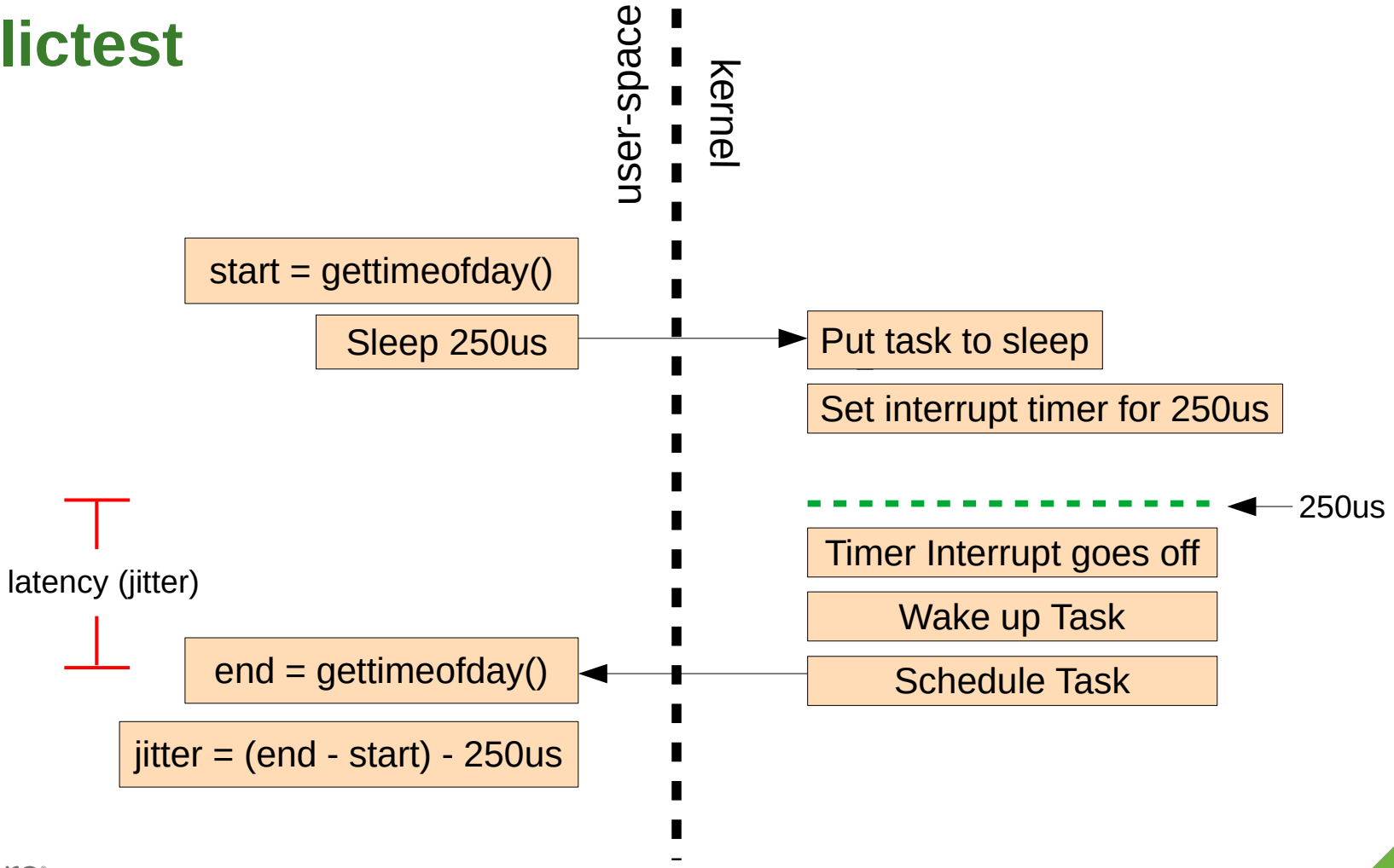
- A tool to measure latency
- Runs a simple loop (in a high priority task)
  - Sleep for a specified time
  - Get timestamp when wakes up
  - Compare the difference
- Favorite application of the Linux RT folks


last_t2 = 0
t1 = time_get()
t2 = time_get()
last_t2 == 0
diff = t1 - last_t2
diff > outer
outer = diff
diff = t2 - t1
diff > inner
inner = diff
time < width
exit loop

Cyclictest


user-space
kernel
start = gettimeofday()
Sleep 250us
Put task to sleep
Set interrupt timer for 250us
250us
Timer Interrupt goes off
Wake up Task
Schedule Task
end = gettimeofday()
jitter = (end - start) - 250us

Cyclictest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latency (jitter)
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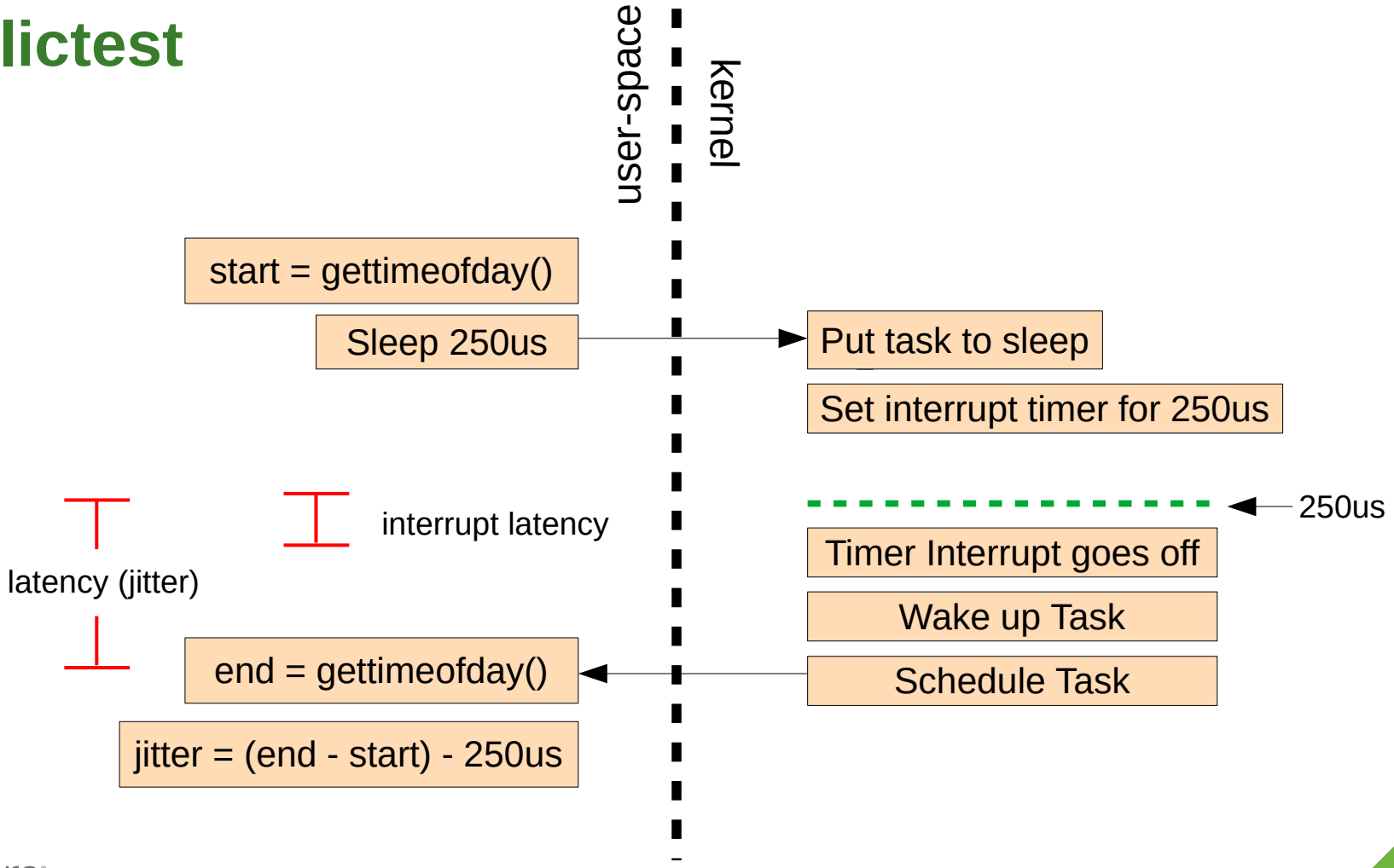
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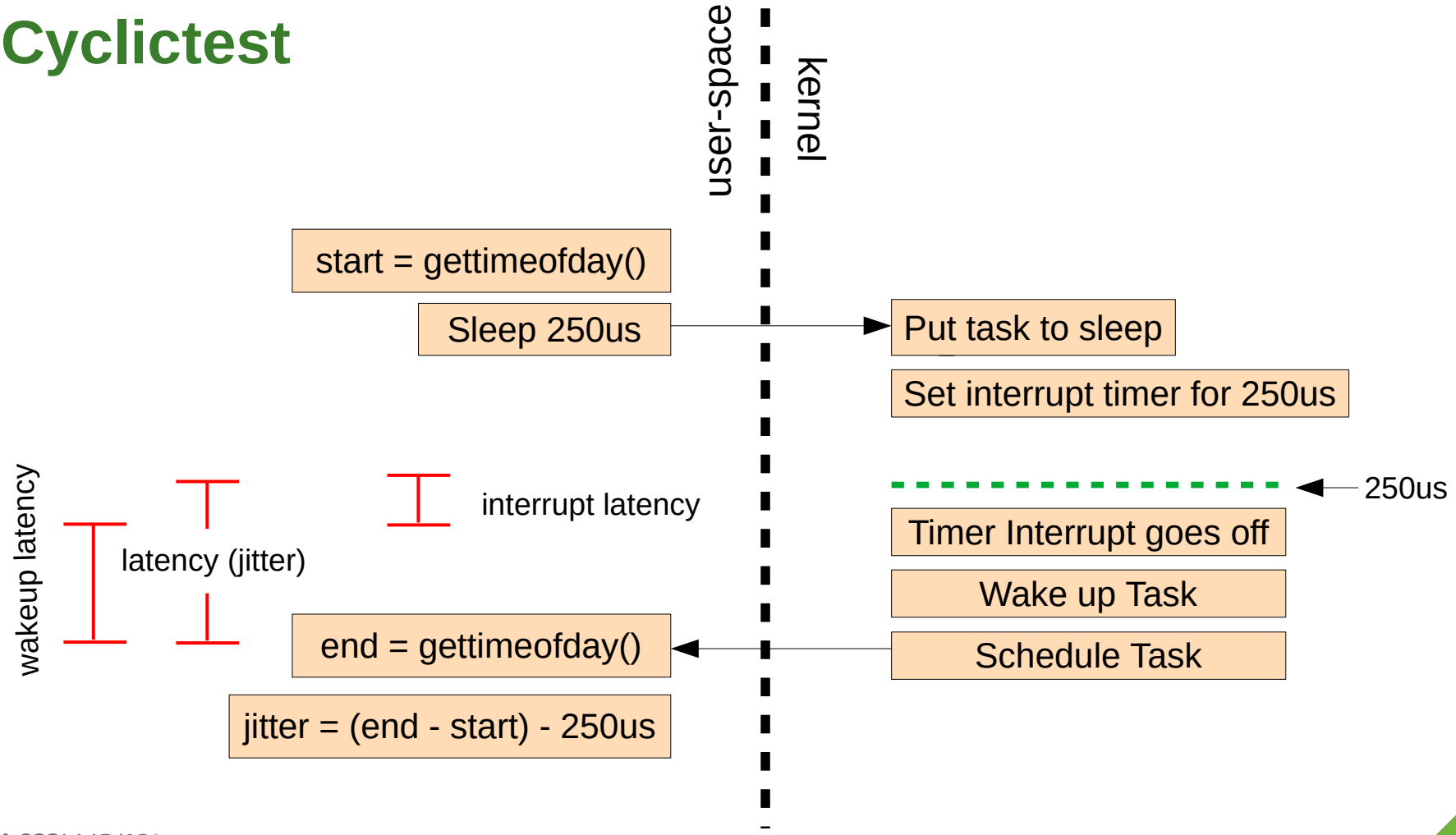
Cyclictest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Wake up Task
Schedule Task
end = gettimeofday()
jitter = (end - start) - 250us
interrupt latency
latency (jitter)
wakeup latency

See the hardware latency?

```
    ksoftirqd/33-216   [033] 55597.719935: timer_cancel:         timer=0xffff88403f0ce520
    ksoftirqd/33-216   [033] 55597.719935: timer_expire_entry:   timer=0xffff88403f0ce520 function=delayed_work
    ksoftirqd/33-216   [033] 55597.719935: funcgraph_entry:       0.069 us   |  _raw_spin_lock_irqsave();
    ksoftirqd/33-216   [033] 55597.719936: funcgraph_entry:       0.047 us   |  _raw_spin_lock();
    ksoftirqd/33-216   [033] 55597.719936: sched_stat_sleep:     comm=kworker/33:1 pid=1222 delay=132870067
    ksoftirqd/33-216   [033] 55597.719937: sched_wakeup:         kworker/33:1:1222 [120] success=1 CPU:033
    ksoftirqd/33-216   [033] 55597.719937: timer_expire_exit:    timer=0xffff88403f0ce520
    ksoftirqd/33-216   [033] 55597.719942: timer_cancel:         timer=0xffff88403f0ce620
    ksoftirqd/33-216   [033] 55597.719942: timer_expire_entry:   timer=0xffff88403f0ce620 function=delayed_work
    ksoftirqd/33-216   [033] 55597.719943: funcgraph_entry:       0.045 us   |  _raw_spin_lock_irqsave();
    ksoftirqd/33-216   [033] 55597.719943: timer_expire_exit:    timer=0xffff88403f0ce620
      cyclictest-6110  [007] 55597.719955: funcgraph_entry:       0.194 us   |  _raw_spin_lock();
      cyclictest-6110  [007] 55597.719956: funcgraph_entry:       0.175 us   |  _raw_spin_lock_irqsave();
      cyclictest-6110  [007] 55597.719957: funcgraph_entry:       0.175 us   |  _raw_spin_lock_irqsave();
      cyclictest-6113  [010] 55597.719957: funcgraph_entry:       2.436 us   |  _raw_spin_lock();
      cyclictest-6110  [007] 55597.719957: funcgraph_entry:       0.203 us   |  _raw_spin_lock();
      cyclictest-6110  [007] 55597.719958: sched_wakeup:         cyclictest:6113 [4] success=1 CPU:010
      cyclictest-6110  [007] 55597.719959: funcgraph_entry:       0.048 us   |  _raw_spin_lock_irqsave();
      cyclictest-6113  [010] 55597.719960: funcgraph_entry:       0.170 us   |  _raw_spin_lock_irq();
      cyclictest-6113  [010] 55597.719961: funcgraph_entry:       0.045 us   |  _raw_spin_lock_irqsave();
      cyclictest-6113  [010] 55597.719962: funcgraph_entry:       0.043 us   |  _raw_spin_lock_irq();
      cyclictest-6110  [007] 55597.719963: print:                ffffffff810e5776 hit latency threshold (247 > 200)
```

How about now?

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Better?

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I do, here

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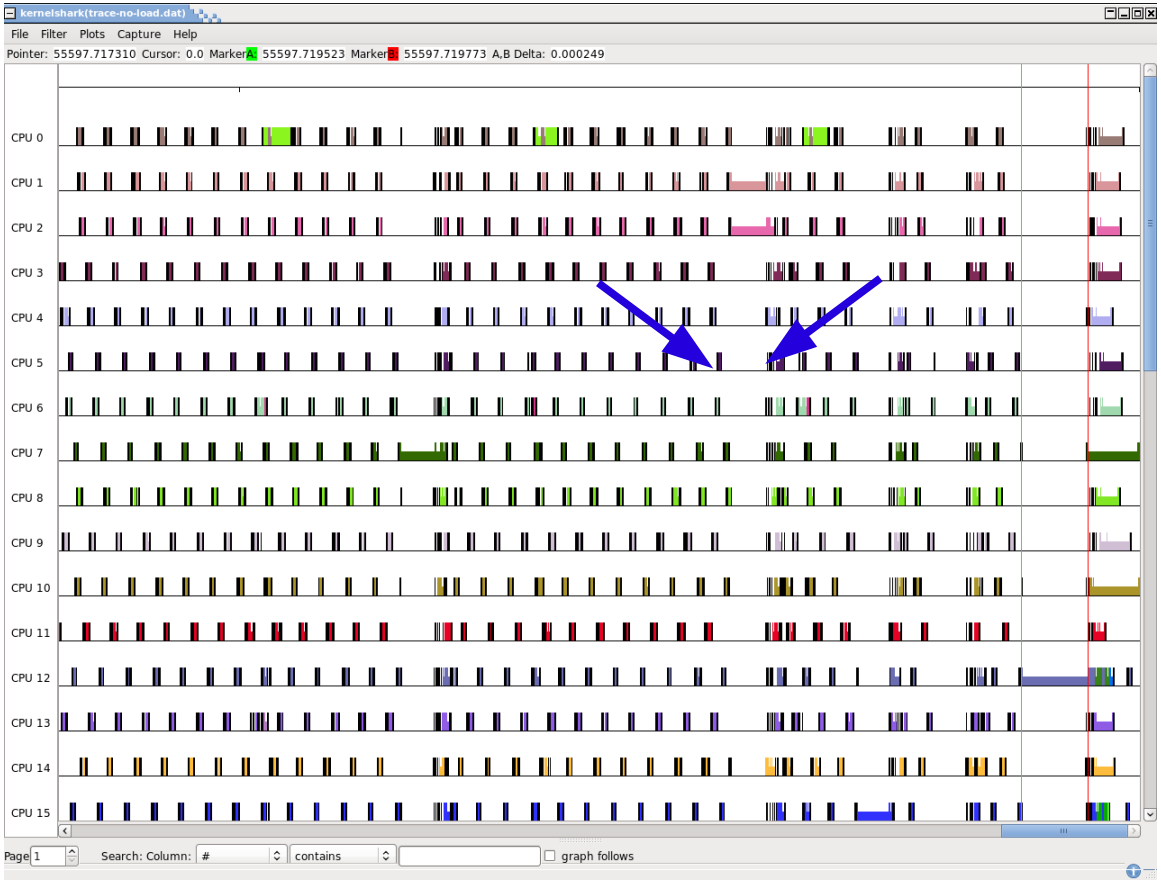
and here



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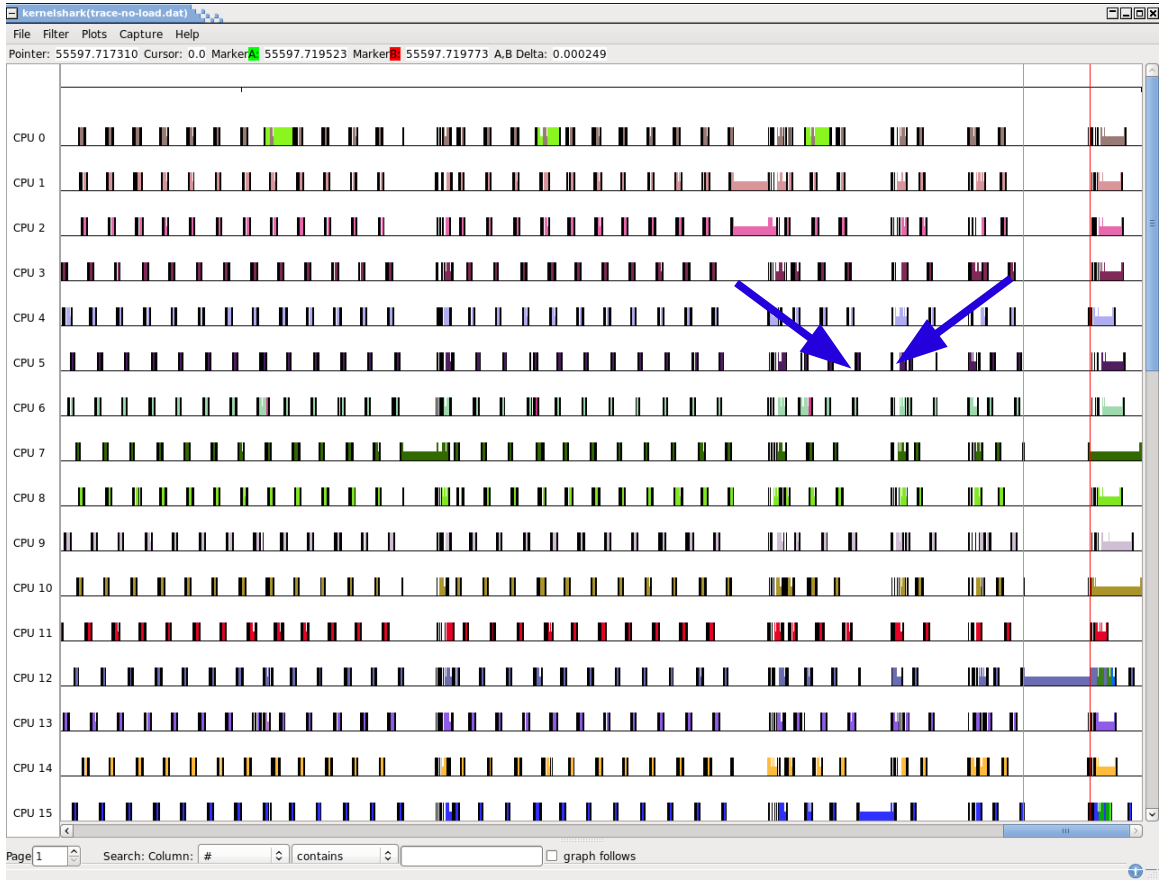
and here



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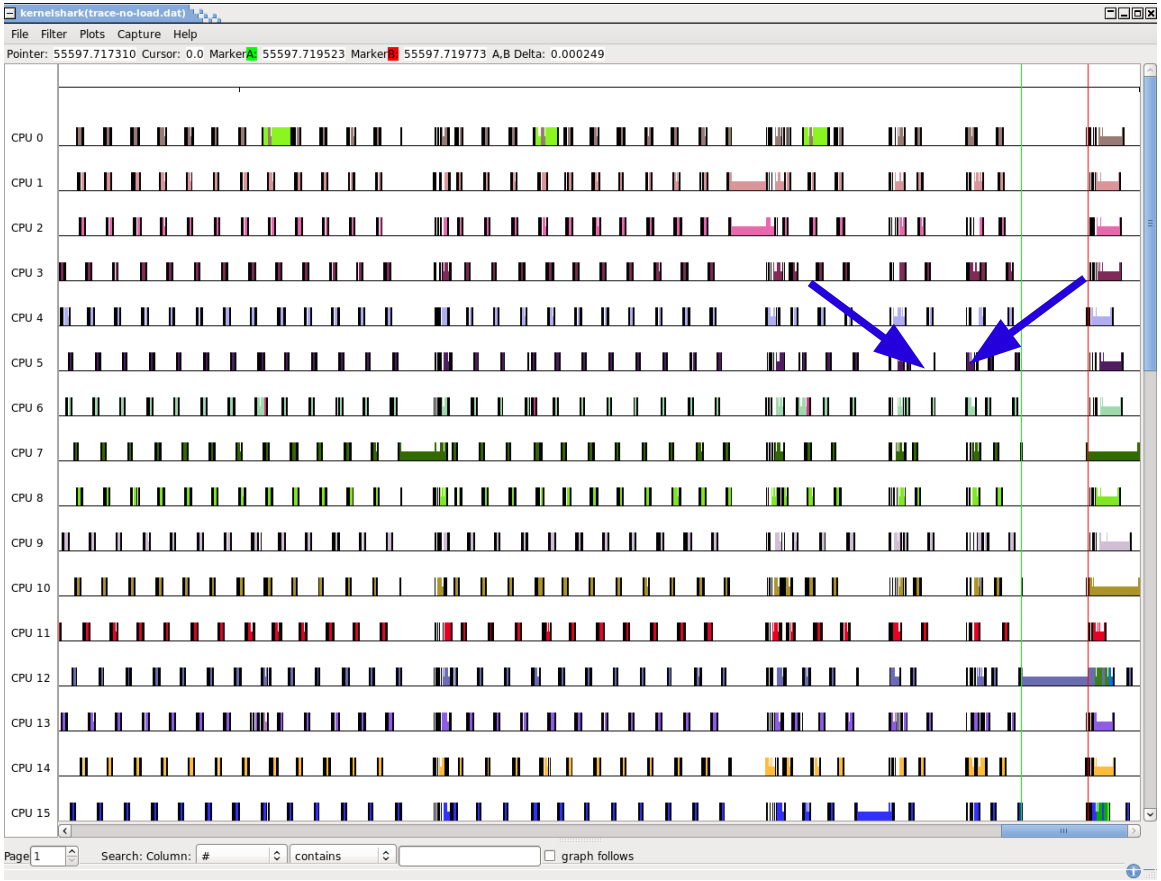
and here



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and here

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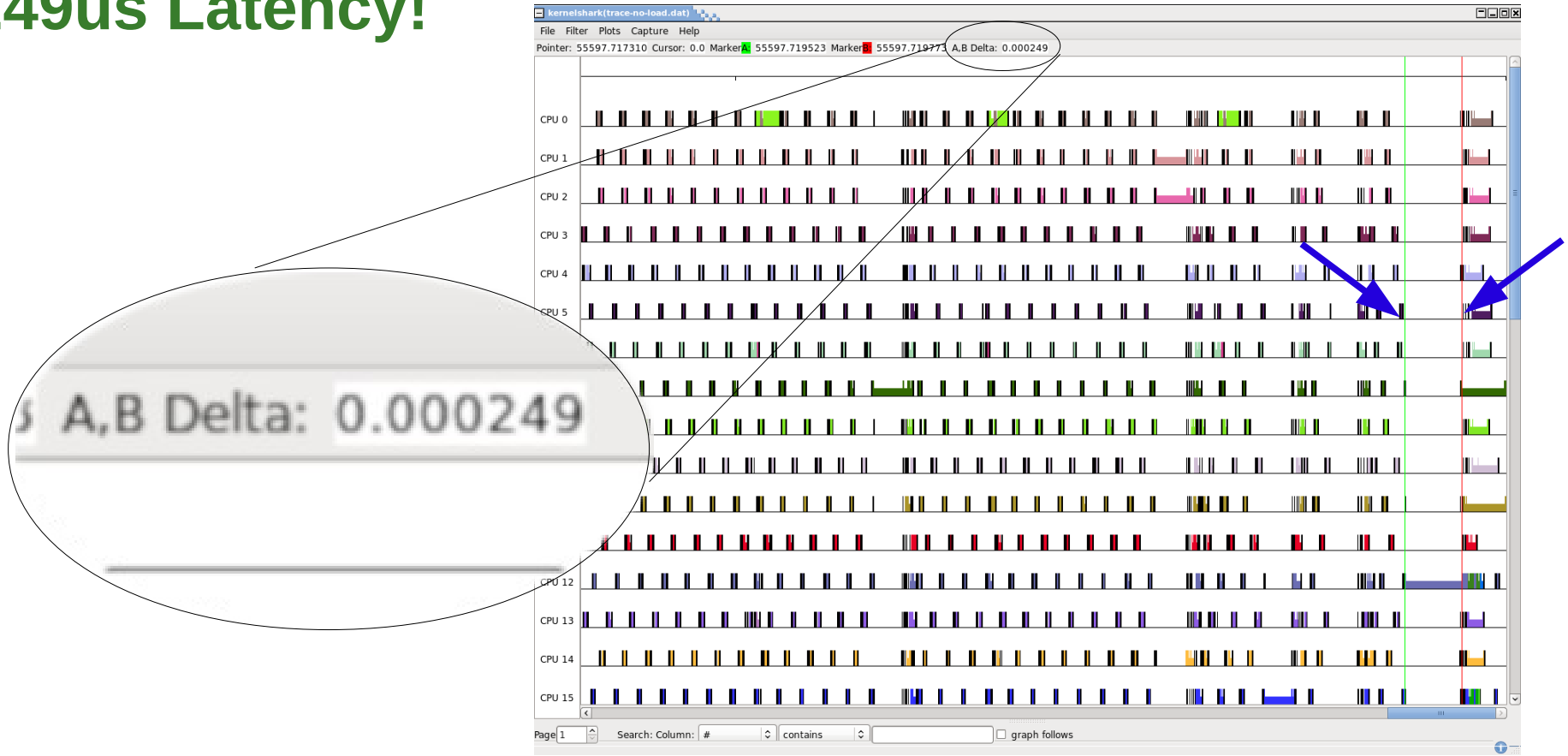
249us Latency!



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SCHED_DEADLINE

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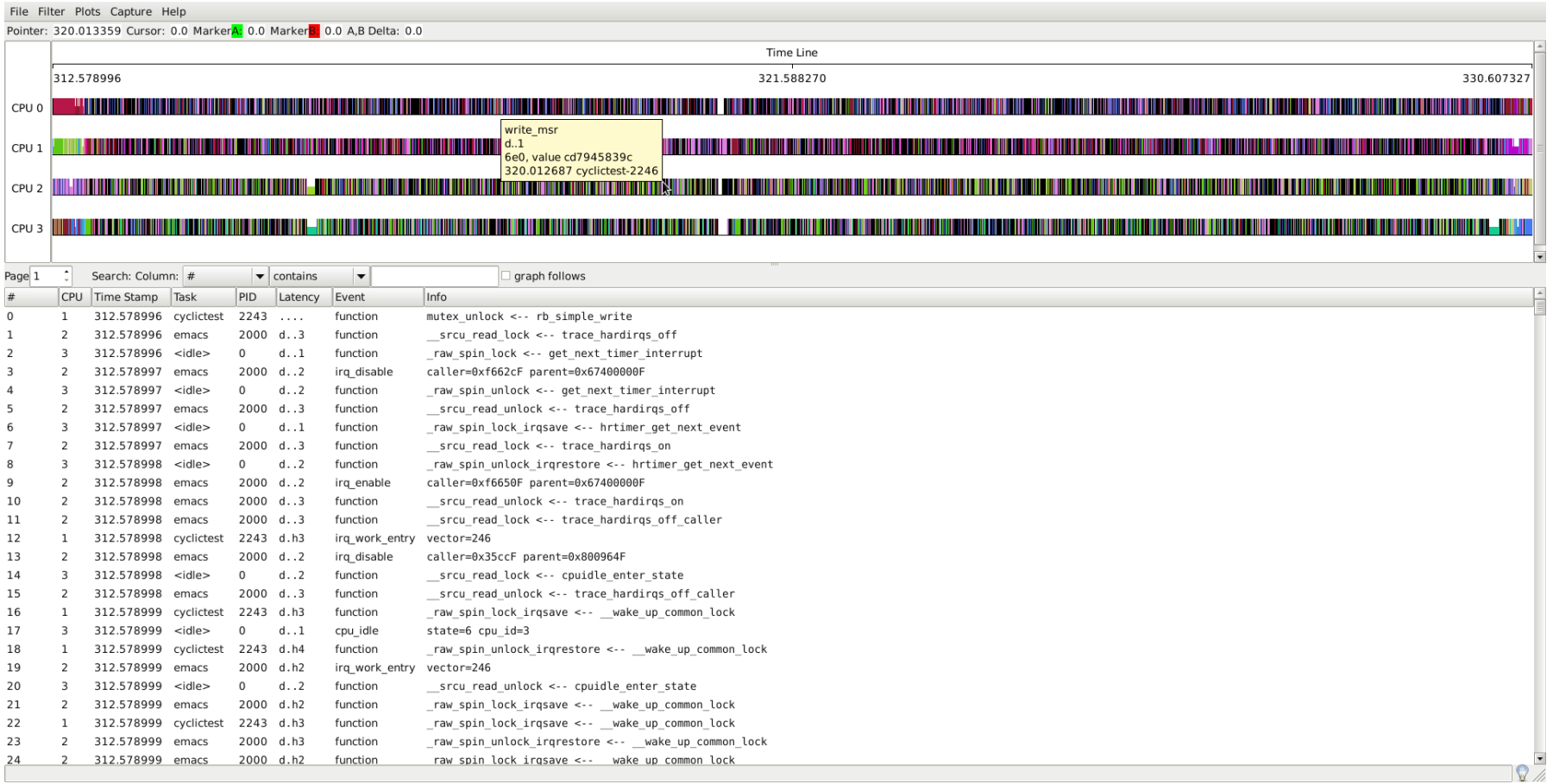
KernelShark 0.2 (GTK version) vs 1.0 (Qt version)

- 1.0 is MUCH faster!
  - New algorithm to fill in pixels
    - With 1,000,000,000(n) events in 1000(m) pixels width window
      - 0.2 Would do linear search to find next event to draw the next line
        - 1,000,000 queries per vertical line drawn - O((n/m))
      - 1.0 does a binary search for the event in the next pixel
        - 30 queries per vertical line draw - $O(\log_2 n)$
        - Switches to linear search when $\log_2 n >= n/m$
          - ~10,000 events per 1000 pixels

KernelShark 1.0 (Qt version)

- Written by Yordan Karadzhov
  - Although I’m still the maintainer (reviewer of the code)
- Rewritten from scratch
  - I let him play
    - The requirement was to have all features of KernelShark 0.2
    - Then I revisited to help him
    - Break it up into a patch series
      - Why it’s late :-p
  - New Look!
  - New design!
    - Becoming a library (more on that later)
- Much faster than KernelShark 0.2 (must keep stressing this!)

KernelShark 0.2



#	CPU	Time Stamp	Task	PID	Latency	Event	Info
0	1	312.578996	cyclictest	2243	....	function	mutex_unlock <-- rb_simple_write
1	2	312.578996	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off
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3	2	312.578997	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
4	3	312.578997	<idle>	0	d..2	function	_raw_spin_unlock <-- get_next_timer_interrupt
5	2	312.578997	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off
6	3	312.578997	<idle>	0	d..1	function	_raw_spin_lock_irqsave <-- hrtimer_get_next_event
7	2	312.578997	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_on
8	3	312.578998	<idle>	0	d..2	function	_raw_spin_unlock_irqrestore <-- hrtimer_get_next_event
9	2	312.578998	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
10	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_on
11	2	312.578998	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off_caller
12	1	312.578998	cyclictest	2243	d.h3	irq_work_entry	vector=246
13	2	312.578998	emacs	2000	d..2	irq_disable	caller=0x35ccF parent=0x800964F
14	3	312.578998	<idle>	0	d..2	function	__srcu_read_lock <-- cpuidle_enter_state
15	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off_caller
16	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
17	3	312.578999	<idle>	0	d..1	cpu_idle	state=6 cpu_id=3
18	1	312.578999	cyclictest	2243	d.h4	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
19	2	312.578999	emacs	2000	d.h2	irq_work_entry	vector=246
20	3	312.578999	<idle>	0	d..2	function	__srcu_read_unlock <-- cpuidle_enter_state
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23	2	312.578999	emacs	2000	d.h3	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
24	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock

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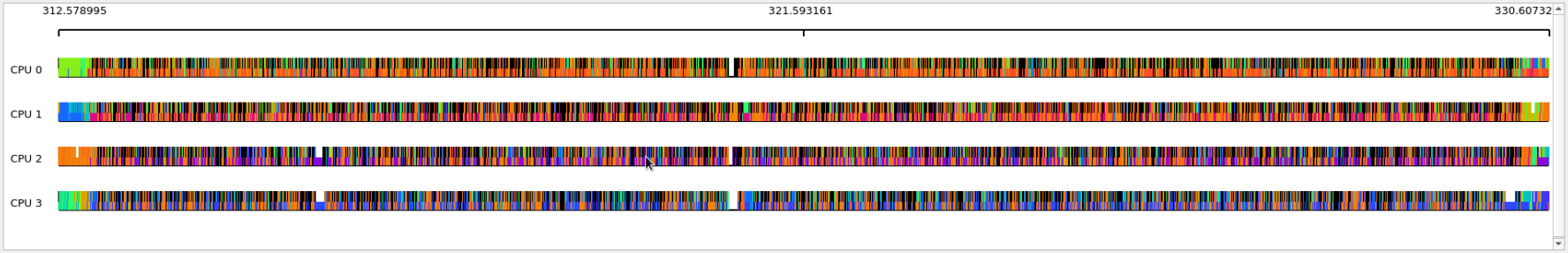
KernelShark 1.0

File Filter Plots Tools Help

Pointer: 319.681174 trace-cmd-2239 Cpu 2 dNh4 sched_wakeup cyclictest:2246 [19] success=1 CPU:002

< + - > Marker A Marker B A,B Delta:



Search: Column # contains Next Prev ☑ Graph follows

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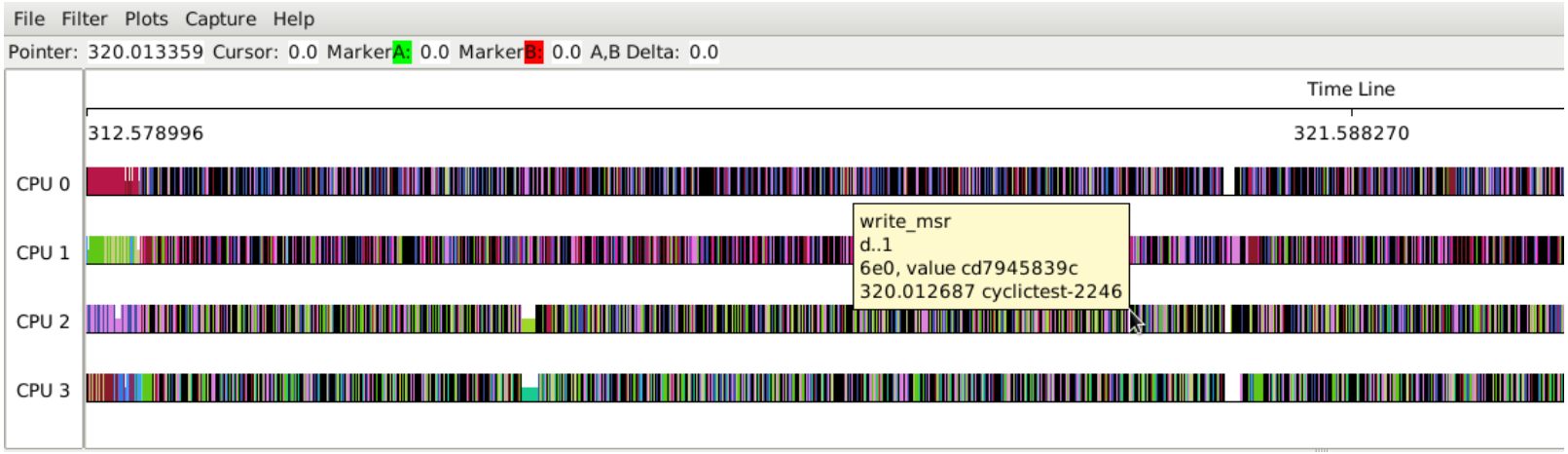
Headers

KernelShark 0.2



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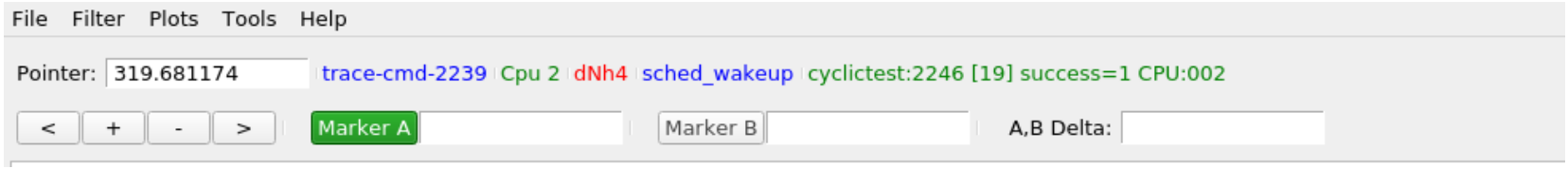

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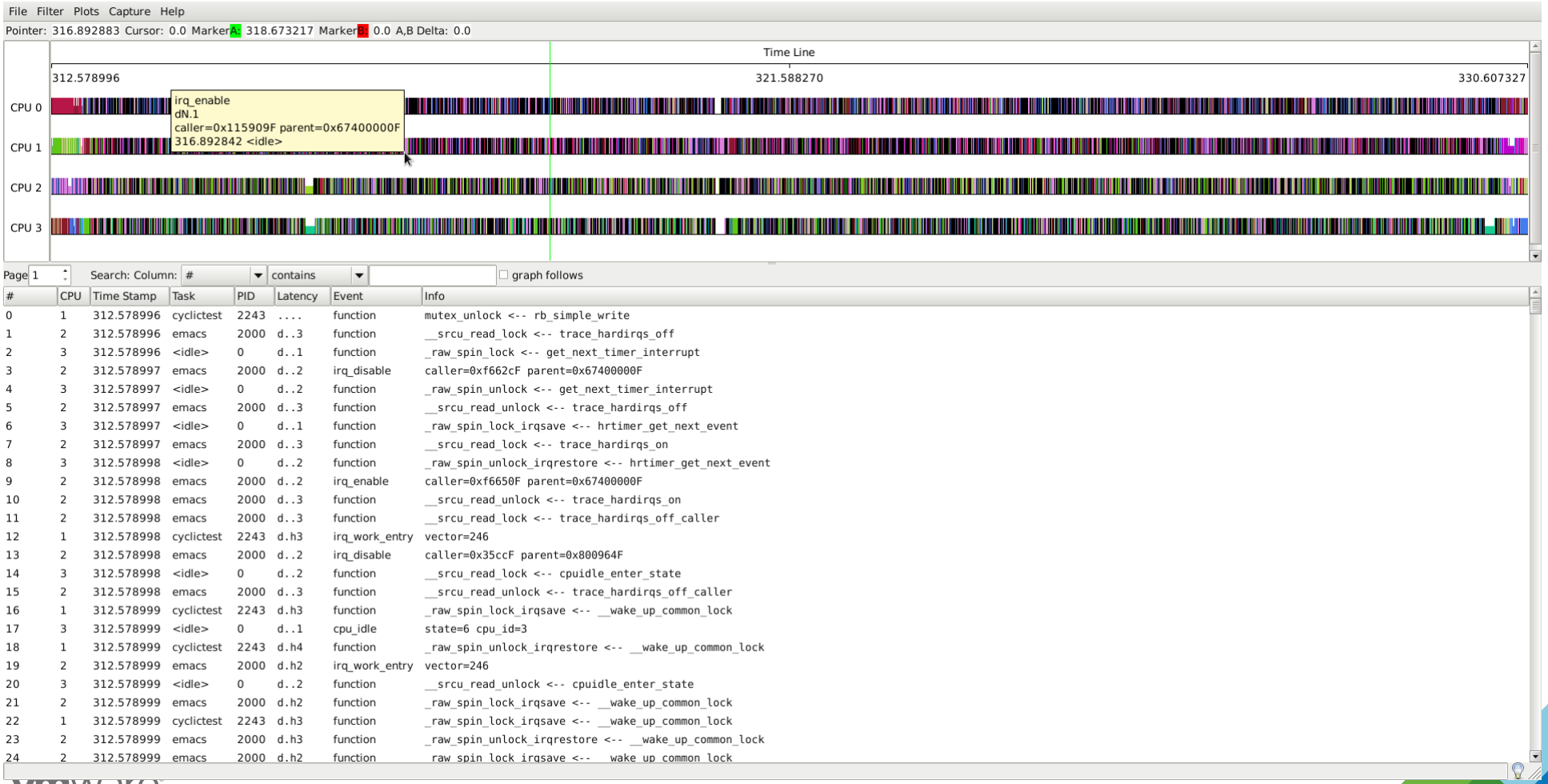
KernelShark 0.2 Markers (“Marker A”)



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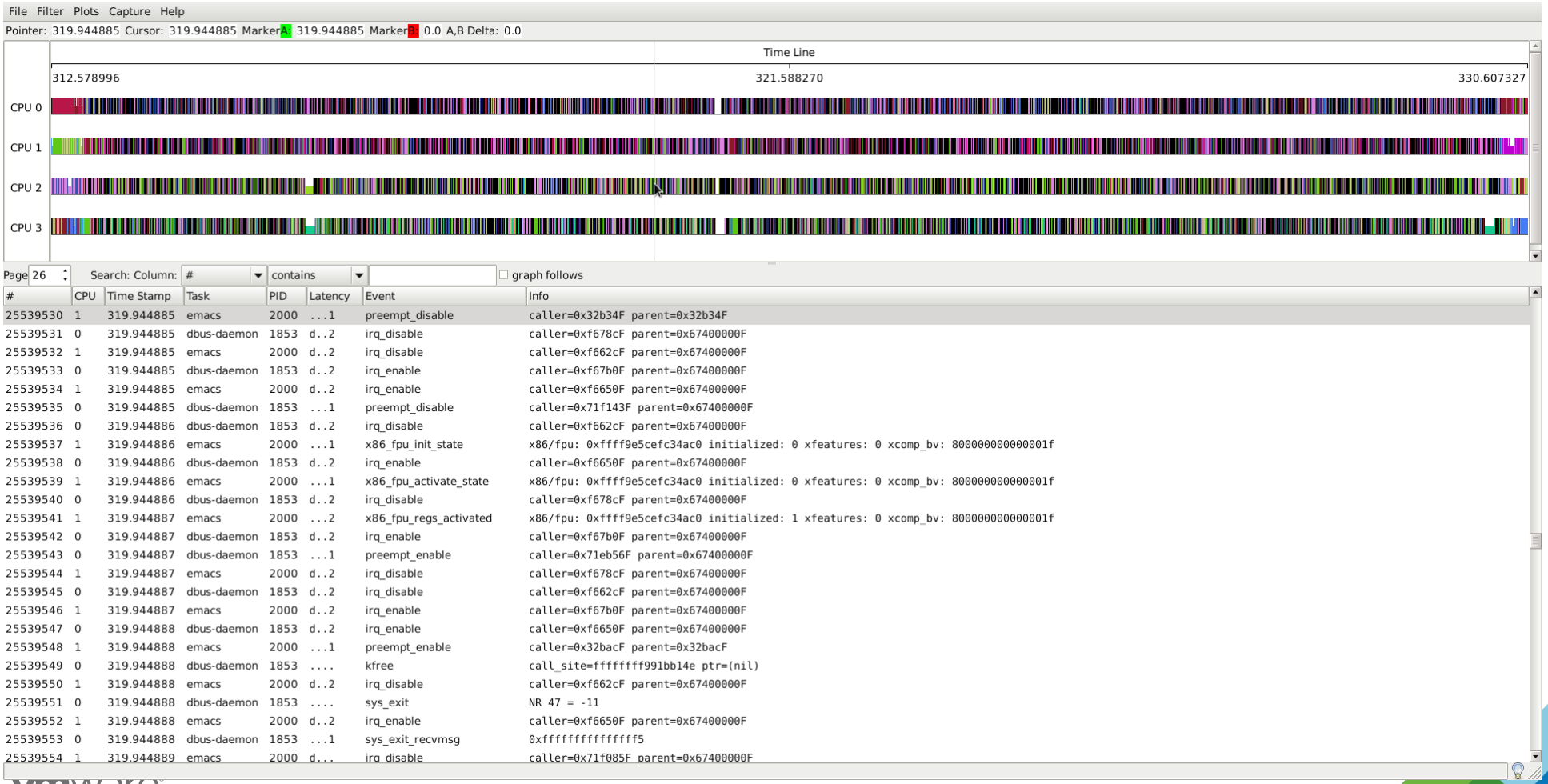
9	2	312.578998	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
10	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_on
11	2	312.578998	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off_caller
12	1	312.578998	cyclictest	2243	d.h3	irq_work_entry	vector=246
13	2	312.578998	emacs	2000	d..2	irq_disable	caller=0x35ccF parent=0x800964F
14	3	312.578998	<idle>	0	d..2	function	__srcu_read_lock <-- cpuidle_enter_state
15	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off_caller
16	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
17	3	312.578999	<idle>	0	d..1	cpu_idle	state=6 cpu_id=3
18	1	312.578999	cyclictest	2243	d.h4	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
19	2	312.578999	emacs	2000	d.h2	irq_work_entry	vector=246
20	3	312.578999	<idle>	0	d..2	function	__srcu_read_unlock <-- cpuidle_enter_state
21	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
22	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
23	2	312.578999	emacs	2000	d.h3	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
24	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock

KernelShark 0.2 Markers (“Cursor”)

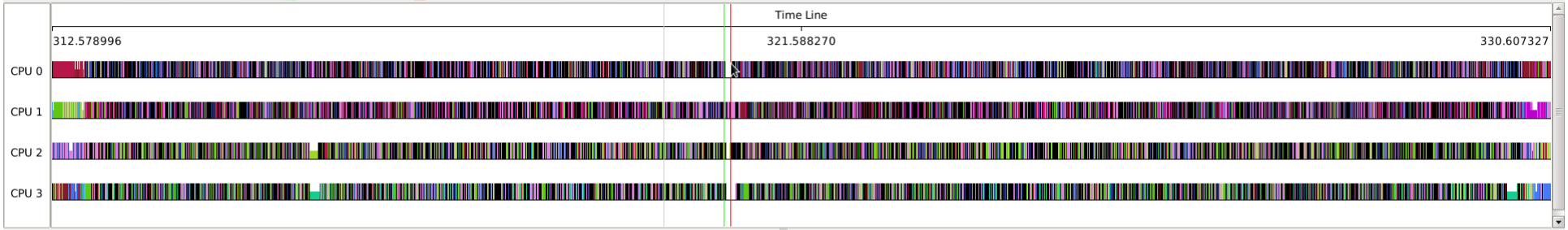


#	CPU	Time Stamp	Task	PID	Latency	Event	Info
25539530	1	319.944885	emacs	2000	...1	preempt_disable	caller=0x32b34F parent=0x32b34F
25539531	0	319.944885	dbus-daemon	1853	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
25539532	1	319.944885	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539533	0	319.944885	dbus-daemon	1853	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
25539534	1	319.944885	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539535	0	319.944885	dbus-daemon	1853	...1	preempt_disable	caller=0x71f143F parent=0x67400000F
25539536	0	319.944886	dbus-daemon	1853	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539537	1	319.944886	emacs	2000	...1	x86_fpu_init_state	x86/fpu: 0xffff9e5cefc34ac0 initialized: 0 xfeatures: 0 xcomp_bv: 800000000000001f
25539538	0	319.944886	dbus-daemon	1853	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539539	1	319.944886	emacs	2000	...1	x86_fpu_activate_state	x86/fpu: 0xffff9e5cefc34ac0 initialized: 0 xfeatures: 0 xcomp_bv: 800000000000001f
25539540	0	319.944886	dbus-daemon	1853	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
25539541	1	319.944887	emacs	2000	...2	x86_fpu_regs_activated	x86/fpu: 0xffff9e5cefc34ac0 initialized: 1 xfeatures: 0 xcomp_bv: 800000000000001f
25539542	0	319.944887	dbus-daemon	1853	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
25539543	0	319.944887	dbus-daemon	1853	...1	preempt_enable	caller=0x71eb56F parent=0x67400000F
25539544	1	319.944887	emacs	2000	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
25539545	0	319.944887	dbus-daemon	1853	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539546	1	319.944887	emacs	2000	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
25539547	0	319.944888	dbus-daemon	1853	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539548	1	319.944888	emacs	2000	...1	preempt_enable	caller=0x32bacF parent=0x32bacF
25539549	0	319.944888	dbus-daemon	1853	....	kfree	call_site=ffffffff991bb14e ptr=(nil)
25539550	1	319.944888	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539551	0	319.944888	dbus-daemon	1853	....	sys_exit	NR 47 = -11
25539552	1	319.944888	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539553	0	319.944888	dbus-daemon	1853	...1	sys_exit_recvmsg	0xfffffffffffffff5
25539554	1	319.944889	emacs	2000	d...	irq_disable	caller=0x71f085F parent=0x67400000F

KernelShark 0.2 Markers (“Marker B”)

File Filter Plots Capture Help

Pointer: 320.747013 Cursor: 319.944885 MarkerA: 320.668757 MarkerB: 320.747013 A,B Delta: 0.078256



Page 26 Search: Column: # contains graph follows

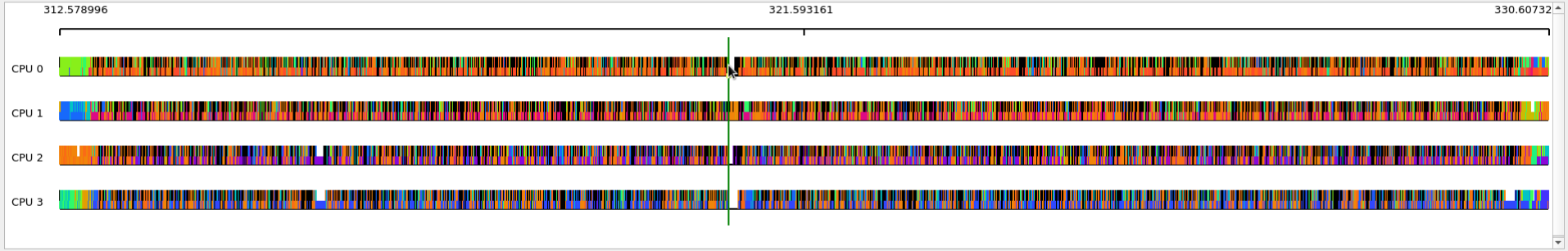
#	CPU	Time Stamp	Task	PID	Latency	Event	Info
25539530	1	319.944885	emacs	2000	...1	preempt_disable	caller=0x32b34F parent=0x32b34F
25539531	0	319.944885	dbus-daemon	1853	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
25539532	1	319.944885	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539533	0	319.944885	dbus-daemon	1853	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
25539534	1	319.944885	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539535	0	319.944885	dbus-daemon	1853	...1	preempt_disable	caller=0x71f143F parent=0x67400000F
25539536	0	319.944886	dbus-daemon	1853	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539537	1	319.944886	emacs	2000	...1	x86_fpu_init_state	x86/fpu: 0xffff9e5cefc34ac0 initialized: 0 xfeatures: 0 xcomp_bv: 800000000000001f
25539538	0	319.944886	dbus-daemon	1853	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539539	1	319.944886	emacs	2000	...1	x86_fpu_activate_state	x86/fpu: 0xffff9e5cefc34ac0 initialized: 0 xfeatures: 0 xcomp_bv: 800000000000001f
25539540	0	319.944886	dbus-daemon	1853	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
25539541	1	319.944887	emacs	2000	...2	x86_fpu_regs_activated	x86/fpu: 0xffff9e5cefc34ac0 initialized: 1 xfeatures: 0 xcomp_bv: 800000000000001f
25539542	0	319.944887	dbus-daemon	1853	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
25539543	0	319.944887	dbus-daemon	1853	...1	preempt_enable	caller=0x71eb56F parent=0x67400000F
25539544	1	319.944887	emacs	2000	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
25539545	0	319.944887	dbus-daemon	1853	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539546	1	319.944887	emacs	2000	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
25539547	0	319.944888	dbus-daemon	1853	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539548	1	319.944888	emacs	2000	...1	preempt_enable	caller=0x32bacF parent=0x32bacF
25539549	0	319.944888	dbus-daemon	1853	....	kfree	call_site=ffffffff991bb14e ptr=(nil)
25539550	1	319.944888	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
25539551	0	319.944888	dbus-daemon	1853	....	sys_exit	NR 47 = -11
25539552	1	319.944888	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
25539553	0	319.944888	dbus-daemon	1853	...1	sys_exit_recvmsg	0xfffffffffffffff5
25539554	1	319.944889	emacs	2000	d...	irq_disable	caller=0x71f085F parent=0x67400000F

KernelShark 1.0 Markers (“Marker A”)

File Filter Plots Tools Help

Pointer: 320.674448 <idle>-0 Cpu 0 d..1 irq_disable caller=0x35ccF parent=0x800964F

< + - > Marker A 320.6744485 Marker B A,B Delta:



Search: Column # contains Next Prev Graph follows

#	CPU	Time Stamp	Task	PID	Latency	Event	Info
28095211	2	320.674445	cyclictest	2246	d..2	sched_switch	cyclictest:2246 [19] D ==> emacs:2000 [120]
28095212	2	320.674446	cyclictest	2246	d..2	tlb_flush	pages=0 reason=flush on task switch (0)
28095213	2	320.674446	cyclictest	2246	d..2	x86_fpu_regs_deactivated	x86/fpu: 0xffff9e5ce9872b40 initialized: 1 xfeatures: 2 xcomp_bv: 800000000000001f
28095214	2	320.674446	cyclictest	2246	d..2	write_msr	c0000100, value 7fb16f1b0d00
28095215	2	320.674447	cyclictest	2246	d..2	x86_fpu_regs_activated	x86/fpu: 0xffff9e5cefc34ac0 initialized: 1 xfeatures: 3 xcomp_bv: 800000000000001f
28095216	2	320.674447	emacs	2000	d..2	irq_enable	caller=0x71ecf1F parent=0x67400000F
28095217	2	320.674447	emacs	2000	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
28095218	2	320.674448	emacs	2000	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
28095219	2	320.674448	emacs	2000	...1	preempt_enable	caller=0x71955cF parent=0x71955cF
28095220	2	320.674448	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
28095221	0	320.674449	<idle>	0	d..1	irq_disable	caller=0x35ccF parent=0x800964F
28095222	2	320.674449	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
28095223	2	320.674449	emacs	2000	d...	irq_disable	caller=0x3ec7F parent=0x67400000F
28095224	0	320.674449	<idle>	0	d.h1	local_timer_entry	vector=236
28095225	2	320.674450	emacs	2000	d...	irq_enable	caller=0x35b0F parent=0x8009c9F
28095226	0	320.674450	<idle>	0	d.h2	hrtimer_cancel	hrtimer=0xffffb58cc47d7e70
28095227	0	320.674450	<idle>	0	d.h1	hrtimer_expire_entry	hrtimer=0xffffb58cc47d7e70 now=320671382513 function=hrtimer_wakeup/0x0
28095228	0	320.674451	<idle>	0	d.h2	sched_waking	comm=cyclictest pid=2244 prio=19 target_cpu=000
28095229	2	320.674451	emacs	2000	d...	irq_disable	caller=0x35ccF parent=0x800082F
28095230	2	320.674451	emacs	2000	d...	irq_enable	caller=0x4192F parent=0x67400000F
28095231	0	320.674451	<idle>	0	dNh3	sched_wakeup	cyclictest:2244 [19] success=1 CPU:000
28095232	2	320.674451	emacs	2000	....	sys_enter	NR 7 (7ffe4450a7f8, 1, ffffffff, d00160, 0, 0)

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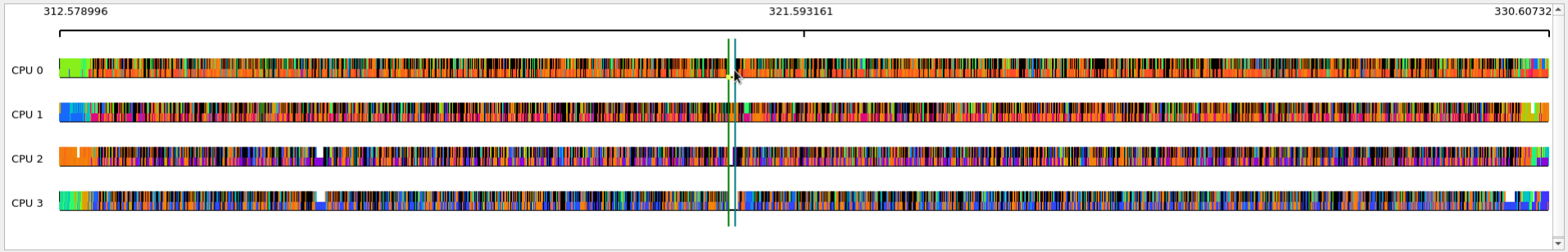
KernelShark 1.0 Markers (“Marker B”)

File Filter Plots Tools Help

Pointer: 320.757043 <idle>-0 Cpu 0 dN.2 irq_enable caller=0xf67b0F parent=0x67400000F

< + - > Marker A 320.6744485 Marker B 320.7570437 A,B Delta: 0.0825951



Search: Column # contains Next Prev Graph follows

#	CPU	Time Stamp	Task	PID	Latency	Event	Info
28260589	1	320.757039	emacs	2000	d...	irq_disable	caller=0x420dF parent=0x67400000F
28260590	1	320.757039	emacs	2000	d...	irq_enable	caller=0x3ee5F parent=0x67400000F
28260591	1	320.757039	emacs	2000	d...	irq_disable	caller=0x3ec7F parent=0x67400000F
28260592	1	320.757040	emacs	2000	d...	irq_enable	caller=0x35b0F parent=0x80009dF
28260593	1	320.757041	emacs	2000	d...	irq_disable	caller=0x35ccF parent=0x80093aF
28260594	1	320.757041	emacs	2000	d.h.	preempt_disable	caller=0x84b21F parent=0x84b21F
28260595	1	320.757041	emacs	2000	d.h.	irq_work_entry	vector=246
28260596	1	320.757042	emacs	2000	d.h2	sched_waking	comm=trace-cmd pid=2240 prio=120 target_cpu=000
28260597	1	320.757043	emacs	2000	d.h3	sched_wake_idle_without_ipi	cpu=0
28260598	1	320.757043	emacs	2000	d.h3	sched_wakeup	trace-cmd:2240 [120] success=1 CPU:000
28260599	0	320.757044	<idle>	0	dN.2	irq_enable	caller=0xf67b0F parent=0x67400000F
28260600	1	320.757044	emacs	2000	d.h.	irq_work_exit	vector=246
28260601	0	320.757044	<idle>	0	.N.1	cpu_idle	state=4294967295 cpu_id=0
28260602	1	320.757044	emacs	2000	d.h.	preempt_enable	caller=0x84b6bF parent=0x84b6bF
28260603	0	320.757044	<idle>	0	dN.2	irq_disable	caller=0xf662cF parent=0x67400000F
28260604	0	320.757044	<idle>	0	dN.2	irq_enable	caller=0xf6650F parent=0x67400000F
28260605	1	320.757045	emacs	2000	d...	irq_enable	caller=0x35b0F parent=0x8009c9F
28260606	0	320.757045	<idle>	0	dN.1	irq_disable	caller=0xf667dF parent=0x67400000F
28260607	0	320.757045	<idle>	0	dN.1	irq_enable	caller=0xf66c0F parent=0x67400000F
28260608	1	320.757045	emacs	2000	d...	irq_disable	caller=0x35ccF parent=0x800082F
28260609	0	320.757046	<idle>	0	dN.1	irq_disable	caller=0x1158cdF parent=0x67400000F
28260610	1	320.757046	emacs	2000	d...	irq_enable	caller=0x4192F parent=0x67400000F

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KernelShark 0.2 Zooming

File Filter Plots Capture Help

Pointer: 321.167642 Cursor: 0.0 MarkerA: 0.0 MarkerB: 0.0 A,B Delta: 0.0

Page 1 Search: Column: # contains graph follows

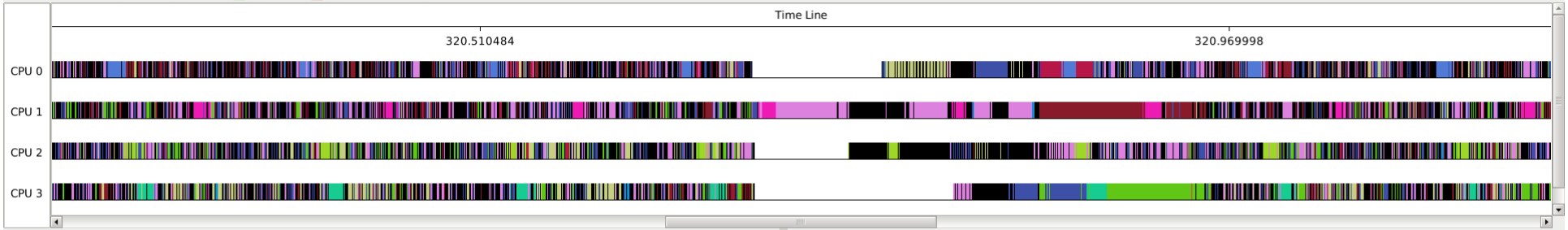
#	CPU	Time Stamp	Task	PID	Latency	Event	Info
0	1	312.578996	cyclictest	2243	....	function	mutex_unlock <-- rb_simple_write
1	2	312.578996	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off
2	3	312.578996	<idle>	0	d..1	function	_raw_spin_lock <-- get_next_timer_interrupt
3	2	312.578997	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
4	3	312.578997	<idle>	0	d..2	function	_raw_spin_unlock <-- get_next_timer_interrupt
5	2	312.578997	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off
6	3	312.578997	<idle>	0	d..1	function	_raw_spin_lock_irqsave <-- hrtimer_get_next_event
7	2	312.578997	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_on
8	3	312.578998	<idle>	0	d..2	function	_raw_spin_unlock_irqrestore <-- hrtimer_get_next_event
9	2	312.578998	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
10	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_on
11	2	312.578998	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off_caller
12	1	312.578998	cyclictest	2243	d.h3	irq_work_entry	vector=246
13	2	312.578998	emacs	2000	d..2	irq_disable	caller=0x35ccF parent=0x800964F
14	3	312.578998	<idle>	0	d..2	function	__srcu_read_lock <-- cpuidle_enter_state
15	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off_caller
16	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
17	3	312.578999	<idle>	0	d..1	cpu_idle	state=6 cpu_id=3
18	1	312.578999	cyclictest	2243	d.h4	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
19	2	312.578999	emacs	2000	d.h2	irq_work_entry	vector=246
20	3	312.578999	<idle>	0	d..2	function	__srcu_read_unlock <-- cpuidle_enter_state
21	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
22	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
23	2	312.578999	emacs	2000	d.h3	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
24	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock

vmware

KernelShark 0.2 Zooming

File Filter Plots Capture Help

Pointer: 320.771923 Cursor: 0.0 MarkerA: 0.0 MarkerB: 0.0 A,B Delta: 0.0



Page 1 Search: Column: # contains graph follows

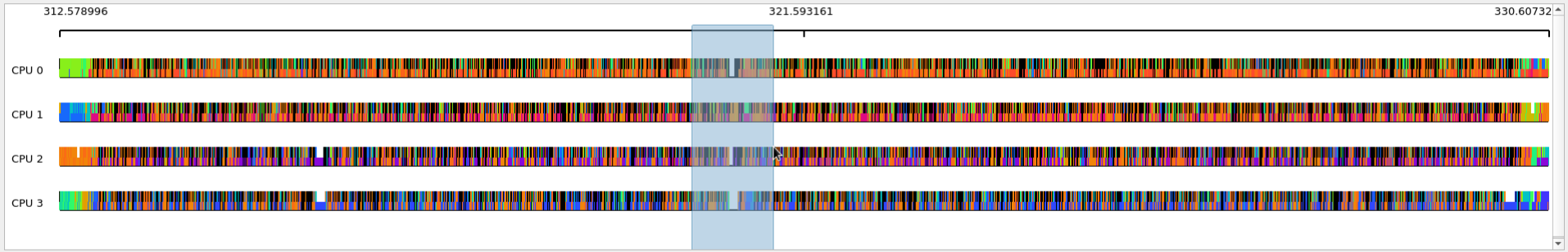
#	CPU	Time Stamp	Task	PID	Latency	Event	Info
0	1	312.578996	cyclictest	2243	....	function	mutex_unlock <-- rb_simple_write
1	2	312.578996	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off
2	3	312.578996	<idle>	0	d..1	function	_raw_spin_lock <-- get_next_timer_interrupt
3	2	312.578997	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
4	3	312.578997	<idle>	0	d..2	function	_raw_spin_unlock <-- get_next_timer_interrupt
5	2	312.578997	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off
6	3	312.578997	<idle>	0	d..1	function	_raw_spin_lock_irqsave <-- hrtimer_get_next_event
7	2	312.578997	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_on
8	3	312.578998	<idle>	0	d..2	function	_raw_spin_unlock_irqrestore <-- hrtimer_get_next_event
9	2	312.578998	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
10	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_on
11	2	312.578998	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off_caller
12	1	312.578998	cyclictest	2243	d.h3	irq_work_entry	vector=246
13	2	312.578998	emacs	2000	d..2	irq_disable	caller=0x35ccF parent=0x800964F
14	3	312.578998	<idle>	0	d..2	function	__srcu_read_lock <-- cpuidle_enter_state
15	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off_caller
16	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
17	3	312.578999	<idle>	0	d..1	cpu_idle	state=6 cpu_id=3
18	1	312.578999	cyclictest	2243	d.h4	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
19	2	312.578999	emacs	2000	d.h2	irq_work_entry	vector=246
20	3	312.578999	<idle>	0	d..2	function	__srcu_read_unlock <-- cpuidle_enter_state
21	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
22	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
23	2	312.578999	emacs	2000	d.h3	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
24	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock

KernelShark 1.0 Zooming

File Filter Plots Tools Help

Pointer: 321.220675 emacs-2000 Cpu 2 dNh. hrtimer_expire_exit hrtimer=0xffffb58cc223fe70

< + - > Marker A Marker B A,B Delta:



Search: Column # contains Next Prev Graph follows

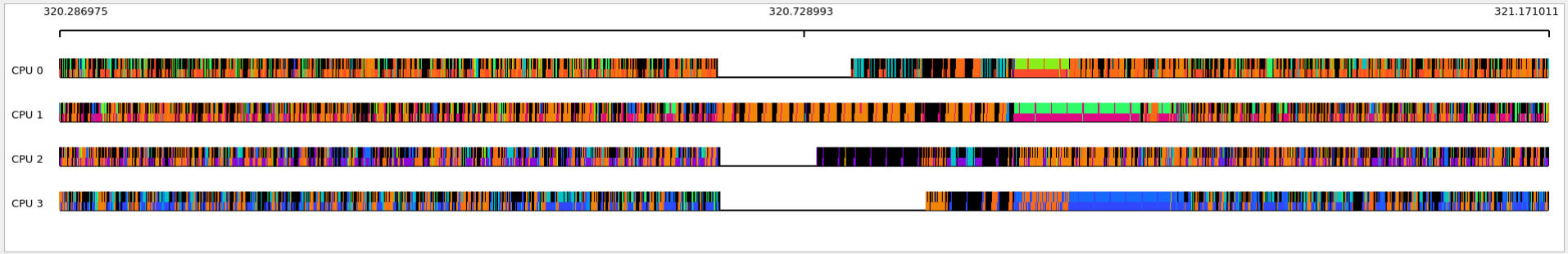
#	CPU	Time Stamp	Task	PID	Latency	Event	Info
27581632	1	320.530305	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
27581633	3	320.530305	Xorg	805	d...	irq_disable	caller=0x35ccF parent=0x800082F
27581634	3	320.530305	Xorg	805	d...	irq_enable	caller=0x4192F parent=0x67400000F
27581635	1	320.530305	emacs	2000	d...	irq_disable	caller=0x71ee50F parent=0x67400000F
27581636	3	320.530305	Xorg	805	....	sys_enter	NR 47 (3a, 7fffa024dbb0, 0, a, 0, 55ac8fe9fdf0)
27581637	3	320.530306	Xorg	805	...1	sys_enter_recvmsg	fd: 0x0000003a, msg: 0x7fffa024dbb0, flags: 0x00000000
27581638	1	320.530306	emacs	2000	d..1	preempt_disable	caller=0x71ee5aF parent=0x67400000F
27581639	1	320.530306	emacs	2000	d..1	irq_enable	caller=0x71ed60F parent=0x67400000F
27581640	3	320.530306	Xorg	805	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
27581641	1	320.530306	emacs	2000	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
27581642	3	320.530307	Xorg	805	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
27581643	1	320.530307	emacs	2000	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
27581644	3	320.530307	Xorg	805	...1	preempt_disable	caller=0x71f143F parent=0x67400000F
27581645	1	320.530307	emacs	2000	...1	preempt_enable	caller=0x71ed4eF parent=0x67400000F
27581646	3	320.530308	Xorg	805	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
27581647	1	320.530308	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
27581648	3	320.530308	Xorg	805	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
27581649	1	320.530308	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
27581650	3	320.530308	Xorg	805	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
27581651	1	320.530308	emacs	2000	....	sys_exit	NR 7 = 1
27581652	1	320.530309	emacs	2000	...1	sys_exit_poll	0x1
27581653	3	320.530309	Xorg	805	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F

KernelShark 1.0 Zooming

File Filter Plots Tools Help

Pointer: 320.785737

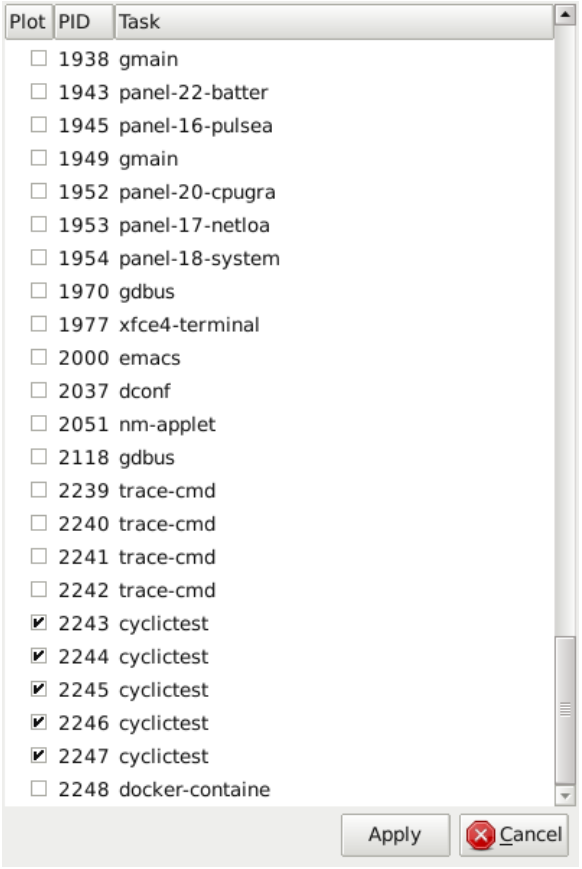
< + - > Marker A Marker B A,B Delta:

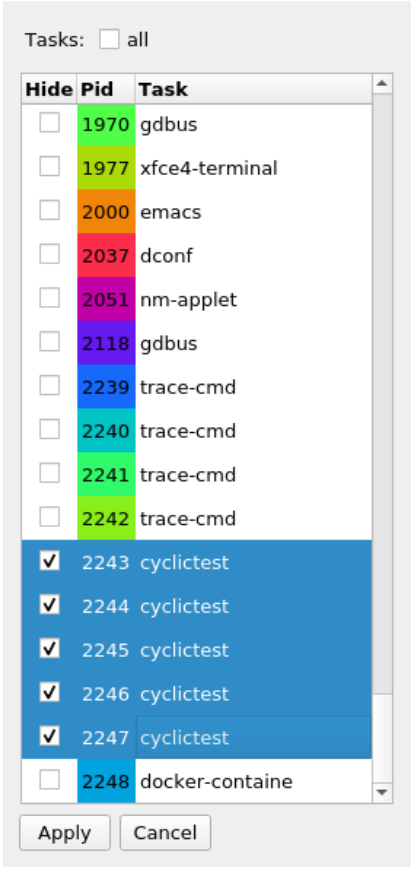


Search: Column # contains Next Prev Graph follows

#	CPU	Time Stamp	Task	PID	Latency	Event	Info
26739090	3	320.286977	emacs	2000	d..4	sched_wake_idle_without_ipi	cpu=2
26739091	2	320.286978	<idle>	0	dN.2	irq_disable	caller=0xf678cF parent=0x67400000F
26739092	3	320.286978	emacs	2000	d..4	sched_wakeup	Xorg:805 [120] success=1 CPU:002
26739093	2	320.286978	<idle>	0	dN.2	irq_enable	caller=0xf67b0F parent=0x67400000F
26739094	3	320.286978	emacs	2000	d..1	irq_enable	caller=0x71ed60F parent=0x67400000F
26739095	2	320.286978	<idle>	0	.N.1	cpu_idle	state=4294967295 cpu_id=2
26739096	3	320.286979	emacs	2000	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
26739097	2	320.286979	<idle>	0	dN.2	irq_disable	caller=0xf662cF parent=0x67400000F
26739098	3	320.286979	emacs	2000	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
26739099	2	320.286979	<idle>	0	dN.2	irq_enable	caller=0xf6650F parent=0x67400000F
26739100	3	320.286979	emacs	2000	...1	preempt_enable	caller=0x71ed4eF parent=0x67400000F
26739101	3	320.286980	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
26739102	2	320.286980	<idle>	0	dN.1	irq_disable	caller=0xf667dF parent=0x67400000F
26739103	2	320.286980	<idle>	0	dN.1	irq_enable	caller=0xf66c0F parent=0x67400000F
26739104	3	320.286980	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
26739105	2	320.286981	<idle>	0	dN.1	irq_disable	caller=0x1158cdF parent=0x67400000F
26739106	3	320.286981	emacs	2000	....	kfree	(vfs_writev+0xc5) call_site=ffffffff98e6eb15 ptr=(nil)
26739107	2	320.286981	<idle>	0	dN.1	irq_enable	caller=0x115909F parent=0x67400000F
26739108	3	320.286981	emacs	2000	....	sys_exit	NR 20 = 4
26739109	3	320.286981	emacs	2000	...1	sys_exit_writev	0x4
26739110	2	320.286981	<idle>	0	dN.1	irq_disable	caller=0x718cf1F parent=0x67400000F
26739111	2	320.286982	<idle>	0	dN.1	rcu_utilization	Start context switch

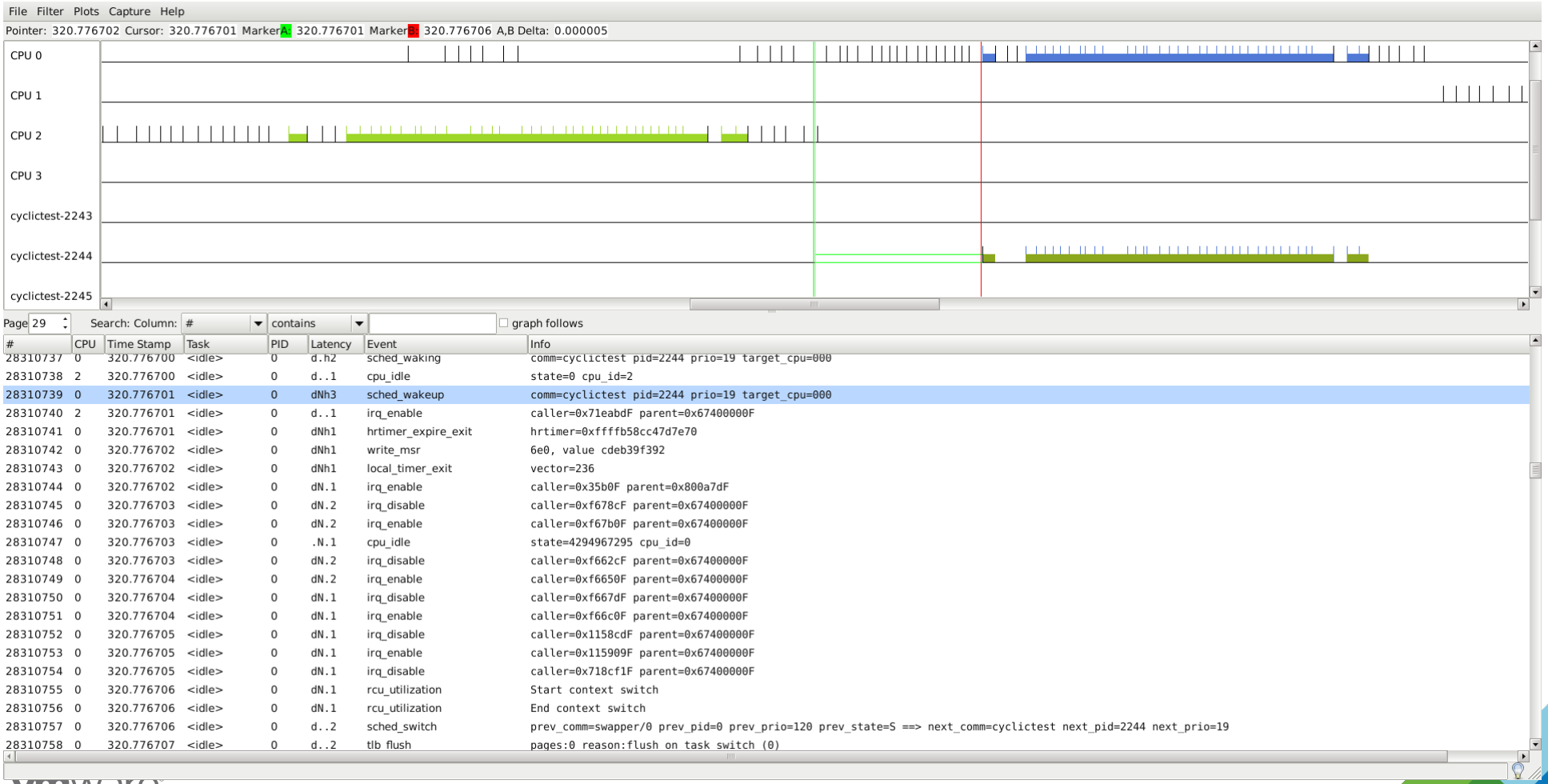
Selecting Tasks





vmware

KernelShark 0.2 Wake-up Latency



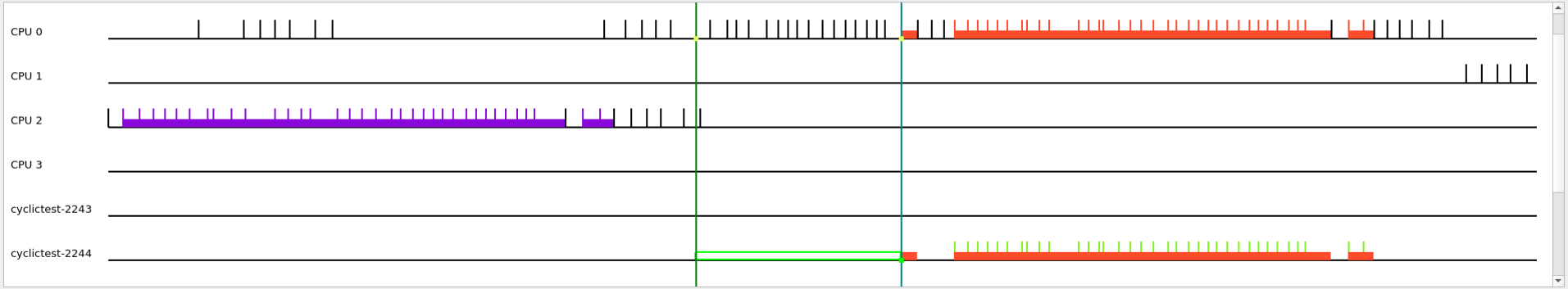
#	CPU	Time Stamp	Task	PID	Latency	Event	Info
28310737	0	320.776700	<idle>	0	d.h2	sched_waking	comm=cyclictest pid=2244 prio=19 target_cpu=000
28310738	2	320.776700	<idle>	0	d..1	cpu_idle	state=0 cpu_id=2
28310739	0	320.776701	<idle>	0	dNh3	sched_wakeup	comm=cyclictest pid=2244 prio=19 target_cpu=000
28310740	2	320.776701	<idle>	0	d..1	irq_enable	caller=0x71eabdF parent=0x67400000F
28310741	0	320.776701	<idle>	0	dNh1	hrtimer_expire_exit	hrtimer=0xffffb58cc47d7e70
28310742	0	320.776702	<idle>	0	dNh1	write_msr	6e0, value cdeb39f392
28310743	0	320.776702	<idle>	0	dNh1	local_timer_exit	vector=236
28310744	0	320.776702	<idle>	0	dN.1	irq_enable	caller=0x35b0F parent=0x800a7dF
28310745	0	320.776703	<idle>	0	dN.2	irq_disable	caller=0xf678cF parent=0x67400000F
28310746	0	320.776703	<idle>	0	dN.2	irq_enable	caller=0xf67b0F parent=0x67400000F
28310747	0	320.776703	<idle>	0	.N.1	cpu_idle	state=4294967295 cpu_id=0
28310748	0	320.776703	<idle>	0	dN.2	irq_disable	caller=0xf662cF parent=0x67400000F
28310749	0	320.776704	<idle>	0	dN.2	irq_enable	caller=0xf6650F parent=0x67400000F
28310750	0	320.776704	<idle>	0	dN.1	irq_disable	caller=0xf667dF parent=0x67400000F
28310751	0	320.776704	<idle>	0	dN.1	irq_enable	caller=0xf66c0F parent=0x67400000F
28310752	0	320.776705	<idle>	0	dN.1	irq_disable	caller=0x1158cdF parent=0x67400000F
28310753	0	320.776705	<idle>	0	dN.1	irq_enable	caller=0x115909F parent=0x67400000F
28310754	0	320.776705	<idle>	0	dN.1	irq_disable	caller=0x718cf1F parent=0x67400000F
28310755	0	320.776706	<idle>	0	dN.1	rcu_utilization	Start context switch
28310756	0	320.776706	<idle>	0	dN.1	rcu_utilization	End context switch
28310757	0	320.776706	<idle>	0	d..2	sched_switch	prev_comm=swapper/0 prev_pid=0 prev_prio=120 prev_state=S ==> next_comm=cyclictest next_pid=2244 next_prio=19
28310758	0	320.776707	<idle>	0	d..2	tlb_flush	pages:0 reason:flush_on_task_switch (0)

KernelShark 1.0 Wake-up Latency

File Filter Plots Tools Help

Pointer: 320.776706 cyclictest-2245

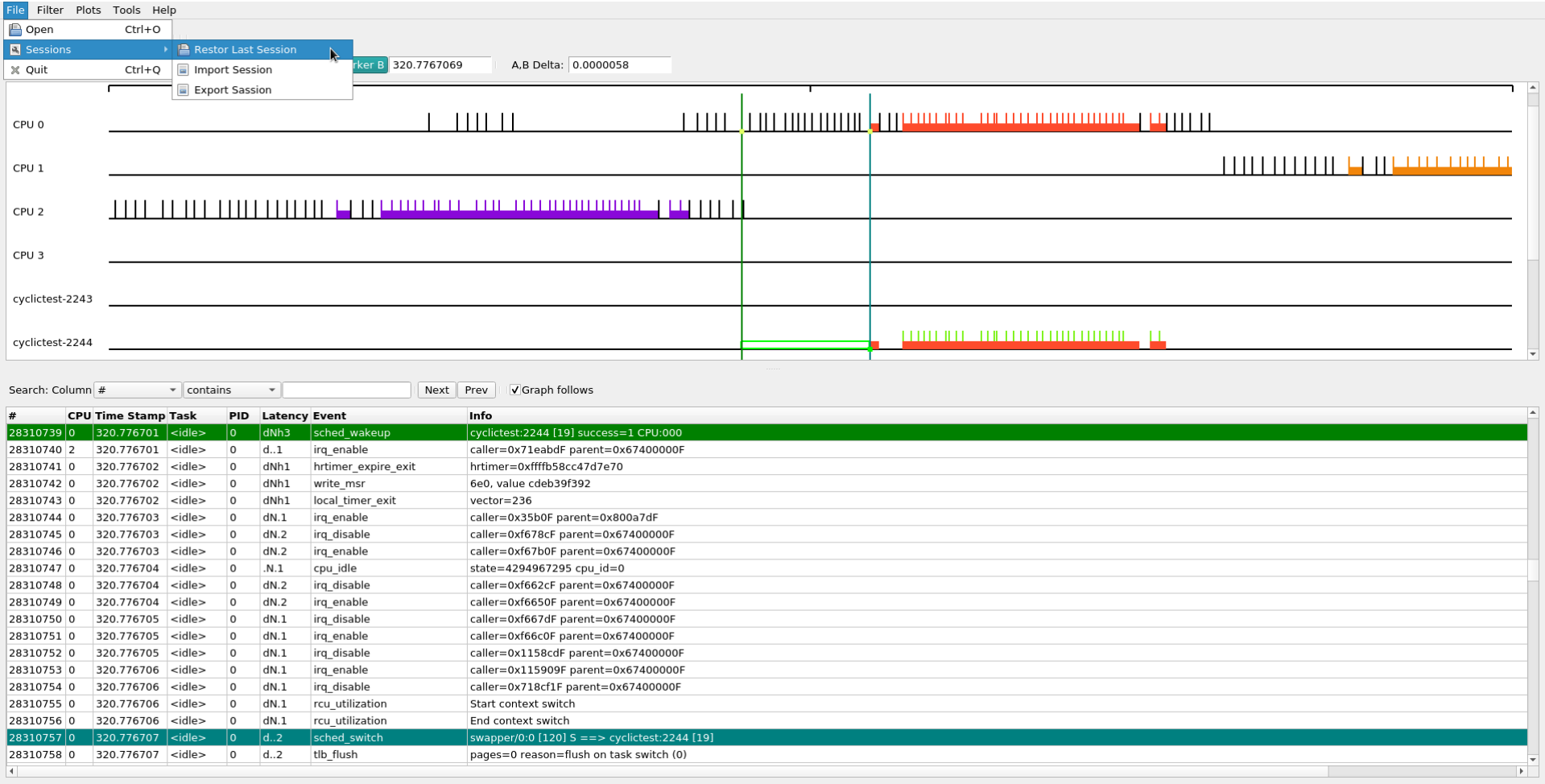
< + - > Marker A 320.7767011 Marker B 320.7767069 A,B Delta: 0.0000058



Search: Column # contains Next Prev ☑ Graph follows

#	CPU	Time Stamp	Task	PID	Latency	Event	Info
28310739	0	320.776701	<idle>	0	dNh3	sched_wakeup	cyclictest:2244 [19] success=1 CPU:000
28310740	2	320.776701	<idle>	0	d..1	irq_enable	caller=0x71eabdF parent=0x67400000F
28310741	0	320.776702	<idle>	0	dNh1	hrtimer_expire_exit	hrtimer=0xffffb58cc47d7e70
28310742	0	320.776702	<idle>	0	dNh1	write_msr	6e0, value cdeb39f392
28310743	0	320.776702	<idle>	0	dNh1	local_timer_exit	vector=236
28310744	0	320.776703	<idle>	0	dN.1	irq_enable	caller=0x35b0F parent=0x800a7dF
28310745	0	320.776703	<idle>	0	dN.2	irq_disable	caller=0xf678cF parent=0x67400000F
28310746	0	320.776703	<idle>	0	dN.2	irq_enable	caller=0xf67b0F parent=0x67400000F
28310747	0	320.776704	<idle>	0	.N.1	cpu_idle	state=4294967295 cpu_id=0
28310748	0	320.776704	<idle>	0	dN.2	irq_disable	caller=0xf662cF parent=0x67400000F
28310749	0	320.776704	<idle>	0	dN.2	irq_enable	caller=0xf6650F parent=0x67400000F
28310750	0	320.776705	<idle>	0	dN.1	irq_disable	caller=0xf667dF parent=0x67400000F
28310751	0	320.776705	<idle>	0	dN.1	irq_enable	caller=0xf66c0F parent=0x67400000F
28310752	0	320.776705	<idle>	0	dN.1	irq_disable	caller=0x1158cdF parent=0x67400000F
28310753	0	320.776706	<idle>	0	dN.1	irq_enable	caller=0x115909F parent=0x67400000F
28310754	0	320.776706	<idle>	0	dN.1	irq_disable	caller=0x718cf1F parent=0x67400000F
28310755	0	320.776706	<idle>	0	dN.1	rcu_utilization	Start context switch
28310756	0	320.776706	<idle>	0	dN.1	rcu_utilization	End context switch
28310757	0	320.776707	<idle>	0	d..2	sched_switch	swapper/0:0 [120] S ==> cyclictest:2244 [19]
28310758	0	320.776707	<idle>	0	d..2	tlb_flush	pages=0 reason=flush on task switch (0)

KernelShark 1.0 Sessions



#	CPU	Time Stamp	Task	PID	Latency	Event	Info
28310739	0	320.776701	<idle>	0	dNh3	sched_wakeup	cyclictest:2244 [19] success=1 CPU:000
28310740	2	320.776701	<idle>	0	d..1	irq_enable	caller=0x71eabdF parent=0x67400000F
28310741	0	320.776702	<idle>	0	dNh1	hrtimer_expire_exit	hrtimer=0xffffb58cc47d7e70
28310742	0	320.776702	<idle>	0	dNh1	write_msr	6e0, value cdeb39f392
28310743	0	320.776702	<idle>	0	dNh1	local_timer_exit	vector=236
28310744	0	320.776703	<idle>	0	dN.1	irq_enable	caller=0x35b0F parent=0x800a7dF
28310745	0	320.776703	<idle>	0	dN.2	irq_disable	caller=0xf678cF parent=0x67400000F
28310746	0	320.776703	<idle>	0	dN.2	irq_enable	caller=0xf67b0F parent=0x67400000F
28310747	0	320.776704	<idle>	0	.N.1	cpu_idle	state=4294967295 cpu_id=0
28310748	0	320.776704	<idle>	0	dN.2	irq_disable	caller=0xf662cF parent=0x67400000F
28310749	0	320.776704	<idle>	0	dN.2	irq_enable	caller=0xf6650F parent=0x67400000F
28310750	0	320.776705	<idle>	0	dN.1	irq_disable	caller=0xf667dF parent=0x67400000F
28310751	0	320.776705	<idle>	0	dN.1	irq_enable	caller=0xf66c0F parent=0x67400000F
28310752	0	320.776705	<idle>	0	dN.1	irq_disable	caller=0x1158cdF parent=0x67400000F
28310753	0	320.776706	<idle>	0	dN.1	irq_enable	caller=0x115909F parent=0x67400000F
28310754	0	320.776706	<idle>	0	dN.1	irq_disable	caller=0x718cf1F parent=0x67400000F
28310755	0	320.776706	<idle>	0	dN.1	rcu_utilization	Start context switch
28310756	0	320.776706	<idle>	0	dN.1	rcu_utilization	End context switch
28310757	0	320.776707	<idle>	0	d..2	sched_switch	swapper/0:0 [120] S ==> cyclictest:2244 [19]
28310758	0	320.776707	<idle>	0	d..2	tlb_flush	pages=0 reason=flush on task switch (0)

KernelShark 0.2 Zooming

File Filter Plots Capture Help

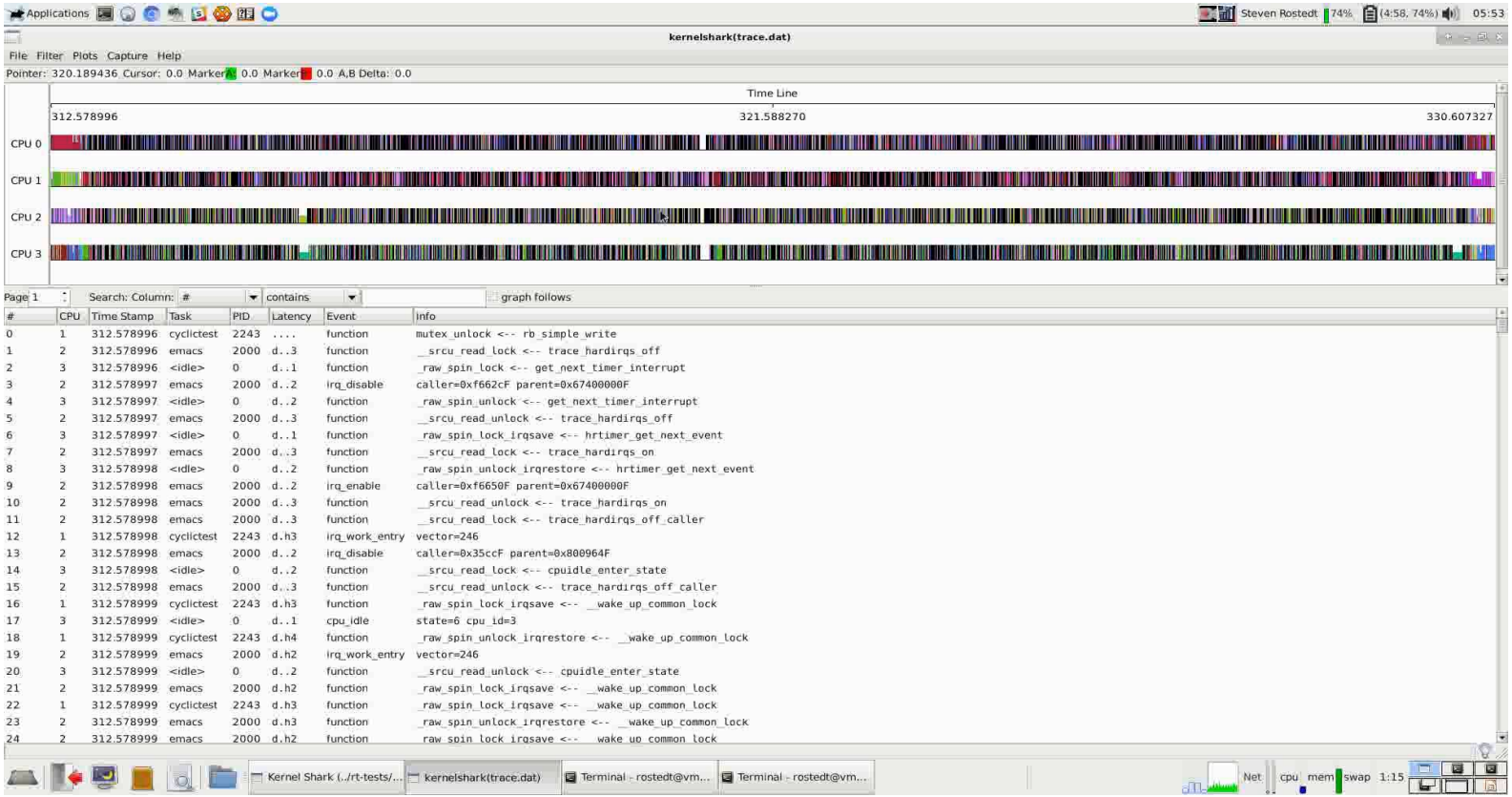
Pointer: 321.167642 Cursor: 0.0 MarkerA: 0.0 MarkerB: 0.0 A,B Delta: 0.0

Page 1 Search: Column: # contains graph follows

#	CPU	Time Stamp	Task	PID	Latency	Event	Info
0	1	312.578996	cyclictest	2243	....	function	mutex_unlock <-- rb_simple_write
1	2	312.578996	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off
2	3	312.578996	<idle>	0	d..1	function	_raw_spin_lock <-- get_next_timer_interrupt
3	2	312.578997	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
4	3	312.578997	<idle>	0	d..2	function	_raw_spin_unlock <-- get_next_timer_interrupt
5	2	312.578997	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off
6	3	312.578997	<idle>	0	d..1	function	_raw_spin_lock_irqsave <-- hrtimer_get_next_event
7	2	312.578997	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_on
8	3	312.578998	<idle>	0	d..2	function	_raw_spin_unlock_irqrestore <-- hrtimer_get_next_event
9	2	312.578998	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
10	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_on
11	2	312.578998	emacs	2000	d..3	function	__srcu_read_lock <-- trace_hardirqs_off_caller
12	1	312.578998	cyclictest	2243	d.h3	irq_work_entry	vector=246
13	2	312.578998	emacs	2000	d..2	irq_disable	caller=0x35ccF parent=0x800964F
14	3	312.578998	<idle>	0	d..2	function	__srcu_read_lock <-- cpuidle_enter_state
15	2	312.578998	emacs	2000	d..3	function	__srcu_read_unlock <-- trace_hardirqs_off_caller
16	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
17	3	312.578999	<idle>	0	d..1	cpu_idle	state=6 cpu_id=3
18	1	312.578999	cyclictest	2243	d.h4	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
19	2	312.578999	emacs	2000	d.h2	irq_work_entry	vector=246
20	3	312.578999	<idle>	0	d..2	function	__srcu_read_unlock <-- cpuidle_enter_state
21	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
22	1	312.578999	cyclictest	2243	d.h3	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock
23	2	312.578999	emacs	2000	d.h3	function	_raw_spin_unlock_irqrestore <-- __wake_up_common_lock
24	2	312.578999	emacs	2000	d.h2	function	_raw_spin_lock_irqsave <-- __wake_up_common_lock

vmware

KernelShark 0.2 Zooming



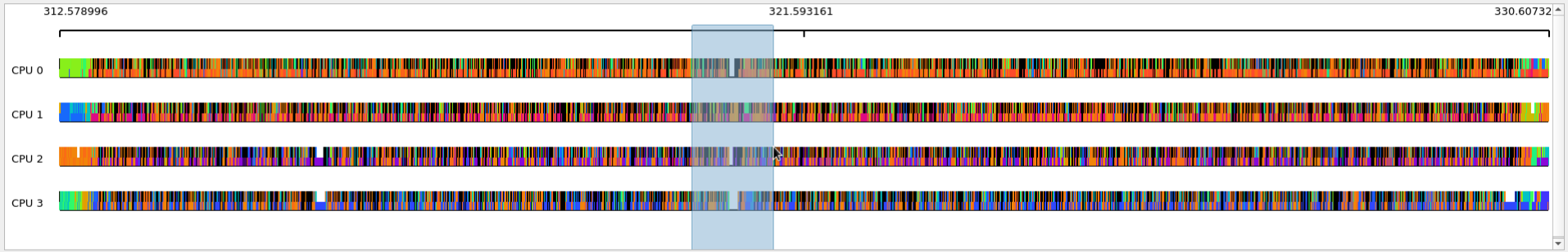
vmware

KernelShark 1.0 Zooming

File Filter Plots Tools Help

Pointer: 321.220675 emacs-2000 Cpu 2 dNh. hrtimer_expire_exit hrtimer=0xffffb58cc223fe70

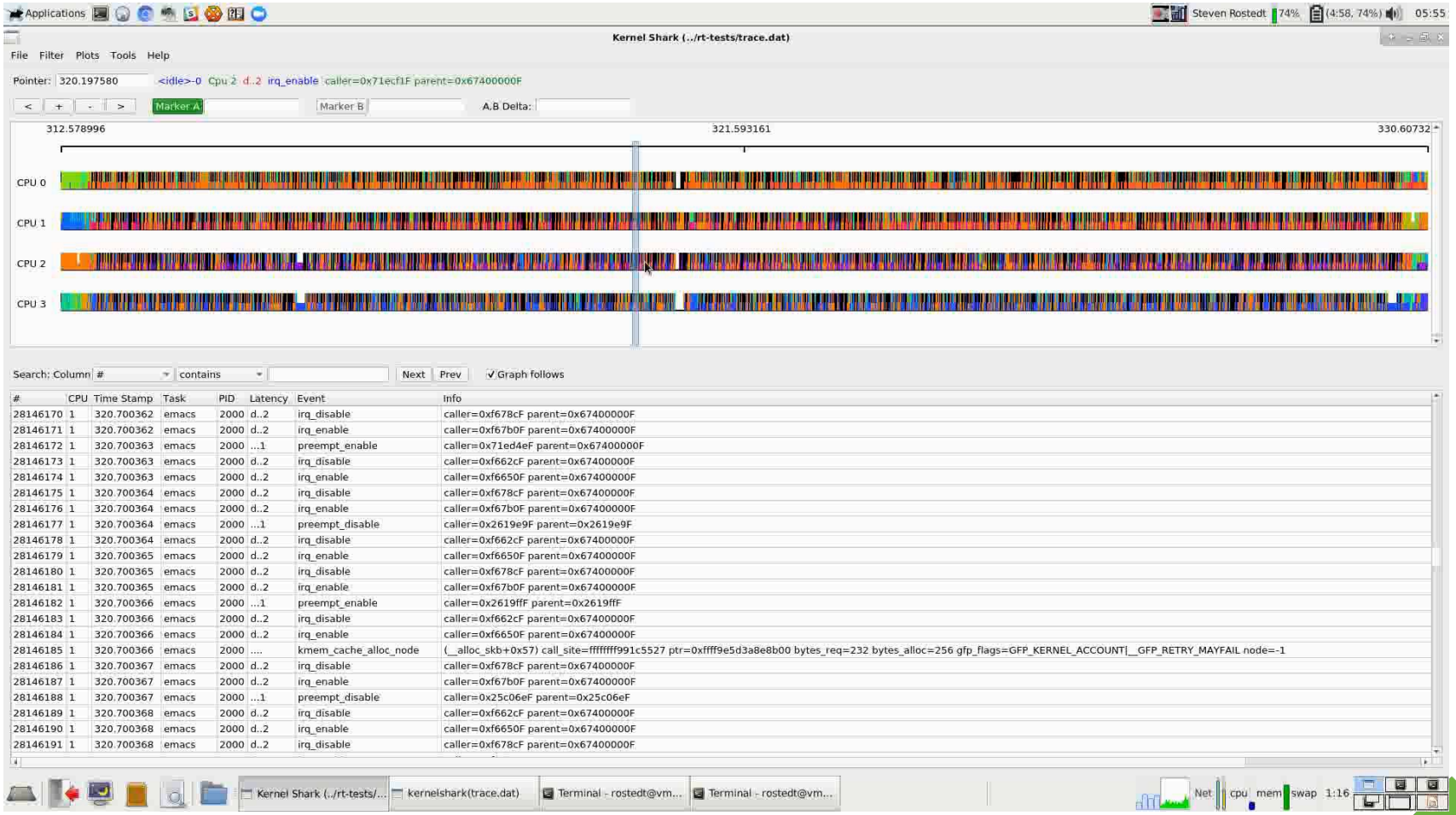
< + - > Marker A Marker B A,B Delta:



Search: Column # contains Next Prev Graph follows

#	CPU	Time Stamp	Task	PID	Latency	Event	Info
27581632	1	320.530305	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
27581633	3	320.530305	Xorg	805	d...	irq_disable	caller=0x35ccF parent=0x800082F
27581634	3	320.530305	Xorg	805	d...	irq_enable	caller=0x4192F parent=0x67400000F
27581635	1	320.530305	emacs	2000	d...	irq_disable	caller=0x71ee50F parent=0x67400000F
27581636	3	320.530305	Xorg	805	....	sys_enter	NR 47 (3a, 7fffa024dbb0, 0, a, 0, 55ac8fe9fdf0)
27581637	3	320.530306	Xorg	805	...1	sys_enter_recvmsg	fd: 0x0000003a, msg: 0x7fffa024dbb0, flags: 0x00000000
27581638	1	320.530306	emacs	2000	d..1	preempt_disable	caller=0x71ee5aF parent=0x67400000F
27581639	1	320.530306	emacs	2000	d..1	irq_enable	caller=0x71ed60F parent=0x67400000F
27581640	3	320.530306	Xorg	805	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
27581641	1	320.530306	emacs	2000	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
27581642	3	320.530307	Xorg	805	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
27581643	1	320.530307	emacs	2000	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F
27581644	3	320.530307	Xorg	805	...1	preempt_disable	caller=0x71f143F parent=0x67400000F
27581645	1	320.530307	emacs	2000	...1	preempt_enable	caller=0x71ed4eF parent=0x67400000F
27581646	3	320.530308	Xorg	805	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
27581647	1	320.530308	emacs	2000	d..2	irq_disable	caller=0xf662cF parent=0x67400000F
27581648	3	320.530308	Xorg	805	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
27581649	1	320.530308	emacs	2000	d..2	irq_enable	caller=0xf6650F parent=0x67400000F
27581650	3	320.530308	Xorg	805	d..2	irq_disable	caller=0xf678cF parent=0x67400000F
27581651	1	320.530308	emacs	2000	....	sys_exit	NR 7 = 1
27581652	1	320.530309	emacs	2000	...1	sys_exit_poll	0x1
27581653	3	320.530309	Xorg	805	d..2	irq_enable	caller=0xf67b0F parent=0x67400000F

KernelShark 1.0 Zooming

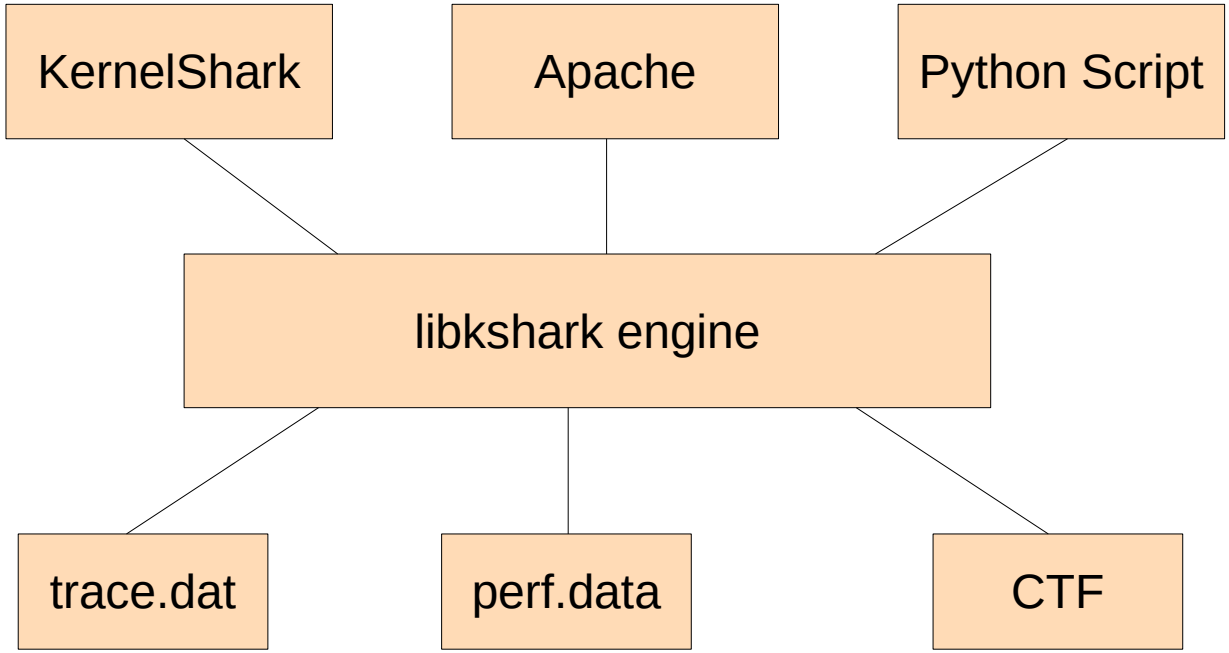


vmware

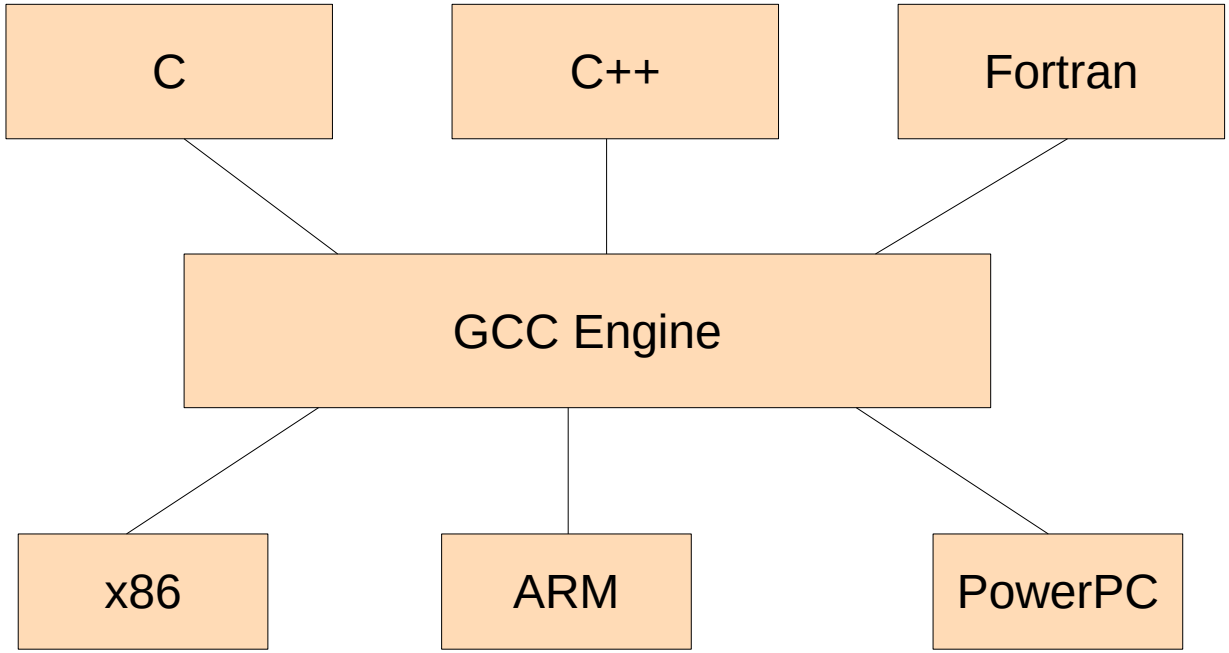
What’s next after 1.0?

- libkshark.so
  - The guts of KernelShark is being “modularized”
  - The KernelShark application is just a “shell”
  - Any tool will be able to use it
  - Also will be used by Python applications (libkshark.py)
- Will read multiple formats
  - Not just trace.dat
  - perf.data
  - Common Trace Format (CTF)
- Plugins
  - C, C++, Python

What’s next after 1.0?



What’s next after 1.0?



What’s next after 1.0?

- More than one view
  - Plot view (what it currently is)
  - Graphs
  - Flame graphs (see Brendan Gregg’s presentations)
- Will show multiple machines
  - Show interactions between hosts and multiple guests

Questions?

We have time!

DEMO!