Trace Compass Update

Remote Edition

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Plan

- Community updates
- Trace Compass Updates
- Theia Updates
- Trace Compass incubator updates
- Roadmap
- A brief discussion on UX (Why flame graphs have failed me)

DURATION: 22 MIN?

Community

Changes in the team

- Simon D has left, thank you for all your work!
- More importantly, Simon D is a father!!! :) :) :)
- Christophe (former intern) has joined Dorsal
- David (former intern) has joined Dorsal
- New committer in Incubator: Ivan Grinenko
- We are a quaran**team**

Trace Compass Updates

Trace Compass 6.0 is coming

- Cross view interactions improvements (e.g. focus on a thread)
- Preserving selection on trees when context changes
- Hide less relevant information
- Support for tracef
- Build is 50% faster!
- Time Graph (Gantt chart) is much faster to draw (average of 2x acceleration)
- Tracef support
- Density chart improvements
- Security fixes
- Migrated to EPLv2
- Released 5.2 and 5.3

Trace Compass Incubator Updates

Disk Requests view

Scripting

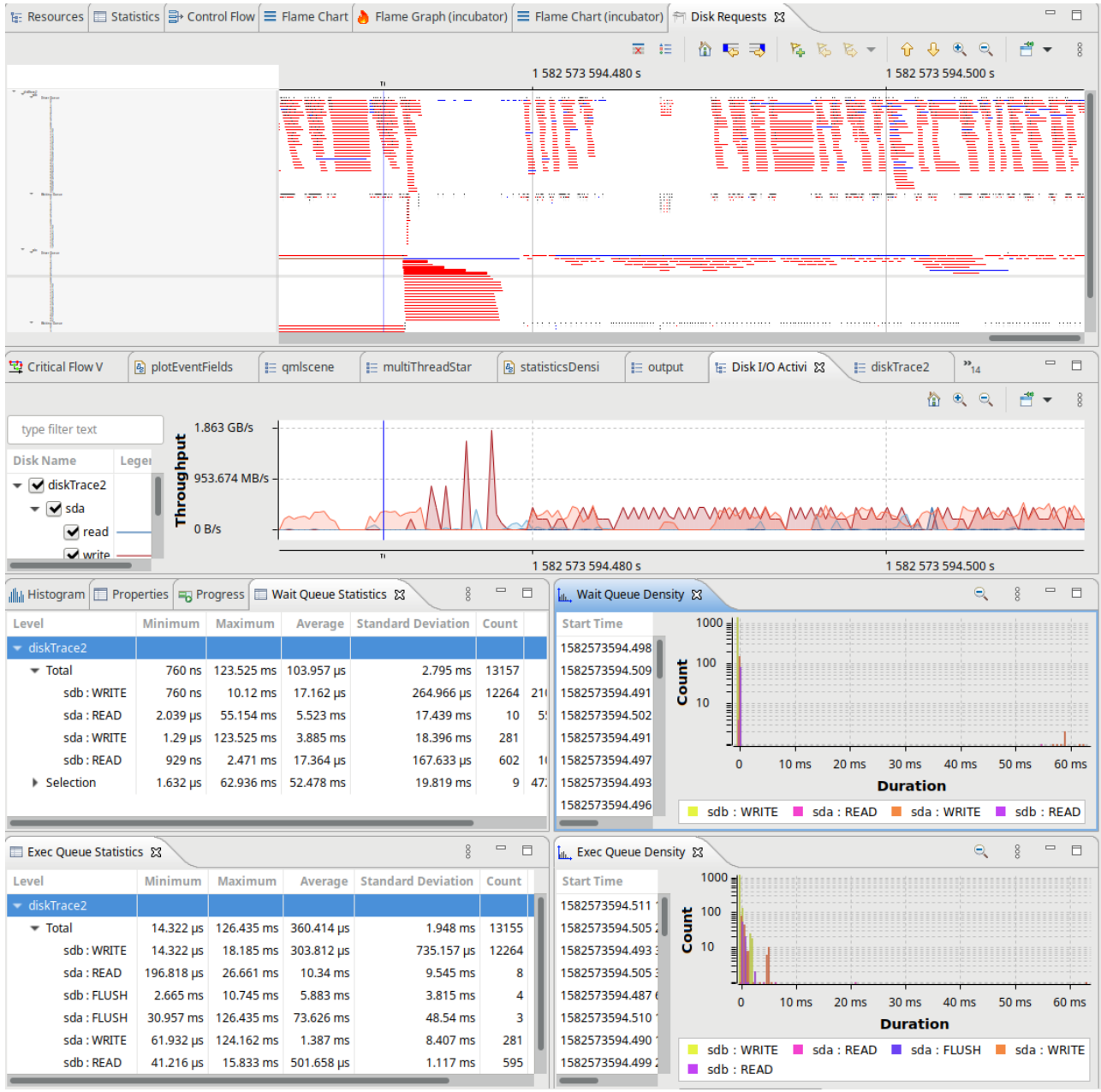
Multi-view

Python CLI to test trace server

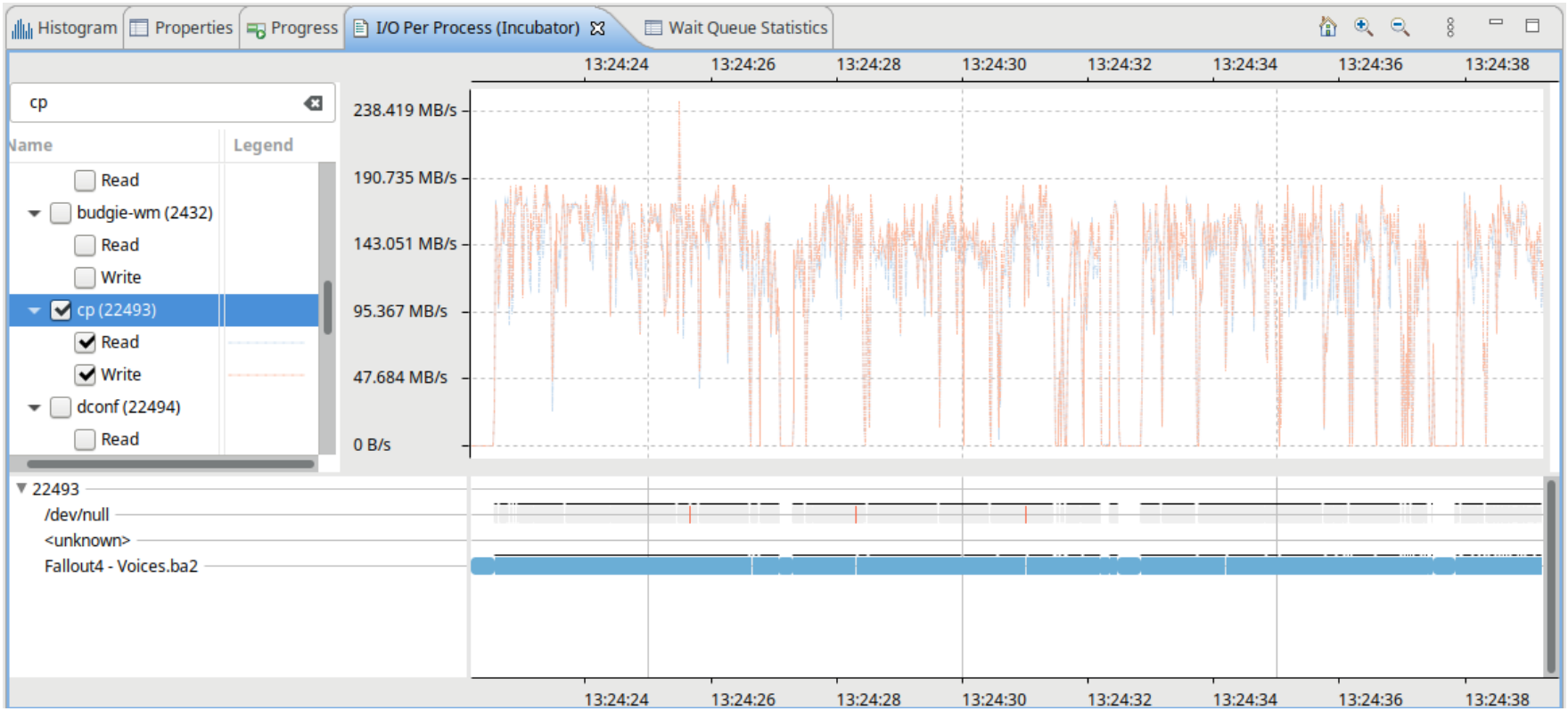
In and out analysis (in progress)

Disk IO View

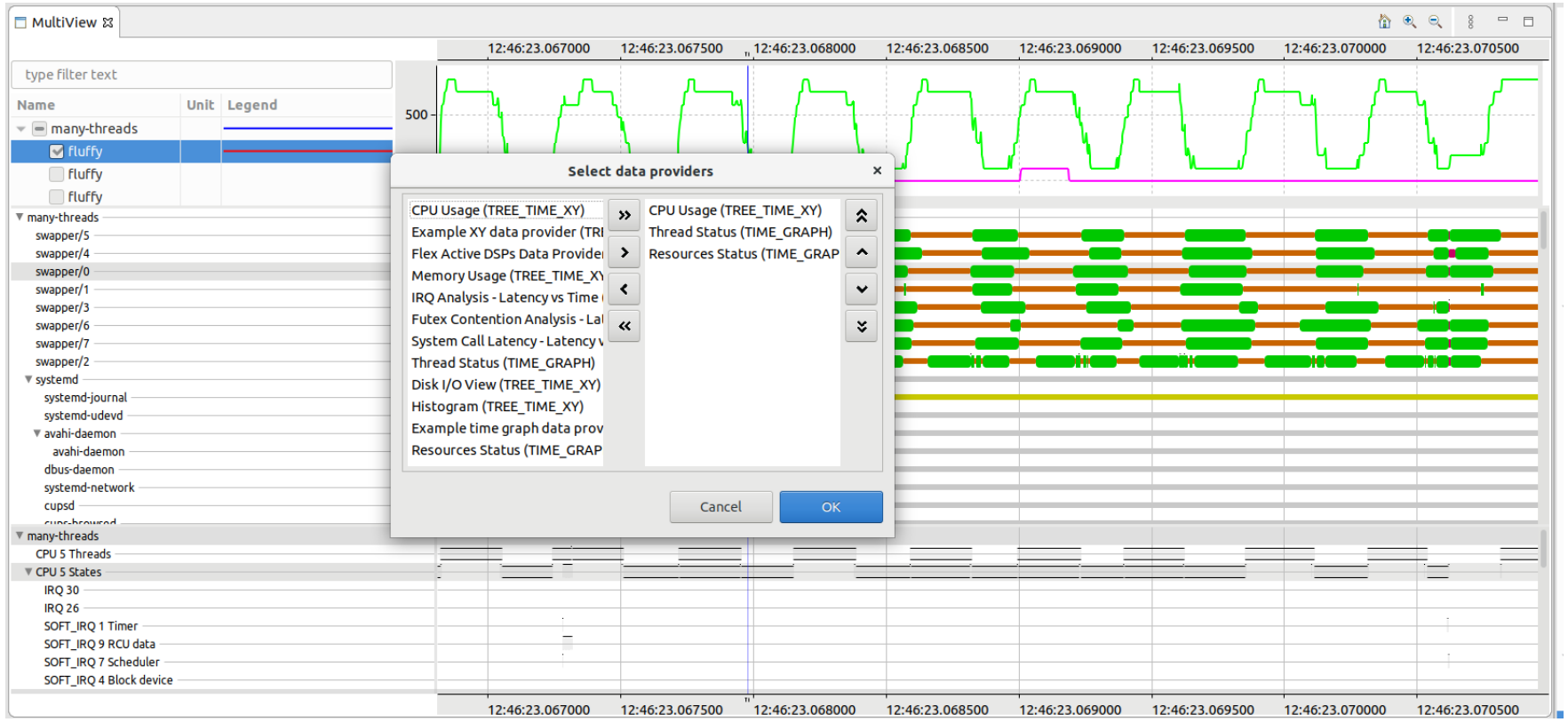
- See full view of block devices waits
- Typically, IO is a bottleneck, drill down on that



Disk IO View


Histogram
Properties
Progress
I/O Per Process (Incubator)
Wait Queue Statistics
13:24:24
13:24:26
13:24:28
13:24:30
13:24:32
13:24:34
13:24:36
13:24:38
cp
Name
Legend
Read
budgie-wm (2432)
Read
Write
cp (22493)
Read
Write
dconf (22494)
Read
238.419 MB/s
190.735 MB/s
143.051 MB/s
95.367 MB/s
47.684 MB/s
0 B/s
22493
/dev/null
<unknown>
Fallout4 - Voices.ba2

Multiview


MultiView
type filter text
Name
Unit
Legend
many-threads
fluffy
fluffy
fluffy
swapper/5
swapper/4
swapper/0
swapper/1
swapper/3
swapper/6
swapper/7
swapper/2
systemd
systemd-journal
systemd-udevd
avahi-daemon
avahi-daemon
dbus-daemon
systemd-network
cupsd
many-threads
CPU 5 Threads
CPU 5 States
IRQ 30
IRQ 26
SOFT_IRQ 1 Timer
SOFT_IRQ 9 RCU data
SOFT_IRQ 7 Scheduler
SOFT_IRQ 4 Block device
500
12:46:23.067000
12:46:23.067500
12:46:23.068000
12:46:23.068500
12:46:23.069000
12:46:23.069500
12:46:23.070000
12:46:23.070500
Select data providers
CPU Usage (TREE_TIME_XY)
Example XY data provider (TRI
Flex Active DSPs Data Provide
Memory Usage (TREE_TIME_XY
IRQ Analysis - Latency vs Time
Futex Contention Analysis - La
System Call Latency - Latency v
Thread Status (TIME_GRAPH)
Disk I/O View (TREE_TIME_XY)
Histogram (TREE_TIME_XY)
Example time graph data prov
Resources Status (TIME_GRAP
CPU Usage (TREE_TIME_XY)
Thread Status (TIME_GRAPH)
Resources Status (TIME_GRAP
Cancel
OK

Roadmap

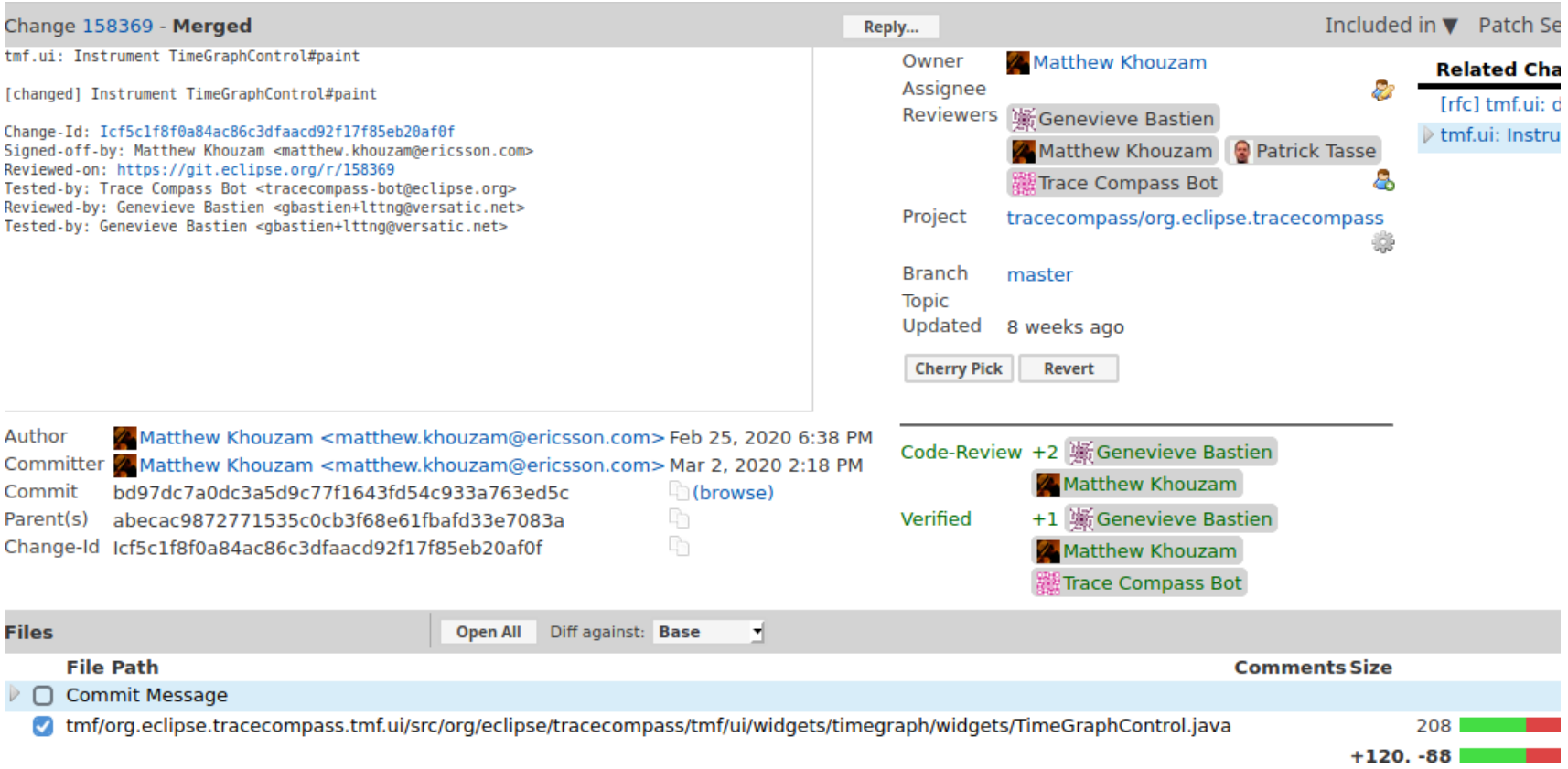
- Statistics improvements
- Work towards command line mode
- Work towards TSP/Theia
- Internal improvments
- Support more internal clients!

Story time

"Why the Flame Graph has failed me"

- Tested trace compass on 4K displays
- UI was sluggish
- Profiling didn't show much, most of the time was spent in draw

Instrumented the code



Results

95% of the time was spent in "Draw items"

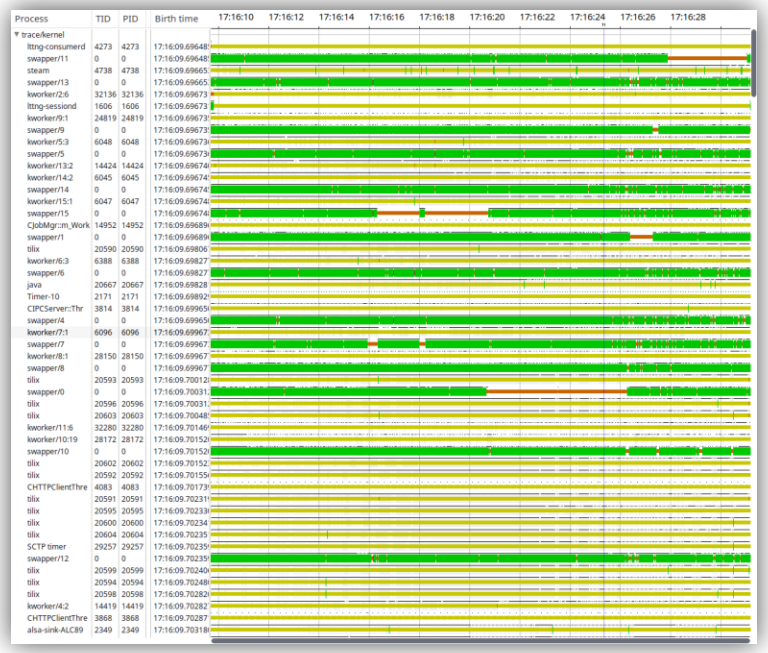
1 frame takes 1 second to draw on a reasonably high-end PC

Which one should take more time to draw?

- 60 FPS 1440p, 16 ms/draw

Source: Rebel Galaxy Outlaw - "The Smuggler's Den" @rebel_den

- 1 FPS 1440p, 1000 ms/draw



Source: Trace Compass

Findings

Only using 1 thread (Draw Thread)

Drawing over 100K primitives

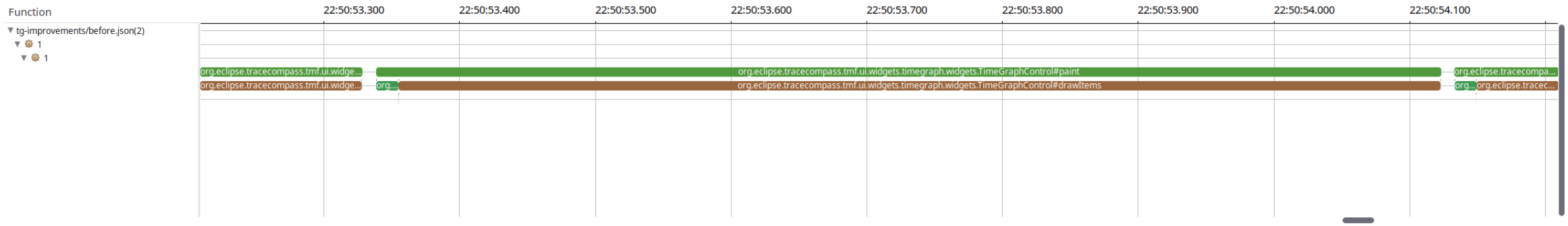
Calling Draw API 100K times

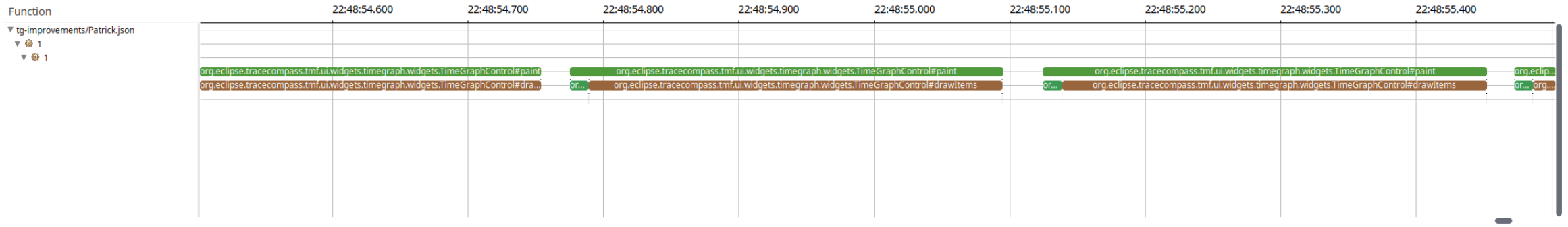
Styles are "toString"ed 100K times

Items are drawn OVER other items, making background items useless

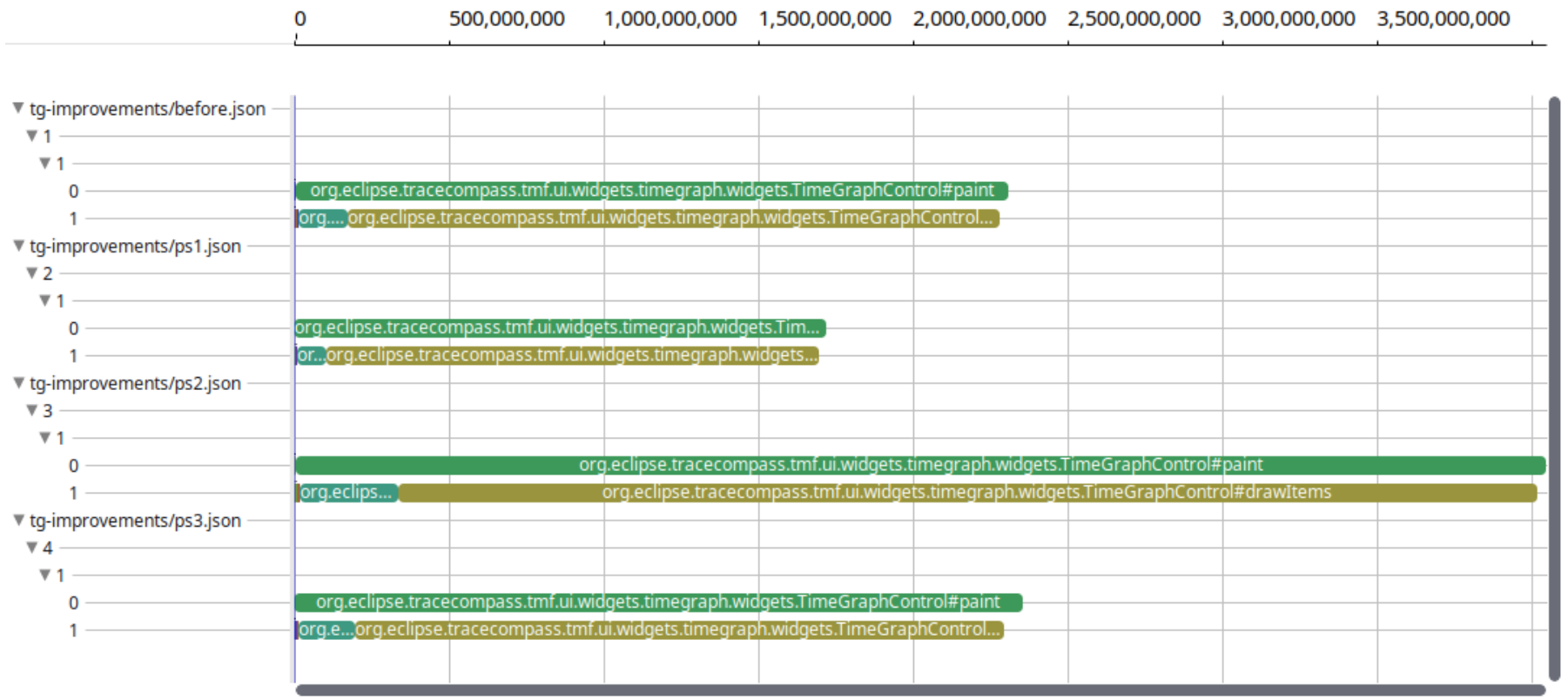
Fixed some issues, Decided to Trace

Patches

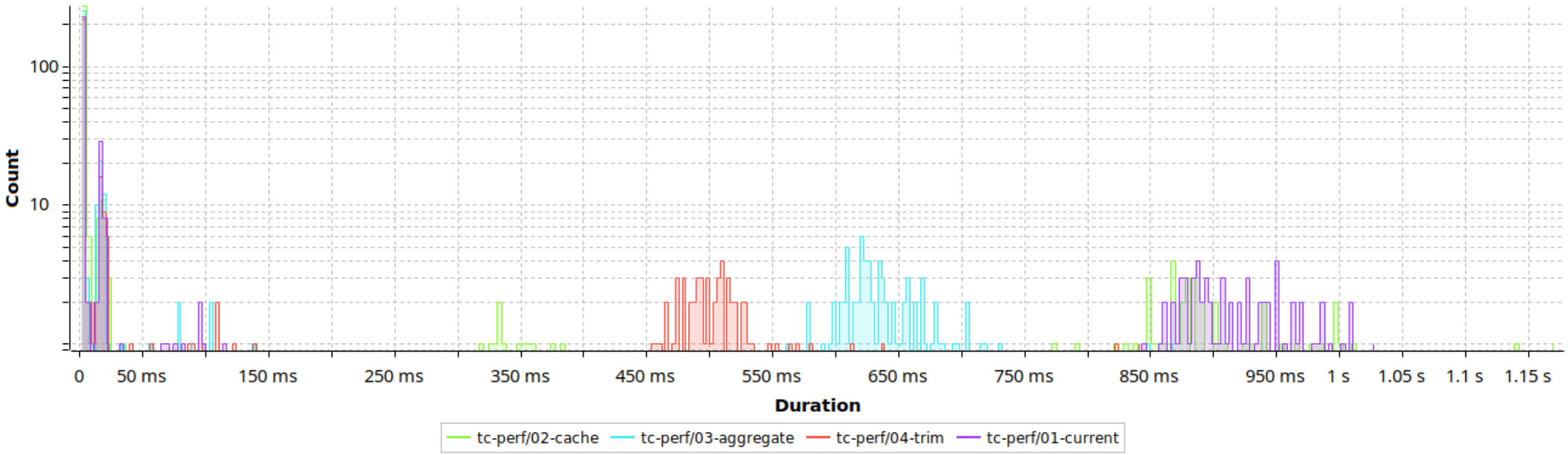

Function
22:50:53.300
22:50:53.400
22:50:53.500
22:50:53.600
22:50:53.700
22:50:53.800
22:50:53.900
22:50:54.000
22:50:54.100
tg-improvements/before.json(2)
1
1
org.eclipse.tracecompass.tmf.ui.widge...
org.eclipse.tracecompass.tmf.ui.widgets.timegraph.widgets.TimeGraphControl#paint
org.eclipse.tracecompa...
org.eclipse.tracecompass.tmf.ui.widgets.timegraph.widgets.TimeGraphControl#drawItems
org.eclipse.tracec...


Function
22:48:54.600
22:48:54.700
22:48:54.800
22:48:54.900
22:48:55.000
22:48:55.100
22:48:55.200
22:48:55.300
22:48:55.400
tg-improvements/Patrick.json
1
1
org.eclipse.tracecompass.tmf.ui.widgets.timegraph.widgets.TimeGraphControl#paint
org.eclipse.tracecompass.tmf.ui.widgets.timegraph.widgets.TimeGraphControl#drawItems

Et tu, Flamegraph?



Density view to the rescue!



Root cause?

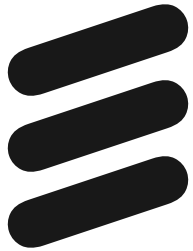
Hardware polling, the flame graph was showing the truth, just not in a way that is useful.

Next step: Drill in

- In the 300 remaining ms, 125 ms were spent on the scene placement, 200 were spent on the draws.
- Prototype in OpenGL, and using a different draw thread...

Effort is too much, BUT

- Theia's time graph already uses OpenGL
- Proof that migrating to Theia when done carefully will increase Trace Compass's performance.

Key Takeaways

- Trace your code, it's a good way to prove you meet requirements
- Don't look at only one view and assume it shows the whole truth, no matter how popular it is on twitter. #fakeviews
- Understand your data
- Therefore...