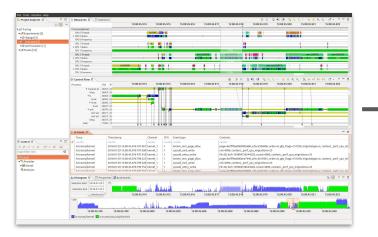
Theia Trace Viewer Design Improvements

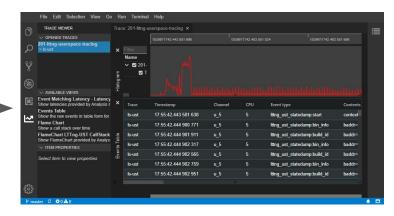
Erica Bugden DORSAL Research Associate, Information Design Consultant January 2022

Trace Viewer: Theia-based front end

Before



After



Purpose of work

Improve the tool's user experience:

- Improve overall flow, intuitiveness (reduce learning curve)
- Improve view functionality

Outline

- Theia Trace Viewer Minimum Viable Product
- User-centered development
 - User-centered planning
 - User survey results

Theia Trace Viewer

Minimum Viable Product

Theia Trace Viewer MVP

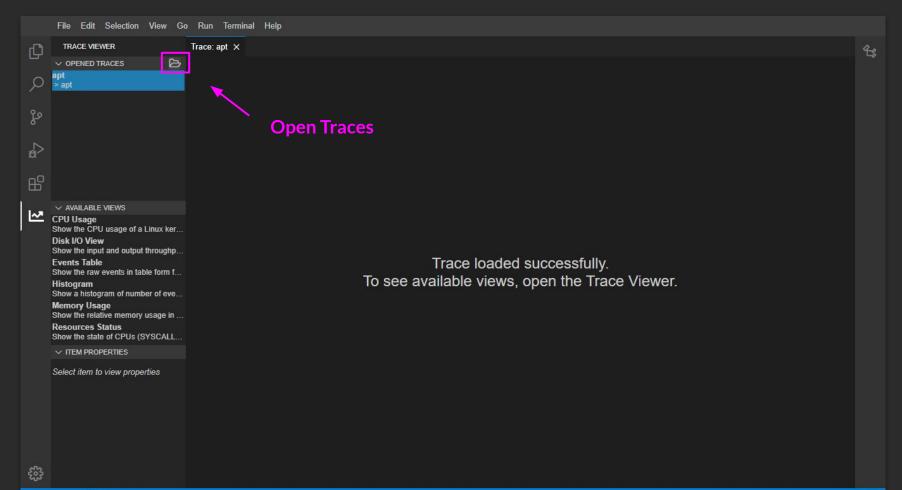
Goal: Allow basic trace analysis without running into features that don't work.

✓ Minimal set of trace visualisations (not at feature parity with Trace Compass)

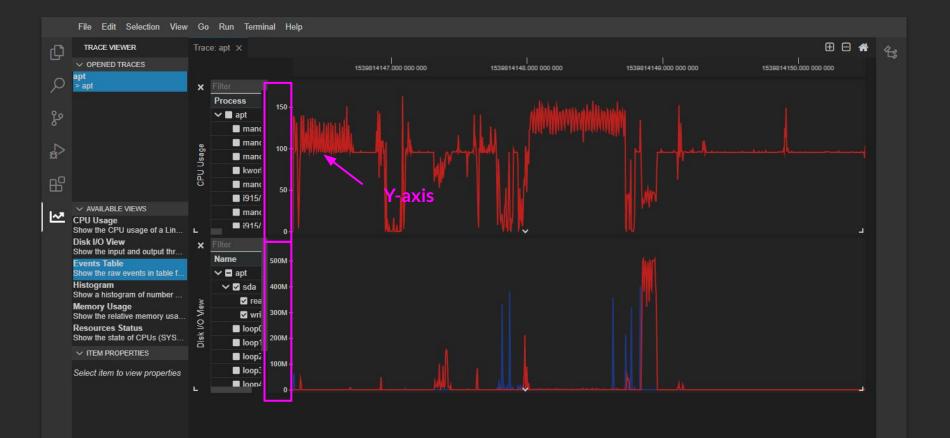
✓ Consistent experience

UX Improvements (since June)

- Additional intuitive way to open traces
- Removing/fixing views that do not behave as expected
- Communicating more clearly with users through UI
 - Handling analysis errors (fails, missing events)
 - Displaying something by default in charts



Prmaster C ⊗0∆0



MVP: Highly visible limitations

- XY charts: Navigation lag
- Low discoverability of some important features
 - $\circ \qquad {\sf Creation \, of \, trace \, groups}$
 - Zoom to a specific range (using mouse)

MVP: Give it a try!

Try it using either:

- Gitpod Live Demo, or
- Downloadable Application (If you want to analyze your own traces)

User-centered development

User-centered development

User-centered planning
 User survey

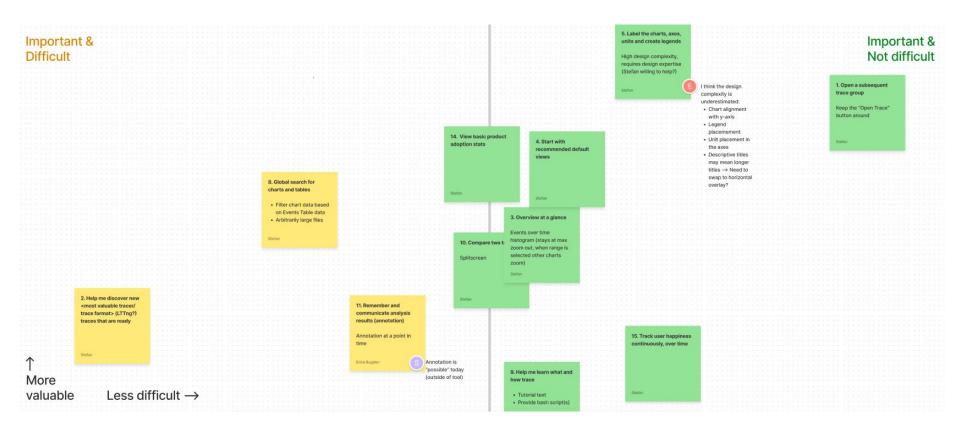
1. User-centered planning

Goal: Identify the most important issues affecting the user experience

- Temporary substitute for user feedback
- Planning participants: Developers and designers (Ericsson & Poly)
- Critique the tool while imagining the user's point of view







Impact: Ericsson 2022 Roadmap

New roadmap section specifically for tracking impact of user-centered tasks:

• Evaluate UX impact → If positive: Continue user-centered process shift

2. User Survey

12 survey responses

Participants:

- Dorsal (current members and alumni), Cienna, EfficiOS
- Not sent to Ericsson folks

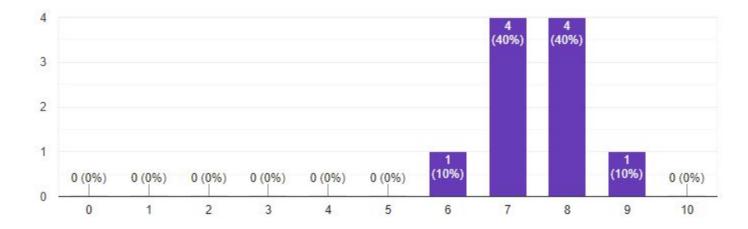
Take the results with a grain of salt

None of the survey respondents regularly use the Trace Viewer for trace analysis.

75% used the tool for less than an hour. The 25% who used the Trace Viewer for more than one hour are developers not users. How likely are you to recommend?

Overall, how likely are you to recommend the Theia Trace Viewer extension to a friend or colleague who needs to perform trace analysis?

10 responses



Respondents were engaged

Unexpectedly, **most** respondents gave way more detailed feedback than the survey required of them.

6 out of 12 respondents are interested in participating in future user research sessions.

All recommendations (clustered)

isadable application	Try the tool, install the tool		Discover and load compatible traces		Open relevant views		Navigate and read a chart				Select and filter data		General		New features (Scope enlarging)	
	Clarify demo	+		Hide analyses that don't work	List events required for views	Chart labeling	Don't display time spare	Column width	<u>. 10. 10. 00. 00.</u> 04	Filter events table	More advanced searching	Polish, stability		Flama Granh stars is		
	· ·	(Way to open additional traces)	opening traces (sn't	(T)	Terrer Constants		for not time-based charts.	The column sizes should be auto-adaptive to the	In the expanded CPU	- Page March Concerns	T THE REPORT OF THE	- Carlon and Carlos	S.m.	Plane Graph view is missing. That is a must in	No stack frame in to pare	
be great if it were download and	Clarify how to open the port 3000 with the	Gabest	discoverable wrough for	Analyses that aren't available are still	for each view, list the espected kernel-space	Chart labelling	separate time-based and	be auto-adaptive to the largest signaut. There is	graph, when two lines	Allow to use the search box as a fifter las in	Also for the payload section, matching only	There are still many rough enlows as compared to	Lack of smoothness	addition to the Flame	parter	
DOMINICALD BING	browser via gitted	when the Trace Viewer	folks who have already	displayed.	events or user-space	For CPU and dick VO	not time-based charts)	too much wasted column	overlap, only a single color	Tracecompass)	with text seems limited	Eclipse Trace Compass		Chart view.		
	mowsee on gapos	extension is selected, it	used the tool)	netroken	events inquired to render	usage grapha, it's unclear		space which required	wins so it masks the other	matecongrassp	(and did not work for my).	Emble mare compass				
viloading Trace	Theia pop-up disappears	seems like the only way to		some analyzes seems to	the view	to me what the Y axis	time scale being displayed	unnecessary scrolling.			second second second second	The product should be				
as a standalone	after a few moments and	open another trace is to	In the page where you	not be evailable but users		represents (units 7)	at the top of the screen			in the events window,		erore stable				
n (RCP) is	then it's very difficult to	go to the Explorer, right	explain how to run the	may request to display			may be misleading when the user first opens the			there is a missing search.	Need a way to search for					
easy: download,	figure out how to open the	click on a directory, click	demo, it would be great if	them and they will get a	The second memory		me user first opens the event table 0 had the	CPU usage left pane is too		and event filter capability	symbols by name and			1		
tone: If Theia +	viewar.	Open With > Trace Viewer. Is it? Not sure what would	you mention somewhere the video and what it	message indicating that	usage view could not be rendered because there		reflex to open it first since	enal and can't see the		per column,	highlight then in the					
trace viewer		be better, though, Maybe	shows. Personally, I forgot	the analysis is being	were missing events. The		Luse more frequently	SCPU util right away without scrolling.	-	(disappears when too	Bisby					
is eventually as	Since loading the gitpod	right clicking on "OPENED	how to open a trace from	processed.	expected event types to	Chart labeling	TraceCompany and it is	without surgering.	The userspace collistack	small?				Why is not there a socket	No may to load	
writed and	demo takes so much time IOs common for folka to	TRACES" (on on the	Theirs, I found this	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	record must be slated	construction of	the first view you get		had no thread/process		The payload is organized		It was a bit sluggish on my and but this is stuff that	or packet view for a trace called instwork	THES.	
t's going to be not sure if the	click away and then the	empty space under the list	information in the video.	1 M	upfrant so it's no guesis	timestamps would gain	when you open a trace)	Users expect the chart	names Ested like the CPU	(Add filtering)	data, and it should be		can be improved in time.	context renework		
is how people	notif is gone by the time	of traces) could open a		There are some views		from being formulted in a	since the time scale will	side bars (with all the	usage window has.		clear how to do more		can be improved in time.	opportunity (
p using it, but	they check	window with all the	is it possible/ interesting	that are not available yet ?	None of the other	standard ISO format.	be at the top of the event	details) to be adjustable.		In the events list; I saw the	"advanced" search with	Colours				
d he pretty cool.		directories in the	to make the "Trace	Like memory usage,	available views worked to	https://en.w&ipedia.org/	table.	Otherwise it requires a lot		search box per cuturm	tips, e.g. thatfield++"abc"	and the second se				
	While there's nothing to	workspace?	Viewer"menu/view as	syncall, Futex. May be	apen up on the right. Only	wiki150,5601	And the second s	of scroling		and used it. But there was	and such (if it is available).	Colours:				
	download, there are a few	and the second se	the first view that the	informing the user	the CPU usage view					no way to only show those		 using the dark theme, 				
	steps to do to get to the		user sees one he opens the demo? Because, I	somewhere to avoid any frustration will be a good	worked. If views are not		·		the second second second second	searched rows alone. I could only use the up?		everything is kind of "a				
porating an	actual trace viewer after		think, it's the first thing he	museaton we be a good	available, then they		Allow to scroll the event			could only use the up?		bit too dark."				
ve tutorial which	clicking on the altood	ICiarilly how to open	may want to do ; "open a		should not be shown.	Label the graphs when	table laterally with			stown navigation arrows.		 Using the default light Their there is similar, 	HUGE lag in XY chart		To be on per with	
work shows how	inform the user that he	traces, where in the Ne	A PARTY OF A PARTY OF A PARTY			Revering them, so we	shift+scrol		Please on pixese gray ou			Their thema to similar, but "a bit too light."	nexigation when handling		TraceCompass	
th different the extension	may need to authorize the	structure, ex. with an icon. preving out the sub-files)	Jaconerability of the	the mark and	When a view is presented	know what they			be explicit about views		The order of the columns	By this I mean that it	relatively small traces.		viewing user sp	
the extension a a long term	viewer to open a window	greying out the sub-files)	Trace Viewert	analyzes being processed	after loading a trace, if not all event typos required	correspond to	and the second se	· · · · · · · · · · · · · · · · · · ·	that we still loading/		is important. Laftmost	foels the the views lack			kernel space tra	
we to work on,	on Firefox for example,	File-+open and double		indefinitely () think those	all event types required for the trace are prevent,		Infinite scrolling is a bit weird with the mouse	(There should be	incomplete. This is a pet		columns should contain	some soucture.	The views couldn't keep		well as experim	
t at all).	otherwise, he risks to not	clicked on metadata.	I finally found the "Trace	analyzes are just not	tell the user which ones		weed with the mouse wheel since you have to	something displayed by	preve of mine but hear me	For the event view, the	the most useful data e.g.	44. 1 . A . A	us and weren't dropping			
	be able to open the demo.	That's how I used to open	Viewer* option under	available)	are missing		be-	default in the chart)	out: you zoow outlin, the	assarch box for matching	timestamp, tid, pid, cpu, event type and content.	Not guite sure it is there	any inputs so they lept		(Arowened that	
		the traces.	View. This might be on				on top of the small	and the second sec	view looks looded and is responsive, in a split	text makes no sense for a	whice type and consent.	yet in term of oxior	scrolling back and forth by		hadn't used the	
		Clicking on the open	me. though, I probably			· · · · · · · · · · · · · · · · · · ·	scrolling bar on the right	The disk (/O view had	second you put your	timestamp column: there you would want the user		selection (et least in dark	thereastens for several		last 6 months)	
		button opened the same	(Discoversbility of how to				side. Not sure what could	nothing displayed.	mind in "interpretation	you would want the user to allow selecting time		mode).	minutes after the user had stopped scrolling		Hove a visble p	
		file twice and reported	open files, for folks who		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Lack of details	be		mode' then half a second	ranges (e.g. days, hours,			scappeo scrosing		stores 95% of the	
		that it was a binary or test	have already used the				done here considering we	0Histogram (all charts)	later NEW elements	minutes)					works in the bro	
		fila.	glugis before)		When displaying the view		have to keep the scrolling	meet to show something by default, otherwise folks	appear on the graph. This		The event table visible		Stalability: Needs to be			
		The frontend should perhaps go up the trace		Memory usage keeps	list in alphabetical order		context aware (sub	by default, otherwse forks think it doesn't work)	is ENRAGING. These been		columns should be		able to handle 1.0 traces		(Answered that	
		hierarchy to open the	 Oeneral usability: I've used 	aboving Analysia	some of the most relevant		- internal		saying this for years about		configurable.	· · · · · · · · · · · · · · · · · · ·	no problem		hadn't used the	
		trace rather than thinking	the Theia trace viewer a while ago, but only for a	running/.	views (ex. Thread,		view).	Histogram shows no	TC. I get that for the TC			A Designation of the second se			(antream 8 teal	
		the user wares to open	while ago, but only for a very short amount of time.		Resecution) are at the bottom			swares.	later they do not want to appear slow but this its	CPU Usage: rows should		The trace viewer icon				
			so I don't remember much.		bottom		-		appear skow out its this is not doing any favour to	be sorted first by highest		should charge shape to				
		Users are used to clicking	When I opened the law				Discoverability of view		the users. I know I'm	CPU usage at the backreing.		show when the view is				
		on metadata to open trace files so that's what they	demo, I didn't know how				adjustment licons	A THE REAL PROPERTY AND A DESCRIPTION OF A DESCRIPTIONO OF A DESCRIPTION OF A DESCRIPANTI OF A DESCRIPTION OF A DESCRIPTION OF A DESCRIPTION O	suppose to move my eye	pathound-		expended or contracted				
		often try first.	to open a trace. I clicked			Thread names are not			in TC in the lower		1		20			
		mote by arst.	File > Open and selected		Long to the second second	shown. Only thread IDs.	It also took me a write to	Events Table: Arrows for	right corner for the	Highlighting top	A DESCRIPTION OF A DESC					
		Manuel try makes if presses	a trace directory, but		Some views have the		find how to make a view tailer. The little corner icon	mexicating up/down	freaking eclipse "leading"	anomalies in the trace	Add option to not show		Also responsiveness is a			
		clear what is a trace, what	obviously that oldn't open	Memory usage spinning Infinitely	some title		(bottom left comer of a	through the matching	bar but god dann.		the IRGs and CPU		big thing for large traces			
		you click on to open a	a trace.	innney	Sector and		view) and down arrow	events you searched for		(Answered that they	frequency		> 20M events.			
		trace					loon lbottom of a view, in	are hidden on smaller	Contraction of the second second	tradn't used the tool in the last 6 months)			Gaswered that they			
							the middle) bland too	resolution screens	Barizod the view manually	and o morning)	Just want to see the CPUs	Maybe visibility, elarity	hadn't used the tool in the			
			For the compressed trace				much into the background	What screen resolution is	then was surprised when the view resized back to		and the processes that	the loverall transition	last 6 months)			
		-	files (tarbells), make sure				when using the dark	the minimum we support?	default after opening		are running. Having the	from tracecompass?				
		(Relabel trace actions)	the zst compression			in the resource status	theme.	the management of the support	another view		the IRQs and the	Answered that they				
			format is supported. It is		a second s	view, there should be a				-	frequency always present without being able to	 hadn't used the tool in the 				
						Reported Unit's shows the			When adding new view,	Everita Table: When a	remove them isn't often	Aget 6 months)				
		When I selected "Oksa	much better and faster													
		Trace" it deleted the views	much better and faster than gaip.			meaning of those		Also, some views den't	the custom length I set to	single trace is loaded, the	useful and it takes up a lot					
		Trace" it deleted the views on the right but kept the			I would prefer to see the			have any much structure	the custom length I set to other view is always	trace column is useless. It	useful and it takes up a lot of vertical space.					
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Top issues

- 1. **Missing or unclear chart labelling** (11 comments)
- 2. Lack of UI smoothness (5 comments)
- 3. Fix analyses that appear to not work (5 comments)

Ongoing user-centered work

- 2022 Roadmap theme: User feedback (metrics, surveys)
- Internal user survey at Ericsson

A couple more things...

Hackathon: Come +1 your favourite issues!

Issues prioritized in:

- User-centered planning
- User survey

Thank you!

What do you think?

Trace Viewer UX Contact: Stefan Smagula stefan.smagula@ericsson.com

Presenter Contact: Erica Bugden erica.bugden@gmail.com



User-centered planning results

IMPORTANT & EASIER (MAGIC QUADRANT)

- Open subsequent trace group
- Label the charts, axes, units, create legends
- Start with recommended default views
- View basic product adoption stats
- Track user happiness
- Overview at a glance
- Compare two traces
- Help me learn what and how to trace

IMPORTANT & DIFFICULT

• Global search across charts and tables

Prospective User Survey - Recommendations

Try the tool, Install the tool

- Clarify how to open the port 3000 with the browser via gitpod DONE
- Provide quick way for users to analyze their own traces \ddagger DONE

Discover and load compatible traces

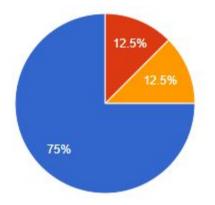
- Add intuitive way to open additional traces 🕁 DONE
- Start demo with Trace Viewer open 🛠
- Clarify which file to select to open a trace
- Clarify when the trace server is offline
- Clarify trace set actions

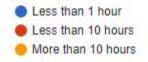
Open relevant views

Usage

In the past 6 months, how many hours have you spent using the Theia Trace Viewer extension?

8 responses







Try the tool, Install the tool Discover and load compatible traces Open relevant views Navigate and read a chart Select and filter data General Chart labeling Clarify how to open the Provide ration way for And intuitive way to open Start demo with Trace Fix/filter analyses that List events required for Events Table: Only show Clarify the overall Only display the time Viscolly show when data Duncte Table: Add Shar Improve view port 3000 with the ze their Viewer open don't work properly views scale for time-based is still loading. trace column when there manonsiuments transition from Trace Add units to charts Clarify explanations of browser via gitped coart 1 charts Allow filtering out oil is more than one trace in Compass + New users aren't sure Memory Usage still seems Can we know which charl contents If data that should events that don't match the set All chart types need to be kleally in the mis labels and a suppose 10. D where to look for it. to spin infinitely often. events were enabled? This didn't happen in the currently be visible to the the search criteria. able to handle typically monts and apple Done · Old users rtiss the new ex. Improve chart titlen live domo when I tested R, user is still loading, show Displaying this information sized traces (ex. 1 G) way to open traces. and descriptions but one user reported that this visually so that users for one trace is not useful without strugging because they go when they opened the don't start interpreting and a weste of space. Without this, we can't call straight to the File Events Table the time what they see. the product viable. Explorer and use the scale appeared. aid trace opening Since weaking use gapon ex. Only out the view Currently the XY charts Clarify which file to select Events Table: Use a Events Table: Order demo takes so much time method car't keep up with the to open a trace it's common for toks to different kind of search columns based on Centt charts at all. This Add thread names click away and then the Clarify which fine Display some data by for timestamps importance looks sloppy to usrs and Ex. Special file icon for the notif is some by the time represts which data Difficult to read detailed default "charts sprovines makes XY root of a trace file, grey Clarify when the trace they come back Text matching search Laftercost columns about contents. charts unertable. out sub-folders/files server is offline. ex. Add legend, label lines ti not doesn't make sense for contain the most useful directly throatsmos. data e.o. timestamp, tid. Right new lots of scrolling Caused by memory leaks? whee Some Trace Compass This is critical information pid, cpu, event type and 11000 in succeivent loss of users are trying to click on because the Trace Wesser content. broko 📕 important details are the metadata file to open does not work without the hidden by delautt Trace Server a trace. CPU Usage: Sort rows Columns within that Users seem to not notice from highest to lowest. Events Table: Alleyr adapt to longest contents, the bottom bar. Even if Use standard ISO format CPUusage configuring which adjustable column width Clarify trace set actions they did notice, they Don't automatically resize for timestamps columns are visible manually resident views wouldn't be able to guess Have the details in a Right click menu: that "Offline" means "The when a new view is separate pull out menu + Rename-'Dolete Trace' trace server is offline". opened that can be hidden? to Tierrove Trace!-DONE Users were surprised (and · Remove "Open Trace": some frustrated) when It's faster to just click they apened a new views Separate time-based on the blace and manually resized Gantt Allow hiding IRQs charts from others + Rename "Close Trace" views were reset back to and CPU frequency to "Close Tab" or the default size. Time scale: Add units Time scale: Improve For example, if you open "Close Trace Tab": This number formatting Sometimes interesting the Events Table first, as option can be useful if but most often take up a soon as you open a chart you have many tabs lat of vertical space that is time-based the open and don't went to time-scale will appear hunt for the tab above the Events Table which is confusing.

Recommendations