amos2024ws03-planning-document Project Data

<	
Online team meeting	https://fau.zoom-x.de/j/9776061710?pwd=9BPbcHYQaVEf6L0IH3xbsSeNzajvJ0.1
Production system (if any)	
Test system (if any)	
GitHub repository	https://github.com/amosproj/amos2024ws03-android-zero-instrumentation
GitHub feature board	https://github.com/orgs/amosproj/projects/72/views/2
GitHub imp-squared backlog	https://github.com/orgs/amosproj/projects/76
Team T-shirt (white)	https://www.shirtinator.de/s/OaDrwZ0JQ9WL1QrhmOU7KA
Team T-shirt (black)	https://www.shirtinator.de/s/Ou9CCXOBQIW04aOC_Hov6g
Additional materials	
Team maling list	oss-amos-proj3@lists.fau.de

amos2024ws03-planning-document Project Team

Last Name	First Name	GitHub User Name	Email Address
Krug	Maximilian	HaruspexSan	krugm03@gmail.com
Ayach	Mohammed Tamim	Tamemo99	Tamemayash@gmail.com / Ayachmoh@hu
Bretting	Luca	luca-dot-sh	luca.bretting@fau.de
Seidl	Robin	mr-kanister	robin.seidl@fau.de (main) / 68117355+Mr-ł
Labroussis	Christos	clabrous	c.labroussis1@gmail.com
Hilgers	Felix	fhilgers	felix.hilgers@fau.de
Weisshuhn	Tom	der-whity	tom.weisshuhn@fau.de
Schlicht	Franz	ffranzgitHub	franz.schlicht@fau.de
Nawlo	Ali	alinawlo	ali.nawlo@campus.tu-berlin.de
Zinn	Benedikt	BenediktZinn	benedikt.wh.zinn@gmail.com

amos2024ws03-planning-document Role Assignments

#	Meeting Day	Product Owners	Software Developer	Release Manager	Scrum Master	Comment
1	2022-10-16	Mohammed Tamim Ayach	Everyone else		Maximilian Krug	
2	2022-10-23	Ali Nawlo	Everyone else	Maximlian Krug	Maximilian Krug	
3	2022-10-30	Mohammed Tamim Ayach	Everyone else	Benedikt Zinn	Maximilian Krug	
4	2022-11-06	Ali Nawlo	Everyone else	Tom Weißhuhn	Maximilian Krug	
5	2022-11-13	Mohammed Tamim Ayach	Everyone else	Robin Seidl	Maximilian Krug	
6	2022-11-20	Ali Nawlo	Everyone else	Franz Schlicht	Maximilian Krug	
7	2022-11-27	Mohammed Tamim Ayach	Everyone else	Benedikt Zinn	Maximilian Krug	Mid-term due
8	2022-12-04	Ali Nawlo	Everyone else	Robin Seidl	Maximilian Krug	
9	2022-12-11	Mohammed Tamim Ayach	Everyone else	Luca Bretting	Maximilian Krug	
10	2023-01-11	Ali Nawlo	Everyone else		Maximilian Krug	
11	2023-01-18	Mohammed Tamim Ayach	Everyone else		Maximilian Krug	
12	2023-01-25	Ali Nawlo	Everyone else		Maximilian Krug	
13	2023-02-01	Mohammed Tamim Ayach	Everyone else		Maximilian Krug	
14	2023-02-08	Ali Nawlo	Everyone else		Maximilian Krug	Demo day!
15	2023-02-15	Mohammed Tamim Ayach	Everyone else		Maximilian Krug	Retrospective
		-				
roduct	owners, software	developers, and Scurm Master	are set and ideally don't change	over time; the critical part is the F	Release Manager role you need to	define here

amos2024ws03-planning-document Team Contract

Goals 1	
	Completing the objective and task given by our IP, becoming a well rounded team in the meantime
Meeting norms 2	Be punctual (with a 5min pardon time)
	Max. two times missing from IP meeting
	not having the camera off two consecutive times
Working norms 2	Don't push to main, keep main in working order
	Dependencies are a team effort
	all tests must pass
	criticism via pull/merge requests
Coordination norms 2	PR with one other member
	max keeps meetings on track
Communication norms 2	communication via discord - team meeting via zoom
	document major changes
Consideration norms 2	be repectfull
	small disagreement, discuss and vote
Cont. improvement norms 2	team meeting for tracking team's progress -> standup emails for gathering intel
	pushing non functional changes will trigger a workshop
Rewards 1	have cake together
Sanctions 1	Otheres choose a random virtual background
Signatures	
Scrum Master	Maximilian Krug
Product owner	Mohammed Tamim Ayach
Product owner	Ali Nawlo
Software developer	Luca Bretting
Software developer	Benedikt Zinn
Software developer	Christos Labroussis
Software developer	Robin Seidl
Software developer	Franz Schlicht
Software developer	Felix Hilgers
Software developer	Tom Weißhuhn
	https://oss.cs.fau.de/wp-content/uploads/2014/04/Team-Contract-Explanation-and-Examples.pdf

amos2024ws03-planning-document Product Goal

Product Vision Project Mission In systems with a high frequency of component changes, it is difficult to determine ZIOFA (Zero Instrumentation Observability for Android) aims to implement which component might be causing performance issues and affecting the entire observability use cases relevant to performance specified by our industry partner system negatively. This is especially hard if the source code and/or build environment using eBPF. Examples include tracing long-running blocking calls, leaking JNI indirect for the components is not present as they might be coming from external suppliers, references or signals like SIGKILL sent to processes, all without instrumenting the which means they cannot easily be instrumented. This can result in a lot of observed application itself. The eBPF programs are loaded and unloaded using a backend daemon running as communication and extra work. root that will collect metrics and send them to a client. For displaying these metrics to Using eBPF allows for tracking some of these issues at the kernel level, where for example blocking calls are made and can be tracked. It allows for hooking into Systhe user, we are implementing an on-device UI that can display visualizations for Calls as well as calls to other userspace or kernel-level functions (uprobes and these use cases and allow for configuration of the enabled use cases, but using a kprobes), all without needing to modify application code. This makes it possible to decoupled Client SDK so that future work may easily make the data accessible the track down cross-cutting performance issues without needing additional support from external processing. the vendor of the component. The information about, for example the length of a blocking calls, can then be passed to various frontends, such as an Android application running on the target hardware or an external sink for displaying the data in visualization software like Grafana.

amos2024ws03-planning-document Product Glossary

Term	Definition

amos2024ws03-planning-document Sprint Goals

Sprint #	Sprint goal
1	None
2	None
3	None
4	Optional
5	Working, loading, and unloading of eBPF Programs from UI all the way to eBPF
6	Analyzing traffic over Unix Domain Sockets
7	Analyzing user space function calls
8	Finalizing User space function calls
9	
10	
11	
12	
13	
14	
15	

amos2024ws03-planning-document

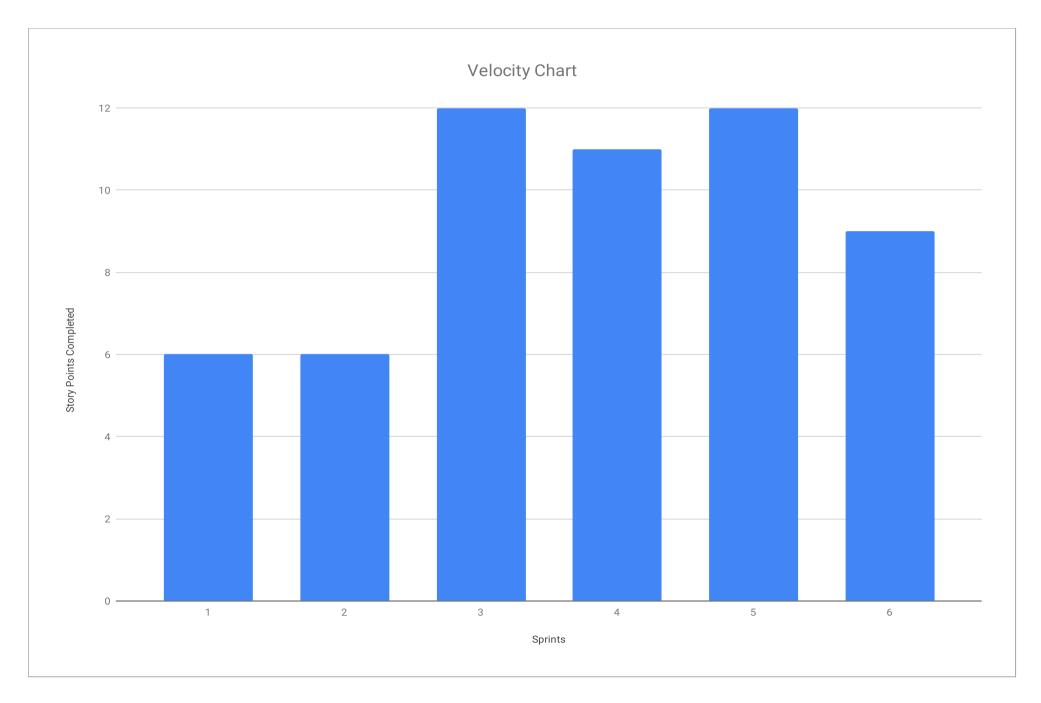
Mid-Project Release plan

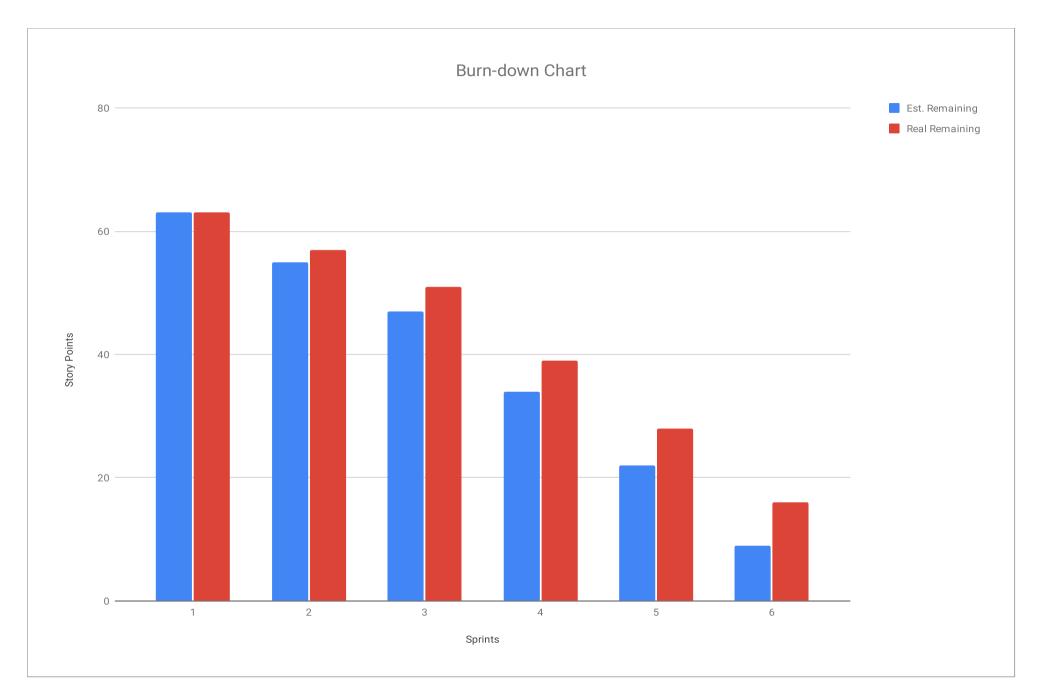
Sprint	Goal	Feature Name	Est. Size	Est. Remaining	Real Size	Real Remaining
Release) }					
Total			00	200		
Total			63	63		
Sprints						
1	Get to know the Team		8	63	6	63
2	Get familiar with eBPF and other required technologies.		8		6	
3	Start Developing, have a UI blueprint and a Backend beginning		13		12	
4	Build a UI and work with Ebpf		12	34	11	39
5	Working, loading, and unloading of eBPF Programs from UI all the way to eBPF		13	22	12	28
6	Analysing traffic over Unix Domain Socket		9	9	9	16
Feature	9 S					
1	Get to know the Team					
		Brain-storm Architecture	3		1	
		Preperation of Kotlin	3		3	
		Brain-storm ebpf use cases	2		2	
2	Get familiar with eBPF and other required technologies.					
	<u>, </u>	Docker Container	3		3	
		get information about android processes to list them	3		1	
		set aarch64 als target	1		1	
		use android 13 instead of 15	1		1	
3	Start Developing, have a UI blueprint and a Backend beginning					
	January G. Santa and January G	Preparation of CI	3		3	
		find timeseries visualization library	2		2	
		Shom generation	2		1	
		Generation of sboms doesn't include kotlin	1		1	
		Communcation between Android side and Rust side	5		5	
4	Build a UI and work with Ebpf					
		unix domain socket traffic analysis (research)	5		3	
		Home Screen and Navigation Drawer	2		3	
		EBPF Program extension to load kProbes	3		3	
		Implement frontend load and list programs	2		2	
5	Working, loading, and unloading of eBPF Programs from UI all the way to eBPF					
	may 10 021 1	kotlin interface for frontend loading and listing programs	1		1	
		test cli client: load and list programs	3		2	
		client library exported to kotlin	2		1	
		Running processes List	3		3	

amos2024ws03-planning-document

Mid-Project Release plan

Sprint	Goal	Feature Name	Est. Size	Est. Remaining	Real Size	Real Remaining
		loading/unloading of ebpf functions in daemon	2		3	
		Display Installed Procceses in UI	2		2	
6	Analysing traffic over Unix Domain Socket					
0	Analysing traine over only bolham socket	collecting unix domain sockets events	2		2	
		configuring unix domain socket tracing	2		2	
		visualizing traffic from unix domain socket	3		3	
		setting tracepoint for sendmsg syscalls	2		2	



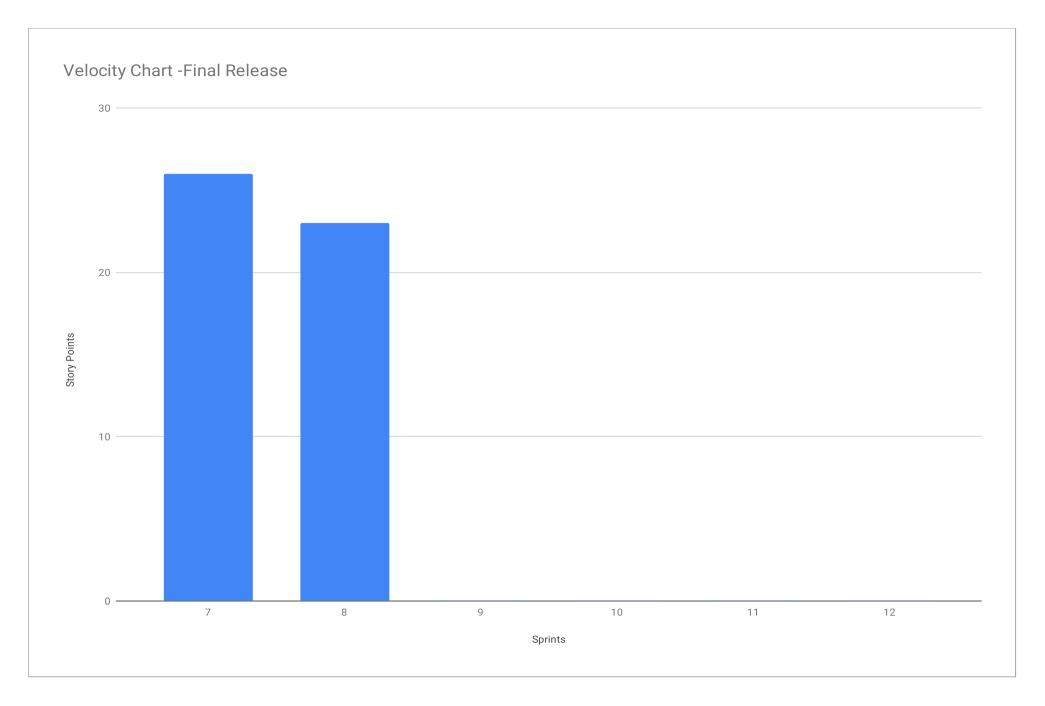


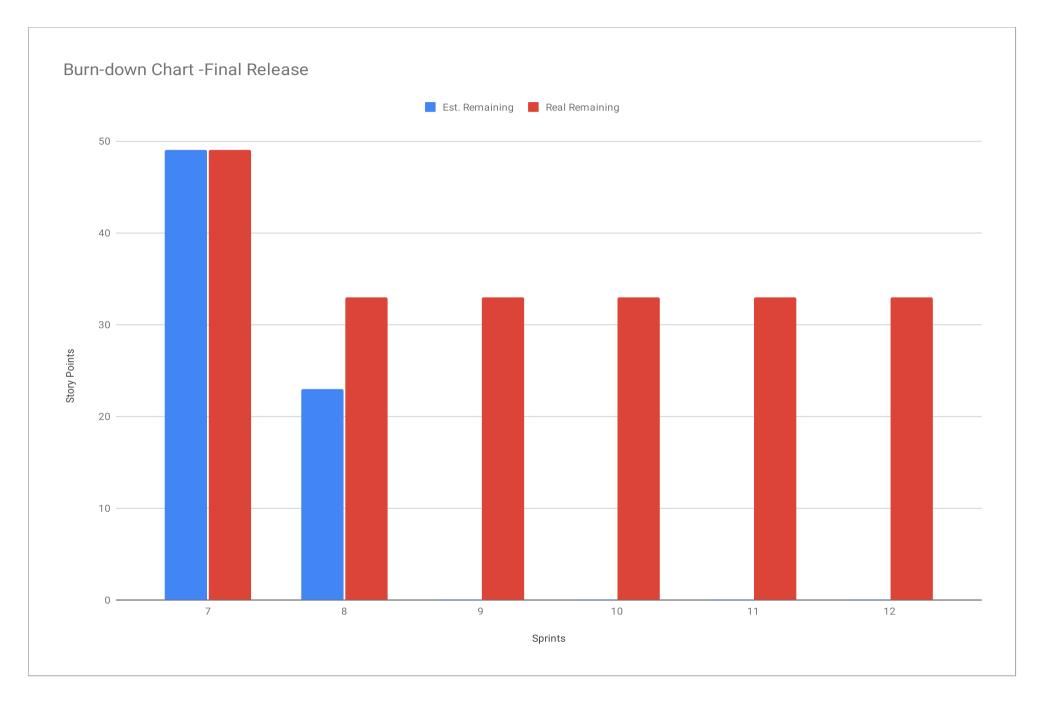
amos2024ws03-planning-document Final Project Release plan

Sprint	Goal	Feature Name	Est. Size	Est. Remaining	Real Size	Real Remaining
Release	e					
Total			49	49		
TOLAI			49	49		
Sprints						
7	Analyzing user space function calls		26		16	
8	Finalizing User Space Function Calls		23		0	
9			0		0	
10			0		0	
11			0		0	
12			0	0	0	33
Feature	98					
7	Analyzing user space function calls					
		setup Uprobe Analysis	2		5	
		Configure Uprobe Analysis	1		-	
		Uprobe Events in Frontend	2		_	
		Collect Uprobe events	1		-	
		defining metrics for the visualization screen	3		3	
		setup ebpf uprobes	3		-	
		Dex/Oat Symbols	5		-	
		Project Refactored	9		8	
8	Finalizing User Space Function Calls					
		Configure Uprobe Analysis	2			
		Uprobe Events in Frontend	1			
		Collect Uprobe events	1			
		setup ebpf uprobes	3			
		Dex/Oat Symbols	5			
		Refactoring ebpf Programs	1			
		Refactoring Configuration API	2			
		Refactoring pIDs to uint32	2			
		Refactoring Collection of events in Daemon	2			
		Uprobe Analysis: Frontend Show Symbols	2			
		Uprobe Analysis: Frontend Show Uprobe Events	2			
9						
J						

amos2024ws03-planning-document Final Project Release plan

Sprint	Goal	Feature Name	Est. Size	Est. Remaining	Real Size	Real Remaining
10						
11						
12						





amos2024ws03-planning-document Definition of Done

#	Feature Definition of Done	Sprint Release Definition of Done	Project Release Definition of Done
	1. Code for Components has been written. a. The code does comply to the naming conventions of the used programming language b. Code has been completed c. Unclear code parts are provided with a short comment, to explain what this part is supposed to do. 2. Developers submit a screenshots of the finished feature as a comment to the related issue 3. Feature has been reviewed by another team member 4. Feature has been merged and closed	1. Finished issues are marked as done 2. Code is tested and deployed 3. A short demo is available for each sprint (this is compliant with point 3 in DoD for Feature) so it can be the screenshots or a small video or even a short-live presentation 4. Bill of Material is kept in a current state	Team agrees on which features to be released Features have been tested and reviewed by other team member Documentations are kept updated A short demo featuring major features is provided

Type	Link / reference

amos2024ws03-planning-document Bill of Materials

Conte	ext	Name	Version	License	Comment
1 Gradle	le Plugin	org.cyclonedx.bom	1.10.0	APACHE-2.0	https://qithub.com/CycloneDX/cyclonedx-gradle-plugin
2 Gradle			0.8.5	APACHE-2.0	https://github.com/littlerobots/version-catalog-update-plugin
3 Gradie			0.51.0	APACHE-2.0	https://qithub.com/ben-manes/gradle-versions-plugin
4 Gradie			8.6.0	APACHE-2.0	https://maven.google.com/web/index.html?q=com.android.applicat#com.android.application.com.android.application.gradle.plugin:8.6.0
5 Gradie			0.21.0	MIT	https://github.com/cortinico/ktfmt-gradle
6 Gradie			2.1.0	APACHE-2.0	https://github.com/telBrains/compose-multiplatform
			2.1.0	APACHE-2.0	
7 Gradie		org.jetbrains.kotlin.android			https://github.com/JetBrains/kotlin
8 Androi		androidx.activity:activity-compose	1.9.3	APACHE-2.0	https://maven.google.com/web/index.html?q=androidx.activity#androidx.activity:activity-compose:1.9.3
9 Androi		androidx.compose:compose-bom	2024.11.00	APACHE-2.0	https://maven.google.com/web/index.html?q=androidx.compose#androidx.compose:compose-bom:2024.11.00
10 Androi		androidx.core:core-ktx	1.15.0	APACHE-2.0	https://maven.google.com/web/index.html?q=androidx.core#androidx.core:core-ktx:1.15.0
11 Androi		androidx.lifecycle:lifecycle-runtime-ktx	2.8.7	APACHE-2.0	https://maven.google.com/web/index.html?q=androidx.life#androidx.lifecycle:lifecycle-runtime-ktx:2.8.7
12 Androi	oid DI	io.insert-koin:koin-android	4.0.0	APACHE-2.0	https://github.com/InsertKoinIO/koin
13 Androi	oid DI	io.insert-koin:koin-androidx-compose	4.0.0	APACHE-2.0	https://github.com/InsertKoinIO/koin
14 Androi		io.insert-koin:koin-core	4.0.0	APACHE-2.0	https://github.com/lnsertKoinIO/koin
15 Androi	oid Test	io.insert-koin:koin-test-junit4	4.0.0	APACHE-2.0	https://github.com/InsertKoinIO/koin
16 Androi		androidx.test.espresso:espresso-core	3.6.1	APACHE-2.0	https://maven.google.com/web/index.html?q=androidx.test.es#androidx.test.espresso.espresso-core:3.6.1
17 Androi		androidx.test.ext:junit	1.2.1	APACHE-2.0	https://maven.google.com/web/index.html?q=androidx.test.ext#androidx.test.ext:junit:1.2.1
18 Androi		junit:junit	4.13.2	EPL-1.0	https://github.com/junit-leam/junit4
19 Rust E			0.13.1	MIT OR APACHE-2.0	https://github.com/aya-rs/aya
		aya	0.13.1	MIT OR APACHE-2.0	
20 Rust E		- 2 1			https://github.com/aya-rs/aya
21 Rust E		aya-log	0.2.1	MIT OR APACHE-2.0	https://github.com/aya-rs/aya
22 Rust E			0.1.1	MIT OR APACHE-2.0	https://github.com/aya-rs/aya
23 Rust E		libc	0.2.168	MIT OR APACHE-2.0	https://github.com/rust-lang/libc
24 Rust E		anyhow	1.0.0	MIT OR APACHE-2.0	https://github.com/dtolnay/anyhow
25 Rust E	Build	cargo_metadata	0.19.1	MIT	https://github.com/oli-obk/cargo_metadata
26 Rust E	Build	clap	4.5.23	MIT OR APACHE-2.0	https://github.com/clap-rs/clap
27 Rust E	Build	which	7.0.0	MIT	https://github.com/harryfei/which-rs
28 Rust L	Logging	env-logger	0.11.5	MIT OR APACHE-2.0	https://qithub.com/rust-cli/env_logger
29 Rust L		log	0.4.22	MIT OR APACHE-2.0	https://qithub.com/rust-lang/log
30 Rust A		tokio	1.42.0	MIT	https://github.com/toklo-rs/toklo
31 Rust A		tokio-stream	0.1.17	MIT	https://github.com/tokio-rs/tokio
32 Rust A		prost	0.13.4	APACHE-2.0	
33 Rust A		tonic	0.12.3	MIT	https://dithub.com/tokio-rs/prost
				MIT	https://github.com/hyperium/lonic
34 Rust A			0.12.3		https://github.com/hyperium/tonic
35 Toolch		python3	3.12.6	PSF-2.0	https://docs.python.org/3/license.html
36 Toolch		rust	1.84.0-nightly	MIT OR APACHE-2.0	https://www.rust-lang.org/policies/licenses
37 Toolch		cargo-ndk	3.5.7	MIT OR APACHE-2.0	https://github.com/bbqsrc/cargo-ndk
38 Toolch		protoc	28.2	BSD-3-Clause	https://github.com/protocolbuffers/protobuf
39 Toolch	hain	bpf-linker	0.9.13	MIT OR APACHE-2.0	https://github.com/aya-rs/bpf-linker
40 Toolch	hain	nix	2.18.7	LGPL-2.1	https://github.com/NixOS/nix
41 Toolch	hain	cyclonedx-cli	0.25.1	APACHE-2.0	https://qithub.com/CycloneDX/cyclonedx-cli
42 Toolch			8.10.2	APACHE-2.0	https://github.com/gradle/gradle
43 Toolch		openjdk	21.0.3	GPL-2.0-with-classpath-exception	https://openidk.org/legal/gplv2+ce.html
44 Toolch		android-cmdline-tools	16	android-sdk-license	https://developer.android.com/studio/terms
45 Toolch		android-emulator	35.3.6.0	android-sdk-license	
				android-sdk-license	https://developer.android.com/studio/terms
46 Toolch		android-ndk	28.0.12433566		https://developer.android.com/studio/terms
47 Toolch		android-tools	35.0.0	android-sdk-license	https://developer.android.com/studio/terms
48 Toolch		platform-tools	35.0.2	android-sdk-license	https://developer.android.com/studio/terms
49 Toolch		platforms-android	35	android-sdk-license	https://developer.android.com/studio/terms
50 Rust A		uniffi	0.28.2	MPL-2.0	https://github.com/mozilla/uniffi-rs
51 Rust A		thiserror	2.0.6	MIT OR APACHE-2.0	https://github.com/dtolnay/thiserror
52 Gradle	e Plugin	com.android.library	8.7.2	APACHE-2.0	https://maven.google.com/web/index.html?q=com.android.libr#com.android.library.com.android.library.gradle.plugin:8.7.2
53 Gradle	e Plugin	org.mozilla.rust-android-gradle.rust-android	0.9.4	APACHE-2.0	https://github.com/mozilla/rust-android-gradle
54 Androi		net.java.dev.jna	5.15.0	Apache-2.0 OR LGPL-2.1	https://github.com/java-native-access/jna
		androidx.navigation:navigation-compose	2.8.4	Apache-2.0	https://maven.google.com/web/index.html?q=androidx.navigation:#androidx.navigation:compose:2.8.4
			2.8.0	Apache-2.0	https://github.com/JakeWharton/timber
		com.partykandpatrick.vico:compose	2.0.0-beta.3	Apache-2.0	https://github.com/patrykandpatrick/vico
			2.0.0-beta.3	Apache-2.0	https://github.com/patrykandpatrick/vico
		com.partykandpatrick.vico:compose-m2	2.0.0-beta.3	Apache-2.0 Apache-2.0	https://github.com/patykandpatrick/vico
		com.partykandpatrick.vico:core	2.0.0-beta.3	Apache-2.0	https://github.com/patrykandpatrick/vico
		serde	1.0.215	MIT OR APACHE-2.0	https://github.com/serde-rs/serde
		serde-json	1.0.0	MIT OR APACHE-2.0	https://github.com/serde-rs/json
63 Rust T	Tracing	tracing	0.1.41	MIT	https://github.com/tokio-rs/tracing
64 Rust T	Tracing	tracing-subscriber	0.3.19	MIT	https://github.com/tokio-rs/tracing
65 Rust S		procfs	0.17.0	MIT OR APACHE-2.0	https://github.com/eminence/procfs
		com.google.accompanist:accompanist-			
66 Androi		drawablepainter	0.15.0	Apache 2.0	https://github.com/google/accompanist/tree/main/drawablepainter
		async-broadcast	0.7.1	MIT OR APACHE-2.0	https://aithub.com/smol-rs/async-broadcast
6/ Rust A		console	0.15.8	MIT	https://github.com/console-rs/console
67 Rust A					
68 Rust T 69 Rust T		dialoguer	0.11.0	MIT	https://qithub.com/console-rs/dialoguer

amos2024ws03-planning-document Bill of Materials

#	Context	Name	Version	License	Comment
	71 Rust Raw Linux APIS	nix	0.29.0	MIT	https://github.com/nix-rust/nix
	72 Gradle Plugin	com.android.tools.build:gradle	8.7.2	APACHE-2.0	https://maven.google.com/web/index.html?q=com.android.tools.build#com.android.tools.build:gradle:8.7.2
	73 Android Coroutines	org.jetbrains.kotlinx:kotlinx-coroutines-android	1.9.0	APACHE-2.0	https://github.com/Kotlin/kotlinx.coroutines
	74 Rust Safety	bytemuck	1.20.0	MIT OR APACHE-2.0 OR Zlib	https://github.com/Lokathor/bytemuck
	75 Rust Concurrency	ractor	0.13.4	MIT	https://github.com/slawlor/ractor
	76 Rust Concurrency	crossbeam	0.8.4	MIT OR APACHE-2.0	https://github.com/crossbeam-rs/crossbeam
	77 Rust Parsing	object	0.36.5	MIR OR APACHE-2.0	https://github.com/gimli-rs/object

amos2024ws03-planning-document Planning Poker

Last Name	First Name	Value			
Krug	Maximilian		#DIV/	#DIV/	
Ayach	Mohammed Tamim				
Bretting	Luca		O!	0!	
Seidl	Robin			<u> </u>	
Hilgers	Felix		0	No size	
Weisshuhn	Tom		1	Trivial size	
Schlicht	Franz	?	2	Small size	
Nawlo	Ali		3	Medium size	
Zinn	Benedikt		5	Large size	
			8	Very large size	
			13	Too large (size)	
Team members left					
Labroussis	Christos				
How to play planning poker					
1. Everyone type their number in	to their value field, don't hit return yet				
2. Someone, perhaps a product of	owner, count down 3 2 1				
3. Then, everyone hit return to su					