

Polkawatch

Kusama Decentralization Analytics

2023 Q1-Q3
9 Months Continued Operation
(50% already delivered)

Kusama
Treasury Proposal

Proposer
EJYeKKwU6Ua8H8TWqq85eRgAfcB1ZLneapYuR6FhRB5YgVL
Valletech

Allocation
568 KSM (15.057 USD)



The Problem

Kusama, and generally speaking Substrate built block-chains have tremendous potential to deliver decentralized computing, however depending on how they are deployed and operated by the community the resulting system can be more or less centralized/decentralized.

When analyzing the degree of decentralization of the Polkadot Rely chain by the following variables: Region, Computing Network and Node Operator, it turns out that the network is very centralized with most of the public validation activity concentrated and a few Operators, Regions and Computing Networks. We suspect the Kusama network is in the same state.

For a detailed account of the problem and motivation behind launching Polkawatch see our blog post: [Introducing Polkawatch](#).

Recent events point to the need to monitor the effective decentralization of our network:

- Hetzner deplatformed Solana events, banned applications related to blockchain.
- SEC claimed jurisdiction over Ethereum based on the concentration of Nodes in US.
- SEC is targeting crypto in US, centralized exchanges report, aggressive regulatory behaviour.

The Solution

Polkawatch is an analytic tool designed to measure effective decentralization of Polkadot/Substrate's Validation process.

Polkawatch is a project [supported by the Web3 Foundation](#) and was part of the Wave 13 of the grants program. Polkawatch is also supported by both Polkadot and Kusama treasuries.

It uses the Reward event as the main measure of Computing Effort and it complements the information with networking information (IP address) of validator nodes which is then crossed with external geolocation data sources.

Polkawatch allows us to navigate our rewards, or validation operation, by geography, computing network and node operators.

This not only allows us to measure the realization of our decentralization potential, but it also allows us to measure the rewards produced by our own nomination, which is useful for us to know if we are contributing to decentralize Kusama or not.

Polkawatch can be accessed at: kusama.polkawatch.app for the Kusama Network.

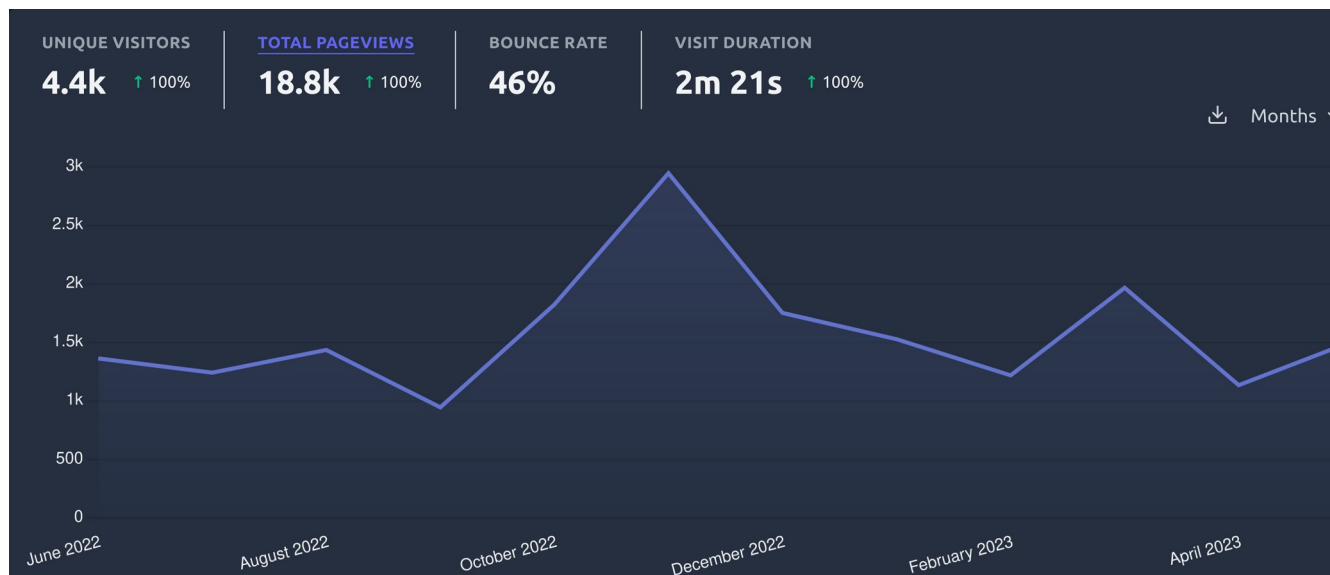
For a description of Polkawatch System Architecture and how it is Operated, already presented in previous proposals, see Appendix A.



Polkawatch usage in our Community

Polkawatch provides analytical evidence designed to raise awareness in our community.

In the last 12 months Polkawatch has delivered 18K decentralization reports to an estimated 4.5K nominators and validators. There is a growing segment of nominators that analyze their nomination more than twice a month. The statistics exclude calls made via API.



Heavy users fall in two groups: small validator (1kv) screening the network prior to migrating their validator to a new location/network, and nominators adjusting their nomination with decentralization in mind. We also receive direct queries via email from both groups which allowed us to understand their motivations.

Spikes in traffic depend heavily on communications in the ecosystem. Polkawatch communications are systematically amplified by Polkadot community accounts. Most remarkably the [state of decentralization report 2022](#) was included in the 2022 roundup report of our community.

Ultimately, the key success metrics for Polkawatch are actually the decentralization metrics themselves. During last 2022, in the state of decentralization report, we could see clear trends with a decentralizing effect while seeing key challenges remaining ahead.



Next Actions and Milestones

The proposed improvements actions and maintenance costs of Polkawatch until 2023Q3 are as follows:

ID	Category	Area	Type	Concept	Unit	Q	Rate	USD Total
1	Infrastructure	Operation	Recurrent	9 Months Period	Man/Hours	135	75	10,125
2	Infrastructure	Hosting	Recurrent	Server Hosting Hetzner + Scaleway	Monthly Fee	9	165	1,485
3	Infrastructure	Hosting	Recurrent	Server Hosting Lab	Monthly Fee	9	183	1,647
4	Infrastructure	Network	Recurrent	Server hosting Lab	Monthly Fee	9	100	900
5	Management	Administration	Recurrent	Of Project Admin/Direction	Man/Hours	9	100	900
d1	Software	Development	One-Time	DHT Topology Implementation	Man/Hours	45	90	DEFERRED
d2	Software	Development	One-Time	Traceability Improvement	Man/Hours	20	90	DEFERRED

1. Continued operation of Polkawatch: Operating and monitoring of the system. Monitoring CD/CI pipelines and DDPs production, etc.
2. Third party Data Center hosting costs.
3. Own Lab hosting costs (financial amortization of dedicated equipment over period of 60 months)
4. Network / Traffic costs. (Data center - Lab)
5. A 10% of effort reserved for project management/technical direction.
6. (d1) We have been advised by substrate team to move the topology detection to lower levels of the peer to peer protocol, by means of querying the Distributed Hash Table of the peer to peer protocol. Information currently in the Heartbeat event is not being used and likely to be removed. [See Github issue](#).
7. (d2) Traceability needs to be improved as detected with the traceability observability system deployed in our last report.

The roles involved in the proposed activities are: Operations Role, Software Engineer, Project Management with different degrees of involvement.

Economic Information

State of the Treasury

Kusama treasury is currently [under stress](#) and several stakeholders have raised the hand expressing concern and calling for responsible use of funds.

We follow the appropriate financial practices when planing our projects. For that reason we always report independently recurrent costs versus one time costs. One time costs are typically new developments (investments) that can be deferred in time for the purpose of adapting to budgeting needs / cashflows.



Adapting to treasury needs does not mean that we will stop developing out service. We may attempt to fund upcoming developments via other sources, slow down the development pace, execute the development and ask for its funding at a later stage, or most probably a combination of different measures.

Economic Summary

- Project duration: 9 months (2022Q1 – 2023Q3, 50% already delivered)
- Total Man/Hours Required: 209 or 1/5 FTE.
- One time costs: 0 USD or 0 USD per month targeting further service development (**deferred**).
- Recurrent Costs: 15.057 USD or 1.673 USD per month targeting continued operation of Polkawatch.
- Total Cost: 568 KSM (15.057 USD)
- KSM EMA7: 23.01

Beneficiary:

Valletech AB / Polkawatch Project

KSM: FbYWAVERn6SgSw5rCg4XKpfMEEh4qEnyUnvKN2fr2sLpdpZ

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Submission History

The following submissions have been approved in the past:

- 2022 Q3: Kusama Deployment [Proposal](#), [Delivery Report](#)
- 2022 Q4: Continued Operation + Parachain Support [Proposal](#), [Delivery Report](#)

Project Communication

Polkawatch communicates on regular basis using the following channels:

- All proposals are accompanied of a delivery report, and the delivery report listed in the Submission History.
- Major releases, reports and events are accompanied by [blog posts](#).
- All previous announcements plus related industry news are also made via [Twitter](#) .
- It is also possible to subscribe to notifications via email at kusama.polkawatch.app by clicking on bell icon.
- You can proactively reach the project at info@valletech.eu



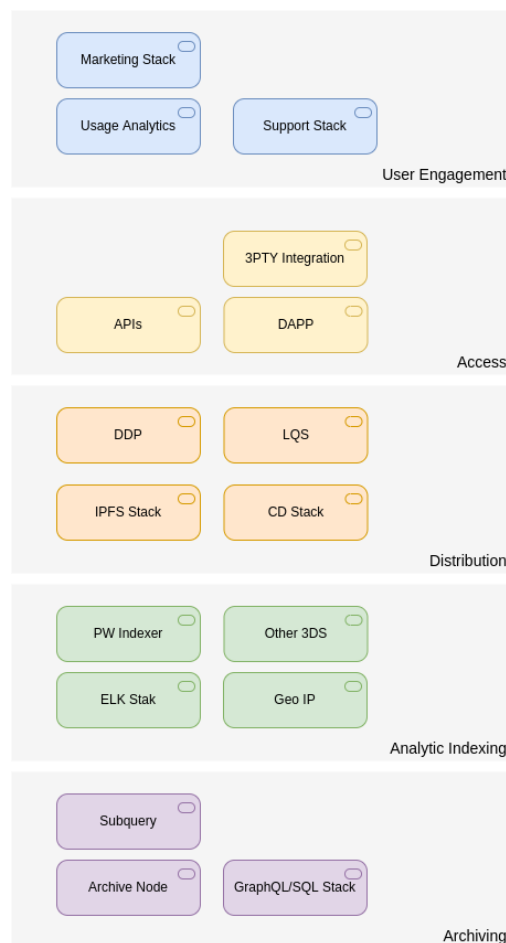
Appendix A

Polkawatch System Architecture

Operating Polkawatch involves the following components:

The **archiving** layer is responsible for indexing the “canonic” events of the blockchain, and it involves the deployment of a full-archive substrate node and a subquery stack with the corresponding GraphQL stack.

The **analytic indexing** layer uses the data from the archive layers and traces dependencies between identified events, plus merges this information with external data sources, such as GeoIP data sources or any data source relevant for analytics. This layer includes a lucene inverted index (and ELK stack)



for efficiently creating and querying analytic information.

The **distribution** layer makes the Analytic data available, from a pragmatic way. There are 2 delivery formats: deferred analytics that are distributed in IPFS data packs (DDPs) and live data which is accessible via Live Query Server (LQS). DDPs are cheaper to host and deliver with DAPPs. Depending on the nature of the analytics served DDPs may be the preferred delivery format. DDPs generation are managed from a CD/CI stack based on Gitlab. An IPFS cluster is responsible for serving DDPs.



The **access** layer is responsible for presenting the information to the user, via a DAPP, or via any other means, such as, APIs for or Component Libraries for third party integration.

The **user engagement** layer is responsible for managing a long term relationship with the user. It is an Opensource Stack of marketing automation services and user support services: plausible analytics, mautic and zammad are the main components.

Our Operational Model

We run Polkawatch strictly on top of Open Source Stacks and directly on Metal using privaz.io a sister project developed by Valletech AB that provides metal to service automation.

We believe that having the capability to manage physical infrastructure efficiently is a decentralization enabler. As such we stay out of Public clouds when operating infrastructure. Privazio automates the deployment of Apache CloudStack on metal and then all the layers of our System Architecture on top of it.

Having the capability to run a complete stack directly on metal provides economic efficiency and digital autonomy.

Typically, we split service deployment between our own Lab and Data Center. Higher layers in the stack have higher demand in terms of availability, and they run on the Data Center.

Development Process / Canary

Since the introduction of Polkawatch for Kusama in 2022Q3, Kusama is considered the “Canary” branch for Polkawatch in line with the rest of the ecosystem. New functionalities are developed first on Kusama and ported to Polkadot branch afterward with an estimated delay of 3 to 6 months.

This is our preferred process, however, exceptionally features may need to be brought to Polkadot first if the Kusama treasury is under stress.



Appendix B

About Valletech

[Valletech](#) is the developer behind Polkawatch, is a Product Development Lab that helps customers innovate Software Products that nicely fit into leading OperSource stacks, including latest Web 3 technologies.

Historically Valletech has helped companies create new Software Products or help launched new Software and IOT ventures.

[Rafael del Valle](#) is partner/owner and has hands-on Software Product development experience for over 20 years. Rafael helped create products for TIBCO, Reuters, Credit Suisse, Vodafone and participated in the creation of 2 Software ventures with Angel, Public and VC funding totaling EUR 4M approx.

In 2020 Valletech decided to focus on Blockchain technology and selected Polkadot as the stack to focus on due its architectural superiority.

On top of Polkawatch Valletech has already started [DINFRA](#), the second ecosystem project currently under development. [DINFRA](#) has also been accepted under the Web3 Grant Program, a proper announcement will follow after successful delivery of milestones.

