

Polkadot Decentralization Analytics

2024 Q1-Q3
9 Months Retroactive Infrastructure and Maintenance

Polkadot
Treasury Proposal

Proposer

15yhxUC89ULF3WxvH2P6r4ktWRPhF7r7LtXMaGGADoyVxs2B
Valletech

Allocation
7.647 DOT (32.937 USD)



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Polkawatch Authors and Contributors



The Problem

Polkadot, and generally speaking Substrate built blockchains 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 Relay 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.

For a detailed account of the problem and motivation behind launching Polkawatch see our blog post: Introducing Polkawatch.

The Solution

Polkawatch is an analytic tool designed to measure effective decentralization of Polkadot'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 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 datasources.

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. This is useful for us to know if we are contributing to decentralize Polkadot or not.

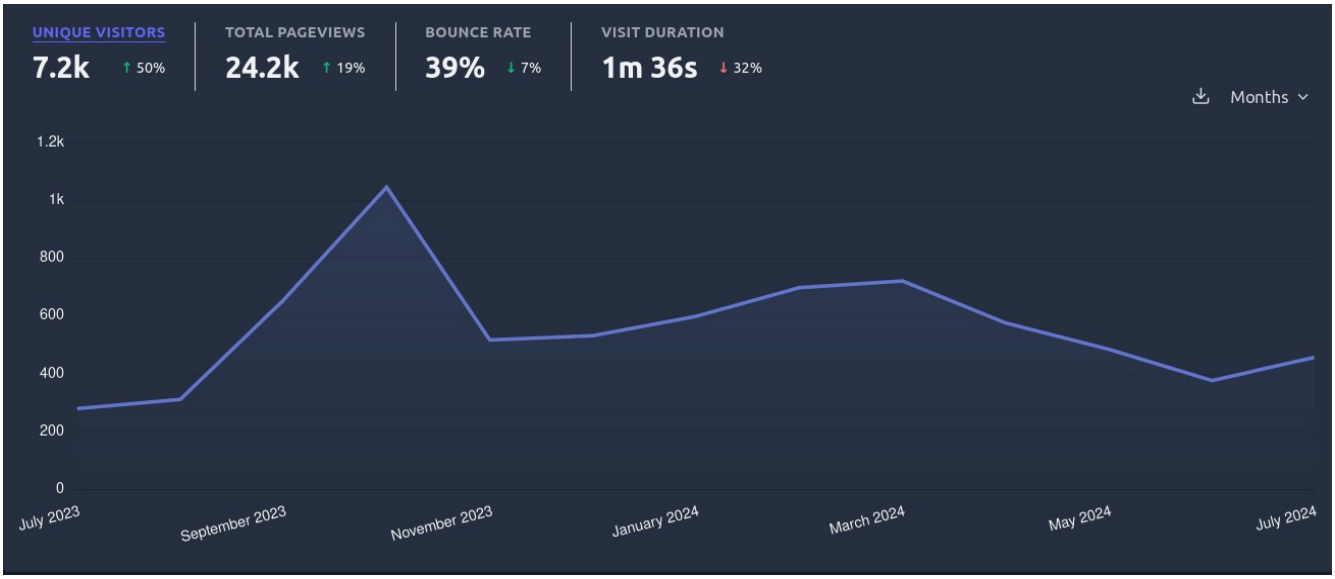
Polkawatch can be accessed at: polkawatch.app and is also integrated in: staking.polkadot.cloud

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 24.2K decentralization reports to an estimated 7.2K nominators and validators. The YoY increase is related to the ongoing integration with the Polkadot Staking Dashboard.



This report includes the traffic at polkawatch.app, including traffic sent from the Polkadot Dashboard. But it excludes API traffic, used from the Staking Dashboard itself: i.e. nomination/decentralization tab.

Next Actions and Milestones

The proposed improvements actions and maintenance costs of Polkawatch until 2024Q3 are as follows:

ID	Category	Area	Type	Concept	Unit	Q	Rate	USD Total
1	Software	Development	Recurrent	Maintenance, Updates, Bugfixing.	Man/Hours	126	80	10,080
2	Infrastructure	Operation	Recurrent	9 Months Period	Man/Hours	207	75	15,525
3	Infrastructure	Datasource	Recurrent	Premium Geolocation	Monthly Fee	9	50	450
4	Infrastructure	Hosting	Recurrent	Server Hosting Hetzner + Scaleway	Monthly Fee	9	145	1,305
5	Infrastructure	Hosting	Recurrent	Server Hosting Lab	Monthly Fee	9	187	1,683
6	Infrastructure	Network	Recurrent	Server Hosting Lab	Monthly Fee	9	100	900
7	Management	Marketing	Recurrent	Polkawatch Promotion	Fixed	5	PCT	1,497
8	Management	Administration	Recurrent	Of Project Admin/Direction/Promotion	Fixed	5	PCT	1,497

1. Software maintenance, bug fixing, dependency updates, etc. Small incremental implementations. i.e. Support for Staking Pools decentralization in the Staking Dashboard, better traffic reporting.
2. Continued operation of Polkawatch: Operating and monitoring of the system, also includes checking that data quality is achieved (events are being traced to GeoIP data, etc). Substrate Archive node maintenance/updates, Monitoring CD/CI pipelines and DDPs production, etc.
3. Cost of premium Geolocation Data Sources.
4. Third party Data Center hosting costs, including both Hetzner and Scaleway.
5. Own Lab hosting costs. The monthly cost is calculated as financial amortization of dedicated equipment over an expected lifetime period of 5 years or 60 months.
6. Network / Traffic costs. (Data Center – Lab)
7. Project Promotion, including: Writing blog posts which typically include introduction of new functionality, followup on Twitter. Monitoring of engagement analytics. Engaging with the community/attending events. 5% of effort reserved for the activity.
8. Project management, technical direction and interface with partner projects. 5% of effort reserved for the activity.

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

Economic Summary Information

- Project duration: 9 months (2024Q1 – 2024Q3)
- Total Man/Hours Required: 333 or ¼ FTE
- DOT EMA7: 4,307 USD
- Total Cost: 7.647 DOT (32.937 USD)
- Beneficiary Address: 13QpsZQDNdUon9rzcgGH2B7CdiHAM8r4B152QHviobM44i3e

Project Sustainability and Future

Polkawatch development is considered complete for Relay Chains, only software maintenance and small fixes/incremental features will be applied going forward.





The project has, from its inception, reported and minimized its recurrent costs, and as a result Polkawatch is Sustainable with a very reasonable economic effort, of around 3K USD per month. Considering current analytics that is equivalent to 0.5 USD per user/month, and includes maintenance of Relay and People chain archive nodes, a generic storage public service.
There remains revenue opportunities for Polkawatch in our ecosystem: Other live chains, parachains and liquid staking providers, which would be similar to the implementation of staking pools. These present the possibility of additional revenue sources, other than the Polkadot OpenGov, adding to project sustainability.

Submission History

The following submissions have been approved in the past:

- 2023H2: Continued Operation and Software Development. Proposal, Report
- 2023H1: Continued Operation and Software Development. Proposal, Report
- 2022Q3: Continued Operation and Software Development. Proposal, 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 polkadot.polkawatch.app by clicking on bell icon.

You can proactively reach the project at info@valletech.eu

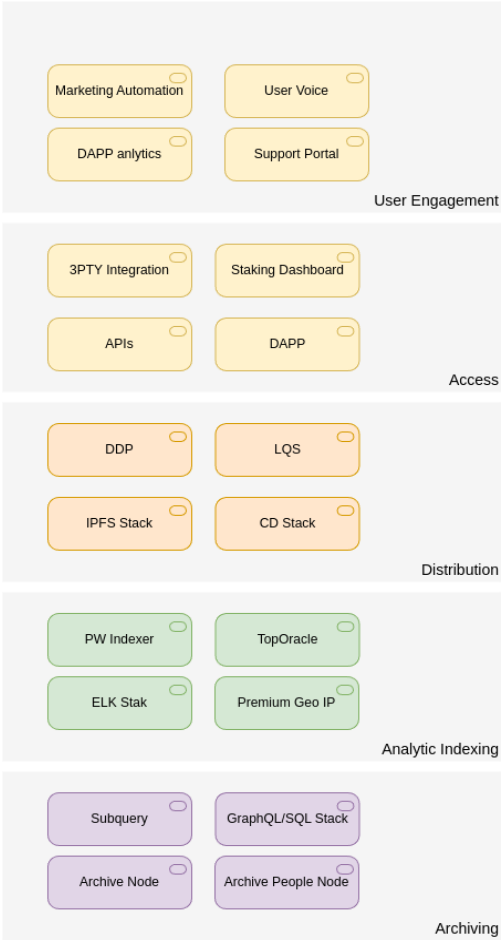
Appendix A

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 layer and traces dependencies between identified events, plus merges this information Network Topology from P2P DHT and premium 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 Opersource 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.

Appendix B

About Valletech

Valletech (and community contributors) is the developer/sponsor behind Polkawatch, 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, a decentralized infrastructure orchestrator based on Substrate, the second ecosystem project currently under development. DINFRA is also in the Web3 Grant Program.



