

Polkadot Decentralization Analytics

Project Delivery Report

Polkadot
Treasury Proposal

#463 Polkawatch, Decentralization Analytics, Continued Operation and Development

Valletech

About This Document

This report contains information about the execution of actions and milestones agreed in the referenced Treasury proposal, the deliverables, community engagement and potential next steps.

Executed Actions and Milestones

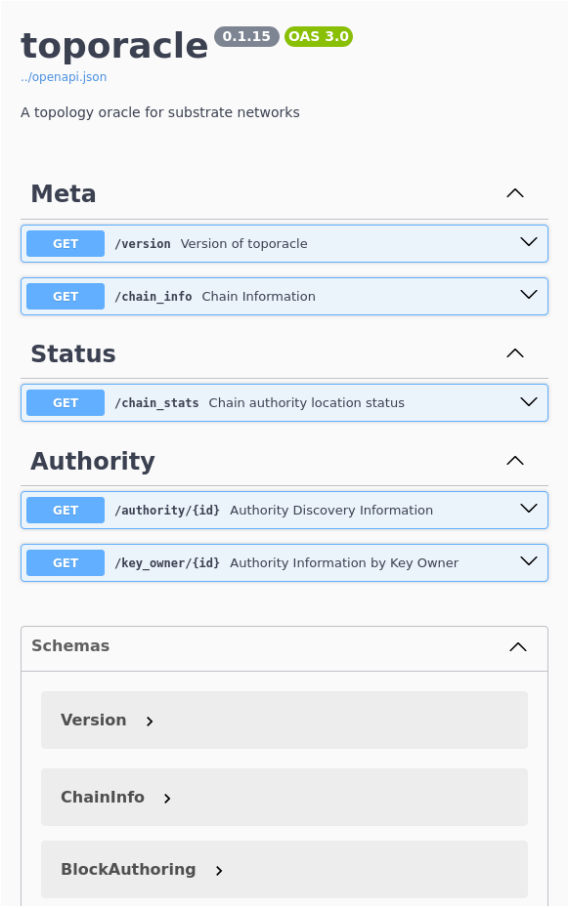
Development Actions

DHT Lookup - TopOracle

Polkawatch now uses the libP2P, DHT (distributed hash table) to resolve the IP addressing of the validators, following the deprecation of the addressing information in substrate heartbeat event.

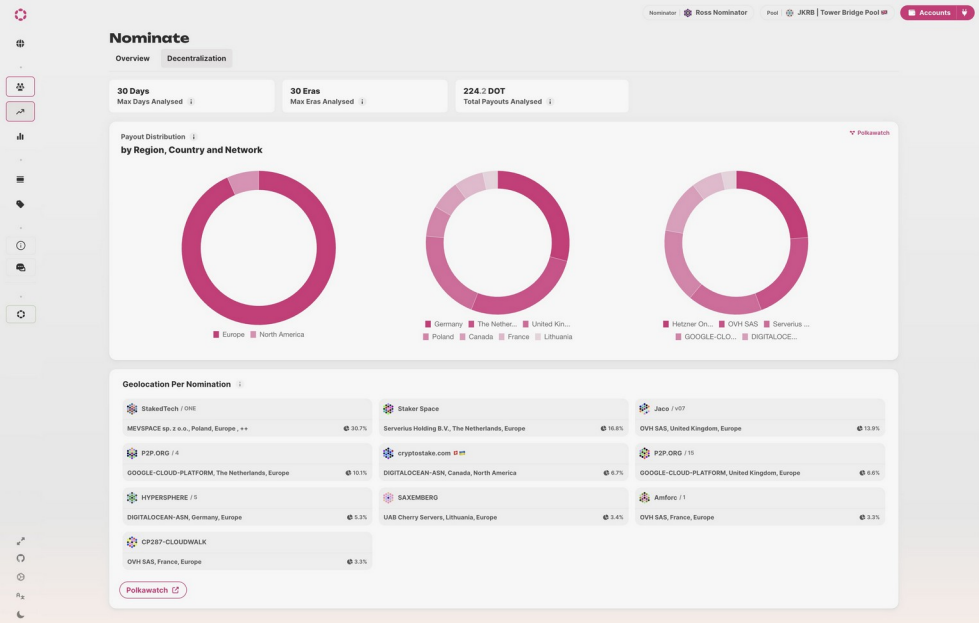
A new component, a Rust server called TopOracle, has been implemented for the purpose. TopOracle explores the libP2P network in order to locate the authorities using the DHT. TopOracle is very respectful with network resources, keeps a cached registry of authorities and only locates the required authorities putting minimum load on the network. The new component is open source and meant to eventually become the base for a “Topology Oracle”, that would add on-chain attestations of Network Topology, making it possible to, for example, to plan workloads according to geolocation. TopOracle has a OpenAPI interface for easy integration in ecosystem projects.

TopOracle is based on subp2p-explorer by Alexandru Vasile, a crate we decided to integrate and contribute to instead of maintaining our own separate implementation.



Polkawatch Analytics in Polkadot Staking Dashboard

We have implemented decentralization analytics inside the Polkadot Staking Dashboard using Polkawatch client API and the Dashboard plugin system. Nominators can see how decentralized their nomination is and make adjustments accordingly.



The Staking Dashboard is now a community project part of the Polkadot Cloud. The plugin system was very easy to use and Polkawatch's API fit in nicely.

Premium Geolocation

The TopOracle implementation includes both community GeoLocation using MaxMind community databases and also premium GeoLocation using MaxMind paid endpoints.

Premium Geolocations are cached a configurable number of days to minimize premium lookups and save costs. At the end of the day, Geolocation information of Datacenter IPs are very stable data.

At the time of writing of this report the data quality in Polkawatch is 99.991%. That is the percentage of rewards that could be traced to a geolocation.

Continued Operation and Project Management

The system has been operated according to the agreed model without major issues.

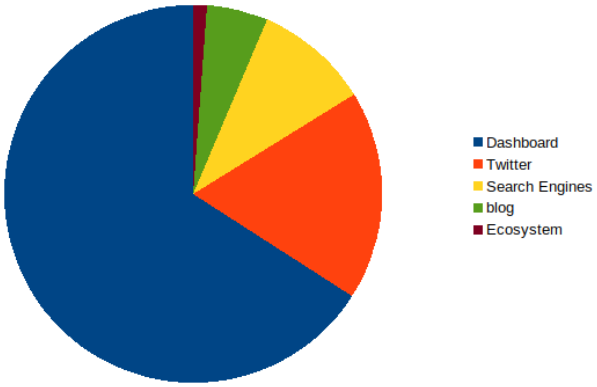
Data quality was affected during the migration from Heartbeat addressing to DHT addressing.

Polkawatch Promotion

We continue to announce our relevant releases on X and/or blog.

Our plan to promote Polkawatch by means of integrating in community products is being very successful, with over 65% of traffic originated from the Staking Dashboard now.

Other ecosystem projects (wiki, polka projects) also generate some additional traffic.



We also attended Decoded 2024 where we could feel first-hand community appreciation, engaged in technical discussions, and gathered general feedback.

Project Next Steps

Changes in Administration and Project Funding

Through OpenGov we received feedback of community members asking developers to put focus on projects that have the potential to bring additional users or use cases to the Polkadot ecosystem, while leaving Polkawatch on maintenance. The reason being the moment our ecosystem is at.

Generally speaking we agree with this feedback and decided to slow down the development of Polkawatch. We also started a second project called DINFRA.

Going forward we decided to cut development cost to a maximum of 1/3 of proposal size and focus mainly on software maintenance and small incremental developments.

Short term priorities

Regarding foreseeable incremental developments we expect:

- Complete Staking Dashboard integration: Remaining features such as Pool Decentralization will be added to the staking dashboard.
- The archive process will be migrated to Sidecar Pattern in our indexing architecture, more in line with the process used by other platform such as dot lake.
- Limited Parachain Support: Our infrastructure provider community keep requesting us parachain support on Polkawatch. However in Aura parachains collators don’t use the DHT to be located. We may implement a feature-limited polkawatch implementation that provides some visibility on the decentralization of parachains.

Marketing Activities

Integration with ecosystem projects (The Dashboard) is bringing the awareness Polkawatch needs. Complemented with X and Blog is more than sufficient.