Subscan | Infrastructure Costs of Subscan for Kusama & Statemine Networks (from January to September 2023)

This is a follow up proposal to what we submitted before:
#229 Subscan | Infrastructure Costs of Subscan for Kusama & Statemine (from July to December 2022)

Overview

Subscan is an essential block explorer and analytics tool for the Substrate ecosystem, providing valuable insights to the Substrate community. However, the maintenance and operation of Subscan requires a significant investment of resources, including server infrastructure, security, and personnel costs. Therefore, we propose reimbursing the operation and maintenance fee for Subscan for the period **January to September 2023** from the Kusama treasury to ensure its continuous operation and maintenance.

We highly value feedback from our community users, and over the past few months, we've made substantial efforts to reduce infrastructure costs. The results have been both effective and gratifying. Starting from **July 2023**, the operational expenses have gradually decreased and have recently stabilized. As an illustration, taking our GCP bill as an example, the costs for the past week have decreased by more than **50.52%** compared to their historical peak.

- For specific parameters and billing details, please refer to the "GCP Bill" section below.
- For our specific development efforts, please refer to the "Operations and Maintenance Cost Reduction Plan" section below.

The growth of Subscan is intrinsically tied to the support of our community, which we deeply appreciate. We aspire to enhance community involvement in Subscan's decision-making

processes. As a result, we propose a gradual shift in Subscan's development approach, starting from November 2023, towards a community-developer collaborative model. In this new framework, Subscan's development will be guided by the needs and feedback of the community. Features with the highest demand from the community will be prioritized for development, aligning more closely with the ecosystem's requirements. While we have implemented some of these principles in the past, we recognize that they have not been as open and transparent as desired. Our aim is to continually improve upon this aspect. And the specific plan will be officially announced in December!

Subscan Traffic Overview

Take the latest 30 days data as an example:

Overview

subscan.io

Monitor security and performance for subscan.io. Configure products and services from the menu.

Review Cloudflare fundamentals

★ Starred

24 Hours 7 Days **30 Days** 19 SEPTEMBER — 19 OCTOBER

Unique Visitors
1.34M

Total Requests
495.52M

Percent Cached
28.46%

Total Data Served
4 TB

Data Cached
1 TB

Traffic for subscan.io

Print report Download data

Add filter

Previous 30 days

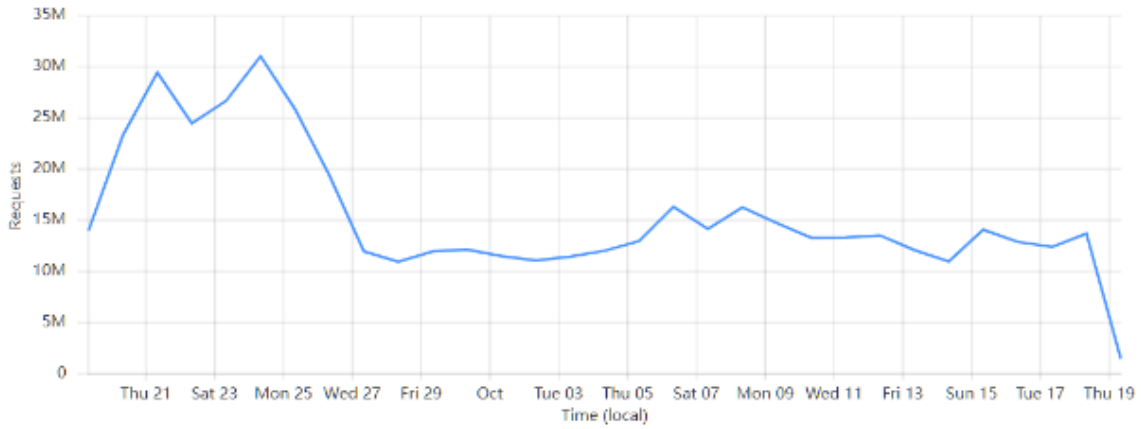
Requests summary

An HTTP request. A typical page view requires many requests.

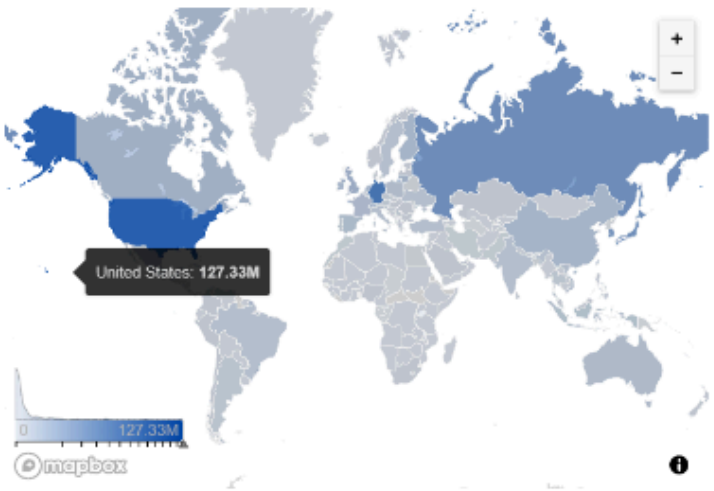
All Referer Host Country Path Edge status code ...

Total requests

479.23M



Requests by country



United States	127.33M
Germany	78.02M
Russian Federation	38.21M
Japan	37.15M
Korea, South	28.83M
Hong Kong	22.71M
Singapore	18.09M
Seychelles	15.33M
United Kingdom	10.15M
Switzerland	8.49M

1 to 10 of 200 items

Requests by source

5 items

Referers

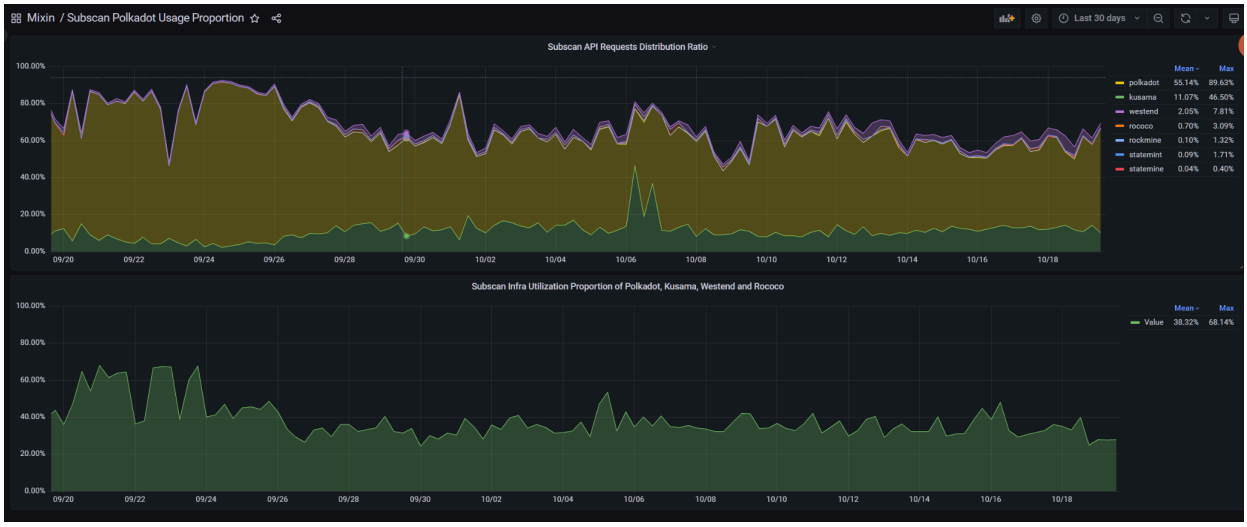
None (direct)	259.94M
www.subscan.io	132.07M
polkadot.subscan.io	34.33M
kusama.subscan.io	7.56M
hydradx.subscan.io	6.87M

Paths

/api/scan/multiChain/account	105.5M
/api/scan/extrinsic	43.63M
/api/scan/metadata	31.04M
/api/scan/transfers	28.64M
/api/scan/blocks	20.83M

Subscan API Traffic and Distribution

Take the lastest 30 days as an example:



Operations and Maintenance Cost Reduction Plan

We highly value feedback from our community users, and over the past few months, we've made substantial efforts to reduce infrastructure costs. Starting from July 2023, the operational expenses have gradually decreased and have recently stabilized, which can be evident from the bills , and is very conducive to the sustainable development of the Substrate ecosystem.

Main work including:

1. Database Storage Structure Optimization

- Optimized block index
- Enhanced event index
- Improved extrinsic index
- Streamlined transfer index

2. Database Data Cleanup

- Cleaned up redundancy in blocks: extrinsics, logs, and event fields
- Eliminated redundant log_index in logs
- Removed redundant fields such as extrinsic block_hash and extrinsic_index
- Cleared redundant event_index
- Data cleanup for prod-a and prod-c

3. Merged prod-c data into prod-a to reduce number of database instances.

4. Node Service Testing and Migration to Onfinality

5. Resource Optimization

- Checked the actual CPU and memory usage of each application, adjusted requests and limits in the cluster
- Replaced six c2-standard-16 type machines with more cost-effective t2d-standard-16 type machines

6. Data Backup Type Adjustment

- Transitioned most backup data from SSD disks to more cost-effective single-zone object storage
- Converted some SSD disks to single-zone storage

7. Service Log Adjustment

- Implemented a self-hosted EFK (Elasticsearch, Fluentd, Kibana) log center
- Transferred the majority of service logs to the self-hosted log center, filtering out non-essential logs to reduce Datadog costs
- Discontinued GCP log collection for the cluster, reducing GCP logging and monitoring expenses

This plan strikes a balance between cost reduction and security. We assessed the option of migrating from a **GKE cluster** to an **self-hosted Kubernetes cluster**, which would have significantly lowered costs. However, for security reasons, we did not adopt this option.

However, there are some unavoidable factors that will lead to increased infrastructure costs, such as:

1. Addition of New Features:

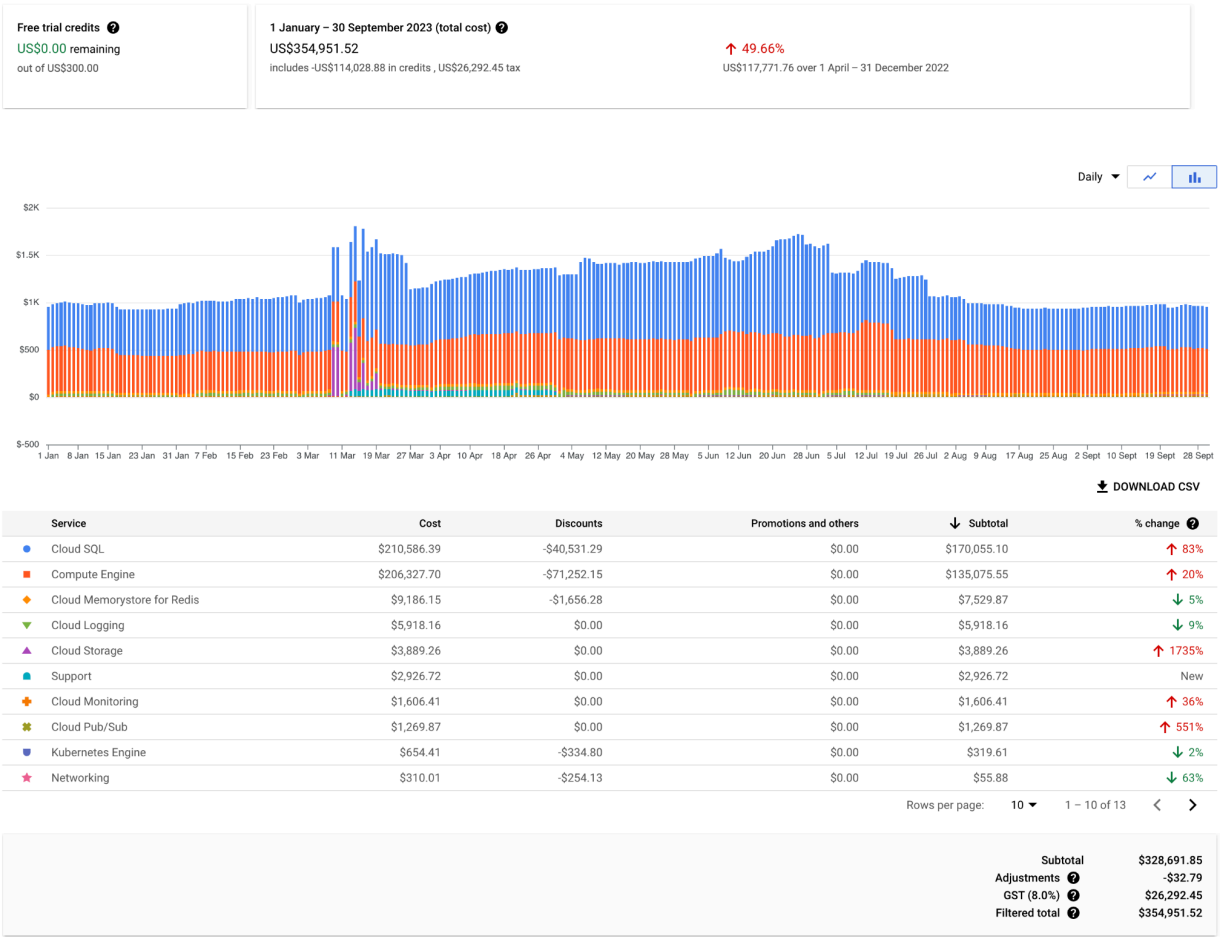
The introduction of new features such as **trace**, **xcm**, and **opengov** has significantly increased the volume of data processed and stored by Subscan. These features enhance the user experience but also entail additional infrastructure costs.

2. Increasing Data Volume

As the network continues to produce blocks, the volume of data on Subscan has gradually expanded. This is due to the growing activity within the Substrate ecosystem, necessitating more resources to handle the increased workload.

GCP Bill

The operation and maintenance of Subscan require significant server infrastructure, including high-performance servers and storage devices. The total cost for the server infrastructure is estimated to be **354,951.52 USD(tax included)**. Based on the analysis of API traffic and distribution data, the 2 networks of Kusama and Statemine collectively represent approximately **11.11%** of the total usage. Therefore, the actual GCP cost for these networks is **39,435 USD (tax included).**



Others Cost

The operation and maintenance of Subscan demand a dedicated team of experienced professionals to ensure its seamless functionality. To provide an overview of the labor costs, we present a breakdown of the actual workload and associated expenses for **Kusama and Statemine**. The estimated total cost for personnel is **73,800** USD.

Please note that the amount requested in this application solely covers the basic operation and maintenance of the aforementioned networks, as well as our efforts to reduce infrastructure costs. It does not encompass any development of new features. Despite our diligent efforts, such as developing Trace , XCM, OpenGov, and more, these development costs have been shouldered by Subscan for nearly three years. This has not been an easy feat, particularly in the current market environment. In the future, Subscan hopes to seek partial subsidies for

workloads proposed or recognized by the community; this will foster the healthy growth of Subscan's economic model and ensure sustainable operation.

Basic Maintenance for Kusama and Statemine Networks:
- One DevOps engineer: $600 per day, working 1 days per week
- One front-end engineer: $600 per day, working 1 days per week
- One backend engineer: $600 per day, working 1 days per week

Technical Infrastructure Optimization for Kusama and Statemine Networks:
- Database migration, resource cleanup, index optimization, and MySQL storage data optimization: 1 engineer, total working 8 days
- Node service testing and migration to Onfinality: 1 engineer, total working 2 days
- Resource optimization for applications: 1 engineer, total working 1.5 days
- Data backup type adjustment: 1 engineer, total working 1.5 days
- Service log adjustment: 1 engineer, total working 2 days

Total

We believe that this reimbursement proposal will help to ensure the continuous operation and maintenance of Subscan, and benefit the growth and development of the Kusama and Statemine network. This time, we plan to apply for a total of **113,235 USD** in Kusama, the amount of KSM will be converted based on the EMA7 price on the day of the official submission.

Exchange rate

2023-11-26 16:01:42 (+UTC), Block #20727352

KSM EMA7 Price (USD): 24.913;

Number of KSM: 4,545.049

https://kusama.subscan.io/tools/price_converter?value=113235&type=time&from=USD&to=KSM&time=1701014400