

The StarGazer Vol. 3 - Subspace Network

By Subspace Network

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Subspace Network Ecosystem Update May 2023 Edition



Captain's log: Stardate 47634.44

Jeremiah Wagstaff

Chief Hacker at Subspace Labs

It's been an interesting couple of months with many exciting developments inside and outside the company. We've been heads-down finalizing some key artifacts to set Subspace up for long-term success.

With the support from our Research Team, Nazar completed an initial implementation of our consensus v2, dilithium, on a private test network, which we continue to test and improve. We've also deployed MUD on our core-evm domain, bringing the framework to Substrate. MUD is a framework for ambitious Ethereum applica-

tions that compresses the complexity of building EVM apps with a tightly integrated software stack. We plan to launch our core-evm domain on Gemini III soon.

We're thrilled to welcome two new contributors to support our continued growth. Our Gemini 3d testnet is live with thousands of farmer nodes distributed across 60+ countries. We've also successfully launched our Open-Source Block Explorer!

Dilithium: Subspace Consensus v2

Nazar achieved a huge milestone by completing an initial implementation of dilithium in a private test network. With the support from our research team, we are in the process of making further improvements through rigorous testing.

Our research team, in collaboration with our partners, has made significant progress in ensuring the robustness, security, and ASIC resistance of Subspace consensus v2, *dilithium*. Through our combined analysis approach, we have developed a more comprehensive understanding of potential attacks and vulnerabilities. For the dilithium security proof, we've incorporated some ideas from [Security of Blockchains at Capacity](https://eprint.iacr.org/2023/381) → <https://eprint.iacr.org/2023/381>, an academic research paper co-authored by one of our Affiliate Research Partners, Joachim Neu.

The Hitchhiker's Guide to Subspace

We've recently unveiled our latest blog series, "The Hitchhiker's Guide to Subspace," which aims to provide a comprehensive overview of our cutting-edge research findings and technical details about our new consensus v2, *dilithium*. Through this blog series, we share in-depth insights and analysis that, we hope, will inform and educate our community.

- [Ep. I](https://blog.subspace.network/polynomial-pors-for-subspace-v2-daa6dd7822ea) → <https://blog.subspace.network/polynomial-pors-for-subspace-v2-daa6dd7822ea> — **Polynomial PoRs for Subspace v2** → <https://blog.subspace.network/polynomial-pors-for-subspace-v2-daa6dd7822ea>: In the first episode, Polynomial PoRs for Subspace v2, Jeremiah explains the technical details of our v2 consensus, which constructs proofs-of-replication (PoRs) and proofs-of-archival-storage (PoAS) — among several other exciting things, from polynomial schemes such as Reed-Solomon erasure codes and Kate-Zaverucha-Goldberg (KZG) commitments.
- [Ep. II](https://blog.subspace.network/combining-kzg-and-erasure-coding-fc903dc78f1a) → <https://blog.subspace.network/combining-kzg-and-erasure-coding-fc903dc78f1a> — **Combining KZG and Erasure Coding** → <https://blog.subspace.network/combining-kzg-and-erasure-coding-fc903dc78f1a>: In the second episode, Combining KZG and erasure coding, our Research Engineer, Dariia Porechna, outlines our lessons learned from combining RS and KZG and provide an overview of existing schemes, some described in research papers and others currently used by different teams in the space.
- [Ep. III — Dilithium: Subspace Consensus v2](https://blog.subspace.network/dilithium-the-subspace-consensus-v2-3c5df0759e72) → <https://blog.subspace.network/dilithium-the-subspace-consensus-v2-3c5df0759e72>: In the third episode, Dariia provides an overview of how we combine the underlying proof-of-space from the Chia protocol with erasure coding and KZG commitments. Their synergy produces a lightweight, secure, and energy-efficient proof-of-archival storage (PoAS) consensus variant, a significant step forward in security and user experience.

What's Next for Research

Our research discussions have found a new home in the [Subspace Network forum](https://forum.subspace.network/) → <https://forum.subspace.network/>, providing a central place to publish our findings and facilitate deeper engagement. In addition, we plan to release a list of open research problems in the

next few weeks to encourage participation from the academic community, allowing us to leverage the collective knowledge and expertise of the wider community.

Gemini III

The non-incentivized stress test of Gemini III has been launched successfully, thanks to the unwavering efforts of our dedicated engineering team. As previously mentioned, the initial stages of Gemini III will be non-incentivized, and we anticipate making some significant changes in the upcoming weeks. Our focus on testing the protocol on a live network is paramount as we implement dilithium consensus and enhance the features of Gemini III. By conducting these iterative tests, we can anticipate and proactively resolve potential issues, ensuring that our network is resilient and secure.



Gemini 3c

In Gemini 3c, we upgraded the consensus to v2.2, adding enhancements to the security guarantees of the network. We also upgraded our Distributed Storage Network (DSN) to v2, enabling farmers to download data (sync) from other farmers (not nodes). Our engi-

neers are already working on the next iteration, where nodes will be able to sync from the farmer network. These huge milestones bring us closer to finally resolving the farmer's dilemma.

Gemini 3d

After a few weeks of successfully testing Gemini 3c, we launched Gemini 3d. [A basic Proof-of-Space](https://github.com/subspace/subspace/issues/1164) → <https://github.com/subspace/subspace/issues/1164> has been implemented, [KZG implementation has been aligned with primitives used for erasure coding](https://github.com/subspace/subspace/pull/1280) → <https://github.com/subspace/subspace/pull/1280>, and [runtime solution verification has been implemented](https://github.com/subspace/subspace/pull/1278) → <https://github.com/subspace/subspace/pull/1278>. Other exciting upgrades include domains and cross-domain messaging. We are currently testing the implementation for system domains, core payments, and more.



What's Next for Gemini III

Recently, [we successfully deployed MUD](https://twitter.com/NetworkSubspace/status/1656415218753306625?s=20) → <https://twitter.com/NetworkSubspace/status/1656415218753306625?s=20> on our core-evm domain. The [Subspace core-evm domain](https://polkadot.js.org/apps/?rpc=wss%3A%2F%2Frpc-0.evm.devnet.subspace.network%2Fws#/explorer) → <https://polkadot.js.org/apps/?rpc=wss%3A%2F%2Frpc-0.evm.devnet.subspace.network%2Fws#/explorer> supports smart contract development with solidity, enabling us to bring MUD into the Substrate ecosystem. We even [launched a simple example world](#)

using MUD v2 → <https://github.com/subspace/mud/tree/main/examples/minimal> on Subspace that demonstrates how to use the MUD framework to create simple on-chain applications. We plan to launch our core-evm domain on Gemini III soon.



Product at Subspace

We are excited to share that we have completed a successful soft launch of our in-house open-source block explorer → <https://explorer.subspace.network/>. This early version provides a clear and user-friendly visualization of Subspace-specific statistics that cater to the needs of our farmers.

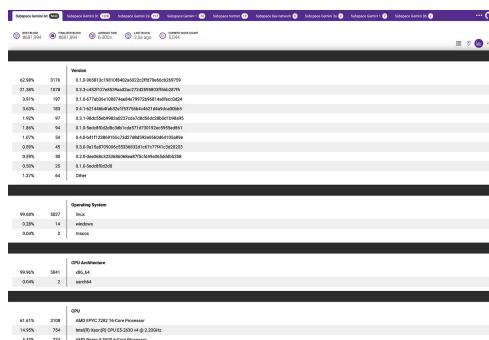
A screenshot of the Subspace Network block explorer. The top navigation bar includes "Dashboard", "Blocks", "Transactions", "Contracts", and "Farmers". The main area has sections for "LATEST BLOCKS" and "LATEST EXTRinsics". The "LATEST BLOCKS" section shows 10 blocks with details like height, timestamp, and difficulty. The "LATEST EXTRinsics" section shows 10 extrinsics with details like block hash, extrinsic index, and status. At the bottom, there are "SUBSPACE", "LAND", and "SOCIAL" sections, along with a footer note about the 2023 Subspace Data Privacy Agreement.

DevSDK

Subspace Network's DevSDK is designed to be a powerful tool for developers, allowing them to explore the full range of the network's capabilities. By leveraging this resource, developers will be able to easily understand how the network functions and use this knowledge to bootstrap community-driven growth loops. With an early version of the DevSDK, we plan to offer support for Moonbeam EVM builders, Solidity-on-Ethereum experts, and Metaverse builders, allowing them to get quick-started. We plan to launch our first application running on the DevSDK in the coming weeks!

Subspace Network Telemetry

The Subspace Network Telemetry → <https://telemetry.subspace.network> has undergone an upgrade that provides more information to assist with version upgrades. It is important to note that no tracking mechanisms have been added to the codebase, and the team has no plans to include any to respect the privacy of the community members. Understanding Subspace CLI's adoption over time and observing the time the community needs to upgrade to new releases will help us make informed decisions and provide better support to the community.



What's Next for Product

The product design process for the Block Explorer v2 has been initiated, beginning with the account visualization stage. This step is crucial in determining how the Domain UX will be prototyped, built, and tested. The Product Team is taking the necessary steps to ensure that the Domain UX is developed with the end-user in mind.

Additionally, the team will continue to work closely with the Protocol Engineering Team to ensure fast iteration and adaptability throughout the various iterations of Gemini III.

Subspace Propulsion

Over the last month, our Ecosystem Team has been dedicated to supporting the launch of Gemini III to ensure our community members are well-guided.



Ambassador Program

After several weeks of accepting applications, we are preparing to onboard a new cohort of [Subspace Network Ambassadors → https://subspace-network-ambassadors.notion.site/](https://subspace-network-ambassadors.notion.site/)! Our ambassadors are the backbone of our community, driving impact around the world.

Community Project Registry

Our Ambassadors successfully launched the [Subspace Network Community Project Registry](https://github.com/subspace-ambassadors/project-registry) → <https://github.com/subspace-ambassadors/project-registry>. The Registry serves as the central hub for all Subspace-related community projects. This registry will enable us to create a thriving environment where community members can come together, share ideas, and collaborate on projects.

Ambassador OS Beta

AmbassadorOS, the autonomous operating system for our ambassadors, is set to revolutionize the way we manage and empower our growing community.

Our team has been working on developing a scalable and semi-autonomous system that will serve as the foundation for the future when we will have hundreds and potentially thousands of ambassadors distributed across the world. We're excited to share that we're currently testing a beta version, and the feedback so far has been fantastic. We are looking forward to launching the fully autonomous version and continue to empower our ambassadors in new and innovative ways.

SupportGPT

In an effort to improve our technical support processes for our community, we are leveraging the power of AI to create SupportGPT. It is an innovative tool designed to provide fast and accurate technical support to our community members 24/7. Thanks to AI, we've created a tool that can provide instant, context-aware support. We are in the early stages and hope to launch SupportGPT in the coming weeks.

AI Initiative

In our pursuit to remain at the forefront of the tech industry, it is essential to explore and adopt advanced technologies like AI that can redefine the way we work. Each team member has incorporated AI into their day-to-day responsibilities. We will continue to identify areas where AI can make a significant impact, allowing us to optimize processes and foster innovation across the board. Our goal is to create a smarter, more efficient workplace that leverages the full potential of technology to drive success.

AI Community Hackathon

At Subspace, we believe that AI is a critical component in shaping the future, and we want to continue fostering innovation by tapping into the collective intelligence of our community. To do so, we have launched an AI Hackathon! We are looking for the best use of AI to advance the Subspace Network ecosystem, whether it is through improving our existing products or creating entirely new ones.



For more details about the AI Hackathon, please view the [full announcement in the Subspace Network Forum → https://forum.subspace.network/t/subspace-network-community-hackathon-innovate-with-ai/1483](https://forum.subspace.network/t/subspace-network-community-hackathon-innovate-with-ai/1483).

Subspace in the Wild

It has been an exciting and productive few months for Subspace. We recently attended two conferences, and as we prepare for the highly anticipated release of our new vision, we are more energized than ever. The insights gained from these events have validated the need for the innovative solutions we are building at Subspace. We can't wait to share our vision and demonstrate how our technology will transform the industry.



GDC 2022

Jeremiah at GDC

Jeremiah attended the Game Developers Conference (GDC), and it was an eye-opening experience for them. They noticed the significant growth of Web3's presence in gaming and were amazed by the high level of interest in virtual worlds and persistent games among developers. These conversations validated our vision for the Subspace Network and our new vision, reinforcing the belief that what we're building is much needed. It's exciting to see the industry heading towards a future where our vision can become a reality.



Jeremiah at GDC

Jeremiah and Jeremy at ETHDenver

Jeremiah and Jeremy finally got to meet Santiago Balaguer from Parity in person. He has been our main point of contact for the Substrate Builders Program from the start. Santiago invited Jeremiah and Jeremy to join the photo that captures the key teams in the Polkadot Ecosystem. Shoutout to Nazar for all the amazing work he has contributed to Substrate!!!



Jeremiah and Jeremy at ETHDenver

Join our Engineering Team in Slack!

If you want to stay up-to-date on the engineering team's ground-breaking work, join our Slack channel! Last year, our engineers moved their discussions to Slack, which is open to the public. Do note, however, that **the channel is primarily for transparency and is read-only for now**.

Join the Subspace Labs Engineering Slack channel by filling out the form below and wait for an email invitation:

<https://forms.gle/Yo8onAJj1TwyoMcg7>

Thank you for your continued support, and we look forward to seeing you in our community!

Let's connect!

Website — <https://www.subspace.network> → <https://www.subspace.net/work/>

Discord — <https://discord.gg/subspace-network>

GitHub — <https://www.github.com/subspace>

Twitter — <https://www.twitter.com/NetworkSubspace>

