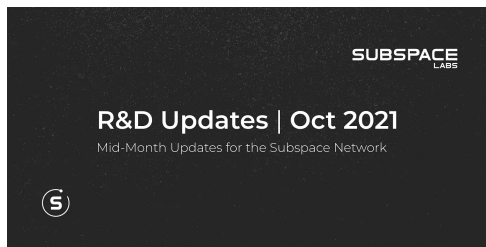# R&D Updates | Oct 2021 - Subspace Network

By Subspace Network

Welcome to the second edition of our monthly R&D updates for the Subspace Network! Our engineering team is working non-stop to deliver several key milestones by the end of this month.

🔗 Subspace Blockchain Client → https://github.com/subspace/subspace

A highly-customized substrate node using our novel Proof-of-Archival-Storage (PoAS) consensus algorithm

Merged 24 PRs → https://github.com/subspace/subspace/pulls?q=is%3Apr+is%3Aclosed

- Implemented the final six steps of the upgrade to PoAS, allowing for consensus based on a useful proof-of-storage of the blockchain itself, rather than a useless proof-of-space.

- Extended pallet-feeds to support put() calls, allowing for developer-friendly permanent storage of arbitrary data on the Subspace Blockchain within ordinary transactions.

Next Steps — Deploy our new consensus algorithm to the Aries Testnet!

🔗 Subspace Relayer → https://github.com/subspace/sloth256-189 + 📖 Relayer Front-End

A standalone Node.js app that archives every block of the Kusama relay chain and all parachains on the Subspace Network.

Merged 14 PRs → https://github.com/subspace/subspace/pulls?q=is%3Apr+is%3Aclosed *(backend)* + *4 PRs* → https://github.com/subspace/subspace-relayer-front-end *(front-end)*

- Added support for real-time back-ups of the Kusama relay chain and all live parachains. Each full block is wrapped in a Subspace transaction and retained forever by the farmer storage network.
- Extended for multiple feeds under different accounts, with each having unique metadata and aggregate storage statistics.
- Built a simple dApp dashboard that connects to the Subspace blockchain and displays the live progress of each feed (chain), including the latest block uploaded and the total blocks and space utilized by each feed.

Next Steps — Seed the Subspace blockchain with the entire history of the Kusama network and add support for restarts and resyncs before deploying onto the Aries Testnet.

👩‍🌾 Subspace Farmer Protocol → https://github.com/subspace/sloth256-189

A heavily optimized disk-based plotter and distributed storage node.

> *Merged 4 PRs* → https://github.com/subspace/sloth256-189/pulls?q=is%3Apr+is%3Aclosed

- Updated SLOTH 256–189 codec usage to Subspace consensus, now supporting full end-to-end plotting on all CPU platforms.
- Updated and refactored the farmer protocol to support the upgrade from Spartan to Subspace PoAS consensus, so that the proofs it generates are also recognized by the substrate client.
- Added object mappings to support retrievability for decentralized storage, allowing data stored on the network to be served by farmers directly from their consensus plots.

Next Steps — Expose get methods over a network RPC to support retrievability of pieces directly from farmers, while slowly upgrading from full replica to partial replica farming.

🖥️ Subspace Desktop → https://github.com/subspace/subspace-desktop (formerly Subspace Desktop Farmer)

An easy-to-use cross-platform app that makes farming accessible to anyone with a hard drive. Will be available on macOS, Windows, & Linux.

> *Merged 12 PRs* → https://github.com/subspace/desktop-farmer/pulls?q=is%3Apr+is%3Aclosed

- Auto-launch on startup for existing installations is now supported on all major platforms (Mac, Windows, and Linux) meaning that farming will automatically resume after system reboot.
- Completed Polkadot-js integration to read the accurate chain state and number of blocks farmers from the paired substrate client and display in the user interface.
- Added tray icon support, allowing the farmer to continue to run in the background without interfering with the normal operation of the host machine and user workflow.

Next Steps — Complete the integration with the backend farmer protocol, allowing us to reach an initial alpha release and allow for user testing of the desktop app.

🏹 **Polkadot JS Apps** → **https://github.com/subspace/apps**

Our version of the standard dashboard for all Polkadot, Kusama, and substrate-based networks, providing a simple block explorer and web-based wallet.

    Merged 2 PRs → https://github.com/subspace/apps/pulls?q=is%3Apr+is%3Aclosed

- Updated and refactored to support the transition from Spartan to Subspace consensus.
- Improved logo, theme, and branding to better reflect our style guide.
- Fixed issues with custom types.

Next Steps — Submit to Parity for review and deploy the explorer to support the Aries testnet!

🖖 Thanks for reading and don't hesitate to reach out if you have any questions or ideas!