Community-build dMail & dChat Supper App perfectly aligned with decentralized fundamentals

Gnosis Grant Proposal Document

In the ever-evolving landscape of communication, pivotal technologies have shaped how humans connect. Brought by the invention of electricity the Telegraph once symbolized the reach of reliable global correspondence, while the invention of the microprocessors and the internet transformed the way we interact and communicate at scale. Today, blockchain technology propels us into a new era of secure, non-custodial, permissionless, and decentralized digital communication. Furthermore, it offers unparalleled data ownership, safeguarded by the distributed nature of blockchain, ensuring uninterrupted access and preserving the integrity of your conversations. Following the invention of electricity, microprocessors and the internet, blockchain technology can also be referred to as the fourth pillar of technology innovation, hence The 4thPillar project or short 4P. 4P's mission is the creation of robust blockchain communication in the form of decentralized email and messaging powered by community collaboration.[1]

Keywords *— Web3 communication, on-chain communication, non-custodial, communication, blockchain, decentralization, decentralized storage, immutability, permissionless, peer-to-peer, decentralized email, decentralized messaging*

[1] https://bit.ly/4p-whitepaper

1. PROJECT OVERVIEW

Community-build dMail & dChat Application perfectly aligned with decentralized fundamentals;

👉Decentralized, self-custodial & modular communication application
👉Immutable & on-chain; 1 email/message = 1 Gnosis transaction
👉Self-custodial AES-256 E2E encryption via Encryptor Extension
👉Self-custodial decentralized storage via PollinationX storage NFTs[2]
👉Robust & Resistant to Web2 data mining, data ownership loss, censorship & phishing
👉Next-gen Web3 UI/UX with click connect and network switching
👉Permissionless & open-source

Goals & WinWins;
👉Introducing a non-financial blockchain utility in the form of on-chain email & messaging communication on Gnosis.
👉Introducing PollinationX decentralized storage NFTs on Gnosis.
👉Empowering users with email & messaging alternatives that are decentralized, modular, self-custodial and not based on the existing predatory model.
👉4P on-chain model (1 email/message = 1 Gnosis transaction) empowers unparallel Gnosis transaction volume opportunity.

Maturity;
4P runs on battle-tested OCC infrastructure[3] that has been in development since 2018. Already in TestNet 4P application is already in production and available for testing. Currently tested by various L1/L2 ecosystems, the application already produces thousands of communication transactions. Check the Multi-chain Deployment table[4] for more information.

Revenue Model;
Parallel to the underlying Gnosis communication transaction Gas cost, the Protocol Fee is also settled on the smart contract level and is applicable for every email or message transaction. We are estimating ~0.005$ xDAI ≡ per executed email and ~0.0025$ xDAI ≡ per executed message. Total user cost equals the sum of the Gnosis transaction cost and the Protocol Fee. Both the Gas and Protocol Fees converge and manifest as one end-user communication transaction fee. Check the 4P Fee Model[5] for more information.

2. CORE PRIMITIVES

The dChat W2W message exchange happens on-chain as one short message represents one Gnosis blockchain transaction. As dMail is data heavier, lite encrypted JSON objects are created to hold dMail metadata. The link to this metadata and checksum is recorded on the chain as a blockchain transaction. So again, the core primitive described by the formula below applies.

💡1 email/message = 1 Gnosis-TX

Every wallet becomes an on-chain identity, and the message or data vault can be accessible (i.e. decrypted) only with users' private keys! AES secret key produced by ECDH (i.e. Elliptic-Curve Diffie-Hellman) is used to enable E2E email or message encryption between wallets.

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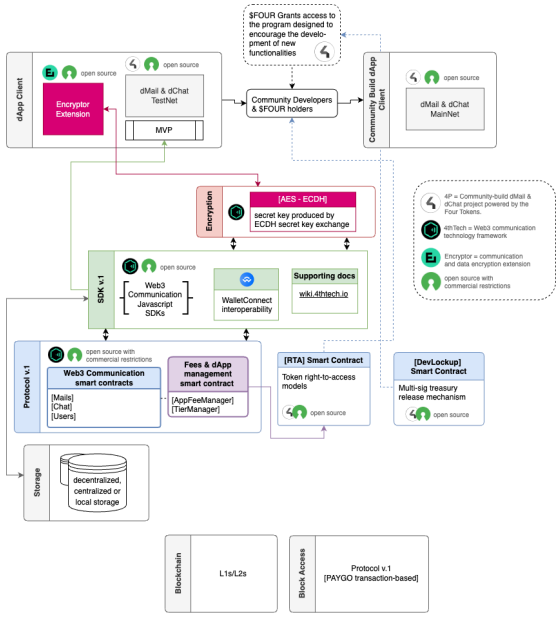
[2] https://wiki.pollinationx.io/overview/px-storage-nft
[3] https://github.com/4thtech
[4] https://docs.the4thpillar.io/dapps-and-clients/multi-chain-deployment
[5] https://docs.the4thpillar.io/dapps-and-clients/fee-model

💡not your keys = not your email/message/data

3. ARCHITECTURE BY LAYERS

Zooming out, the architecture is quite straightforward. The 4P dMail & dChat app is on the top, powered by the OCC SDK[6], OCC Protocol v.1[7], encryption framework, decentralized storage, and blockchain network. 4P smart contracts enable Four Token RTA (i.e. right-to-access) models within the system, enabling users to access the 4P Pro features.



Architecture by layers[8]

4. SMART CONTRACTS

Various smart contracts are forming within the ecosystem. Legacy smart contracts that are a part of the OCC Infrastructure and PollinationX and utilised on the back end[9];

(1) [Mail] on Gnosis - used for encrypted data exchange over the blockchain[10]
(2) [Chat] on Gnosis - used for encrypted short message exchange over the blockchain: TBA
(2) [PX] on Gnosis - used to enable decentralized storage NFTs on Gnosis[11]

Smart contracts that are a part of the 4P Project R&D;

(1) [FOUR] - ERC-20 token framework smart contract[12];
(2) [RTA] on Gnosis - Four Token right-to-access model smart contract: TBA

5. DMAIL

dMail refers to decentralized email. Composed of; (1) subject; (2) content, and; (3) attachment, the dMail can be from a few kilobytes to 20 megabytes in size. Based on the [Mail] smart contract and OCC SDK, 4P aims to be one of the first community-based integrators of this new on-chain communication technology.

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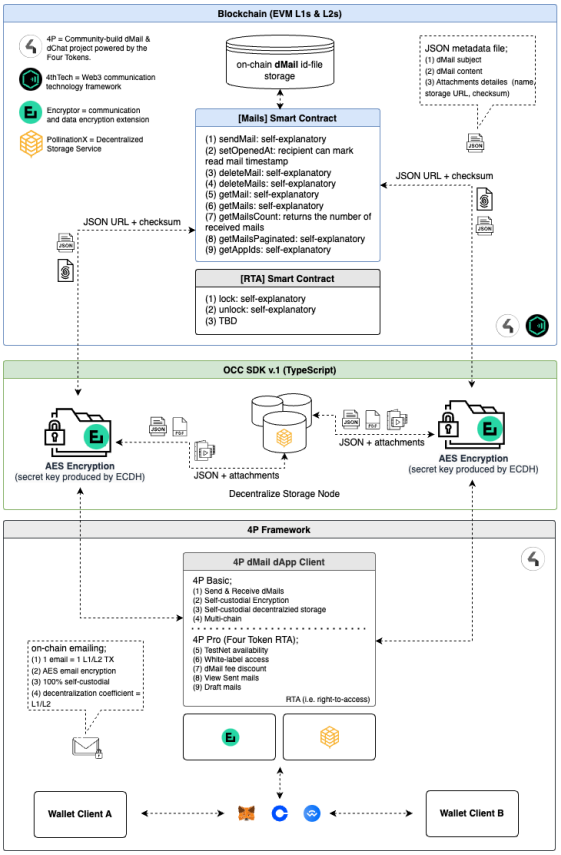
[6] https://github.com/4thtech/sdk-js
[7] https://github.com/4thtech/smart-contracts
[8] https://github.com/4P-project/static-assets/blob/3cc2f8d48eab1cb5435137d0fb0a3ef43a6ff6eb/pdf/4P-infrastructural-layer-schematic.pdf
[9] https://github.com/4thtech/smart-contracts
[10] https://gnosis-chiado.blockscout.com/address/0xa6199D54df4c904976DC1741eE75A9570c7A3308
[11] https://gnosis-chiado.blockscout.com/address/0xd0466eB975dE9CDfd790Db14f143f4aAAFd67cF2
[12] https://github.com/4P-project/smart-contracts



dMail technical diagram[13]

Phases within dMail; (1) to enable end-to-end encryption, both sender and receiver need to install and run “Encryptor Extension[14]”;

⚡***Note:*** *“Encryptor Extension” generates EC (i.e. Elliptic Curve) keypairs and stores the public key for its ETH address on a smart contract. It enables self-custodial W2W encryption and decryption of the on-chain communication or shared data files that are created within the dMail & dChat communication.*

(2) dMail's are encrypted with AES while ECDH key agreement protocol is used for generating the secret key (i.e. used in AES encryption);
(3) all encrypted attachments are stored on decentralized storage via PX NFTs;
(4) JSON metadata file is created that includes sender and recipient details, dMail subject, content, and attachment details (i.e. name, stored location, and checksum);
(5) JSON metadata file is encrypted with AES encryption and stored on decentralized storage;
(6) JSON metadata file URL and checksum are sent to Gnosis [Mail] smart contract;
(7) after transaction finality, the receiver loads and decrypts a JSON metadata file and loads and decrypts all the attachments.

⚡***Note****: dMail is data heavier so lite encrypted JSON objects are created to hold dMail metadata. The link to this metadata and checksum is recorded on the chain as a blockchain transaction; 1 email = 1 Gnosis TX.*

6. DCHAT

dChat refers to decentralized messaging. Composed from; (1) content, and; (2) possible data files (i.e. media files, photos…), the individual message can be from a few kilobytes to a couple of megabytes in size.

Based on the [Chat] smart contract and OCC SDK, 4P aims to be one of the first community-based integrators of this new on-chain communication technology.

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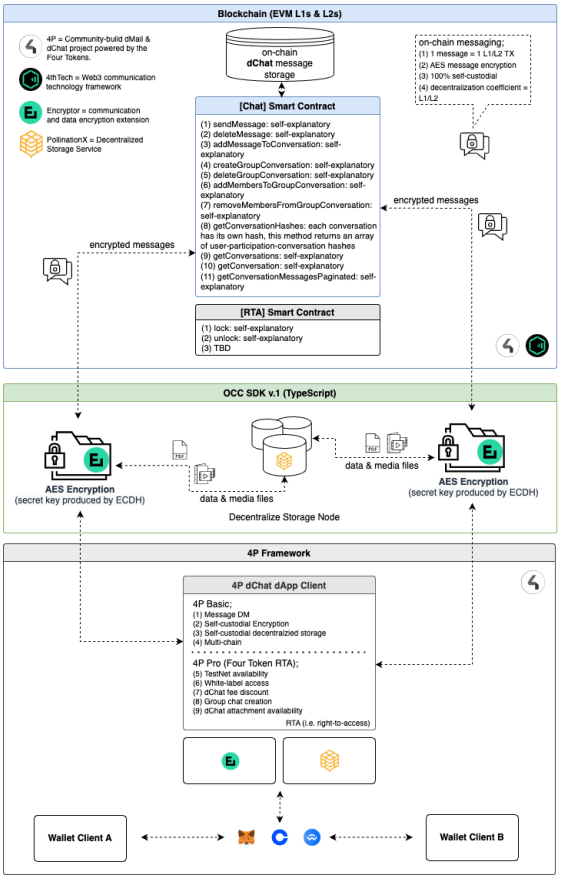
13 https://github.com/4P-project/static-assets/blob/c01dfc8d7bb84a30d46802a3ca25ac54f446f514/pdf/dMail-4P.pdf

14 https://chrome.google.com/webstore/detail/encryptor/feolajpinjjfikmmeknkdjbllbppojij?hl=en-GB&authuser=3



dChat technical diagram[15]

Phases within dChat;

(1) to enable end-to-end encryption, both sender and receiver need to install and run Encryptor Extension[16];

(2) dChat messages are encrypted with AES (i.e. Advanced Encryption Standard) while ECDH (i.e. Elliptic-Curve Diffie-Hellman) key agreement protocol is used for generating the secret key (i.e. used in AES encryption);

(3) all encrypted attachments are stored on decentralized storage via PX NFTs;

(4) message data is sent to Gnosis [Chat] smart contract, and;

(5) after transaction finality, the receiver decrypts message content.

⚡***Note:*** *At the final stage, the message hash is written on the blockchain. While the message is temporarily stored on-chain, attachments are stored on decentralized storage.*

⚡***Note:*** *The average dChat message transaction confirmation depends on the transaction finality of the chosen L1/L2, the same goes for message transaction cost.*

dMail & dChat Details;

(1) 4P dApp[17]

(2) Stack: MVP UI framework, encryption, OCC SDK, OCC Protocol v1 & Blockchain network;

(3) Architecture: Nuxt 3, TypeScript, Wagmi;

(4) Self-custodial E2E Encryption: Encryptor Extension[18];

(5) Self-custodial Storage: PollinationX Decentralized Storage NFTs[19];

(6) Monetization: PAYGO transaction-based (i.e. pay-as-you-go);

(7) 4P Docs & Manuals[20]

(8) 4P dApp GitHub repo[21]

(9) TestNet: Gnosis Chiado

(10): MainNet: TBA

Web3 specific features;

(1) Permissionless access: Wallet login, no phone number or email required Multi-chain wallet interoperability via MetaMask, Coinbase and Wallet Connect frameworks;

(2) 100% non-custodial (i.e. the user controls his or her full communication and data state);

(3) No centralized point of failure, and;

(4) De-platforming and rug pull-resistant.

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15 https://github.com/4P-project/static-assets/blob/c01dfc8d7bb84a30d46802a3ca25ac54f446f514/pdf/dChat-4P.pdf

16 https://chrome.google.com/webstore/detail/encryptor/feolajpinjjfikmmeknkdjbllbppojij?hl=en-GB&authuser=3

17 https://app.the4thpillar.io/

18 https://chrome.google.com/webstore/detail/encryptor/feolajpinjjfikmmeknkdjbllbppojij?hl=en-GB&authuser=3

19 https://wiki.pollinationx.io/overview/px-storage-nft

20 https://docs.the4thpillar.io/

21 https://github.com/4P-project/app.the4thpillar.io

7. TEAM & CONTACTS

Our Web3 story began in 2017 when the 4thPillar (4P) genesis team formed to innovate Ethereum's first on-chain communication and data file transfer application. The first 4thPillar dMail iteration was deployed on Ethereum MainNet in April 2018. The project was later divided into two teams. Block Labs Luxembourg focuses on back-end on-chain communication (OCC) infrastructure (i.e. OCC Protocol, OCC SDK, white label client stack), while the 4thPillar (4P) team focuses on dMail & dChat application development.

4P dApp Team;
👉Ian Božič, GTM, PR, Marketing: Twitter (@IanBozi), **Telegram (@Ian4th)**
👉4punk, full-stack dev contributor: GitHub (@4punk-web3)
👉Firstjetli, Web3 full-stack dev contributor: GitHub (@firstjetli)
👉Silvo Fortuna, GTM, PR, Marketing: Twitter (@dj_sylvain)
👉Zil (Design)

OCC Infrastructure Block Labs/4thTech Team;
👉Dr. Tali Režun, Web3 researcher & academic: Twitter (@talirezun), **Telegram (@talirezun)**
👉Denis Jazbec, Full-stack: GitHub (@denisjazbec)
👉David Tacer, Full-stack: GitHub/HitLab (@davidtacer)

The tech stack has been rewarded several times and is being tested by prominent European institutions;

👉Tron Hackathon Winner (2022)[22]
👉Solana Recognition (2021)[23]
👉EU Chain (2021)[24]
👉SI-Chain, first national blockchain infrastructure (2021)[25]
👉UNCEFACT (2020)[26]
👉Adriatic Council (2018)[27]

8. KNOWLEDGE LIBRARY

👉4P Whitepaper[28]
👉4thTech Whitepaper (OCC Infrastructure)[29]
👉A Comprehensive Analysis of 4P dMail & dChat in Contrast to Existing Web2 & Web3 Communication Platforms[30]
👉4P Q&A[31]
👉From online to on-chain, the evolution of digital communication[32]
👉Block Labs' OCC Tech Pioneers Next-Level Email, Messaging & Data File Transfer Communication Security[33]

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22 https://devpost.com/software/4thtech-privacy-enabled-w2w-communication-infrastructure

23 https://x.com/solana/status/1482045683364511759?s=20

24 https://euchain.org/

25 https://youtu.be/rjzO5kVRpbk?si=ptCkxTy7powP8HZo

26 https://youtu.be/0Lzb-D-IQ9Y?si=d5uK46U3kji2Mj50

27 https://medium.com/4thtech/dr-tali-rezun-beyond-4-0-award-by-adriatic-council-af48985d8cb8

28 https://bit.ly/4p-whitepaper

29 https://github.com/4thtech/static-assets/raw/main/pdf/whitepaper.pdf

30 https://medium.com/4p-project/comprehensive-analysis-of-4p-dmail-dchat-in-contrast-to-existing-web2-web3-platforms-ef2feff72e0c

31 https://medium.com/4p-project/4thpillar-4p-q-a-6d3debc5048d

32 https://medium.com/4thtech/from-online-to-on-chain-the-evolution-of-digital-communication-0fb201f98df1

33 https://medium.com/4thtech/beyond-encryption-next-level-email-messaging-data-file-transfer-communication-security-3194fdffce5f

👉Human “on-chain” Communication Dedicated Protocol & SDK[34]

9. GNOSIS GRANT

While there are many L1/L2 EVMs available, our focus is to find the perfect match. Due to the project's on-chain model, we are mostly reaching out to L2 networks that have inherent security from Ethereum L1 and offer low transaction costs and fast transaction finality, all extremely relevant for our on-chain email & messaging communication use case. While technical interoperability is required, we are also looking for L1/L2 partnerships that ideologically match with us, focusing on decentralization alignments and fundamentals. This is where we see a match with Gnosis.

While dMail smart contracts are already deployed on Gnosis, we are deploying the dChat smart contracts on Gnosis later in February, starting the Gnosis Early tester program in March. We are planning the 4P dApp MainNet launch on Gnosis by the end of Q2 2024. In parallel with the MainNet launch, we are deploying the 4P Pro.

⚡ ***Explainer:*** *4P Pro is a full-featured professional browser-based dMail & dChat application from 4thPillar. By holding the predefined amount of Four Tokens in a wallet and later in a dedicated RTA (i.e. right-to-access) smart contract, users will be able to unlock Pro features; (1) TestNet availability; (2) White-label access; (3) dMail & dChat fee discount (RTA smart contract feature available in phase 2); (4) View Sent mails; (5) Draft mails; (6) on-chain group chat creation; (7) dChat attachment availability…*

We request a grant in size of 15.000 USDT.

Milestones	Measured by Deliverables	Dev Hours	Total Cost	Deadline
Integrating Gnosis blockchain into the 4P back-end framework	Successful deployment https://app.the4thpillar.io/	18 (220$/h)	3,960 USDC	TO + 8 weeks
Integrating Gnosis blockchain into the 4P front-end framework	Successful deployment https://app.the4thpillar.io/	22 (220$/h)	4,840 USDC	TO + 8 weeks
[Mail] smart contract Deployment on Gnosis TestNet + Testing	Smart Contract Deployment (explorer URL)	2 (250$/h)	500 USDC	✅
[Mail] Smart contract Deployment on Gnosis MainNet + Testing	Smart Contract Deployment (explorer URL)	2 (250$/h)	500 USDC	TO + 8 weeks
[Chat] Smart contract Deployment on Gnosis TestNet + Testing	Smart Contract Deployment (explorer URL)	2 (250$/h)	500 USDC	TO + 8 weeks
[Chat] Smart contract Deployment on Gnosis MainNet+ Testing	Smart Contract Deployment (explorer URL)	2 (250$/h)	500 USDC	TO + 8 weeks
[PX] Smart contract Deployment on Gnosis TestNet+ Testing	Smart Contract Deployment (explorer URL)	2 (250$/h)	500 USDC	✅
[PX] Smart contract Deployment on Gnosis MainNet+ Testing	Smart Contract Deployment (explorer URL)	2 (250$/h)	500 USDC	TO + 8 weeks
Gnosis GMT (go-to-market) strategy	Media Plan & Creatives (document URL)	70 (45$/h)	3,150 USDC	TO + 8 weeks

34 https://medium.com/4thtech/human-on-chain-communication-dedicated-protocol-sdk-a3f35d68eedf