

ETHGlobal SuperHack 2023

Ghost NFTs

GhostNFTs enables NFT registering on another chain, enabling multiple use cases: MultiChain NFTs, TokenGating, ENS availability...

Summary

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Solo / Team

- Zapaz :
 - co-founder and lead dev @Kredeum
 - ETHGlobal finalist early 2021 with Best AAVE FlashLoan Project
 - currently Formal Verification Audits contests with Certora for AAVE, GMX
- Kredeum :
 - team of 5 Web2 entrepreneurs passionate about Web3
 - Kredeum NFT Factory : existing Open Source platform with multichain NFTs (BUT only for Soulbound NFT)
 - Grants via GitCoin, Polygon, Swarm and The Graph

Use Cases

Vision : same NFT can be own in multiple chain (contrary to fungible token)

- Solve the multichain NFT transfer problem
- Enabling it's own NFT Avatar on a metaverse implemented on other chain
- MultiChain TokenGating
- ENS availability on any EVM
- ...

Ghost NFTs (1/3)

GhostNFTs is a registry of NFTs with these properties :

- GhostNFTs is an ERC721 Metadata NFT collection
- one GhostNFTs singleton may exists on each evm chain with same deterministic address
- ghost NFT can be registered on same or another evm chain than original NFT
- ghost NFT owner is synced to NFT owner AT a specific timestamp of original chain
- ghost NFT tokenId (also named ghostId) is a hash of chainId, collection address and tokenId of original NFT

Ghost NFTs (2/3)

- when original NFT collection is ERC721Metadata : ghost NFT tokenURI is original NFT tokenURI
- GhostNFTs communicates from any chain to the chain of the original NFT with the help of inter-blockchain communication service like: LayerZero, Hyperlane or Chainlink CCIP
- GhostNFTs only communication function is `ghostSync` , that enable to propagate NFT metadata (or ghostData) threw chains
- ghostData is only synced / updated when timespamp is bigger thant last one
- Only orginal NFT chain can update ghostData timestamp, with online NFT data and snapshot timestamp

Ghost NFTs (3/3)

- GhostData have fixed fields : chainId, collection address, tokenId and ghostId (a combination of 3 previous ones)
- GhostData, for this first version, has 3 snapshots data fields : owner, uri and timestamp (i.e. last timestamp of the snapshot data on the original chain)

Demo

- Demo via scripts can be run on this repo.
- Scripts can be run locally or on Optimism, Base and Zora mainnets or testnets.
- Reference code available here : [GhostNFTs.sol](#)

Currently multi-chain communication is only simulated, tests with LayerZero are coming

Future 1/2

- Continue testing and development multichain
- Implement ENS specific feature
(as ENS is not an ERC721 metadata collection)
- Full implementation with at least one communication layer
- Propose Ghost NFTs as an EIP
- GhostNFTs could be combined with ERC6551 registry...
- enhance multichain transfer

Future 2/2

- propose UI requirement : Ghost NFT could be forced to be « grey », with no color
- Implement in Kredium Factory
- develop transferEverywere function inside ERC6551 Bound Accounts
- Implement specific feature to any specific NFT collection

Contact

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