Litepaper

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Web3 fiat on/off ramp infrastructure VM agnostic
Integrating banking rails to smart contracts

Written by: Anna Vladi | technology@metl.co

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Summary

Overview

Just like TCP/IP transformed the web into a global, accessible network capable of information transfer, Web3 will do the same for the internet of value. Our mission is to become the intermediary between legacy financial systems and cryptosassets, and onboard the next billion users to Web3.

METL consists of price-stable ERC20s, banking APIs and secure multi-party computation (MPC) to provide non-custodial, autonomous fiat gateways to any EVM.

- **USDr** tokens are multichain USD-backed receipts.
- **USDr** tokens are exchanged for any ERC20 offered on **AMMs**.
- **Banking APIs** are used to produce zero knowledge (zk) proofs to verify transaction settlements on-chain and off-chain.
- **MPC** node operators use on-chain and off-chain proofs to mint and burn USDr tokens.

In summary - METL offers an autonomous, independently operated tech stack that seamlessly integrates banking rails to smart contracts.

Current fiat gateway problems

- User's purchase crypto via centralized exchanges (CEX) and cryptoassets are held in central custody. Hosted wallets are prone to security risks. The digital assets of the user are held in FOB (for benefit of) accounts that are subject to centralized control, censorship & seizure. Assets held in custody of CEX can be subject to investment and earning interest for the CEX without sharing the interest with the user.
- ERC20 withdrawals on most major CEXs and fiat-crypto gateways are limited to Ethereum L1. As an example, purchasing OP token on Coinbase does not mean that a user is able to withdraw those funds to a wallet on the https://www.optimism.io
- Large exchanges such as Coinbase and Binance encourage fiat entry/exit via USDC and BUSD (respectively), exposing customers to reserve risk.[3]

Use Cases

- Non-intermediated access to crypto for individuals and businesses
- Non-custodial exchange of fiat/crypto for MSBs, broker dealers
- Non-custodial exchange of fiat/crypto for existing cryptocurrency exchanges.

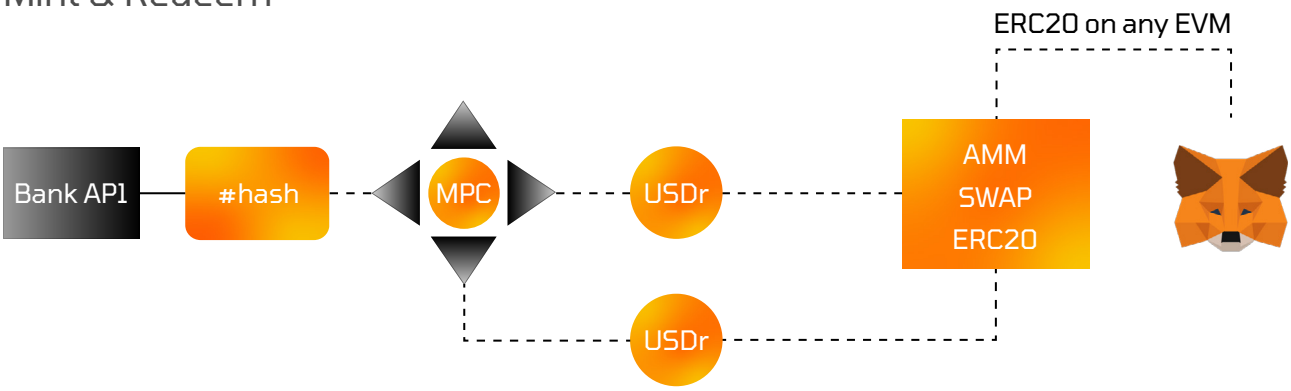
[1] https://www.cnbc.com/2019/05/08/binance-bitcoin-hack-over-40-million-of-cryptocurrency-stolen.html
[2] https://www.coinbase.com/legal/user_agreement/united_states
[3] https://nytimes.com/2022/06/17/technology/tether-stablecoin-cryptocurrency.html

Technology

METL network consists of banking API, zkp, AMM, MPC with nodes operators and USD receipt token.

Architecture

Mint & Redeem



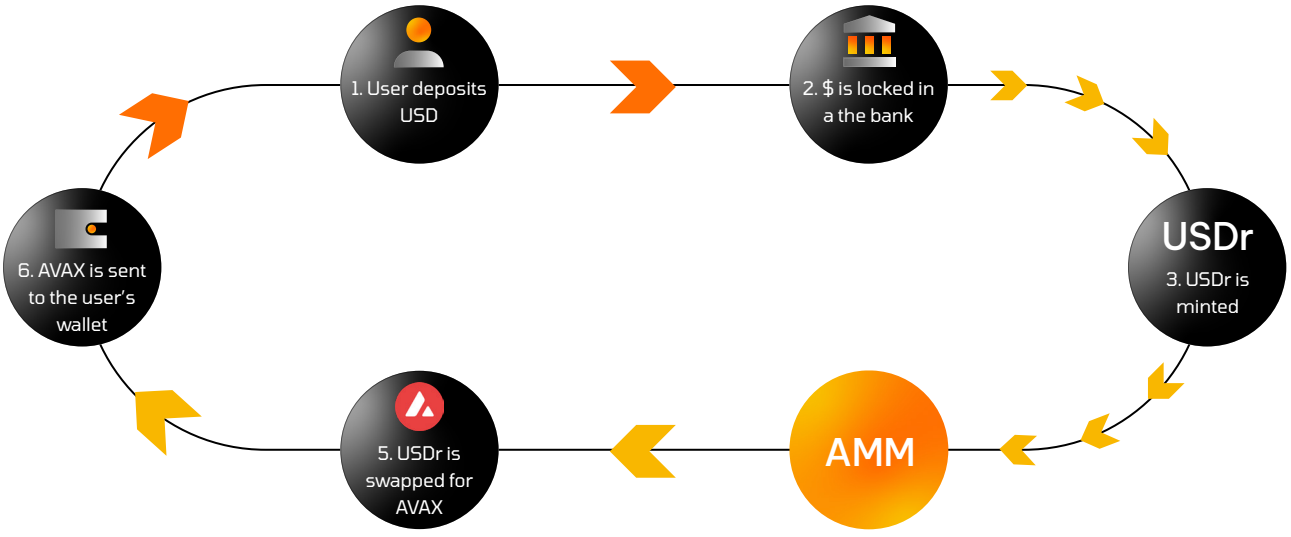
USDr

USDr is a smart contract that implements the ERC20 standard. It extends additional functionalities such as Access Control and zK proof verification - to allow authorized MPC node operators to mint and burn USDr tokens on behalf of users.

Mint

1. Users transfer funds to Metl using any supported banking network (eg. RTP, ACH).
2. Upon settlement, Metl's MPC system mints and swaps USDr tokens in exchange for an ERC20 of choice.
3. The exchanged tokens are then transferred to an EOA[4] and EVM, provided by the user.

Lock & Mint

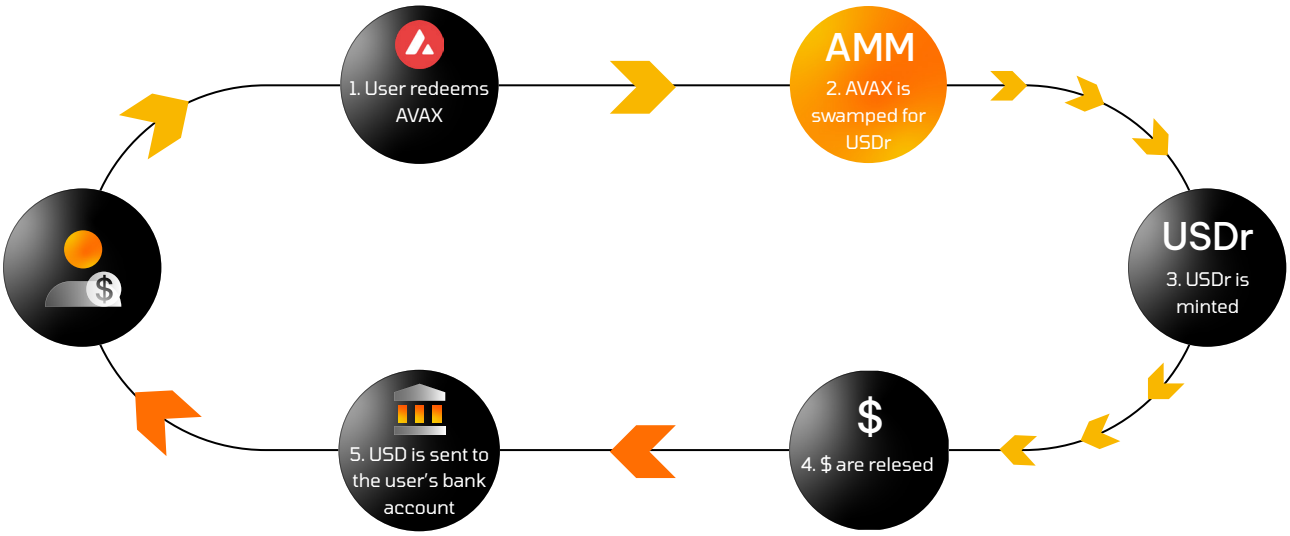


[4] https://ethereum.org/en/developers/docs/accounts/

Burn

1. Users convert their ERC20 tokens to fiat by notifying the MPC system, providing a wallet, chainId and amount of the tokens to be redeemed.
2. MPC node operators freeze and independently verify the request.
3. If authorized, a given node operator will initiate a request to the banking API to transfer USD to the user's bank account.
4. USDr token is burned once ACH settles into user's originating bank account

Release & Burn



Access Control

The USDr token contract implements a variation of Open Zeppelin's 'Access Control' - providing roles and rules to access permissioned functions in the USDr contract.[5]

AMM

Automated market makers (AMMs) allow ERC20 tokens to be traded in an autonomous and permissionless manner.[6] AMMs use pre-programmed mathematical equations to adjust prices based on supply in order to make sure the ratio of assets in any liquidity pool remains balanced.

METL may leverage externally operated AMMs such as Trader Joe in the case of Avalanche, and Aave in the case of ZKSync to swap USDr tokens in exchange for the ERC20 asset requested by the user (onramp) and vice versa, to swap a given ERC20 for USDr tokens (offramp).

[5] https://github.com/OpenZeppelin/openzeppelin-contracts-upgradeable/blob/master/contracts/access/AccessControlEnumerableUpgradeable.sol
[6] https://uniswap.org/whitepaper-v3.pdf

Banking APIs

Banking APIs provide status of the banking transactions on the banking ledger. Settled banking transactions provide inputs into zk proof:

RequestDate | MintRequest | Bank_id | User_name | Account_id | Routing_id | Amount | Currency

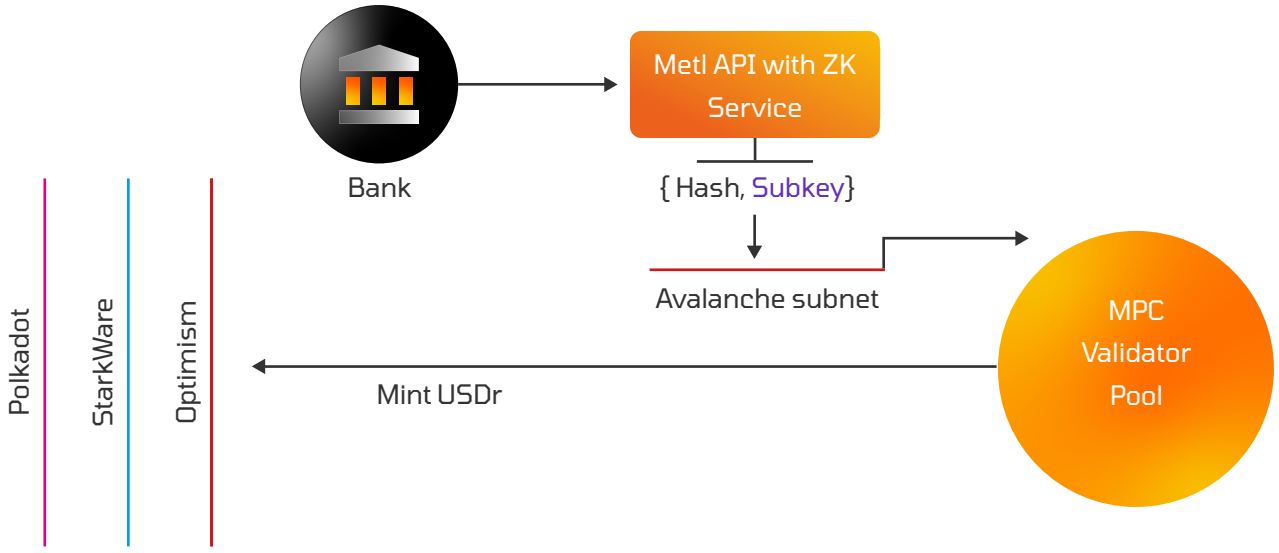
zK Proofs

zkSNARK with Poseidon[7] hash function is planned to be used for encrypting banking data on chain. It is designed to minimize prover and verifier time on proof generation and size of the proof when zero-knowledge proofs are generated and validated. For privacy and security reasons as well as computational intensity, this data maybe be stored using outsourced verifiable computation such as oracles or on a private side chain such as Avalanche's subnet[8].

MPC

The tokenized representation model[9] is used by METL to provide universal interoperability. An all-encompassing level of interoperability between banking systems and EVMs is made possible by METL's MPC network. METL is able to instantiate a decentralized, permission-less, and trust-less custodian capable of locking assets on banking networks and processing one-to-one pegged representations of them on other EVMs by combining consensus with secure multi-party computation (MPC) methods. Users can interact with numerous programs, assets, and chains in this fashion using just one transaction.

zkMPC Construct



[7] https://eprint.iacr.org/2019/458.pdf
[8] https://docs.avax.network/subnets
[9] https://cointelegraph.com/nonfungible-tokens-for-beginners/asset-tokenization-a-beginners-guide-to-converting-real-assets-into-digital-assets

Economics

Metl's MPC network is underpinned by a staking implementation, to incentivize and sustain reliable service provision of the METL network, including the regular distribution of a subsidy to active MPC service-providers.

This subsidy is generated through the scheduled expansion of the native token's circulating supply, following a 'two-phase' model where subsidies are ultimately supported by protocol fees only. The "two-phase" approach has been designed to maximize operational efficiency at the start (cold start problem) and to secure long-term network decentralization.

Details pertaining rules for stake management, including locking, splitting, extending, and withdrawing stakes will be provided in a separate 'Economics Paper', where the impact of individual staking configurations on global supply dynamics is analyzed.

At the time of writing, our team is considering the use of a separate staking model to provide protocol performance exposure to non-node operators. Specifically the use of a voting escrow (ve) contract, where stakes are used to allocate protocol emissions and fees.

Legal & Licenses

Given the state of our regulatory framework, Metl's banking partners have provided approval that we can operate in all US states except NY.

Patent for the tech stack was issued by USPTO in August 2021. We are currently filing a continuation application to allow the pursuit of additional claims.

Glossary

chainID- ID as it relates to each EVM chain where USDr is deployed.

MPC- multi-party computation is a subfield of cryptography with the goal of creating methods for parties to jointly compute a function over their inputs while keeping those inputs private.

Zero-knowledge - is a concept from cryptography, an interactive method for one party to prove to another that a (usually mathematical) statement is true without revealing anything other than the veracity of the statement.

zkSNARK- The acronym zk-SNARK stands for “Zero-Knowledge Succinct Non-Interactive Argument of Knowledge,” and refers to a proof construction where one can prove possession of certain information, e.g. a secret key, without revealing that information, and without any interaction between the prover and verifier.

AMM- Automated Market Maker platform to swap ERC20 tokens.

USDr- USD receipt token that is an ERC20 standard with a short life span that can exist on any EVM, can be swampt for any ERC20 in an AMM and be managed by MPC.


Metl