KIRA NETWORK | Tech Report | 2022

Backend

Blockchain Application aka. **SEKAI** - Github Repository Ref.

FEATURE	DESCRIPTION	STATUS
Governance Module	- Roles-permission model governance - Creating and voting on gov. Proposal & customisable Pools - Managing network properties, such as defining tx fees, voting quorum, and 32+ other parameters. - Managing Data Registrar used for saving file references to IPFS or GitHub (on-chain SLA, trusted code releases, etc.) - Managing Token Aliases registrar for defining which on-chain assets can be trusted - Managing Token Rates Registrar to support multi-asset fee payment and ensure spam protection	**COMPLETED**
Custody Module	- Token transfers protected by recipient verification with a shared secret - Collaborative transfers (2FA & multi-sig style) - Withdrawal addresses whitelist & customisable token transfer limits	**COMPLETED**
Identity Registrar	- Decentralized dID, enables linking of KIRA address with any set of key-value records - Users can attest each other identity records and trusted verifiers (e.g. public persons / entities) can earn attestation rewards / tips from users - Allows to define globally unique records. e.g. username or validator moniker (on-chain enforced atomicity)	**COMPLETED**
Validators & Ranks	- Gov-permissioned joining the network (network can't be exploited by accumulating or stealing tokens) - On-chain performance counters (rank & statuses) - Support for Validator maintenance mode, pausing & jailing	**COMPLETED**
Spending Pools	- Automated token distribution based on gov. roles or list of addresses - Anyone (users/gov. body) can create a pool and define distribution rate - Users can be incentivised for performing tasks and claim tokens on-demand - Allows weighted reward distribution (e.g. reward more those who add more value)	**COMPLETED**

Universal Basic Income	- Governance can periodically issue tokens within inflation limits and distribute them to any configured Spending Pool - Network actors (e.g. validators, fisherman, etc.) can be rewarded for operating hardware at fixed rate to ensure economic sustainability without depending on fees or commissions - Community groups can be incentivised for being active and bringing more users to the project	**COMPLETED**
Multi-stake Module	- Block rewards issuance & distribution from KEX inflation - Fee rewards distribution from tx. fees in multiple fee-currencies - Support for staking multiple tokens - Native staking derivatives	**COMPLETED**
Slashing Module	- Single-validator double-signing slashing prevention (automatic unjail) - Multiple-validator double-signing slashing prevention (gov. unjail) - Governance assisted slashing - assisted judgment to prevent all types of accidental slashes and defining penalty (if one is needed) - Inactivating nodes instead of slashing for going-offline to enable operation in the home environment / outside of large data centers (AWS, Azure, etc.)	**COMPLETED**
Staking Collectives	- Allows distribution of staking rewards (multiple-tokens) from one group of users to another (IVO style) - Can be connected to the Staking Pools with a support for weighted distribution of rewards - Allows rewards compounding	**COMPLETED**
Token Basketing	- Allows combining multiple tokens of the same time into a single asset & redenomination (e.g. collections of NFT's or multiple staking derivatives representing the same asset, e.g. AED, USDT, USDC) - Supports simple token swaps without slippage between assets of the same type - Overexposure protection - Pool deposit & withdraw limits	**COMPLETED**
Layer 2	TBA, internal doc.	**SPEC WIP**
LTS	- <u>Dependent on L2 implementation being finalized</u> - Native Cosmos IBC support - Executing community requests for improvements - Maintaining codebase, applying security patches & audits	**PENDING**

Middleware

Interchain NginX, a decentralized REST-API aka. **INTERX** - [Github Repository Ref.](#)

FEATURE	DESCRIPTION	STATUS
Response Signing	- Signing of responses using asymmetric key that can be announced using Identity Registrar (on-chain) - Users can choose which node operators they trust and verify origin & integrity of data - Multiple nodes can be queried at once to generate proof of malicious intent and increase response confidence	**COMPLETED**
Response Caching	- Offloads Full Nodes from having to respond multiple times to the same request (data does not change within duration of a single block) - Block height tracking is used to determine if cached responses are obsolete - Operator can define maximum storage dedicated to cached data	**COMPLETED**
SEKAI Gateway	- Node operator can configure custom RPC url of his SEKAI full node - All REST-API requests are proxied to a dedicated endpoint - Supports response signing, caching, rate limiting - Supports multi-token faucet with claim spam protection mechanism - Supports up-to date documentation of INTERX & SEKAI via dedicated metadata endpoint	**COMPLETED**
Node Discovery	- Allow for SEKAI RPC & INTERX API priv. & pub. nodes discovery - Allow for network visualization - references connections between nodes in the network - Discover nodes that accept connections during congestion and exhausted connection limits of many nodes (1000+ validators support)	**COMPLETED**
Data Gateway	- Makes files referenced in the on-chain data registrar available to frontend and other types of client applications - Allow node operators to share sekai state backups (faster sync)	**COMPLETED**
Ethereum Gateway	- Allow for Ethereum node RPC configuration and authentication, supports full nodes, Infura, Quicknode, Pokt & etherscan (Third party RPC services make it cheaper and more sustainable to run INTERX nodes on the testnet) - Support account query, transaction propagation, gas price estimation, blocks query, contract calls, ABI fetch - Support multi-token faucet with claim spam protection mechanism	**COMPLETED**

	• Ready to be used with dApps such as Ethereum Bridge	
Bitcoin Gateway	• Allows for bitcoin core RPC configuration • Supports status query, blocks query, account balance query, token transfer and tx hash lookup • Support token faucet with claim spam protection mechanism	**DEVELOPMENT**
ECDSA TSS CLI	• Threshold signature scheme offline console tool for disaster recovery in case of network / dApp halt & other unforeseen circumstances • Main building block of dApp Bridges to Bitcoin & Ethereum allowing for pegging of tokens between KIRA and other blockchains	**DEVELOPMENT**
Ethereum & Bitcoin Bridge dApp	• <u>Dependent on L2 implementation being finalized</u> • Pegging of tokens from Ethereum and Bitcoin into KIRA and vice versa • No smart contracts needed thanks to ECDSA TSS - MPC cooperation of dApp Verifiers and dApp Leader managing key-shares	**PENDING**
AMM dApp	• <u>Dependent on L2 implementation being finalized</u> • Allow simple pool creation and token swaps • Support dApp dedicated sub-accounts	**PENDING**
dApp Templates	• <u>Dependent on L2 implementation being finalized</u> • Ready to launch dApp templates in Go, Python & JS • Ready to launch on IPFS static UI with basic wallet support	**PENDING**

Frontend

Static (fully client side) fronted, aka. **MIRO** - [Github Repository Ref.](#) with IPFS support. Written in Dart and Flutter supports both Mobile & Desktop. For the purpose of the demo only mobile screens are shown from the application deployed live.

FEATURE	DESCRIPTION	STATUS	VISUALS
Loading Page	- Attempt connection with default set of known gateways - Attempt reconnect until timeout occurs or user chooses to cancel connection	**COMPLETED**	Mobile
Connection Page	- If default network can't be found allows user to preview status of known chains and retry - Provides details in regards to the server status and any potential connection issues - Allows to input a custom INTERX dAPI address (connect to your own server)	**COMPLETED**	- Mobile (1) - Mobile (2) - Mobile (3) - Mobile (4)
Dashboard	- Shows live statistics and statuses of the network, validators, blocks & governance proposals - Handles case of the failed connection and other networking issues by informing user about the issues	**COMPLETED**	- Desktop(1) - Mobile (2)
Basic Sign-in	- Sign in with keyfile & password - Sign in with mnemonic - Sign out - Preview public key, handle incorrect key file formats, passwords, bip39 word sequences and other edge cases	**COMPLETED**	- Mobile (1) - Mobile (2) - Mobile (3) - Mobile (4) - Mobile (5) - Mobile (6)
Basic Account Creation	- Create new account / keyfile - Support AES256 encrypted keyfiles secured by password - Preview mnemonic using QR code that can be imported into hardware security systems	**COMPLETED**	- Mobile (1) - Mobile (2) - Mobile (3)
Switch Network	- Allows switching network after signing through a quick access drawer - Display status and allow defining custom RPC same as in the Connection Page	**COMPLETED**	- Mobile (1) - Mobile (2)

Basic Account Page	- Preview your account balances in different tokens - Pin/Like specific tokens to the top of the list, sort & search - Preview balances details such as denom & support quick access to send - View transactions	**COMPLETED**	- Mobile (1) - Mobile (2) - Mobile (3) - Mobile (4)
Send Tokens	- Simple token transfers - discover sequence, sign and propagate tx to the network - Support text memo, tx fee discovery and tx fee customisation - Display transaction status, hash and handle all edge cases such as invalid input or disconnection	**COMPLETED**	- Mobile (1) - Mobile (2) - Mobile (3) - Mobile (4) - Mobile (5) - Mobile (6) - Mobile (7)
Basic Validators Page	- List, query & sort validators - Preview details such as their uptime statistics - Like/Favour validators to prioritize connecting with their INTERX dAPI - Stake & Unstake Tokens	**DEVELOPMENT**	Figma
Basic Proposals Page	- List, query & sort governance proposals - Preview details such as content & stats - Vote on proposals based on your on-chain permissions	**DEVELOPMENT**	Figma
Basic Tx Explorer	- Sort & search transactions by hash, block number & keywords - Preview transaction details	**DEVELOPMENT**	Figma
Basic Block Explorer	- Sort & search blocks by hash, number, proposer, tx & keywords - Preview block details such as list of transactions, fees, validators signing the block, etc.	**DEVELOPMENT**	Figma
Basic dApp Explorer	- Discover & Access dApps - Create sub-accounts to increase security of interacting with dApps - Bond your KEX to launch code - Swap & acquire dApp tokens	**PENDING**	TBD

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