BUILDING UPON THE BLOCKCHAINS

presented by

INTRODUCING THE NEUROWARE FOUNDERS

ONLY MSC BLOCKCHAIN COMPANY

MSC MALAYSIA Status Company

SUPPORTED BY MDEC & MOF

Mark Smalley - CEO

Living in Malaysia for the past 20 Years

Building FinTech Applications for 15 Years

Spent 10 Years Building Tech Communities

Building Blockchain Apps for 5 Years

Ruben Tan - CTO

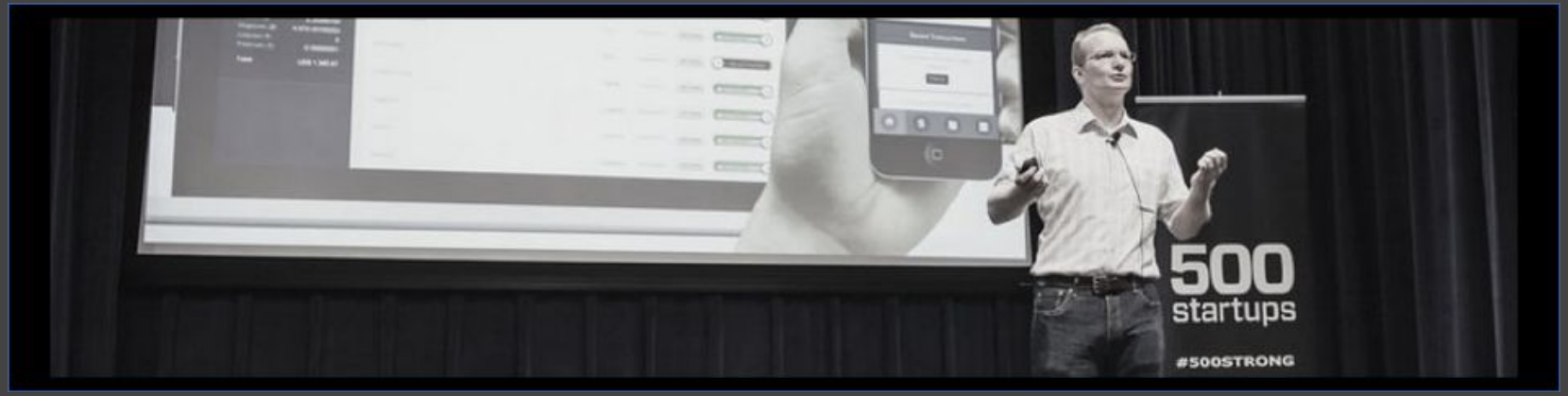
Building Web Applications for 10 Years

Active Community Evangelist & Presenter

Early Developer at MyTeksi and OnApp

Studying Distributed Consensus for 5 Years

EXPERIENCED INNOVATORS IN AN EARLY ECOSYSTEM

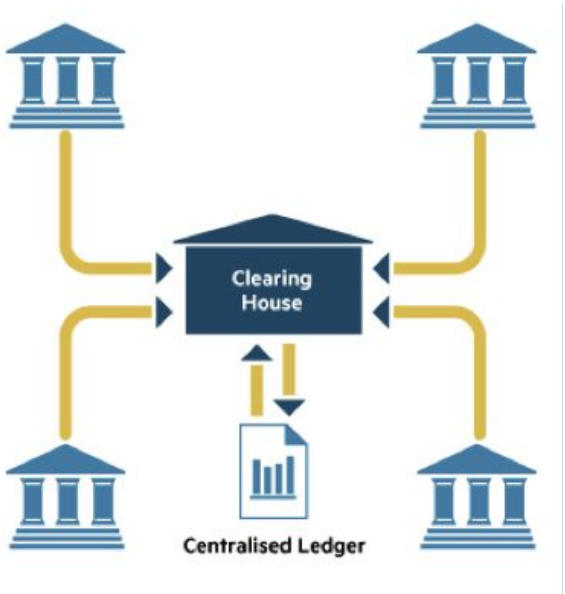


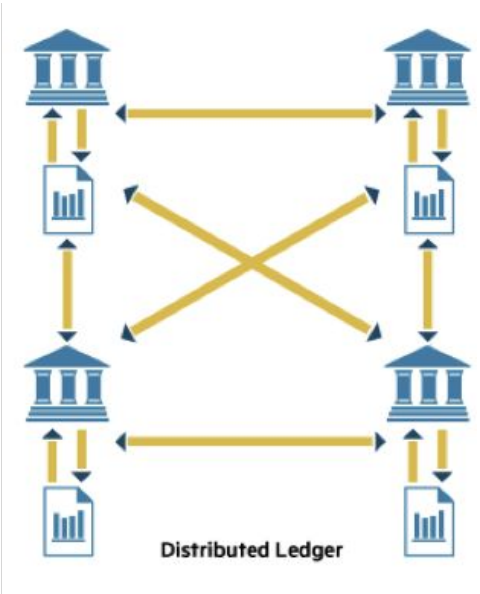
- **Only Malaysian Company** to Graduate from 500 Startups in Silicon Valley
- 1st Company in Asia Providing Public Blockchain APIs & Developer Toolkits
- 1st in The World to Develop Non-Financial Blockchain Agnostic Protocols
- Helped Organize World's 1st Bank-Backed Blockchain Hackathon (DBS)
- Over 15 Years of Collective Blockchain Development Experience

DISTRIBUTED LEDGERS Vs BLOCKCHAINS

PICKING THE CORRECT NETWORK

SANTANDER BANK - FIRST TO ADMIT US$20B DLT ANNUAL SAVINGS





- Reconciling Multiple Central Ledgers Vs Auto-Audited Distributed Ledgers?
- Batch Processing CSVs every 24 Hours Vs Really Real-Time Settlement?

BITCOIN
(the first application / popular digital asset)

Vs

BLOCKCHAINS
(underlying tech / shared public ledger)

CONSENSUS - WHAT MAKES PROOF OF WORK SO SPECIAL ...?

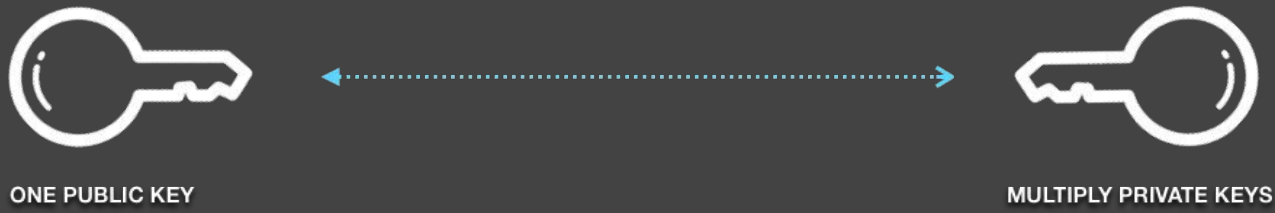
THE MOST IMPORTANT OF ALL - THERE ARE NO COINS

ON THE BLOCKCHAINS EVERY ACCOUNT IS A SET OF KEYS

AND EACH “ADDRESS” REQUIRES A PRIVATE KEY TO ACCESS IT

SOME ADDRESSES EVEN REQUIRE MULTIPLE KEYS

WHOEVER HOLDS THE PRIVATE KEYS CONTROLS THE DATA



- Example of a Bitcoin public address (derived from the public key):
  1GzBZ7eK6wzNjp1Wt6AxHo73kJL2tzoErq
- Example of a Bitcoin private key (used to transfer funds from address):
  L1winVkoRmxMdHKbwssx33Z9ZEuXeJ1eP9CVYvnNn4TdYA32GsWY
- Example of a Bitcoin extended private key (used by HD protocol):
  xprv9s21ZrQH143K2Ywhg9bhZ5nd31t3EbXsg8v28gkKjSm9PA3PiZ89d
  WW6YKxWZa2pgTuErQ65K46KGVfu1xCRBCK3Ppd465QGtH7TmxAEiLv

COMPARING OUR 4 + (1 X 2) FAVOURITE PUBLIC BLOCKCHAINS

Data from CoinGecko on June 6th	Bitcoin	Litecoin	Dogecoin	Dash	Ethereum	ETC
Coin Limit	21 Million	84 Million	UNLIMITED	22 Million	Unknown	200+ Million
Current Supply	16 Million	51 Million	100 Billion	7 Million	91 Million	91 Million
Mining Algorithm	SHA-256	Scrypt	Scrypt	X11	Ethash	Ethash
Hash-Rate	644 PH/s	7.2 TH/s	6 TH/s	3.6 TH/s	30 TH/s	Unknown
Average Block Time	10 Minutes	2.5 Minutes	1 Minute	2.5 Minutes	10 Seconds	10 Seconds
Launched	03 / JAN / 09	07 / OCT / 11	08 / DEC / 13	19 / JAN / 14	30 / JUL / 15	25 / OCT / 16
US$ Price per Coin	US$2,800+	US$30	US$0.0038	US$149	US$260	US$17
Current Market Cap	**US$47+ B**	**US$1.5+ B**	**US$420+ M**	**US$1+ B**	**US$24+ B**	**US$1.6+ B**
Size of Raw Blockchain	135 GB	8 GB	21 GB	3 GB	180 GB	120 GB
Hardware Cost of 51% Attack	US$1.6+ B	US$240+ M	US$200+ M	US$450+ M	Unknown	Unknown

GETTING STARTED

MAPPING USE CASES

CHOOSING THE CORRECT TECHNOLOGY AT THE CORRECT TIME

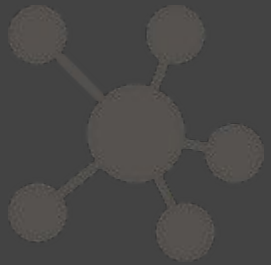
- **SHORT TERM OBJECTIVES** - PoC (Proof of Concept)
  - Ensure your foundations are blockchain neutral (frameworks, APIs or QTs?)
  - Be confident with key management solutions (deterministic or hardware?)
- **MEDIUM TERM OBJECTIVES** - MVP (Minimal Viable Products)
  - Privately beta test product, generate marketing material and tracking tools
  - Evaluate final scaling requirements for production ready public launch
- **LONG TERM OBJECTIVES** - Production Ready
  - Integrate with and (or) replace centralized data with new distributed networks
  - Engage multiple external partners and (or) developer communities

BREAKING THINGS DOWN INTO SMALLER STEPS

DISTRIBUTED DATA

STEP 1

Use existing public blockchain technology to distribute structured data used through all future projects - from token variables to smart contract oracles



CUSTOMIZED TOKENS

STEP 2

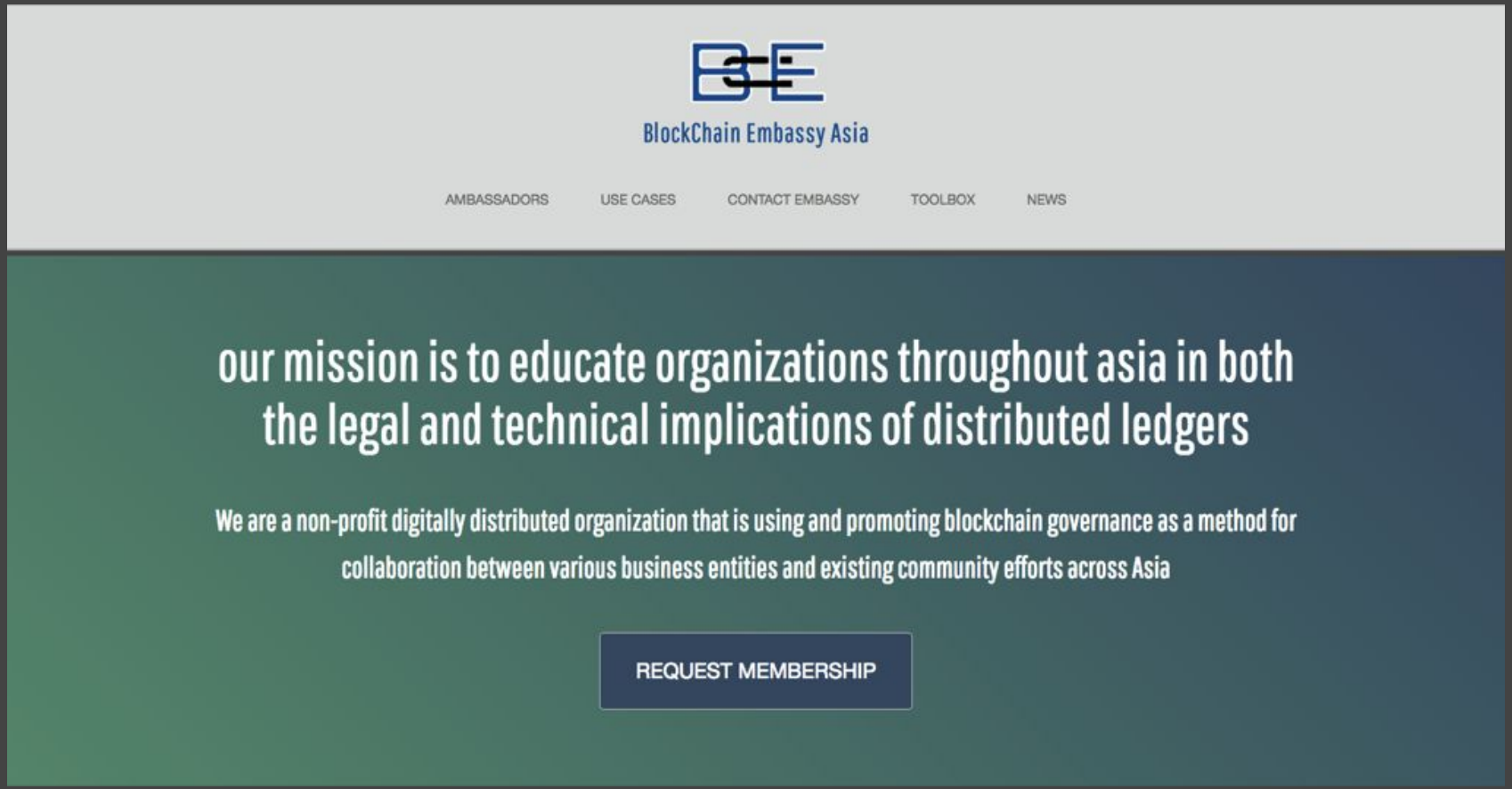
Generate fixed, centrally or decentralized minted supplies of custom tokens to represent real-world assets and (or) incentivize new network needs

SMART CONTRACTS

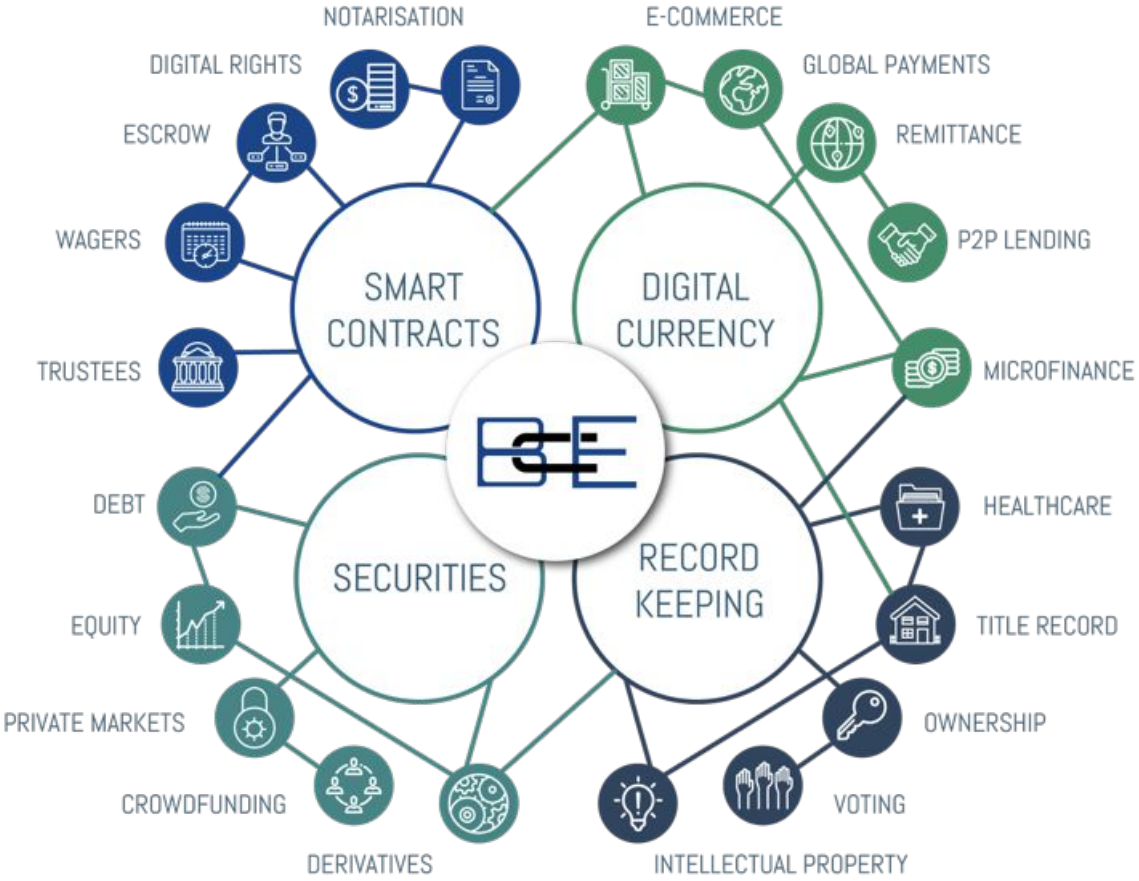
STEP 3

Integrating smart contracts with legally binding real-world contracts requires multiple entities working together on neutral platforms and redefining regulation along the way

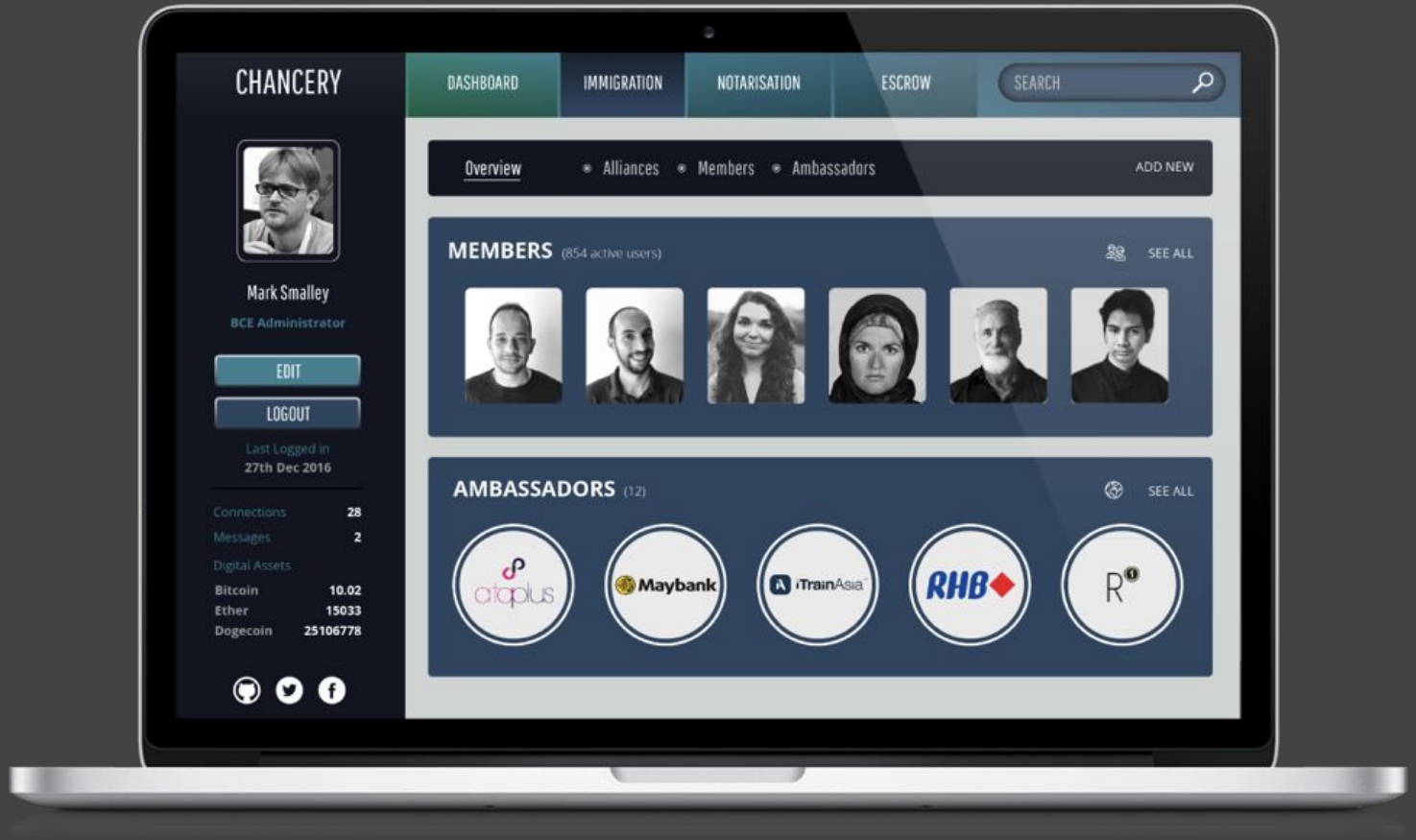
ORGANIZATIONS ARE NOW WORKING TOGETHER



BIG PROBLEMS INVOLVE MULTIPLE PARTNERS & MOVING PARTS



THE BLOCKCHAIN EMBASSY'S CHANCERY PROJECT



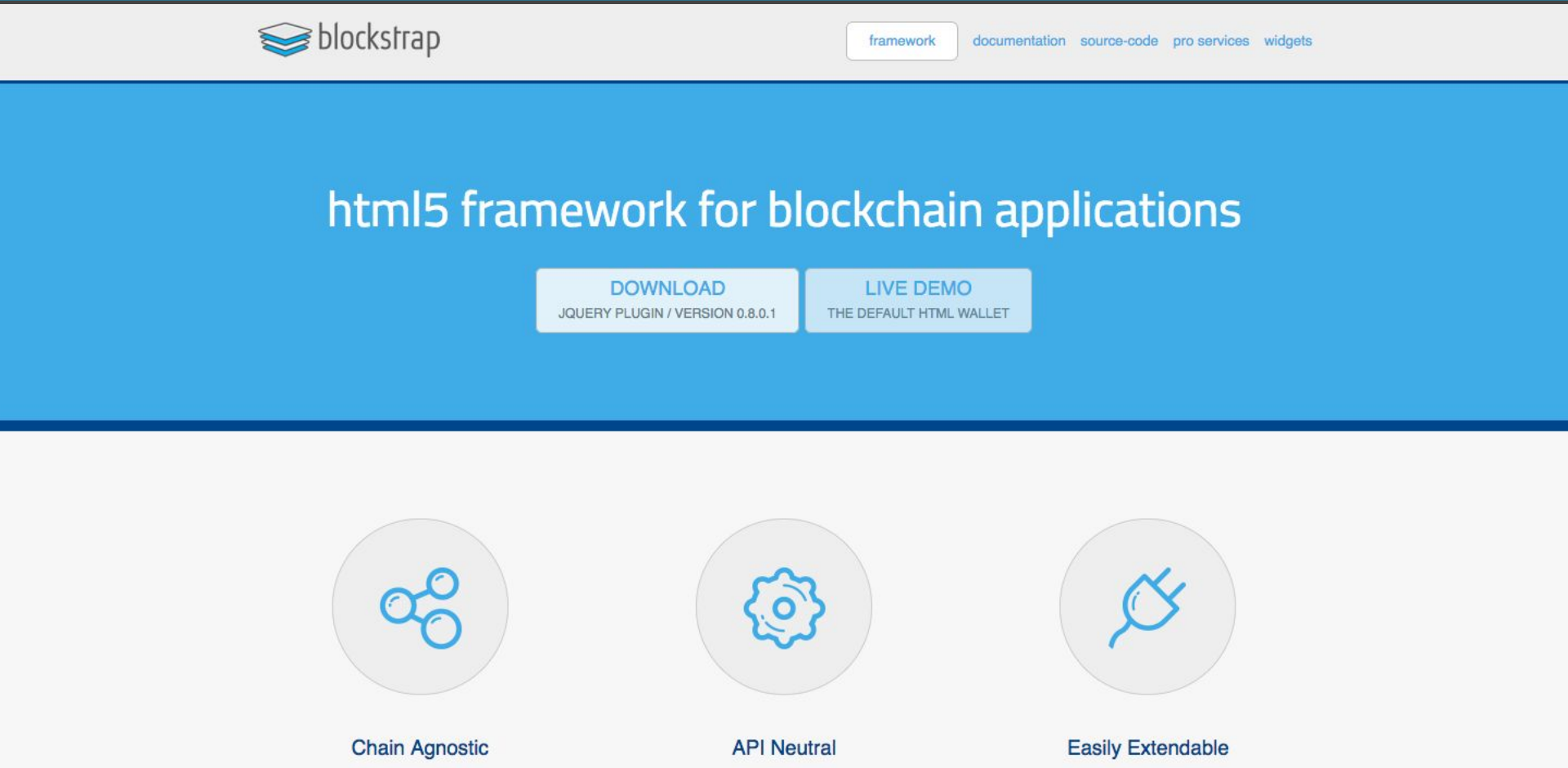
INCLUDES A DIGITAL BLOCKCHAIN-BASED PASSPORT

- Allows users to create and host their identity on the blockchains
- Uses endorsements and referrals to validate certain events occurred
- Allows users to login and sign-up for partnering services with 1 click

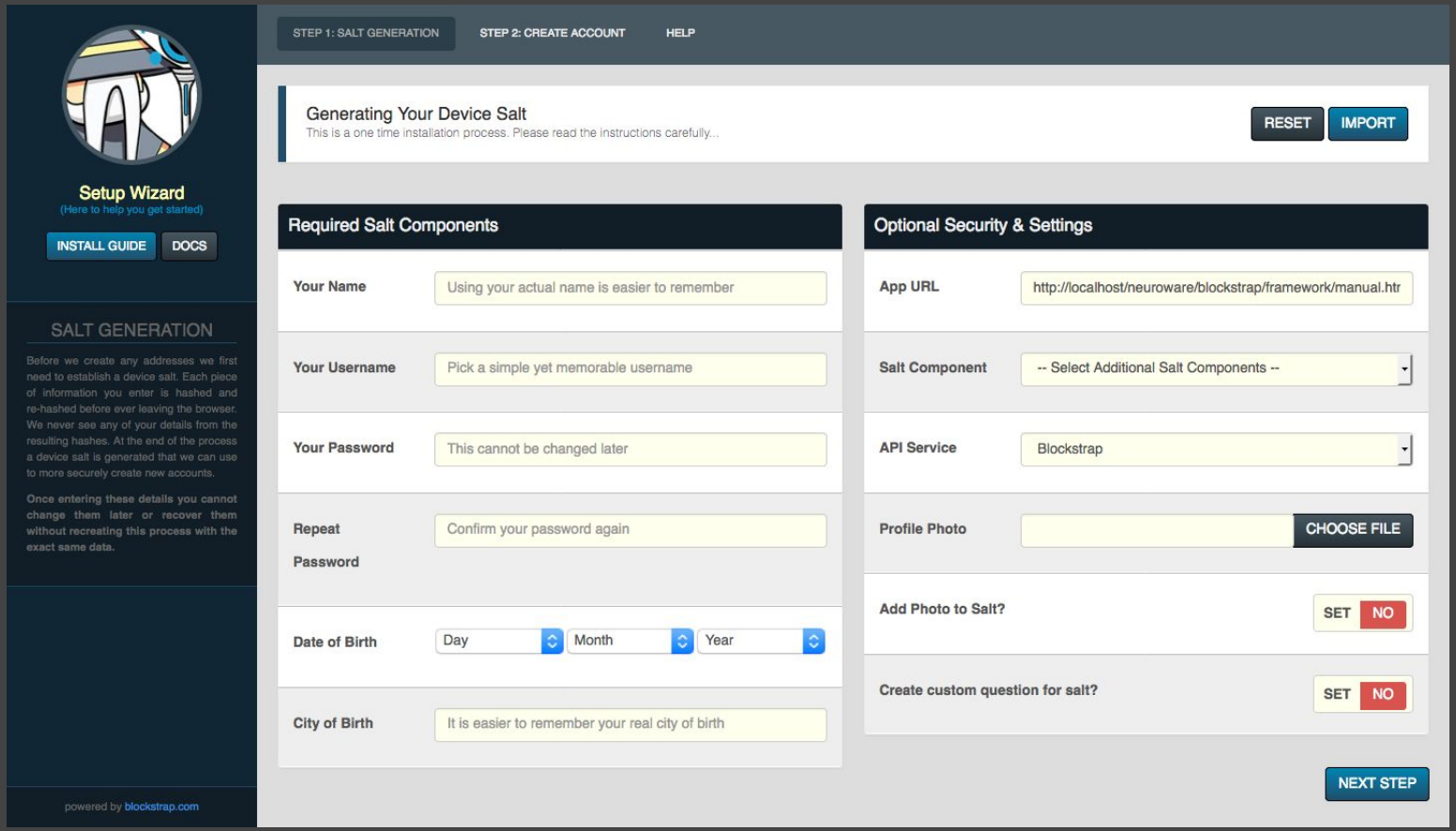
GETTING STARTED

TECHNICAL REQUIREMENTS

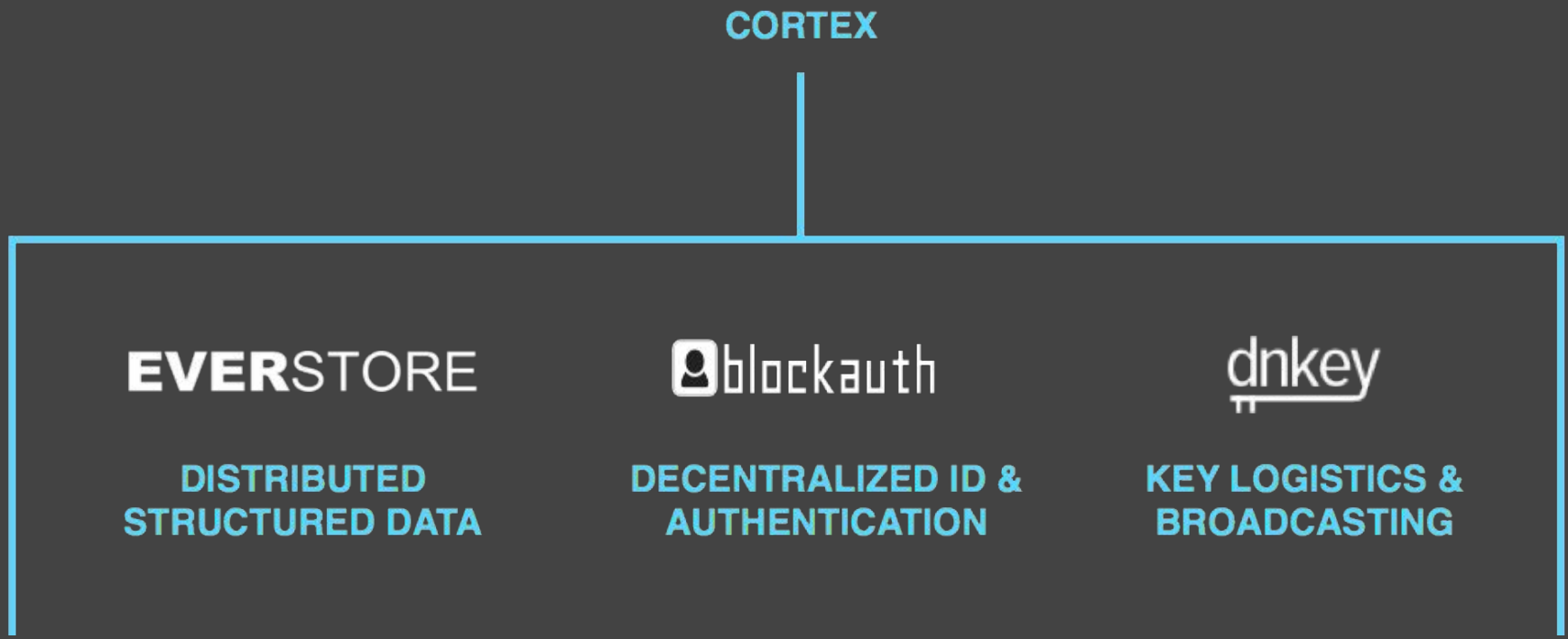
DEVELOPER TOOLS / APIs



KEY MANAGEMENT / WALLETS



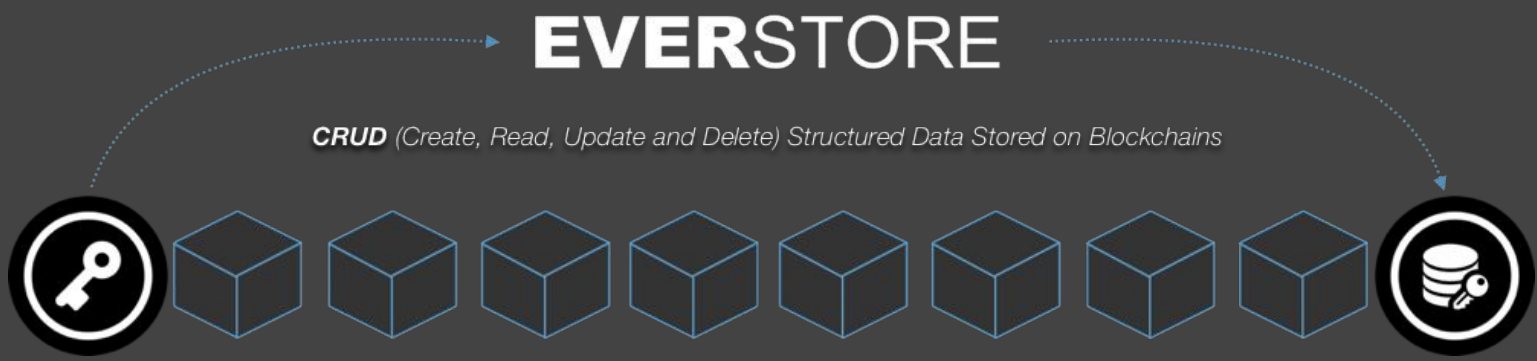
NON-FINANCIAL NEUTRAL DISTRIBUTED PROTOCOLS



NEUROWARE'S AGNOSTIC PROTOCOLS - DESIGNED TO WORK WITH ANY BLOCKCHAIN

EVERSTORE - THE FIRST BLOCKCHAIN POWERED DATABASE

- Everstore is the first protocol capable of storing large amounts of structured data directly on a blockchain - bypassing singular transaction limitations
- Replicates full CRUD-like functionality with schemas, indexes & relationships
- Data encoded via an Everstore instance is available for the life of the ledger



BLOCKAUTH - IDENTITY MANAGEMENT & AUTHENTICATION

- Enables intelligent account authentication via cryptographic keys
- Private keys replace passwords whilst the public keys becomes an identity
- Applications and organizations can independently authenticate credentials

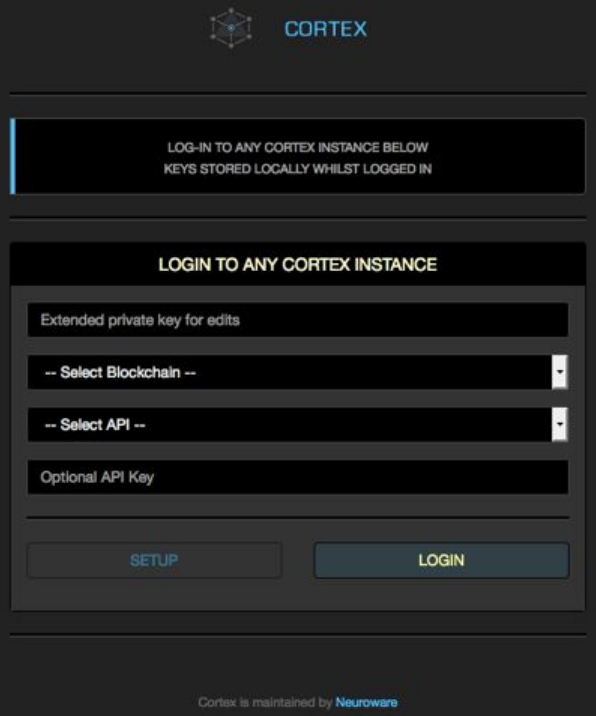
SIMPLIFIED CRYPTOGRAPHIC IDENTITIES WITH DNKEY

- Scalable key logistics across multiple platforms, applications, and processes
- Enables DNS style abstraction for key retirement, replacement, and rotation
- Decodes memorable, trustworthy domain names to public cryptographic keys

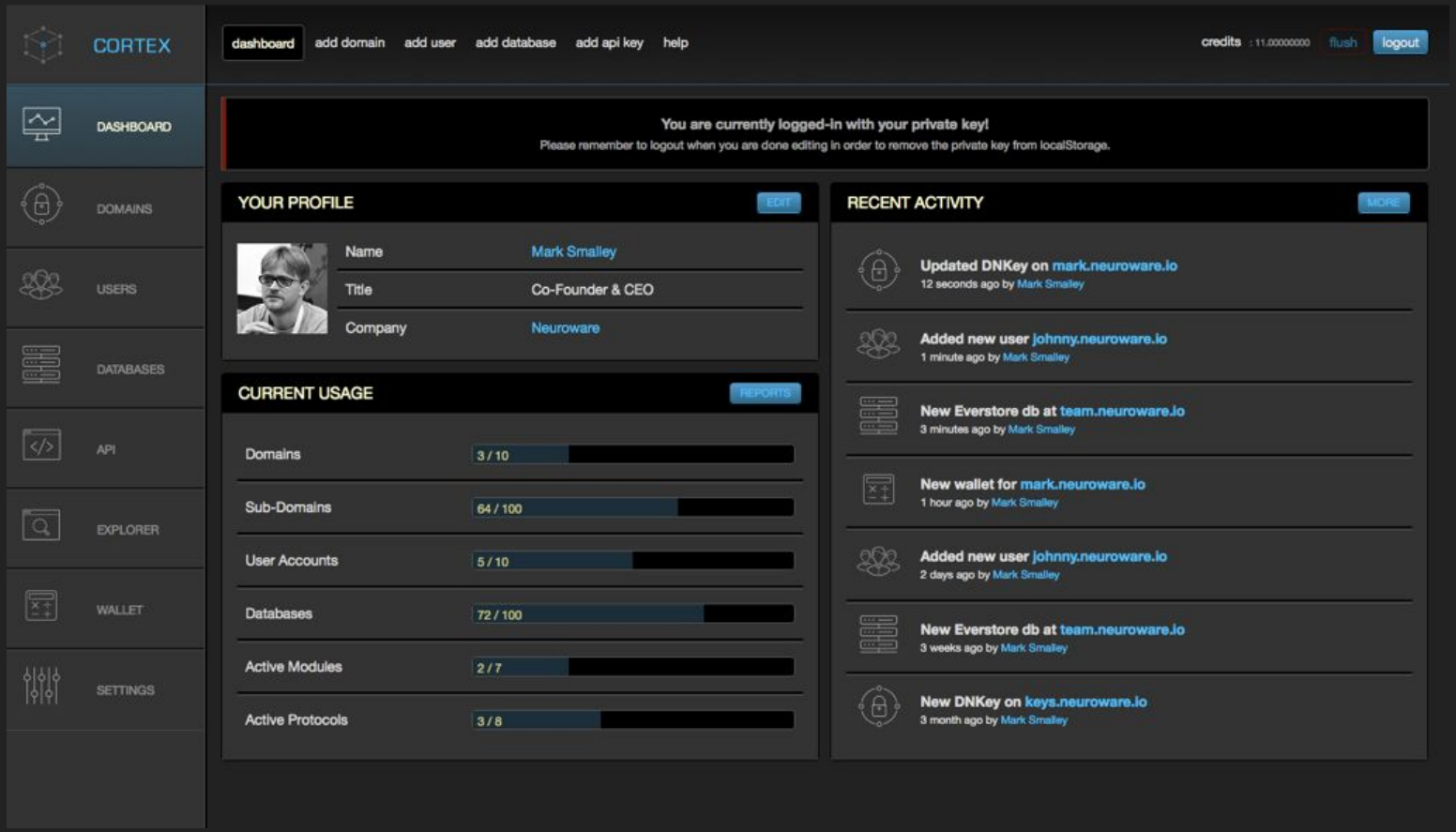
CORTEX

GUIDED TOUR

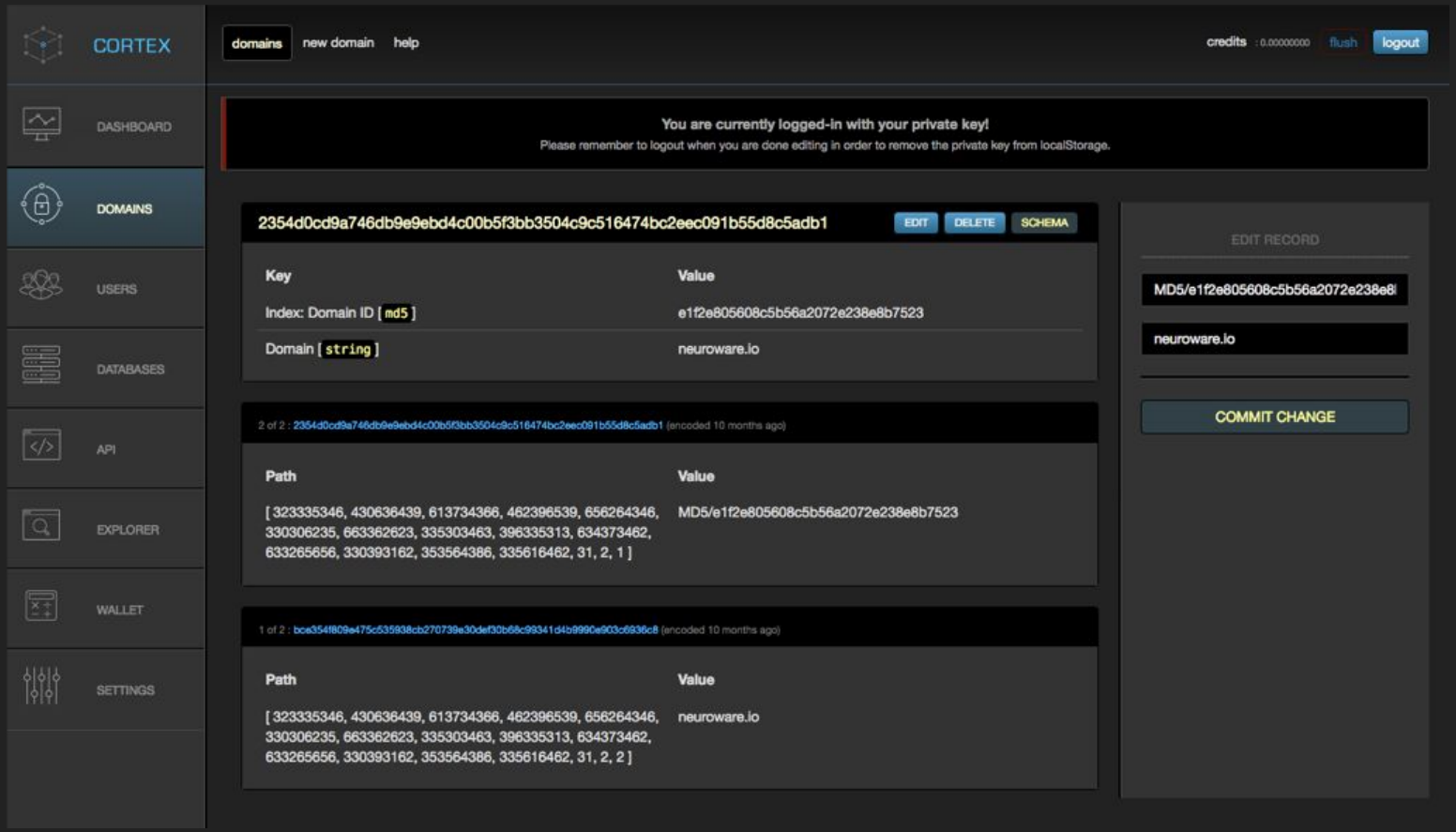
CORTEX IS OUR BLOCKCHAIN-BASED OPERATING SYSTEM



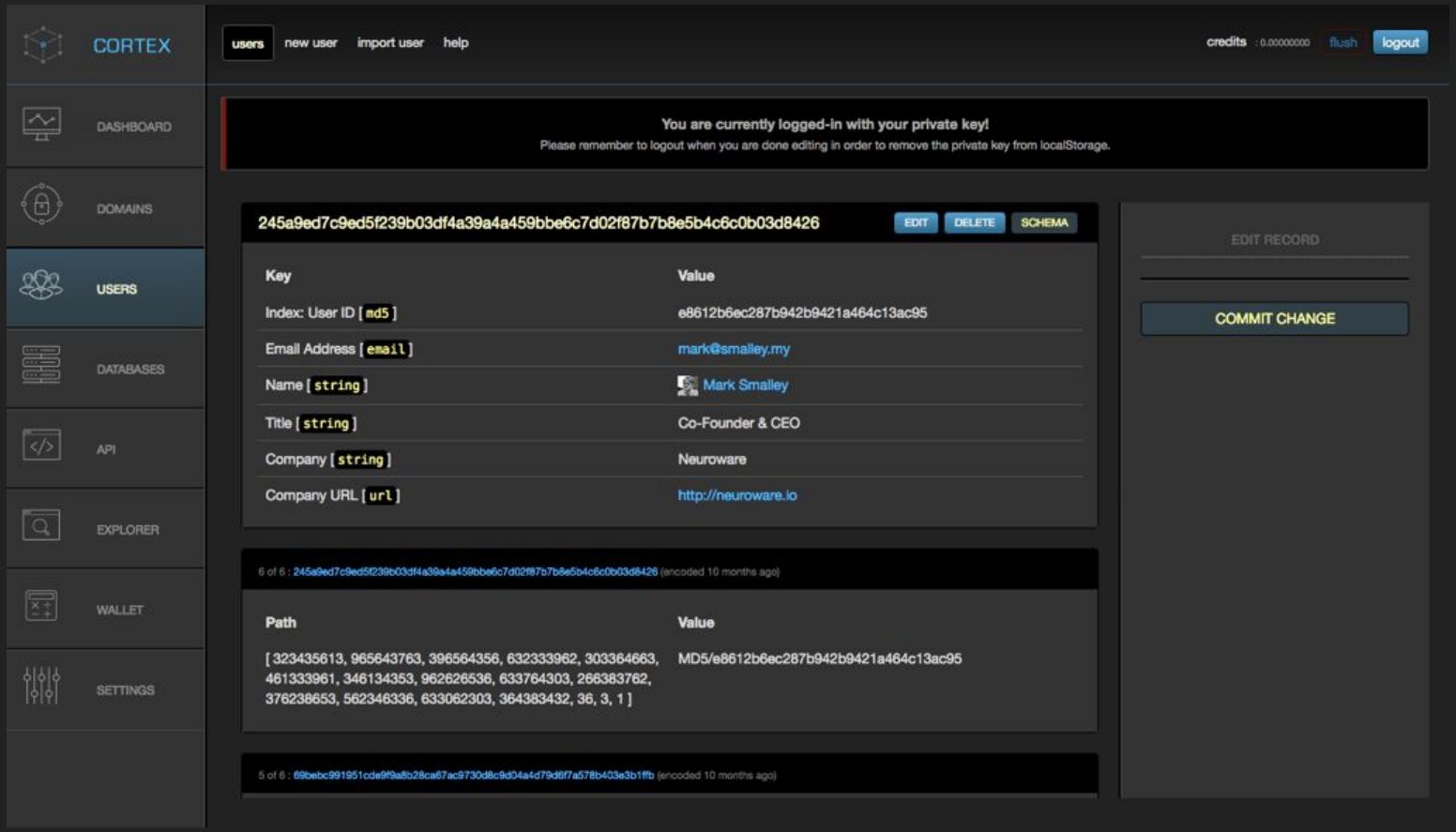
WORKS WITH ANY BLOCKCHAIN - SUPPORTS 10 OUT OF THE BOX



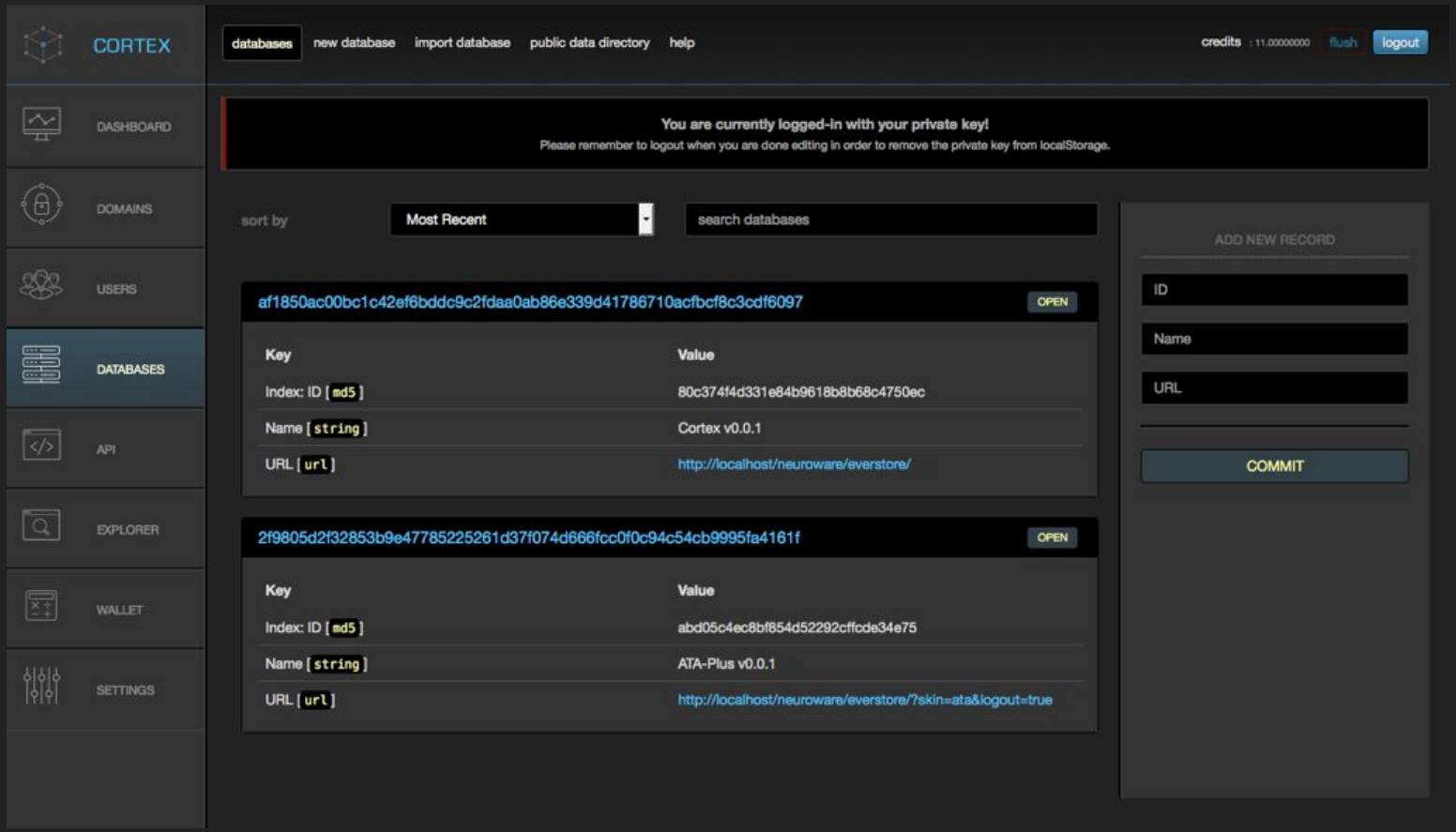
MANAGE DOMAIN NAMES FOR KEY ABSTRACTION SERVICES



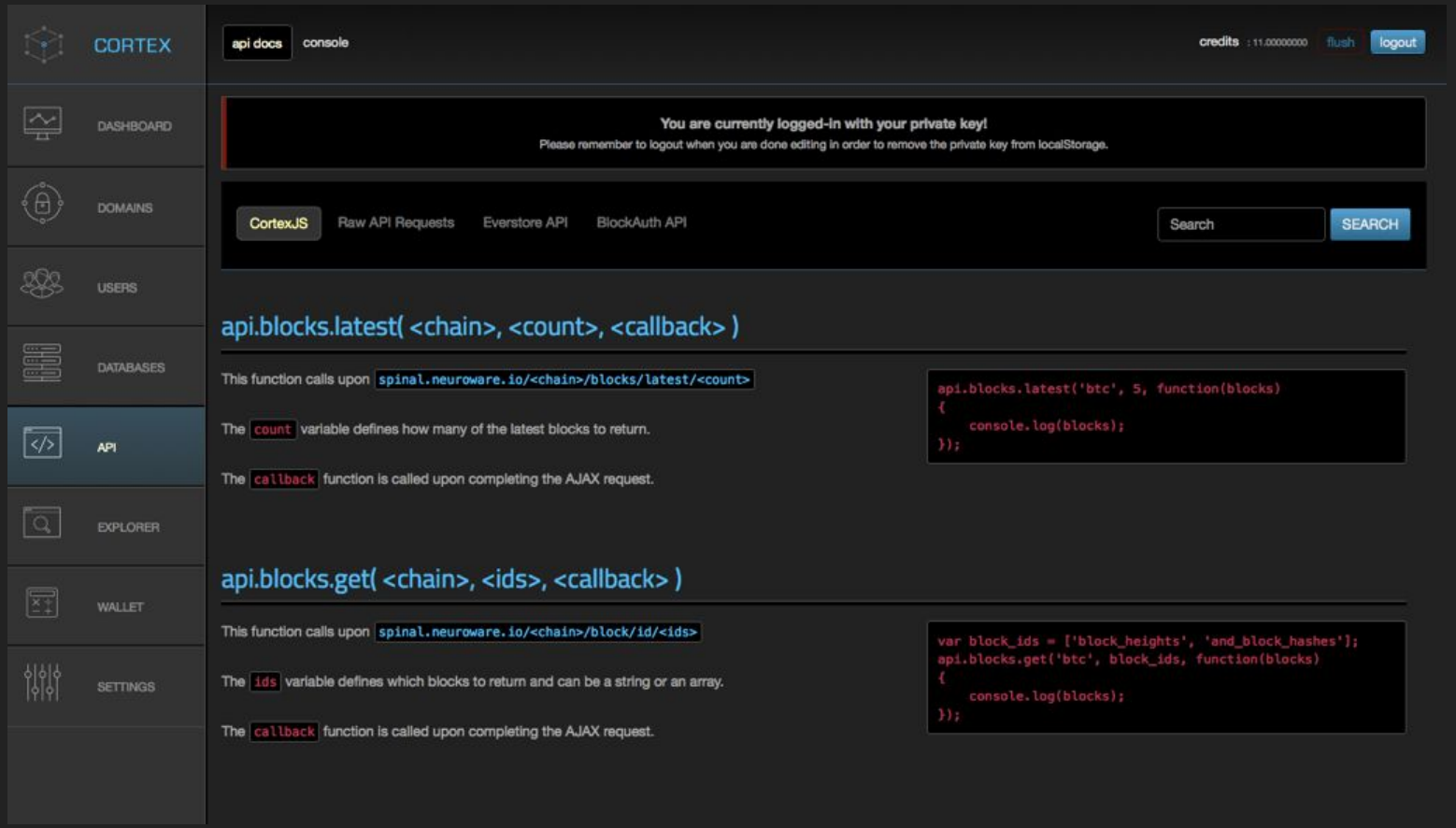
CREATE, AUDIT AND MANAGE DISTRIBUTED USERS



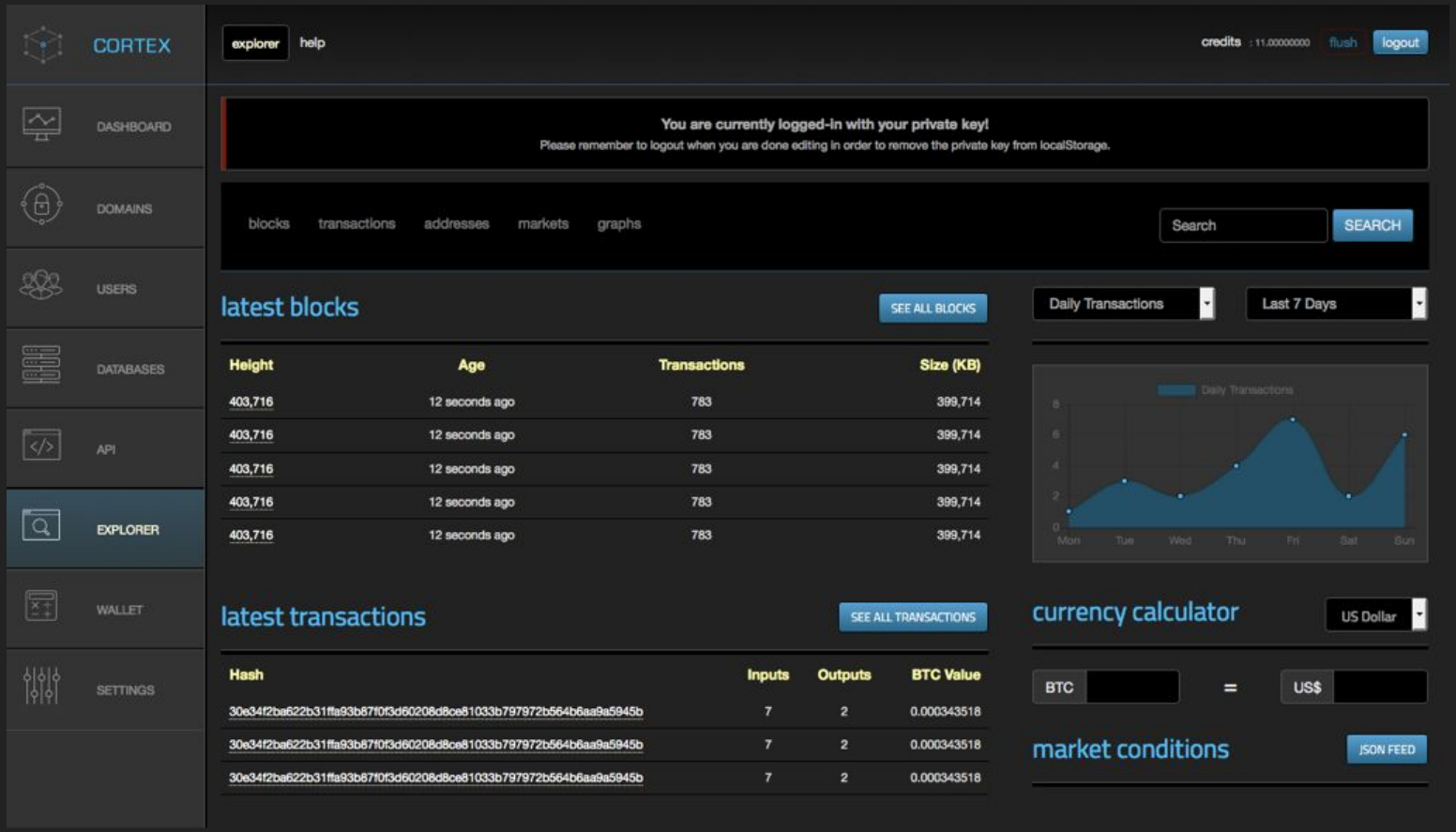
CREATE AND MANAGE DISTRIBUTED BLOCKCHAIN DATABASES



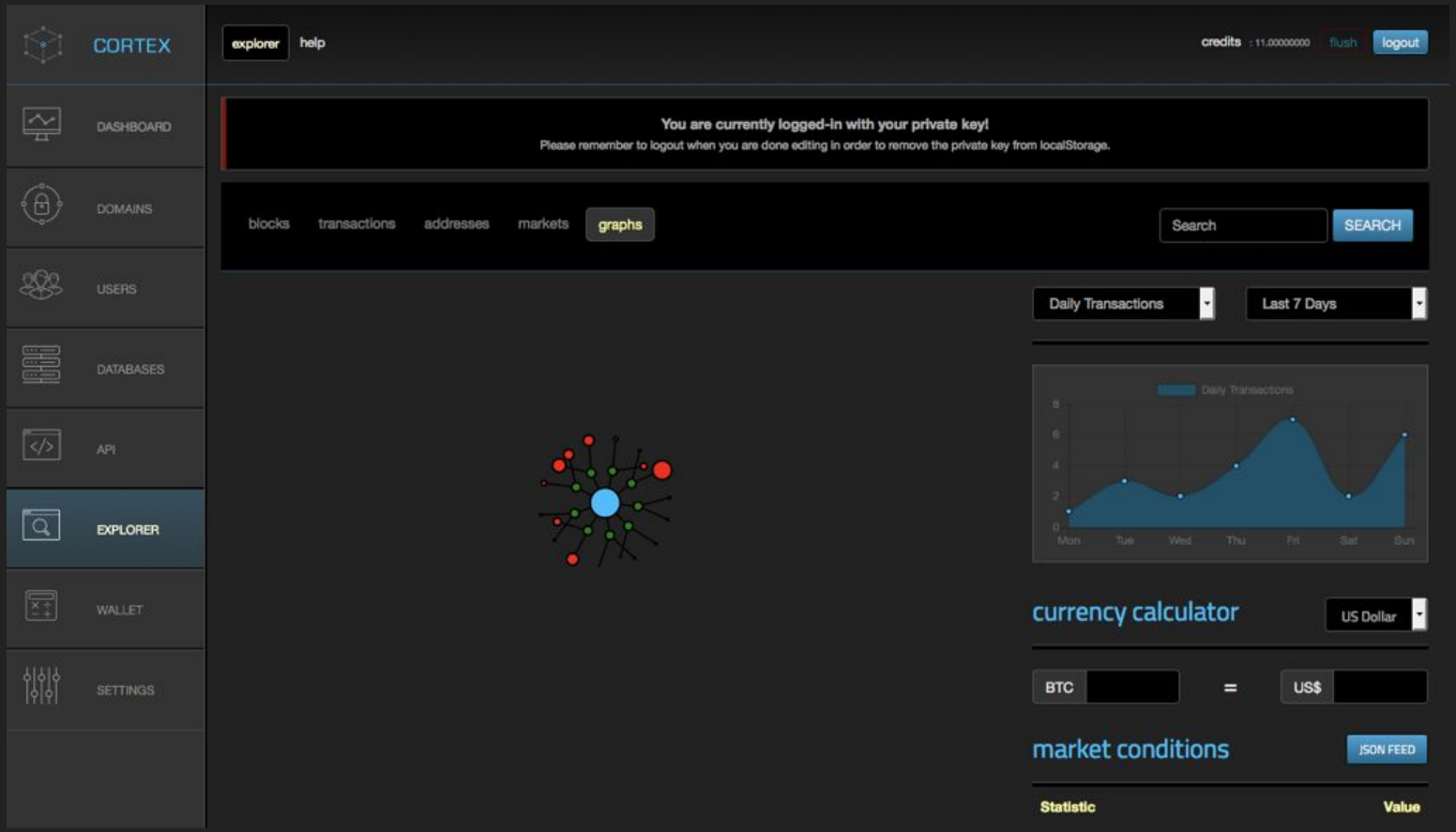
CORTEX ALSO INCLUDES ITS OWN API AND DOCUMENTATION



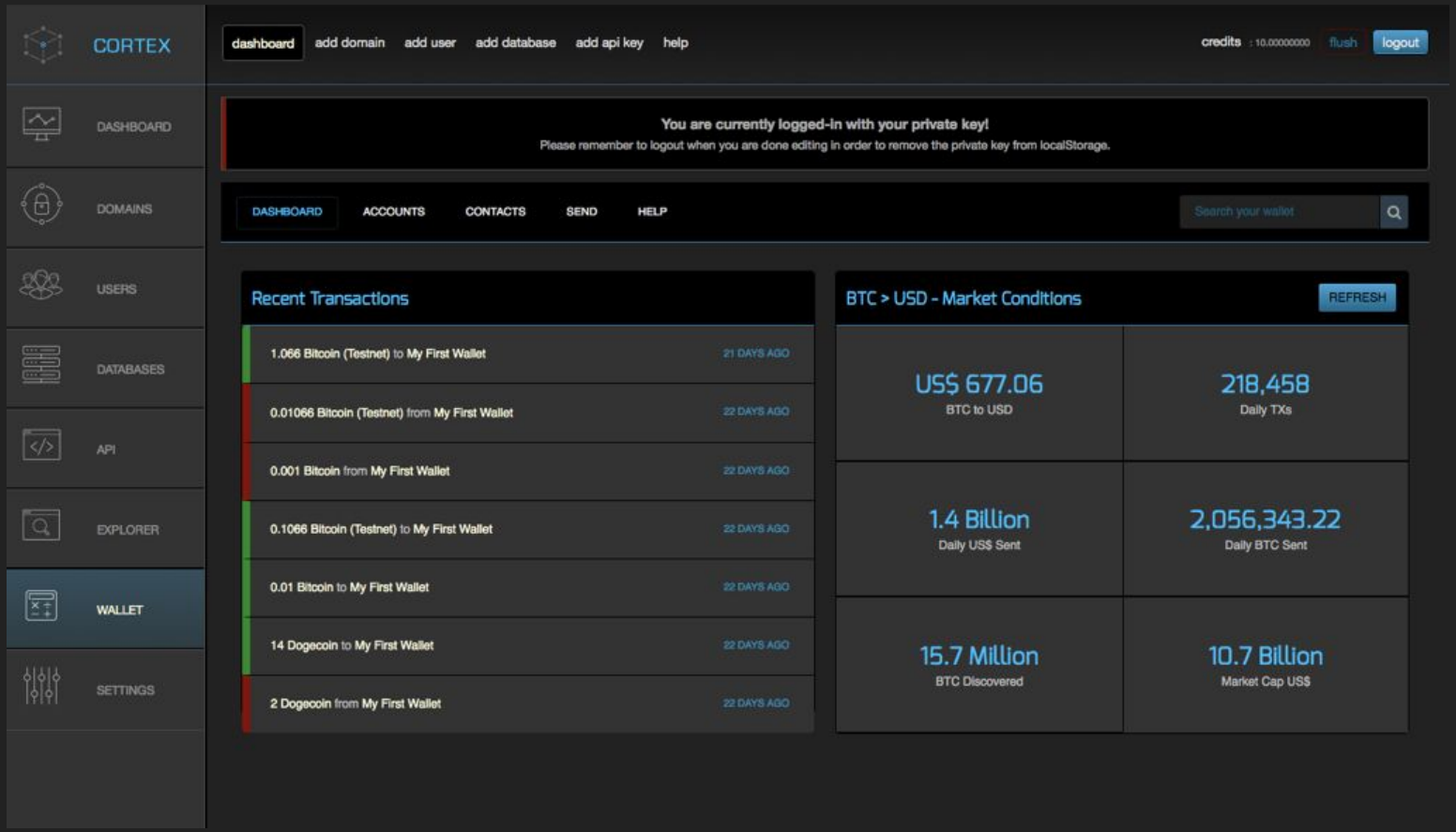
AS WELL AS A IT'S OWN BUILT-IN BLOCK-EXPLORER



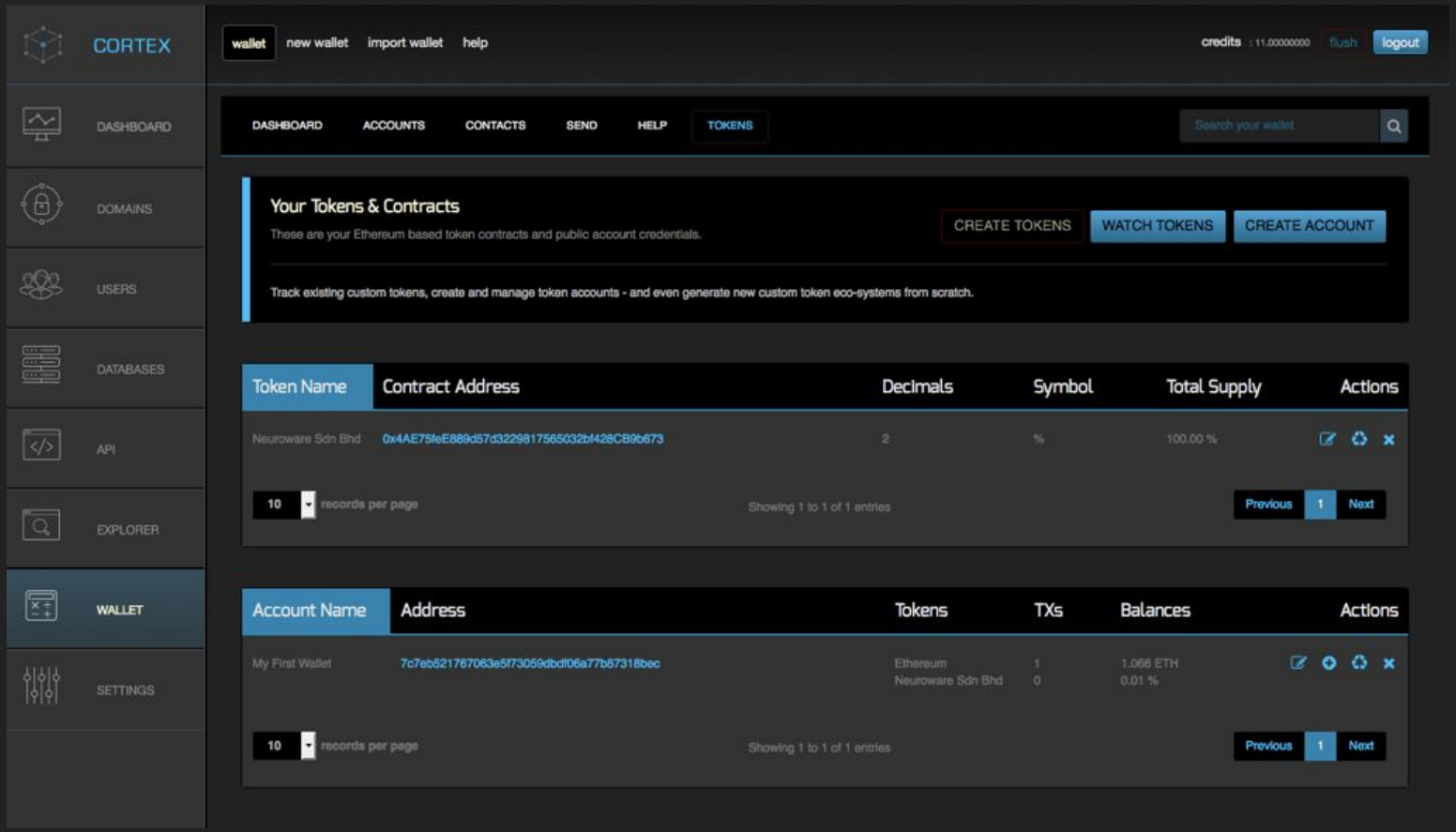
WITH GRAPH QUERIES FOR ADVANCED ANALYTICS AND TRACING



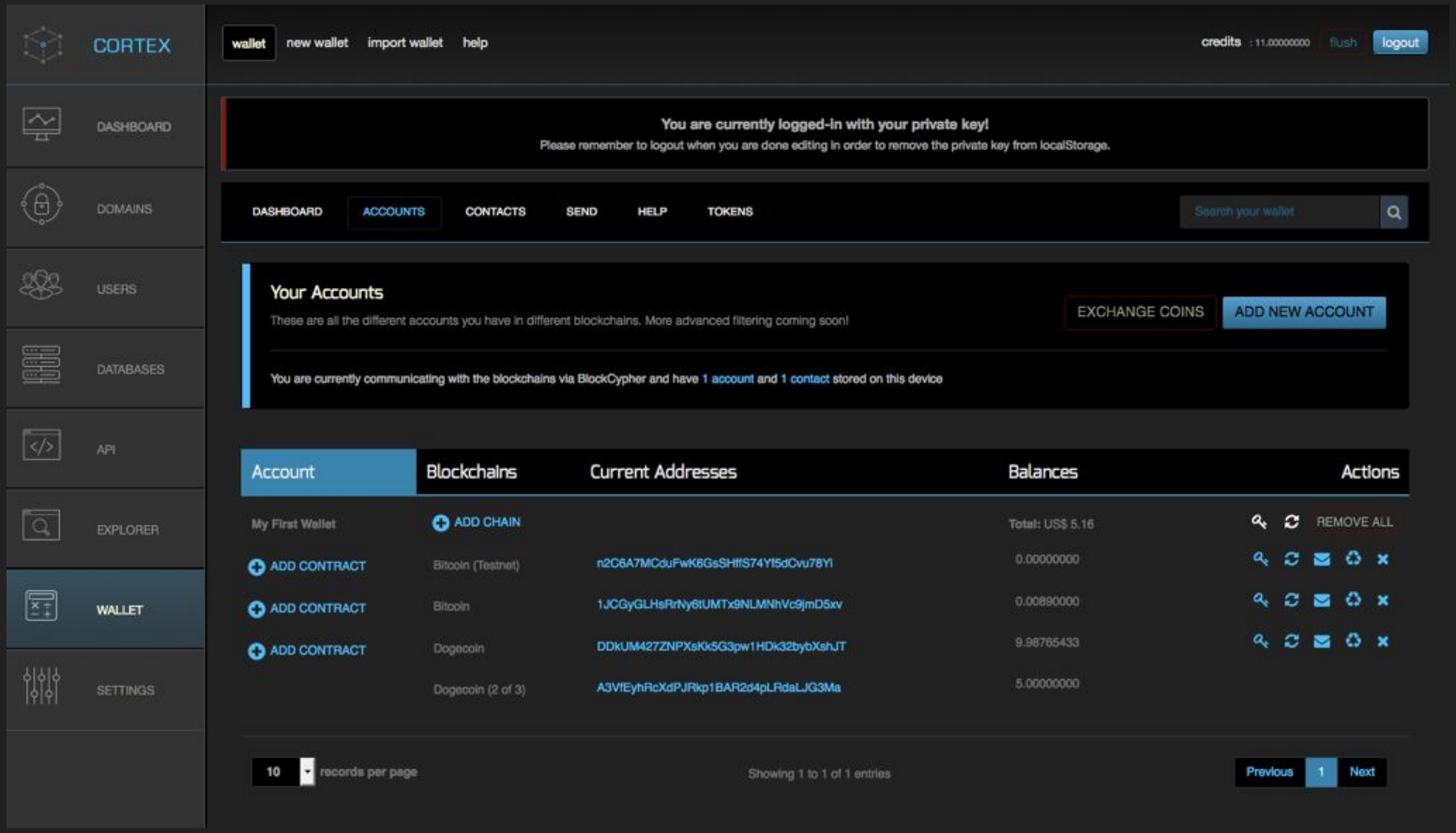
NOT TO MENTION INTEGRATED MULTI-CURRENCY WALLETS



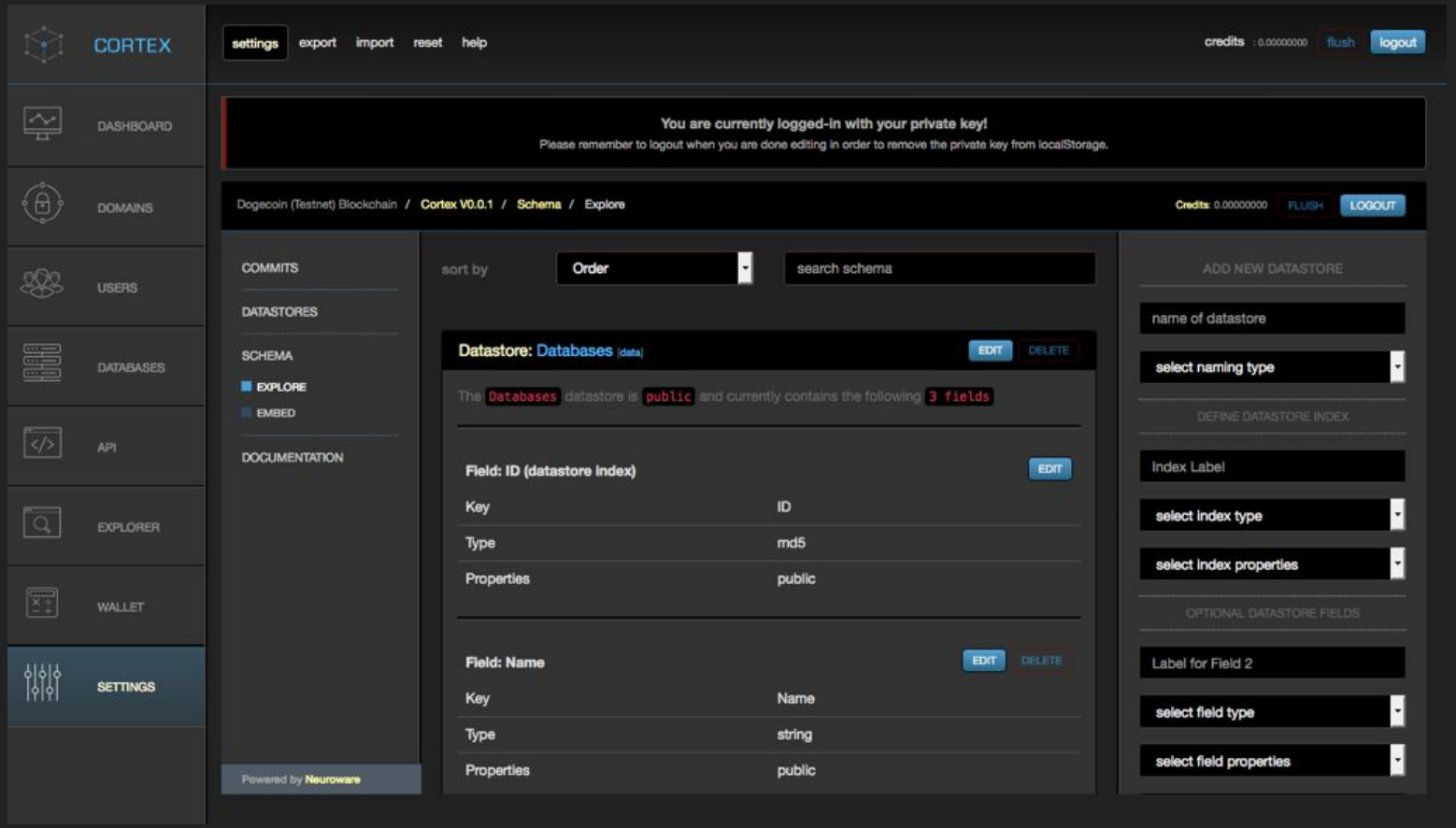
ALSO ABLE TO CREATE AND MANAGE CUSTOM TOKENS



WITH OPTIONAL MULTI-SIGNATURE ESCROW CONTRACTS



CAN BE EASILY EXTENDED WITH THEMES AND PLUGINS



neuroware

THANK YOU FOR YOUR TIME

please email us for more information - founders@neuroware.io