



neuroware

BEYOND THE FINANCIAL BOUNDARIES OF BLOCKCHAINS

BLOCKCHAINS & DISTRIBUTED LEDGER TECHNOLOGY

"A blockchain is a shared ledger of all transactions that have ever been executed. It is constantly growing as verified blocks containing new transactions are added to it. Blocks are automatically added to the blockchain in a linear, chronological order and secured by cryptography to provide a transparent and tamper proof history."

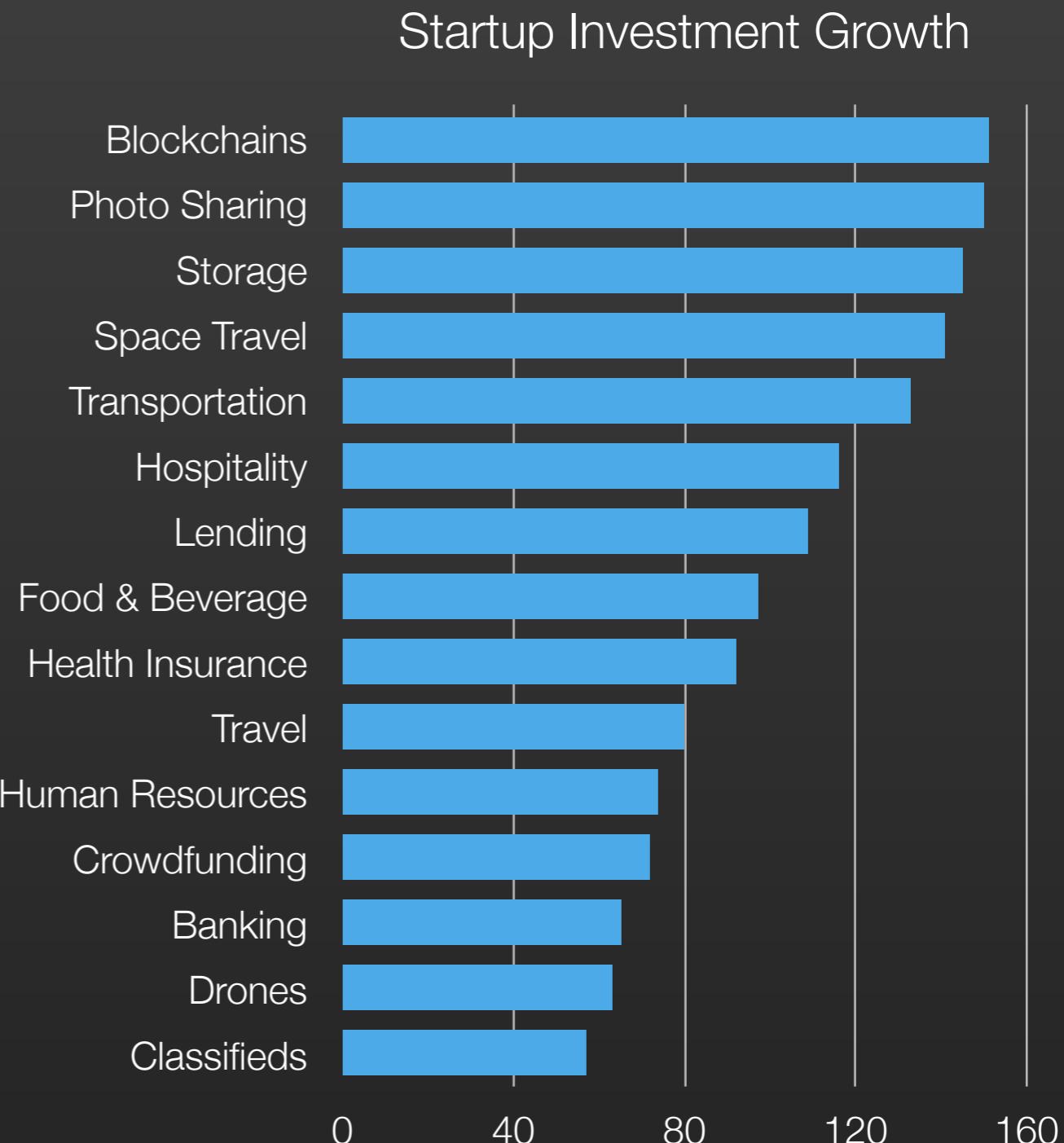


Set to help revolutionize old processes and create entirely new services, these new technologies provide significant benefits over centralized data stores:

- Fraud & error prevention
- Reduced CapEx
- Automated auditing
- Cryptographically secure
- Independently verifiable
- Less vulnerable to attack
- Easy data sharing between partners
- Increased transparency of data

IT'S THE FASTEST GROWING TECHNOLOGY EVER CREATED

- Bitcoin was the first application built using distributed ledger technology.
- Also known as blockchains, distributed ledger technology enables an entirely new form of application development.
- Distributed applications are being developed by organizations such as IBM, NASDAQ, CitiBank, Goldman Sachs, Santander, DBS, and more.
- The last time this much capital and effort was put into creating a decentralized network - ***the Internet was created.*** Bill Gates, Reid Hoffman, and Sir Richard Branson believe it is the most important technological advancement since then.



A TECHNOLOGY STARTUP FOUNDED BY TECHNOLOGISTS



Mark Smalley - CEO

Mark's been building distributed applications on the blockchains for over 5 years now from Malaysia, where he's been developing web-applications for 19 years & helping to organize and present at several prominent technology groups and conferences worldwide. He was also the first qualified MongoDB Master in Asia, where he won an award for his open-source NoSQL Content Management System.



Ruben Tan - CTO

Ruben is one of Malaysia's leading NodeJS developers, founding member of the Malaysian JS User-Group, and regular contributor to many open-source projects and communities; having explored distributed consensus technologies and NoSQL data relationships with previous projects such as MyTeksi and OnApp - he has spent a decade mentoring startups and businesses worldwide.

WE ARE BACKED BY A TRUSTED TEAM OF VESTED ADVISORS



Colin Charles
MariaDB Founder



Adam Giles
Ex Standard Chartered



Hanson Goh
Axiata / Ex Google



David Barton Grimley
Sapient Nitro



Johnny Mayo
Forbes 30 Under 30



Wu Han Ngeow
Maxis

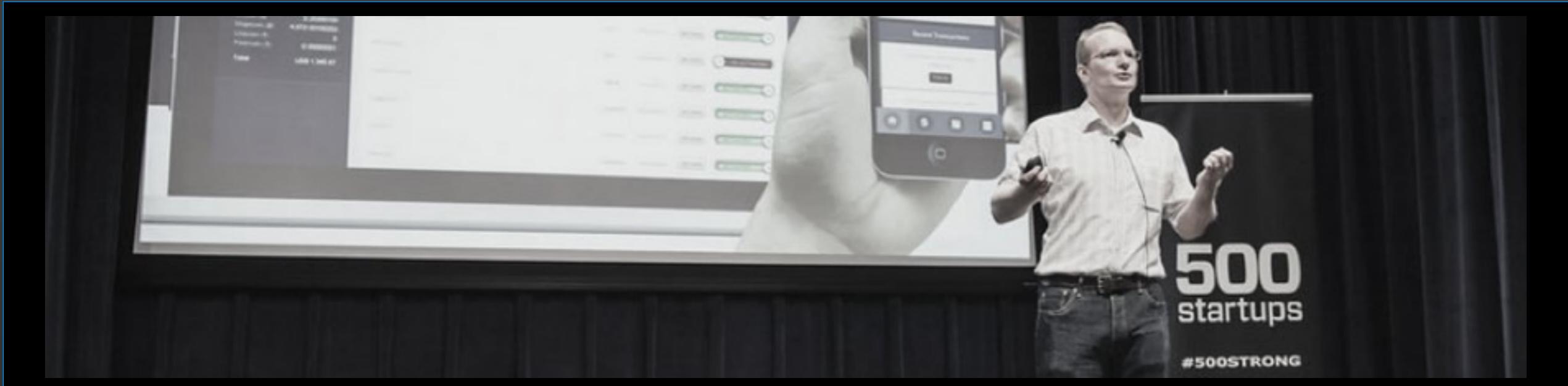


Gabey Goh
Campaign Asia-Pacific



Gareth Davies
Mindvalley

WE ARE EXPERIENCED INNOVATORS IN AN EARLY ECOSYSTEM



- 1st Malaysian Company to Graduate from 500 Startups in Mountain View
- 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)
- **Only VC-Backed Blockchain Consultants in South East Asia**

WE CREATE CUSTOMIZED BLOCKCHAIN EXPERIENCES

- Enterprise solutions can be licensed to use on premise
- We help integrate our protocols with existing legacy systems
- We create custom modules that extend the functionality of our protocols
- We conceptualize new products and services that utilize our protocols
- We provide training and ideation sessions to institutions to help them understand and benefit from blockchain technologies

AND SOLVE LARGE DISTRIBUTED DATA PROBLEMS

- Most of the funding and innovation is taking place within closed silos that are creating new blockchains or entirely dependent only one chain
- Communication between different blockchains is nonexistent
- Public keys are difficult to remember and cannot be revoked
- Generating and or securing private keys can be challenging
- Verifying users and authenticating decentralized access is difficult
- Storing large amounts of structured data is incredibly complex
- Setting-up and configuring infrastructure can be time consuming
- Our industry has few experts that organizations can call upon...

OUR TECHNOLOGY ENABLES NEW OPPORTUNITIES

BANKING

From AML & KYC cost reductions to reward schemes & reaching the unbanked or general key-signing

HEALTHCARE

Complete and immutable family histories of every related diagnosis and condition available from one key

ACCOUNTING

Creation of programmable processes and automated auditing trails that increase transparency and efficiency

LEGAL

Cryptographically secure document notarization, copyright protection, and dispute settlement

GOVERNANCE

Increase the accountability of public officials and offer total transparency in voting and elections

LOGISTICS

Tracking of shipping cycles and provenance systems that autonomously verify actions

GAMING

Share digital assets between an entire network of games, or use the blockchains to create immutable persistent open-worlds

ASSETS

Track possession of your property in the digital economy by creating, managing, storing, or sharing multiple asset classes

INSURANCE

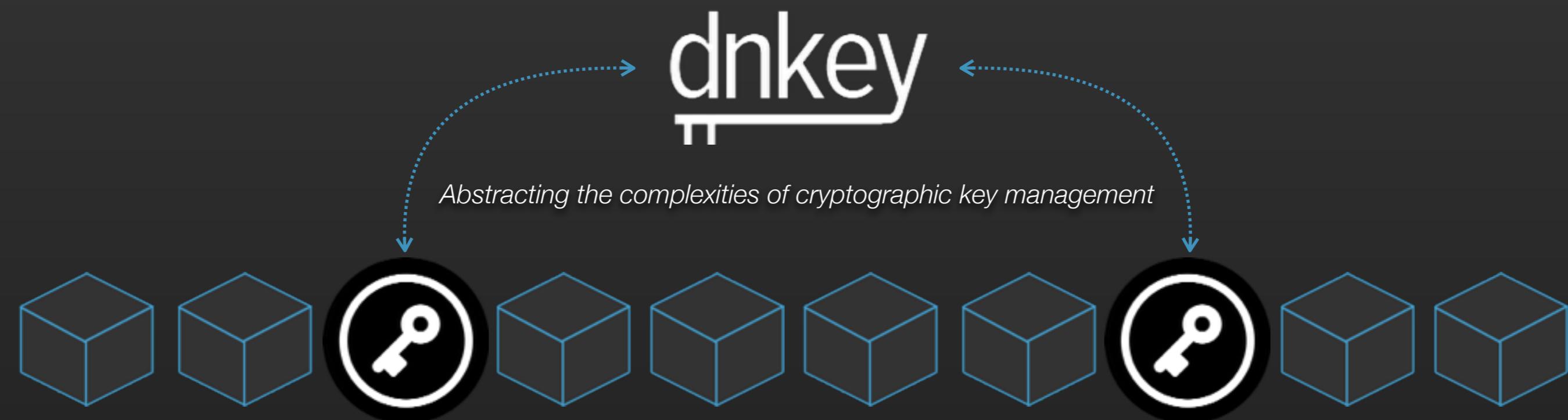
Integrated insurance and medical services can be intelligently designed to quickly and contractually settle claims with cryptographically

OUR PROTOCOLS ARE UNIQUE IN THE ECOSYSTEM

- We developed and maintain the following blockchain agnostic protocols:
 - **DNKey** - Cryptographic Key Management
 - **BlockAuth** - Identity & Authentication
 - **Everstore** - Distributed Structured Data Storage
- They form the foundations for non-financial distributed applications
- '**CORTEX**' is our integrated development environment unifying these protocols
- We have a wealth of experience in setting up blockchain infrastructure
- We're working with institutions and regulators to integrate these solutions

DNKEY - ROBUST CRYPTOGRAPHIC KEY MANAGEMENT

- 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



HOW WE ABSTRACT THE COMPLEXITIES OF KEY MANAGEMENT

- Transform wallet addresses from complicated public keys such as: `13aaehx6p4QrTHMvQUZy3dTEevXr4Wprap` into something much more memorable and manageable - such as **mark.neuroware.io**
- Services configured to read DNKeys (rather than direct public keys) can programmatically control keys remotely
- Ensures organizations have total control over key management and are not locked-in to any one vendor or blockchain
- High-level domains can be used as a way to control your distributed on-chain presence across multiple applications

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



HOW WE ENABLE DISTRIBUTED AUTHENTICATION

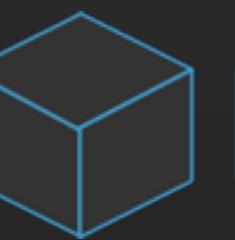
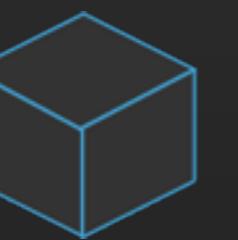
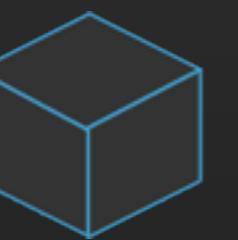
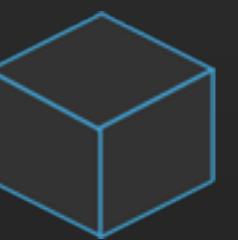
- Allows applications without a central server to authenticate users
- Removes the need for internal storage and helps minimize risk
- Scalable identity management from simple site logins to verifying distributed teams with varying levels of administrative control
- We also provide on-premise enterprise solutions for additional functionality such as integrated SMS for 2FA

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

EVERSTORE

CRUD (*Create, Read, Update and Delete*) Structured Data Stored on Blockchains



CURRENT BLOCKCHAIN DATA STORAGE ATTEMPTS

- Most well known in the ecosystem are Factom.org and Tierion.com
- Both store checksums or ‘receipts’ on a blockchain in an OP_RETURN
- Records notarized on the blockchain must fit within Bitcoin’s 38 byte limit
- References then link to the actual data which is stored somewhere off-chain
- Other solutions such as StoreJ and Filecoin are attempting to build dedicated blockchains from the ground up specifically for just storing data and files
- The concern from the technical community is that without an underlying token of value or properly incentivized network security will suffer

CURRENT BLOCKCHAIN DATA STORAGE ATTEMPTS

Pros

- Timestamped with proof of ownership
- Verifiable entry of records backed by the blockchain

Cons

- Data is not secured by the blockchain - just mentioned on it
- Data can still be edited externally without an independently verifiable audit trail
- Trusting a 3rd party to store your data and records introduces many risks
- Same risks as centralized servers - potential for data loss, hacking, etc
- Byte limit prevents structured linking of data

WHY EVERSTORE IS SO SPECIAL

- Using a ‘master key’ Everstore can map transaction-outputs intelligently
- This allows Everstore to bypass the 38 byte limit with structured linking
- Data can be directly encoded on a blockchain - making it the database itself
- Each Everstore instance can hold up to 999,999,999 tables each with up-to 999,999,999 fields, with unlimited records, indexes and relationships
- Already supports over 15 field types from simple strings and numbers to more complex arrays and objects such as dates and geo-coordinates
- Private keys allow updates whilst public keys provide read-only access

WHY EVERSTORE IS SO SPECIAL

Pros

- Use the blockchains to store structured data over just transactional data
- Replicates full CRUD database functionality (Create, Read, Update, Delete)
- Everstore can encode multiple fields, indexes, schemas, and data types
- Built in fully automated audit trail tracking every change ever made
- Lifetime distributed and redundant hosting for a single one-time encoding fee

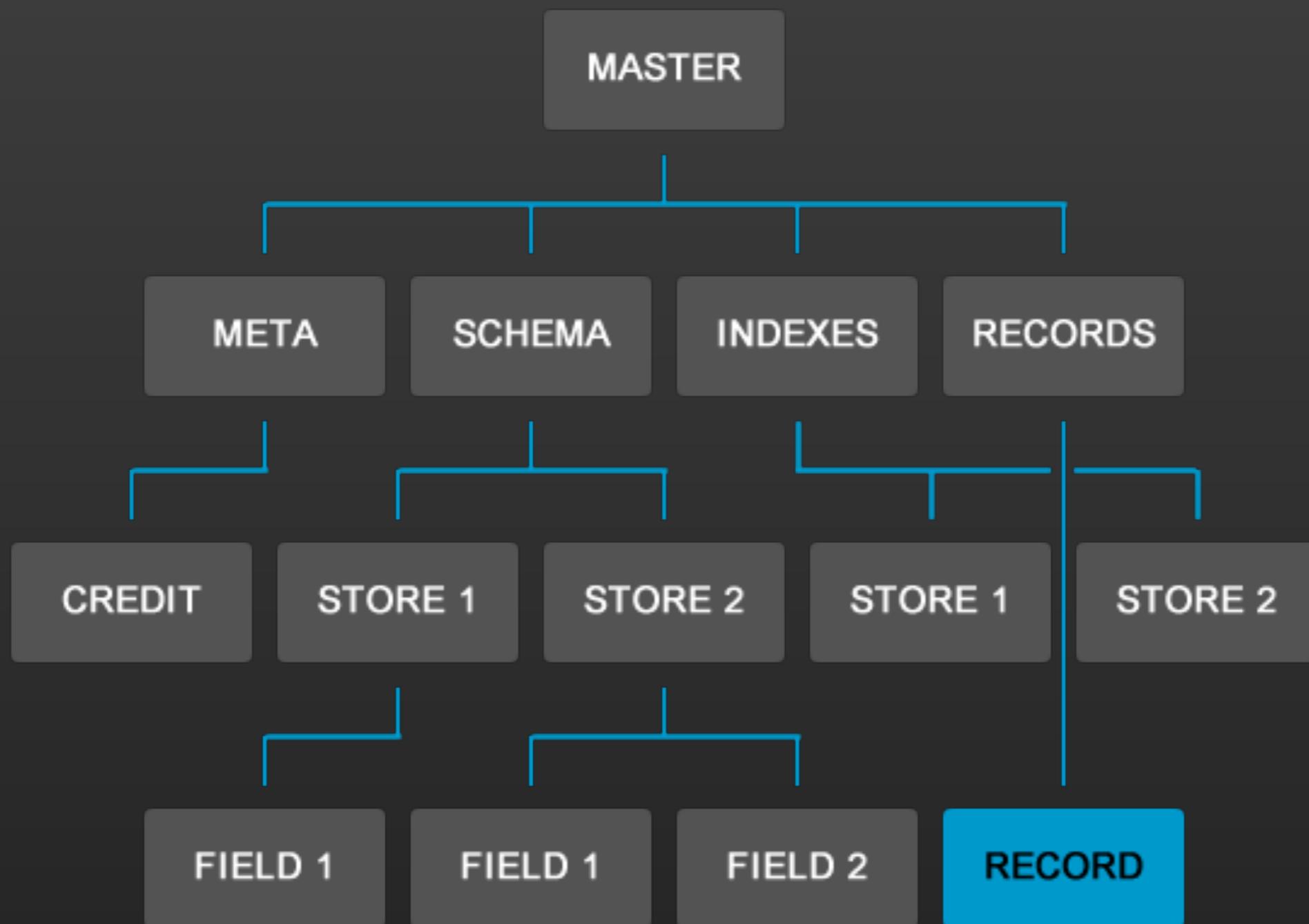
Cons

- It can be slow if accessing the protocol directly without hosted caching

WHY EVERSTORE IS SO SPECIAL

- Data is public by default but can also be stored privately with encryption too
- Blockchain agnostic protocol so data can be easily exported between chains
- Works as a standalone protocol or in conjunction with other protocols
- Easy integration with Everstore driven data for third-party applications
- Can utilize DNKey for easily sharing databases (such as db.neuroware.io)
- Can be integrated with BlockAuth to track which users are updating data
- Includes an integrated interface for managing data and caching locally
- Does not suffer from storage, API provider lock-in, or any third-party conflicts
- Can also be operated within a server-less environment

AN ABSTRACT VIEW OF EVERSTORE HIERARCHAL DATA STORAGE



USE EVERSTORE TO **LOGIN** TO ANY BLOCKCHAIN USING HTML5

The screenshot shows the Cortex login interface. At the top, there is a logo consisting of a hexagonal grid of dots with a central blue dot, followed by the word "CORTEX" in blue capital letters. Below this is a dark rectangular box containing white text: "LOG-IN TO ANY CORTEX INSTANCE BELOW" and "KEYS STORED LOCALLY WHILST LOGGED IN". The main form is titled "LOGIN TO ANY CORTEX INSTANCE" in white capital letters. It contains four input fields: "Extended private key for edits" (a text input field), "-- Select Blockchain --" (a dropdown menu), "-- Select API --" (another dropdown menu), and "Optional API Key" (a text input field). At the bottom of the form are two buttons: "SETUP" in a light gray box and "LOGIN" in a blue box.

Cortex is maintained by [Neuroware](#)

WITH CORTEX AS A SERVERLESS INTERFACE FOR BLOCKCHAINS

CORTEX

dashboard add domain add user add database add api key help credits : 11.00000000 flush logout

DASHBOARD

DOMAINS

USERS

DATABASES

API

EXPLORER

WALLET

SETTINGS

You are currently logged-in with your private key!
Please remember to logout when you are done editing in order to remove the private key from localStorage.

YOUR PROFILE

EDIT

Name: Mark Smalley
Title: Co-Founder & CEO
Company: Neuroware

RECENT ACTIVITY

MORE

Updated DNKey on mark.neuroware.io
12 seconds ago by Mark Smalley

Added new user johnny.neuroware.io
1 minute ago by Mark Smalley

New Everstore db at team.neuroware.io
3 minutes ago by Mark Smalley

New wallet for mark.neuroware.io
1 hour ago by Mark Smalley

Added new user johnny.neuroware.io
2 days ago by Mark Smalley

New Everstore db at team.neuroware.io
3 weeks ago by Mark Smalley

New DNKey on keys.neuroware.io
3 month ago by Mark Smalley

CURRENT USAGE

REPORTS

Domains: 3 / 10

Sub-Domains: 64 / 100

User Accounts: 5 / 10

Databases: 72 / 100

Active Modules: 2 / 7

Active Protocols: 3 / 8

CREATE AND MANAGE MULTIPLE BLOCKCHAIN DATABASES

The screenshot shows the Cortex blockchain management interface. On the left is a sidebar with icons for CORTEX, DASHBOARD, DOMAINS, USERS, DATABASES (selected), API, EXPLORER, WALLET, and SETTINGS. The main area has a header with 'databases' (selected), 'new database', 'import database', 'public data directory', 'help', 'credits : 11.00000000', 'flush', and 'logout'. A message says 'You are currently logged-in with your private key! Please remember to logout when you are done editing in order to remove the private key from localStorage.' There are two database entries:

Key	Value
Index: ID [md5]	80c374f4d331e84b9618b8b68c4750ec
Name [string]	Cortex v0.0.1
URL [url]	http://localhost/neuroware/everstore/

af1850ac00bc1c42ef6bddc9c2fdाaa0ab86e339d41786710acfbcf8c3cdf6097 OPEN

Key	Value
Index: ID [md5]	abd05c4ec8bf854d52292cffcde34e75
Name [string]	ATA-Plus v0.0.1
URL [url]	http://localhost/neuroware/everstore/?skin=ata&logout=true

2f9805d2f32853b9e47785225261d37f074d666fcc0f0c94c54cb9995fa4161f OPEN

ADD NEW RECORD

ID
Name
URL

COMMIT

EASILY CUSTOMISED THROUGH MODULAR THEMES AND PLUGINS

ataplus Dogecoin (Testnet) Blockchain / ATA-Plus V0.0.1 / Datastores / Investments Credits: 254.00000000 FLUSH LOGOUT

COMMITS

DATASTORES

- ISSUERS
- COMPANIES
- INVESTORS
- INVESTMENTS**
- SECTORS
- ADD NEW

SCHEMA

DOCUMENTATION

6 Months Sitewide Total Investments

RM Invested (Millions)

A bar chart titled "6 Months Sitewide Total Investments" showing RM Invested (Millions) on the Y-axis (0 to 0.9) against months on the X-axis. The bars represent the following values:

Month	RM Invested (Millions)
January	0.40
March	0.35
April	0.30
May	0.50
June	0.70

sort by Most Recent search investments

f2583c4bbbc1d7f70fe776ef8de24e3e9131884de2be5ed3365fe72e53fa2177 EDIT DELETE SCHEMA

Key	Value
Index: Investment ID [auto]	bf28617205e695439c0dd2285a76d7c1

ADD NEW RECORD

74c87dfa57a94dc86666209cd87a01b6

Date of Investment

Select Investor

Select Company

RM Invested

Equity Given

COMMIT

powered by neuroware

CORTEX ALSO INCLUDES AN OPTIONAL API & DOCUMENTATION

The screenshot shows the Cortex application interface with a dark theme. On the left is a vertical sidebar with icons and labels for CORTEX, DASHBOARD, DOMAINS, USERS, DATABASES, API (which is selected), EXPLORER, WALLET, and SETTINGS. The main content area has a header with 'api docs' (highlighted in orange), 'console', 'credits : 11.00000000', 'flush', and 'logout'. Below this is a message: 'You are currently logged-in with your private key! Please remember to logout when you are done editing in order to remove the private key from localStorage.' A navigation bar includes 'CortexJS', 'Raw API Requests', 'Everstore API', 'BlockAuth API', 'Search', and a 'SEARCH' button. The 'api docs' section contains two examples of API functions:

api.blocks.latest(<chain>, <count>, <callback>)

This function calls upon `spinal.neuroware.io/<chain>/blocks/latest/<count>`

The `count` variable defines how many of the latest blocks to return.

The `callback` function is called upon completing the AJAX request.

```
api.blocks.latest('btc', 5, function(blocks){  console.log(blocks);});
```

api.blocks.get(<chain>, <ids>, <callback>)

This function calls upon `spinal.neuroware.io/<chain>/block/id/<ids>`

The `ids` variable defines which blocks to return and can be a string or an array.

The `callback` function is called upon completing the AJAX request.

```
var block_ids = ['block_heights', 'and_block_hashes'];api.blocks.get('btc', block_ids, function(blocks){  console.log(blocks);});
```

AS WELL AS A IT'S OWN BLOCK-EXPLORER

 CORTEX

[explorer](#) [help](#)

credits : 11.00000000 [flush](#) [logout](#)

 DASHBOARD

 DOMAINS

 USERS

 DATABASES

 API

 EXPLORER

 WALLET

 SETTINGS

You are currently logged-in with your private key!
Please remember to logout when you are done editing in order to remove the private key from localStorage.

[blocks](#) [transactions](#) [addresses](#) [markets](#) [graphs](#)

[SEARCH](#)

latest blocks

[SEE ALL BLOCKS](#)

Height	Age	Transactions	Size (KB)
403,716	12 seconds ago	783	399,714
403,716	12 seconds ago	783	399,714
403,716	12 seconds ago	783	399,714
403,716	12 seconds ago	783	399,714
403,716	12 seconds ago	783	399,714

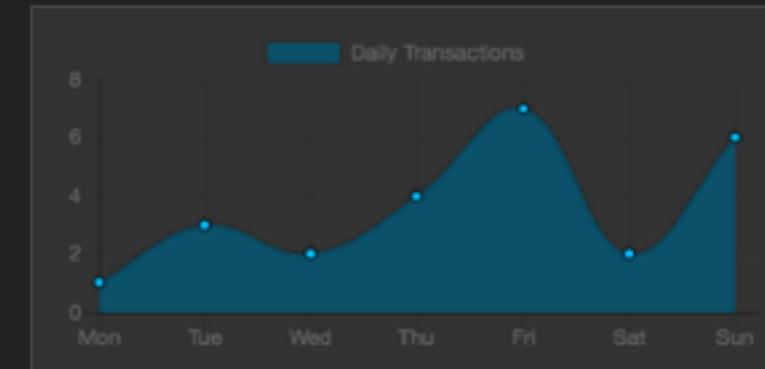
latest transactions

[SEE ALL TRANSACTIONS](#)

Hash	Inputs	Outputs	BTC Value
30e34f2ba622b31ffa93b87f0f3d60208d8ce81033b797972b564b6aa9a5945b	7	2	0.000343518
30e34f2ba622b31ffa93b87f0f3d60208d8ce81033b797972b564b6aa9a5945b	7	2	0.000343518
30e34f2ba622b31ffa93b87f0f3d60208d8ce81033b797972b564b6aa9a5945b	7	2	0.000343518

Daily Transactions

[Last 7 Days](#)



The chart shows a weekly trend of daily transactions. The y-axis represents the number of transactions, ranging from 0 to 8. The x-axis shows the days of the week: Mon, Tue, Wed, Thu, Fri, Sat, Sun. The data points are approximately: Mon (1), Tue (3), Wed (2), Thu (4), Fri (7), Sat (2), Sun (6). A blue area represents the daily transactions.

currency calculator

[US Dollar](#)

BTC = US\$

market conditions

[JSON FEED](#)

WITH GRAPH QUERIES FOR ADVANCED ANALYTICS AND TRACING

CORTEX

explorer help credits : 11.00000000 flush logout

DASHBOARD

DOMAINS

USERS

DATABASES

API

EXPLORER

WALLET

SETTINGS

You are currently logged-in with your private key!
Please remember to logout when you are done editing in order to remove the private key from localStorage.

blocks transactions addresses markets graphs Search SEARCH

Daily Transactions Last 7 Days

Daily Transactions

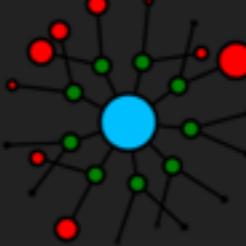
Day	Transactions
Mon	1
Tue	3
Wed	2
Thu	4
Fri	7
Sat	2
Sun	6

currency calculator US Dollar

BTC = US\$

market conditions JSON FEED

Statistic Value



NOT TO MENTION INTEGRATED MULTI-CURRENCY WALLETS

The screenshot shows the CORTEX dashboard with a sidebar and a main content area. The sidebar includes icons for CORTEX, DASHBOARD, DOMAINS, USERS, DATABASES, API, EXPLORER, WALLET (selected), and SETTINGS. The main content area has a top navigation bar with links for dashboard, add domain, add user, add database, add api key, help, credits (10.00000000), flush, and logout. A message states "You are currently logged-in with your private key! Please remember to logout when you are done editing in order to remove the private key from localStorage." Below this is a sub-navigation bar with DASHBOARD (selected), ACCOUNTS, CONTACTS, SEND, and HELP. A search bar says "Search your wallet" with a magnifying glass icon. The central part of the screen displays two main sections: "Recent Transactions" and "BTC > USD - Market Conditions".

Recent Transactions

1.066 Bitcoin (Testnet) to My First Wallet	21 DAYS AGO
0.01066 Bitcoin (Testnet) from My First Wallet	22 DAYS AGO
0.001 Bitcoin from My First Wallet	22 DAYS AGO
0.1066 Bitcoin (Testnet) to My First Wallet	22 DAYS AGO
0.01 Bitcoin to My First Wallet	22 DAYS AGO
14 Dogecoin to My First Wallet	22 DAYS AGO
2 Dogecoin from My First Wallet	22 DAYS AGO

BTC > USD - Market Conditions

US\$ 677.06	218,458
BTC to USD	Daily TXs
1.4 Billion	2,056,343.22
Daily US\$ Sent	Daily BTC Sent
15.7 Million	10.7 Billion
BTC Discovered	Market Cap US\$

WE'VE BEEN WORKING WITH AND TRAINING LEADING BRANDS



Suruhanjaya Sekuriti
Securities Commission
Malaysia



BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA





neuroware

BEYOND THE FINANCIAL BOUNDARIES OF BLOCKCHAINS

EMAIL OUR TEAM DIRECTLY - founders@neuroware.io