DATASTAX
DEVELOPERS

# Astra Block: Real-Time Indexed Blockchain Data To Build Web3 Dapps

## Build Web Apps that are off the BlockChain

# ❯ Cédrick Lunven

## Director of Developer Relations

clunven

clunven

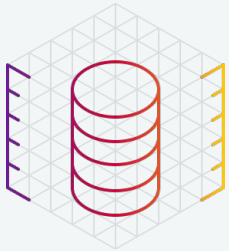
clun



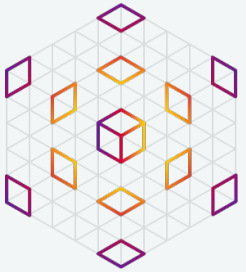




- Trainer
- Public Speaker
- Developers Support
- Developer Applications
- Developer Tooling
- Creator of ff4j (ff4j.org)
- Maintainer for 8 years+
- Implementing APIs for 8 years



# Agenda



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Live and Hands-On

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Create your instance

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Hands-on

**06**

**What's next?**
Homework, next sessions

# Advocate Team


Cedrick Lunven

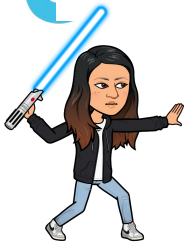

David Dieruf


Aaron Ploetz


Kirsten Hunter

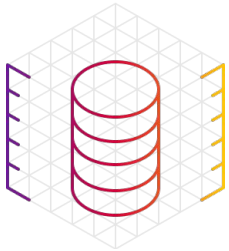

Artem Chebotko


Aleksandr Volochnev

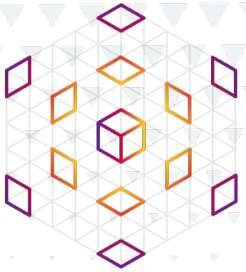



Mary Grygleski

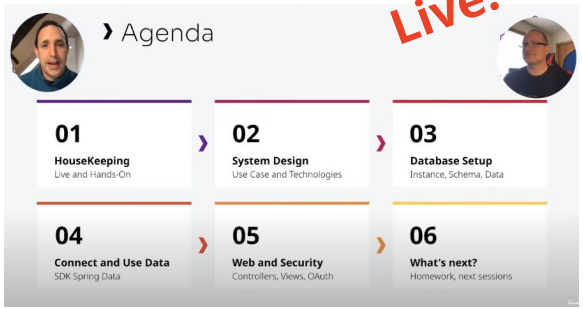

Stefano Lottini



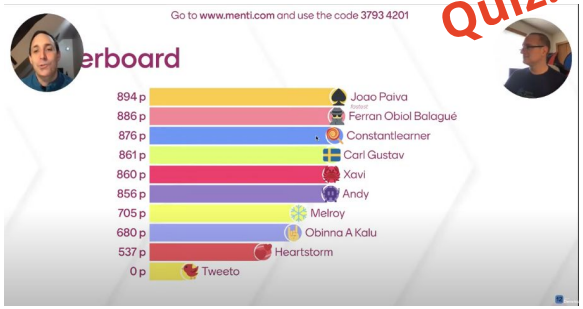
# ❯ Live & Interactive



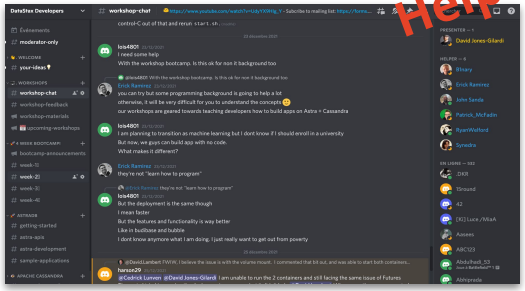
youtube.com/DataStaxDevs




!menti




!discord



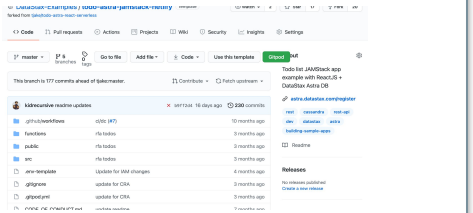

YouTube

Mentimeter

Discord (#workshop-chat)

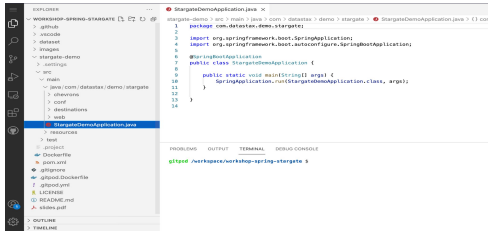
# Hands-on housekeeping

**Source code + exercises + slides**



GitHub !github

**IDE**



Gitpod !gitpod

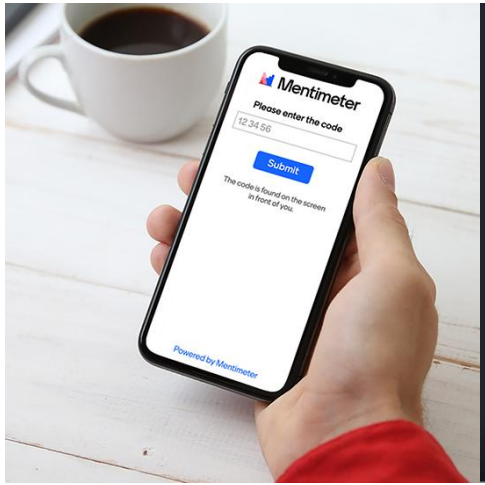
**Database + Api + Streaming**


DATASTAX ASTRA DB !astra

Nothing to install !

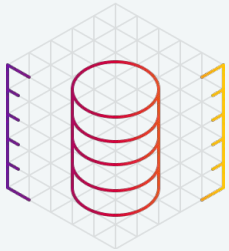
# "Menti" for survey and quiz

!menti





**menti.com** ⇒ enter code
Don't answer in YT chat
Look at phone (not at YT)
Keep it open for later



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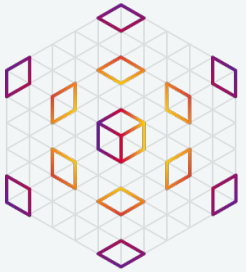

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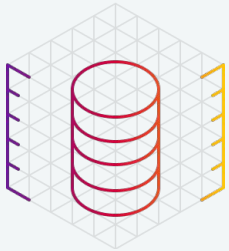
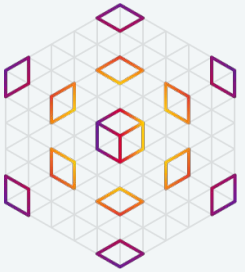
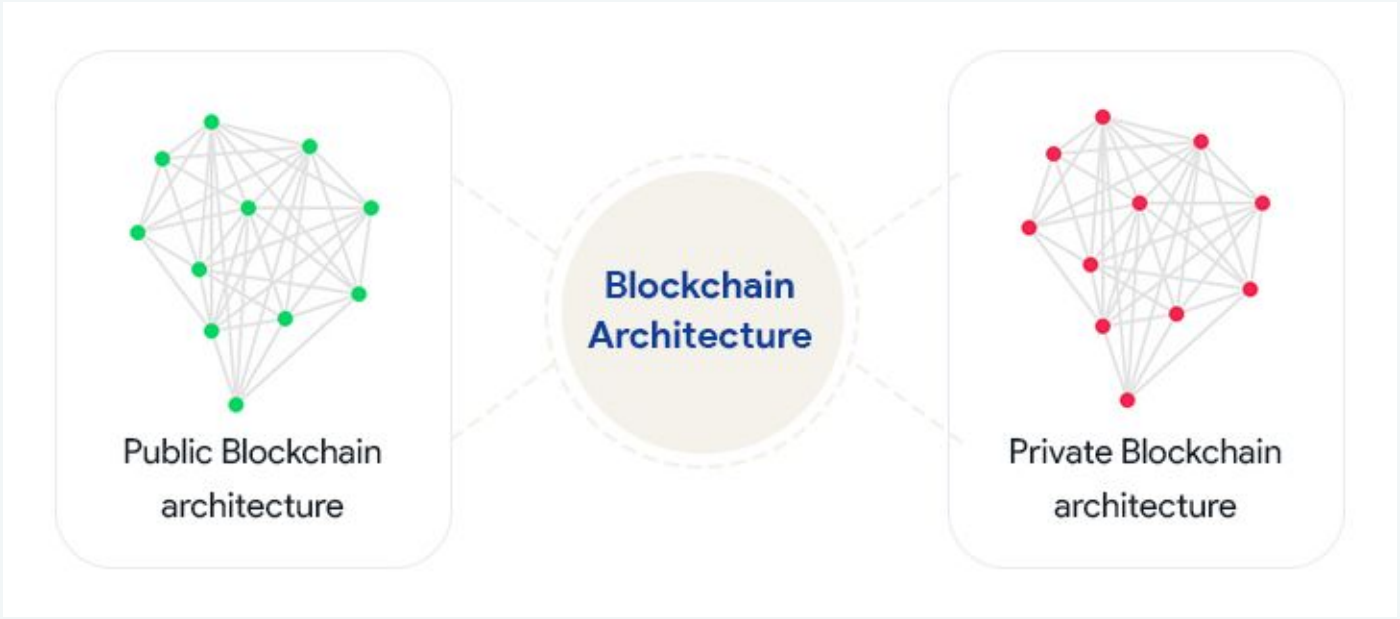


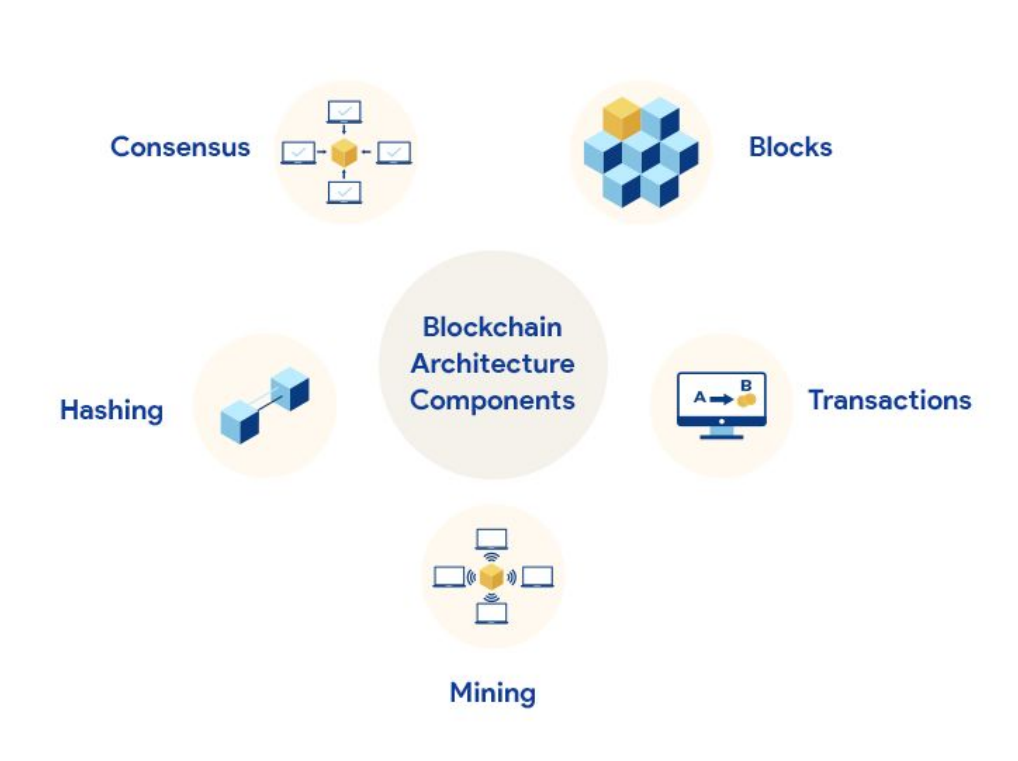
# Blockchain

**Decentralized**
**Distributed Ledger**
**Chain of blocks**

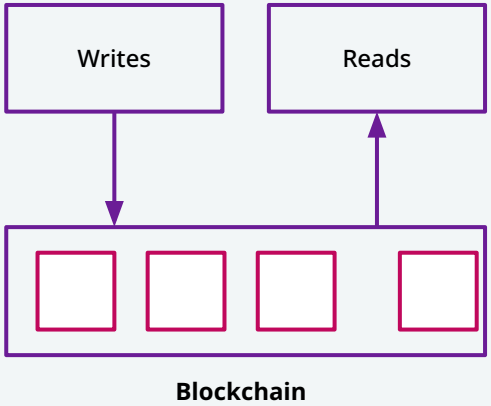


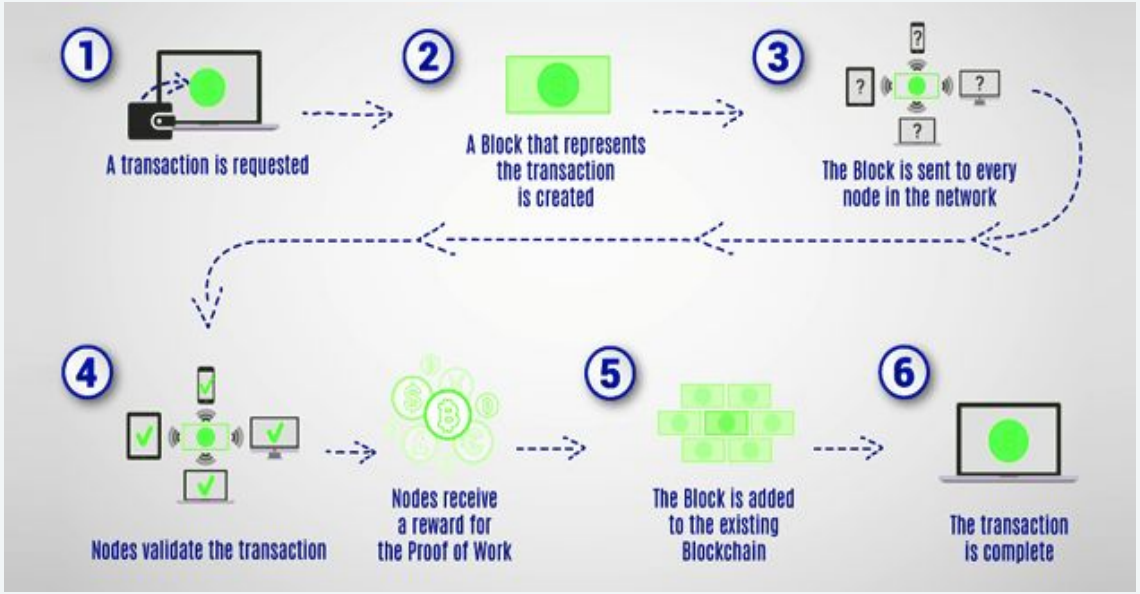


# Blockchain Overview



# How it works


Writes
Reads
Blockchain
Consensus
Transaction Processing
Validated Transactions


1
A transaction is requested
2
A Block that represents the transaction is created
3
The Block is sent to every node in the network
4
Nodes validate the transaction
Nodes receive a reward for the Proof of Work
5
The Block is added to the existing Blockchain
6
The transaction is complete

# Use cases


## NFTs / Identity

Unique, indivisible and untamperable tokens that can represent real world or intangible / digital assets. Identity services are a potent use case.

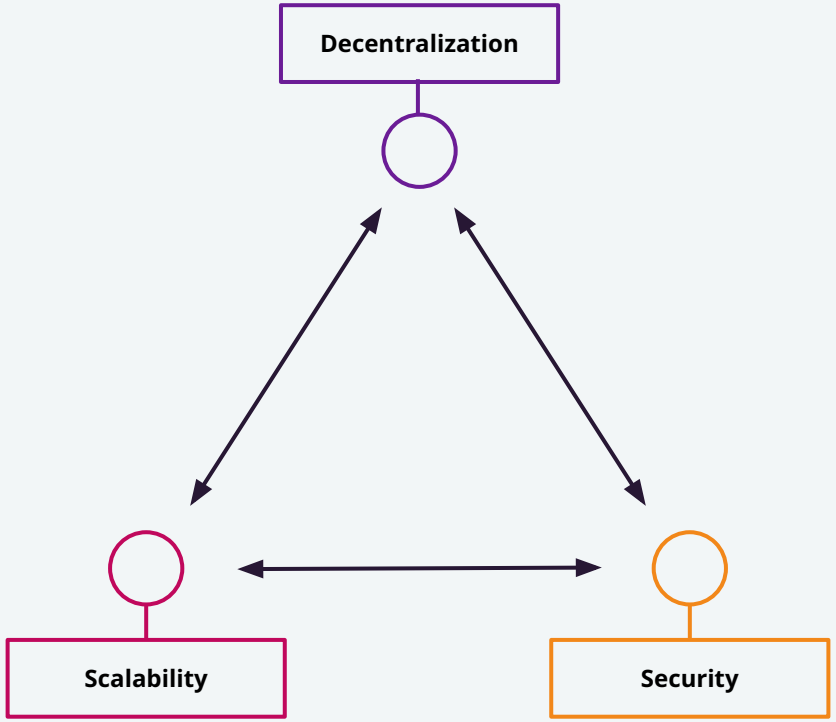
## DeFit

Loans, deposits, remittances, asset swaps, trade finance are emerging decentralized finance use cases based on secure distributed ledgers.

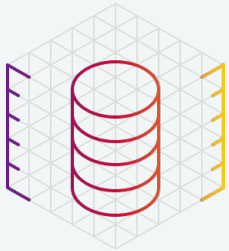
## Gaming, Social, Media

Gaming, social and online media are early but show significant activity.

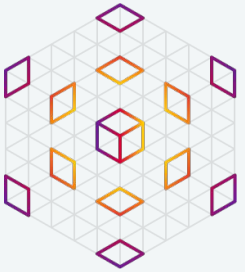
# The blockchain dilemna

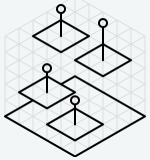



'Off-Chain' data stacks help solve **immediate scale** and adoption challenges for operational data services



# ❯ Blockchain challenges limit impact





## Performance

Queries often require complex orchestration of multiple API calls, eroding performance for key apps

## Data Inconsistency

Distributed ledgers extended data consistency resolution times gives rise to inconsistent data


## Costs

Data storage costs escalate with massive volume of blockchain, limiting business impact

## Specialized Skills

Raw blockchain data requires significant cleansing and decoding

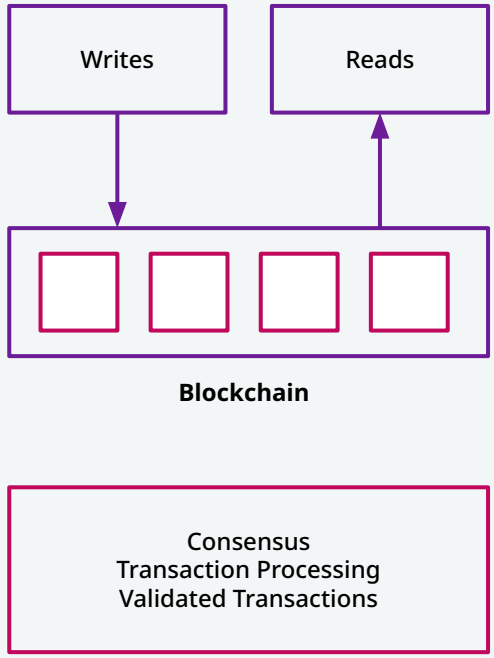
## Security

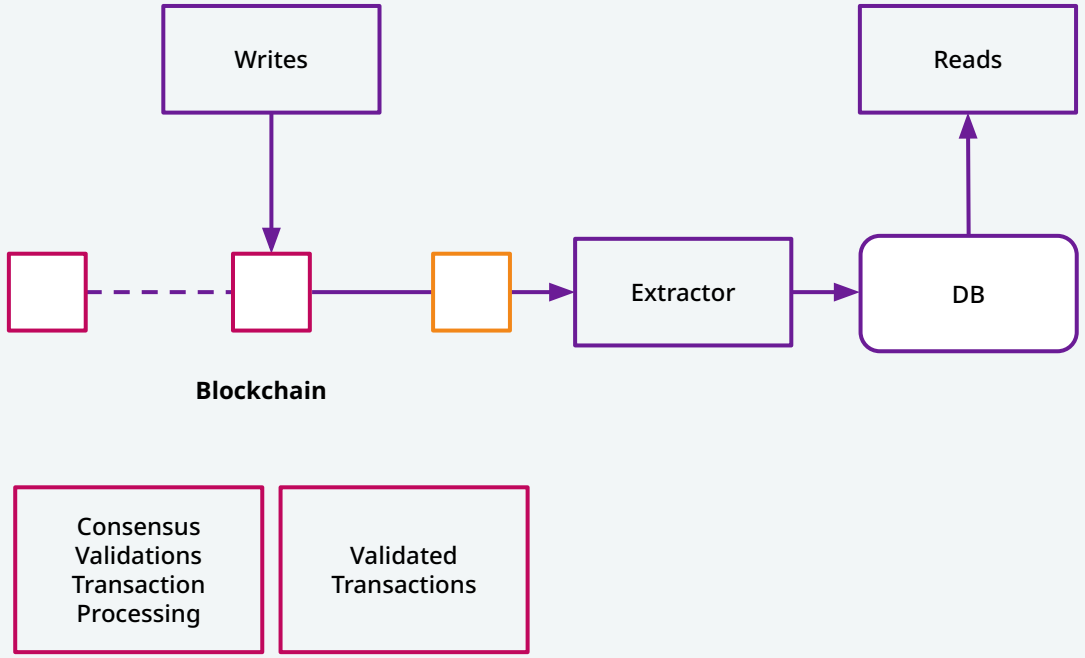
Privacy, compliance, governance, and data sovereignty concerns keep sensitive data from being stored on-chain

## Complex Infrastructure

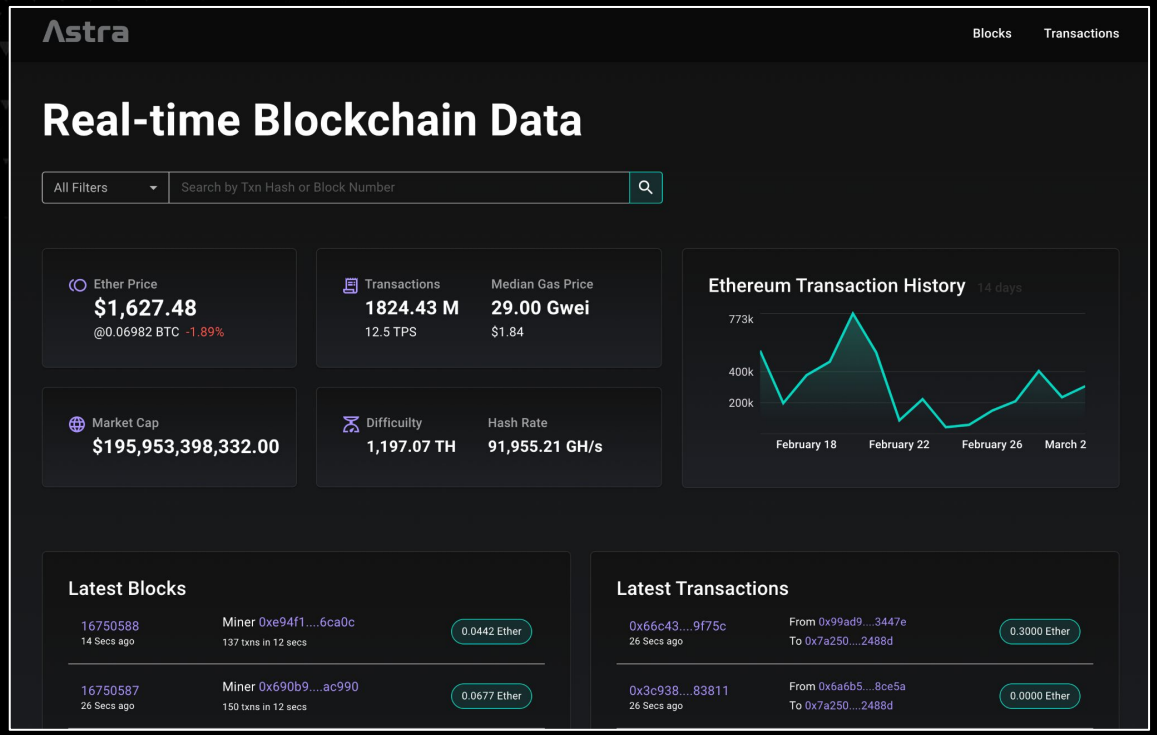
Blockchain node configuration and ops time-consuming, expensive and undifferentiated

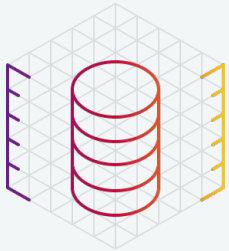
# Patterns in Web3 Architecture



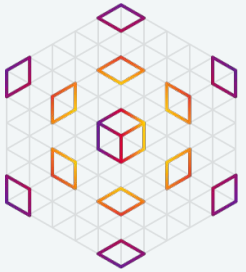



# eth-explorer.datastax.com

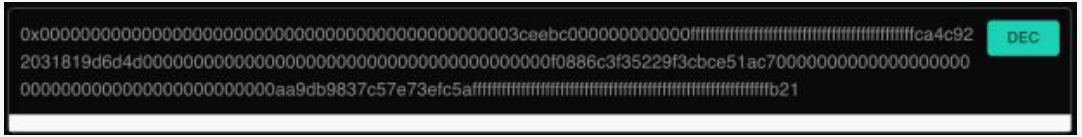


# ❯ Developer Datasets

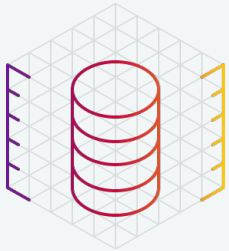


- Blocks
- Contracts
- Logs
- Token Transfers
- Traces
- Transactions
- NFTs
- Dashboard Analytics





https://docs.datastax.com/en/astra-streaming/docs/astream-ethereum.html#_data_models



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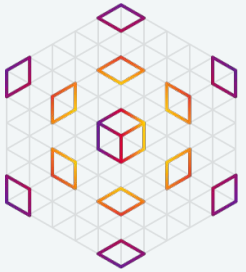

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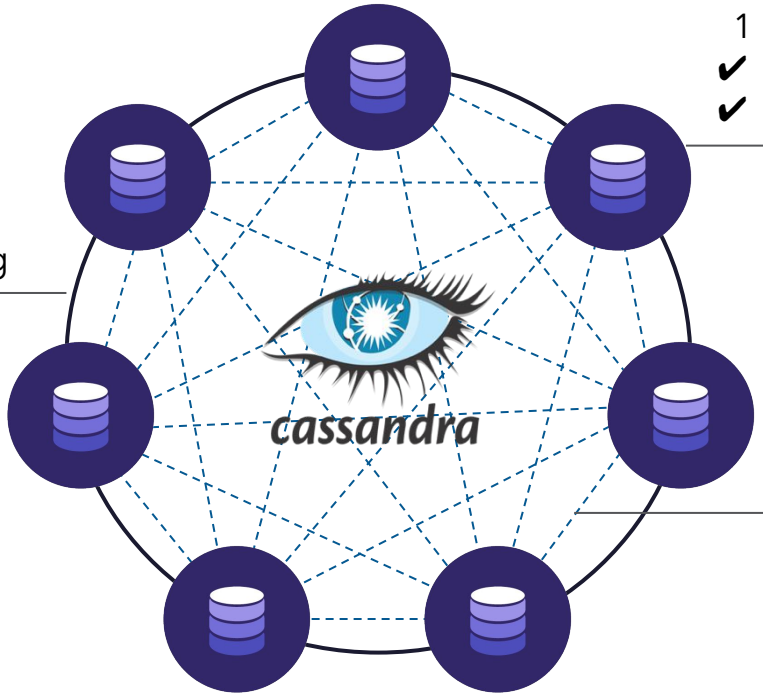
# › **Nosql** Distributed database

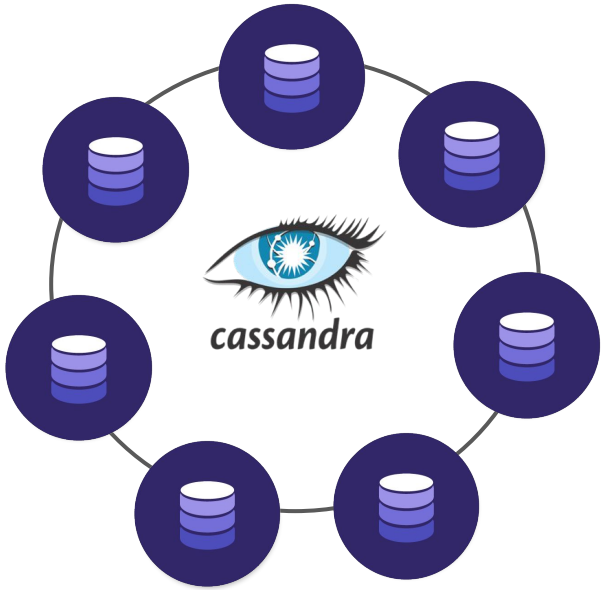



1 Installation = 1 NODE
- ✔ Capacity = ~ 2-4TB
- ✔ Throughput = LOTS Tx/sec/core

DataCenter (DC) | Ring

Communication:
- ✔ Gossiping
- ✔ No Master (peer-to-peer)

# ❯ NoSQL **Distributed** Database

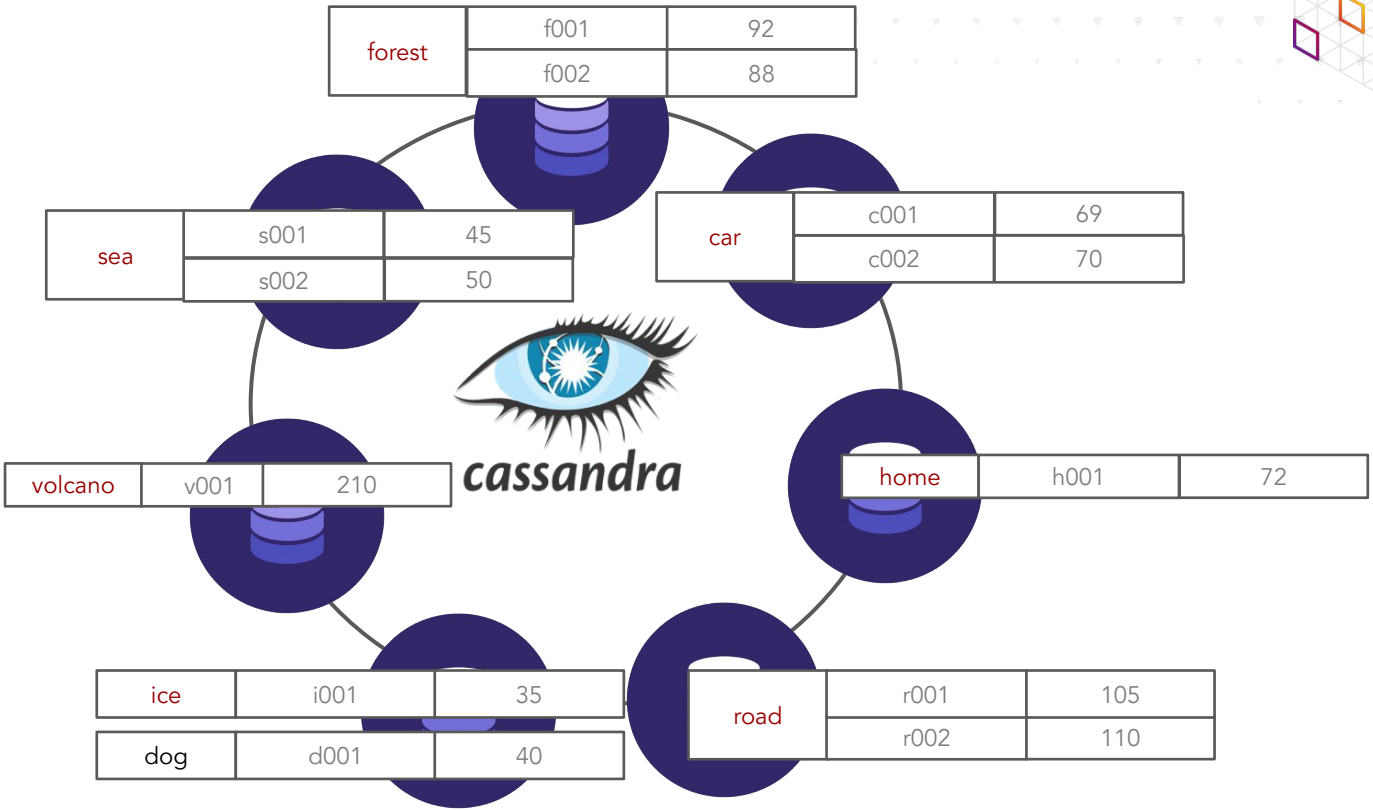



| sensors_by_network | | |
|---|---|---|
| network | sensor | temperature |
| forest | f001 | 92 |
| forest | f002 | 88 |
| volcano | v001 | 210 |
| sea | s001 | 45 |
| sea | s002 | 50 |
| home | h001 | 72 |
| car | c001 | 69 |
| car | c002 | 70 |
| dog | d001 | 40 |
| road | r001 | 105 |
| road | r002 | 110 |
| ice | i001 | 35 |

Partition Key

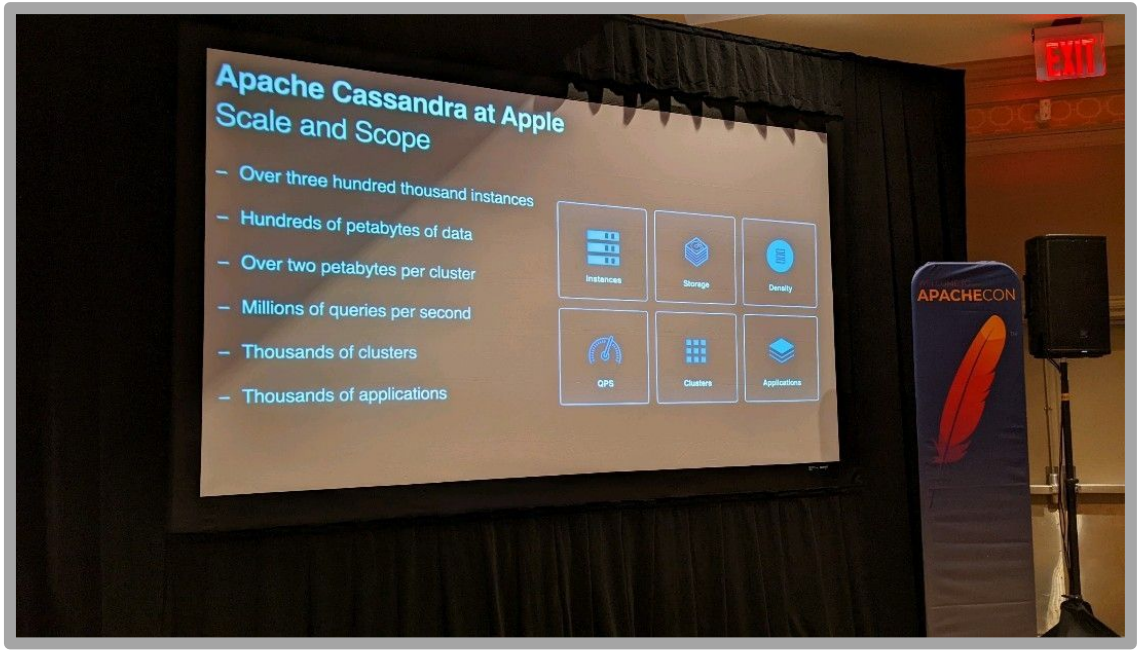
Primary Key

# NoSQL **Distributed** Database

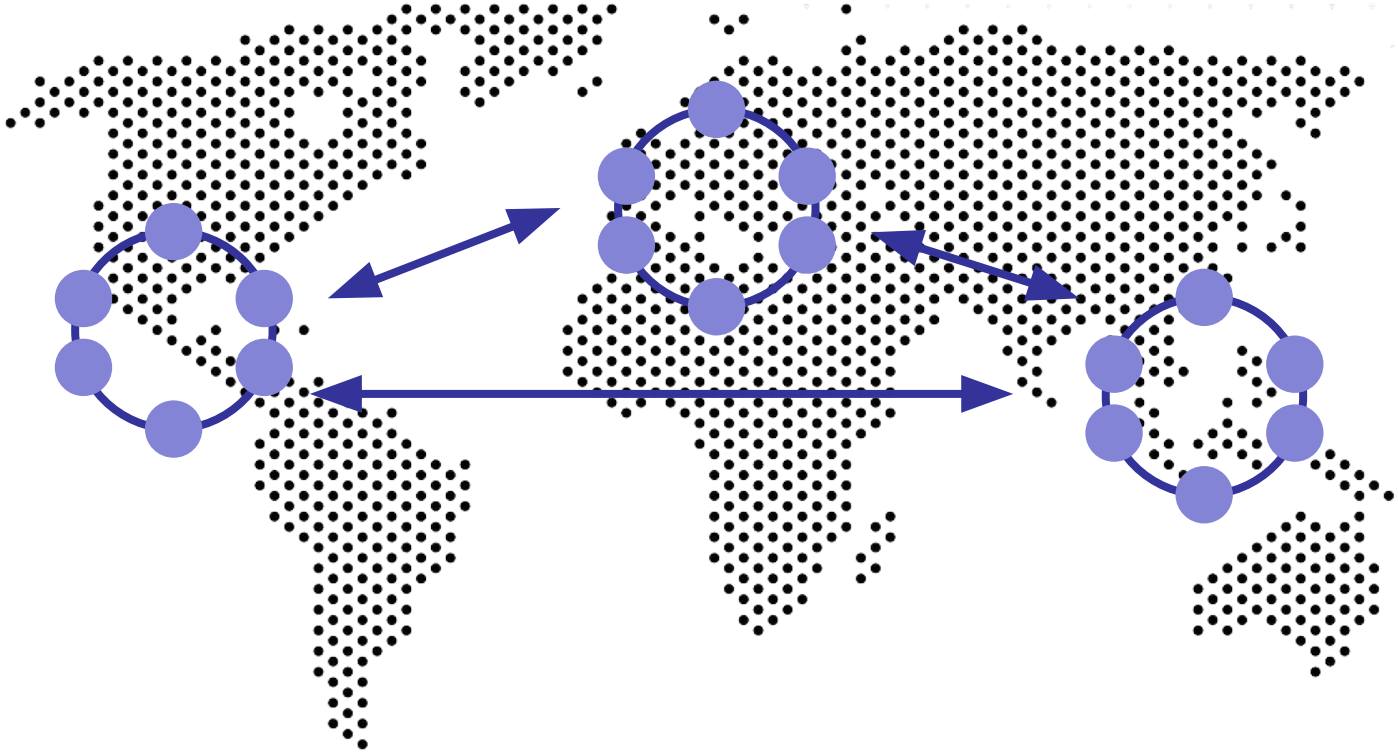


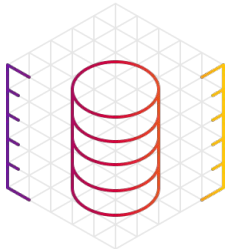
# Scalability

300 000+ nodes

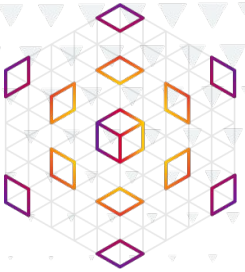


# › **Geographically** distributed





# Apache Cassandra



## High Availability

**Always On**

Every second of downtime translates into lost revenue

## Linear Scalability

**Hyper Scalability**

Millions of operations per day, hour, or second

## Low Latency

**Faster Pace**

Every millisecond of latency has consequence

## Global Distribution

**Data Everywhere**

On-premises, hybrid, multi-cloud, centralized, or edge

# DATASTAX ASTRA

**CQL API**
***Compatibility***
*It is Apache Cassandra !*

**PULSAR CLIENT**
***Compatibility***
*It is Apache Pulsar !*

**GRAPHQL API**
***Discoverability, Flexibility***
*Read only what you need*

**JAVA MESSAGING SYSTEM**
***Interoperability***
*Plug any Existing Java Application*

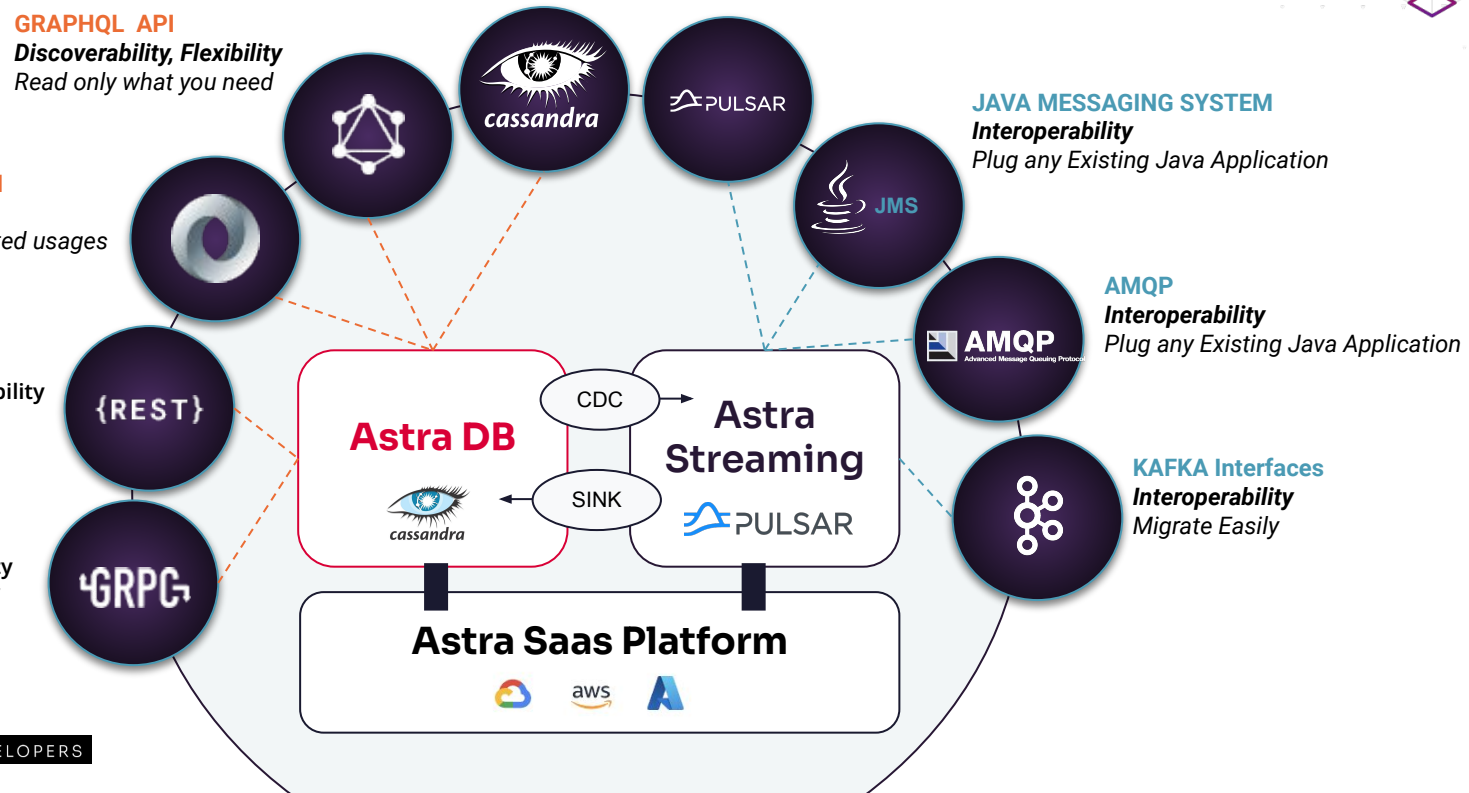
**DOCUMENT API**
***Flexible Schema***
*Document-Oriented usages*

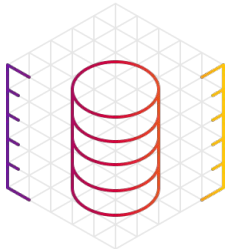
**AMQP**
***Interoperability***
*Plug any Existing Java Application*

**REST API**
**Stateless, Interoperability**
CRUD for Cassandra

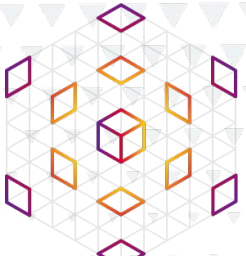
**KAFKA Interfaces**
***Interoperability***
*Migrate Easily*

**GRPC API**
**Performance, Interoperability**
Execute cql in the fastest way

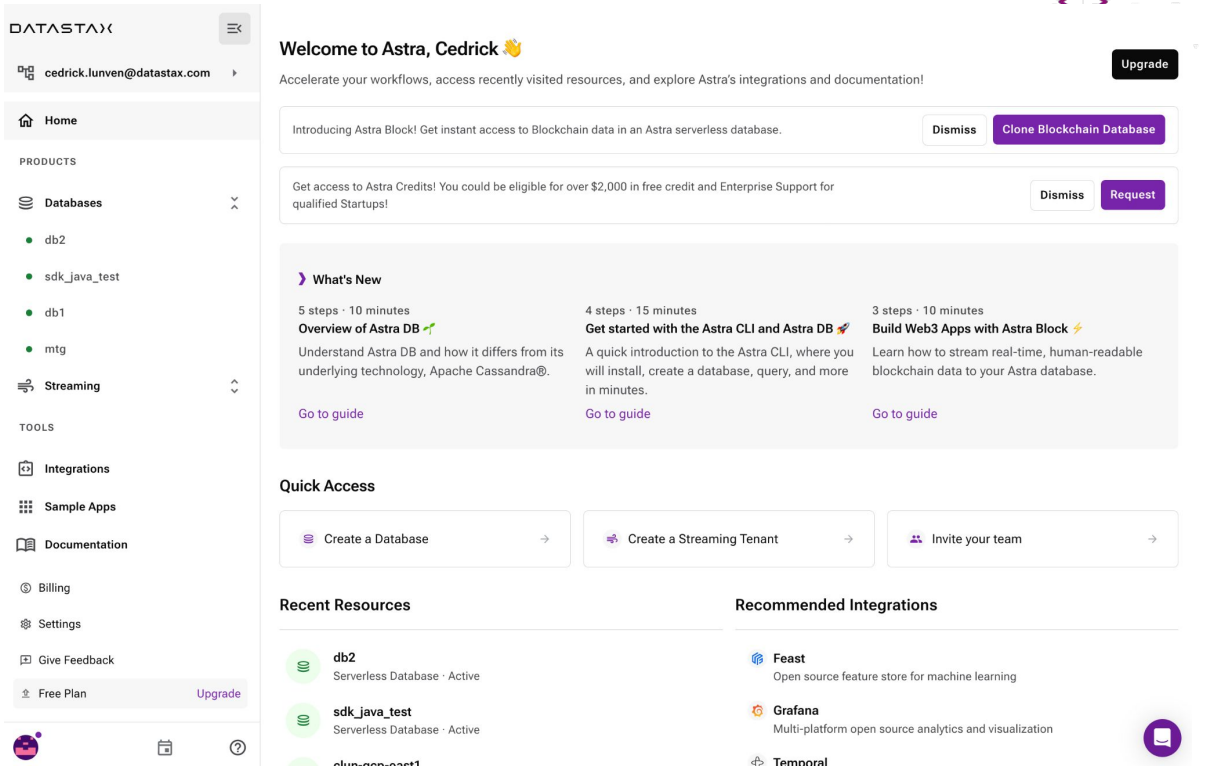




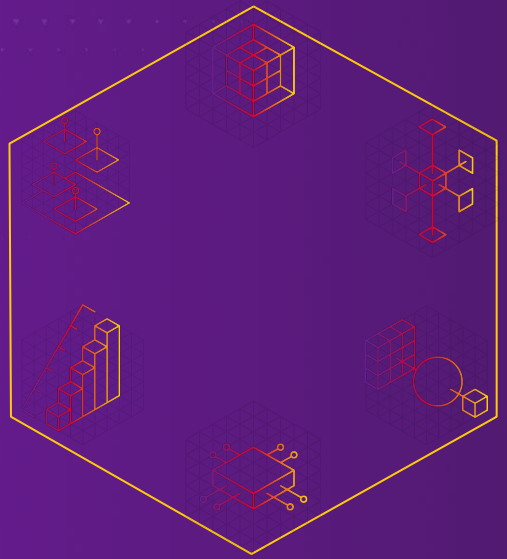
DATASTAX | ASTRA DB



# Multi-cloud Database-as-a-Service built on Apache Cassandra




DATASTAX DEVELOPERS



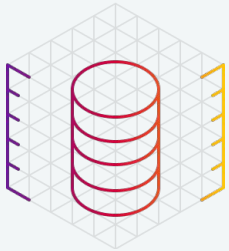
# Lab 1

## Database Initialization

**1.1 Create Astra Instance**

**1.2 Create Astra Token**

github.com/datastaxdevs/workshop-astra-block



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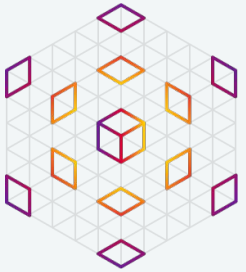

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# ❯ Astra Block

**Real-Time ETL**
Skip building your own real-time capable indexer

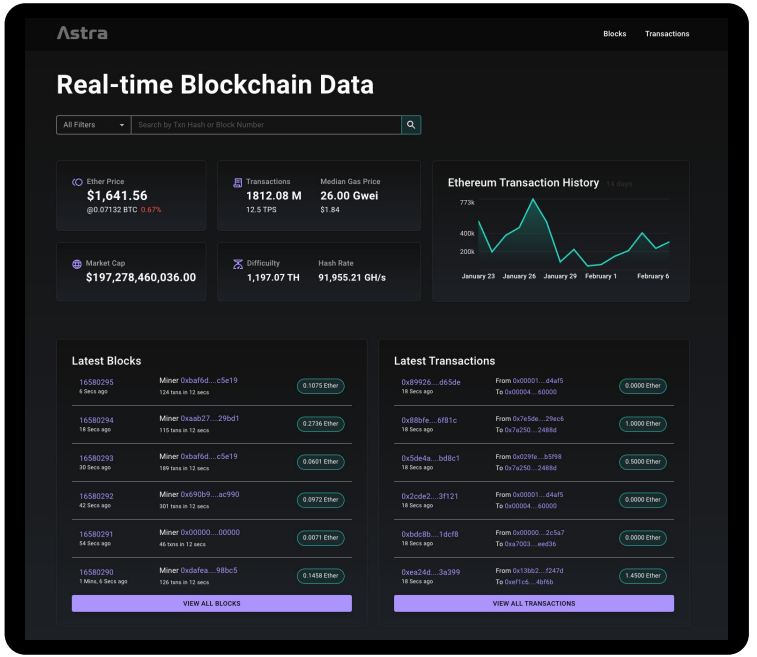
**Auto-decoded Chain Data**
Encoded Hex data is automatically made human readable

**Enriched Chain Data**
WhatsABI, NFT Metadata, Etherscan data enhances raw chain data into developer-ready dataset(s)

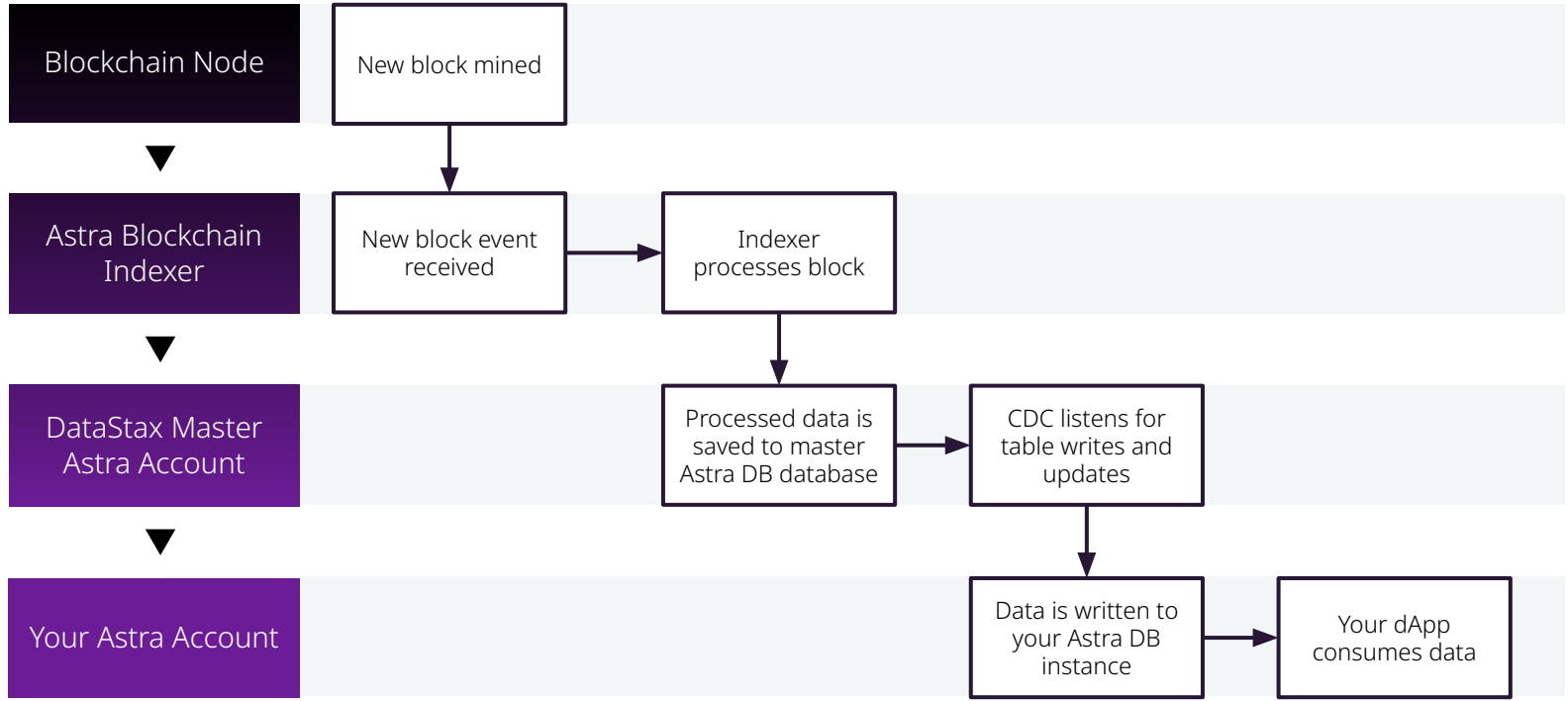
**Data Models Included**
Get developers productive instantly with using a robust,  standard database query language and the confidence of Cassandra data models designed by the experts

**Built on Apache Cassandra**
Handle Blockchain data volume today, and tomorrow, at real-time query speeds for your web3 apps on any cloud

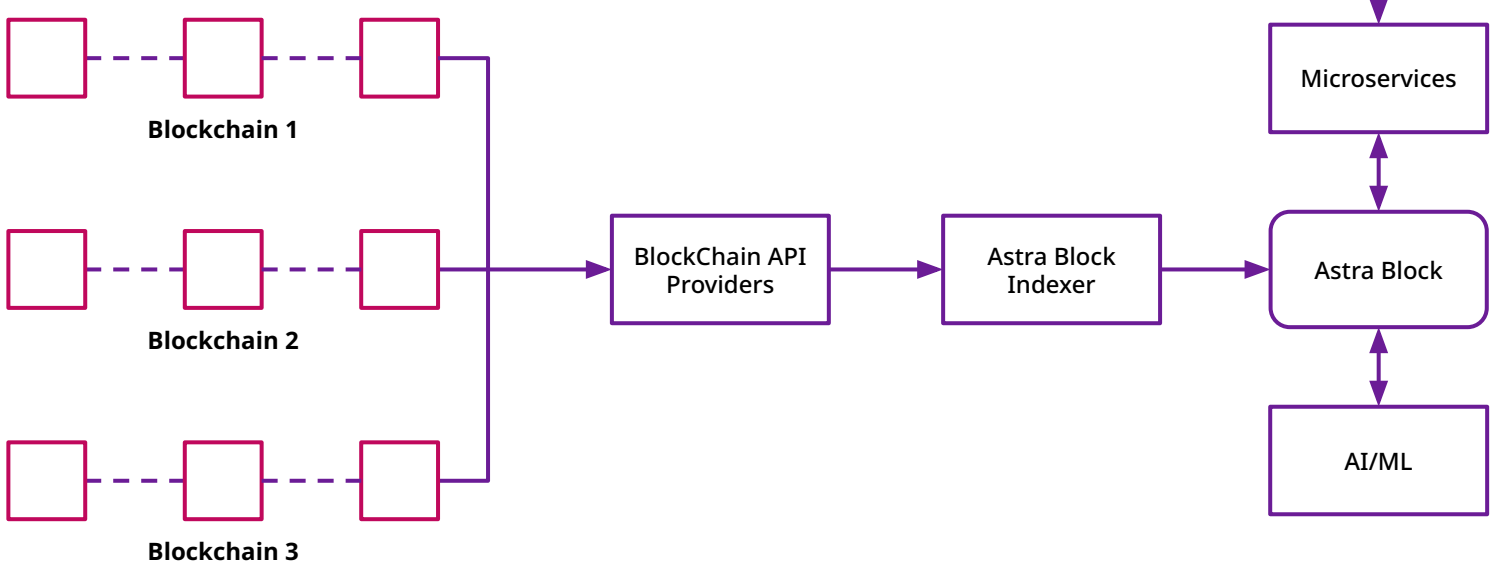
**Built on Astra DB**
Skip building, provisioning, configuring and operating your own blockchain node infrastructure with a serverless, autoscaling DBaaS built on Apache Cassandra



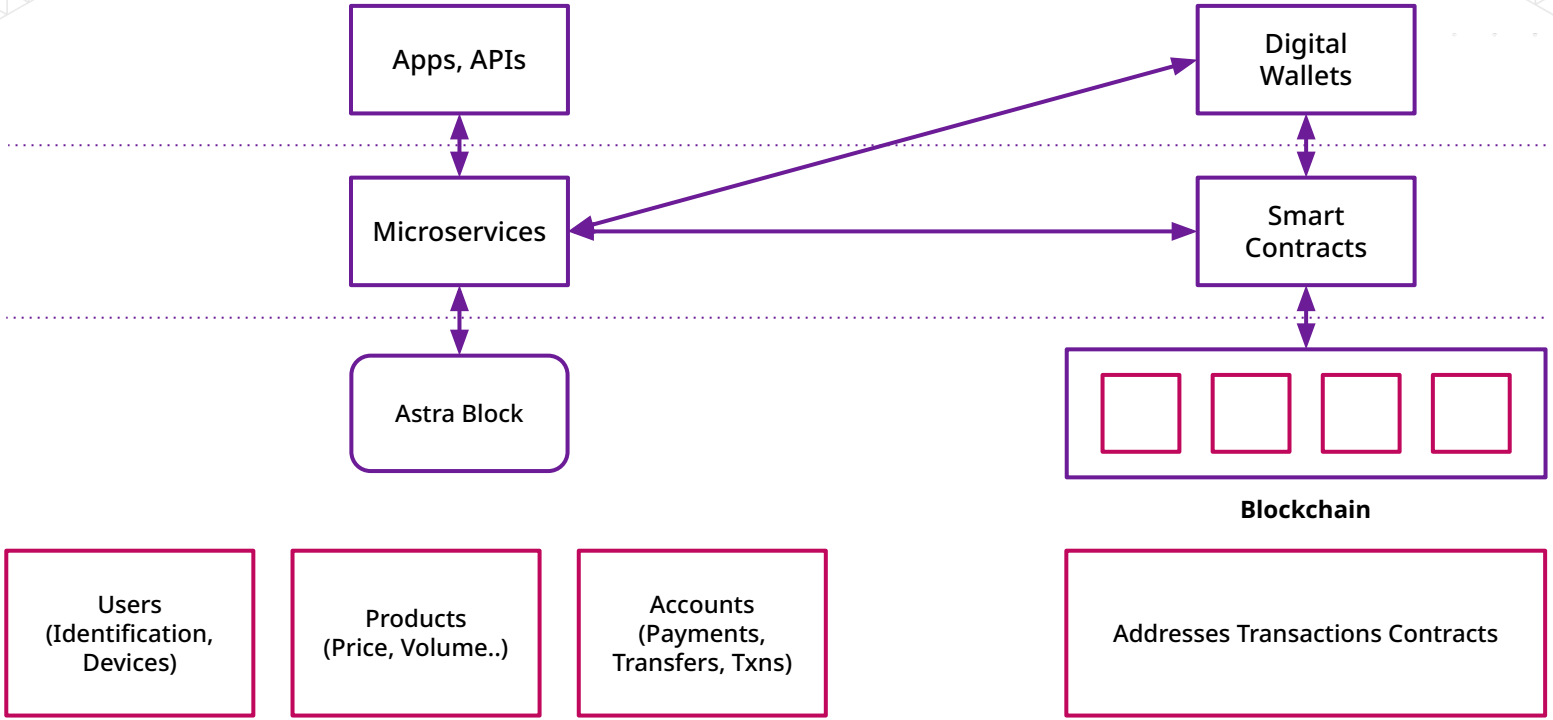
# How it works ?


Blockchain Node
New block mined
Astra Blockchain Indexer
New block event received
Indexer processes block
DataStax Master Astra Account
Processed data is saved to master Astra DB database
CDC listens for table writes and updates
Your Astra Account
Data is written to your Astra DB instance
Your dApp consumes data

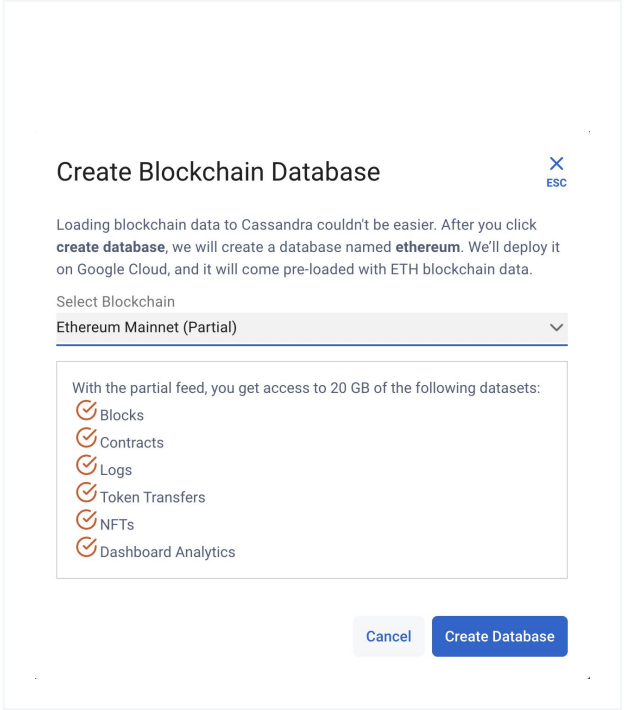
# Data Analysis Use Case

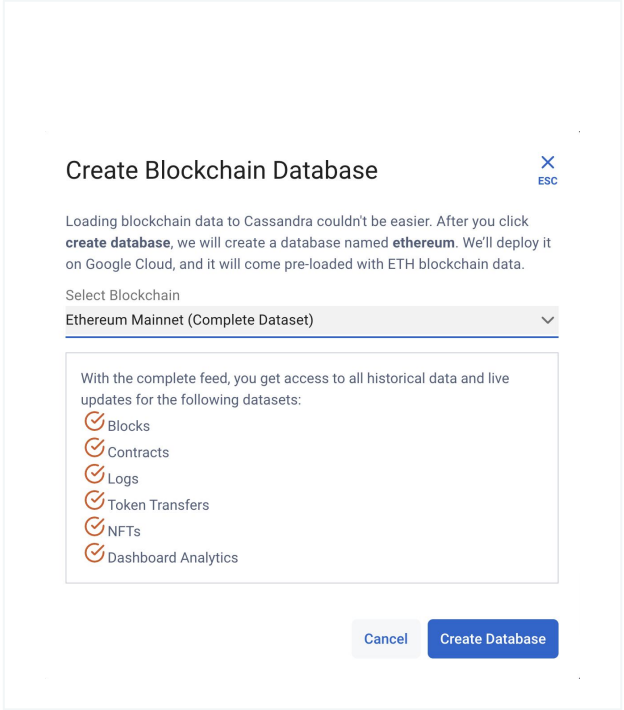


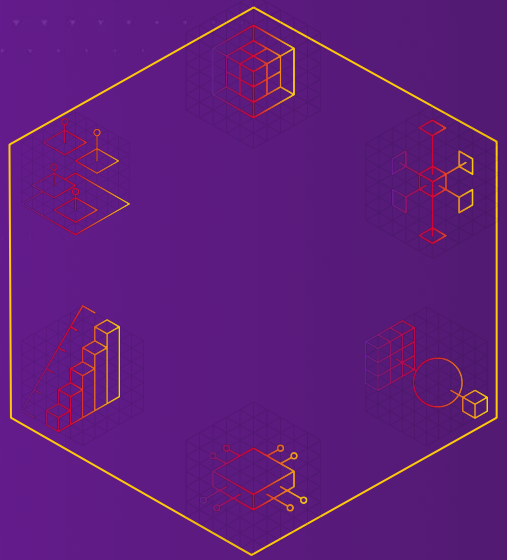
# Transactions Use-case Operational



# Astra Block Offerings





# Lab 2

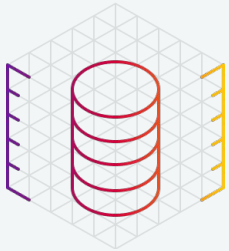
## Astra Block QuickStart

**2.1 Request Access**

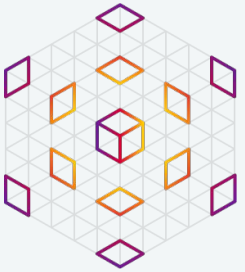
**2.2 Create Astra Block**

**2.3 First Request**

github.com/datastaxdevs/workshop-astra-block



# Agenda



**01**

**HouseKeeping**
Live and Hands-On

**02**

**Blockchain and Web3**
Use Cases and Opportunities

**03**

**Cassandra and Astra DB**
**Scalable Database**

**04**

**Astra Block**
Create your instance

**05**

**Ethereum Block Explorer**
Hands-on

**06**

**What's next?**
Homework, next sessions

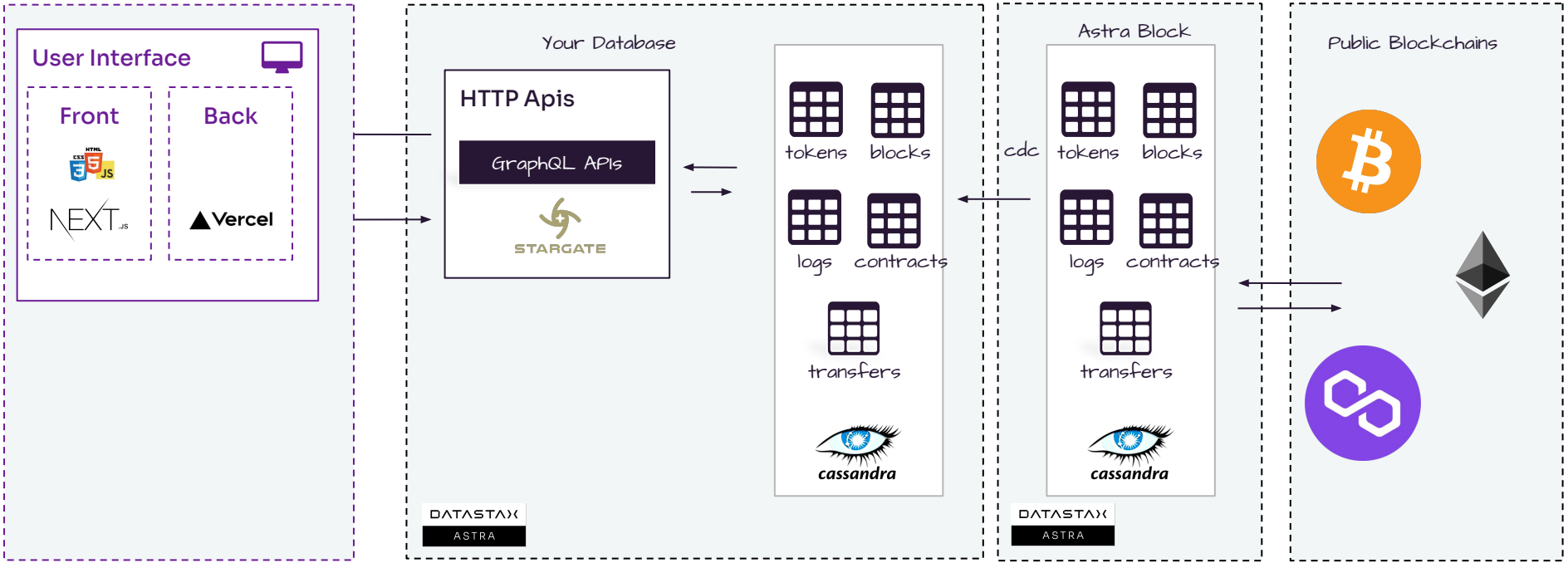
# ❯ Alex Leventer

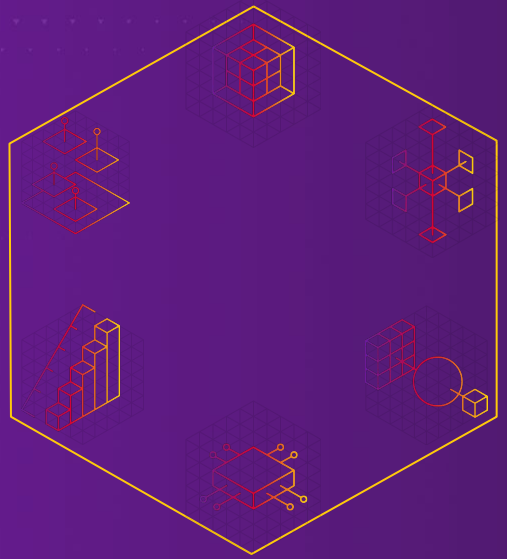
## Astra Block Product Lead

A little about you

- Javascript/Typescript Guru
- Open Source Web3 Maintainer
- Previously worked on Product-Led-Growth and Digital Marketing @DataStax

# Architecture





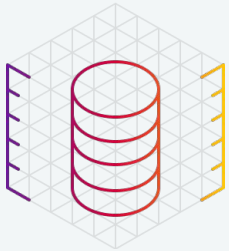
# Lab 3

## Ethereum Block Explorer

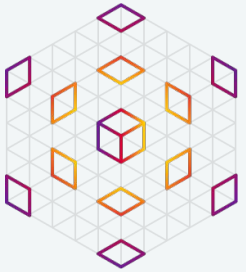
**3.1 Setup the app**

**3.2 Start the application**

github.com/datastaxdevs/workshop-astra-block



# Agenda



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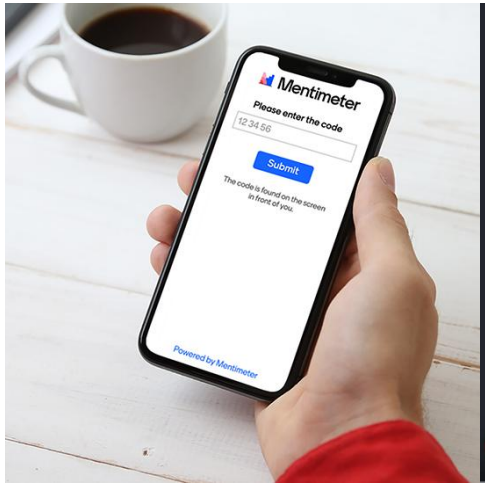
Homework, next sessions

# "Menti" for survey and quiz

!menti





**menti.com** ⇒ enter code
Don't answer in YT chat
Look at phone (not at YT)
Keep it open for later

# Accelerate Delivery of Web3 Apps Today

**Available now:**

- Ethereum Blockchain
- Stream real-time copy of Ethereum blockchain to Astra DB

**Polygon Blockchain Support**

Stream real-time copy of Polygon blockchain to Astra DB

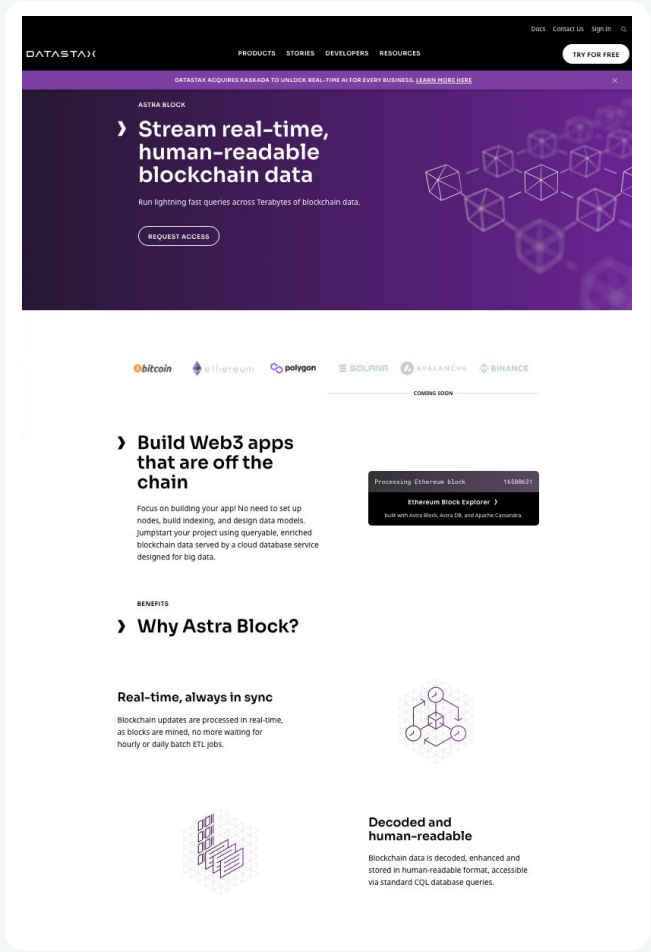
**Coming soon:**

- Solana Blockchain Support
- Stream real-time copy of Solana blockchain to Astra DB
- The Graph Subgraph Support
- Stream real-time copy of TheGraph.com subgraphs directly to Astra DB

Click Here to Register

# Learn More

- Web3: What is It?
- Web2 vs. Web3: Explained
- What is Web3, Blockchain, NFTs.
- What is Ethereum?
- What is Blockchain technology?
- What is Web3.js?
- Why Web3 Needs Real Time Data
- Webinar: Ethereum gets real-time
- Product Page on DataStax.com
- Block Explorer Sample App
  - source code
- NFT Explorer Sample App
  - source code



# Register Now !

dtsx.io/cassandra-forward-meetup

# Stay in touch!

**Discord**: **dtsx.io/discord**

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# Thank You