

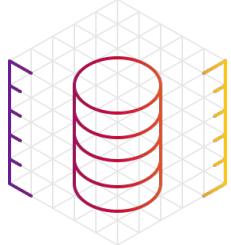
DATASTAX

DEVELOPERS

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

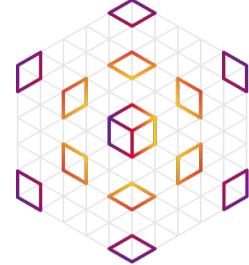
Build Web Apps that are off the BlockChain



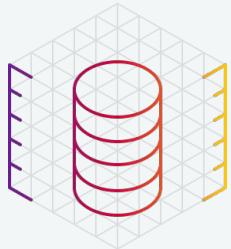


# › Cédrick Lunven

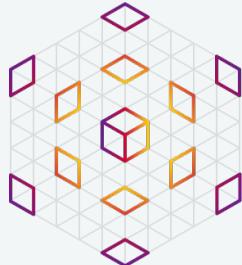
## Director of Developer Relations



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



# › Agenda



**01**

**HouseKeeping**  
Live and Hands-On

**02**

**Blockchain and Web3**  
Use Cases and Opportunities

**03**

**Cassandra and Astra DB**  
Specifications and Hands-ON

**04**

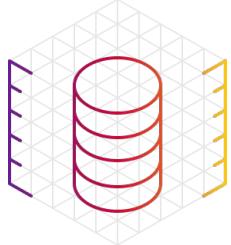
**Astra Block**  
Create your instance

**05**

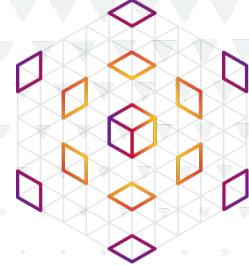
**Ethereum Block Explorer**  
Hands-on

**06**

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



# Advocate Team



Cedrick  
Lunven



David  
Dieruf



Aaron  
Ploetz



Kirsten  
Hunter



Artem  
Chebotko



Aleksandr  
Volochnev

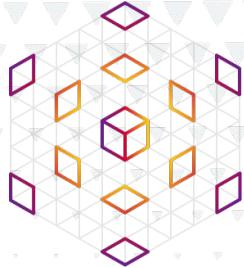
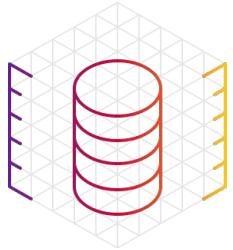


Mary  
Grygleski



Stefano  
Lottini

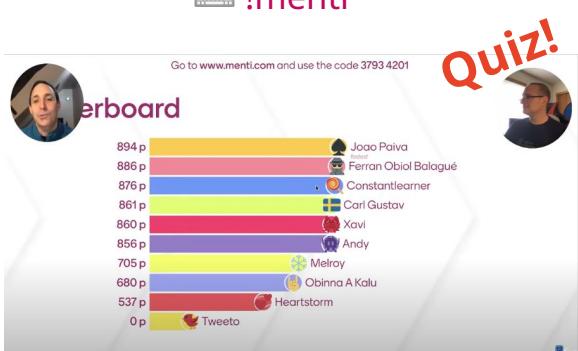
# » Live & Interactive



[youtube.com/DataStaxDevs](https://youtube.com/DataStaxDevs)

Live!

!menti



Quiz!

!discord

Help!



YouTube

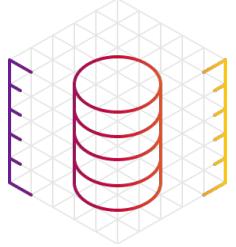


Mentimeter



Discord (#workshop-chat)

# › Hands-on housekeeping



Source code + exercises + slides

GitHub

!github

IDE

```
StargateDemoApplication.java
1 package com.datastax.demo.stargate;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5
6 @SpringBootApplication
7 public class StargateDemoApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(StargateDemoApplication.class, args);
11     }
12 }
```

Gitpod

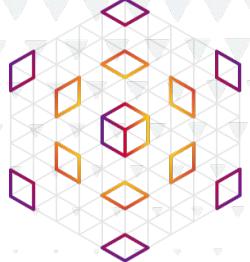
!gitpod

Database + Api + Streaming

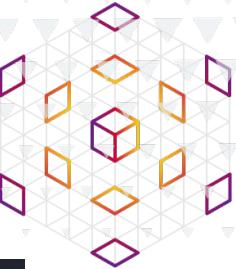
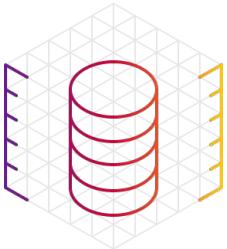
DATASTAX

ASTRA DB

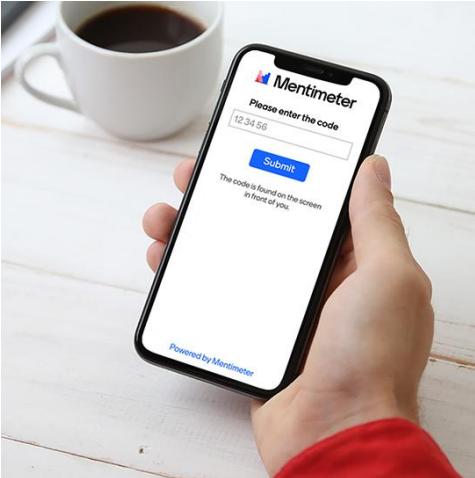
!astra



# ➤ "Menti" for survey and quiz



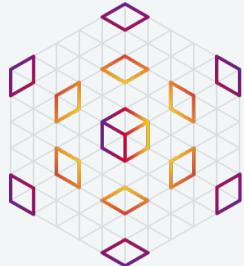
!menti



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



# › Agenda



**01**

## **HouseKeeping**

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## **Blockchain and Web3**

Use Cases and Opportunities

**03**

## **Cassandra and Astra DB**

Specifications and Hands-ON

**04**

## **Astra Block**

Create your instance

**05**

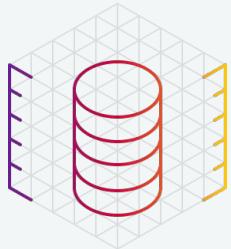
## **Ethereum Block Explorer**

Hands-on

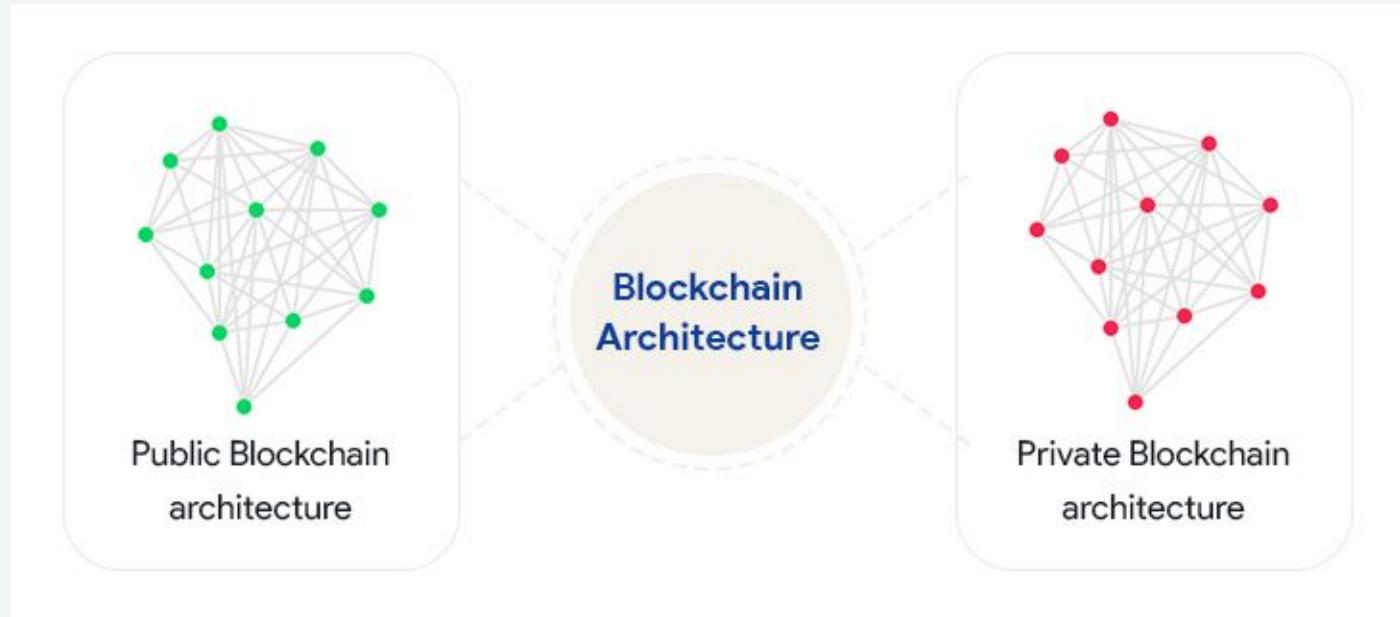
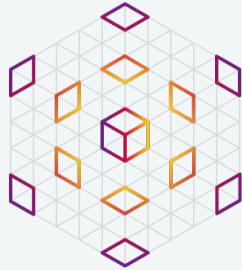
**06**

## **What's next?**

Homework, next sessions

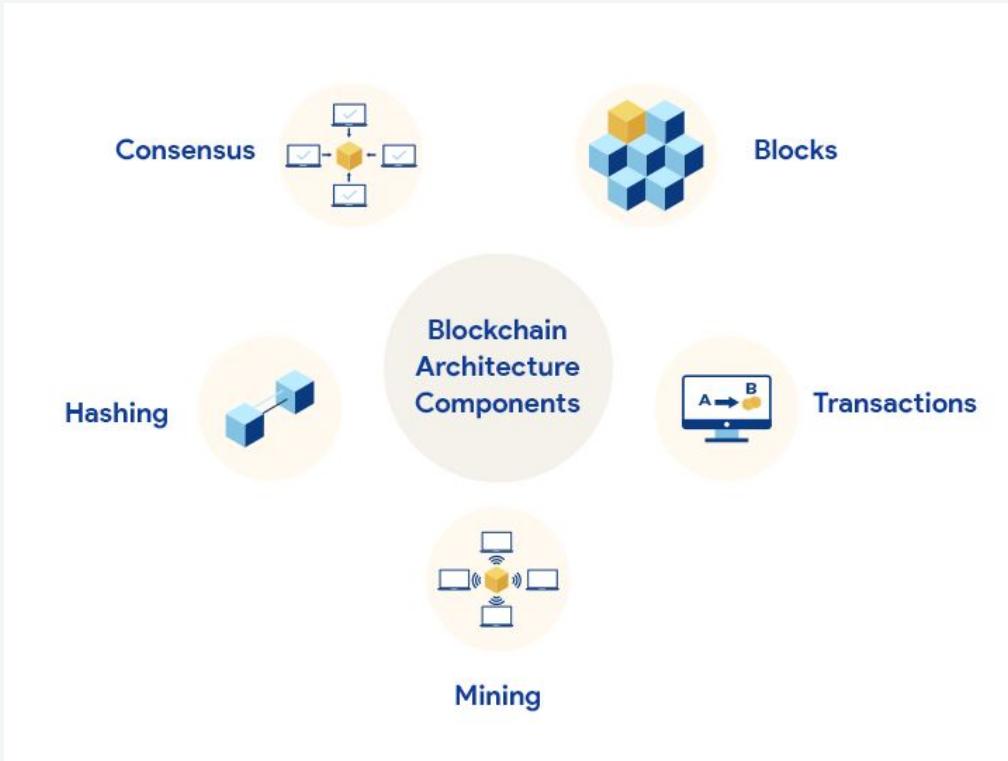
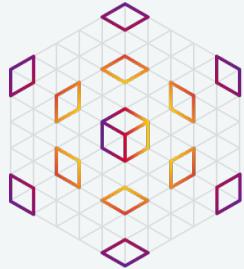


# ➤ Blockchain Decentralized Distributed Ledger Chain of blocks

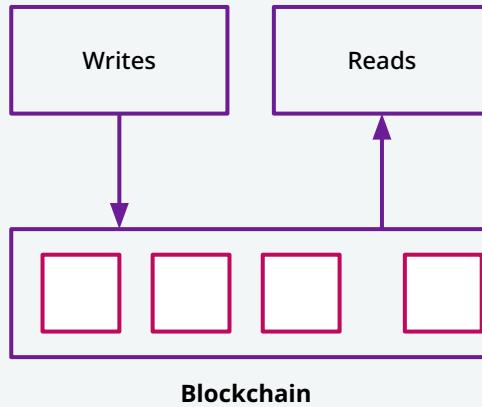
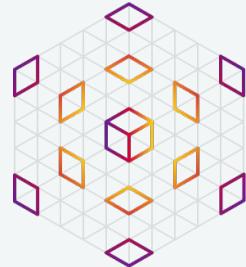
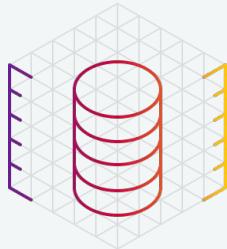




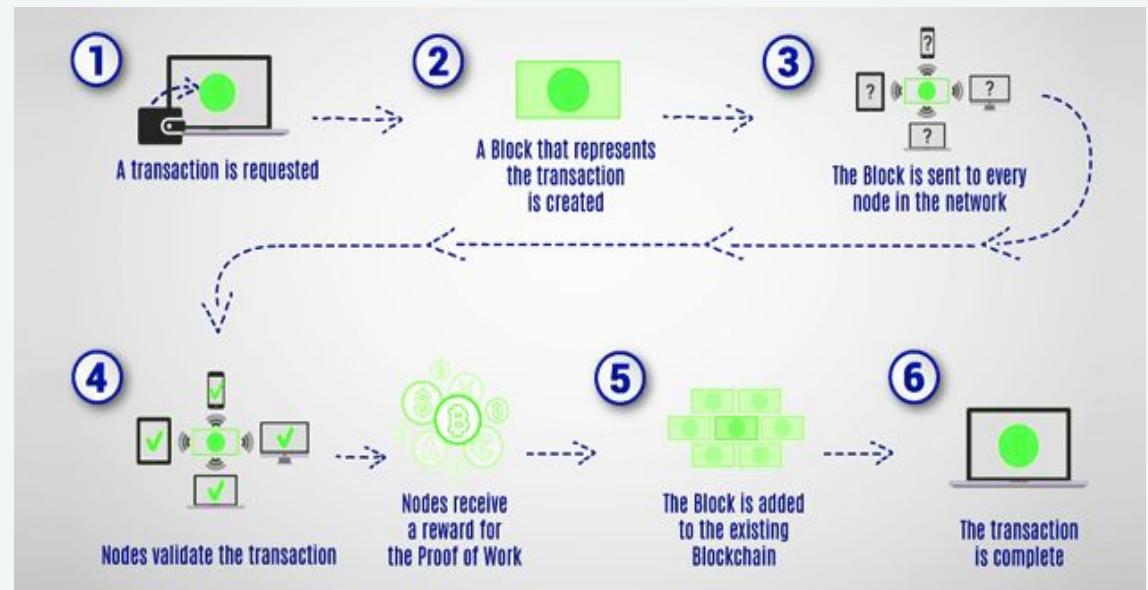
# › Blockchain Overview

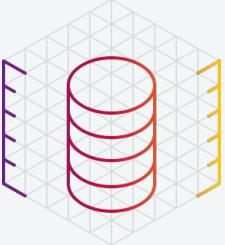


# ➤ How it works

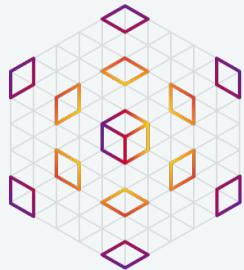


Consensus  
Transaction Processing  
Validated Transactions





# ➤ 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.



## DeFi

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

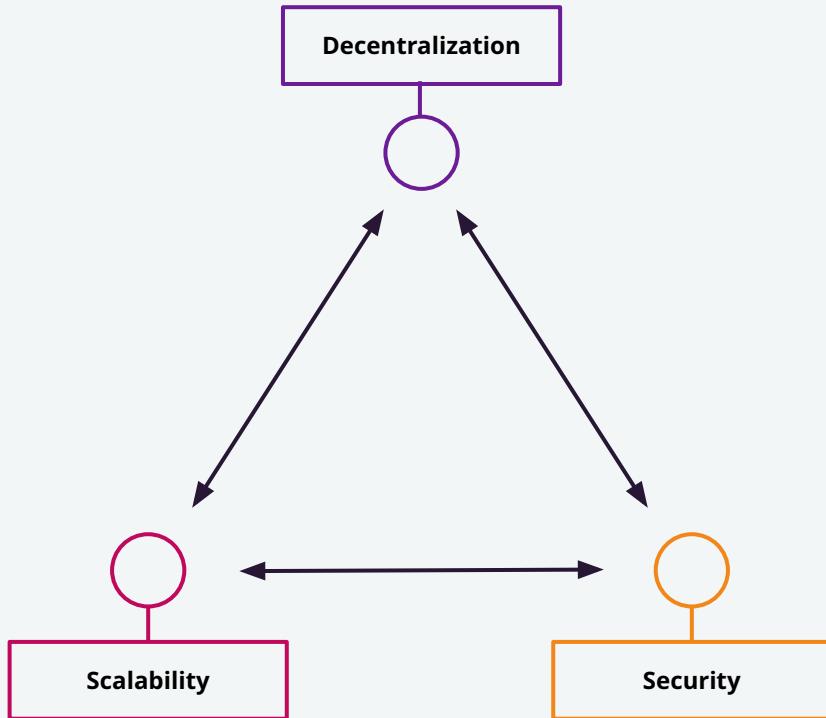
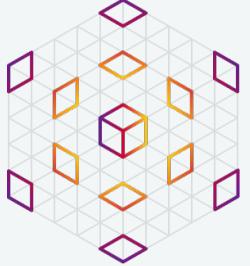


## Gaming, Social, Media

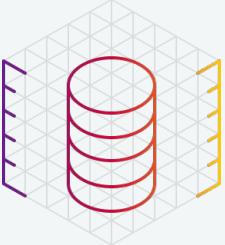
Gaming, social and online media are early but show significant activity.



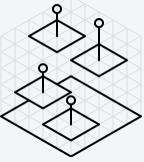
# › The blockchain dilemma



'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

---

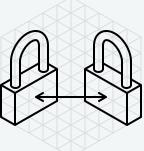
## Costs

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

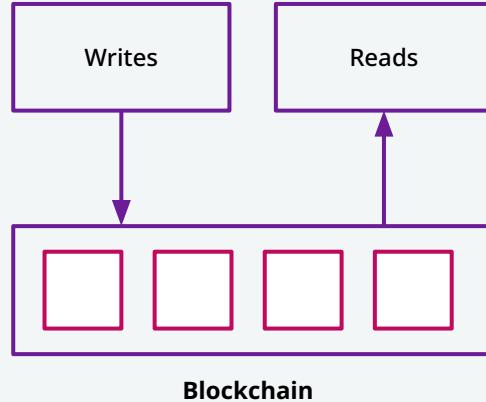
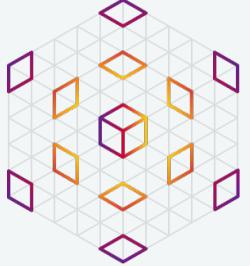


## Complex Infrastructure

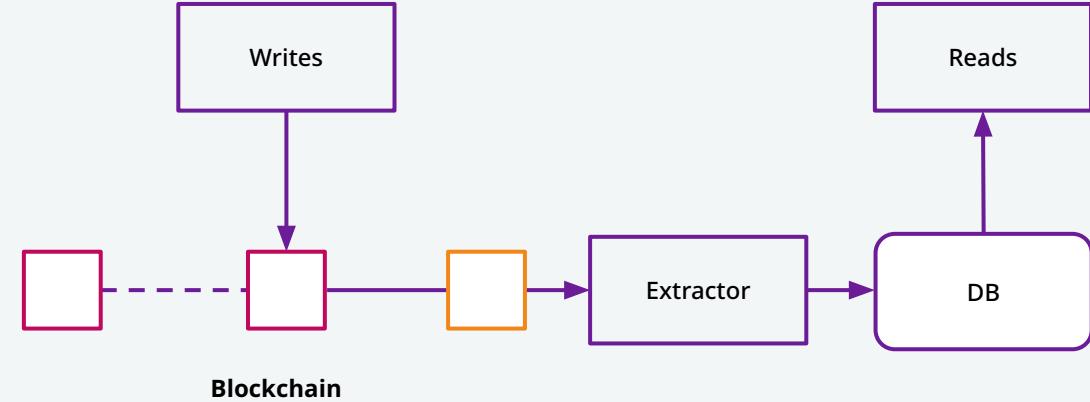
Blockchain node configuration and ops time-consuming, expensive and undifferentiated



# Patterns in Web3 Architecture



Consensus  
Transaction Processing  
Validated Transactions



Consensus  
Validations  
Transaction Processing

Validated Transactions



# eth-explorer.datastax.com



**Astra**

Real-time Blockchain Data

All Filters ▼ Search by Txn Hash or Block Number 🔍

Ether Price **\$1,627.48**  
@0.06982 BTC **-1.89%**

Transactions **1824.43 M**  
12.5 TPS

Median Gas Price **29.00 Gwei**  
\$1.84

Market Cap **\$195,953,398,332.00**

Difficulty **1,197.07 TH**  
Hash Rate **91,955.21 GH/s**

**Ethereum Transaction History** 14 days

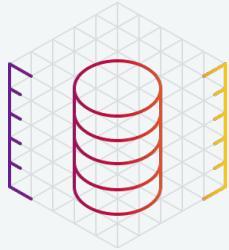
773k  
400k  
200k  
February 18 February 22 February 26 March 2

**Latest Blocks**

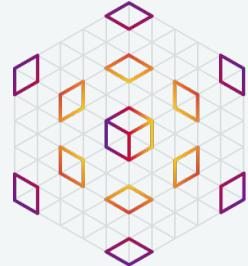
16750588 14 Secs ago	Miner 0xe94f1...6ca0c 137 txns in 12 secs	0.0442 Ether
16750587 26 Secs ago	Miner 0x690b9...ac990 150 txns in 12 secs	0.0677 Ether

**Latest Transactions**

0x66c43...9f75c 26 Secs ago	From 0x99ad9...3447e To 0x7a250...2488d	0.3000 Ether
0x3c938...83811 26 Secs ago	From 0x6a6b5...8ce5a To 0x7a250...2488d	0.0000 Ether



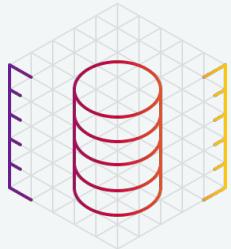
## › Developer Datasets



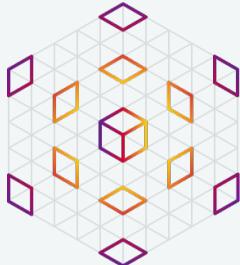
- Blocks
  - Contracts
  - Logs
  - Token Transfers
  - Traces
  - Transactions
  - NFTs
  - Dashboard Analytics

dec ▾	1124007269099221549056	HEX
dec ▾	115792089237316195423570985008687907853269984665640564038466977335823296195917	
dec ▾	74441327450144230343526652615	
dec ▾	805711808572248035359834	
dec ▾	115792089237316195423570985008687907853269984665640564039457584007913129638689	

[https://docs.datastax.com/en/astra-streaming/docs/astream-ethereum.html#\\_data\\_models](https://docs.datastax.com/en/astra-streaming/docs/astream-ethereum.html#_data_models)



# › Agenda



**01**

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Live and Hands-On

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Use Cases and Opportunities

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## **Cassandra and Astra DB**

Scalable Database

**04**

## **Astra Block**

Create your instance

**05**

## **Ethereum Block Explorer**

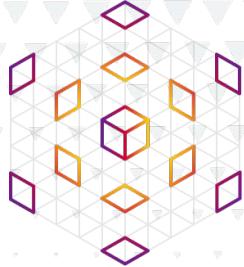
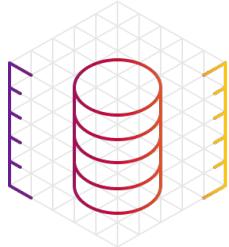
Hands-on

**06**

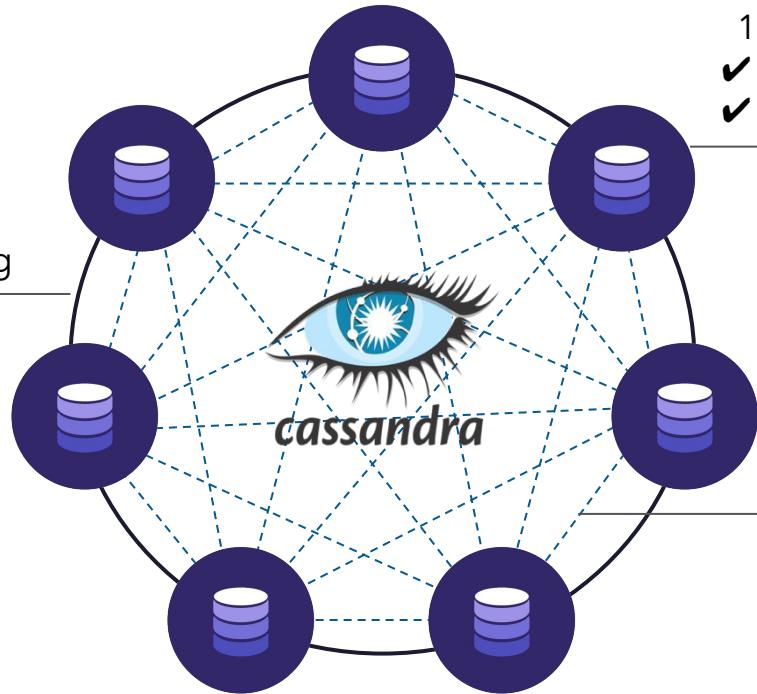
## **What's next?**

Homework, next sessions

# › Nosql Distributed database

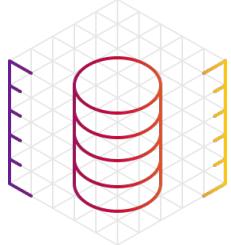


DataCenter (DC) | Ring

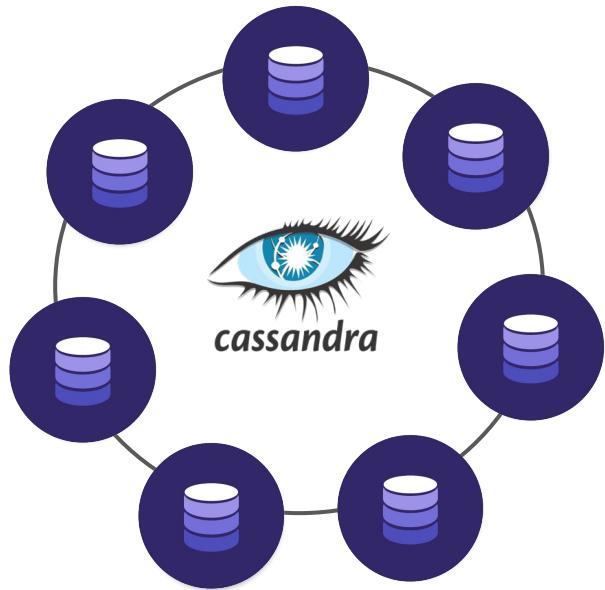
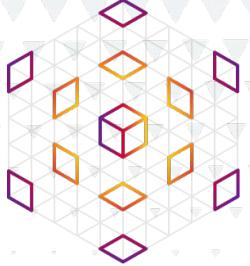


- 1 Installation = 1 NODE
- ✓ Capacity = ~ 2-4TB
- ✓ Throughput = LOTS Tx/sec/core

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



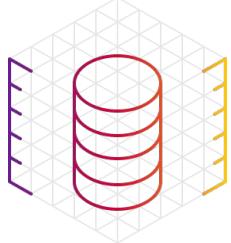
# › NoSQL **Distributed** Database



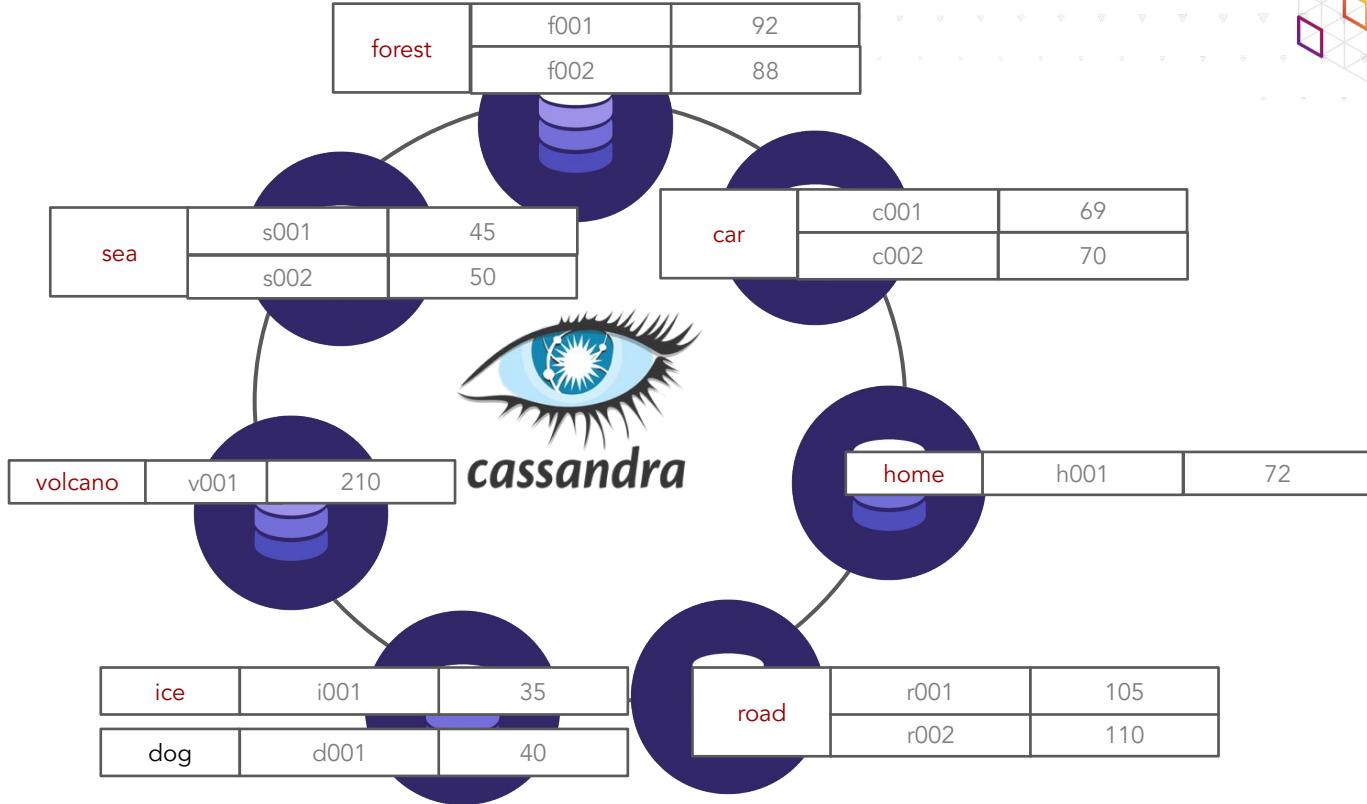
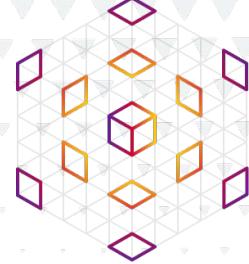
sensors_by_network		
network	sensor	temperature
forest	f001	92
forest	f002	88
volcano	v001	210
sea	s001	45
sea	s002	50
home	h001	72
car	c001	69
car	c002	70
dog	d001	40
road	r001	105
road	r002	110
ice	i001	35

Partition Key

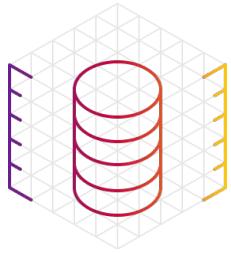
Primary Key



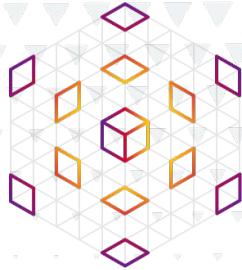
# › NoSQL **Distributed** Database



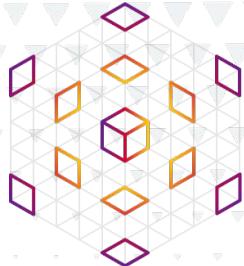
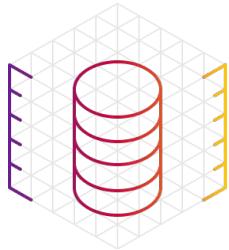
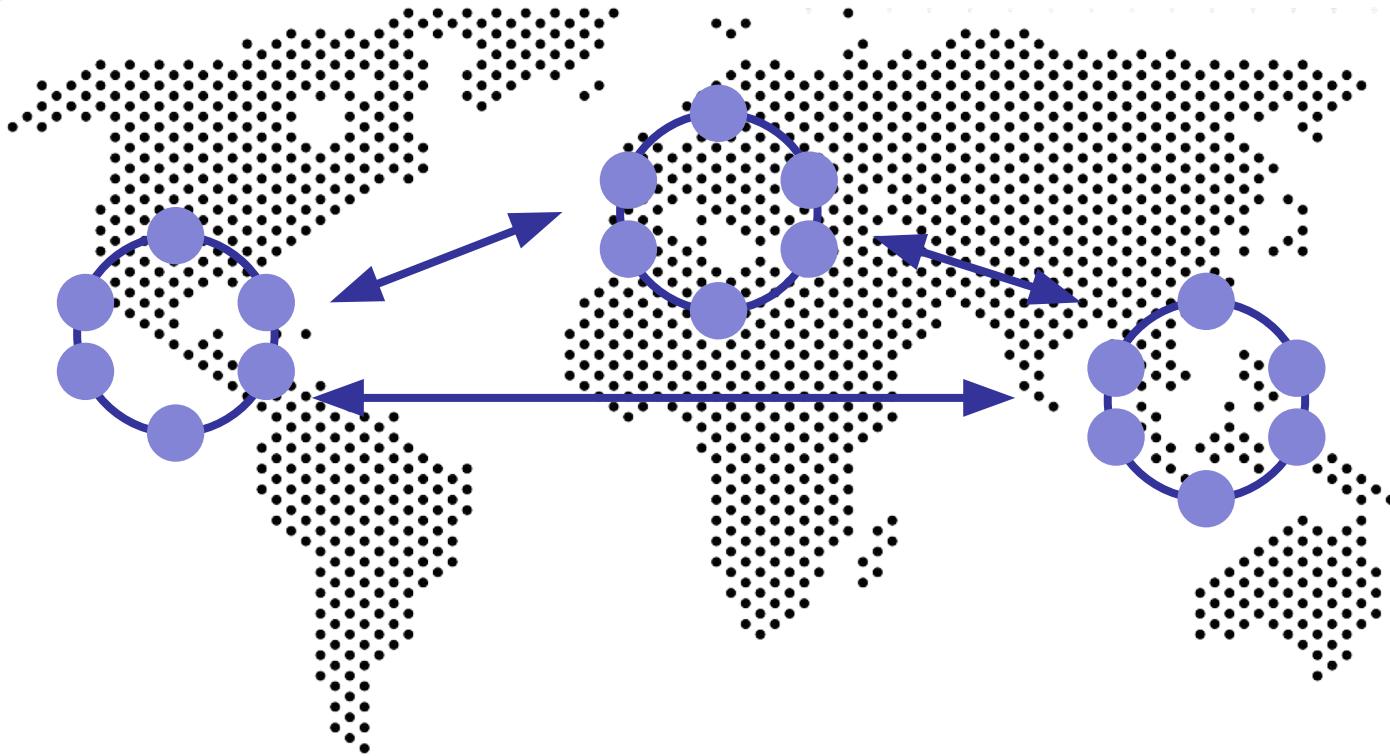
# ➤ Scalability

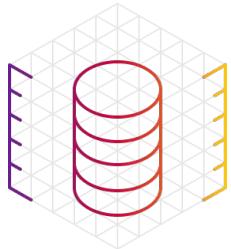


 300 000+  
nodes

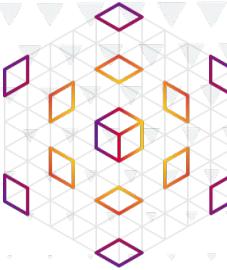


› **Geographically** distributed





# 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

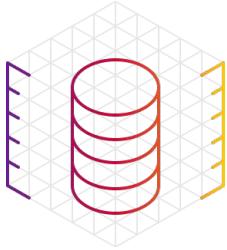
Faster Pace

Every millisecond of latency has consequence

## Global Distribution

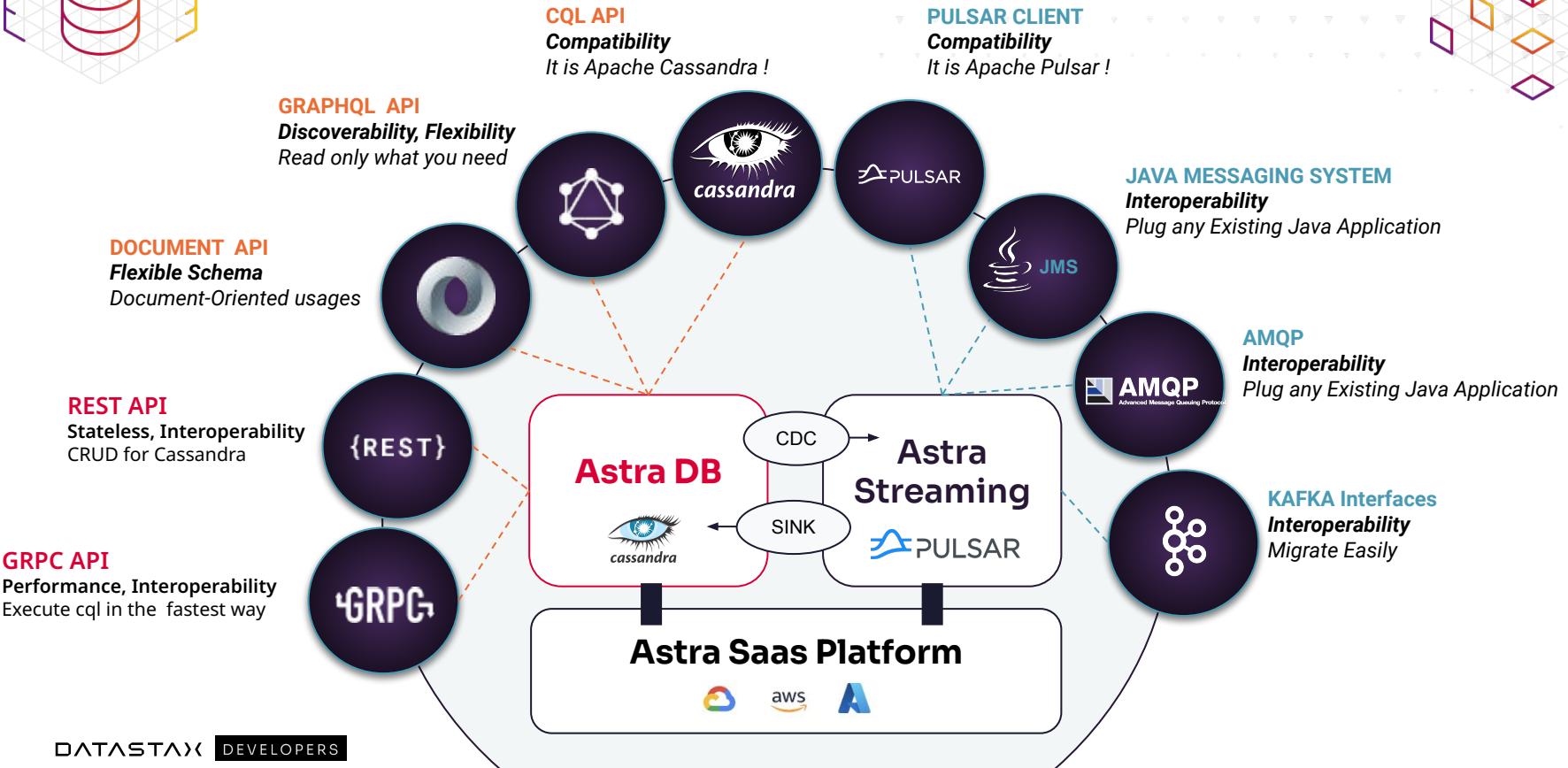
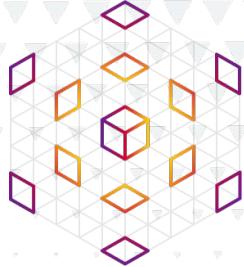
Data Everywhere

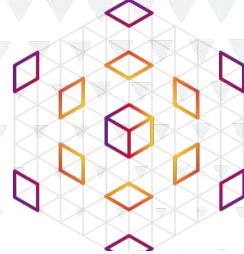
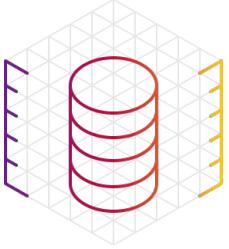
On-premises, hybrid, multi-cloud, centralized, or edge



# DATASTAX

## ASTRA





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

**Welcome to Astra, Cedrick 🌟**

Accelerate your workflows, access recently visited resources, and explore Astra's integrations and documentation!

Introducing Astra Block! Get instant access to Blockchain data in an Astra serverless database.

Get access to Astra Credits! You could be eligible for over \$2,000 in free credit and Enterprise Support for qualified Startups!

**What's New**

5 steps · 10 minutes <a href="#">Overview of Astra DB</a>	4 steps · 15 minutes <a href="#">Get started with the Astra CLI and Astra DB</a>	3 steps · 10 minutes <a href="#">Build Web3 Apps with Astra Block</a>
Understand Astra DB and how it differs from its underlying technology, Apache Cassandra®.	A quick introduction to the Astra CLI, where you will install, create a database, query, and more in minutes.	Learn how to stream real-time, human-readable blockchain data to your Astra database.
<a href="#">Go to guide</a>	<a href="#">Go to guide</a>	<a href="#">Go to guide</a>

**Quick Access**

[Create a Database](#) → [Create a Streaming Tenant](#) → [Invite your team](#) →

**Recent Resources**

- [db2](#)  
Serverless Database · Active
- [sdk\\_java\\_test](#)  
Serverless Database · Active
- [mtg](#)

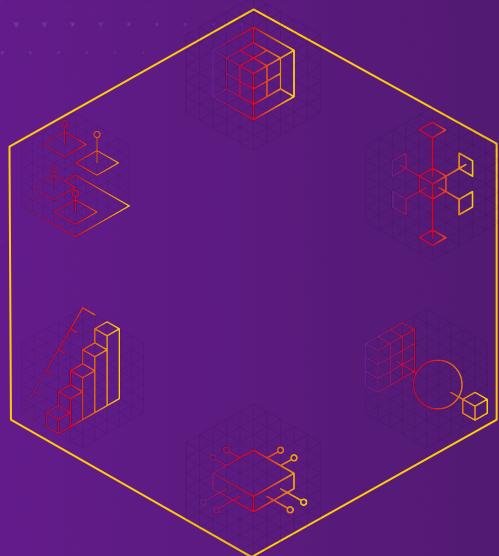
**Recommended Integrations**

- [Feast](#)  
Open source feature store for machine learning
- [Grafana](#)  
Multi-platform open source analytics and visualization
- [Temporal](#)



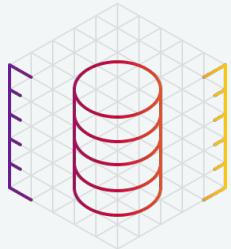
# Lab 1

## Database Initialization

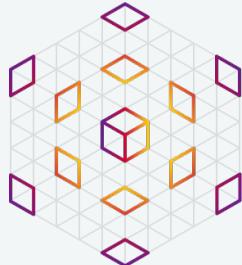


### 1.1 Create Astra Instance

### 1.2 Create Astra Token



# » Agenda



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**04**

**Astra Block**  
Quickstart

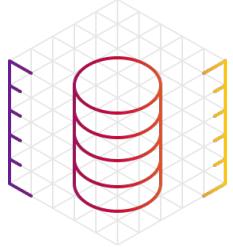
**05**

**Ethereum Block Explorer**  
Hands-on

**06**

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

# ➤ 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

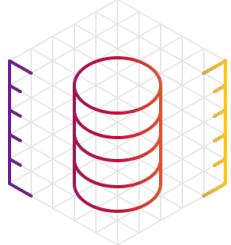
Skip building, provisioning, configuring and operating your own blockchain node infrastructure with a serverless, autoscaling DBaaS built on Apache Cassandra



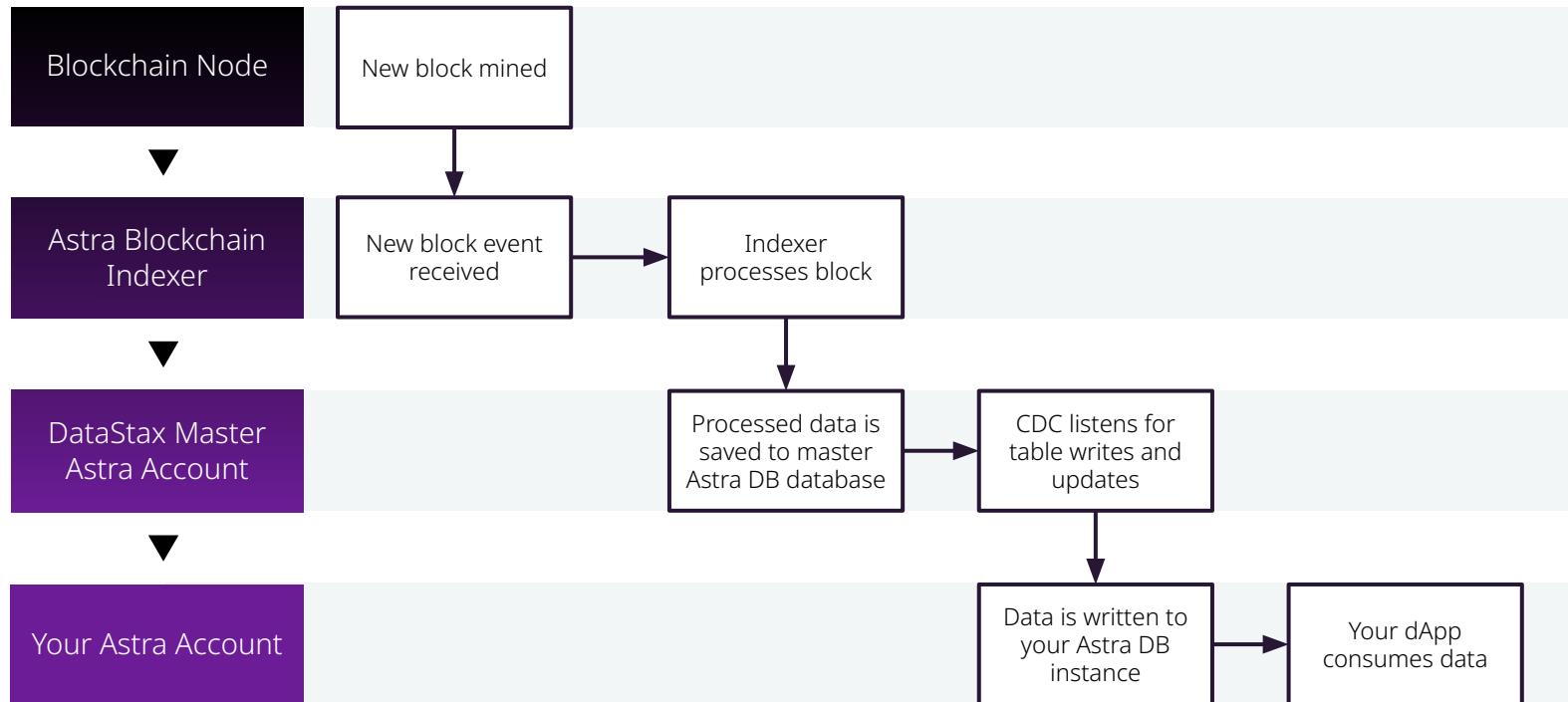
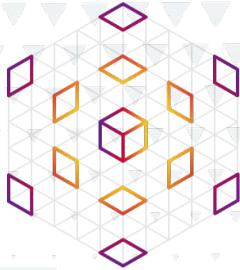
The screenshot displays the Astra Blockchain Data interface. At the top, it shows real-time metrics: Ether Price (\$1,641.56), Transactions (1812.08 M), Median Gas Price (26.00 Gwei), Market Cap (\$197,278,460,366.00), Difficulty (1,197.07 TH), and Hash Rate (91,955.21 GH/s). Below these are sections for "Latest Blocks" and "Latest Transactions". The "Latest Blocks" section lists recent blocks with their hash, miner, timestamp, and reward. The "Latest Transactions" section lists recent transactions with their hash, from/to addresses, and value. At the bottom, there are buttons for "VIEW ALL BLOCKS" and "VIEW ALL TRANSACTIONS".

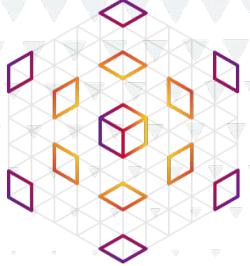
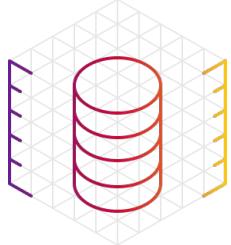
Block ID	Miner	Timestamp	Reward
16580295	Miner 0xbaf0d...c5e19	6 Secs ago	0.1075 Ether
16580294	Miner 0x8ab27...29bd1	14 Secs ago	0.2736 Ether
16580293	Miner 0xbabf9...c5e19	30 Secs ago	0.0661 Ether
16580292	Miner 0x690b9...ac990	42 Secs ago	0.0972 Ether
16580291	Miner 0x00000...00000	54 Secs ago	0.0071 Ether
16580290	Miner 0x0feaf...98bc5	1 Min, 5 Secs ago	0.1458 Ether

Transaction ID	From	To	Value
0x89526...db5de	0x00000...	0x00004...	0.0000 Ether
0x88bf6...6f81c	0x7e5d6...	0x7e5d6...	1.0000 Ether
0x5d4e4...bd8c1	0x00001...	0x5f98...	0.0000 Ether
0x2cd2e...3f121	0x00000...	0x00004...	0.0000 Ether
0x6bb8b...1dcf8	0x00000...	0x7e5d6...	0.0000 Ether
0x624d...3e399	0x1f1862...	0x1f16d...	1.4500 Ether

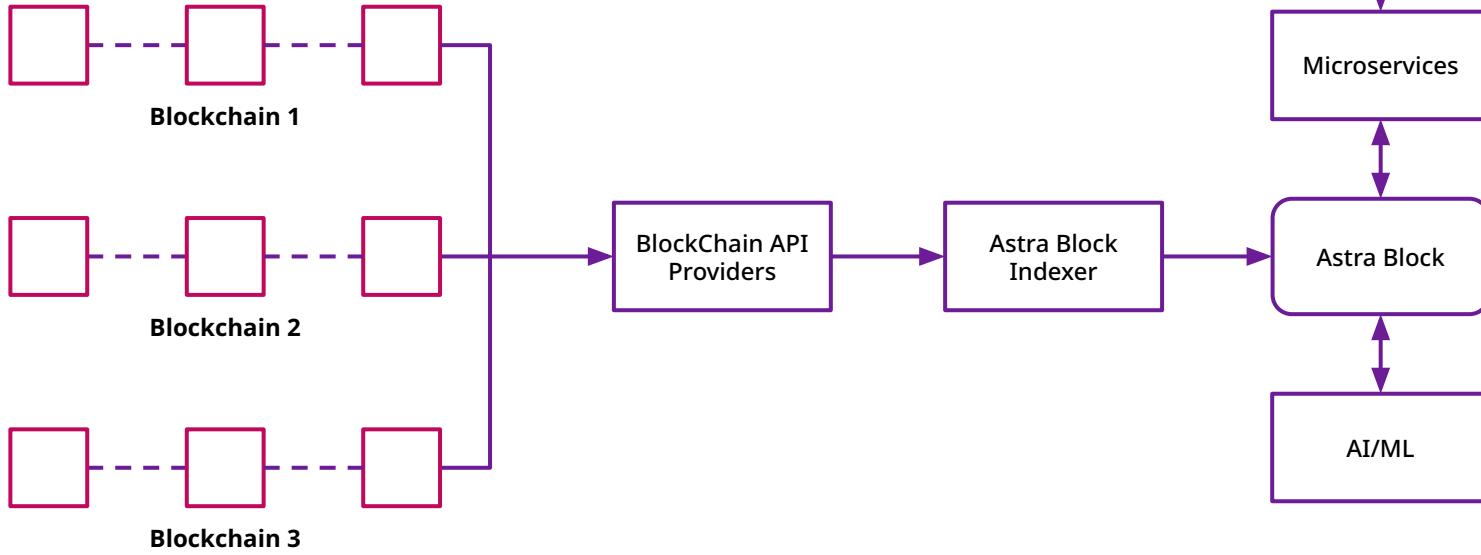


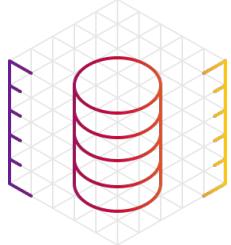
# ➤ How it works ?



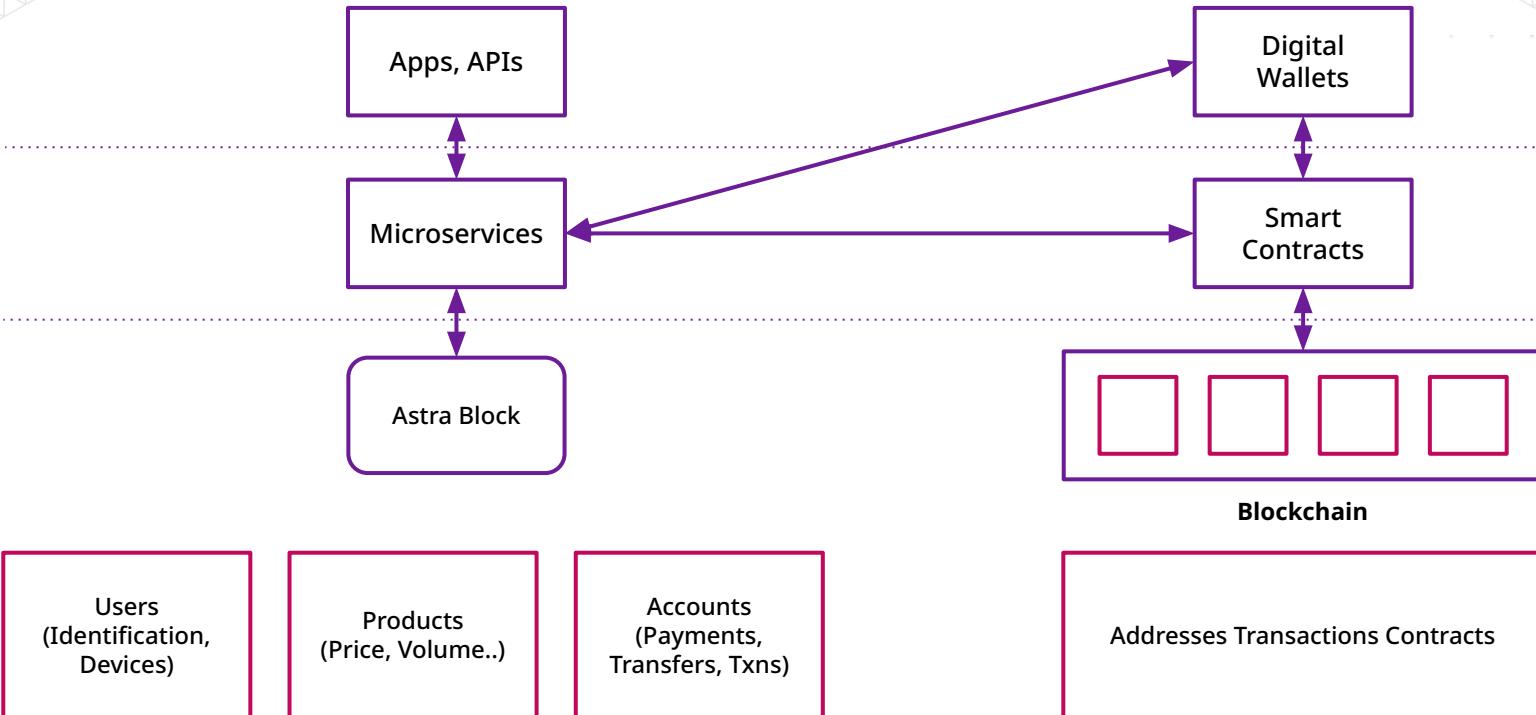


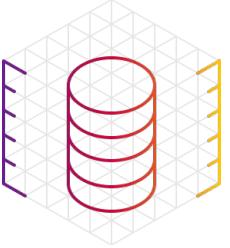
# ➤ Data Analysis Use Case





# ➤ Transactions Use-case Operational





# › Astra Block Offerings

## Create Blockchain Database X esc

Loading blockchain data to Cassandra couldn't be easier. After you click **create database**, we will create a database named **ethereum**. We'll deploy it on Google Cloud, and it will come pre-loaded with ETH blockchain data.

Select Blockchain  
**Ethereum Mainnet (Partial)**

With the partial feed, you get access to 20 GB of the following datasets:

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

Cancel Create Database

## Create Blockchain Database X esc

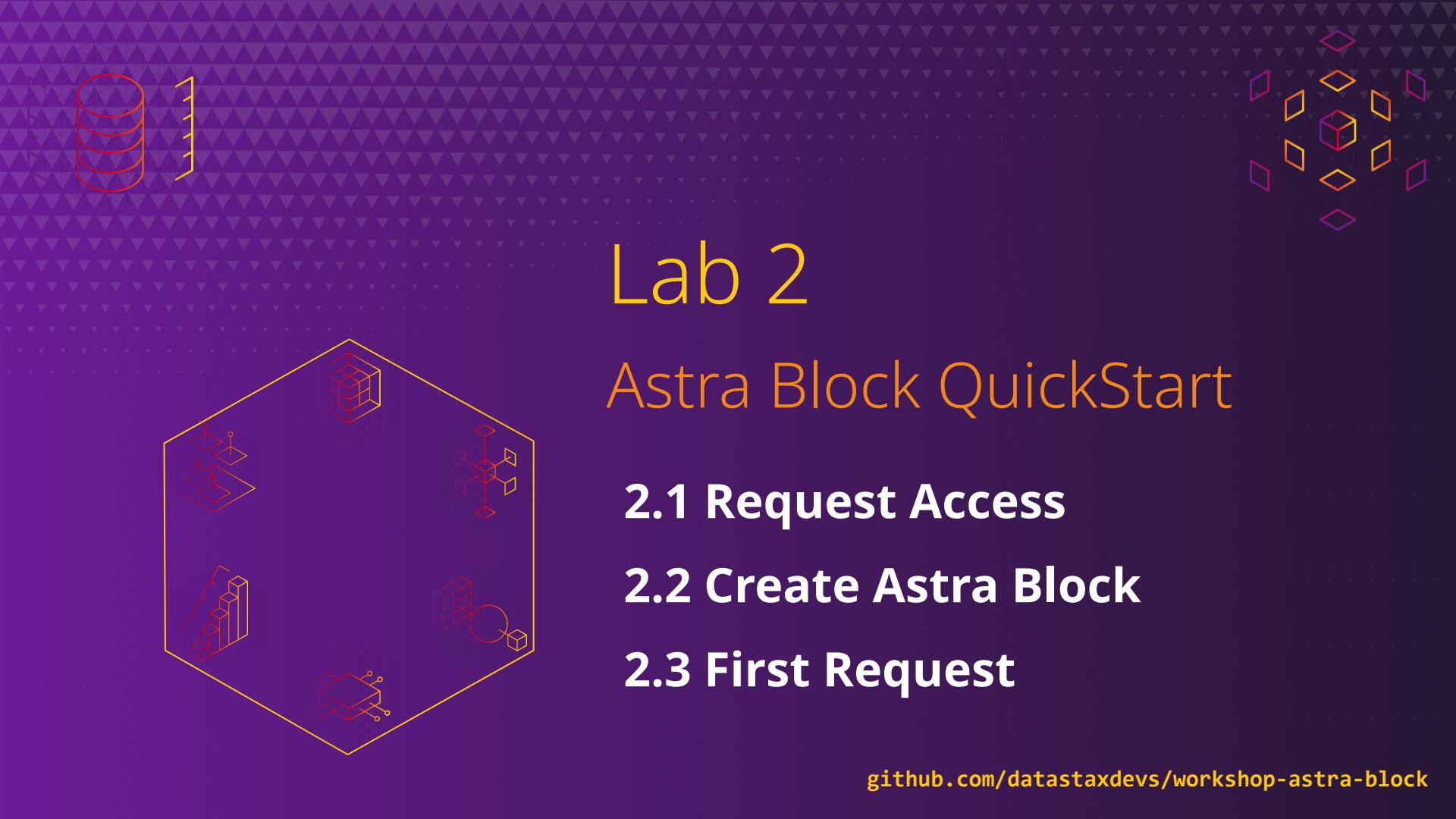
Loading blockchain data to Cassandra couldn't be easier. After you click **create database**, we will create a database named **ethereum**. We'll deploy it on Google Cloud, and it will come pre-loaded with ETH blockchain data.

Select Blockchain  
**Ethereum Mainnet (Complete Dataset)**

With the complete feed, you get access to all historical data and live updates for the following datasets:

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

Cancel Create Database



# Lab 2

## Astra Block QuickStart

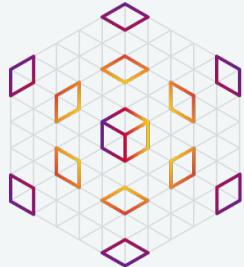
**2.1 Request Access**

**2.2 Create Astra Block**

**2.3 First Request**



# › Agenda



**01**

**HouseKeeping**  
Live and Hands-On

**02**

**Blockchain and Web3**  
Use Cases and Opportunities

**03**

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

**04**

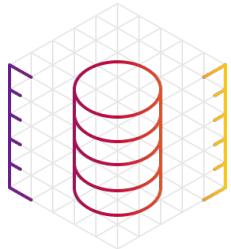
**Astra Block**  
Create your instance

**05**

**Ethereum Block Explorer**  
Hands-on

**06**

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



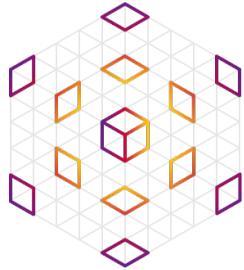
# › Alex Leventer

## Astra Block Product Lead

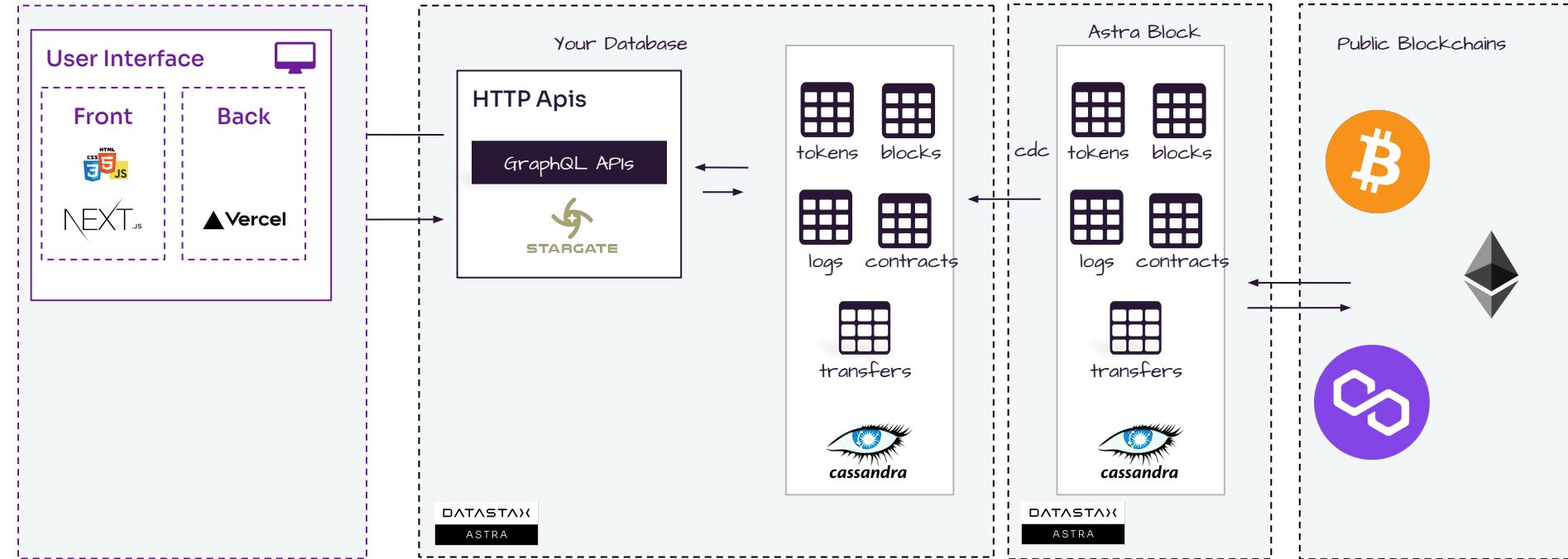
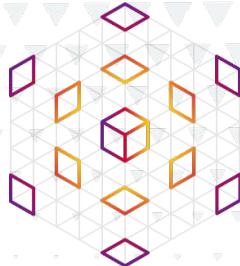
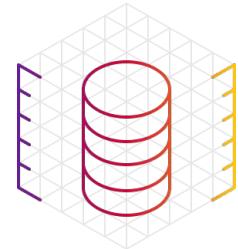


A little about you

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



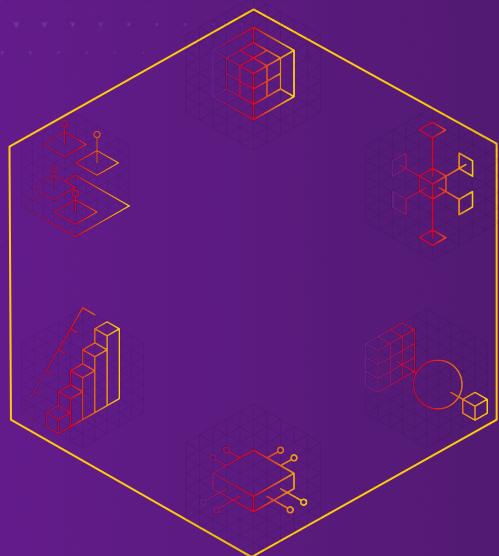
# ➤ Architecture





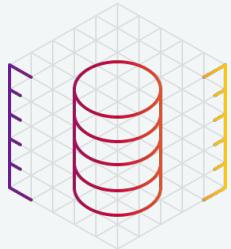
# Lab 3

## Ethereum Block Explorer

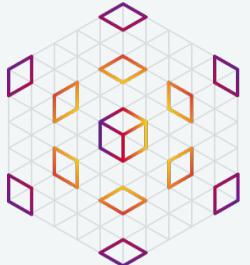


### 3.1 Setup the app

### 3.2 Start the application



# » Agenda



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**Scalable Database**

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**Astra Block**  
Create your instance

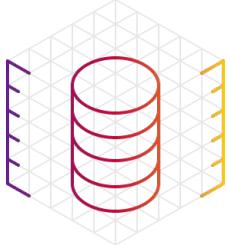
**05**

**Ethereum Block Explorer**  
Hands-on

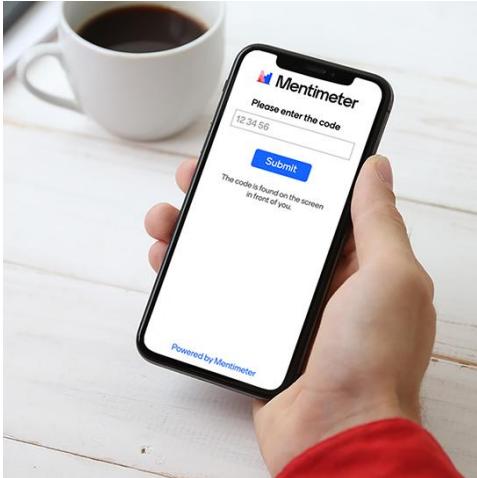
**06**

**What's next?**  
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:

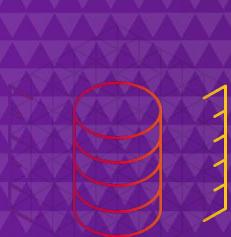
- Solana Blockchain Support
- Stream real-time copy of Solana blockchain to Astra DB
- The Graph Subgraph Support
- Stream real-time copy of TheGraph.com subgraphs directly to Astra DB

[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](#)

The screenshot shows the DataStax Astra Block landing page. At the top, there's a purple banner with the text "DATASTAX ACQUIRES KASAKADA TO UNLOCK REAL-TIME AI FOR EVERY BUSINESS. LEARN MORE HERE" and a "TRY FOR FREE" button. Below the banner, the "ASTRA BLOCK" logo is displayed. A main heading reads "Stream real-time, human-readable blockchain data". A subtext says "Run lightning fast queries across Terabytes of blockchain data." with a "REQUEST ACCESS" button. To the right, there's a graphic of a blockchain network with hexagonal nodes. Below this section, there are logos for various cryptocurrencies: bitcoin, ethereum, polygon, SOLANA, AVALANCHE, and BINANCE, followed by a "COMING SOON" message. Further down, another heading "Build Web3 apps that are off the chain" is shown with a subtext about jumpstarting projects using enriched blockchain data. A "Processing Ethereum block 16509631" status bar is visible. On the right side, there are two sections: "BENEFITS" (with a "Real-time, always in sync" icon) and "Why Astra Block?" (with a "Decoded and human-readable" icon). Both sections provide detailed descriptions of the product's capabilities.



# Register Now!

[dtsx.io/cassandra-forward-meetup](https://dtsx.io/cassandra-forward-meetup)



## *Cassandra Forward*

MARCH 14, 2023 • FREE • ONLINE



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- Workshops:** [datastax.com/workshops](https://datastax.com/workshops)
- YouTube:** [@DataStax Developers](https://www.youtube.com/@DataStaxDevelopers)

A large, stylized arrow pointing to the right, composed of three horizontal bars with a gradient from yellow to red.

# Thank You