

**DataStax**



# Building APIs for Cassandra

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October 6, 2022

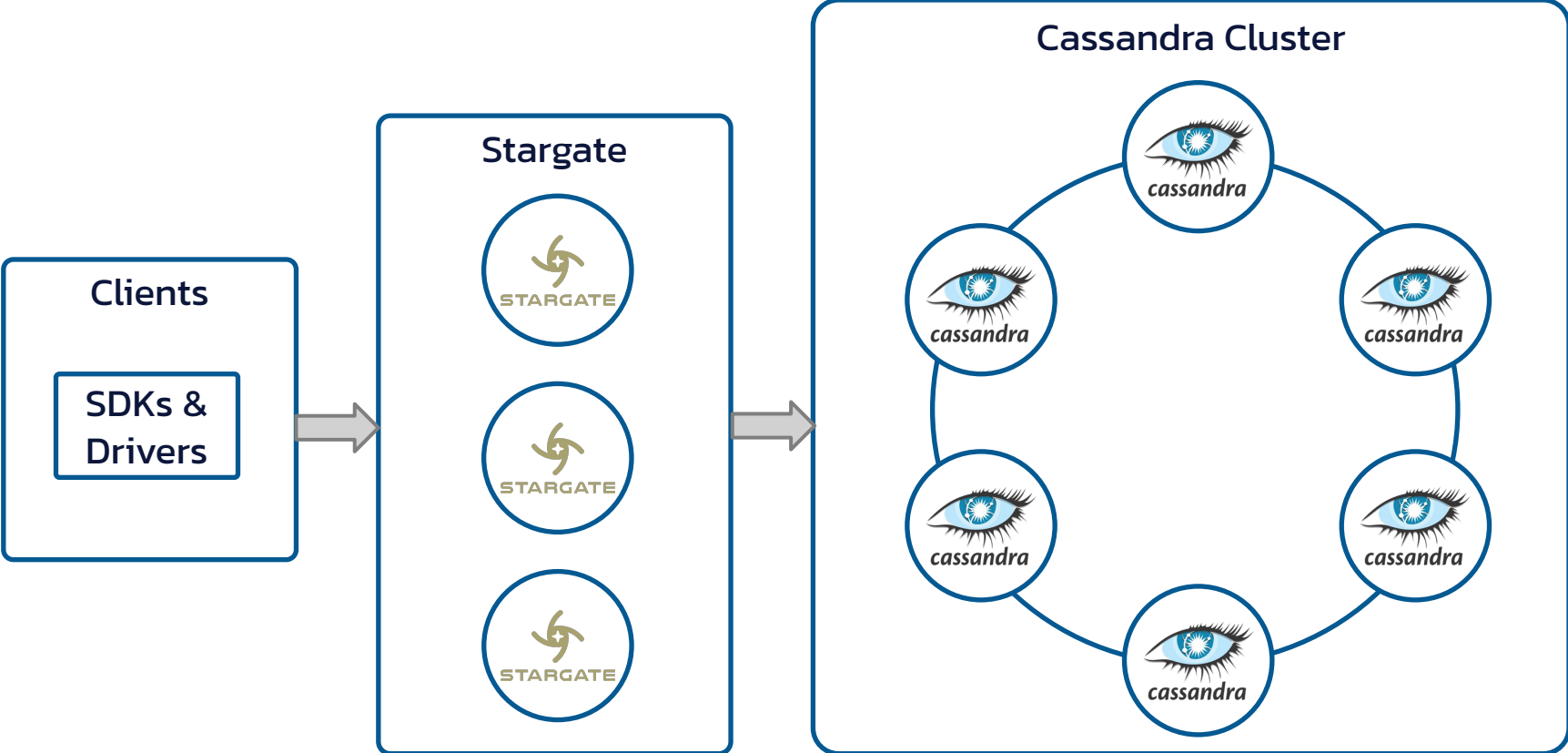


**STARGATE**

<https://stargate.io>



# Stargate Architecture (Conceptual)





## API EXTENSIONS

REST  
{REST:API}

GraphQL  
  
GraphQL

Document API  
 JSON

gRPC  


CQL  
  
cassandra



## PERSISTENCE EXTENSIONS

Cassandra  
3.11

Cassandra  
4.0

DataStax  
Enterprise  
6.8

## AUTH EXTENSIONS

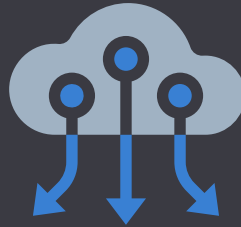
# Stargate History

- 2020 - Initial concept - Coordinator 2 (C2)
- Sept 2020 - Launch Announcement
- Oct 2020 - GraphQL API and the Document API
- Dec 2020 - 1.0 milestone, added to Astra DB
- July 2021 - Support for Cassandra 4.0
- Jan 2022 - gRPC API
- Stargate v2
  - Nov 2021 - Stargate v2 Announcement
  - Jan 2022 - First Stargate v2 Alpha with REST API
  - Sept 2022 - Stargate v2 Beta with GraphQL and Docs API

# Why you should care about Stargate



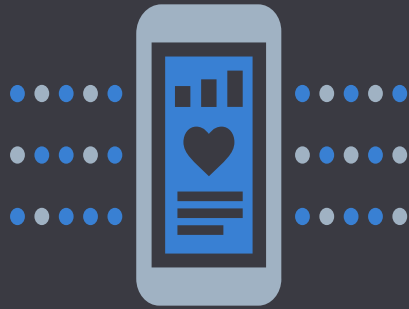
**Developers**



**Operators**

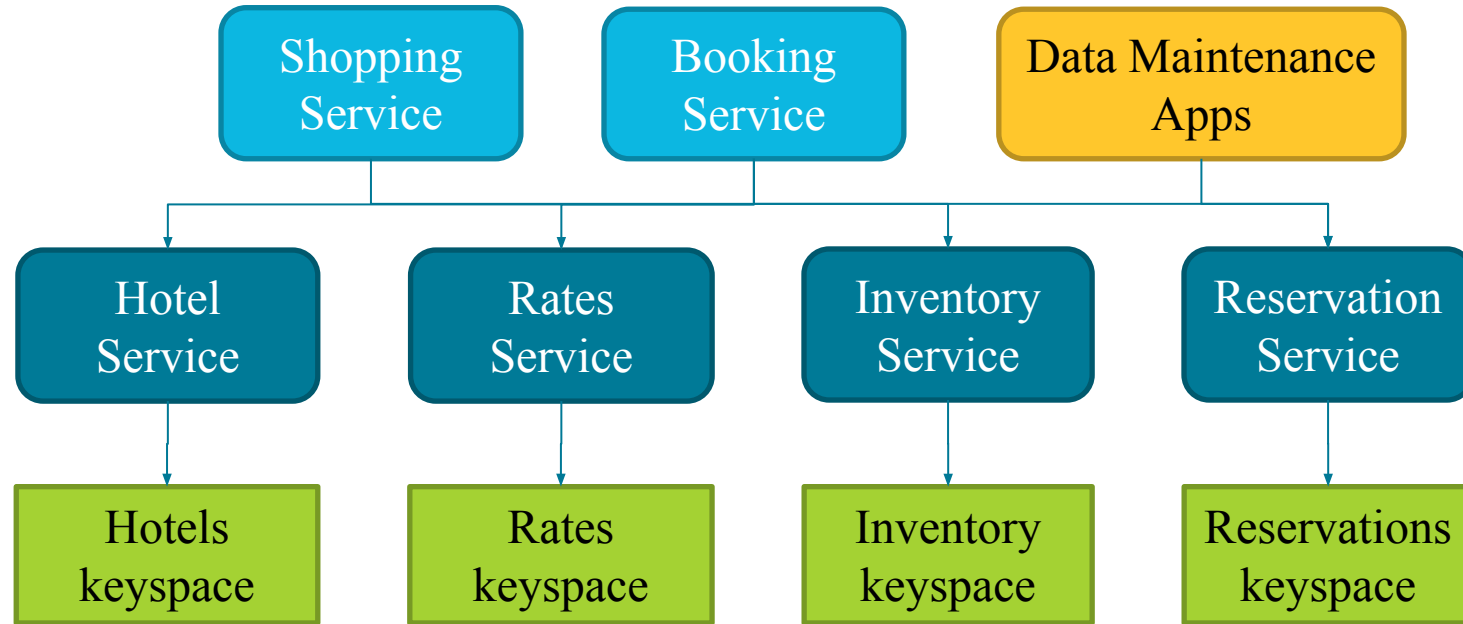


**Community**



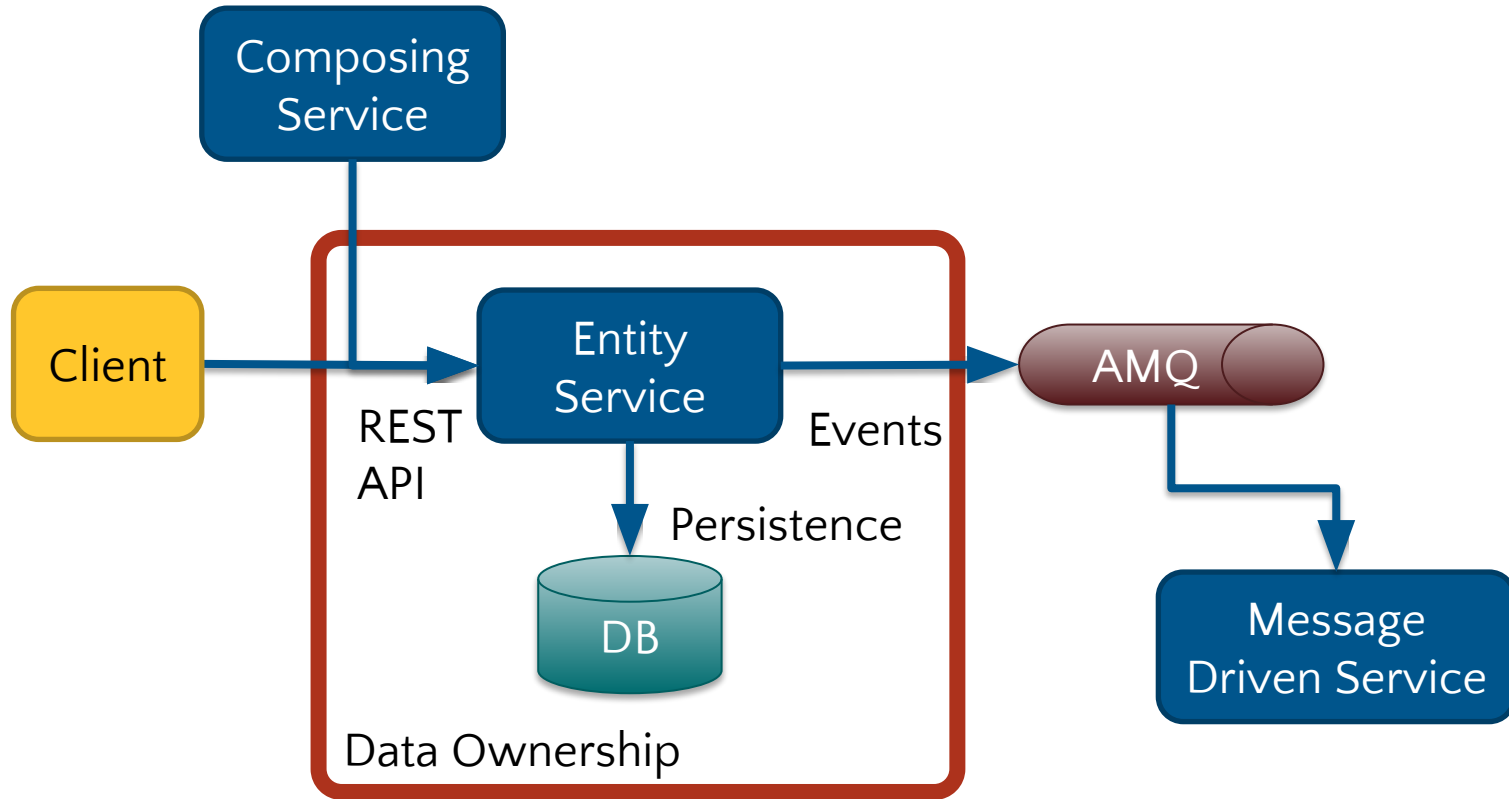
**Developers**

# Key Data Types → Microservices





# What is a Microservice? (one definition)



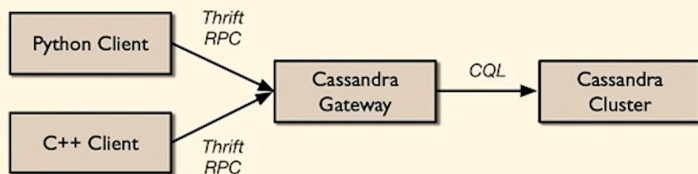
# API Layers on Cassandra - Everyone's Doing It

<https://youtu.be/YSkN9zOP6oQ>

DATASTAX  
**ACCELERATE**

## Cassandra Traffic Management at Instagram

### PRESENT CASSANDRA INFRASTRUCTURE



Michaël Figuière  
Software Engineer  
Instagram

# Comparing Stargate APIs

## Drivers

## Open API



**Cassandra Query Language**

SQL like Table Model

**Structured Data**

**Key-Value Data**

**Strong Types**

**Minimal query overhead**



**gRPC**

Structured Data (CQL)

**Lighter weight**

**Native driver alternative**

**Low query overhead**



**GraphQL**

Hierarchy of types and fields

**Structured Data**

**Key-Value Data**

**Low query overhead**

**{REST}**

**REST**

Row based

**Structured Data**

**Key-Value Data**

**Weaker Types**

**High query overhead**



**Document**

JSON Documents

**Semi-Structured Data**

**Weaker Types**

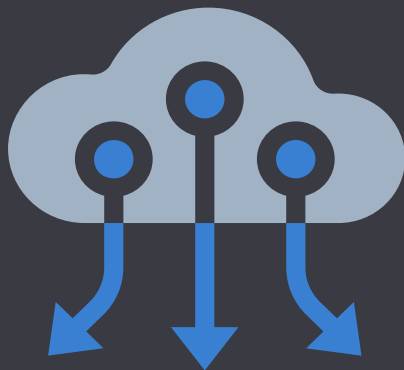
**High query overhead**

**More Performant**

**More Flexible**

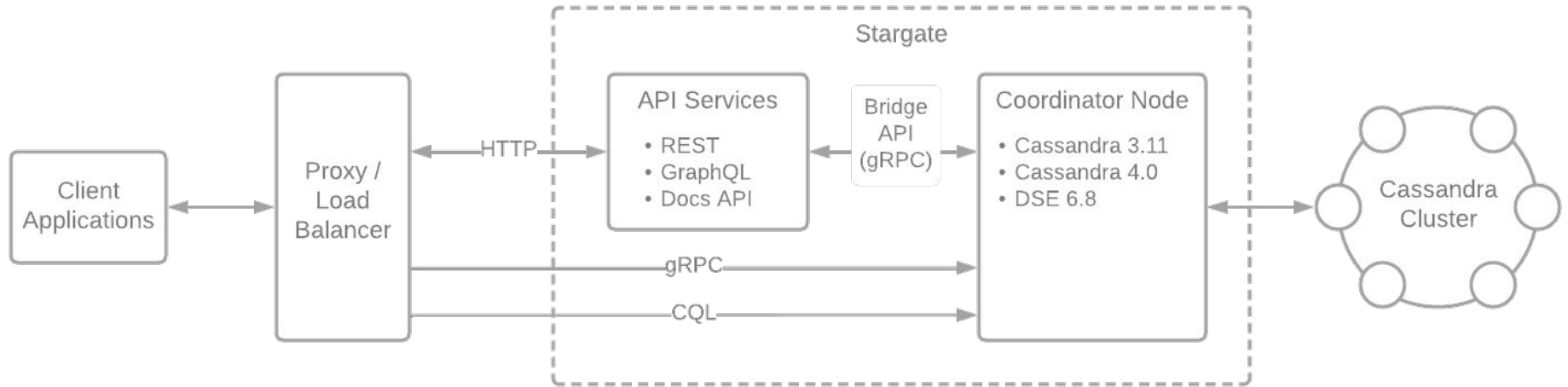
# Installing and Running Stargate v2 Locally (the DIY demo)

- Clone repo and checkout v2 branch (until GA)
  - `git clone https://github.com/stargate/stargate.git`
  - `cd stargate`
  - `git checkout v2.0.0`
- Running Docker Compose Images
  - `stargate/docker-compose/README.md`
  - **Important: Recommended Docker Settings**
- Sample queries - Postman
  - <https://www.postman.com/datastax/workspace/stargate-cassandra/overview>



**Operators**

# Stargate v2 Architecture (High Level)

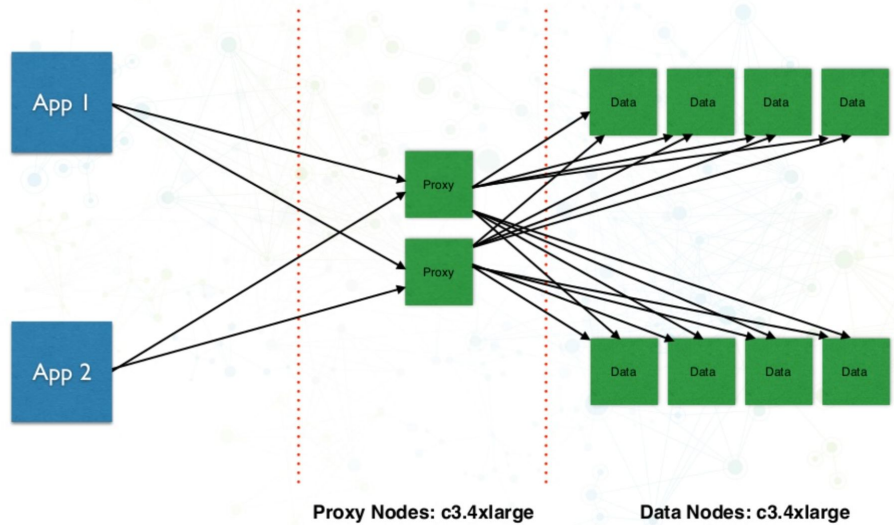


# Coordinator only nodes – not a new idea

<https://youtu.be/K0sQvaxiDH0>

## CASSANDRA PROXY TIER SETUP

APPLICATION TIER      PROXY TIER      CASSANDRA CLUSTER

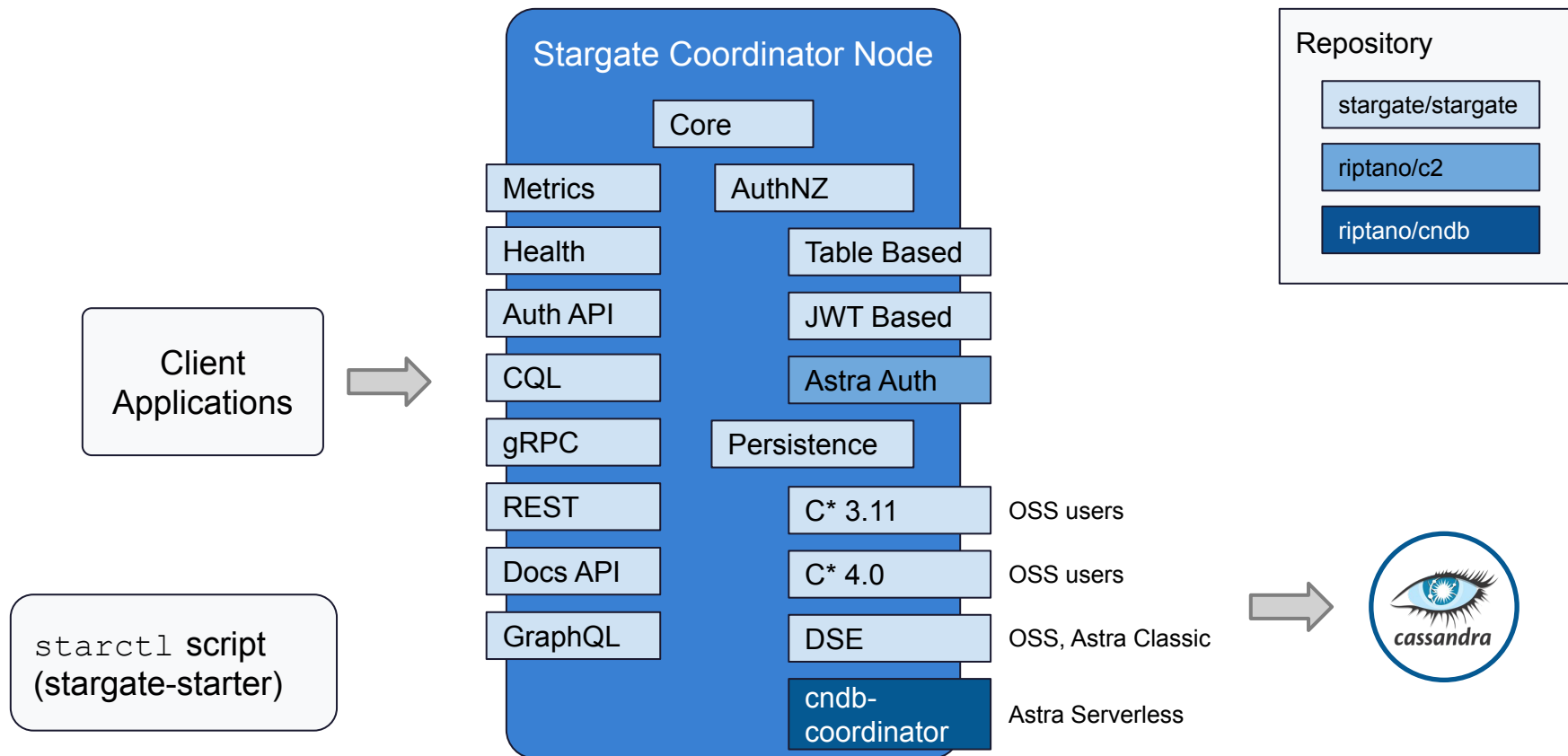


**SOMETHING SOMETHING  
COORDINATOR NODES**  
Cheating Our Way to Better Performance

Eric Lubow @elubow

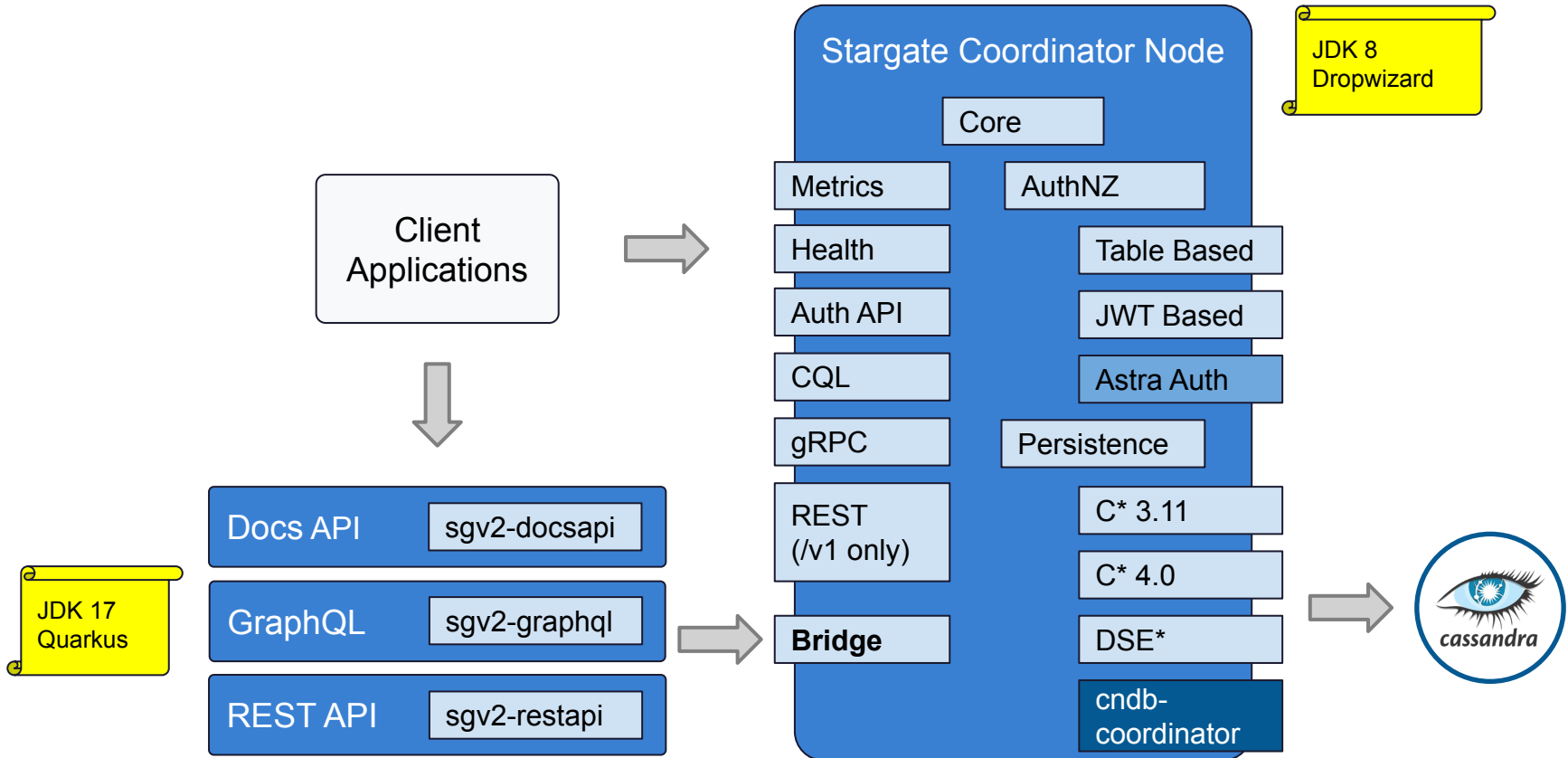
#CassandraSummit

# Stargate v1 Architecture (Components)

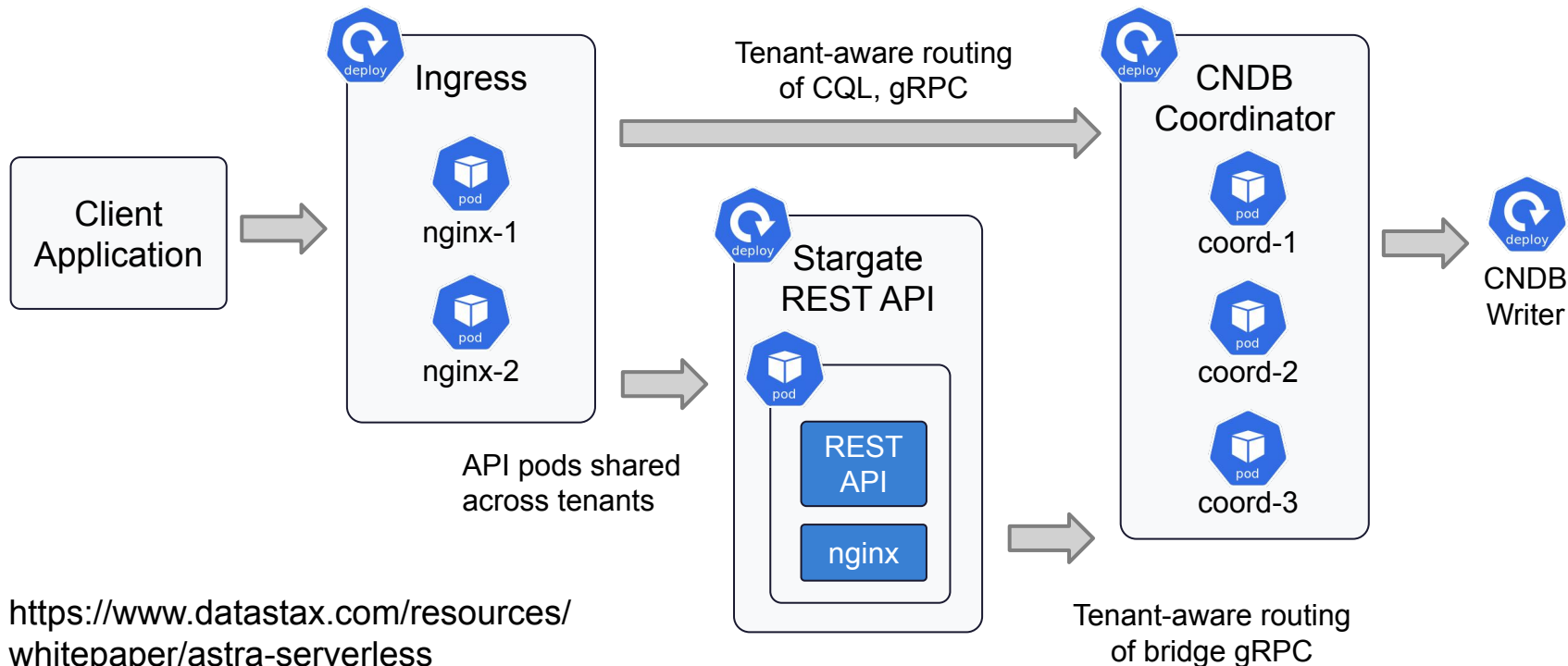




# Stargate v2 Architecture (Components)



# Stargate v2 as Deployed in Astra Serverless



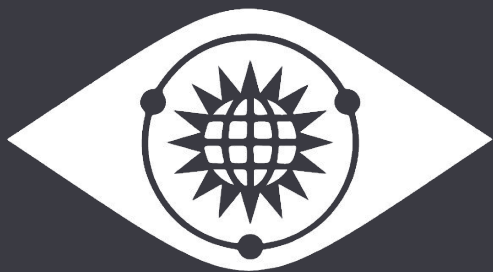


**Community**

# Stargate Roadmap (engineering edition)

- v2 GA
- New APIs
- Asynchronous notifications
- Performance improvements
  - Leverage additional indexing (CEP-7)
- Documentation
  - More examples and sample apps
  - Recipes (HA deployments, etc.)
- Backpressure

**Save the Date!**



# **CASSANDRA SUMMIT**

MARCH 13-14, 2023 • SAN JOSE, CA

- **Training day March 12**
- **In-person and Virtual**
- **CFP and Registration coming soon**