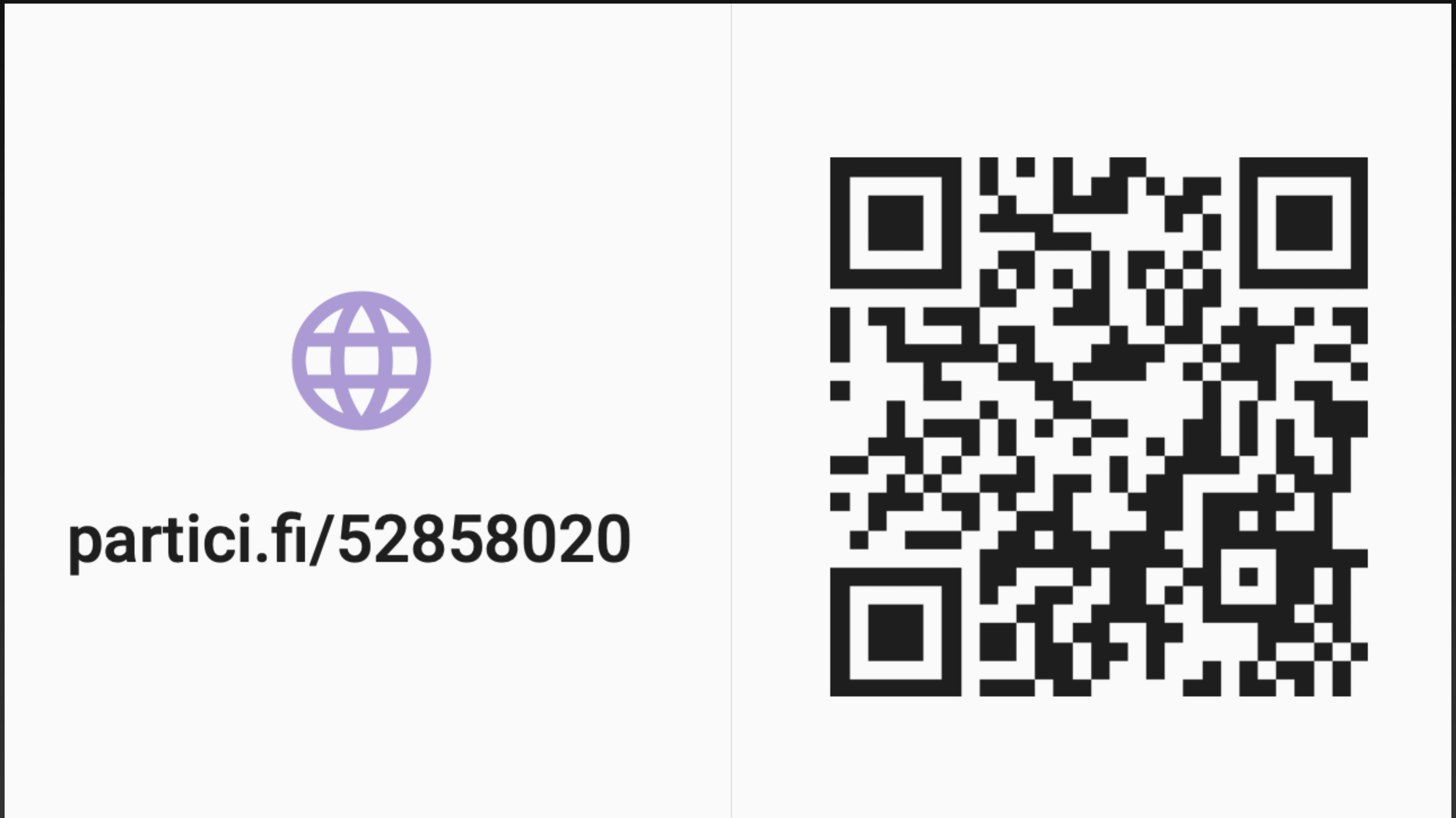
While eat your popcorns, please try this QUIZ. Thanks 🙃



partici.fi/52858020

Solving persistence in modern container-based architectures

AWS User Group Lisbon

Tiago Rodrigues - 2022

tecRACER
Cloud Enabling Your Business

Roadmap of this talk

1. Read the Room (Review questionnaire results)
2. What is Data Persistence?
3. What are Containers?
4. Some problems with Containers and Volumes
    4.1. Concurrency - two containers writing to same volume
    4.2. Kubernetes containers spawn on different servers.
5. Persistence in Containers
6. Q&A

1. Read the Room

Review questions to understand the room level.

2. What is Data Persistence?

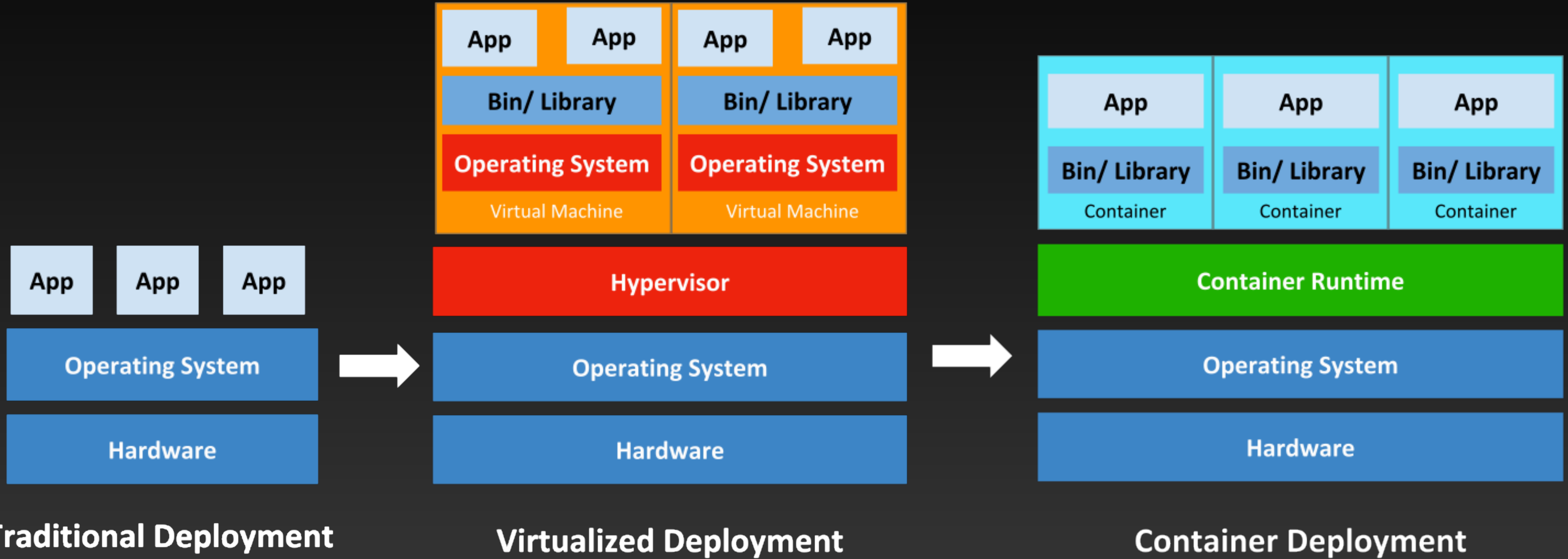
Persistence is "the continuance of an effect after its cause is removed”.

In the context of storing data in a computer system, this means that the **data survives after the process with which it was created has ended**.

In other words, for a data store to be considered persistent, it must write to non-volatile storage.

Source: Matt Pfeil - DataStax.com

3. What are Containers?



Source: kubernetes.io

4. Some problems with Containers and Volumes

4.1. Concurrency - two containers writing to same volume

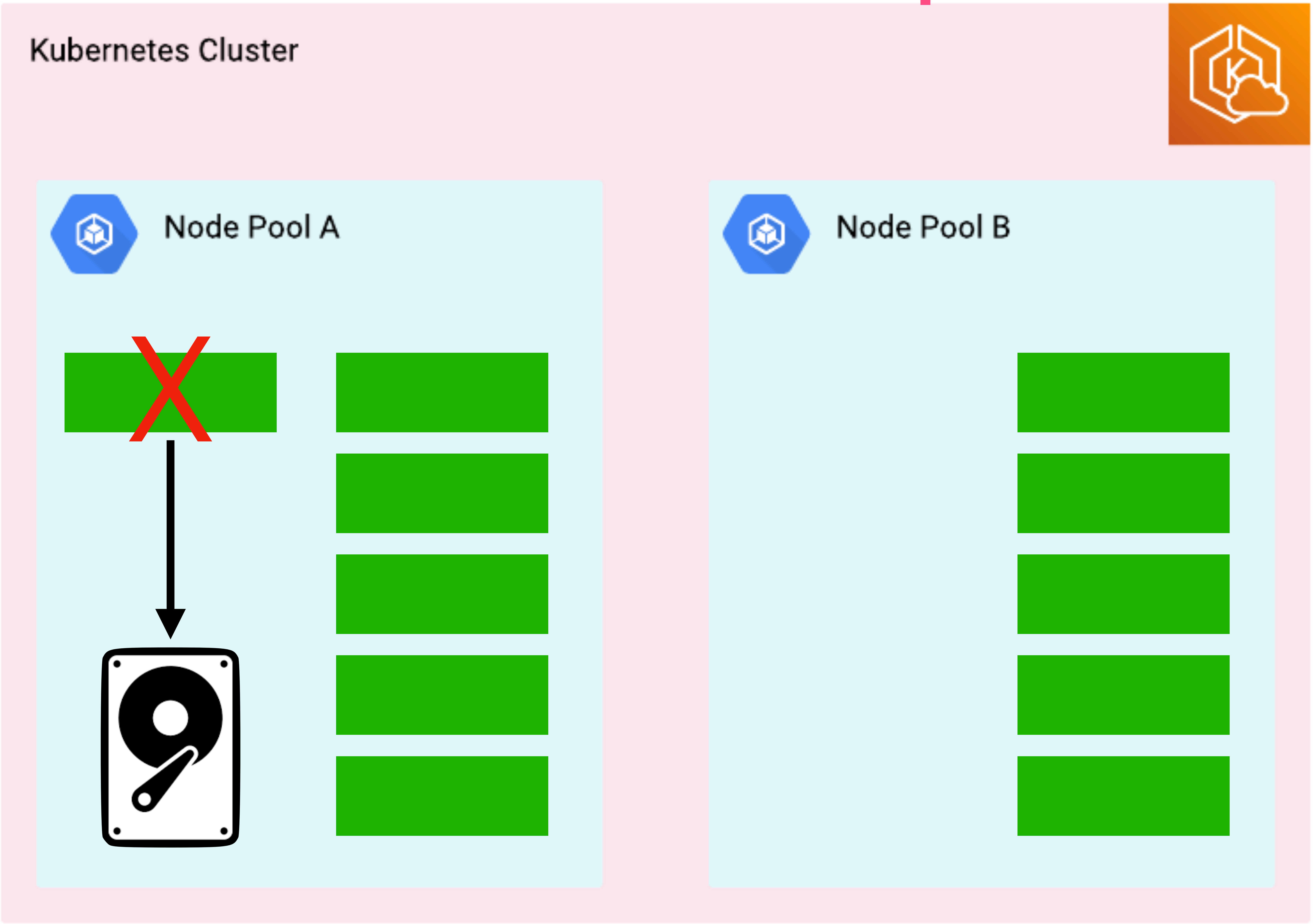
4.2. Kubernetes containers spawn on different servers.

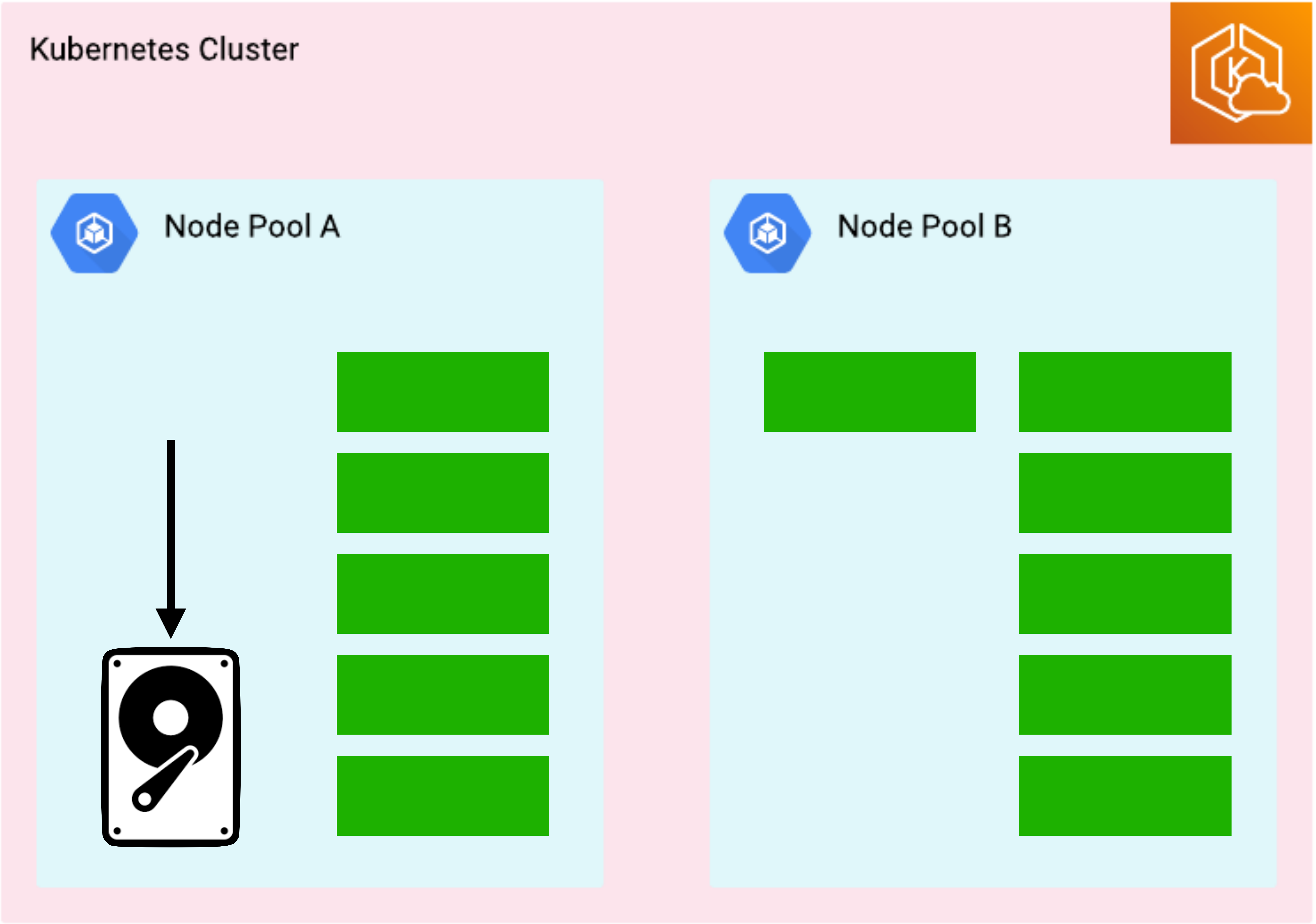
4.1. Concurrency - two containers writing to same volume

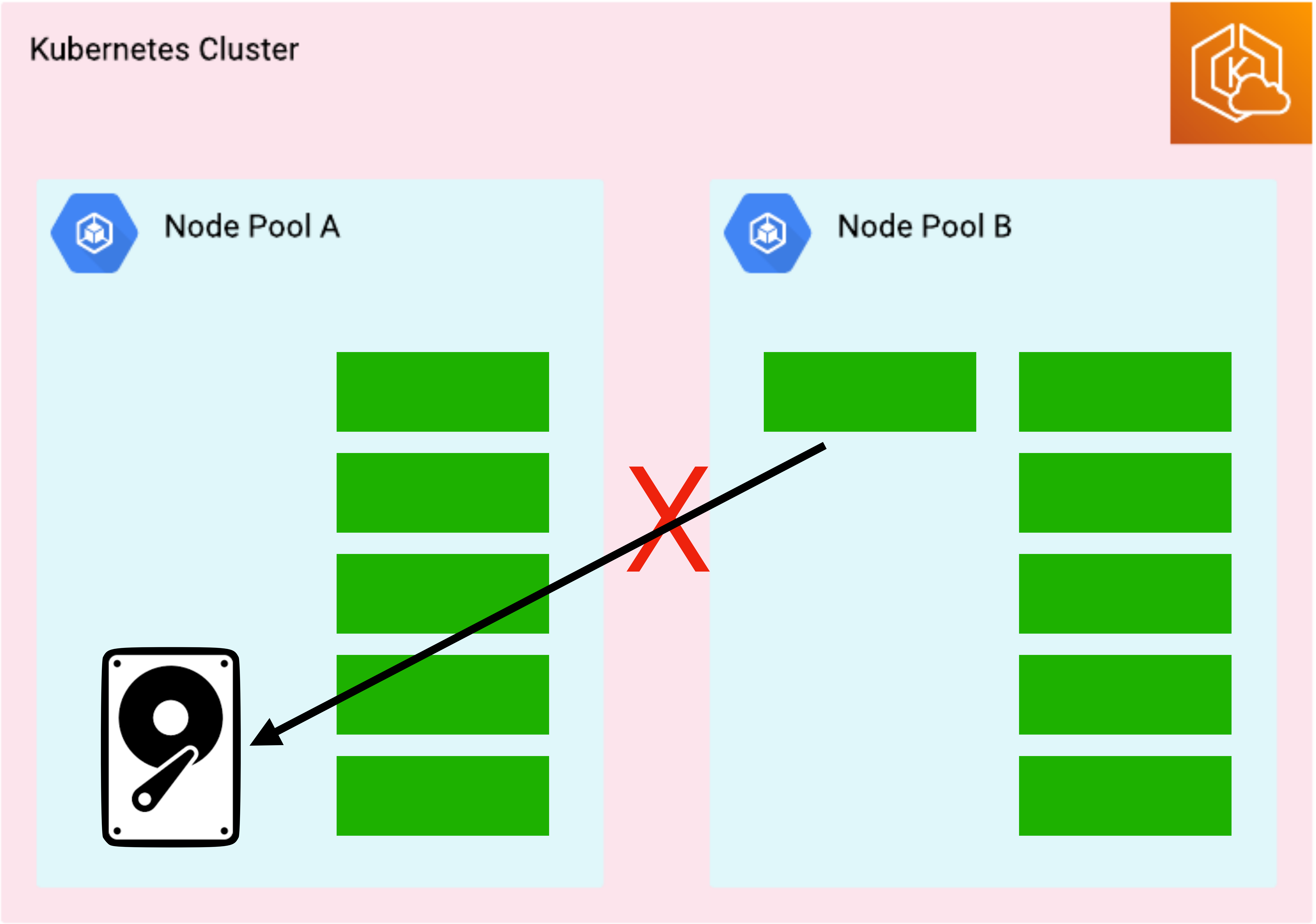
Demo

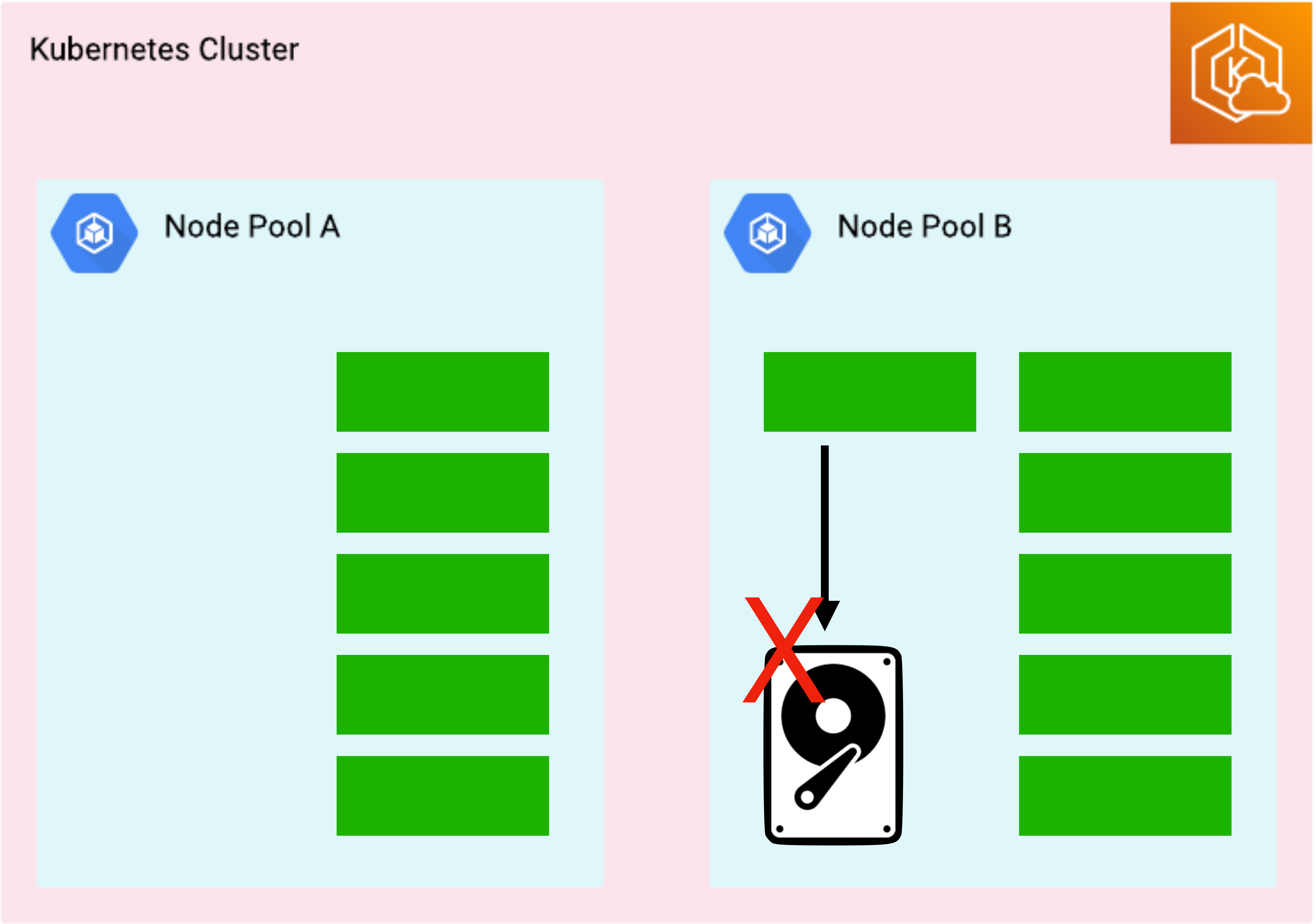
4.2. Kubernetes containers spawn on different servers.

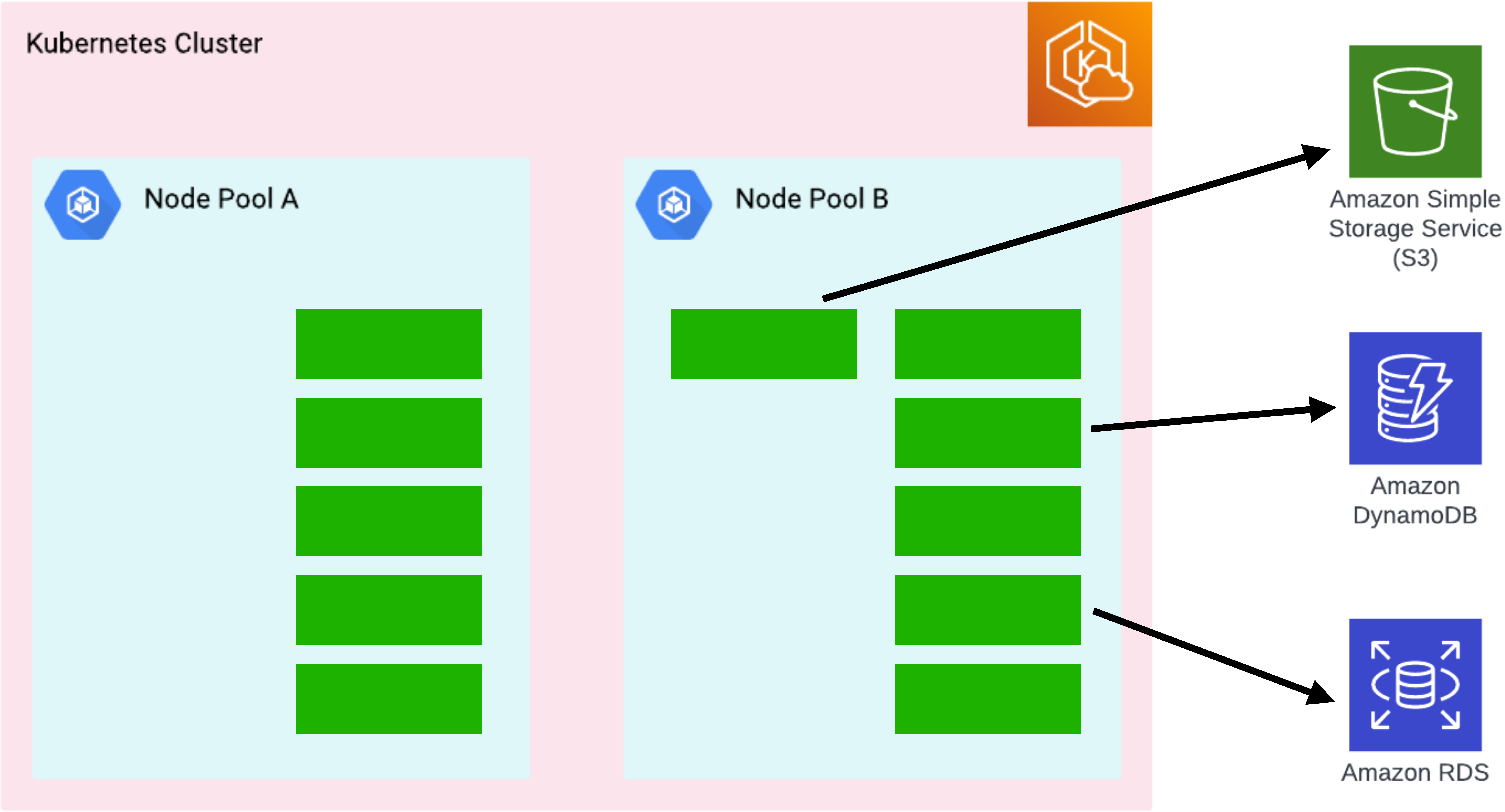
4.1. Kubernetes containers spawn on different servers.




Kubernetes Cluster
Node Pool A
Node Pool B


Kubernetes Cluster
Node Pool A
Node Pool B
X


Kubernetes Cluster
Node Pool A
Node Pool B

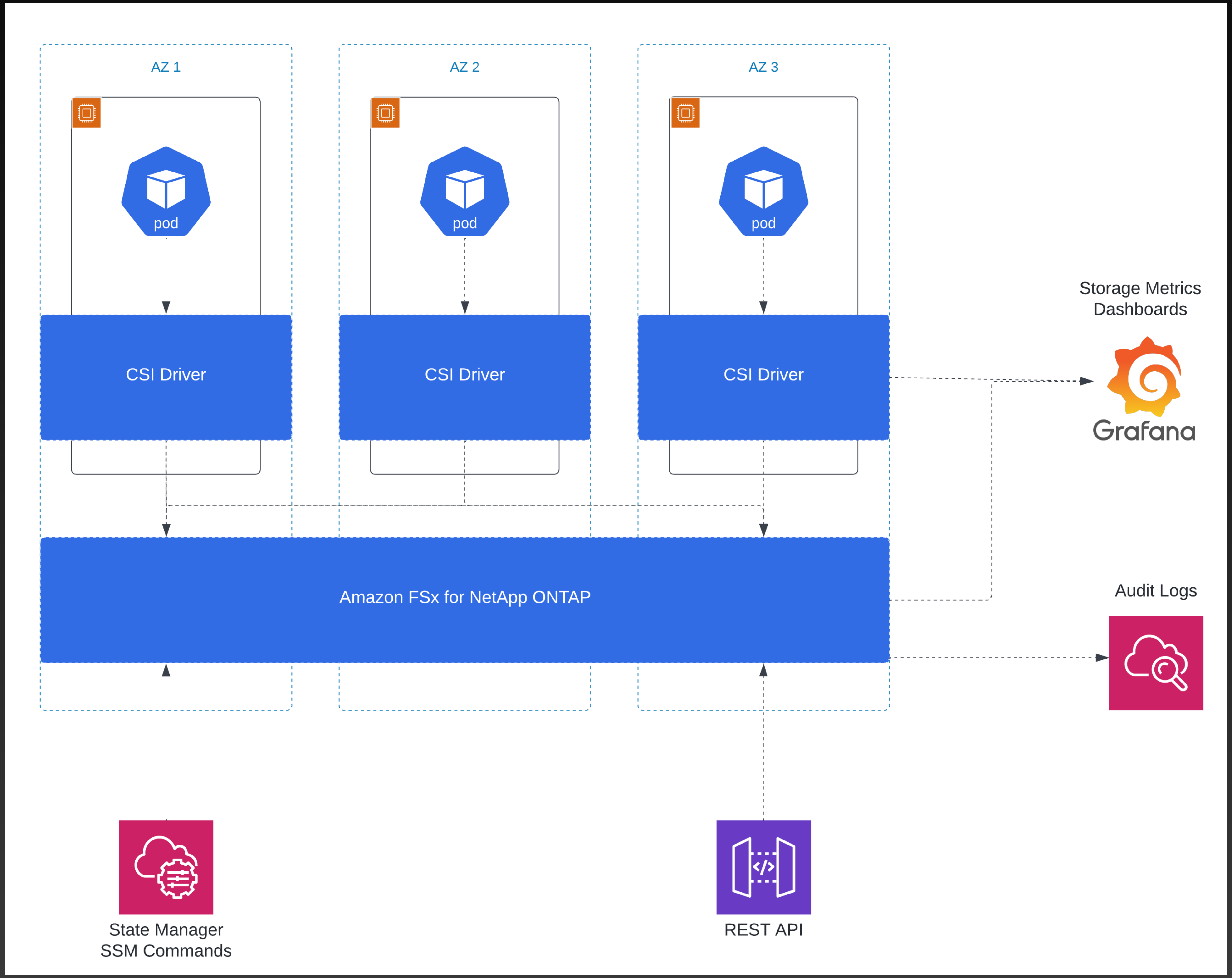

Kubernetes Cluster
Node Pool A
Node Pool B
Amazon Simple Storage Service (S3)
Amazon DynamoDB
Amazon RDS

Embrace Public Cloud

Outsource Responsibilities to Managed Services

5. Persistence in Containers

- Mounting a volume;
- Delegate to external managed services;
- Complex solutions like multi-AZ AWS FSx NetApp ONTAP.


AZ 1
AZ 2
AZ 3
pod
pod
pod
CSI Driver
CSI Driver
CSI Driver
Storage Metrics Dashboards
Grafana
Amazon FSx for NetApp ONTAP
Audit Logs
State Manager SSM Commands
REST API

5.1. Use the Right Tool for the Job

5.2 AWS Storage Services

Amazon Simple Storage Service (S3)

Object storage with industry-leading scalability, availability, and security for you to store and retrieve any amount of data from anywhere.

Amazon Elastic File System (EFS)

A simple, serverless, elastic, set-and-forget file system for you to share file data without managing storage.

Amazon FSx

Fully managed, cost-effective file storage offering the capabilities and performance of popular commercial and open-source file systems.

Amazon Elastic Block Store (EBS)

Easy to use, high-performance block storage service for both throughput and transaction-intensive workloads at any scale.

5.3 AWS Database Services

Database type	Use cases	AWS service
Relational	Traditional applications, enterprise resource planning (ERP), customer relationship management (CRM), ecommerce	Amazon Aurora Amazon RDS Amazon Redshift
Key-value	High-traffic web applications, ecommerce systems, gaming applications	Amazon DynamoDB
In-memory	Caching, session management, gaming leaderboards, geospatial applications	Amazon ElastiCache Amazon MemoryDB for Redis
Document	Content management, catalogs, user profiles	Amazon DocumentDB (with MongoDB compatibility)
Wide column	High-scale industrial apps for equipment maintenance, fleet management, and route optimization	Amazon Keyspaces
Graph	Fraud detection, social networking, recommendation engines	Amazon Neptune
Time series	Internet of Things (IoT) applications, DevOps, industrial telemetry	Amazon Timestream
Ledger	Systems of record, supply chain, registrations, banking transactions	Amazon Ledger Database Services (QLDB)

6. Q&A

Questions ?

Thank you!