



Azure Dev Days

for developers, by developers

Ravi Tella
MTC Houston

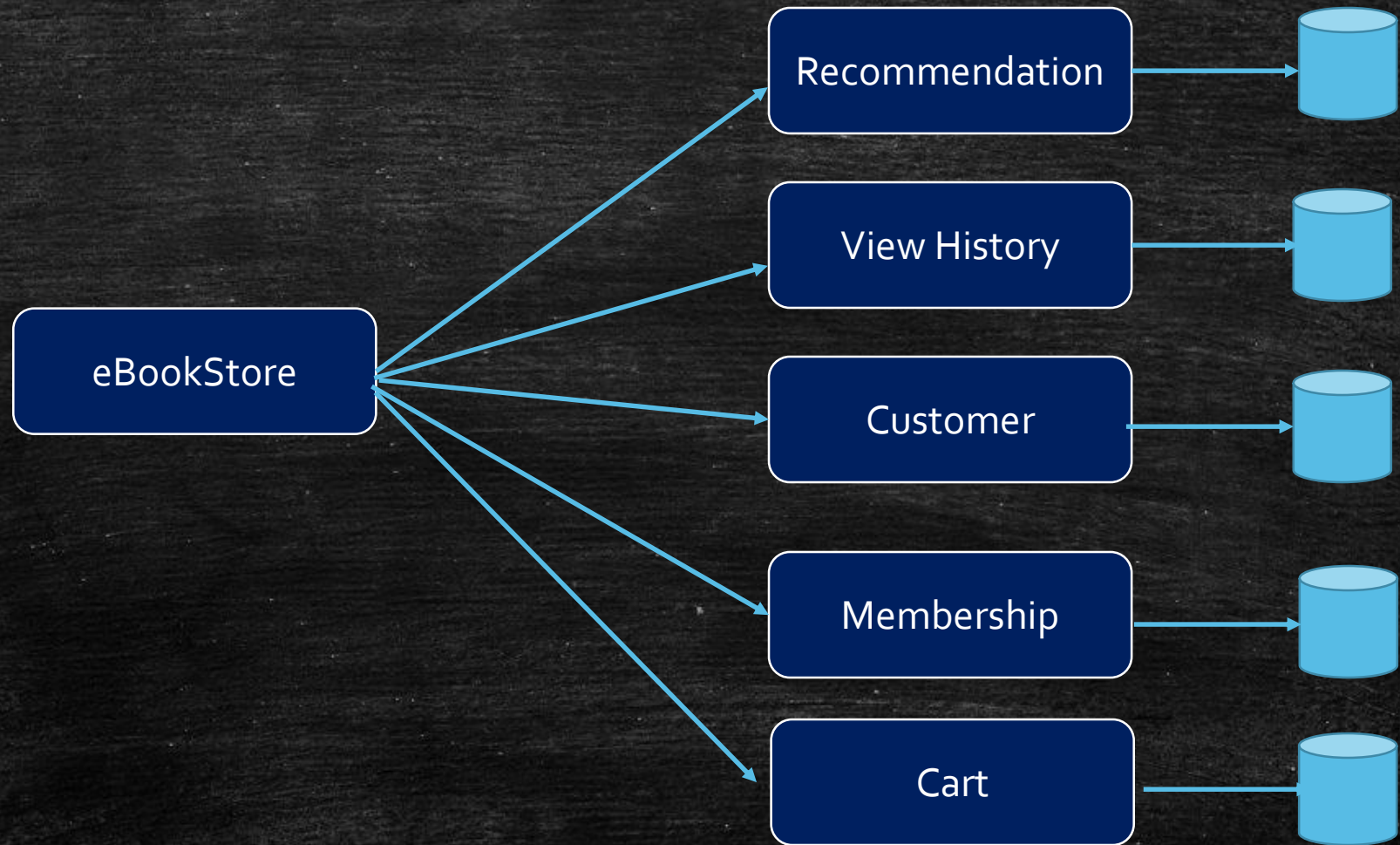
Learn.
Connect.
Explore.

Containers and Microservices

Ravi Tella
Houston MTC

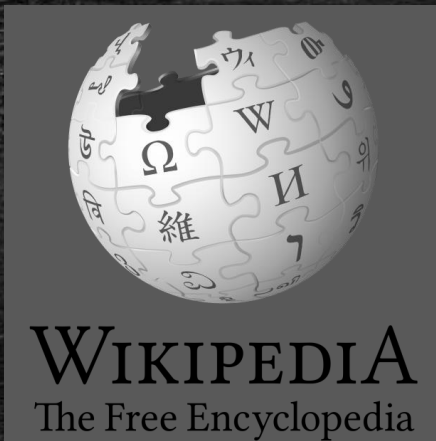
Topics

- Microservice Architecture Style
- Container Services in Azure
- More About Microservice Architecture Style
- Build Announcements



Characteristics of Microservices

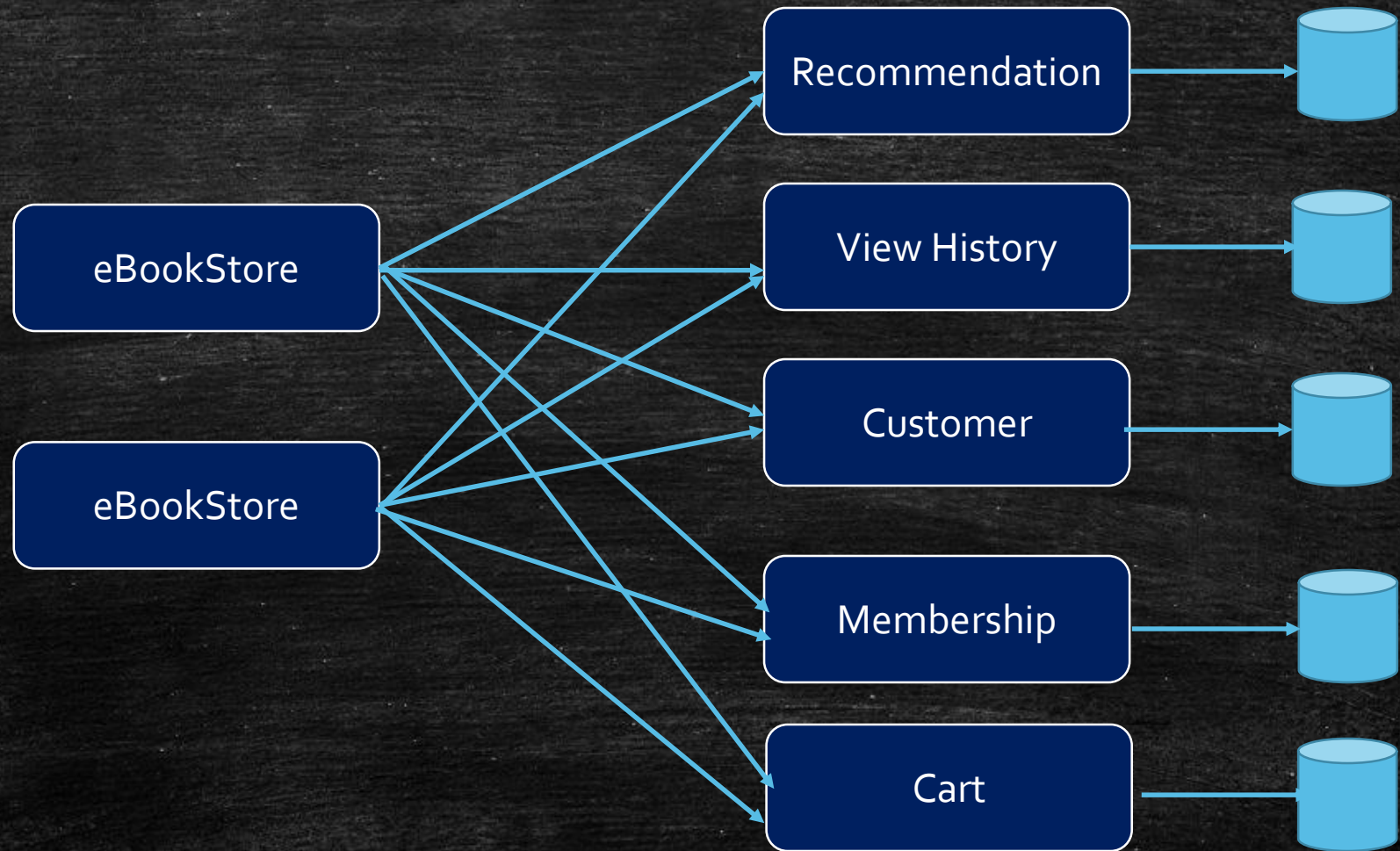
- Modeled around business concepts
- Hide implementation detail
- Isolate failure
- Decentralized
- Managed independently



Microservices are a modern interpretation of service-oriented architectures used to build distributed software systems.

Decentralized

Managed independently



SOA

+

Ease of Automation

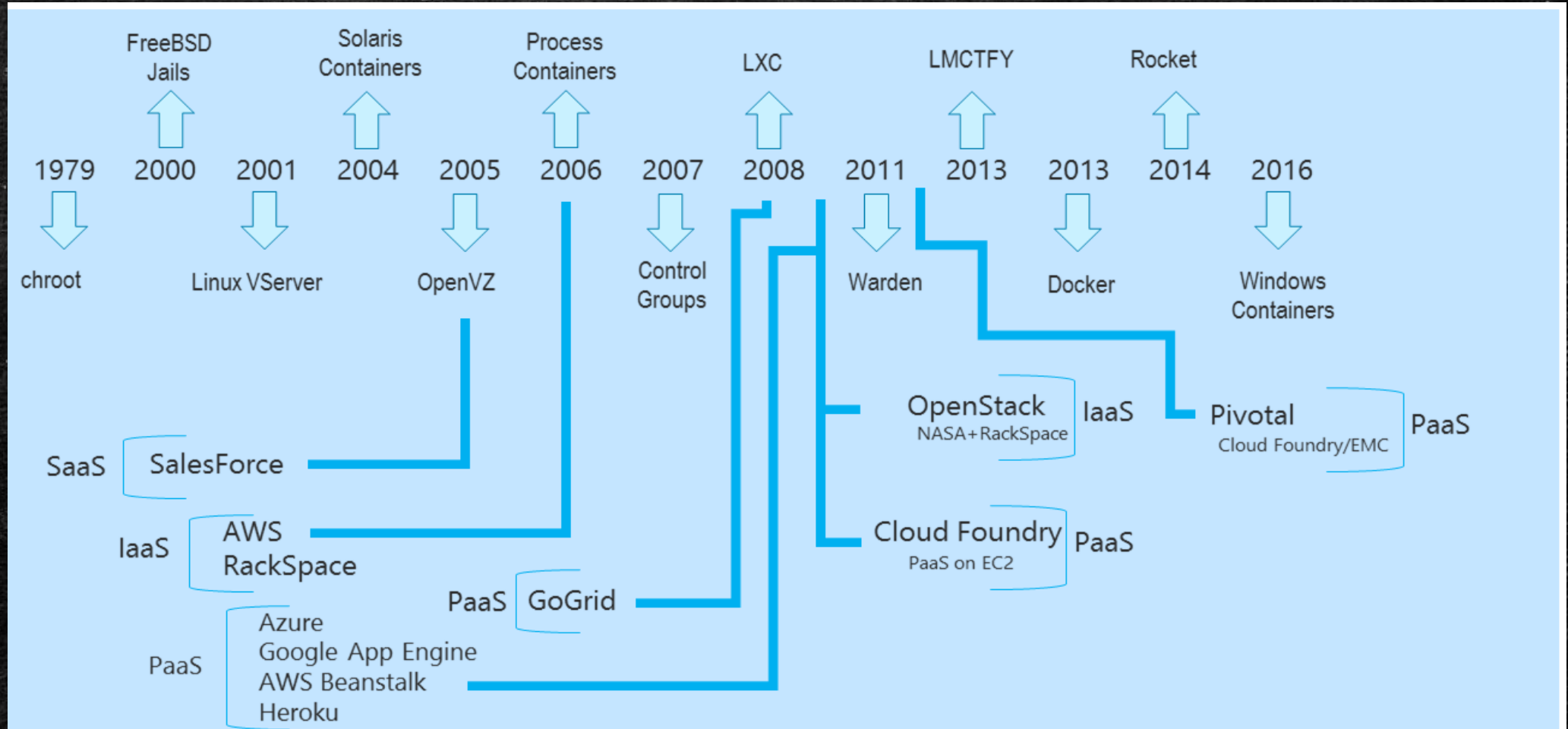
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Microservice Architecture

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PaaS

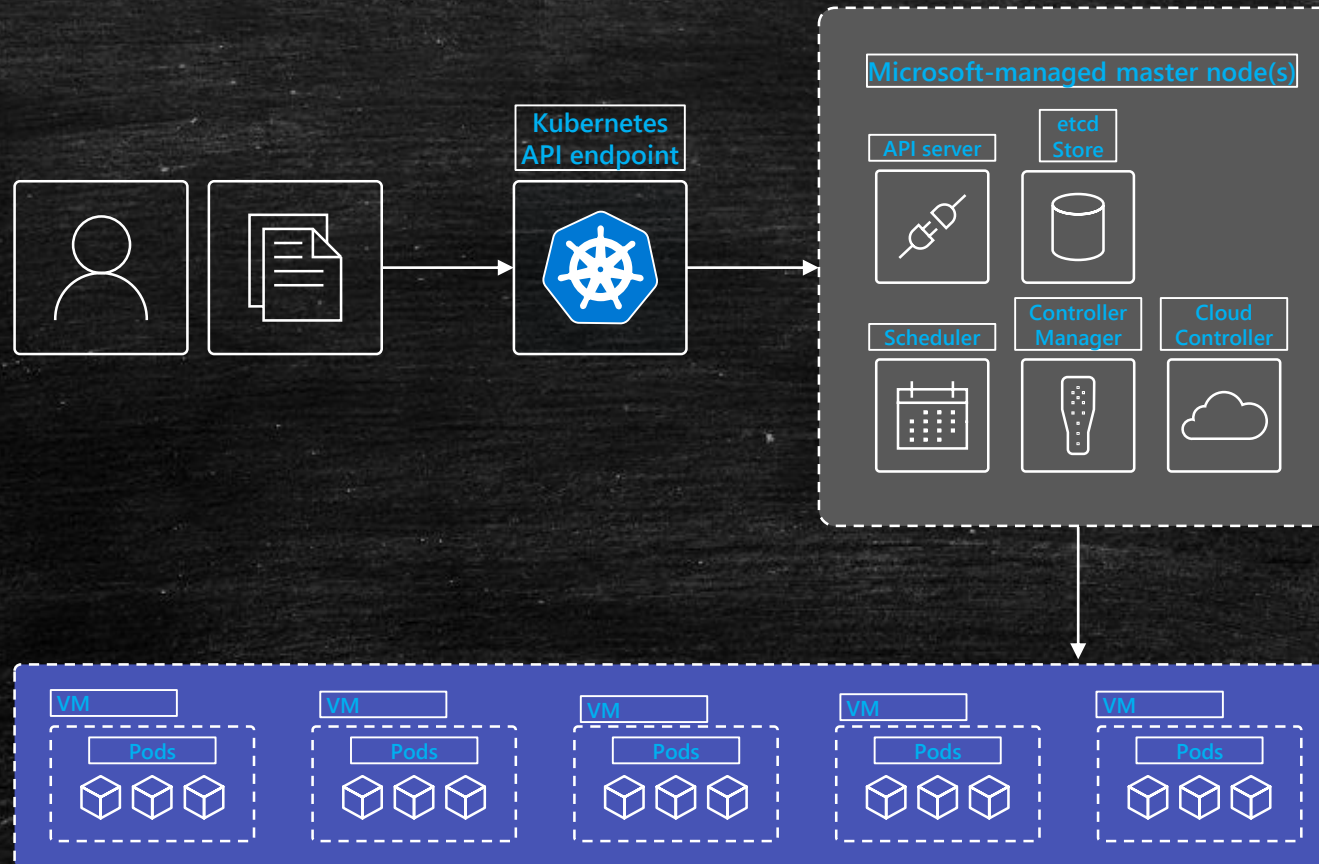
Container usage before Docker



Container Services on Azure

- Azure Kubernetes Service
- App Service
- Container instance
- Service Fabric
- Azure Red Hat OpenShift
- Container Registry
- AKS Engine

Kubernetes Service (AKS)



	OS	VNet	Orchestrator	Deployment	Resource limits	Volumes
App Services	Windows, Linux	Yes	App Services	Docker Compose, Kubernetes Deployment		Yes
ACI	Windows, Linux	Yes	ACI	Azure CLI, Power Shell	4 CP, 16 GB	Yes (Linux)
ACI(Group)	Linux	Yes	ACI	ACI YAML ARM Template		Yes (Linux)
AKS	Linux, Windows	Yes	Kubernetes	Kubernetes Deployment		Yes
Azure Red Hat OpenShift	Linux	Yes	Kubernetes	Deployment Config, Kubernetes Deployment		Yes
ACS Engine	Windows, Linux	Yes	Kubernetes	Kubernetes Deployment		Yes
Service Fabric	Windows, Linux	Yes	Service Fabric	Service Fabric, Docker Compose		Yes

Challenges

- Performance
- Cascading Failures
- Eventual Consistency

Latency Numbers Every Programmer Should Know

■ 1 ns

■ L1 cache reference: 0.5 ns

■ Branch mispredict: 5 ns

■ L2 cache reference: 7 ns

■ Mutex lock/unlock: 25 ns

■ = 100 ns

■ Main memory reference: 100 ns

■ = 1 μ s

■ Compress 1 KB with Zippy: 3 μ s

■ = 10 μ s

■ Send 1 KB over 1 Gbps network: 10 μ s

■ SSD random read (1Gb/s SSD): 150 μ s

■ Read 1 MB sequentially from memory: 250 μ s

■ Round trip in same datacenter: 500 μ s

■ = 1 ms

■ Read 1 MB sequentially from SSD: 1 ms

■ Disk seek: 10 ms

■ Read 1 MB sequentially from disk: 20 ms

■ Packet roundtrip CA to Netherlands: 150 ms

Source: <https://gist.github.com/2841832>

What can you do today?

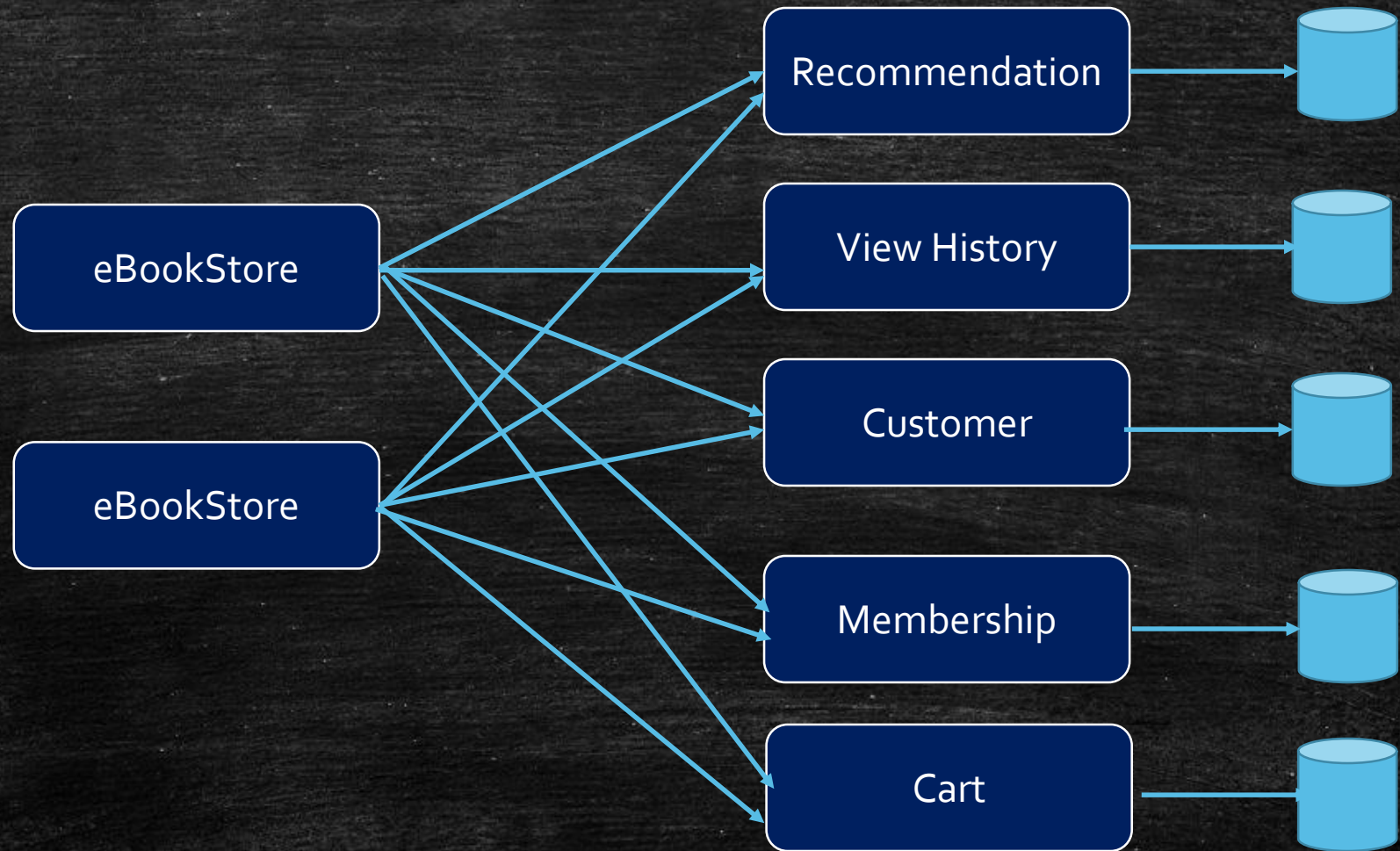
➤ Scale Better

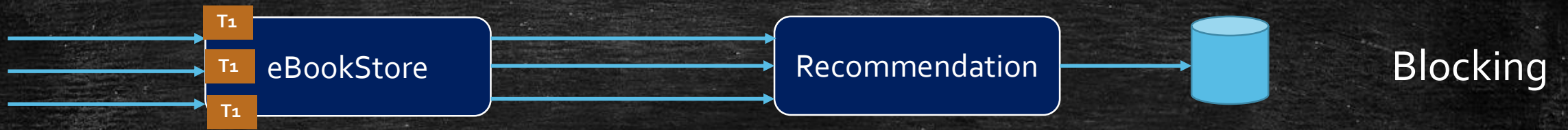
➤ Prevent Cascading Failures

➤ Asynchronous & Non-Blocking

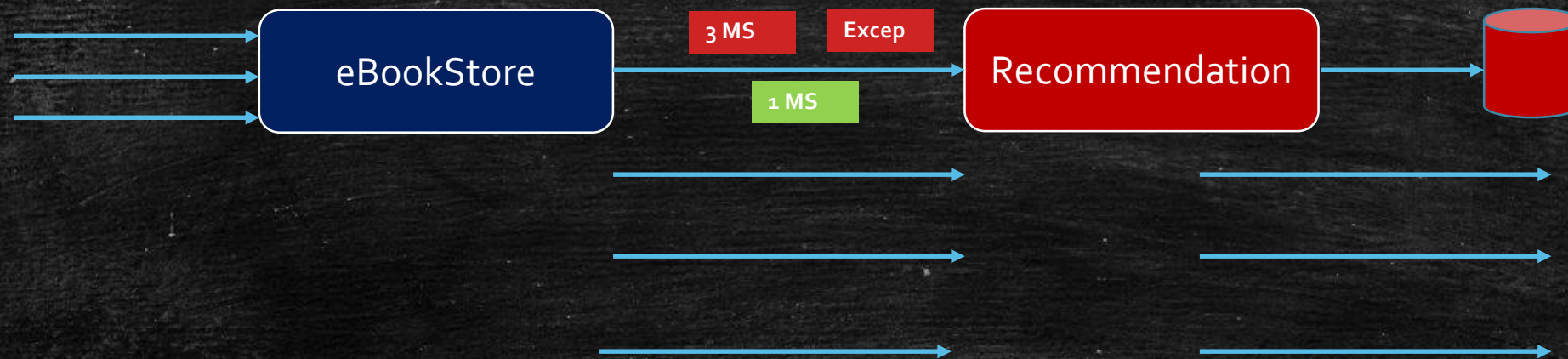
➤ Bulk Head

➤ Circuit Breaker

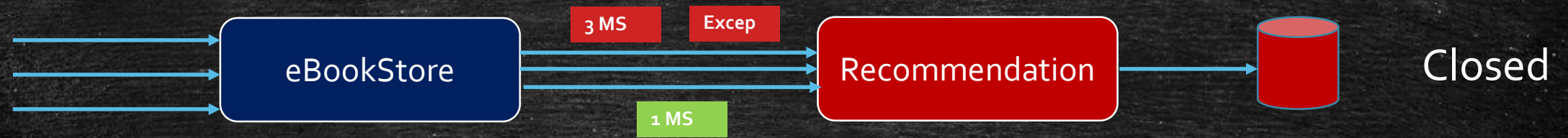




Functional Reactive Programming



Circuit Breaker to the rescue



There is Help



Service Mesh



Eventual Consistency ?


Build 2019 - Now available


- User-defined network policy in Azure Kubernetes Service (AKS) is now available
- Azure Kubernetes Service (AKS) virtual node is now available
- Azure Dev Spaces for Azure Kubernetes Service (AKS)

Build-In preview

- Azure Container Registry virtual network and firewall rules support
- Authenticated IP for Azure Kubernetes Service (AKS)
- Azure Kubernetes Service (AKS) multi node pools
- Windows Server containers support in Azure Kubernetes Service (AKS)


RaviTella/Microservices



 Set status





Ravi Tella
RaviTella



★ **PRO**




 Microsoft



Overview Repositories **22** Projects **0** Stars **0** Followers **5** Following **0**



Pinned Order updated.


 **SpringBootWebFlux** 
Spring Boot 2 on WebFlux stack, integrated with Spring Data Reactive Repositories with MongoDB and Azure CosmosDB
 Java ★ 2  2

 **Databricks**
 1

 **PlayScalaReadingListApp** 
Scala Play Framework sample application using Spring Data Reactive Repositories with MongoDB and Azure CosmosDB
 Scala

 **ReadingListDotNetCore**
 C#

 **PlayJavaAzureCosmosSQL** 

 **LeetCode**