Building Event-driven Microservices with Azure Cosmos DB Change Feed

INTRODUCTION

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Course Objectives

Cosmos DB

Review partitioning

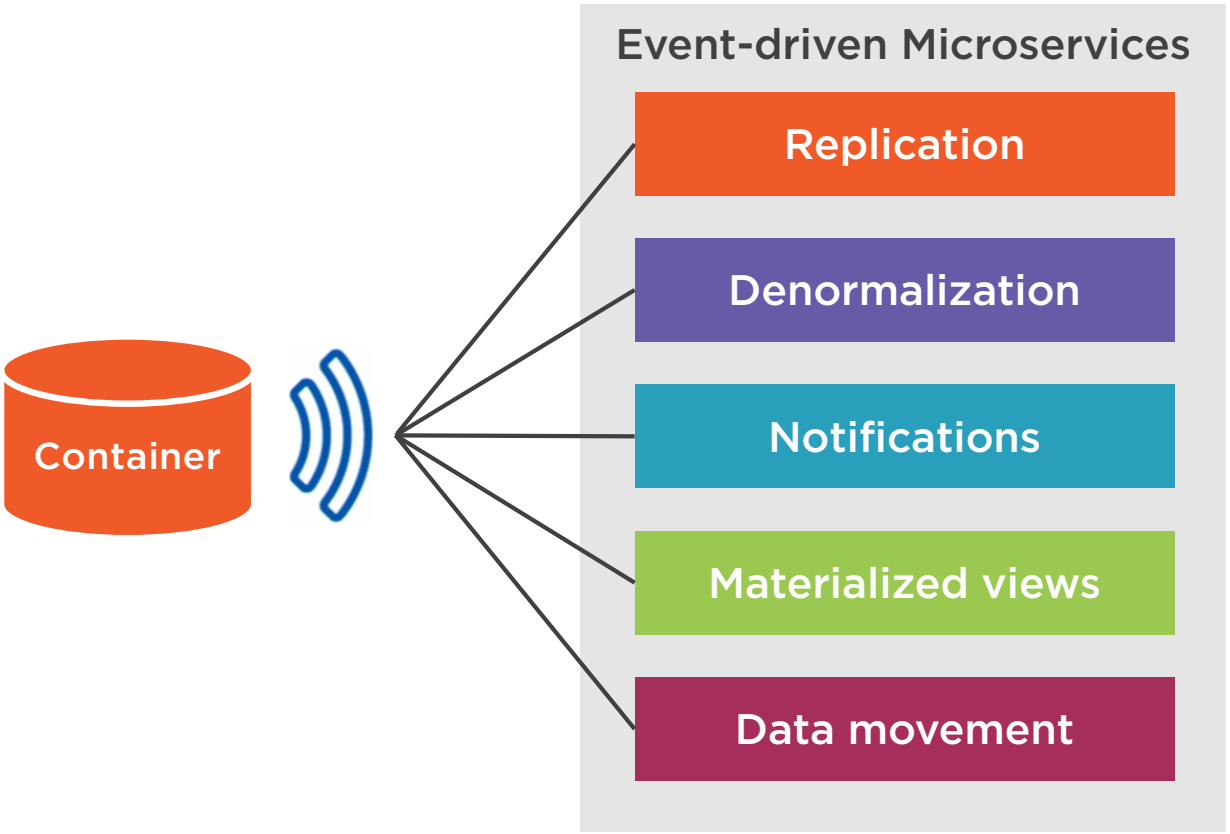
Change feed

Learn about Cosmos DB change feed

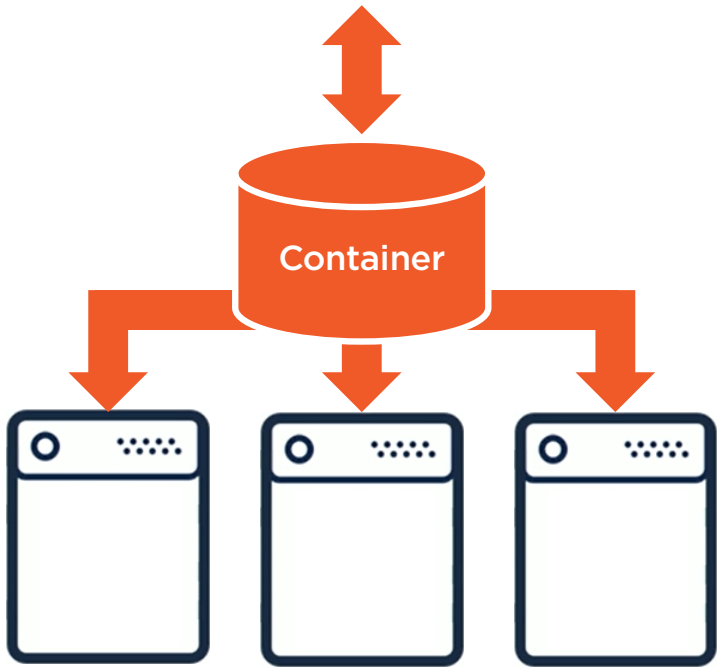
Microservices

Apply these concepts to build event-driven microservices

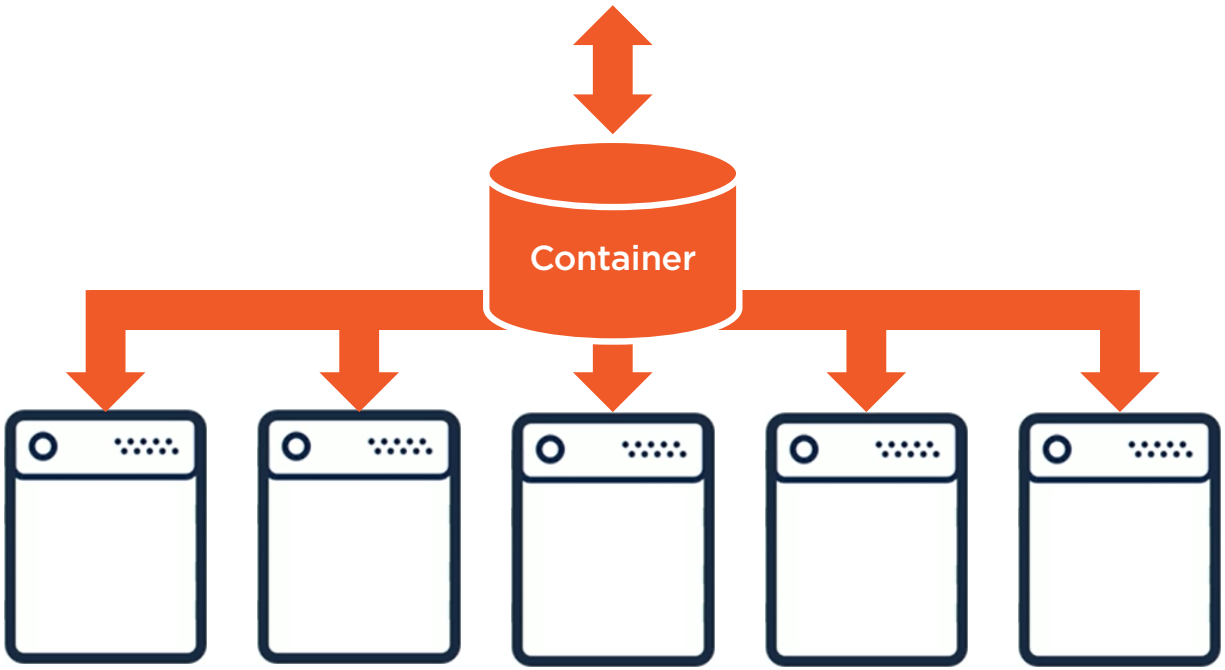
Introducing Change Feed



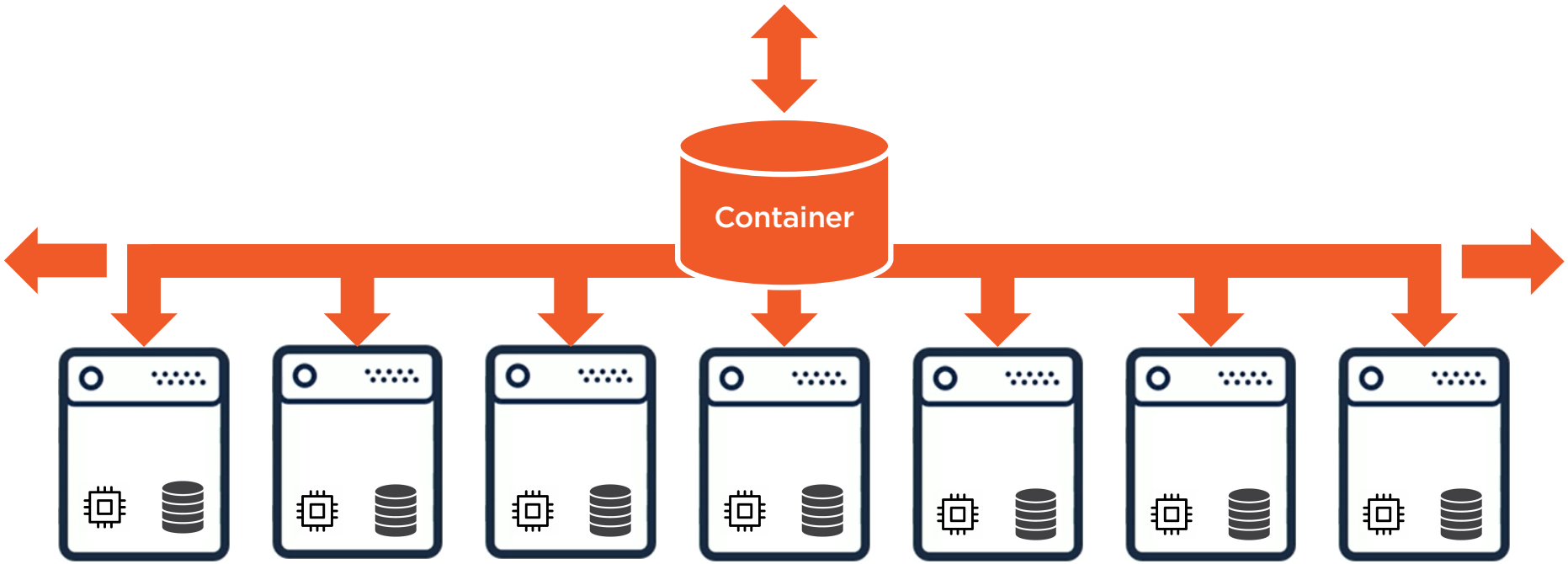
Horizontal Partitioning



Horizontal Partitioning



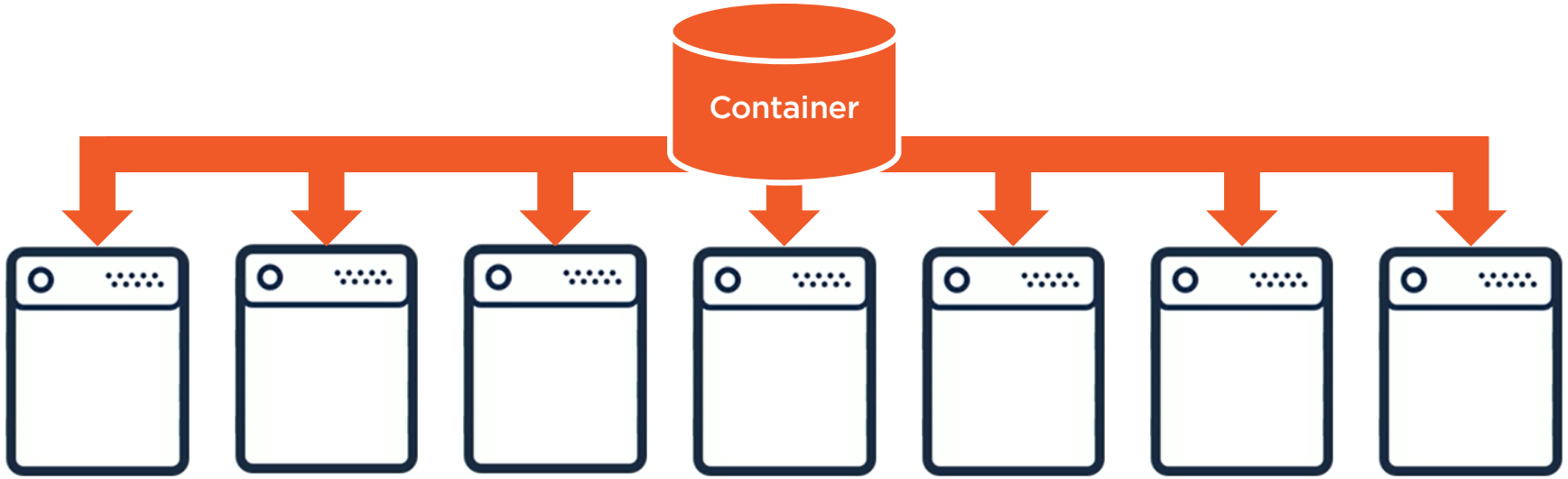
Horizontal Partitioning



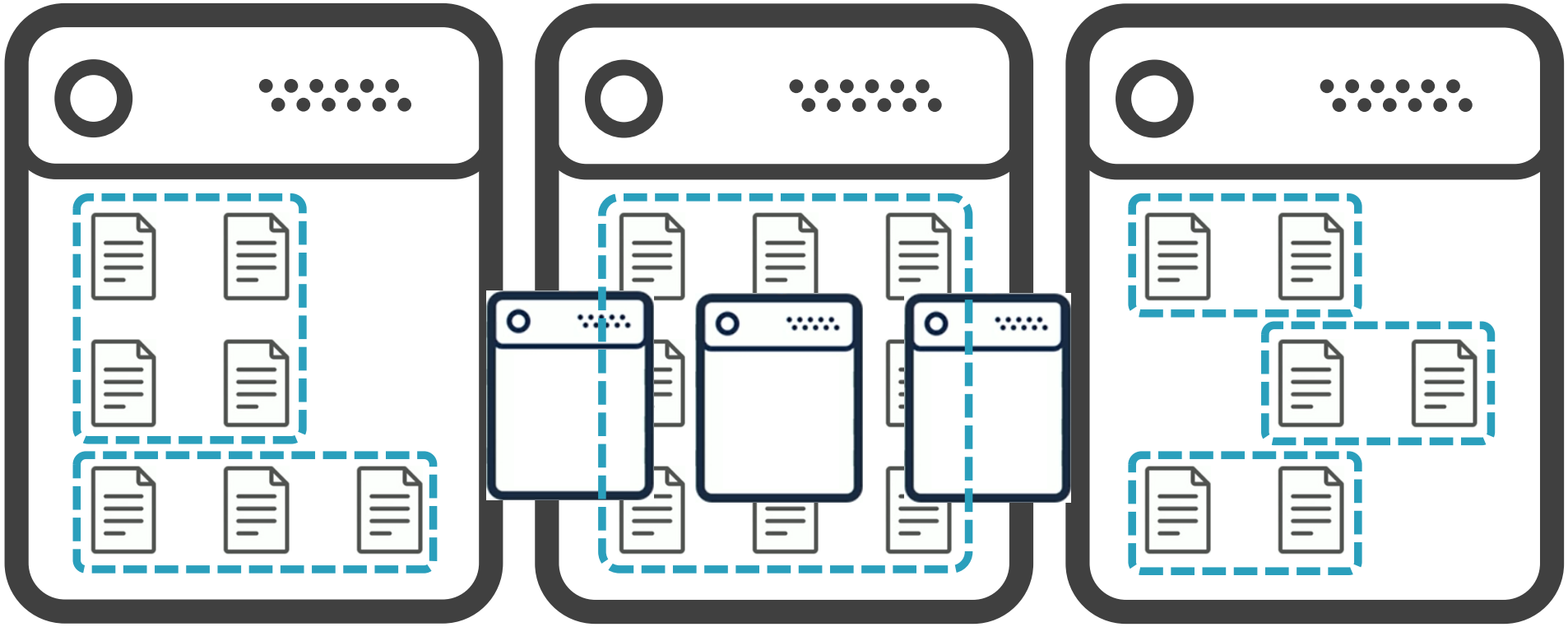
Unlimited storage

Unlimited throughput

Understanding Logical Partitions

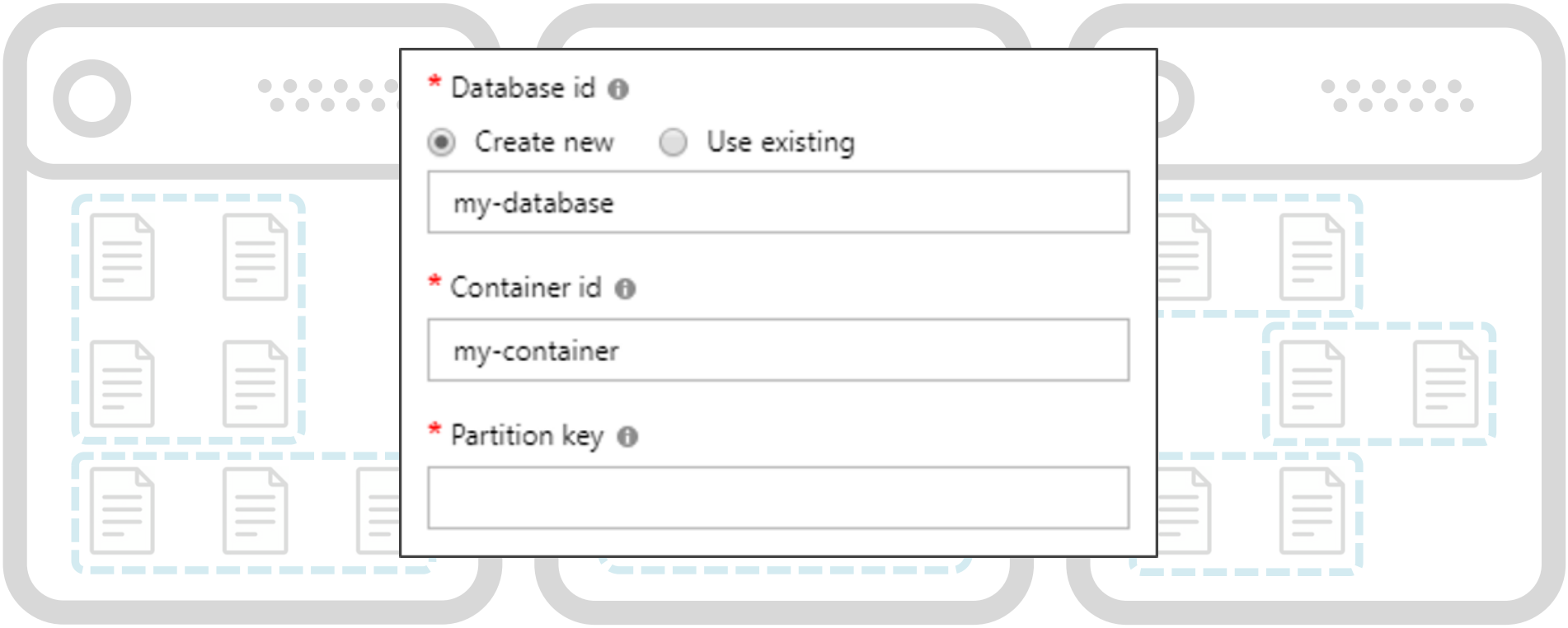


Understanding Logical Partitions



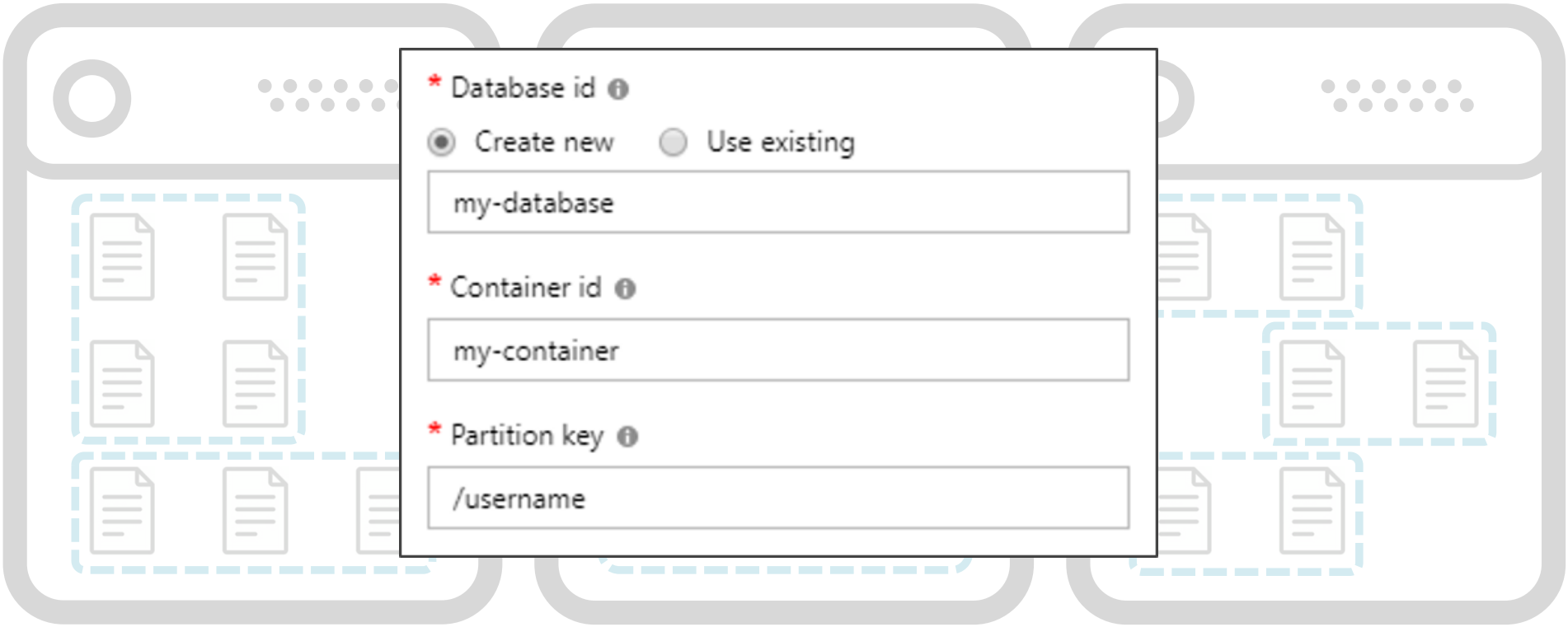
Logical Partitions

Understanding Logical Partitions



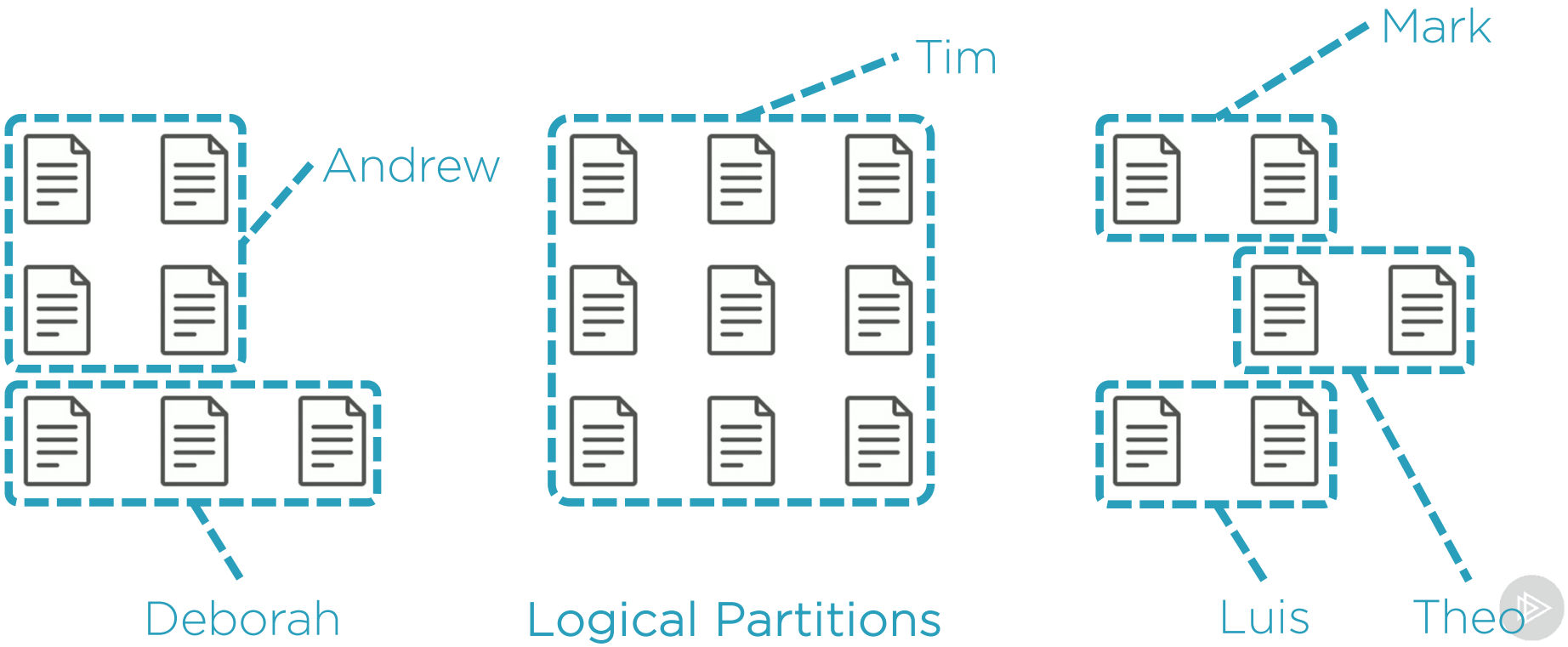
Logical Partitions

Understanding Logical Partitions

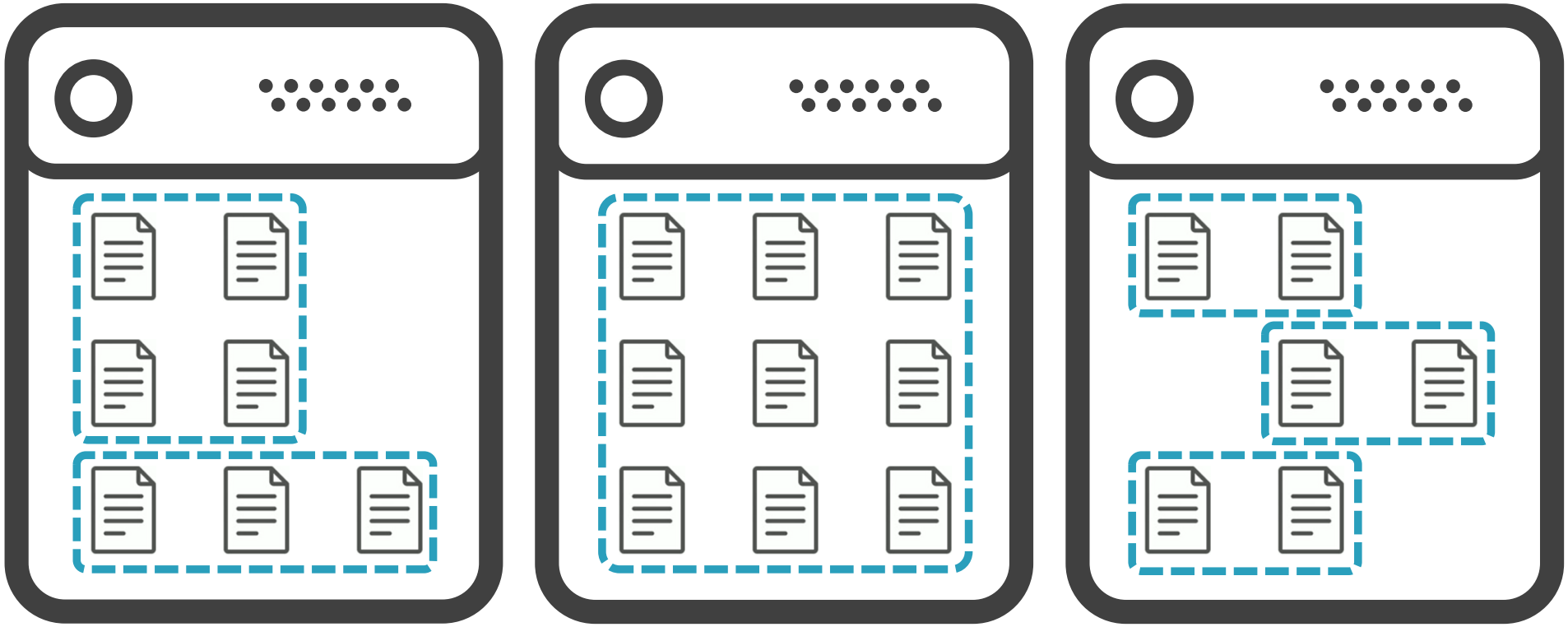


Logical Partitions

Understanding Logical Partitions

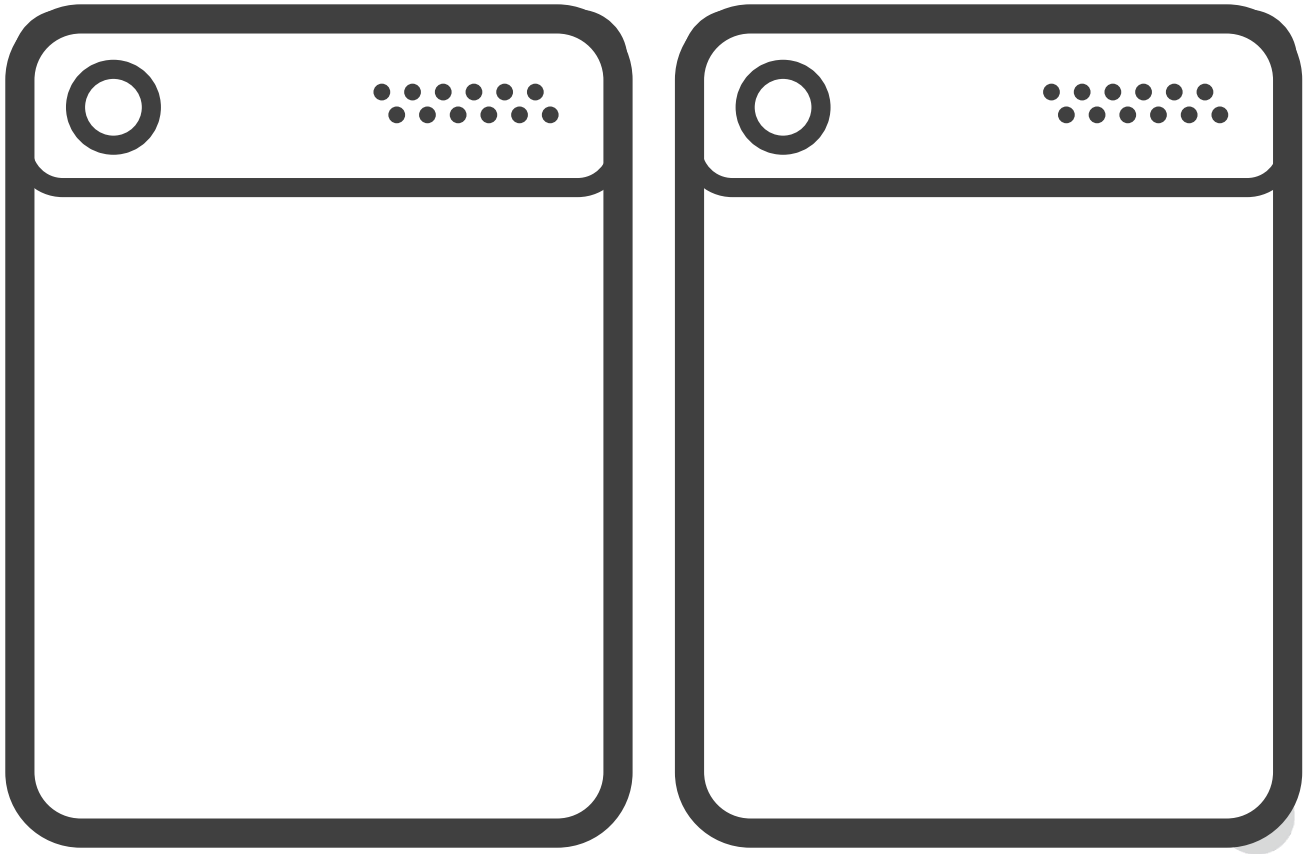


Understanding Logical Partitions



Logical Partitions

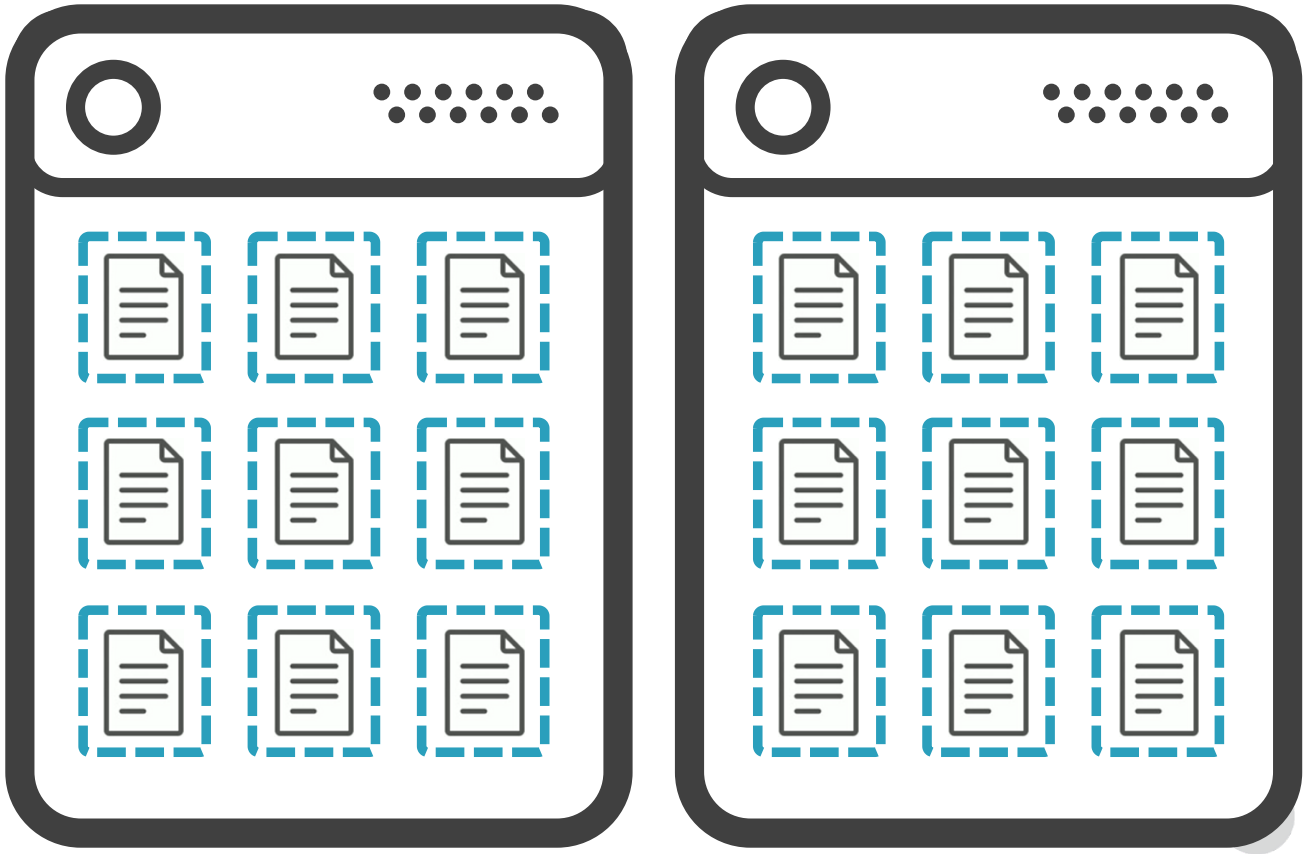
Common Partitioning Patterns



Common Partitioning Patterns

/id

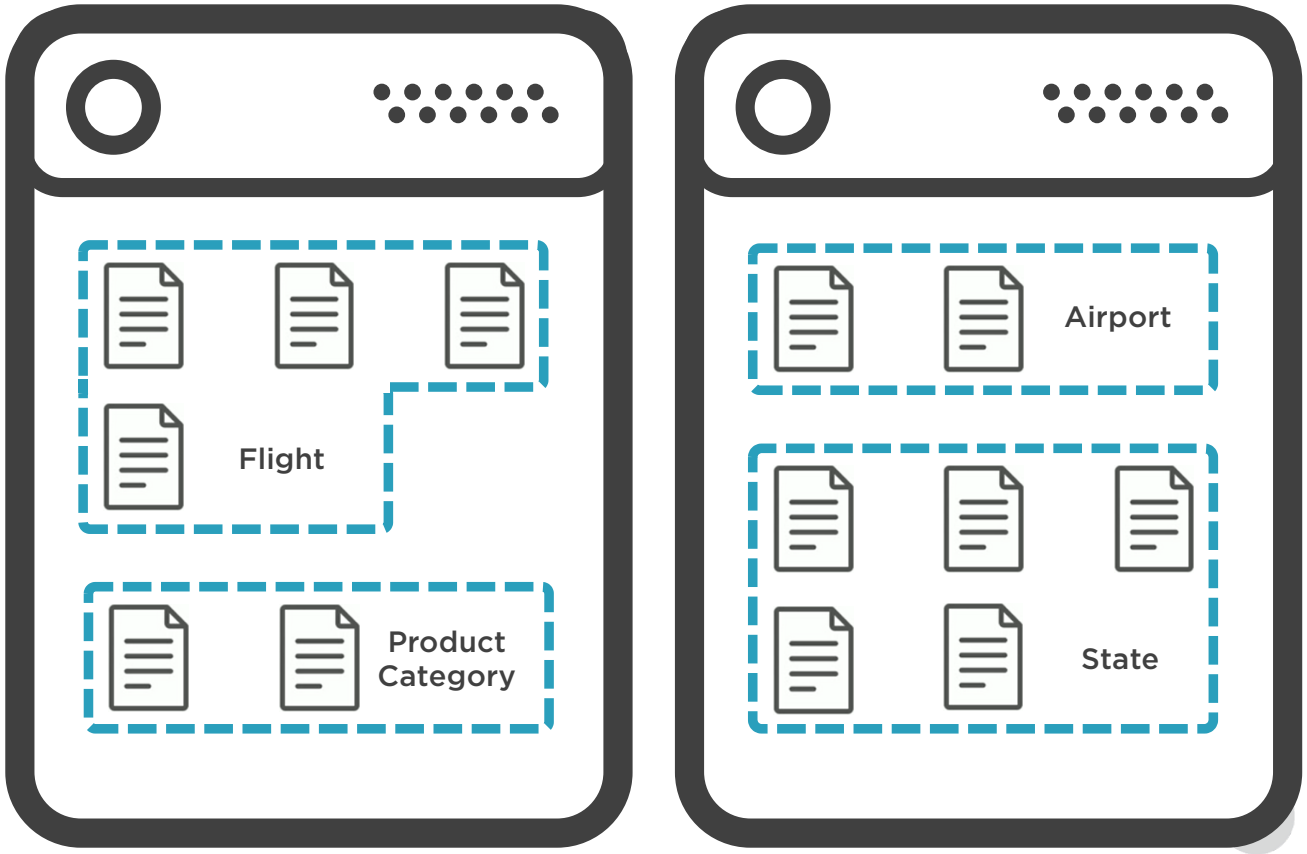
Write-heavy (e.g. IoT)



Common Partitioning Patterns

/id
Write-heavy (e.g. IoT)

/type
Small lookup lists

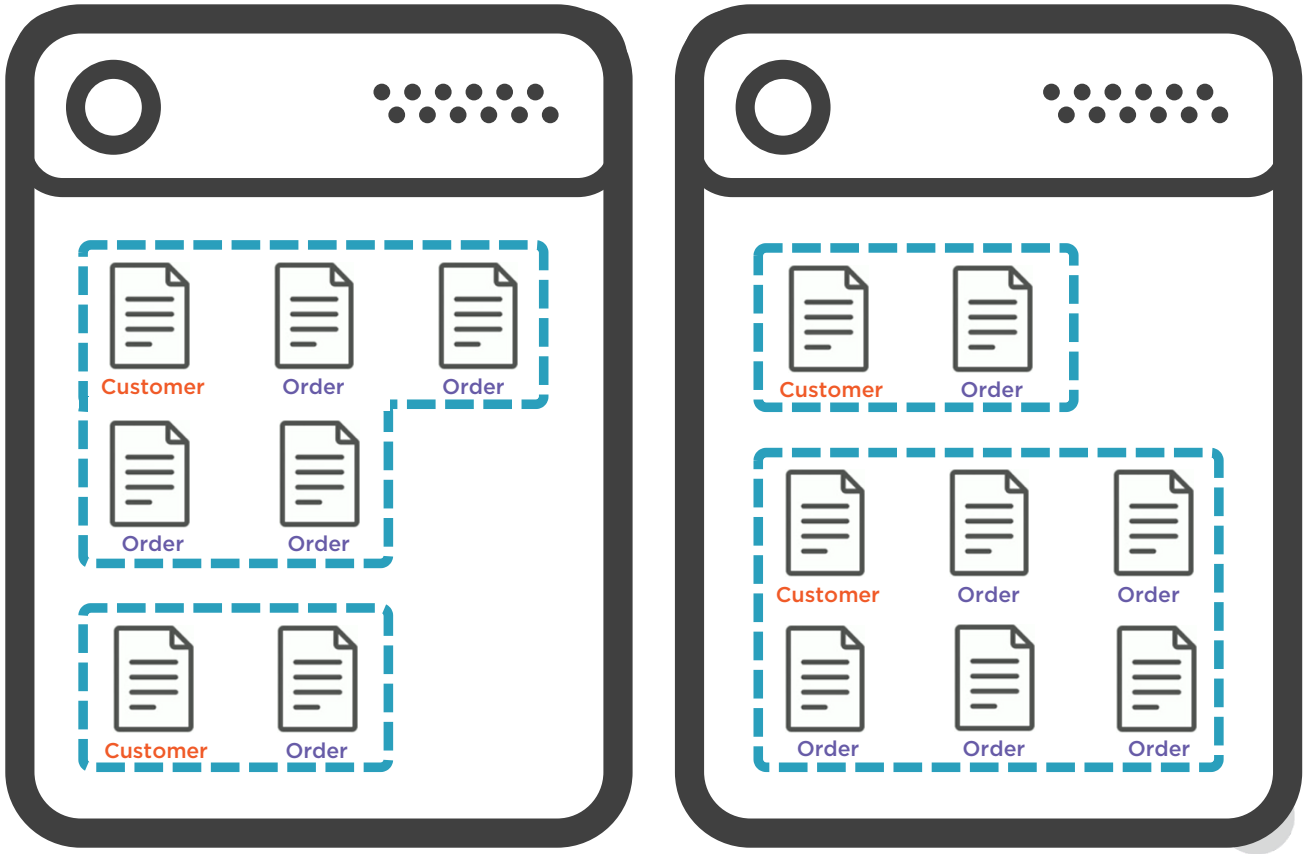


Common Partitioning Patterns

/id
Write-heavy (e.g. IoT)

/type
Small lookup lists

Other **Example: /customerId**
Optimize for queries

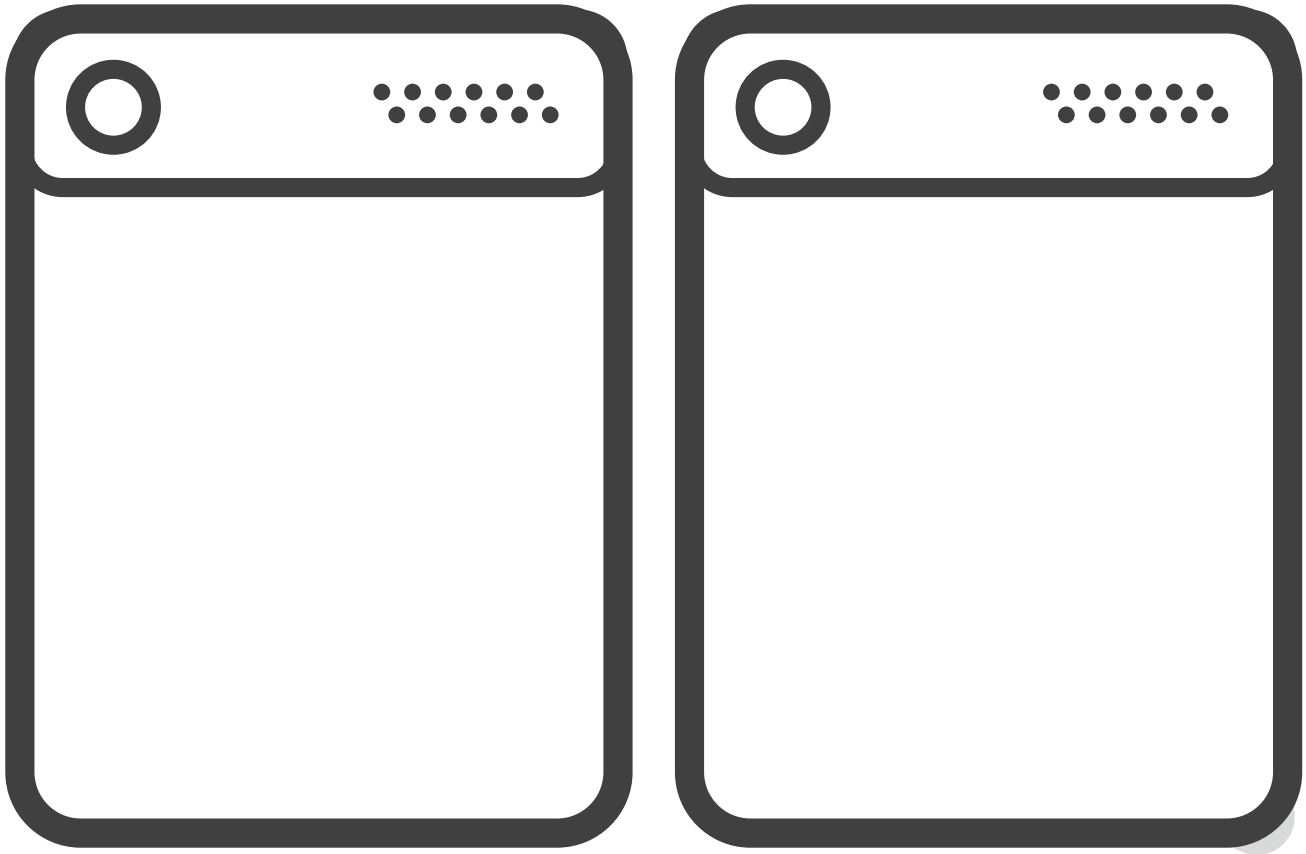


Common Partitioning Patterns

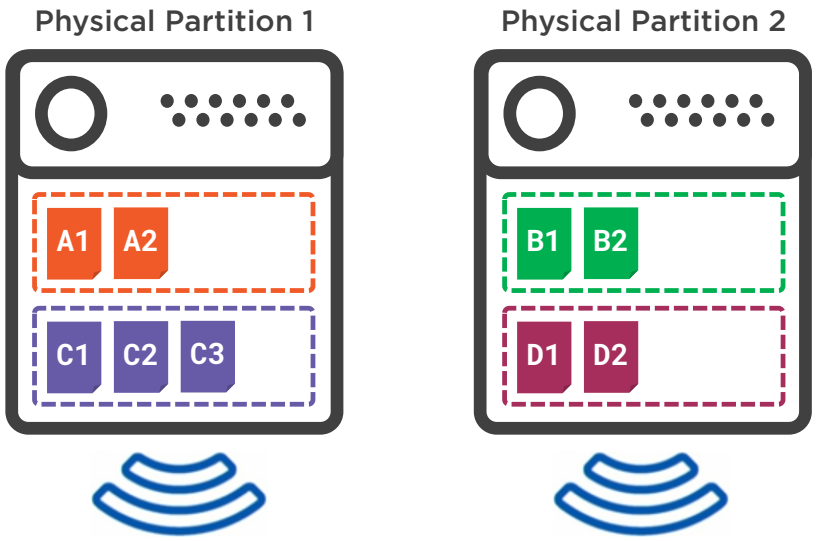
/id
Write-heavy (e.g. IoT)

/type
Small lookup lists

Other
Optimize for queries



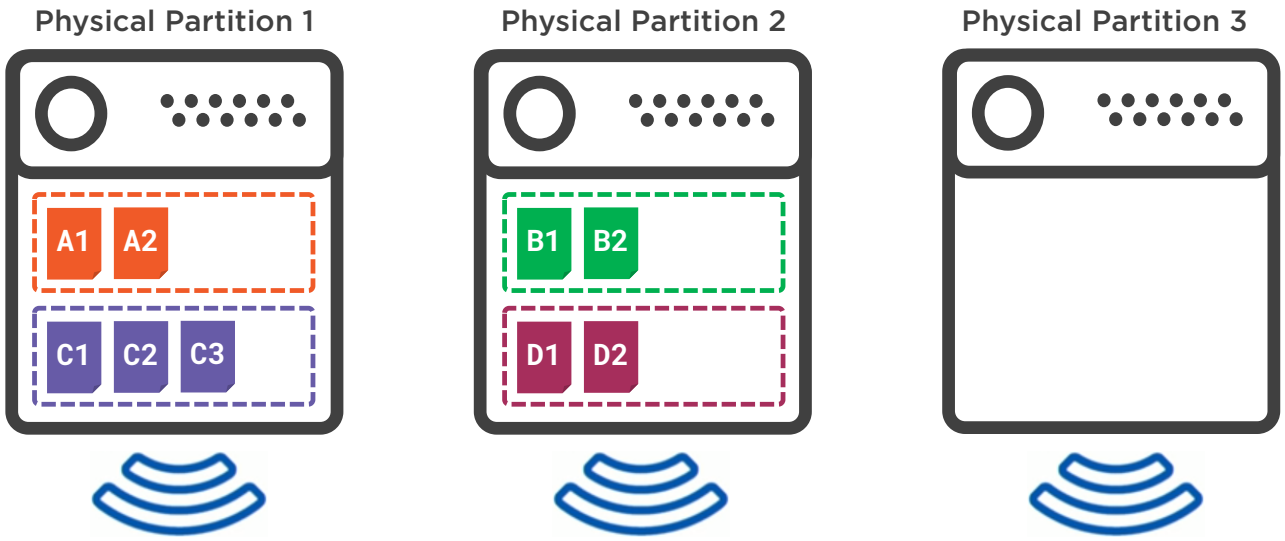
Ordered Change Events




```
Cart A, Event 1
Cart C, Event 1
Cart C, Event 2
Cart A, Event 2
Cart C, Event 3
```

```
Cart B, Event 1
Cart B, Event 2
Cart D, Event 1
Cart D, Event 2
```

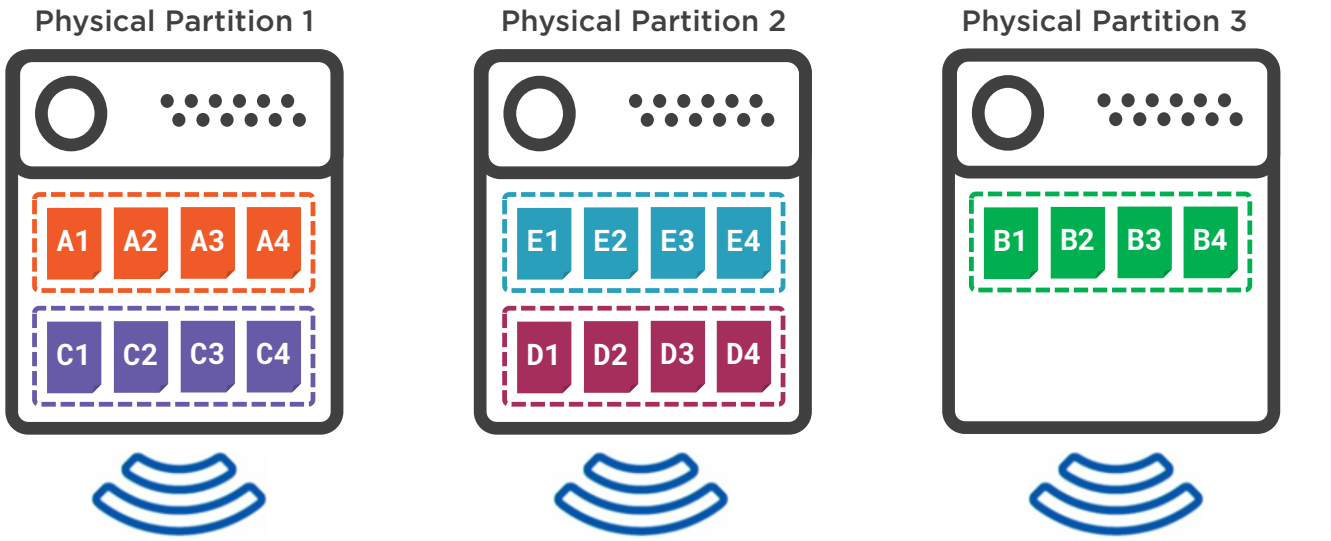
Ordered Change Events




```
Cart A, Event 1
Cart C, Event 1
Cart C, Event 2
Cart A, Event 2
Cart C, Event 3
```

```
Cart B, Event 1
Cart B, Event 2
Cart D, Event 1
Cart D, Event 2
```

Ordered Change Events




```
Cart A, Event 1
Cart C, Event 1
Cart C, Event 2
Cart A, Event 2
Cart C, Event 3
Cart A, Event 3
Cart A, Event 4
Cart C, Event 4
```

```
Cart D, Event 1
Cart D, Event 2
Cart E, Event 1
Cart E, Event 2
Cart E, Event 3
Cart D, Event 3
Cart E, Event 4
Cart D, Event 4
```

```
Cart B, Event 1
Cart B, Event 2
Cart B, Event 3
Cart B, Event 4
```

Ordered Change Events

Physical Partition 1	Physical Partition 2	Physical Partition 3
Cart A, Event 1	Cart D, Event 1	Cart B, Event 1
Cart C, Event 1	Cart D, Event 2	Cart B, Event 2
Cart C, Event 2	Cart E, Event 1	Cart B, Event 3
Cart A, Event 2	Cart E, Event 2	Cart B, Event 4
Cart C, Event 3	Cart E, Event 3	
Cart A, Event 3	Cart D, Event 3	
Cart A, Event 4	Cart E, Event 4	
Cart C, Event 4	Cart D, Event 4	

Logical Change Feed

Cart A, Event 1
Cart D, Event 1
Cart C, Event 1
Cart D, Event 2
Cart B, Event 1
Cart D, Event 3
Cart E, Event 1
Cart C, Event 2
Cart A, Event 2
Cart B, Event 2
Cart C, Event 3
Cart E, Event 2
Cart A, Event 3
Cart E, Event 3
Cart B, Event 3
Cart A, Event 4
Cart E, Event 4
Cart B, Event 4
Cart D, Event 4
Cart C, Event 4

Consuming the Change Feed

Directly

Low-level direct access, per partition

Change Feed Processor (CFP) Library

Stateful and scalable

Azure Functions

Serverless wrapper around the CFP Library

Demo

Using the
Change Feed Processor (CFP) Library

Summary

Horizontal partitioning

- Logical partitions
- Common patterns

Change feed overview

- Persistent log of changes
- Guaranteed partitioned ordering

Consuming the change feed

- Directly (not recommended)
- Change Feed Processor (CFP) Library
- Azure Functions