



flight



Of the Order of Billions: Building  
Observability at Twitter

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Tech Lead Observability | @caitie

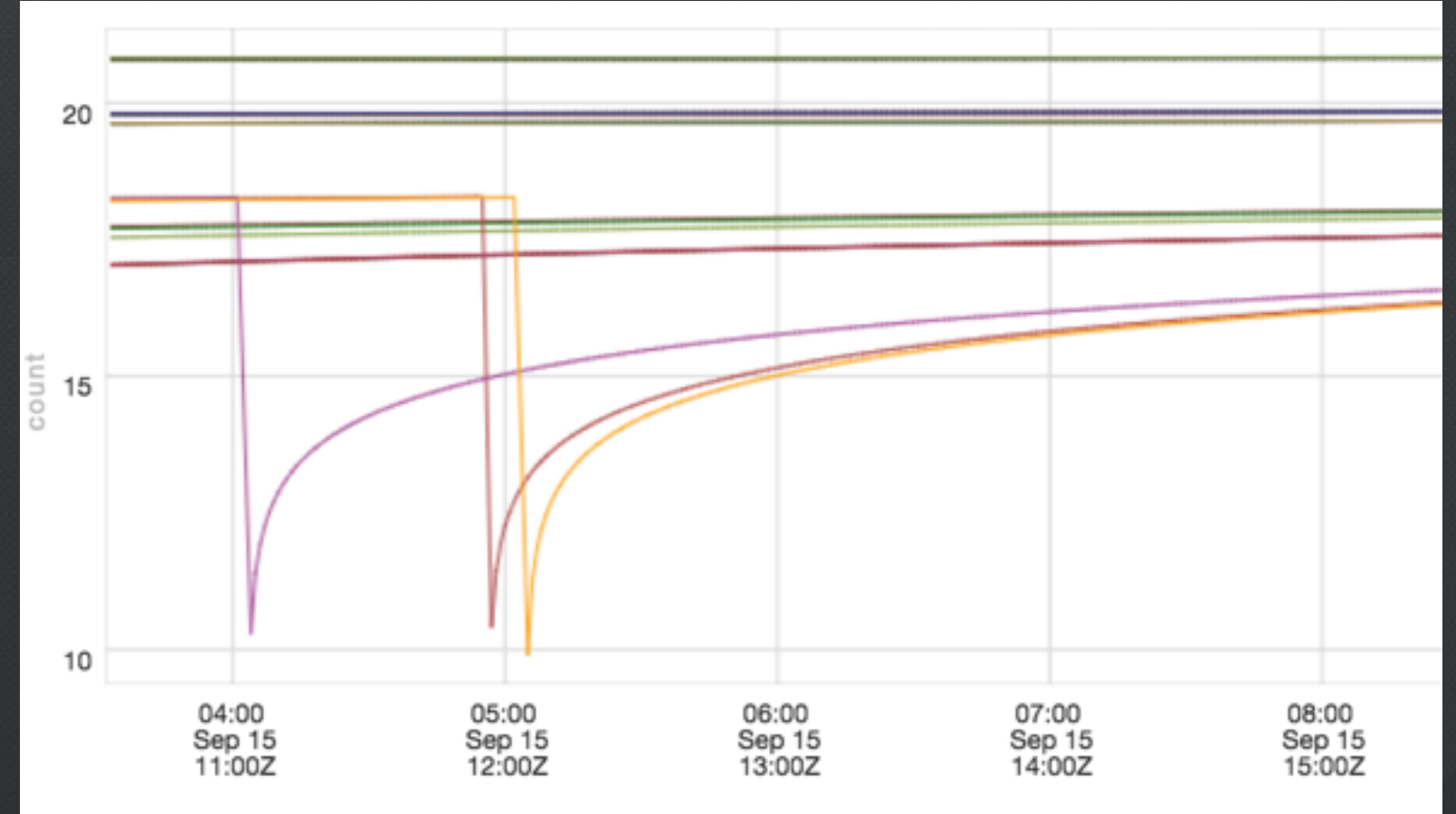
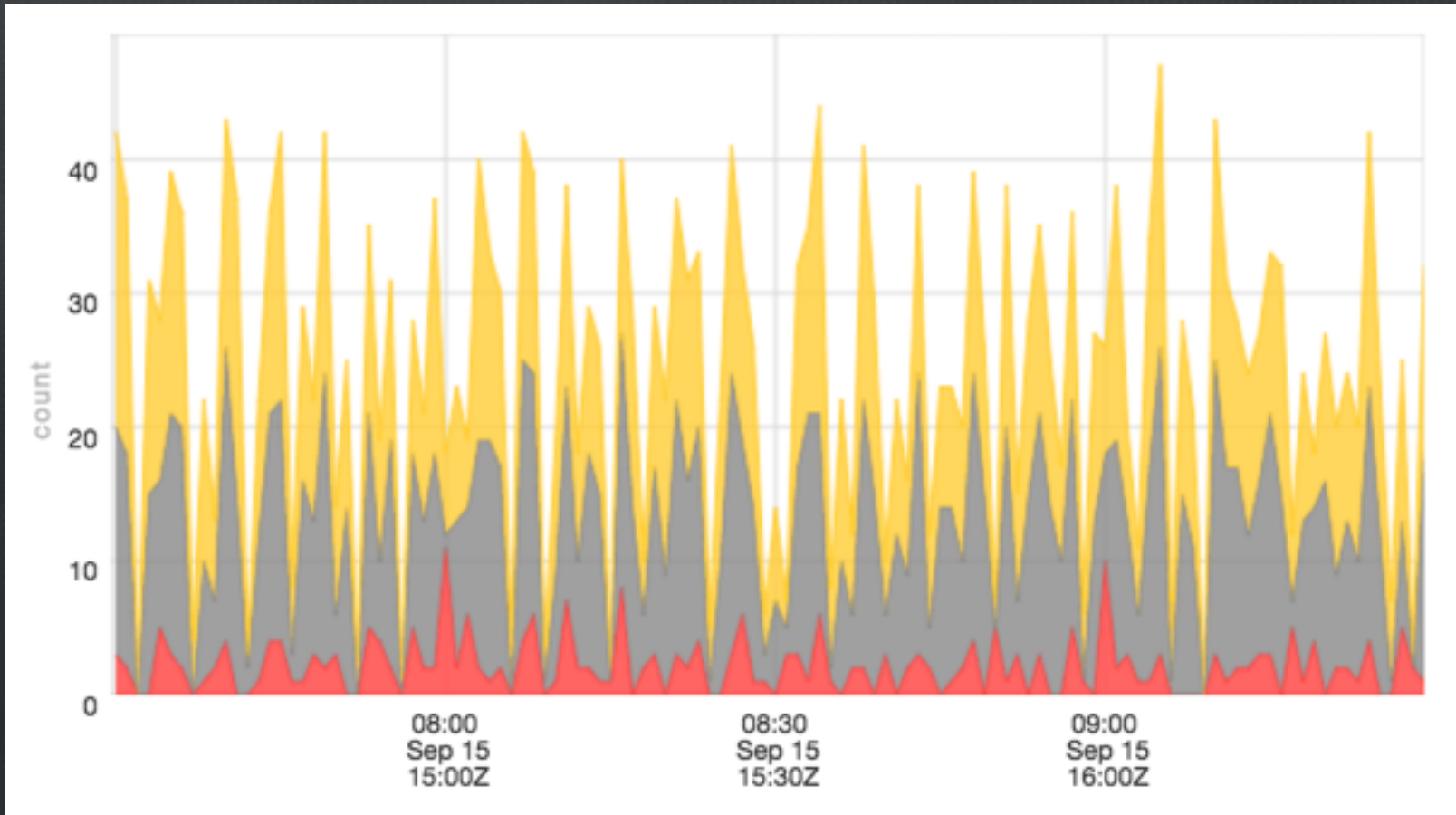
# Of the Order of Billions

BUILDING OBSERVABILITY AT TWITTER

# Observability

PROVIDES VISIBILITY INTO TWITTER SERVICES

# Dashboards & Charts



# Alerts

## Monitor States

25 ok

 Showing All

## Snoozers


 Showing All

Rules

State History

Alert Definition

### Rule

Status 

GC latency is high

 12

Free heap space is low

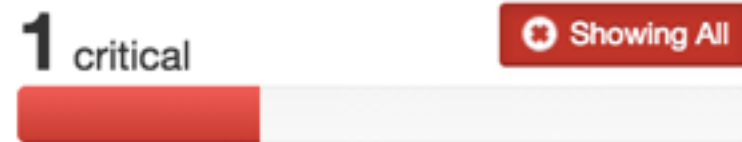
 12

Success Rate is low

 1

# Alerts

## Monitor States ?



Rules

State History

Alert Definition

Rule ?

Status ?

GC latency is high

12

Free heap space is low

12

Success Rate is low

1

KOALABIRD  
ALERTING



1 MINUTE



10 MILLION METRICS

2 Billion

METRICS PER MINUTE



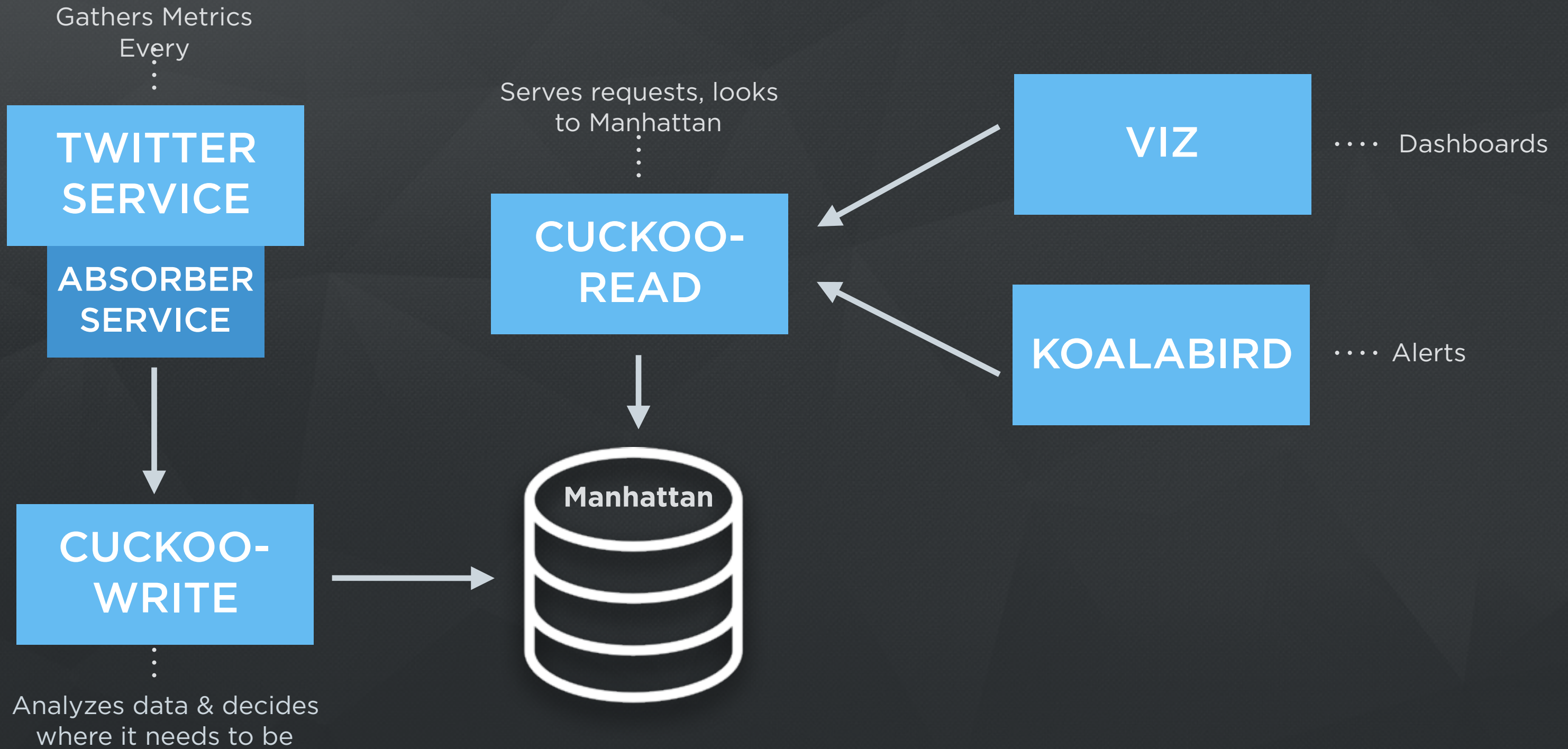
2 Billion Metrics

20 Billion Metrics

1 Hour

# 40 Trillion Metrics

# Life Of A Metric



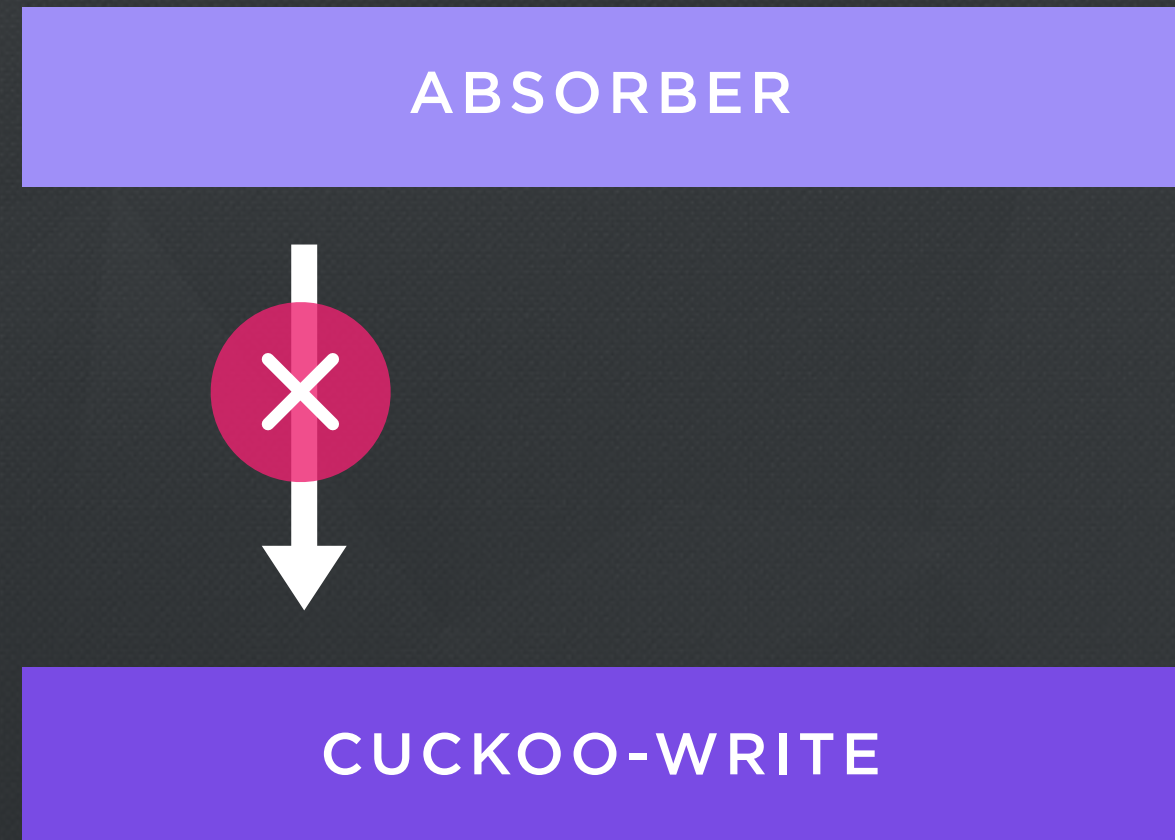
# Building Highly Available, Scalable & Fault Tolerant Systems

# Idempotent Operations

$$F(F(X)) = F(X)$$

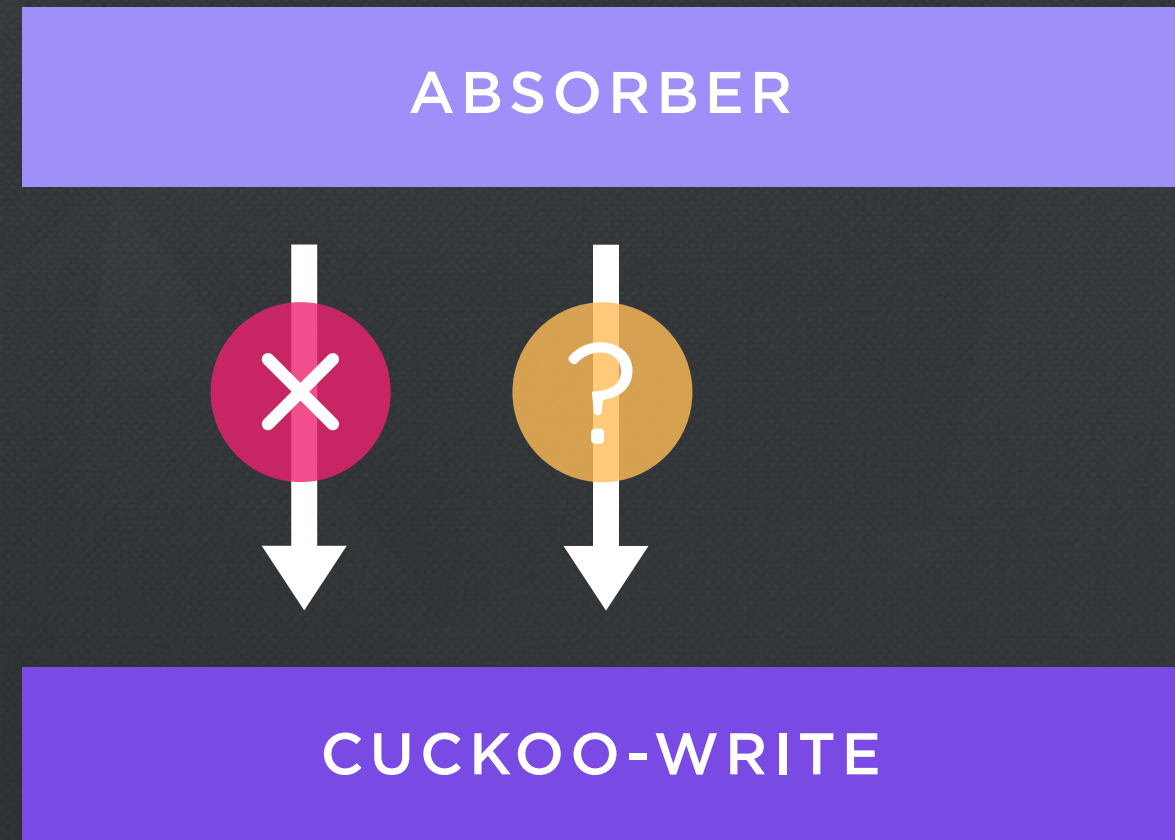
# Idempotent Operations

$$F(F(X)) = F(X)$$



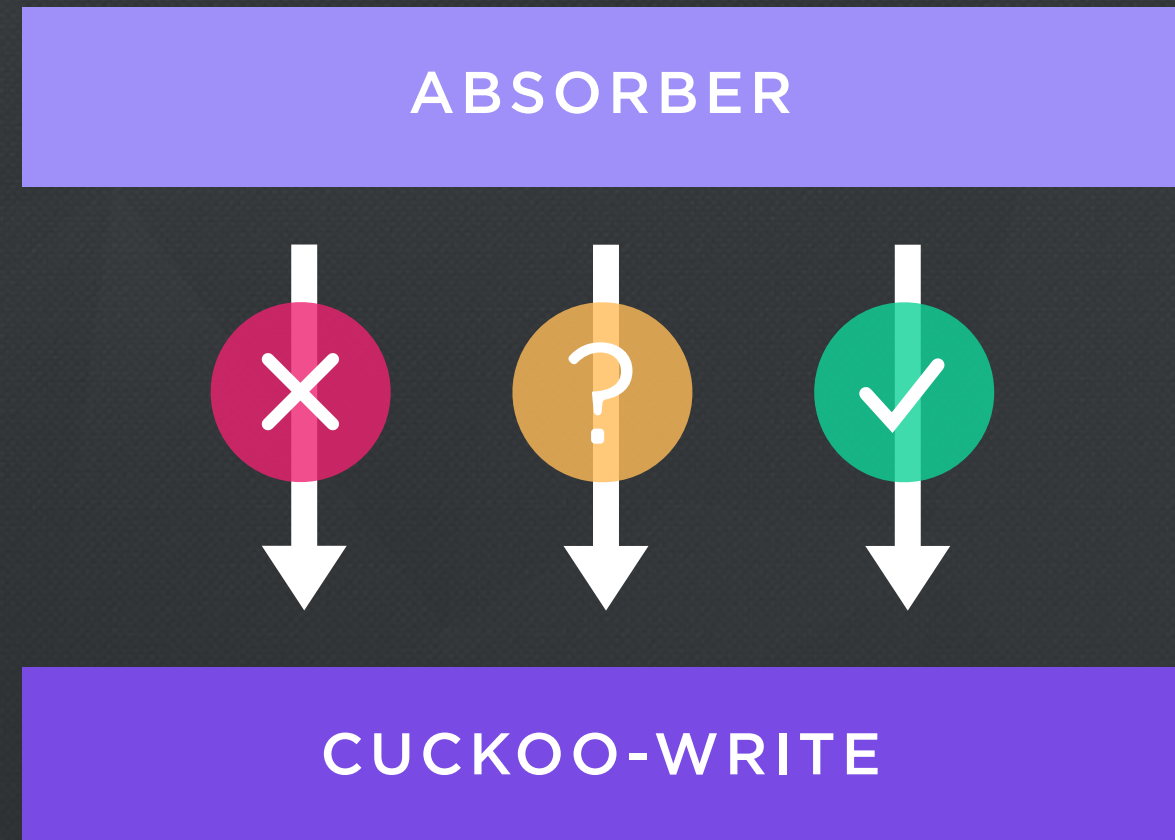
# Idempotent Operations

$$F(F(X)) = F(X)$$



# Idempotent Operations

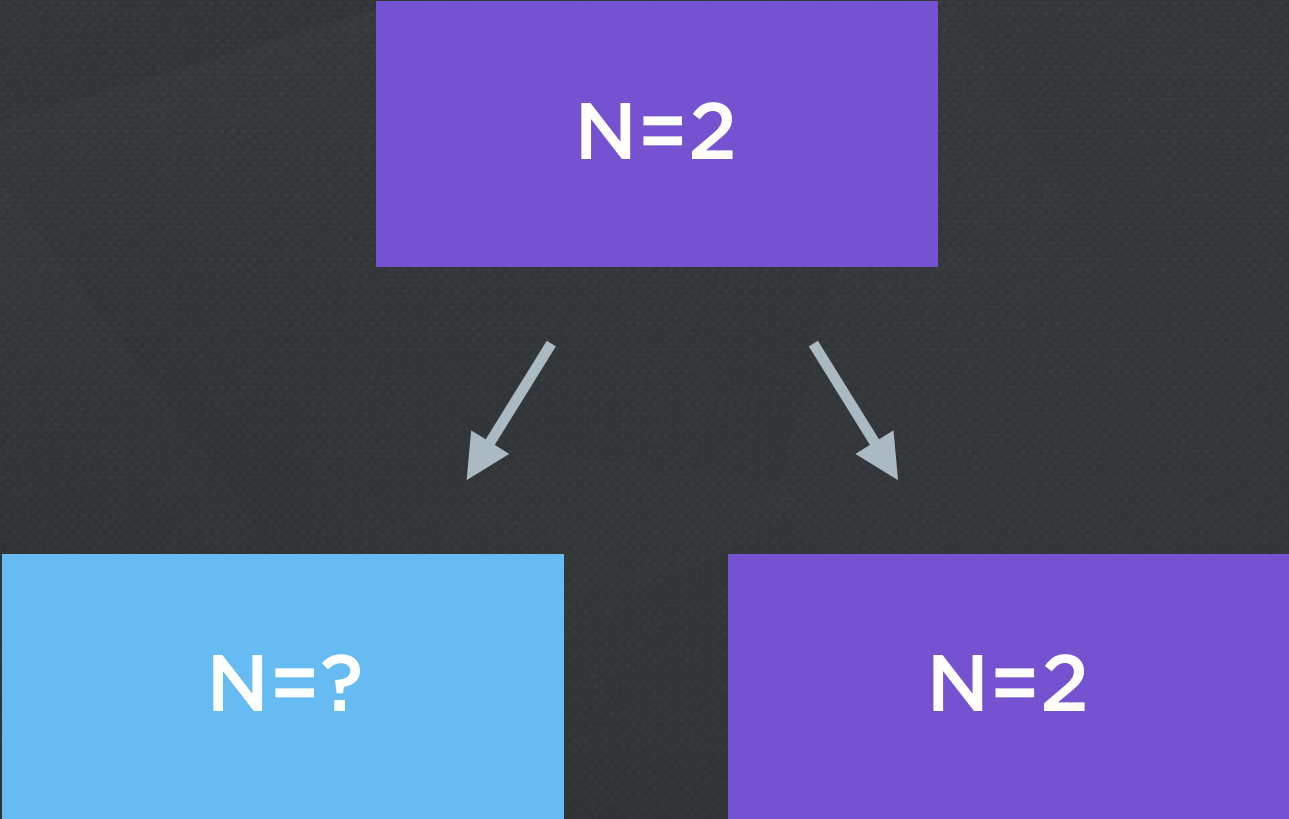
$$F(F(X)) = F(X)$$



# Avoid Coordination

Minimizing coordination is key to maximizing scalability, availability, and high performance

Value of n? n?





# Avoid Coordination

Minimizing coordination is key to maximizing scalability, availability, and high performance

Value of n?

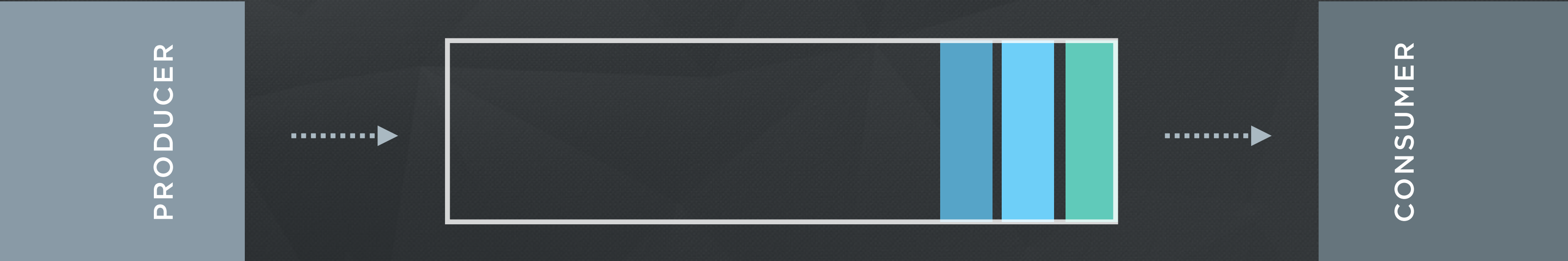
N=2

Value of n?

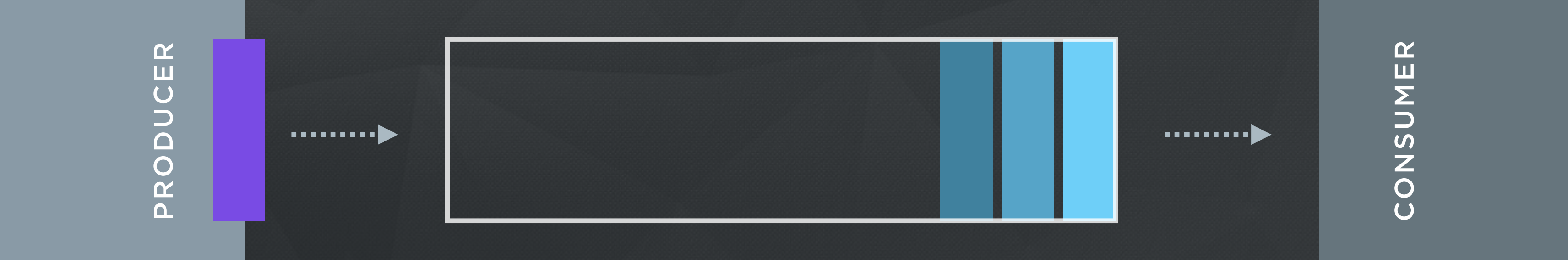
N=?

N=2

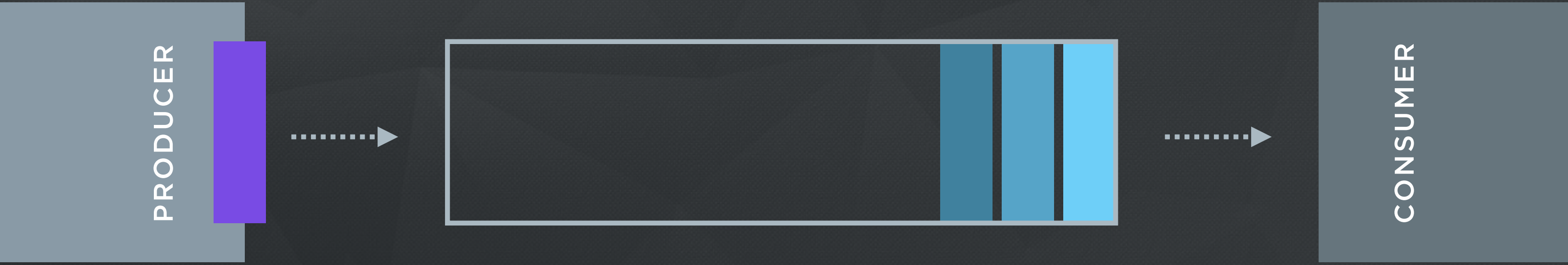
# Make Assumptions Explicit



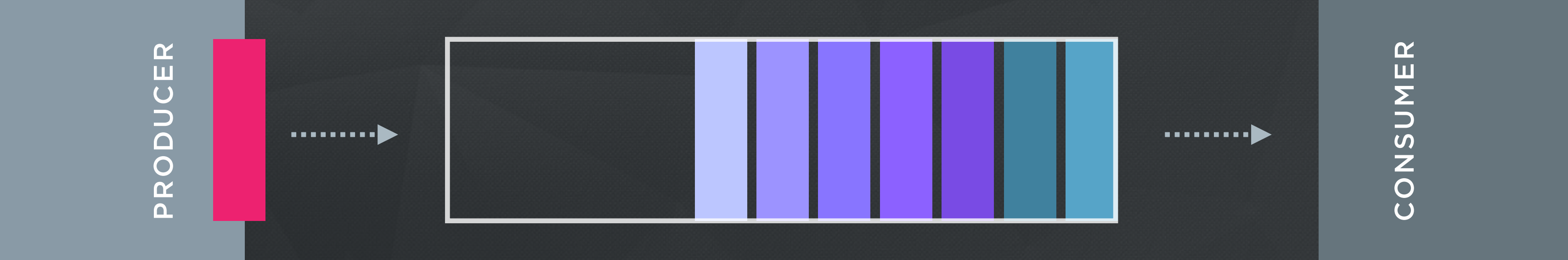
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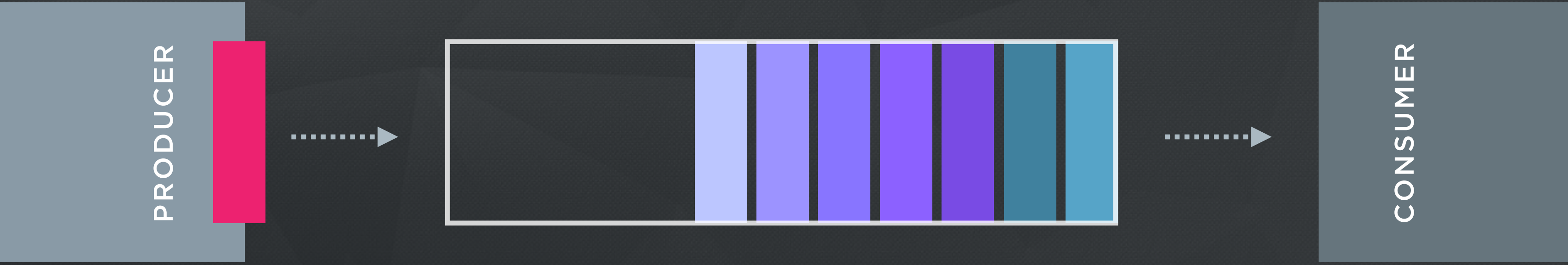
# Make Assumptions Explicit



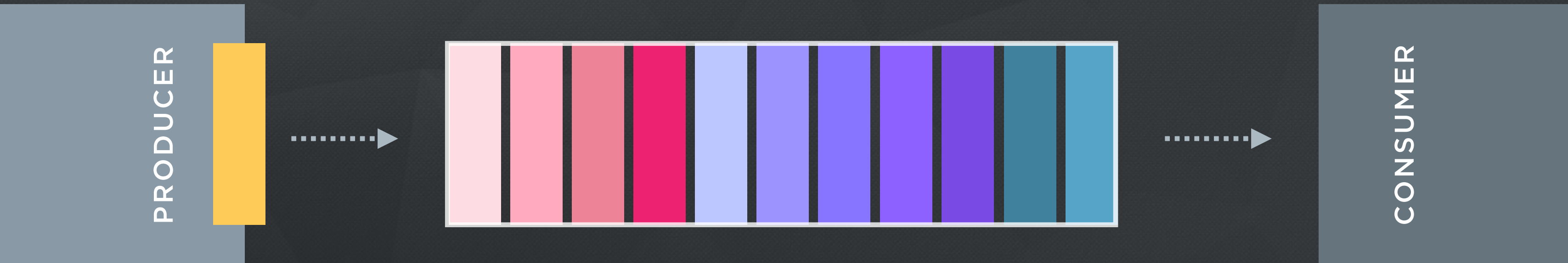
# Make Assumptions Explicit



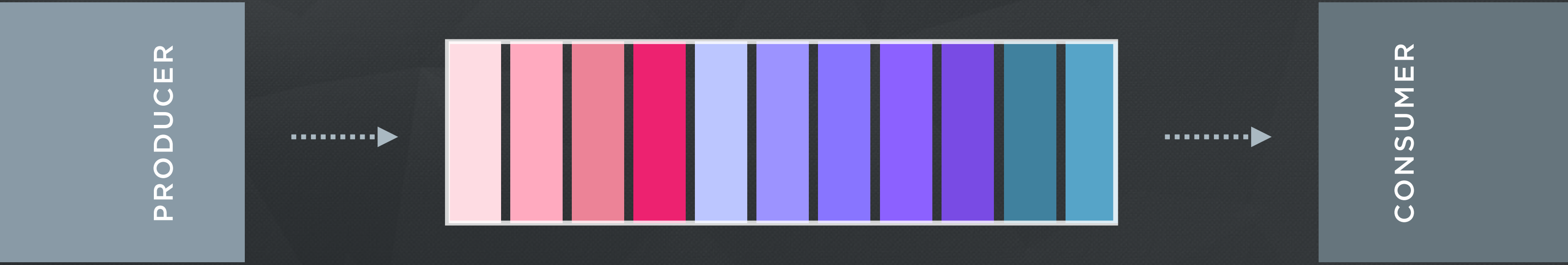
# Make Assumptions Explicit



# Make Assumptions Explicit



# Make Assumptions Explicit





# Make Assumptions Explicit

- Queue Lengths
- Input Data Length
- Requests Per Second
- In Memory Data Structure Sizes

**SOME  
LESSONS  
LEARNED**

Idempotent Operations

Avoid Coordination

Make Assumptions Explicit

Thank You

@caitie