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Shifting Gears: From Events to Event Driven

Events in the fast lane



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Principal Engineer @ Motorway

AWS Community Builder

Building on AWS for 10+ years and
serverless, event driven for 6+



Agenda

Where we started

- Finding the right road
- Leading the race

Events without purpose

- Database changes
- No trust in events

Going fast with events

- From idea to prod
- Building safely

Becoming Event Driven

- Team changes
- Event Storming
- Product changes

What's next?

What is Motorway?



UK's fastest growing
used car
marketplace



Sale agreed every 3
minutes, and we've
helped over 500,000
people sell their car,
the Motorway way



In 2023, we
achieved a GMV ov
£2.7bn

Where we came from

01

Grew and scaled quickly on Heroku

Generally on all open source, semi managed systems

02

Largely lift and shift onto AWS Elastic Beanstalk

03

Large use of Postgres with some use of RabbitMQ and Redis

Last 2 years

Step 1

Move to Fargate

Step 2

Increased use of
event

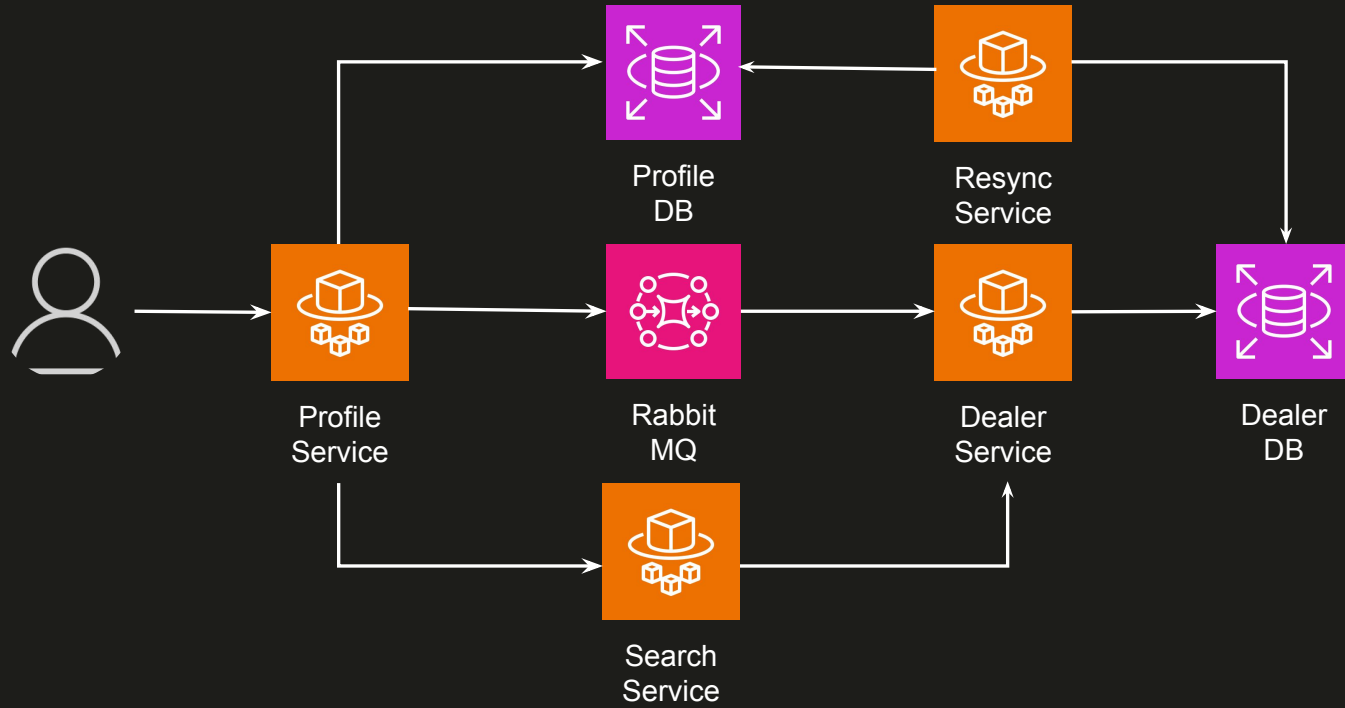
Step 3

Large growth of
features within
systems and huge
increase in
services and
business products

Step 4

An ever increasing
dependency chain
across service to
service
communication

Typical System



Events without trust or purpose



Accidental events



Published data
mirrors database
schemas



Lack of dead letter
queues



A resync system

Queues

▼ All queues (558, filtered down to 72)

Pagination

Page 1 of 1 - Filter: undelivered ☐ Regex ?

Overview			Messages				
Name	Type	Features	Ready	Unacked	In Memory	Persistent	▼ Total
BLANK_undelivered	classic	D	45,952	0	9,796	45,952	45,952
BLANK_undelivered	classic	D	2,232	0	452	2,232	2,232
BLANK_undelivered	classic	D	1,591	0	1	1,591	1,591

What is event driven?

“

An event-driven architecture uses events to trigger and communicate between decoupled services and is common in modern applications built with microservices. An event is a change in state, or an update, like a car being listed on a marketplace website

”

Event Driven

Events are facts



**Events allow for
low temporal
coupling**

**Events can have
many
consumers**

Vehicle Sold

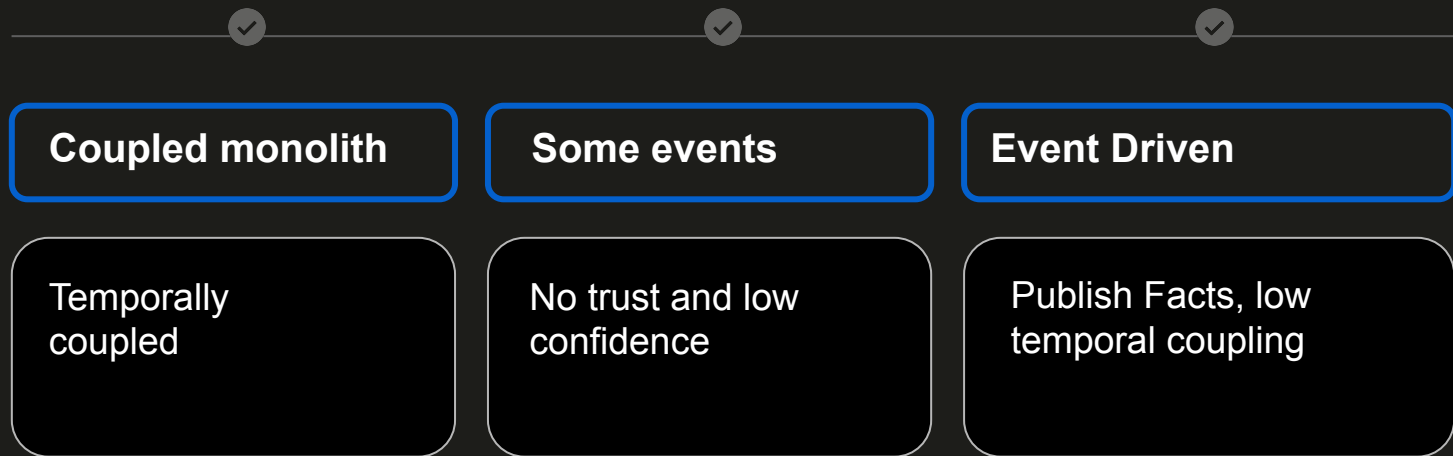
```
{  
  "UserId": "123-abc",  
  "Vehicle": {  
    "Make": "Porsche",  
    "Model": "911",  
    "SalePrice": "60000",  
  },  
  "Purchaser": {  
    "DealershipId": "xyz-789"  
  },  
  "SaleDate": "2024-03-05"  
}
```



Vehicle sold



Events but not Event Driven



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Becoming Event Driven



Becoming Event Driven

01

Event Storming
Workshops

02

Identify domains
and boundaries

03

Understand the changes
and concepts required,
across the Product and
Engineering teams

Event Storming

Identifying Domains

Product and engineering
changes

Thinking asynchronously

Event storming is a rapid group modeling
approach to domain-driven design

Involve Product and Engineering teams

Helps to model out business process

Event Storming

Identifying Domains

Product and engineering changes

Thinking asynchronously



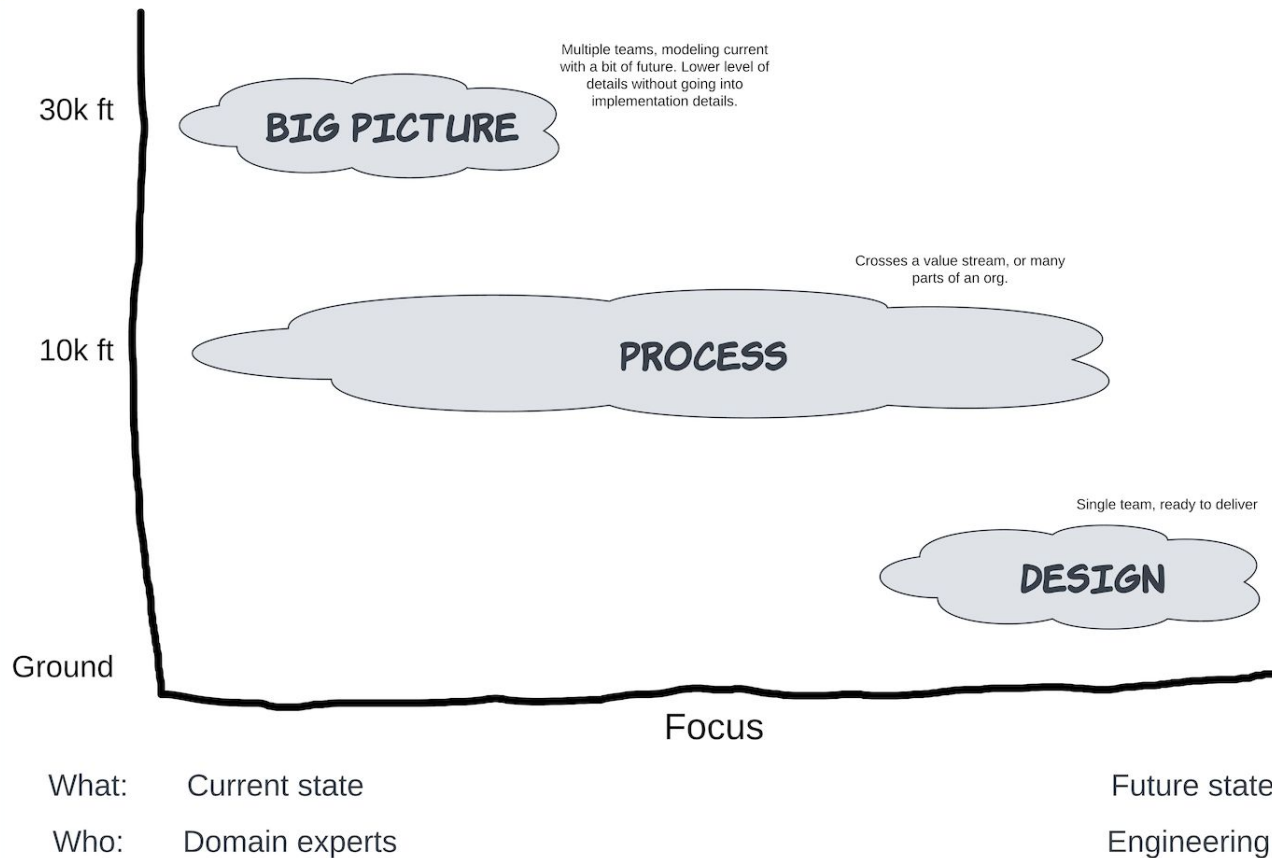
Event Storming

Identifying Domains

Product and engineering changes

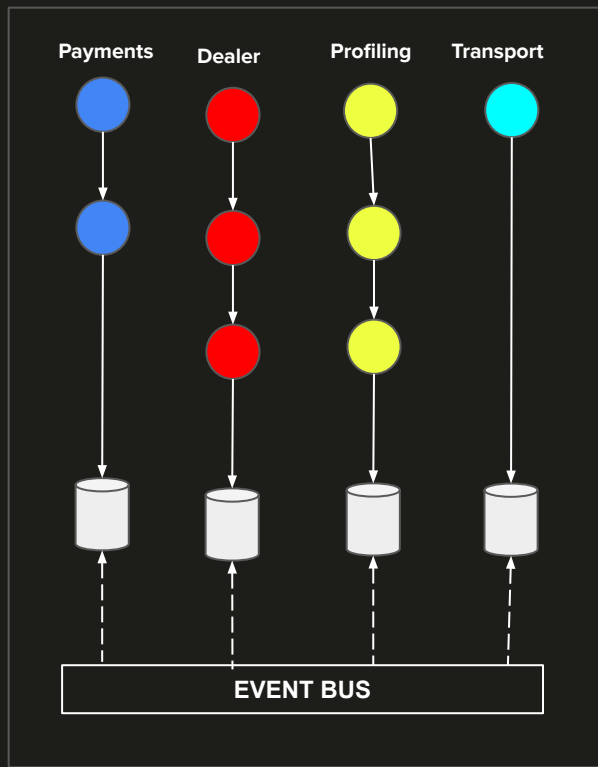
Thinking asynchronously

EventStorming models



Domains and Boundaries

- 01 Outcomes from Event Storming
- 02 Identify the events and domains that exist
- 03 Understand the processes between domains
- 04 Use events to communicate between events



Event Storming

Identifying Domains

Product and engineering
changes

**Thinking
asynchronously**

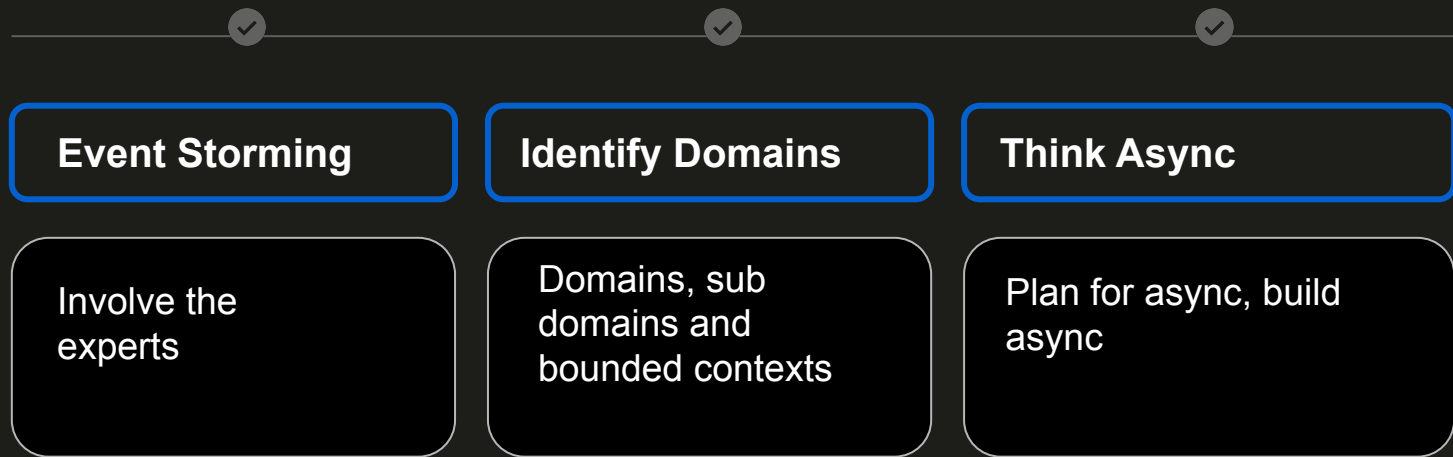
The world is asynchronous

Build our clients so they don't expect an
immediate response

Polling and sockets are great

Allows for easier plugin and modular systems

Becoming Event Driven



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It's all about the teams



Empower Teams

Teach the Teacher

Lean on the Cloud

Communicate with Events

01

**Independent teams
can build faster**

02

**Learning and
experimentation is
key**

Build with safety

03

**Start small. One
team at a time**

Embrace failure

Run through two way
doors

Don't stop everything
else

Empower Teams

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Events



01

Moved 1 team at
a time



02

Mix of experts and
hungry learners



03

Embrace internal
knowledge sharing

Empower Teams

Teach the Teacher

Lean on the Cloud

Communicate with
Events

01

**It's not just a
fancy data centre**

02

**Vendor lock-in is a
feature, not a bug**

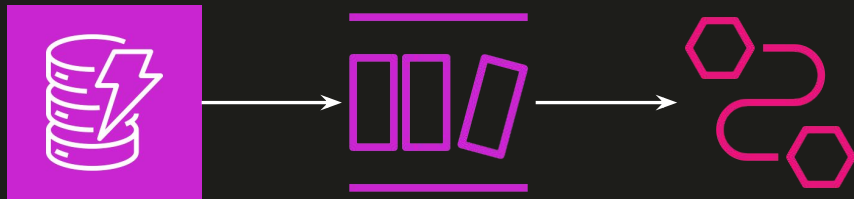
03

**Pay per use rather
than always on**

04

**Async Native
services**

Lean on the Cloud



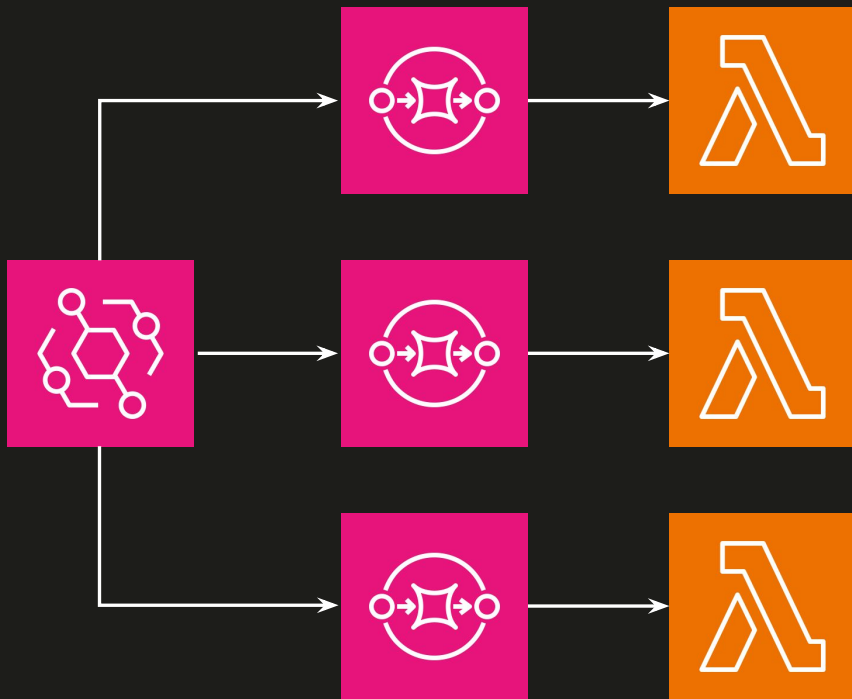
Dynamo Streams

Atomic

Pay per use

Transform to your Event

Lean on the Cloud



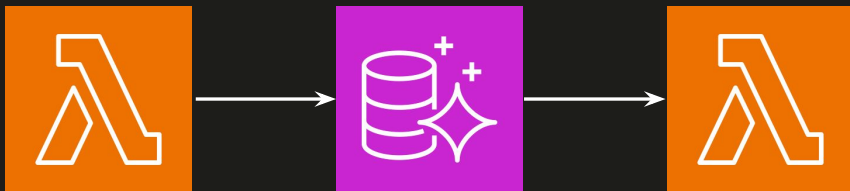
Eventbridge => SQS

SQS => Lambda

Pay per use

Many systems can be made aware of “VehicleSold” events

Lean on the Cloud



Decouple data writes from
event publishing

No native CDC stream
with Postgres

No complex 2 phase
commits

Empower Teams

Teach the Teacher

Lean on the Cloud

**Communicate with
Events**

01

Publish facts

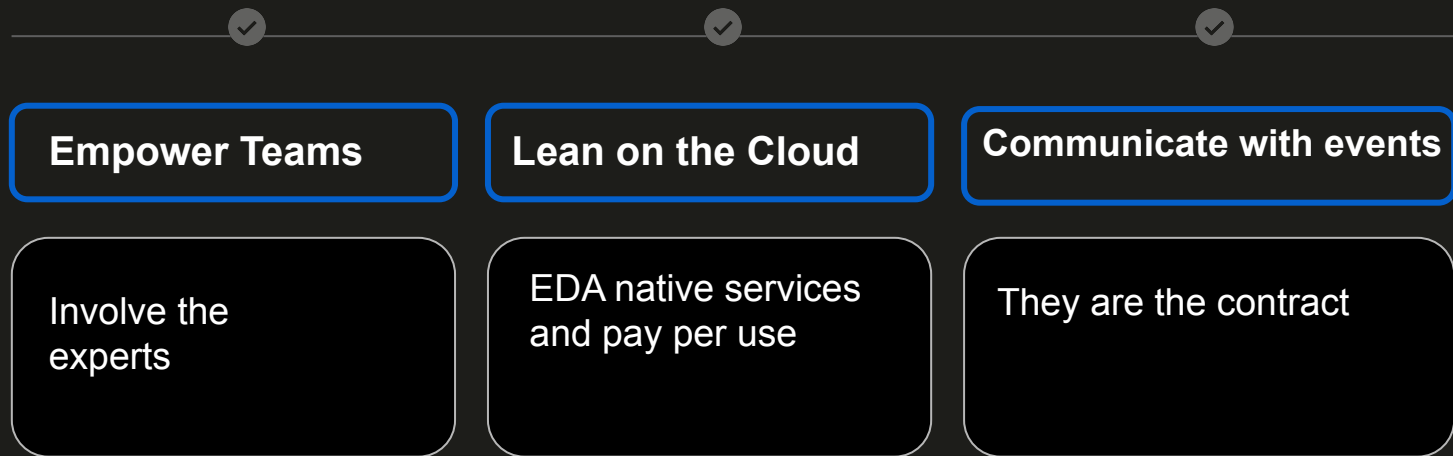
02

Publish state
changes

03

Remember Event
Storming. Publish your
business process, not
your technical system
detail

It's all about the teams

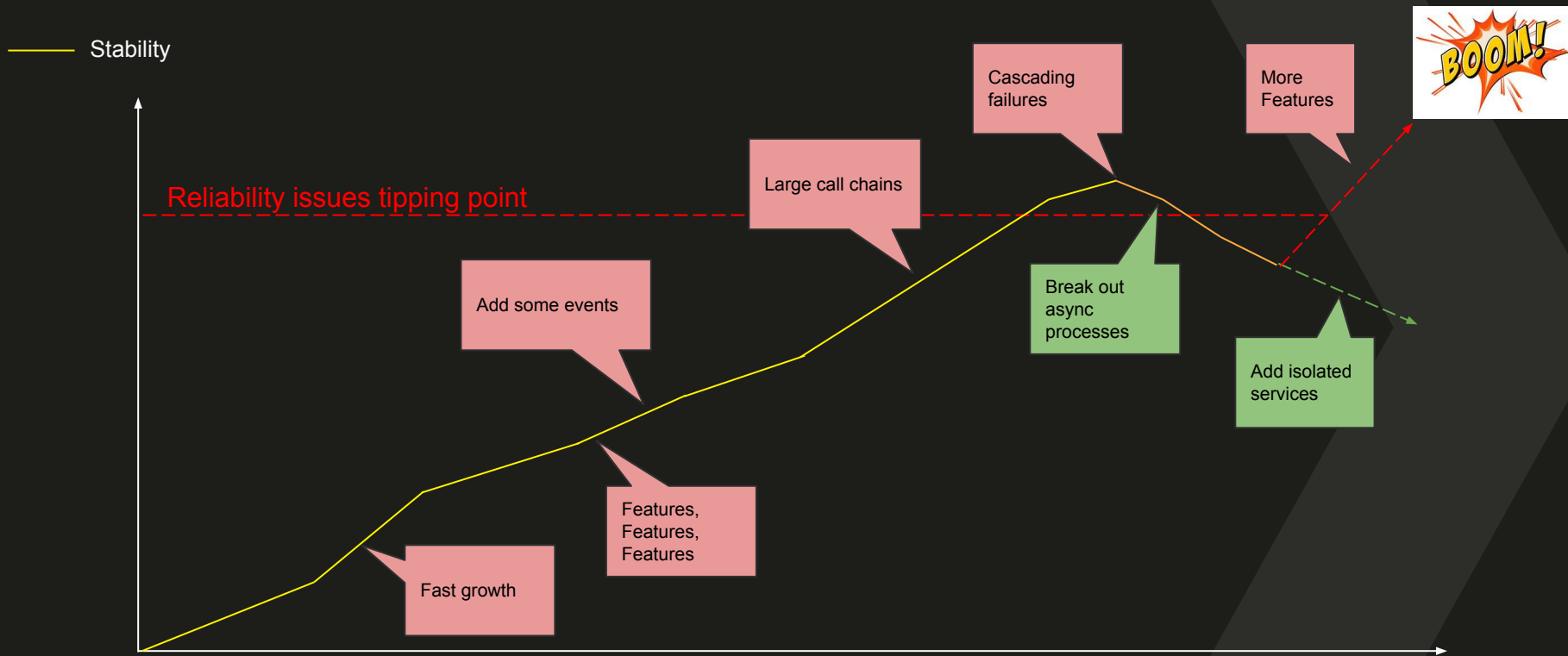


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Bring the business along



Build in safe, isolated ways



2024

Driving the benefits

Minimum viable migrations

Build safe and decoupled

01

Reliability and cost
are features

02

Build in isolation
and safely

03

Empowers Product
teams to build new
innovation

Driving the benefits

**Minimum viable
migrations**

Build safe and decoupled

01

Change the
systems a small
bit at a time

02

No big bang
changes

03

Learn from the
migration and
evolve

Driving the benefits

Minimum viable migrations

**Build safe and
decoupled**

01

Extra data a bit at
a time

02

Remove temporal
coupling

03

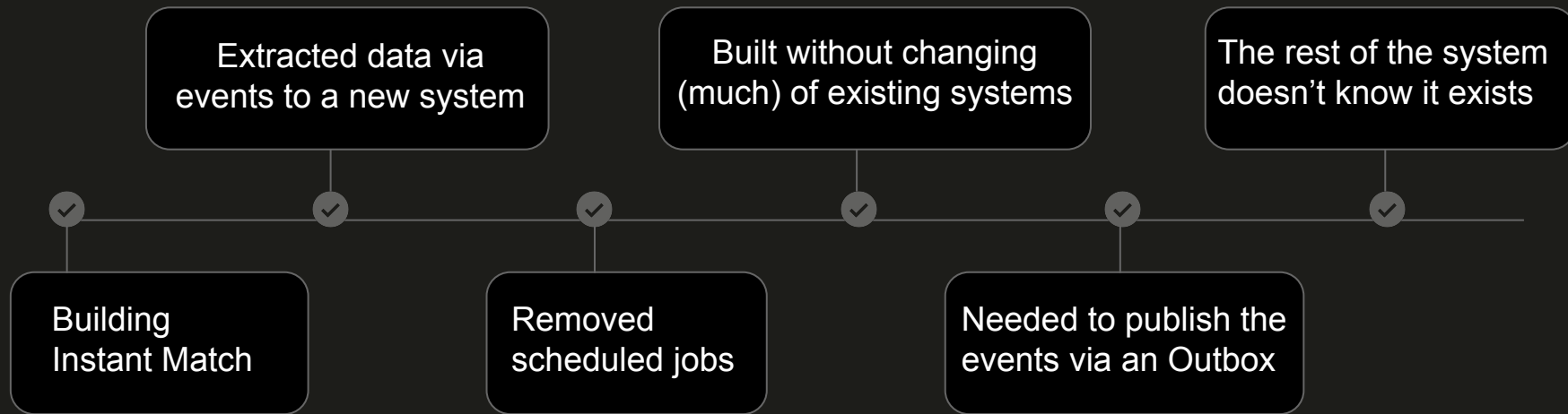
Champion the
success

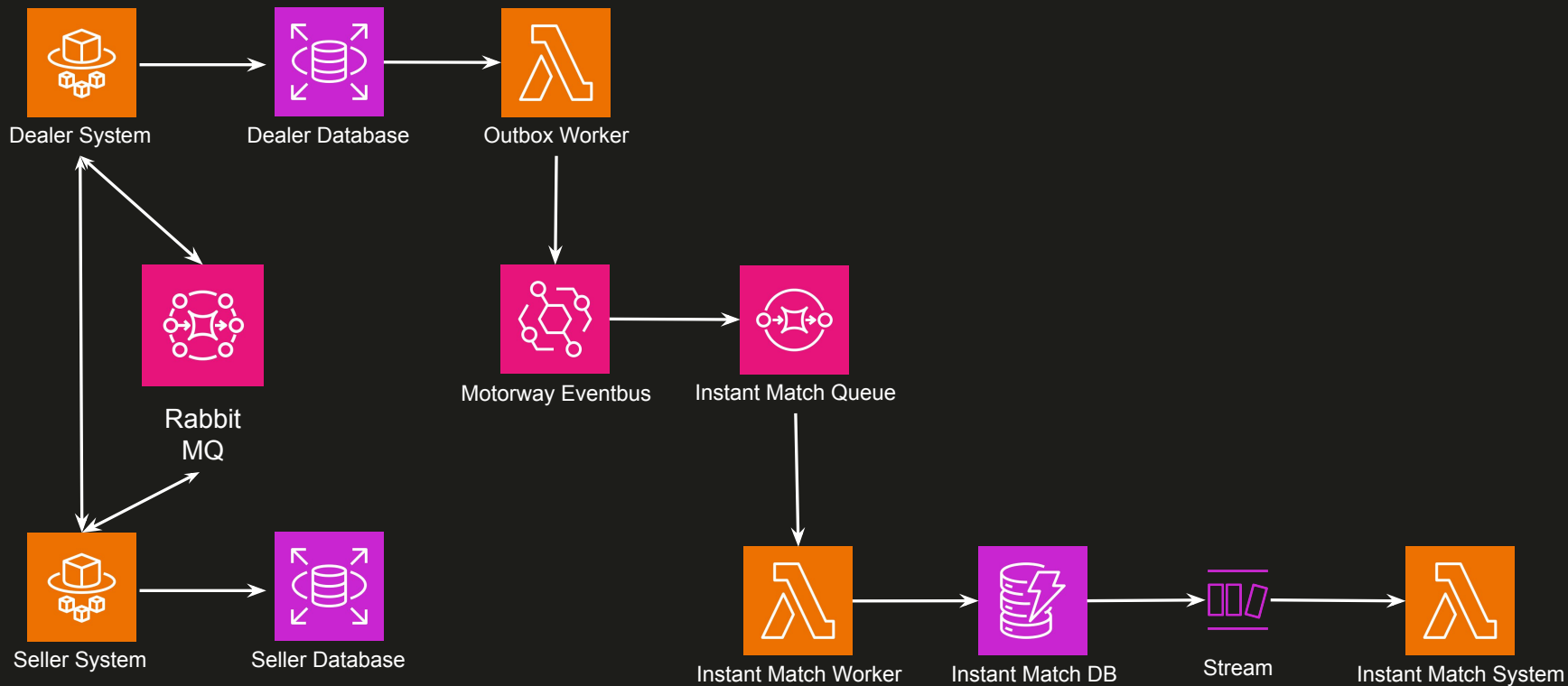
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Arriving at the destination



Arriving at the destination





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Future



Moving into 6th Gear



Continue to MVM
existing systems



Isolate services
based on domains



Building isolated
systems

Empowering and owning



Events need
owners



Systems shouldn't
be aware of
consumers but
teams should be



Events are just
another API. Don't
break APIs

Takeaways



Event Driven isn't all
about the tech



The world is async



Scalable, safe and
cost efficient

DOWNLOAD & USE **THE GOTO GUIDE APP**

DOWNLOAD THE APP
CREATE YOUR SCHEDULE
ASK QUESTIONS
RATE SESSIONS

