

Becoming an Event-Driven Enterprise

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Agenda

Why events are important to an enterprise

Event driven projects

Events as part of a Hybrid Integration Strategy

Managing Events within an enterprise

Using events to provide engaging customer experiences



Phone company has existing data around customers' usage and buying preferences



Combined with events generated when phones connect to in-store wi-fi



Enables a more engaging and personal customer experience



Anatomy of a microservices application

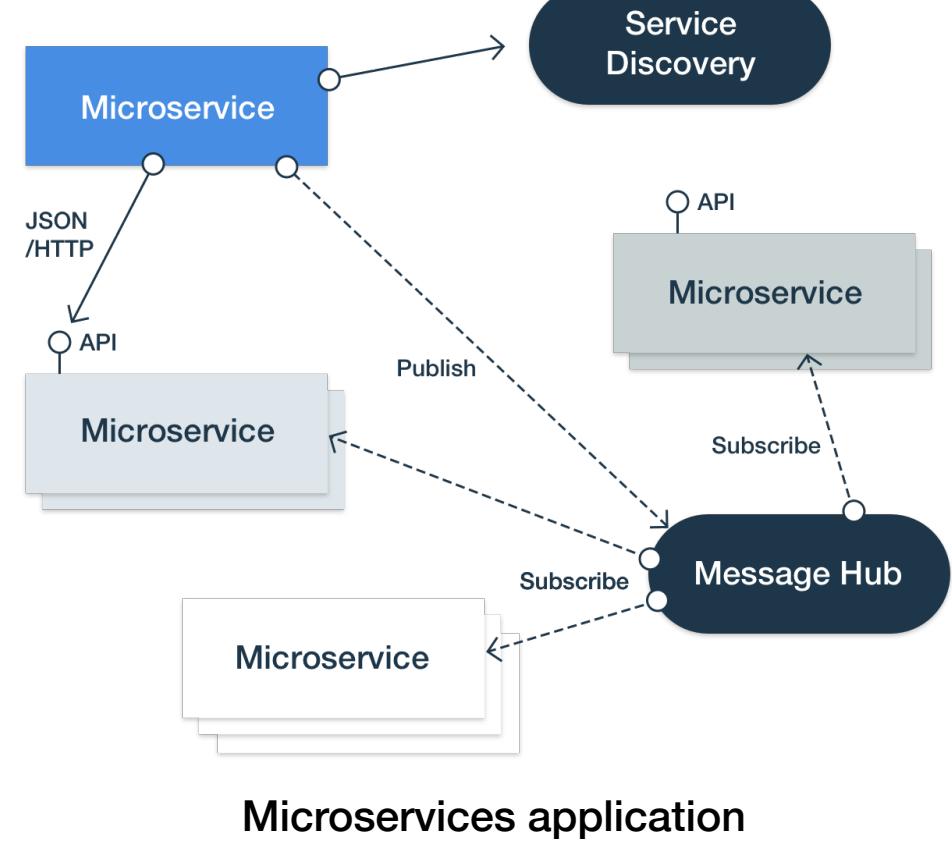
Event-driven interactions between microservices promotes decoupling for robustness and scale

Messaging where possible

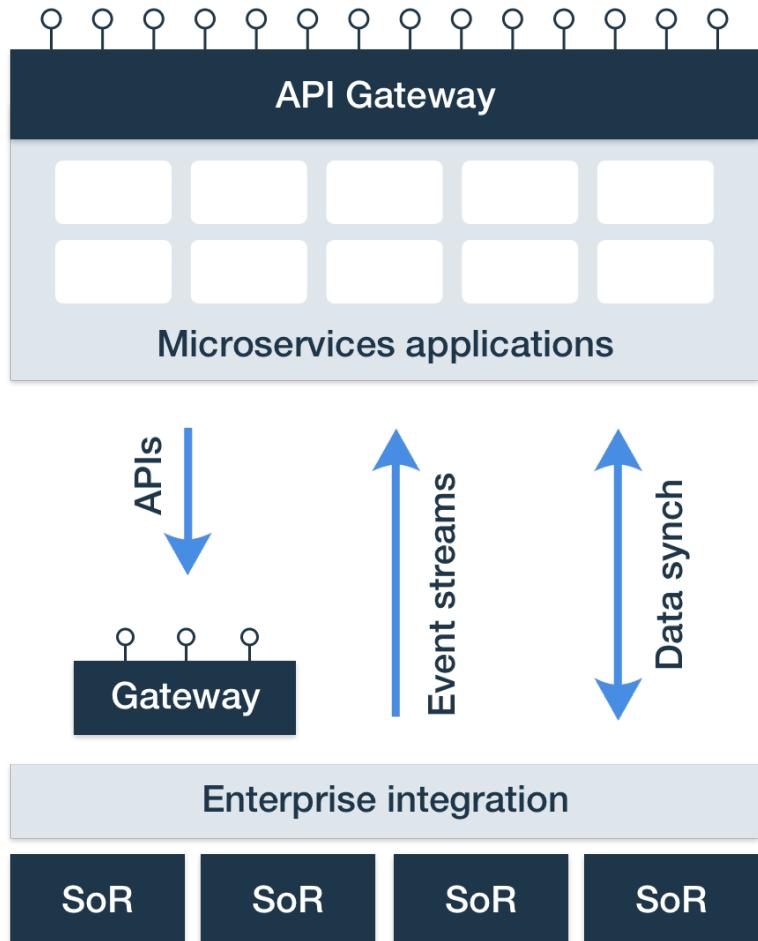
- Lightweight messaging e.g. AMQP, Kafka
- Publish/subscribe
- Eventual consistency

Direct calls where necessary

- Lightweight protocols e.g. JSON/HTTP
- Load balancing/scaling via service discovery
- Circuit breaker
- Caching



Creating truly independent digital applications



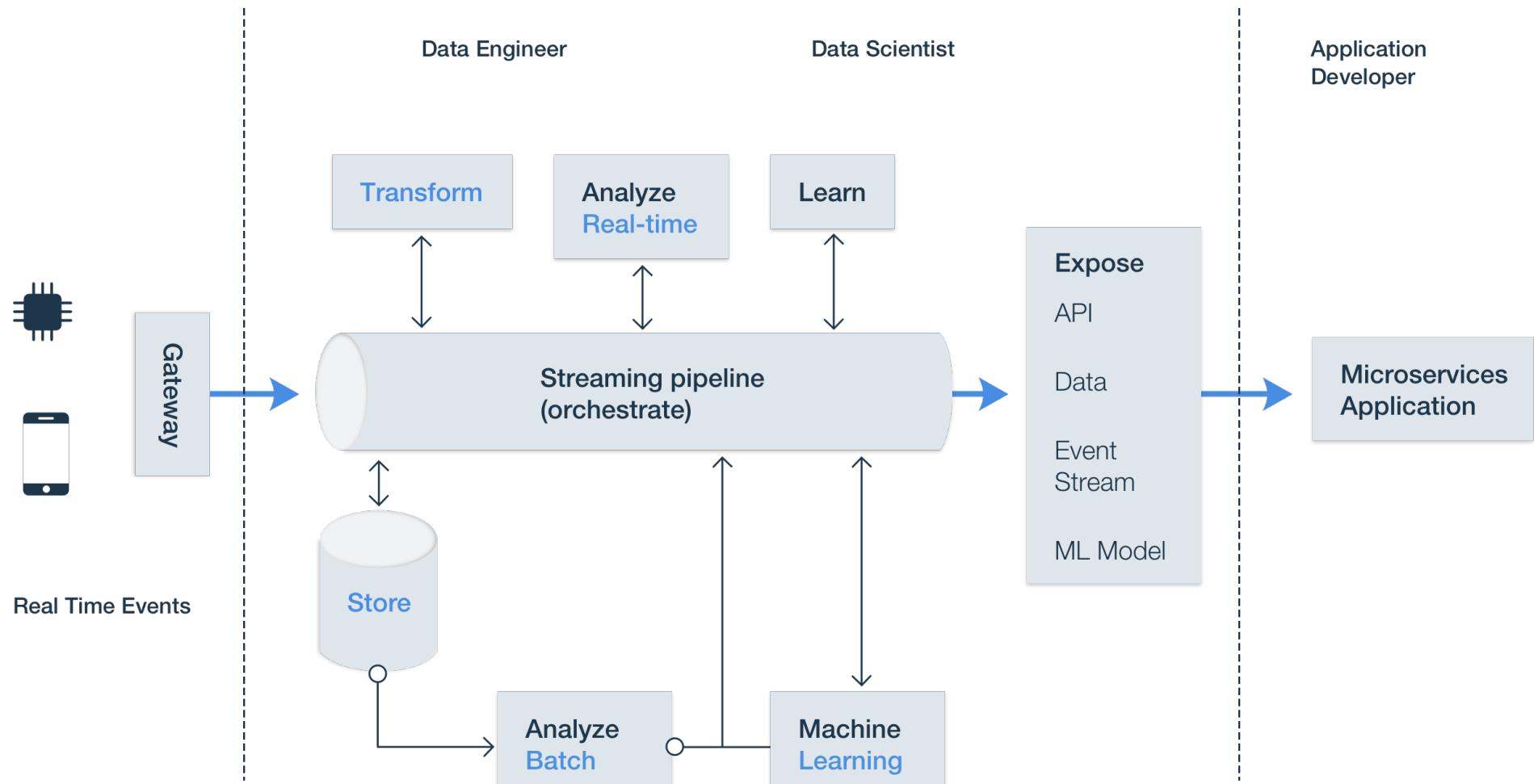
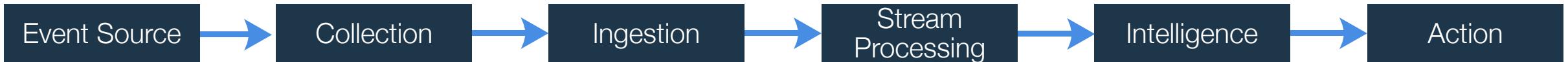
Independent microservice components enable

- **Agility:** Innovate rapidly without affecting other components
- **Scalability:** Scale only what you need, and only when you need to
- **Resilience:** Fail fast, return fast, without affecting other components

To provide those benefits they need to be independent of the systems of record

- **APIs:** Are simplest to use, but create a real-time dependency
- **Event streams:** Enable microservices to build views on changing data and react to situations as they occur
- **Data sync:** Provides a local replica of back-end system data

Anatomy of fast data applications



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Event Driven Projects

Capture

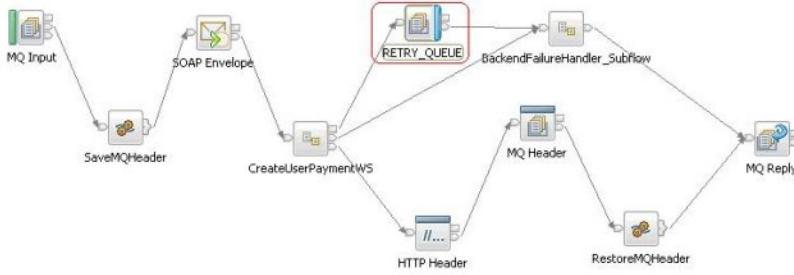
Refine

Process & Act

- Start with an idea naturally suited to being event driven
- Work out what events you ideally require to drive this
- Examine the processes and systems would be involved in those events
- Determine what events can actually be sourced
- Combine / refine and enrich events to make them useful for your application

Capturing Events

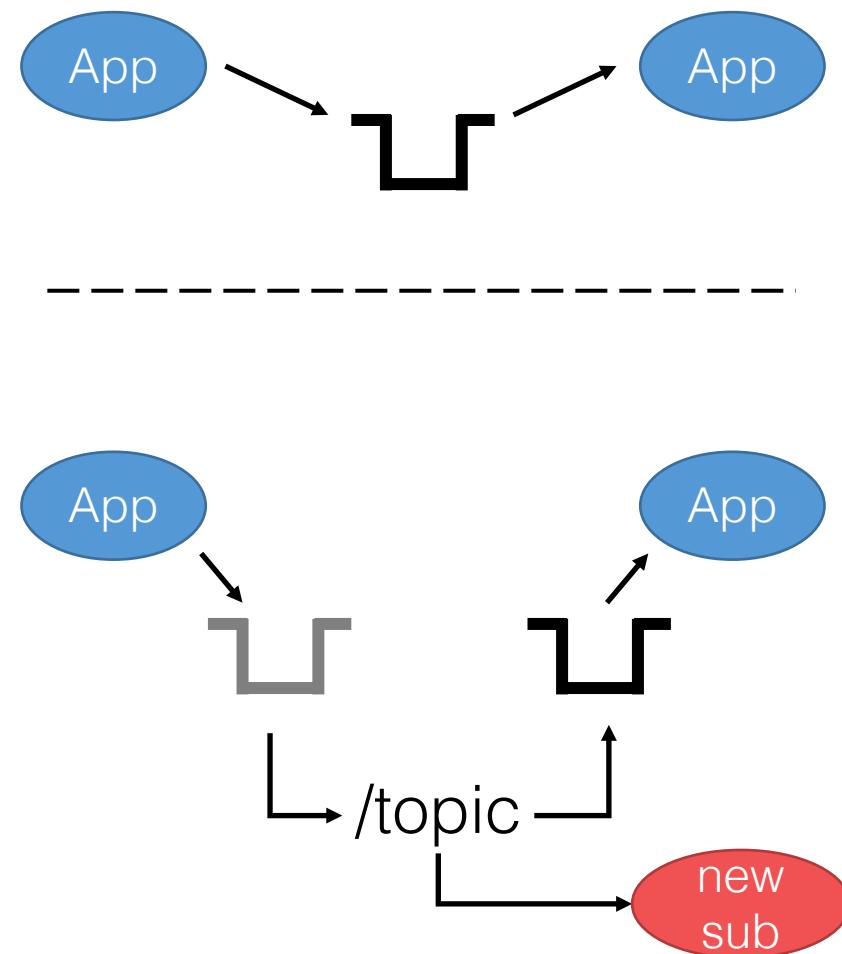
Integration Bus



Wire in an additional MQ output node to emit meaningful events from an IIB flow



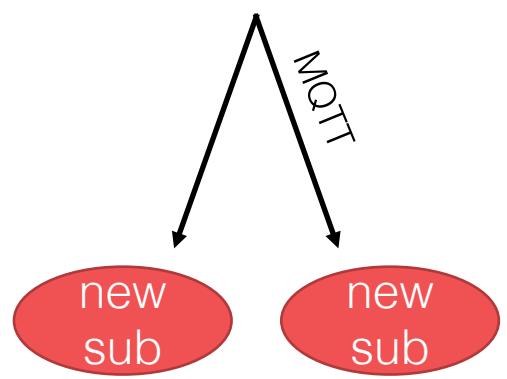
MQ



IoT Platform



Internet of Things
Platform



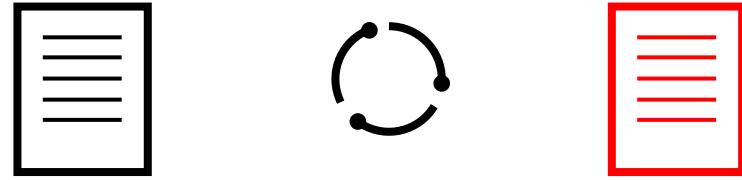
Capturing Events

- Change data capture
- CICS events
- DB triggers
- Customer digital journey analytics
- Application Code

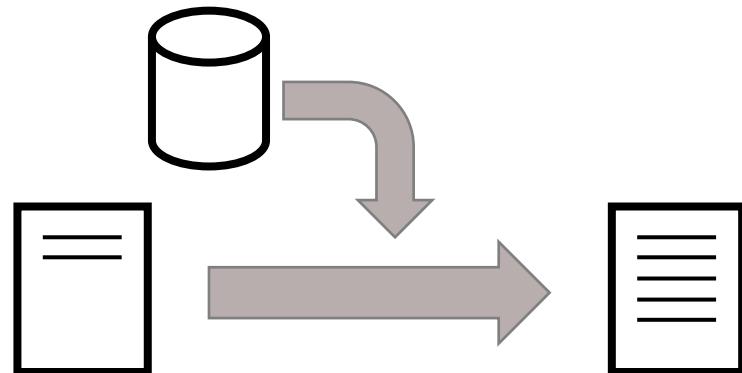
Refining Events

Integration

Transform

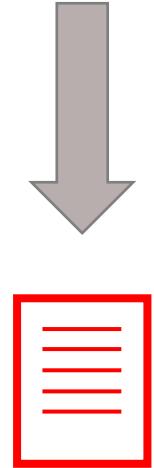


Augment



Complex Event Processing

Infer



Agenda

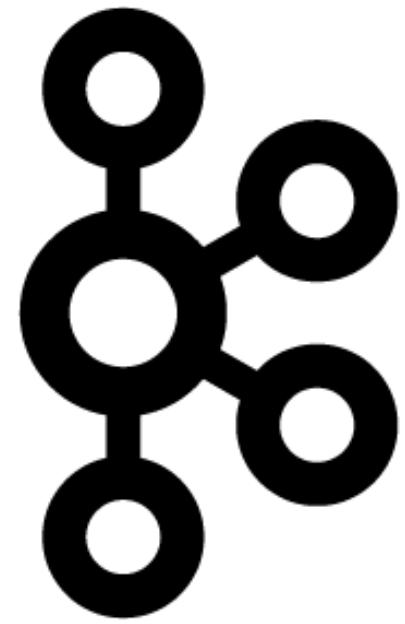
Why events are important to an enterprise

Event driven projects

- Capture
- Refine
- Process & Act Ingest | Analytics | Serverless

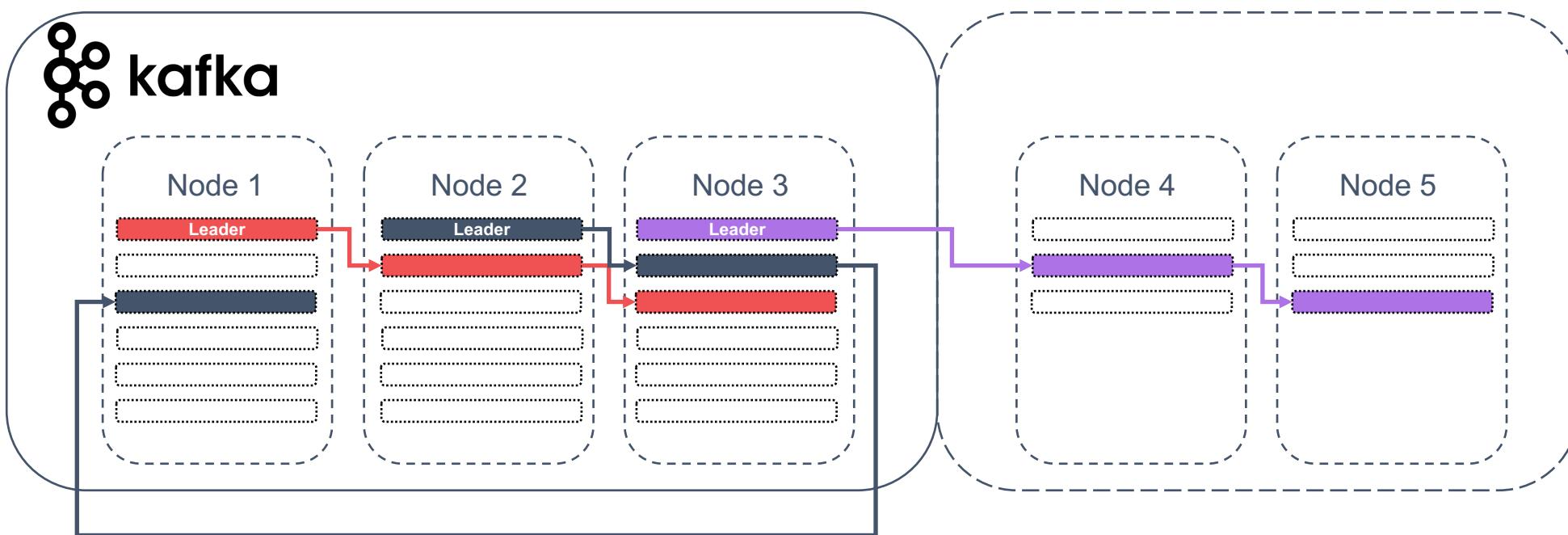
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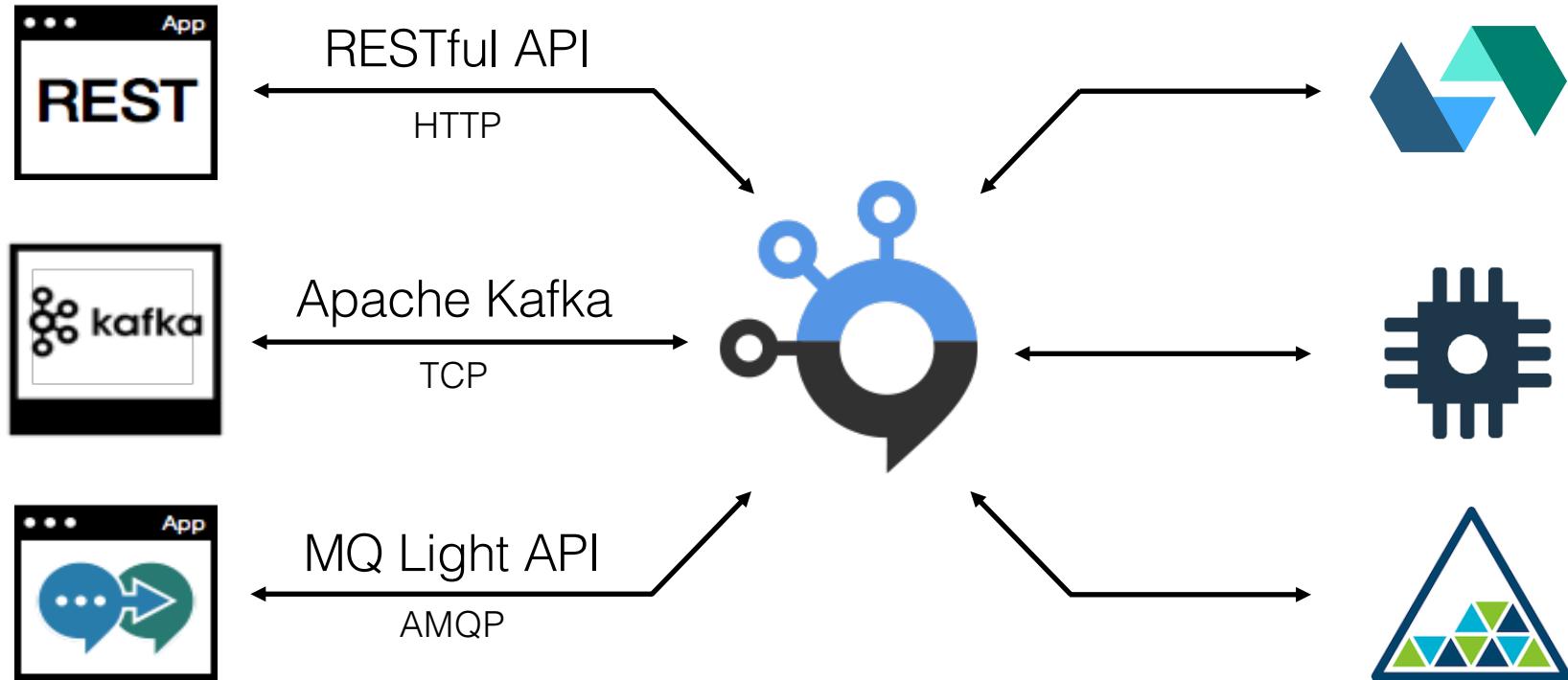


kafka

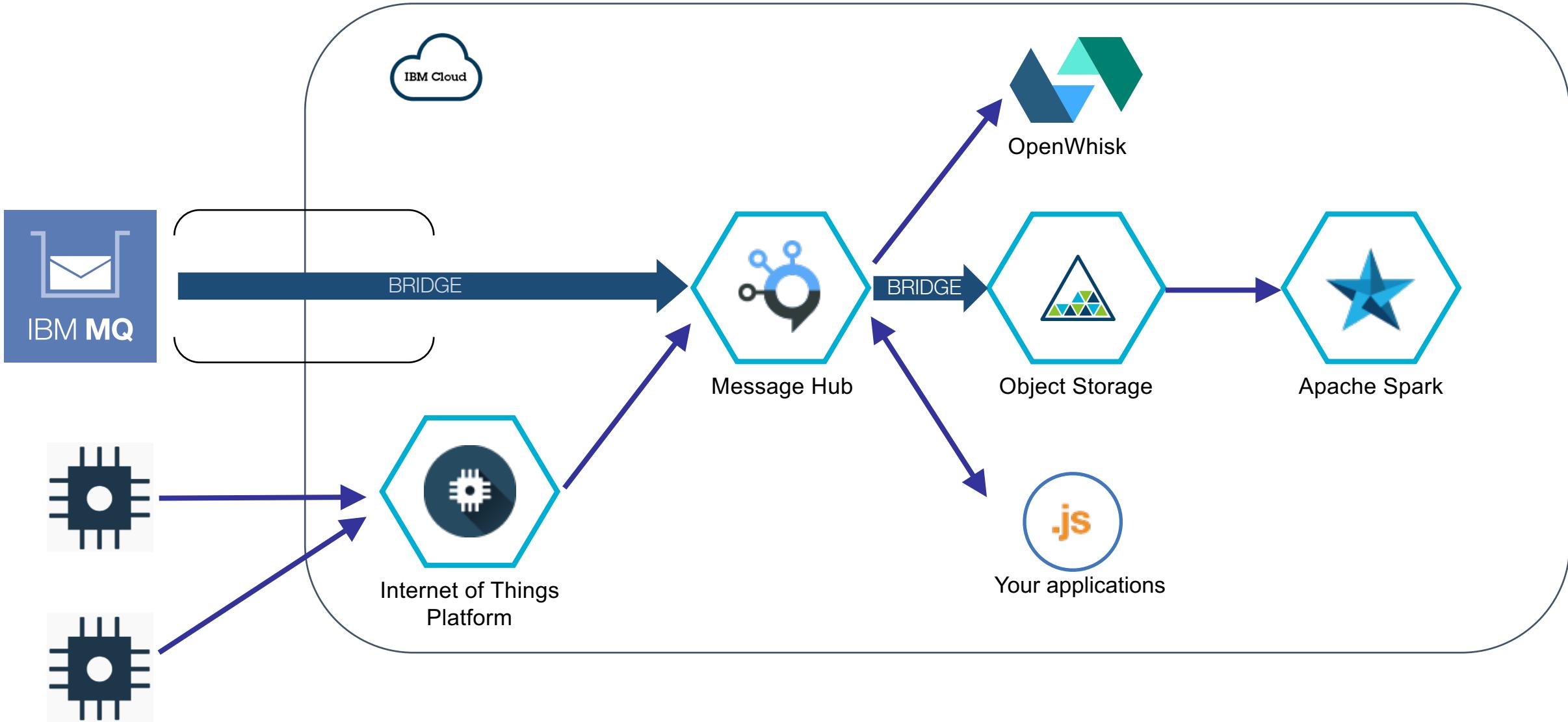
Kafka Is Built For Scale



Message Hub is Apache Kafka in IBM Cloud



Event ingestion and distribution using Message Hub



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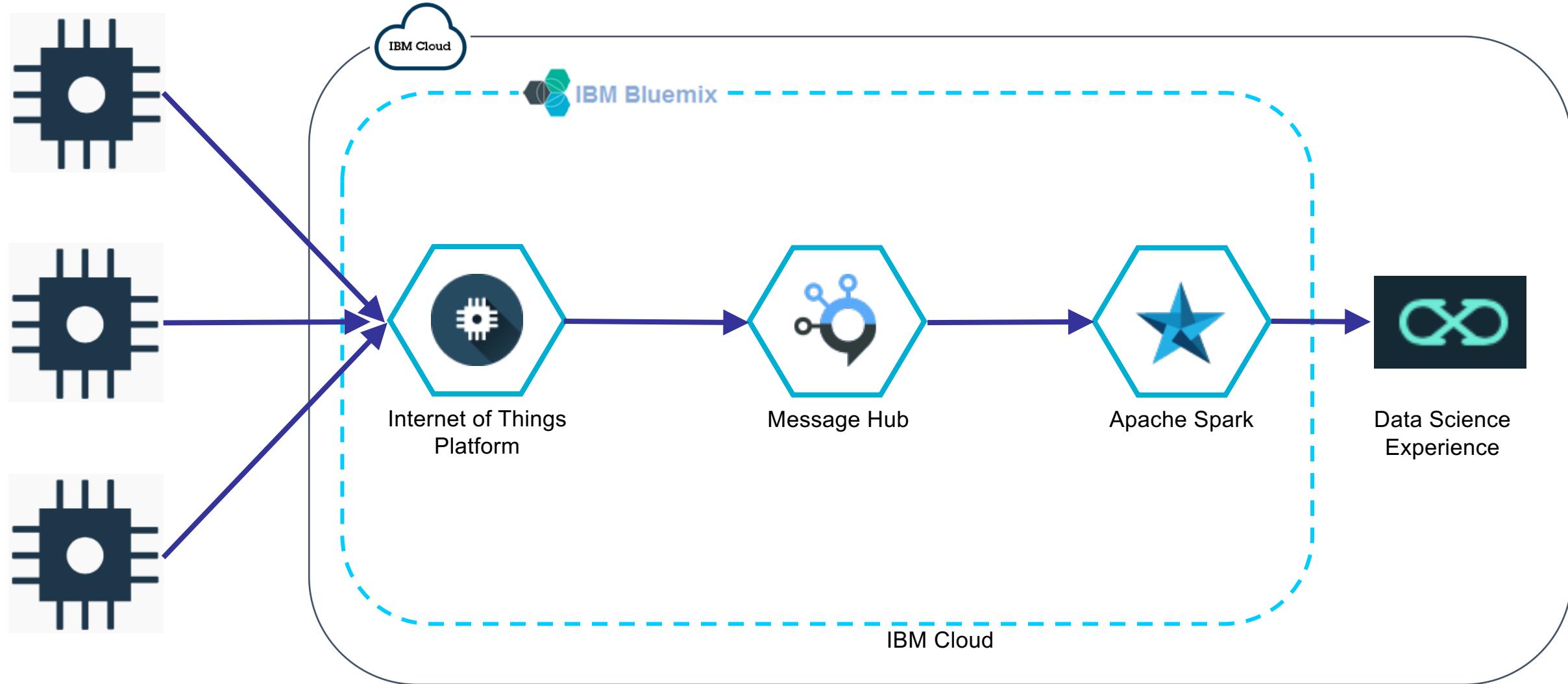
Events as part of a Hybrid Integration Strategy

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Options for stream processing

- IBM Streams
 - Advanced analytics platform for analysing data in motion
 - Extremely capable and high performance
- Apache Spark Streaming
 - An extension to the very well known Apache Spark platform
 - Integration with Kafka very straightforward
 - Not really proper streaming (uses “micro-batches”)
- Kafka Streams
 - Basic stream processing framework in Apache Kafka
 - Aimed more at developers, rather than data scientists

Streaming Analytics using Apache Spark Streaming



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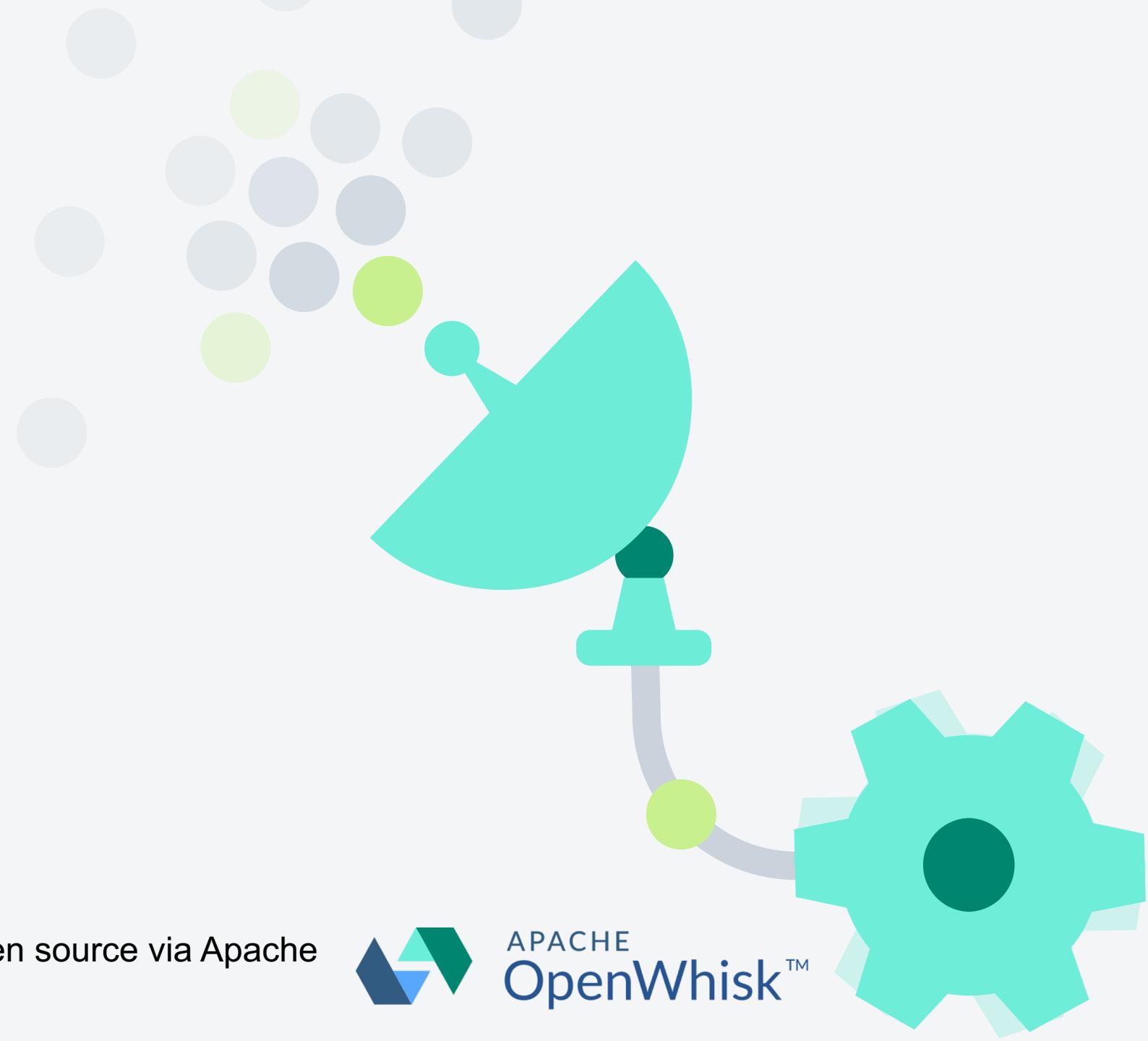
- Capture
- Refine
- Process & Act Ingest | Analytics | Serverless

Events as part of a Hybrid Integration Strategy

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What is **IBM Cloud Functions**?

An open
serverless
platform to
execute code
in response to
events



Delivered as open source via Apache
openwhisk.org



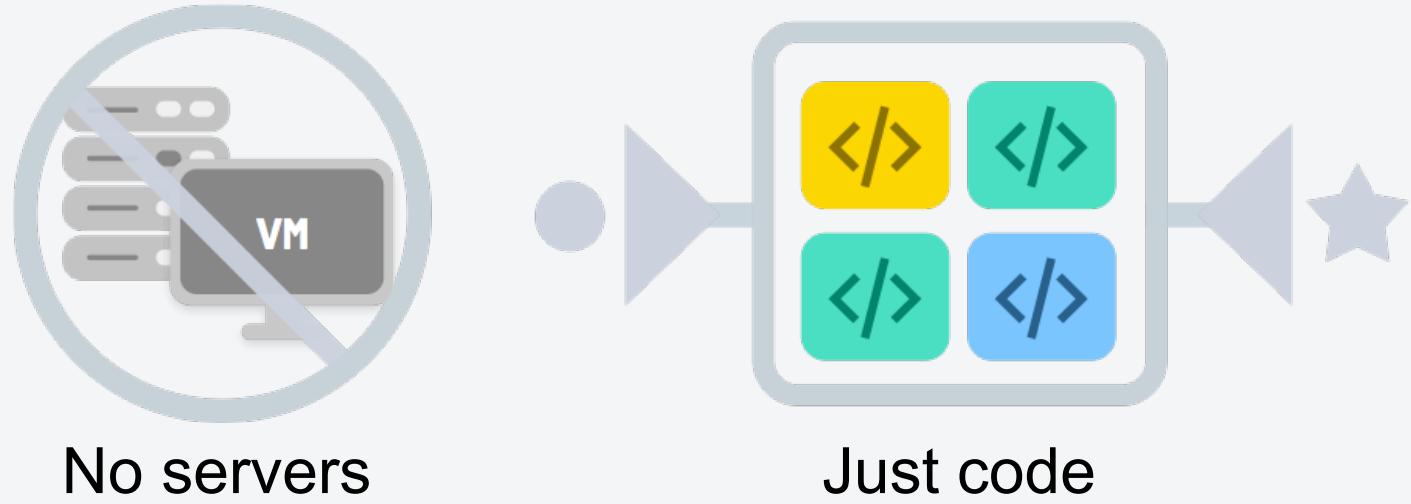
What is serverless computing?

Runs code **only**
on-demand on a
per-request basis



Runs code **only** on-demand on a per-request basis

Serverless is for
compute what
object storage is
for storage

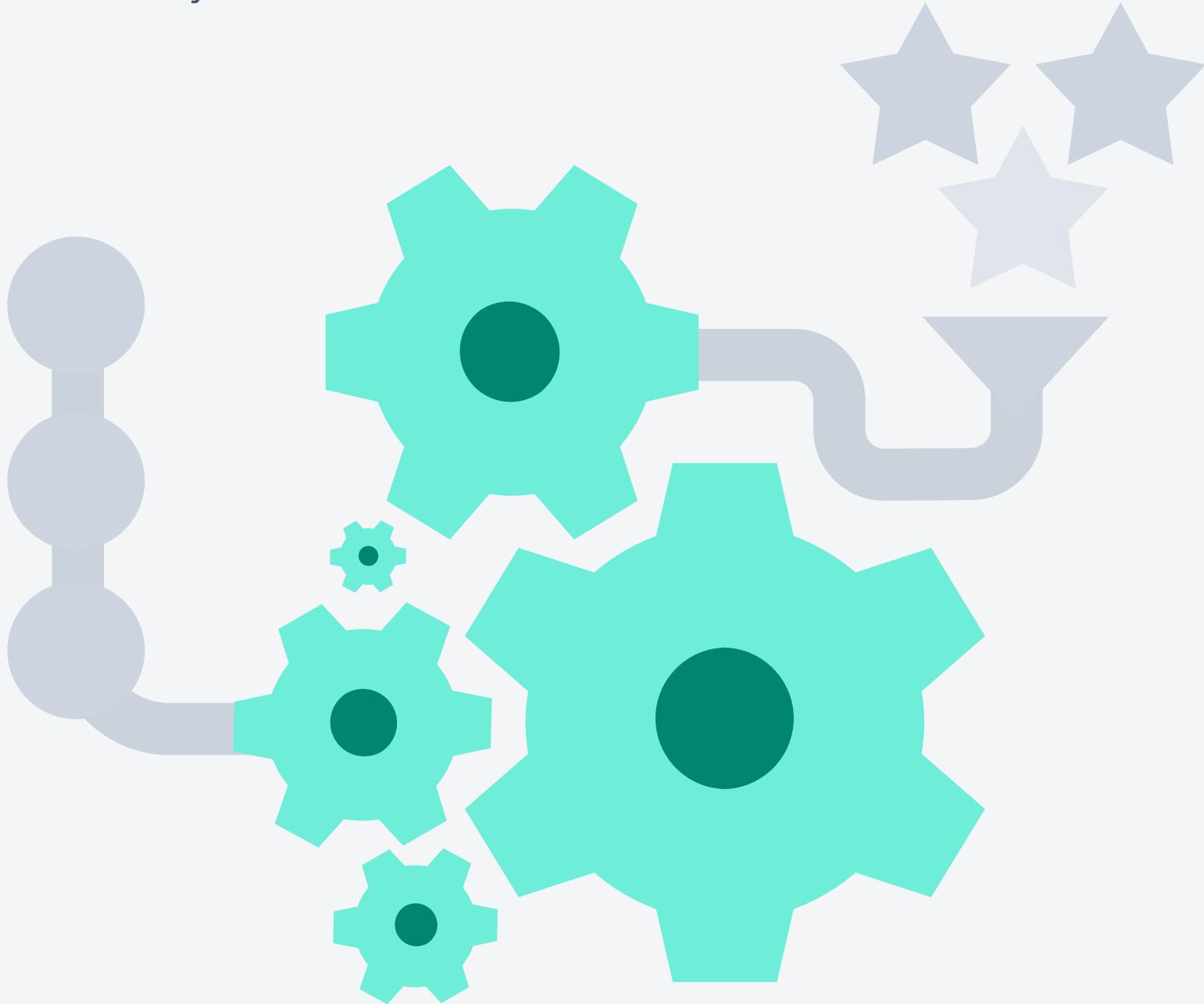


Runs code **only** on-demand, pay for what you use

Scales on
a per-request
basis

Price = (Time an action was running *
memory allocated to action)

\$0.000017 per GBs
Free tier: 400,000 GBs



A wide array of Event Providers



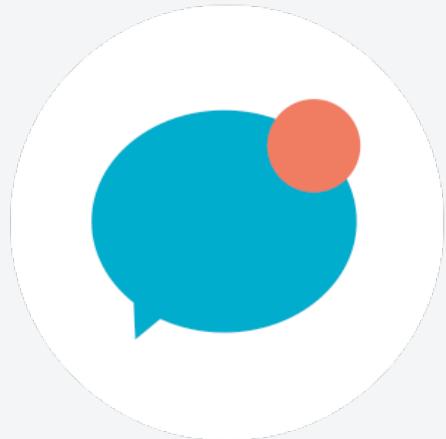
Periodic



IBM **Cloudant**



Message Hub



Mobile Push

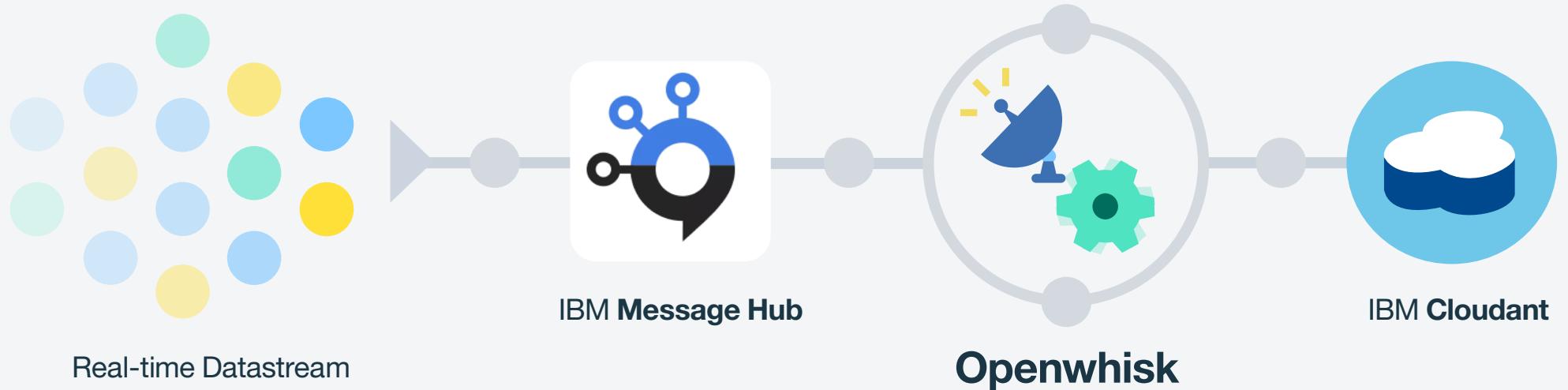


Github



IBM App Connect

Event processing with Message Hub



Agenda

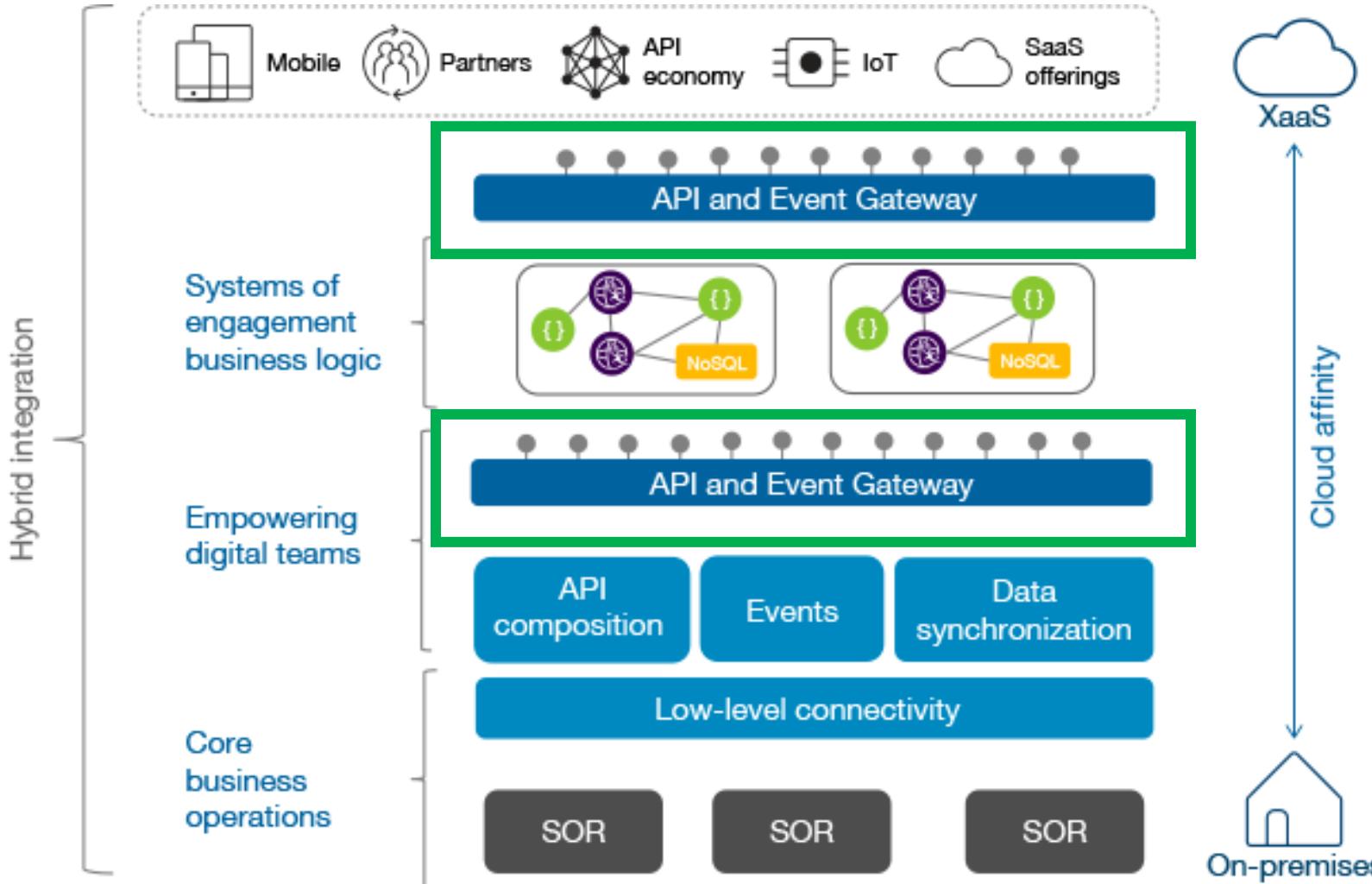
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Events Are Part Of A Hybrid Integration Strategy



Event Driven Enterprise

Capture

Refine

Manage & Expose

Process & Act

Event Driven Enterprise



Sometimes the output of these new innovation projects are more events that should be disseminated for others to act upon



The owners of backend systems best understand how to extract and infer re-usable business events for others to consume

Agenda

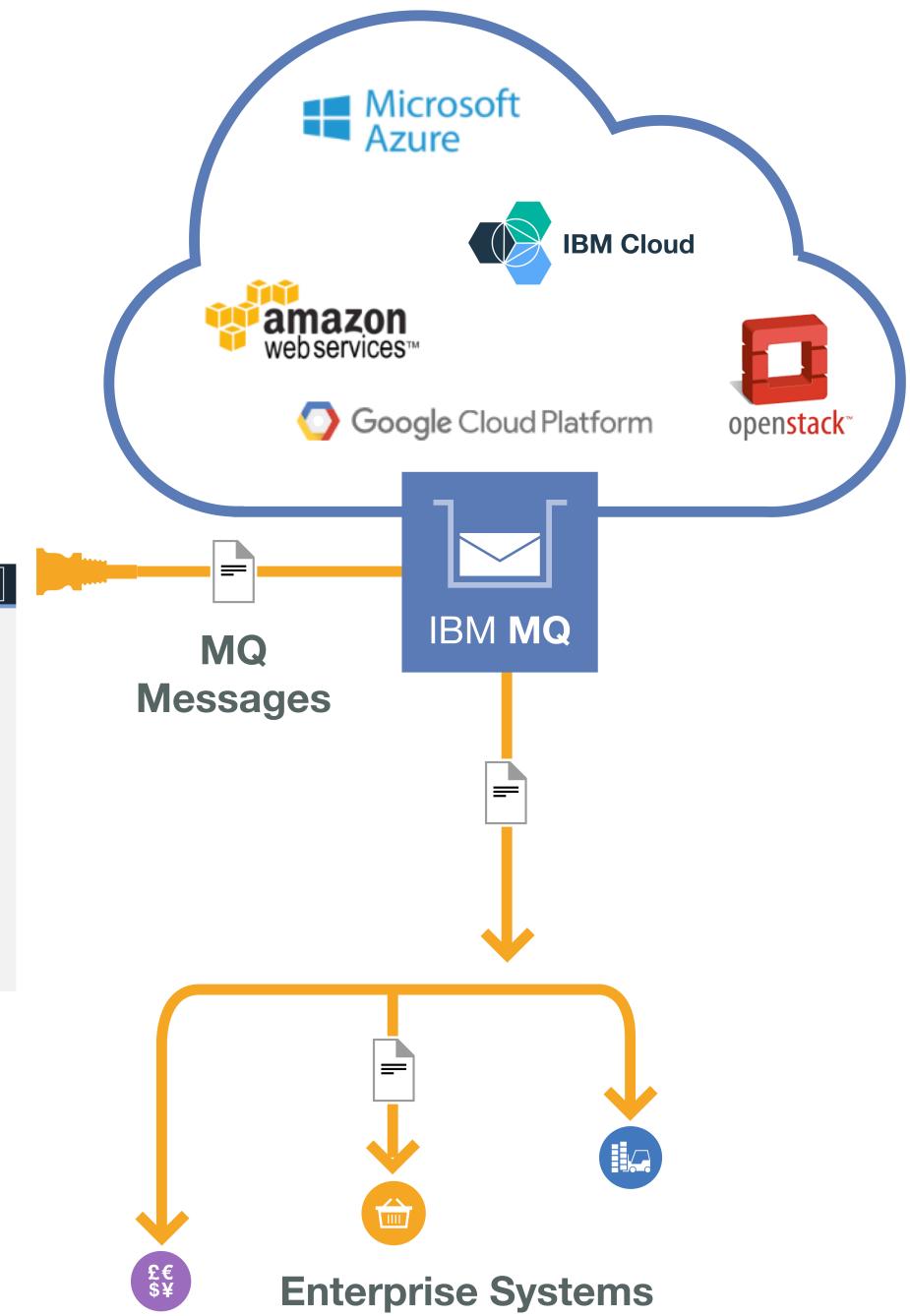
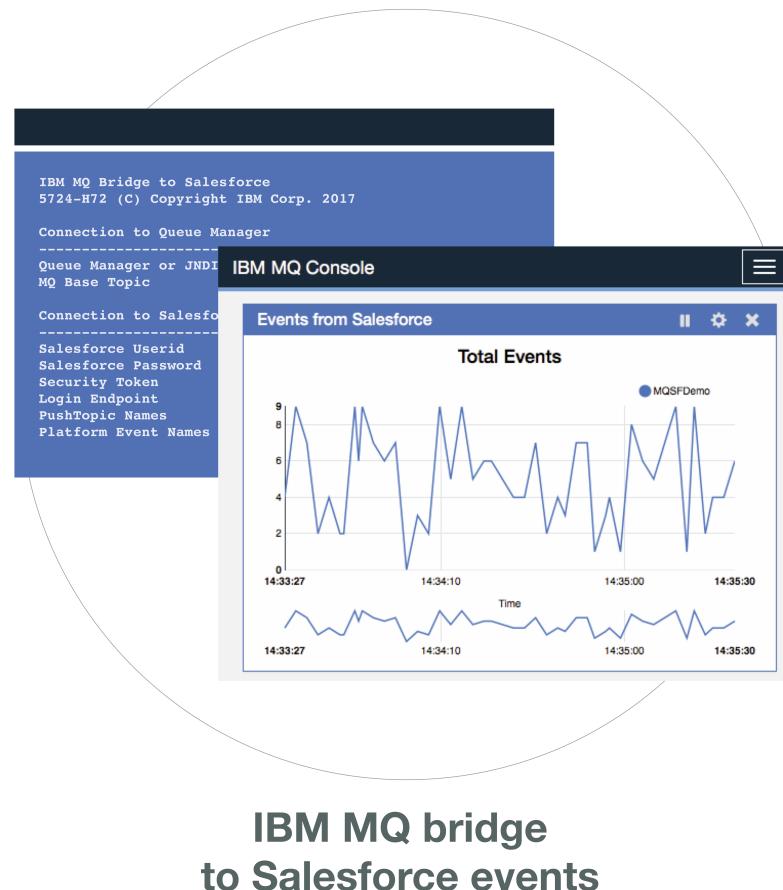
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An example of an Event Streaming interface: Streaming Salesforce events



Making Events Usable



Easily found and quickly consumed



De-coupled infrastructure



Consumed reliably by cloud applications



Delivered in time to be useful

Making Events Usable



Easily found and quickly consumed



De-coupled infrastructure



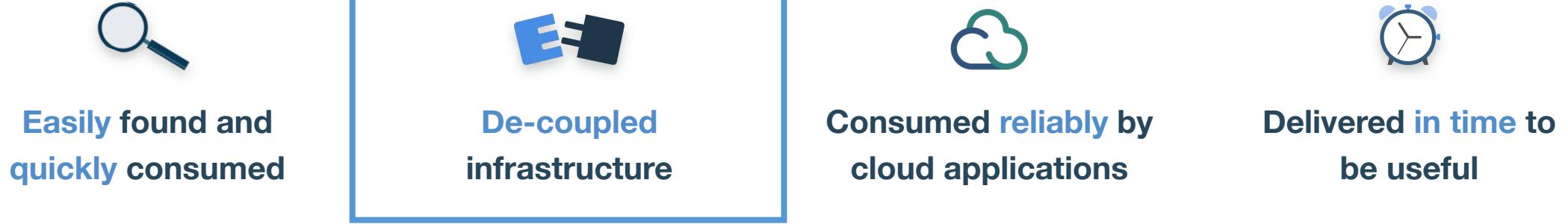
Consumed reliably by cloud applications



Delivered in time to be useful

- Innovation teams, partners and developers can discover event streams in a catalogue
- Events must be self service consumable without human interaction

Making Events Usable



- No **technology** ties between producer and consumer
- No **operational** ties between producer and consumer

Making Events Usable



Easily found and quickly consumed



De-coupled infrastructure



Consumed reliably by cloud applications



Delivered in time to be useful

- Replay history
- Durable Subscriptions, surviving disconnection and app failure
- Horizontally scalable consuming apps for increasing capacity and HA

Making Events Usable



Easily found and quickly consumed



De-coupled infrastructure



Consumed reliably by cloud applications



Delivered in time to be useful

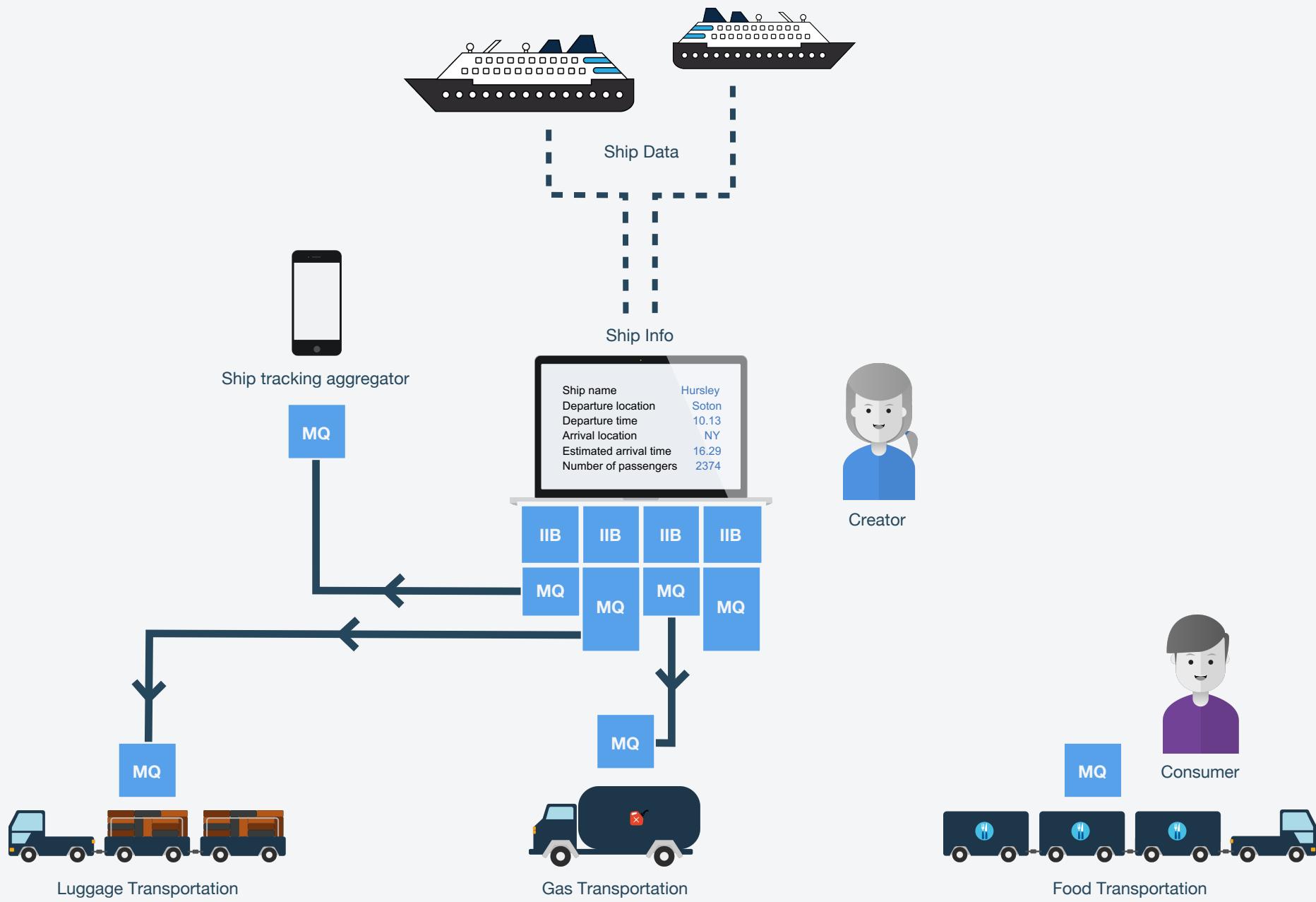
- Latency ~ 1 second
- Delivered to an application, not polled

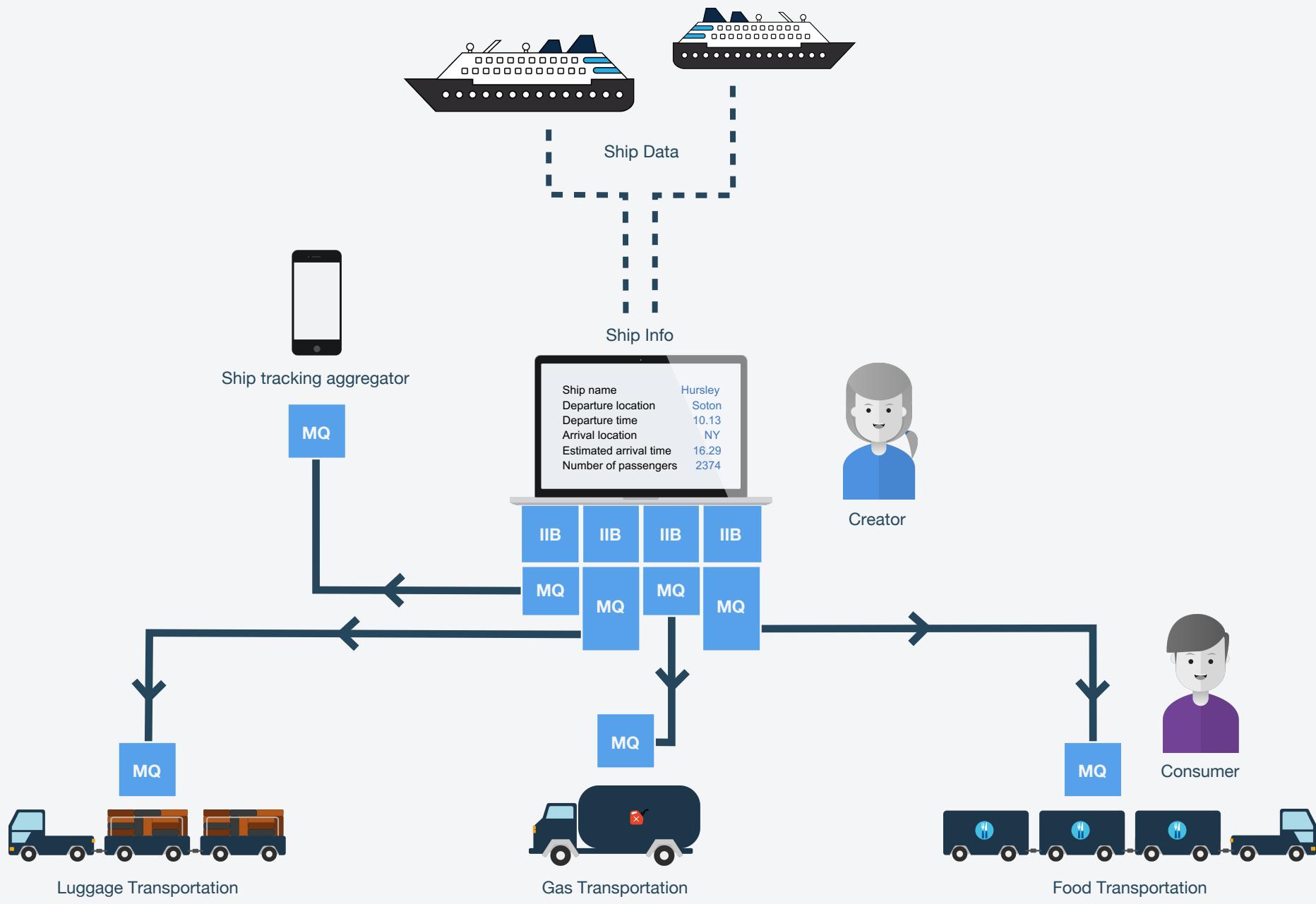
Common Ways To Make Events Available

MQ to MQ

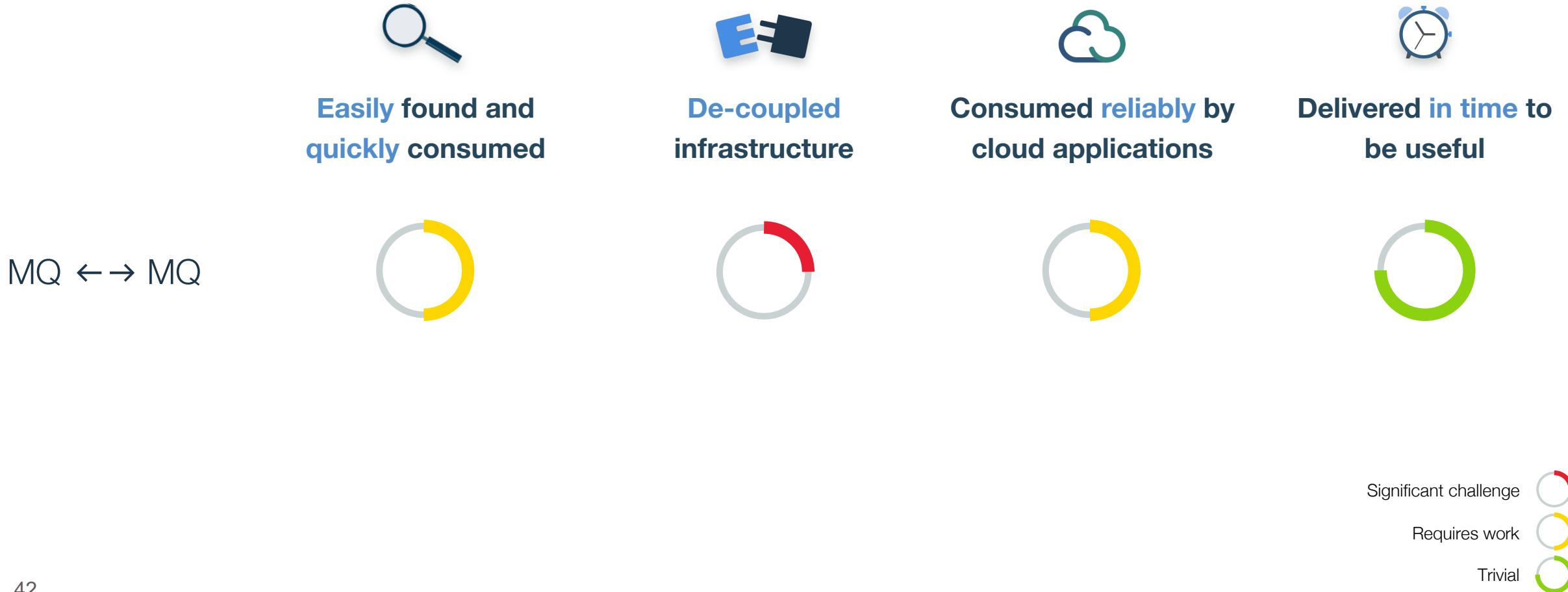
Over REST

MQ to Message Hub (IBM's managed Kafka service)

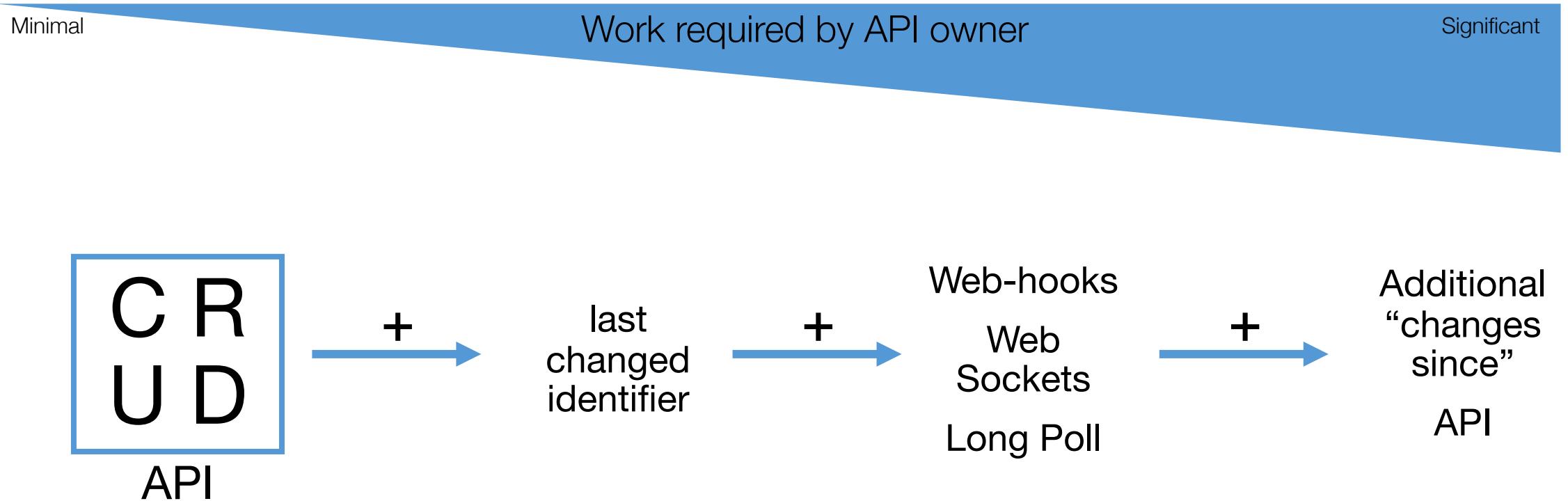




MQ to MQ connections



Events over REST



REST APIs

Rest APIs



Easily found and quickly consumed



De-coupled infrastructure



Consumed reliably by cloud applications



Delivered in time to be useful

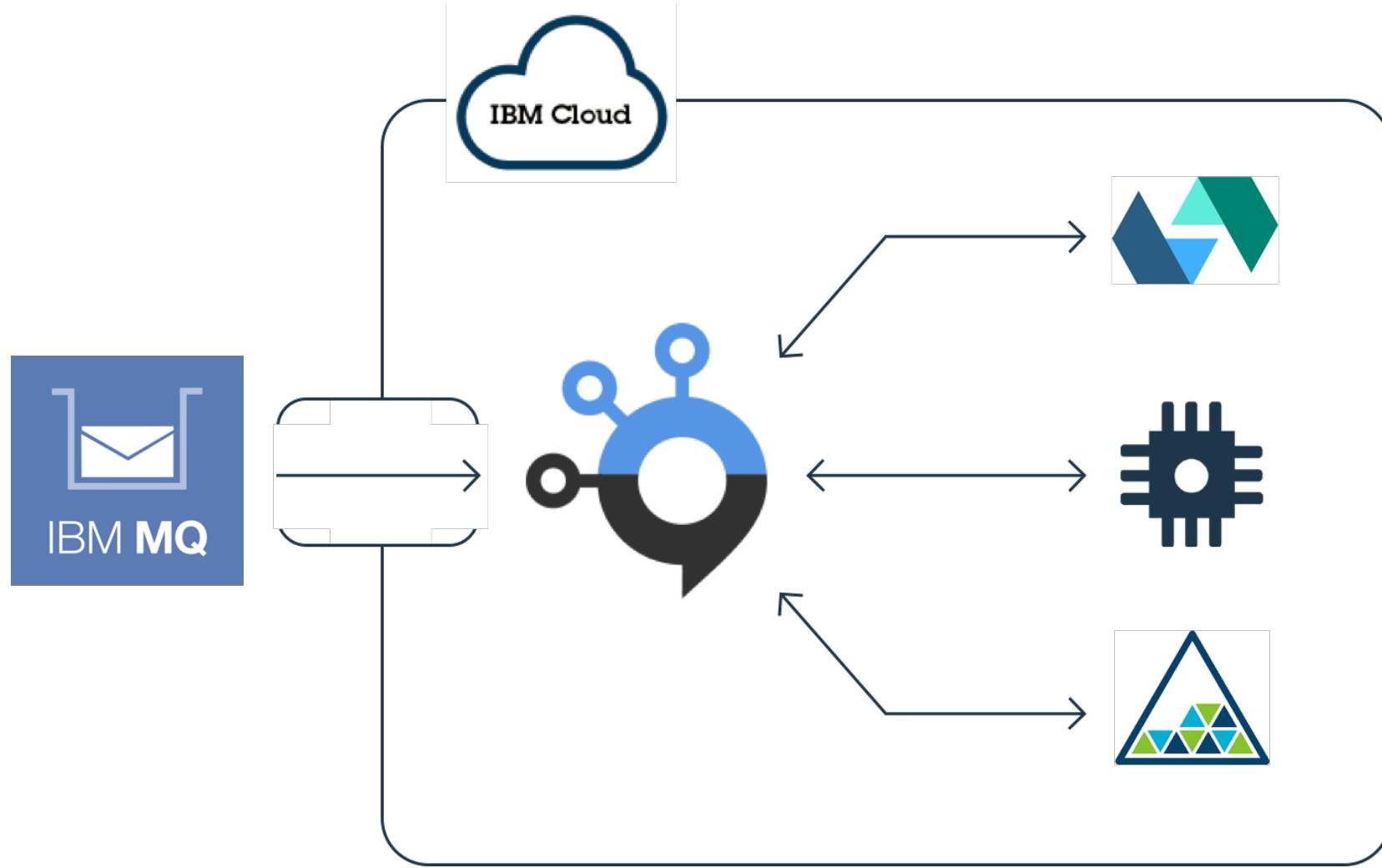


Significant challenge

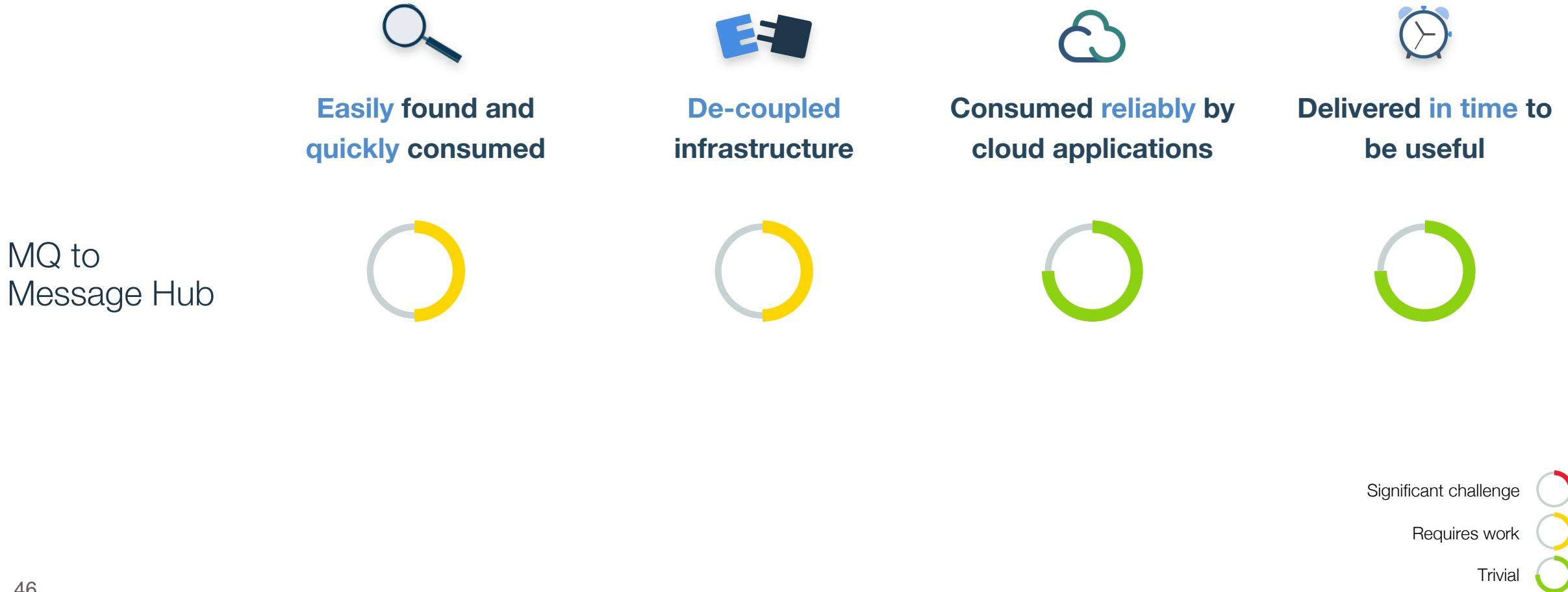
Requires work

Trivial

Message Hub + MQ



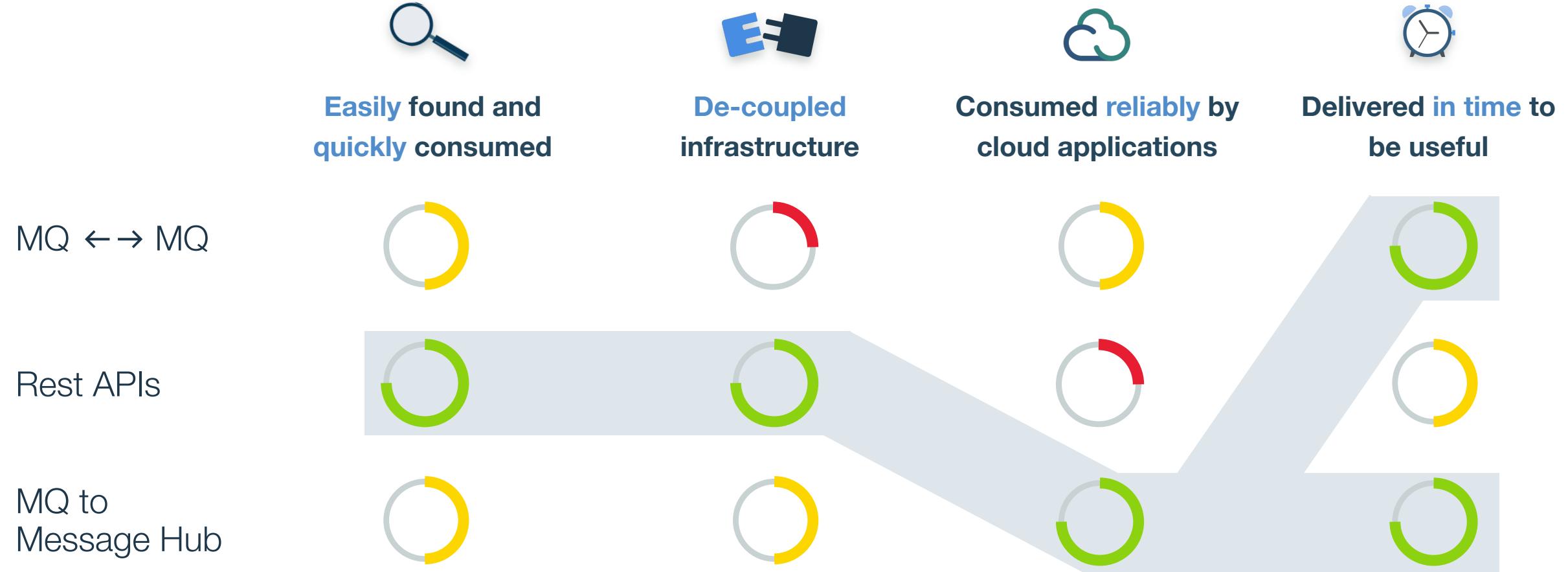
MQ to Message Hub



Summary

				
Easily found and quickly consumed				
De-coupled infrastructure				
Consumed reliably by cloud applications				
Delivered in time to be useful				
MQ ←→ MQ				
Rest APIs				
MQ to Message Hub				

Every challenge has been addressed...



...waiting to be combined into one solution



**Easily found and
quickly consumed**



**De-coupled
infrastructure**



**Consumed reliably by
cloud applications**



**Delivered in time to
be useful**

Event management
solution



Demo

Summary

Events are driving the key areas of innovation within the enterprise

Managing the distribution of these event streams is key to rapid innovation

Stay in touch

www.EventDrivenEnterprise.com



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