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Arq. Java - Event First Microservice Design

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About me...

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- Eduardo **Bobsin** Machado
- Systems Architect
- Java dev since 1999
- Professor at specialization course @ Uniritter
  - Agile architecture and development techniques
- Actually a contractor for Jive Software

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What is your pain?

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Change or evolve as fast as the business

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Elephant in the daily meeting

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One of my pains:
How to integrate with an old ERP?


Always Keep It
OPEN

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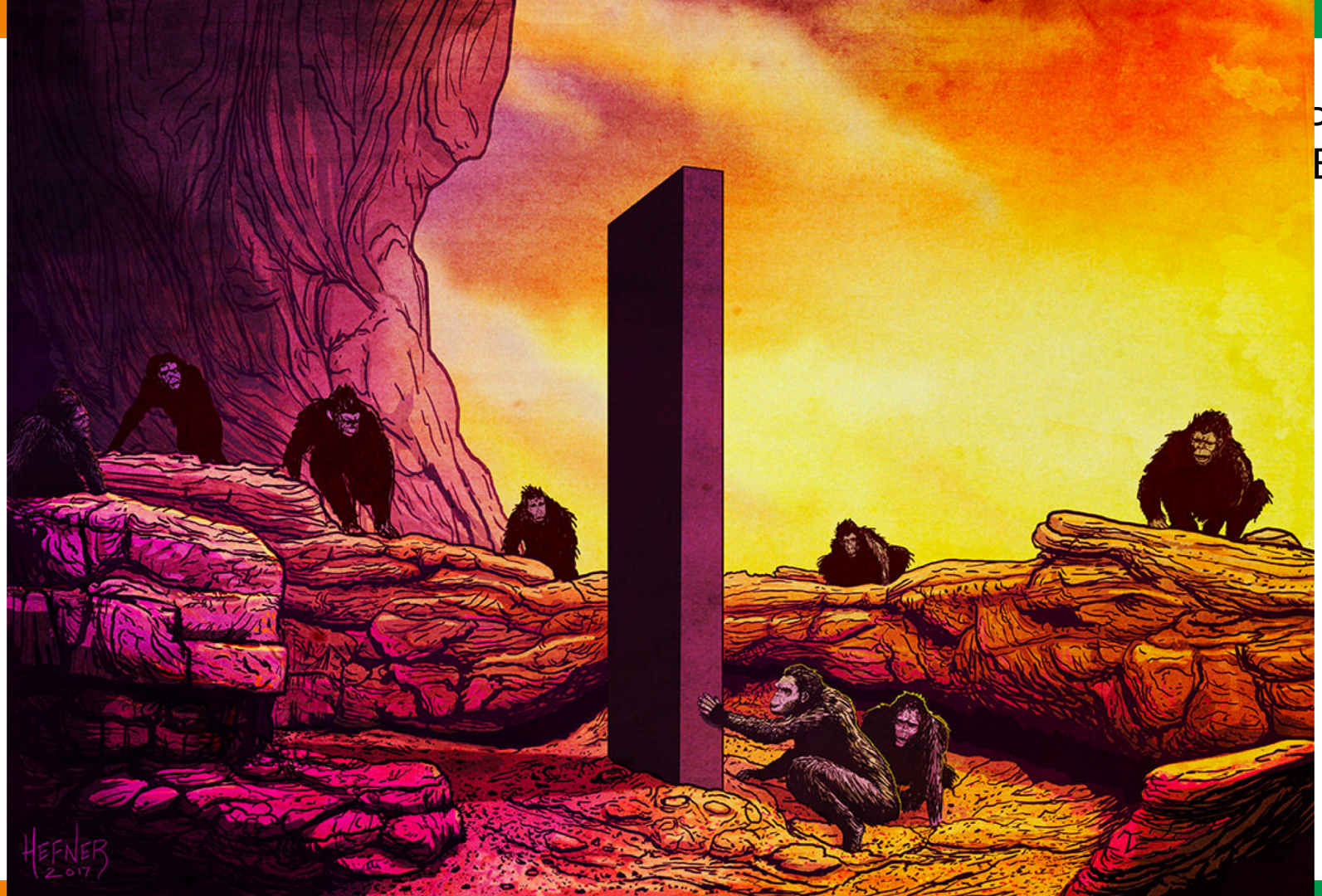

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We don't want a monolyth

We also don't want a collection of microlyths

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Demands some

mindset change

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Stop modeling system structure

Start modeling events (and thus system behaviour)

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But what is an event?

Inside an Event

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- Timestamp
  - When it was generated?
- Name
  - Who are you?
- Basic data
  - What happened?
  - Who created it?
  - References to relevant data/objects (ids)

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Events

Represent facts of information

Facts are cumulative

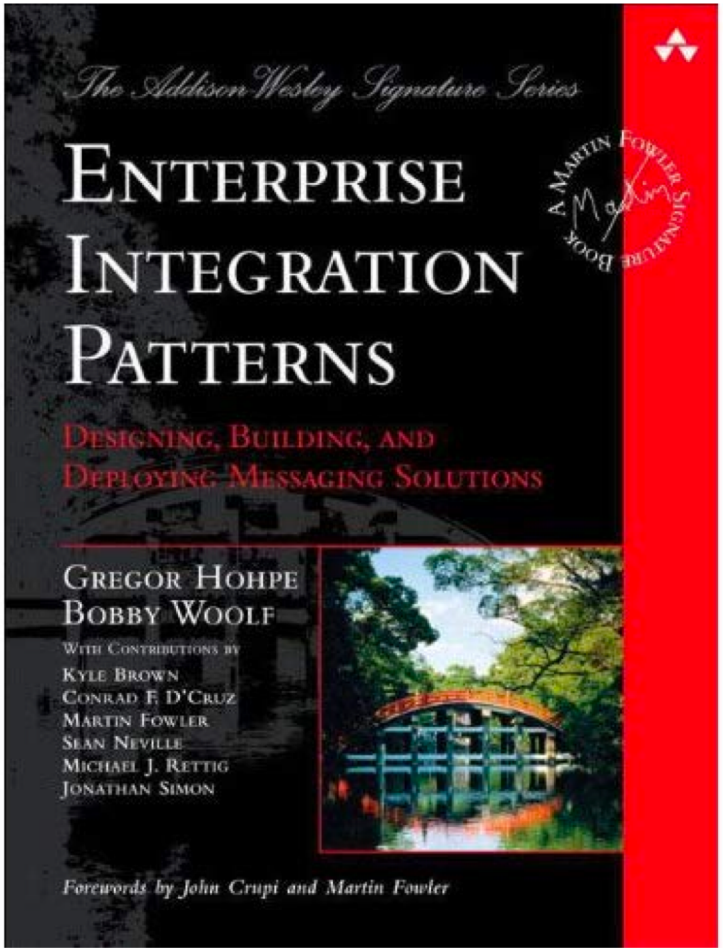
Facts can be ignored

Facts can't be retracted

Facts can't be deleted

New facts can invalidate previous ones

Enterprise Integration Patterns



Types of messages, or what's your **intent**?

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Command

- Imperative
- Execution
- Tend to wait for response
- 1:1
- Distributed

Document

- Data transfer
- Accepts transformation
- Might want for processing confirmation
- 1:1 or 1:N
- Local/Distributed

Event

- Notification
- Facts
- Immutable
- Response is not of interest
- 1:N
- Local

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How to identify and model events?

EVENT STORMING

Event Storming Steps

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Create domain events

Add the Command that produced that event

Add the actor that executes the command

Add corresponding aggregate

Why Event Storming?

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Facilitates Domain-Driven Design

Business Process as outcome

Helps change focus from system structure to event dynamics

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Domain-Driven Design?

Let the events define the Bounded Context

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Event-Driven Services!

Event-Driven Services

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- Receive and react to events
  - Maybe not...
- Publish new events
  - Asynchronously, obviously
- Invert the control flow
  - Create autonomy for the services

Event-Driven Services

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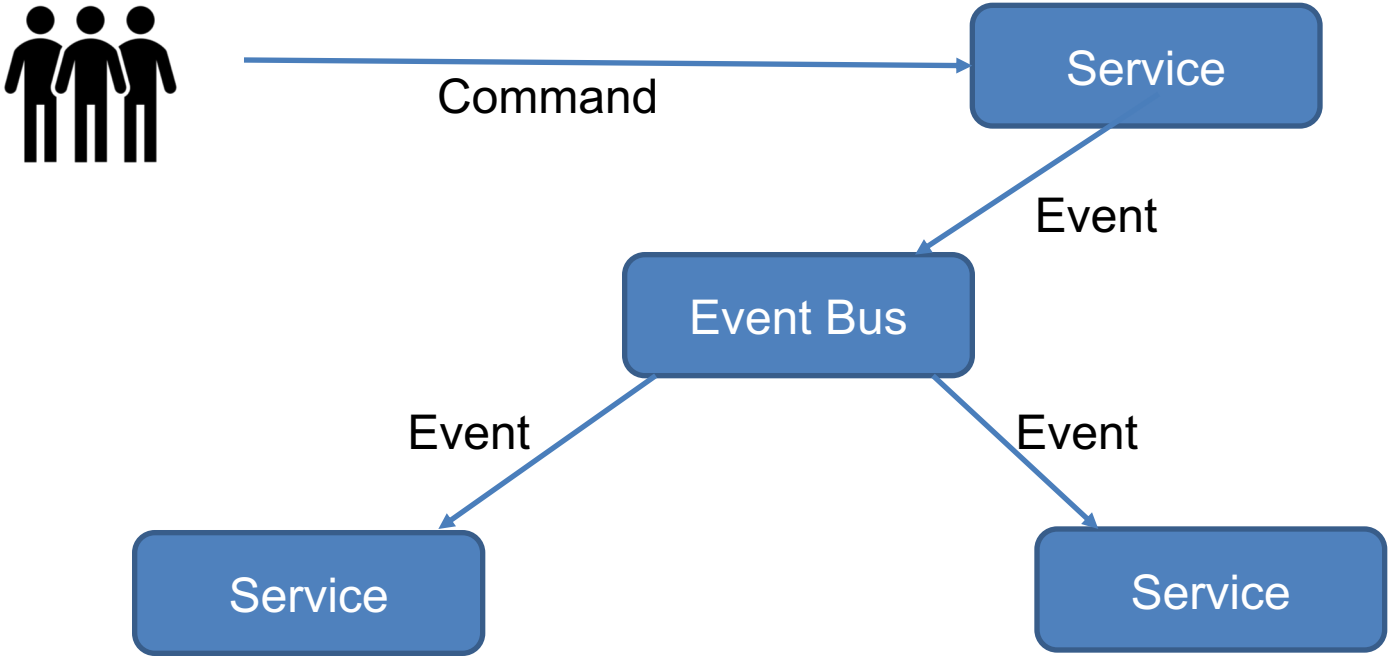
- Hide the mutable state
- Publish facts only
- The Aggregate provides consistency

Event-Driven Services



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Event Stream/Bus

Communication
Integration
Replication
Consensus
Persistence

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CRUD Services?

Good for isolated data

Cross CRUD services consistency is hard

No joins

Embracing Eventual Consistency

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- It's how the world works, anyway...
- Information is from the past
- We are developing distributed systems
- Non-deterministic
- Modeling uncertainty in business logic

Autonomous Services

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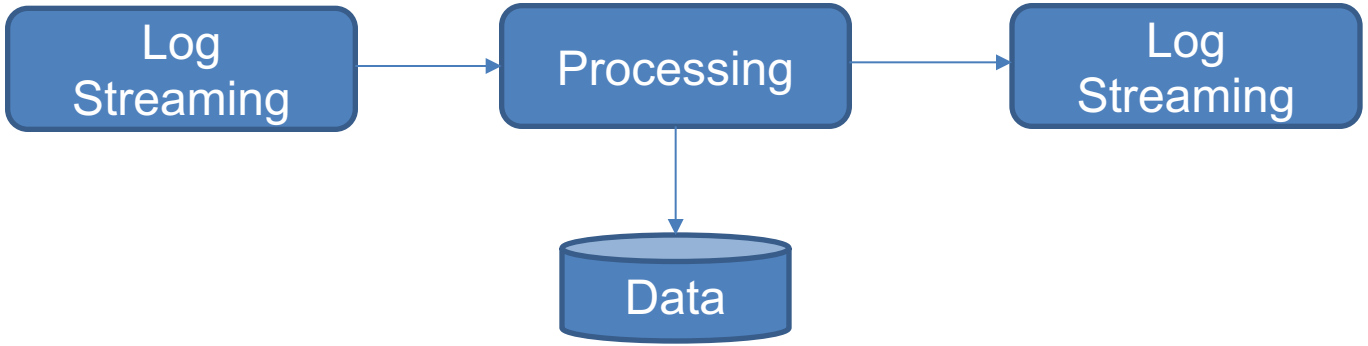

Modeling failures

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Failures must be:

Contained

Reified

Signaled

Observed

Managed

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Constant flow to convergence

More?

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- CQRS – Command Query Responsibility Segregation
- Event Sourcing

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Does it solve all my problems?

NO! It's just **an** approach.

Takeaways

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- Makes evolution easier over time
- Reduced risk
- Scalable
- Resilient
- Autonomous services
- Balance between uncertainty and certainty
- Choose carefully where and how to apply

How to start?

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- Enterprise Integration Patterns book
- Event Storming book
- Domain-Driven Design books
- The InfoQ eMag: Streaming Architecture

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Thank you!

Questions?

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