

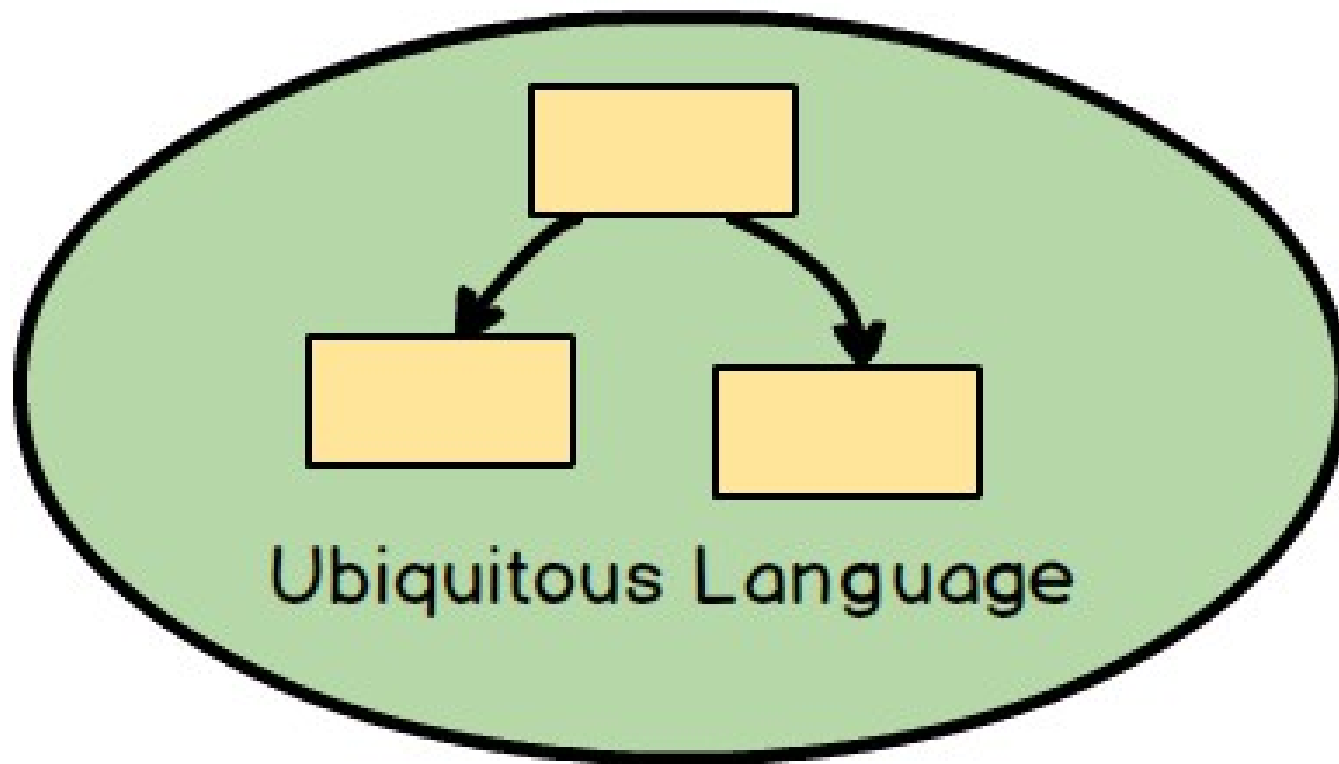
# DDD Today: Modeling Uncertainty



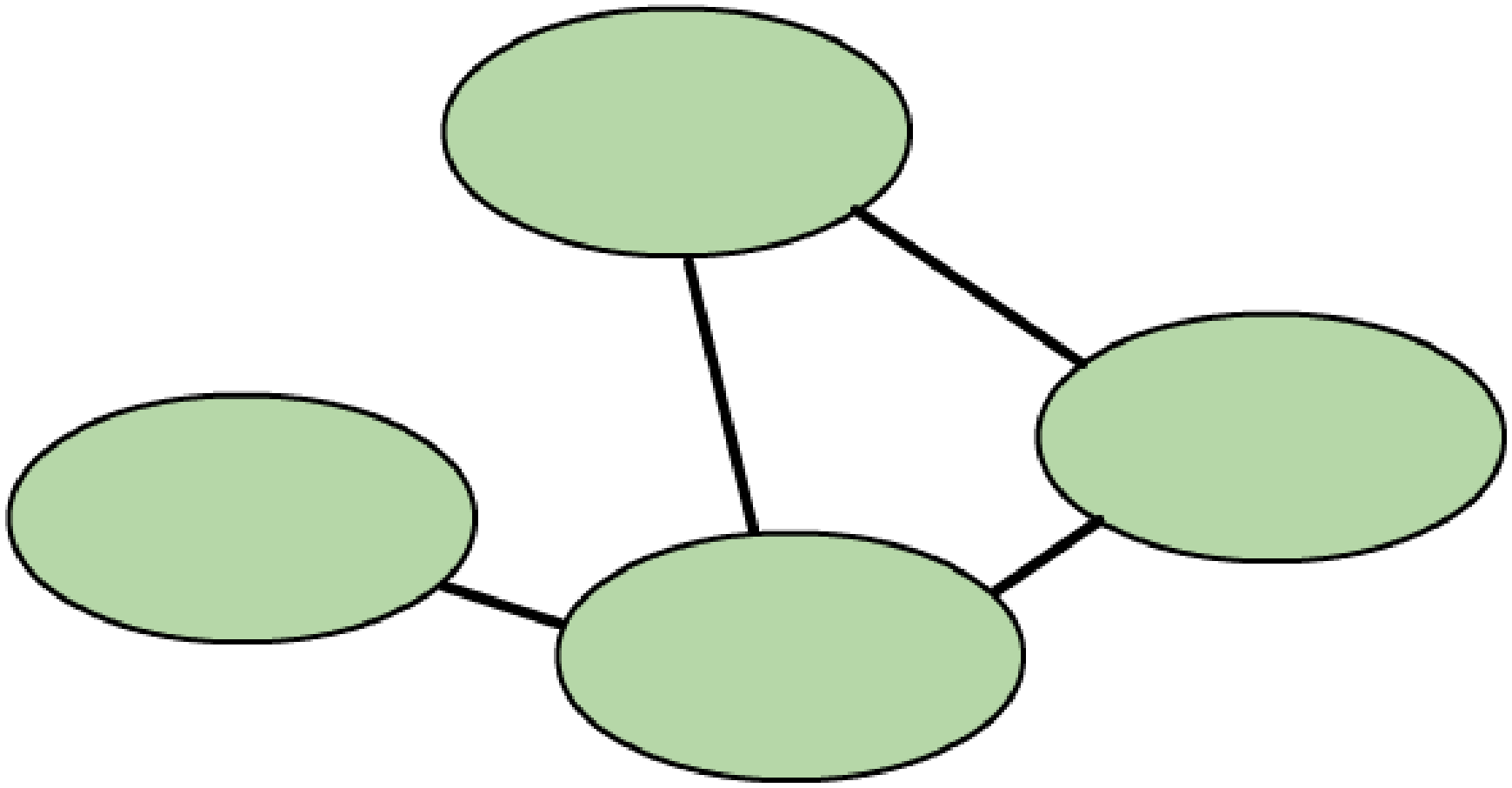
 @VaughnVernon

# Essence of DDD

**Bounded Context**



# Context Mapping



# Powers of 10



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# Donald Knuth



“Premature optimization is the root of all evil.”

@VaughnVernon

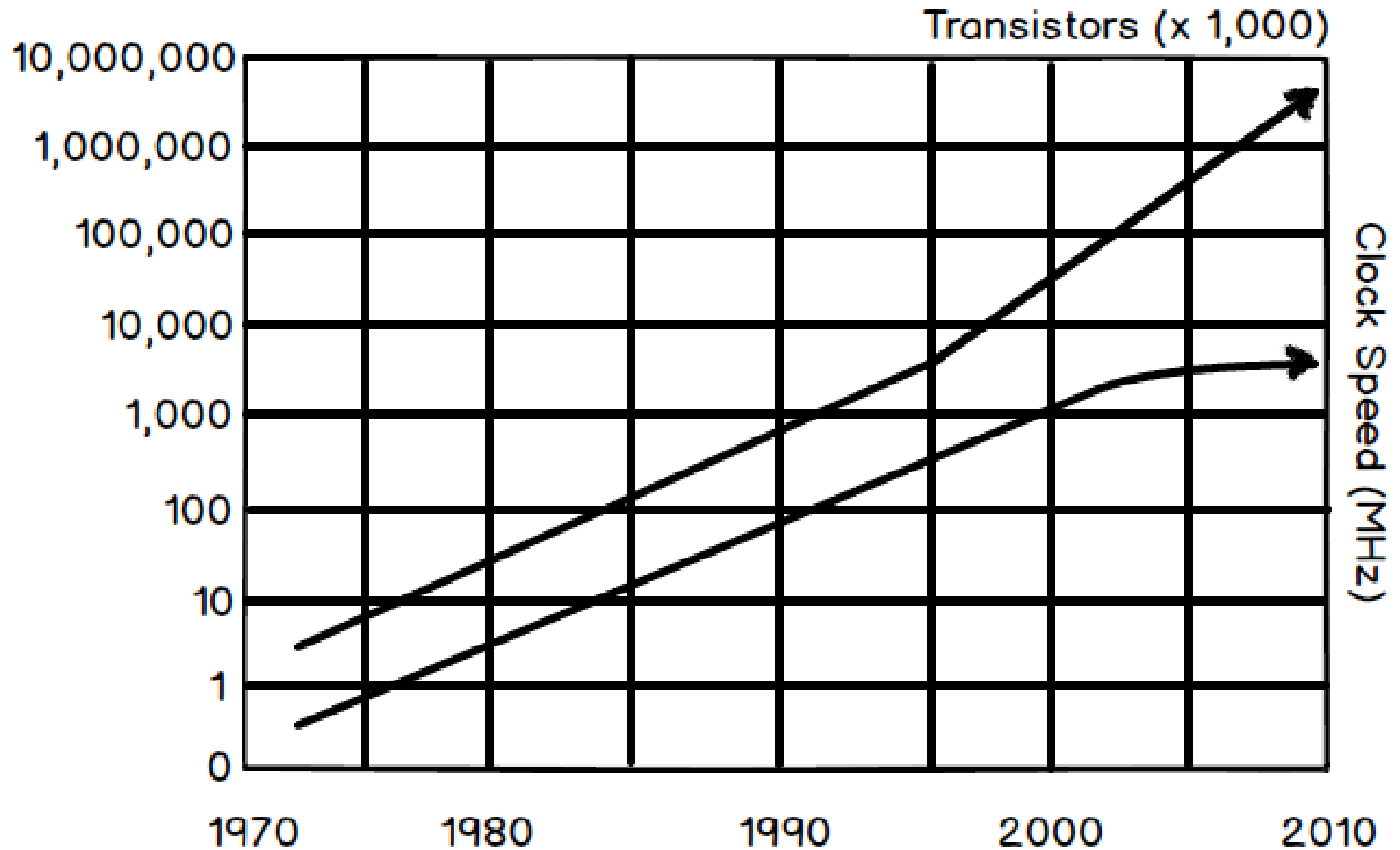
# What Donald Knuth Actually Said:

“We should forget about small efficiencies...  
premature optimization is the root of all evil.”

# And Donald Knuth Also Said:

“People who are more than casually interested in computers should have at least some idea of what the underlying hardware is like. Otherwise the programs they write will be pretty weird.”

# 1973 - 2003



# Cores Matter



**More cores, not (much) faster cores**

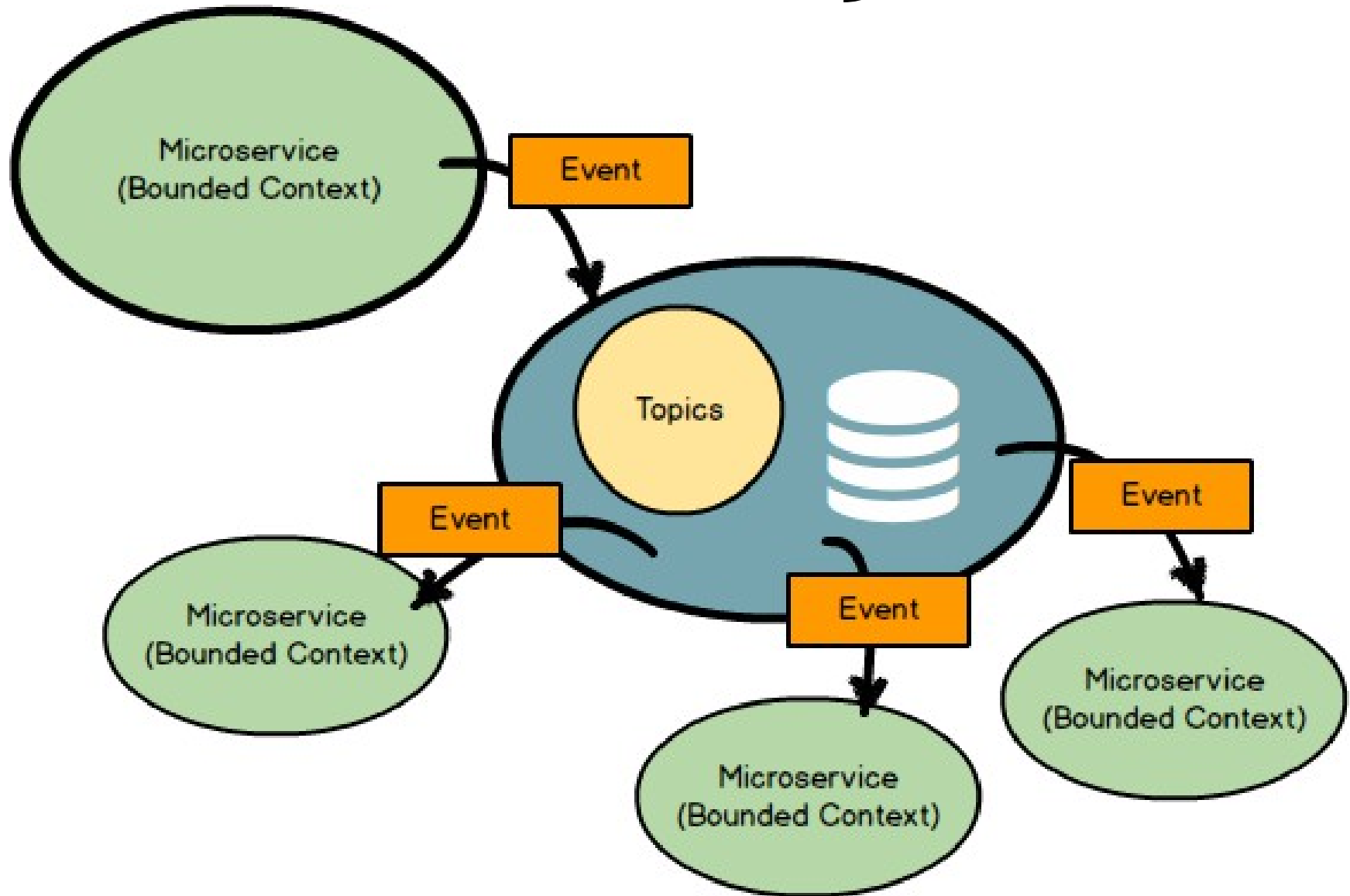
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# Reactive/Actors

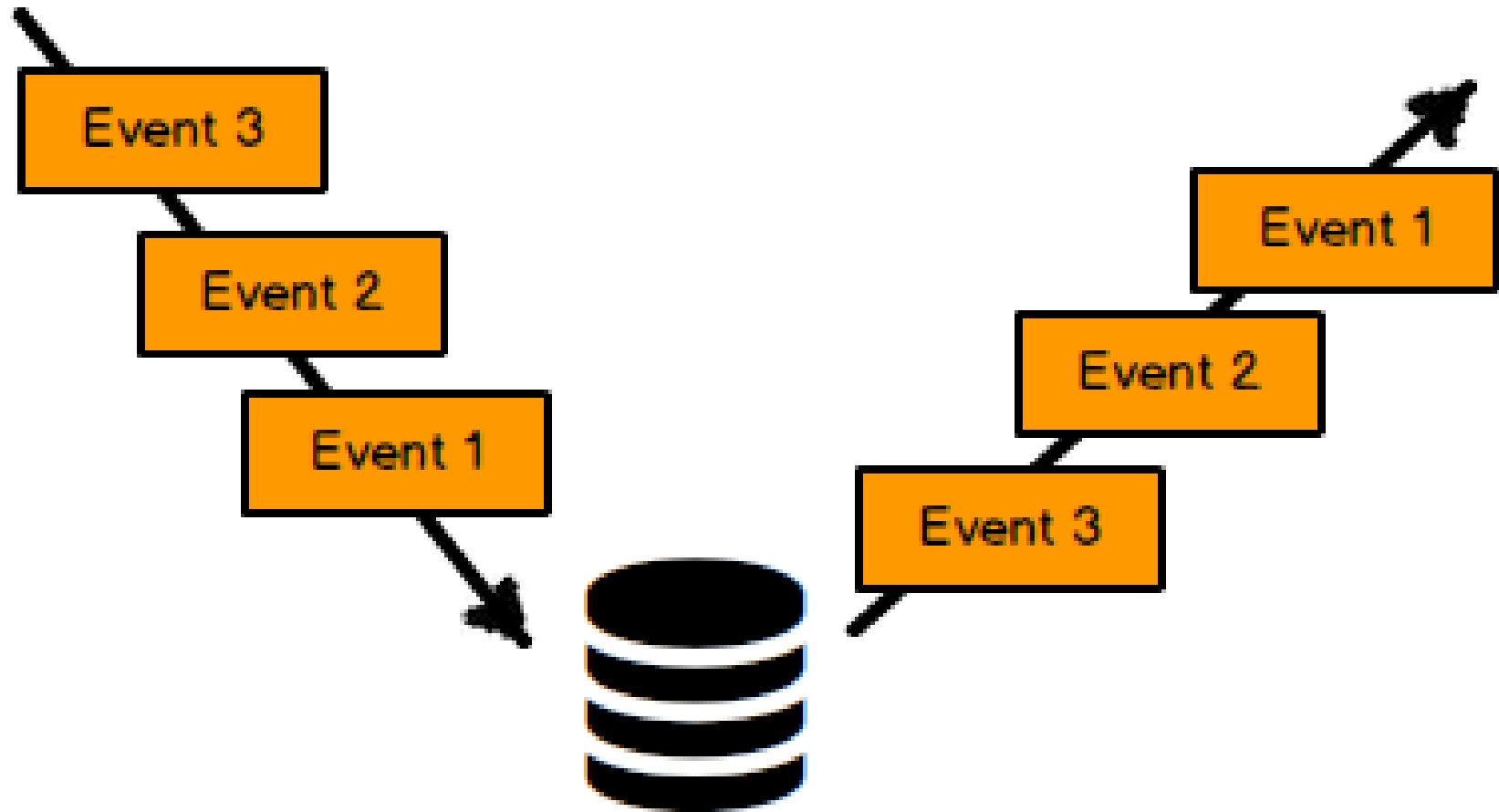


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# Reactive Systems



# Welcome, Uncertainty!



# un·cer·tain·ty

the state of being uncertain.

# un·cer·tain·ty

the state of being uncertain.

# un·cer·tain·ty

**synonyms:** unpredictability,  
unreliability, riskiness,  
chanciness, precariousness,  
changeability, variability...

# un·cer·tain·ty

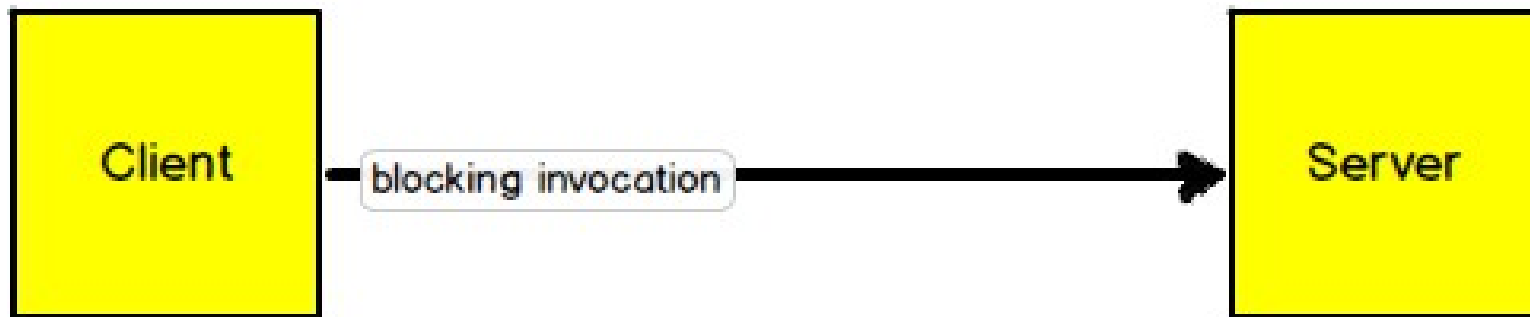
synonyms:

*uncomfortable ;-)*

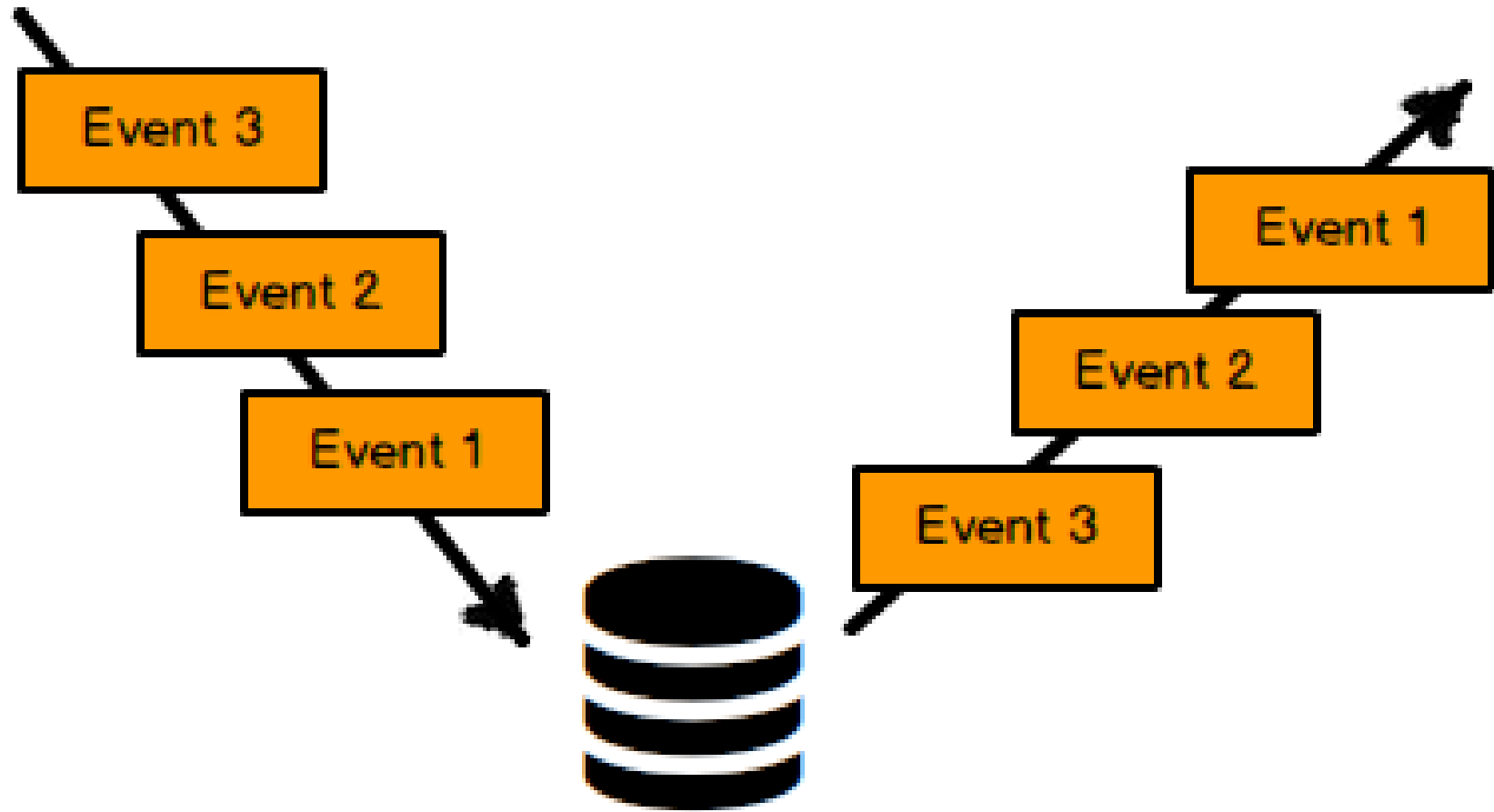


# Addiction

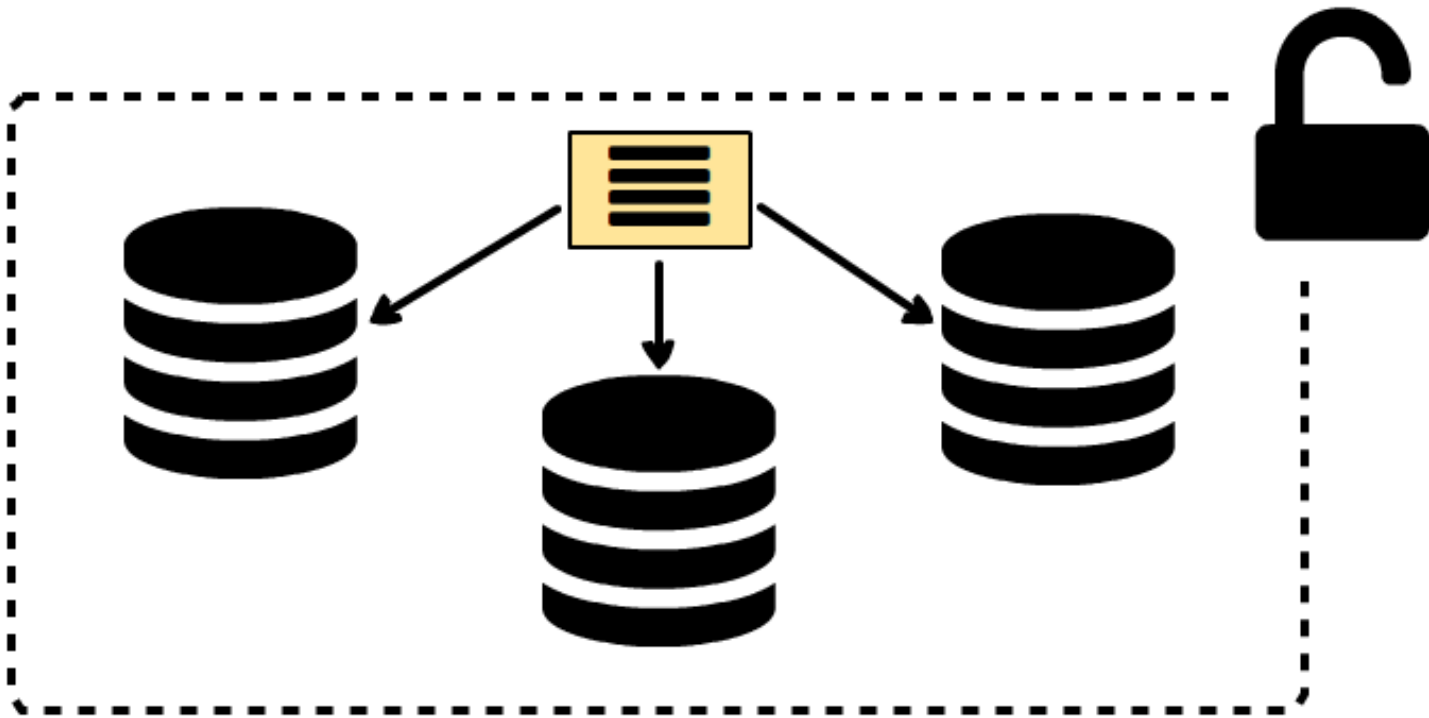
Blocking



# Addiction



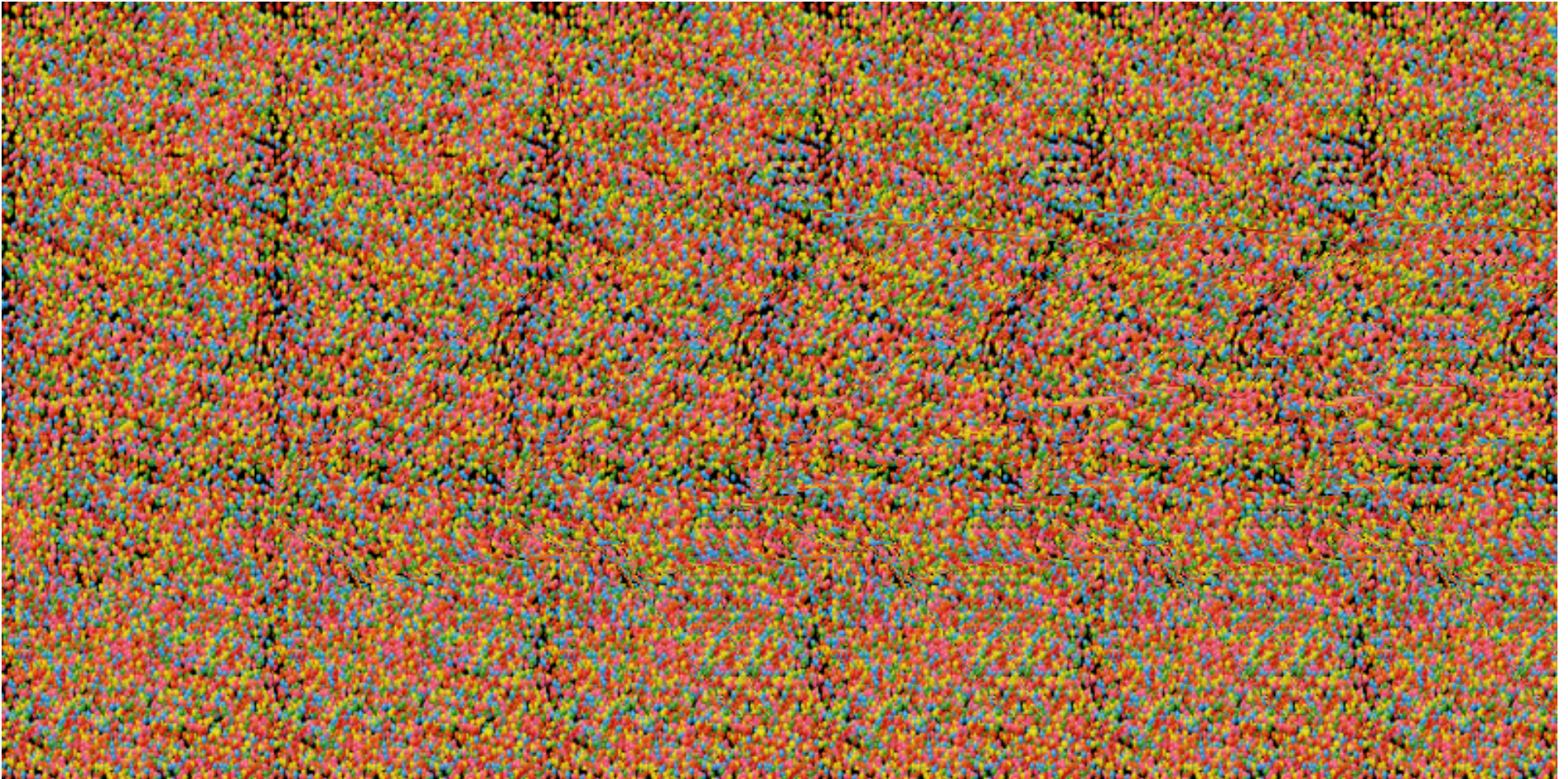
# Addiction



# uncomfortable

It's okay to feel this way.

# Perception



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# “Cleverly hidden”



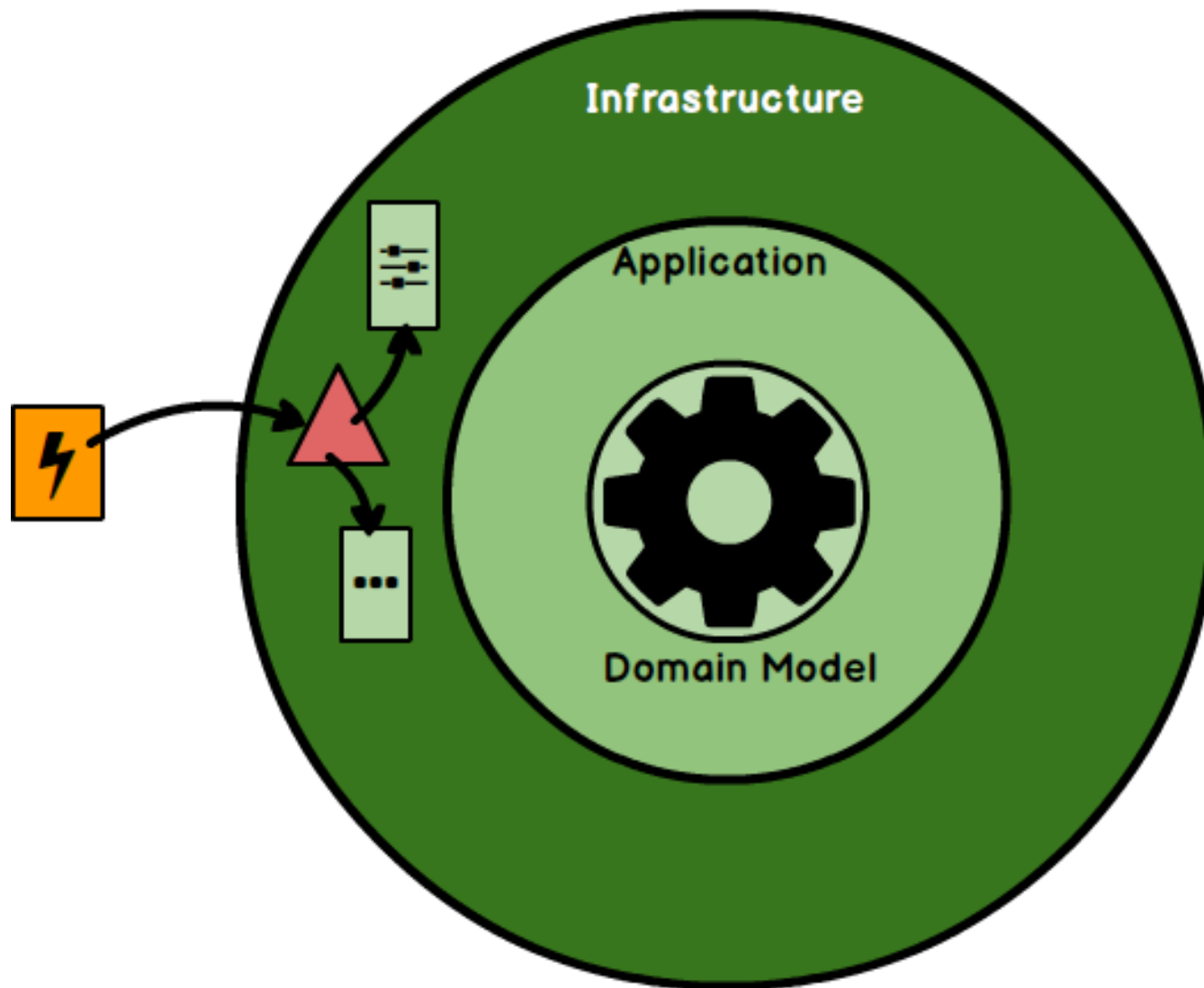
@VaughnVernon

# Fortress



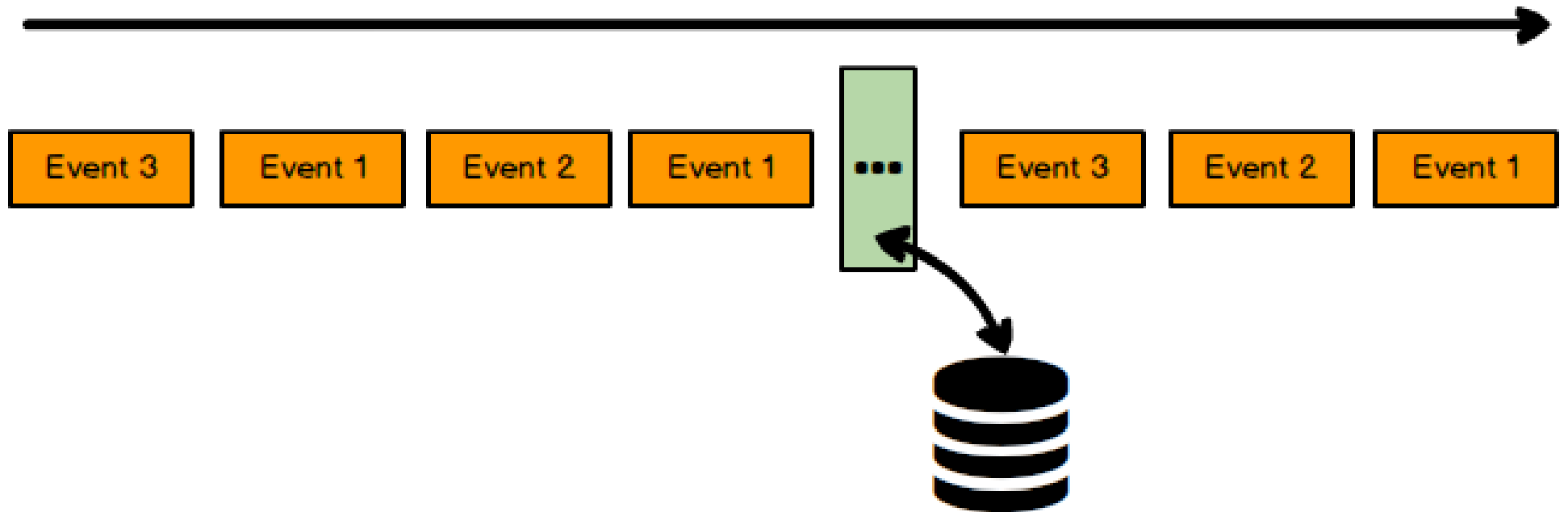
@VaughnVernon

# Infra Fortress

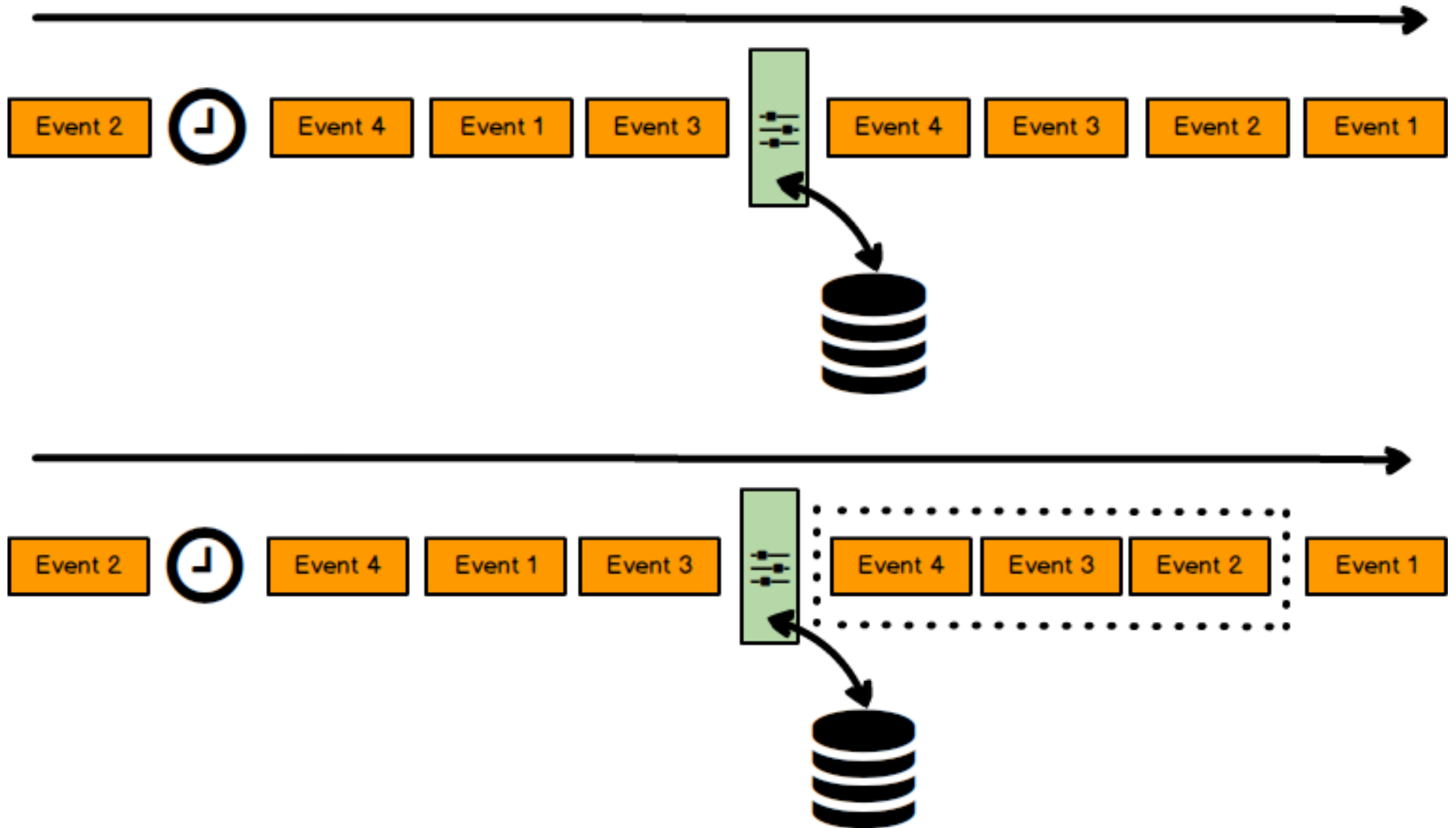


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# De-duplicator



# Resequencer



**Stop everything.**

**Ok, I'm ready now.**

# **“There is no now.”**



**Justin Sheehy**

@VaughnVernon

# Urgent Global Bug

`LocalTime.now()`

# un·cer·tain·ty

“Distributed systems are here to stay. If you don't like it, change careers. Maybe open a restaurant.” – Me

# **Why Modeling un·cer·tain·ty Matters**

# Cores Matter



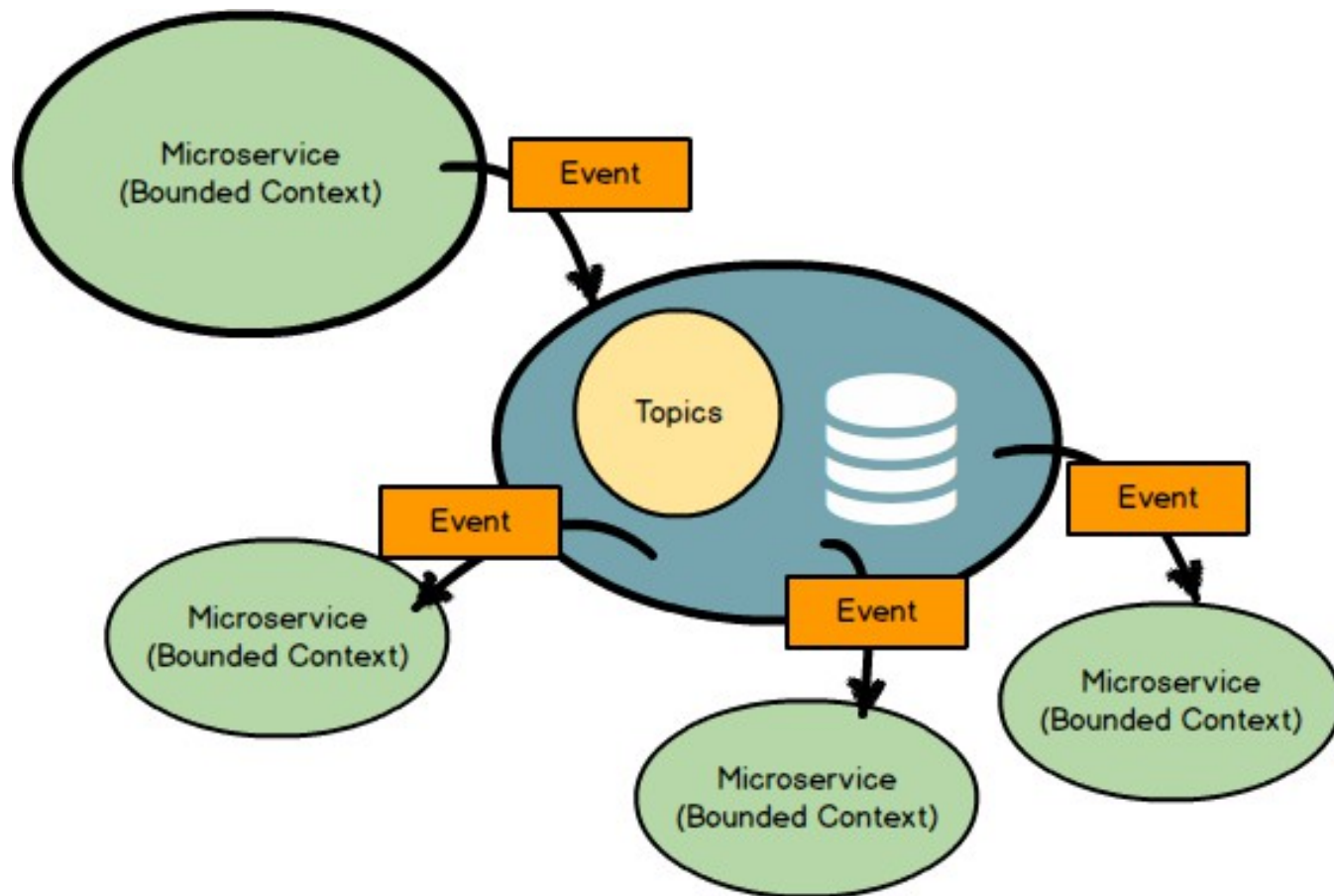
**More cores, not (much) faster cores**

@VaughnVernon

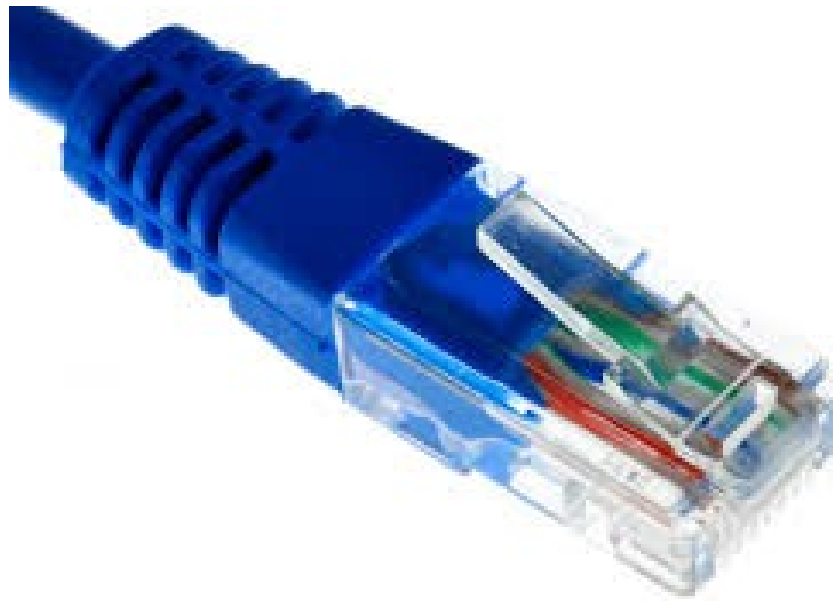
# Cloud Matters



# Microservices Matter



# Latency Matters



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# IoT Matters



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# Cheap



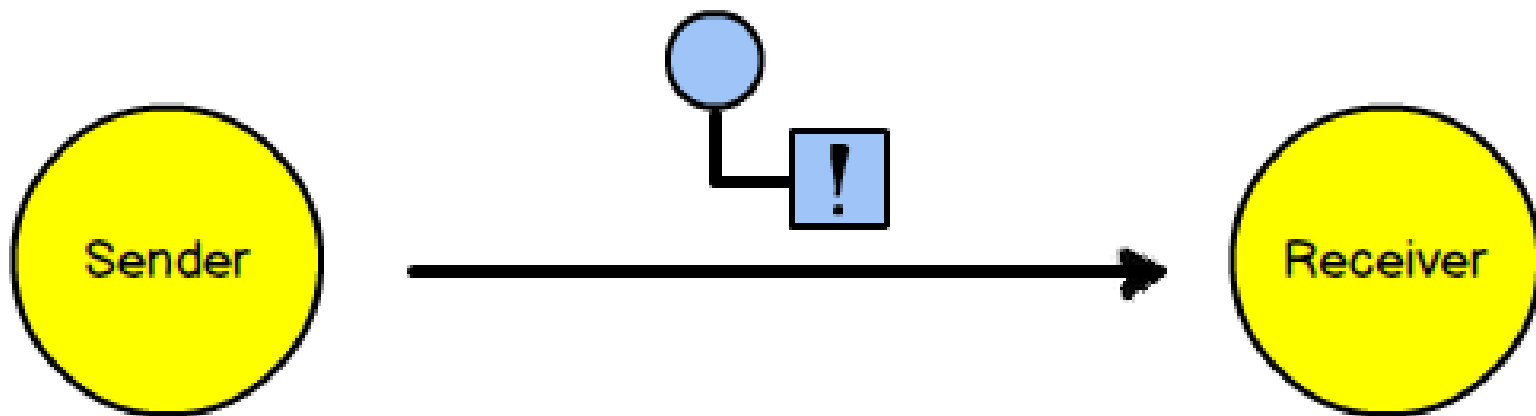
## #IoT



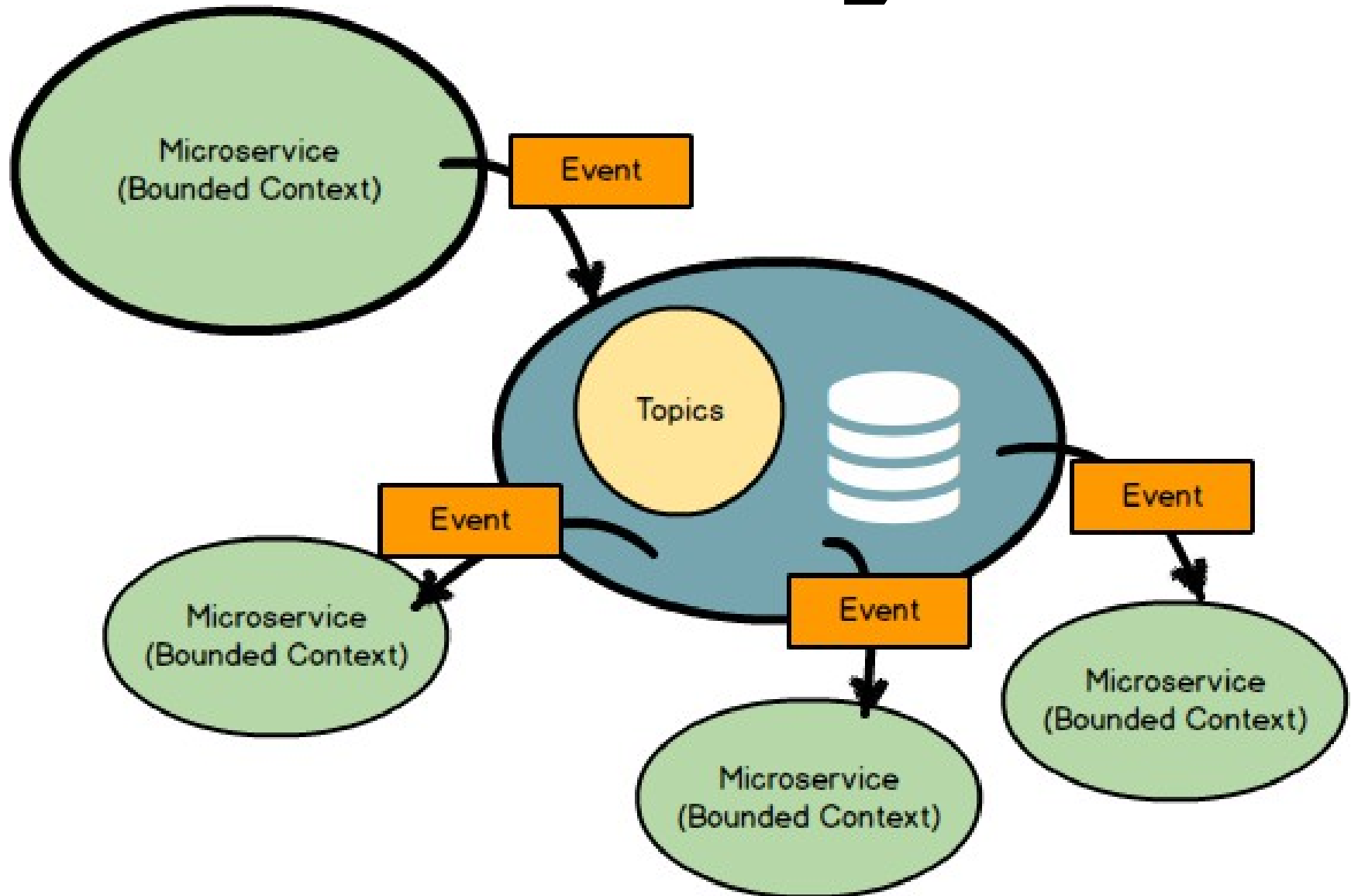
@VaughnVernon

# SOLID vs Ma

Message Driven



# Reactive Systems



# un·cer·tain·ty

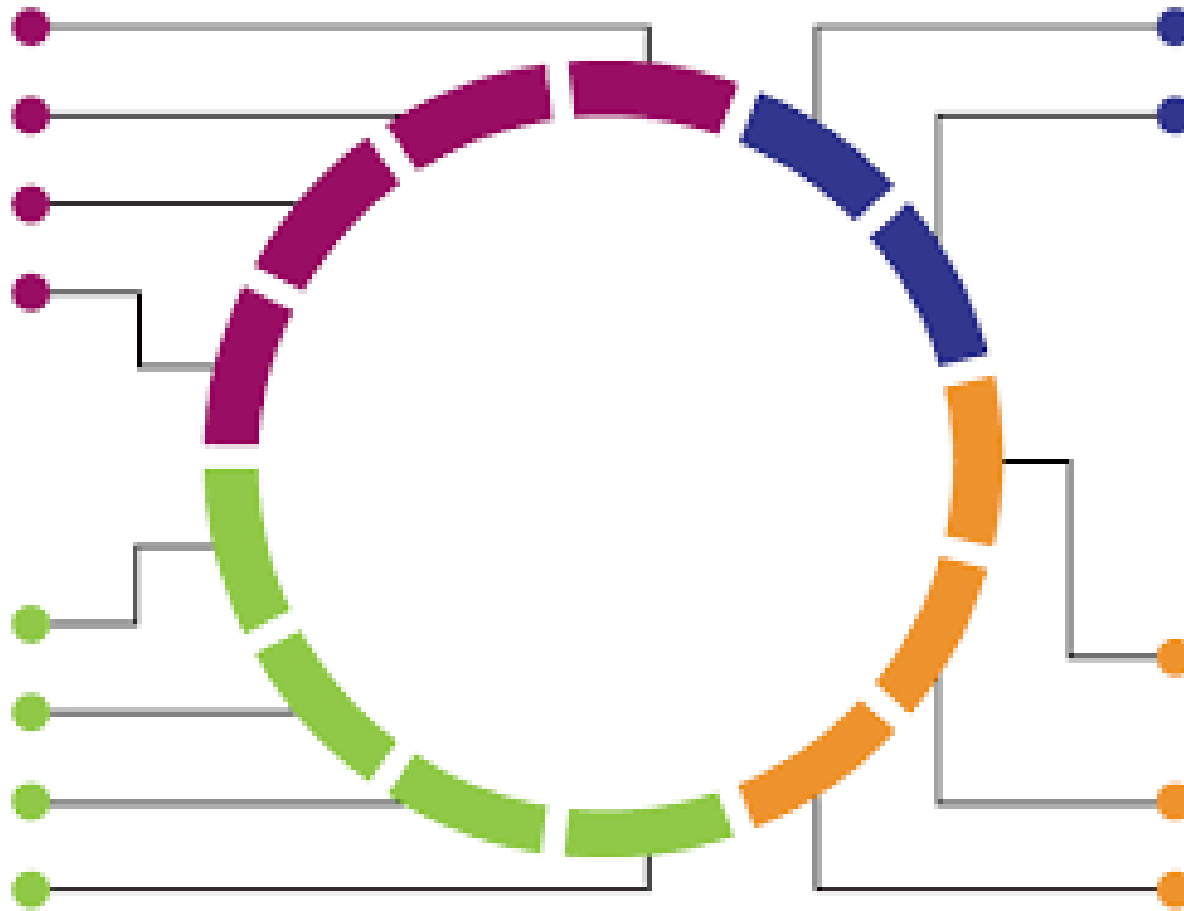
the state of being uncertain.

# Pat Helland

## Life Beyond Distributed Transactions (updated)

“In a system that cannot count on distributed transactions, the management of uncertainty must be implemented in the business logic.”

# Activity

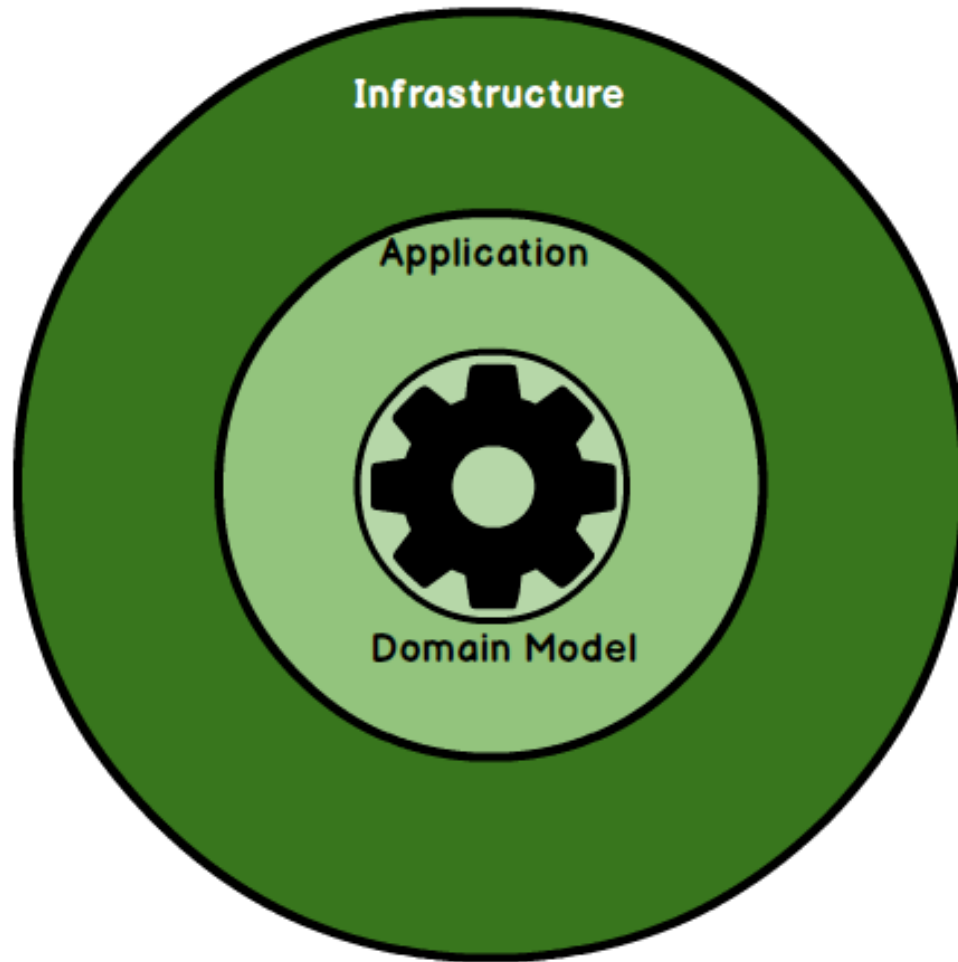


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# Activity

```
public final class PartnerActivities {  
    private final Set<PartnerActivity> activities;  
    ...  
    public void record(Partner p, Activity a) {  
        activities.add(new PartnerActivity(p, a));  
    }  
  
    public boolean seen(Partner p, Activity a) {  
        activities.contains(new PartnerActivity(p, a));  
    }  
}
```

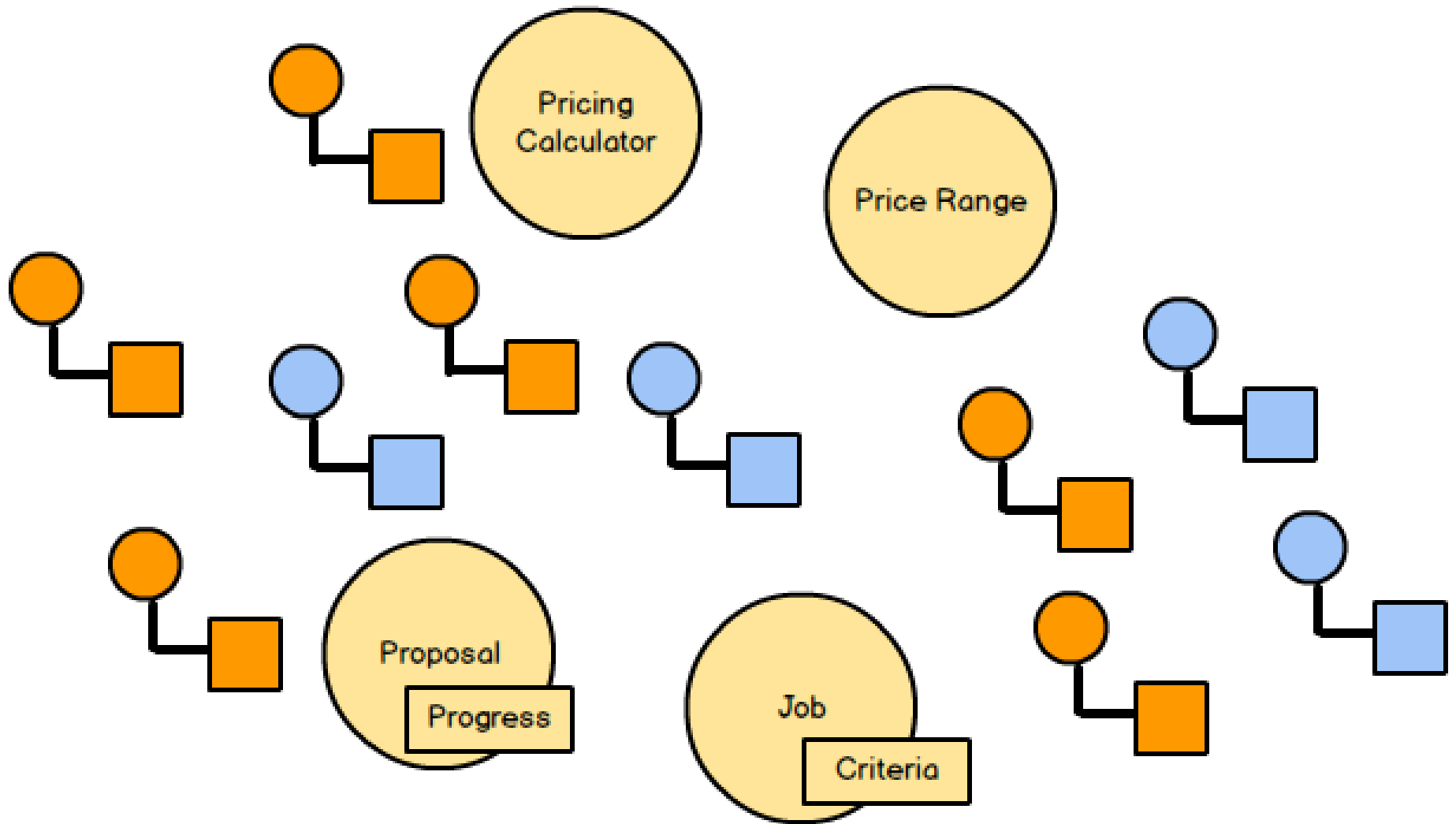
# Where?



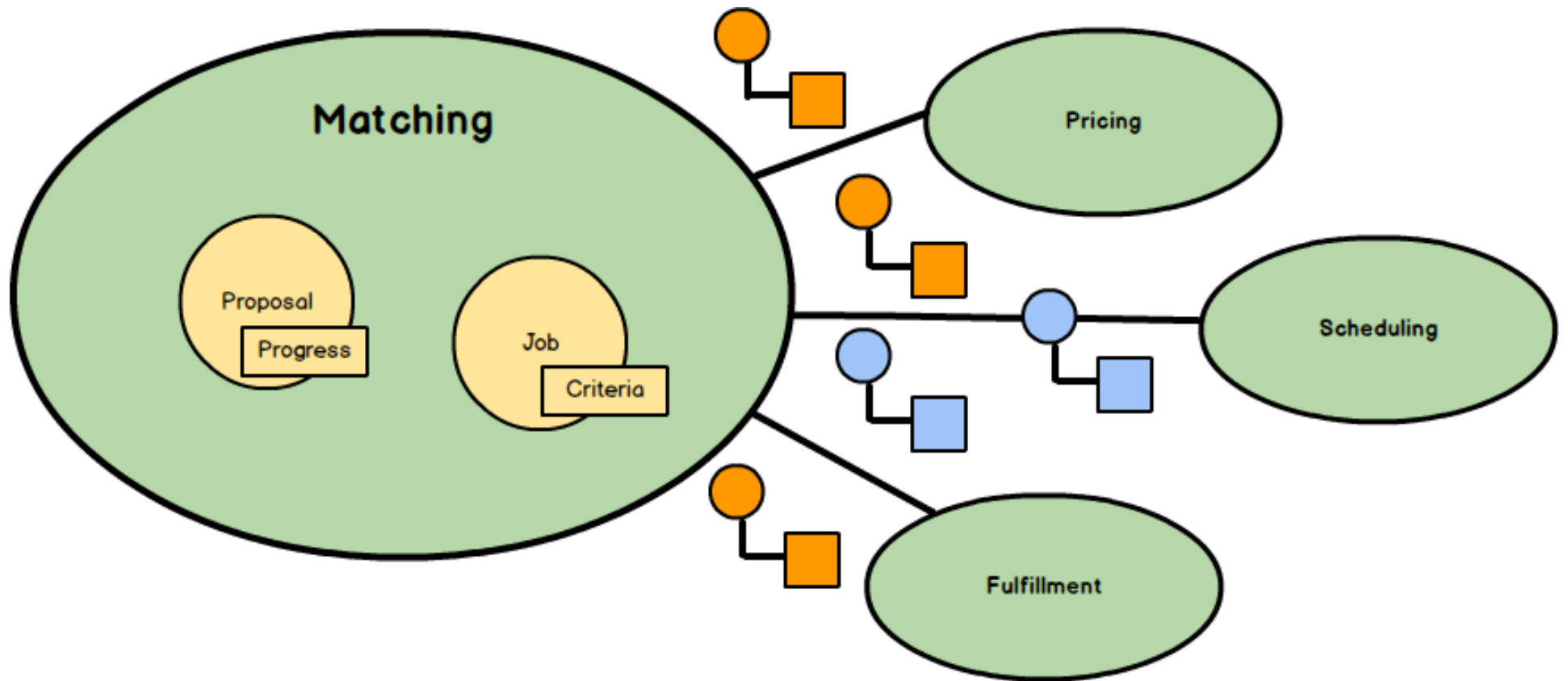
## Less complex!

@VaughnVernon

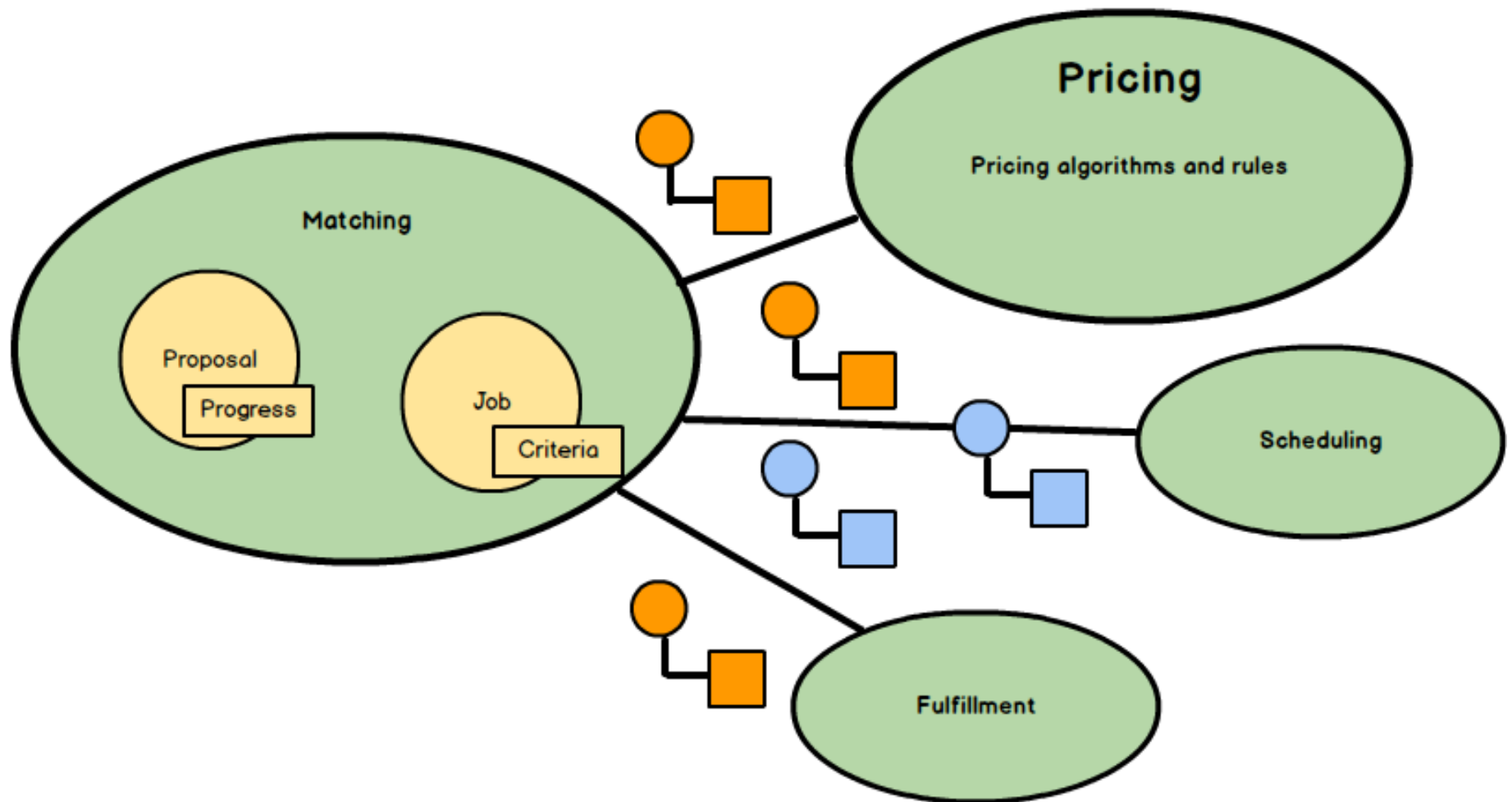
# Explicit Model



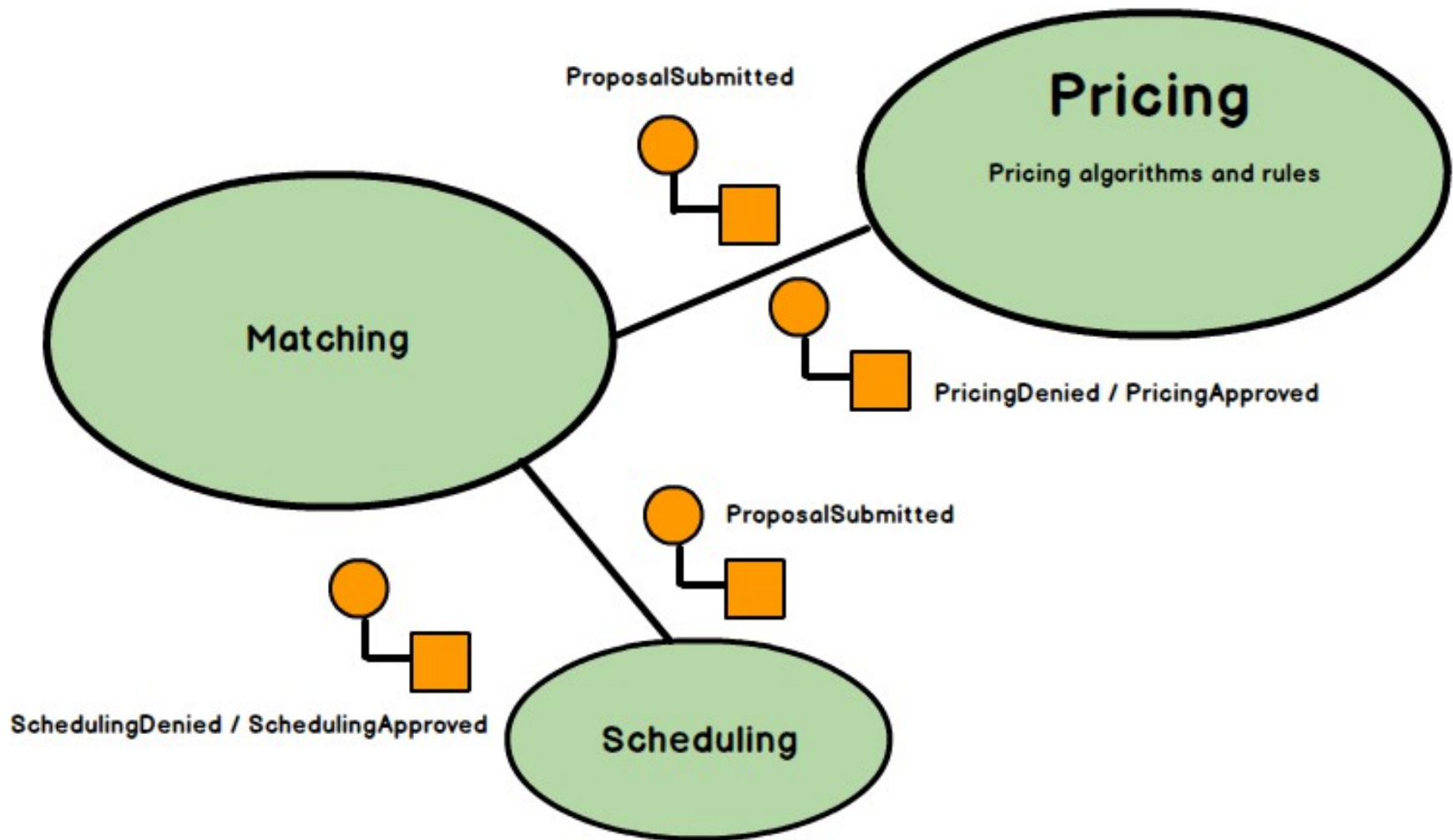
# Core Domain?



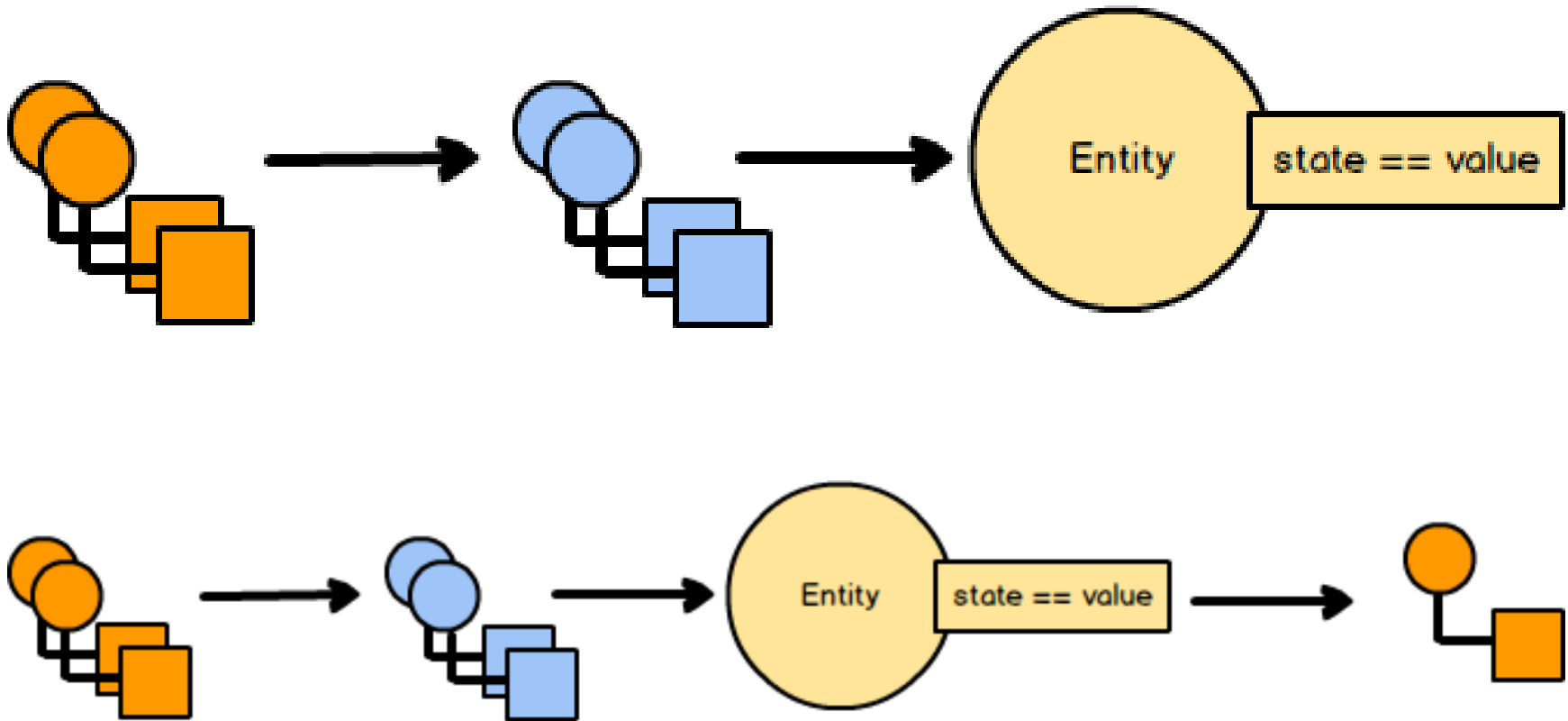
# Core Domain



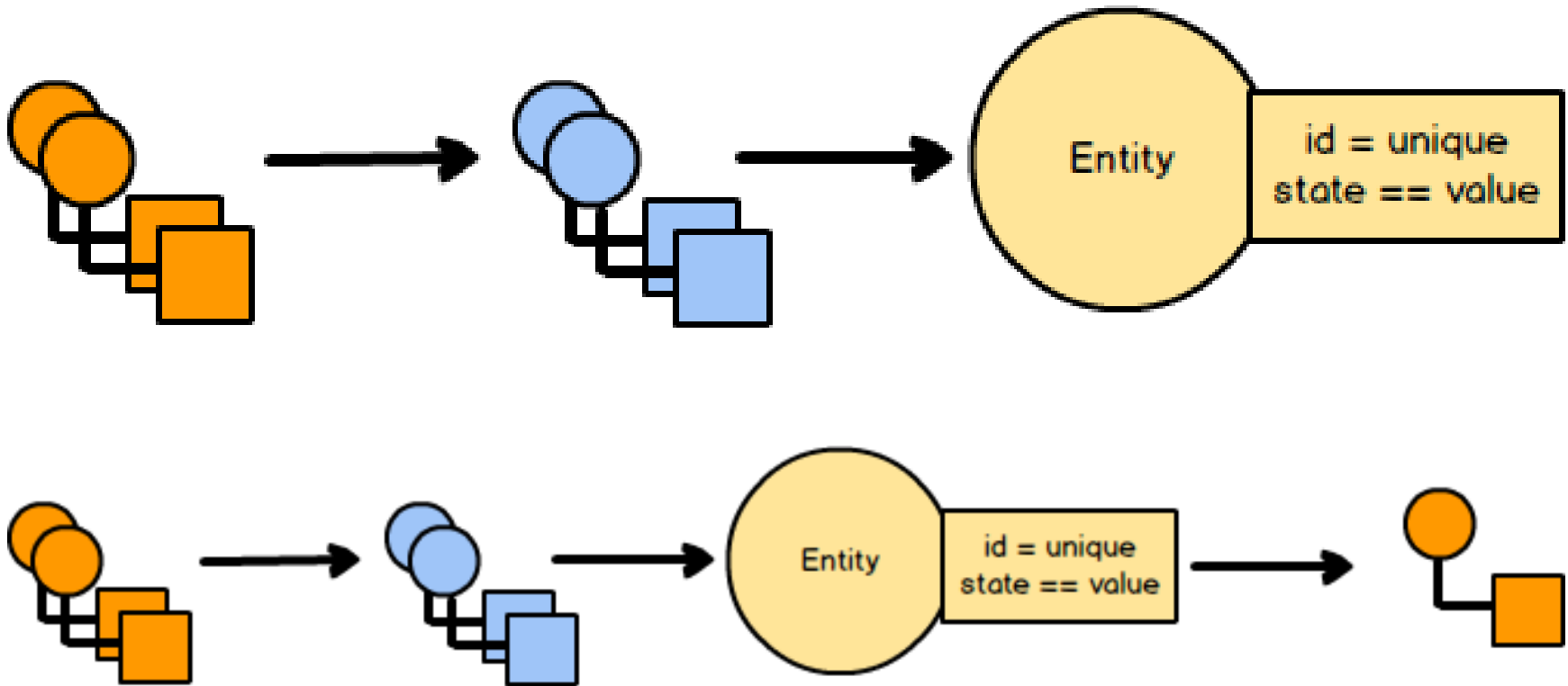
# Events



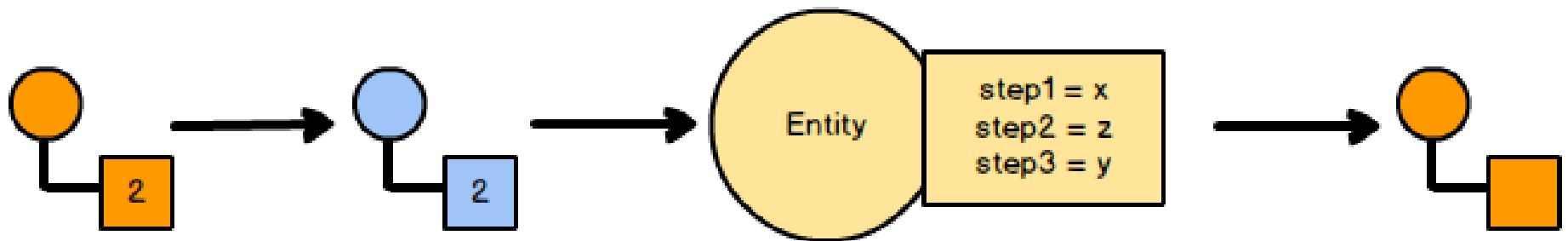
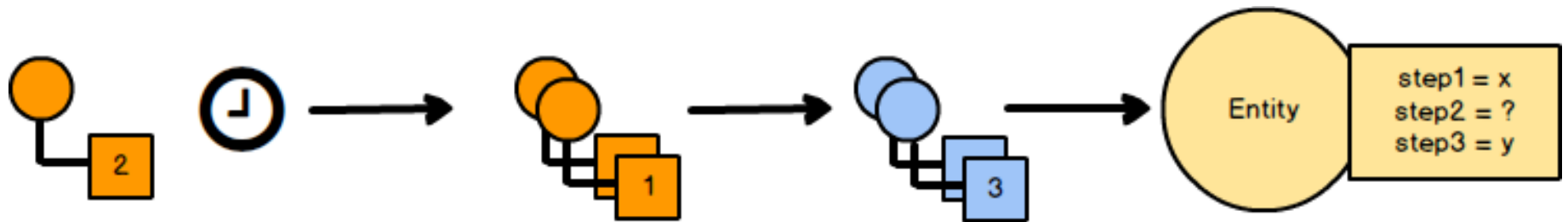
# Duplicate Commutative



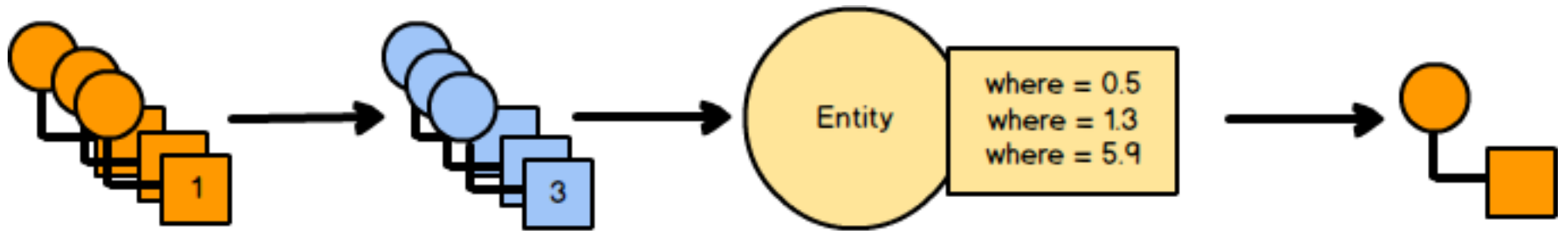
# Duplicate Non-commutative



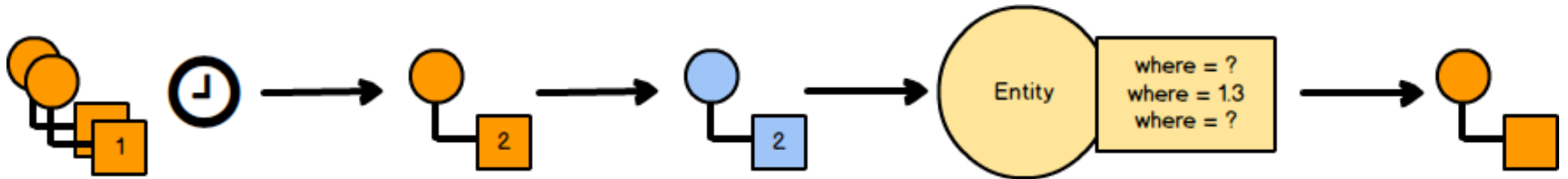
# Ordered Sequence



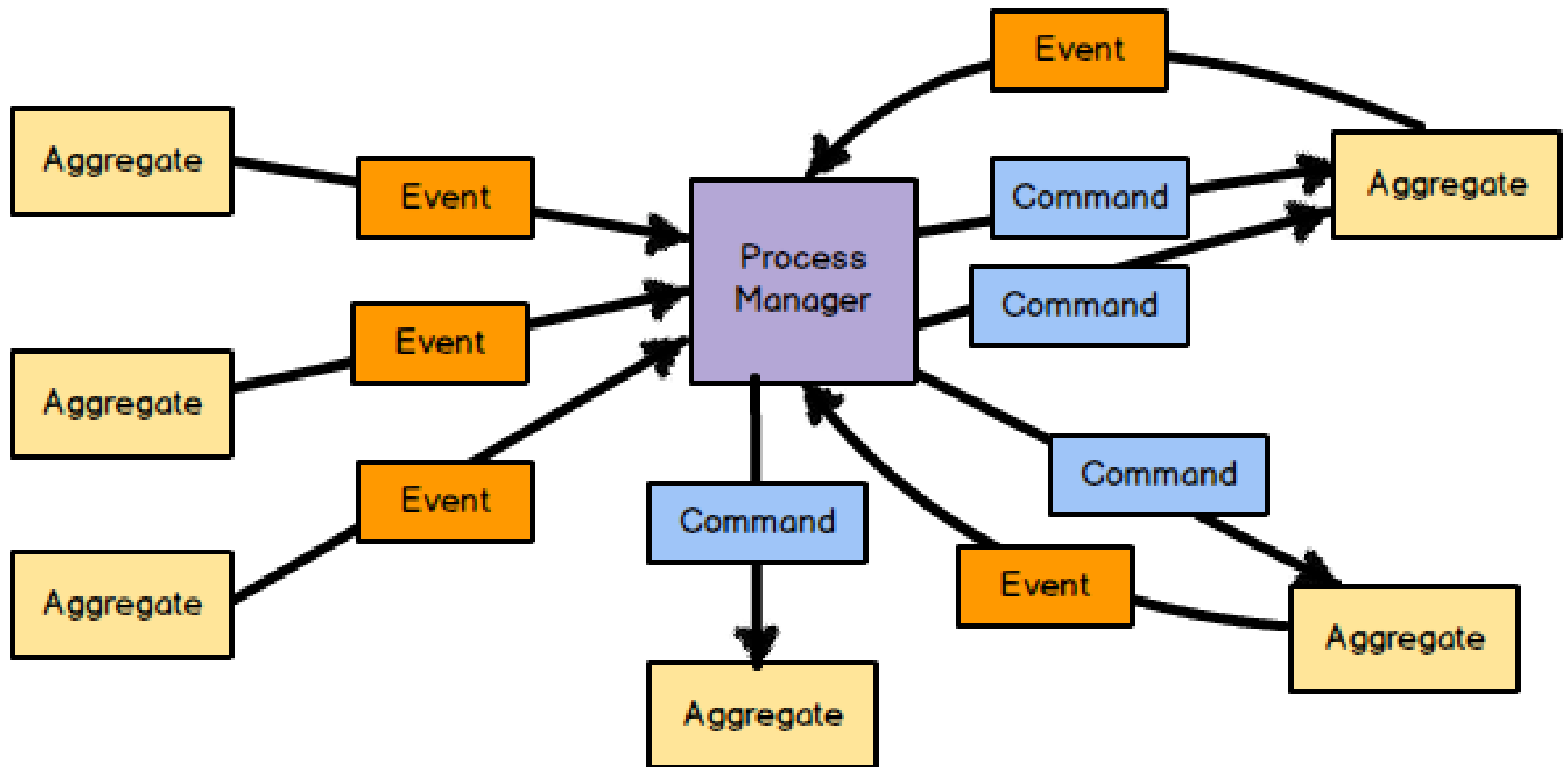
# Closest

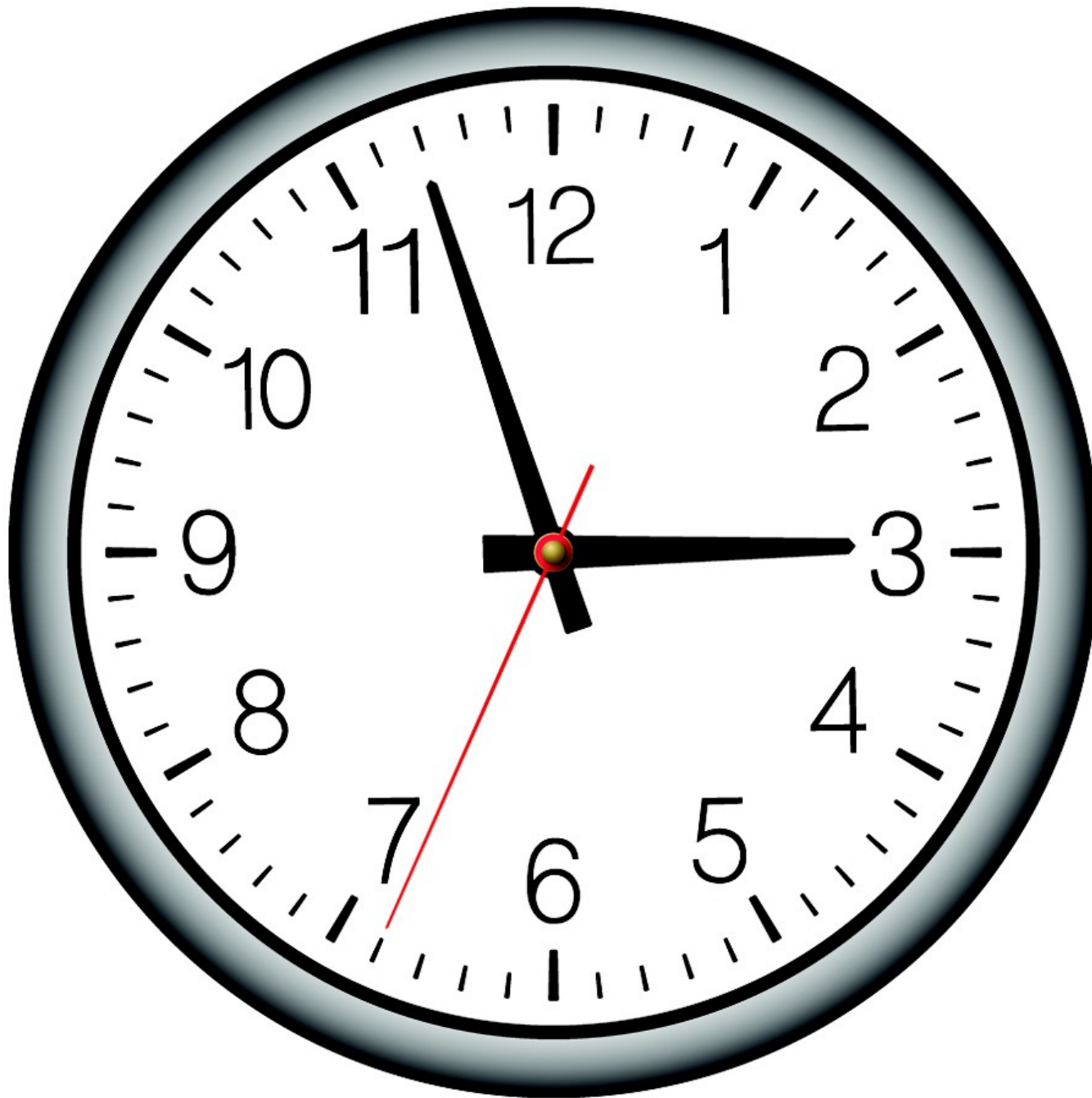


# Multiple Choice First/Fastest



# Process





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# Modeling Heuristics

- You don't own the time frame.
- Be uncomfortable, but make decisions.
- Start with what you know.

**for** { *comprehension* }

Watch this space: **vlingo/**\*



vaughn@forcomprehension.com



@VaughnVernon