



Getting started with event-driven architecture

@marcoemrich

Nuremberg





OPEN WEB LEARNING



Softwerkskammer.org





Developer?

Architect?

Scrum Master?

PO?

*Project
Manager?*

*Something
Else?*

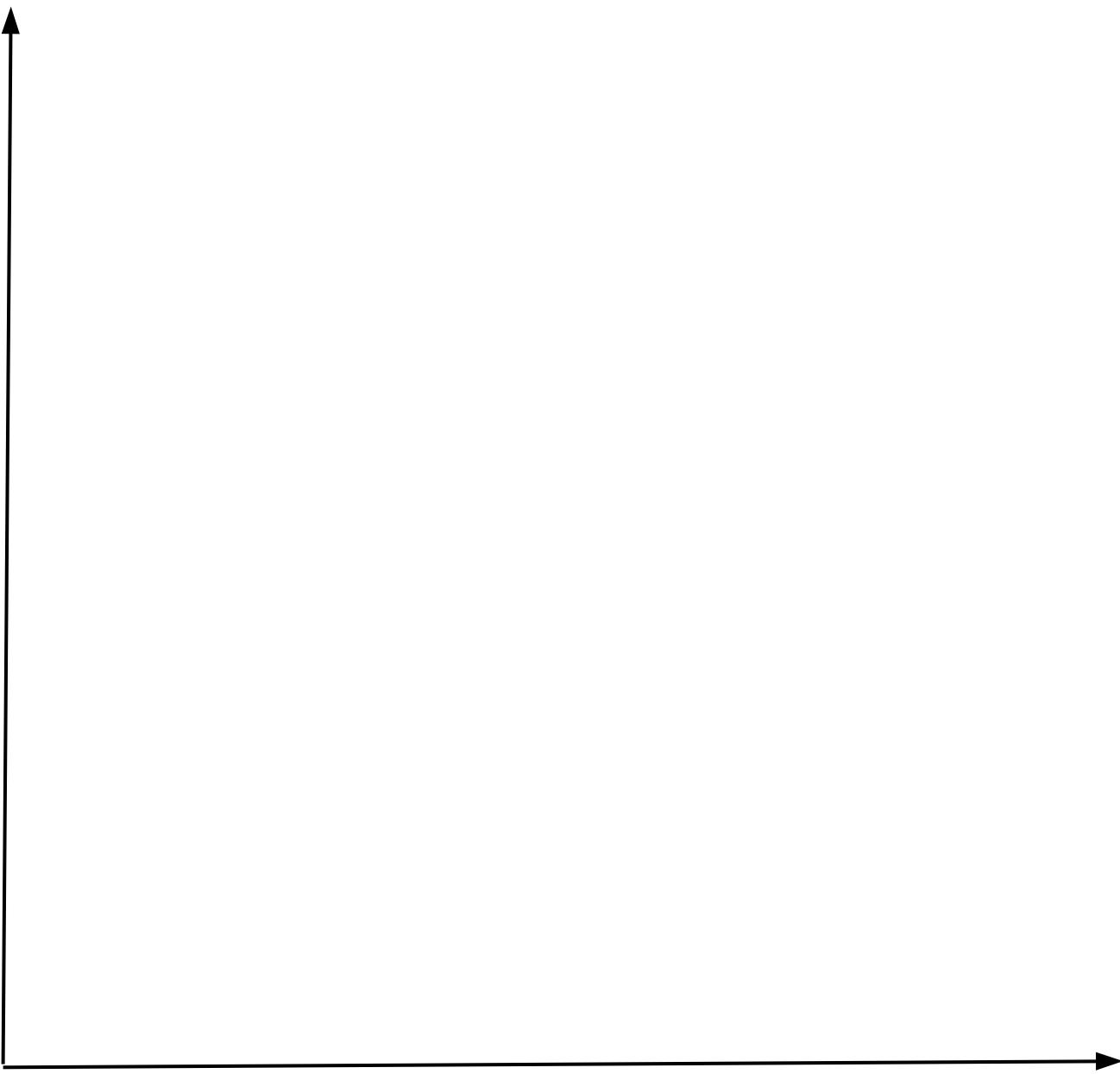
Programming Languages?

*Test Driven
Development?*

Experience

One Rule

TDD Skill



Event Knowledge

*What is an
Event?*

*“a social
occasion or
activity”*

- Merriam Webster's

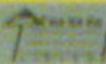
“the fundamental entity of observed physical reality represented by a point designated by three coordinates of place and one of time in the space-time continuum postulated by the theory of relativity”

- Merriam Webster's

*“a noteworthy
happening”*

- Merriam Webster's

Where?



Knop ingedrukt houden

BEDIENINGSKNOP

-1 BG +1

ALARM
10 sec. indrukken



NOODSTOP



Draaien om
te ontgrendelen

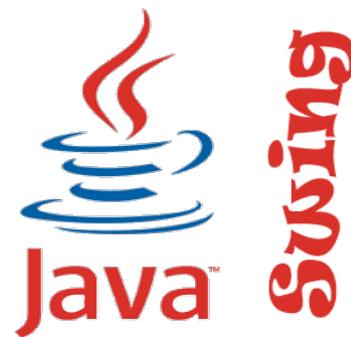
KNOP INGEDRUKT HOUDEN



OVERBELASTING



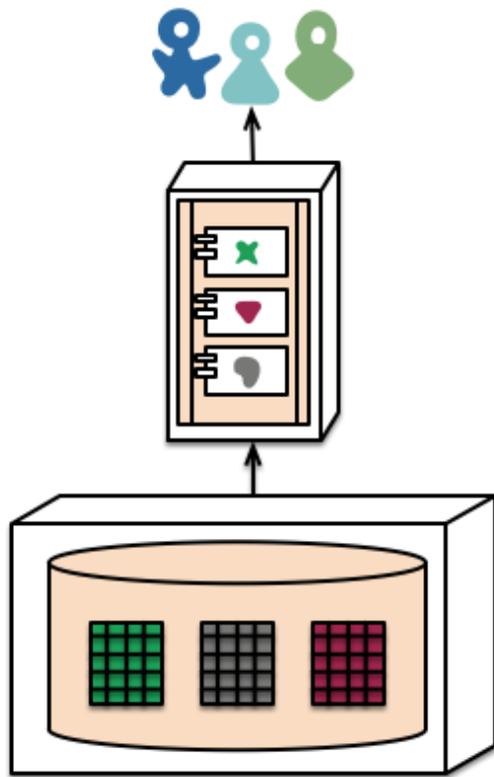
GUIs



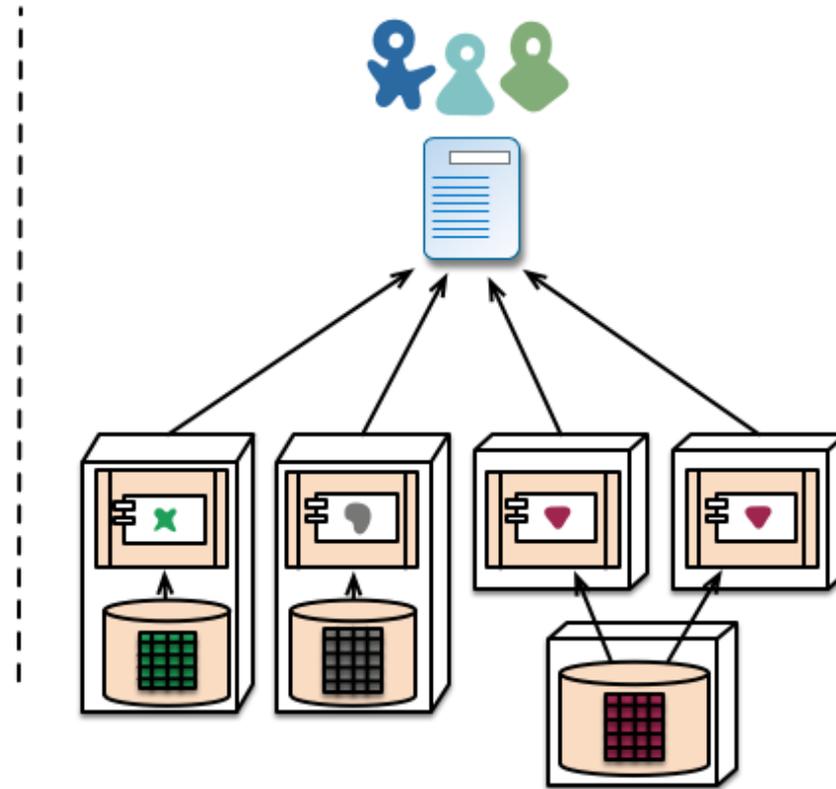
Architecture



Microservices

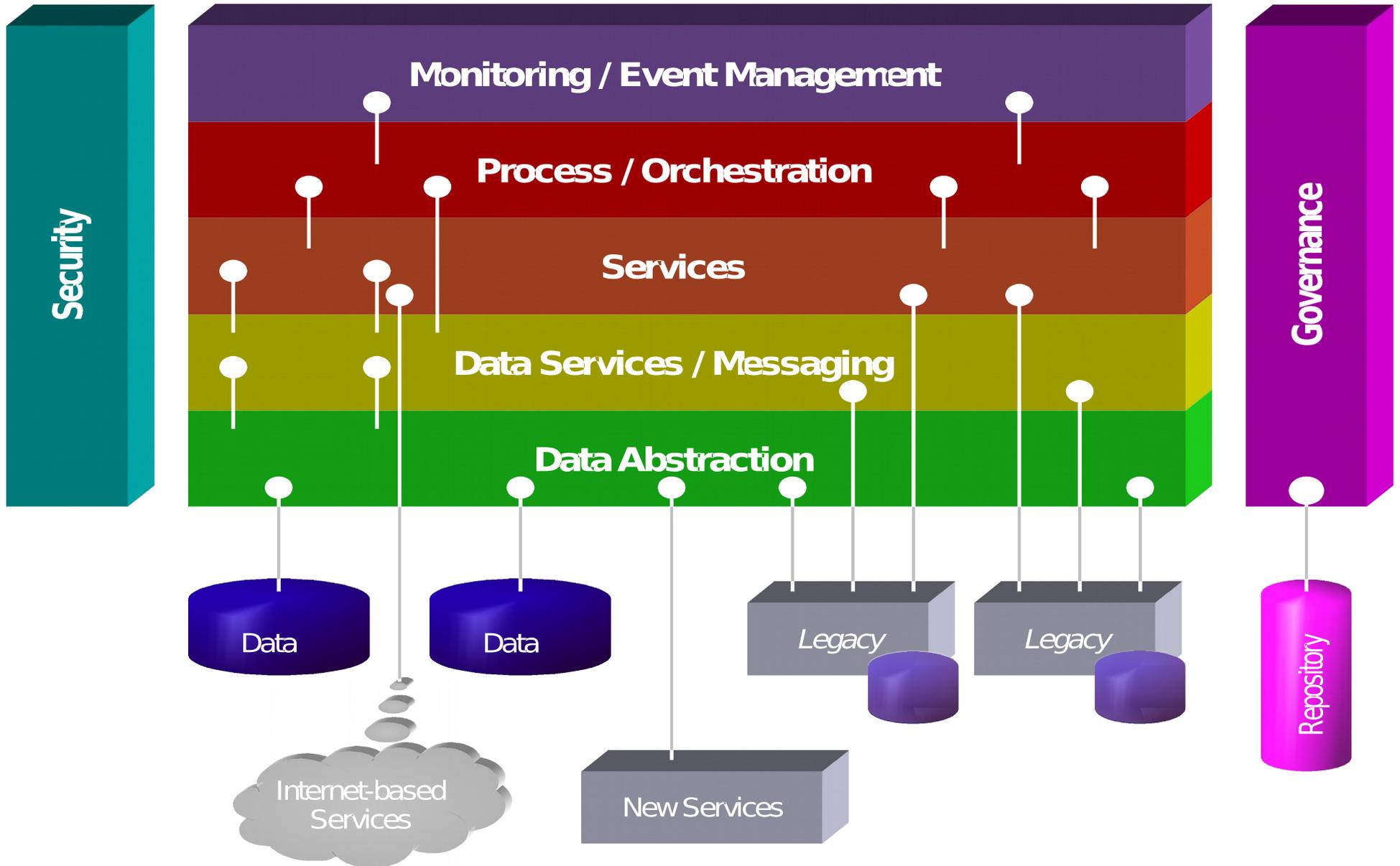


monolith - single database

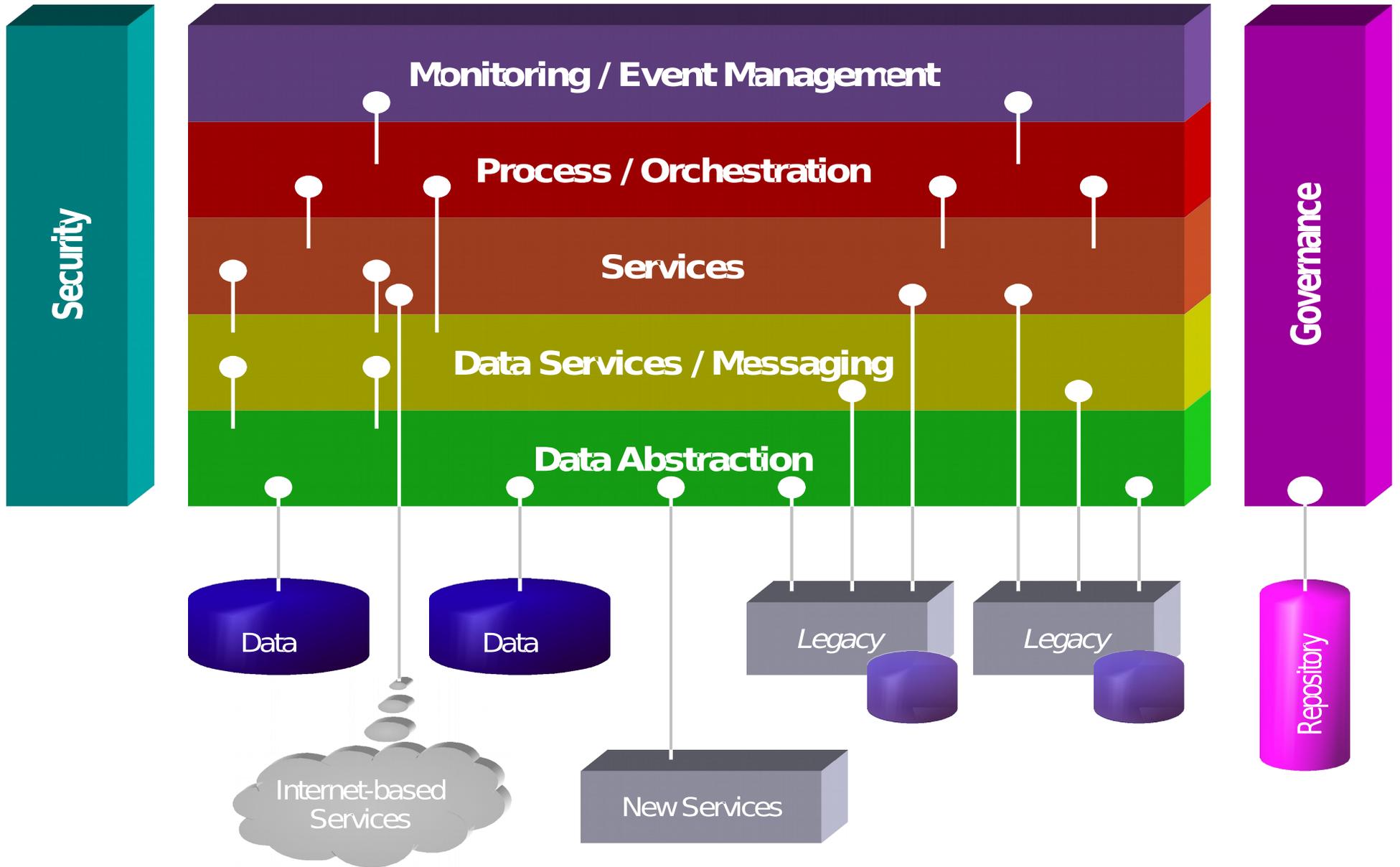


microservices - application databases

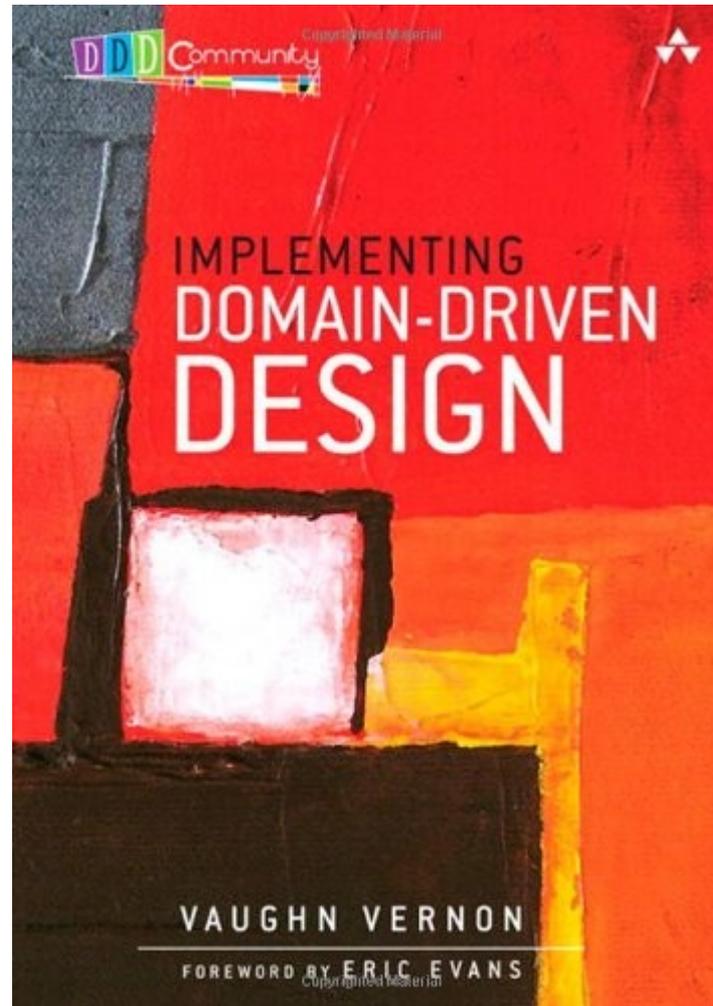
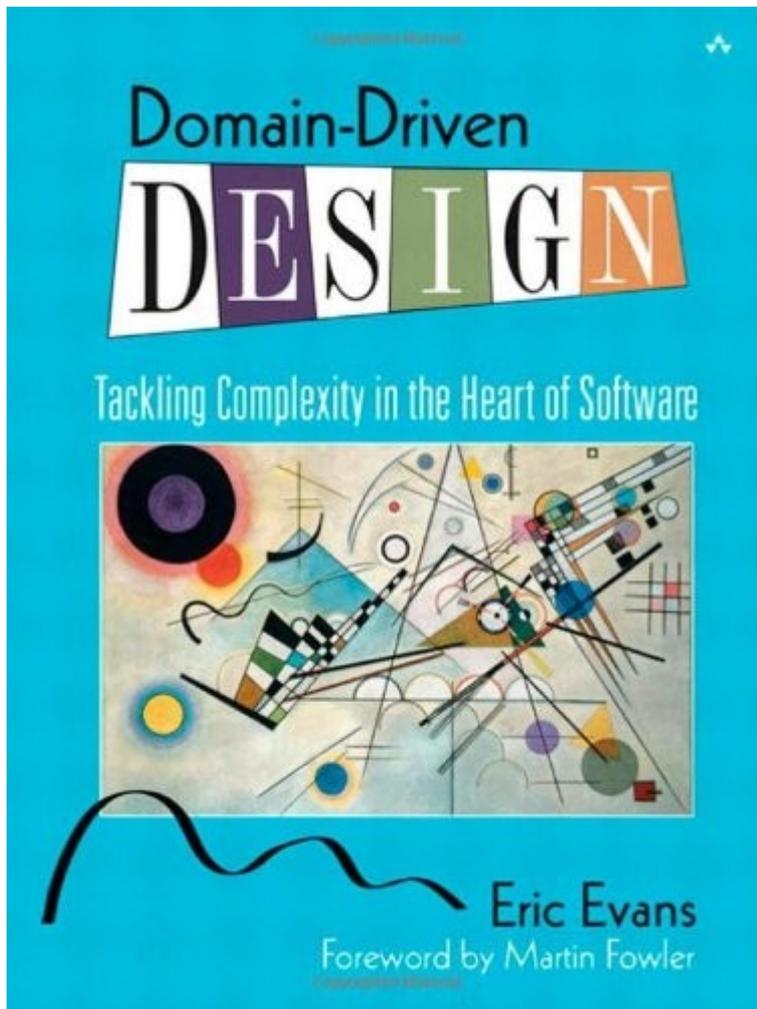
SOA



Evented-SOA



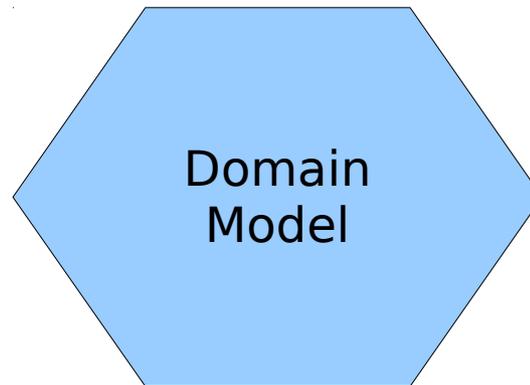
Domain Driven Design



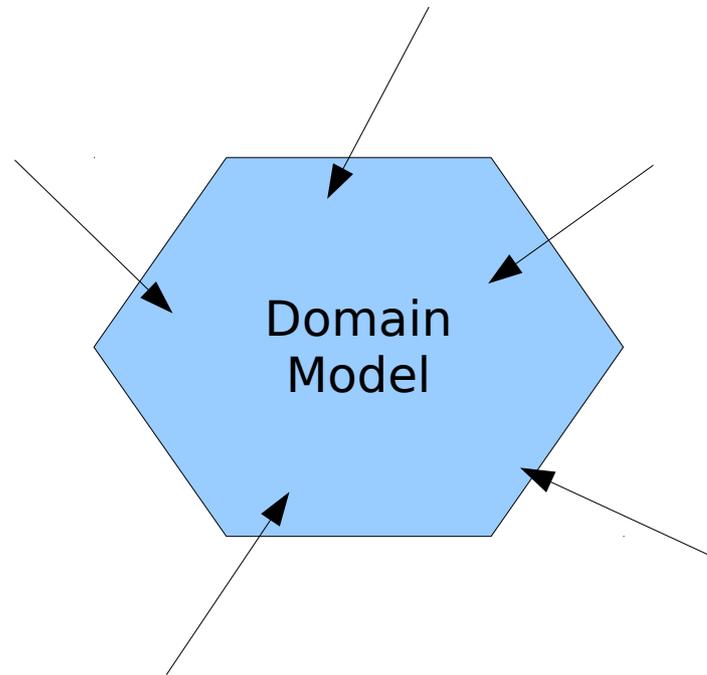
Hexagonal Architecture



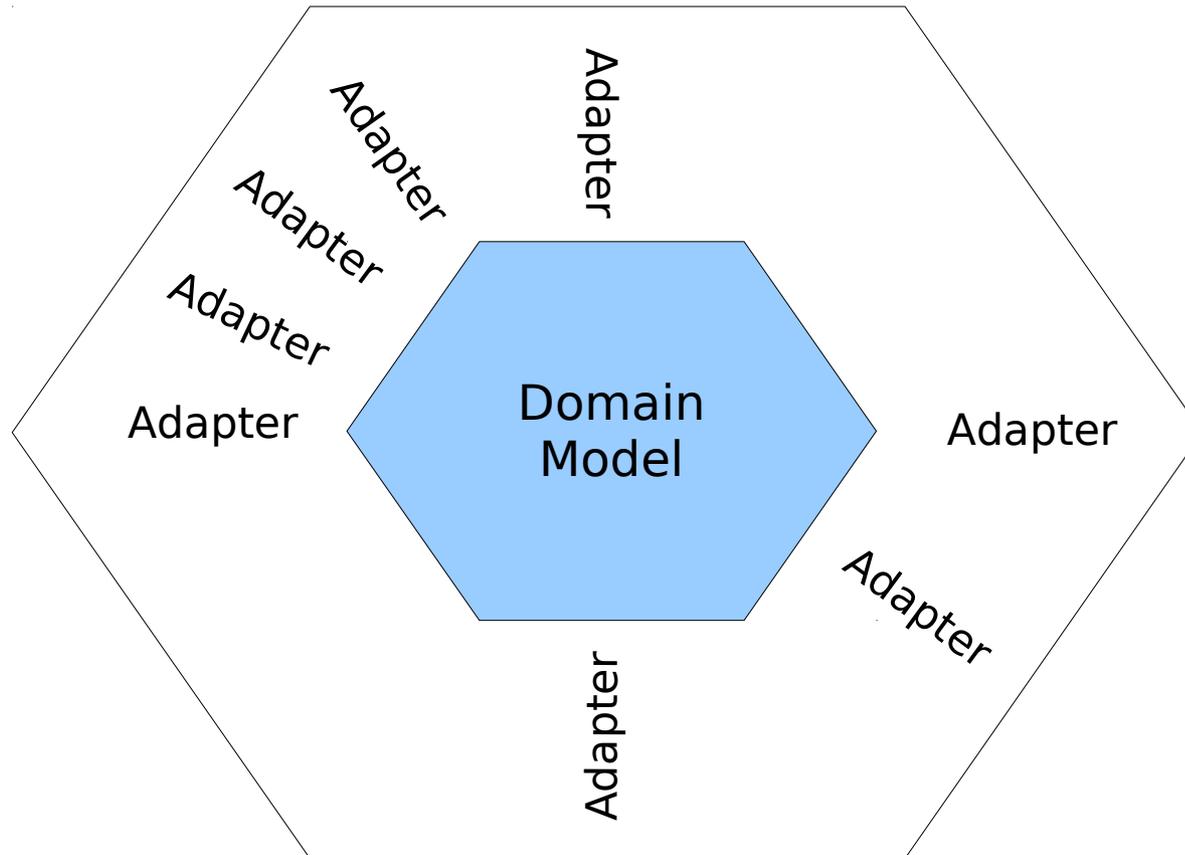
Hexagonal Architecture



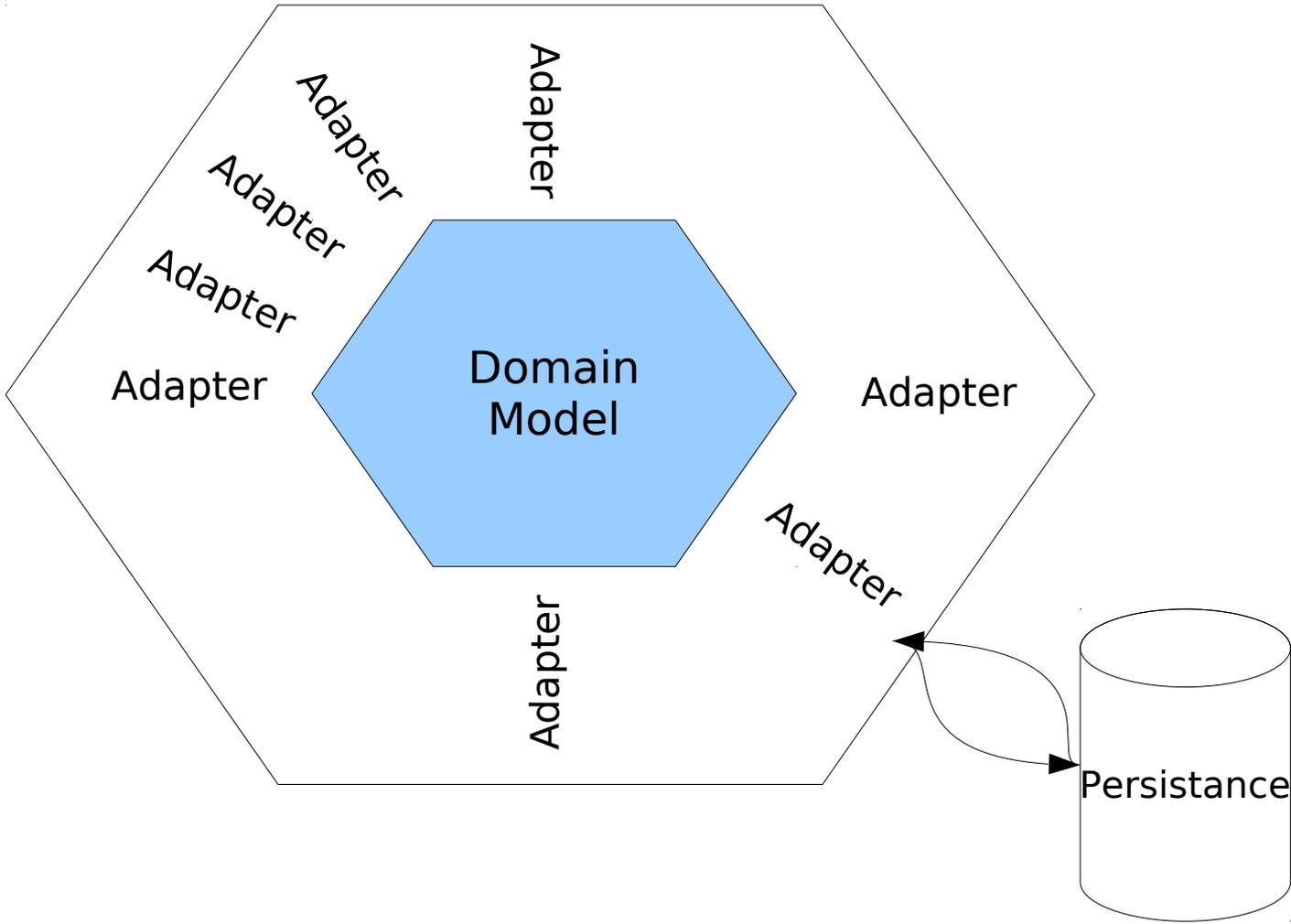
Hexagonal Architecture



Hexagonal Architecture



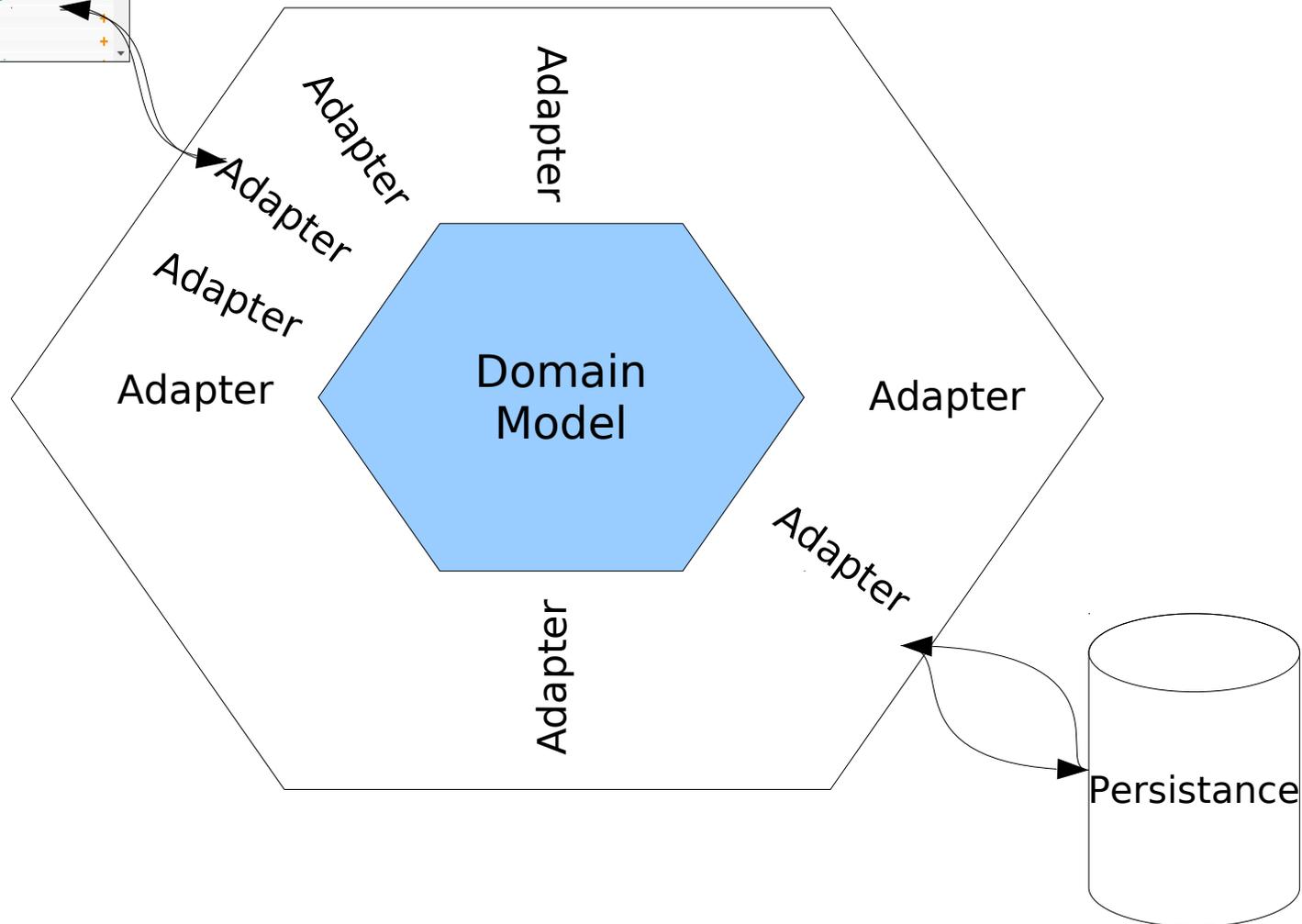
Hexagonal Architecture



Hexagonal Architecture

2 items selected	Remove all	Add all
Germany	-	Estonia +
Finland	-	France +
		Georgia +
		Greece +
		Hong Kong +
		Hungary +
		Iceland +
		India +

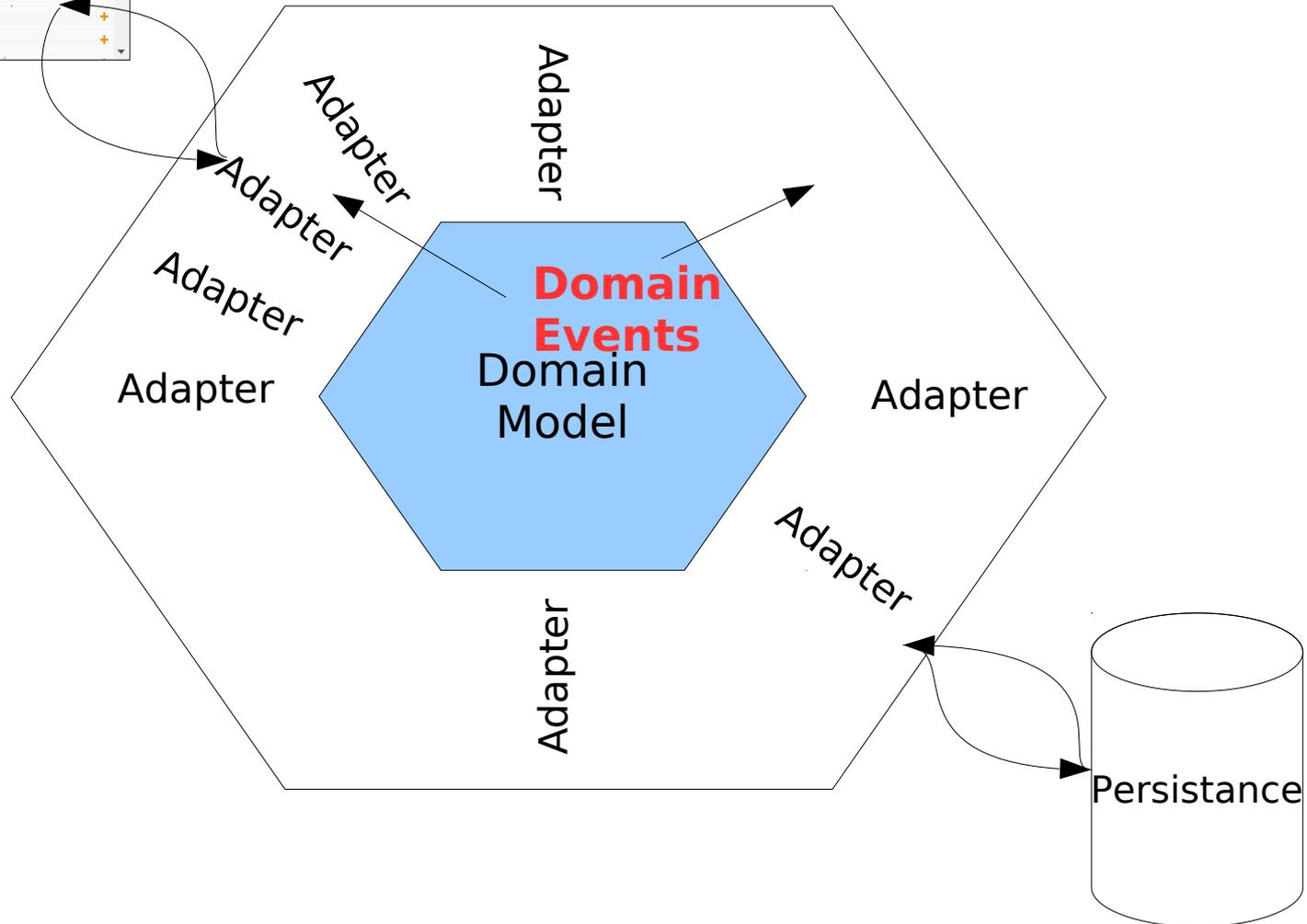
GUI



Hexagonal Architecture

2 items selected		Remove all	Add all
Germany	-	Estonia	+
Finland	-	France	+
		Georgia	+
		Greece	+
		Hong Kong	+
		Hungary	+
		Iceland	+
		India	+

GUI



Event Storming



What do you mean by “Event-Driven”?

- Event Notification
- Event-Carried State Transfer
- Event Sourcing
- CQRS



Martin Fowler

Buzzword Free Workshop

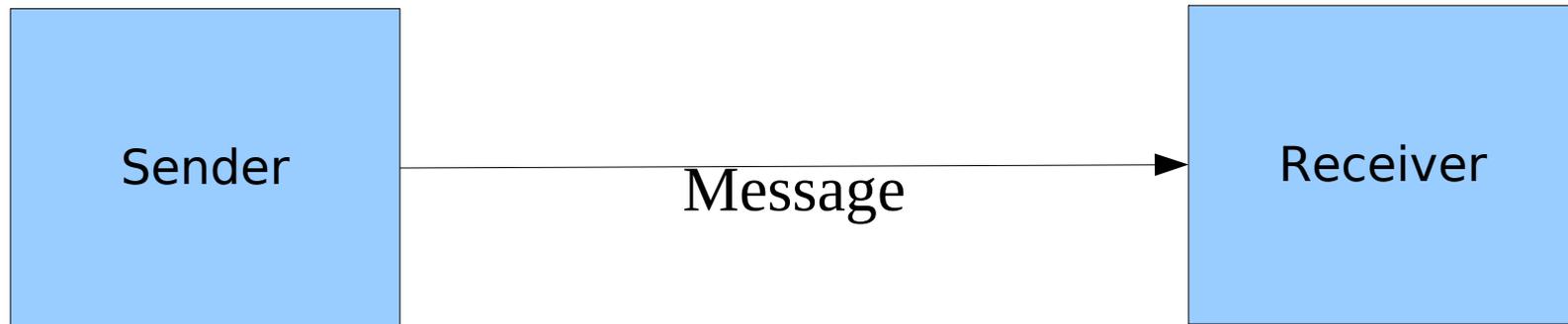
General Programming-Model

Method vs. Event



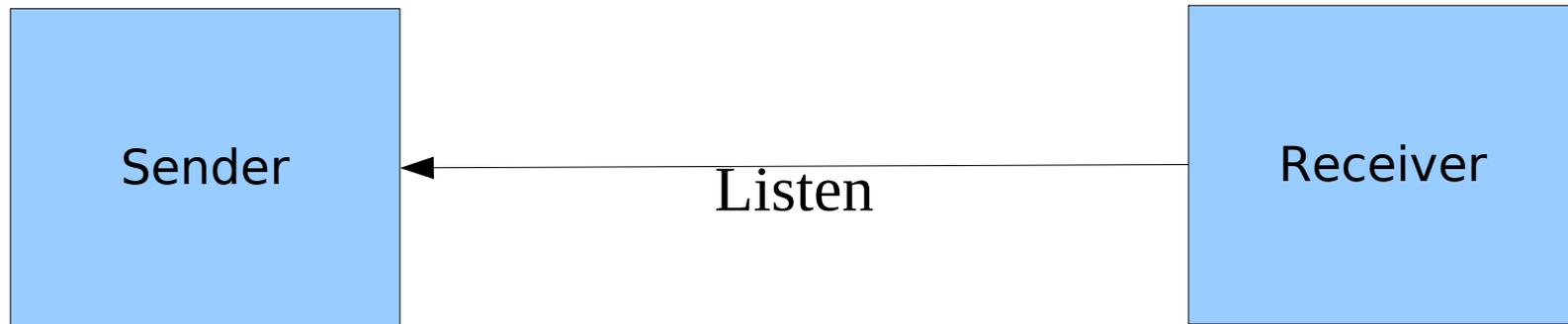
<https://www.flickr.com/photos/gen/325927418>

Method Call



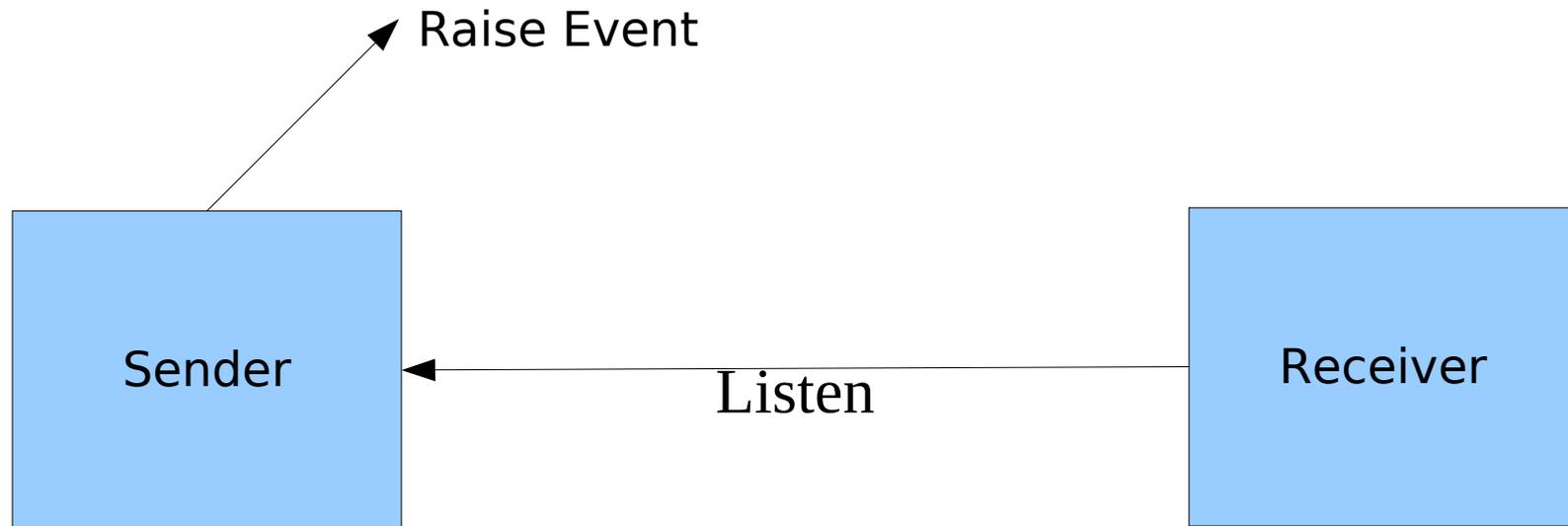
```
class A {  
    ...  
    b.someMethod();  
    ...  
}
```

Event



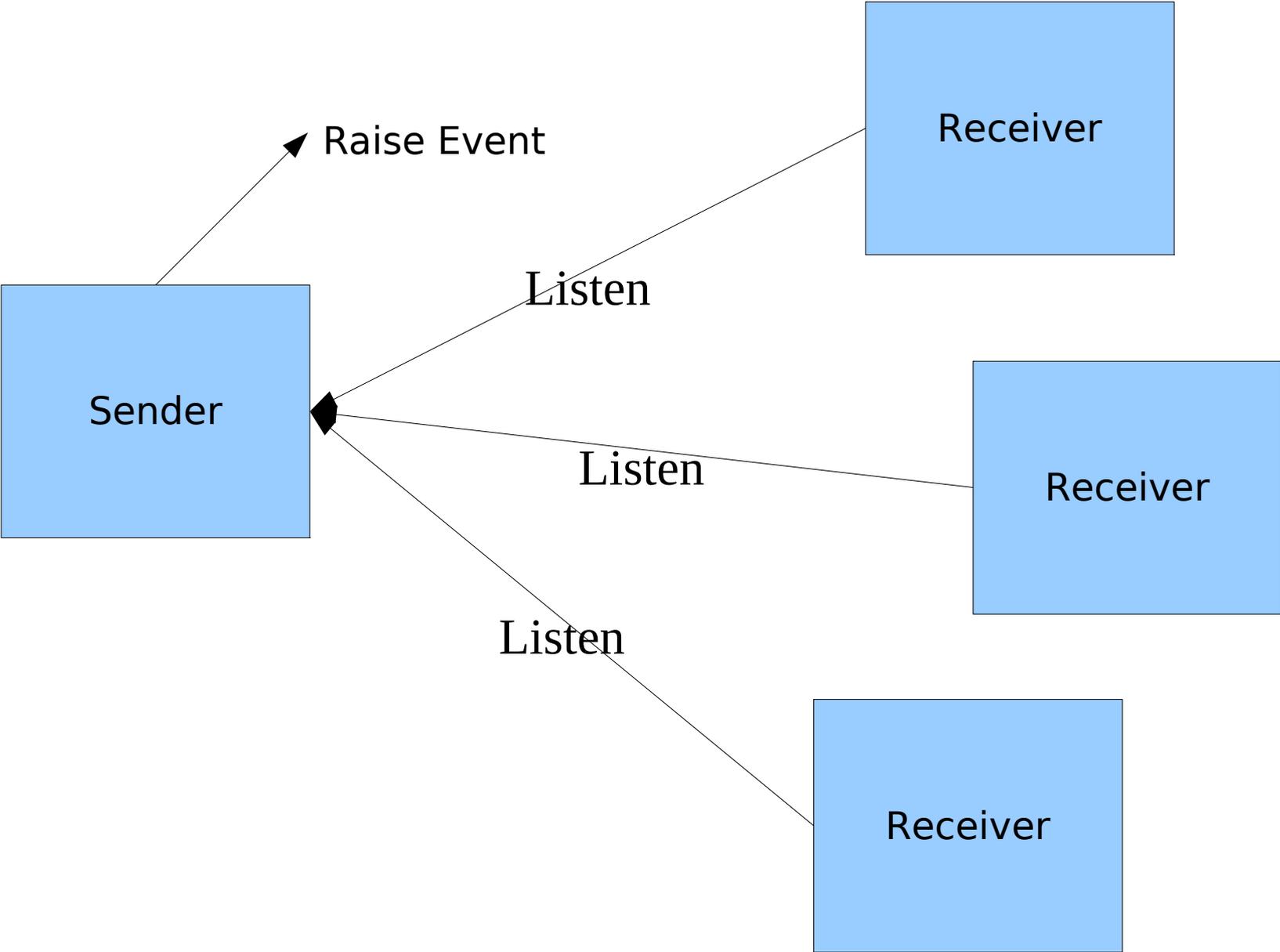
```
a.on('someEvent', b.someMethod);
```

Event



```
a.on('someEvent', b.someMethod);  
a.emit('someEvent');
```

Event





VS.

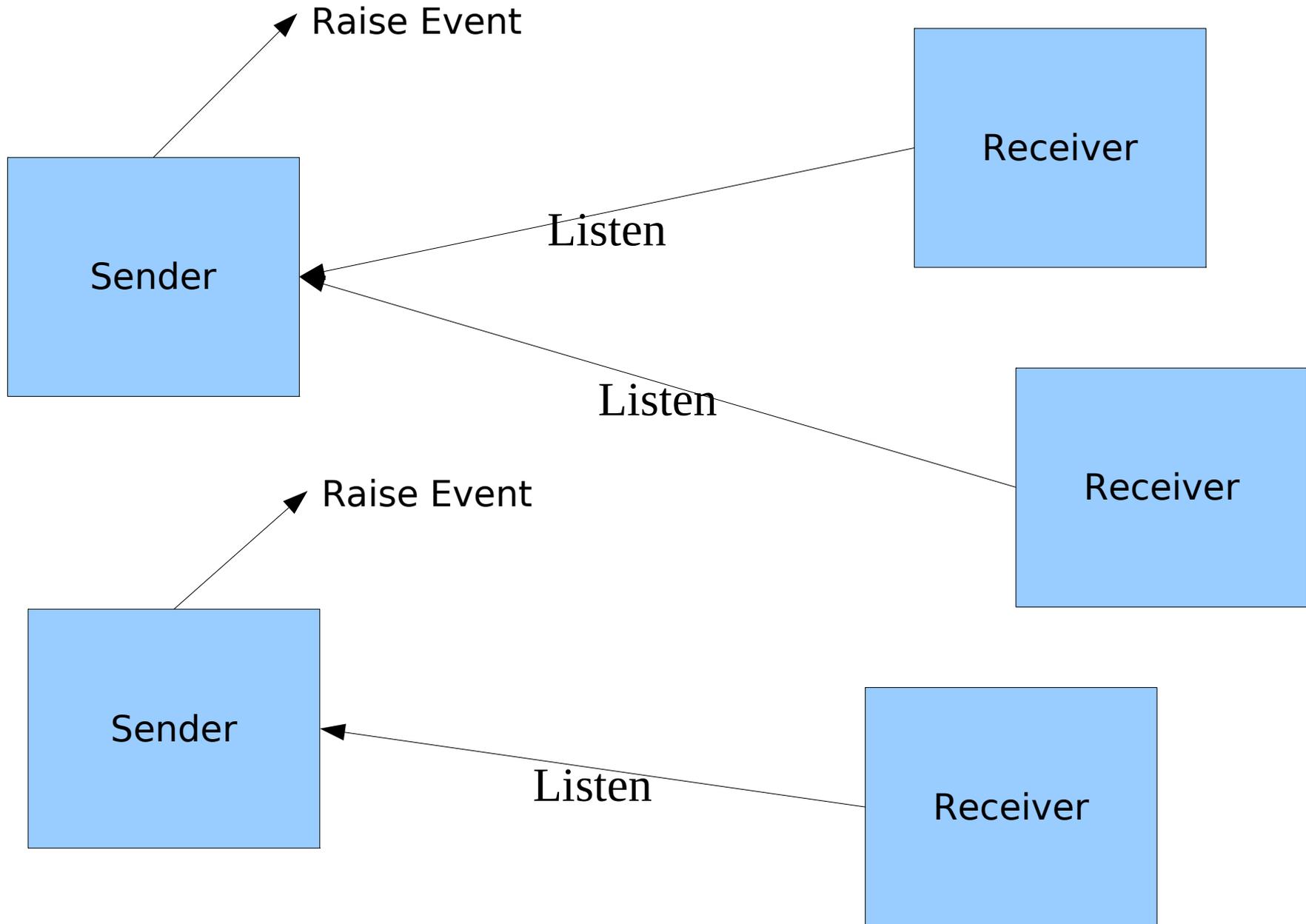


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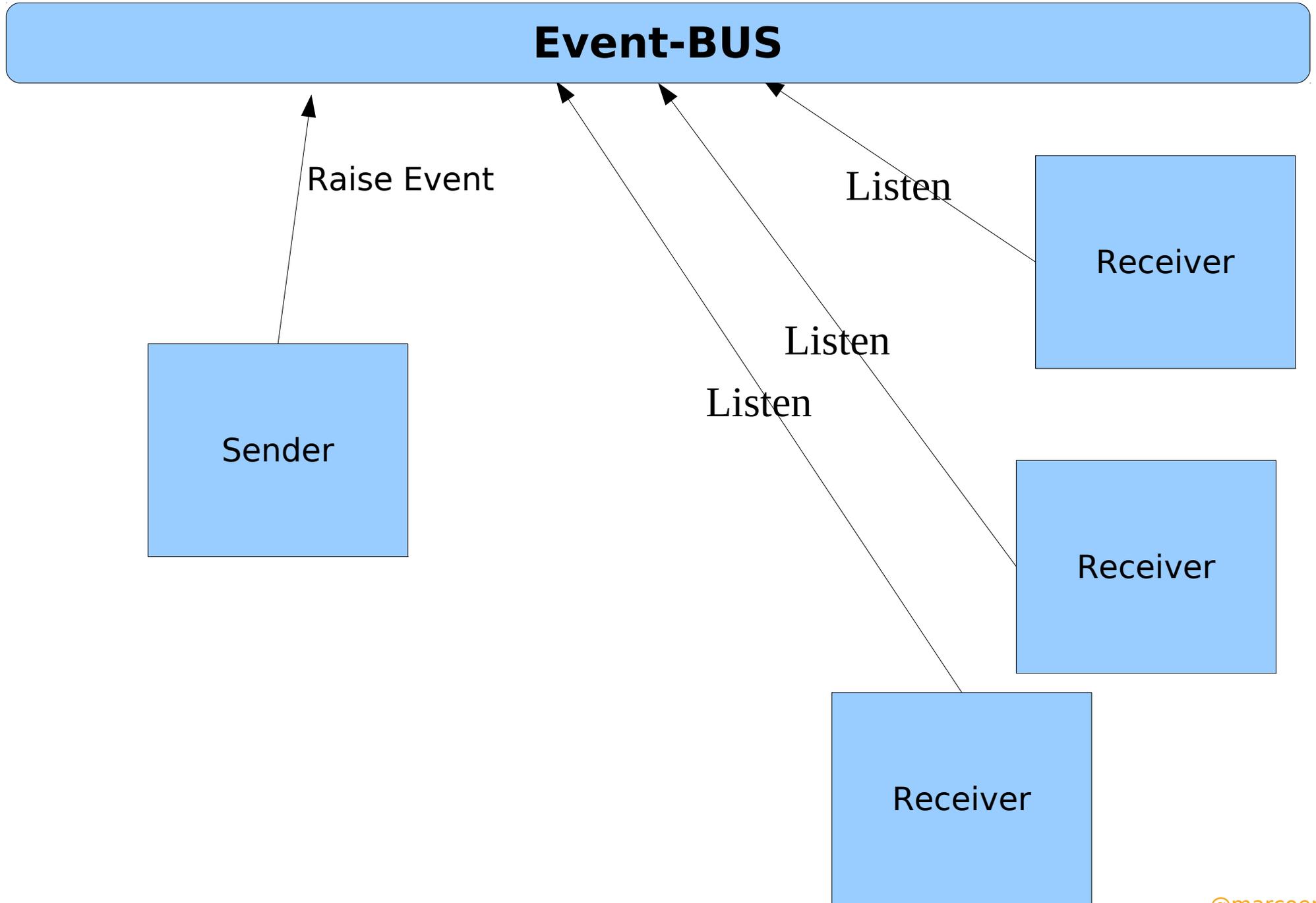
Wiring



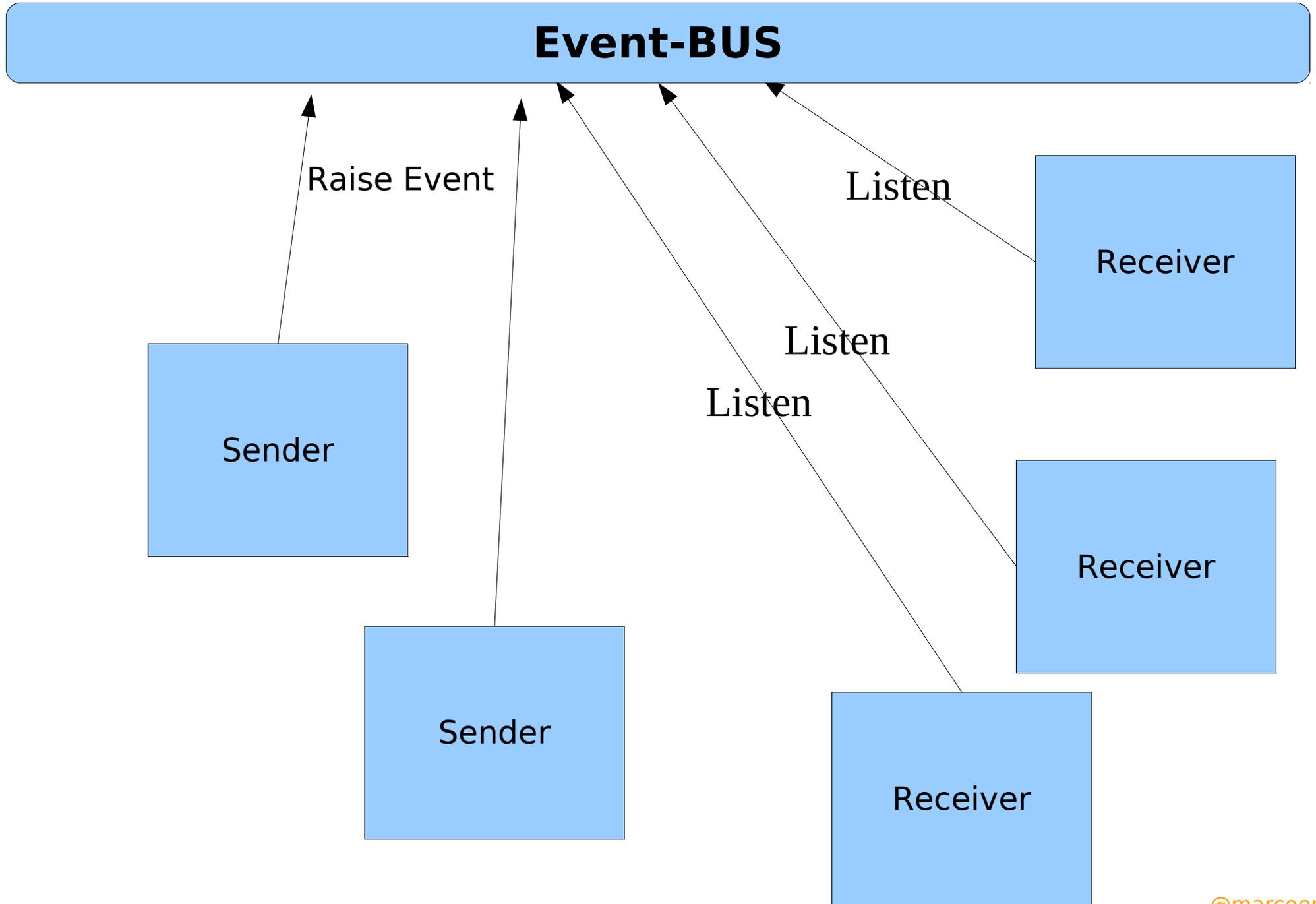
Observer



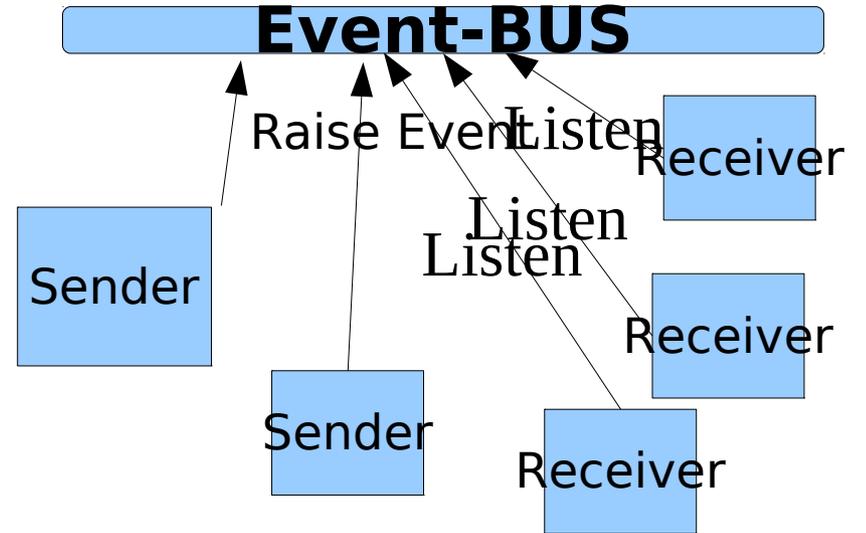
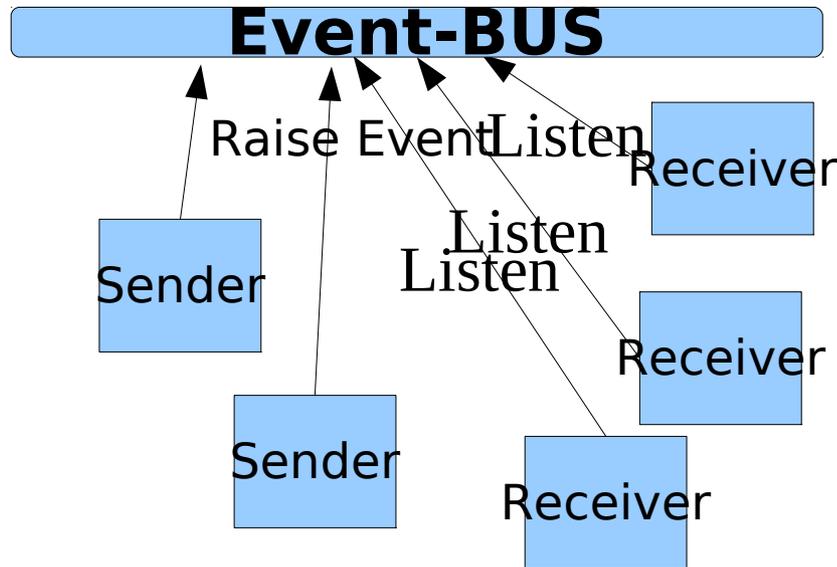
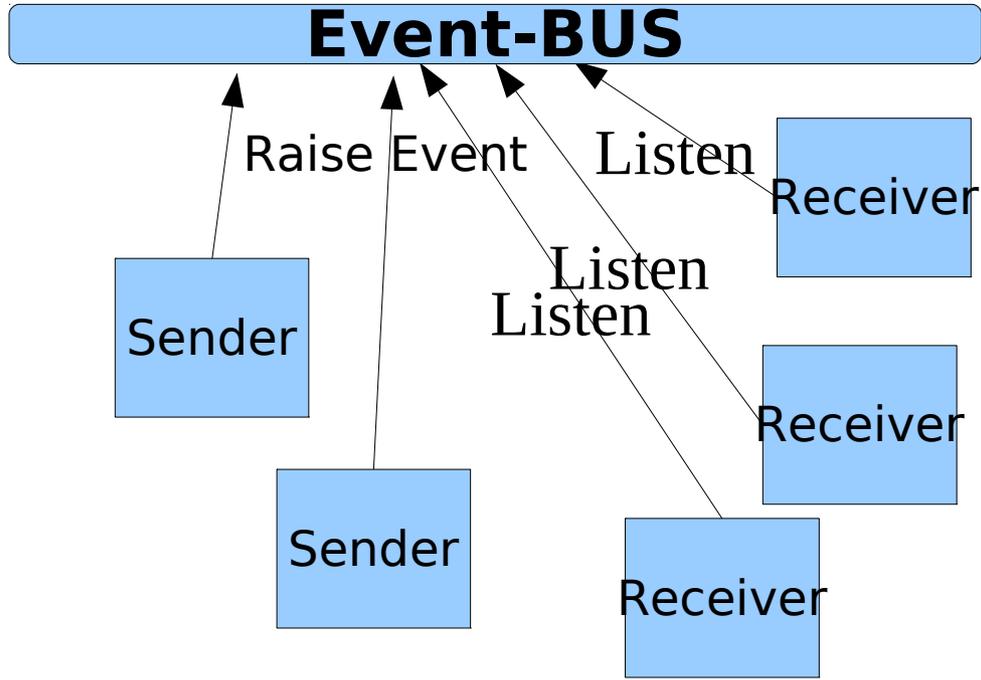
Pub/Sub

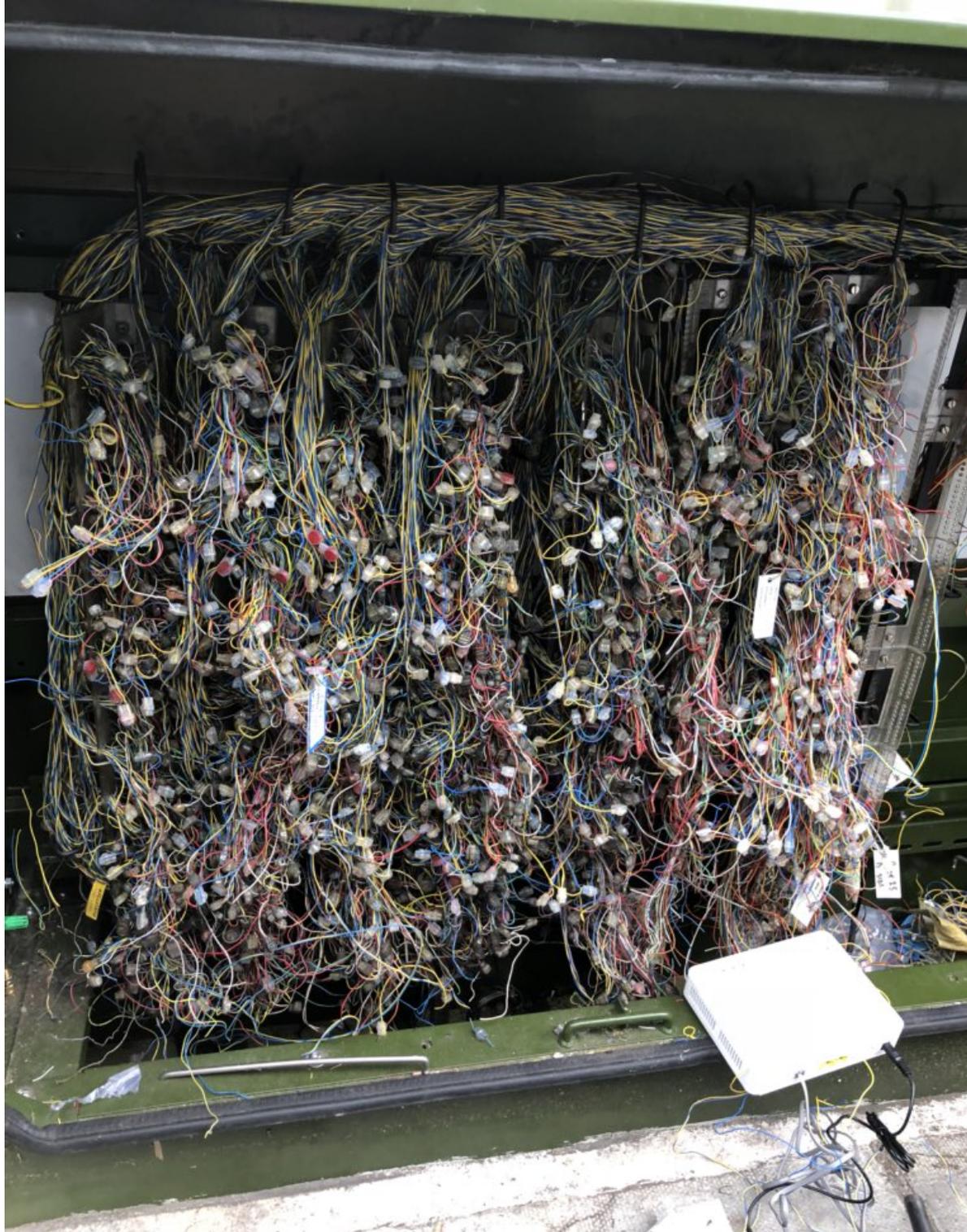


Pub/Sub



Pub/Sub





Found in a tweet by Kent Beck

Event vs. Method

Method

- Sender tells Receiver
- Usually Sync
- Fixed Coupling
- New Receiver: change to Sender

Event

- Receiver listens to Sender
- Usually Async
- Loose Coupling
- New Receiver: **no** change to Sender
- Sometimes: Hard to Debug



Testing?



Winner?



We want
you for
Kata



Kata

Call Center Kata



Phone Number / Caller ID



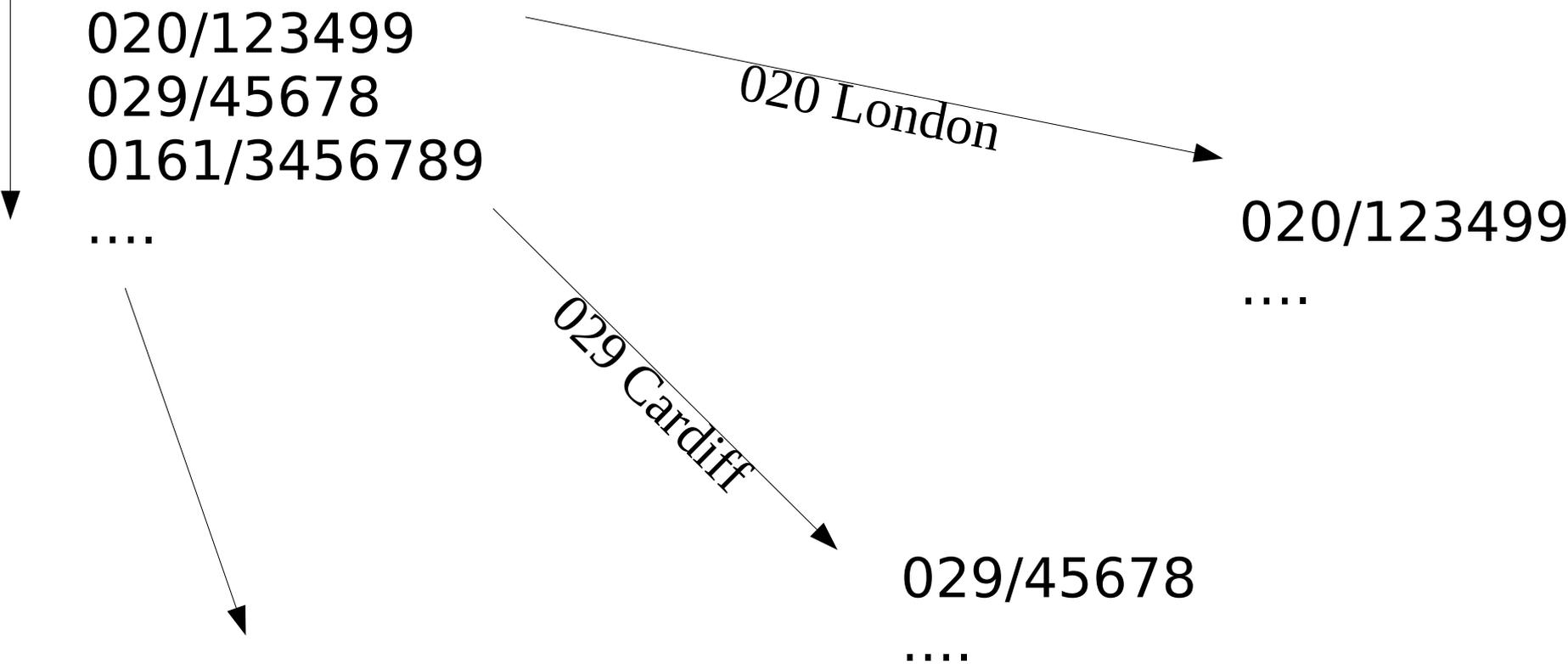
020/123499

029/45678

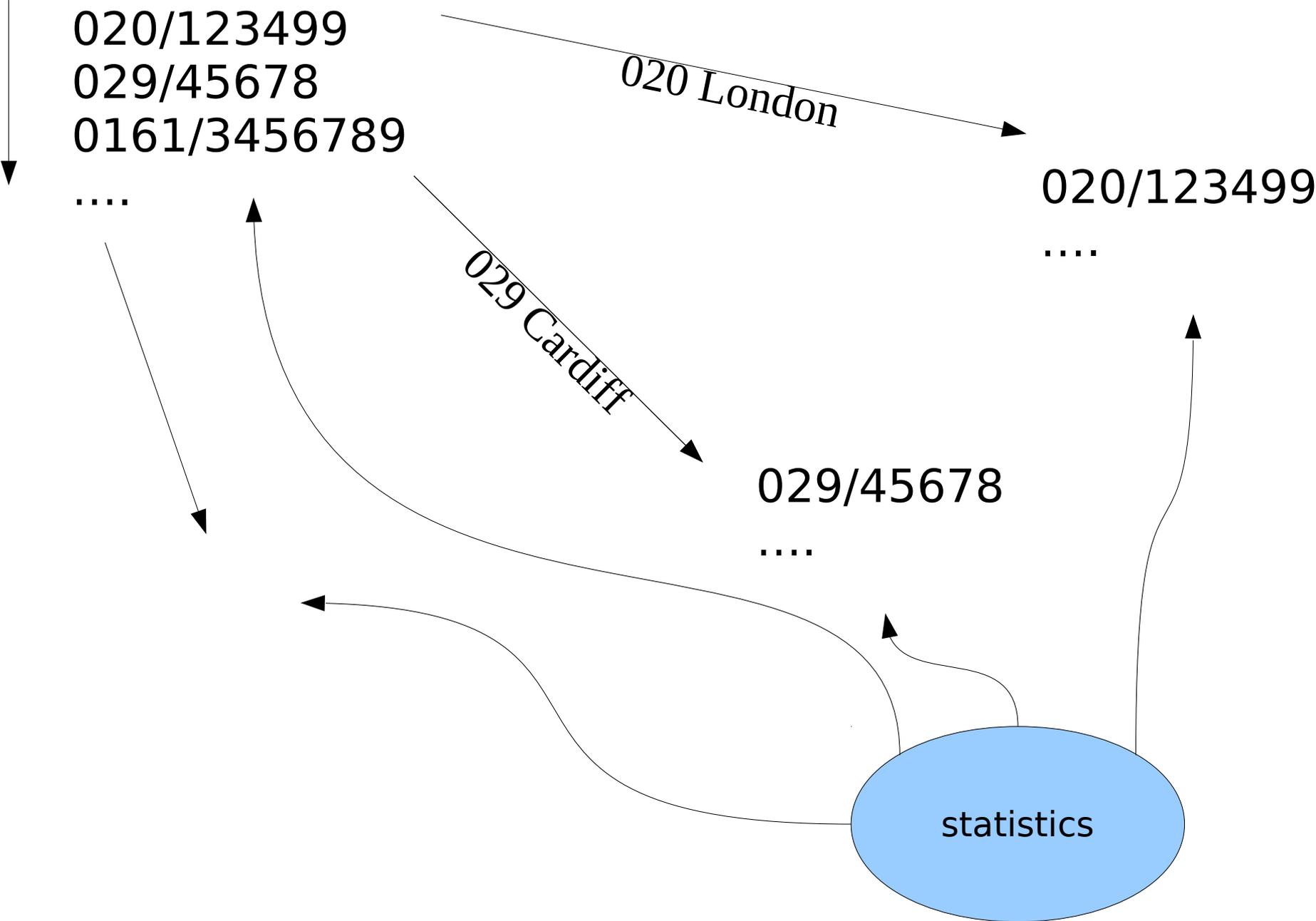
0161/3456789

....

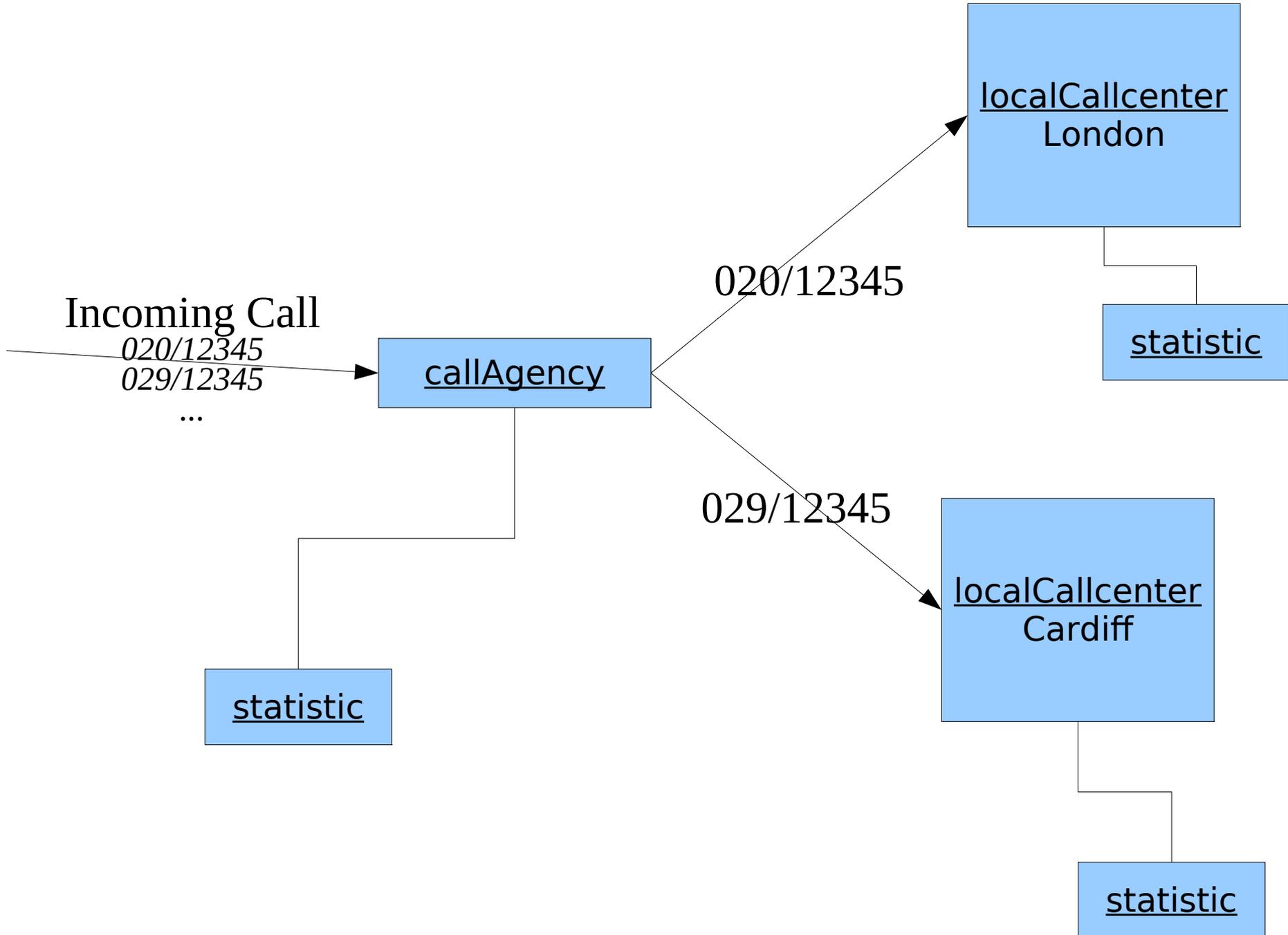
Phone Number / Caller ID



Phone Number / Caller ID



Pure OO

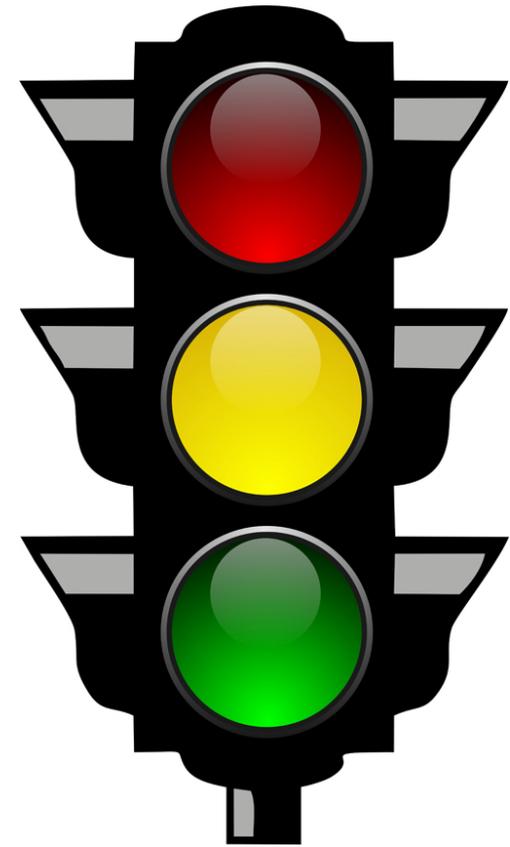
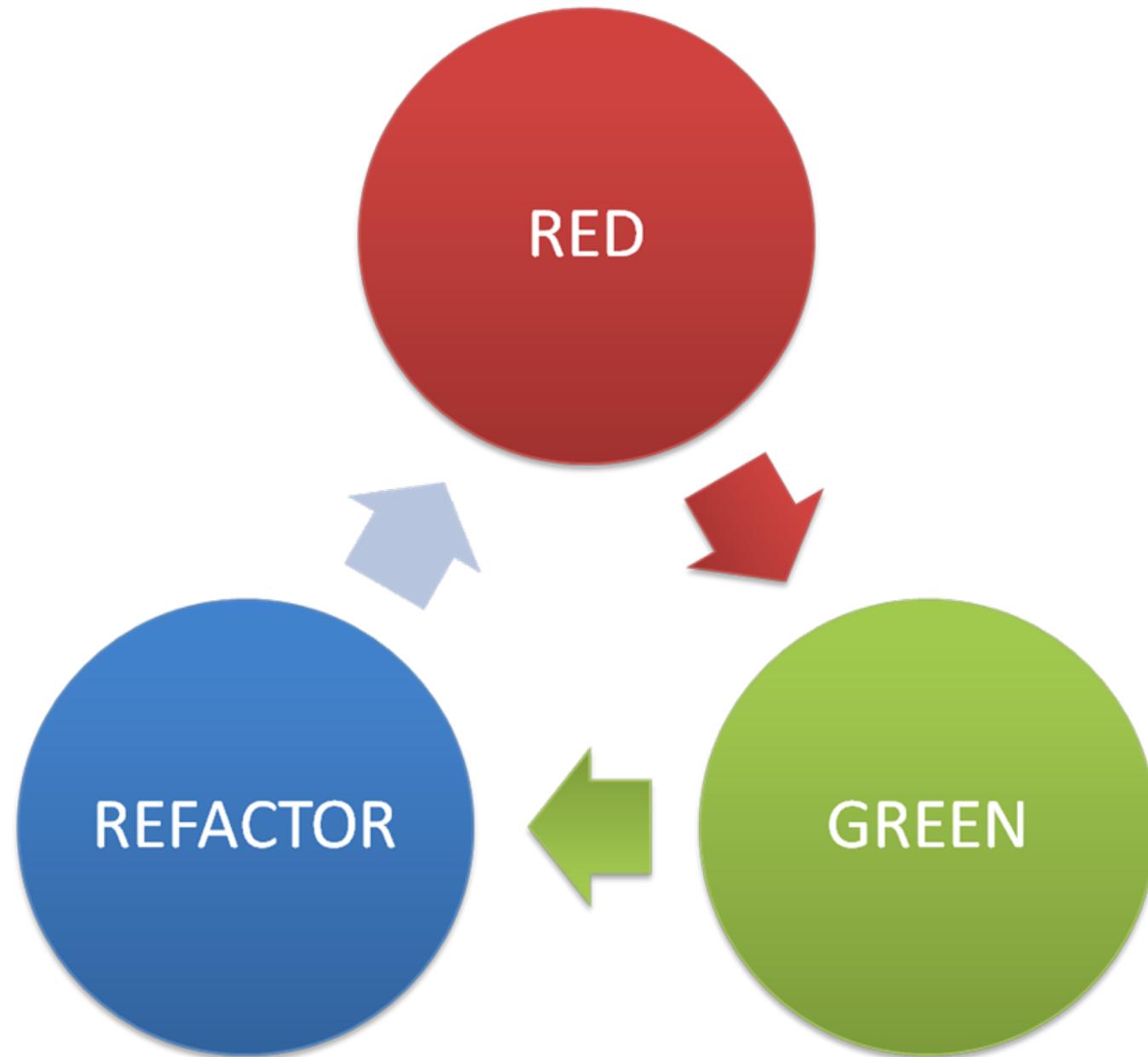


Try Extremes



Constraints

- Method-communication
no Events
- Small Classes (SRP)
max. 20-30 LOC
max. 5 Methods



TDD



<https://www.youtube.com/watch?v=8wUOUmeuINs> © 2012 Atlassian

Pair-Programming

Wizards
&
Bumblebees



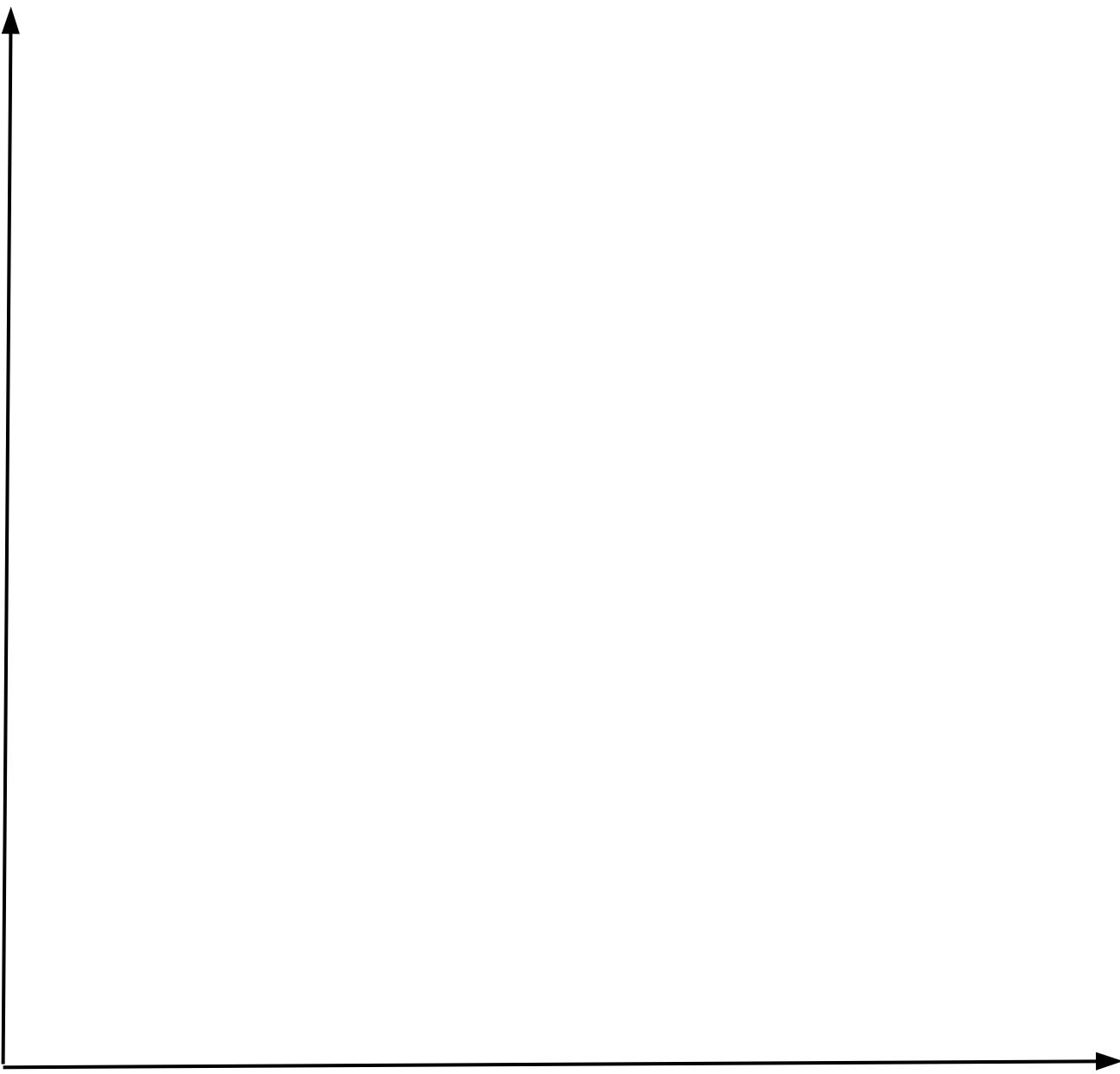
dore (old English) → male bee
Dumbledore → bumblebee





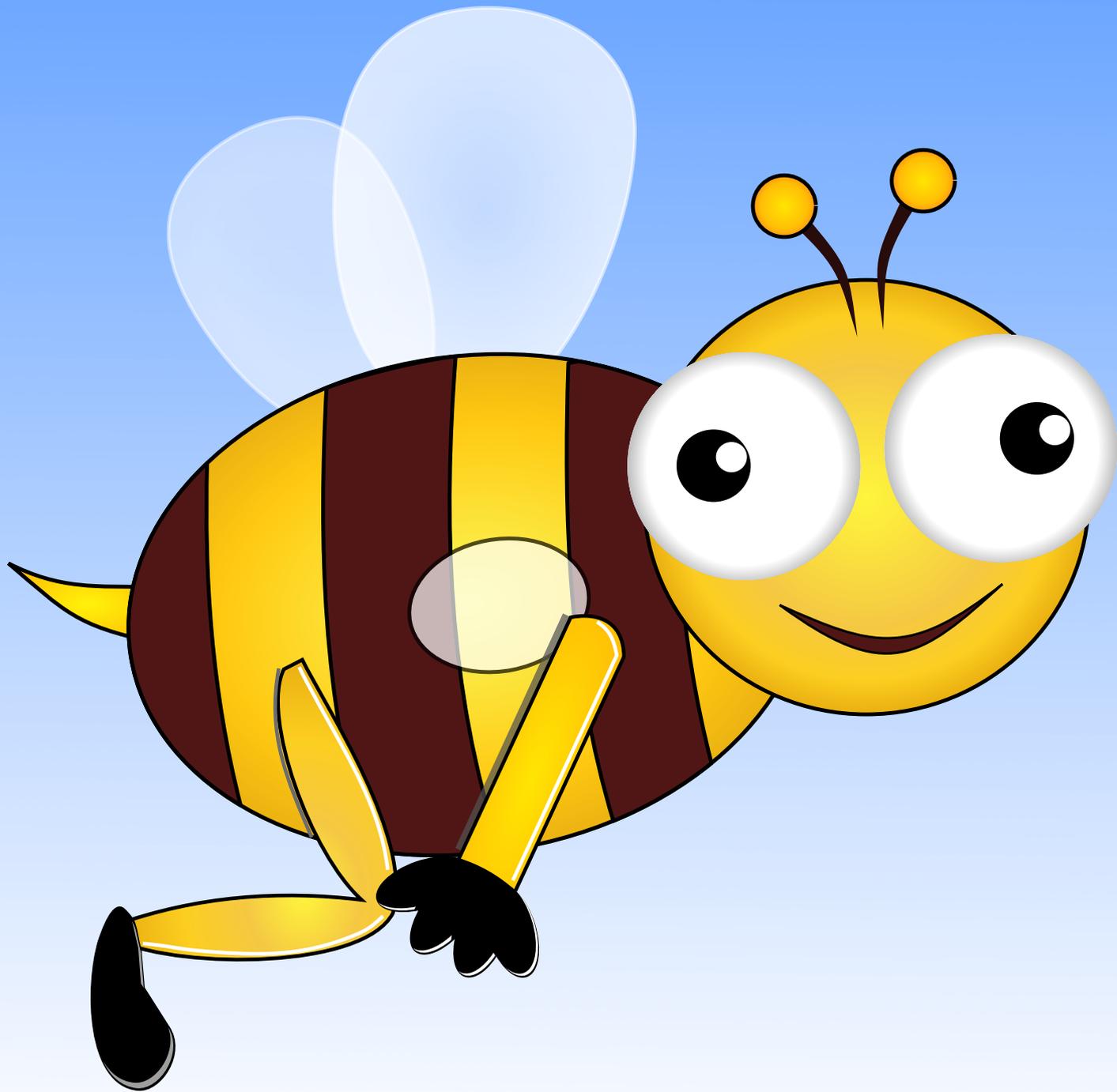


TDD Skill



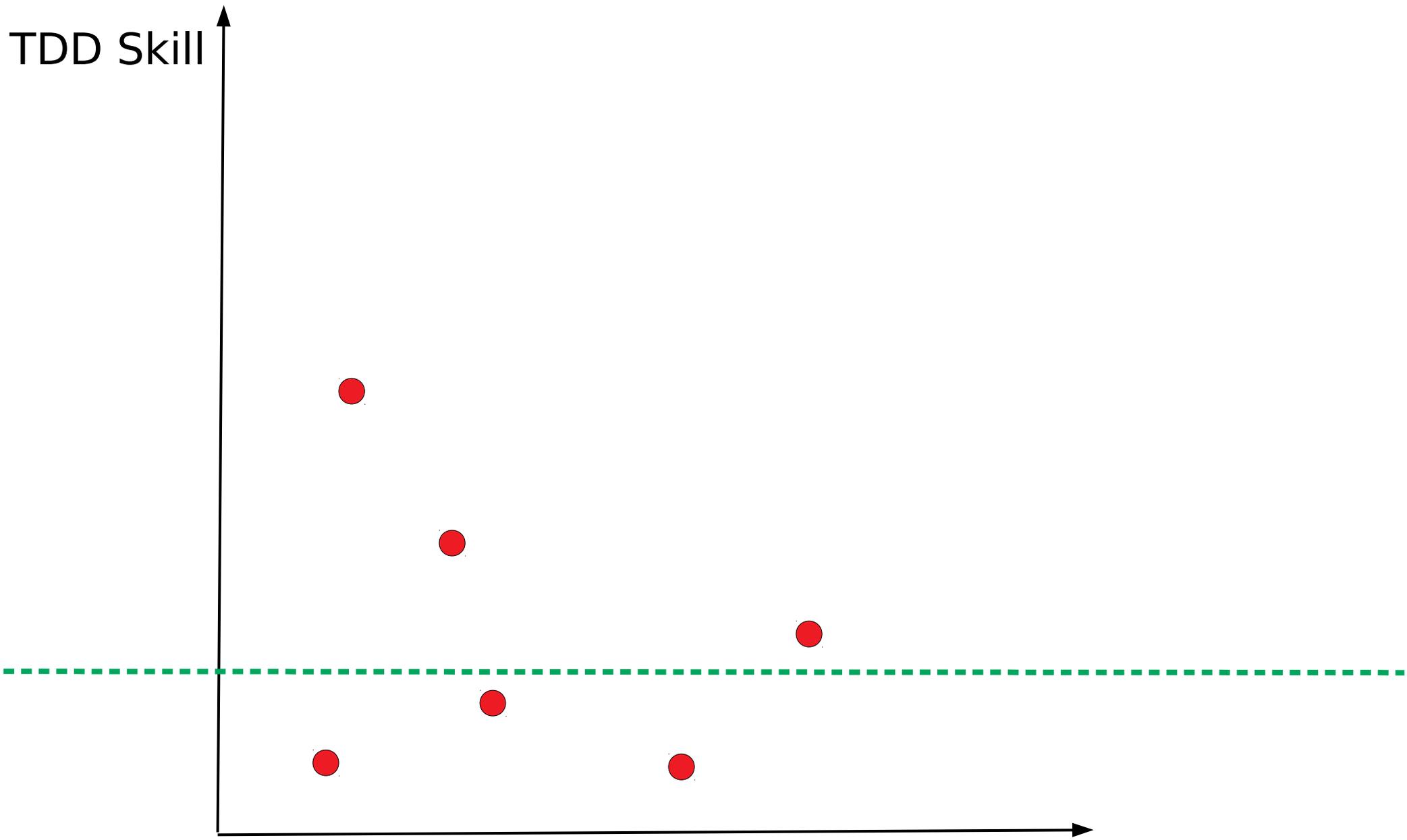
Event Knowledge





Languages?

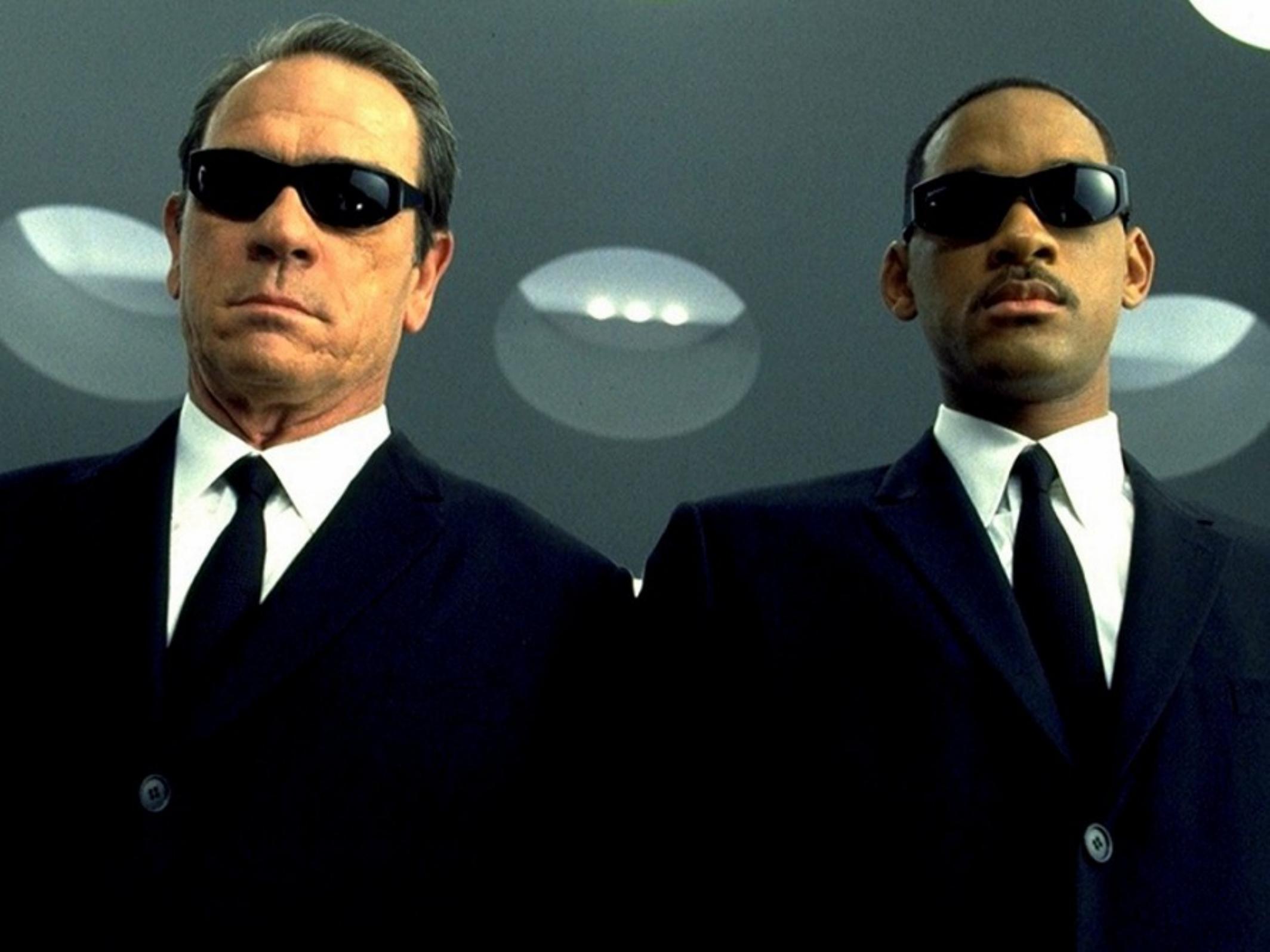
TDD Skill



Event Knowledge



GO



Really Dangerous Numbers

029/12345
0161/9876
...



Log Alert

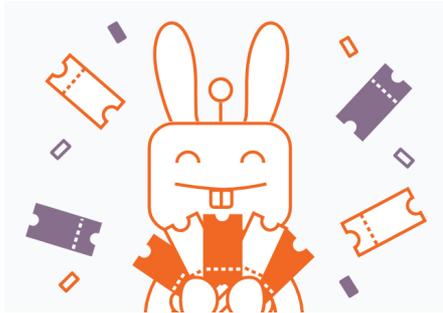
Retrospective

- *How was the experience?*
- *How did you solve it?*
- *What did you learn?*

Event Frameworks



<https://www.flickr.com/photos/alebaffa/8939535066>

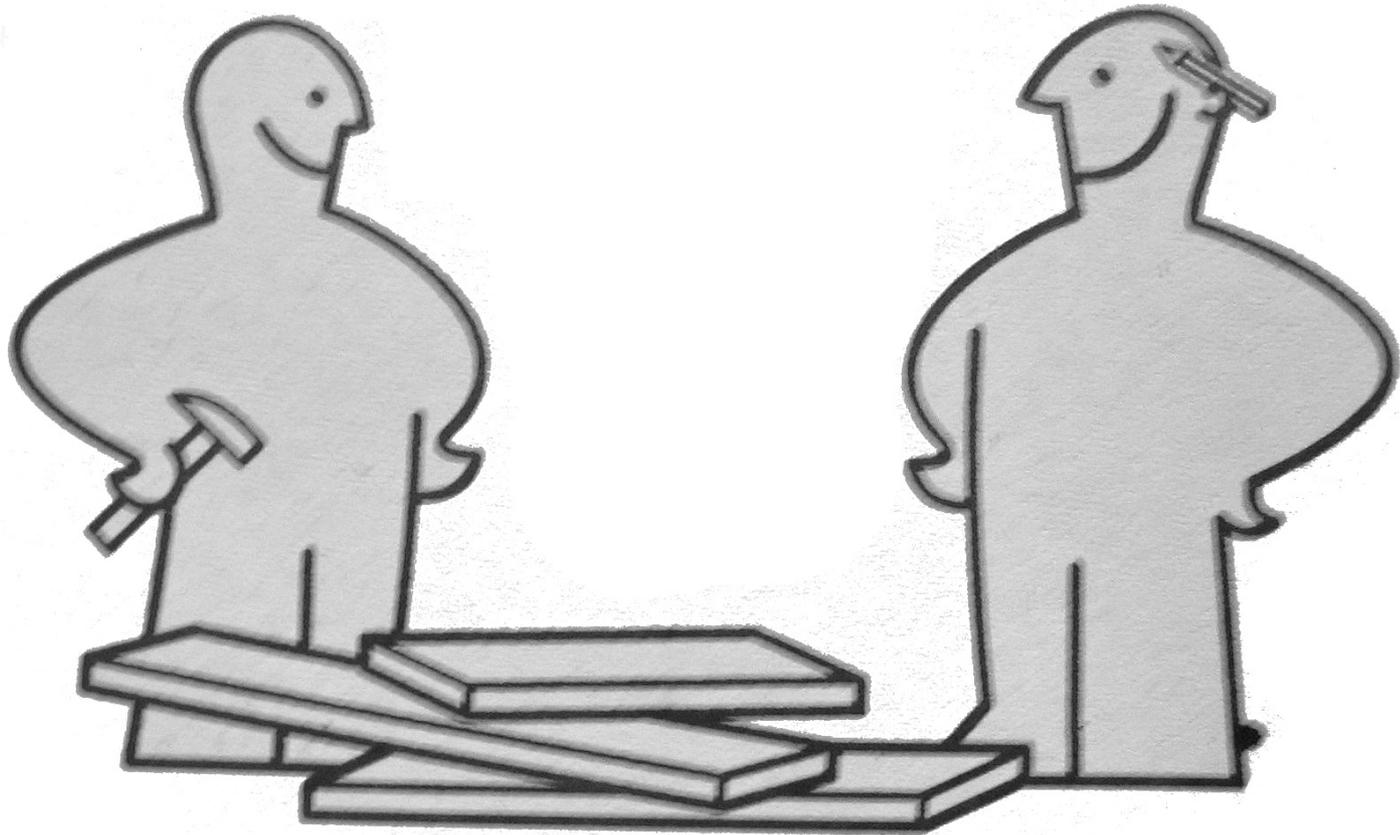


Rabbit MQ



EventEmitter





Do It Yourself

Effective meetings, for remote and local teams.

 No installation

 Touch support

 Mobile support

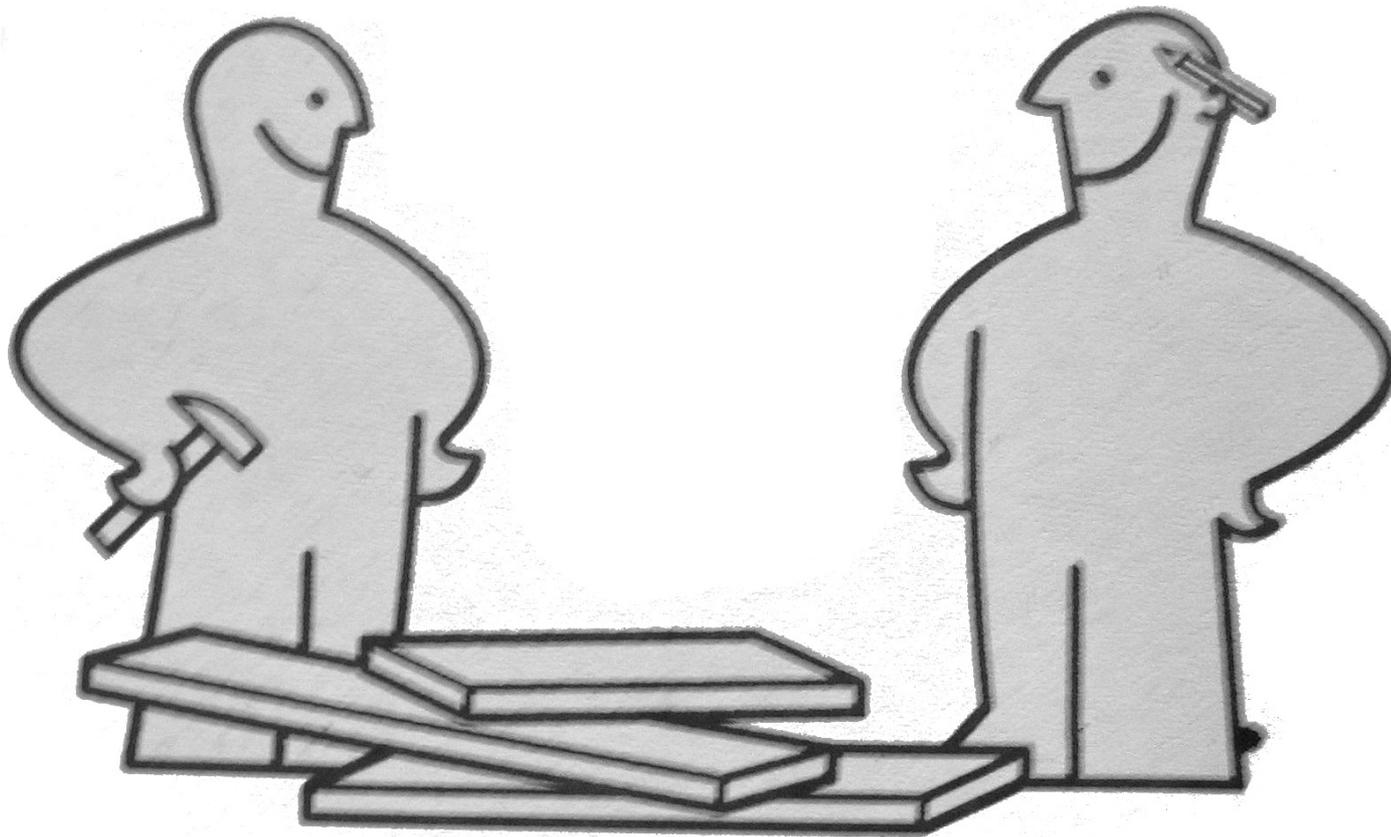
[START A FREE TRIAL](#)



 **eventric.js**

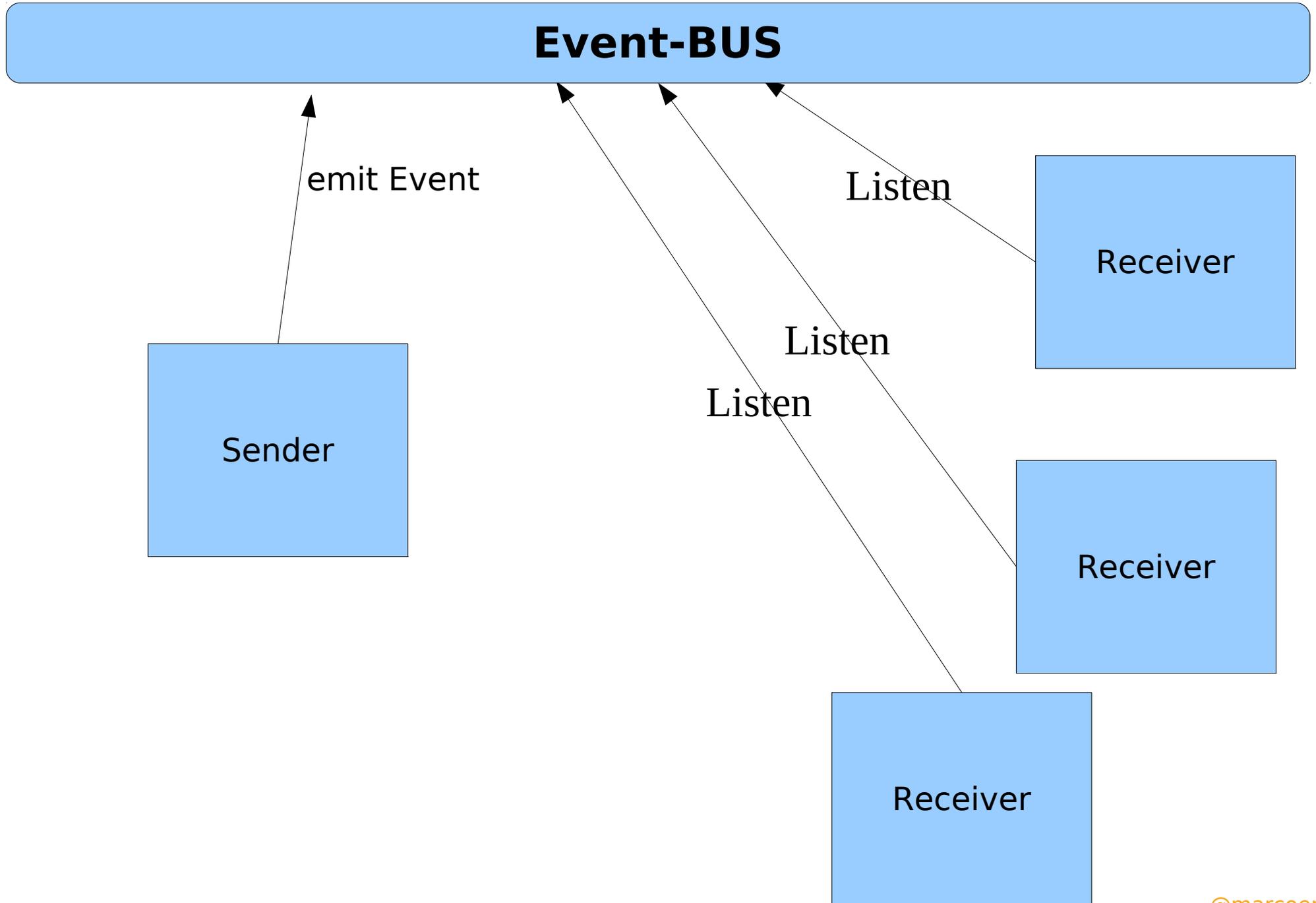


<https://www.wolkenkit.io/>

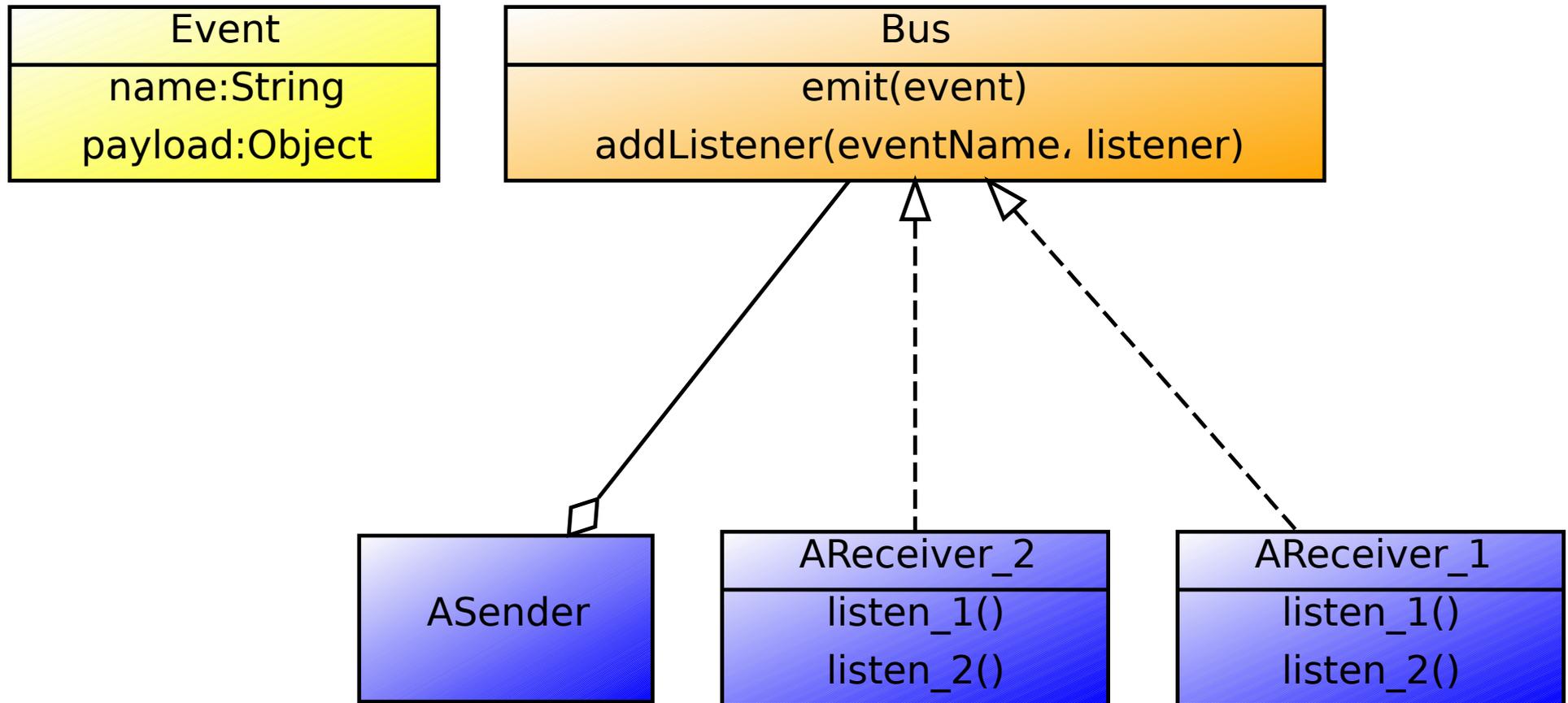


Do It Yourself

Pub/Sub



Minimal EventFramework



Event (Java)

```
public class Event {  
  
    private String name;  
    private Object payload;  
  
    public Event(String name, Object payload) {  
        this.name = name;  
        this.payload = payload;  
    }  
    ...  
}
```

Basics (Java)

```
public class ReceiverDemo implements EventListener {  
    public void receive(Event event) {}  
    ...  
}
```

```
EventBus bus = new EventBus();  
ReceiverDemo receiver1 = new ReceiverDemo();  
ReceiverDemo receiver2 = new ReceiverDemo();
```

```
bus.addListener("SomethingHappened", receiver1);  
bus.addListener("SomethingHappened", receiver2);  
bus.emit(new Event("SomethingHappened"));
```

Payload (Java)

```
public class ReceiverDemo implements EventListener {  
    public void receive(Event event) {}  
    ...  
}
```

```
int payload = 27;  
EventBus bus = new EventBus();  
ReceiverDemo receiver1 = new ReceiverDemo();
```

```
bus.addListener("SomethingHappened", receiver1);  
bus.emit(new Event("SomethingHappened", payload));
```

Basics (JS)

```
const callback1 = () => { ... }  
const callback2 = () => { ... }
```

```
bus.addListener('SomethingHappened', callback1);  
bus.addListener('SomethingHappened', callback2);  
bus.emit('SomethingHappened');
```

Payload (JS)

```
const callback = payload => {  
  ...  
});
```

```
bus.addListener('SomethingHappened', callback);
```

```
bus.emit('SomethingHappened', {bar: 'foo'});
```

Tests/Specs

- 1) a_Bus_can_emit_Events
- 2) a_Receiver_gets_notified
- 3) multiple_Receivers_get_notified
- 4) Events_accept_a_Payload



GO

Retrospective

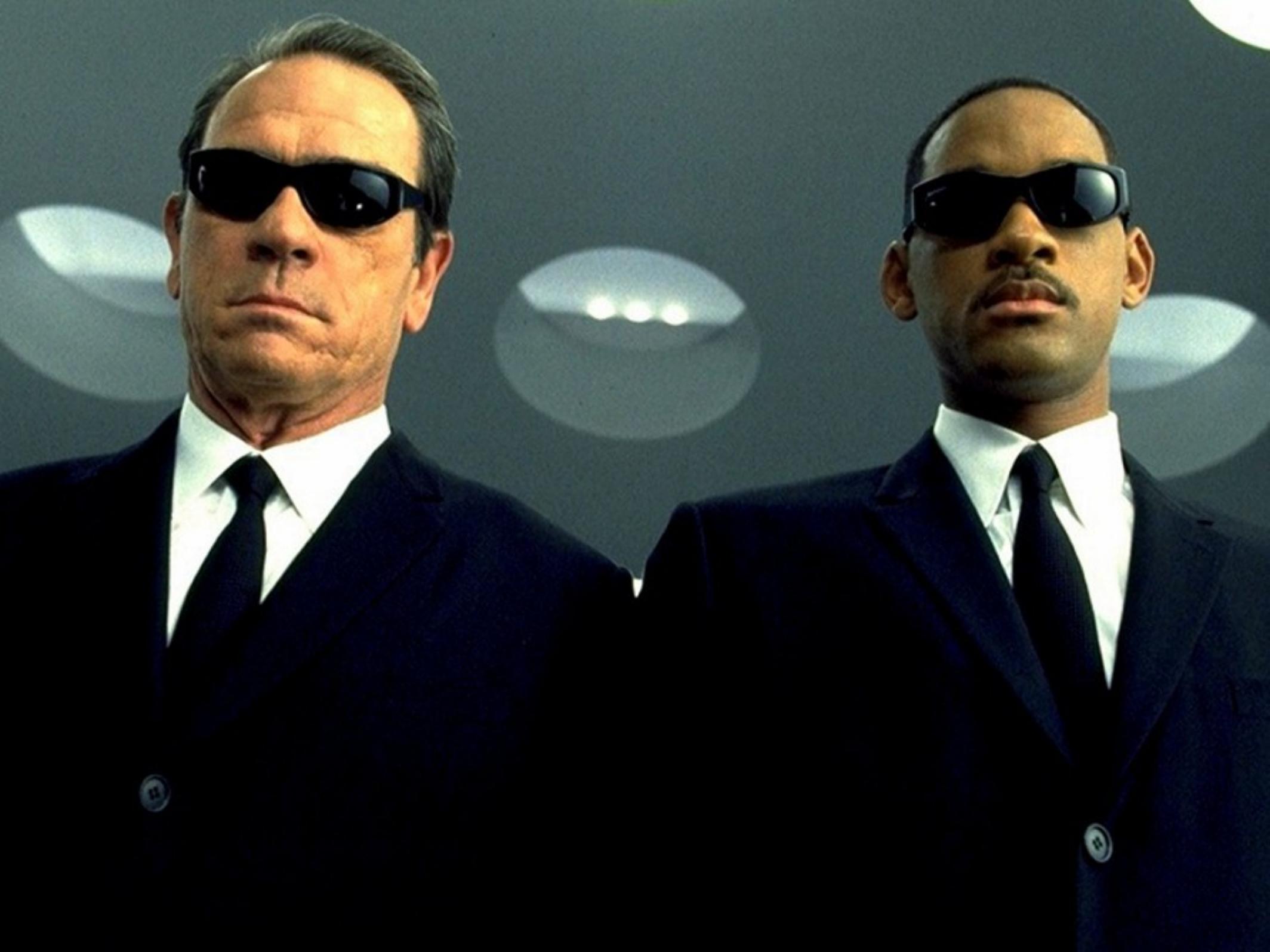
- *How was the experience?*
- *How did you solve it?*
- *What did you learn?*

Call Center Kata



Constraints

- no Method-communication,
Events only
- Small Classes (SRP)
 - max. 20-30 LOC
 - max. 5 Methods



Really Dangerous Numbers

029/12345
0161/9876
...



Log Alert

Retrospective