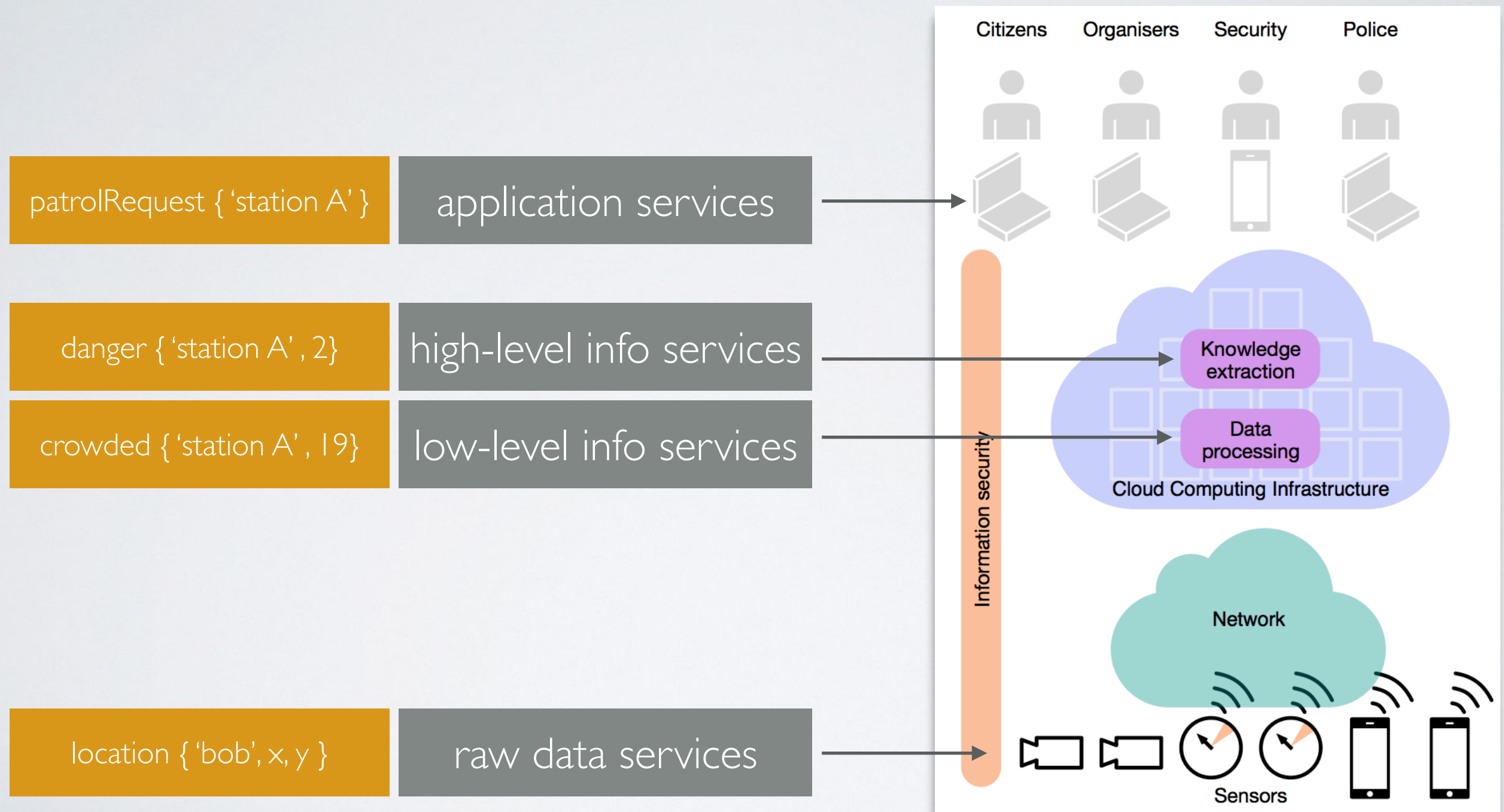


ENABLING REACTIVE CITIES WITH THE IFLUX MIDDLEWARE

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Despraz and Marc Sommer



INUIT: SMART CITY STACK



ENTERPRISE SILOS



HR

Procurement

R&D

Sales



iOT SILOS IN SMART CITIES



Sport



Transport



Security

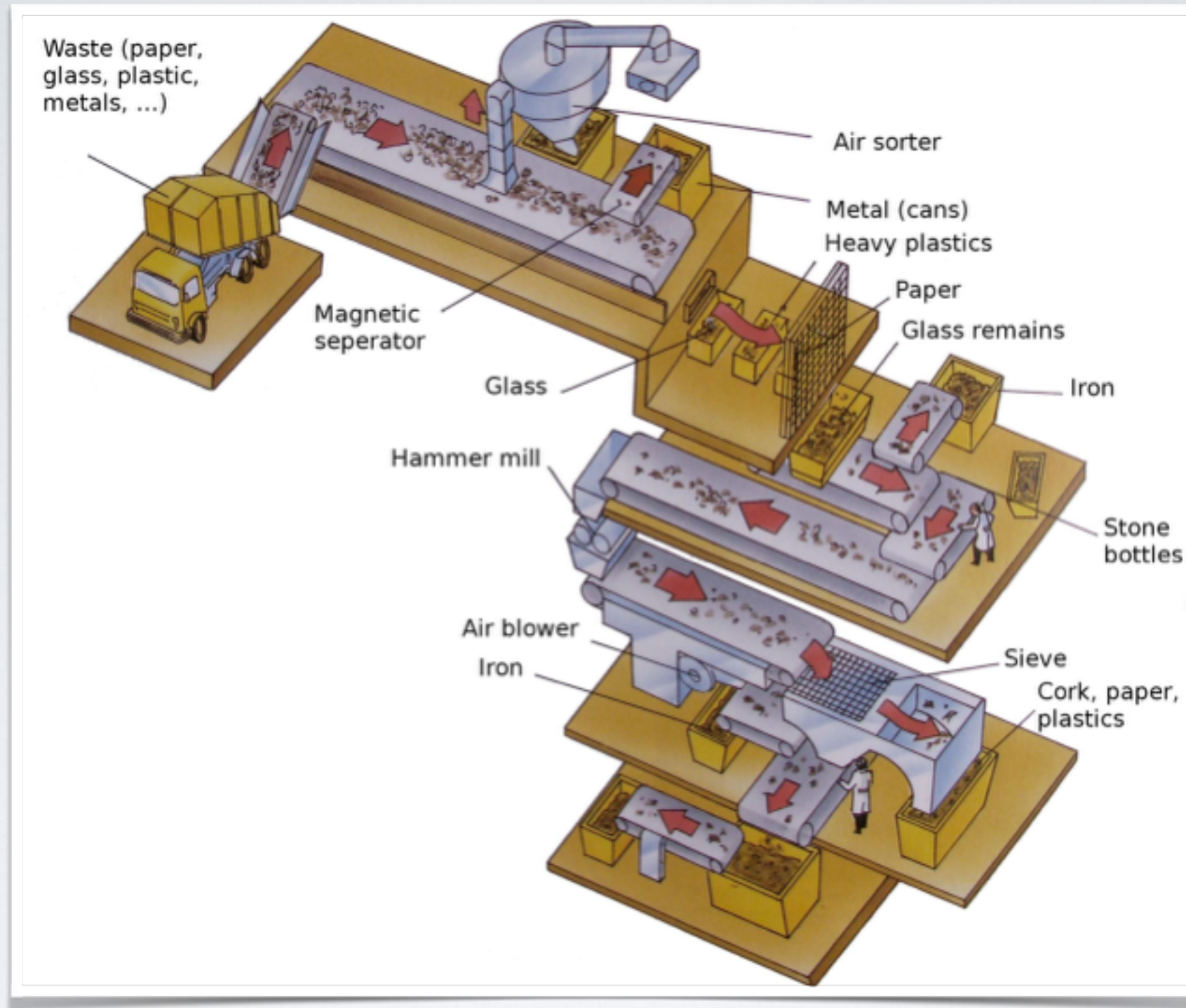


Police





```
SELECT stuff FROM garbage WHERE material='PET'  
GROUP BY stuff.color, stuff.size, stuff.shape
```

```
SELECT COUNT(*) FROM newTrashEvent  
.win:time(1 hour) WHERE material='PET'
```



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About IFTTT

What is IFTTT?

IFTTT is a service that lets you create powerful connections with one simple statement:

Recipe

if this then that

Trigger

Action

IFTTT is pronounced like “gift” without the “g.”

Channels

Channels are the basic building blocks of IFTTT. Each Channel has its own Triggers and Actions. Some example Channels are:



Facebook



Evernote



Email

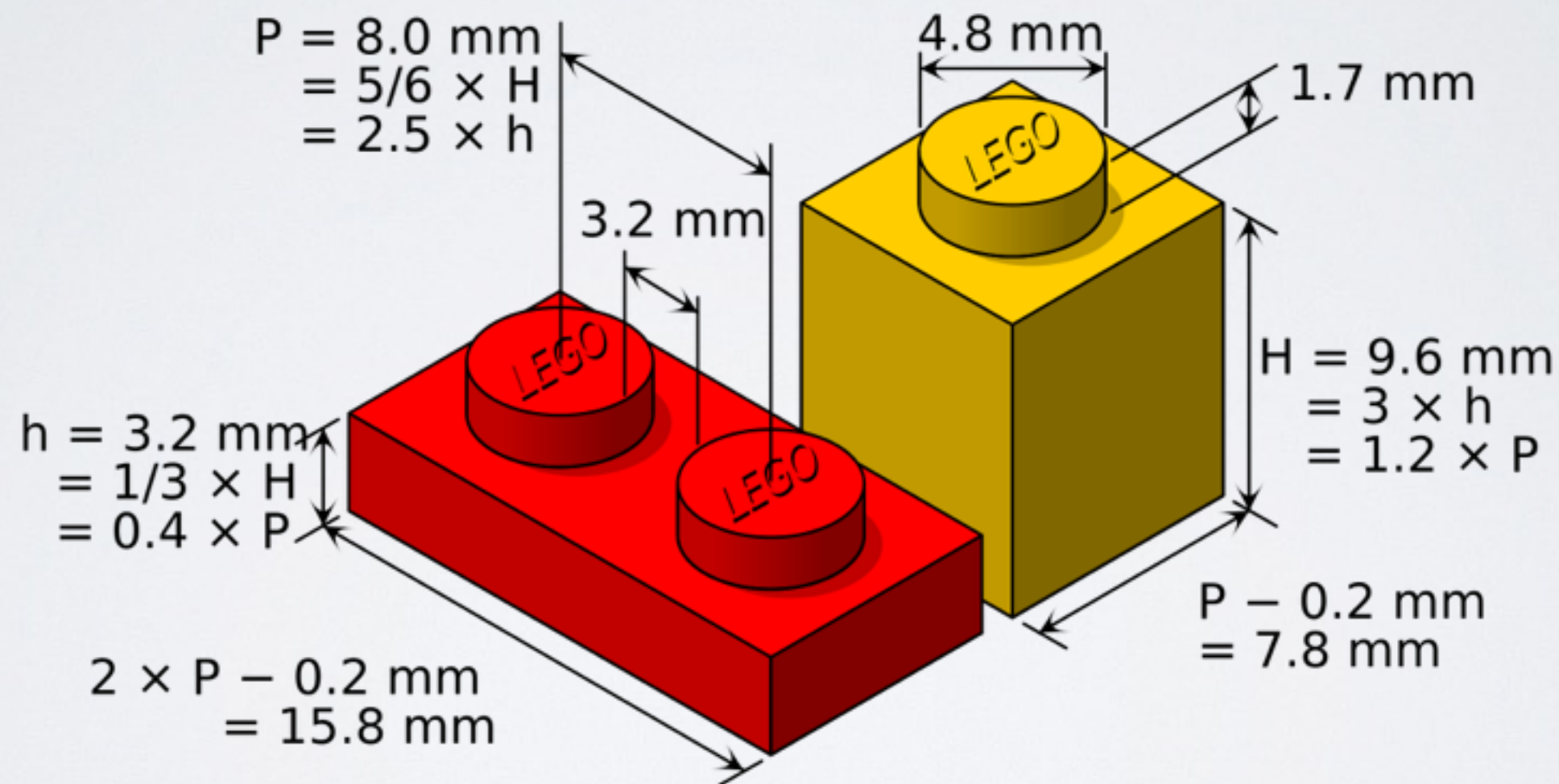


Weather



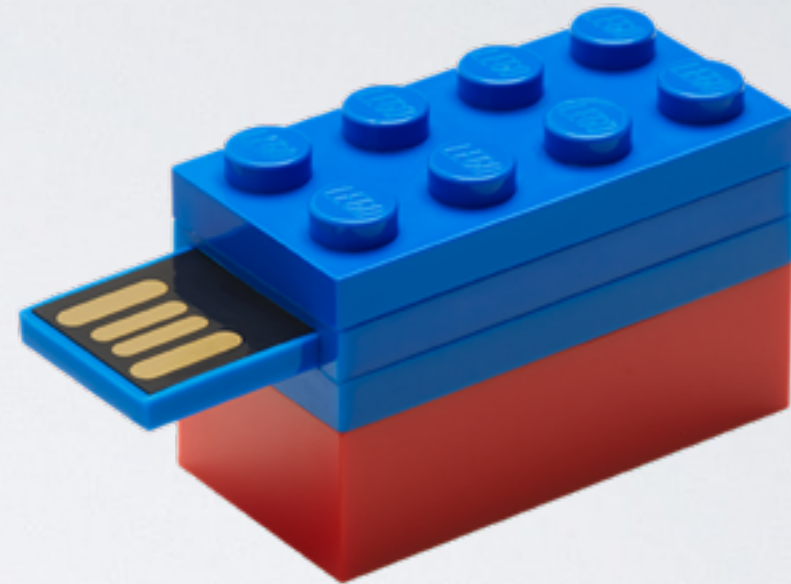
LinkedIn

LEGOS FOR SMART CITIES



EVENT SOURCES

- Any kind of “**sensor**” that emits a stream of events.
- Some sources are embedded in “**smart objects**” (e.g. thermometer)
- Other sources are embedded in **software applications** (e.g. user activity tracking in GAPS)
- It is **very easy for third-party developers** to create them. They just need to POST simple event payloads on the iFLUX REST endpoint.



HTTP client



/events/

iFLUX

EVENT SOURCE EXAMPLE



events:

a bike has arrived, a bike has left

EVENT SOURCE EXAMPLE

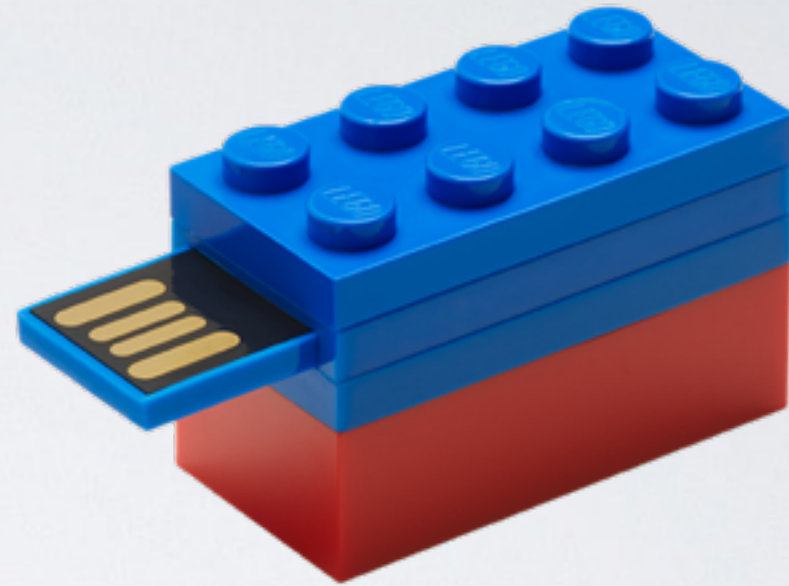


events:

a car has entered the parking, a car has left

ACTION TARGETS

- Any kind of **actuator** that can be controlled remotely.
- Some sources are embedded in “**smart objects**” (e.g. lamp).
- Other sources are embedded in **software** (e.g. a SMS gateway).
- They are also **easy to create**.
Third-party developers need to implement a simple REST endpoint.

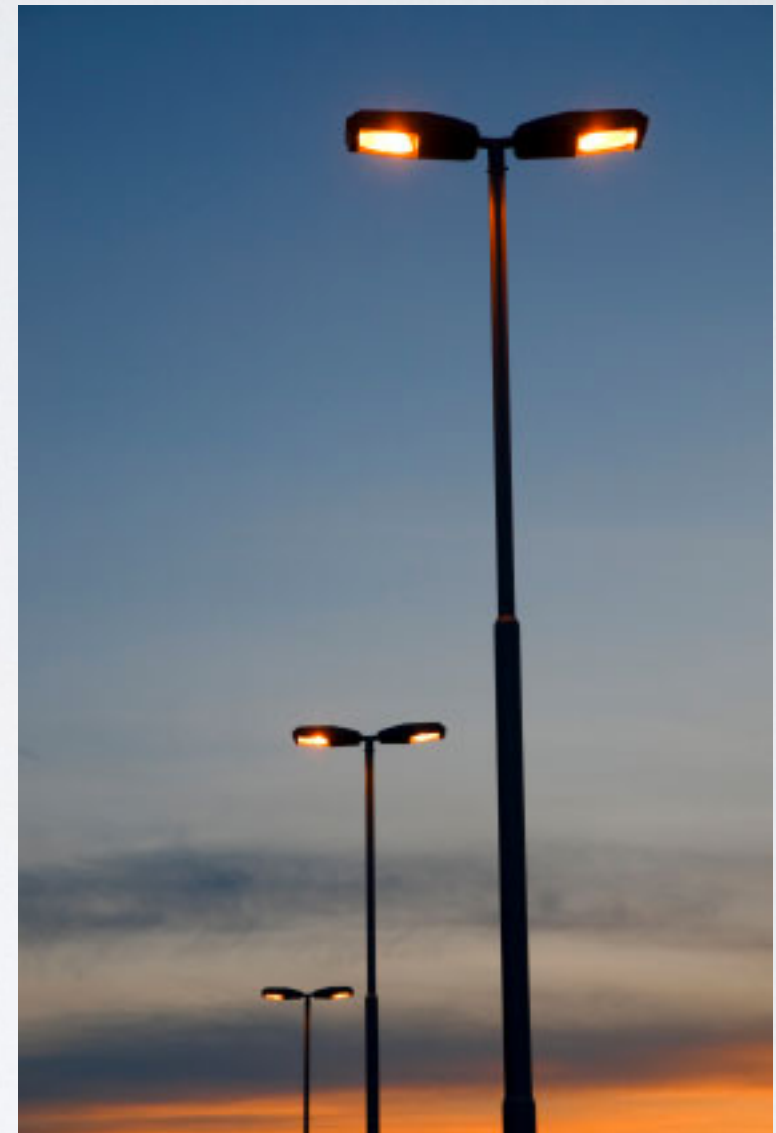


/actions/



iFLUX

ACTION TARGET EXAMPLE



actions:

turn on, turn off, set intensity

ACTION TARGET EXAMPLE

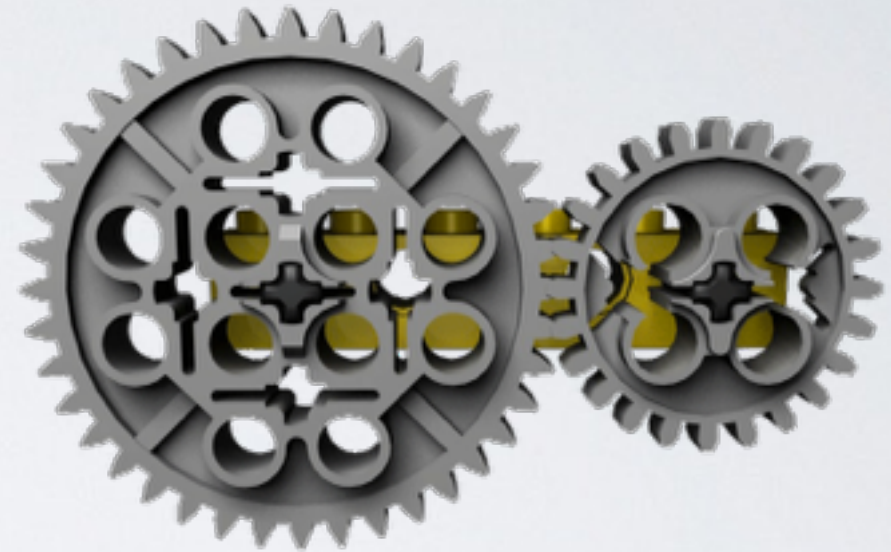


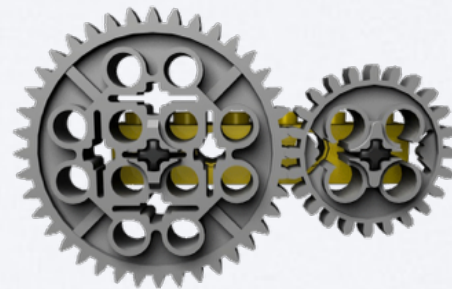
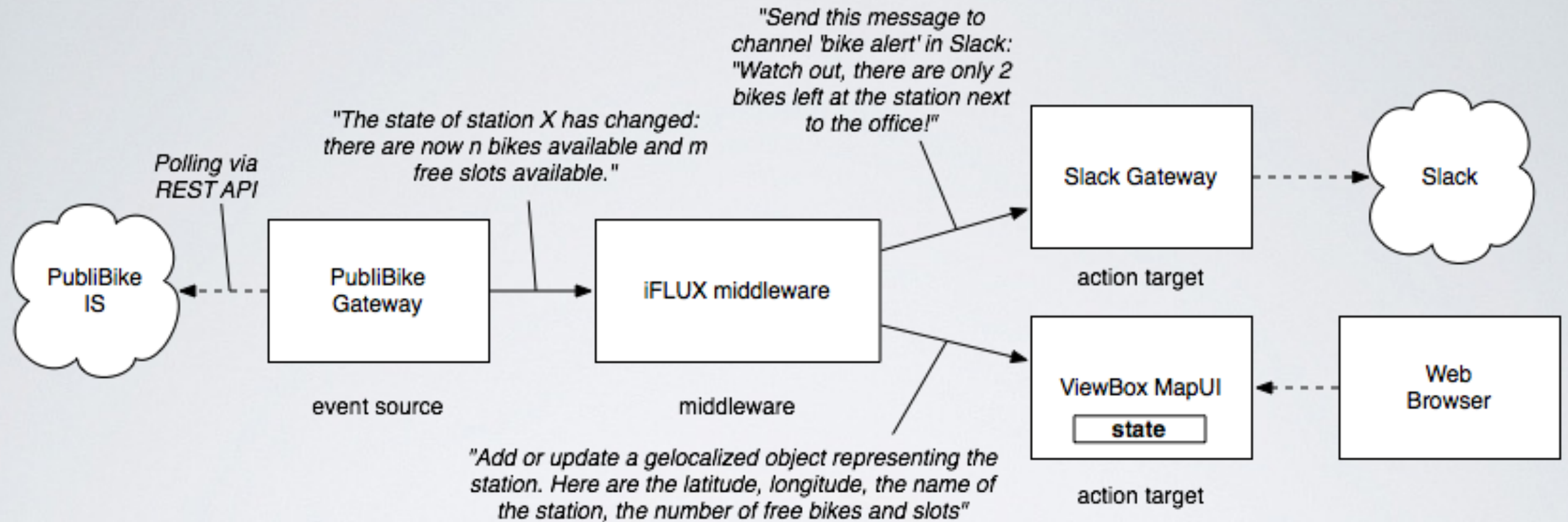
actions:

send message “hello” in channel “team alerts”

FUN WITH RULES

- The catalog of event sources and action targets can be combined with stateless Event-Condition-Action rules.
- **IF** an event with these properties happens, **THEN** trigger an action with these properties.



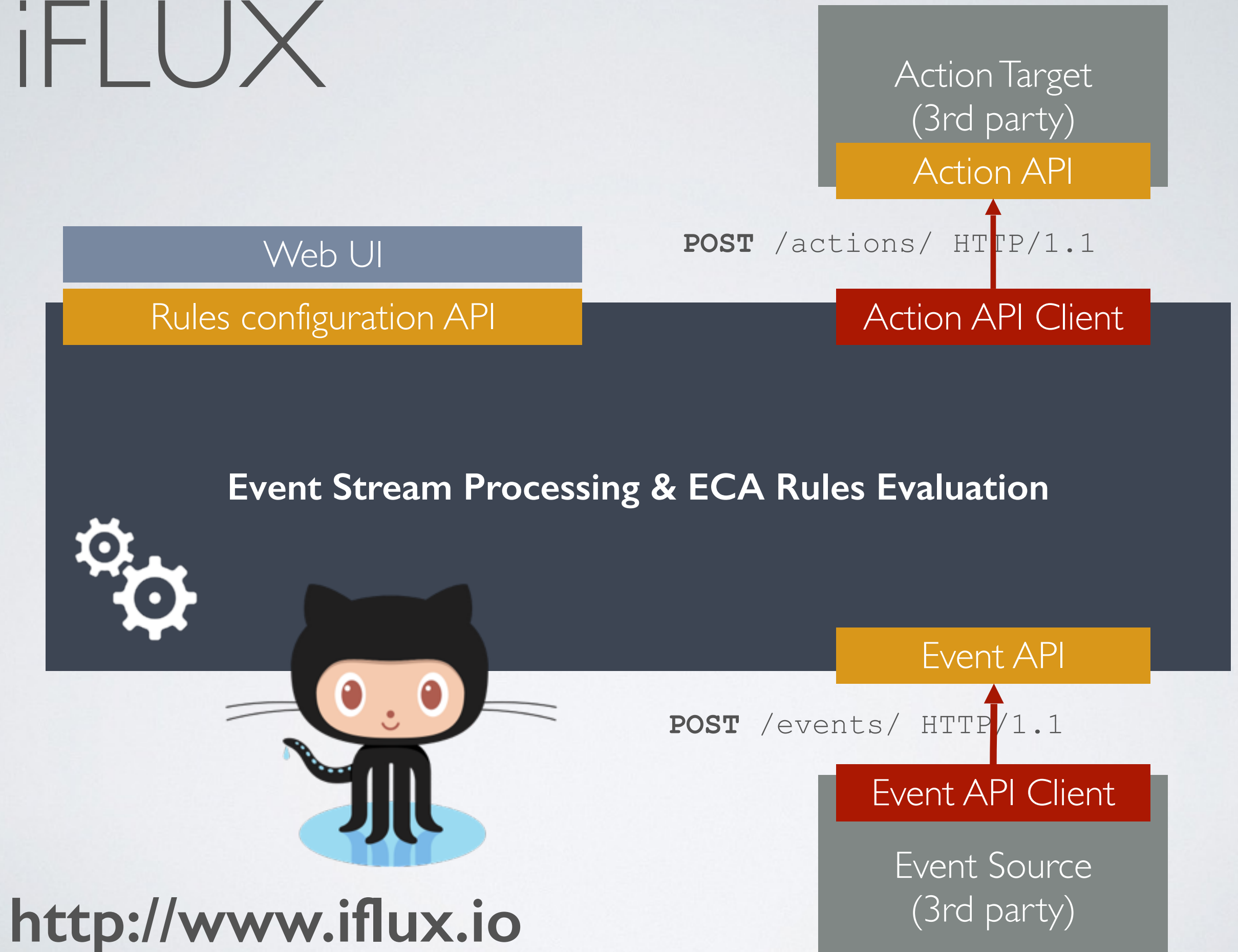


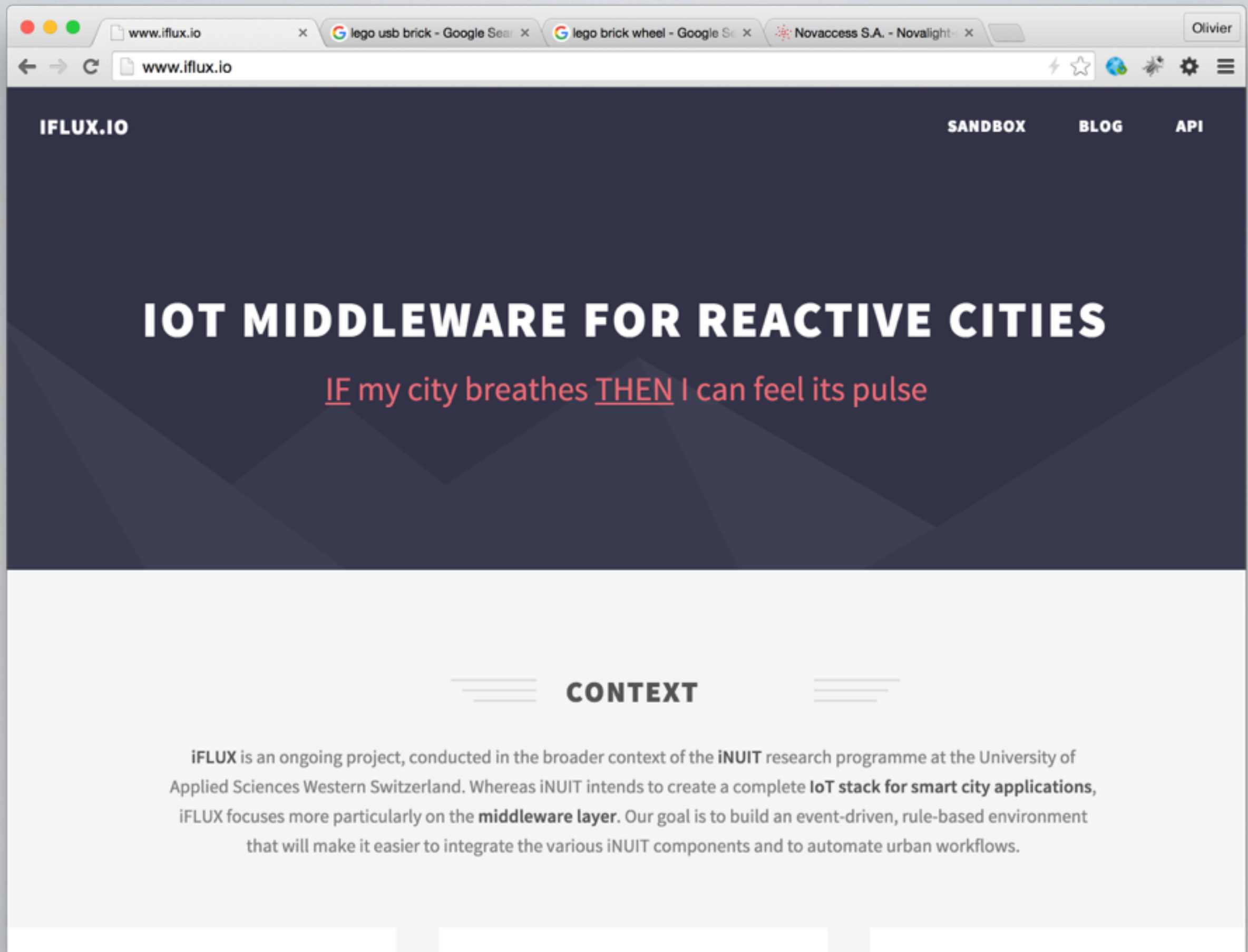
Rule:

IF a bike has left Y-Parc station and the number of remaining bikes ≤ 3

THEN send message "Warning! Not many bikes available near the office" in Slack

iFLUX





IOT MIDDLEWARE FOR REACTIVE CITIES

IF my city breathes THEN I can feel its pulse

CONTEXT

iFLUX is an ongoing project, conducted in the broader context of the iNUIT research programme at the University of Applied Sciences Western Switzerland. Whereas iNUIT intends to create a complete **IoT stack for smart city applications**, iFLUX focuses more particularly on the **middleware layer**. Our goal is to build an event-driven, rule-based environment that will make it easier to integrate the various iNUIT components and to automate urban workflows.