Breakout:
Data processing & analysis with eMagiz

State generation

eMagiz - Flow designer
eMagiz - Runtime statisti
CAPTURE
DESIGN
CREATE
DEPLOY
MANAGE
Community
Store
Resources
History
transform.status-add-headers
route.status-by-root-element-name
route.status-by-api
transform.status-xml-to-projst
transform.status-json-to-xml
transform.status-remove-headers
filter.status-validate
transform.status-source-to-cdm
transform.klic-event-to-status
transform.error-to-status
send.status
Steps 1. Filter en
Filter by API type
project status 4.
message
transform.file-xpath-headers
transform.file-request-headers
send.file-getdocumentlist
transform.file-remove-headers
Steps 1. Get document list
Use buffer with 'requests'
Transform to CDM 6. Inser
transform.file-headers
transform.file-source-to-cdm
send.file-buffer
Toggle state
Deploy
Help
Export to store

Introduction

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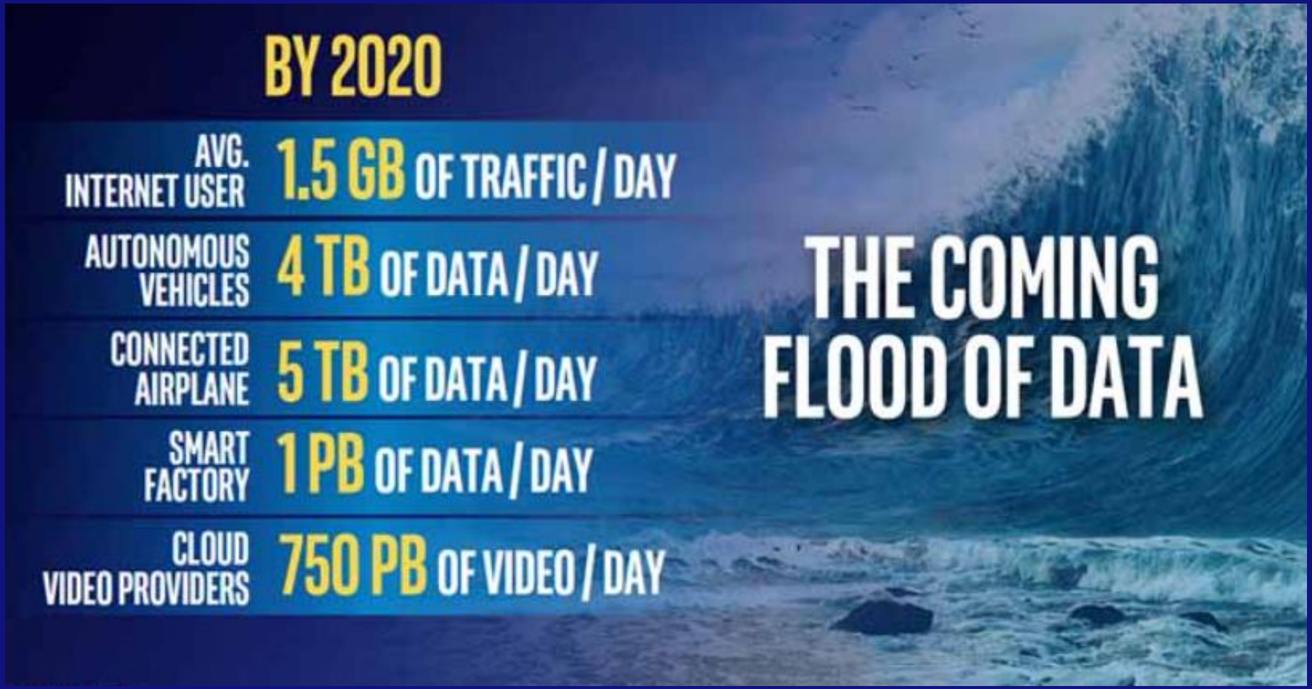
A flood of data is forcing us to become data-driven in an efficient manner



BY 2020

AVG. INTERNET USER	1.5 GB OF TRAFFIC / DAY
AUTONOMOUS VEHICLES	4 TB OF DATA / DAY
CONNECTED AIRPLANE	5 TB OF DATA / DAY
SMART FACTORY	1 PB OF DATA / DAY
CLOUD VIDEO PROVIDERS	750 PB OF VIDEO / DAY

A STATELESS

API

Application

Firewall

Service

Etc.

Etc.

Doesn’t need any data to be stored to function.

It just represents the current state / condition

A STATEFUL

API

Application

Firewall

Service

Etc.

Etc.

Does need data to be stored to function.

Uses past states, to derive information

Why do we go from?

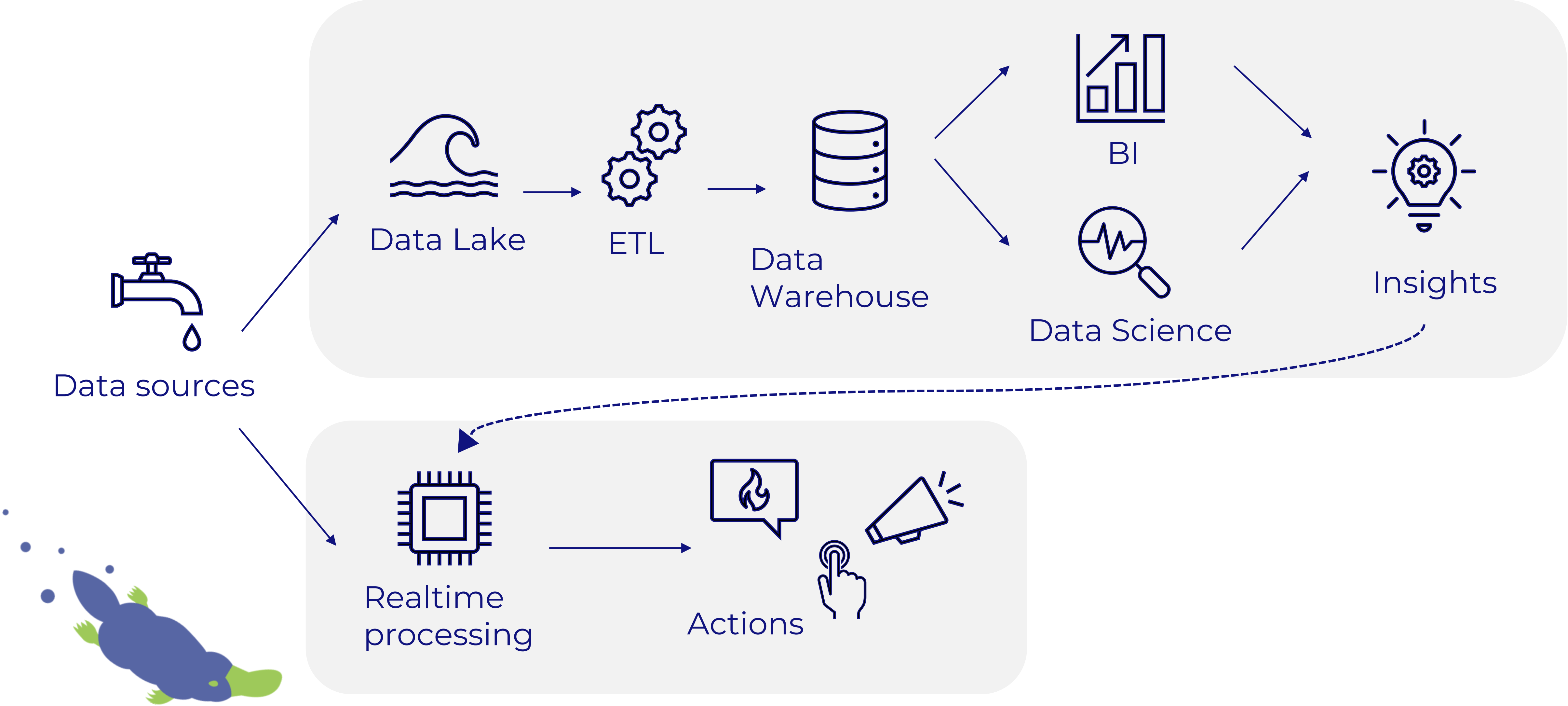
Stateless

TO

Stateful

- Thermostat produces data
  - “ 46 ”
- Data needs to put in context
  - “46 degrees Celsius at 16:05 in room Z”
- Data needs to be evaluated over time
  - In room Z, temperature was 21 degrees 1 minute ago, and now is 46 degrees so it rose by 25 degrees in 1 minute.
- Data needs to be tested against a norm, to generate actions
  - “Temperature rose by 25 degrees in 1 minute” > FIRE alert.

Data warehouse + real-time



Data sources

Data Lake

ETL

Data Warehouse

BI

Data Science

Insights

Realtime processing

Actions

Datalake or warehouse as solution?

Yes, ideal for complex analytics and advanced BI solutions but……

- Data is always outdated
- Always looking back
- Data not complete, and unmanageable in quantity
- High upfront costs
- Poorly scalable
- High management costs

Not suitable for real-time decision making

Realtime state-generation

- Immediately, always up-to- date
- Take real action, real-time decision making
- No need to store data unnecessarily

How do we go from?

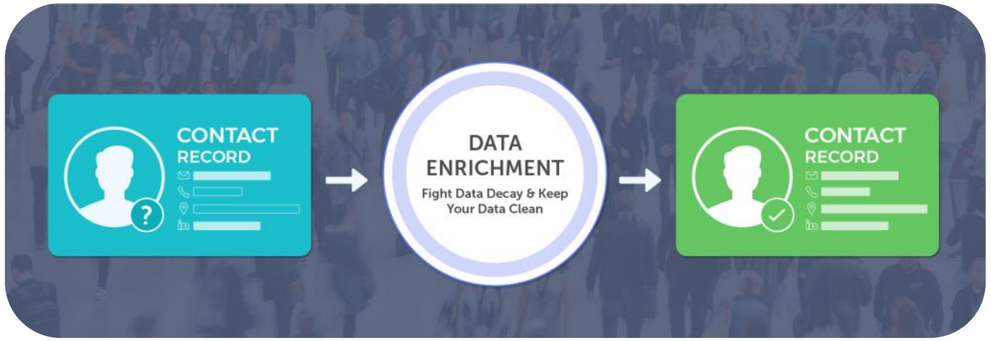
Stateless

TO

Stateful

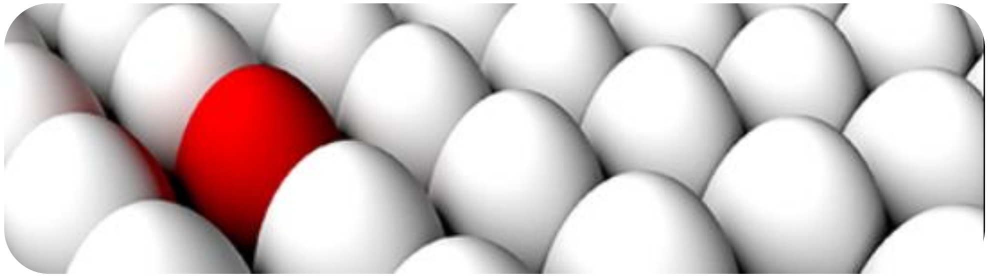
How do we get statefull data?

- ENRICH



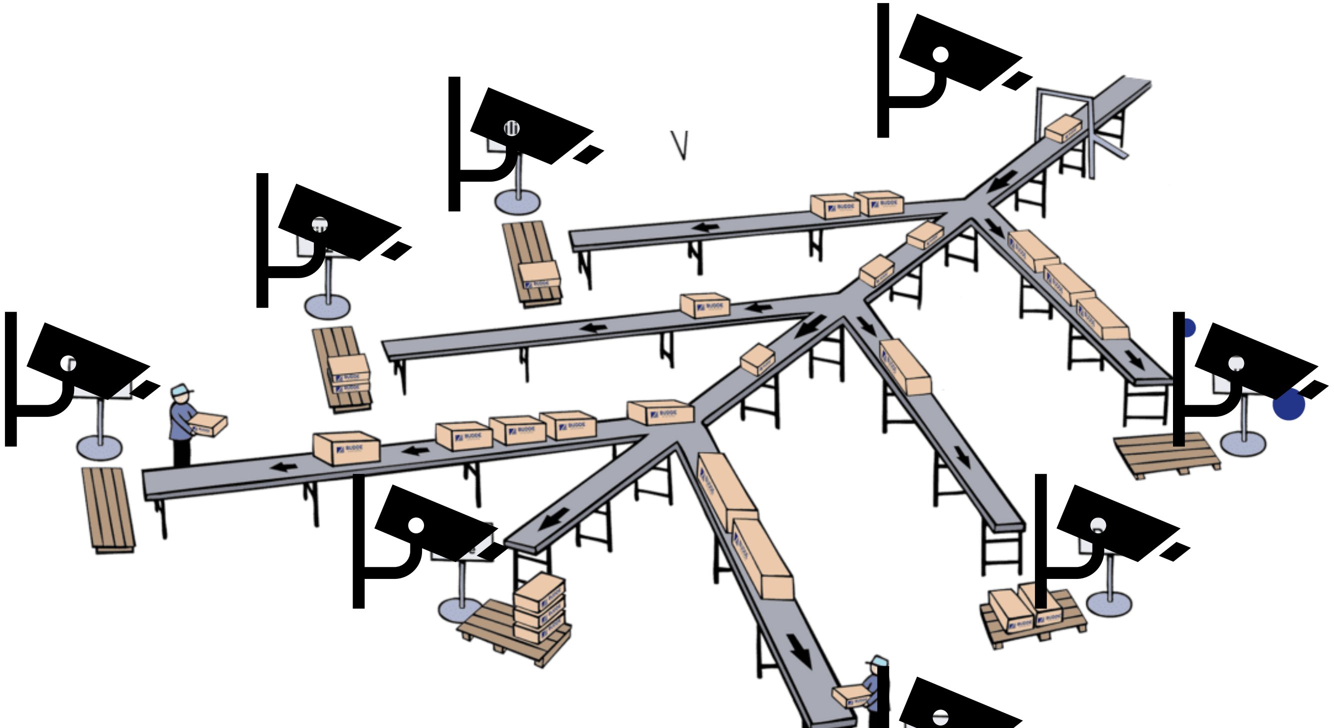
- AGGREGATE

- DETECT ANOMALIES AND CHANGES



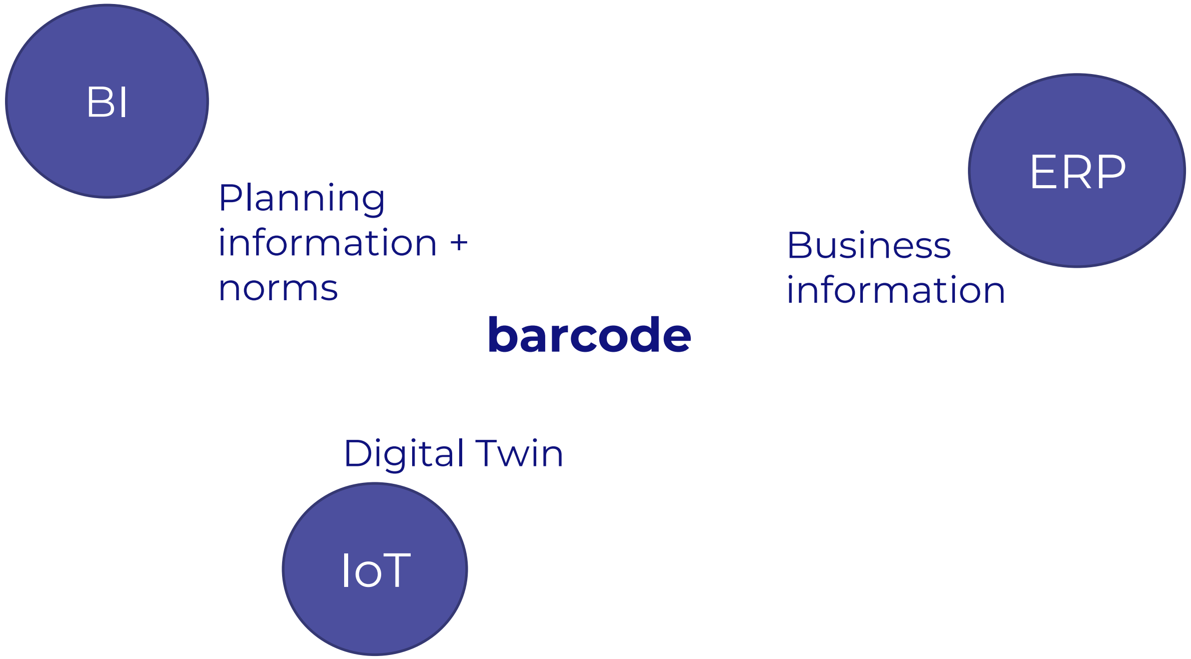
Example 1

- Parcel sorting center produces data events
  - Barcodes are scanned on entry and on leave the sorting center
  - We want to know when parcels don’t take the expected route or when they are stuck in the chain



Example 1

- Planning (BI) provides the expected route
- IoT provides the scan events
- ERP stores package info and state



BI

Planning information + norms

ERP

Business information

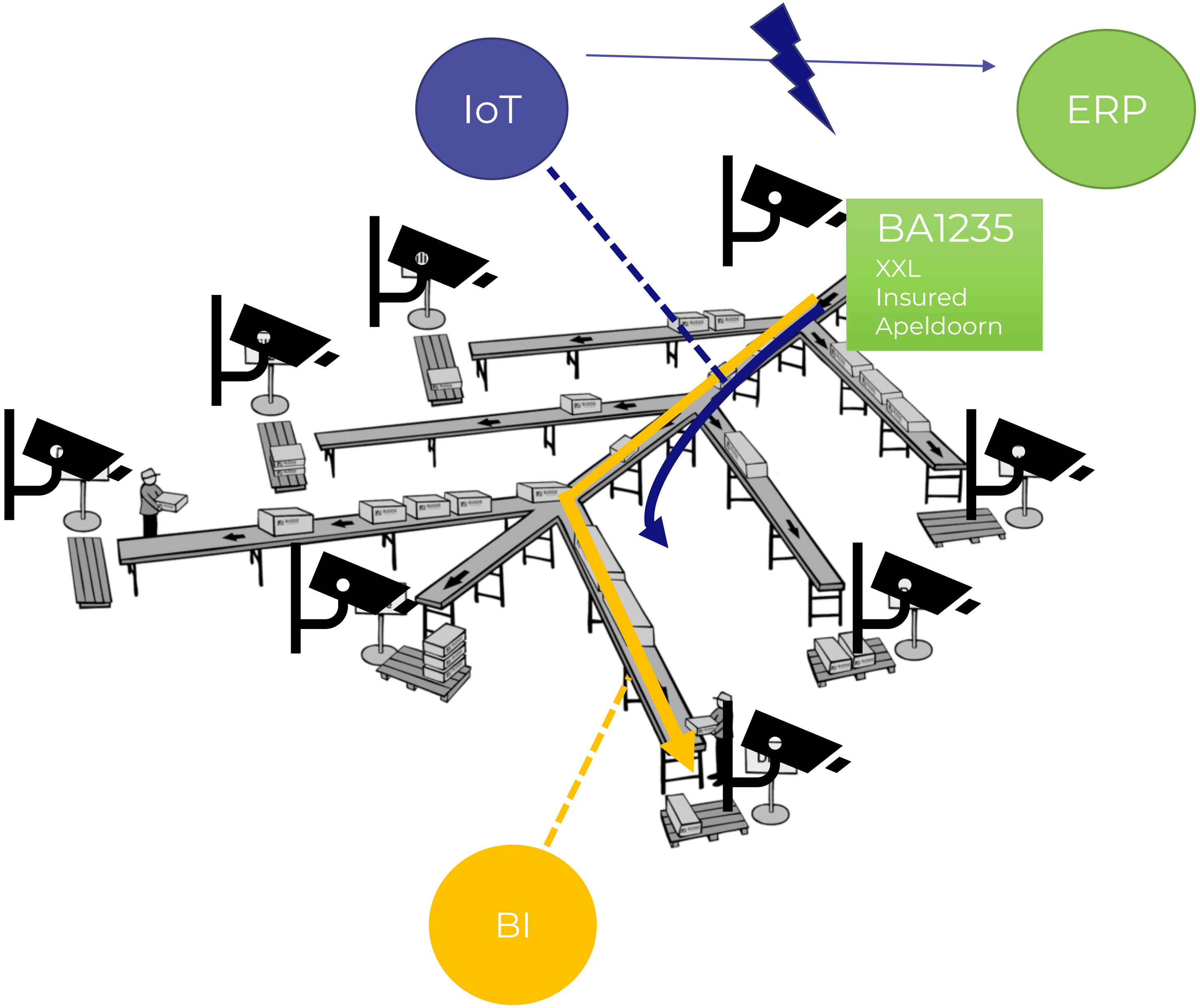
barcode

Digital Twin

IoT

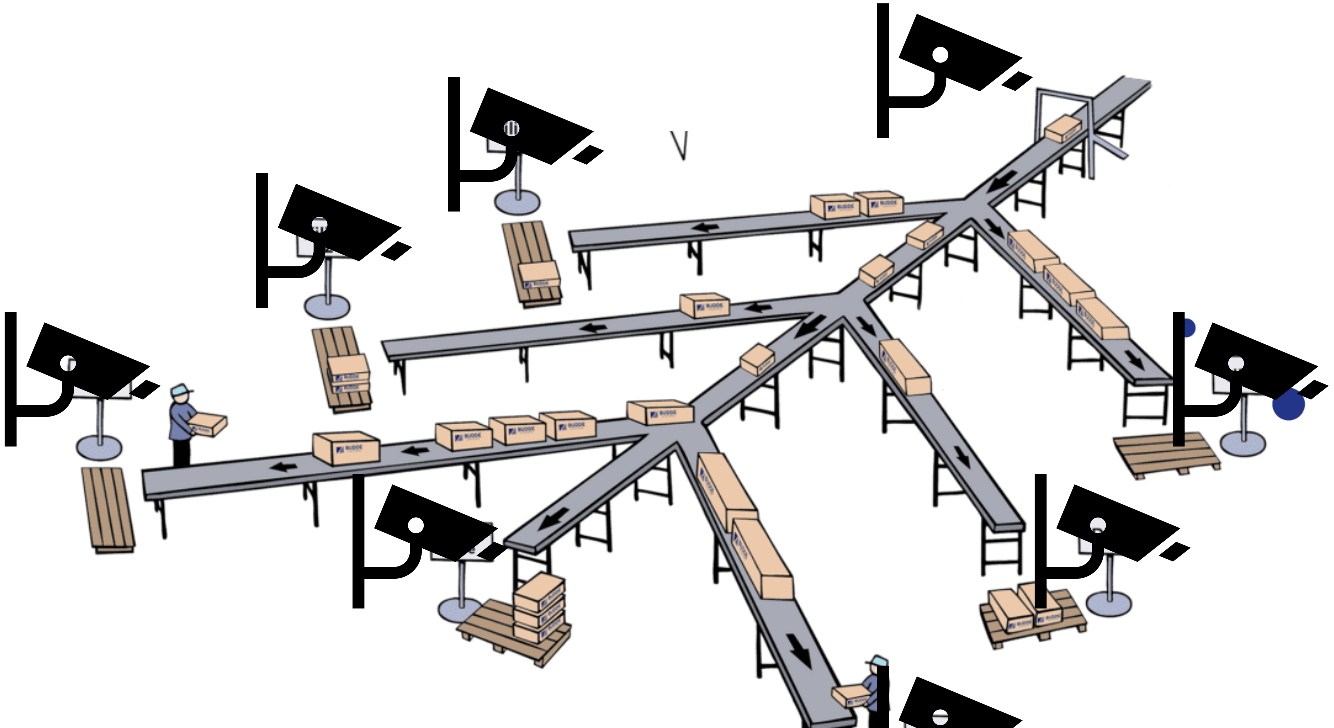
Example 1

- Entry sensor scans parcel
  - BA1235 at ENTRY1 at 12:45
- Scan is **enriched** based on ERP
  - BA1235 is insured XXL parcel heading to Apeldoorn
- Destination is **enriched** based on planning / norm info from BI
  - BA1235 should go to LEFT3 within 30 minutes
- 30 minute **aggregate** finds final package state
  - BA1235 has not arrived at LEFT3
- **State transition** to not arrived triggers exception in ERP
  - BA1235 is in exception state, employee should check



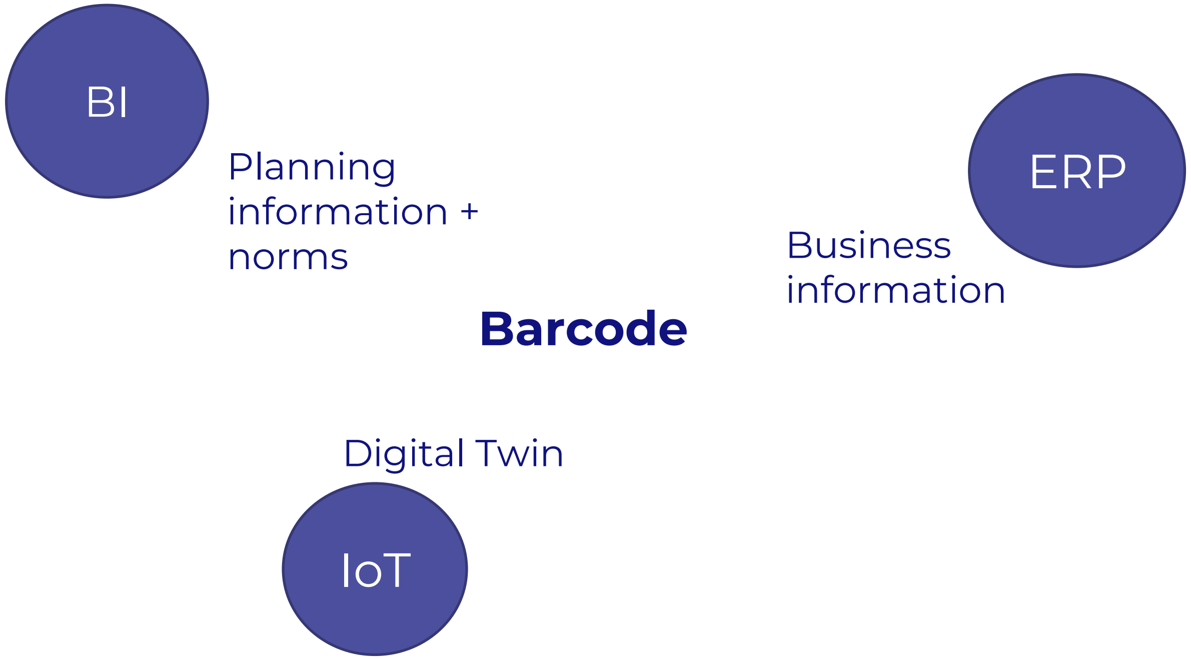
Example 2

- We want to take immediate action when the planned volume deviates more than 10% from the actual volume



Example 2

- BI provides the planning for the expected volume
- IoT provides the actual volume
- BI can provide a new planning based on actual volume
- ERP is where actions are taken



BI

Planning information + norms

ERP

Business information

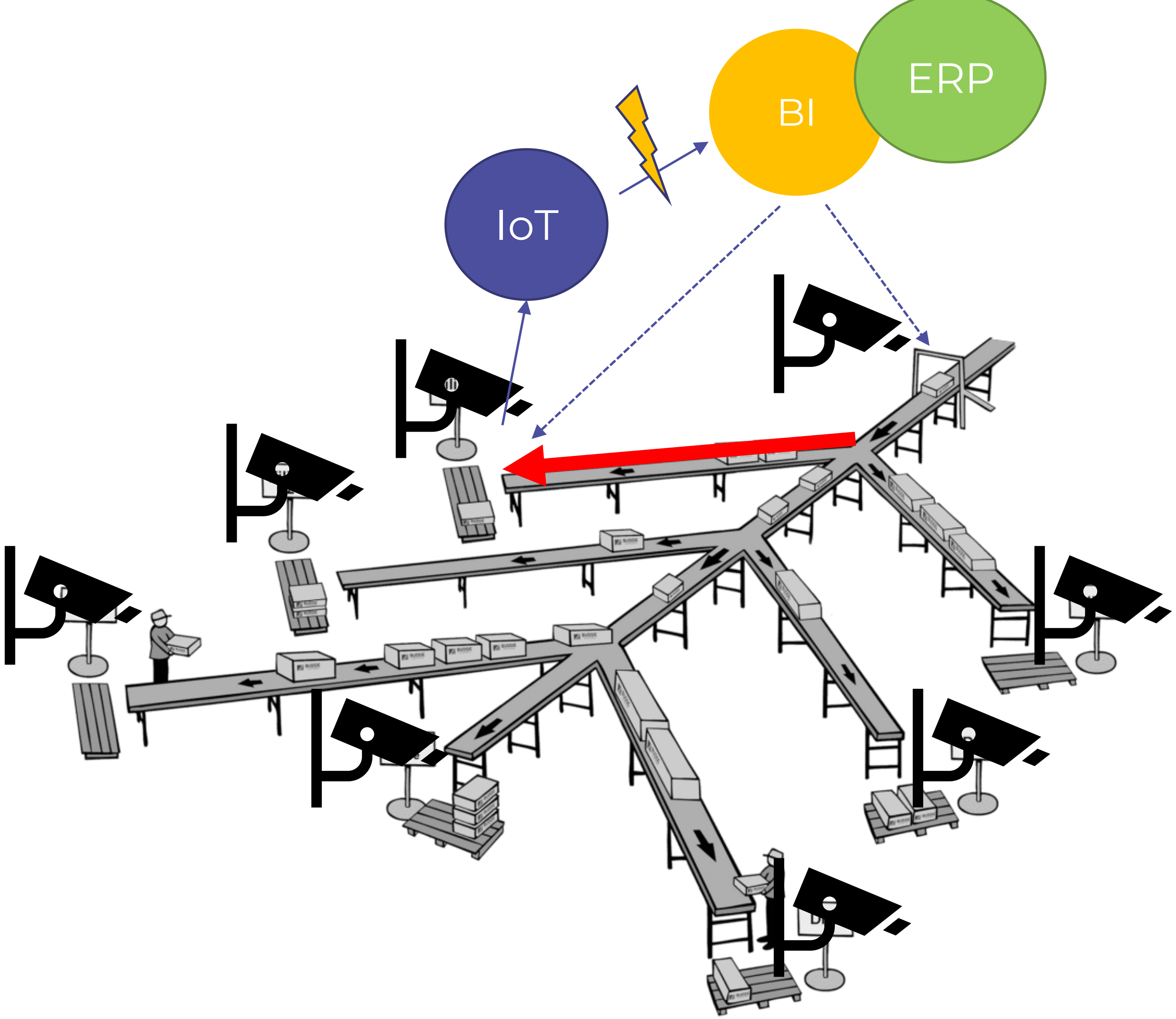
Barcode

Digital Twin

IoT

Example 2

- IoT provides actual exit RIGHT1 volume, measured at 27 packages per minute [**aggregate**]
- BI provides expected offload of 24 packages per minute for exit RIGHT1 [**enrich**]
- This exceeds threshold of 10% deviation [**state change**]
  - Alert is generated to lower the intake at entry, or to schedule additional employees at the exits in the ERP

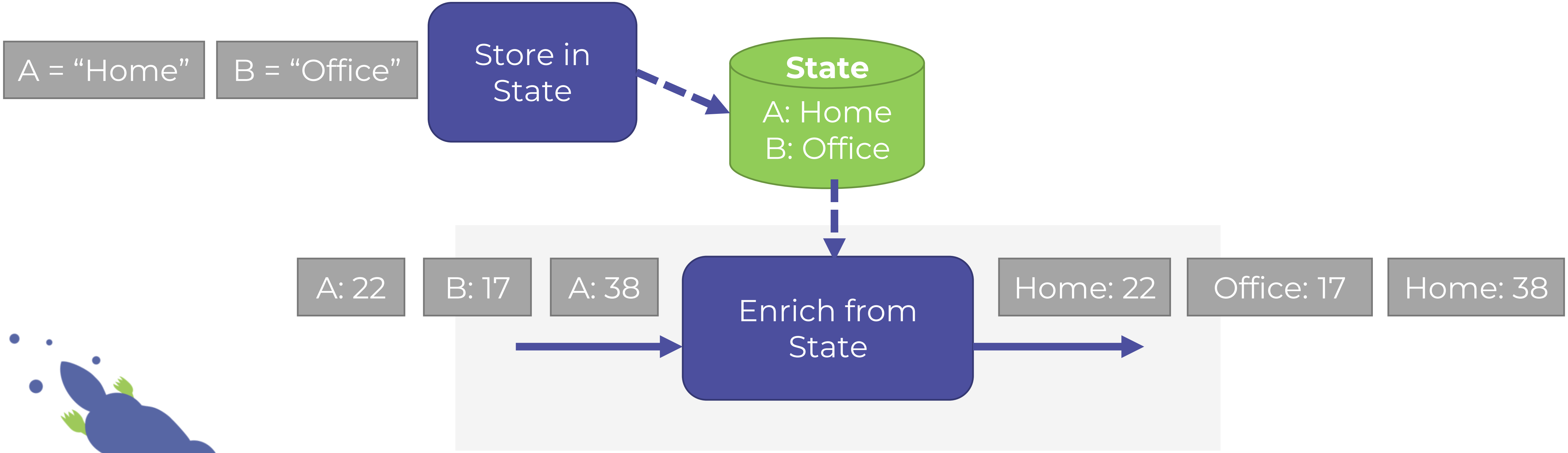


How can we realize this with eMagiz State Generation

New, **optional**, components that have a state

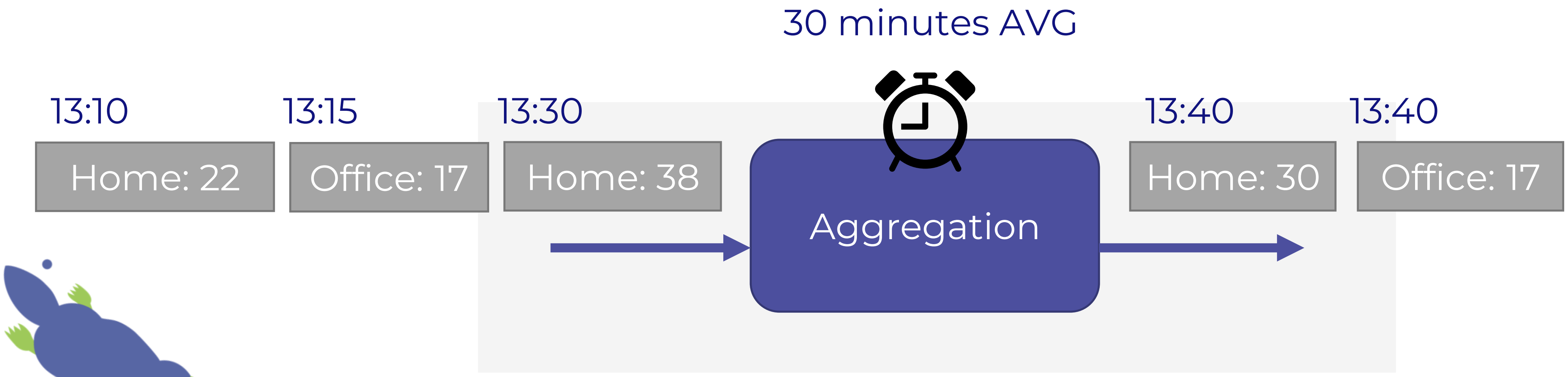
Enrich

- Enrich a message based on a lookup for a certain key
- High performance



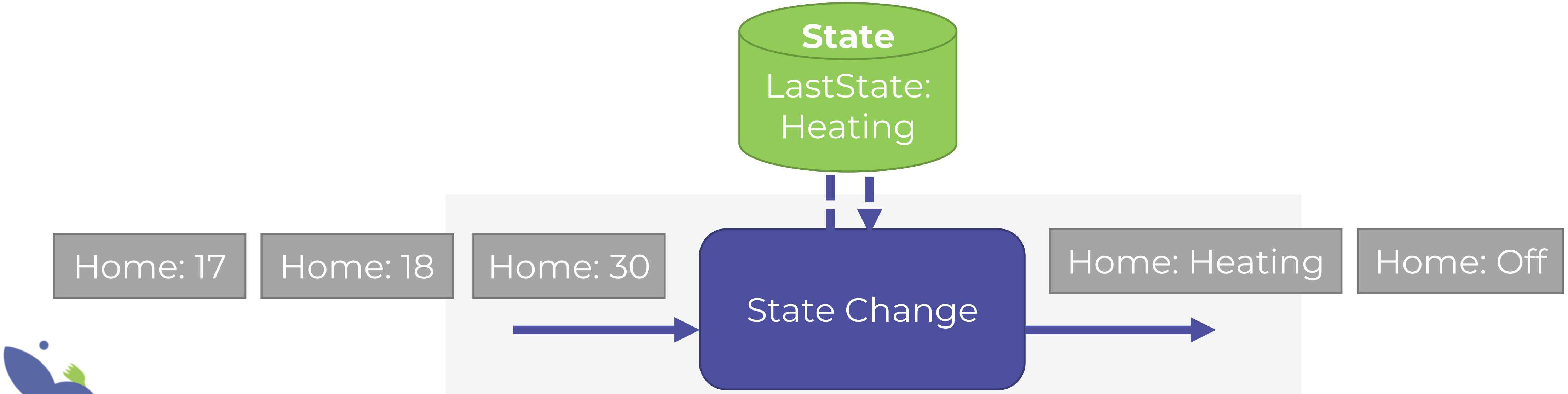
Aggregation

- Compute an aggregation, such as average, minimum, maximum, etc (optionally grouped by a key) over a certain range of time.



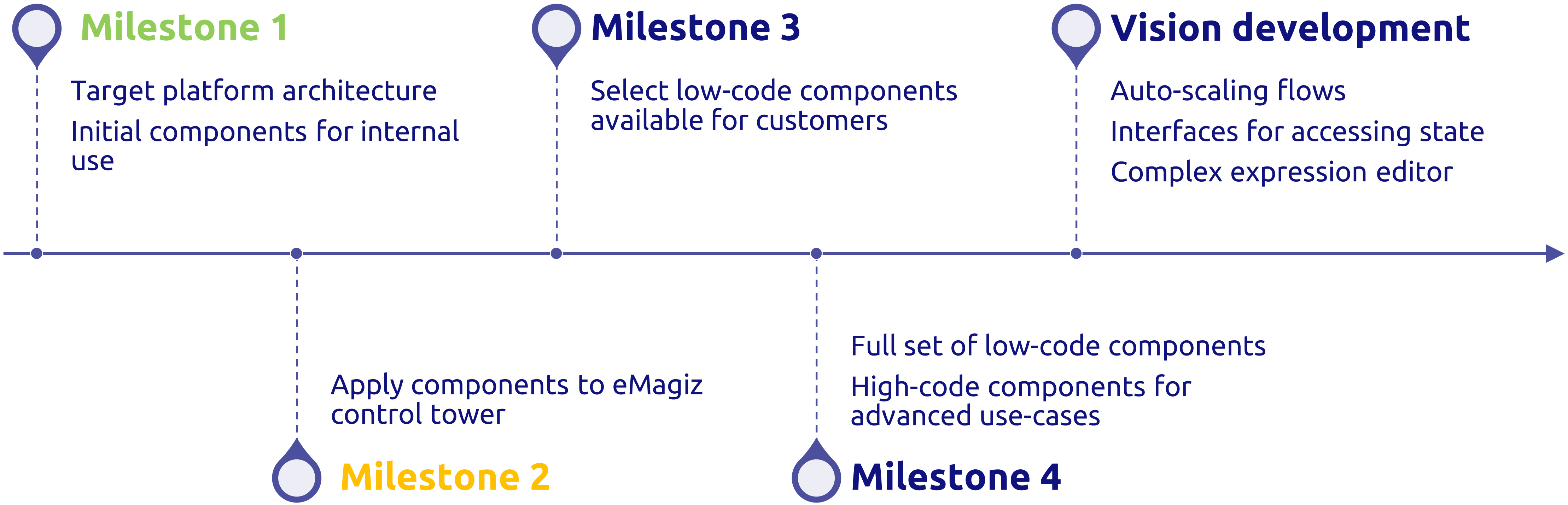
Change detection

- Detect and send out notifications for certain state changes
- Can define complex state transition logic
- Can also enrich messages with state change, and optionally pass only messages causing state changes or all input messages.



When >= 30 and LastState = Heating, Go into Off mode
When >= 30 and LastState = Cooling, Go into SuperCool mode

Timeline



Milestone 1

Target platform architecture

Initial components for internal use

Milestone 2

Apply components to eMagiz control tower

Milestone 3

Select low-code components available for customers

Milestone 4

Full set of low-code components

High-code components for advanced use-cases

Vision development

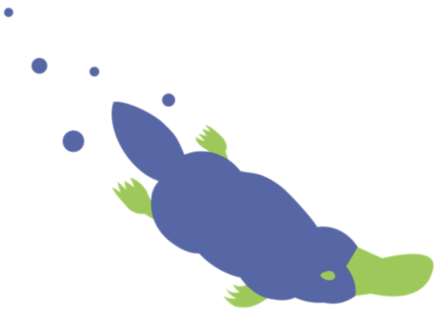
Auto-scaling flows

Interfaces for accessing state

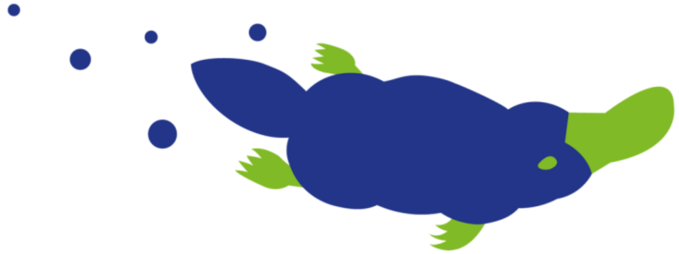
Complex expression editor

Summary

- Data grows exponentially
- Real-time processing enables us to do real-time decision making
  - Enrich
  - Aggregate
  - Detect changes
- The future of eMagiz towards real-time statefull processing.



Thank you!



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