HackaTown

MareNostrum Team

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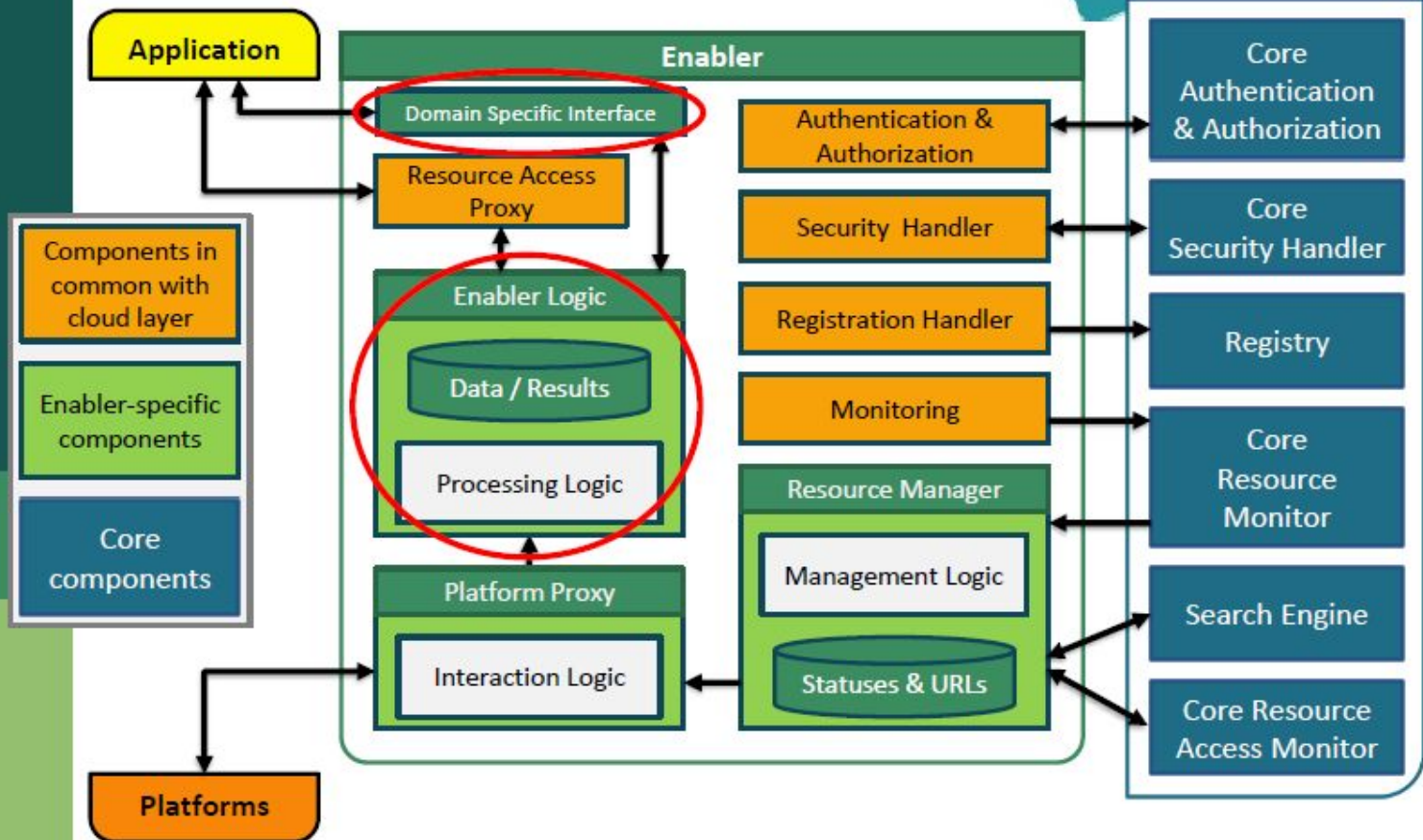
Enabler challenge

Challenge

Design and build a symbIoTe Enabler to provide your specific smart city service on top of symbIoTe-enabled resources (sensors, actuators and services)
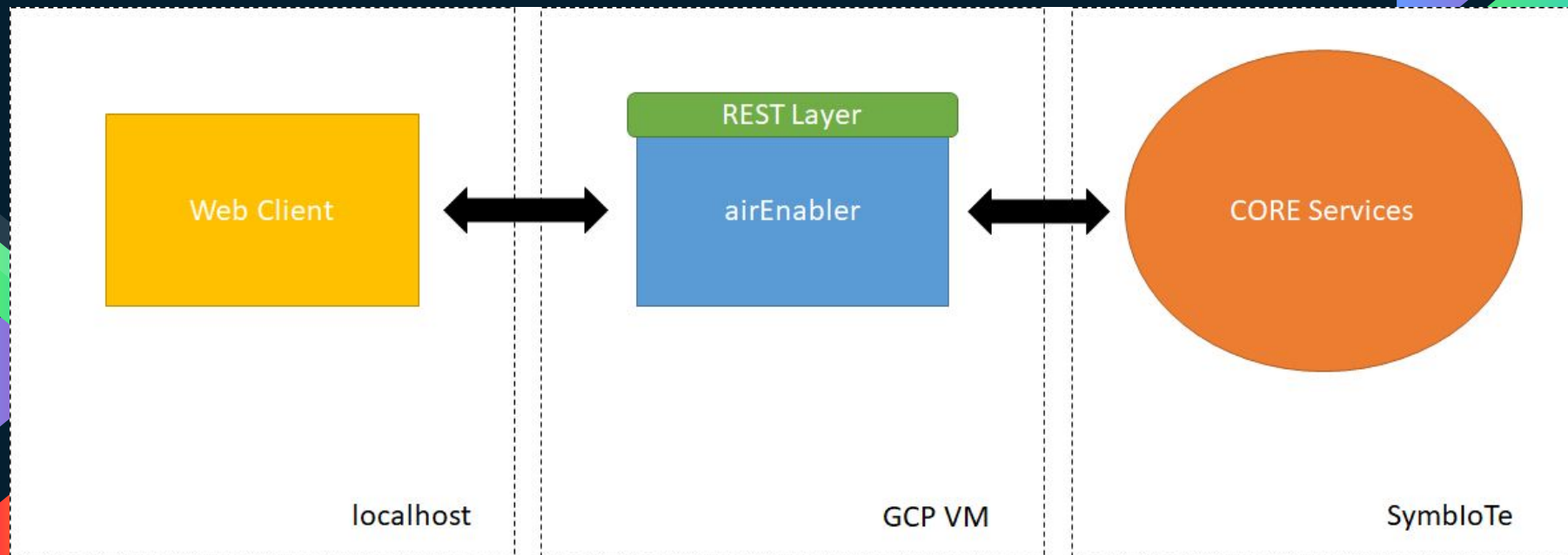
Challenge

- › Combine existing information from sensors/actuators and adds additional information from other sources
- › Uses data analytics and provides analysed data
- › Uses interpolation for non existing data

Generic architecture

symbloTe

symbloTe Core

Application

Components in common with cloud layer

Enabler-specific components

Core components

Platforms

Enabler

Domain Specific Interface

Resource Access Proxy

Enabler Logic

Data / Results

Processing Logic

Platform Proxy

Interaction Logic

Authentication & Authorization

Security Handler

Registration Handler

Monitoring

Resource Manager

Management Logic

Statuses & URLs

Core Authentication & Authorization

Core Security Handler

Registry

Core Resource Monitor

Search Engine

Core Resource Access Monitor

Our architecture

Our process is easy

Get Air quality data from sensors → **Analyze collected data** → **Serve data for client** →

Interoperability

Air quality in Zagreb

Pollution limits

	watchout	advice	danger
NO2	140 μg/m³	160 μg/m³	200 μg/m³
PM10	-	50 μg/m³	80 μg/m³

Data from Barcelona city council

Data Processing

```
{
   "no2": [
      {
         "latitude": 45.789845,
         "longitude": 15.916228,
         "value": "3.0",
         "uom": {
            "symbol": "μg/m³",
            "name": "μg per cubic meter",
            "iri": "microPerCubicIri",
            "description": [
               "NO2 concentration in μg/m³"
            ]
         }
      },
      {
         "latitude": 45.82069,
         "longitude": 15.979998,
         "value": "4.0",
         "uom": {
            "symbol": "μg/m³",
            "name": "μg per cubic meter",
            "iri": "microPerCubicIri",
            "description": [
               "NO2 concentration in μg/m³"
            ]
         }
      },
      … …
```

- Filter data with same units and not null

- Sensors from a **requested zone**

- Storage of enablers responses
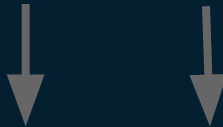
Prediction and pattern recognition

Data Analysis
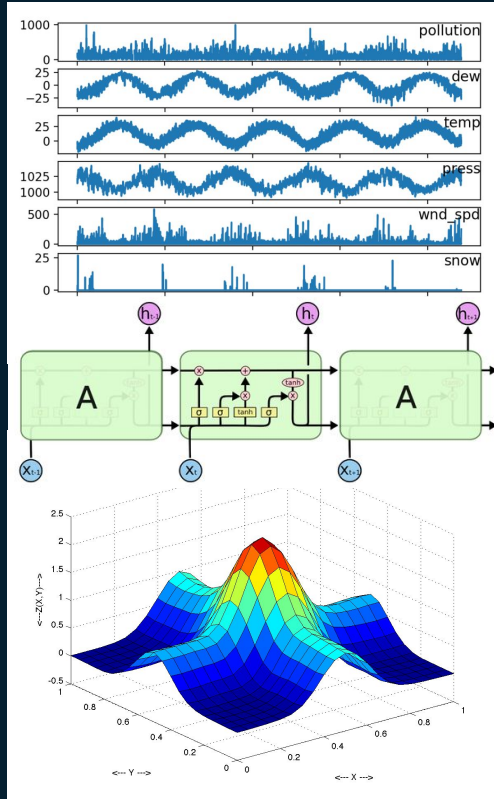
- Dataset from historical data collection

- Create Time series data

- Model a LSTM predictor

- Radial Basis Functions for smoothing / interpolation

- Predictions for next 24h in a map grid area

Business potential

Multiple potential service consumers:

- Social outdoor events organization

- Health metrics for healthcare services

- In-city traffic regulation

- Public awareness

- ...

CLIENT EXAMPLE

Demo

THANKS!

Any questions?