TECNOPORT 2025

A project for freight logistics in the port of Seville

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INTRODUCTION

Present situation

Seville is the only inland port in Spain

Canary Islands-Seville-Madrid corridor

Very special features because an intermodal transport is used

Tecnoport was born to optimize the intermodal transport methods

INTRODUCTION

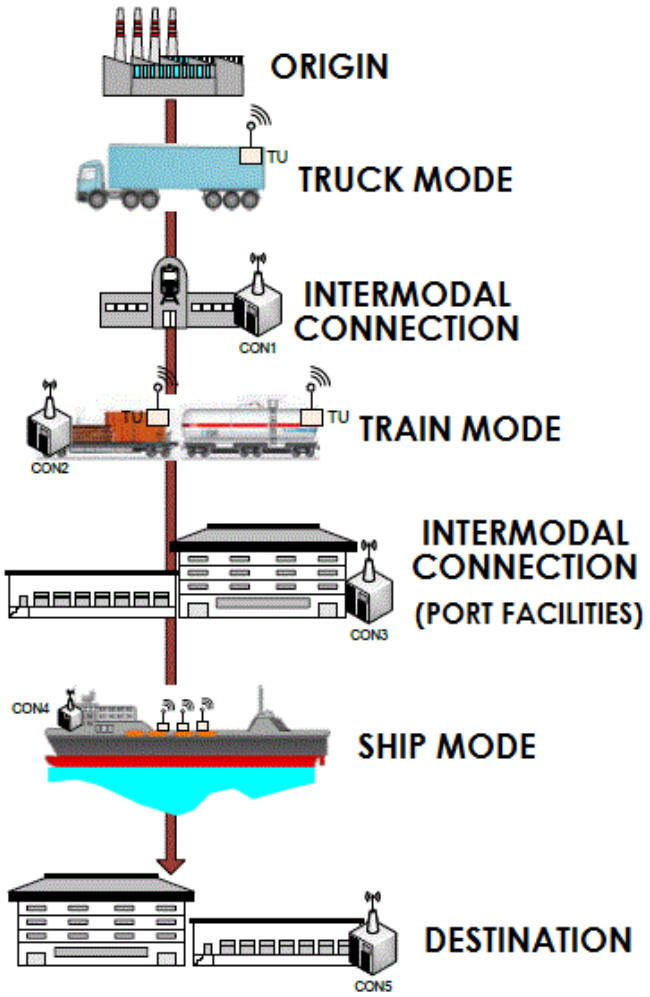
Main objectives

Reduce external cost

Optimize intermodal traffic routes

Improve logistic

Development and application of technology



GENERAL OVERVIEW

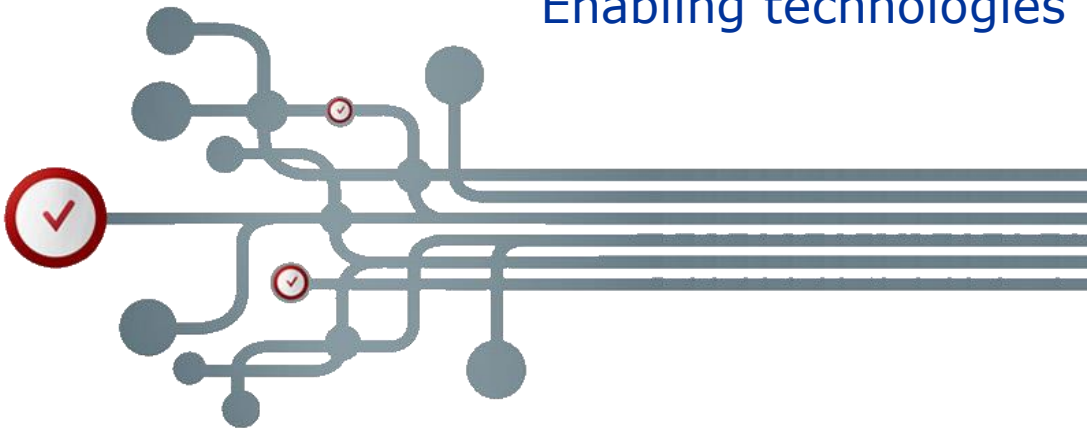
Divided into three axes of actions

FPS

eRIO

CUTs

Enabling technologies



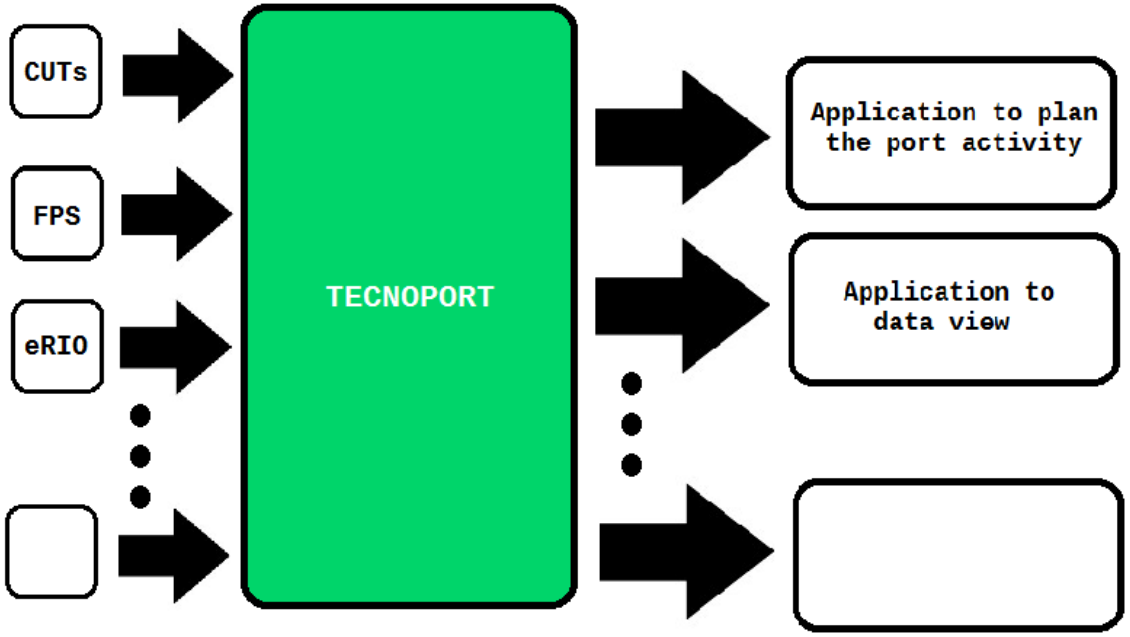
GENERAL OVERVIEW

Operation schema

Uses the existing subsystems

Add new subsystems

Development of existing or new applications



CUTs

Cooperative unitized tracking system

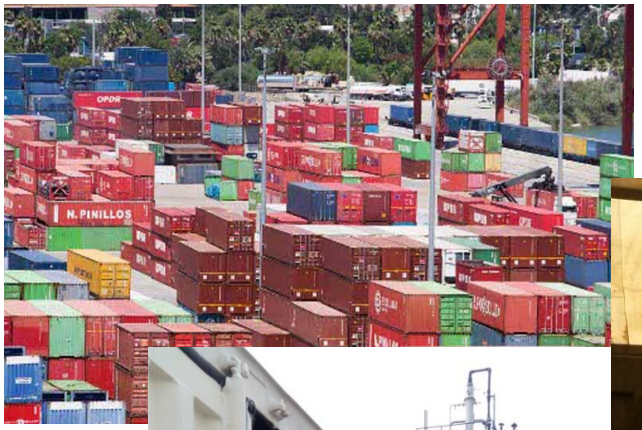
Geolocation

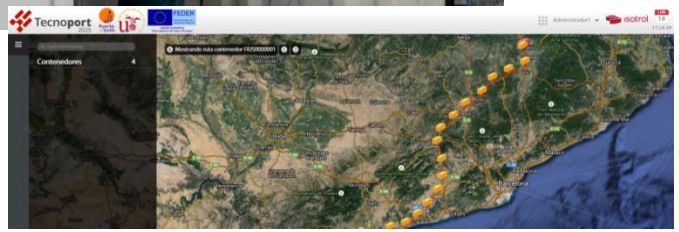
Monitoring
- Periodic data
- Alarms/Events

Tracking
- Canary Island-Seville-Madrid

Field Action
- Send commands to terminal node

New capabilities and services





CUTs

Transportation modes

Terminals and warehouse

CUTs

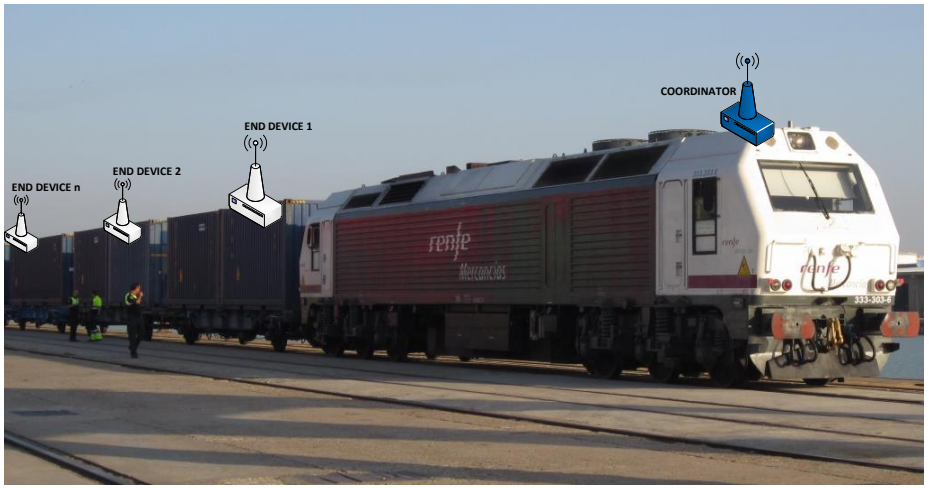
Truck place devices

- GPRS Coordinator
- One end-device
- Sensors

CUTs

Train place devices

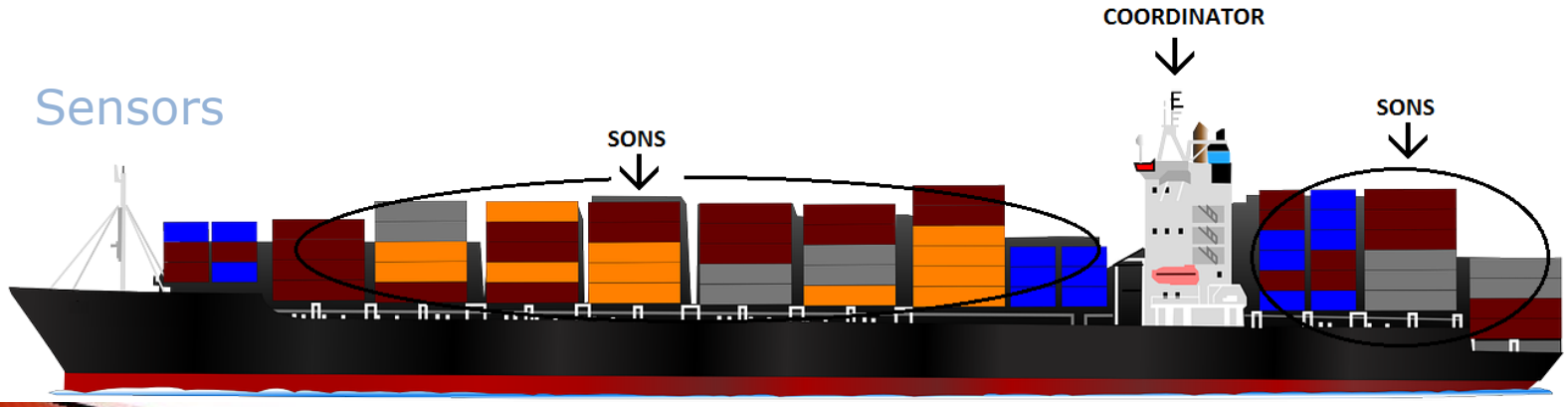
- Several end-device in each container in a star network
- Sensors
- GPRS Coordinator



CUTs

Ship place devices

- GPRS/Satellite coordinator
- Several end device in a star network
- Sensors

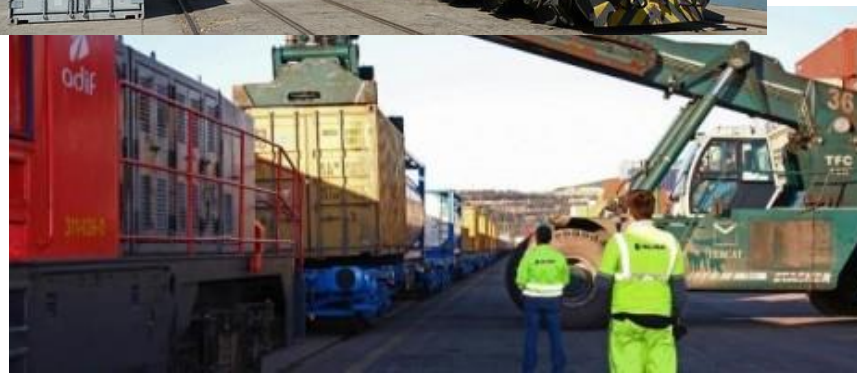


FPS

Ferro port system

Signaling systems for conventional rail are not suitable for particular installations

FPS objective is improve the safety through innovation and automation



FPS

Monitoring

- Sensor of occupation of the railroad
- Automatic detection of length

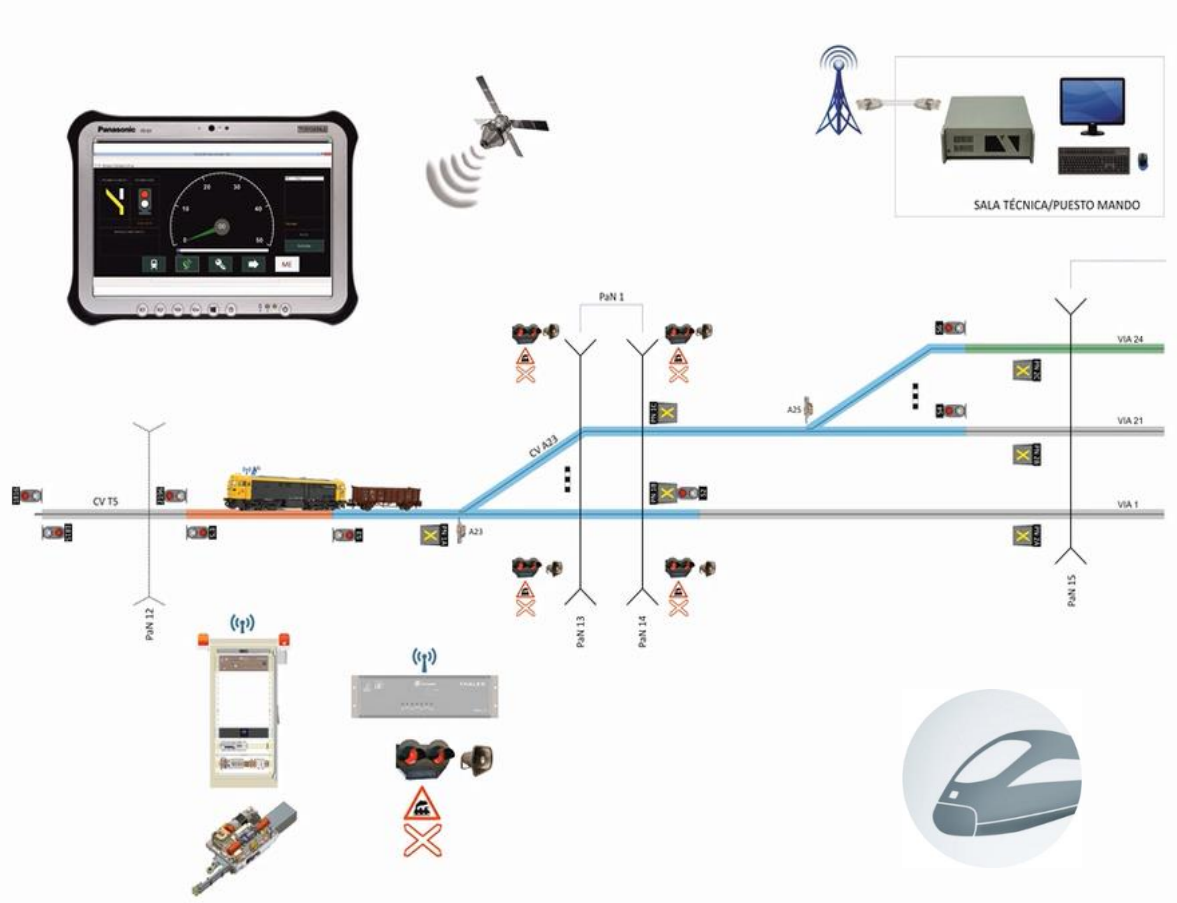
Automation

- Switch rail

Input and output planning

Virtual signaling

Train driver support



FPS

Automatic switch rail

eRIO

Electronic river Information and Optimization

River monitoring
- Periodic data
- Alarms/Events

Field action
- Send commands

Data base
- From several systems

SIVN: System Information Via navigable
- RIS Standar

Traffic planning and monitoring

Electronic nautical chart

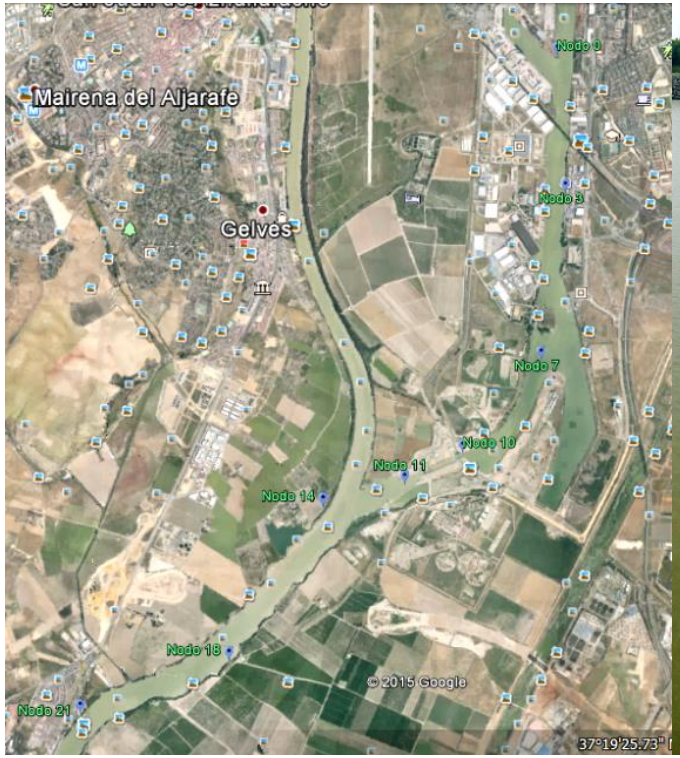
Navigator support

Complementary signaling

eRIO

Sensor Network

- Autonomous
- Very low power consumption
- Powered by solar energy
- Over the whole river
- Scalable
- Low maintenance cost



ENABLING TECHNOLOGIES

Communication network

Sensor network

Service integration platform

ENABLING TECHNOLOGIES

Communication network

- New communication infrastructure
- End to end security
- Total coverage
- Several network technologies integration

- WiMax
- Satellite
- 3G

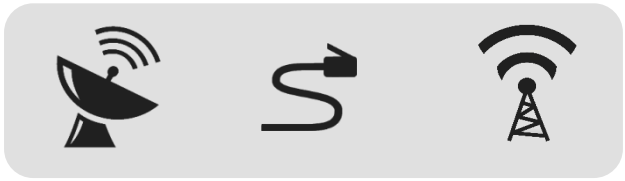
ENABLING TECHNOLOGIES

Sensor network

- **Send data**
- Periodic data
- Alarms/Events
- Public, open and expandable
- Bidirectional
- Low power consumption

- **Collaborative**
- 802.15.4
- IP
- 3G

FIWARE
OPEN APIs FOR OPEN MINDS

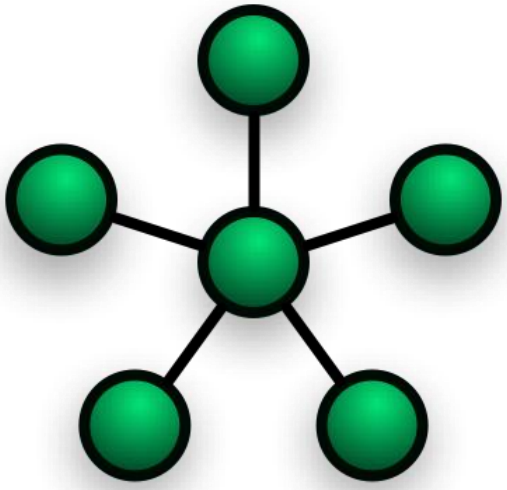


ENABLING TECHNOLOGIES

Sensor network

CUTS

- CUTS cover the whole way of the containers
- Star network
- Synchronous networks
- Periodic data
- Different channels for each transportation mode
- Automatic mode change by scanning

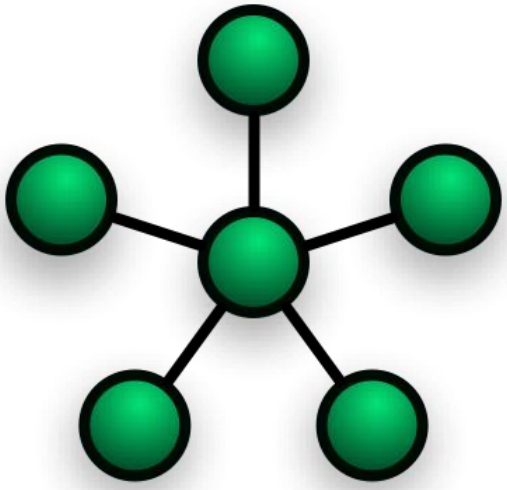


ENABLING TECHNOLOGIES

Sensor network

FPS

- Star network
- Asynchronous networks
- Alarms/Events
- Periodic data

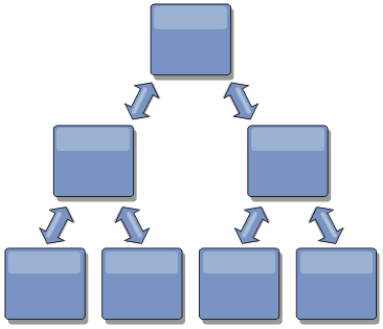


ENABLING TECHNOLOGIES

Sensor network

eRIO

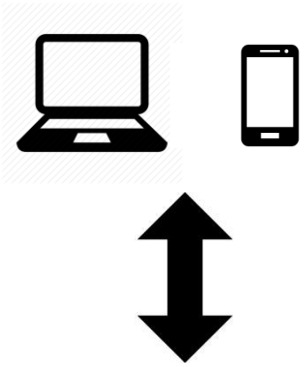
- Tree topology
- Two levels of routers
- Synchronous networks
- Periodic data
- Two subnetworks
- 90 Km covering area



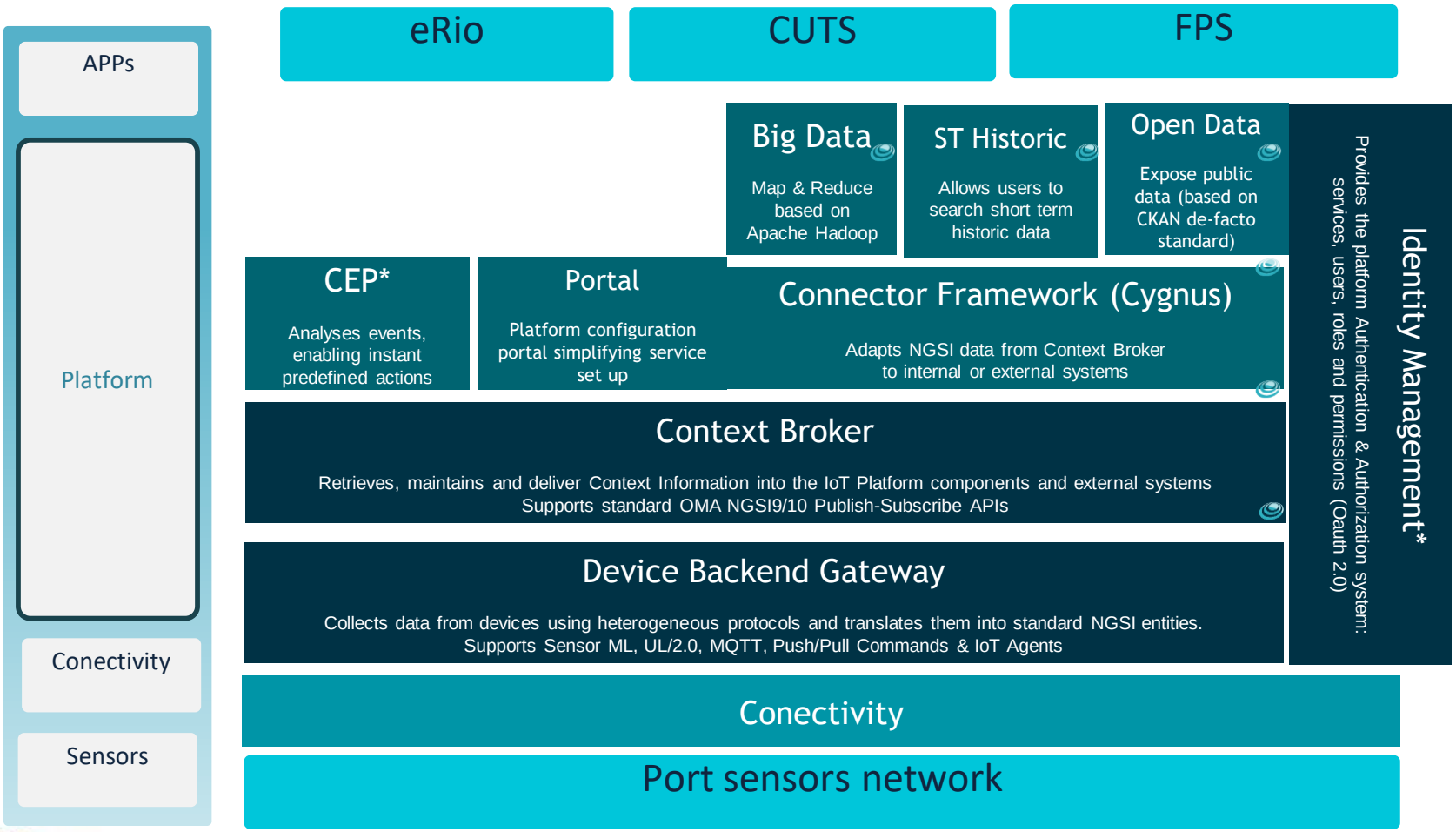
ENABLING TECHNOLOGIES

Service integration platform

- All technologies integrated
- Modular and scalable design
- Link between different data sources and applications



FIWARE
OPEN APIs FOR OPEN MINDS


APPs
Platform
Conectivity
Sensors
eRio
CUTS
FPS
Big Data
Map & Reduce based on Apache Hadoop
ST Historic
Allows users to search short term historic data
Open Data
Expose public data (based on CKAN de-facto standard)
Identity Management*
Provides the platform Authentication & Authorization system: services, users, roles and permissions (Oauth 2.0)
CEP*
Analyses events, enabling instant predefined actions
Portal
Platform configuration portal simplifying service set up
Connector Framework (Cygnus)
Adapts NGSI data from Context Broker to internal or external systems
Context Broker
Retrieves, maintains and deliver Context Information into the IoT Platform components and external systems
Supports standard OMA NGSI9/10 Publish-Subscribe APIs
Device Backend Gateway
Collects data from devices using heterogeneous protocols and translates them into standard NGSI entities.
Supports Sensor ML, UL/2.0, MQTT, Push/Pull Commands & IoT Agents
Conectivity
Port sensors network

MAIN INNOVATIONS

- Containers geolocation and monitoring in whole intermodal transport chain
- Low power consumption and autonomous network
- Improve safety through automation
- Logistic optimization
- Traffic, pollution and noise reduction
- Integrating platform of all services and applications

THANK YOU for your attention

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