

5G TRANSFORMER

5G MOBILE TRANSPORT PLATFORM FOR VERTICALS

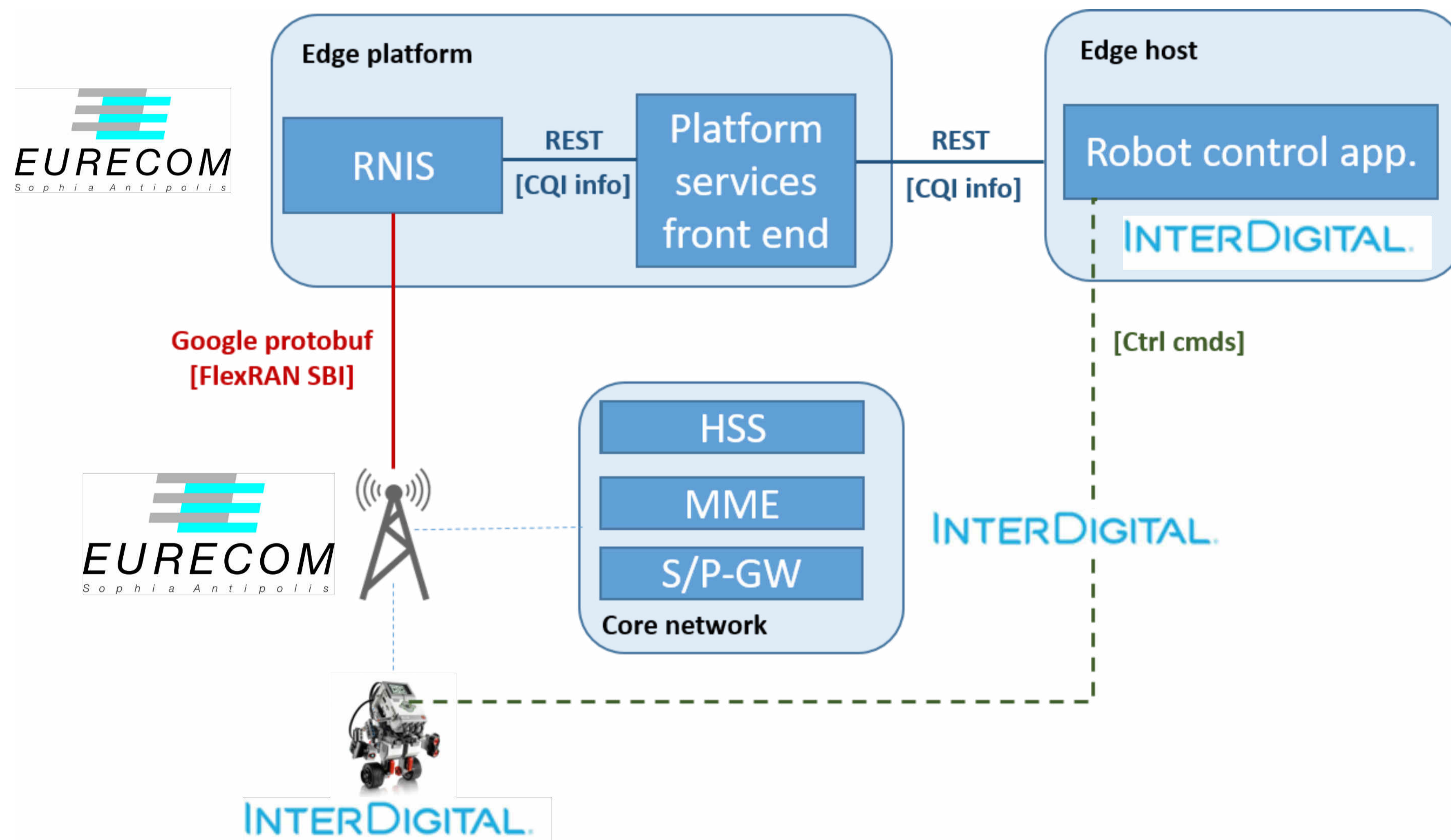
ROBOTIC CONTROL LEVERAGING A RADIO NETWORK INFORMATION SERVICE (RNIS)

Motivation

For various **time critical** and/or **bandwidth demanding** applications, **RAN-level information** are vital. This information can be used for run-time application behavior adaptation. For **cloud robotics** in particular, where **low latency** is often a requirement, robotic control can be executed from application instances running at the edge cloud. It is then necessary to create the **infrastructure support** for the provision of such RAN-level information to **MEC** application instances and to demonstrate ways to **effectively utilize them**.

High-level view

- RNIS provided as a MEC platform service
- A robotic control application accesses the RNIS over its RESTful HTTP northbound interface
- Based on the received RAN-level information, it executes the appropriate remote control actions.



Demo platform

LTE mobile network

- OpenAirInterface eNodeB and virtualized EPC
- USRP B210 RF board (eNodeB radio head)

RNIS

- HTTP/REST NBI exposed as a MEC service
- Southbound communication (FlexRAN protocol) with agent built into eNodeB
- Channel Quality Indications (CQI) are reported

Robot control

- Lego Mindstorms robot equipped with LTE interface
- Control agent embedded into robot
- Control app hosted at the edge

Application scenarios

Example demo app

- Robot moves towards a direction while CQI is remotely monitored
- When control app detects a CQI drop below a threshold, it instructs the robot to return
- CQI info is visualized in real time

Potential application areas

- Automated channel quality surveys/mapping
- Remote surveillance in disaster recovery situations