Piccolo - In-network compute for 5G services Use cases

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COINRG

26th July 2021
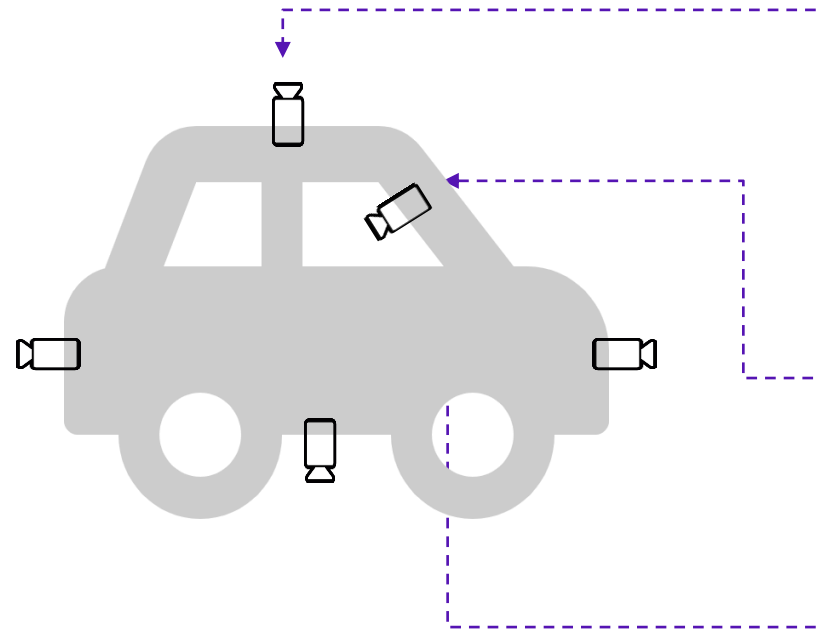
Automotive real-time 'Risk Index'

What

- A real-time measure of the 'situational risk' of a vehicle
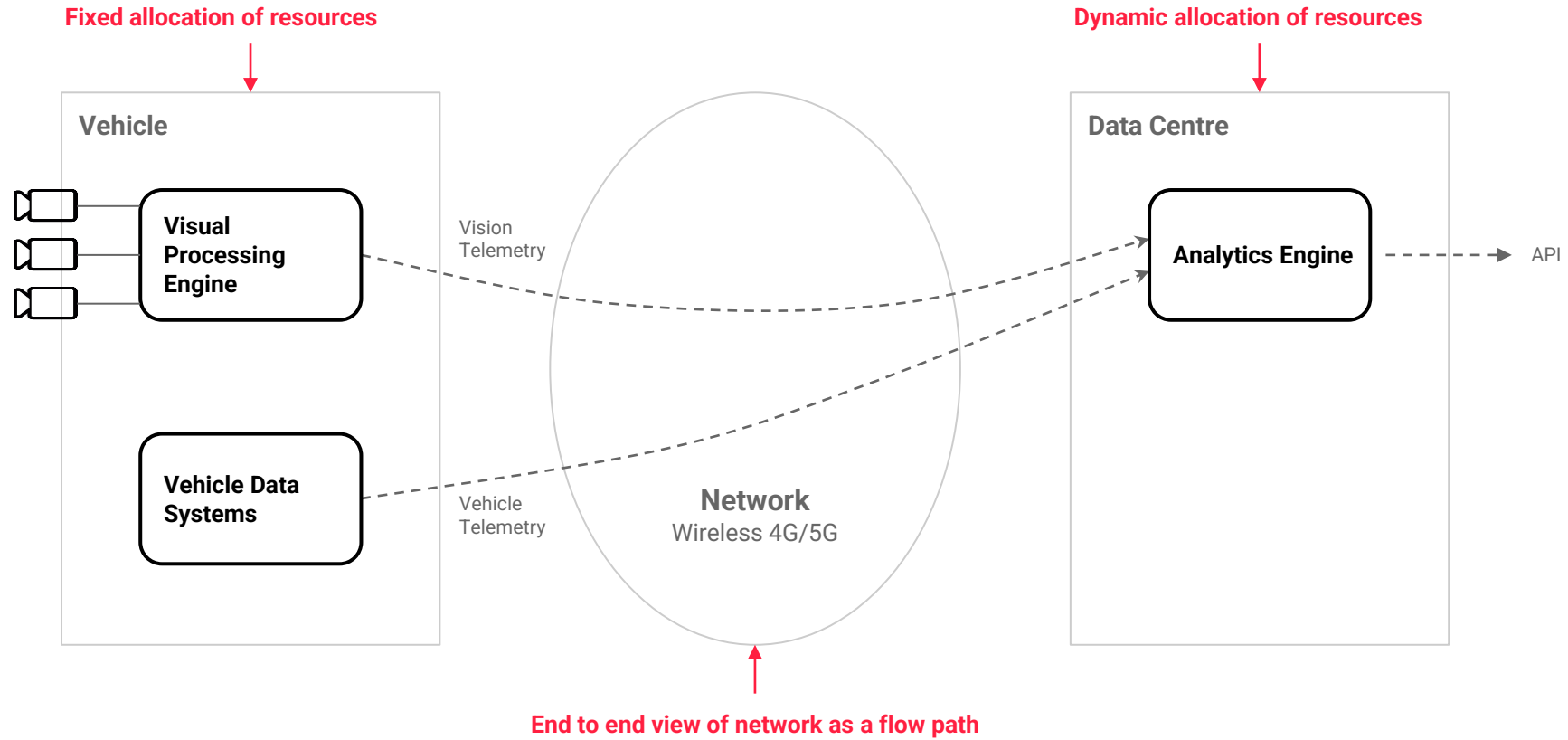
Why

- Modification of vehicle occupant/ driver behaviours

- Decision support for remote fleet operations & control entities

- Ecosystem optimisation:
  - underwriting & insurance, policing
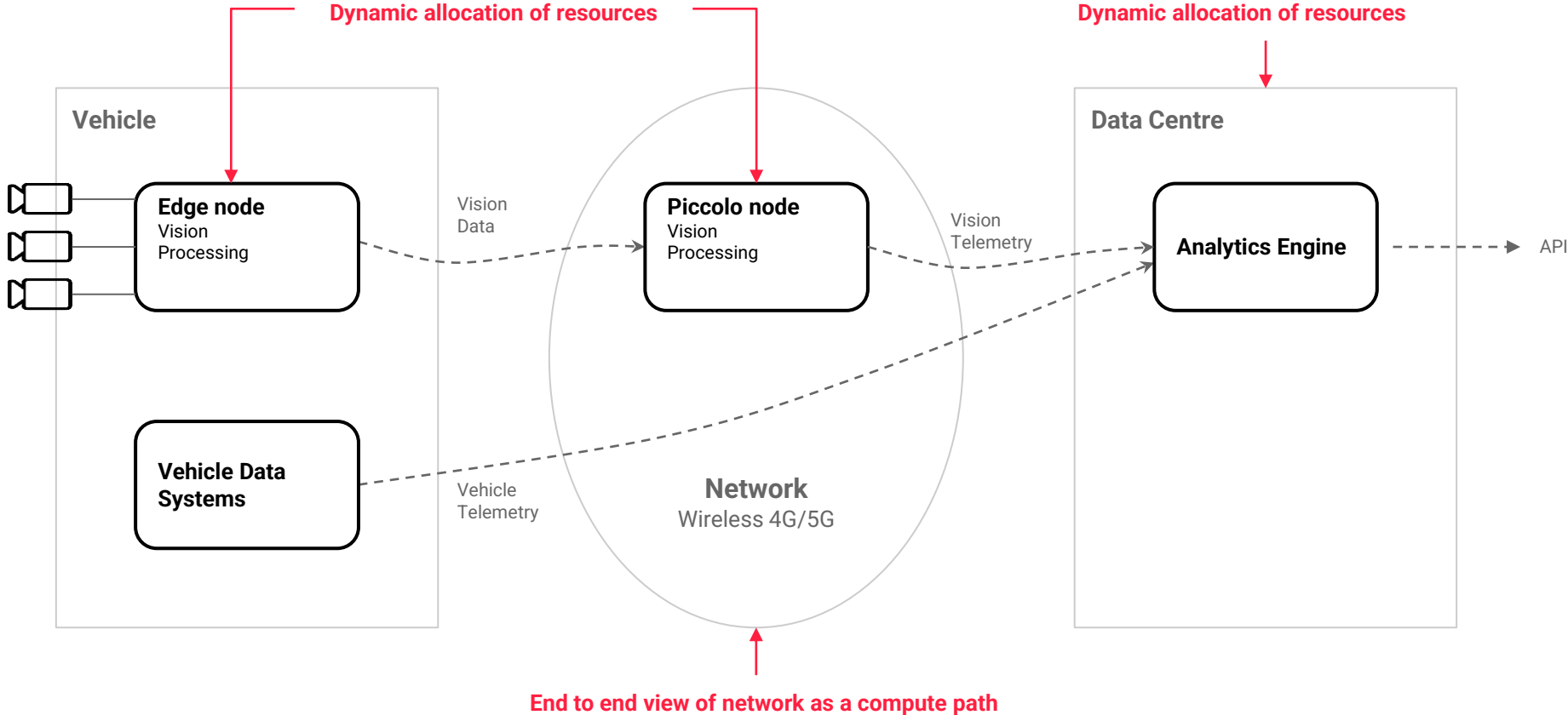 - urban planning

How

- Visual sensing of the situation and behaviours outside the vehicle
  - Environmental conditions
  - Humans and animals
  - Objects & hazards

- Visual sensing of the situation inside the vehicle
  - Human behaviour

- State of the vehicle and its subsystems
  - Vital signs
  - subsystem health etc.

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Current architectural state of the art

Fixed allocation of resources

Dynamic allocation of resources

Vehicle

Data Centre

Visual Processing Engine

Vehicle Data Systems

Vision Telemetry

Vehicle Telemetry

Network
Wireless 4G/5G

Analytics Engine

API

End to end view of network as a flow path

Piccolo architecture

PoC design - Automotive real-time 'Risk Index'

26/07/2021 16:48   Piccolo consortium. Philip Eardley   π PICCOLO
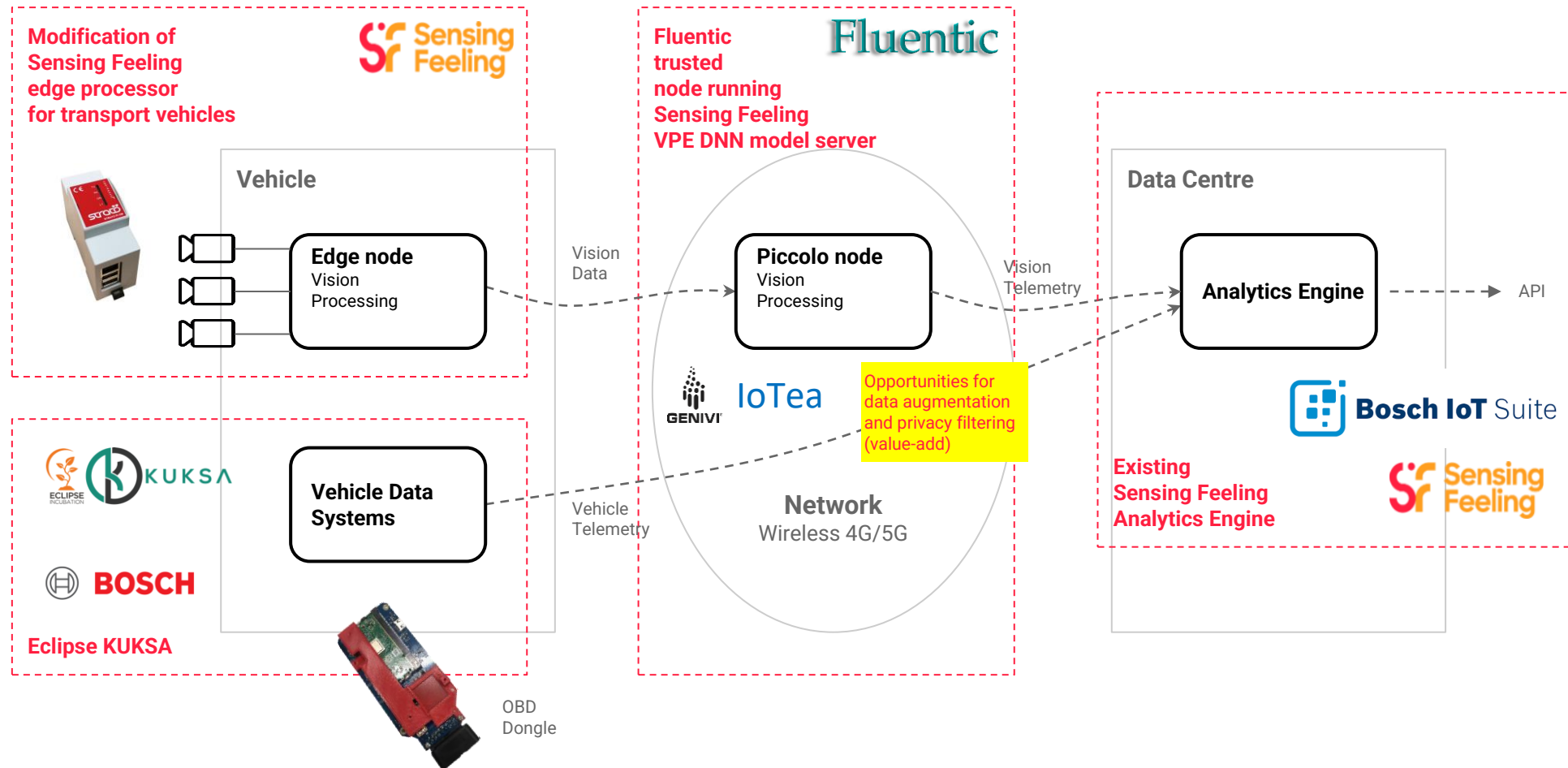
Topics under development & Research questions

- Re-engineer the in-network logic to be able to handle multiple edge nodes
- Orchestration/control function eg to deliver algorithms to the network nodes
- Capabilities of in-network nodes: just ML/DNN inferencing or arbitrary logic?
- Flex resources up or down to handle concurrent demand
- Ensure the in-network execution is secure & private, as the vehicle moves

Piccolo – key facts

- Collaborative project under the Celtic framework
- Jointly funded by Partners and Innovate-UK (UK) & BMWi (Germany)
- 2 years from October 2020
- https://www.piccolo-project.org/
- Keen to collaborate through fora such as COINRG

Partner	Key people
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