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Deep AR Law Enforcement Ecosystem

DARLENE - MEC for AR in a law enforcement ecosystem

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ETSI MEC meeting, March 2023

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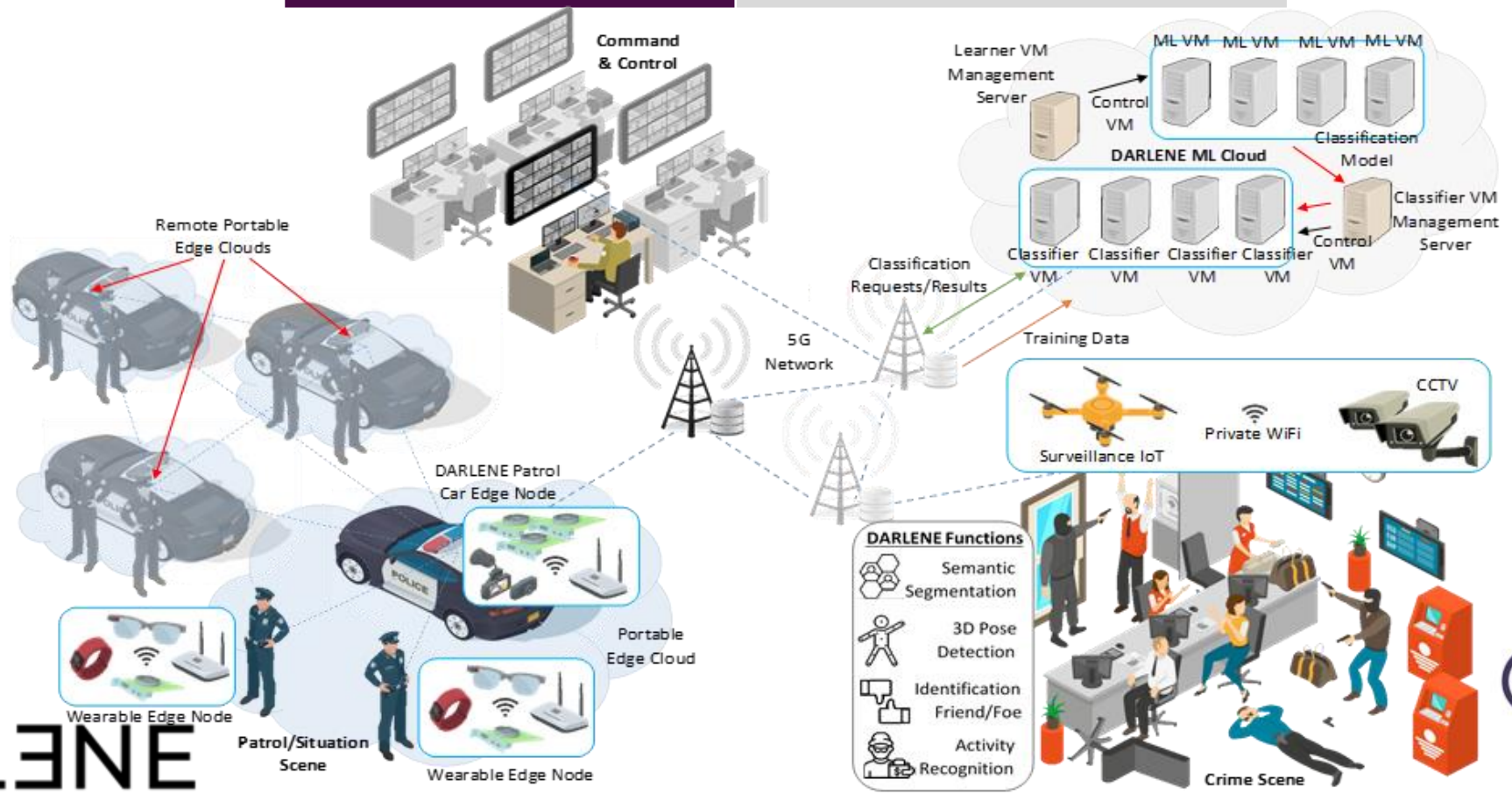
Outline

- Introduction
- MEC architecture
- MEC implementation
- Conclusions

INTRODUCTION: MEC IN DARLENE

Start Date:	**1**
End Date:	**36**

WP Leader:	**CTTC**
WP Contributors:	**CERTH, FORTH, THALES, EBOS, YBQ, CTTC.**



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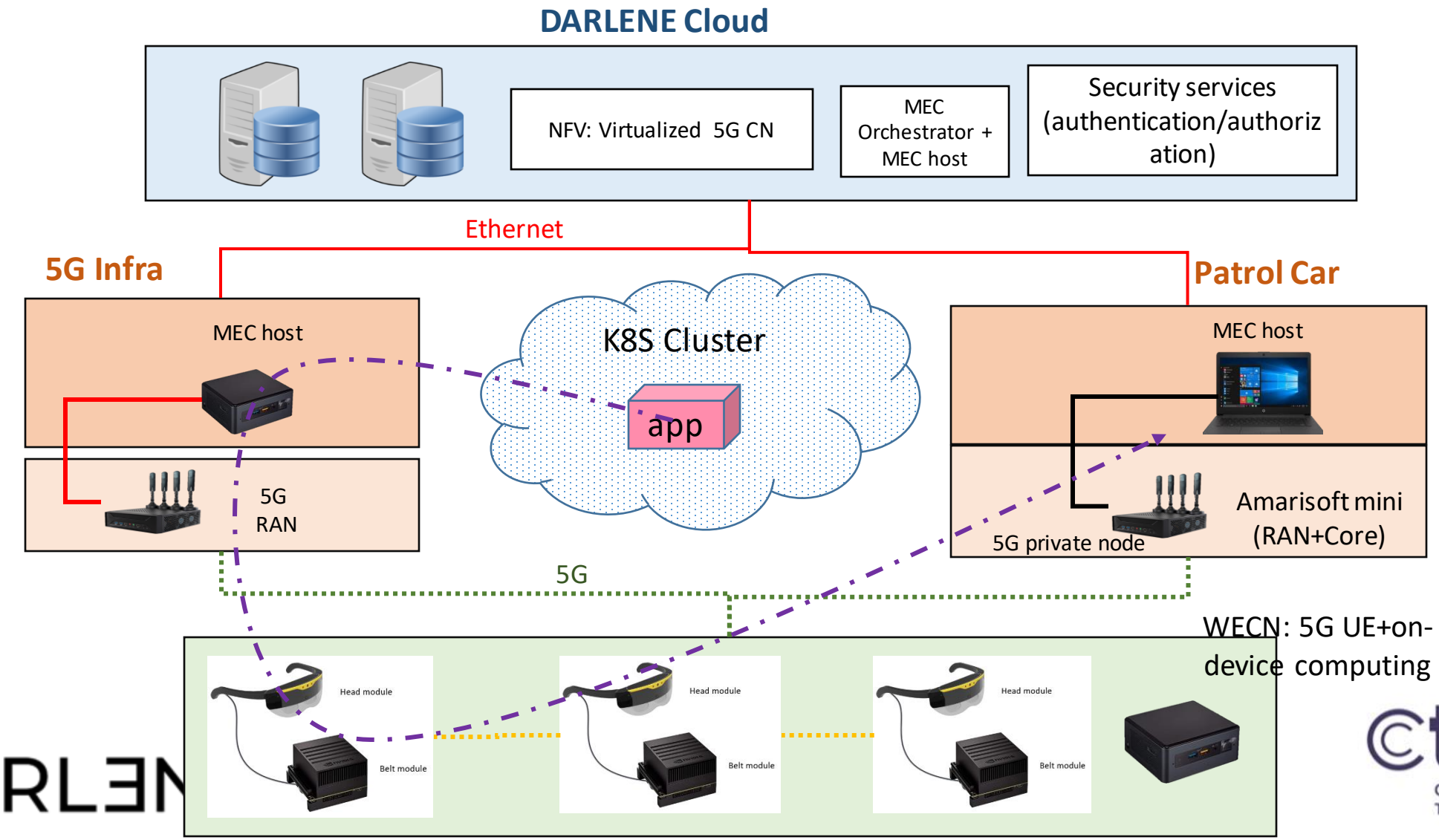
DARLENE 5G-MEC OVERVIEW



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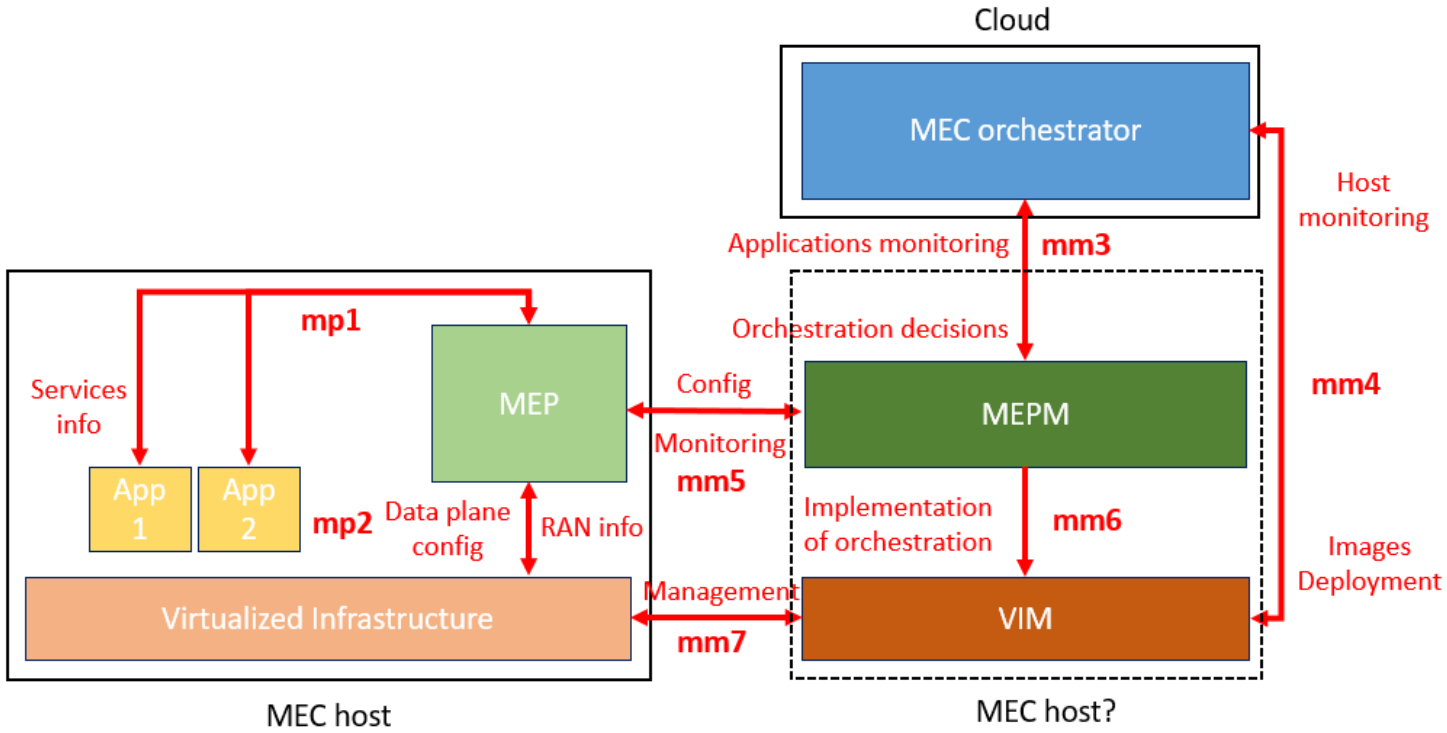
ETSI-MEC in DARLENE

- MEC-O: lightweight orchestrator based on python and Kubernetes monitoring tools.
- VIM: Kubernetes.
- MEPM: collect net status (latencies), battery level,
- App: deployed in containers.



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MEC application for DARLENE

- MEC app: Video analysis for AR. Object recognition, 3D video pose estimation.
- Input: Video stream encoded in h264
- Output: labels of object recognition to display on the AR glasses.
- MEC role: Decide host placement to optimize end-user battery, app quality (framerate).

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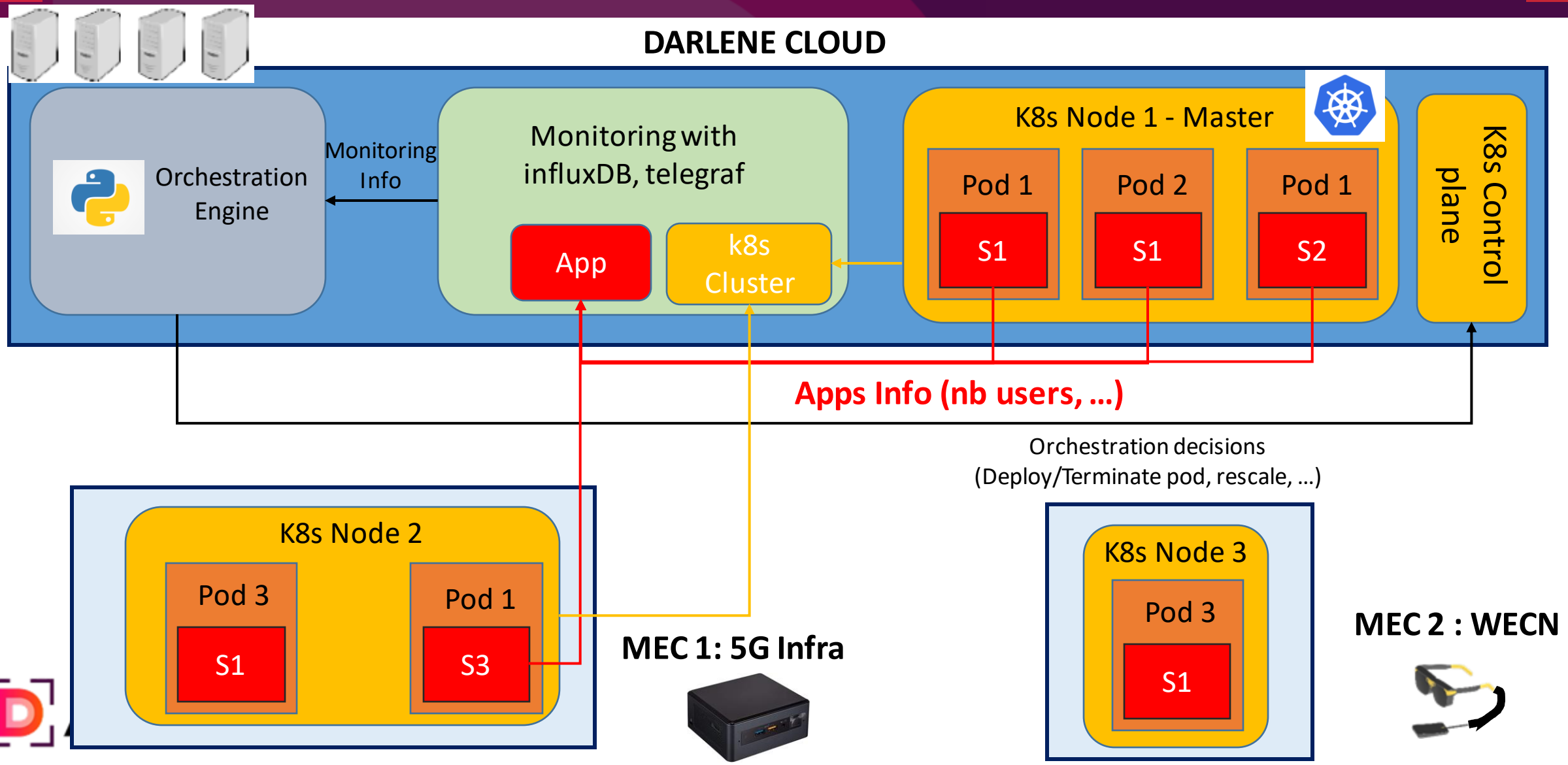
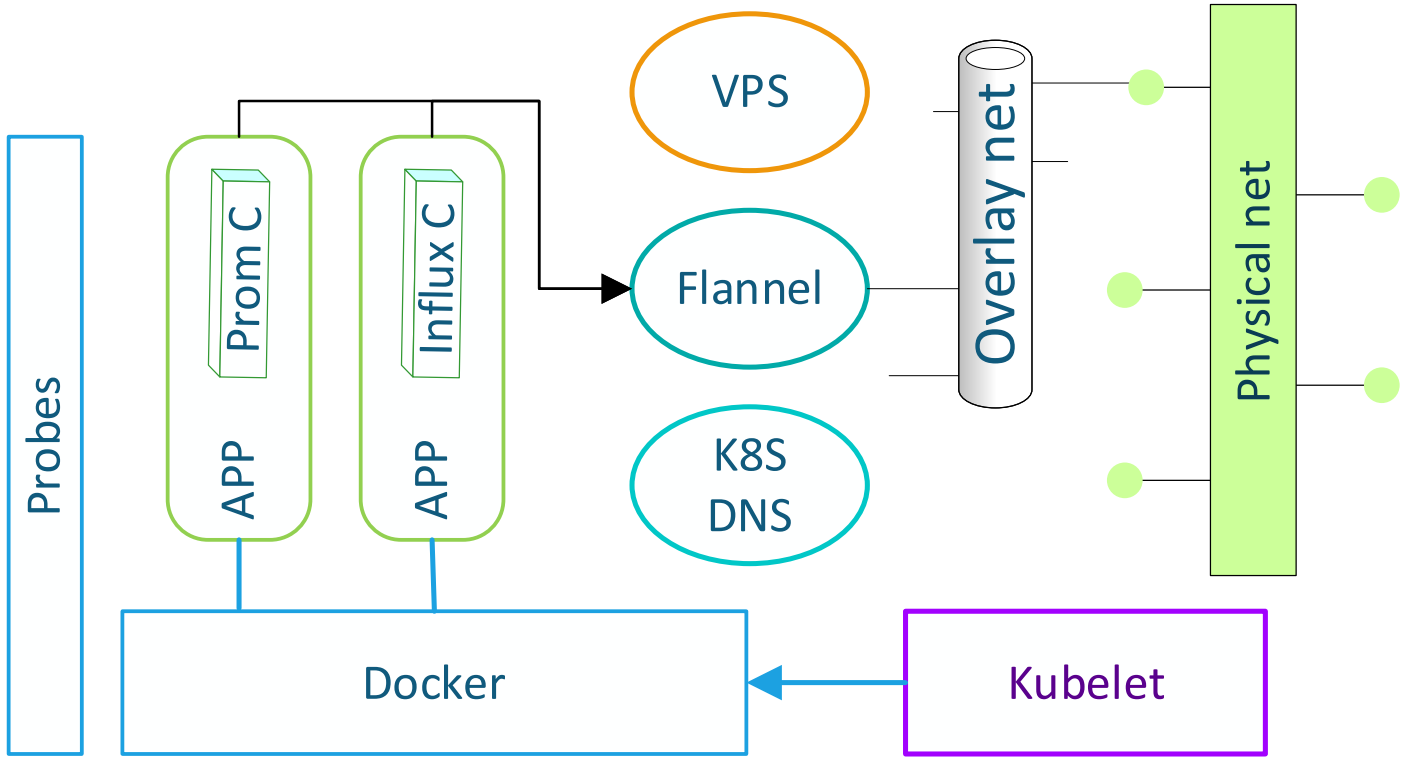
MEC implementation



MEC implementation: monitoring

- Probes are configured to gather
  - Latency between each layers
    - Cloud to edge
    - Cloud to devices
    - Cloud to cloud
  - Batteries level



MEC orchestration

- Goal: optimize tradeoff battery life, app quality (visual accuracy)
  - MEC offloading to extend battery.
  - Net condition impairs video => AR app desynchronized, flickering effects.
- Monitored information for MEC orchestration:
  - Network latencies between computing layers.
  - Battery level
  - QoS application metric: video fps for each MEC host layer
- MEC orchestration algorithm.
  - Threshold based: Place to host if expected fps > th. (From cloud to edge)
  - Reinf. Learning: Optimize battery level and app quality (fps)
    - Action: application is moved to given MEC host layer
    - State: (Current layer hosting app; latency of layers; current battery level; current quality application :fps)
    - Reward: weighted battery level , app quality (fps)

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Conclusions

- DARLENE: MEC for AR application
- Architecture within ETSI-MEC scope
- DARLENE MEC implementation: Kubernetes, InfluxDB, optimize battery usage and end-user QoS.

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Questions - Discussion

CTTC, THALES

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Thank you for your attention!

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