5G NORMA:

An adaptive mobile network architecture

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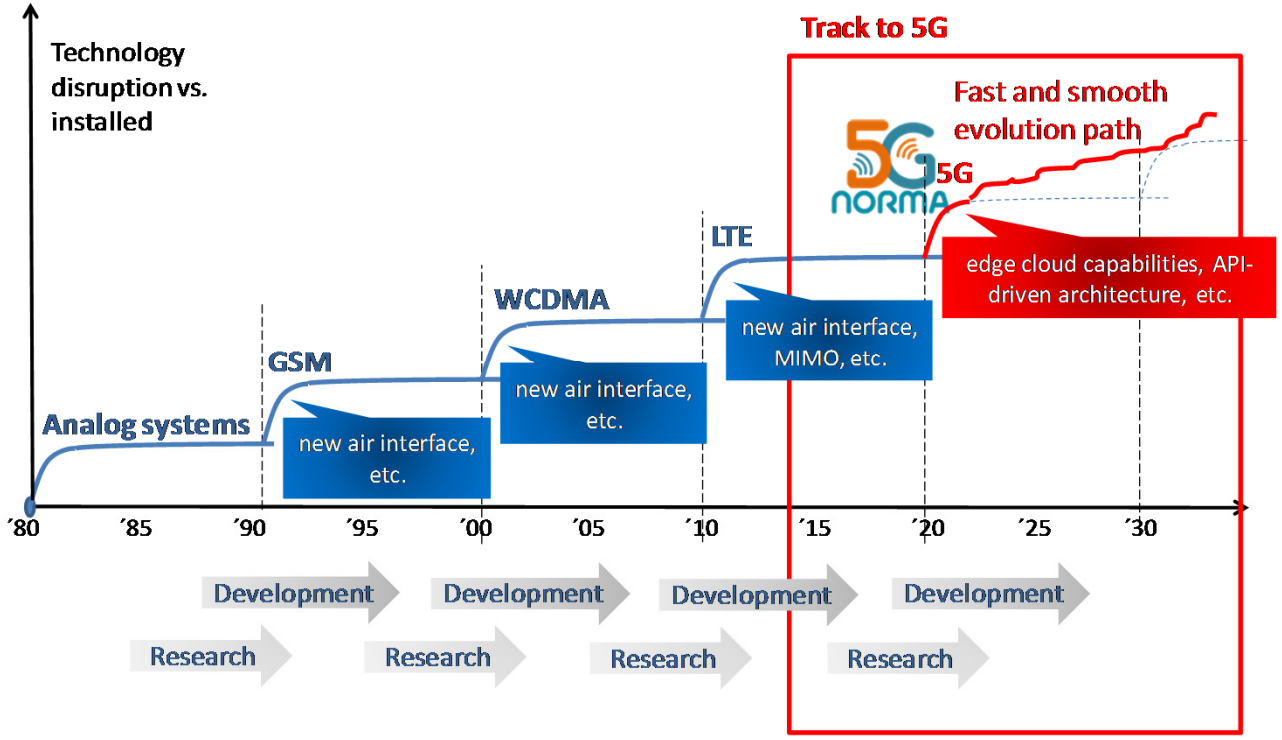
Outline

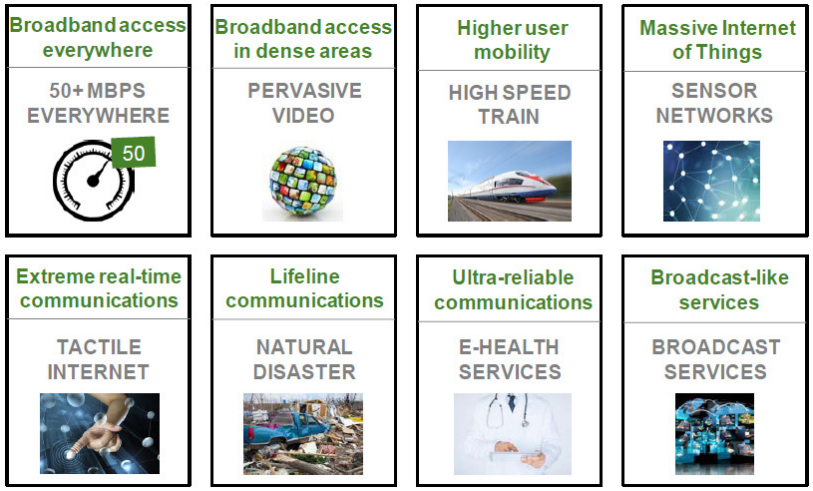
- Motivation and objectives
- Architecture framework
- Impact on RAN and CN
- Software-define mobile network control

Motivation and objectives

Motivation: It's time, again



Motivation: It's the mix



The focus of 5G NORMA is on <u>enabling new 5G business</u>.

But 5G NORMA's innovations will also help to

- increase wireless capacity,
- support very high terminal densities,
- lower latency,
- improve cost efficiency,
- lower energy consumption.

Motivation: NGMN Vision

"5G is an end-to-end ecosystem to enable a fully mobile and connected society. It empowers value creation towards customers and partners, through existing and emerging use cases, delivered with consistent experience, and enabled by sustainable business models."

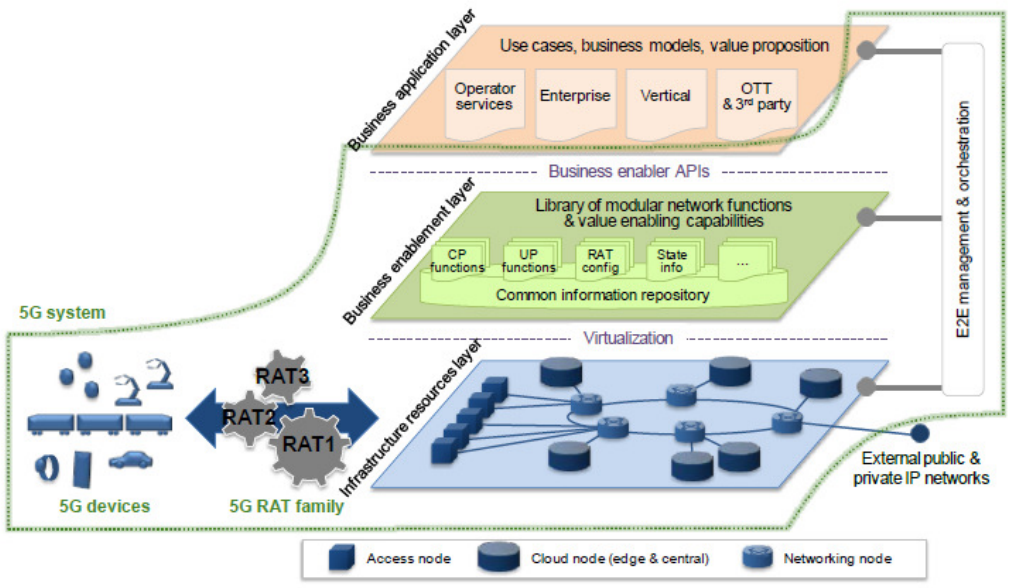


Figure 8: 5G Architecture

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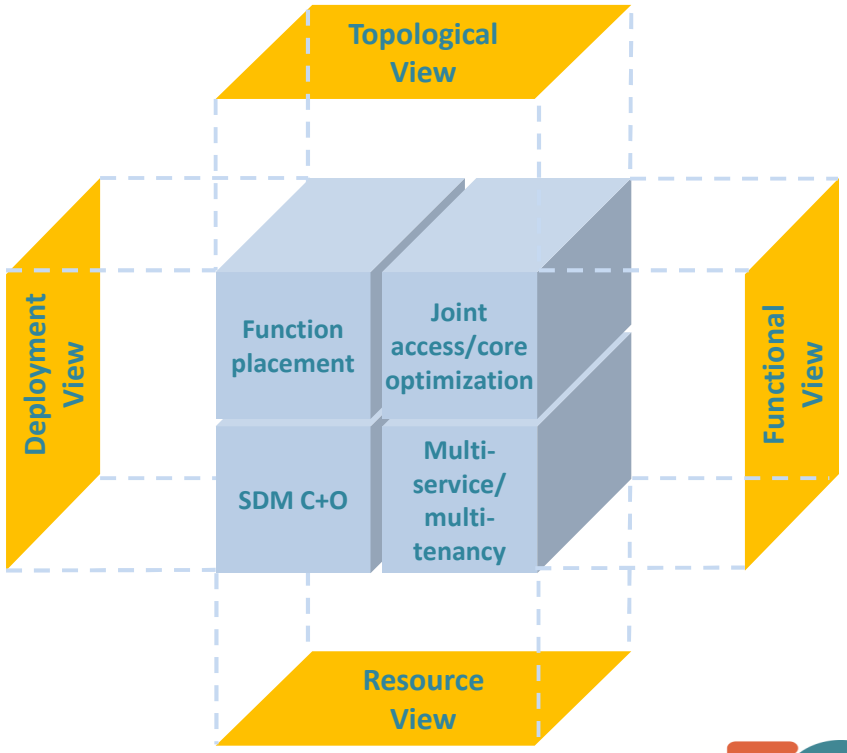
Architecture framework

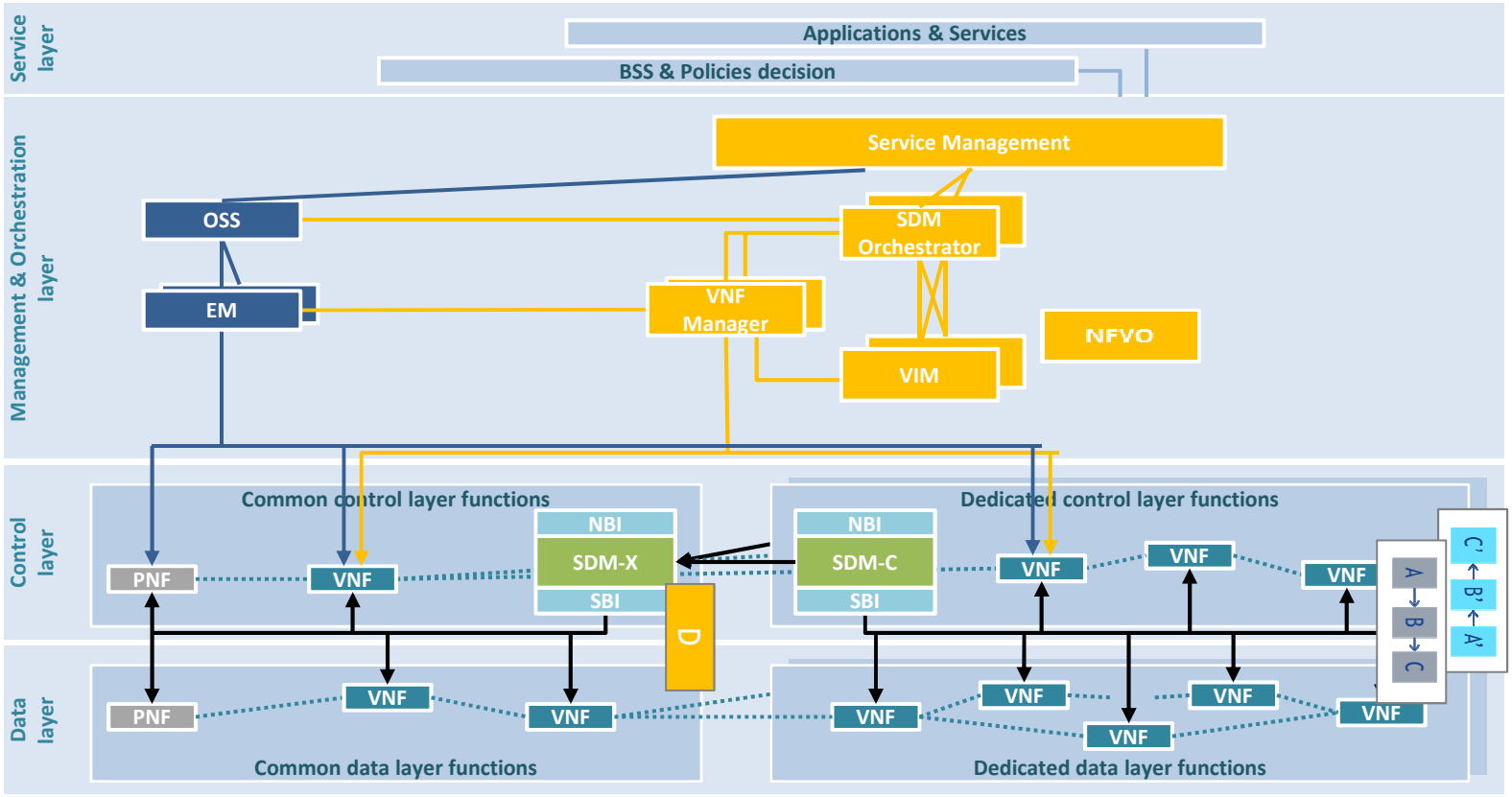
5G NORMA Architecture Innovations and Views

Covering all layers: Control and Data Layer, Management & Orchestration, and Service

- The “5 Innovations” of 5G NORMA
  1. Adaptive function (de)composition and flexible placement
  2. Joint optimization of access/core functions
  3. Software defined mobile network control and orchestration (SDM C+O)
  4. Multi-service and context-aware adaptation of network functions
  5. Mobile network multi-tenancy
- Different architectural views for clarity
  - each highlighting specific aspects of 5G NORMA architecture and innovations



5G NORMA Architecture Framework



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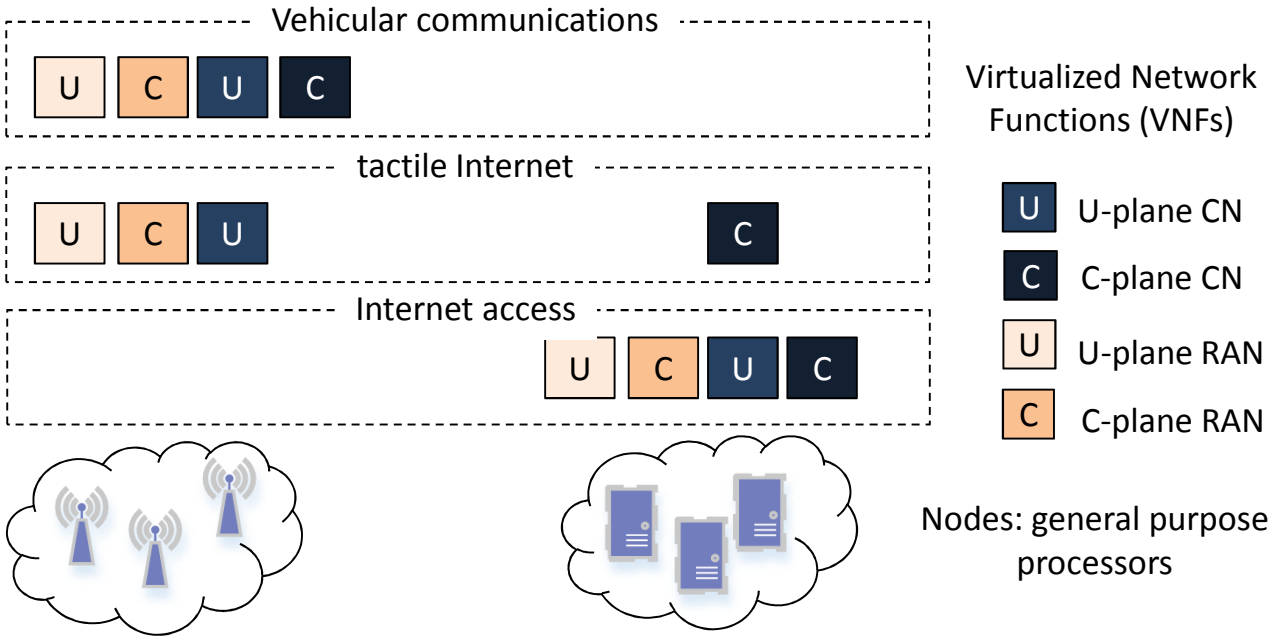
Impact on RAN and CN

Flexible function allocation: Opportunities

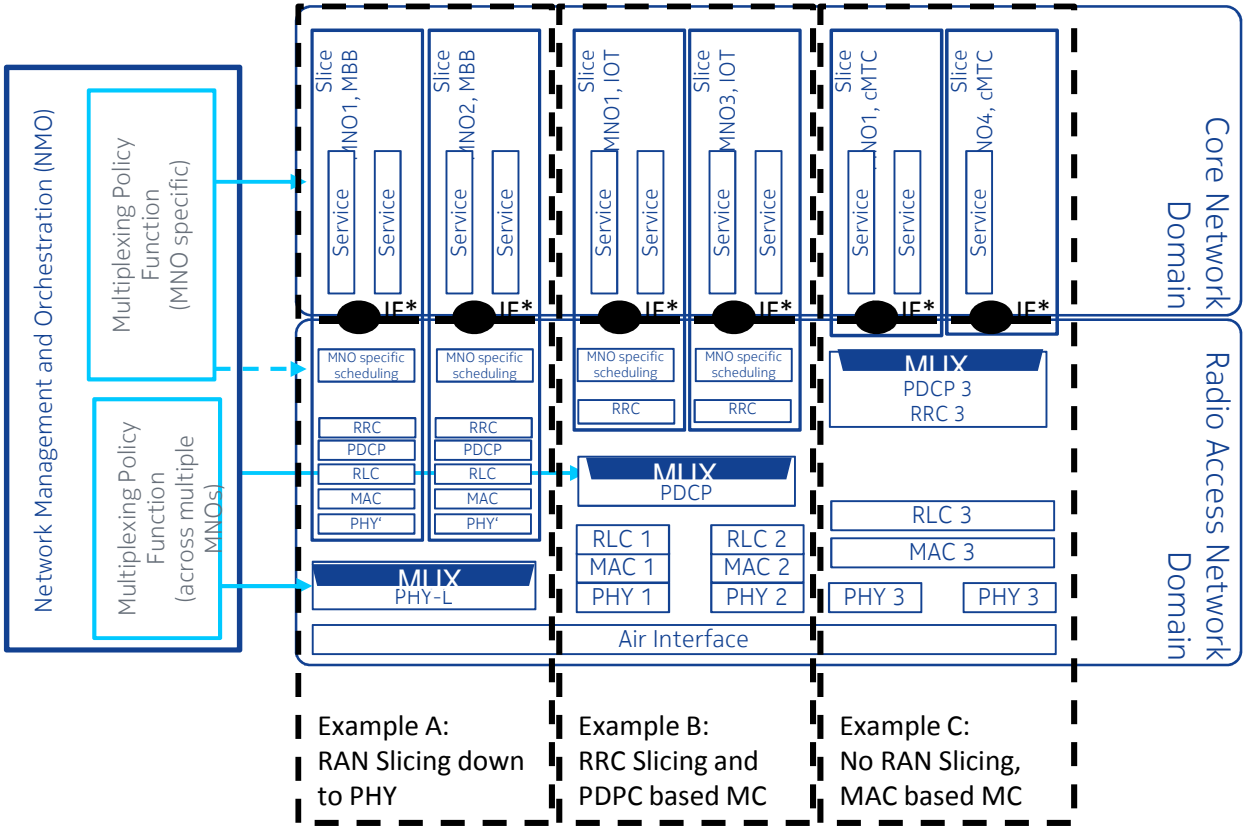
- Flexible placement of network functions



Flexible function allocation: Interfacing

- Flexible CN/RAN split
  - As a result of the flexible network allocation, CN and RAN functions no longer (necessarily) reside in different nodes
  - The borderline between CN/RAN is blurred
  - CN and RAN functions may be co-located in the edge cloud or in the network cloud
- CN/RAN interface
  - The optimal CN/RAN interface may depend on the function allocation
  - If CN and RAN reside in the same locations, we can benefit from exchanging large amount of data at low latencies
  - If CN and RAN reside in different locations, the interface needs to be adapted to throughput/latency constraints
  - Even when co-located, different functionality can be provided depending on the location of both functions

Example: RAN Slicing



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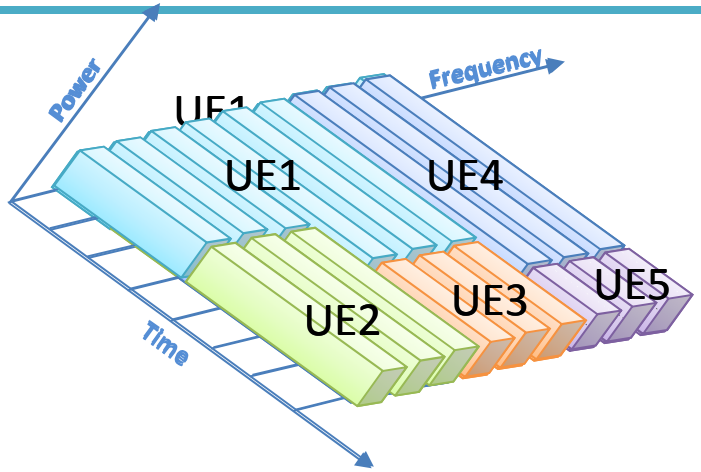
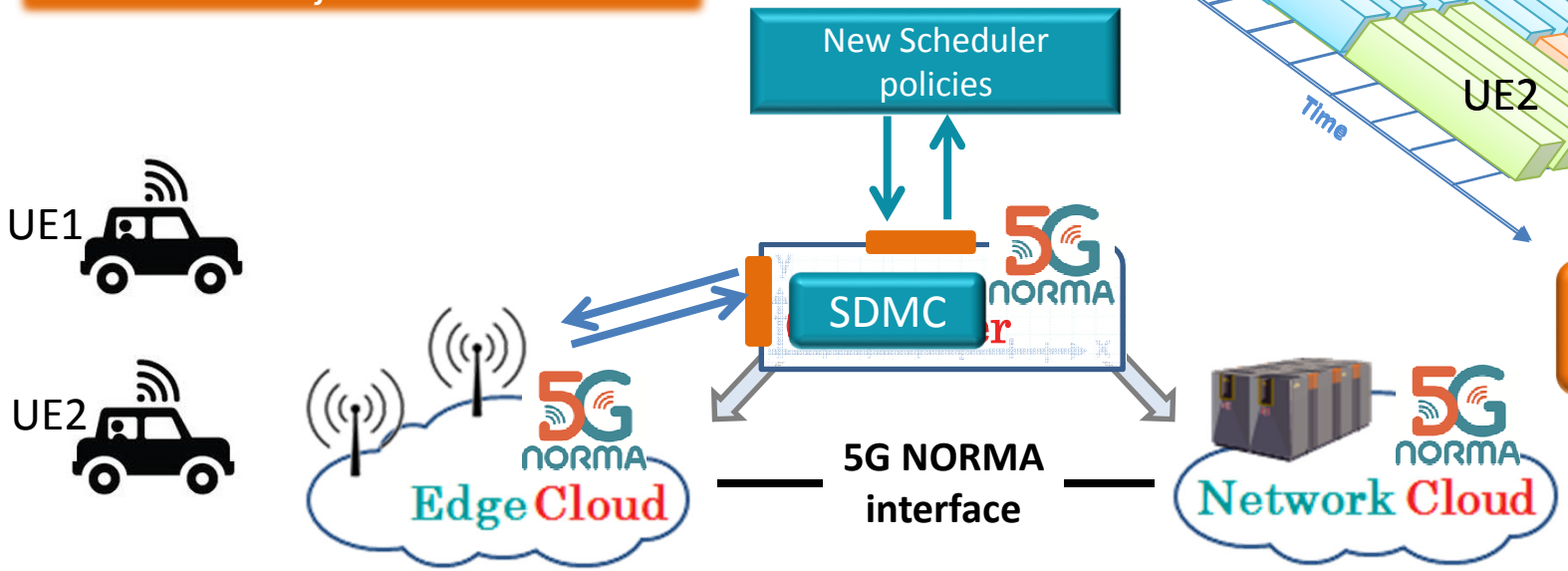
Software-defined mobile network control

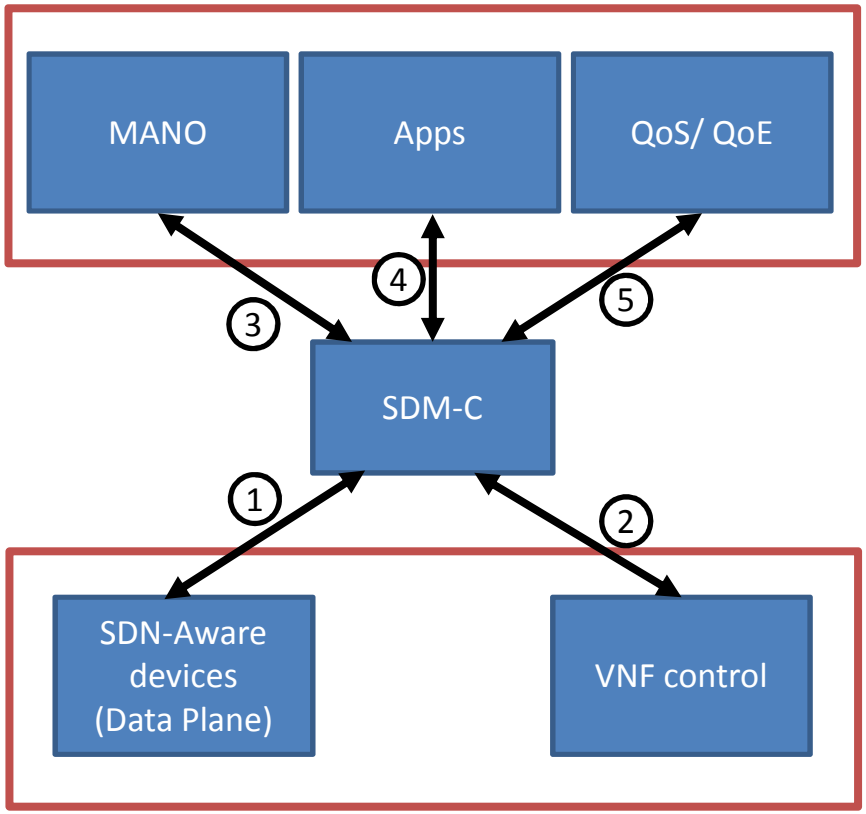
SDMC: Flexible Service Creation

SDMC allows flexible scheduler reconfiguration. New services, like low latency ones (autonomous driving) are easily supported while reducing the service creation time from 90 hours to 90 minutes



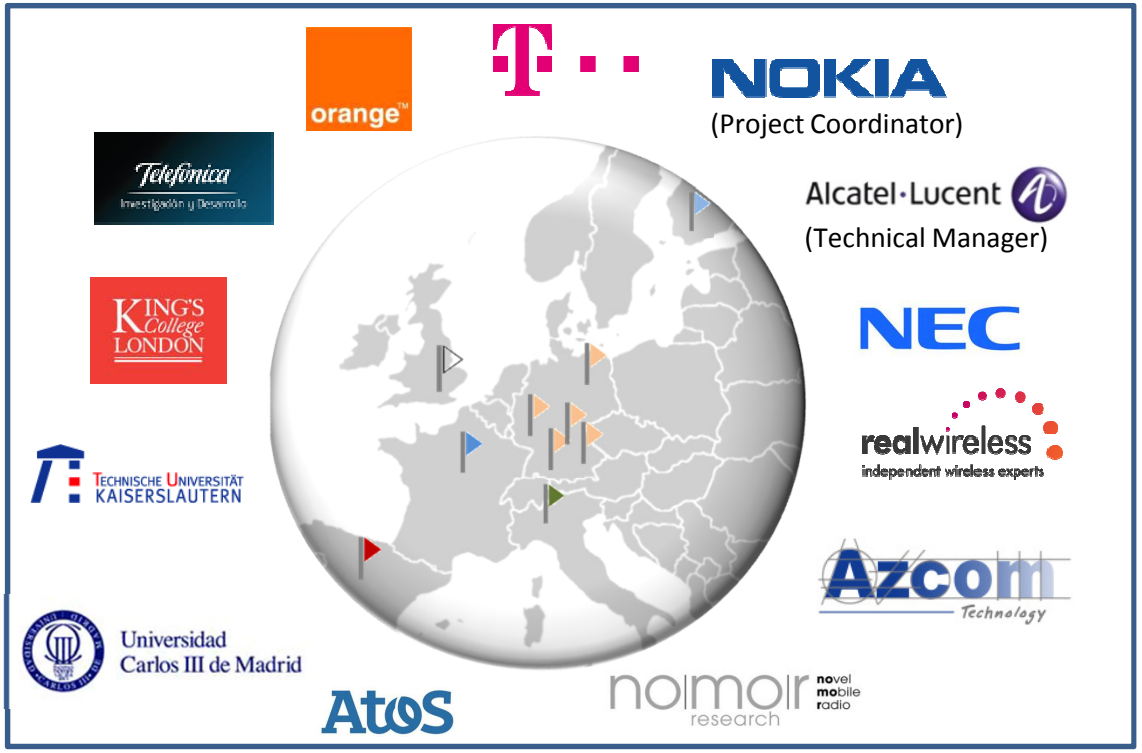


SDM-C Interfaces



1. Resource pool management
2. Resource requests
3. Service requirements extraction
4. Mobility information feed
5. Mobility-driven orchestration

5G NORMA Consortium



5G NORMA in a nutshell

EU funded R&D project within 5GPPP Initiative, aiming on building consensus on E2E mobile network architecture and rapid implementation

Duration: Jul'15 – Dec'17 (30 months)
Project Mgmt: Peter Rost, Nokia
Technical Mgmt: Mark Doll, Nokia

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