



Dynamic coverage Extension and Distributed Intelligence for human Centric Applications with assured security, privacy, and Trust: from 5G to 6G

Intelligence Distribution as a Service (IDaaS)

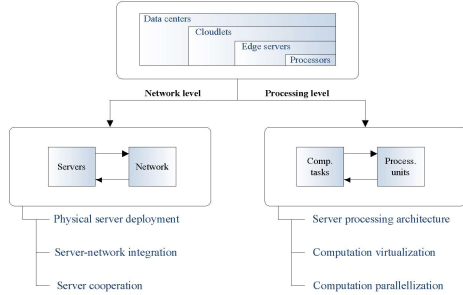
Main contributions

- Low-level mechanisms for Distribution of Intelligence
 - context switching
 - patterns of computation and communication
 - load balancing
 - movement of threads
 - reducing the state of computation
 - synchronization, programmability and placement of functionality

Functional Architecture dedicated to Distribution of Intelligence

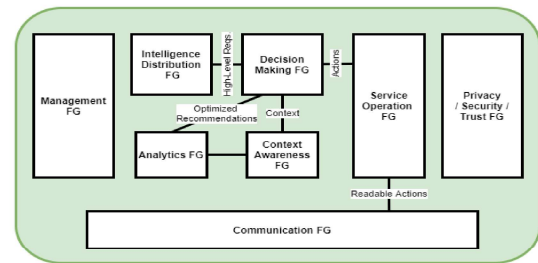
- Algorithms for micro-service / function optimal placement
 - Security isolation constraints
 - Latency constraints
 - Multi-objectives Reinforcement Learning
 - Integer Linear Programming
 - Intelligence Migration

Architectural techniques for distributed computing



Architectural techniques for distributed computing at different levels

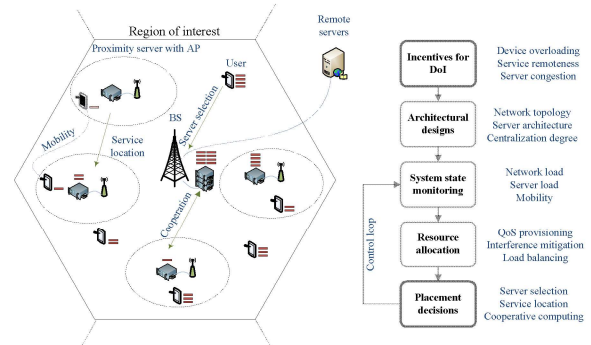
Vertical applications



Legacy 5G Infrastructure

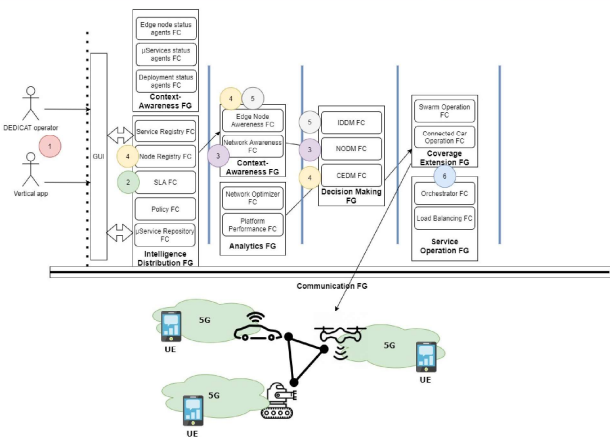
3rd Party Components (SW/HW)

Functional Architecture of the DEDICAT 6G ecosystem applied to Intelligence Distribution



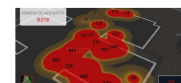
Networked computing framework for Distribution of Intelligence

Coverage Extension as a Service (CEaaS)

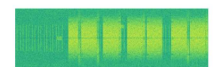


Functional Group (FGs) and Functional Components (FCs) involved in CEaaS

- A vertical application (e.g., a public concert organizer) requests a temporary coverage extension for the duration of its event, including a set of technical constraints (e.g., number of targeted attendees, event location, type of traffic and target traffic per UE).
- Intelligence Distribution like registries and repositories for the MEC and associated look-up /discovery functions plus Service Level Agreements (SLA) and migration policies storage.
- Coverage Extension Decision Making (CEDM) instruments Network Operation Decision Making (NODM) with QoS targets, which in turn will configure the network in order to fulfill the QoS objective.
- CEDM decides about the nature of Mobile Access Point (MAP) involved and their deployment (e.g., planning, number of MAPs).
- CEDM instruments Intelligence Distribution Decision Making (IDDM) where information distribution is also required, either to support the deployment and execution of specific vertical FCs or to support purely telecom-related aspects.
- Operation of the MAPs, services, and (eventually) the MEC
 - Coverage Extension FG supports MAP dynamic ad-hoc routing, autonomy management, placement management.
 - Service operation translates decisions into readable instructions or commands for external agents, e.g., NFV Orchestrator.
 - The Load balancing functionality is applied to the service and networking components required for the distributed nature of the micro services to be on boarded.

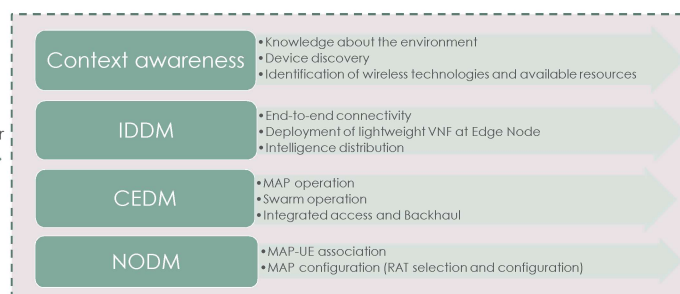


Heat Map

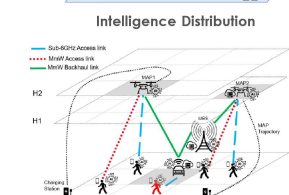


Real-Time Technology Identification

DEDICAT6G Operator
Vertical App



First Implementation of DEDICAT 6G framework for CEaaS



Coverage Extension and Network Operation



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