
5GCity
A DISTRIBUTED CLOUD & RADIO PLATFORM FOR 5G NEUTRAL HOSTS
5GCity & OSM
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Hamzeh Khalili, i2CAT foundation

Introduction

5GCity is a second phase EU Project, which design, develop, deploy and demonstrate, in operational conditions, a **distributed cloud** and **radio platform** for municipalities and infrastructure owners acting as 5G **neutral hosts**.

Partners

Neutral Host

- **Concept:** 5GCity project defines the neutral host concept for 5G infrastructure to allow **infrastructure sharing** among different operators/service providers.

- **Neutral host platform**: 5GCity is developing a **neutral host platform** (software code) that can be **deployed over an infrastructure** to enable infrastructure sharing, i.e. to slice up the infrastructure and lease it to operators or service providers for a certain amount of time. In addition, within each slice, the slice owner (operators or service provider) can deploy a **network service** or a **MEC application**.

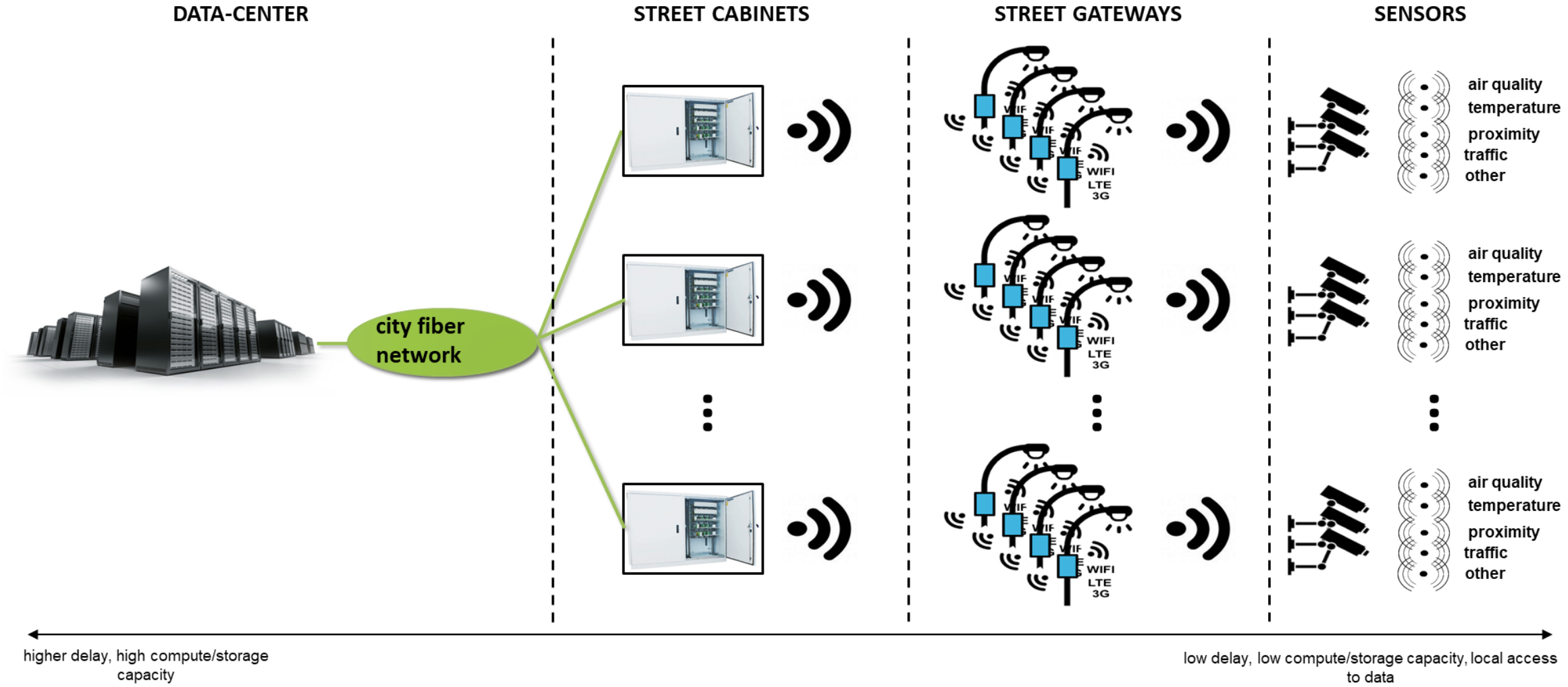
Goals

1. End to end virtualization
2. Cloud technologies -> realization of novel, heterogeneous and distributed cloud paradigm.
3. Edge computing
   a) Process data close to where they are collected -> minimizing processing latency
   b) Offloads gigabytes of network traffic from the core network
   c) Keep sensitive data inside the network itself (local access)

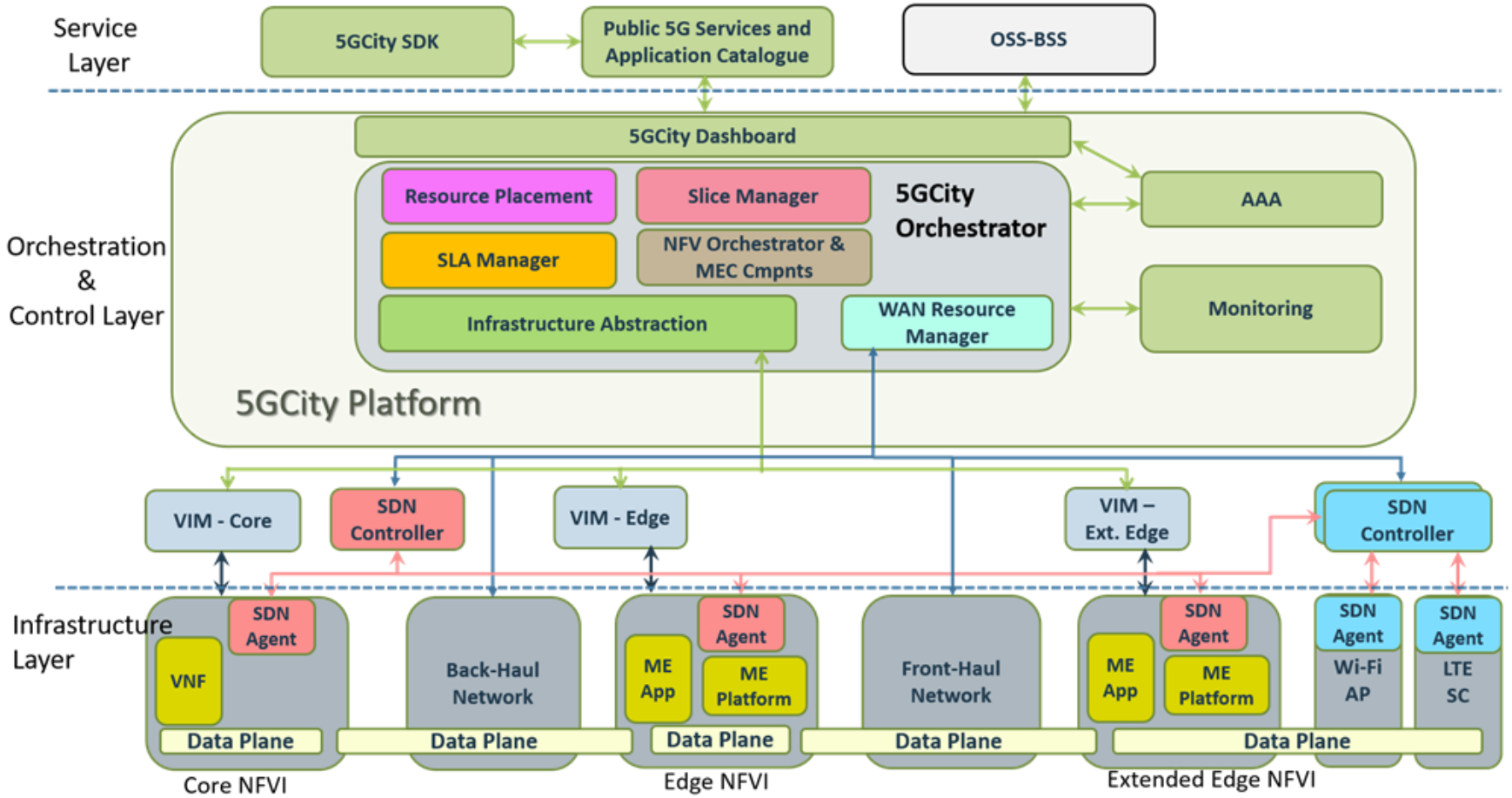
Objectives

1. Definition of the 5GCity three-tier architecture
   - Implement network sharing , slicing and mobile edge computing capabilities.
2. 5GCity MEC Node Virtualization Platform and Guest optimizations
   - Minimize overhead and optimize performance.
   - Increase the security and robustness of the 5GCity platform.
   - Define a layer to enable co-execution of ETSI NFV and MEC applications
3. 5GCity Network Virtualization
   - Develop a virtual wireless virtualization solution for 802.11 radios
4. Scalable Management and Orchestration
   - Design 5GCity Orchestration platform, 5GCity SDK and location aware mechanism learning
5. City-wide Pilots Deployment and Validation
   - Deployment of the 5G-based edge platform in three distinct smart cities: Barcelona, Lucca and Bristol

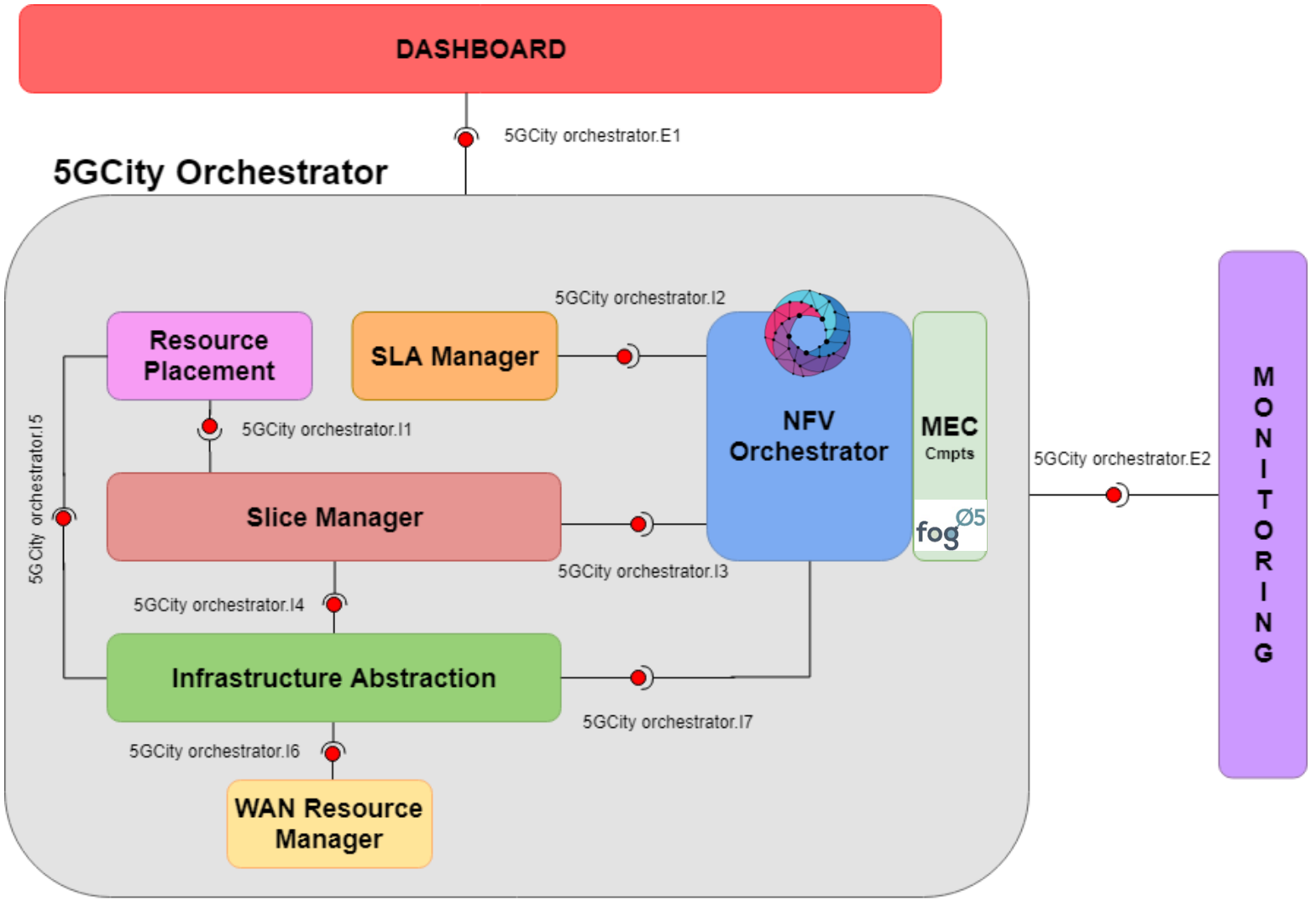
Deployment Overview



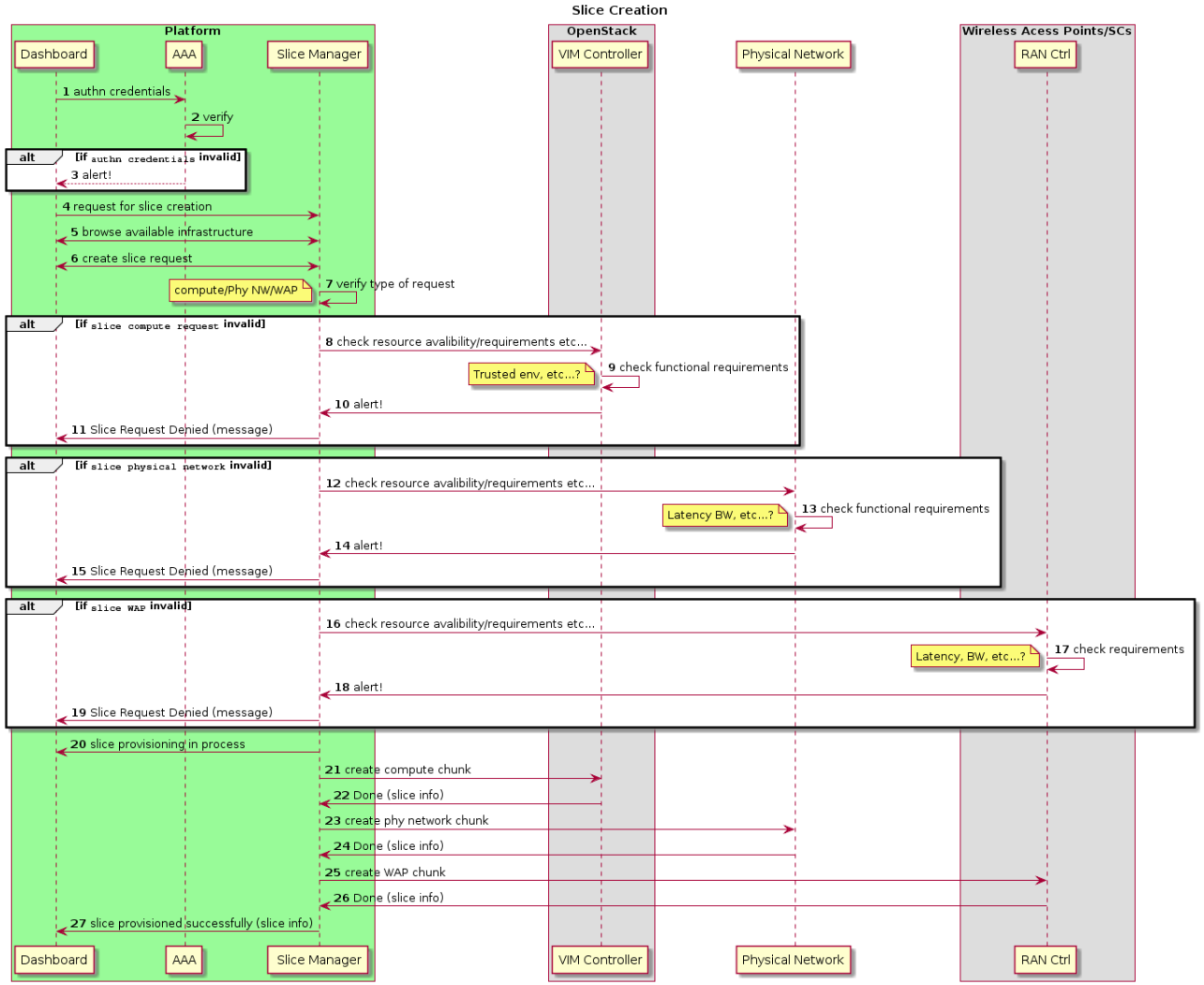
5GCity high-level architecture



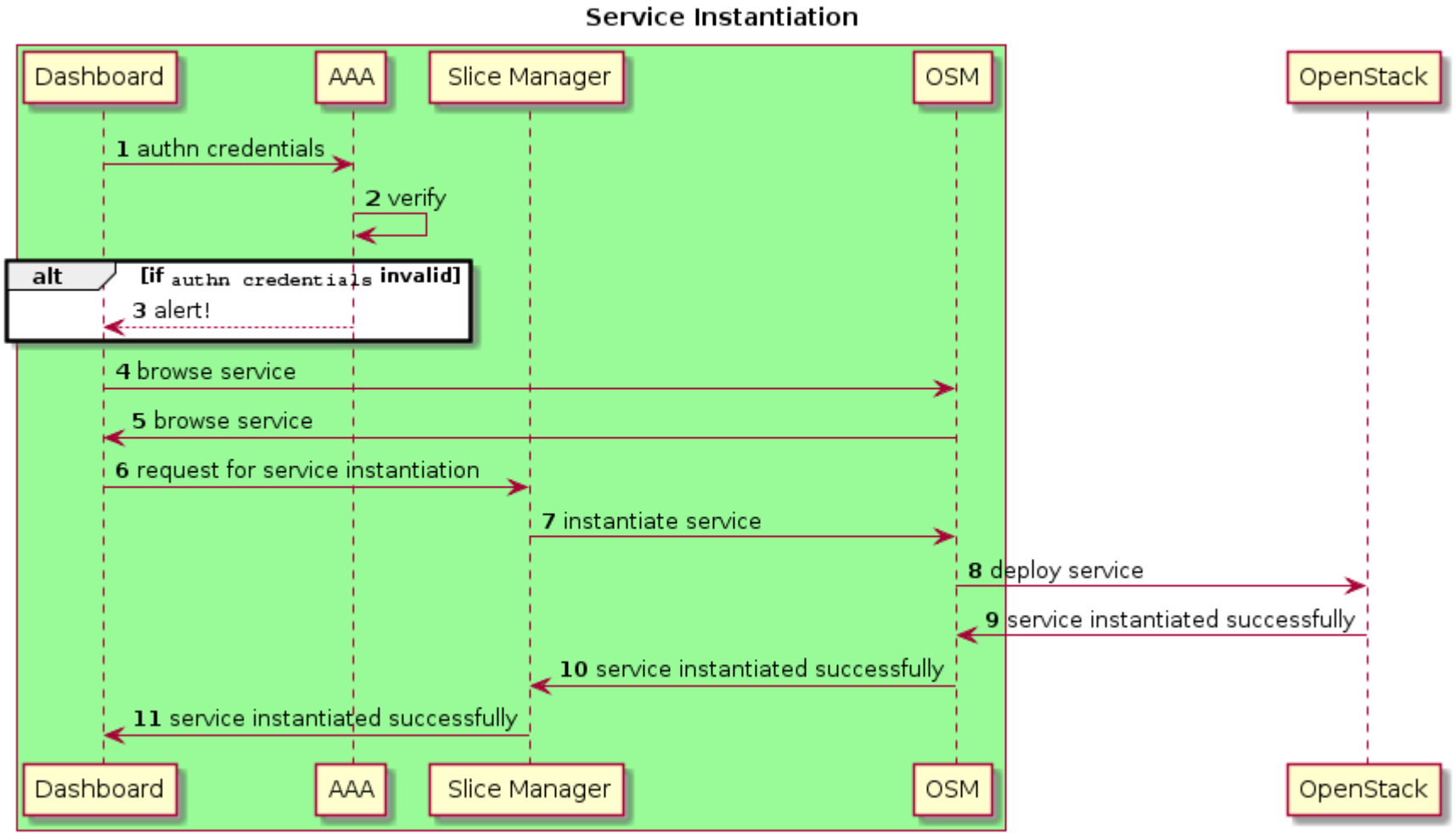
5GCity Orchestration Platform



5GCity Slice creation



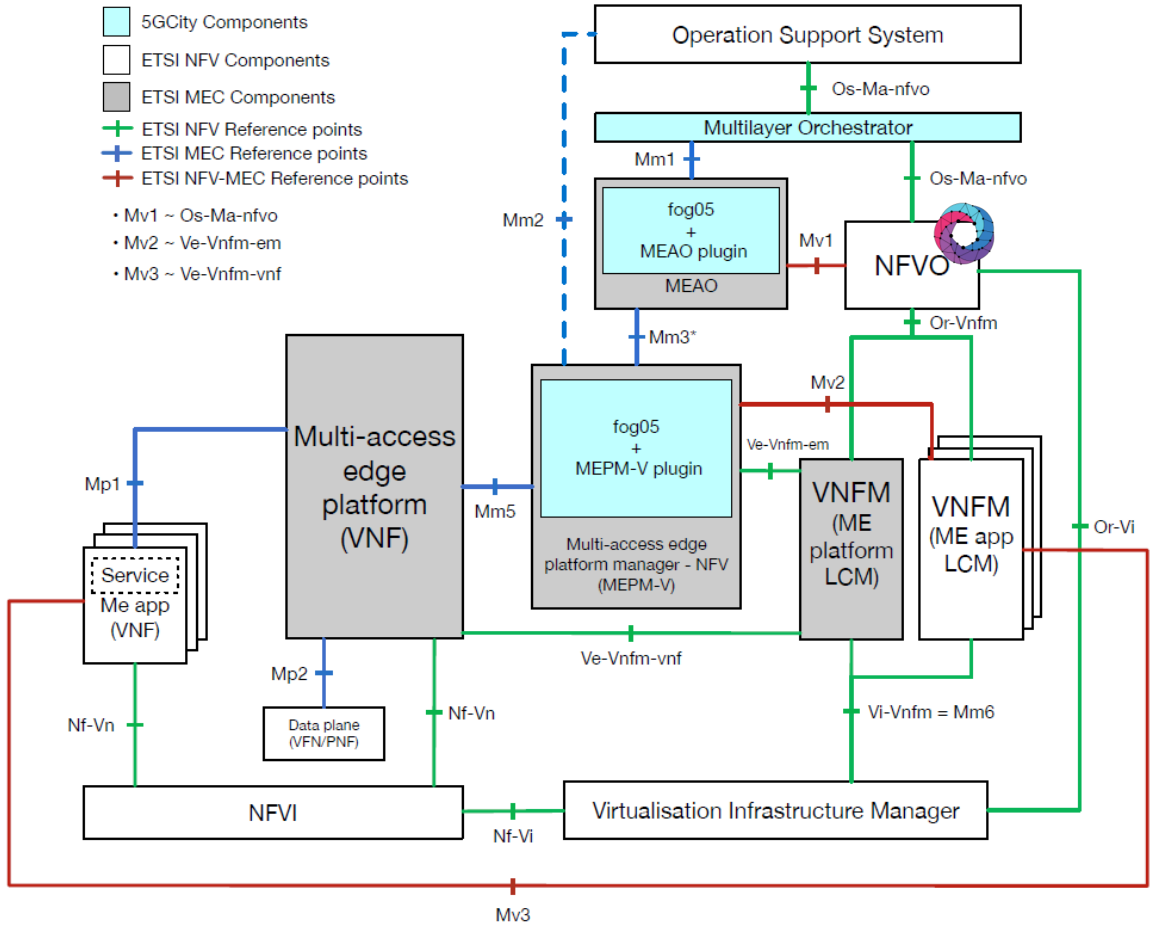
5GCity Service Instantiation



ETSI MEC and NFV positioning

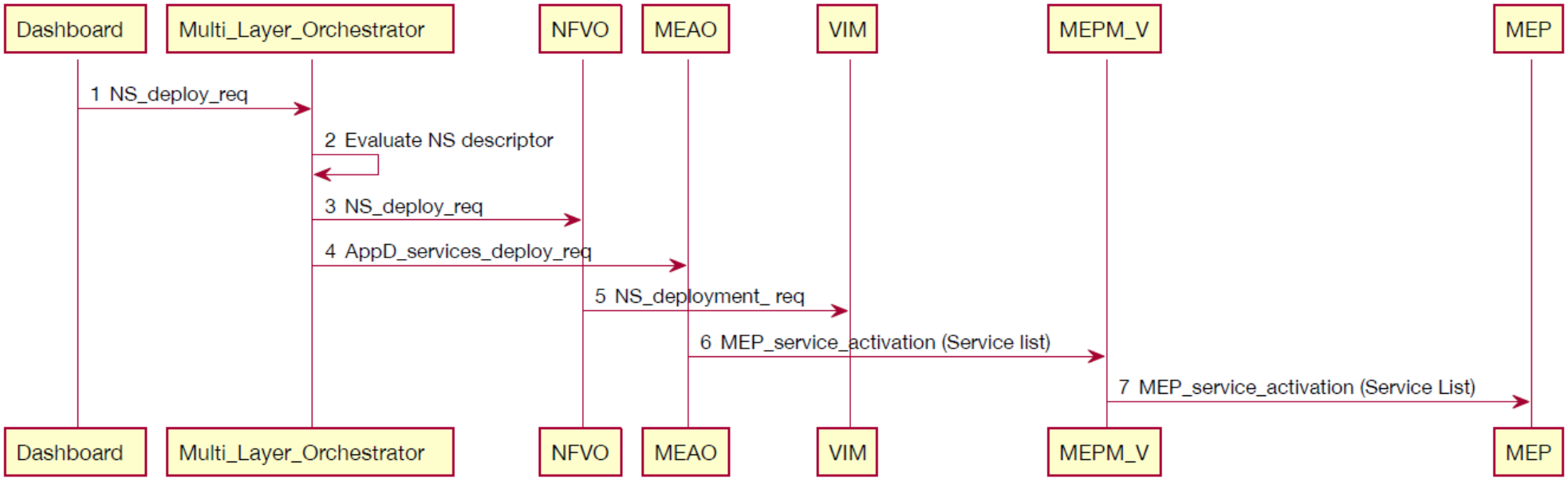
Define a virtualization layer that enable co-existence of ESTI NFV and MEC applications:

- Multi-layer Orchestration
- NFV Orchestration
  - Perform actual deployment of functions on NFV Infrastructure
- MEC Orchestration
  - Controlling the edge application and the edge platform management



ETSI MEC and NFV positioning

Deployment of an Network Service over the 5GCity NFV enabled architecture



5GCity contribution

1. Slice Manager functionality in line with 5GCity slice Information Models.
2. An Infrastructure Abstraction component able to connect OSM to Edge and Extended Edge VIMs.
3. Define the usage of the OSM NBI to connect "neutral hosting"-oriented Dashboard and SDK to the orchestration platform.
4. Integration of OSM with ETSI MEC by using a thin layer on top of the two orchestrators (NFVO and MEC-O), pre-processing and dispatching the Services to one of the two according to appropriate descriptor extensions.

Conclusions

- Neutral Hosting paly a main role in the deployment of 5G networks, especially in the urban scenarios where very dense small cell deployments are required to serve business on crowded districts and events.
- Both ETSI NFV and ETSI MEC bring innovation solutions and accelerate the adaptation of the neutral hosting.
- Develop a thin layer of orchestration on top of the individual NFV and MEC orchestrators in order to make them integrated.

Thank you!

Questions?

Why we selected the OSM

1. Fine-grained architecture.
2. **Open source platform** with standardized interfaces, which allows third parties to extend functions/plugins and/or add new ones.
3. **Supports the addition** of other types of VIM, SDN controller and monitoring **components**.
4. Can be extended for **multi-VIM** and **multi-cloud** environments such as OpenStack (almost all the versions), OpenVIM, VMware, vCloud, Fog05, etc.
5. Can **integrate multiple SDN controllers** such as OpenDayLight, ONOS, Floodlight, etc.
6. Widely adopted in 5G research projects.
7. Regular **software updates**, i.e., every 6 months.
8. High **availability of software** and code documentation and distributions.

Use Cases Scenarios

Telecom Use Case

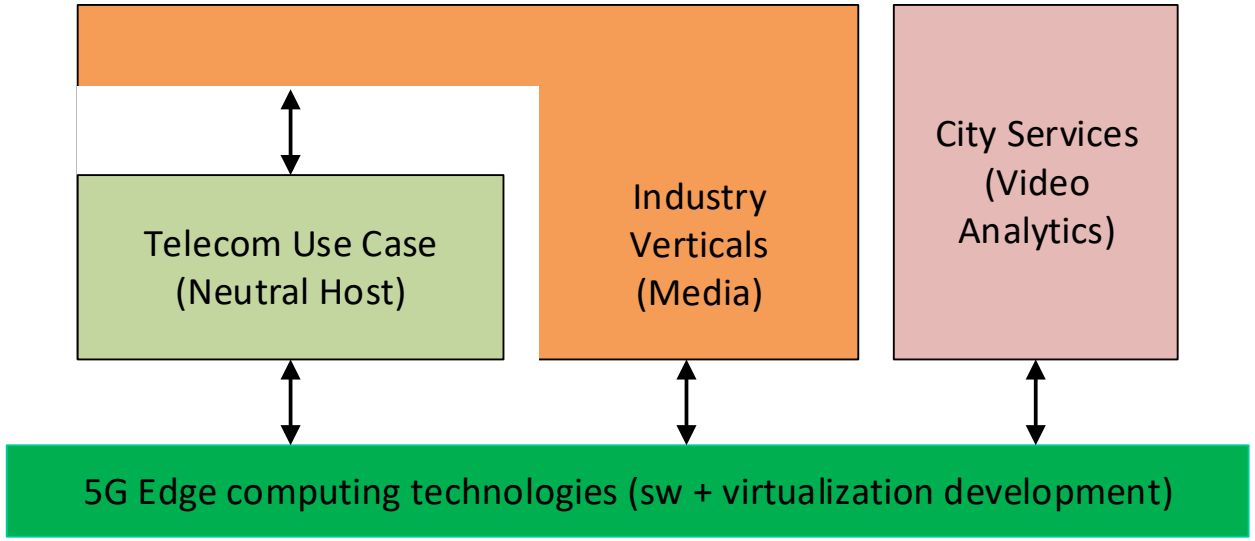
Dynamic end-to-end slices made of both virtualized edge and network resources to lease to third-party operators

Industry vertical

Mobile real-time media transmission, UHD video distribution, Real-time video acquisition and production in the edge cloud

City Services

Virtualized city monitoring service to identify illegal waste dumping



5GCity distributed infrastructure (city hardware)
Barcelona, Lucca, Bristol