Architectural Views based on Recent Enhancements of the SESAME Innovative Approach

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Challenges

- Virtualization of Small Cell and their utilization and partitioning into logically isolated 'slices', offered to multiple operators/tenants.

- Capability to accommodate multiple operators under the same infrastructure, satisfying the profile and requirements of each operator separately

- With the advent of Cloud Computing, Software Defined Networking (SDN) and Network Function Virtualization (NFV), to have general-purpose computing and storage assets at the edge of mobile networks.

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SESAME architecture

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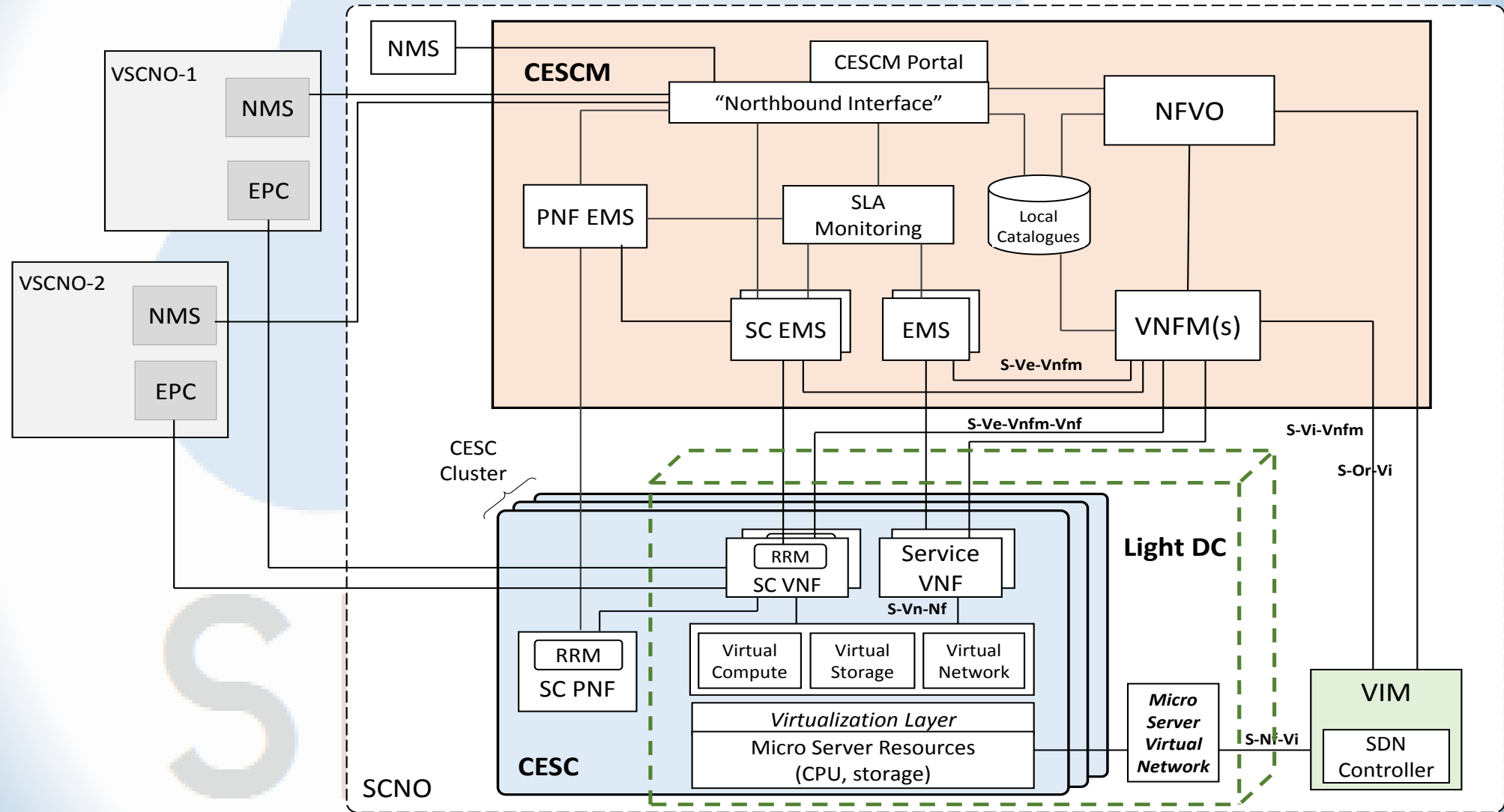
Evolutionary steps of the architecture

Evolution 1 – SC-Common VNF as fun-in/fun-out module

Introduction of a new functional entity, SC-Common VNF.

A *new element that resides between the SC PNF and the different SC VNFs*.

There is a unique SC-C-VNF per CESC, which performs control-plane multiplexing and coordination functions.

Each SC-VNF supports a single VSCNO and maintains its own control and user plane connections to the VSCNO's core network.

Depending on different parameters, one SC could implement a higher level functional split while others could go for a lower level functional split.

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Evolutionary steps of the architecture (cont.)

Evolution 2 – Progress in SESAME Small Cell functional splits

SESAME has progressed in the definition of the SC functional split.

Although this has not a direct impact on the high level architecture components, **it has an impact on the definition of the interfaces** between the SC PNF, the SC-C-VNF and the SC VNF components.

Two alternative functional splits:

❖ *S1-level functional split*

❖ *RLC – MAC functional split.*

Each one implicates a series of capabilities and requirements.

The former functional split is considered for the SESAME intended PoC and the latter is considered for research and prototyping activities.

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Evolutionary steps of the architecture (cont.)

Evolution 3 – Placement of "Self-x" features

The analysis of different "Self-x" functionalities has leaded to the specific identification of the most convenient components to support these functionalities.

The design decisions do not implicate a modification of the high-level architecture, since the different alternatives are supported at different functional elements.

Centralised "Self-x" features are supported at CESCM level though the SC VNF EMS and SC PNF EMS modules.

Distributed "Self-x" features are supported at CESC level though the SC VNF and SC PNF modules.

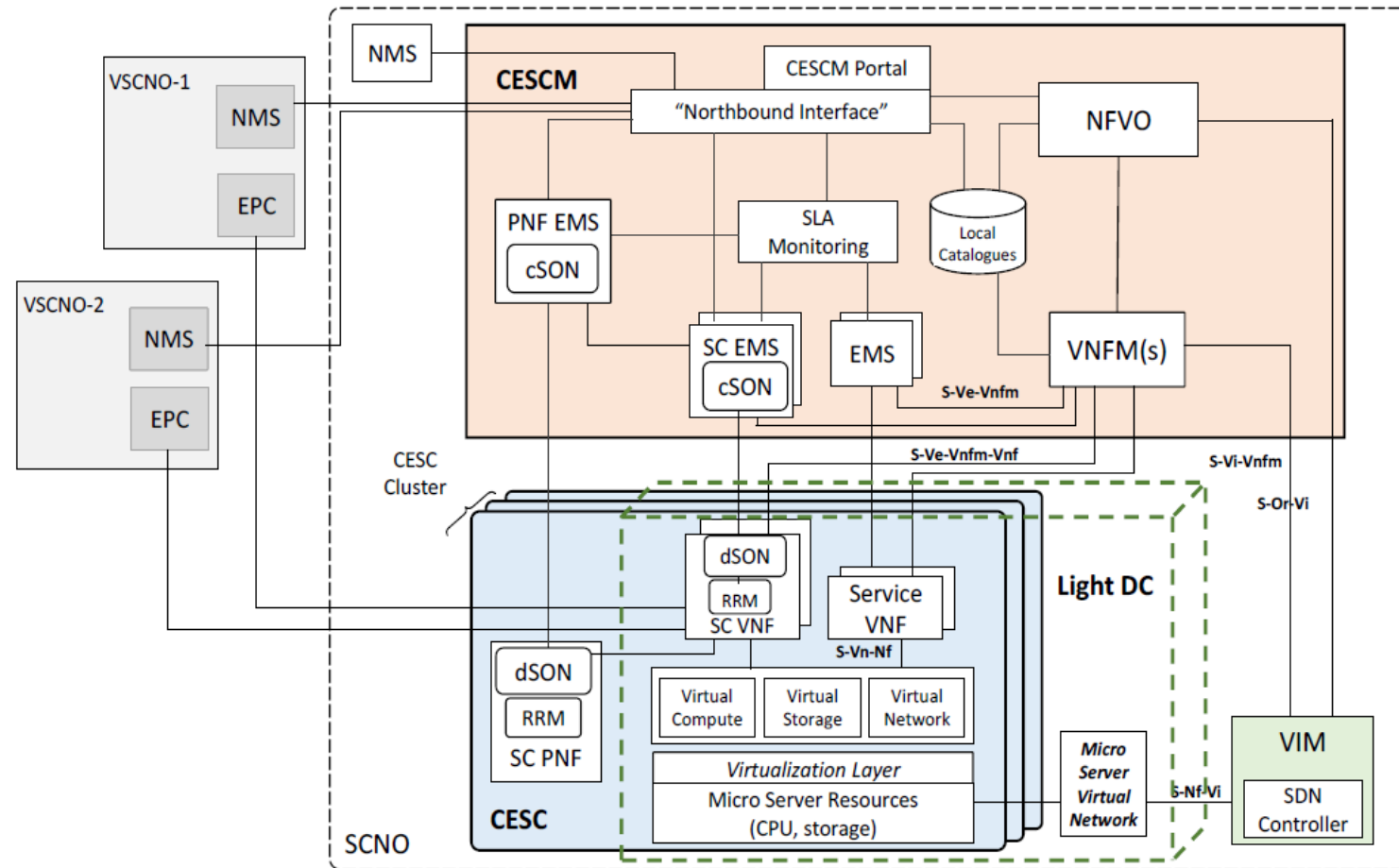# Evolutionary steps of the architecture (cont.)

Evolution 4 – Wireless backhauling

To support a wider range of deployments and enhanced resiliency models, it has been introduced the possibility of connecting the different CESCs through wireless links.

The different CESCs in the cluster can be connected in an *ad-hoc* way, and enabling one or several of them to serve as providers for the backhaul connection to the vEPCs.

The wireless fronthauling/backhauling system is designed to support multi-tenancy and is driven by SDN operations, allowing the implementation of SDN rules based on different metrics.

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Update of the SESAME architecture in relation to "Self-X" functionalities

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Achievements

- **Provided detailed description** of the CESCM and VIM components.
    - CESCM designed to manage and keep track of CESC clusters, CESCs and individual VNFs and radio network configurations.
    - VIM entity provides the management of both the physical and virtual resources in the Light DC.
- **Development and demonstration of an architecture**, capable of providing Small Cell coverage to multiple operators, *"as a Service".*
- **Logical partitioning of localized Small Cell network to multiple isolated slices**, as well as their provision to several tenants.
- **Support enhanced multi-tenant edge cloud services** by enriching Small Cells with "micro servers".

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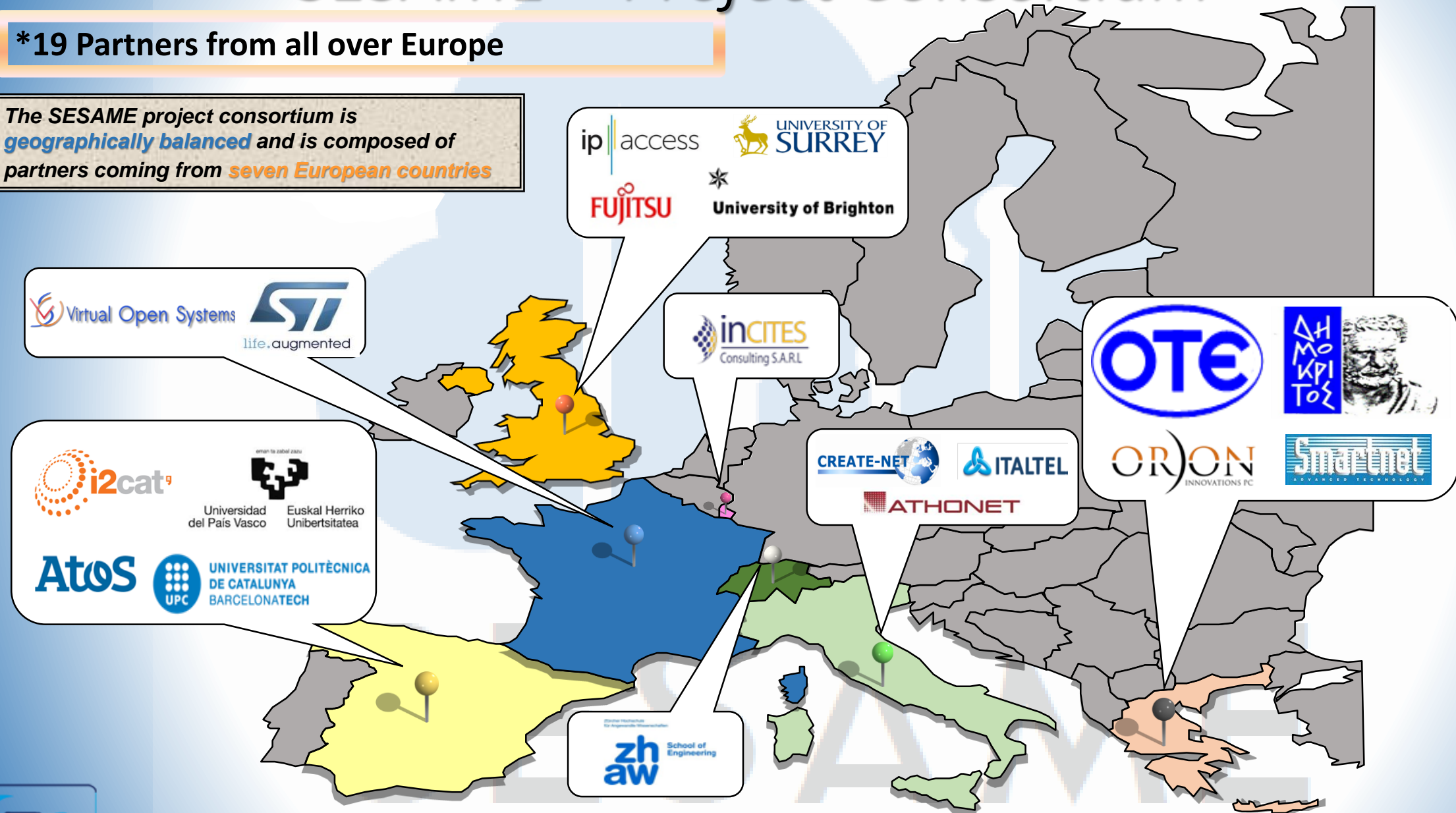Tel.:   +30-210-6114651 , +30-210-6114671
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SESAME – Project Consortium

*19 Partners from all over Europe

The SESAME project consortium is geographically balanced and is composed of partners coming from seven European countries

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Thank you

Questions?