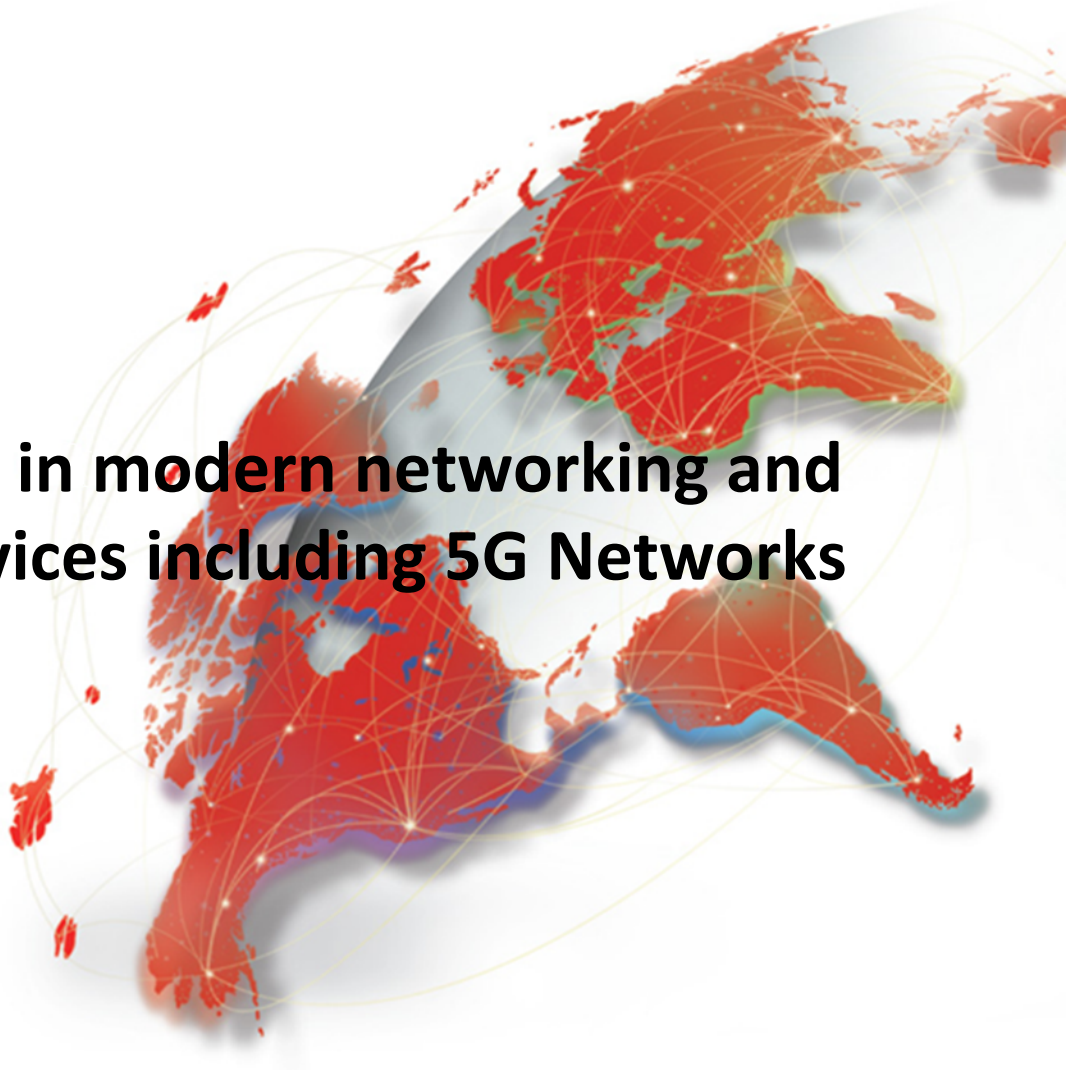

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Managing softwarization in modern networking and future networks and services including 5G Networks

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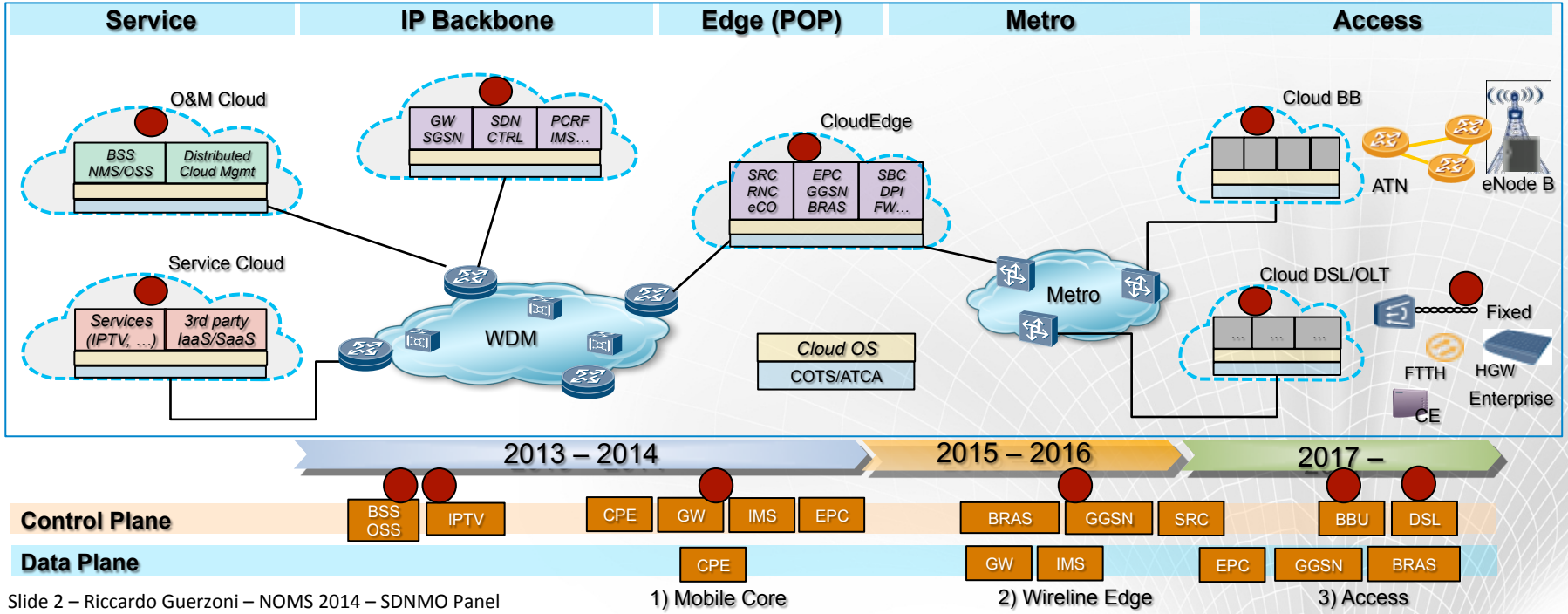
Why softwarization of networks is happening now?

ICT and Telecom players are looking to the virtualization of network resources and network functions (NFV) as new opportunities to re-position their business scope. Reducing OPEX is just one of their objectives, the main goal is to identify new verticals and to disclose and exploit new business areas enabled by the evolving technology eco-system.



What are the available key s/w tools and environment suitable for developing future network features and qualities?

Cloud Management Platforms (CMPs) are infrastructure automation tool to orchestrate and simplify the management of the virtualized resources. They provide:

- ❑ Resources virtualization on multi-purpose hardware
- ❑ Multi-tenancy
- ❑ Automated infrastructure provisioning
- ❑ Dynamic scaling of resources
- ❑ Governance: security and location compliance

Proprietary CMPs

vmware vCloud Suite

IBM Cloud

Piston OpenStack 3.0

HP Cloud

Open source CMPs

EUCALYPTUS

OpenNebula

openstack CLOUD SOFTWARE

apachecloudstack

But they lack of:

- ❑ Integration with WAN SDN infrastructures: only focus on compute and storage capacity
- ❑ Cloud federation: lack of standardized interfaces (APIs) for resource federation
- ❑ Inter-operability
- ❑ Integrated monitoring: many tools, no integration

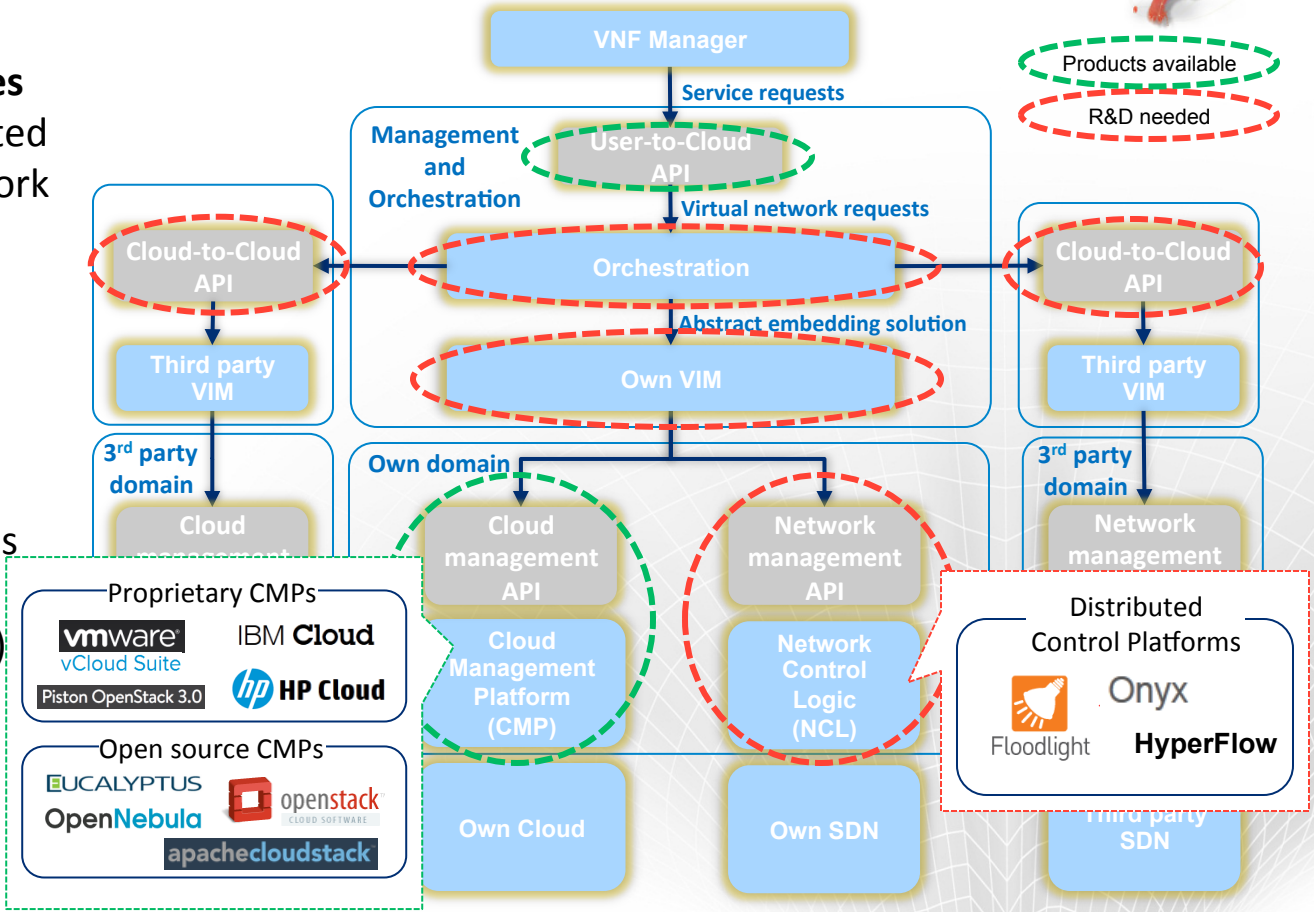
In order to handle NFV use cases, CMPs need integration with:

- Network Control Logics (NCL)
- Centralized monitoring framework

What are the models/architectures enabling softwarization of networks?

SDN-based cloud infrastructures will offer on-demand orchestrated integration of computing, network and storage resources.
They will involve the following components:

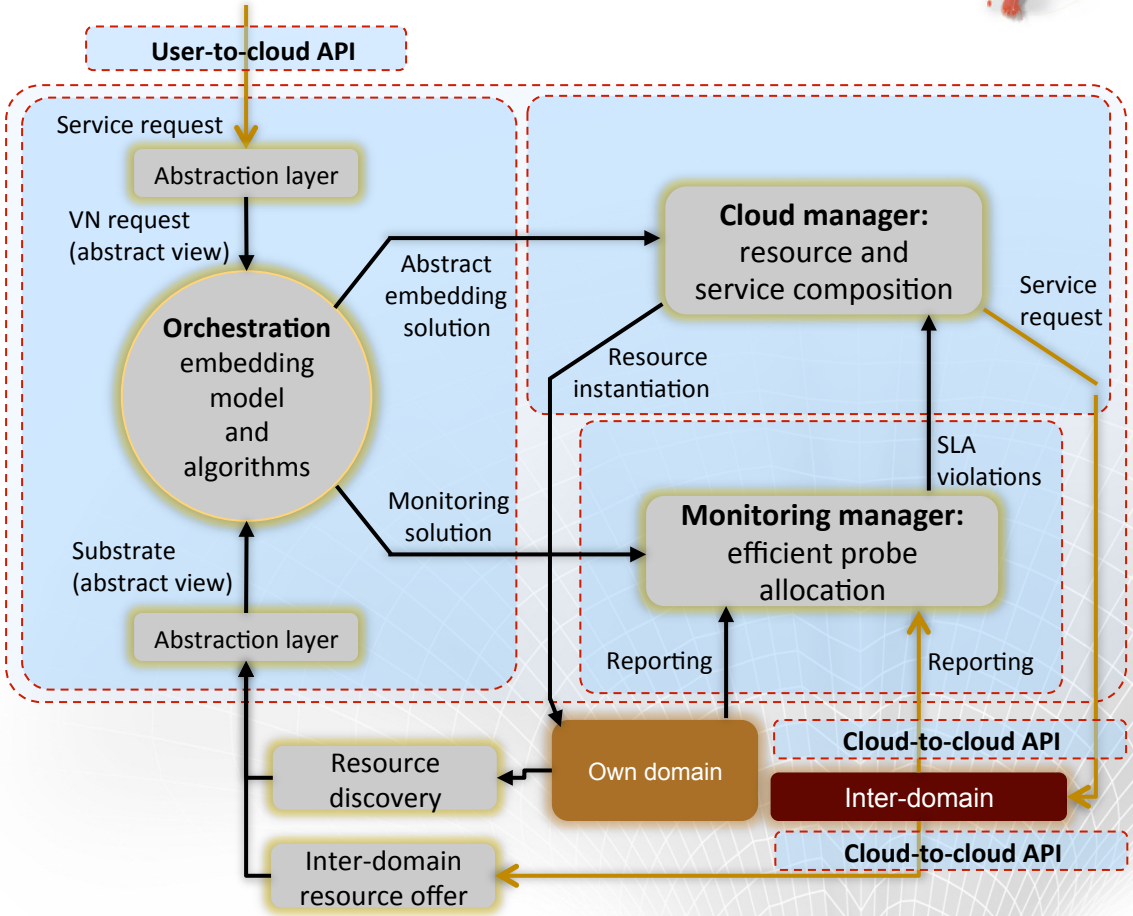
- ❑ Orchestrator
- ❑ Virtualised Infrastructure Managers (VIM)
- ❑ Cloud Management Platforms (CMP)
- ❑ Network Control Logics (NCL)
- ❑ APIs: User-to-Cloud APIs, Cloud-to-Cloud APIs, Cloud and network management APIs



What are the key missing necessary abstractions and associated s/w tools to make softwarization of networks a reality?

Main components of a centralized Management and Orchestration Plane for carrier grade networks:

- Cloud Manager: a virtualized infrastructure manager (VIM) enabling coordination of CMP (cloud computing) and DCP (distributed networking);
- Orchestrator: a centralized control logic implementing efficient resource allocation and service composition at multiple levels of abstraction;
- User-to-Cloud and Cloud-to-Cloud APIs
- Monitoring framework: monitoring infrastructure integrated in the M&O Plane.



Huawei contribution

Collaborate with government and private sector companies in EU, especially looking at 5G PPP initiative

Demonstrate the technical feasibility and business viability of the proposed solutions

Thank you

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