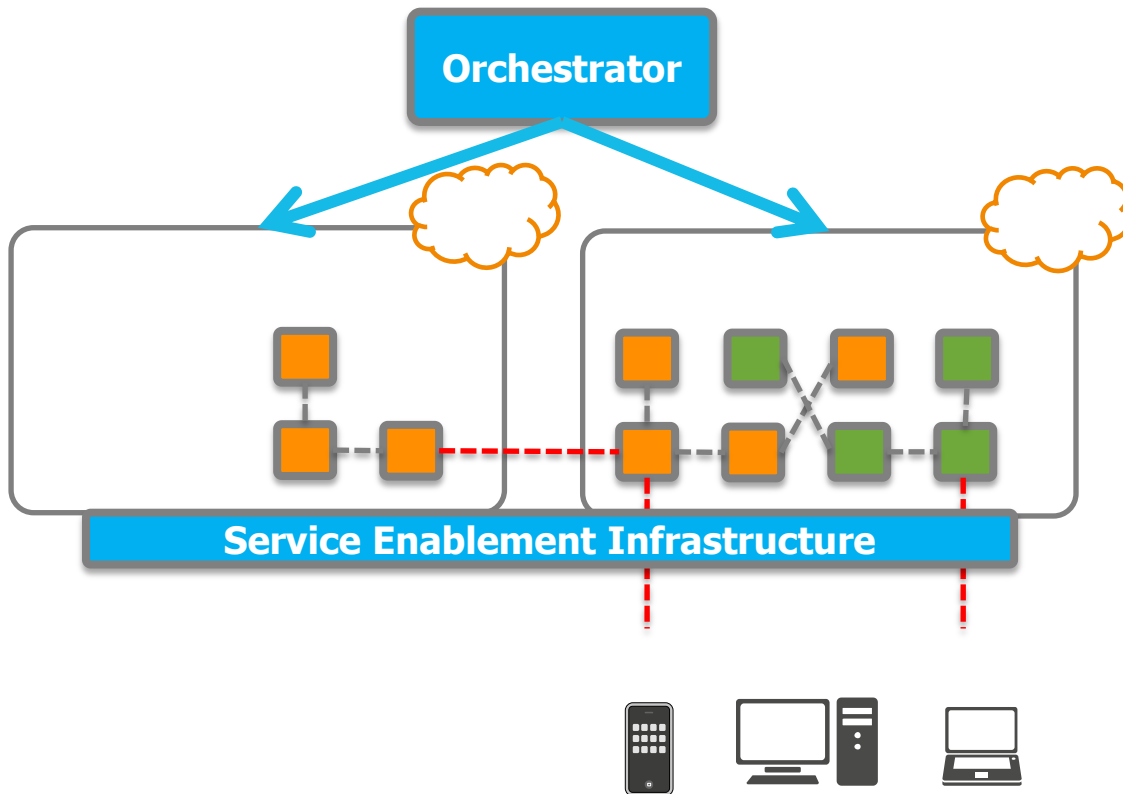


ARCHITECTURAL CLOUD SECURITY (ARCH)

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What we have



Cloud Today:

- Homogeneous data centers
 - Uniform VMs deployment
 - Efficient elasticity
 - VM placement
- Basic connectivity to the external world
 - To devices
 - To legacy physical functions
- Uniform internal connectivity
- Single entry points to the infrastructure

What we need: Short Use Cases Analysis

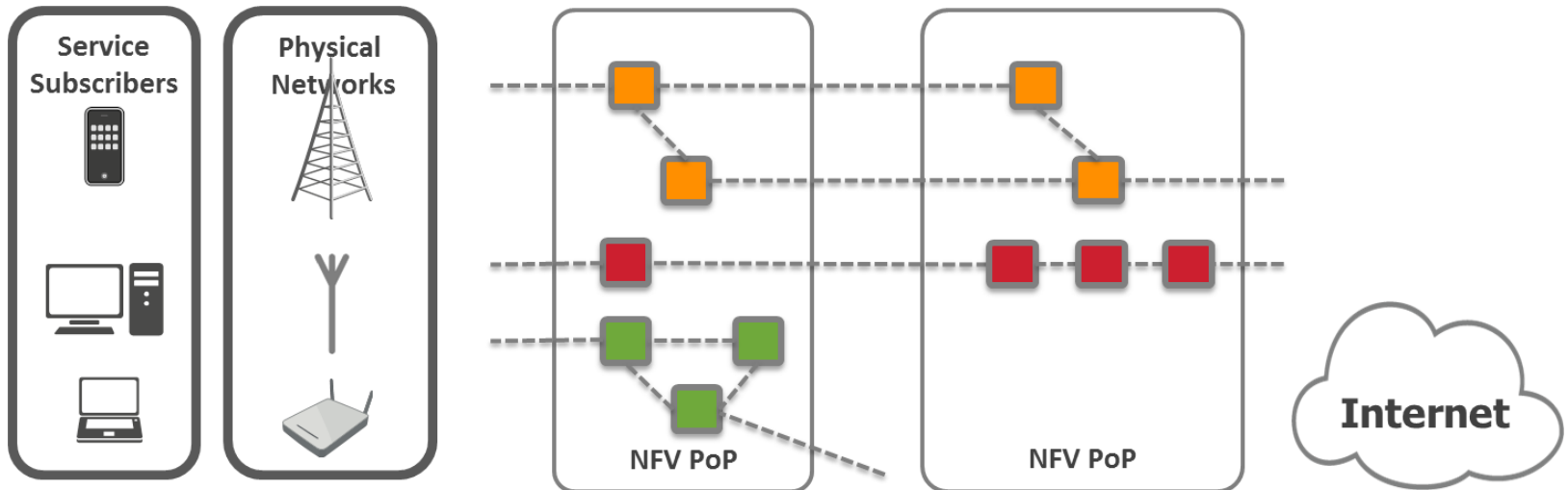
- Professional Networks:
 - Controlled allocation of network functions
 - to data centers/to racks/to servers
 - to virtual network
- Enterprise Networks:
 - With different access right levels
 - Dynamic firewall adaptation
 - Distributed security
 - Creating dynamic trust zones
- Specialized networks: factories, M2M
 - Secure connectivity management
 - Service chaining control



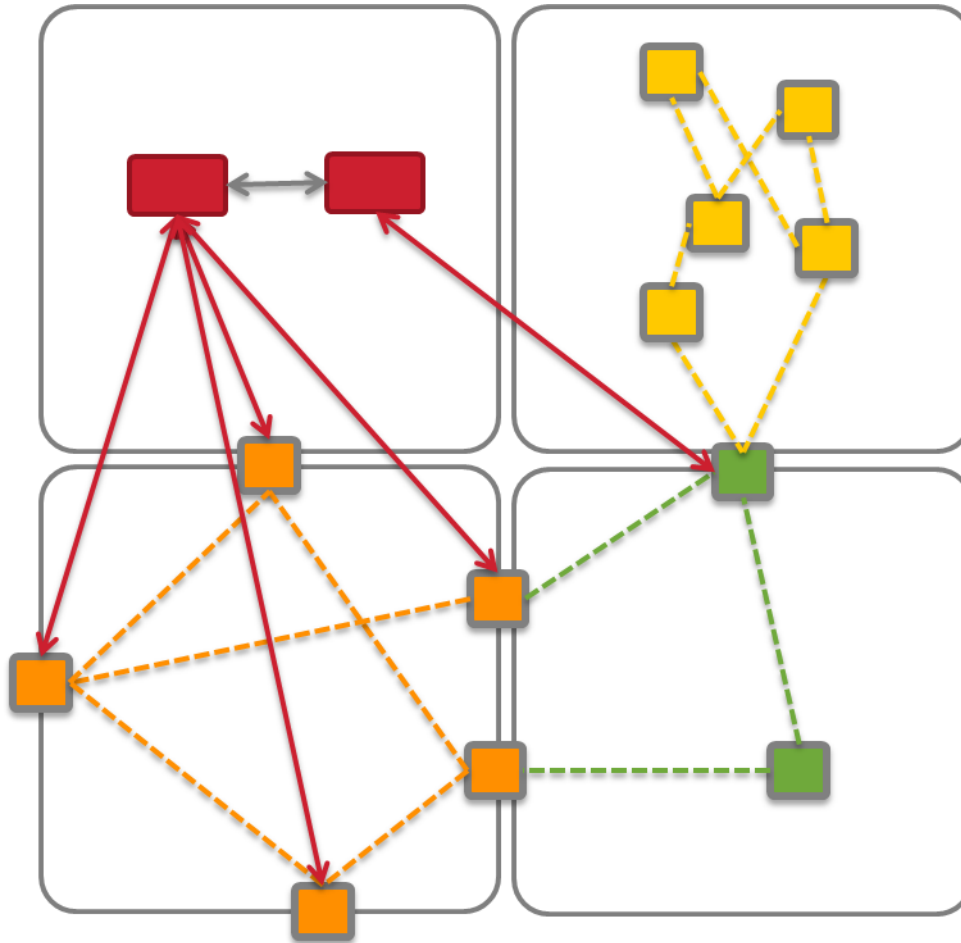
For a large number of parallel virtual infrastructures

What we need: A heterogeneous virtual network infrastructure

- Secure support for the deployment in parallel of a large number of networks
 - For dynamic starting and stopping of network entities (including firewalls!)
 - For network functions placement in different data centers
 - For the sharing of the network infrastructure inside and between data centers
 - For dynamic connectivity to physical networks
 - For dynamic updates of network functions

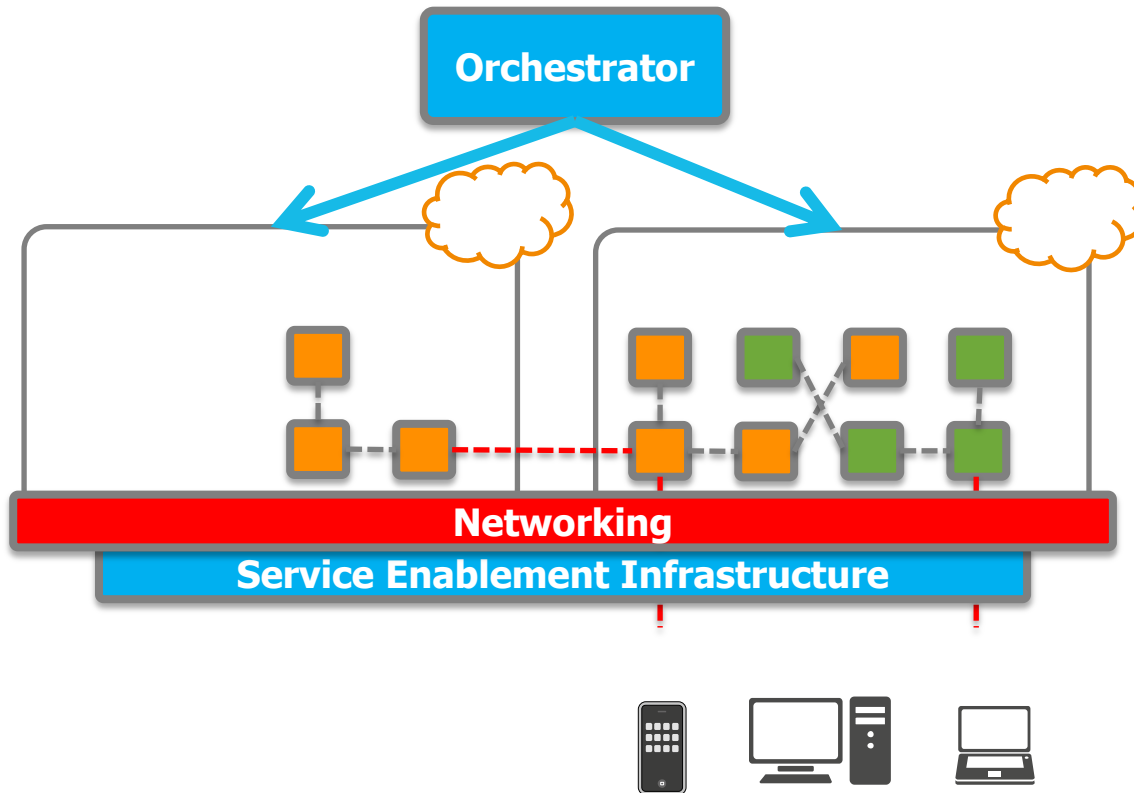


What we need: Dynamic controlled connectivity to external



- Multiple Virtual Networks
 - With different access right levels
 - With different firewalls
- Dynamic firewall adaptation
 - Distributed security
 - Creating dynamic trust zones
- Allocation of network functions to the virtual networks
 - Network function placement
 - Service chaining control
- Encapsulation between different data centers
 - Extend SDN towards secure network areas

Approach: Extend the networking within the cloud architecture



- Extend the current homogeneous networking layer of the service enablement infrastructure to support the dynamic security features
 - Massive parallelization
 - Distributed firewalls
 - Different security zones
 - Network Affinity
 - AAA
 - Dynamic Updates
- Easy to further integrate security algorithms
- Practical implementation of the networking security as part of OpenStack

Basic toolkits considered



- FOKUS **OpenSDNCore** – www.opensdncore.org
- Cloud Orchestrator for OpenStack, Amazon EC2, etc.
 - SDN Networking for Cloud and Telco services

open mtc

- FOKUS **OpenMTC** – www.open-mtc.org
- M2M testbed solution with optimized connectivity for Smart Grid, Smart Home, E-Health and Facility Management



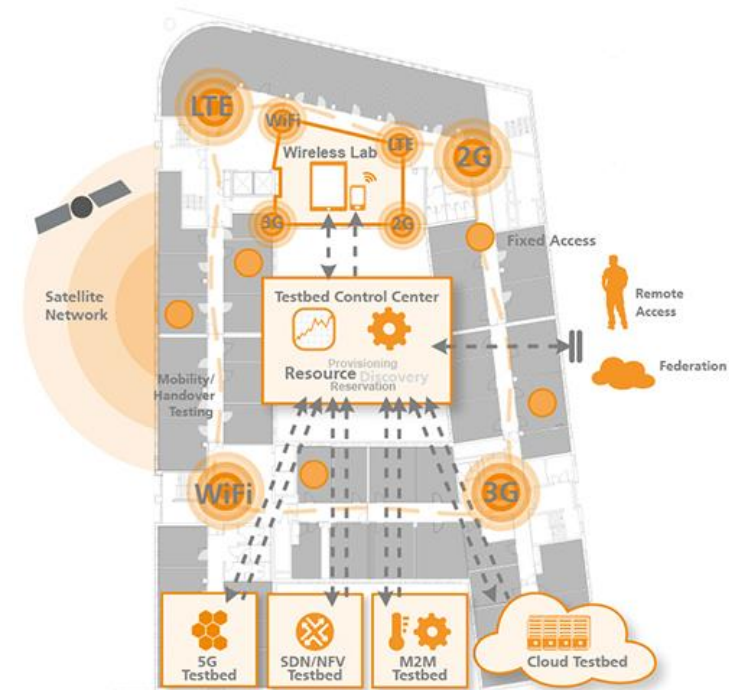
OpenStack providing the cloud related functionalities

ZABBIX

Zabbix providing the cloud related functionalities for monitoring

FUSECO Playground

- State of the art testbed infrastructure as a cooperation of Berlin's Next Generation Mobile Network expertise for
 - **OpenIMS** for H2H communications
 - **OpenMTC** for M2M communications
 - **OpenEPC** for seamless access
 - **OpenSDNCore** for advanced virtual networking features
 - Various access network technologies
- Enabling to prototype application support for
 - handover optimization across heterogeneous networks
 - support for Always Best Connected (ABC)
 - subscriber profile based service personalization
 - QoS provisioning and related charging
 - controlled access to IMS-based services
 - controlled access to Internet/Mobile Clouds
 - **SDN and NFV prototyping**



5TH FOKUS FUSECO FORUM ON THE FUTURE SEAMLESS COMMUNICATION:

NOVEMBER 13 & 14, 2014 IN BERLIN, GERMANY

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