

Security Level:

Evolution of the Mobile Core

Softwarization in 5G MCN

www.huawei.com

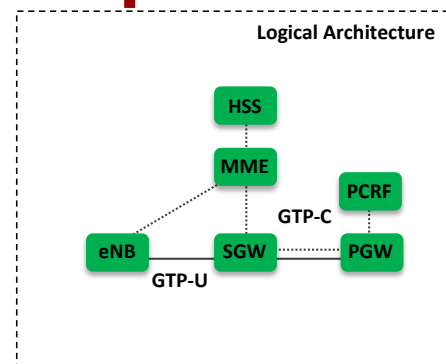
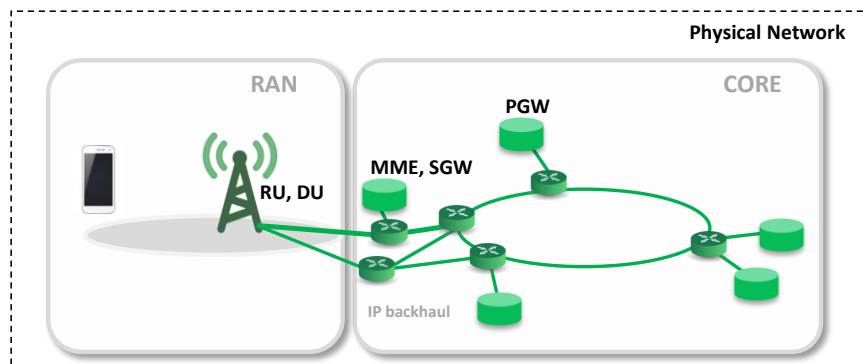
Author/ Email: Artur Hecker/ artur.hecker@huawei.com

Version: V1.0(20160110)

HUAWEI TECHNOLOGIES CO., LTD.



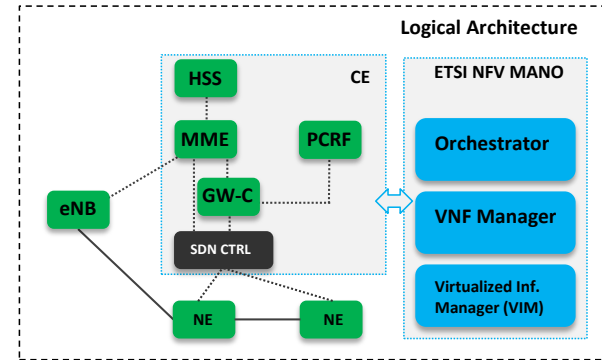
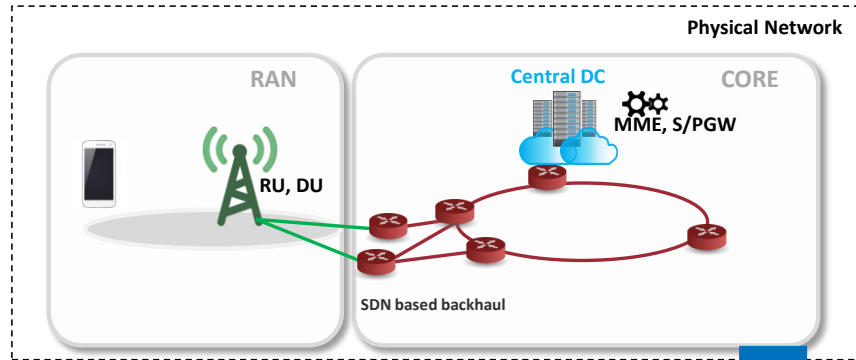
LTE EPC: Limitations wrt 5G expectations



LTE EPC	5G
<p>Unique, fixed architecture for all needs</p> <ul style="list-style-type: none"> The same C-Plane and D-Plane pipelines for all requests MME and PGW often overloaded as single anchoring point “Always on” principle creates too much network state and signaling messages Carrier grade, secure and reliable elements 	<p>New device types</p> <ul style="list-style-type: none"> Massive cheap and low power Giant critical (V2V, M2M) <p>Structural dynamics</p> <ul style="list-style-type: none"> Multi-tenant Small cells, green net
<p>Limited extensibility</p> <ul style="list-style-type: none"> Introduction of new elements is difficult 	<p>Flexible for unknown</p> <ul style="list-style-type: none"> Support of vertical services
<p>Overlay over the transport infrastructure</p> <ul style="list-style-type: none"> Non-native usage of the infrastructure, indirect routing TCP/IP over GTP over TCP/IP 	<p>Smart, low latency</p> <ul style="list-style-type: none"> Rapid offloading, breakout Augmented data plane No-tunneling protocols
<p>Bearer concept</p> <ul style="list-style-type: none"> a single pipe or bearer split from the UE to the gateway 	<p>MultiRAT Network</p> <ul style="list-style-type: none"> Multi-bearer support Access agnostic

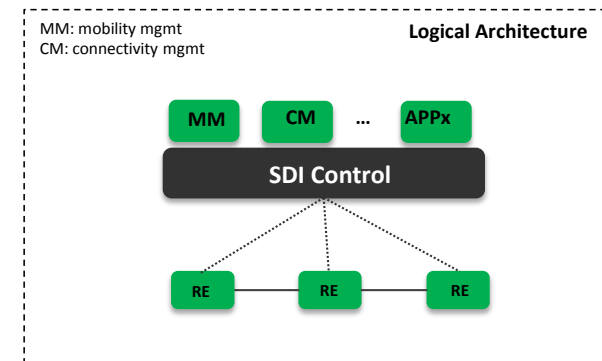
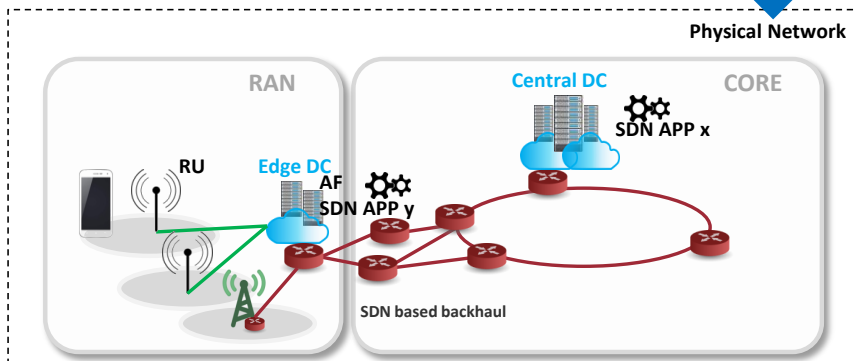
Softwarization of Mobile Core Networks

State of the art
(research)



CE: Computation Element
NE: Network Element

Full Softwarization
(vision)

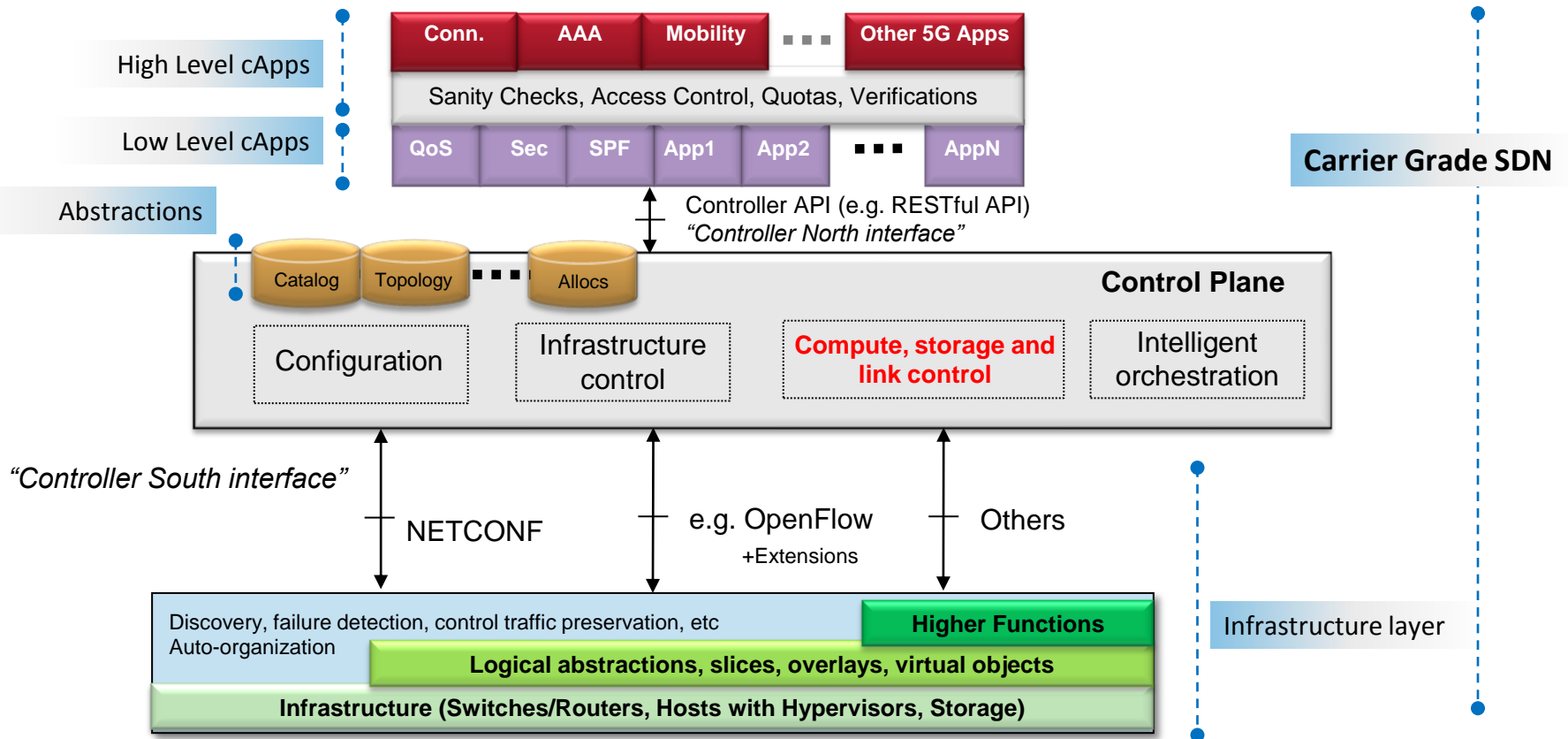


RE: Resource Element

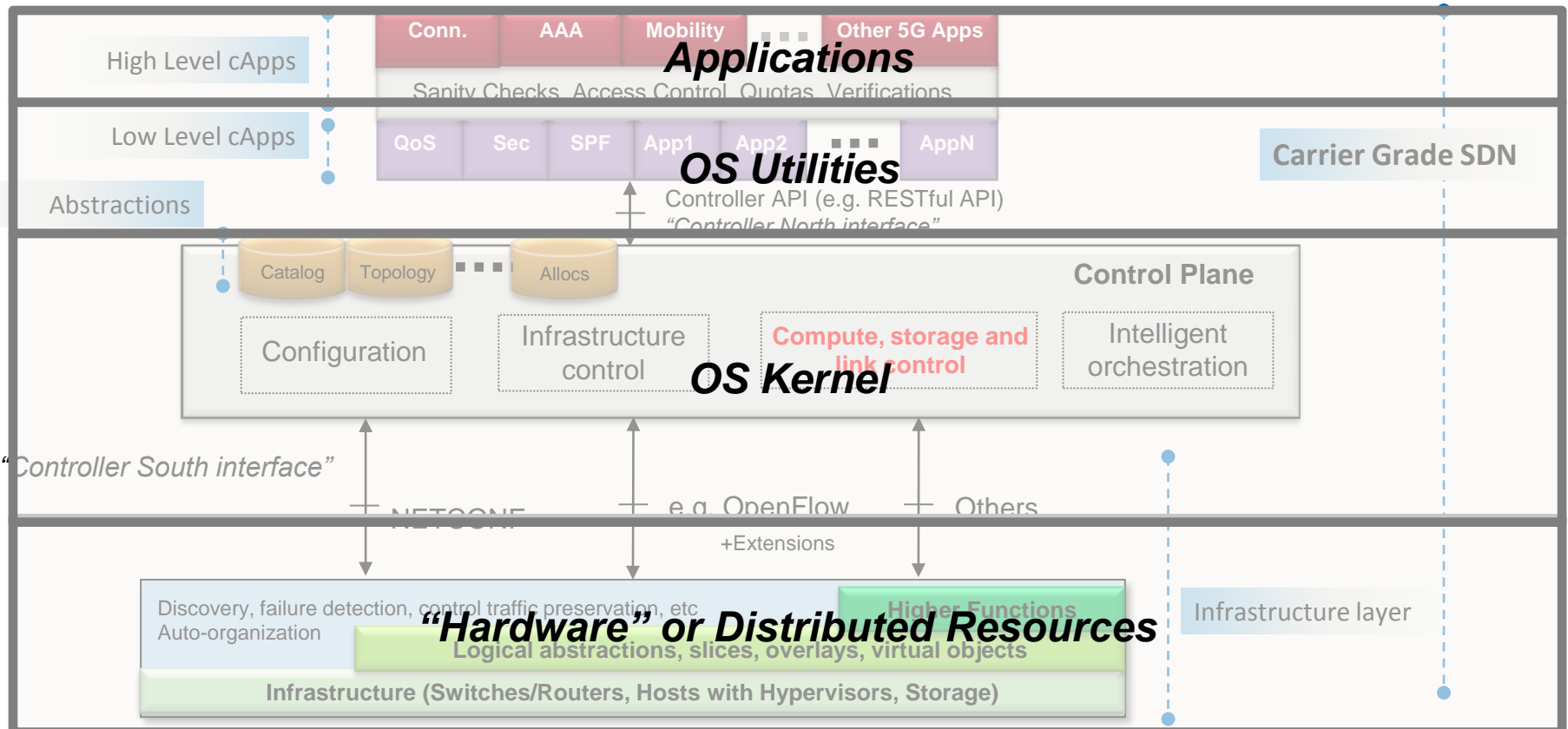
Challenges to the enabling technologies

- **Challenges to specific technologies**
 - SDN: scalability, flow aggregation, resilience, security
 - NFV/MEC: performance, placement, orchestration
 - *Overall*: flexibility, and dependability of dealing with dynamics
 - Both NFV and SDN were conceived for fixed/static environments
- **Software Networks: OK, but what exactly is in software?**
 - Network: 1. Topology 2. Protocol Stacks 3. Routing
 - 2: NFV, 3: SDN. What about 1?
 - SN: How to support structural dynamics, node and link churn
 - Expected 5G traits will bring such effects: small cells, front/backhaul integration, V2X, mobile BS, cloud integration, virtual nodes, etc.

Vision and Technological Gaps



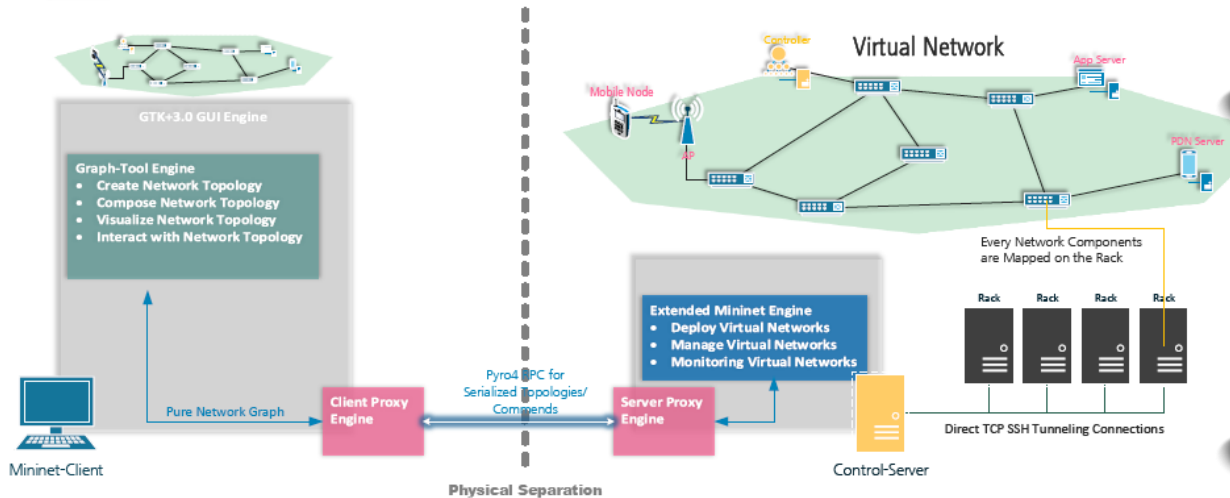
Vision and Technological Gaps



From Theory to Practice: 5G Testbed



Product of
Future Network Technologies
ERC in Munich, Huawei Technologies



- Client Specifications:
- OS Platform: Linux Ubuntu
 - GUI Engine: GTK+3.0
 - Client Proxy Engine: Pyro4 RPC

- Server Specifications:
- OS Platform: Linux Ubuntu
 - Mininet: Customized Mininet 2.2.1
 - Server Proxy Engine: Pyro4 RPC

We pursue a radical goal of tuneless, anchor-less and NFV-less mobility support in SDN

MCN support: service request, mobility, paging, etc.

It could measure!

It also scales!

Conclusions

- **We target a flexible, carrier grade, logical access core network that becomes a unified platform for different instantiations of connection, mobility, security and routing managements**
 - Owned resources are dynamically integrated into a tenant control pool
 - These resources are usable over a layer cake of abstractions, starting with low level abstractions (IaaS like) and going up to enriched APIs
 - Service, management and network applications run on the latter using standard interfaces
- **We welcome partners and EC feedback to realize our vision and prove technical feasibility and business viability through tests and large scale trials in 5GPPP Phase II and, especially, Phase III (show cases in Europe)**

Thank you

www.huawei.com

Copyright©2011 Huawei Technologies Co., Ltd. All Rights Reserved.

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Huawei may change the information at any time without notice.