

# Network Based Services in Mobile Networks

## Context, Typical Use Cases, Problem Area, Requirements

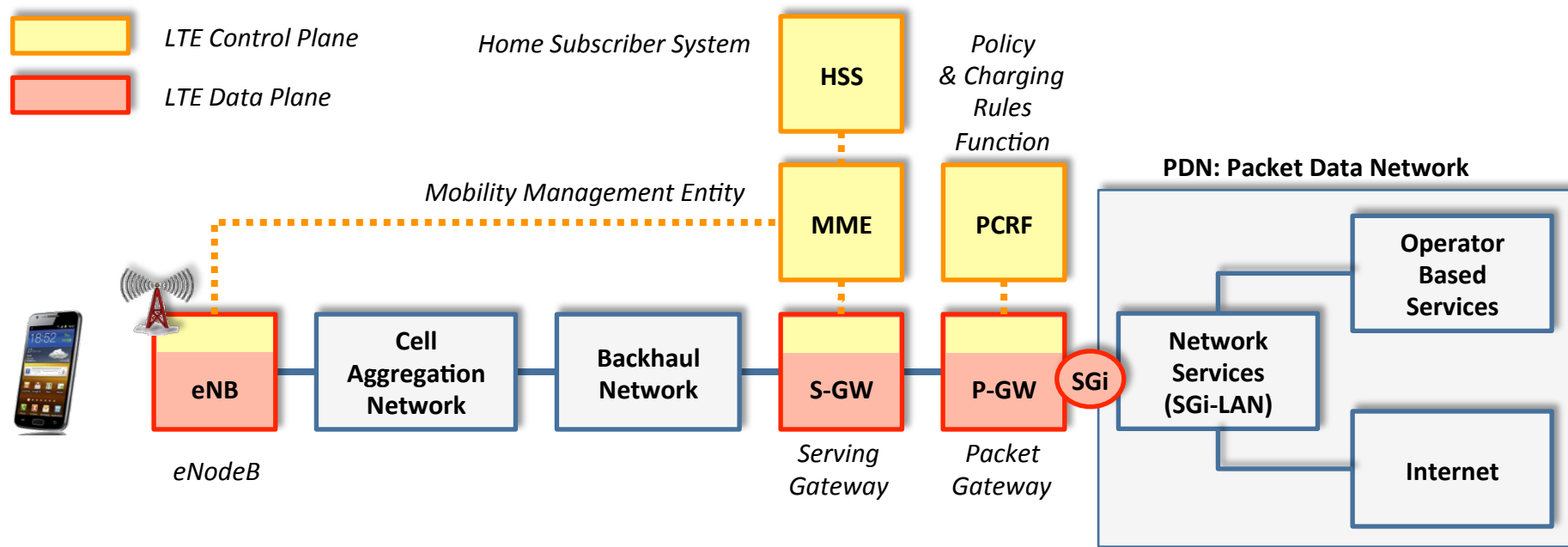
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BoF Meeting on Network Service Chaining (NSC)

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# Context: Mobile Networks and Service Platforms

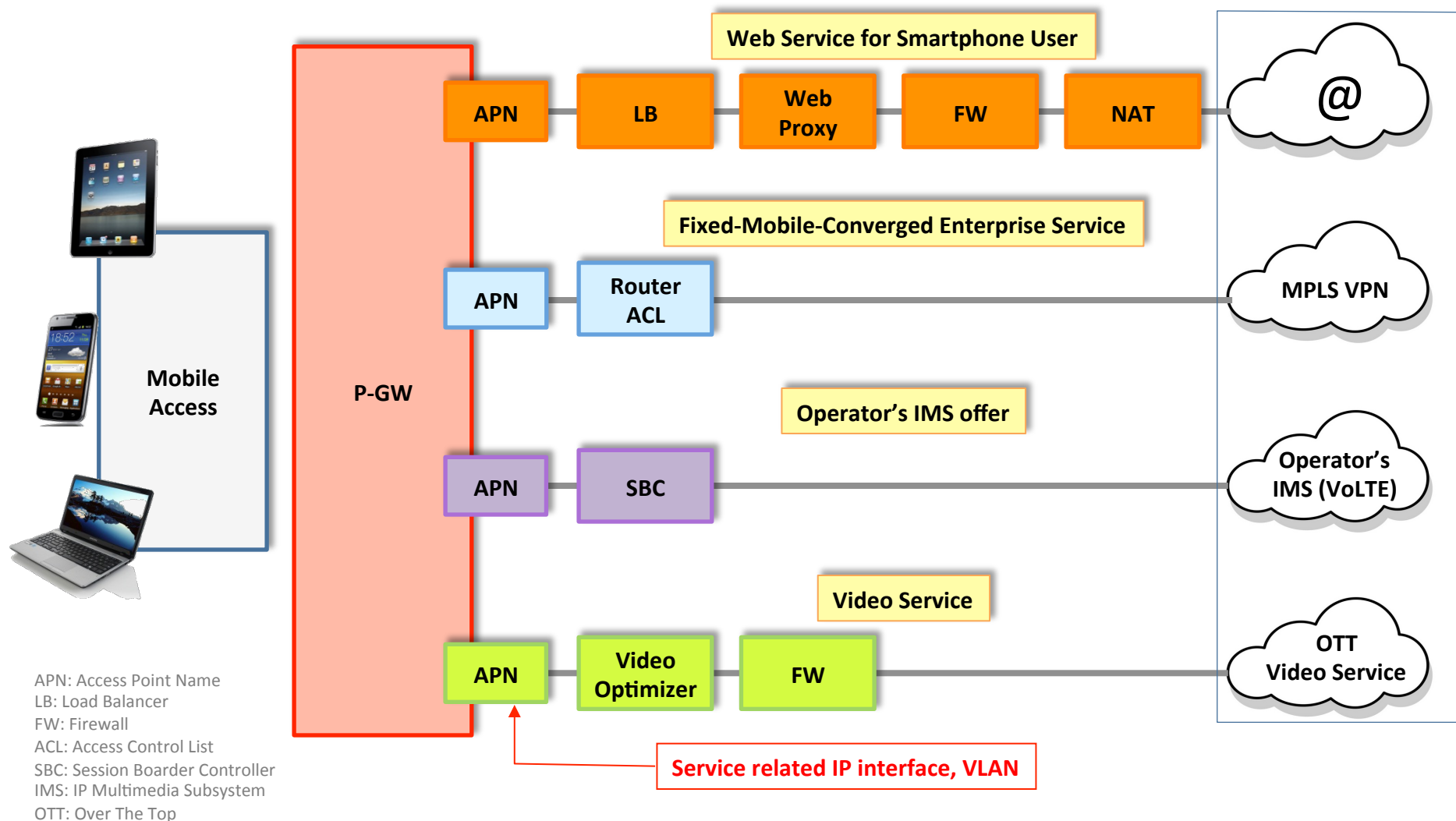
## Major Building Blocks of a LTE Service Platform



- ❑ SG-interface is the 3GPP reference point between P-GW and Packet Data Network.
- ❑ SGi protocol structure, data content, scope not specified (equal for Gi in 3G networks).
- ❑ Operator based services like, VoLTE, Mail, Web, RCS-e/Joyn, SMS, MMS not in scope.
- ❑ Scope here: network services like firewalls, DPI, performance enhancement proxies for videos, TCP optimization & header enrichment, NAT, load balancers, caching, etc.
- ❑ This class of services takes care of managing network traffic and network policing.

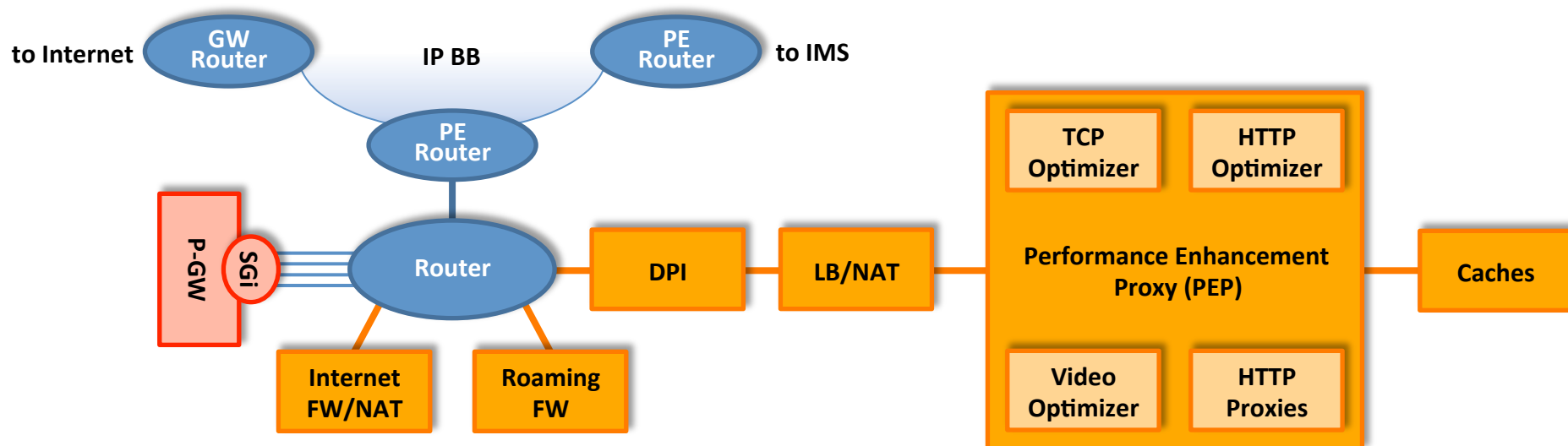
# Context: Principle of Typical Hard-Wired SGi-LAN Services

## Current Common Approach – Logical View on Typical Use Cases



# Problem: Hard-Wired SGi-LAN Services

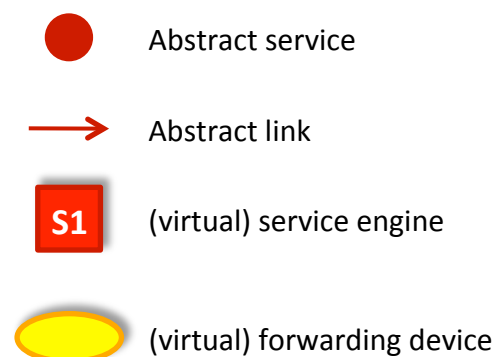
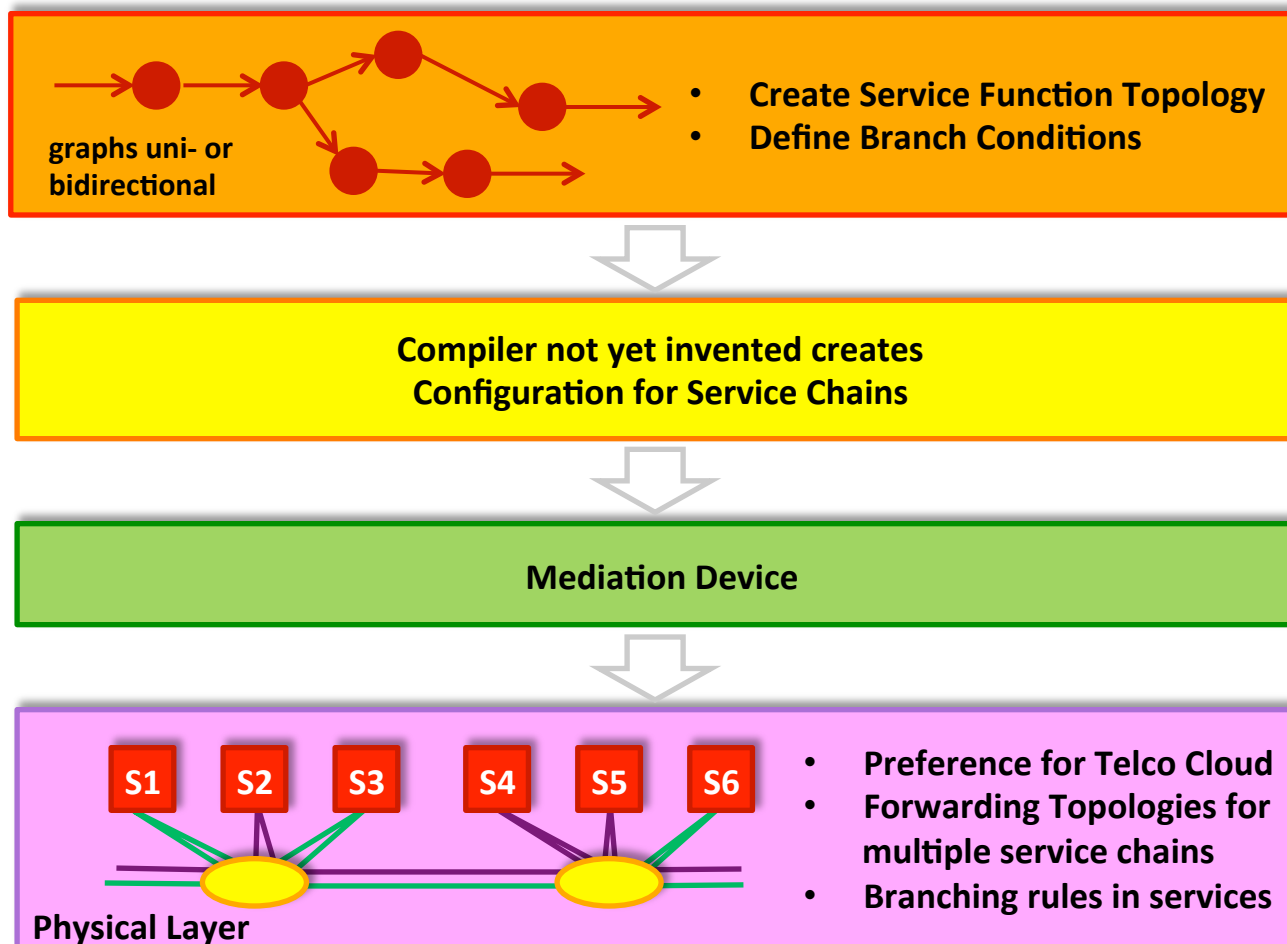
## Current Common Approach – More Physical View on Typical SGi-LAN



- ❑ With deployment of additional value-added services increasing number of functions required in SGi-LAN. Some functions in dedicated devices, sometimes multiple functions in one box.
- ❑ Due to fast service introduction cycles service chains emerge, growth & change evolutionary.
- ❑ Very often static IP links, policy routing, VRFs etc. used to enforce required service sequence.
- ❑ Results in steadily increasing, handcrafted complexity and decreased visibility of functional dependencies between service chains and underlying LAN topology. Means expensive OAM.
- ❑ Practically impossible to implement automated service provisioning and delivery platform.

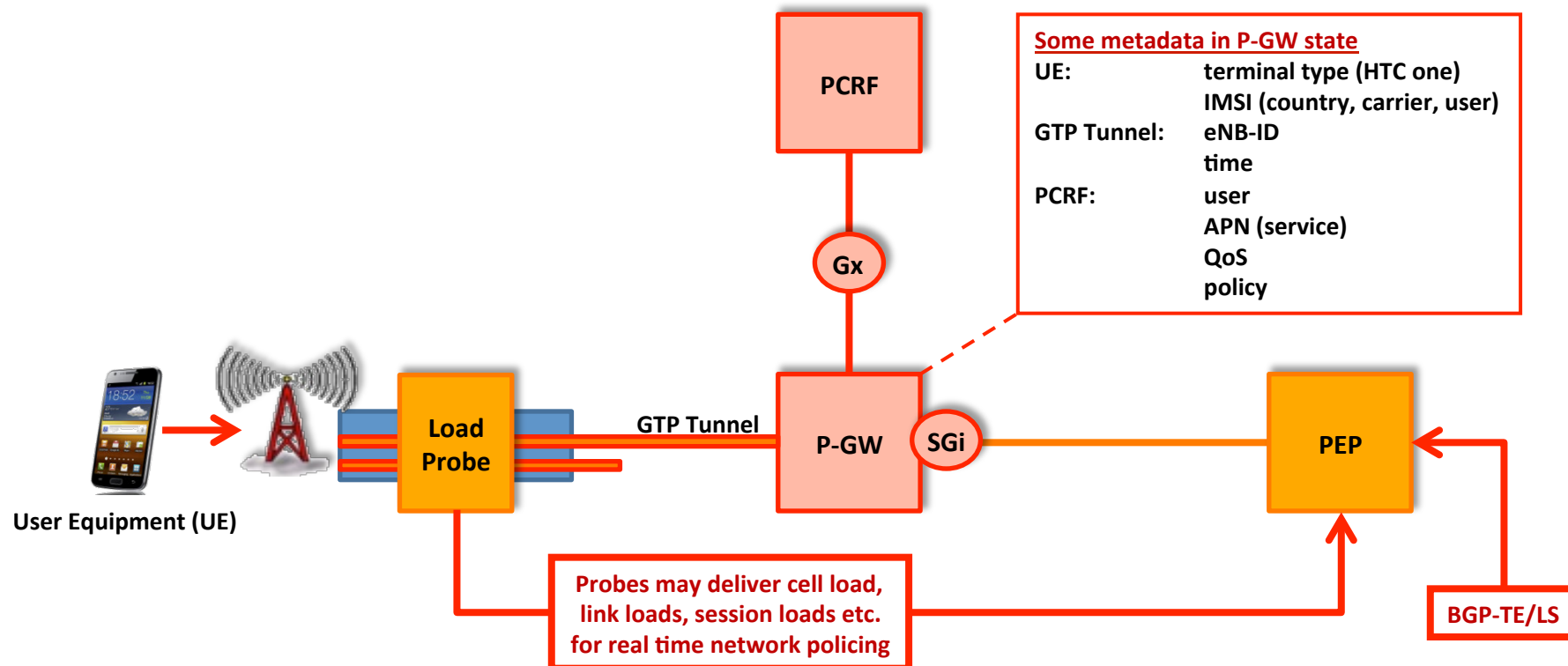
# Requirement: Simplicity, Flexibility, Speed, Expandability

Vision: Service Chain Abstraction and Network Compilation



## Requirement: High Degree of Freedom in Chain Creation

Network provides us with sufficient Metadata to differentiate



- ❑ We may connect all relevant service functions with all relevant sources for metadata or
- ❑ We may piggyback metadata information with the IP packets traversing a service chain.
- ❑ Piggybacking metadata seems to be more straightforward than picking them out with DPI.

## Summary:

- ❑ Market dynamics accelerate need and demand for more services at an even faster rate.
- ❑ With current approaches network service LANs and their service chains become more and more complex, error-prone, hard to manage and hard to extend. It's a dead end street.
- ❑ Vision is to decouple creation of service topologies and their internal branching conditions from the creation of the associated underlying packet forwarding (overlay) network.
- ❑ Operators think in terms of an ordered sequences of network services (more precisely graphs) selected out of a service pool and define forking conditions in the service graphs based on metadata sets including user data, related service classes, type of user equipment in use, network conditions etc.
- ❑ (Conditional) forwarding decisions done in a network service node may allow for more real time flexibility than more static service topology paths in an underlying network.
- ❑ We would appreciate if IETF agrees to start a WG on Network Service Chaining analyzing requirements and specifying solutions also supporting virtualized service environments.