

Service Function Chaining in Mobile Networks

Status draft-haeffner-sfc-use-case-mobility

IETF 89 London, 3 March 2014
Service Function Chaining WG

Walter Haeffner - walter.haeffner@vodafone.com, Jeff Napper - jenapper@cisco.com
Martin Stiernerling - mks.ietf@gmail.com, Diego R. Lopez - diego@tid.es

draft-haeffner-sfc-use-case-mobility

acknowledgement

We thank

Linda Dunbar

Ron Parker

Wim Hendericks

Alla Goldner

Dave Dolson

Peter Bosch

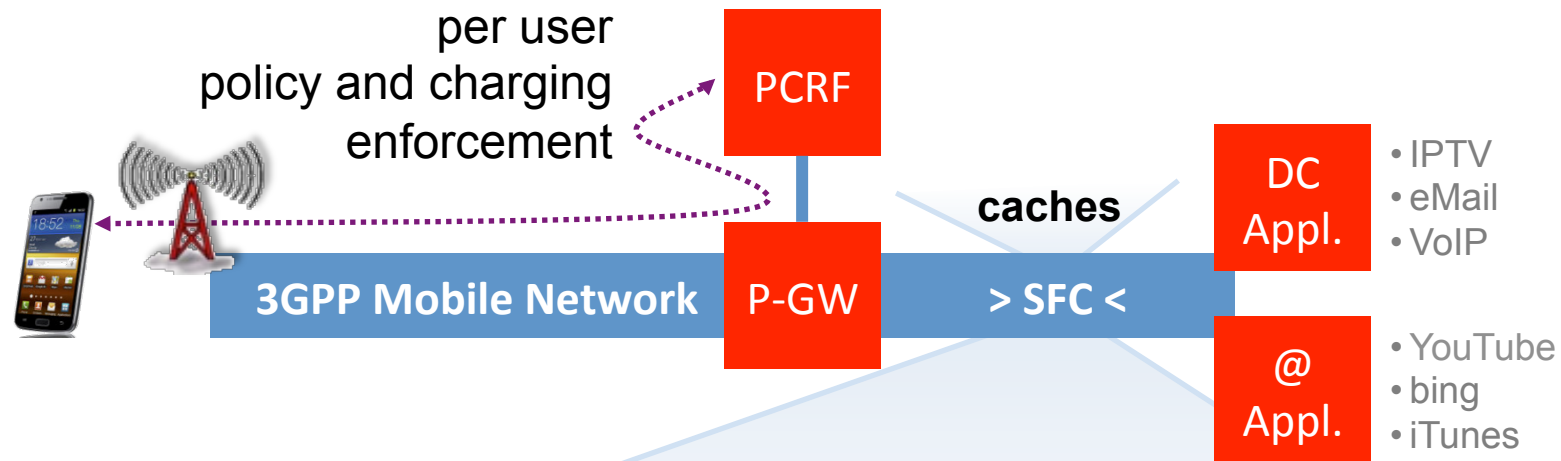
Praveen Muley

Carlos Correia, **for valuable comments**

draft-haeffner-sfc-use-case-mobility

1 – context

Mobile network operators need to implement a complex array of single- (or few-) function devices (a.k.a. SFC) to control data traffic such that they can achieve their business goals.



draft-haeffner-sfc-use-case-mobility

2 - objectives

- ❑ Understand importance of Service Function Chaining for mobile network operators - Influence to their business
- ❑ Discuss Service Function Chains (SFC) in the context of mobile network architectures – exemplary state of the art use cases
- ❑ Work out potential weaknesses in current environments and derive operator requirements to support SFC WG objectives
- ❑ Compare with activities of other standard bodies, especially clarify interaction between 3GPP and IETF SFC approach
- ❑ A possible dream SFC environment from an operator's point of view based on NFV, SDN, reflecting abstraction levels

draft-haeffner-sfc-use-case-mobility

3 – status draft

❑ **Draft-00 issued 29 Jan. 2014**

- ❑ Service chains supplement 3GPP policy and charging control architecture
- ❑ PCC and SFCs play a significant role in mobile service specifications
- ❑ SFCs often a sequence of “little” proprietary SFC implementations
- ❑ Therefore typically a hierarchy of inspections & classifications in place
- ❑ Discussed simple classification and flow steering schemes
- ❑ Sketched use case “video optimization” (L7) and “TCP optimization” (L4)
- ❑ Discussed weakness of current solutions and requirements to SFC WGs

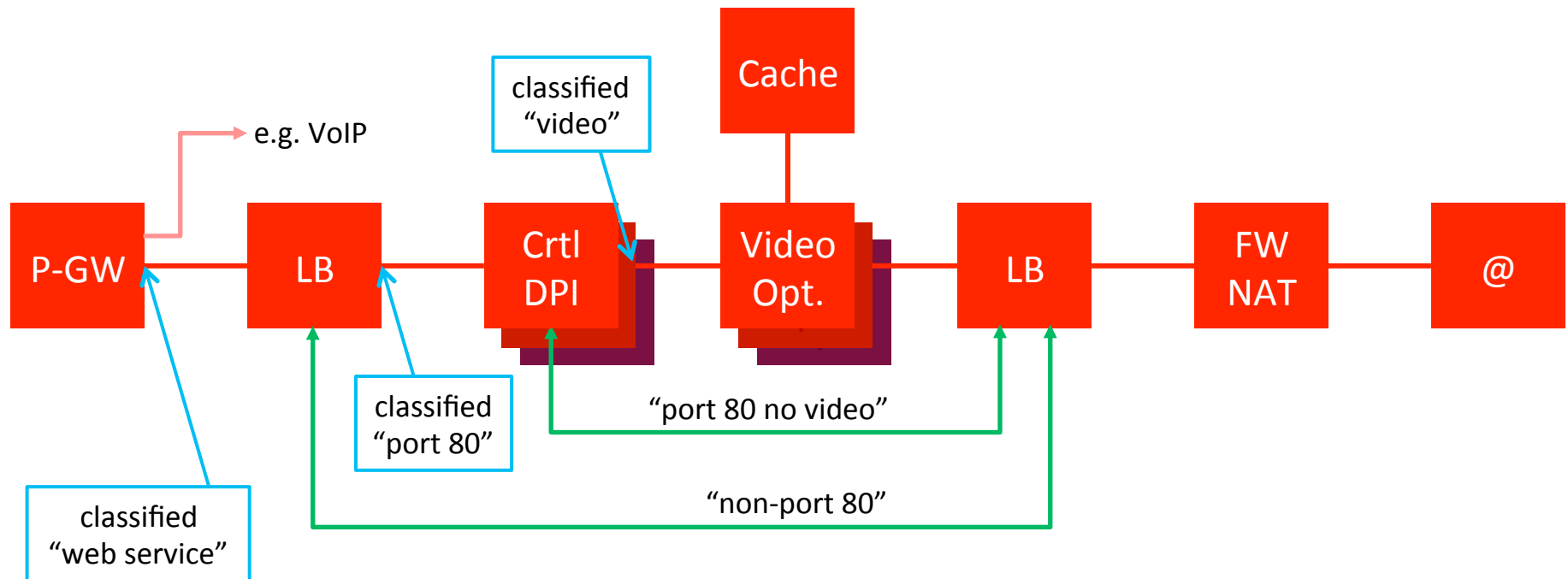
❑ **Draft-01 issued 14 Feb. 2014**

- ❑ Added 3GPP R11 Traffic Detection Function (TDF) [*3GPP TS.23.203*]
- ❑ Allows for fine grained classification schemes and feedback to PCC

draft-haeffner-sfc-use-case-mobility

3 – status draft - basics of a video optimization SFC

Functional view of a model video optimizer SFC

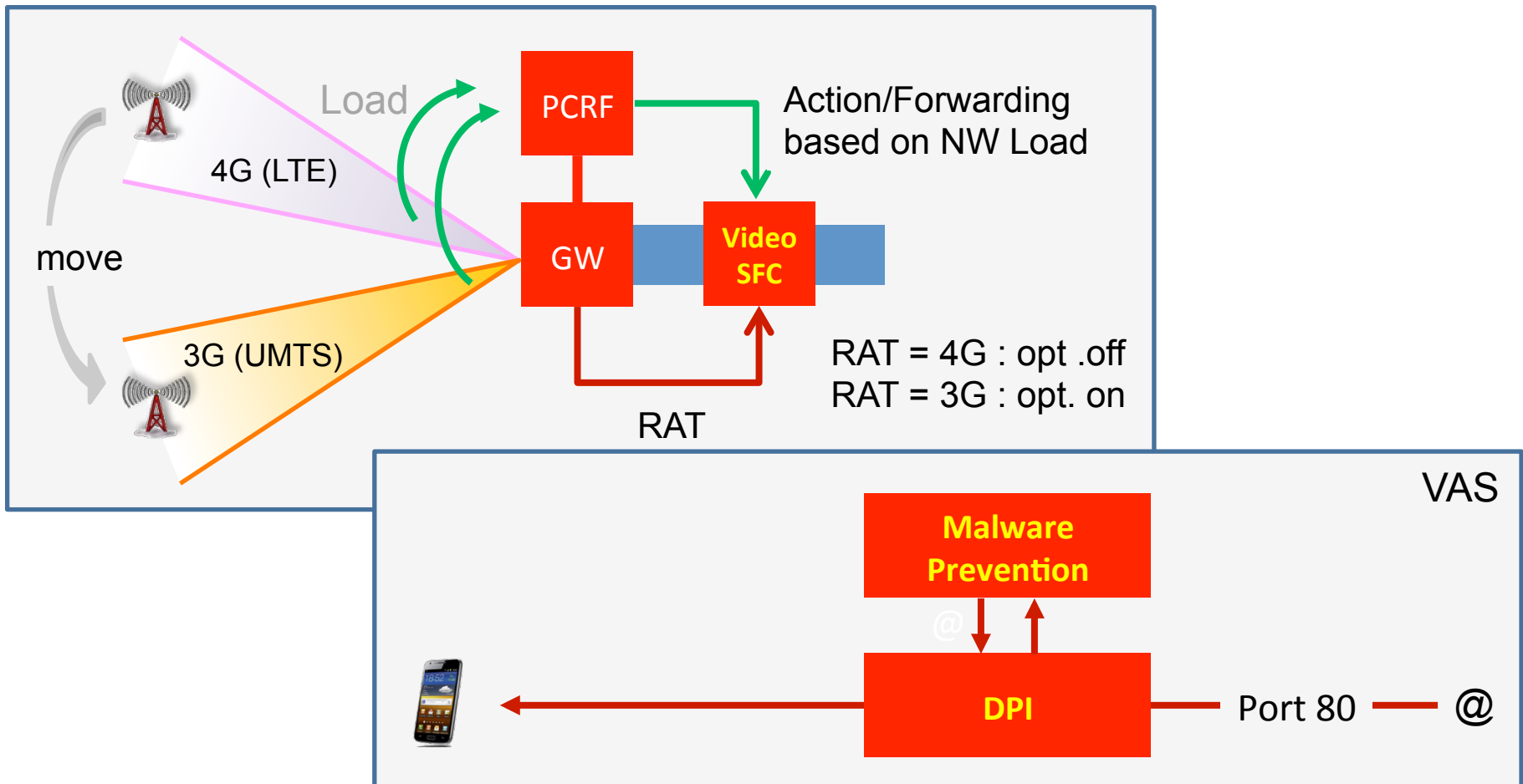


Draft-00 & draft-01 shows flow steering based on HTTP redirections

draft-haeffner-sfc-use-case-mobility

4 – outlook draft-02 to be published end of March

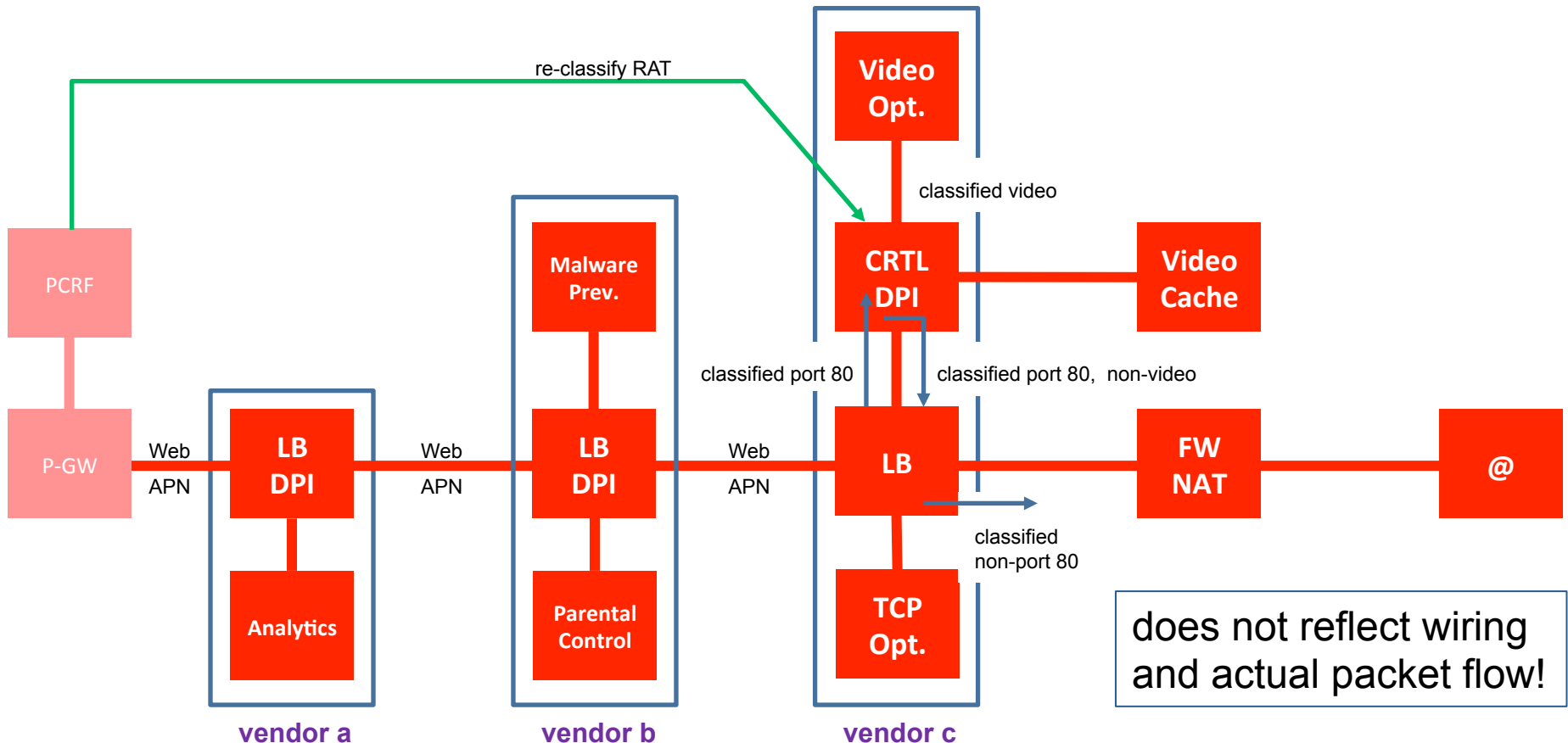
Discuss impact of re-classification and chains of value added services.



draft-haeffner-sfc-use-case-mobility

5 – outlook draft-02 to be published end of March

Grown multi-vendor structures may become very complex, inefficient, hard to understand and hard to manage



draft-haeffner-sfc-use-case-mobility

5 – Weaknesses and Requirements

Weaknesses in current deployments

- ❑ Per APN service chaining, in almost any case classification too coarse grained
- ❑ Means traffic often unnecessarily traverses a service function, no offloading
- ❑ Often ad hoc sequence of individual mini-chains, each with its own classification
- ❑ Results in multiple, individual DPI inspection systems, multiple LB batteries
- ❑ Is expensive, complex, inflexible, hard to modify/extend with reduced performance

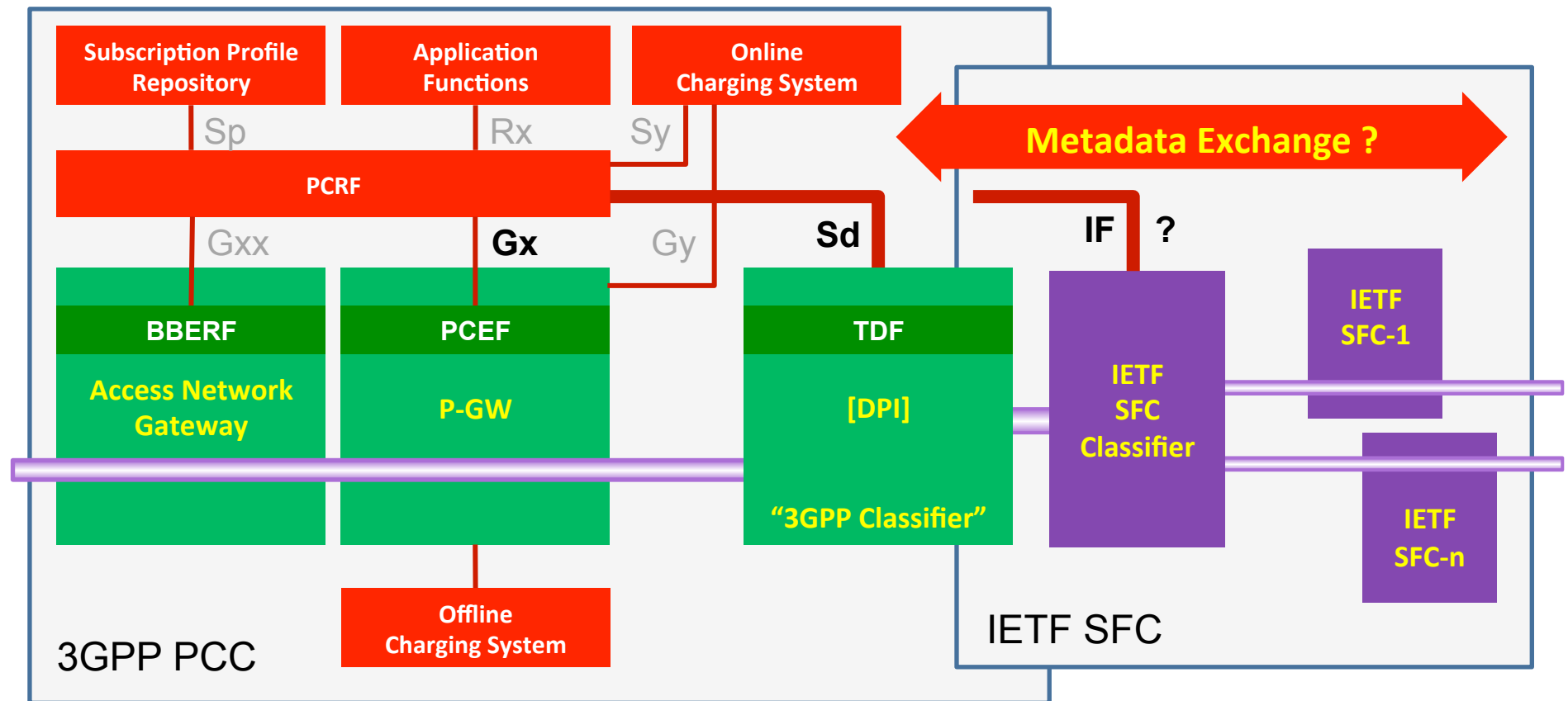
Possible solutions

- ❑ Mobile network MUST exchange context with the IETF SFC classifier function
- ❑ SFC classifier MUST tag packets such that these enter only the SFs required
- ❑ Means bi- and unidirectional flows MUST be allowed
- ❑ Individual SFs MUST participate in multiple, different SFCs
- ❑ Creation/modification of SFCs including their branching rules SHOULD be done in a simple to use SFC editor. Mapping onto the underlay MUST then be automatic.

draft-haeffner-sfc-use-case-mobility

6 – IETF SFC interactions with 3GPP PCC architecture

How to exchange 3GPP user & control plane metadata with IETF SFC?



BBERF: Bearer Binding and Event Reporting Function

draft-haeffner-sfc-use-case-mobility

7 – outlook draft-IETF 90

- ❑ Listed all use case classes required to verify universality of SFC WG architecture and design paradigms for mobile.
- ❑ Isolate input to requirements and functional specifications.
- ❑ SFCs for fixed networks (xDSL, Cable) are typically a subset of what is seen in mobile. List synergies w.r.t. FMC scenarios.
- ❑ Analyse requirements for the interaction between the 3GPP and the IETF SFC classification schemes.
- ❑ Initiate a discussion to clarify how to proceed in case of encrypted traffic (IETF 88 resolution).