

Source: Ericsson
Title: QoS for 2G/3G access
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Work Item / Release: SAES

Abstract of the contribution:

At the SA2 #62 meeting the question for the QoS model for Rel-8 GPRS access has been brought up. The contribution presents Ericsson's view on the questions outlined in SA2 #62 S2-080823.

Introduction

- The following slides investigate to which extent GPRS QoS supports EPS QoS and outline enhancements that could be done in 2G/3G in order to align GPRS QoS and EPS QoS
- Goal:
 - Minimize impact on UE and RAN
 - Align network behavior between 2G/3G and LTE accesses.

Key Elements of EPS QoS

- *NW Controlled QoS*
- *QCI-Based Bearer QoS Parameters*
- *No Support for QoS Negotiation / Re-Negotiation*
- *'EPS subscribed QoS profile' = < AMBR + [(QCI; ARP) per APN] >*

Realizing EPS QoS in GPRS (1/4)

Network Controlled QoS

- *Bearer Establish / Modify Controlled by GW*
 - *UL Packet Filters in UE / DL Packet Filters in GW. Controlled by GW*

- Largely Supported Already by 23.060 Rel-7 (NW-Requested Secondary PCA)
- Required Changes valid only for a Rel-8 compatible UE
 - Default Bearer in 23.060:
 - PCA Procedure ⇒ default bearer established
 - Secondary PCA Procedure ⇒ dedicated bearer established
 - During UE-init PCA Procedure Rel-8 SGSN Ignores R99 QoS received from UE, and Sets Bearer QoS Parameters Based on Subscription Data from HSS.
 - Mandate Bearer Control Mode = 'MS/NW' for Rel-8 UEs and Rel-8 SGSNs
- Rel-8 SGSN/PDN-GW continues to support pre-Rel-8 UEs with pre-Rel-8 protocol behavior

Realizing EPS QoS in GPRS (2/4)

QCI-Based Bearer QoS Parameters

- *<QCI; ARP> for Non-GBR Bearers*
- *<QCI; ARP; GBR; MBR> for GBR Bearers*

■ Required Changes

- Rel-8 SGSN Maps Between QCI and R99 QoS *<TC; THP; SI; SSD>* According to 1-1 Mapping Table in Annex E of TS 23.401
 - ARP, GBR, and MBR are the Same in GPRS and EPS QoS
 - Other QoS parameters than those in the mapping table and ARP, GBR, MBR may become declared obsolete.
- ⇒ Rel-7 and/or Rel-8 CR Against 23.107?

Realizing EPS QoS in GPRS (3/4)

No Support for QoS Negotiation / Re-Negotiation

- HSS Assigns Bearer QoS Parameters for Default Bearers
 - GW (PCRF) Assigns Bearer QoS Parameters for Dedicated Bearers
 - ⇒ UE / MME / E-UTRAN can Only Accept or Reject
 - ⇒ E-UTRAN Can NOT Initiate Bearer Modify

- A UE can still perform a UE initiated PC Modification Procedure on a PDP context that was UE initiated.

- Required Changes
 - Rel-8 SGSN Shall Disable QoS Negotiation / Re-Negotiation
 - Rel-8 SGSN is transparent for UE initiated procedures and performs the necessary mapping.
 - Rel.8 GERAN/UTRAN Can Only Accept or Reject PFC/RAB
 - Rel-8 SGSN Shall Reject RAN-init PDP Ctxt Modify Request

Realizing EPS QoS in GPRS (4/4)

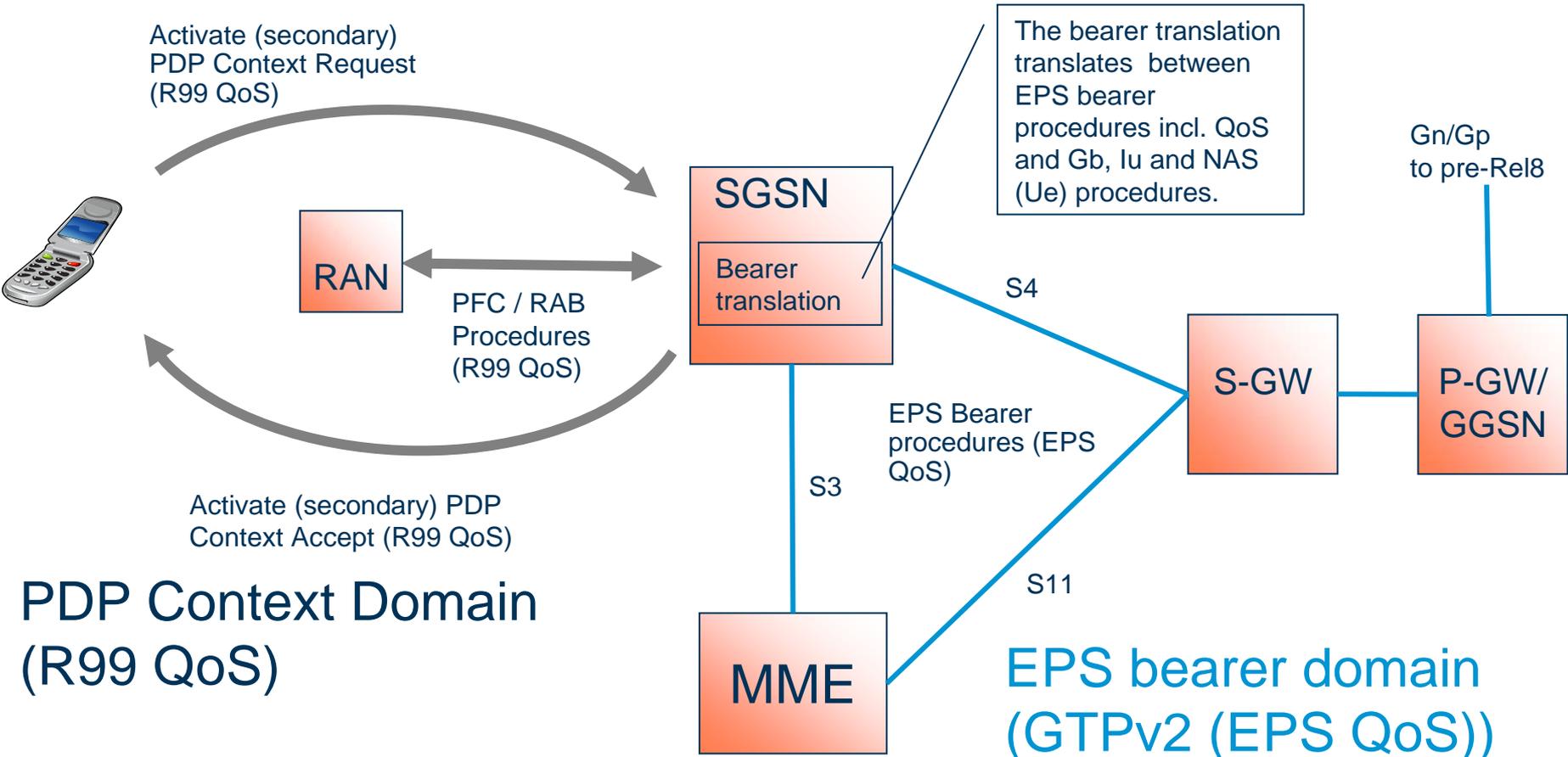
'EPS subscribed QoS profile'

– < AMBR + [(QCI; ARP) per APN] >

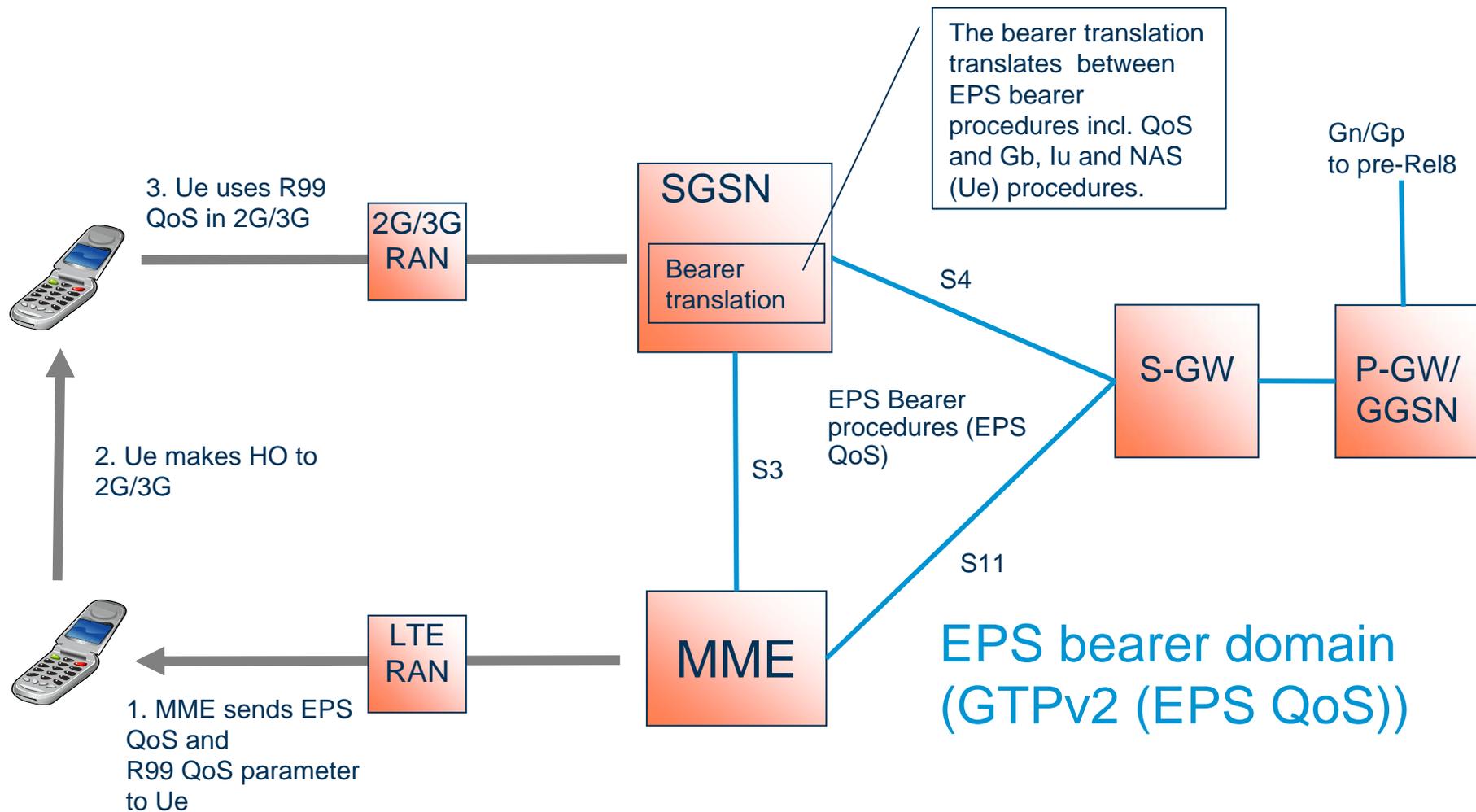
■ Required Changes

- Rel-8 subscribed QoS profile = EPS subscribed QoS profile
- Rel-8 GERAN/UTRAN: Include AMBR in RANAP / BSSGP Rel-8

Connect 2G/3G to EPC



QoS for LTE-2G/3G mobility



Ericsson view on S2-080823

0. Which QoS model for 3G in Release 8 will be used: UMTS QoS model or SAE QoS Model;

R99 QoS model is preferred for 2G/3G. Alignments of EPS QoS and Rel-99 QoS behaviour should be discussed.

1. Whether to assume S11-like or Gn-like procedure model on S4 interface;

S4 should be aligned with S11 i.e. EPS bearer procedures and EPS QoS.

2. Whether to transfer SAE QoS Profile or GPRS QoS Profile from P-GW to S-GW;

S5/S8 forwards only SAE QoS Profile

3. Whether the “QoS Negotiation” is allowed for 2G/3G Rel-8 architecture in TS 23.060;

We do not see a need of supporting QoS negotiation procedures towards RAN..

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