

# S8a-S2 chaining: issues and recommendations

Nortel

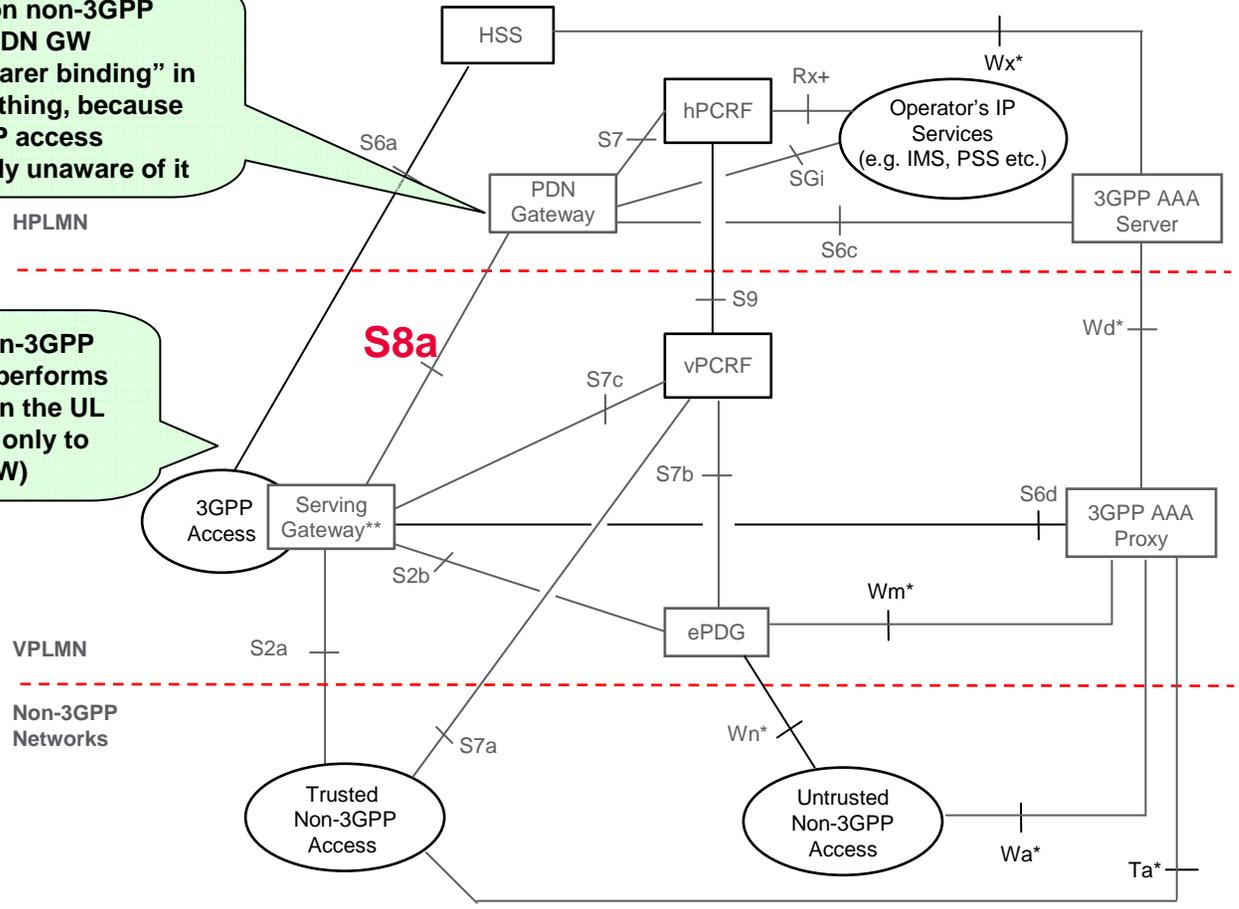
# Outline

- > This presentation focuses on the S8a-S2 chaining scenario in which GTP is used to support non-3GPP access anchored in the VPLMN
  - We identify what we believe is a contradiction, and
  - We investigate three ways to address this contradiction
- > The PCC/QoS signalling architecture for IETF interfaces has the following salient features that differ from the S8a (GTP) paradigm:
  - QoS information is signalled “off path” via S9, S7a, S7b and S7c
  - The “bearer binding” function with S8b (PMIP) and E-UTRAN access is located in the Serving GW (whereas with GTP the bearer binding is performed in the PDN GW)
  - There are no bearer IDs in user plane packets i.e. there is no equivalent to the GTP usage of TEIDs to identify individual bearers
- > In the chained scenario (S8a – S2) agreed in the last meeting, the GTP bearer-aware model on S8a is superimposed on top of the PMIP bearer-less model on S2a
  - The result is a contradiction described in the next slide

# The contradiction

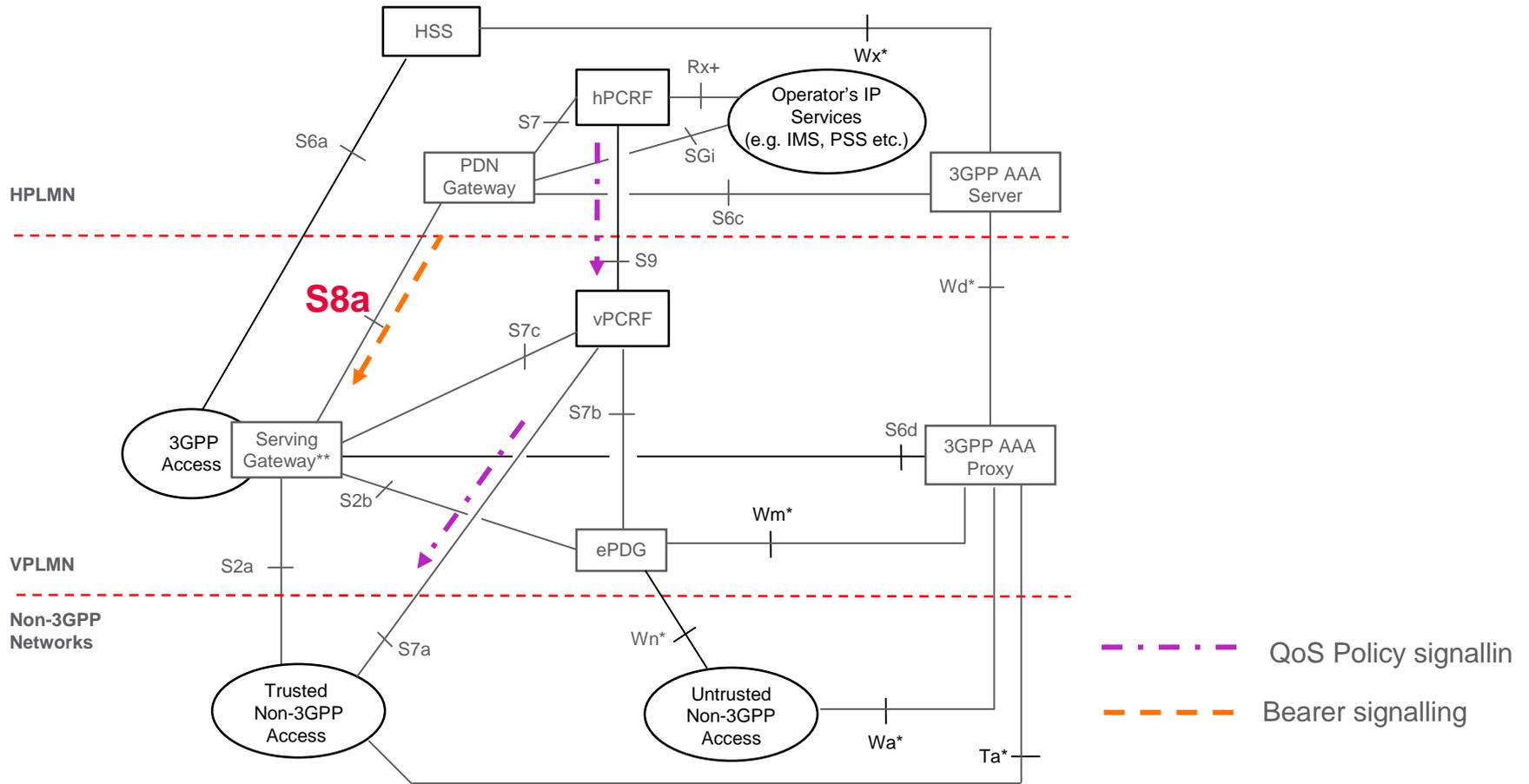
When UE is on non-3GPP access, the PDN GW performs "bearer binding" in the DL for nothing, because the non-3GPP access remains totally unaware of it

When UE is on non-3GPP access, the SGW performs "bearer binding" in the UL for nothing (if not only to please the PDN GW)



> Two different QoS models: "bearer-less" S2 meets "bearer-aware" S8a

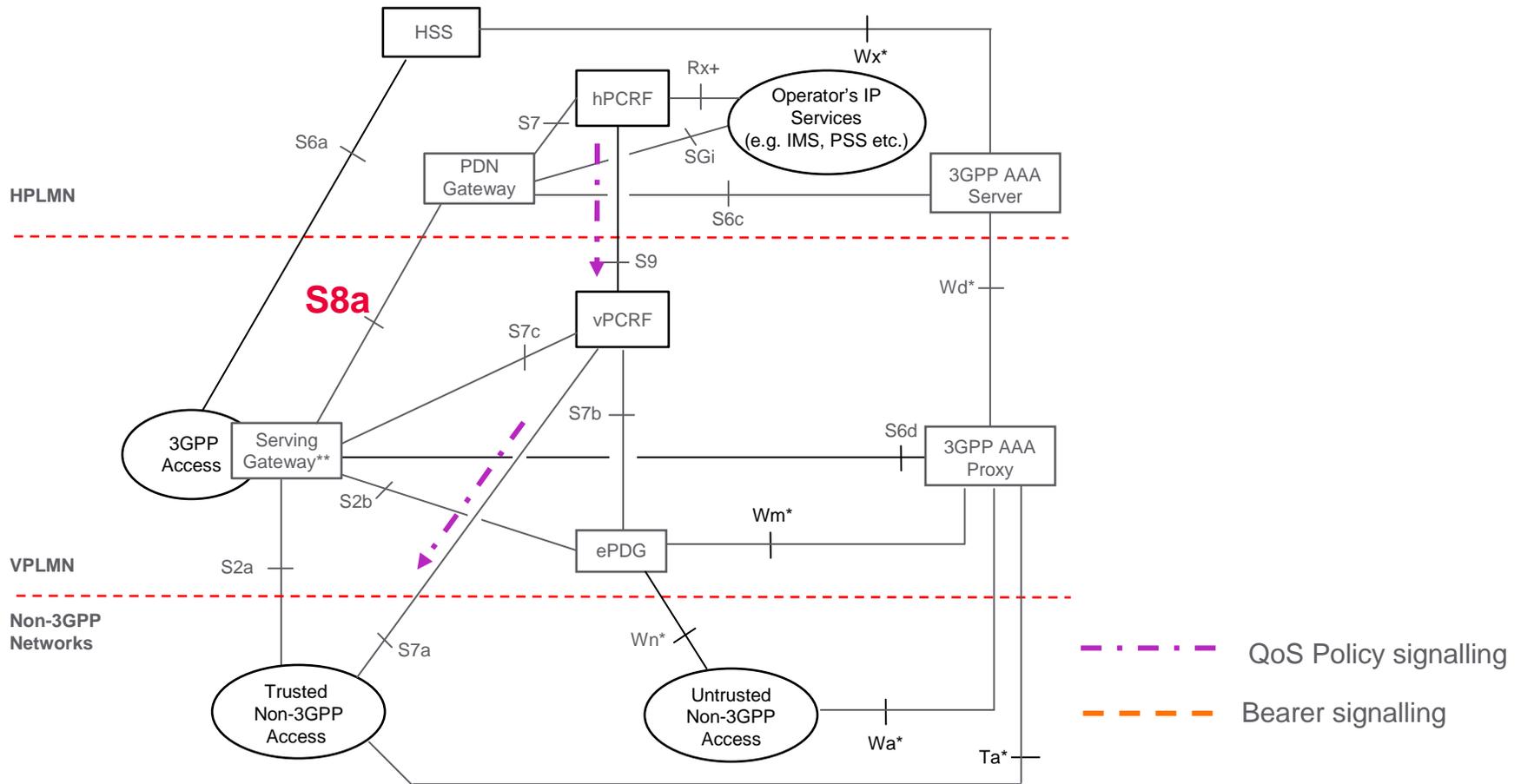
# Possible solution 1: two C-planes in parallel



- > Always use GTP-C and S9 signalling in parallel
- > For non-3GPP access the GTP-C signalling is overridden by S9 signalling, whereas PGW and SGW perform useless bearer binding across S8a in DL and UL, respectively



# Possible solution 3: no GTP-C



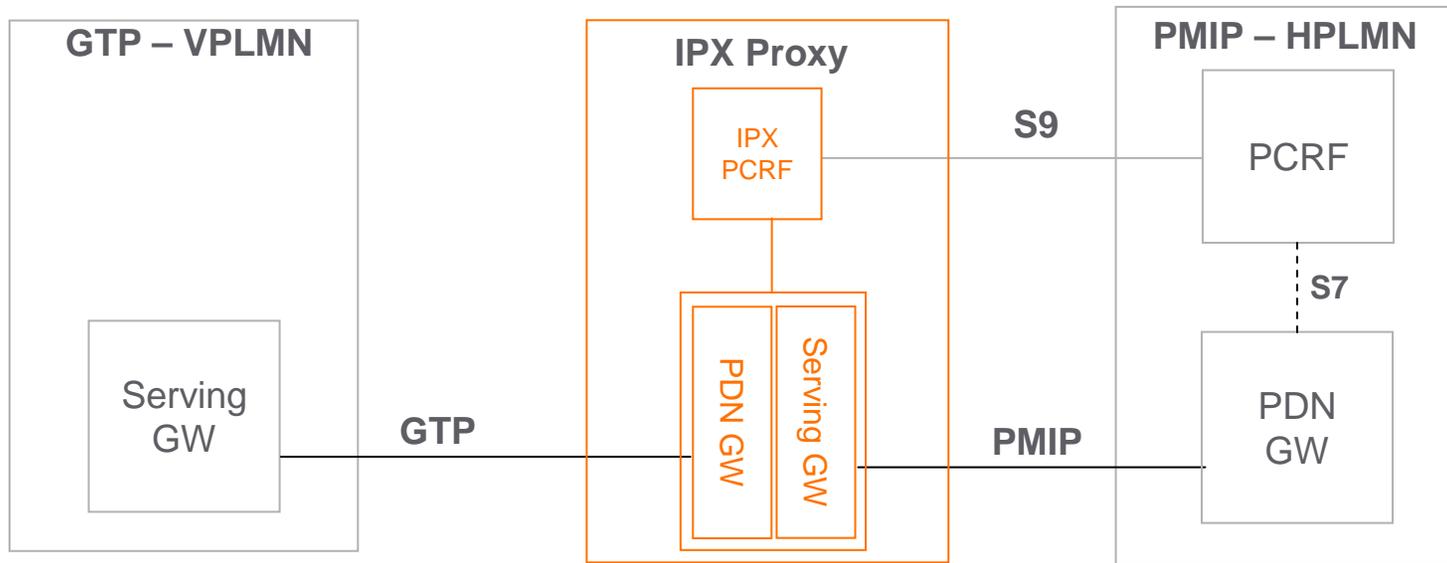
- > Use S9 for QoS signalling towards all accesses
- > Use GTP-U with single TEID per UE per PDN on S8a
  - Also needed is GTP-U based mechanism for tunnel movement, as discussed in S1 context
- > Functionality-wise this is equivalent to the S8b option with a '3GPP-specific' user plane encapsulation over S8a (e.g. note that with this approach the bearer binding for 3GPP access is in the SGW)

# Conclusions

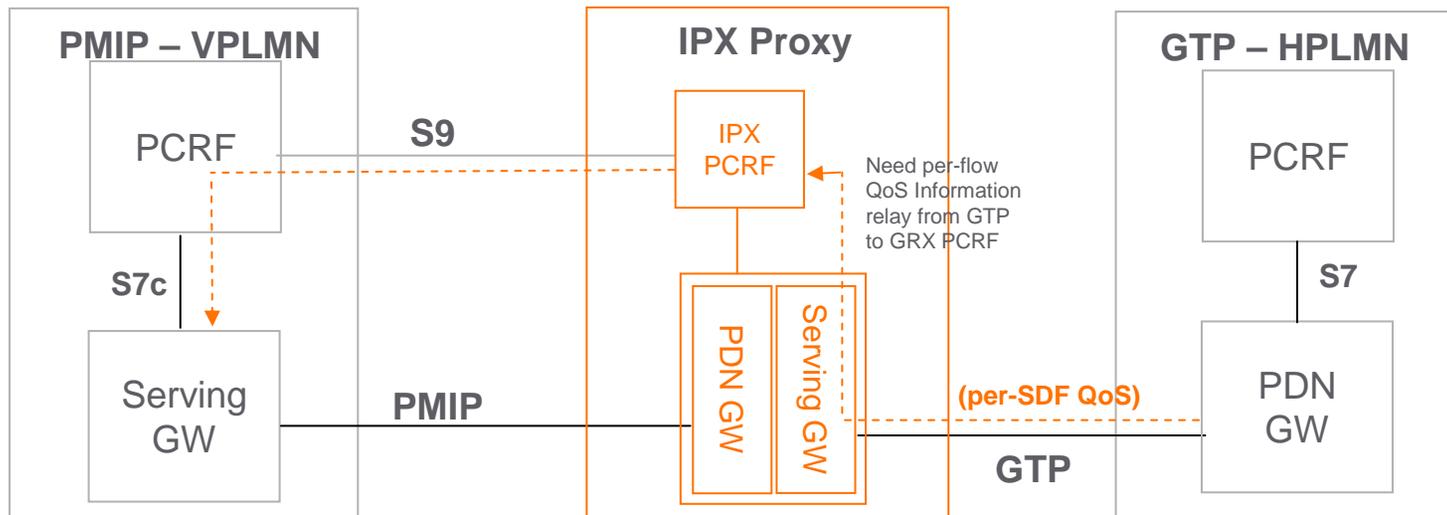
- > 3GPP SA2 has to decide which of the three options should be supported in the standards:
  - Option 1 looks awkward - “the worst of both worlds”:
    - useless bearer binding in SGW and PGW;
    - new interface (S9) across the roaming boundary;
    - S9 relocations, etc
  - Option 2 is easiest from standardisation viewpoint
    - basically requires transparent transport of per-SDF QoS information within GTP-C;
    - is very similar to the approach for GTP-PMIP roaming with the help of IPX Proxies, the SGW being in the role of IPX Proxy (see backup chart)
    - seems to be addressing most closely the main motivation for S8a-S2 chaining, namely, re-using of existing roaming agreements and operational experiences
    - on the downside, it requires a PCRF Proxy functionality collocated with the SGW
  - Option 3 is closest to the S8b (PMIP) architecture
    - apart from the U-plane encapsulation, this option is fully aligned with the 402 architecture
    - requires tunnel movement mechanism within GTP-U

Backup slides...

# GTP – PMIP Roaming with IPX Proxies



GTP VPLMN – PMIP HPLMN



PMIP VPLMN – GTP HPLMN