**SA WG2 Meeting #140-e S2-200xxxxx**

**August 19th -September 2nd 2020, Online (revision of S2-20xxxx)**

**Source: Nokia, Nokia Shanghai Bell**

**Title: CC#4 S2-2005800 and KI#7 in general**

**Document for: Discussion**

**Agenda Item: 8.4**

**Work Item / Release: FS\_eNS\_Ph2**

*Abstract of the contribution: xxx*

# **KI scope:**



The scope is: selection of a cell where to stand a chance to successfully register with a slice that is band specific (i.e. not supported in all bands of a PLMN).

# **Discussion**

S2-2005800 however is not teaching how to steer a UE to select a cell suitable to execute Unfortunately, like most papers allocated to KI#7 at this meeting. It addresses deployments that depart from the assumption all the cells in a TA support the S-NSSAIs the TA is declared to support to the CN and other RAN nodes over Xn. The following are scenarios that are considered in various papers.

**CASE A) the baseline case (uniform support in TA)**

Some describe how band preference is done today. That is fine, but it does not qualify as a solution to the KI while it shows that a deployment can privilege some bands for certain PDU sessions (or even QoS flows even if it is not shown in any solution). The plus of this is that it show a way for operator to support all PLMN bands in the TA while steering in connected mode to preferred bands for optimal radio resource management. This is compatible with rel-15/16 network and UEs. Example: the TA may include FB x at 700MHz and FB y ar 3.5 GHz. All bands support both S-NSSAIs but there is a preference to run S-NSSAI 2 on 3.5GHz (say URLLC) and eMBB can run on both bands. So this can address most deployment issues and is compatible with rel-15/16 UEs



**Figure 1: band preference in TA**

**CASE B)** **the scenario of S2-2005800**

Other solutions, like the one in S2-2005800, assume there is a band inside a TA where some S-NSSAIs the TA supports just do not work despite the related cells are in a TA. Then this requires some UE radio capability check (eg. See S2-2005800) to see if the UE can use both S-NSSAIs in the allowed NSSAI only as DC configuration (BTW people seem to forget that in DC configuration the primary cell runs the C-plane for both S-NSSAIs as the rules for C-plane handling depend on the S-NSSAIs a RRC connection supports!). But, unfortunately, for a Ue that supports both bands, this is not considering at all the case band x or band y band is the only one the UE can select in the RA (non-overlapping coverage). So even if we can allow both S-NSSAIs in the overlapping area to UEs that support DC, the rest of RA/TA will have to a fall back to one S-NSSAI only as unfortunately, even if the UE supports both bands and can go DC in areas where both are available, it can only use one of the S-NSSAIs at a time in each band where these do not overlap. This means that the determination of the Allowed NSSAI in the CN for a rel-15 UE cannot be based alone on the knowledge of the TA where the UE is, but also of the precise cell/band (the UE would get both S-NSSAIs accepted otherwise but could only use one at a time in areas where the bands coverage does not overlap). This information on BAND/Cell related policies however should be handled in the RAN like in CASE A, where a preference of band is discussed rather that exclusive support (which means also exclusive support on C-plane!). The access stratum capabilities per cell should not burden the CN. Also, a Rel-15/16 UE that was allowed a single S-NSSAI in an area of non-overlapping coverage, would miss the opportunity to use both in the area of overlapping coverage as there is no trigger for the UE to renegotiate the Allowed NSSAI. In summary, this solution does not help in addressing the same deployment needs as CAE A. it just makes the operation more complicated and cumbersome, and it ignores that the c-plane should support all the allowed S-NSSAIs.



**Figure 2: Some band in TA does not support certain S-NSSAI the TA supports. Only band combinations allow simultaneous use. In some case if a UE selects a certain band it can only use a subset of S-NSSAIs the TA supports**

In summary: to be compatible with a rel-15 UE the network should be able to detect support per cell, and there is no trigger to perform mobility registration that lets a rel-15/16 UE understand that a S-NSSAI is no longer supported in a band.

**CASE C)**

The following in figure would however be compatible with rel-15/16 UEs: if TA x and TA y are in different RA, the UE and network are in sync on what can be used in Band x and Band y. In the area of overlapping coverage, a UE configuration or UE driven cell reselection based on receiving a cause code "not supported in RA" would enable selection of right band. This would solve KI#7. This cause code cannot be received in CASE B.



**Figure 3: different TAs for cells that support different set of S-NSSAIs**

**Conclusions**

In the scope of FS\_eNS\_Ph2 KI#7 we should only address the deployments that allow a UE and network to be in synch and also provide triggers for UE and network to resync on what slices to use (which happens at RA boundaries – if Support of slices in cells of TAs is actually unknown, the network cannot even have proper strategies to allocate a RA). So, CASE A and CASE C are supported. CASE B is not. The deployment use case underlying CASE B is also unclear why it cannot be satisfied by CASE A and CASE C strategies, even assuming this was desirable.