**3GPP TSG-WG SA2 Meeting #153E e-meeting *S2-220xxxx***

**Elbonia, October 10 – 17, 2022 (revision of S2-220xxxx)**

**Source: Thales, ?**

**Title: Conclusion**

**Document for: Approval**

**Agenda Item: 9.24**

**Work Item / Release: FS\_5GSAT\_Ph2 / Rel-18**

*Abstract: a conclusion is proposed.*

# 1. Introduction/Discussion

This pCR provides a structure for the conclusions and conclusions on some aspects.

# 2. Text Proposal

It is proposed to capture the following changes vs. TR 23.700-28.

\* \* \* \* First change \* \* \* \*

# 8 Conclusions

## 8.1 Conclusion on general mobility management and/or power saving

The following chapters determines preferable system assumptions and selected solutions to the requirements R1, R2 for KI#1 and R5 and R6 for KI#2:

### 8.1.1 Preferable system assumptions

Considering previously defined system assumptions:

* [SYSA1] Satellite service coverage shall be determined by the NW or by the UE
* [SYSA2] For non-static UE, it is preferable to take the UE trajectory into account if this is known. The entity (UE, NWDAF, and external AS via NEF) providing this trajectory may depend on the use case.
* [SYSA3] Decision on system behaviour shall be made preferably by NW rather than by the UE
* [SYSAx]: AMF/MME shall be in relation with satellite constellation data without RAN dependency, nor indirection trough NGAP.
* [SYSAy]: AMF/MME shall remain a simple state machine and processing for comparison logic between UE positions and satellite footprint on earth shall be done in Network Function inside CN for privacy considerations, but not directly inside/by AMF/MME.
* [SYSAz]: satellite coverage map related information shall be exchanged between CN and external world through NEF/SCEF interface.
* [SYSAzz]: satellite footprint evaluation and extrapolation shall be done in a way minimizing impacts on existing interfaces.

Editor's note: Previous list is a reminder for the sake of clarity and can be removed in final version.

It is concluded that preferable system assumptions (psa) and behaviour are the following:

1. (case1) If UE precise location and mobility is known or predicable by the NW, the NW determines the UE behaviour for PSM, eDRX, MICO and plan the paging accordingly. AMF/MME needs to retrieve information of satellite coverage for the UE from dedicated processing in another node in CN and/or via SCEF/NEF. It is preferable that accurate coverage information is made available for UE also.

The necessary logic to determine if a (set of) position(s) or logical entity (Tracking Area) will (when and how) be included in satellite earth footprint for a given period is done:

* 1. (case1.1) In a CN Network Function in 5GC case and the information from Satellite Network Centre are conveyed via NEF.
  2. (case1.2) By external (to CN) Application Server, through SCEF interface, in EPC case.

1. (case2) To cover the uses cases where the NW does not know UE precise location and mobility, it is necessary to have a backup mechanism where the UE determines its behaviour by itself, but with coverage information retrieves from the network with enhanced solution compared to R17.
2. The solutions for (a) must take precedence over the solutions for (b) if both co-exists.

### 8.1.2 Conclusion on solutions

Given mapping between solutions and requirements, the solutions satisfying R1, R2, R5, and R6 are:

Sol#1, 3, 6, 11, 16, 19, 21, and potentially 2, 22.

Sol#15, 17 and 22 are enablers for others solutions.

* Solutions for case 1:

In this case, 2 aspects need to be considered:

* + - how CN retrieves information of satellite coverage
    - how CN modifies power saving and mobility management procedures accordingly

Sol#1 could be candidate solution if modified to take [SYSAx] into account.

Sol#2 is candidate solution if SCEF use is chosen (see EN), restricted to EPC

Sol#6 is candidate solution, restricted to 5GC and to management of unreachibilty period

Sol#11 is candidate solution

Sol#17 is an enabler for UE and CN to get coverage information satisfying above psa, would need to be complemented to cover R2, restricted to 5GC

Sol#19 is candidate solution, restricted to the case where UE trajectory is known by AF

Sol#21 is candidate solution, restricted to 5GC

Sol#22 is an enabler for UE and CN to get coverage information satisfying above psa, would need to be complemented to cover R2

Editor’s Note: final selection on solutions is FFS. Solutions combination is possible.

* Solutions for case 2:

In this case, 2 aspects need to be considered:

* + - how UE retrieves information of satellite coverage
    - how UE modifies power saving and mobility management procedures accordingly

Sol#3 is candidate solution and could be enhanced with above enablers.

Sol#16 is candidate solution

Sol#15, Sol#17, Sol#22 are enablers for UE to get more accurate coverage information than R17 solution.

Editor’s Note: final selection on solutions is FFS. Solutions combination is possible.

* Solutions not directly in relation with requirements, but that enhance the system:

Sol#10 enhances UE reachability events sent to the AF.

Sol#18 clarifies system behavior and parameter priority in case of discontinuous covergae

Editor’s Note: final selection on solutions is FFS. Solutions combination is possible.

Editor’s Note: mechanism to specify case 3 is let to normative phase.

## 8.2 Conclusion on overload impacts to a target RAT/PLMN

The following are conclusions for this overload impacts to a target RAT/PLMN:

Editor’s Note: The conclusion is FFS.

## 8.3 Conclusion on alternative RAT/PLMN selection

The following are conclusions for alternative RAT/PLMN selection:

Editor’s Note: The conclusion is FFS and may not be required according to the discussion in Rel-17.

\* \* \* \* End of changes \* \* \* \*