**3GPP TSG-SA5 Meeting #156 *S5-244795d1***

**Maastricht, NetherLands, 19 - 23 Aug 2024**

**Source: CATT**

**Title: Rel-19 pCR TR 28.874 Add solution on support 5G system functions on board the NTN**

**Document for: Approval**

**Agenda Item: 6.19.15**

# 1 Decision/action requested

***Approval***

# 2 References

[1] 3GPP TR 28.874-020: " Study on management aspects of NTN – Phase 2"

[2] SP-231733: "New SID: Study on Management Aspects of NTN Phase 2"

# 3 Rationale

It is proposed to add a potential solution on support 5G system functions on board the NTN.

# 4 Detailed proposal

This contribution proposes to make the following changes in [1].

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| **1st change** |

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 38.423: "Technical Specification Group Radio Access Network; NG-RAN; Xn application protocol (XnAP) "

[3] 3GPP TS 38.300: "Technical Specification Group Radio Access Network; NR; NR and NG-RAN Overall Description; Stage 2"

[4] 3GPP TR 38.821: "Technical Specification Group Radio Access Network; Solutions for NR to support non-terrestrial networks (NTN) "

[5] 3GPP TR 22.865: “Study on satellite access Phase 3”

[6] 3GPP TS 23.501: “System architecture for the 5G System (5GS)”

[7] 3GPP TS 23.401: “General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access”

[8] 3GPP TS 23.682: “Architecture enhancements to facilitate communications with packet data networks and applications”

[9] 3GPP TS 28.530: “Management and orchestration; Concepts, use cases and requirements”

[10] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".

[11] 3GPP TS 22.261: "Service requirements for the 5G system; Stage 1".

[12] 3GPP TR 23.700-29: " Study on integration of satellite components in the 5G architecture; Stage 3".

[x] 3GPP TS 28.541: "Management and orchestration of 5G networks; Network Resource Model (NRM); Stage 2 and stage 3".

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| **Next change** |

5.1.3.3.1 Potential solution #1: : Pre-configure provisioning data for NTN related NF

A feeder link switchover is the procedure where the feeder link is changed from a source NTN Gateway to a target NTN Gateway for a specific NTN payload. The feeder link switchover is a Transport Network Layer procedure.

Following are the proposed solutions to support above enhancements based on existing NRM fragment in TS 28.541 [x].

* To support feeder link switchover:
1. If the satellite remains in the coverage area of current AMF. Considering that NTN-GW is transport network node and how to configure gNB/AMF to associate with NTN-GW is out of scope of 3GPP, in this case, the switch is transparent to the UEs and network, the NG interface remains unaffected after the satellite/gNB connects to current AMF via the new NTN Gateway.
2. If satellite moves into a coverage of a new AMF. Considering the switchover may be predictable (e.g. based on the LEO satellite ephemeris information and NTN GWs location) or event-triggered (e.g. for maintenance), an gNB can be configured to associate with multiple AMFs as well as with predicted time windows, solutions under 5.1.1.3 are proposed to reuse to address the issues.

NOTE: This solution needs to align with RAN WG3 and SA WG2.

* To support configuration enhancement for gNB and/or CN functions on board the satellite:
1. New attribute called "isOnBoard" can be defined in the corresponding IOCs (e.g. GNBCUCPFunction IOC, AMFFunction IOC, etc.) to indicate whether these functions are on board the satellite.
2. Existed attribute “nRSatelliteRATtype” defines the RAT Type for NR satellite access (e.g. GEO, MEO, LEO etc) in TS 28.541 [x] can be reused in corresponding function IOCs (e.g. GNBCUCPFunction IOC, AMFFunction IOC, etc.).

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| **End of change** |