3GPP TSG-RAN WG3#125bis R3-245768

Hefei, China, 14-18 October 2024

Agenda Item: 14.3

Source: Moderator - CATT

Title: Summary of Discussion on CB: # NRNTN2\_RegenerativePayload

Document for: Discussions & Approval

# Introduction

**CB: # NRNTN2\_RegenerativePayload**

**- Work on TPs for NG removal**

**- Only focus on the open issues above**

(moderator - CATT)

Summary of offline disc [R3-245768](Inbox%5CR3-245768.zip)

# For Chairman’s notes

**NG management:**

* Agree the following TPs for NG Removal:
* R3-245799 revised from R3-245179 (TP for TS 38.413) Introduce NG Removal procedure
* R3-245800 revised from R3-245362 (TP for TS 38.410) Introduce NG Removal procedure
* R3-245801 revised from R3-245493 NG Removal – Stage 2 Description

**Supported TAI list of the on-board gNB:**

* Send the LS to SA2 and SA5 about the OAM requirement, LS out in R3-245802.

**For Feeder Link Switch:**

* The current mechanisms including, e.g. multiple TNLA association, are sufficient for TNL management during feeder link switch.

**Intra cell inter AMF HO:**

* Legacy NG HO procedure could be reused for inter AMF HO for NTN regenerative payload.(Common understanding, suggest MCC to minutes)
* The mapping between TACs and AMF(service area) could be configured to gNB and AMF via OAM. (Seems like common understanding, rely on companies internal coordination, e.g. check with SA5.)

# Discussion

## 3.1 NG Management

**Work on the TPs for NG Removal**

|  |  |  |
| --- | --- | --- |
| [R3-245179](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_125-bis%5CDocs%5CR3-245179.zip) | (TP for TS 38.413) Introduce NG Removal procedure (Nokia, Nokia Shanghai Bell, Huawei, CATT, CMCC, Ericsson, Qualcomm, Xiaomi) | Other* In NG Removal Response message, Global RAN Node ID should be changed to AMF name.
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| [R3-245362](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_125-bis%5CDocs%5CR3-245362.zip) | (TP for TS 38.410) Introduce NG Removal procedure (Huawei, Nokia, Nokia Shanghai Bell, CATT, CMCC, Ericsson, Qualcomm, Xiaomi) | other |
| [R3-245493](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_125-bis%5CDocs%5CR3-245493.zip) | NG Removal – Stage 2 Description (Ericsson, Huawei, Nokia, Nokia Shanghai Bell, Xiaomi, CATT, Qualcomm Incorporated) | Other* Remove the last sentence “The NG Removal procedure is only supported for NTN operation.”
* Add Editor’s Note to say NG Removal procedure may also be used for WAB.

“ |

For NGAP TP:

* Global RAN Node ID is used for future proof, keep it is. (no change to the existing TP)
* In NG Removal Response message, Global RAN Node ID should be changed to AMF name.
* Add co-source companies, LG Electronics, China Telecom, Samsung, ZTE, NEC, ETRI

For 38.300 TP:

* Remove the last sentence “The NG Removal procedure is only supported for NTN operation.”
* Add Editor’s Note to say NG Removal procedure may also be used for WAB, how to capture this for WAB is pending to WAB discussion.
* Add co-source companies, LG Electronics, China Telecom, Samsung, ZTE, NEC, ETRI

For 38.410 TP：

* Add co-source companies, LG Electronics, China Telecom, Samsung, ZTE, NEC, ETRI

**Moderator’s Proposal: Revise the TPs taking above into account.**

If anything needs to be specified in the stage 2 about NG re-setup to be further considered.

**RAN CONFIGURATION UPDATE procedure could be reused to support NG suspend/Resume, by introducing suspend/resume indicators to avoid frequent TNL disconnection and re-connection?**

Nok: What can be saved during the suspend and resume in the gNB?

CATT: Keep the NG association context and store the TNL connection. Provide the feasibility on different scenarios.

Nok: There is heartbeat mechanism over SCTP and IPsec

E///: The key thing is the SCTP connection has to be teared.

Xiaomi: The assumption mentioned by E/// is not correct, the SCTP may still remain. Load level information can be kept in gNB.

**Moderator’s Proposal: Not reopen the discussion in the offline, still have time to check the details of of suspend/resume solution in the coming RAN3 meetings.**

## 3.2 Supported TAI list

**The supported TAIs of an on-board gNB could be provided to AMF by OAM/pre-configuration.**

**Moderator’s Proposal: No stage 2 TP, LS to SA2 and SA5 is needed, draft is as below, as simple as possible.**

**Draft LS to SA2, SA5 LS on OAM requirements**

**Title: [Draft]** **LS on OAM requirements to support regenerative payload**

**Release:** **Rel-19**

**Work Item: NR\_NTN\_Ph3-Core**

Source: CATT (to be RAN3)

To: SA2, SA5

Cc:

**Contact Person:**

**Name:** Jiancheng Sun

**E-mail Address:** **sunjiancheng@catt.cn**

**Attachments: n/a**

**1. Overall Description:**

RAN3 discussed the potential issues on support of regenerative payload for NR NTN, RAN3 has agreed OAM based solution, assuming that the information of supported TAIs is provided to AMF per RAN node ID by OAM.

**2. Actions:**

**To SA2, SA5:**

**ACTION:** RAN3 respectfully requests SA2 and SA5 to take above into account.

**3. Date of Next TSG-RAN WG3 Meetings:**

RAN3#126 Nov 18th – Nov 22nd 2024 Orlando, US

RAN3#127 Feb. 17th – Feb. 21st 2024 Athens, GR

## 3.3 Feeder link switch

A new TNLA is needed for the new feeder link between on-board gNB and AMF.

The AMF indicates on-board gNB which new TNLA is applied, e.g. indicate gNB the usage of a TNLA is for new feeder link?

**Whether the current multiple TNLA association mechanism is sufficient for new feeder link switch or not?**

Nok: The new TNLA will be used immediately, why do we need to inform in advance?

🡺Further checked with Nok, Ericsson, and a few companies, TNLA endpoints of the AMF side may change, but not necessary to be changed during feeder link switch. But the gNB side TNLA endpoint shall be changed for the new feeder link, to let AMF correctly send the DL NGAP signalling towards the gNB (e.g. select old or new feeder link). The establishment and activation of the new TNLA from gNB side could follow the legacy behaviour.

**Moderator’s Proposal:**

**The current mechanisms including, e.g. multiple TNLA association, are sufficient for TNL management during feeder link switch.**

## 3.4 Intra cell inter AMF HO

This part is online treated, but not discussed. As we do not see too much work to do, the moderator would like to quickly heck if it’s agreeable or common understanding:

* **The mapping between TACs and AMF(service area) could be configured to gNB and AMF via OAM. (rely on companies internal coordination, e.g. check with SA5..)**
* **Legacy NG HO procedure could be reused for inter AMF HO.(Common understanding, in MCC minutes)**

***-----------------Start of the Changes-------------------***

16.14.7 O&M Requirements

The following NTN related parameters shall be provided by O&M to the gNB providing NTN access:

- Ephemeris information describing the orbital trajectory information or coordinates for the NTN payload. This information is provided on a regular basis or upon demand to the gNB;

- Two different sets of ephemeris format shall be supported:

- Set 1: NTN payload position and velocity state vectors:

- Position;

- Velocity.

- Set 2: At least the following parameters in orbital parameter ephemeris format, as specified in NIMA TR 8350.2 [51]:

- Semi-major axis;

- Eccentricity;

- Argument of periapsis;

- Longitude of ascending node;

- Inclination;

- Mean anomaly at epoch time.

- The explicit epoch time associated to ephemeris data;

- The location of the NTN Gateways;

- The mapping between TAC(s) and AMF service area;

NOTE 1: The ephemeris of the NTN payloads and the location of the NTN Gateways, are used at least for the Uplink timing and frequency synchronization. It may also be used for the random access and the mobility management purposes.

- Additional information to enable gNB operation for feeder/service link switch overs.

NOTE 2: The NTN related parameters provided by O&M to the gNB may depend on the type of supported service links, i.e., Earth-fixed, quasi-Earth-fixed, or Earth-moving.

# 4 Reference

1. R3-245057 (TP to BL CRs) Support of regenerative payload (CATT) other
2. R3-245179 (TP for TS 38.413) Introduce NG Removal procedure (Nokia, Nokia Shanghai Bell, Huawei, CATT, CMCC, Ericsson, Qualcomm, Xiaomi) other
3. R3-245362 (TP for TS 38.410) Introduce NG Removal procedure (Huawei, Nokia, Nokia Shanghai Bell, CATT, CMCC, Ericsson, Qualcomm, Xiaomi) other
4. R3-245493 NG Removal – Stage 2 Description (Ericsson, Huawei, Nokia, Nokia Shanghai Bell, Xiaomi, CATT, Qualcomm Incorporated) other
5. R3-245085 Support of regenerative payload (Xiaomi) discussion
6. R3-245126 Further discussion on support of regenerative payload for NR NTN (Samsung) discussion
7. R3-245140 Support of regenerative payload in NR NTN (China Telecom) discussion
8. R3-245178 (TP for TS 38.300) Discussion on the support of Regenerative payload (Nokia, Nokia Shanghai Bell) other
9. R3-245288 (TP for TS 38.300) Discussion on regenerative payload enhancement for NR NTN (NEC) other
10. R3-245340 Discussion on support of regenerative payload for NR NTN (CSCN) discussion
11. R3-245361 (TP for BLCR for TS 38.300) Support of regenerative payload (including LS responses to SA2) (Huawei) other
12. R3-245373 Discussion on Support of NTN Regenerative Architecture (TCL) discussion
13. R3-245404 Discussion on interfaces mobility aspects for regenerative payload (THALES) discussion
14. R3-245410 Discussion on UE-Sat-UE communications (THALES) discussion
15. R3-245434 (TP for TS 38.300) Discussion on RAN Signaling impacts for NR NTN Regenerative Payload (Qualcomm Incorporated) other
16. R3-245451 Interface management for regenerative payload in NTN (Lenovo) discussion
17. R3-245494 Further Discussion on NTN Regenerative Payload Issues in Rel-19 (Ericsson, Thales, SES, ESA, Sateliot) discussion
18. R3-245495 [DRAFT] Reply LS on Support of Regenerative Payload Issues in Rel-19 (Ericsson) LS out To: SA2 CC: RAN2
19. R3-245519 Discussion on Support of regenerative payload for NR NTN (CMCC) discussion
20. R3-245571 Discussions on NG management and Inactive support (LG Electronics Inc.) discussion
21. R3-245572 (TP for NR\_NTN\_Ph3 TS 38.300) (LG Electronics Inc.) other
22. R3-245586 Discussion on Xn impact for NR NTN regenerative payload (NTT DOCOMO INC..) discussion
23. R3-245588 Discussion on NG interface management through ISL (ETRI) discussion
24. R3-245666 Further discussion on support of regenerative payload (ZTE Corporation) other