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

To be updated later…

# 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 |
| [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 |

**Moderator’s Proposal: Check if anything needs to be refined for the above TPs, and agree the TPs to the BL CRs.**

**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.**

## 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: work on stage 2 TP to capture the OAM requirement? and send the LS to SA2 and SA5 about our decision.**

**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:

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**Attachments: n/a**

**1. Overall Description:**

RAN3 discussed the potential issues on support of regenerative payload for NR NTN and identified the following candidate mechanisms, which need to be confirmed by SA2 and SA5:

1. *The mobility of the on board gNB causes the coverage of the gNB will changed with time, accordingly the supported TAIs list of the gNB will change with time. Frequent updates of the supported TAIs list using the legacy RAN Configuration Update procedure may cause a large number of NG interface signalling interactions.*

RAN3 prefers to consider OAM based solution, the information of supported TAIs is provided to AMF per RAN node ID by pre-configuration or OAM configuration.

1. *RAN3 assumes the AMF service area is consist of a list of TAC, RAN could trigger inter AMF HO in case the UE moves across the TACs of the different AMFs.*

*RAN3 would like to confirm with SA2 and SA5 if the assumption is correct. If yes, the relationship between AMF and TACs should be configured to the gNB via OAM.*

**2. Actions:**

**To SA2, SA5:**

**ACTION:** RAN3 respectfully requests SA2 and SA5 to check the RAN3 assumptions as above, and response accordingly.

**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 multiple TNLA association mechanism is sufficient for new 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.**
* **Legacy NG HO procedure could be reused for inter AMF HO.**

**If yes, we’d better have OAM requirement in stage 2, and send the LS to SA2 and SA5.** (if agreeable, same LS could be used to cover 3.2 and 3.4)

***-----------------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