**3GPP T****SG-RAN WG3 Meeting #122 R3-237778**

**Chicago, USA, 13th – 17th November 2023**

**Agenda Item: 25.2.1**

**Source: Nokia (moderator)**

**Title: CB: # R18XR1\_PDUSet**

**Document for: Other**

# Introduction

This is the summary document for the following come back:

CB: # R18XR1\_PDUSet

- Discuss the open issues above

- Provide TPs if agreeable

(moderator - Nok)

Please provide your comments by 6AM, Wednesday (Nov 15th) Chicago time, in order to discuss it in Wed morning.

# For the Chairman’s Notes

**Agreements:**

* **Introduce *PDU Set based Handling Indicator* IE with value "supported" in NGAP, XnAP, F1AP, and E1AP.**
* **Introduce a new Extension header to transfer the PDU Set Information and indication of End of Data Burst.**
* **For UL Jitter, describe gNB-DU behavior in F1AP.**
* **For DL N6 Jitter, define N6 Jitter including lower bound jitter and upper bound jitter as INTEGER (-127..127).**
* **For EDB, use 3-bit to align with TS 26.522**
* **If related TPs are agreed, assign following BL CRs**

**- 38.420 BL CR -> Lenovo**

**- 38.410 BL CR -> China Unicom**

**- 38.470 BL CR -> China Telecom**

* **Wait for SA2 decision on following:**
* **Whether need separate UL PDU Set QoS parameters and DL PDU Set QoS parameters**
* **Whether an XR-capable NG-RAN node need to inform SMF whether a QoS Flow is established with PDU Set QoS parameters or with normal QoS parameters**
* **Whether gNB indicates to SMF when PDU Set QoS handling can’t be supported anymore or when PDU Set QoS handling can be supported again using NGAP PDU SESSION RESOURCE NOTIFY message.**
* **The F1AP impact to support new DRX cycle need to wait for RAN2 decision.**

**Agree following TPs:**

**R3-237840 (TP for TS 38.423 BL CR) support for PDU Set based QoS handling**

**R3-237841 (TP for TS 38.413 BL CR) support for PDU Set based QoS handling**

**R3-237842 (TP for TS 37.483 BL CR) support for PDU Set based QoS handling**

**R3-237843 (TP for TS 38.300) Non-homogenous support of PDU set based QoS handling in NG-RAN**

**R3-237844 (TP to BLCR for TS 38.415) User Plane Protocol for PDU Set Information**

**R3-237845 LS on defining new GTP-U Extension Header for PDU Set Information**

**R3-237846 (TP to BL CR TS 38.410) Support for XR UP design using new container**

**R3-237847 (TP to BL CR TS 38.470) Support for XR UP design using new container**

**R3-237848 (TP for TS38.425) Support for XR PDU Set Handling**

**R3-237849 (TP to BL CR TS 38.420) Support for XR UP design using new container**

**R3-237850 (TP to BL CR TS 38.473) Support for UL jitter**

**R3-237851 (TP to BL CR TS 38.473) Support for N6 jitter**

# Discussion first round

## PDU Set handling Support indicator

RAN3 agreed:

**Turn the following WA into agreement on the capability indication of PDU set handling: Taking Opt1 (Explicit PDU Set handling Support indicator) for XR in R18.**

Moderator propose to check the related NGAP TP, e.g. R3-237438 (Please only focus on the new text/IE on PDU Set QoS Support Indicator)

Contribution (R3-237359) proposes the Support Indicator is also needed in Xn HANDOVER REQUEST ACKNOWLEDGE mssage.

Contribution (R3-237261) proposes the Support Indicator is also needed in F1AP-UE CONTEXT SETUP/MODIFICATION RESPONSE messages, and E1 E1AP-BEARER CONTEXT SETUP/MODIFICATION RESPONSE messages.

Contribution (R3-237331) proposes the Support Indicator is also needed in Xn HANDOVER REQUEST ACKNOWLEDGE mssage, and E1AP.

**Q1: Please share your view on:**

* Any comments on NGAP TP R3-237438 (Please only focus on PDU Set QoS Support Indicator related text).
* Any view to add the PDU Set handling Support indicator in XnAP HANDOVER REQUEST ACKOWLEDGE message, F1AP-UE CONTEXT SETUP/MODIFICATION RESPONSE messages, and E1 E1AP-BEARER CONTEXT SETUP/MODIFICATION RESPONSE messages.

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| **Company** | **Comment** |
| Nokia | Agree to use R3-237438 as a starting point.  Agree to add the support indicator in XnAP, F1AP and E1AP. |
| Xiaomi | Agree with Nokia |
| QC | Agree with Nokia |
| Huawei | Agree the PDU set handling support indicator to be included in the NGAP  For the NGAP TP R3-237438, the procedure text seems not needed, same as the MBS support indicator.  Agree to also introduce the support indicator in XnAP HANDOVER REQUEST ACKOWLEDGE message. And suggest the XnAP TP in R3-237359 can be taken as start point if this can be agreed.  No need to be included in E1AP and F1AP, because we already agreed that the “**If a gNB supports PDU Set handling, all parts support it: DU, CU-CP, CU-UP.**  ” |
| Ericsson | Agree with Huawei, we did not have any text for the MBS support indicator. Also it describes sender behaviour. So we can skip adding any procedural text for the support indicator.  Regarding F1/E1 Support indicators, this is not needed. |
| ZTE | Agree with Nokia |
| Samsung | Agree to include support indicator in NG. Also agree to include it in the Xn Handover Request Ack message. We also agree to include in the E1. Since if we agree Xn Handover Request Ack message contains support indicator of the target, this indicator should be sent to the source CU-UP because data forwarding is performed at the CU-UP. |
| **Moderator** | **TS38.413 have following rule in Section 4.1**  **Any required inclusion of an optional IE in a response message is explicitly indicated in the procedure text. If the procedure text does not explicitly indicate that an optional IE shall be included in a response message, the optional IE shall not be included.**  **This is the reason why need behavior text for the Optional *Support* IE in the Response message in NGAP TP.** |
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**Summary**

* **use R3-237438 as a starting point for NGAP TP (Nok).**
* Section 8.2.1.2, use below text

If the PDU SESSION RESOURCE SETUP REQUEST message includes the *PDU Set QoS Parameters* IE, The NG-RAN node shall, if supported, report in the PDU SESSION RESOURCE SETUP RESPONSE message in the *PDU Set QoS Support Indicator* IE of the *PDU Session Resource Setup Request Transfer* IE.

(similar text for 8.2.3.2)

* **Introduce the Support indicator in the XnAP HANDOVER REQUEST ACKNOWLEDGE message, and E1AP-BEARER CONTEXT MODIFICATION REQUEST messages, and use Option 3 for UP container (to be defined in 38.415).**
* **XnAP TP: Huawei**
* **E1AP TP: Samsung**
* **38.415 TP: Lenovo**
* **38.410 TP: ZTE**
* **Potential 38.420 TP: CMCC**
* **Potential 38.470 TP: ZTE**
* **Potential 38.425 TP: CMCC**
* **LS to CT4: Ericsson**

The above NGAP/XnAP/E1AP TP will also include the N6 Jitter agreed in Section 3.3.

## UP design

**Down-select between opt 1 and opt 3**

Option1: define PSI and EoDB into the existing Frames (e.g frame with PDU Type =0) of NG-U/F1-U: 9 companies

Option3: Define a new GTP-U extension PDU Set container for PSI and EoDB: 3 companies

There is a question on how an XR-incapable target NG-RAN node ignore the new XR field during the data forwarding of Xn-HO.

**Q2: Please share your view on adopt Option 1 or Option 3, and how to address the above issue:**

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| **Company** | **Comment** |
| Nokia | As we commented online, we prefer Option 1, but can also accept Option 3 if majority want.  For the issue, it can be avoided. Source NG-RAN node can know whether target NG-RAN node support it during the Xn HO preparation procedure. Then source NG-RAN node does not include the new XR field during the data forwarding. |
| Xiaomi | We’re neutral but slightly prefer option 3, which is cleaner and have less processing consumption from decoding point of view, if the receiving node cannot read the PDU set specific header, it just ignores the whole frame, if option 1 is used, the receiving node needs to decode the whole frame and it will find out some information cannot be read and ignore it. |
| QC | Option 1 should work with the assumption that PDU set supporting source node is not required to forward PDU Set Parameters to non-supporting target node. |
| Huawei | Prefer option 1.  For the issue, both Nokia, and Xiaomi’s solution can solve the issue. i.e., the source NG-RAN can remove the PDU set related fields before the data forwarding, or the receiver can ignore the unknown fields (With “Extension Header Length” field, the legacy receiver is aware of the length of the GTP-U extension header, and can identify the position of these new added fields.)  Can accept option 3 if majority in favor of it. |
| Ericsson | So far, there no technical arguments against Option 3. The closest mention of argument that we have heard is about the added specification impacts. But we see that many companies (e.g., ZTE, Len, SS) have already provided TPs to implement option 3, so the “homework” phase is already done; why hinder RAN3 specifications from a better solution when this solution is preferable from a processing and future-proof aspects, and the related TPs are available?  Further to Nokia statement on “the source NG-RAN node does not include the new XR field during the data forwarding”, this would require E1AP impact.  To Xiaomi statement on “ the receiving node find out some information cannot be read and ignore it”. This is exactly the old/receiving node cannot do. |
| ZTE | Similar view as Nokia, prefer Option 1 but can accept Option 3 if majority can agree.  The issue could be solved by the C-plane, i.e. The source NG-RAN node is able to know whether the target NG-RAN node supports PDU set QoS handling. If the target does not support PDU set QoS handling, the source will not include the PDU set info during the data forwarding.  In addition, the MBS related info has been added during the data forwarding, and there is no compatibility issue so far.  From technical point of view, both options can work. Considering that Option 3 has more impact on specs, we prefer Option 1. |
| Samsung | Our view is Option 3 is more future proof, therefore prefer option 3.  Regarding the data forwarding, we think currently if the target doesn’t support PDU set handling, the CN won’t send data with PDU set header, the data forwarding should be same. The source won’t include the PDU set header for the forwarding data. For split gNB-case, that means E1AP need to be impacted. |
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**Summary**

## N6 Jitter

There is UL Jitter reported from the UE, and the DL Jitter received from 5GC. For UL jitter, UE report it via *UEAssistanceInformation-v1800*. Current *CU to DU RRC Information* IE includes the *UEAssistanceInformation* IE. The UL Jitter can be different to DL Jitter.

The DL Jitter is received from 5GC, as defined in 23.501:

Upon reception of a PCC rule with Periodicity information, the SMF determines the TSCAI and forwards it to the NG-RAN. If the PCC rule indicates to perform N6 Traffic Parameter measurements, the SMF shall request the UPF to monitor and periodically report the N6 Traffic Parameters (i.e. the N6 jitter range associated with the DL Periodicity and, if not provided by the AF, UL/DL periodicity) using the N4 Session Modification procedure, see clause 5.8.5.11. If the measurement of N6 jitter range associated with the DL Periodicity is required and the DL Periodicity is available at the SMF, the SMF also sends the DL Periodicity to the UPF. The UPF reports the measured N6 Traffic Parameters to SMF via N4 interface.

At reception of measured N6 Traffic Parameter(s) from the UPF in the N4 Session Level Report, the SMF includes the N6 jitter range together with the associated DL periodicity and the UL periodicity if not provided by the AF in the TSCAI and forwards it to the NG-RAN in an NGAP message, see clause 5.27.2.

NOTE 2: In order to prevent frequent updates from the UPF, the UPF sends the N6 Jitter Measurement Report periodically or only when the N6 jitter is larger than a threshold.

The DL periodicity associated N6 jitter indicates the positive or negative deviation of the arrival time of first packet of a Data Burst compared to the ideal Data Burst start time which is be determined based on the DL periodicity.

Contribution (R3-237392) proposes to transfer the UL Traffic Information to UP via E1AP.

**Q3: Please share your view on:**

* Whether need any enhancement to support UL Jitter in F1AP, and E1AP
* How to define the N6 Jitter, following options:
* **Opt1: Align with the R2 defined UL jitter range and granularity: Define upper bound and lower bound for N6 jitter separately, with the range of [-7, +7] ms and the granularity of 0.5 ms.**
* **Opt2: Define N6 jitter with reference to TS29.244**
* **Opt3: ENUMERATED (ms1, ms2, ms3,...)**

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| **Company** | **Comment** | |
| Nokia | For UL Jitter, No new IE is needed in F1AP, since current *CU to DU RRC Information* IE also contains the *UEAssistanceInformation* IE.  For DL Jitter, prefer Opt 2 for following reasons: 1) DL Jitter can be different to UL Jitter, 2) 23.501 states it should be a singed value in order to provide a “positive or negative deviation” | |
| Xiaomi | For F1AP, UL traffic information (not only jitterRange, but also trafficPeriodicity, burstArrivalTime, pduSetIdentification) can needs to be transferred over F1AP, existing *UEAssistanceInformation* IE can be reused but the procedural text should be updated, the DU behavior is different in XR case, as we captured in R3-237392.  For E1AP, we think at least trafficPeriodicity, jitterRange and burstArrivalTime can be provided to CU-UP for resource management, as the same information for DL is already introduced.  For the N6 jitter encoding, we don’t think it’s a good idea to copy paste UL jitter, DL jitter is measured by CN function, and DL jitter have different characteristics from UL jitter, option 2 is the only correct option to choose. | |
| QC | UE provided UL Jitter Info MUST be provided to DU. We are fine with either new IE or use existing *CU to DU RRC Information* IE which carries *UEAssistanceInformation* IE. Don’t see need for sending UL jitter info to CU-UP unless there is good reasoning from others.  DL jitter can be defined using Option 2 as Nokia explained. | |
| Huawei | For UL Jitter, F1AP already support the UAI delivery from CU to DU, agree with Nokia. For E1AP, we do not see any motivation for the CU-UP to know the UAI.  For the N6 jitter, we propose some rewording for option 1, and prefer this option 1 for the following reasons:   * Option 1 allows that the DL jitter be different with the UL jitter. The design in option 1 just try to use same range and granularity as UL jitter, the value of upper bound and lower bound of DL jitter can definitely be different from the UL jitter. * Option 1 allows the indicates the positive or negative deviation as defined in TS 23.501, and provides more flexibility when compared to option 3. * For option 2, The *N6 Jitter measurement* defined in 29.244 is used for the UPF to report the measured N6 jitter, and it contains a lot of contents, e.g., the “DL periodicity” can be included in this IE. However, we know that DL Periodicity already included in existing TSCAI as mandatory IE, if reuse the *N6 Jitter measurement* defined in 29.244, there will be redundant information about the periodicity and the overhead is really large.  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  | **Bits** | | | | | | | |  | |  | **Octets** | **8** | **7** | **6** | **5** | **4** | **3** | **2** | **1** |  | |  | 1 to 2 | Type = 327 (decimal) | | | | | | | |  | |  | 3 to 4 | Length = n | | | | | | | |  | |  | 5 | Spare | | | | | | | DL |  | |  | 6 to 9 | DL Periodicity | | | | | | | |  | |  | 10 to 13 | Lower DL Jitter Measurement | | | | | | | |  | |  | 14 to 17 | Higher DL Jitter Measurement | | | | | | | |  | |  | 18 to (n+4) | These octet(s) is/are present only if explicitly specified | | | | | | | |  |   **Figure 8.2.220-1: N6 Jitter Measurement**   * Option 3 requires the positive deviation and negative deviation share same value. | |
| Ericsson | Agree with Xiaomi. We realize that the UAI IE in CU to DU RRC Info can be re-used, but dedicated XR procedural text is needed, as proposed by Xiaomi TP.  Ok to add the information over E1.  For N6 Jitter, it is jitter measured by the CN, it must therefore be separated from the UL UE’s one. We think defining upper bound and lower bound for N6 jitter separately is better, instead of octet string. | |
| ZTE | | For UL Jitter, we share the same view as Nokia.  Since RAN2 has made the decision to define the UL jitter with the range of [-7, +7] ms and the granularity of 0.5 ms, we prefer to define the DL jitter with the same range and granularity.  It is not suitable to use Option 2 since the definition in TS 29.244 includes DL periodicity. |
| Samsung | For the UL jitter, it is included in *UEAssistanceInformation* IEin the F1 which is already transmitted in F1, so no need to add new IE.  For the E1 transmission for UL jitter, transmission in E1AP is beneficial.  For the N6 jitter, no strong view, either way works. | |
| **Moderator** | **We need to first discuss whether DL Jitter has same value range as UL Jitter.**  **\* N6 is between Data Network and UPF.**  **\* According to 23.501 text (copied above), the N6 Jitter sent to NG-RAN is based on the measured N6 Traffic Parameters reported from UPF. The value range can be different to UL Jitter. Based on the N6 Jitter Measurement defined in 29.244, it is possible for lower jitter = 5ms and upper jitter =20ms, or lower jitter= -10ms and upper jitter=10ms.**  **Suggest define N6 Jitter including lower jitter (a signed octet) and upper jitter (a signed octet).** | |
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**Summary**

**\* For UL jitter, potential behavior text for F1AP (Xiaomi will prepare TP)**

**\* For DL N6 Jitter, define N6 Jitter including lower bound jitter (a signed octet) and upper bound jitter (a signed octet).**

**Moderator: the jitter can be defined as INTEGER (-127.. 127). The N6 Jitter will be added in the same NGAP/XnAP/E1AP TP in Section 3.1. The additional F1AP TP for N6 Jitter is assigned to Huawei.**

- TS38.473 TP (Huawei) for DL Jitter

## Non-homegeneous deployment

Moderator believes Contribution (R3-237391) proposes a good summary for Stage-2 TP. Moderator propose to use this contribution as a starting point, and check whether there is anything missing.

**Q4: Please share your view on Stage-2 TP (R3-237391), e.g. anything missing, or any error, etc:**

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| **Company** | **Comment** |
| Nokia | Agree with **Stage-2 TP (R3-237391)** |
| Xiaomi | Agree with **Stage-2 TP (R3-237391) as starting point** |
| Qualcomm | Looks ok. |
| Huawei | Even for the HO from non-PDU set handling capable NG-RAN node, instead of allow the target NG-RAN node provides the support indicator to the SMF directly, we think the following principle should be applied also: The NG-RAN provides explicit indication of PDU set handling support after receiving the PDU set QoS parameters from SMF.  In addition, maybe the stage 2 TP can also include the non-HO case. |
| Ericsson | Disagree on the second paragraph, describing receiver’s behavior based on absence of an IE, This is against RAN3 principles:   * During an XR session, at mobility from a supporting NG-RAN node to a non-supporting NG-RAN node, the target NG-RAN node does not provide the “PDU set handling support” indication to SMF, SMF infers from the absence of an "PDU set handling support" indication that PDU set QoS handling is not supported in the target NG-RAN node, SMF will act as specified in TS 23.501[3]. |
| ZTE | Fine with Stage 2-TP (R3-237391). |
| Samsung | We are fine to take stage 2 TP R3-237391 as starting point. |
| **Moderator** | **Current spec have examples for defining the receiver behavior related to “absence of IE”.** |
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**Summary**

**\* Xiaomi will update the TP based on R3-237391 to avoid duplication with SA2 spec.**

## Separate UL/DL PDU Set QoS parameters

Contribution (R3-237332, R3-237390, R3-237540) proposes to add a direction field to indicate whether the PDU Set QoS parameter is for UL, or DL, or both UL and DL.

9.3.1.x PDU Set QoS Parameters

This IE defines the PDU Set QoS Parameters to be applied to a QoS flow.

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| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** |
| PDU Set Packet Delay Budget | O |  | Extended Packet Delay Budget 9.3.1.135 | PDU Set Delay Budget as specified in TS 23.501 [9]. |
| PDU Set Error Rate | O |  | Packet Error Rate  9.3.1.81 | PDU Set Error Rate as specified in TS 23.501 [9]. |
| PDU Set Integrated Handling Information | O |  | ENUMERATED (true, false, …) | PDU Set Integrated Handling Information as specified in TS 23.501 [9]. |
| Direction information | O |  | ENUMERATED (uplink, downlink, both-uplink-and-downlink, …) | Direction Information for the PDU Set QoS Parameters. |

Moderator consider adding the *Direction information* can make this IE more future-proof.

**Q5: Please share your view on adding *Direction Information* IE in NGAP/XnAP/F1AP/E1AP *PDU Set QoS Parameters* IE.**

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| **Company** | **Comment** |
| Nokia | Agree to add *Direction Information* IE in NGAP/XnAP/F1AP/E1AP *PDU Set QoS Parameters* IE.  Sorry to the co-signers, I forgot to submit the E1AP TP. I uploaded the E1AP TP in the draft folder. |
| Xiaomi | Agree to add *Direction Information* IE in NGAP/XnAP/F1AP/E1AP *PDU Set QoS Parameters* IE.  At least we think the UL PSDB and UL PSIHI are needed. UL PSDB can be used for PDCP discard timer configuration, and UL PSIHI can be used for gNB to decide whether to activate or deactivate the discard operation in UE side. |
| QC | We must support separate PDU Set QoS parameters for DL and UL.  Even though QC co-signed this CR, after some further thinking, we prefer to specify PDU Set QoS parameters separately as captured in **R3-235802 (from RAN3#121bis)** because it allows to specify separate PDU Set QoS parameters for DL and UL Flows separately. Using R3-237540 CR, it is not clear how to provide separate PDU Set QoS parameters for DL and UL separately (unless we are missing some piece of information) |
| Huawei | Not need now, we need to wait for SA2 feedback. |
| Ericsson | Agree with Xiaomi. Stage 2 text needs also update. We propose to modify section 16.X.2 from TS 38.300 BL CR as follows:  16.X.2 Awareness  […]  The following **PDU Set QoS Parameters** may be provided by the SMF to the Gnb as part of the QoS profile of the QoS flow, and to enable PDU Set based QoS handling at least one of them shall be provided:  - PDU Set Delay Budget (PSDB): as defined in TS 23.501 [3],.  - PDU Set Error Rate (PSER): as defined in TS 23.501 [3].  NOTE 1: In this release, a PDU set is considered as successfully delivered only when all PDUs of a PDU Set are delivered successfully.  - PDU Set Integrated Handling Information (PSIHI): as defined in TS 23.501 [3].  And remove EN.  [QC] Intention is OK but RAN2 added text can be updated by RAN2. We should not edit RAN2 agreed text. |
| ZTE | According to the following highlighted contents captured from TS 23.501, it is clearly stated that the PSDB and PSER are the same in UL and DL. If there is only one value provided by the CN, this direction IE is not needed.  In addition, we have asked SA2 to reply the LS within R18 timeline so we should wait for the reply from SA2. This is not a big issue, it can be solved easily as long as we get the response from SA2. We prefer to postpone the discussion of this issue to save more discussion time for other critical issues.  TS 23.501  A QoS Flow is associated with only one PDU Set Delay Budget. The value of the PDU Set Delay Budget is the same in UL and DL. PSDB is an optional parameter that may be provided by the PCF. The provided PSDB can be used by the NG-RAN to support the configuration of scheduling and link layer functions.  A QoS Flow is associated with only one PDU Set Error Rate. PSER is an optional parameter. If the PSER is available, the PSER supersedes the PER. The value of the PDU Set Error Rate is the same in UL and DL. |
| Samsung | Agree to add *Direction Information* IE in NGAP/XnAP/F1AP/E1AP *PDU Set QoS Parameters* IE.  To align with SA2 conclusion, we can add the editor note. |
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**Summary**

**\* Wait for SA2.**

## QoS Flow established with PDU Set QoS or normal QoS parameters

Contribution (R3-237359, R3-237624, R3-237678, R3-237392) proposes: the NG-RAN node needs to provide an indication of whether the PDU Set QoS is accepted. The reason is the QoS flow may be established with PDU Set QoS parameters, or with normal QoS parameters (e.g. when an XR-capable NG-RAN node does not have enough resource to support the PDU Set QoS parameters)

**Q6: Please share your view whether an XR-capable NG-RAN node need to inform SMF whether a QoS Flow is established with PDU Set QoS parameters or with normal QoS parameters.**

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| **Company** | **Comment** |
| Nokia | It is beneficial for SMF to know whether a QoS Flow is established with PDU Set QoS parameters, or with normal QoS parameters. |
| Xiaomi | It is possible that NG-RAN node establishes the QoS flow with normal QoS instead of PDU set QoS, even though it supports PDU set QoS handling. This case provides more flexibility for NG-RAN node operation and can be decided by RAN3, if we agree to support this scenario, SMF should be informed about whether the QoS flow is setup with PDU set QoS or legacy QoS, so that it can notify UPF start or stop PDU set marking which is already supported in SA2. |
| QC | From TS 23.501 clause 5.7.7.1: "If the NG-RAN receives PDU Set QoS Parameters and supports them, it enables the PDU Set based QoS handling and applies PDU Set QoS Parameters as described in this clause."  Our understanding is that (after checking with SA2 colleagues as well), if NG-RAN indicates support of PDU Set QoS parameters to SMF means, RAN has to setup SMF provided QoS flows using PDU Set QoS Parameters always. For any reason if RAN can’t set using PDU Set QoS Parameters provided by SMF, **RAN has to inform SMF or RAN has to reject setup of these QoS flows**. If RAN provides indication or reject , SMF can interact with PCF to determine QoS policies and make decision accordingly and informs UPF how to handle these QoS flows. |
| Huawei | We think such indication is needed. And can be achieved by adding a new IE to indicate the QoS flow(s) setup successfully but without accepting the PDU set QoS parameters. |
| Ericsson | Strongly disagree. This is severely complicating the admission control mechanism in RAN for no reason. Why the additional complexity?  Also the case that RAN admits QoS flows but does not apply PDU Set QoS parameters should not happen; the network configuration for the targeted XR service in fact should know that RAN has the necessary resources to cater to XR traffic, and the values of the PSQP should be reasonably pre-configured in advance by the PCF. So we question the need of adding another dimension to admission control mechanism. |
| ZTE | It would be beneficial to have this flexibility. |
| Samsung | Agree with QC, if NG-RAN supports, then the RAN has to use PDU set configuration. |
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**Summary**

**\* Wait for SA2.**

## End of Data Burst

Contribution (R3-237359) provides following analysis:

First, in TS 26.522, End of Data Burst (EDB) field is defined as 3 bits length to provide guidelines to UPF for identifying the end of a Data Burst, as described below.

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| - **End of Data Burst [EDB] (3 bits):** The EDB field is 3 bits in length and indicates the end of a Data Burst. The 3 bits encode the End of Data Burst indication as per the encoding and guidelines provided in Clause 4.4.2.6.1. |

However, the field provided by UPF to NG-RAN could be much simpler since the end of the Data Burst is already identified by the UPF, and one bit would be enough to indicate the end to NG-RAN. So to make things simpler and to save the extension header overhead, we suggest RAN3 to define EDB as 1 bit length in the GTP-U headers.

***Proposal 10*: RAN3 to use 1 bit to indicate the End of Data Burst in TS 38.415 and TS 38.425.**

Moderator believes that it may be better to align with 26.522. Otherwise, it can cause issue in case the full 3-bit is used in future release.

**Q7: Please share your view on use 3-bit (align with TS26.522), or 1-bit for End of Data Burst.**

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| --- | --- |
| **Company** | **Comment** |
| Nokia | Prefer 3-bit to align with TS 26.522 |
| Xiaomi | Prefer to align with TS 26.522 |
| QC | As long as UPF can decide EODB, it can provide this by using single bit indicator to RAN. Onus is on UPF how it detects EODB. But we don’t strong concern on usage of 3 bits either. |
| Huawei | It is just an end indication, and 1 bit is enough. SA4 also re-evaluate whether the 3 bits length is over design or not. |
| Ericsson | Prefer to align with TS 26.522 |
| ZTE | We should follow the definition of SA4, i,e. 3-bit. |
| Samsung | We are fine to use 1-bit. |
| **Moderator** | **Need to discuss the pros/cons for both Options**  **\* Option 1: use 3-bit to align with TS26.522**  **- pros: alignment, and be future-proof**  **- cons: waste 2-bit (is this an issue?)**  **\* Option 2: use 1-bit**  **- Pros: save 2-bit (is this a big benefit?)**  **- cons: backwards compatibility issue in case future release uses more code-points of the 3-bit.** |
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**Summary**

**\* For EDB, use 3-bit to align with TS 26.522**

## New DRX Cycle in F1AP

Contribution (R3-237633) provides new DRX cycle based on rational numbers which aligns with RAN2, needs to be contained in F1 interface.

**Q8: Please share your view on introduce new DRX cycle based on rational numbers in F1AP.**

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| **Company** | **Comment** |
| Nokia | Agree. A new F1AP IE may be needed. |
| Xiaomi | Agree, RAN3 can update the corresponding specs based on the stable outcome of RAN2 running CR, this can be done next meeting. |
| QC | Agree |
| Huawei | Agree, can wait for R2 outcome. |
| Ericsson | Even a new cycle is added in DRX, why would we need a new IE? |
| ZTE | Not needed. The new DRX cycle is included in the *CellGroupConfig* IE contained in the *CU to DU RRC information* IE. |
| Samsung | Agree, can wait for RAN2 |
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**Summary**

**\* Wait for RAN2. The potential F1AP CR can be submitted in Feb meeting.**

## Other issues

Please add other issues if missing. Moderator suggest only list the urgent issues that must be solved in this meeting in order to complete the WI. Other enhancements can be further proposed in Feb meeting. Thank you very much for your understanding!

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| **Company** | **Any issues need to be resolved in this meeting** |
| Huawei | Presence of PDU Set Size, we raise this issue in R3-237359:  PDU Set Size is defined to be optional in the RTP extension header according to TS 26.522. However, PDU Set Size is not regarded as optional in SA2 TS 23.501. So when designing the corresponding field in the GTP-U extension header, RAN3 can assume it is always present along with the other PDU set parameters. This can simplify our design for the GTP-U header in UP. In this way, the UPF’s behaviour when it cannot obtain the PDU Set Size information shall be specified, e.g., to mark the field as “0”. RAN3 can send an LS to SA2 to raise the issue and ask SA2 for confirmation. And our proposal is:  **RAN3 assumes the PDU set size is always present along with the other PDU set parameters. And send LS to SA2 for confirmation.** |
| Ericsson | To Huawei, how can a new IE be mandatory? in XR all the PDU Set related information are optional. |
| QC | From **R3-237261,** following issue needs to be discussed.  Due to congestion or other gNB internal issues if gNB can’t handle PDU Set QoS parameters anymore and when gNB is able handle PDU Set QoS parameters after sometime then gNB has to inform SMF though PDU Session Resource Notify procedure. This will ensure that both SMF and gNBs will remain in sync about PDU Set handling and SMF can indicate to UPF whether to continue to provide PDU Set Information in N3 GTP-U headers.  Proposal: gNB indicates to SMF whether PDU Set QoS handling can’t be supported anymore or when PDU Set QoS handling can be supported again using NGAP PDU SESSION RESOURCE NOTIFY message. |
| **Moderator** | **For HW comment, in case this field is optional, need to discuss whether need a flag to indicate whether the PDU Set Size is present or absent.**  **For QC comment, is this required by SA2?** |
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**Summary**

\* No need to have flag to indicate whether PDU Set Size is present or absent

- ZTE prefer to have a further check this week.

\* For QC proposal, wait for SA2.

# References

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| [R3-237359](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237359.zip) | (TP for NR\_XR\_enh BL CRs for TS38.413/38.423/38.473/38.415):PDU set handling for support NR XR (Huawei) |
| [R3-237438](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237438.zip) | (TP for TS 38.413 BL CR) Discussion on support for PDU Set based QoS handling (Nokia, Nokia Shanghai Bell) |
| [R3-237261](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237261.zip) | XR Enhancements for PDU Set Handling (Qualcomm Incorporated) |
| [R3-237331](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237331.zip) | (TP to BL CR for 38.413, 37.483, 38.423) Discussion on the support of PDU Set handling (Samsung) |
| [R3-237332](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237332.zip) | (TP to BL CR for TS 37.483) Addition of UL PDU Set QoS parameters (Samsung, Ericsson, Nokia, Nokia Shanghai Bell, Qualcomm Inc., Xiaomi, China Telecom) |
| [R3-237390](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237390.zip) | (TP for TS 38.423) Introduction of Direction Information for PDU Set QoS Parameters (Xiaomi, Ericsson, Qualcomm Inc., Nokia, Nokia Shanghai Bell, Samsung, China Telecom) |
| [R3-237391](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237391.zip) | (TP for TS 38.300) Non-homogenous support of PDU set based QoS handling in NG-RAN (Xiaomi, Nokia, Nokia Shanghai Bell, ZTE) |
| [R3-237392](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237392.zip) | (TPs for 38.473, 37.483 and 38.413) PDU set based QoS handling for XR (Xiaomi) |
| [R3-237421](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237421.zip) | (TP to BLCR for TS 38.415) User Plane Protocol for PDU Set Information (Lenovo, Ericsson) |
| [R3-237539](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237539.zip) | (TP to F1-AP BL CR): introduction of UL UE XR Traffic assistance Information (Ericsson) |
| [R3-237540](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237540.zip) | (TP to NG-AP BL CR): introduction of Direction Information for PDU Set QoS Parameters (Ericsson, Qualcomm Inc., Nokia, Nokia Shanghai Bell, Samsung, Xiaomi, China Telecom) |
| [R3-237541](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237541.zip) | LS on defining new GTP-U Extension Header for PDU Set Information (Ericsson, lenovo) |
| [R3-237591](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237591.zip) | (TP for XR 38.415 and 38.425) Discussion on PDU set handling for XR (CATT) |
| [R3-237624](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237624.zip) | Discussion on support of PDU Set Handling (ZTE) |
| [R3-237625](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237625.zip) | (TP to BL CR TS 38.415) Support for XR UP design using existing frame (ZTE, Nokia, Nokia Shanghai Bell, China Telecom, China Unicom, CMCC) |
| [R3-237626](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237626.zip) | (TP to BL CR TS 38.415) Support for XR UP design using new container (ZTE, Ericsson, China Unicom, China Telecom) |
| [R3-237627](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237627.zip) | (TP to BL CR TS 38.410) Support for XR UP design using new container (ZTE, Ericsson, China Unicom, China Telecom) |
| [R3-237628](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237628.zip) | (TP to BL CR TS 38.420) Support for XR UP design using new container (ZTE, Ericsson, China Unicom, China Telecom) |
| [R3-237629](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237629.zip) | (TP to BL CR TS 38.470) Support for XR UP design using new container (ZTE, Ericsson, China Unicom, China Telecom) |
| [R3-237633](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237633.zip) | Discussion on XR Enhancement in Split Architecture (China Telecom) |
| [R3-237677](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237677.zip) | (TP for TS38.425) Support for XR PDU Set Handling (CMCC, Nokia, Nokia Shanghai Bell, Huawei, ZTE) |
| [R3-237678](file:///D:\会议硬盘\TSGR3_122\Docs\R3-237678.zip) | Discussion on PDU Set handling (CMCC) |