3GPP TSG-RAN WG3 Meeting #114-e R3-216001

E-meeting, 1 – 11 November 2021

**Agenda item: 10.2.1.5**

**Source: Nokia, Nokia Shanghai Bell, Huawei**

**Title: [TP to SON BL CR to 38.423, NR\_ENDC\_SON\_MDT\_enh] Semantics for the PRB per slice description**

**Document for: Endorsement**

# 1 Introduction

At RAN3 #112, reporting of PRB utilisation per slice was agreed and at RAN3 #113, it was agreed that the utilisation percentage will be counted against the total number of PRBs in the cell. In this paper, we propose a TP to XnAP to remove the FFS from the semantics.

# 2 Discussion

PRB utilisation has so far been defined for whole cell and per beam. In both cases the reference for the percentage is the total number of PRBs in the cell – which is not mentioned though. The situation with the per-slice description is therefore similar as in case of per-SSB reporting: it is to be calculated against the total number of PRBs in the cell, but the utilisation concerns only a subset of resource. The semantics shall then be defined in the same way too.

**Proposal 1: The semantics of the per-slice PRB utilisation is aligned with the per-SSB semantics.**

In addition, since the semantics do not define explicitly the reporting is the percentage, nor the reference point, it may be good to clarify this for all the PRB utilisation IEs.

During the meeting, it was further clarified that the changes apply to the gNB option only.

**Proposal 2: A statement that the value is a percentage calculated against the cell total PRB number is added to all semantics of the PRB-related IEs in the gNB reporting option.**

# 3 Text proposal

The below changes are proposed to be included in the XnAP BL CR for SON (last endorsed version in R3-213181).

============ First Change ==============

#### 9.2.2.50 Radio Resource Status

The *Radio* *Resource Status* IE indicates the usage of the PRBs per cell, per SSB area, and per slice for all traffic in Downlink and Uplink and the usage of PDCCH CCEs for Downlink and Uplink scheduling.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| CHOICE *Radio Resource Status Type* | M |  |  |  | – |  |
| >*ng-eNB* |  |  |  |  | – |  |
| >>DL GBR PRB usage | M |  | INTEGER (0..100) | Per cell DL GBR PRB usage | – |  |
| >>UL GBR PRB usage | M |  | INTEGER (0..100) | Per cell UL GBR PRB usage | – |  |
| >>DL non-GBR PRB usage | M |  | INTEGER (0..100) | Per cell DL non-GBR PRB usage | – |  |
| >>UL non-GBR PRB usage | M |  | INTEGER (0..100) | Per cell UL non-GBR PRB usage | – |  |
| >>DL Total PRB usage | M |  | INTEGER (0..100) | Per cell DL Total PRB usage | – |  |
| >>UL Total PRB usage | M |  | INTEGER (0..100) | Per cell UL Total PRB usage | – |  |
| >>DL scheduling PDCCH CCE usage | O |  | INTEGER (0..100) |  | YES | ignore |
| >>UL scheduling PDCCH CCE usage | O |  | INTEGER (0..100) |  | YES | ignore |
| >*gNB* |  |  |  |  | – |  |
| >>**SSB Area Radio Resource Status List** |  | *1* |  |  | – |  |
| >>>**SSB Area Radio Resource Status Item** |  | *1..<maxnoofSSBAreas>* |  |  | – |  |
| >>>>SSB Index | M |  | INTEGER (0..63) |  | – |  |
| >>>>SSB Area DL GBR PRB usage | M |  | INTEGER (0..100) | Per SSB area DL GBR PRB usage in percentage of the cell total PRB number. | – |  |
| >>>>SSB Area UL GBR PRB usage | M |  | INTEGER (0..100) | Per SSB area UL GBR PRB usage in percentage of the cell total PRB number. | – |  |
| >>>>SSB Area DL non-GBR PRB usage | M |  | INTEGER (0..100) | Per SSB area DL non-GBR PRB usage in percentage of the cell total PRB number. | – |  |
| >>>>SSB Area UL non-GBR PRB usage | M |  | INTEGER (0..100) | Per SSB area UL non-GBR PRB usage in percentage of the cell total PRB number. | – |  |
| >>>>SSB Area DL Total PRB usage | M |  | INTEGER (0..100) | Per SSB area DL Total PRB usage in percentage of the cell total PRB number. | – |  |
| >>>>SSB Area UL Total PRB usage | M |  | INTEGER (0..100) | Per SSB area UL Total PRB usage in percentage of the cell total PRB number. | – |  |
| >>DL scheduling PDCCH CCE usage | O |  | INTEGER (0..100) |  | YES | ignore |
| >>UL scheduling PDCCH CCE usage | O |  | INTEGER (0..100) |  | YES | ignore |
| **>>Slice Radio Resource Status List** |  | *0..1* |  |  | YES | ignore |
|  **>>>Slice Radio Resource Status Item** |  | *1..< maxnoofBPLMNs >* |  |  | – |  |
|  >>>>PLMN Identity | M |  | 9.2.2.4 |  | – |  |
|  **>>>>S-NSSAI Radio Resource Status List** |  | *1* |  |  | – |  |
|  **>>>>>S-NSSAI Radio Resource Status Item** |  | *1..<maxnoofSliceItems>* |  |  | – |  |
|  >>>>>>S-NSSAI | M |  | 9.2.3.21 |  | – |  |
|  >>>>>>Slice DL GBR PRB usage | M |  | INTEGER (0..100) | Per slice DL GBR PRB usage in percentage of the cell total PRB number. | – |  |
|  >>>>>>Slice UL GBR PRB usage | M |  | INTEGER (0..100) | Per slice UL GBR PRB usage in percentage of the cell total PRB number. | – |  |
|  >>>>>>Slice DL non-GBR PRB usage | M |  | INTEGER (0..100) | Per slice DL non-GBR PRB usage in percentage of the cell total PRB number. | – |  |
|  >>>>>>Slice UL non-GBR PRB usage | M |  | INTEGER (0..100) | Per slice UL non-GBR PRB usage in percentage of the cell total PRB number. | – |  |
|  >>>>>>Slice DL Total PRB allocation | M |  | INTEGER (0..100) | Total amount of DL PRBs available per cell for the slice if all the resources the slice could access were usable. | – |  |
|  >>>>>>Slice UL Total PRB allocation | M |  | INTEGER (0..100) | Total amount of UL PRBs available per cell for the slice if all the resources the slice could access were usable. | – |  |

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| --- | --- |
| Range bound | Explanation |
| maxnoofSSBAreas | Maximum no. SSB Areas that can be served by a NG-RAN node cell. Value is 64. |
| maxnoofSliceItems | Maximum no. of signalled slice support items. Value is 1024.  |
| maxnoofBPLMNs | Maximum no. of broadcast PLMNs by a cell. Value is 12. |

============ End of changes ==============