3GPP TSG-RAN WG3 #119bis-e R3-231586

Online, Apr 17th – Apr 26th, 2023

Agenda Item: 10.2.3

Source: Ericsson

Title: (SON TP to TS38.473) RACH Optimisaiton

Document for: Discussion, Decision

# 1 Text Proposals for SON BL CR for TS 38.473

------------------------------------------------------------Start of Changes------------------------------------------------------------

### 8.2.x RACH Indication

#### 8.2.x.1 General

This procedure is initiated by the gNB-DU to inform the gNB-CU about the occurrences of successful random access attempts which are only known by the gNB-DU.

The procedure uses non-UE associated signalling.

#### 8.2.x.2 Successful Operation



Figure 8.2.x.2-1: RACH Indication procedure.

The gNB-DU initiates the procedure by sending the RACH INDICATION message to the gNB-CU. The RACH INDICATION message contains information concerning one or more successful random access attempts in which are only known by the gNB-DU. Upon reception of the RACH INDICATION message, the gNB-CU may trigger retrieval of RA Reports from the UE(s).

#### 8.2.x.3 Abnormal Conditions

Not applicable.

<<< next change >>>

#### 9.2.1.x RACH INDICATION

This message is sent by the gNB-DU to inform the gNB-CU about one or more successful random access attempts performed at the gNB-DU.

Direction: gNB-DU  gNB-CU.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.3.1.1 |  | YES | ignore |
| **RACH Indication List** |  | *1* |  |  | YES | reject |
| >RA Report List Item |  | *1..<maxnoofRACHIndications>* |  |  |  |  |
| >>gNB-CU UE F1AP ID | M |  | 9.3.1.4 |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofRACHIndications | Maximum number of RACH Indications. Value is 64. |

### 9.4.4 PDU Definitions

*(unchanged part skipped)*

<<<<<<<<<<<<<<<<<<<< Next Change >>>>>>>>>>>>>>>>>>>>

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- PDU definitions for F1AP.

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

[snip]

 SRSPosRRCInactiveConfig,

 SDTBearerConfigurationQueryIndication,

 SDTBearerConfigurationInfo,

 PosSItypeList,

 DAPS-HO-Status,

 UuRLCChannelID,

 UplinkTxDirectCurrentTwoCarrierListInfo,

 UlTxDirectCurrentMoreCarrierInformation,

 SRSPosRRCInactiveQueryIndication,

 MC-PagingCell-Item,

 RachIndicationList

FROM F1AP-IEs

[snip]

 id-SRSPosRRCInactiveConfig,

 id-SDTBearerConfigurationQueryIndication,

 id-SDTBearerConfigurationInfo,

 id-PosSItypeList,

 id-DAPS-HO-Status,

 id-SRBMappingInfo,

 id-UplinkTxDirectCurrentTwoCarrierListInfo,

 id-UlTxDirectCurrentMoreCarrierInformation,

 id-SRSPosRRCInactiveQueryIndication,

 id-RachIndicationList,

 maxCellingNBDU,

 maxnoofCandidateSpCells,

 maxnoofDRBs,

 maxnoofErrors,

[snip]

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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-- RACH Indication ELEMENTARY PROCEDURE

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- RACH Indication

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RachIndication ::= SEQUENCE {

 protocolIEs ProtocolIE-Container {{ RachIndication-IEs}},

 ...

}

RachIndication-IEs F1AP-PROTOCOL-IES ::= {

 { ID id-RachIndicationList CRITICALITY reject TYPE RachIndicaionList PRESENCE mandatory },

 ...

}

END

[snip]

### 9.4.5 Information Element Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Information Element Definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

*(unchanged part skipped)*

[snip]

RachIndicationList ::= SEQUENCE (SIZE(1..maxnoofRaReports)) OF RachIndication-Item

RachIndication-Item ::= SEQUENCE {

 uEAssistantIdentifier GNB-CU-UE-F1AP-ID PRESENCE mandatory },

 iE-Extensions ProtocolExtensionContainer { { RachIndication-Item-ExtIEs} } OPTIONAL,

 ...

}

RachIndication-Item-ExtIEs F1AP-PROTOCOL-EXTENSION ::= {

 ...

}

RANAC ::= INTEGER (0..255)

RAN-MeasurementID ::= INTEGER (1.. 65536, ...)

[snip]

### 9.4.7 Constant Definitions

-- ASN1START

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

--

-- Constant definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

*(unchanged part skipped)*

[snip]

id-SRSPosRRCInactiveConfig ProtocolIE-ID ::= 674

id-SDTBearerConfigurationQueryIndication ProtocolIE-ID ::= 675

id-SDTBearerConfigurationInfo ProtocolIE-ID ::= 676

id-UL-GapFR2-Config ProtocolIE-ID ::= 677

id-ConfigRestrictInfoDAPS ProtocolIE-ID ::= 678

id-UE-MulticastMRBs-Setup-List ProtocolIE-ID ::= 679

id-UE-MulticastMRBs-Setup-Item ProtocolIE-ID ::= 680

id-MulticastF1UContextReferenceCU ProtocolIE-ID ::= 681

id-PosSItypeList ProtocolIE-ID ::= 682

id-DAPS-HO-Status ProtocolIE-ID ::= 683

id-UplinkTxDirectCurrentTwoCarrierListInfo ProtocolIE-ID ::= 684

id-UE-MulticastMRBs-ToBeSetup-atModify-List ProtocolIE-ID ::= 685

id-UE-MulticastMRBs-ToBeSetup-atModify-Item ProtocolIE-ID ::= 686

id-MC-PagingCell-List ProtocolIE-ID ::= 687

id-MC-PagingCell-Item ProtocolIE-ID ::= 688

id-UlTxDirectCurrentMoreCarrierInformation ProtocolIE-ID ::= 689

id-SRSPosRRCInactiveQueryIndication ProtocolIE-ID ::= 690

id-RachIndicationList ProtocolIE-ID ::= xx -- assigned by MCC

id-ChannelOccupancyTimePercentageUL ProtocolIE-ID ::= 901 -- assigned by MCC

END

## LS to RAN2 on RACH optimisation

**3GPP TSG-RAN WG3 Meeting #119bis-e *R3-23xxxx***

Online, Online 17th Apr – 26th Apr 2023

**Title:** LS on RACH Optimisation

**Release:** Rel-18

**Work Item:** NR\_ENDC\_SON\_MDT\_enh2-Core

**Source:** RAN3

**To:** RAN2

**Cc:** -

**Contact Person:**

 **Name:**  Angelo Centonza

**E-mail Address:** angelo.centonza@ericsson.com

**Send any reply LS to: 3GPP Liaisons Coordinator,****mailto:3GPPLiaison@etsi.org**

**Attachments:** -

**1. Overall description:**

As part of the work on SON for NG-RAN, RAN3 discussed enhancements to the RACH optimisation functions.

As part of such discussions RAN3 identified potential enhancements to the RACH report collected by UEs and signalled to the NG-RAN. Such enhancements are listed below:

1. Enable the addition in the RACH Report of the feature priority of each feature in the feature combination used by the UE at the time RACH access is triggered. This enables the NG-RAN to determine whether any optimisation is needed with respect to how features with different priorities are combined in the same feature combination associated to a RACH partition
2. Enable the addition in the RACH Report of RACH partition configuration information. This information consists of the start preamble index and the number of preambles in the partition for which the RACH Report was generated. This enables the NG-RAN to determine the RACH partition configuration at the time the RACH Report was generated. This enhancement is needed because the RACH partitions configurations may change with time and a RACH Report generated under certain RACH partition configurations may be reported to the NG-RAN after such RACH partition configurations have changed.

2. Actions:

RAN3 respectfully asks RAN2 to take it the above into account and to provide feedback on whether the proposed additions are feasible and can be specified in Rel18.

**3. Date of next TSG RAN WG3 meetings:**

3GPP RAN2#120 from 2023-05-22 to 2023-05-26 Incheon , KR