3GPP TSG-RAN WG3 Meeting #114-e R3-21xxxx

Online, 01 – 11 November 2021

**Agenda item: 19.2.3**

**Source: Nokia, Nokia Shanghai Bell**

**Title:** **(TP for NR\_pos\_enh BL CR for TS 38.455) Further details for on-demand PRS**

**Document for: Discussion and Decision**

# 1 Introduction

This NRPPa TP captures the agreements from CB # 1903\_Pos\_OnDemandPRS.

# A Appendix: Text Proposal for TS 38.455 BL CR

*Start of Text Proposal for TS 38.455 BL CR*

8.2.X PRS Configuration Exchange

8.2.X.1 General

The PRS Configuration Exchange procedure is initiated by the LMF to request the NG-RAN node to configure PRS transmission. This procedure applies only if the NG-RAN node is a gNB.

8.2.X.2 Successful Operation



**Figure 8.2.X.2-1: PRS Configuration Exchange procedure, successful operation**

The LMF initiates the procedure by sending a PRS CONFIGURATION REQUEST message to the NG-RAN node, indicating in the *PRS TRP List* IE the TRP(s) for which DL-PRS transmission is requested. The NG-RAN node should use the information in the *Requested DL PRS Transmission Characteristics* IE to configure DL-PRS transmission by the indicated TRP(s).

If DL-PRS transmission is successfully configured for at least one of the TRPs, the NG-RAN node shall respond with a PRS CONFIGURATION RESPONSE message.

8.2.X.3 Unsuccessful Operation



**Figure 8.2.X.3-1: PRS Configuration Exchange procedure, unsuccessful operation**

If the NG-RAN node cannot configure DL-PRS transmission for any of the TRPs in the *PRS TRP List* IE of the PRS CONFIGURATION REQUEST message, it shall respond with a PRS CONFIGURATION FAILURE message with an appropriate cause value.

8.2.X.4 Abnormal Conditions

Void.

*Next Change*

9.1.1.a1 PRS CONFIGURATION REQUEST

This message is sent by LMF to request NG-RAN node configuring the PRS transmission.

Direction: LMF → NG-RAN node.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| Message Type | M |  | 9.2.3 |  | YES | reject |
| NRPPa Transaction ID | M |  | 9.2.4 |  | - |  |
| **PRS TRP List** |  | *1* |  |  | YES | ignore |
|  **>PRS TRP Item** |  | *1 .. <maxnoTRPs>* |  |  | EACH | ignore |
| >>TRP ID | M |  | 9.2.24 |  | - |  |
| >>Requested DL PRS Transmission Characteristics | [FFS] |  | 9.2.x1 |  | YES | ignore |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoTRPs | Maximum no. of TRPs in a NG-RAN node. Value is 65535 |

9.1.1.a2 PRS CONFIGURATION RESPONSE

This message is sent by NG-RAN node to acknowledge updating the PRS transmission.

Direction: NG-RAN node → LMF.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| Message Type | M |  | 9.2.3 |  | YES | reject |
| NRPPa Transaction ID | M |  | 9.2.4 |  | - |  |
| **PRS Transmission TRP List** |  | *1* |  |  | YES | ignore |
|  **>PRS Transmission TRP Item** |  | *1 .. <maxnoTRPs>* |  |  | EACH | ignore |
| >>TRP ID | M |  | 9.2.24 |  | - |  |
| >>On-demand PRS information | [FFS] |  | 9.2.x2 |  | YES | ignore |

|  |  |
| --- | --- |
| **Range bound** | **Explanation** |
| maxnoTRPs | Maximum no. of TRPs in a NG-RAN node. Value is 65535 |

*Next Change*

### 9.2.x1 Requested DL PRS Transmission Characteristics [FFS]

This IE contains the requested PRS configuration for transmission by the LMF.

Editor’s Note: All details of this IE are FFS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| **PRS Resource Set List** |  | *1..<maxnoofPRSresourceSet>* |  |  |
| >PRS Resource Set ID | M |  | INTEGER(0..7) |  |
| >PRS bandwidth | M |  | INTEGER(1..63) | 24,28,…,272 PRBs |
| >Resource Set Periodicity | M |  | ENUMERATED(4,5,8,10,16,20,32,40,64,80,160,320,640,1280,2560,5120,10240,20480,40960,81920,…) |  |
| **>PRS Resource List** | M | *1..<maxnoofPRSresources>* |  | *NR-DL-PRS-Resource-r16* as defined in TS 37.355 [14] |
| >>PRS Resource ID | M |  | INTEGER(0..63) |  |
| >> CHOICE *QCL Info* | O |  |  |  |
| >>>*SSB* |  |  |  |  |
| >>>>NR PCI | M |  | INTEGER(0..1007) |  |
| >>>> SSB Index | O |  | INTEGER(0..63) |  |
| >>>*DL-PRS* |  |  |  |  |
| >>>>QCL Source PRS Resource Set ID | M |  | INTEGER(0..7) |  |
| >>>>QCL Source PRS Resource ID  | O |  | INTEGER(0..63) | If it is absent, the QCL source PRS resource ID is the same as the PRS resource ID |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofPRSresourceSet | Maximum no of PRS resources set. Value is 8. |
| maxnoofPRSresource | Maximum no of PRS resources per PRS resource set. Value is 64. |

### 9.2.x2 On-demand PRS information [FFS]

This IE contains the updated PRS configuration.

Editor’s Note: All details of this IE are FFS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE Type and Reference | Semantics Description |
| PRS Configuration [FFS] | FFS |  | 9.2.44 |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

*Next Change*

*Next Change*

9.3.4 PDU Definitions

\*\* SKIPPING UNCHANGED TEXT \*\*

PRSConfigurationRequest ::= SEQUENCE {

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

 ...

}

PRSConfigurationRequest-IEs NRPPA-PROTOCOL-IES ::= {

 { ID id-PRSTRPList CRITICALITY ignore TYPE PRSTRPList PRESENCE mandatory},

 ...

}

\*\* SKIPPING UNCHANGED TEXT \*\*

PRSConfigurationResponse ::= SEQUENCE {

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

 ...

}

PRSConfigurationResponse-IEs NRPPA-PROTOCOL-IES ::= {

 { ID id-PRSTransmissionTRPList CRITICALITY ignore TYPE PRSTransmissionTRPList PRESENCE mandatory},

 ...

}

*Next Change*

9.3.5 Information Element definitions

\*\* SKIPPING UNCHANGED TEXT \*\*

RequestedDLPRS ::= SEQUENCE {

 requestedDLPRSResourceSet-List RequestedDLPRSResourceSet-List,

 iE-Extensions ProtocolExtensionContainer { { RequestedDLPRS-ExtIEs} } OPTIONAL,

 ...

}

RequestedDLPRS-ExtIEs NRPPA-PROTOCOL-EXTENSION ::= {

 ...

}

RequestedDLPRSResourceSet-List ::= SEQUENCE (SIZE (1..maxnoofPRSresourceSet)) OF RequestedDLPRSResourceSet-Item

RequestedDLPRSResourceSet-Item ::= SEQUENCE {

 pRSResourceSetID PRS-Resource-Set-ID,

 pRSbandwidth INTEGER(1..63),

 resourceSetPeriodicity ResourceSetPeriodicity,

 requestedDLPRSResource-List RequestedDLPRSResource-List,

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

 ...

}

RequestedDLPRSResourceSet-Item-ExtIEs NRPPA-PROTOCOL-EXTENSION ::= {

 ...

}

RequestedDLPRSResource-List::= SEQUENCE (SIZE (1..maxnoofPRSresource)) OF RequestedDLPRSResource-Item

RequestedDLPRSResource-Item ::= SEQUENCE {

 pRSResourceID PRS-Resource-ID,

 qCLInfo PRSResource-QCLInfo OPTIONAL,

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

 ...

}

RequestedDLPRSResource-Item-ExtIEs NRPPA-PROTOCOL-EXTENSION ::= {

 ...

}

\*\* SKIPPING UNCHANGED TEXT \*\*

ResourceSetPeriodicity ::= ENUMERATED{n4,n5,n8,n10,n16,n20,n32,n40,n64,n80,n160,n320,n640,n1280,n2560,n5120,n10240,n20480,n40960, n81920,...}

*End of Text Proposal for TS 38.455 BL CR*