3GPP TSG-RAN WG2 Meeting #109-e R2-200xxxx

Electronic Meeting, 24th February – 6th March 2020

Agenda: x.x.x

Source: Ericsson

Title: Report to Offline #701

Document for: Discussion, Decision

# 1 Introduction

This document is to kick-off the following email discussion:

* [Offline Disc#701]: To discuss if option2 is feasible or not and the corresponding RAN2 specification impacts (Ericsson, R2-2001963 for discussion and R2-2001964 for draft response LS to RAN3) (Comeback Thurs. or next Wed.)

# 2 Discussion

In the LS received from RAN3 [1], it was asked RAN2 option on whether their preferred option was feasible from RAN2 point of view. The preferred RAN3 option is the following:

* *ask RAN2 to define in existing RRC containers, present in the CU to DU RRC Information IE (such as, the CG-ConfigInfo), the exact information related to the UE SL information.*

According to this, we would like to analysis what would be the impact on the RRC running CR if this option needs to be supported by RAN2. Looking at the last endorsed RRC running CR [2], we have the following in the *HandoverPreparationInformation* message (i.e., in the inter-node RRC messages clause 11 of TS 38.331).

***HandoverPreparationInformation* message**

-- ASN1START

-- TAG-HANDOVER-PREPARATION-INFORMATION-START

HandoverPreparationInformation ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

handoverPreparationInformation HandoverPreparationInformation-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

HandoverPreparationInformation-IEs ::= SEQUENCE {

ue-CapabilityRAT-List UE-CapabilityRAT-ContainerList,

sourceConfig AS-Config OPTIONAL, -- Cond HO

rrm-Config RRM-Config OPTIONAL,

as-Context AS-Context OPTIONAL,

nonCriticalExtension SEQUENCE {} OPTIONAL

}

AS-Config ::= SEQUENCE {

rrcReconfiguration OCTET STRING (CONTAINING RRCReconfiguration),

...,

[[

sourceRB-SN-Config OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL,

sourceSCG-NR-Config OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL,

sourceSCG-EUTRA-Config OCTET STRING OPTIONAL

]]

}

AS-Context ::= SEQUENCE {

reestablishmentInfo ReestablishmentInfo OPTIONAL,

configRestrictInfo ConfigRestrictInfoSCG OPTIONAL,

...,

[[ ran-NotificationAreaInfo RAN-NotificationAreaInfo OPTIONAL

]],

[[ ueAssistanceInformation OCTET STRING (CONTAINING UEAssistanceInformation) OPTIONAL -- Cond HO2

]],

[[

selectedBandCombinationSN BandCombinationInfoSN OPTIONAL

]],

[[ sidelinkUEInformationNR-r16 OCTET STRING (CONTAINING SidelinkUEinformationNR-r16) OPTIONAL,

sidelinkUEInformationEUTRA-r16 OCTET STRING OPTIONAL

]]}

ReestablishmentInfo ::= SEQUENCE {

sourcePhysCellId PhysCellId,

targetCellShortMAC-I ShortMAC-I,

additionalReestabInfoList ReestabNCellInfoList OPTIONAL

}

ReestabNCellInfoList ::= SEQUENCE ( SIZE (1..maxCellPrep) ) OF ReestabNCellInfo

ReestabNCellInfo::= SEQUENCE{

cellIdentity CellIdentity,

key-gNodeB-Star BIT STRING (SIZE (256)),

shortMAC-I ShortMAC-I

}

RRM-Config ::= SEQUENCE {

ue-InactiveTime ENUMERATED {

s1, s2, s3, s5, s7, s10, s15, s20,

s25, s30, s40, s50, min1, min1s20, min1s40,

min2, min2s30, min3, min3s30, min4, min5, min6,

min7, min8, min9, min10, min12, min14, min17, min20,

min24, min28, min33, min38, min44, min50, hr1,

hr1min30, hr2, hr2min30, hr3, hr3min30, hr4, hr5, hr6,

hr8, hr10, hr13, hr16, hr20, day1, day1hr12, day2,

day2hr12, day3, day4, day5, day7, day10, day14, day19,

day24, day30, dayMoreThan30} OPTIONAL,

candidateCellInfoList MeasResultList2NR OPTIONAL,

...,

[[

candidateCellInfoListSN-EUTRA MeasResultServFreqListEUTRA-SCG OPTIONAL

]]

}

-- TAG-HANDOVER-PREPARATION-INFORMATION-STOP

-- ASN1STOP

According to this, what RAN3 is basically asking is to include the same two fields i.e., the *sidelinkUEInformationNR-r16* and the *sidelinkUEInformationEUTRA-r16* within the *CG-ConfigInfo* in TS 38.331.

Therefore, the overall impact on the current V2X RRC running CR [2] would be just the following (highlighted below):

*CG-ConfigInfo* message

-- ASN1START

-- TAG-CG-CONFIG-INFO-START

CG-ConfigInfo ::= SEQUENCE {

criticalExtensions CHOICE {

c1 CHOICE{

cg-ConfigInfo CG-ConfigInfo-IEs,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}

}

}

CG-ConfigInfo-IEs ::= SEQUENCE {

ue-CapabilityInfo OCTET STRING (CONTAINING UE-CapabilityRAT-ContainerList) OPTIONAL,-- Cond SN-AddMod

candidateCellInfoListMN MeasResultList2NR OPTIONAL,

candidateCellInfoListSN OCTET STRING (CONTAINING MeasResultList2NR) OPTIONAL,

measResultCellListSFTD-NR MeasResultCellListSFTD-NR OPTIONAL,

scgFailureInfo SEQUENCE {

failureType ENUMERATED { t310-Expiry, randomAccessProblem,

rlc-MaxNumRetx, synchReconfigFailure-SCG,

scg-reconfigFailure,

srb3-IntegrityFailure},

measResultSCG OCTET STRING (CONTAINING MeasResultSCG-Failure)

} OPTIONAL,

configRestrictInfo ConfigRestrictInfoSCG OPTIONAL,

drx-InfoMCG DRX-Info OPTIONAL,

measConfigMN MeasConfigMN OPTIONAL,

sourceConfigSCG OCTET STRING (CONTAINING RRCReconfiguration) OPTIONAL,

scg-RB-Config OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL,

mcg-RB-Config OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL,

mrdc-AssistanceInfo MRDC-AssistanceInfo OPTIONAL,

nonCriticalExtension CG-ConfigInfo-v1540-IEs OPTIONAL

}

CG-ConfigInfo-v1540-IEs ::= SEQUENCE {

ph-InfoMCG PH-TypeListMCG OPTIONAL,

measResultReportCGI SEQUENCE {

ssbFrequency ARFCN-ValueNR,

cellForWhichToReportCGI PhysCellId,

cgi-Info CGI-InfoNR

} OPTIONAL,

nonCriticalExtension CG-ConfigInfo-v1560-IEs OPTIONAL

}

CG-ConfigInfo-v1560-IEs ::= SEQUENCE {

candidateCellInfoListMN-EUTRA OCTET STRING OPTIONAL,

candidateCellInfoListSN-EUTRA OCTET STRING OPTIONAL,

sourceConfigSCG-EUTRA OCTET STRING OPTIONAL,

scgFailureInfoEUTRA SEQUENCE {

failureTypeEUTRA ENUMERATED { t313-Expiry, randomAccessProblem,

rlc-MaxNumRetx, scg-ChangeFailure},

measResultSCG-EUTRA OCTET STRING

} OPTIONAL,

drx-ConfigMCG DRX-Config OPTIONAL,

measResultReportCGI-EUTRA SEQUENCE {

eutraFrequency ARFCN-ValueEUTRA,

cellForWhichToReportCGI-EUTRA EUTRA-PhysCellId,

cgi-InfoEUTRA CGI-InfoEUTRA

} OPTIONAL,

measResultCellListSFTD-EUTRA MeasResultCellListSFTD-EUTRA OPTIONAL,

fr-InfoListMCG FR-InfoList OPTIONAL,

nonCriticalExtension CG-ConfigInfo-v1570-IEs OPTIONAL

}

CG-ConfigInfo-v1570-IEs ::= SEQUENCE {

sftdFrequencyList-NR SFTD-FrequencyList-NR OPTIONAL,

sftdFrequencyList-EUTRA SFTD-FrequencyList-EUTRA OPTIONAL,

nonCriticalExtension CG-ConfigInfo-v16xy-IEs OPTIONAL

}

CG-ConfigInfo-v16xy-IEs ::= SEQUENCE {

sidelinkUEInformationNR-r16 OCTET STRING (CONTAINING SidelinkUEinformationNR-r16) OPTIONAL,

sidelinkUEInformationEUTRA-r16 OCTET STRING OPTIONAL

}

SFTD-FrequencyList-NR ::= SEQUENCE (SIZE (1..maxCellSFTD)) OF ARFCN-ValueNR

SFTD-FrequencyList-EUTRA ::= SEQUENCE (SIZE (1..maxCellSFTD)) OF ARFCN-ValueEUTRA

ConfigRestrictInfoSCG ::= SEQUENCE {

allowedBC-ListMRDC BandCombinationInfoList OPTIONAL,

powerCoordination-FR1 SEQUENCE {

p-maxNR-FR1 P-Max OPTIONAL,

p-maxEUTRA P-Max OPTIONAL,

p-maxUE-FR1 P-Max OPTIONAL

} OPTIONAL,

servCellIndexRangeSCG SEQUENCE {

lowBound ServCellIndex,

upBound ServCellIndex

} OPTIONAL, -- Cond SN-AddMod

maxMeasFreqsSCG INTEGER(1..maxMeasFreqsMN) OPTIONAL,

-- TBD Late Drop: If maxMeasIdentitiesSCG is used needs to be decided after RAN4 replies to the LS on measurement requirements for MR-DC.

maxMeasIdentitiesSCG-NR INTEGER(1..maxMeasIdentitiesMN) OPTIONAL,

...,

[[

selectedBandEntriesMNList SEQUENCE (SIZE (1..maxBandComb)) OF SelectedBandEntriesMN OPTIONAL,

pdcch-BlindDetectionSCG INTEGER (1..15) OPTIONAL,

maxNumberROHC-ContextSessionsSN INTEGER(0.. 16384) OPTIONAL

]]

}

SelectedBandEntriesMN ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandEntryIndex

BandEntryIndex ::= INTEGER (0.. maxNrofServingCells)

PH-TypeListMCG ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF PH-InfoMCG

PH-InfoMCG ::= SEQUENCE {

servCellIndex ServCellIndex,

ph-Uplink PH-UplinkCarrierMCG,

ph-SupplementaryUplink PH-UplinkCarrierMCG OPTIONAL,

...

}

PH-UplinkCarrierMCG ::= SEQUENCE{

ph-Type1or3 ENUMERATED {type1, type3},

...

}

BandCombinationInfoList ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationInfo

BandCombinationInfo ::= SEQUENCE {

bandCombinationIndex BandCombinationIndex,

allowedFeatureSetsList SEQUENCE (SIZE (1..maxFeatureSetsPerBand)) OF FeatureSetEntryIndex

}

FeatureSetEntryIndex ::= INTEGER (1.. maxFeatureSetsPerBand)

DRX-Info ::= SEQUENCE {

drx-LongCycleStartOffset CHOICE {

ms10 INTEGER(0..9),

ms20 INTEGER(0..19),

ms32 INTEGER(0..31),

ms40 INTEGER(0..39),

ms60 INTEGER(0..59),

ms64 INTEGER(0..63),

ms70 INTEGER(0..69),

ms80 INTEGER(0..79),

ms128 INTEGER(0..127),

ms160 INTEGER(0..159),

ms256 INTEGER(0..255),

ms320 INTEGER(0..319),

ms512 INTEGER(0..511),

ms640 INTEGER(0..639),

ms1024 INTEGER(0..1023),

ms1280 INTEGER(0..1279),

ms2048 INTEGER(0..2047),

ms2560 INTEGER(0..2559),

ms5120 INTEGER(0..5119),

ms10240 INTEGER(0..10239)

},

shortDRX SEQUENCE {

drx-ShortCycle ENUMERATED {

ms2, ms3, ms4, ms5, ms6, ms7, ms8, ms10, ms14, ms16, ms20, ms30, ms32,

ms35, ms40, ms64, ms80, ms128, ms160, ms256, ms320, ms512, ms640, spare9,

spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1 },

drx-ShortCycleTimer INTEGER (1..16)

} OPTIONAL

}

MeasConfigMN ::= SEQUENCE {

measuredFrequenciesMN SEQUENCE (SIZE (1..maxMeasFreqsMN)) OF NR-FreqInfo OPTIONAL,

measGapConfig SetupRelease { GapConfig } OPTIONAL,

gapPurpose ENUMERATED {perUE, perFR1} OPTIONAL,

...,

[[ measGapConfigFR2 SetupRelease { GapConfig } OPTIONAL

]]

}

MRDC-AssistanceInfo ::= SEQUENCE {

affectedCarrierFreqCombInfoListMRDC SEQUENCE (SIZE (1..maxNrofCombIDC)) OF AffectedCarrierFreqCombInfoMRDC,

...

}

AffectedCarrierFreqCombInfoMRDC ::= SEQUENCE {

victimSystemType VictimSystemType,

interferenceDirectionMRDC ENUMERATED {eutra-nr, nr, other, utra-nr-other, nr-other, spare3, spare2, spare1},

affectedCarrierFreqCombMRDC SEQUENCE {

affectedCarrierFreqCombEUTRA AffectedCarrierFreqCombEUTRA OPTIONAL,

affectedCarrierFreqCombNR AffectedCarrierFreqCombNR

} OPTIONAL

}

VictimSystemType ::= SEQUENCE {

gps ENUMERATED {true} OPTIONAL,

glonass ENUMERATED {true} OPTIONAL,

bds ENUMERATED {true} OPTIONAL,

galileo ENUMERATED {true} OPTIONAL,

wlan ENUMERATED {true} OPTIONAL,

bluetooth ENUMERATED {true} OPTIONAL

}

AffectedCarrierFreqCombEUTRA ::= SEQUENCE (SIZE (1..maxNrofServingCellsEUTRA)) OF ARFCN-ValueEUTRA

AffectedCarrierFreqCombNR ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF ARFCN-ValueNR

-- TAG-CG-CONFIG-INFO-STOP

-- ASN1STOP

On top of this we would like to highlight few motivations on why Option 2 is feasible from RAN2 point of view:

* Usually inter-node RRC message are used to exchange UE-related information between NG-RAN nodes (i.e., from clause 11 of 38.331 we have 🡪 *“These RRC messages may be transferred to or from the UE via another Radio Access Technology.”*)
* Option 2 is future proof if, in later Release, we are going to handle SL in MR-DC scenarios. The CG-ConfigInfo IEs, indeed, is exchanged over the F1 interface as well as the X2/Xn interface. This that going for option 1 it may create overhead and unnecessary signalling in the future.
* This is the usual way of working for UE-related information. A clear example is the *HandoverPreparationInformation* where the SUI messages are included within this message and no replicated over the F1 and X2/Xn interface.

For all these reasons, we believe that Option 2 described in the LS from RAN3 [1] is feasible from RAN2 point-of-view and can be implemented in the V2X RRC running CR with minimum standardization effort.

According to this, we would like to ask companies whether they agree on this analysis and if not, please add a “strong” motivation of why this should not be supported.

**Question 1: Do you agree that Option 2 described in the RAN3 LS [1] is feasible from a RAN2 point-of-view? If not, please add a “strong” motivation of why this should not be supported.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Movitation** |
| Samsung | Yes | Since CG-ConfigInfo IE is used to carry UE specific context, we think SUI can be included in the IE. |
| Nokia | Yes | In F1 interface, legacy *CG-ConfigInfo* is mainly used to perform delta configuration in SN-DU during SN change or intra-SgNB-CU SgNB-DU change. So maybe at least RAN3 need to think of potential impact allowing it to support other procedures. |
| LG | Yes | It is feasible from RAN2 perspective. But decision should be made in RAN3. |
| CATT | Yes | Agree with rapporteur’s analysis. It is feasible from RAN2 perspective. |
| Huawei | NO | As clarified in the email, the real intention of this RAN3 LS is actually asking whether “it is feasible for RAN2 to accept including SUI in the existing RRC information contrainer (CG-ConfigInfo) in the RAN2 Spec“, not simplying asking whether such signalling design itself is feasible or not.   |  | | --- | | **1. Overall Description:**  In order to support F1 signalling for NR V2X, RAN3 has discussed how to handle sidelink resource requesting and configuration when the UE is in RRC Connected mode. RAN3 has discussed two possible options:   1. Either to introduce a new *SidelinkUEInformation* IE in the CU to DU RRC Information IE, 2. or, **to ask RAN2 to define in existing RRC containers**, present in the *CU to DU RRC Information* IE (such as, the CG-ConfigInfo), the exact information related to the UE SL information.   From RAN3 point of view, option 2 is preferable (the impact on RAN3 specifications will be minimal). RAN3 kindly asks RAN2 to feedback on whether option 2 is feasible from their perspective.  **2. Actions:**  To RAN2 group**:**  ACTION:         From RAN3 point of view, option 2 is preferable (the impact on RAN3 specifications will be minimal). RAN3 kindly asks RAN2 to feedback on whether option 2 is feasible from their perspective. |   Of course, to include SUI in whatever RRC information IE may be feasible, if one simply focuses on the singalling design itself. But the key issue here should now be whether it is really \*appropriate\* to include SUI in this *CG-ConfigInfo* and make corresponding RAN2 spec impactfrom RAN2 perspective. As for the appropriateness, we do not think it is proper to include SUI into *CG-ConfigInfo* which now includes Uu cell group related configurations that are rather independent of SL related info. Also, as pointed in R2-2000262, there has already been RRC information IE introduced specifically for UEAssistanceInformation, instead of squeezing it into other IEs. With such a precedent, we are wondering why we cannot follow the legacy handling for the UAI case and also introduce another RRC information IE specific for SU in F1, and what the point is to have to include the UE **SL** information in a IE used for **Uu** CG related inforamtion. From RAN3’s LS and our RAN3 delegate’s feedback, no clear techinical reason has ever been identified behind this, so we cannot see the appropriateness of option 2 from RAN2 perspective.  Also it is seen that some companies have already submitted RAN3 CRs based on the assumption of option 2. Now that anyway there are potential (considerable) RAN3 Spec impacts, we do not see any problem for RAN3 to tackle the whole issue by themselves and the necessity to have to offload part of the work to RAN2.  For the reply LS, it should be indicated that RAN2 see no necessity/appropriateness in including SUI in CG-ConfigInfo. From company views provided so far, even though this is regarded as feasible from singalling design perspective, at least RAN2 shouldn’t indicate any preference/decision in the reply LS on where this siganlling should be captured (but up to RAN3). |
| Ericsson | Yes | Option 2 is more future proof if, in later Releases, we are going to handle SL in MR-DC scenarios. The CG-ConfigInfo IEs, indeed, is exchanged over the F1 interface as well as the X2/Xn interface. This means that going for option 1 it may create overhead and unnecessary signalling in the future.  Therefore, this is the usual way of working for UE-related information. A clear example is the *HandoverPreparationInformation* where the SUI messages are included within this message and not replicated over the F1 and X2/Xn interface (i.e., since this message is already included in the CU to DU RRC Information IE. |
| ZTE | No | Share the same view with HW, also as we mentioned in the email thread, after checking the difinition of CG-ConfigInfo in TS 38.331:  "This message is used by mater eNB or gNB to request the SgNB or SeNB to perform certain actions e.g. to establish, modify or release an SCG. The message may include additional information e.g. to assist the SgNB or SeNB to set the SCG configuration. It can also be used by a CU to request a DUto perform certain actions, e.g. to establish, or modify an MCG or SCG."  In addition, the operation specified in TS 38.473:  "For DC operation, the CG-ConfigInfo IE shall be included in the CU to DU RRC Information IE at the gNB acting as secondary node. If the CG-ConfigInfo IE is included in the UE CONTEXT SETUP REQUEST message, the gNB-DUshall regard it as a reconfiguration with sync as defined in TS 38.331[8]"  Thus, based on the above citation, it is observed that the CG-ConfigInfo IE is included in the CU to DU RRC Information only when gNB acting as SN in DC operation. For NR V2X, we think non-DC scenario is more common and widely agreed. Thus, we should also consider non-DC scenario for SL resource request over F1. In addition, it can be found that UEAssistanceInformation is already captured in CU to DURRC Information, thus, why not to comply with the same principle for sidelinkUEInformation ? |
| HERON | Yes | Agree with ZTE that is a problem with the container name.  However, the IEs for both NR and EUTRA are already in the approved CR to 38.331 in R2-2000756. Below is a quote for NR from CR to 38.331:   | ***SidelinkUEInformationNR message*** | | --- | | -- ASN1START | | -- TAG-SIDELINKUEINFORMATIONNR-START |   ***SidelinkUEInformationNR message***  -- ASN1START  -- TAG-SIDELINKUEINFORMATIONNR-START  SidelinkUEInformationNR-r16::= SEQUENCE {  criticalExtensions CHOICE {  sidelinkUEInformationNR-r16 SidelinkUEInformationNR-r16-IEs,  criticalExtensionsFuture SEQUENCE {}  }  }  SidelinkUEInformationNR-r16-IEs::= SEQUENCE {  sl-RxInterestedFreqList-r16 SL-InterestedFreqList-r16 OPTIONAL,  sl-TxResourceReqList-r16 SL-TxResourceReqList-r16 OPTIONAL,  lateNonCriticalExtension OCTET STRING OPTIONAL,  nonCriticalExtension SEQUENCE {} OPTIONAL  }  SL-InterestedFreqList-r16 ::= SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF INTEGER (1..maxNrofFreqSL-r16)  SL-TxResourceReqList-r16 ::= SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-TxResourceReq-r16  SL-TxResourceReq-r16::= SEQUENCE {  sl-DestinationIdentity-r16 SL-DestinationIdentity-r16,  sl-CastType-r16 ENUMERATED {broadcast, groupcast, unicast, spare1},  sl-RLC-ModeIndicationList-r16 SEQUENCE (SIZE (1.. maxNrofSLRB-r16)) OF SL-RLC-ModeIndication-r16 OPTIONAL,  sl-QoS-InfoList-r16 SEQUENCE (SIZE (1..maxNrofSL-QFIsPerDest-r16)) OF SL-QoS-Info-r16 OPTIONAL,  sl-Failure-r16 ENUMERATED {true} OPTIONAL,  sl-TypeTxSyncList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-TypeTxSync-r16 OPTIONAL,  sl-TxInterestedFreqList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF INTEGER (1..maxNrofFreqSL-r16) OPTIONAL  } |
| Futurewei | No | According to TS 38.331, CG-ConfigInfo “is used by master eNB or gNB to request the SgNB or SeNB to perform certain actions e.g. to establish, modify or release an SCG.” Even when it is sent from CU to DU, it is also “used by a CU to request a DU to perform certain actions, e.g. to establish, or modify an MCG or SCG.” Hence, CG-ConfigInfo is supposed to be used in DC related configuration/operation.  Option 1 doesn’t need to unnecessarily “hack” CG-ConfigInfo, and it is consistent with F1 signaling principle, and with the practice of other IEs, e.g., UEAssistanceInformation. |

# 3 Conclusion

# 4 Reference

1. R2-2000031, LS to RAN2 on Sidelink UE Information (R3-197770; contact: Ericsson), RAN3
2. R2-2000756, Running CR to TS 38.331 for 5G V2X with NR sidelink, Huawei, HiSilicon, RAN2#109e, February 2020.