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. |
|  |  |  |

# 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.