3GPP TSG-RAN WG2 #113bis-e R2-210xxxx

Electronic meeting, 12th April – 20th April 2021

Agenda Item: 6.1.4.1.3

Source: Ericsson

Title: Summary of [AT113bis-e][021][NR16] Sys Info Inter Node and Misc

Document for: Discussion, Decision

# 1 Introduction

This document is to handle the following email discussion:

* [AT113bis-e][021][NR16] Sys Info Inter Node and Misc (Ericsson)

Scope: Treat R2-2102714, R2-2103582, R2-2103661, R2-2103929, R2-2104205, R2-2103851, R2-2103645, R2-2103936,

Phase 1, determine agreeable parts, Phase 2, for agreeable parts Work on CRs.

Intended outcome: Report and Agreed-in-principle CRs

Deadline: Schedule A

Regarding the deadlines, I would like to set the following 2 deadlines:

1) First deadline on **Wednesday April 14 1000 UTC** to settle scope what is agreeable.

2) Second deadline on **Monday April 19 1800 UTC** to agree the CRs (where applicable) and final check.

# 2 Contact information

|  |  |
| --- | --- |
| Company (Name) | Email |
| Ericsson (Zhenhua Zou)  Section 3.2 | zhenhua.zou@ericsson.com |
| Google | frankwu@google.com |
| Lenovo | hchoi5@lenovo.com |
| Apple | zhibin\_wu@apple.com |
| Samsung | anilag@samsung.com |
| Ericsson (Tony) | antonino.orsino@ericsson.com |
| MediaTek | Chun-fan.tsai@mediatek.com |
| ZTE (Ting Lu) Section 3.2 | lu.ting@zte.com.cn |

# 3 Discussion

## 3.1 Corrections to UE action upon SIB1 reception

[R2-2102714](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2102714.zip) Corrections to UE action upon SIB1 reception Samsung Electronics Co., Ltd CR Rel-16 38.331 16.4.0 2475 - F NR\_pos-Core, 5G\_V2X\_NRSL-Core

*Reason for change:*

If the UE needs to acquire a SIB, it checks si-BroadcastStatus in SIB1. According to current procedure, if UE has already acquired SIB1 in current modifictaion period, UE does not reacquire SIB1 for checking si-BroadcastStatus .

A) If the si-BroadcastStatus is set to broadcasting in the SIB1 acquired in current modification period, **there is no need to reacquire SIB1** as the value of the si-BroadcastStatus is valid until the end of the BCCH modification period when set to broadcasting.

B) If the si-BroadcastStatus is set to notbroadcasting in the SIB1 acquired in current modification period, SIB1 **needs to be reacquired**. si-BroadcastStatus can be changed from notbroadcasting to broadcasting during the modification period.

**Question 1**: Do company agree with the changes proposed in CR [R2-2102714](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2102714.zip)?

|  |  |  |
| --- | --- | --- |
| Company | Agree (y/n) | Comments |
| Lenovo | Yes | The CR is aligned with what has been minuted in the RAN2#112-e chairman notes.   * When UE trigger SIB acquisition in Connected and SIB Bcast status is nonbroadcast, then the UE shall acquire SIB1 without paying respect to modification period (same as Idle mode R15 procedure). |
| Apple | Yes | This change is in line with what has been captured in Chairman’s notes RAN2#112 |
| Samsung | Yes | For scenario (B), UE should re-acquire SIB1 |
| Ericsson (Tony) | Yes |  |
| MediaTek | No | So, we don’t trust the SIB1 within current modificaion period and the UE should acquire SIB1 untill the broadcast status of desired SIB is set to *broadcasting* ?  Even if *si-BroadcastStatus* can be changed from *notbroadcasting* to *broadcasting* during the modification period. There is no harm to trigger on-demand SI.  The change makes the sentence super long and very difficult to understand. We don’t think this is needed. |

## 3.2 Discussion on leap second and DST for R16 accurate time

[R2-2103582](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103582.zip) Discussion on leap second and DST for R16 accurate time ZTE Corporation, Sanechips discussion Rel-16 NR\_IIOT-Core

[R2-2104506](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2104506.zip)  Discussion on leap second and DST for R16 accurate time   ZTE Corporation, Sanechips, CMCC, China Southern Power Grid Co., Ltd Rel-16 NR\_IIOT-Core

*Observation 1: It can be seen that the leap seconds are not considered in the calculation of R16 accurate time based on referenceTimeInfo IE.*

*Observation 2a: If the referenceTimeInfo indicates the GPS time (Alt1), it’s no need for UE to correct the referenceTimeInfo when leap second occurs.*

*Observation 2b: When the time is from remote TSN GM clock (Alt2) or Local on-site TSN GM clock, leap second may exist in the TSN GM clock. The gNB may need to further notify this leap second information to UE for UE to correct the local time but this is infeasible based on the current referenceTimeInfo IE definition.*

*Observation 3a: Based on the leap second process mechanism from R15 (would be in R16 if Proposal 1 is agreed), if leap second occurs, there will be one second time difference between UE and gNB in the time duration between the occurrence of leap second and the subsequent reference time information provision. This would further cause negative impacts on deterministic delay, e.g., to the R16 TSN system.*

*Observation 3b: If DST/DSTE switch occurs, there will be one or two hours time difference between UE and gNB in the time duration between the occurrence of DST/DSTE switch and the subsequent reference time information provision.*

*Proposal 1: The R16 referenceTimeInfo IE definition of accurate reference timing delivery needs to take leapSeconds into account in order to correct the local time when leap second occurs.*

*Proposal 2a: To provide leap second prediction indication via referenceTimeInfo IE to UE in order that UE and gNB can apply the time with leap second synchronously.*

*Proposal 2b: To provide DST prediction indication via referenceTimeInfo IE to UE in order that UE and gNB can apply the time with DST/DSTE synchronously.*

**Question 2**: According to the analysis provided in [R2-2104506](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2104506.zip), do companies agree on the proposals regarding the issue regarding the leap second and DST for the R16 accurate time?

|  |  |  |
| --- | --- | --- |
| Company | Proposal x:  Agree (y/n) | Comments |
| Ericsson | No | The *referenceTimeInfo* is to provide a common time reference among UEs and gNBs. There is no absolute need for UEs to know which clock it is, be it GPS time or UTC time, for TSN time synchronization. In addition,   1. Leap second information is already possible to indicate in the legacy SIB9: Leap second is to indicate the difference between GPS time and UTC time. The leap second info is already in the field *timeInfoUTC*.   ***leapSeconds***  Number of leap seconds offset between GPS Time and UTC. UTC and GPS time are related i.e. GPS time -leapSeconds = UTC time.   1. To implement leap second is costly: If there are further information in the reference time, like leap seconds, both UEs and gNBs need to perform additional actions/translation which introduce uncertainty. For GPS time, the network can easily obtain it from the GPS receivers, and this approach has the least efforts. 2. Leap second is ruled out from the start of the accurate reference time delivery discussions: In Rel-15 LTE discussions, there are explicit agreements to use the GPS time just to avoid the leap second issue in the UTC time format, discussed in the point 2 above. |
| Apple | See comments | 1. The usage of referenceTimeInfo is to provide an offset of the time in sub-microseconds level for TSN end stations. In this regard, the meaning of "day“ in the IE structure is just equivalent to 86400 seconds and may not convey any meaning of earth’s self-rotation. Therefore, the DST and leap second may not be applicable. 2. Another point to consider is that RAN2 probably cannot decide this on its own. The referenceTimeInfo IE in 38.331 is linked with the SFN timing where the time field indicates the time at the ending boundary of the system frame indicated by referenceSFN. And the RAN3 definition of SFN initialization time is without leap seconds. So, this also need to check with RAN3 or even SA2 for further confirmation. |
| Samsung | No | ReferenceTimeInfo is used for local synchronization between gNB and UE with respect to 5G local clock. The synchoronization over the TSN network will be done in the upper layer. Leap second/DST can be considered there. |
| MediaTek | No | We have not discussed the case where the (local) master clock would change its time, e.g. due to DST or leap seconds. Given that R16 is closed, our suggestion is to not consider such a case in R16 and to move this discussion to R17. |
| ZTE | Yes | 1. We disagree the above Ericsson’s comment that only GPS time can be used in R15/R16 LTE and R16 NR accuracy timing. If this is the case, why we have defined the *timeInfoType* IE? 2. Moreover, one of the important use cases for R16 NR accuracy timing is IIoT application. We have already seen the need from industry customers about considering leap second in accuracy timing and also providing leap second prediction indication in 5G NR network. Therefore, even if there was assumption only to use the GPS time in R15 LTE, that’s cannot be the reason to prevent the consideration of leap second related information in R16 accurate reference time, e.g., when using local time type. 3. We are not clear the techenical reason why consideration on leap second related information would introduce additional uncertainty, as only a fixed value (1 second or 1 or 2 hours) is added? 4. For samsung‘s comments, we think this may be not the case. For 5GS TSN network, it needs to synchronize the clock of NW-TT and the clock of DS-TT and guarantee the timestamp in NW-TT and DS-TT strictly aligned.Moreover, we learn that leap second/DST already can be considered in Remote TSN GM clock or Local on-site TSN GM clock. And gNB already has way to know the existence of leap second or DST if gNB acquires time information from Remote TSN GM clock via gPTP or v1588 protocols, or gNB acquires time information from Local on-site TSN GM clock. But the only missing part is leap second and DST awareness in UE side. 5. Hope the above point 1 and point 4 can also address Apple’s first comment. For Apple’s second comment, we think it’s a good catch, we have the following explanations:  * Technically, we understand definition of SFN initialization time in RAN3 has no relationship to leap seconds, similar as that in R15 LTE/NR. * Similar as that in RAN2, the time information in RAN3 spec needs to take leap second into account. For the first proposed change in R2-2104506, as Reference Time in TS 38.473 is just a container which refers to the ReferenceTime IE in TS 38.331, the changes to ReferenceTime IE would be transparent to TS 38.473. But for the second proposed change related to leap second indication, RAN3 signalling may need accorsponding change, e.g., to also add new IE. |
|  |  |  |

## 3.3 Correction on failure type for SCG failure

### 3.3.1 Correction on failureType in FailureReportSCG-EUTRA and scgFailureInfoEUTRA

[R2-2103929](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103929.zip) Correction on failureType in FailureReportSCG-EUTRA and scgFailureInfoEUTRA Huawei, HiSilicon CR Rel-16 38.331 16.4.1 2540 - F NR\_newRAT-Core, NR\_unlic-Core

*Reason for change:*

In RAN2#113-e meeting, it has agreed to remove the *bh-RLF-r16* from *failureTypeEUTRA* within *scgFailureInfoEUTRA-r16*. The reason is that BH RLF cannot be detected in EUTRAN leg since EUTRAN leg cannot support the functionality of backhauling. Some other similar issues still exist in the current NR RRC spec.

The IE *FailureReportSCG-EUTRA* is used to report information about E-UTRA SCG failures detected by the UE. In the RRC spec, it is specified as:

|  |
| --- |
| The UE shall set the contents of the *SCGFailureInformationEUTRA* message as follows:  1> include *failureType* within *failureReportSCG-EUTRA* and set it to indicate the SCG failure in accordance with TS 36.331 [10] clause 5.6.13.4; |

According to clause 5.6.13.4 of TS 36.331, failureType can be set as t313-Expiry, randomAccessProblem, rlc-MaxNumRetx, scg-ChangeFailure; however failureType cannot be set as scg-lbtFailure, beamFailureRecoveryFailure, or t312-Expiry. The text is excerpted as follows:

|  |
| --- |
| 5.6.13.4 Failure type determination in NE-DC  The UE shall:  1> if SCG failure is due to T313 expiry:  2> consider the *failureType* to be *t313-Expiry*;  1> else if SCG failure is due to indication from SCG MAC that a random access problem was detected:  2> consider the *failureType* to be *randomAccessProblem*;  1> else if SCG failure is due to indication from SCG RLC that the maximum number of retransmissions was reached:  2> consider the *failureType* to be *rlc-MaxNumRetx*;  1> else if SCG failure is due to SCG change failure:  2> consider the *failureType* to be *scg-ChangeFailure*; |

For a LTE eNB, the SpCell cannot be configured on the shared spectrum, thus *failureType* with *scg-lbtFailure* will never be reported in IE *failureReportedSCG-EUTRA*. Beam related operation is not supported for LTE and T312 will not be configured for LTE SCG, therefore *failureType* will never be set as *beamFailureRecoveryFailure* or *t312-Expiry* in IE *failureReportSCG-EUTRA*.

Similarly, for *failureTypeEUTRA* in the IE *scgFailureInfoEUTRA* of *CG-ConfigInfo* message, the values *scg-lbtFailure*, *beamFailureRecoveryFailure*, and *t312-Expiry* are of no use and can be removed. The consenquence is that *failureTypeEUTRA* in the IE *scgFailureInfoEUTRA* will only contain spare values. Considering *measResultSCG-EUTRA* within the same IE will never be reported either, we can dummify *scgFailureInfoEUTRA* from the *CG-ConfigInfo* message.

**Question 3**: Do company agree with the changes proposed in CR [R2-2103929](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103929.zip)?

|  |  |  |
| --- | --- | --- |
| Company | Agree (y/n) | Comments |
| Google | Partially agree | We agree that the values *scg-lbtFailure, beamFailureRecoveryFailure*, and *t312-Expiry* are not supported for EUTRA SCG. We are fine to dummify *scgFailureInfoEUTRA-r16* in CG-ConfigInfo.  We wonder whether changing *scg-lbtFailure, beamFailureRecoveryFailure*, and *t312-Expiry* to spare values in the *SCGFailureInformationEUTRA* message are backward compatible from the ASN.1 perspective, although these values are never used. If it is confirmed there is no backward compatible issue, we are fine with the change. |
| Apple | Yes | We are fine to dummify the unused failureTypes. |
| Samsung | See Comments | Note that R2-2103936 covers the same issue, and we are fine to use anyone as a baseline (but think R2-2103936  looks a bit better).  Regarding whether to remove t312-Expiry-r16, we tend to agree with Huawei, as the scenario with SCG was not considered when LTE introduced T312 in Rel-12. Consequently, failureTypeEUTRA-r16 would contain only the dummy values, and thus the parent IE scgFailureInfoEUTRA-r16 can be dummified as proposed in R2-2103929. |
| Ericsson (Tony) | Yes, but no strong view | Even if we have a similar proposal in R2-2103936, we are also fine to go with dummify the whole IE. |
| MediaTek | Yes |  |

### 3.3.2 Correction to scgFailureInfoEUTRA and FailureReportSCG-EUTRA

[R2-2103936](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103936.zip) Correction to scgFailureInfoEUTRA and FailureReportSCG-EUTRA Ericsson CR Rel-16 38.331 16.4.1 2541 - F NR\_newRAT-Core

*Reason for change:*

The scgFailureInfoEUTRA IE within the CG-ConfigInfo-v1610-IEs and the FailureReportSCG-EUTRA IE within the SCGFailureInformationEUTRA include certain failure types which are not applicable to EUTRA. In particular, the scg-lbtFailure-r16, and beamFailureRecoveryFailure-r16 are not applicable to LTE, since in LTE specification there is no LBT failure handling procedure, and no beam failure recovery procedure.

**Question 4**: Do company agree with the changes proposed in CR [R2-2103936](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103936.zip)?

|  |  |  |
| --- | --- | --- |
| Company | Agree (y/n) | Comments |
| Google |  | The CR addresses the same issue as R-2103929. We prefer to dummify *scgFailureInfoEUTRA-r16* as the CR in R2-2103929. *t312-Expiry* should also be dummified because it is not used for EUTRA SCG. |
| Apple |  | Same understanding as Google. |
| Samsung | See comments to Q3 |  |
| Ericsson (Tony) | No strong view | We are also fine to go with dummify the whole IE as proposed in R2-2103929. |
| MediaTek | No strong view | It is covered by R2-2103929 |

## 3.4 Introduction of TDD Configuration Inter-node RRC Message

[R2-2104205](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2104205.zip) Introduction of TDD Configuration Inter-node RRC Message CATT draftCR Rel-16 38.331 16.4.1 F NR\_SON\_MDT-Core Late

*Reason for change:*

RAN3 has agreed to add the *TDD-UL-DL-ConfigurationCommon* in the Served Cell Information NR in 38.423 as following:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| >*TDD* |  |  |  |  |  |  |
| >>**TDD Info** |  | *1* |  |  | – |  |
| >>>Frequency Info | M |  | NR Frequency Info  9.2.2.19 |  | – |  |
| >>>Transmission Bandwidth | M |  | NR Transmission Bandwidth  9.2.2.20 |  | – |  |
| >>>Intended TDD DL-UL Configuration NR | O |  | 9.2.2.40 |  | YES | ignore |
| >>>TDD UL-DL Configuration Common NR | O |  | OCTET STRING | The *tdd-UL-DL-ConfigurationCommon* as defined in TS 38.331 [10] | YES | ignore |

As the 38.423 specified, the TDD-UL-DL-ConfigurationCommon should be defined in 38.331, however in current 38.331, the definition of TDD-UL-DL-ConfigurationCommon for the inter-node message is missing.

**Question 5**: Do company agree with the changes proposed in CR [R2-2104205](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2104205.zip)?

|  |  |  |
| --- | --- | --- |
| Company | Agree (y/n) | Comments |
| Google |  | We agree the intent of the CR. However, we think the “TDD UL-DL Configuration Common NR” in the RAN3 specification can directly refer to IE *TDD-UL-DL-ConfigCommon*. There is no need to create a new inter-node message. |
| Samsung | No | There already is an IE TDD-UL-DL-ConfigCommon. It seems to have sufficient extension options, so there is no real need to introduce an inter-node message. I.e. RAN3 can simply refer to the IE |
| Ericsson (Tony) | No | We tend to agree with Samsung on how this should be handled. |

## 3.5 Correction on UTRA Capabilty forwarding in HO preparation

[R2-2103851](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103851.zip) Correction on UTRA Capabilty forwarding in HO preparation Apple CR Rel-16 36.331 16.4.0 4626 - F SRVCC\_NR\_to\_UMTS-Core

*Reason for change:*

For UTRA-FDD case, the UE UTRA capability must be known a-priori to the target RNC to build the HO to UTRA command. This also makes sense in the light of the UE RAT Container list in NR including the UTRA-FDD as one of the RATs which can be queried by the source NR RAT. Hence, there is no need to exclude this UTRA capability forwarding.

For NR to EUTRA case, the UTRA capability should be allowed to be forwarded to the target RAT in HO preparation and can be ignored by target eNB if received in case the target eNB would obtain UTRA capabilities from the UE for SRVCC.

Also, we need to align this with the agreement made in RAN2#113 for 38.331 CR ([R2-2102046](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113-e/Docs/R2-2102046.zip)) regarding the UTRA capabilities in EUTRA-to-NR HO case.

**Question 6**: Do company agree with the changes proposed in CR [R2-2103851](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103851.zip)?

|  |  |  |
| --- | --- | --- |
| Company | Agree (y/n) | Comments |
| Google | N | We don’t see the need of the change for intra-LTE handover since the text has been existed for a long time.  We don’t prefer to have this the change for handover from LTE to NR because the change causes that Rel-16 has a different behaviour from Rel-15. |
| Lenovo | No | Main motivation for the agreed NR CR R2-2102046 was to specify the missing handling of the UTRA capabilities for the target gNB. This is not the case in LTE as there is already specified behaviour for handling of the UTRA capabilities. |
| Apple | Yes | Proponent oft he CR |
| Samsung | No | UTRA capabilities retrieved while in LTE or NR are perfectly valid. Only capabilities that are to be ignored is ones received from UTRA during IRAT HO |
| Ericsson (Tony) | No |  |

## 3.6 Miscellaneous non-controversial corrections Set IX

[R2-2103645](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103645.zip) Miscellaneous non-controversial corrections Set IX Ericsson CR Rel-16 38.331 16.4.1 2519 - F NR\_newRAT-Core, TEI16

*This CR contains miscellaneous non-controversial correction for 38.331. It may also be used to merge editorial correction agreed in CRs submitted within this or other agenda items.*

**Question 7**: Do company agree with the changes proposed in CR [R2-2103645](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103645.zip)?

|  |  |  |
| --- | --- | --- |
| Company | Agree (y/n) | Comments |
| Lenovo | Partly | 1. We wonder about the change to uac-BarringTime. It is not clear why “minimum time” needs to be replaced by “average time”. And it’s a Rel-15 issue and any change would affect 36.331 as well. 2. If SI-RequestResources is moved to IE SI-RequestConfig then the existing SI-RequestResources field descriptions in IE SI-SchedulingInfo needs to be removed. 3. In 5.2.2.2.1: “see TS 37.355” needs to be added for “expirationTime” as well (2x). 4. Changes to SL “valueN” (change to “5.4E.2”) are also proposed by a R16 SL CR R2-2104105 but differently (change to “5.4.2”). We should leave out the changes in the CR and let V2X session to decide. |
| Apple | Partially | Some of the edirorial chagnes are fine. uac-barringTime is the minimum time interval between two access attempts, so there is no need to emphasize the avarage aspect. |
| Samsung | Yes |  |

## 3.7 Introducing the UE config release in INM

[R2-2103661](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_113bis-e/Docs/R2-2103661.zip) Introducing the UE config release in INM Ericsson discussion Rel-16 TEI16

*Observation 1*: The main motivation in LTE for introducing the ue-ConfigRelease was mainly because there were network implementation not using any ASN.1 decoder at the target eNB and it was then difficult to detect and skip the non-comprehended parts.

*Observation 2*: The target node can use the ASN.1 decoder to detect that the received bitstream contains (or not) non-comprehended parts.

Observation 3: It is not clear how the ue-ConfigRelease should be maintained, which value to assign, and how the source node should set this field. This requires additional standardization effort.

***Proposal 1***: The ue-ConfigRelease field is not introduced in NR.

**Question 7**: Do company agree to not introduce *ue-ConfigRelease* in NR?

|  |  |  |
| --- | --- | --- |
| Company | Agree (y/n) | Comments |
| Ericsson (Tony) | Yes | Proponent |
|  |  |  |
|  |  |  |

# Conclusion

Based on the discussion in the previous sections we propose the following:

# References