3GPP TSG-RAN WG2 Meeting #114 electronic [R2-2106474](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106474.zip)

Online, May, 2021

Source: Session Chair (InterDigital)

Title: Report for Rel-17 Small data and URLLC/IIoT

**Email discussions:**

* [AT114e][500] Organizational Diana – URLLC/IIoT, Small data]

Scope:

* + - Share plans for the meetings and list of ongoing email discussions for the sessions related to URLLC/IIoT, Small data and NR-U, 2-step RACH, and power saving
    - Share meetings notes and agreements for review and endorsement
* [AT114e][501][URLLC/IIoT] Response LS to SA2 on TSN (Nokia)

Scope

- LS response to SA2

CLOSED

* [AT114e][502][URLLC/IIoT] QoS for IIoT (CATT)

Scope

- Discuss the need of fast reactive solutions, identify issues related to gNB implementation, and downscope UE based solutions for further study. Identify target scenario

CLOSED

* [AT114e][503][SData] LS to RAN1 on Small data agreement/question (Vivo)

- Scope:

LS capturing RAN2 agreements and questions to RAN1 related to RA configuration/design

## 8.5 NR IIoT URLLC

(NR\_IIOT\_URLLC\_enh-Core; leading WG: RAN2; REL-17; WID: RP-210854)

Time budget: 1 TU

Tdoc Limitation: 3 tdocs

Email max expectation: 4 threads

### 8.5.1 Organizational

Rapporteur input

[R2-2104720](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104720.zip) LS on gNB-based propagation delay compensation (R3-211136; contact: Nokia) RAN3 LS in Rel-17 NR\_IIOT\_URLLC\_enh To:RAN1, RAN2

=> Noted

[R2-2105867](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105867.zip) Text Proposal of Stage-2 Running CR for Rel-17 IIoT/URLLC Enhancement Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

=> To be revised and discussed post meeting

### 8.5.2 Enhancements for support of time synchronization

Including requirements and scope.

A summary email discussion is expected for this topic

[R2-2104729](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104729.zip) LS on Time Synchronization assistance parameters (S2-2103023; contact: Nokia) SA2 LS in Rel-17 NR\_IIOT-Core To:RAN2, RAN3 Cc:RAN1

1. Is it beneficial for NG-RAN to receive Time synchronization error budget available for the NG-RAN for Uu interface to fulfil the time sync accuracy request?

=> Noted

[R2-2105868](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105868.zip) Time Synchronization Signalling Analysis Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

*Proposal 1: RAN2 confirms it is beneficial for the RAN if CN provides Uu synchronicity budget and worst-case assumption CN for the achievable time synchronization. Indicate this in the reply LS to SA2.*

[R2-2105674](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105674.zip) Determining per Uu Interface Time Sync Error Budget Ericsson discussion

*Proposal 1: For Rel-17 deployments, the Uu interface budget for time synchronization can be derived by network implementation and thus it is not beneficial to receive it from the core network.*

Discussion on benefits

- Ericsson indicates that it is unclear how the CN would know this information

- Huawei thinks that we can at least send a positive answer to SA2. Huawei is not sure that the network is aware

- Nokia doesn’t thinks that this is limited to the one use cases that Ericsson mentions and the SA2 LS is not limited to use cases but it is a general question and whether the CN can obtain the information is out of scope.

- CMCC agrees with Nokia on the use cases, but we shouldn’t just respond yes or no and the CN may not know exactly the budget.

- Samsung also thinks this is useful and the point of the LS is whether RAN can use the information or not and we can definitely use it on the RAN side

- Vivo agrees with Nokia, RAN has no available information to decide what scenario it is detailing with.

- Intel agrees with Nokia – gNB may not be configured to know one or two Uu interfaces.

- Qualcomm thinks we should answer that some information can be useful

=> RAN2 sees some benefits to having this information.

=> email discussion to finetune to converge on what to respond to SA2

CB [501] Response LS to SA2 on TSN (Nokia)

[R2-2106557](C:\\Users\\panidx\\OneDrive - InterDigital Communications, Inc\\Documents\\3GPP RAN\\TSGR2_114-e\\Docs\\R2-2106557.zip) Reply LS on Time Synchronization assistance parameters Nokia

=> The LS is approved in [R2-21065](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106557.zip)60

[R2-2105871](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105871.zip) [Draft] Reply LS on Time Synchronization assistance parameters Nokia, Nokia Shanghai Bell LS out Rel-17 NR\_IIOT\_URLLC\_enh To:SA2 Cc:RAN3

[R2-2104886](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104886.zip) Pre-compensation at the gNB for RTT and TA based PDC Intel Corporation discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2104898](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104898.zip) Design for Time Synchronization in Rel-17 CATT discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2104901](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104901.zip) Propagation Delay Compensation for TSN Qualcomm Incorporated discussion Rel-17

[R2-2105255](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105255.zip) Discussion on the Time synchronisation assistance parameters Huawei, HiSilicon discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2105289](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105289.zip) Discussion on the propagation delay compensation vivo discussion

[R2-2105307](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105307.zip) Further discussion on time synchronization and PDC ZTE Corporation, Sanechips, China Southern Power Grid Co., Ltd discussion NR\_IIOT\_URLLC\_enh-Core [R2-2100327](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2100327.zip)

[R2-2105565](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105565.zip) Consideration on the support of time synchronization enhancement OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105672](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105672.zip) On propagation delay compensation MediaTek Inc. discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105723](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105723.zip) Discussion on the time synchronization error budget in RAN Xiaomi Communications discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105766](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105766.zip) Synchronization and Error Budget Samsung discussion Rel-17

[R2-2105825](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105825.zip) Discussion on enabling UE side propagation delay compensation Lenovo, Motorola Mobility discussion Rel-17

[R2-2105844](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105844.zip) Propagation Delay Compensation Signaling CANON Research Centre France discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2106249](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106249.zip) Support of time synchronization for TSN based on RAN1 progress CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2106323](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106323.zip) Discussion on Propagation Delay Compensation (PDC) III discussion

[R2-2106324](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106324.zip) Timing synchronization for UE in RRC\_INACTIVE state and RRC\_IDLE state TCL Communication Ltd. discussion Rel-17 NR\_IIOT, NR\_IIOT-Core, NR\_IIOT\_URLLC\_enh-Core

[R2-2106433](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106433.zip) Discussion on enhancements for support of time synchronization LG Electronics Deutschland discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

### 8.5.3 Uplink enhancements for URLLC in unlicensed controlled environments

Including email discussion [POST113bis-e][505][R17 IIoT] URLLC in UCE (LG)

Contributions should aim to bring new issues not covered in email discussions already and should be clearly separated in the document from issues covered in email discussions.

RAN2 aspects related to URLLC in unlicensed controlled environments. Initial discussion on potential impacts, including requirements and scope

[R2-2106396](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106396.zip) Summary of [POST113bis-e][505][R17 IIoT] URLLC in UCE LG Electronics Inc. discussion NR\_IIOT\_URLLC\_enh-Core

=> Revised in [R2-2106556](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106556.zip)

[R2-2106556](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106556.zip) Summary of [POST113bis-e][505][R17 IIoT] URLLC in UCE LG Electronics Inc. discussion NR\_IIOT\_URLLC\_enh-Core

Agreements:

1. When both of lch-based Prioritization and cg-RetransmissionTimer are configured, HARQ processes sharing between multiple CG configurations are allowed. No specification change is required.
2. RAN2 confirm that neither autonomous transmission nor autonomous retransmission is triggered if UL grant is prioritized and LBT fails while AutonomousTx is configured and cg-RetransmissionTimer is not configured. No specification change is required.
3. RAN2 confirm that autonomous retransmission is triggered if UL grant is prioritized and LBT fails while AutonomousTx is not configured and cg-RetransmissionTimer is configured. No specification change is required
4. RAN2 confirm that autonomous retransmission is triggered if UL grant is prioritized and LBT fails while AutonomousTx and cg-RetransmissionTimer are configured. No specification change is required.
5. RAN2 confirm that autonomous transmission is triggered if UL grant is deprioritized while AutonomousTx is configured and cg-RetransmissionTimer is not configured. No specification change is required.
6. RAN2 confirm that autonomous transmission is triggered if the transmission of the obtained MAC PDU has not been completely performed and if UL grant is deprioritized while AutonomousTx and cg-RetransmissionTimer are configured. No specification change is required.
7. The HARQ process is kept as pending even if a CG is de-prioritized while the HARQ state of the associated HARQ process is pending (i.e. MAC PDU hasn’t been transmitted). No specification change is required

8. When cg-RetransmissionTimer and lch-basedPrioritization are configured, for overlapping CGs, the MAC entity prioritizes the initial transmission of higher priority data over autonomous retransmission of lower priority data. FFS how to implement this in Rel-17 after some of the Rel-16 discussion takes place

Proposals need further discussion:

Proposal 2: (Out of 20, 12 for Yes, 6 for No, 1 not answered) RAN2 further discuss whether Proposal 1 is supported by the current specification or not.

- Qualcomm thinks that when we agreed we always prioritize retransmissions for a given HARQ process.

- We should at least clarify this ambiguity in Rel-16

- Vivo thinks that this is only for HARQ process selection for NR-U and we should wait for that discussion to complete.

- CATT thinks that the impact to Rel-16 may be different from Rel-17 and we will definitely need to clarify the behaviour.

=> Wait for Rel-16 discussion

Proposal 3: (Out of 20, 11 for Disagree, 9 for Agree) When cg-RetransmissionTimer and lch-basedPrioritization are configured, RAN2 further discuss whether the MAC entity should be able to prioritize the initial transmission of higher priority data over autonomous retransmission of lower priority data within a single CG configuration.

- Lenovo thinks that we should always prioritize high priority data as in NR-U we didn’t consider URLLC. Qualcomm agrees and the multiple CG support is a UE capability so you can’t rely on solution to configure multiple CGs. Further we have ambiguity on proposal 2. Apple agrees and the UE should be able to prioritize URLLC traffic.

- Xiaomi thinks that gNB should not configure both eMBB and URLCC so it can be handled by implementation. Mediatek thinks that this is a new LCP mechanism and this WI should just harmonize and not introduce new mechanisms. ZTE has a similar view as Xiaomi. LG also agrees and the question is whether we should define a new mechanism. Ericsson agrees. This issue already happens in Rel-16, if you have new data this data cannot pre-empt the existing HARQ. Nokia agrees but would like to ask a question – what happens if this re-transmission in an empty MAC PDU. This issue is severe as you are blocking. CATT agrees.

- InterDigital thinks that the whole purpose of the WI is to prioritize URLCC data and if we rely on gNB implementation we would have to over dimension the CGs.

- Samsung also thinks that this use case doesn’t exist.

- Oppo thinks we didn’t consider URLLC in Rel-16 URLCC so if there is higher priority data it should be always prioritized.

Proposal 4: (Out of 20, 9 for No option, 12 for option 3a, 4 for option 1, 2 for option2) When cg-RetransmissionTimer and lch-basedPrioritization are configured, if RAN2 decide to prioritize the initial transmission of higher priority data over autonomous retransmission of lower priority data for a single CG configuration, RAN2 discuss option 3a and option1.

- Option1. The UE always prioritizes initial transmission of higher priority data over autonomous retransmission of lower priority.

- Option 3a. The network configures which prioritization rule to follow, i.e., Rel-16 rule (the retransmission is always prioritized) or Rel-17 rule (the transmission with highest LCH priority is prioritized)

[CB next week]

Proposal 10: (Out of 20, 7 for no preferred option, 11 for option 2, 2 for option 3, 1 for option1) RAN2 further discuss whether option 2 or no option is needed if UL grant is de-prioritized while AutonomousTx is not configured and cg-RetransmissionTimer is configured.

- Option 2. If a CG is not configured with autonomousTx, the cg-RetransmissionTimer is not stopped when the associated CG is deprioritized [13]

Proposal 14: (8/18) From RAN2 perspective, if cg-RetransmissionTimer is not configured and CG-UCI is not configured, Rel-16 URLLC based mechanism is used for HARQ process ID determination.

- Wait for RAN1 to progress further on this

[R2-2104899](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104899.zip) Autonomous retransmission on a different CG configuration CATT discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2104902](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104902.zip) CG Harmonization for Unlicensed Controlled Environment Qualcomm Incorporated discussion Rel-17

[R2-2105256](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105256.zip) Remaining issues about uplink enhancements for URLLC in UCE Huawei, HiSilicon discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2105290](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105290.zip) Remaining issues of harmonizing UL CG enhancements in NR-U and IIoT vivo discussion

[R2-2105456](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105456.zip) Further details on enhancements for URLLC in UCE Lenovo, Motorola Mobility discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105566](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105566.zip) Consideration on URLLC over NR-U OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105675](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105675.zip) Harmonizing UL CG enhancements in NR-U and URLLC Ericsson discussion

[R2-2105676](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105676.zip) RAN enhancements based on new QoS related parameters Ericsson discussion Withdrawn

[R2-2105689](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105689.zip) Prioritization of UL transmissions in unlicensed URLLC Sony discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2103566](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103566.zip)

[R2-2105724](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105724.zip) Remaining issues of CG harmonization Xiaomi Communications discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105789](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105789.zip) Configured grant mode switching for IIoT/URLLC in unlicensed controlled environments III discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2105856](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105856.zip) Further Consideration On the URLLC transmission in UCE ZTE, Sanechips discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105872](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105872.zip) Remaining Issues on Configured Grant for IIoT in NR-U Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2105952](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105952.zip) Uplink enhancements for URLLC in unlicensed controlled environments Intel Corporation discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2106226](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106226.zip) Discussion on the remaining issue for uplink enhancements for URLLC in UCE CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2106381](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106381.zip) Remaining Issue of Harmonization of CG Transmission Samsung discussion Rel-17

[R2-2106395](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106395.zip) Summary of [POST113bis-e][505][R17 IIoT] URLLC in UCE LG Electronics Inc. discussion Late

=> Withdrawn

[R2-2106400](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106400.zip) URLLC on UCE LG Electronics Inc. discussion NR\_IIOT\_URLLC\_enh-Core Late

### 8.5.4 RAN enhancements based on new QoS

Including email discussion [POST113bis-e][506][R17 IIoT] Enhancements based on QoS (CATT)

Contributions should aim to bring new issues not covered in email discussions already and should be clearly separated in the document from issues covered in the email discussion

RAN enhancements based on new QoS related parameters if any, e.g. survival time, burst spread, decided in SA2. [RAN2, RAN3]

[R2-2104897](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104897.zip) Summary of Email Discussion 506 – R17 IIOT QoS CATT discussion NR\_IIOT\_URLLC\_enh-Core Late

Proposal 1: When Survival Time information is provided in TSC AI, RAN action (gNB and/or UE) can utilize it to improve the associated link reliability so that the survival time requirement is met.

- Ericsson highlights that this is optional and not mandatory.

Proposal 7 (19/21): No specific enhancements in support of Survival Time in UCE will be studied in R17.

- Qualcomm thinks that at least when we specify Survival time they should work for both

*Proposal 2 (14/20): Survival Time handling is not left to gNB implementation only.*

- Ericsson doesn’t want to write a blank check and let’s specify 20 solutions. Network solutions are always a baseline and we should discuss scenario that gNB implementation is not sufficient and then see if there is UE solutions and for UE to react it would have to have feedback from the network.

- Mediatek agrees with Ericsson

- Samsung is in favour of the proposal and this is not a blank check and we are looking at solutions

=> Noted

**Agreement:**

1. RAN2 does not consider the Burst Spread parameter in RAN
2. The Burst End Time parameter in RAN is out of scope for Rel-17 IIoT WI.
3. No specific enhancements in support of Survival Time in UCE will be studied in R17, but we should aim for solutions for Survival time that also work in UCE
4. When Survival Time information is provided in TSC AI, RAN action (gNB and/or UE) can utilize it to improve the associated link reliability so that the survival time requirement is met
5. Study fast mechanisms for survival time handling and the need

=> email discussion to discuss the need of fast reactive solution, issues related to gNB implementation, and down-scoping of UE based solutions. What is the target scenario we want to consider?

[R2-2106558](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106558.zip) Summary of [502][URLLC/IIoT] QoS for IIoT (CATT) CATT

*Proposal 3 (14/20): RAN2 does not consider that permanently boosting the transmission by gNB configuration is a viable-enough solution to address Survival Time.*

- Ericsson asks what viable-enough mean as this are solutions that the network can utilize

- CATT explains that we need to downscope and each solution has the issues identified.

- Mediatek explains that 3, 4, and 5 is what already exists

*Proposal 4 (15/20): RAN2 does not consider that gNB sending a CG type 2 (re)-activation command for the failed CG configuration or a dynamic uplink grant with a more robust MCS is a viable-enough solution to address Survival Time.*

*Proposal 5 (14/20): RAN2 does not consider that gNB activating duplication via CG type 2 (re)-activation is a viable-enough solution to address Survival Time.*

**Agreements:**

1 RAN2 takes the performance requirements of the top 3 rows of Table 5.2-1 from TS 22.104 (transfer interval = survival time = 0.5/1/2ms)

2 Survival Time triggered proactively based on Sequence Number is deprioritized

3 UE-based reactive solution based on RLC-NACK is not pursued

4 RAN2 will work/study UE-based reactive solutions to address survival time on top of gNB implementation. RAN2 assumes that gNB implementation solutions on their own are not sufficient.

*Proposal 12 (17/25) (if proposal #11 cannot be agreed): UE-based reactive solution is considered for standardization to address Survival Time on top of gNB implementation*

*­*- Ericsson would like to take the gNB implementations as a baseline and companies can propose solutions to enhance it.

- LG considers that today we can configure PDCP duplication as a baseline and we can use MAC activation/deactivation and we should study if there is a need to introduce something else for activation/deactivation

- Qualcomm thinks that proposal 12 is a minimum that we should agree on so we can start discussing technical details. We have discussed gNB implementation enough. Samsung agrees with Qualcomm.

- Apple thinks that the PDCP duplication is not the only solution to be considered.

- CATT strongly supports the proposal. Two solutions have majority support: Tx timer based solution and HARQ-NACK solution

- Lenovo also agrees and the majority companies provided a lot of technical details and they were saying that it is not enough to use only those tools.

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[R2-2104900](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104900.zip) Comparison of the solutions for Survival Time CATT discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2104903](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104903.zip) RAN Enhancement to support new QoS Qualcomm Incorporated discussion Rel-17

[R2-2104980](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104980.zip) Topics on new QoS handling Fujitsu discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2003196](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2003196.zip)

[R2-2105114](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105114.zip) Reliability enhancements for CG/SPS Apple discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105115](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105115.zip) Further considerations on survival time for new QoS Apple discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105312](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105312.zip) Further discussion on enhanced QoS ZTE Corporation, Sanechips, China Southern Power Grid Co., Ltd discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2105419](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105419.zip) Further discussion on RAN enhancements based on Survival Time III discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105457](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105457.zip) Discussion on the mechanism to guarantee the survival time Lenovo, Motorola Mobility discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105567](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105567.zip) Consideration on RAN enhancement based on new QoS OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2105604](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105604.zip) Entering and operating in the Survival Time state Samsung Electronics GmbH discussion Withdrawn

[R2-2105615](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105615.zip) Entering and operating in the Survival Time state Samsung Electronics GmbH discussion Withdrawn

[R2-2105638](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105638.zip) Entering and operating in the Survival Time state Samsung Electronics GmbH discussion

[R2-2105725](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105725.zip) Clarification on the survival time Xiaomi Communications discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2104288](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104288.zip)

[R2-2105873](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105873.zip) RAN Enhancement for New QoS Parameters Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2105954](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105954.zip) Discussion on the roles played in the survival time operation Futurewei Technologies discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2106041](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106041.zip) Discussion on multi-level PERs for survival time handling Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2106044](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106044.zip) Enhancements based on new QoS requirements InterDigital discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2106066](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106066.zip) RAN2 Enhancements to Support Survival Time Intel Corporation discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2106227](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106227.zip) Discussion on the RAN support for new QoS parameters CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2106328](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106328.zip) Discussion of RAN enhancements based on new QoS TCL Communication Ltd. discussion Rel-17 NR\_IIOT, NR\_IIOT-Core, NR\_IIOT\_URLLC\_enh-Core

[R2-2106397](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106397.zip) Enhancement for survival time LG Electronics Inc. discussion NR\_IIOT\_URLLC\_enh-Core Late

[R2-2106413](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106413.zip) RAN enhancements based on new QoS related parameters Oy LM Ericsson AB discussion

## 8.6 Small Data enhancements

(NR\_SmallData\_INACTIVE-Core; leading WG: RAN2; REL-17; WID: RP-210870)

Time budget: 0.5 TU

Tdoc Limitation: 3 tdocs

Email max expectation: 2 threads

### 8.6.1 Organizational

In coming LSs, rapporteur input for email discussions summaires etc (tdocs in this don’t count towards tdoc limit).

Inputs expected for 38.321 CR (Huawei), 38.331 CR (ZTE), 38.300 CR (Nokia)

[R2-2104707](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104707.zip) Reply LS on uplink timing alignment for small data transmissions (R1-2104012; contact: Lenovo) RAN1 LS in Rel-17 NR\_SmallData\_INACTIVE-Core To:RAN2 Cc:RAN4

=> Noted

[R2-2105032](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105032.zip) Runnning MAC CR for small data Huawei, HiSilicon draftCR Rel-17 38.321 16.4.0 B NR\_SmallData\_INACTIVE-Core

=> The CR will be updated and reviewed post-meeting

[R2-2105639](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105639.zip) Discussion on the spec modeling for Small Data Huawei, HiSilicon, ZTE Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core Revised

[R2-2105847](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105847.zip) Discussion on the spec modeling for Small Data Huawei, HiSilicon, ZTE corporation, Sanechips discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2105639](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105639.zip)

- CATT was wondering where the data volume was being calculated since it is typically done in the PDCP layer. ZTE clarifies that it is done in the MAC layer like the BSR. CATT is concerned that at the MAC we’d have the RLC and PDCP headers. ZTE thinks that these are points to be discussed further.

=> Companies are encouraged to review this document and discuss over email the modelling options

[R2-2105877](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105877.zip) Stage-2 running CR Introduction of SDT Nokia, Nokia Shanghai Bell CR Rel-17 38.300 16.5.0 0357 1 B NR\_SmallData\_INACTIVE-Core [R2-2103527](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103527.zip)

=> Review in post-meeting email discussion

[R2-2105927](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105927.zip) RRC Running CR for SDT ZTE Corporation (rapporteur) draftCR Rel-17 38.331 16.4.1 B NR\_SmallData\_INACTIVE-Core

=> Review in post-meeting email discussion

### 8.6.2 User plane common aspects

This AI will NOT be treated in RAN2#114

NOTE: expected input: paper containing the remaining proposals not discussed as part of [AT113bis-e][501] from rapporteur. This is the only paper that may be treated.

Overall user plane procedure for SDT (including triggering and thresholds, HARQ, and MAC CEs), data volume computation,. suppression of PDCP status report, RSRP threshold for SDT selection, switching between CG/RA

Email discussion summary expected for this AI durin 113bis-e

[R2-2106310](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106310.zip) Remaining untreated proposals from [AT113bis-e][501] UP SDT open issues LG Electronics Inc. (Rapporteur) report Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104760](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104760.zip) Further Discussion on User Plane Aspect for Small Data Transmission vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104770](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104770.zip) Discussion on common user plane issues of SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104784](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104784.zip) User Plane Common Aspects of RACH and CG based SDT Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104964](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104964.zip) Handling of fallback during a SDT procedure Asia Pacific Telecom, FGI discussion

[R2-2105280](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105280.zip) Consideration on UP common aspects of SDT CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105447](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105447.zip) User plane aspects of SDT NEC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105455](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105455.zip) UP common issues for Small Data Transmissions Lenovo, Motorola Mobility discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105597](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105597.zip) Consideration on overall SDT procedure LG Electronics Inc. discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105690](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105690.zip) Some aspects of User Plane for SDT in NR Sony discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103583](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103583.zip)

[R2-2105760](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105760.zip) Common aspects for SDT Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2106043](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106043.zip) User plane aspects of small data transmission InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2106254](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106254.zip) Remaining issues on SDT procedure CMCC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2106311](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106311.zip) Remaining UP issues in SDT LG Electronics Inc. discussion Rel-17 NR\_SmallData\_INACTIVE-Core

### 8.6.3 Control plane common aspects

NOTE: expected input: paper containing the remaining proposals not discussed as part of [Post113-e][503] from rapporteur to be treated.

Focus contributions on FFS and topics that are not relying on inputs from RAN3/SA3/CT1

Cell reselection and failure handling, handling of subsequent data transmissins (including, how to indicate presence of subsequent data, etc) handling of non-SDT DRBs (including whether to resume or not non-SDT), CP data over SDT, SDT termination and data loss prevention

[R2-2106051](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106051.zip) Untreated proposal from [Post113-e][503] InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104761](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104761.zip) Discussion on RRC-Controlled Small Data Transmission vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104771](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104771.zip) Discussion on common control plane issues of SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104785](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104785.zip) Control Plane Common Aspects of RACH and CG based SDT Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104881](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104881.zip) Failure and successful handling for an SDT session Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104882](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104882.zip) CP-SDT remaining open issues Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104981](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104981.zip) Handling of T319-like timer Fujitsu discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104982](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104982.zip) RAN paging reception and response during SDT Fujitsu discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103198](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103198.zip)

[R2-2105100](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105100.zip) Power Saving for SDT Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105101](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105101.zip) Control plane aspects on the SDT procedure Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105102](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105102.zip) Subsequent data transmission for SDT Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105281](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105281.zip) Consideration on CP issues CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105377](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105377.zip) Beam management in SDT ASUSTeK discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103455](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103455.zip)

[R2-2105448](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105448.zip) Control plane aspects of SDT NEC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105575](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105575.zip) Control plane common aspects for SDT Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105691](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105691.zip) Discussion on subsequent SDT in NR, timer handling, and support for SRB1/2 Sony discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105720](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105720.zip) Discussion on the support of the RRC-less SDT Xiaomi Communications, Intel Corporation, ASUSTeK, Fujitsu, MediaTek, Apple, Spreadtrum Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2104221](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104221.zip)

[R2-2105721](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105721.zip) Technical details of the RRC-less SDT Xiaomi Communications, ASUSTeK, Fujitsu, Spreadtrum Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2104222](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104222.zip)

[R2-2105810](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105810.zip) Consideration on CP issues for small data transmission Lenovo, Motorola Mobility discussion Rel-17

[R2-2105885](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105885.zip) Discussion on open issues of SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103431](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103431.zip)

[R2-2105911](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105911.zip) SDT control plane aspects Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE

[R2-2105928](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105928.zip) Control plane common aspects of SDT ZTE Corporation, Sanechips discussion Rel-17

[R2-2106040](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106040.zip) SDT cell re-selection Convida Wireless other Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2106050](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106050.zip) SDT CP and configuration aspects InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2106132](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106132.zip) Discussion on CP aspects of SDT China Telecomunication Corp. discussion

[R2-2106217](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106217.zip) Beam selection and indication for subsequent SDT ETRI discussion

[R2-2106255](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106255.zip) Handling of non-SDT data arriving CMCC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

### 8.6.4 Aspects specific to RACH based schemes

Including email discussion on [Post114][507]

RA resource configuration and selection, PDCCH monitoring after successful SDT RA completion, RAN2 specific details of context fetch/data forwarding with and without anchor relocation

[R2-2104762](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104762.zip) Report of [Post113bis-e][507][SDT] Resource Configuration Aspects vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

=> Revised in [R2-2106443](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106443.zip)

[R2-2106443](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106443.zip) Report of [Post113bis-e][507][SDT] Resource Configuration Aspects vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

- Ericsson indicates that some of this discussion will be impacted on multiple WIs.

- ZTE encourages companies to follow the approach and have a consistent way of implementing this across WIs.

=> Noted

**Agreement**

1. CFRA is not supported for RA-SDT
2. The separate search space is common to the UEs performing RA-SDT. Inform RAN1 of this agreement
3. Working assumption: UE-specific search space is configured for UEs performing CG-SDT. RAN2 asks RAN1 whether this working assumption can be confirmed
4. The UE needs to monitor paging after UE initiates SDT for system information change, PWS. FFS for other cases
5. CG-SDT resource can be configured on either initial BWP or separate SDT BWP. Ask RAN1 to confirm
6. FFS CS-RNTI based dynamic retransmission is reused for CG-SDT

Convert this into questions/guiding points for LS

1. Configure the number of PRACH preambles per SSB for RA-SDT when ROs are shared between SDT and non-SDT. RAN2 requests RAN1 to discuss the details
2. RAN2 requests RAN1 to discuss whether to introduce shared RO mask index for RA-SDT. Clarify what we mean by RO mask index in the LS (i.e. between sharing SDT and non-SDT and 2step and 4step RA).
3. RAN2 requests RAN1 to discuss the details on the PRACH occasion configuration for RA-SDT when the ROs are separately configured for SDT and non-SDT
4. Configure the SSB to PRACH preamble/occasion association for RA-SDT when the ROs are separately configured for SDT and non-SDT. RAN2 requests RAN1 to discuss the details

LS to RAN1

[503] To trigger the discussion and convert them as issue discussion and convert them as questions

[R2-2106559](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106559.zip) Reply LS to RAN1 on physical layer aspects of small data transmission Vivo

[CB]

=> The LS is update in [R2-21065](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106559.zip)61 with new CG agreements and moved to email discussion

Discussions

*Proposal 8: Working assumption: UE-specific search space is configured for UEs performing CG-SDT. RAN2 asks RAN1 whether this working assumption can be confirmed. (23/25)*

- ZTE thinks that there needs to be an association between CG and SSB.

*Proposal 7: CG-SDT resource can be configured on either initial BWP or separate SDT BWP. (15/24)*

- Nokia asks whether the UE should monitoring paging after UE initiates SDT. Nokia believes that the UE should monitor especially since the network may not be aware that the UE has sent something. Xiaomi agrees. QUALCOMM also agrees with Nokia. Lenovo agrees and of course the network should monitor for changing.

- Fujitsu – yes paging reception during SDT is need

- ZTE thinks that for system information change the UE needs to monitor. Apple agrees.

- InterDigital, Sony, and Oppo thinks the UE should monitor the paging

- Ericsson thinks we should trust the network to configure overlapping BWPs

- Samsung thinks there is no issue and we can configure in non-initial BWP. Huawei agrees and thinks the UE should monitor paging for system information change.

- LG thinks that this scenario would occur for a small period of time and we wouldn’t need to optimize. ZTE explains that even in connected mode the UE has to monitor this. Ericsson agrees and it would important to have the option of separate SDT.

=> The UE needs to monitor paging after UE initiates SDT at least for system information change

[R2-2104763](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104763.zip) Supporting Small Data Transmission via RA Procedure vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104772](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104772.zip) Discussion on RACH-based SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104786](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104786.zip) Details of RACH bsaed Small Data Transmission Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104883](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104883.zip) RA-SDT remaining open issues Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104965](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104965.zip) PDCCH monitoring in RA-based SDT procedure Asia Pacific Telecom, FGI discussion

[R2-2105378](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105378.zip) Discussion on PDCCH monitoring for RA-SDT ASUSTeK discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105549](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105549.zip) Discussion on RACH-based SDT Spreadtrum Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105574](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105574.zip) Small data transmission with RA-based schemes Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105692](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105692.zip) Discussion on context fetch and anchor relocation Sony discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103580](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103580.zip)

[R2-2105693](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105693.zip) RACH-based SDT in NR Sony discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105758](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105758.zip) RACH based SDT Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105878](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105878.zip) Details of RACH specific schemes Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105886](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105886.zip) Discussion on open issues for RACH based SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103433](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103433.zip)

[R2-2105929](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105929.zip) Open issues for RACH based SDT ZTE Corporation, Sanechips discussion Rel-17

[R2-2106131](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106131.zip) Considerations on Open issues in RA-SDT China Telecomunication Corp. discussion

[R2-2106256](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106256.zip) Anchor relocation and context fetch CMCC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

### 8.6.5 Aspects specific to CG based schemes

This AI will NOT be treated in RAN2#114

NOTE: expected input: paper containing the remaining proposals not discussed as part of [Post113-e][504] from rapporteur to be treated.

Contributions can be submitted but not required and should focus only on new highly critical open issues and resolving the FFSs

CG resources, configuration and selection, validity of CG resources, multiple CG configurations, handling of beam selection for CG (including association between CGs and SSBs) etc, any other aspects included in [Post113-e][504][SDT] which cannot be concluded as part of the email

[R2-2105031](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105031.zip) Remaining untreated proposals from [POST113-e][504][SDT] CG Open Issues Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

Proposal1: RAN2 should further discuss whether to support CG configuration request.

Proposal2: Release of CG-SDT configuration by system information indication is not supported.

(5/21)

- Nokia thinks that this is already support in LTE and if we don’t support this how is the network supposed to release. Huawei agrees with Nokia. Ericsson doesn’t thinks this is important as you can just release the UE. ZTE also doesn’t think this optimization is needed.

=> Release of CG-SDT configuration by system information indication is not supported

Proposal4: RAN2 should further discussion whether to support autonomous retransmission for CG-SDT.

- CATT thinks we don’t need to support autonomous retransmission.

Proposal5: Support L1-ACK feedback for CG-SDT. (14/24) Send an LS to RAN1 on this.

- Nokia doesn’t think this is needed. LG thinks that we should support some form of feedback. Ericsson thinks that we can have implicit NACK and sympathizes with Nokia that this is not needed. Xiaomi thinks that this is needed for subsequent transmission. InterDigital agrees. Vivo thinks we need some response. Samsung agrees that feedback if needed for subsequent SDT using CG.

- ZTE thinks that we can use the existing DFI. We should think that the CG retransmission timer should be fairly large and we shouldn’t optimize too much.

- Nokia, Lenovo and Qualcomm agree that this is not need

=>

Proposal6: UE does not select any SSB if none of the SSBs’ RSRP is above the RSRP threshold. (18/23) FFS the UE behavior when none of the SSB’s RSRP is above the threshold

- ZTE thinks that switching from CG to RA SDT shouldn’t be allowed

**Agreements:**

1. Release of CG-SDT configuration by system information indication is not supported
2. RAN2 thinks that some feedback may be beneficial in case CG is used for subsequent transmission. RAN2 assumes that existing mechanism can be used.
3. For initial CG transmission, UE does not select any SSB if none of the SSBs’ RSRP is above the RSRP threshold. FFS if re-evaluation for every CG transmission is necessary

[R2-2104787](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104787.zip) Details of Configured Grant based Small Data Transmission Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2104968](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104968.zip) Beam selection and failure handling for CG-SDT Asia Pacific Telecom, FGI discussion

[R2-2104983](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104983.zip) PDCCH monitoring after SDT-TAT expiry Fujitsu discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2003199](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2003199.zip)

[R2-2105282](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105282.zip) Analysis and views on CG-SDT CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105379](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105379.zip) Beam selection for CG-SDT ASUSTeK discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103457](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103457.zip)

[R2-2105465](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105465.zip) Aspects specific to CG based SDT Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105576](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105576.zip) Small data transmission with CG-based scheme Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105598](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105598.zip) Discussion on CG-SDT open issues LG Electronics Inc. discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105694](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105694.zip) CG-based SDT in NR Sony discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103581](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103581.zip)

[R2-2105722](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105722.zip) Remaining issues of CG SDT Xiaomi Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2104223](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2104223.zip)

[R2-2105759](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105759.zip) Details of CG based SDT Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2105811](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105811.zip) Consideration on CG based small data transmission Lenovo, Motorola Mobility discussion Rel-17

[R2-2105887](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105887.zip) Discussion on open issues for CG based SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2103434](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2103434.zip)

[R2-2105930](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2105930.zip) Open issues for CG based SDT ZTE Corporation, Sanechips discussion Rel-17

[R2-2106012](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106012.zip) Discussion on CG-SDT Request by UE NEC Telecom MODUS Ltd. discussion

[R2-2106042](file:///C:\Users\panidx\OneDrive%20-%20InterDigital%20Communications,%20Inc\Documents\3GPP%20RAN\TSGR2_114-e\Docs\R2-2106042.zip) CG-based SDT selection and configuration InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core