3GPP TSG-RAN WG2 Meeting #116 electronic [R2-2111294](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111294.zip)

Online, November 1-12, 2021

Source: Session Chair (InterDigital)

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

**Email discussions:**

* [AT115e][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
* [AT116e][501][Sdata] Summary of UCE open issues (Oppo)

Tuesday night inputs on critical issues only by all companies and proposals by rapporteur for Wednesday session

* [AT116e][502][Sdata] Summary of Tsynch open issues (Oppo)

Tuesday night inputs on critical issues only by all companies and proposals by rapporteur for Wednesday session

* [AT116e][503][Sdata] Summary of UP (LG)

 Thursday night inputs by all companies, Friday proposals by rapporteur

## 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

Including email discussions [Post115-e][511][IIoT] and [Post115-e][512][IIoT]

[R2-2109327](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109327.zip) LS on TA-based propagation delay compensation (R1-2108635; contact: Huawei) RAN1 LS in Rel-17 NR\_IIOT\_URLLC\_enh To:RAN4 Cc:RAN2

=> Noted

[R2-2111217](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111217.zip) LS on propagation delay compensation (R1-2110647; contact: Huawei) RAN1 LS in Rel-17 NR\_IIOT\_URLLC\_enh To:RAN2 Cc:RAN4

=> Noted

[R2-2110441](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110441.zip) Stage-2 Running CR for Rel-17 IIoT/URLLC Nokia, Nokia Shanghai Bell CR Rel-17 38.300 16.7.0 0392 - B NR\_IIOT\_URLLC\_enh

- Ericsson had a wording comment and we should be able to change the wording after the endorsement.

=> The CR is endorsed

[R2-2110495](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110495.zip) MAC Running CR for Rel-17 IIoT/URLLC Samsung draftCR Rel-17 38.321 16.6.0 B NR\_IIOT\_URLLC\_enh-Core

=> The CR is endorsed

### 8.5.2 Enhancements for support of time synchronization

RAN1 progress if any should be taken into account.

Summary email discussion [502]

[R2-2111282](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111282.zip) Summary of email discussion on Tsynch CMCC

Agreements

1. The gNB can enable/disable UE-side PDC via unicast and broadcast RRC signalling.
2. A new RRC parameter can be introduced to explicitly enable/disable UE-side PDC
3. When reference time information is received in both the DLInformationTransfer message and the SIB9, the UE applies the reference time info in the DLInformationTransfer message. The UE will follow dedicated signaling if timing reference is received in both unicast and broadcast
4. **The timing synchronization in I-IoT should focus on the signaling between the UE and gNB, i.e. different from Multi-RTT based signalling flow which involving LMF and AMF**

*Cat-a-Proposal 3 When reference time information is received in both the DLInformationTransfer message and the SIB9, the UE applies the reference time info in the DLInformationTransfer message. (14/17)*

- Qualcomm asks if the UE is going to ignore SIB9 and this would be more complicated. Huawei asks what is the spec implication and what happens when you get the timing both from unicast and sib9. Ericsson explains that when both are received the UE should always apply the dedicate configuration. Ericsson thinks that there can be benefits to send two different values but would like to ask the UE vendors what is the preferred behaviour. Xiaomi thinks that the UE should use the latest information. Nokia indicates that we discussed this in Rel-16 and we concluded that the UE will follow dedicated signaling so there is no need to rediscuss. LG has the same understanding as Nokia. Qualcomm explains that the difference between Rl17 is that the timing sources are supposed to convey different things.

- Samsung is concerned that it is not clear how long the dedicated signaling is valid so the latest information is better.

- Oppo thinks that the UE should follow dedicated signaling and maybe we would need to introduce some validity timer.

- Mediated thinks that if dedicated signalling is provided once, the NW is obligated to provide further dedicated signalling for changes thereafter. CATT agree with Mediatek.

Cat-a-Proposal 4 RAN2 to prioritize discussing the RAN2 impact in terms of framework and flow design of RTT based method that is needed to support RTT-based PDC along with RAN1 and RAN4 ongoing work. (14/17)

- Mediatek explains that the deadlock is in RAN1 and RAN1 should decide and we should design the framework.

- Xiaomi thinks that we should pick the solution that provides the more accurate PDC

Cat-a-Proposal 5 The timing synchronization in I-IoT should focus on the signaling between the UE and gNB, i.e. different from Multi-RTT based signalling flow which involving LMF and AMF. (15 /15)

Cat-a-Proposal 6 if RTT-based PDC is supported, RAN2 to introduce RRC signaling for Rx-Tx time difference measurement report. (11+2/16)

The following are proposals which are controversial and need further discussion:

Cat-b-Proposal 1 RAN2 should only focus on the specification impact from supporting UE-side propagation delay compensation. Meanwhile, for any issues for network pre-compensation related to network implementation, RAN3 can discuss if there are RAN3 impacts.

(9/16: Qualcomm, Huawei, Ericsson, CMCC, Futurewei, ZTE, TCL, Lenovo, LG)

Cat-b-Proposal 2 Support of the proposal that the traditional TA-based PDC shall be supported.

(8/17: Nokia, Huawei, Lenovo, TCL, CMCC, vivo, OPPO, ZTE)

Cat-b-Proposal 3 Support of the proposal that the traditional TA-based PDC shall be supported.

(8/17: Nokia, Huawei, Lenovo, TCL, vivo, OPPO, ZTE, CMCC)

Cat-b-Proposal 4 Enabling/disabling UE-side PDC is supported only for ReferenceTimeInfo by unicast delivery.

(6/17: Samsung, Lenovo, vivo, MediaTek, Apple, CMCC)

[R2-2109302](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109302.zip) RE: LS on Time Synchronization IEEE 1588 WG LS in To:RAN, SA Cc:RAN2

[R2-2109599](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109599.zip) Discussion about propagation delay compensation for accurate time synchronization Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2109776](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109776.zip) Summary of PDC Issues Ericsson discussion

[R2-2109925](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109925.zip) Propagation Delay Compensation for TSN Qualcomm Incorporated discussion Rel-17

[R2-2109990](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109990.zip) Discussion on propagation delay compensation vivo discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110107](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110107.zip) Remaining FFSs on time synchronization and PDC ZTE Corporation, Sanechips, China Southern Power Grid Co., Ltd discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2110199](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110199.zip) Discussion on propagation delay compensation for TSN NTT DOCOMO INC. discussion Rel-17

[R2-2110318](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110318.zip) Left issues for propagation delay compensation Lenovo, Motorola Mobility discussion Rel-17

[R2-2110442](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110442.zip) Views on Support of Propagation Delay Compensation Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2110496](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110496.zip) Issues on Propagation Delay Compensation Samsung discussion

[R2-2110587](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110587.zip) Consideration on the support of time synchronization enhancement OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110801](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110801.zip) Remaining issues of timing synchronization Intel Corporation discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110963](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110963.zip) Discussion about propagation delay compensation enhancements China Telecommunications discussion

[R2-2111046](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111046.zip) Time synchronization for TSN based on RAN1 progress CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2111257](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111257.zip) Summary of AI 8.5.2 on Time Synchronization CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

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

Remaining open issues. \

Summary email discussion [501]

[R2-2111281](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111281.zip) Summary of UCE oppen issues Oppo

[R2-2109600](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109600.zip) Remaining issues about uplink enhancements for URLLC in UCE Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2109653](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109653.zip) cg-RetransmissionTimer configured without autonomousTx CATT discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2109777](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109777.zip) Harmonizing UL CG enhancements in NR-U and URLLC Ericsson discussion

[R2-2109926](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109926.zip) CG Harmonization for Unlicensed Controlled Environment Qualcomm Incorporated discussion Rel-17

[R2-2109991](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109991.zip) Remaining Issue about Autonomous Re-transmission vivo discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110243](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110243.zip) Remaining details on enhancements for URLLC in UCE Lenovo, Motorola Mobility discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110443](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110443.zip) Remaining Issues on HARQ Process Selection for Configured Grant Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2110497](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110497.zip) Remaining Issues on Intra-CG Prioritization and LCH-based Prioritization in UCE Samsung discussion

[R2-2110588](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110588.zip) Consideration on URLLC over NR-U OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110623](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110623.zip) Further Consideration on the Intra-UE multiplexing in UCE ZTE Corporation,Sanechips discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110672](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110672.zip) Remaining issues of CG harmonization Xiaomi Communications discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2108794](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2108794.zip)

[R2-2110754](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110754.zip) Remaining issues for UCE MediaTek Inc. discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110916](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110916.zip) IIoT operation in unlicensed controlled environments InterDigital discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2111104](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111104.zip) Remaining issues of IIoT in UCE III discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2111169](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111169.zip) Remaining issues in intraCG-Prioritization LG Electronics Inc. discussion NR\_IIOT-Core

[R2-2111262](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111262.zip) Summary of Agenda Item 8.5.3: Uplink enhancements for URLLC in unlicensed controlled environments OPPO discussion

### 8.5.4 RAN enhancements based on new QoS

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.

Including email discussion [Post115-e][513][IIoT]

RAN enhancements based on new QoS related parameters taken into account SA2 progress

[R2-2109602](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109602.zip) Summary of [Post115-e][513][IIoT] QoS survival time Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

*Proposal 1: The baseline mechanism for Survival Time support is “CG resources will be used for service with Survival Time requirements, such that the mapping relation between the service and the retransmission grant is commonly known to both gNB and UE, and CG retransmission scheduling (addressed by CS-RNTI) can be used for Survival Time state triggering”. (17/20)*

- LG is concerned with unlicensed band operation and wonders how we handle it. Huawei prefers to consider optimization with unlicensed later. Lenovo thinks that we agreed not to optimize but CATT and Lenovo provided some solutions. ZTE thinks that we can use the optimization of HARQ-NACK solution for unlicensed. CATT thinks it would be risky to deploy survival time on unlicensed and to rely on retransmission timer. Huawei agrees with CATT. QC thinks we can re-use re-tx as an activation.

- Apple is ok with the baseline, but there may be multiple SDUs from different logical channels. Does it mean we have to have dedicated. Huawei explains that we can discuss this later, as this is stage 3. Qualcomm has solution where only DRBs with survival times should be configured for the CG.

- Ericsson points out that how to allocate the resources is not clear. Lenovo thinks that the network can reconfigure the resources so there is no issues. QC shares the views of Lenovo. CATT sees that resources can be pre-allocated and activated with duplication is duplicated

- Ericsson If we do retransmission it requires retransmissions for the failed message, but what should matter is the next one. Lenovo points out that there is a way to address this and we can do it later. QC it is a valid concern but this is something we have to live with. CATT doesn’t see this as a major issue and there is a proposal from Nokia with an RRC parameter on how to interpret HARQ-NACK

- LG points out that we may have a problem with MAC CE and it won’t start the timer. CATT explains that the next packet will use another HARQ process and won’t be blocked by the timer.

*Proposal 2: Further discuss on how UE identifies the corresponding DRB that should enter Survival Time state. (11/19)*

*Proposal 3: RAN 2 to decide whether or not to use DG for DRB with Survival Time support in Rel-17.*

*Proposal 4: A RRC parameter is configured for a DRB with Survival Time support. (17/20)*

*Proposal 5: RAN2 to further discuss and choose between 1) fixing N=1, 2) N can be larger than 1, for N HARQ-NACKs as Survival Time state trigger.*

***Proposal 6: MAC entity shall handle the counting of N, if needed. (18/19)***

- Vivo asks if this includes DC case. Huawei explains that they are not correlated.

- Nokia asks if this is per logical channel. Huawei thinks we can solve this detail later on

*Proposal 7: Specify, if needed, interaction between lower layer (i.e. MAC layer) and PDCP layer for Survival Time state triggering. (16/20)*

- CATT doesn’t see a need to involve PDCP. This is only needed if we support DC duplication scenario and we agreed to focus on the more stringent requirements. We can go with a simple solution that handles everything in MAC.

*Proposal 8: RAN2 to further discuss and choose between Option 1) Activate all configured legs, following entry into Survival Time state, and Option 2) Network indicates by RRC, e.g. a bitmap, the PDCP duplication state that the UE should apply upon entry of Survival Time state, the UE changes the duplication state accordingly.*

- Nokia thinks that option 2 covers option 1 and is more flexible and further points out that option 2 is the only option that aligns with the previous agreement. LG agrees. Samsung doesn’t have the same understanding of that agreement. Nokia explains that the agreement states which LCH should be activated and option 1 activates all of them.

- Qualcomm thinks that option 1 is more simple and trigger to enter survival time is one bit and option2 complicates the procedure. Nokia doesn’t think we should limit gNB to use only PDCP duplication and there is no extra complexity. Samsung, Oppo, Intel and mediatek agrees with Qualcomm. Apple,InterDigital agrees with Nokia.

- CATT would also like to go with the simpler approach. LG explains that PDCP duplication, we already have a mechanism that selectively activates RLC legs. option 2 adds no additional complexity to what we have already. So, simplicity shouldn't be the right argument.

- Futurewei asks “why would the NW configure some LCH(s) that it doesn't plan to use when in the most critical moment?”. Ericsson explains that there are very many reasons for gNB.

**Agreements:**

1. A RRC parameter is configured for a DRB with Survival Time support
2. MAC entity shall handle the determination of triggering survival state based on HARQ-NACK
3. For the DRB configured with Survival Time support, the network can control the duplication state for the DRB via legacy activation/deactivation MAC CE. No specification change is foreseen.
4. For the issue that there may be packets already sent to RLC before the pre-configured PDCP duplication configuration is activated, following entry into the Survival Time state, it is up to gNB/UE implementation to handle and no need to specify extra behaviour
5. RAN2 not to consider the interaction between Survival Time solution and handover procedure in Rel-17
6. No specification enhancement will be pursued for CG activation command as Survival Time state trigger
7. The baseline mechanism for Survival Time support is “CG resources will be used for service with Survival Time requirements, such that the mapping relation between the service and the retransmission grant is commonly known to both gNB and UE, and CG retransmission scheduling (addressed by CS-RNTI) can be used for Survival Time state triggering”.
8. FFS how UE identifies the corresponding DRB that should enter Survival Time state and other details (i.e. resource allocation)
9. FFS on unlicensed band
10. Deprioritize autonomous activation of PDCP duplication based on inputs other than retransmission grant

*Proposal 9: For the DRB configured with Survival Time support, the network can control the duplication state for the DRB via legacy activation/deactivation MAC CE. No specification change is foreseen. (20/20)*

*Proposal 10: For the issue that there may be packets already sent to RLC before the pre-configured PDCP duplication configuration is activated, following entry into the Survival Time state, it is up to gNB/UE implementation to handle and no need to specify extra behaviour. (16/20)*

*Proposal 11: RAN2 not to consider the interaction between Survival Time solution and handover procedure in Rel-17. (18/19)*

*Proposal 12: RAN2 further discuss “to specify” or “not to specify” on how to provide radio resources for the activated legs following entry into the Survival Time state.*

*Proposal 13:* *Not to use CG activation command as Survival Time state trigger. (16/19)*

*Proposal 14: Deprioritize autonomous activation of PDCP duplication based on inputs other than retransmission grant or CG activation grant. (15/19)* [CB]

- Ericsson doesn’t support this as the network can’t use for implementation and this depends on proposal 1.

*Proposal 15: RAN2 further discuss “to specify” or “not to specify” on how to exit the Survival Time state.*

[R2-2109601](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109601.zip) Discussion on two-level PERs for survival time handling Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2109603](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109603.zip) TP of baseline CR for Survival Time state operation Huawei, HiSilicon discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2109654](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109654.zip) HARQ NACK solution: addressing concerns and design details CATT, CMCC discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2109655](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109655.zip) TPs capturing HARQ-NACK solution CATT discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2109709](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109709.zip) L1/L2 configuration adaptation Fujitsu discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2107658](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107658.zip)

[R2-2109710](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109710.zip) Additional thought on supporting N>1 Fujitsu discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2109778](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109778.zip) RAN enhancements based on new QoS related parameters Ericsson discussion

[R2-2109927](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109927.zip) RAN Enhancement to support Survival Time Qualcomm Incorporated discussion Rel-17

[R2-2109992](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109992.zip) Discussion on HARQ NACK solution vivo discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110067](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110067.zip) Remaining QoS solution aspects Apple discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110068](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110068.zip) Adaptive configuration for CG/SPS Apple discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110069](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110069.zip) Further considerations on survival time for new QoS Apple discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110108](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110108.zip) N and combined Tx-side timer for IIoT QoS ZTE, Sanechips, China Southern Power Grid Co., Ltd, TCL Communication Ltd., vivo discussion NR\_IIOT\_URLLC\_enh-Core

[R2-2110201](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110201.zip) Discussion on survival time state NTT DOCOMO INC. discussion Rel-17

[R2-2110227](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110227.zip) Remaining issues on the support of survival time Lenovo, Motorola Mobility discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110263](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110263.zip) Discussion on the RAN solution for introduction of new QoS parameters CMCC discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2110345](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110345.zip) Finalising Survival Time related enhancements Samsung Electronics GmbH discussion

[R2-2110444](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110444.zip) An Overview of Survival Time Enhancements Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_IIOT\_URLLC\_enh

[R2-2110589](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110589.zip) Consideration on the support of survival time OPPO discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110673](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110673.zip) Clarification on the survival time requirement Xiaomi Communications discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2108795](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2108795.zip)

[R2-2110791](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110791.zip) On counting HARQ-NACKs for triggering survival time state Futurewei Technologies discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110802](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110802.zip) Survival time handling Intel Corporation discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110913](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110913.zip) Enhancements based on new QoS requirements InterDigital discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core

[R2-2110918](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110918.zip) Issues with UE Survival Time support Sequans Communications discussion Rel-17 NR\_IIOT\_URLLC\_enh-Core [R2-2108457](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2108457.zip)

[R2-2110965](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110965.zip) Discussion on RAN enhancement to support survival time China Telecommunications discussion

[R2-2111167](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111167.zip) Remaining aspects in ST mechanism LG Electronics Inc. discussion NR\_IIOT-Core

[R2-2111183](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111183.zip) Discussion of RAN Enhancements to Support Survival Time TCL Communication Ltd. discussion Rel-17 NR\_IIOT\_URLLC\_enh

## 8.6 Small Data enhancements

(NR\_SmallData\_INACTIVE-Core; leading WG: RAN2; REL-17; WID: RP-212594)

Time budget: 1.5 TU

Tdoc Limitation: 5 tdocs

Email max expectation: 5 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)

Including [Post115-e][508][SDT] Stage-2 running CR update (Nokia), [Post115-e][506][SDT] RRC running CR update (ZTE), and [Post115-e][507][SDT] MAC running CR update (Huawei)

[R2-2109308](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109308.zip) Reply LS on Small data transmission (C1-215152; contact: Apple) CT1 LS in Rel-17 5GProtoc17, NR\_SmallData\_INACTIVE-Core To:RAN2 Cc:SA2

- Apple points out that NAS cannot differentiate between SDT and non-SDT so AS has to do this

- ZTE thinks that the simplest option to continue with our framework and this doesn’t require any CT1. Intel supports ZTEs view. Samsung and Lenovo also support.

- Intel points out that there are papers that discusses CT1 aspects and encourages the companies to take them to CT1 and CT1 can let us know if they require any information.

- Apple thinks that we should notify CT1. ZTE thinks that we cannot comment on NAS aspects, so no further feedback is needed.

- QC thinks that RAN2 needs to consider the new case “CT1 would like RAN2 to also note that the NAS layer needs to transition to 5GMM-IDLE mode if UE radio capability update is needed during ongoing SDT transfer.”. ZTE explains that this is not new and can happen today.

=> RAN2 will continue with current framework and can notify CT1 later on how the solution looks like.

=> Noted

[R2-2109321](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109321.zip) Reply LS on on physical layer aspects of small data transmission (R1-2108533; contact: vivo) RAN1 LS in Rel-17 NR\_SmallData\_INACTIVE-Core To:RAN2

- Vivo indicates that RAN2 can conclude that we can do SDT on initial BWP. ZTE, Intel, QC, Lenovo, agree.

- Ericsson explains that there is no consensus in RAN1 for RAN1. Huawei thinks we should revert on that agreement for CG. ZTE thinks that the LS also seem to say that CG is not possible. LG also thinks that we should stick to our agreement for CG. LG indicates that the LS says that RAN2 should provide more info for CG. CATT doesn’t see what else we can provide to RAN1. LG thinks that we didn’t provide anything regarding necessity. Xiaomi thinks we can wait for feedback.

=> RAN2 changes the agreements and as a baseline we will focus on initial BWP for RA and CG SDT. FFS if further work on CG SDT for non-initial BWP will be needed, based on RAN1 consensus.

[R2-2109330](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109330.zip) LS on the TA validation and mapping details for CG-SDT (R1-2108649; contact: ZTE) RAN1 LS in Rel-17 NR\_SmallData\_INACTIVE-Core To:RAN2

- ZTE points out that we need to make this decision. ZTE thinks option 3 and 4 work. Ericsson option 1 makes sense. Intel, InterDigital and QC, Spredtrum support option 1. Nokia, Oppo option 4. Vivo option 3.

=> Add this to SeungJune’s email discussion

The SSB subset for RSRP based TA validation is determined as

 Option 1: Within a set of SSBs configured per CG configuration

 Option 2: Within a set of SSBs configured for all CG configurations

 Option 3: Within a set of all SSBs actually transmitted as indicated in SIB1

 Option 4: Highest N SSBs of all SSBs actually transmitted as indicated in SIB1

[R2-2111219](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111219.zip) Reply LS on the physical layer aspects of small data transmission (R1-2110661; contact: ZTE) RAN1 LS in Rel-17 NR\_SmallData\_INACTIVE-Core To:RAN2

- ZTE points out that there is an impact to RAN2 design on L1 feedback. Can we assume that we will not have L1 feedback

- Intel thinks that we can make it work without L1 feedback. CATT, Interdigital, Apple, Lenovo and Nokia agrees.

- Xiaomi indicates that we assumed L1 feedback in the email discussion. Huawei agrees with Xiaomi that we can use the simple solution but for subsequent transmission we need to have some feedback. Vivo thinks we treat this similar to BWP.

- Ericsson assumes dynamic grant, same handle BWP. LG thinks that are other means to enable autonomous transmissions.

=> Assumption that we won’t have L1 feedback as a functionality. Discuss subsequent and autonomous CG transmissions with email discussion.

[R2-2110185](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110185.zip) Running MAC CR for small data Huawei, HiSilicon draftCR Rel-17 38.321 16.6.0 B NR\_SmallData\_INACTIVE-Core Late

- LG indicates that there are some modelling issues that depend on the UP open issues.

=> Noted

[R2-2110573](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110573.zip) RRC Running CR for SDT ZTE Corporation (rapporteur) draftCR Rel-17 38.331 16.6.0 B NR\_SmallData\_INACTIVE

=> Noted

[R2-2110808](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110808.zip) Stage-2 running CR Introduction of SDT Nokia, Nokia Shanghai Bell CR Rel-17 38.300 16.7.0 0357 - B NR\_SmallData\_INACTIVE-Core [R2-2108242](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2108242.zip)

=> Noted

[R2-2110186](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110186.zip) Remaining issue for MAC spec Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

=> Noted

[R2-2110187](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110187.zip) Summary of [Post115-e][507][SDT] MAC running CR update (Huawei) Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

=> Noted

[R2-2110576](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110576.zip) [DRAFT] Reply LS on the physical layer aspects of small data transmission ZTE Corporation, Sanechips LS out Rel-17 To:RAN1

### 8.6.2 User plane common aspects

Overall user plane procedure for SDT (including details of ROHC continuity, BSR/PHR configuration, LCH restrictions, handling of TAT and CG-TAT) )

Email discussion 503 – to be treated second week

[R2-2109437](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109437.zip) Further Discussion on User Plane Aspect of Small Data Transmission vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109524](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109524.zip) User Plane Common Aspects of RACH and CG based SDT Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109593](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109593.zip) Common aspects for SDT Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109621](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109621.zip) User plane leftover issues for SDT procedure Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109711](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109711.zip) Remaining UP open issues Fujitsu discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109768](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109768.zip) Discussion on user plane issues of SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110030](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110030.zip) User plane aspects of SDT Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110182](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110182.zip) User plane common aspects for SDT Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110255](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110255.zip) Remaining user plane aspects of SDT NEC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110328](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110328.zip) The UP common issues for small data transmissions Lenovo, Motorola Mobility discussion Rel-17

[R2-2110397](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110397.zip) Consideration on UP remaining issues of SDT? CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110575](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110575.zip) User plane common aspects for SDT ZTE Corporation, Sanechips discussion Rel-17

[R2-2110667](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110667.zip) Clarification on the data volume computation Xiaomi Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110669](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110669.zip) RACH failure in subsequent data transmission phase Xiaomi Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2108791](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2108791.zip)

[R2-2110752](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110752.zip) Remaining issues on UP aspects of SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110809](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110809.zip) UP aspects for SDT Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110915](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110915.zip) User plane aspects of small data transmission InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110983](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110983.zip) Handling of legacy TAT and CG-SDT-TAT LG Electronics Inc. discussion NR\_SmallData\_INACTIVE-Core

[R2-2111039](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111039.zip) Leftover UP common issues of SDT CMCC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2111124](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111124.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:

Cosourced contributions for CCCH and DCCH solution for non-SDT data arrival indicaiton with acceptable proposals and draft CRs for the solutions for each solution,

Other CP open issues

[R2-2109617](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109617.zip) DCCH-based indication of non-SDT data arrival Intel Corporation, ZTE corporation, Sanechips, Samsung, CMCC, Qualcomm, OPPO, Sharp, Xiaomi, Sony, CATT, FGI, Asia Pacific Telecom, Radisys discussion Rel-17 NR\_SmallData\_INACTIVE-Core

*Proposal 1. DCCH-based approach is used to indicate to the network when data on non-SDT RB(s) is available which involves:*

*Proposal 1.1. When UL non-SDT data is available, RRC layer generates a corresponding DCCH message and submits this to lower layers for transmission.*

*Proposal 1.2. After UE informs the network that non-SDT data is available (i.e. corresponding DCCH message is sent), UE continues with the SDT session ongoing until network informs otherwise to UE (e.g. by transitioning the UE into RRC\_CONNECTED or by releasing the UE into legacy RRC\_INACTIVE or RRC\_IDLE).*

*Proposal 2. For DCCH-based approach, a new UL RRC message is used by UE to inform the network when non-SDT data is available in UE.*

*Proposal 3. From RAN2 point of view, no additional information needs to be included as part of the RRC message that UE uses to notify the network that non-SDT data is available.*

=> Noted

[R2-2110596](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110596.zip) Non-SDT data arrival Huawei, HiSilicon, InterDigital, LGE, Ericsson, ASUSTeK, Nokia, Nokia Shanghai Bell, Google, Rakuten Mobile, Fujitsu, NEC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

*Proposal 1: Either a) adding a new resume cause or b) allocating a new LCID or c) identifying based on UE’s I-RNTI, is adapted for the differentiation between the regular RRC resumption and the non-SDT data arrival indication.*

*Proposal 2: When non-SDT data arrives at the UE during an ongoing SDT session, the UE triggers another RRC resume procedure where the resumeMAC-I is calculated with input parameter(s) (either KEY, MESSAGE or COUNT) modified with respect to the resumeMAC-I included in the previous RRCResumeRequest.*

=> Noted

Discussion on DCCH vs. CCCH

- Intel points out that there are a number of open issues with CCCH with security and data loss as shown in their late paper. Huawei indicates that there are issues on both solutions.

- Interdigital thinks that both DCCH and CCCH have similar pros and cons. The important difference is that CCCH can be used for both cases but DCCH cannot be used.

- ZTE points out that for CCCH one concern is that there are multiple solutions still on the table and there is no convergence. It is true that it works for cell reselection but for same cell data will be lost. Interdigital asks why it will be lost as if we change message or count we satisfy SA3 requirements and we don’t have to suspend PDCP and thus no loss. Intel agrees with ZTE and the solution on the draft CR is different.

- Huawei acknowledges that yes we have to discuss options for CCCH but for DCCH we will also have.

- Ericsson points out that this solution solves all the issues with the SA3 and also data lost as security will not be changes, we will keep using the same keys. RAN2 will have to standardize this solution and it would come for free for SDT.

- ZTE thinks this won't work because the resume cause of SDT is in the RACH resource not in resumeCause. Ericsson explains DCCH would need resumeCause or then limit it to some type of data, also failure handling is not clear, etc. So there are issues as well.

- Xiaomi asks SRB0 of CCCH does not have PDCP. How can we use COUNT change to calculate resumeMAC-I. InterDigital explains SRB0 doesn’t have PDCP but COUNT is still set for SRB0

- Qualcomm thinks that for CCCH we have to check with SA3 and for DCCH we don’t have. InterDigital doesn’t think we need to ask anything to SA3 if we use the COUNT solution as SA3 has already answered.

- LG doesn’t want to introduce a new procedure to cope with a rare use case and companies should bare in mind that this is not very frequent and we don’t have to worry about data loss.

- Mediatek doesn’t understand why the network can respond CCCH immediately instead of DCCH. Why CCCH through RA has higher reliability than DCCH through dedicated transmission

[R2-2109619](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109619.zip) DCCH vs CCCH based approach for indication of non-SDT data arrival Intel Corporation, ZTE corporation, Sanechips, Samsung, Qualcomm, OPPO, Sharp, Xiaomi, Sony, CATT, Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

*Proposal 1. RAN2 only enables DCCH-based approach where UE in RRC\_INACTIVE with an ongoing SDT session indicates the network when data on non-SDT RB(s) is available.*

[R2-2109618](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109618.zip) Draft CR for introduction of DCCH solution for non-SDT data arrival ZTE corporation, Sanechips, Intel Corporation, Samsung, CMCC, Qualcomm, OPPO, Sharp, Xiaomi, Sony, CATT, FGI, Asia Pacific Telecom, Radisys draftCR Rel-17 38.331 16.6.0 NR\_SmallData\_INACTIVE-Core

[R2-2111275](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111275.zip) Comments on the proposed CCCH solution for non-SDT data arrival Intel Corporation, Apple, ZTE discussion 8.6.3 Rel-17 NR\_SmallData\_INACTIVE-Core

Proposal 1. The following open issues are identified to the proposed CCCH solution in [R2-2110596](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110596.zip):

Proposal 1.1. Security related open issues:

Proposal 1.1.1. [Issue 1] Same security key is used by two different network notes (anchor and serving gNBs); SA3 needs to be contacted on whether there is any security concern with this.

Proposal 1.1.2. [Issue 2] Security concern as UE autonomous performs the horizontal key derivation.

Proposal 1.1.3. [Issue 3] How resumeMAC-I is calculated for the 2nd RRCResumeRequest msg would require further discussion on RAN2 and SA3.

Proposal 1.1.4. [Issue 4] Security keys between UE and network may go out of sync (e.g. if the 2nd RRCResumeRequest using the new key is sent before the contention resolution of the 1st RRCResumeRequest is completed).

Proposal 1.2. Data loss and interruption related open issues:

Proposal 1.2.1. [Issue 5] After UE autonomously terminates the SDT procedure, DL SDT data being sent by serving gNB gets lost whilst the key is refreshed and the 2nd RRCResumeRequest msg is sent (i.e. the new resume procedure starts).

Proposal 1.2.2. [Issue 6] Potential data loss, out of order delivery and interruption as PDCP is suspended which results on a reset of the PDCP COUNT.

Proposal 1.3. Network related open issues:

Proposal 1.3.1. [Issue 7] How anchor gNB differentiates the 2nd RRCResumeRequest requires discussion in RAN2.

Proposal 1.3.2. [Issue 8] How the anchor gNB and serving gNB enable CCCH solution needs discussion in RAN2/RAN3.

Proposal 1.3.3. [Issue 9] How proposed CCCH solution can be re-used to a new 3rd gNB is not clear (e.g. when cell reselection happens).

[R2-2109438](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109438.zip) Handling of non-SDT Data Arrival via BSR vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107055](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107055.zip)

[R2-2109439](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109439.zip) Discussion on RRC-controlled Small Data Transmission vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107054](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107054.zip)

[R2-2109525](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109525.zip) Control Plane Aspects of SDT Procedure Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109526](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109526.zip) Handling legacy control plane operations during SDT procedure Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109594](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109594.zip) SDT Faliure Handling Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core Withdrawn

[R2-2109595](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109595.zip) CP aspects for SDT Ericsson discussion

[R2-2109620](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109620.zip) Control plane leftover issues for SDT procedure Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109712](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109712.zip) Handling of SDTF detection timer Fujitsu discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107659](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107659.zip)

[R2-2109713](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109713.zip) RAN paging reception and response during SDT Fujitsu discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107660](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107660.zip)

[R2-2109769](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109769.zip) Discussion on control plane issues of SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110031](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110031.zip) Control plane aspects of SDT Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110032](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110032.zip) SDT specific NAS and AS interaction Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110033](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110033.zip) Power Saving for SDT Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110184](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110184.zip) Discussion on the NAS aspects of Small Data Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110209](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110209.zip) Remaining Issues on the Arrival of Non-SDT Traffic FGI, Asia Pacific Telecom discussion

[R2-2110254](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110254.zip) Remaining control plane aspects of SDT NEC discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107779](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107779.zip)

[R2-2110329](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110329.zip) Discussion on CP data transmission over SDT Lenovo, Motorola Mobility discussion Rel-17

[R2-2110398](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110398.zip) Consideration on NAS and AS Interaction CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110399](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110399.zip) Consideration on CP issues CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110572](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110572.zip) Control plane common aspects of SDT ZTE Corporation, Sanechips discussion Rel-17

[R2-2110595](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110595.zip) Control plane common aspects for SDT Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110668](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110668.zip) Paging reception during SDT Xiaomi Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2108790](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2108790.zip)

[R2-2110753](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110753.zip) Remaining issues on CP aspects of SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107992](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107992.zip)

[R2-2110797](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110797.zip) Draft LS to CT1 on small data transmission Apple LS out Rel-17 NR\_SmallData\_INACTIVE-Core To:CT1

[R2-2110818](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110818.zip) SDT control plane aspects Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE

[R2-2110819](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110819.zip) RRC procedure for SDT Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE

[R2-2110865](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110865.zip) Untreated proposal from [Post113-e][503] InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2106051](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2106051.zip)

### 8.6.4 Aspects specific to RACH based schemes

RA resource configuration and selection, RAN2 specific details of context fetch/data forwarding with and without anchor relocation. Note: common RACH aspects of signalling will be treated in 8.18

[R2-2109440](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109440.zip) Supporting subsequent UL transmission during RA-SDT vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109527](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109527.zip) RACH configuration for Small Data Transmission. Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109591](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109591.zip) RACH based small data transmission Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109622](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109622.zip) RA-SDT leftover issues Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109770](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109770.zip) Discussion on swiching from RA-SDT to legacy RACH OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110123](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110123.zip) Discussion on RACH-based SDT Spreadtrum Communications discussion Rel-17

[R2-2110208](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110208.zip) C-RNTI handling for SDT FGI, Asia Pacific Telecom discussion

[R2-2110210](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110210.zip) Issues of the Subsequent Data Transmission FGI, Asia Pacific Telecom discussion [R2-2107463](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107463.zip)

[R2-2110330](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110330.zip) Analysis on open issues of RA based SDT Lenovo, Motorola Mobility discussion Rel-17

[R2-2110349](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110349.zip) Remaining issues of RACH-based SDT in NR Sony discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110400](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110400.zip) Anchor relocation during SDT CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110594](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110594.zip) Small data transmission with RA-based schemes Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110624](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110624.zip) Discussion on RA-based small data transmission Google Inc. discussion NR\_SmallData\_INACTIVE-Core

[R2-2110760](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110760.zip) Remaining issues on RACH based SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107993](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107993.zip)

[R2-2110810](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110810.zip) RA specific aspects for SDT Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110984](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110984.zip) Switching cases of SDT and non-SDT LG Electronics Inc. discussion NR\_SmallData\_INACTIVE-Core

[R2-2111002](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111002.zip) Discussion on fallback to legacy RA for RA-SDT ASUSTeK discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2111038](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111038.zip) Discussion on RACH based SDT CMCC discussion Rel-17 NR\_SmallData\_INACTIVE-Core

### 8.6.5 Aspects specific to CG based schemes

Including [Post114-e][508][SData] Open issues for CG-SDT (Qualcomm)

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.

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.

[R2-2110670](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110670.zip) Summary of [Post115-e][509][SDT] CG open issues (Xiaomi) Xiaomi Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core Late

*Proposal 2 (22/26): The CG-SDT is supported for the unlicensed band only when Rel-17 time allows.*

- Ericsson thinks that we should leave unlicensed out of the discussion for now

- Nokia thinks no need to capture anything for NR-U. Fine if it works, nothing to be done if not

*Proposal 3 (21/26): If the CG-SDT is supported for the unlicensed band, the Rel-16 CG of the unlicensed band is reused as the baseline for CG-SDT.*

*Proposal 4 (14 (Yes)/ 11 (No)): RAN2 is request to discuss whether the UE autonomous retransmission in licensed band is needed.*

*Proposal 5.a (21/24): If the UE autonomous retransmission is not needed for CG-SDT in licensed band and if the UE does not receive the feedback from the gNB while the CG-SDT timer is running, the UE keeps monitoring the PDCCH and waits for the expiry of the SDT failure timer. FFS whether the UE is allowed to transmit a new MAC PDU at the next CG occasion.*

*Proposal 5.b: If the UE autonomous retransmission is not needed for CG-SDT in licensed band and if the UE does not receive the feedback from the gNB while the CG-SDT timer is running, RAN2 is requested to discuss the following Options to determine the transmission status of the initial MAC PDU:*

* Option 1: THe UE assumes NACK.*

* Option 2: THe UE assumes ACK.*

*Proposal 6 (24/26): If the UE autonomous retransmission in licensed band is needed for CG-SDT, the UE autonomous retransmission is allowed during the whole period of the SDT procedure (i.e. not restricted in the initial CG transmission phase).*

- ZTE explains how it works without L1 feedback. LG explains that there are other mechanisms for feedback like MAC. Lenovo explains that this is similar to connected mode with dynamic grant. We have all the functionalities without something new. Ericsson also thinks that we use dynamic.

*Proposal 7 (17/24): If the UE autonomous retransmission is supported in licensed band, the UE autonomous transmission specified in Rel-16 URLLC is considered as the baseline.*

- Nokia doesn’t agree with this

- Huawei, CATT agrees. ZTE is fine with using URLLC. Xiaomi thinks that using any HARQ process from Nokia is an enhancements and benefits are not quite clear. LG clarifies that the same HARQ is used similar to URLLC. The UE uses the same HARQ process for retransmission. Interdigital, Lenovo, Ericsson, Apple, agree with LG.

*Proposal 8: RAN2 is requested to discuss the following options regarding the expiry of the “CG-SDT timer”*

* Option 1 (13/26): The UE autonomously retransmits the MAC PDU of CG-SDT upon the expiry of the “CG-SDT timer” .*

* Option 2 (11/26): The CG-SDT failure is triggered upon the expiry of the “CG-SDT timer”.*

- Huawei thinks we should not assume ACK when timer expires as there is no beam management. Option 1 is more useful.

- Nokia doesn’t think that autonomous retransmission is needed as it was never needed in licensed. Ericsson, CATT, Sony QC and Intel agree.

- Interdigital explains that for RA SDT we do have autonomous retransmission when we don’t get MsgB or 3 and if we don’t do it for CG then we won’t have a similar behaviour for RA and CG and there will be benefits to having autonomous retx. Apple thinks that aut. Retx is needed at least during initial tx phase, but support both. Vivo thinks that we should have automous tx so NW can have another chance to schedule the UE. LG thinks that it should be supported since even in connected it is supported. The NW doesn’t know if the UE even made an tx so there will be degradation and this will ensure some reliability otherwise CG SDT will not be useful. Lenovo agrees that it is useful as we don’t support beam and it should be support for subsequent. Samsung also supports.

- Nokia explains that we already have the RSRP threshold to ensure beam quality. Huawei thinks that ‘s for DL beam.

- ZTE thinks it is import for initial transmission. ZTE asks if Nokia support initial transmission.

*Proposal 9: During the running period of the “CG-SDT timer” in the initial CG transmission phase, the UE is required to monitor the following L1 signaling:*

* CS-RNTI PDCCH (26/26)*

* C-RNTI PDCCH (25/26)*

* L1 ACK (20/26)*

*Proposal 10: During the running period of the “CG-SDT timer” in the subsequent CG transmission phase, the UE is required to monitor the following L1 signaling:*

* CS-RNTI PDCCH (26/26)*

* C-RNTI PDCCH (26/26)*

* L1 ACK (21/26)*

*Proposal 11 (21/26):The “CG-SDT timer” starts at the first “valid” PDCCH occasion from the end of the CG-SDT PUSCH transmission. The first “valid” PDCCH occasion is defined in RAN1.*

*Proposal 12 (23/26): The “CG-SDT timer” can be started/restarted during the whole SDT period.*

- Nokia thinks this is related to autonomous retx. InterDigital and Huawei explains that it is not related and it is the timer that we have agreed in the past for PDCCH monitoring for retransmissions.

*Proposal 13:* *The UE restarts the “CG-SDT timer”:*

* upon the PUSCH retransmission indicated by the CS-RNTI PDCCH. (21/26)*

* after each CG-SDT transmission. (21/26)*

*Proposal 14: The “CG-SDT timer” stops:*

* When the UE receives L1 ACK for CG-SDT. (17/26)*

* When the UE receives RRC feedback messages (e.g. RRCResume, RRCSetup, RRCRelease and RRCReject). (16/26)*

|  |
| --- |
| **Agreements**1. The Rel-16 CG configuration mechanism in licensed band is reused the baseline for CG-SDT.
2. At least for initial transmission we will have a mechanism to allow the UE to transmit the message again. FFS for retransmission for subsequent.
3. The UE uses/selects the same HARQ process for retransmission
4. The “CG-SDT timer” starts at the first “valid” PDCCH occasion from the end of the CG-SDT PUSCH transmission. The first “valid” PDCCH occasion is defined in RAN1
5. The “CG-SDT timer” can be started/restarted during for initial and subsequent transmissions
6. The UE restarts the “CG-SDT timer” at least:
* upon the PUSCH retransmission indicated by the CS-RNTI PDCCH
* after each CG-SDT transmission

7. The “CG-SDT timer” stops at least:* When the UE receives RRC feedback messages (e.g. RRCResume, RRCSetup, RRCRelease and RRCReject)

8. The Rel-16 calculation on the HARQ process ID of the CG type-1 for licensed band is reused as the baseline for CG-SDT9. The UE is allowed to initiate subsequent UL data transmission only after the reception of confirmation of initial transmission from the gNB10. The UE can use multiple CG resources for the HARQ initial transmission as Rel-16 in the subsequent CG transmission phase11. The following CG-SDT configurations are per UE: The new TA timer in RRC\_INACTIVE The RSRP change threshold for TA validation mechanism in SDT The SSB RSRP threshold for beam selection |

[R2-2109441](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109441.zip) Supporting Small Data Transmission via CG PUSCH vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2107057](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107057.zip)

[R2-2109528](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109528.zip) TAT-SDT expiry handing during the CG-SDT procedure Samsung Electronics Co., Ltd discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109592](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109592.zip) Details of CG based SDT Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109623](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109623.zip) CG-SDT leftover issues Intel Corporation discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109645](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109645.zip) Discussion on left issue for CG-SDT resource release SHARP Corporation discussion NR\_SmallData\_INACTIVE-Core

[R2-2109771](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109771.zip) Discussion on the procedure of CG-SDT OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2109772](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109772.zip) Discussion on handling of CG-SDT resources OPPO discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110034](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110034.zip) CG specific SDT procedure Apple discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110183](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110183.zip) CG-based schemes for SDT Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110245](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110245.zip) Further details on CG based small data transmission Lenovo, Motorola Mobility discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110248](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110248.zip) Additional aspects of CG based SDT Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110401](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110401.zip) Remaining issues for CG-SDT CATT discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110574](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110574.zip) Open issues for CG based SDT ZTE Corporation, Sanechips discussion Rel-17 Revised

[R2-2110625](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110625.zip) Discussion on CG-based small data transmission Google Inc. discussion NR\_SmallData\_INACTIVE-Core

[R2-2110671](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110671.zip) Remaining issues of CG SDT in RAN2 Xiaomi Communications discussion Rel-17 NR\_SmallData\_INACTIVE-Core [R2-2108792](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2108792.zip)

[R2-2110761](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110761.zip) Remaining issues on CG based SDT Qualcomm Incorporated discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110764](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110764.zip) CG-SDT Switch to RA during subsequent transmissions NEC Telecom MODUS Ltd. discussion

[R2-2110914](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110914.zip) CG-based SDT selection and configuration InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110961](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110961.zip) Discussion on open issues for CG based SDT China Telecommunications discussion

[R2-2110986](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110986.zip) Remaining CG-SDT issues in SDT LG Electronics Inc. discussion NR\_SmallData\_INACTIVE-Core

[R2-2111031](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111031.zip) Aspects specific to CG-SDT Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2111125](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111125.zip) Autonomous retransmission in CG-SDT LG Electronics Inc. discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2111185](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111185.zip) Discussion on CG based Small Data Transmission TCL Communication Ltd. discussion Rel-17 NR\_SmallData\_INACTIVE, NR\_SmallData\_INACTIVE-Core

[R2-2111199](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111199.zip) Open issues for CG based SDT ZTE Corporation, Sanechips discussion Rel-17 [R2-2110574](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110574.zip)

## 8.18 RACH indication and partitioning

Time budget: Equivalent to 0.5-1 TU

Tdoc Limitation: 2 tdocs

Expected to cover WIs SDT, CovEnh, RedCap, RAN slicing

[R2-2109572](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109572.zip) Discussion on general PRACH partition solution OPPO discussion Rel-17

[R2-2110037](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110037.zip) Common RACH Design Apple discussion Rel-17 NR\_cov\_enh-Core, NR\_slice-Core, NR\_SmallData\_INACTIVE-Core, NR\_redcap-Core

[R2-2110559](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110559.zip) RACH partitioning for Rel-17 features Ericsson discussion Rel-17

### 8.18.1 Common signalling framework

Discussion on [Post115-e][504][RACH Partitioning] Signalling Aspects (Ericsson) and any other input for RRC signalling (focus company tdocs on issues that are not addressed in [504] email)

[R2-2110270](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110270.zip) Report of [Post115-e][504][RACH Partitioning] Signalling Aspects (Ericsson) Ericsson discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core Late

[R2-2109442](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109442.zip) Discussion on RACH Partitioning in RA Configuration Aspect vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core

[R2-2109531](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109531.zip) Preamble and RACH resource configuration Samsung Electronics Co., Ltd discussion Rel-17 NR\_cov\_enh-Core, NR\_SmallData\_INACTIVE-Core, NR\_slice-Core Late

[R2-2109540](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109540.zip) Consideration on the common signalling framework for RACH partitioning Beijing Xiaomi Software Tech discussion Rel-17

[R2-2109881](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109881.zip) Support of RACH partitioning for multiple feature combinations Intel Corporation discussion Rel-17 NR\_cov\_enh-Core, NR\_redcap-Core, NR\_UE\_pow\_sav\_enh-Core, NR\_slice-Core

[R2-2110439](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110439.zip) Discussion on RACH partitioning for feature combinations CATT discussion Rel-17 NR\_cov\_enh-Core, NR\_slice-Core, NR\_SmallData\_INACTIVE-Core, NR\_redcap-Core

[R2-2110577](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110577.zip) Control plane aspects of RACH partitioning ZTE Corporation, Sanechips discussion Rel-17

[R2-2110597](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110597.zip) Common signalling for RACH indication and partitioning Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_slice-Core, NR\_redcap-Core, NR\_cov\_enh-Core

[R2-2110713](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110713.zip) RACH configuration signalling for Feature Combinations Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core

[R2-2111163](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111163.zip) Discussion on signalling aspects on RACH partitioning features LG Electronics Inc. discussion NR\_SmallData\_INACTIVE-Core, NR\_slice-Core, NR\_redcap-Core, NR\_cov\_enh-Core

### 8.18.2 Common aspects of RACH procedure

RACH procedure and input for handling of the common MAC aspects including handling of RACH initiation, retransmissions etc

**From [AT116-e][112][CovEnh] Coverage enhancements aspects (ZTE)**

Working Assumptions (to be confirmed in the common RACH session):

1. From CE perspective, carrier selection and BWP selection are performed ahead of CE selection during RACH procedure.

2. From CE perspective, UE compares the RSRP of DL path-loss reference with the Msg3 repetition threshold [rsrp-Threshold-Msg3Rep] during the RACH initialization procedure and decides whether to use CE or non-CE RA.

3. From CE perspective, if CE RA is selected, then the decision doesn’t change during the entire RACH procedure (i.e. until RACH failure).

**Priority order for subset of features**

[R2-2109452](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109452.zip) Selection and fallback between RACH partitions Qualcomm Incorporated discussion Rel-17

**RNTI collision**

[R2-2110560](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110560.zip) RNTI collision problem for Rel-17 features Ericsson discussion Rel-17

Proposal 1 The additional PRACH configurations can use the RNTI addresses that are not used by the legacy PRACH configuration in that specific scenario

Proposal 2 A custom offset, signalled through RRC and associated to each PRACH configuration, is added in the formula for RA-RNTI and/or MSGB-RNTI. The legacy PRACH configuration it is assumed to have offset = 0

[R2-2110598](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110598.zip) MAC aspects for RACH partitioning Huawei, HiSilicon discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_slice-Core, NR\_redcap-Core, NR\_cov\_enh-Core

 Observation 1: Legacy UEs are not required to decode RAR/MSGB for Rel-17 feature and feature combination.

Observation 2: With the introduction of feature and feature combination specific RA configurations, it will be extremely hard, if not impossible, to resolve RNTI collision issue by network implementation (e.g. it may be impossible for the network to configure ROs of different features and feature combinations at different time).

Proposal 6: To avoid RA-RNTI/MSGB-RNTI collision issue, the network should be able to (optionally) configure a feature (combination) specific search space for RAR/MSGB monitoring.

**Overall UP procedure**

[R2-2110578](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110578.zip) User plane aspects of RACH partitioning ZTE Corporation, Sanechips discussion Rel-17

[R2-2109532](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109532.zip) RA Procedure Aspects Samsung Electronics Co., Ltd discussion Rel-17 NR\_cov\_enh-Core, NR\_SmallData\_INACTIVE-Core, NR\_slice-Core

[R2-2109542](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109542.zip) Considerations on the common aspects of RACH procedure Beijing Xiaomi Software Tech discussion Rel-17

[R2-2109882](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2109882.zip) RACH resource/configuration selection and fallback mechanism Intel Corporation discussion Rel-17 NR\_cov\_enh-Core, NR\_redcap-Core, NR\_UE\_pow\_sav\_enh-Core, NR\_slice-Core

[R2-2110260](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110260.zip) Discussion on RACH indication and partitioning CMCC discussion Rel-17

[R2-2110665](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110665.zip) Overview of RACH resource selection NEC discussion Rel-17 NR\_redcap-Core, NR\_cov\_enh-Core, NR\_SmallData\_INACTIVE-Core, NR\_slice-Core

[R2-2110813](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110813.zip) Selection of RACH partition Nokia, Nokia Shanghai Bell discussion Rel-17 NR\_SmallData\_INACTIVE-Core

[R2-2110917](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110917.zip) RACH indication and partitioning InterDigital discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core

[R2-2110927](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2110927.zip) Discussion on RACH Partitioning in RA Procedure Aspect vivo discussion Rel-17 NR\_SmallData\_INACTIVE-Core, NR\_cov\_enh-Core, NR\_redcap-Core, NR\_slice-Core [R2-2107058](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2107058.zip)

[R2-2111164](file:///C%3A%5CUsers%5Cpanidx%5COneDrive%20-%20InterDigital%20Communications%2C%20Inc%5CDocuments%5C3GPP%20RAN%5CTSGR2_116-e%5CDocs%5CR2-2111164.zip) Discussion on common RA procedure for RACH partitioning features LG Electronics Inc. discussion NR\_SmallData\_INACTIVE-Core, NR\_slice-Core, NR\_redcap-Core, NR\_cov\_enh-Core