**3GPP TSG RAN meeting #97 DRAFT RP-222218**

**Electronic Meeting, September 12-16, 2022**

## Status Report to TSG

**Agenda item:** 9.2.11

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **WI / SI Name** | Study on XR Enhancements for NR | | | | |
| included in this status report | Study Item:  Yes | Core part:  No | Performance part:  No | | Testing part:  No |
| **Acronym** | FS\_NR\_XR\_enh | | | | |
| **Unique ID** | 940087 | | | | |
| **TSG Tdoc of latest approved WI/SI description (if any)** | [RP-220285](http://3gpp.org/ftp/tsg_ran/TSG_RAN/TSGR_95e/Docs/RP-220285.zip) | | | | |
| **Target Completion Date**  **(indicate if changed)** | Study Item: 12/2022 | Core part: N/A | Performance part: N/A | Testing part: N/A | |
| **Overall Completion level** | Study Item:  30% | Core part: N/A | Performance Part: N/A | Testing part: | |

**Source:**

|  |  |  |
| --- | --- | --- |
| **Leading WG** | | RAN2 |
| **Rapporteur** | **Name** | Benoist Sébire |
| **Company** | Nokia |
| **Email** | benoist.sebire@nokia.com |

## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

The TR is not 60% complete and version 1.0.0 could not be submitted for information to this meeting.

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

## 2.1 RAN1

#### 2.1.1 Agreements

**RAN1 #109-e (May 2022)**

**Agreement**

The TR skeleton (in R1-2205329) for TR 38.835 Study on XR enhancements for NR is endorsed from RAN1 perspective. Send LS to RAN2 to convey this agreement. The LS to RAN2 is endorsed in R1-2205443.

XR specific power saving techniques

**Agreement**

Rel-17 evaluation methodology for XR power saving captured in TR 38.838 is used as the baseline evaluation methodology for UE power evaluation of Rel-18 SI on XR enhancements

**Agreement**

Companies are encouraged to compare performance of the following Rel-15/16/17 features with the proposed enhancements for Rel-18 XR power saving evaluations. Power saving gain is calculated w.r.t. the AlwaysOn baseline.

* Rel-15/16 CDRX including long DRX cycle, short DRX cycle and DRX command MAC CE and DCP
* Rel-17 PDCCH adaptation including PDCCH skipping and SSSG switching

Note: up to companies to report the configuration of the Rel-15/16/17 features

**Agreement**

For power saving study of Rel-18 XR SI, CDRX enhancements to evaluate in this study item are to be selected from the following:

* High priority Issue 1-1: Alignment between CDRX and XR traffic for resolving the mismatch between CDRX cycle and XR traffic periodicity for each flow
* High priority Issue 1-2: C-DRX enhancements to handle jitter
* Medium priority Issue 1-3: CDRX enhancements for multiple XR traffic flows [Note 2]
* Low priority Issue 1-4: CDRX enhancements to adjust to variable burst sizes and frame rate
  + Note: Some companies think the adjustment for variable burst sizes can be realized by existing spec already
* Low priority Issue 1-5: low latency handling
* Low priority Issue 1-6: SFN wraparound mismatch (if handled in RAN1)

FFS: how the solutions or the combination of the solutions can handle all the identified issues.

Note 1: Other considerations are not precluded

Note 2: It can also be adopted for addressing issue 1-1

Note 3: Companies are encouraged to clarify or provide more details of the proposed solutions, for addressing concerns from the group.

Additional details can be found in R1-2205411.

**Agreement**

For power saving study of Rel-18 XR SI, PDCCH monitoring enhancements to evaluate in this study item are to be selected from the following

* Low priority Issue 2-1: Alignment between PDCCH monitoring and XR traffic to resolve the mismatch between PDCCH monitoring periodicity and XR traffic periodicity.
  + Note: some companies think Rel-17 PDCCH monitoring adaptation can solve issue 2-1 or achieve similar intended outcome
  + Note: Solutions proposed for Issue 2-1 and those proposed for Issue 1-1 are motivated by the same issue, namely non-integer XR traffic periodicity. It is to be studied how they compare in in terms of power saving gain and capacity, (a) solutions proposed for Issue 1-1; (b) solutions proposed for Issue 2-1.
* Low priority Issue 2-2: XR-dedicated PDCCH monitoring window to supplement CDRX for multi-flow traffic.
  + Note: some companies think Rel-17 PDCCH monitoring adaptation can solve issue 2-2 or achieve similar intended outcome
  + Note: Solutions proposed for Issue 2-2 and those proposed for Issue 1-3 are motivated by the same issue, namely multiple XR traffic flows. It is to be studied how they compare in in terms of power saving gain and capacity, (a) solutions proposed for Issue 1-3; (b) solutions proposed for Issue 2-2.
* High priority Issue 2-3: Enhancements to Rel-17 PDCCH monitoring adaptation.
  + Note: Discussion on some enhancements may depend on the outcome of Rel-17 PDCCH monitoring adaptation maintenance
  + Note: The study on enhancement to R17 PDCCH monitoring adaptation should focus on the techniques that are used for addressing XR-specific issues, e.g., jitter

Note 1: Other considerations are not precluded

Note 2: Companies are encouraged to clarify or provide more details of the proposed solutions, for addressing concerns from the group.

**Agreement**

For Rel-18 XR power saving enhancements, RAN1 further discusses by RAN1 #110 whether the issues below are to be addressed, and if so, which solutions should be selected for evaluation in this study item. These issues are low priority.

* Issue 3-1: Misaligned UE transmission and reception.
* Issue 3-2: Power saving by XR-aware scheduling.
  + Note 1b: XR SI objective has XR-awareness in RAN listed as a specific topic of RAN2 study
* Issue 3-3: Unnecessary data transmission in allocated resources.

Note 1: Rel-18 XR SI objective only has CDRX enhancements and PDCCH monitoring enhancements explicitly listed as focus of RAN1 study

Note 2: Other considerations are not precluded

**Conclusion**

* If no evaluation result is provided by any company for an issue, the issue is deprioritized. The issue and proposed enhancements for the issue will not be captured by RAN1 in TR 38.835.
* If no evaluation result is provided by the proponent company for a proposed enhancement, the proposed enhancement is deprioritized. The proposed enhancement will not be captured by RAN1 in TR 38.835.
* If multiple enhancement techniques are proposed for the same issue, there can be down selection among them for the consideration of candidate enhancement for study item recommendation by RAN1 at least based on performance (power saving and capacity), spec impact, signaling overhead and implementation complexity.
* Companies are encouraged to provide detailed information for both the proposed enhancement and the existing power saving features used as the performance reference so that the evaluation results for both can be reproduced by other companies.
* When using existing power saving features as the performance reference, companies are encouraged to configure the existing power saving features to achieve the best performance.
* For evaluation of a proposed enhancement and evaluation of the existing power saving features as performance reference, companies are encouraged to provide the high load case (as defined in TR 38.838, Section A.2) results. Results for low load case can also be reported optionally.

XR-specific capacity enhancements techniques

**Agreement**

Rel-17 evaluation methodology for XR capacity enhancement captured in TR 38.838 is used as the baseline evaluation methodology for XR capacity enhancement of Rel-18 SI on XR enhancements.

**Conclusion**

Study of network coding for capacity enhancements during Rel-18 XR SI is down prioritized in RAN1.

**Agreement**

* For each candidate capacity enhancement technique for XR traffic, companies are encouraged to consider the following *common principle for assessment of the candidate capacity enhancement technique*:
  + Identify the XR-specific issue(s) that the enhancement technique is addressing
  + Identify the necessity of the enhancement technique to address the issues
  + Identify whether/how the enhancements provide benefit/performance capacity gain.
    - Consider at least feasibility, complexity, and system level performance evaluations in comparing the enhancement techniques. Power saving gains for a given enhancement technique can optionally be evaluated and considered in addition to these other aspects.
* The baseline scheduling scheme when comparing the proposed capacity enhancements techniques is:
  + Dynamic scheduling and/or
  + Semi-persistent scheduling / Configured grant scheduling
    - Note: Companies are encouraged to additionally use DG scheduling as the baseline scheduling scheme when showing the capacity performance gain

**Agreement**

* To support a candidate capacity enhancement technique for XR traffic, capacity performance gain by the technique as compared to baseline should be shown.
  + Capacity performance gain by the candidate technique as compared to baseline is a necessary condition to consider supporting the candidate technique.

**Conclusion**

Companies are encouraged to use the capacity Excel sheet attached with TR 38.838 in RP-213652 for recording the simulation results that are provided in their contributions.

**Agreement**

To study whether/how to support a candidate capacity enhancement technique for XR traffic based SPS/CG transmissions, companies are encouraged to consider the following studies:

* Study enhancements related to ~~support of~~ multiple PDSCHs SPStransmission occasions in a period
* Study enhancements related to multiple PUSCHs CG transmission occasions in a period
* Study enhancements related to dynamic adaptation of SPS/CG parameters/configurations
* Study enhancements related to non-integer periodicity for SPS/CG transmissions.
* Note: Other studies are not precluded, as well as the combination of the above studies.

Follow the common principle for assessment of the candidate capacity enhancement technique

**Agreement**

To study whether/how to support a candidate capacity enhancement technique for XR traffic based dynamic scheduling/grant transmissions, companies are encouraged to consider the following studies:

* Study enhancements related to extending capability of single DCI scheduling multi-PDSCHs/PUSCHs for FR2-2 to FR1/FR2.
* Note: whether and how to discuss enhancements may depend on the outcome of Rel-17 B52.6G UE feature discussion
* Study enhancements related to HARQ-ACK and/or CBG transmissions for single DCI scheduling one or multi PDSCH(s).
* Study enhancements related to allowing different configurations per PDSCH/PUSCH
* Study enhancement related to scheduling request and/or BSR with the focus on L1 enhancements.
* Note: Other studies are not precluded as well as the combination of the above studies.
* Follow the *common principle for assessment of the candidate capacity enhancement technique.*

**Conclusion**

It is common understanding that studying of RAN2 proposed techniques for XR-awareness information to improve XR capacity can be studied in RAN1 upon request from RAN2.

**Agreement**

The following lists the candidate enhancements techniques for link adaptation to improve XR capacity that are proposed by companies RAN1#109-e.

* At least the proponents are encouraged to justify the corresponding capacity benefits for XR traffic for considering potential study of these candidate enhancements techniques.
  + Delta MCS
  + Soft HARQ-ACK feedback
  + Cooperative MIMO scheme via precoding technique - bi-directional training
  + Enhanced link adaptation for CBG-based transmission
  + CSI report enhancements to address the different BLER requirements of different XR flows
* Follow the *common principle for assessment of the candidate capacity enhancement technique.*

**Agreement**

The following lists the candidate enhancements techniques based on measurement-gap link to improve XR capacity that are proposed by companies RAN1#109-e.

* At least the proponents are encouraged to justify the corresponding capacity benefits for XR traffic for considering potential study of these candidate enhancements techniques.
  + Dynamic L1 based MG activation/deactivation.
  + Reuse current R16/R17 RRM relaxation condition to allow scheduling in MG to transform the R16/R17 RRM power saving gain into capacity gain.
* Follow the *common principle for assessment of the candidate capacity enhancement technique.*

**Agreement**

The following lists the candidate enhancements techniques to improve XR capacity that are proposed by companies RAN1#109-e.

* At least the proponents are encouraged to justify the corresponding capacity benefits for XR traffic for considering potential study of these candidate enhancements techniques.
  + Inter-UE/intra-UE multiplexing techniques, including e.g. finer granularity preemption indication
* Follow the *common principle for assessment of the candidate capacity enhancement technique.*

**RAN1 #110 (August 2022)**

XR specific power saving techniques

**Conclusion**

Conclude that “SFN wraparound mismatch” is a RAN2 issue. It can be left to RAN2 to address. RAN1 does not further study it.

**Agreement**

RAN1 recommends identifying a solution for enhancement of CDRX to align with XR traffic periodicity

**Conclusion**

RAN1 does not assume instantaneous jitter value for a frame is predictable for Rel-18 XR SI power saving study before further input is provided by SA.

**Conclusion**

All the proposed PDCCH monitoring adaptation/reduction schemes including those for jitter handling need to be compared against the Rel-17 PDCCH monitoring adaptation which is to be used as performance reference.

**Conclusion**

UE transmission and reception alignment for Issue 3-1 is deprioritized for power saving in Rel-18 XR SI.

**Conclusion**

RAN1 does not assume dynamic switch of different XR video data rates or frame rates for Rel-18 XR power saving study before further input is provided by SA.

**For future meetings**

Companies are encouraged to account the enhancement of CDRX to align with XR traffic periodicity in their further evaluations for XR power saving enhancements.

**Conclusion**:

* Companies are requested to use the Excel sheet attached with TR 38.838 in RP-213652 for recording the simulation results that are provided in their contributions.

XR-specific capacity enhancements techniques

**Agreement**

RAN1 to make decision on the following in RAN1#110bis-e

* Support single DCI scheduling multi-PDSCHs/PUSCHs which is currently supported for FR2-2 to other SCS in FR1/FR2

**Conclusion**

There is no consensus in RAN1 on the benefits of enhancing SPS for the purpose of XR capacity enhancement

**Agreement**

When DG is used as the baseline scheme, for the performance evaluation scheduling, after SR is triggered, both BSR and UL data can be transmitted using the UL grant after SR.

* Companies are encouraged to provide the size of resources by the first UL grant after SR

**Agreement**

Whether/how to enhance BSR to improve capacity performance of XR traffic is within RAN2 scope and is not handled by RAN1.

* Note that companies should indicate if and what BSR enhancement is assumed in their RAN1 proposals on CG and DG enhancements.
* RAN1 can evaluate BSR enhancement to improve capacity performance

**Agreement**

Deprioritize the study of CQI report for different BLER and/or different XR traffic to improve XR capacity performance.

**Agreement**

Deprioritize the study of intra/inter UE prioritization/multiplexing enhancements to improve XR capacity performance.

**For future meetings:**

Companies are **requested to follow** the following agreement and conclusion from RAN1#109-e. Check final FL summary for details.

* **Agreement**
  + Rel-17 evaluation methodology for XR capacity enhancement captured in TR 38.838 is used as the baseline evaluation methodology for XR capacity enhancement of Rel-18 SI on XR enhancements.
* **Conclusion**
  + Companies are encouraged to use the capacity Excel sheet attached with TR 38.838 in RP-213652 for recording the simulation results that are provided in their contributions.

#### 2.1.2 Remaining Open issues

In accordance of the SID:

- Discuss & evaluate XR-specific power saving and capacity improvements;

- Identify most potential candidate enhancements and capture them in the TR;

- Provide conclusions on beneficial candidate enhancements for XR-specific power saving and capacity.

## 2.2 RAN2

#### 2.2.1 Agreements

Agreements from **RAN2#119-e** meeting:

- RAN2 does not intend to ask RAN1 to change their simulation assumptions;

- RAN2 should take SA2/SA4 work into account.

- RAN2 assumes that PDU Set based parameters and PDU Set related information may be used for better support of XR services. RAN2 can consider both UL and DL directions.

- RAN2 will study PDU Set based parameters and PDU Set related information handling in Network and UE.

- RAN2 to adopt the current SA2 definition of PDU Set as an application media unit as working assumption, subjected to further guidance from SA2 and SA4.

- XR awareness discussion in RAN2 should consider PDU set characteristics and how to use the information available on those (for UL and/or DL). Can also consider how to handle data bursts.

- RAN2 can study e.g. periodicity, arrival time, jitter and frame-size variations for XR awareness to enable power savings and capacity enhancements. Can study also how often such parameters change (i.e. how dynamic they are).

- RAN2 can consider how PDU sets can be mapped to DRBs (FFS if SA2 discussion on PDU set mapping to QoS (sub-)flows impacts this).

- RAN2 to focus on the following issues for power saving, as well necessary parameters XR-awareness to support such enhancements, i.e.:

- DRX enhancements to address the issues of DRX cycle mismatch and jitter;

- Identify necessary parameters from CN for XR-awareness for power saving.

- Enhancements to Rel-17 PDCCH adaptation can be discussed based on RAN1 feedback, if they have any RAN2 impact.

- RAN2-specific aspects can be studied based on contributions (e.g. multiple XR traffic flows with different periodicities, SFN wrap-around, RAN2-specific CDRX aspects, …).

- As starting point, RAN2 can further discuss the solutions in TR 38.838 that can impact on L2 operation (e.g., BSR, LCP, assistance information for scheduling, packet discarding, prioritization) for XR-specific capacity improvement. RAN2-specific solutions are not precluded (even if RAN1 hasn’t discussed them before).

- Enhancement to SPS/CG should be justified for XR scheduling and should be evaluated against dynamic grant (DG) scheduling which should be considered as baseline. Should justify why enhancements are needed.

- RAN2 considers SPS enhancements may not be needed in Rel-18 XR since PDCCH capacity is not assumed to be a problem for XR. FFS if SPS has some power consumption benefits.

#### 2.2.2 Open Issues

In accordance of the SID:

- Identify mechanisms for XR-awareness;

- Discuss & evaluate XR-specific power saving and capacity improvements;

- Identify most potential candidate enhancements and capture them in the TR.

## 3. Detailed progress in SA WGs since last TSG meeting (for all involved WGs)

## 3.1 SA2

The SA2 status report is available in S2-2206987.

A number of key issues affect RAN1 and RAN2 and LSs are exchanged when needed.

## 4. References

**TR 38.835**

Latest version in R2-2209220.

**RAN1#109-e**

1. R1-2204673, TR 38.835 Skeleton for Study on XR enhancements for NR, Rapporteur (Nokia)
2. R1-2205053, Work plan for Rel-18 SI on XR enhancements for NR, Qualcomm Incorporated
3. R1-2205329, TR 38.835 Skeleton for Study on XR enhancements for NR, Rapporteur (Nokia)
4. R1-2205419, [Draft] LS on draft TR 38.835 skeleton, Nokia
5. R1-2205420, LS on draft TR 38.835 skeleton, RAN1, Nokia
6. R1-2205443, LS on draft TR 38.835 skeleton, RAN1, Nokia
7. R1-2203131, Discussion on XR-specific power saving techniques, Huawei, HiSilicon
8. R1-2203348, Discussion on XR specific power saving techniques, Spreadtrum Communications
9. R1-2203484, UE Power saving techniques for XR, CATT
10. R1-2203585, Discussion on XR specific power saving enhancements, vivo
11. R1-2203606, Discussion on XR specific power saving techniques, ZTE, Sanechips
12. R1-2203638, Discussion on power saving enhancements for XR, Ericsson
13. R1-2203666, Discussion on XR enhancement for NR, China Telecom
14. R1-2203744, Considerations on power saving techniques for XR, Sony
15. R1-2203927, Considerations on XR-specific Power Savings, Samsung
16. R1-2203940, Discussion on XR specific power saving techniques, NEC
17. R1-2204028, Discussion on XR specific power saving techniques, OPPO
18. R1-2204123, Discussion on XR specific power saving enhancements, InterDigital, Inc.
19. R1-2204177, XR specific power saving techniques, TCL Communication Ltd.
20. R1-2204264, Views on XR specific power saving techniques, Apple
21. R1-2204326, Discussion on XR-specific power saving techniques, CMCC
22. R1-2204400, Discussion on XR specific power saving techniques, NTT DOCOMO, INC.
23. R1-2204414, XR-specific power saving techniques, Lenovo
24. R1-2204444, Discussion on XR specific power saving techniques, ITRI
25. R1-2204633, Discussion on XR-specific power saving techniques, LG Electronics
26. R1-2204655, Discussion on power saving techniques for XR, ETRI
27. R1-2204674, Discussion on XR-specific power saving enhancements, Nokia, Nokia Shanghai Bell
28. R1-2204698, On XR specific power saving techniques, MediaTek Inc.
29. R1-2204818, Discussion on power saving enhancements for XR applications, Intel Corporation
30. R1-2205054, Power saving techniques for XR, Qualcomm Incorporated
31. R1-2205055, Moderator Summary#1 on XR specific power saving techniques, Qualcomm Incorporated
32. R1-2205176, Power saving techniques for XR, Qualcomm Incorporated
33. R1-2205410, Moderator Summary#2 on XR specific power saving techniques, Moderator (Qualcomm)
34. R1-2205411, Moderator Summary#3 on XR specific power saving techniques, Moderator (Qualcomm)
35. R1-2205412, Final Moderator Summary on XR specific power saving techniques, Moderator (Qualcomm)
36. R1-2205413, Draft Reply LS on UE Power Saving for XR and Media Services, Moderator (Qualcomm)
37. R1-2205530, Draft Reply LS on UE Power Saving for XR and Media Services, Moderator (Qualcomm)
38. R1-2205531, Reply LS on UE Power Saving for XR and Media Services, RAN1, Qualcomm
39. R1-2203065, XR Capacity Evaluation and Enhancements, FUTUREWEI
40. R1-2203132, Discussion on XR-specific capacity enhancements techniques, Huawei, HiSilicon
41. R1-2203349, XR capacity consideration, Spreadtrum Communications
42. R1-2203485, NR enhancement for XR capacity improvement, CATT
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44. R1-2203607, Discussion on XR specific capacity enhancements techniques, ZTE, Sanechips
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51. R1-2204124, Discussion on XR specific capacity enhancements, InterDigital, Inc.
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53. R1-2204178, XR-specific capacity enhancements techniques, TCL Communication Ltd.
54. R1-2204265, Views on XR specific capacity enhancements techniques, Apple
55. R1-2204327, Discussion on XR-specific capacity enhancements techniques, CMCC
56. R1-2204401, Discussion on XR specific capacity improvement enhancements, NTT DOCOMO, INC.
57. R1-2204415, XR-specific capacity enhancement techniques, Lenovo
58. R1-2204634, Discussion on XR-specific capacity enhancement techniques, LG Electronics
59. R1-2204656, Discussion on capacity enhancements techniques for XR, ETRI
60. R1-2204675, Discussion on XR-specific capacity enhancements, Nokia, Nokia Shanghai Bell
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62. R1-2204759, Discussion on potential SPS enhancements for XR, CEWiT
63. R1-2204819, Discussion on capacity enhancements for XR applications, Intel Corporation
64. R1-2205056, Capacity enhancement techniques for XR, Qualcomm Incorporated
65. R1-2205072, Discussion on XR-specific capacity enhancements techniques, FGI
66. R1-2205265, FL Summary#1 – Study on XR Specific Capacity Improvements, Moderator (Ericsson)
67. R1-2205266, FL Summary#2 – Study on XR Specific Capacity Improvements, Moderator (Ericsson)
68. R1-2205267, FL Summary#3 – Study on XR Specific Capacity Improvements, Moderator (Ericsson)
69. R1-2205268, FL Summary#4 – Study on XR Specific Capacity Improvements, Moderator (Ericsson)
70. R1-2203486, XR awareness scheduling and QoS control, CATT
71. R1-2203587, Discussion on other aspects for XR specific RAN enhancements, vivo
72. R1-2203608, Consideration about XR services, ZTE, Sanechips
73. R1-2203640, Discussion on XR-Awareness, Ericsson
74. R1-2204125, Discussion on XR-Awareness, InterDigital, Inc.
75. R1-2204266, Considerations on enhancements for XR, Apple
76. R1-2204635, Other aspects of XR enhancements for NR, LG Electronics
77. R1-2204676, Performance results of XR-related enhancements, Nokia, Nokia Shanghai Bell
78. R1-2204820, Views on XR specific RAN enhancement in QoS, III
79. R1-2204908, Discussion on XR-specific capacity and power issues based on SA2 outcome, Huawei, HiSilicon

**RAN2#119**

1. R2-2206917, LS on draft TR 38.835 skeleton (R1-2205443; contact: Nokia), RAN1
2. R2-2206923, Reply LS on UE Power Saving for XR and Media Services (R1-2205531; contact: Qualcomm), RAN1
3. R2-2206964, LS on QoS support with PDU Set granularity (S2-2201803; contact: Intel), SA2
4. R2-2206966, LS on UE Power Saving for XR and Media Services (S2-2203418; contact: Nokia), SA2
5. R2-2206969, LS Reply on QoS support with PDU Set granularity (S4-220505; contact: Qualcomm), SA4
6. R2-2207042, Draft reply LS on UE power savings for XR and media services, Qualcomm Incorporated
7. R2-2207043, Draft reply LS on RAN feedback for low latency, Qualcomm Incorporated
8. R2-2207371, Work Plan for Rel-18 SI on XR Enhancements for NR, Nokia, Qualcomm (Rapporteurs)
9. R2-2207372, XR TR Structure, Nokia (Rapporteur)
10. R2-2207373, TR 83.835 v001, Nokia (Rapporteur)
11. R2-2207374, TR 83.835 v002, Nokia (Rapporteur)
12. R2-2207375, XR Overview TP, Nokia (Rapporteur)
13. R2-2207376, Draft LS to SA4 on Pose Information for XR, Nokia (Rapporteur)
14. R2-2208316, Discussion of SA2 LS on UE Power Saving for XR and Media Services, Meta Ireland
15. R2-2207044, XR-awareness in RAN, Qualcomm Incorporated
16. R2-2207117, XR awareness: RAN2 areas of interest, assumptions, and inputs to SA2 LS, Intel Corporation
17. R2-2207118, Solution Directions for XR Specific Differentiated Traffic Handling and Packet Dropping, Intel Corporation
18. R2-2207197, Discussion on XR-awareness, NTT DOCOMO, INC.
19. R2-2207210, Discussing on XR-awareness in RAN, Xiaomi Communications
20. R2-2207366, Discussion on XR-awareness, TCL Communication
21. R2-2207377, XR Awareness in SA2, Nokia (Rapporteur)
22. R2-2207429, Considerations on XR-awareness, QoS-metrics, and XR-specific traffic handling, Apple
23. R2-2207489, Discussion on XR-awareness, InterDigital, Inc.
24. R2-2207508, XR requirements and issues, CATT
25. R2-2207680, Discussion on RAN awareness of XR traffic characteristics, Spreadtrum Communications
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29. R2-2207780, Discussion on XR-awareness, KT Corp.
30. R2-2207801, Discussion on XR-awareness in RAN, OPPO
31. R2-2207831, Considerations on XR awareness, Sony
32. R2-2207893, XR-awareness techniques, Google Inc.
33. R2-2207926, First steps for XR handling, Vodafone GmbH
34. R2-2207980, RAN level protocol enhancements for XR awareness, ZTE Corporation, Sanechips
35. R2-2207991, Views on XR-specific handling at RAN, Huawei, HiSilicon
36. R2-2207998, On RAN awareness of XR traffic characteristics, MediaTek Inc.
37. R2-2208021, Draft LS on first steps for XR handling, Vodafone GmbH
38. R2-2208223, RAN behaviour for XR-awareness QoS, ETRI
39. R2-2208259, Discussion on XR awareness, Samsung
40. R2-2208313, Discussion on XR-Awareness RAN , Meta Ireland
41. R2-2208321, Discussion on XR-awareness, LG Electronics Inc.
42. R2-2208443, Consideration on XR-awareness in RAN, CMCC
43. R2-2208618, Discussion on XR traffic characteristics, Futurewei
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45. R2-2206986, Discussion on XR-specific power saving, FGI
46. R2-2206996, Discussion on CDRX enhancement for XR, OPPO
47. R2-2207045, Power saving enhancements for XR, Qualcomm Incorporated
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