**3GPP TSG-RAN RAN2 #122 R2-23xxxxx**

**Incheon, Korea, 22 – 26 May, 2023**

**Agenda Item:**  **7.13.4 SHR and SPCR**

**Source: Huawei (email rapporteur)**

**Title:** **Pre-meeting summary of 7.13.4**

**Document for: Discussion and Decision**

# 1 Introduction

This is the email report of pre-meeting summary for 7.13.4 SHR and SPCR.

According to Skeleton v2, the relevant Tdocs are listed below:

[1] R2-2305324 Remaining issues on SPR vivo discussion

[2] R2-2305422 Discussion on SON for inter-RAT SHR Nokia, Nokia Shanghai Bell discussion

[3] R2-2305423 SPR and SHR related enhancements Nokia, Nokia Shanghai Bell discussion

[4] R2-2305484 Further discussion on inter-RAT SHR and SPR CATT discussion

[5] R2-2305617 SON enhancement for SPR CMCC discussion Withdrawn

[6] R2-2305667 SON/MDT enhancements for SHR and SPR Samsung R&D Institute India discussion

[7] R2-2305704 Discussion on Successful Handover Report Lenovo discussion

[8] R2-2305705 SON enhancements for SPR Lenovo discussion

[9] R2-2306204 SON enhancement for SPR SHARP Corporation discussion

[10] R2-2306246 Remaining issues on SHR and SPCR ZTE Corporation, Sanechips discussion

[11] R2-2306292 Discussion on SHR and SPR Huawei, HiSilicon discussion

[12] R2-2306462 Discussion on SPR NTT DOCOMO, INC. discussion

The following papers are also added here (previously put under 7.13.1). [13] is the RAN3 LS on intra-system inter-RAT SHR and SPR. [14] is to address the question from RAN3, i.e. the feasibility of the scenario of SHR during successful inter-RAT HO (LTE to NR).

[13] R2-2304630 LS on intra-system inter-RAT SHR and SPR (R3-232140; contact: Huawei) RAN3 LS in Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core To:RAN2

[14] R2-2306290 Discussion on RAN2 impacts due to the LS R3-232140 Huawei, HiSilicon discussion

The following paper is also added here as some sections are relevant to SHR and SPR.

[15] R2-2305987 Mobility Robustness Optimization – all topics Ericsson discussion

# 2 Discussion

## 2.1 Inter-RAT SHR

Relevant proposals:

|  |  |  |
| --- | --- | --- |
| **Tdoc** | **Company** | **Proposals** |
| [2], R2-2305324 | Nokia | **(for the need of C-RNTI inter-RAT SHR)**  **Observation 1: The root cause of a T310 or T312 triggered inter-RAT SHR is obvious, and C-RNTI information is not needed for timing related MRO purpose.**  **Observation 2: UE context information is not needed for the genuine MRO root cause analysis.**  **Observation 3: UE context information is only beneficial if a UE needs to be individually identified. If UE-type specific mobility parameters require UE-type specific MRO instances, the IE “mobility information” introduced with Rel-11 can be used.**  **Proposal 1: SHR should follow the C-RNTI usage and definition from RLF report.**  **Proposal 2: RAN WG2 should first specify the purpose of C-RNTI in SHR for inter-RAT if its definition should deviate from RLF report.**  **(for the need of time between SHR generating and fetching)**  **Observation 4: The time between SHR generation and fetching by the network is rather arbitrary and therefore less meaningful.**  **Proposal 3: The time between SHR generation and fetching by the network is meaningless and its inclusion in the SHR is not needed.**  **(for correlation of NR SHR and LTE RLF Report)**  **Observation 5: To correlate a subsequent occurrence of NR SHR and LTE RLF by means of C-RNTI and time measurement is too cumbersome.**  **Observation 6: The correlation can be derived from counter statistics provided that the SHR-related counter is separated into those where RLF immediately followed and those without.**  **Proposal 4: RAN WG2 supports that SHR is amended by an indicator if an RLF followed immediately after the SHR afflicted successful inter-RAT handover.** |
| [4], R2-2305484 | CATT | **Proposal 3: C-RNTI is not included in inter-RAT SHR from NR to LTE.**  **Proposal 4: Time between report generating and fetching is included in R18 inter-RAT SHR from NR to LTE.**  **Proposal 5: RAN2 confirms to support inter-RAT SHR from LTE to NR for T304 trigger.**  **Proposal 6: RAN2 confirms the following assumptions which included in RAN1’s LS:**   * **Target gNB can send SHR configuration (T304 trigger) to UE via NR container (targetRAT-MessageContainer) in MobilityFromEUTRACommand** * **UE stores this SHR configuration in NR format** * **If T304 trigger is met, UE records SHR in NR format** * **UE reports this SHR only to an gNB (either the target gNB or another gNB)**   **Proposal 7: Source LTE cell identity and target NR cell identity are included in inter-RAT SHR from LTE to NR.**  **Proposal 8: For inter-RAT HO from LTE to NR, a new EUTRA source cell CGI is introduced in inter-RAT SHR.** |
| [6], R2-2305667 | Samsung | **Proposal 4: Agree Option 2 as way forward for UE context retrieval i.e. if Mobility Information is sent to the UE together with the T310/T312 threshold configuration, then UE includes Mobility Information in the SHR.**  **Proposal 5: UE doesn’t include the time between report generation and fetching for Inter-RAT SHR.** |
| [7], R2-2305704 | Lenovo | **(for inter-RAT SHR from NR to LTE)**  **Proposal 3: For retrieval of UE context at source gNB during inter-RAT HO from NR to LTE, the UE can include source C-RNTI, and Time between HO command and SHR retrieval in the inter-RAT SHR.**  **Observation 3: When T310/T312 triggers inter-RAT SHR from NR to LTE, source gNB correlates inter-RAT SHR and LTE RLF Report in case that there is a RLF shortly after a successful inter-RAT HO from NR to LTE.**  **Proposal 4: When T310/T312 triggers inter-RAT SHR from NR to LTE, source C-RNTI can be included in the inter-RAT SHR.**  **(for inter-RAT SHR from LTE to NR)**  **Proposal 5: T304 trigger for inter-RAT SHR from LTE to NR is supported, but neither T310 nor T312 trigger for inter-RAT SHR from LTE to NR is supported.**  **Proposal 6: For inter-RAT SHR from LTE to NR:**   * **Target gNB can send SHR configuration (T304 trigger) to UE via NR container (targetRAT-MessageContainer) in MobilityFromEUTRACommand;** * **UE stores this SHR configuration in NR format;** * **If T304 trigger is met, UE records SHR in NR format;** * **UE reports this SHR only to an gNB (either the target gNB or another gNB).**   **Proposal 7: Inter-RAT SHR** **from LTE to NR can at least include:**   * **Source LTE cell identity** * **Target NR cell identity** * **Measurement results for source, target and neighbours** * **Cause to indicate which inter-RAT SHR triggering condition was met** * **UE location Information** |
| [10], R2-2306246 | ZTE | **Proposal 1: RAN2 confirms the assumption of RAN3’s LS(R2-2304630) on SHR collected for inter-RAT HO from LTE to NR:**  **SHR during successful inter-RAT HO (LTE to NR) is supported only if there is no impact on LTE, and below details are considered:**   * **Only T304 trigger is supported** * **Target gNB can send SHR configuration (T304 trigger) to UE via NR container (targetRAT-MessageContainer) in MobilityFromEUTRACommand** * **UE stores this SHR configuration in NR format** * **If T304 trigger is met, UE records SHR in NR format** * **UE reports this SHR only to an gNB (either the target gNB or another gNB)**   **Proposal 2: Introduce source EUTRA cell CGI in SHR collected for inter-RAT HO from LTE to NR.**  **Proposal 3: No need to include C-RNTI and Time between report generating and fetching in SHR collected for inter-RAT HO from NR to LTE.**  **Proposal 4: RAN2 wait for more progress in RAN3 to decide whether target C-RNTI is needed for SHR collected for inter-RAT HO from NR to LTE.** |
| [11], R2-2306292 | Huawei | **Observation 1: For inter-RAT SHR, the reception node directly forwards it to source NR node for inter-RAT HO from NR to LTE while to the target NR node for inter-RAT HO from LTE to NR, without UE context delivery between network nodes.**  **(from NR to LTE)**  **Proposal 1: Introduce source C-RNTI in inter-RAT SHR from NR to LTE.**  **Observation 2: C-RNTI can be re-allocated if released.**  **Proposal 2: Introduce time between reception of HO Command and inter-RAT SHR fetching in inter-RAT SHR from NR to LTE.**  **(from LTE to NR)**  **Proposal 3: For inter-RAT SHR from LTE to NR, below parameters is stored, reuse the existing IEs defined in R17 for intra-NR SHR:**   1. **target NR cell information** 2. **target NR C-RNTI**   **c. Measurement results for source, target and neighbours**  **d. Cause to indicate which inter-RAT SHR triggering condition (T304) was met**  **e. UE location Information**  **Proposal 4: A new EUTRA source cell CGI is introduced in inter-RAT SHR from LTE to NR.**  **Proposal 5: A new time information to indicate the time between HO command and SHR fetching in inter-RAT SHR from LTE to NR.** |
| [13], R2-2306290 | Huawei | **Observation 1: There are LTE impacts on UE capability scheme, including:**   * **Explicit UE capability indicator reported from UE to LTE network which impacts TS36.331** * **Define the UE capability information in TS36.306** |
| [15], R2-2305987 | Ericsson | **(from NR to LTE, Optimization of source node towards target)**  **Observation 17 Inter-RAT SHR cannot be used for improving the handover performance of the target (LTE) cell.**  **Proposal 17 RAN2 agree to enhance the inter-RAT SHR configuration with a triggering condition associated to the number of random accesses attempts toward the LTE cell.**  **Proposal 18 For Inter-RAT handover from NR to LTE, augment the SHR with a counter for the number of RA attempts made for the successful handover.**  **Proposal 19 For Inter-RAT handover from NR to LTE, augment the SHR with a flag on whether contention was observed for the successful handover.**  **Proposal 20 Also note that this behaviour is against a previous RAN2 agreement to not use T304. For this particular case, this agreement must be reverted.RAN2 to agree to allow the source (NR) node to configure triggers for T304 for inter-RAT SHR.**  **(from NR to LTE, UE logs the time since SHR generation)**  **Observation 18 For a SHR generated for a NR-to-LTE handover, the SHR can be reported to the source node only when the UE returns to the NR network. This can take up to 48 hours.**  **Proposal 21 Inter-RAT SHR to include the time between report generation and report fetching.**  **(from NR to LTE, ASN.1)**  **Proposal 22 For Inter-RAT SHR, the shr-Cause-r17 IE needs to be extended with a new cause for RACH issues.**  **Proposal 23 The ra-InformationCommon-r17 IE contains information regarding the NR RACH procedure. For handovers to LTE, we need to be able to include information about the LTE RACH procedure. Such information enable optimization on selecting the right target cell based on the RACH performance.For Inter-RAT SHR, an IE for LTE RA related information needs to be added.**  **Proposal 24 For Inter-RAT SHR, the description for the c-RNTI-r17 IE needs to be updated so it refers to the source cell instead of the target cell.** |

### 2.1.1 From NR to LTE

At RAN2#121 meeting, there are the following FFSes for inter-RAT SHR, and they can be further discussed in this meeting.

8: RAN2 further discuss if below content is needed for inter-RAT SHR when HO from NR to LTE:

a. C-RNTI (FFS target or source)

c. FFS: Time between report generating and fetching

#### 2.1.1.1 Discussion on the FFS “C-RNTI (FFS target or source)”

Companies’ views are listed in the table below.

|  |  |
| --- | --- |
| **Company** | **Views** |
| Nokia [2] | **Proposal 1: SHR should follow the C-RNTI usage and definition from RLF report.**  **Proposal 2: RAN WG2 should first specify the purpose of C-RNTI in SHR for inter-RAT if its definition should deviate from RLF report.** |
| CATT [4] | **Proposal 3: C-RNTI is not included in inter-RAT SHR from NR to LTE.** |
| Lenovo [7] | **Proposal 3: For retrieval of UE context at source gNB during inter-RAT HO from NR to LTE, the UE can include source C-RNTI, and Time between HO command and SHR retrieval in the inter-RAT SHR.**  **Observation 3: When T310/T312 triggers inter-RAT SHR from NR to LTE, source gNB correlates inter-RAT SHR and LTE RLF Report in case that there is a RLF shortly after a successful inter-RAT HO from NR to LTE.**  **Proposal 4: When T310/T312 triggers inter-RAT SHR from NR to LTE, source C-RNTI can be included in the inter-RAT SHR.** |
| ZTE [10] | **Proposal 3: No need to include C-RNTI and Time between report generating and fetching in SHR collected for inter-RAT HO from NR to LTE.**  **Proposal 4: RAN2 wait for more progress in RAN3 to decide whether target C-RNTI is needed for SHR collected for inter-RAT HO from NR to LTE.** |
| Huawei [11] | **Proposal 1: Introduce source C-RNTI in inter-RAT SHR from NR to LTE.** |
| Ericsson [15] | **Proposal 24 For Inter-RAT SHR, the description for the c-RNTI-r17 IE needs to be updated so it refers to the source cell instead of the target cell.** |

Lenovo, Huawei and Ericsson prefer to introduce C-RNTI in the source cell in the inter-RAT SHR from NR to LTE, because it would enable the retrieval of UE context at source cell during the HO. However, CATT and ZTE have a different view, and there is no need to include it.

**Proposal 1: For inter-RAT SHR from NR to LTE, if T310 or T312 trigger threshold is fulfilled, RAN2 to discuss:**

* **No need to include C-RNTI**
* **Or , include C-RNTI of source cell**

#### 2.1.1.2 Discussion on the FFS “Time between report generating and fetching”

Companies’ views are listed in the table below.

|  |  |
| --- | --- |
| **Company** | **Views** |
| Nokia [2] | **Proposal 3: The time between SHR generation and fetching by the network is meaningless and its inclusion in the SHR is not needed.** |
| CATT [4] | **Proposal 4: Time between report generating and fetching is included in R18 inter-RAT SHR from NR to LTE.** |
| Samsung [6] | **Proposal 5: UE doesn’t include the time between report generation and fetching for Inter-RAT SHR.** |
| ZTE [10] | **Proposal 3: No need to include C-RNTI and Time between report generating and fetching in SHR collected for inter-RAT HO from NR to LTE.** |
| Huawei [11] | **Proposal 2: Introduce time between reception of HO Command and inter-RAT SHR fetching in inter-RAT SHR from NR to LTE.** |
| Ericsson [15] | **Proposal 21 Inter-RAT SHR to include the time between report generation and report fetching.** |

CATT, Huawei and Ericsson are ok to include the time information, but Nokia, Samsung and ZTE are not ok.

**Proposal 2: For inter-RAT SHR from NR to LTE, if T310 or T312 trigger threshold is fulfilled, RAN2 to discuss the need of inclusion of time between report generating and fetching.**

#### 2.1.1.3 On Inter-RAT SHR configuration

Based on companies’ proposals, RAN2 can discuss the enhancements on the SHR reporting content.

**Proposal 3: for inter-RAT SHR from NR to LTE, enhance the configuration by:**

* **a triggering condition associated to the number of random accesses attempts toward the LTE cell**

#### 2.1.1.4 On Inter-RAT SHR reporting content

Based on companies’ proposals, RAN2 can discuss the enhancements on the SHR reporting content.

**Proposal 4: for inter-RAT SHR from NR to LTE, enhance the report with the following information:**

* **a counter for the number of RA attempts made for the successful handover**
* **a flag on whether contention was observed for the successful handover**

#### 2.1.1.5 Other enhancements

Some companies proposed to discuss correlation of SHR and RLF reports, and the email rapporteur thinks that it is within RAN3 scope and thus RAN3 can discuss it.

The following enhancements can be discussed in RAN2:

**Proposal 5: Agree Option 2 as way forward for UE context retrieval i.e. if Mobility Information is sent to the UE together with the T310/T312 threshold configuration, then UE includes Mobility Information in the SHR.**

**Proposal 6: Also note that this behaviour is against a previous RAN2 agreement to not use T304. For this particular case, this agreement must be reverted.RAN2 to agree to allow the source (NR) node to configure triggers for T304 for inter-RAT SHR.**

**Proposal 7: For Inter-RAT SHR, the shr-Cause-r17 IE needs to be extended with a new cause for RACH issues.**

**Proposal 8: The ra-InformationCommon-r17 IE contains information regarding the NR RACH procedure. For handovers to LTE, we need to be able to include information about the LTE RACH procedure. Such information enable optimization on selecting the right target cell based on the RACH performance.For Inter-RAT SHR, an IE for LTE RA related information needs to be added.**

### 2.1.2 From LTE to NR

In the RAN3 LS [13], RAN3 mentions the following on inter-RAT SHR:

|  |
| --- |
| Inter-RAT SHR  RAN3 has agreed to support collection of SHR during successful inter-RAT HO (LTE to NR) but only if there is no impact on LTE. With this in mind, RAN3 agreed to only consider the T304 trigger. This agreement will be revisited if RAN2 detects impact on LTE. This decision further relied on the following assumptions which needs to be confirmed by RAN2:   * Target gNB can send SHR configuration (T304 trigger) to UE via NR container (targetRAT-MessageContainer) in MobilityFromEUTRACommand * UE stores this SHR configuration in NR format * If T304 trigger is met, UE records SHR in NR format * UE reports this SHR only to an gNB (either the target gNB or another gNB)   In case the above scenario is also considered feasible for RAN2, RAN3 has identified that at least the following information is beneficial to be reported from the UE:   * Source LTE cell identity * Target NR cell identity |

Then the actions to RAN2 is:

**To RAN2**

**ACTION:** RAN3 kindly asks RAN2 to take the above into consideration and provide feedback on the feasibility of the scenario of SHR during successful inter-RAT HO (LTE to NR)

From the email rapporteur’s point of view, RAN2 can discuss the following aspects in this meeting:

* Check RAN3 assumptions to see whether they are feasible and there are LTE impacts in RAN2. In addition, RAN2 may also discuss more details based on contributions
* Check whether there are another LTE impacts or not

Companies’ views are listed in the table below.

|  |  |
| --- | --- |
| **Company** | **Views** |
| CATT [4] | **Proposal 5: RAN2 confirms to support inter-RAT SHR from LTE to NR for T304 trigger.**  **Proposal 6: RAN2 confirms the following assumptions which included in RAN1’s LS:**   * **Target gNB can send SHR configuration (T304 trigger) to UE via NR container (targetRAT-MessageContainer) in MobilityFromEUTRACommand** * **UE stores this SHR configuration in NR format** * **If T304 trigger is met, UE records SHR in NR format** * **UE reports this SHR only to an gNB (either the target gNB or another gNB)**   **Proposal 7: Source LTE cell identity and target NR cell identity are included in inter-RAT SHR from LTE to NR.**  **Proposal 8: For inter-RAT HO from LTE to NR, a new EUTRA source cell CGI is introduced in inter-RAT SHR.** |
| Lenovo [7] | **Proposal 5: T304 trigger for inter-RAT SHR from LTE to NR is supported, but neither T310 nor T312 trigger for inter-RAT SHR from LTE to NR is supported.**  **Proposal 6: For inter-RAT SHR from LTE to NR:**   * **Target gNB can send SHR configuration (T304 trigger) to UE via NR container (targetRAT-MessageContainer) in MobilityFromEUTRACommand;** * **UE stores this SHR configuration in NR format;** * **If T304 trigger is met, UE records SHR in NR format;** * **UE reports this SHR only to an gNB (either the target gNB or another gNB).**   **Proposal 7: Inter-RAT SHR** **from LTE to NR can at least include:**   * **Source LTE cell identity** * **Target NR cell identity** * **Measurement results for source, target and neighbours** * **Cause to indicate which inter-RAT SHR triggering condition was met** * **UE location Information** |
| ZTE [10] | **Proposal 1: RAN2 confirms the assumption of RAN3’s LS(R2-2304630) on SHR collected for inter-RAT HO from LTE to NR:**  **SHR during successful inter-RAT HO (LTE to NR) is supported only if there is no impact on LTE, and below details are considered:**   * **Only T304 trigger is supported** * **Target gNB can send SHR configuration (T304 trigger) to UE via NR container (targetRAT-MessageContainer) in MobilityFromEUTRACommand** * **UE stores this SHR configuration in NR format** * **If T304 trigger is met, UE records SHR in NR format** * **UE reports this SHR only to an gNB (either the target gNB or another gNB)**   **Proposal 2: Introduce source EUTRA cell CGI in SHR collected for inter-RAT HO from LTE to NR.** |
| Huawei [11] | **Proposal 3: For inter-RAT SHR from LTE to NR, below parameters is stored, reuse the existing IEs defined in R17 for intra-NR SHR:**   1. **target NR cell information** 2. **target NR C-RNTI**   **c. Measurement results for source, target and neighbours**  **d. Cause to indicate which inter-RAT SHR triggering condition (T304) was met**  **e. UE location Information**  **Proposal 4: A new EUTRA source cell CGI is introduced in inter-RAT SHR from LTE to NR.**  **Proposal 5: A new time information to indicate the time between HO command and SHR fetching in inter-RAT SHR from LTE to NR.** |
| Huawei [13] | **Observation 1: There are LTE impacts on UE capability scheme, including:**   * **Explicit UE capability indicator reported from UE to LTE network which impacts TS36.331** * **Define the UE capability information in TS36.306** |

For the RAN2 LS [13], the RAN3 assumptions on inter-RAT SHR from LTE to NR are supported by the following companies: CATT, Lenovo, ZTE, Huawei.

Regarding LTE impacts, Huawei pointed out that there are LTE impacts on UE capability, which means TS 36.331 and TS 36.306 may be impacted. As mentioned in the RAN3 LS, the RAN3 agreements will be revisited if RAN2 detects impact on LTE, so it is proposed RAN2 to discuss it.

**(agreeable) Proposal 9: For inter-RAT SHR from LTE to NR, RAN2 confirms that if only T304 trigger is supported, the assumptions of the RAN3 LS R2-2304630 are feasible from RAN2 point of view, and there are no LTE impacts for the assumptions.**

**Proposal 10: For inter-RAT SHR from LTE to NR, RAN2 to discuss whether there are LTE impacts on UE capability scheme, including:**

* **Explicit UE capability indicator reported from UE to LTE network which impacts TS36.331**
* **Define the UE capability information in TS36.306**

**Proposal 11: Send a reply LS to RAN3 to including RAN2 progress.**

For the reporting content, companies have some proposals, and here is a summary:

(a) Source LTE cell id (CATT, Lenovo, ZTE, Huawei)

(b) Target NR cell id (CATT, Lenovo, Huawei)

(c) Measurement results for source, target and neighbours (Lenovo, Huawei)

(d) Cause to indicate which inter-RAT SHR triggering condition (Lenovo, Huawei)

(e) UE location Information (Lenovo, Huawei)

(f) Target NR C-RNTI (Huawei)

Some companies think that (b), (c), (d), (e), (f) can reuse the existing Ies defined in Rel-17 for intra-NR SHR. While (a) would need a new IE.

**Proposal 12: For the reporting content for inter-RAT SHR from LTE to NR, RAN2 to discuss whether the following content is needed:**

**(a) Source LTE cell id. A new IE is required**

**(b) Target NR cell id**

**(c) Measurement results for source, target and neighbours**

**(d) Cause to indicate which inter-RAT SHR triggering condition**

**(e) UE location Information**

**(f) Target NR C-RNTI**

## 2.2 SPR

Relevant proposals:

|  |  |  |
| --- | --- | --- |
| **Tdoc** | **Company** | **Proposals** |
| [1], R2-2305324 | Vivo | **(for Issue 1: Remaining issues of SPR configuration)**  **Proposal 1: The current agreed triggering conditions of SPR are sufficient, i.e., no other triggering condition is needed.**  **Proposal 2: Regarding values of the triggering conditions of SPR, RAN2 to agree the following:**   * **Define separate thresholds for T310/T312/T304;** * **The percentage value is to indicate the ratio of the threshold value (unit: ms) over the signalled T310/T312/T304 value (unit: ms);** * **The percentage values are 40%, 60%, 80%, and the percentage value also includes 20% for the threshold for T312.**   **(for** **Issue 2: What other information can be included in SPR)**  **Proposal 3: The following information should be included in the SPR:**   * **CGI of the PCell which sent the SPR configuration.** * **An indication to indicate the type of PSCell addition/change, i.e., PSCell addition, MN-initiated PSCell change or SN-initiated PSCell change.**   **(for** **Issue 3: Whether additional work is needed for HO with SN change)**  **Proposal 4: For HO with SN change, the existing SHR and SPR mechanisms are sufficient and no additional work is needed.** |
| [3], R2-2305423 | Nokia | **(for SPR generation trigger)**  **Observation 1.1: Outages exceeding a certain percentage of failure criterion during the mobility procedure are triggering an SPR.**  **(for** **SPR for “almost too late” CPC execution)**  **Observation 1.2: SPR of outages where CPC execution rescued the UE are relevant MRO refinements.**  **Observation 1.3: A SPR is created even though T310 is stopped by RLM and might be therefore wrongly interpreted.**  **Observation 1.4: The current SPR (also SHR) does not allow a distinction of the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**  **Proposal 1.1: RAN2 agrees that current SPR procedure (as well as SHR procedure) does not provide means to distinguish the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**  **Proposal 1.2: RAN2 agrees to means how SPR (as well as SHR procedure) should be enhanced to enable the distinction of the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**  **(for** **SPR reporting mechanism)**  **Observation 2: SPR availability cannot be indicated to the network by using *RRCReconfigurationComplete* message as the latter is sent to MN too early.**  **Proposal 2: RAN2 discusses a different mechanism (other than indicating it in *RRCReconfigurationComplete* message) to indicate SPR availability to the network.**  **(for** **SPR content enhancements – Root cause analysis)**  **Proposal 3.1: The initiating node of PSCell change should also carry out the root cause analysis based on the contents of the SPR.**  **Proposal 3.2: MN may forward the SPR to the initiating node for root cause analysis.**  **Proposal 3.3: RAN2 to discuss solutions for determining the initiating node for PSCell change associated with an SPR to enable the forwarding of the SPR to the initiating node for root cause analysis.**  **(for** **SPR content enhancements – User plane interruption time)**  **Observation 3: Current SPR content does not allow the network to accurately obtain information of user plane interruption time on a per cell group type granularity during a PSCell change.**  **Proposal 3.4: RAN2 to discuss the possibility of including user plane interruption time measurements on a per cell group type in SPR.** |
| [4], R2-2305484 | CATT | **Observation 1: The UE cannot determine whether it should record SPR or not and furthermore it could record the SPR and report the SPR to SN based on SN configured SPR configuration when receives MN-initiated PSCell change command as UE has no idea about the PSCell change type.**  **Observation 2: If the UE can get to know the PSCell change type, the SPR configuration is inefficient in case of UE is configured with MN/SN configured SPR configuration but receives SN/MN triggered PSCell change command.**  **Observation 3: MN/SN configured SPR configuration can override SN/MN configured SPR configuration as MN/SN doesn’t know the UE has stored SN/MN configured SPR configuration.**  **Observation 4: MN and SN cannot configure SPR configuration to UE** **simultaneously in case of both MN-initiated CPC and SN-initiated CPC are configured to UE.**  **Observation 5: The SPR configuration could be useless as it is unpredictable for MN-initiated CPC or SN-initiated CPC is performed.**  **Observation 6: For legacy PSCell change, the PSCell change type indication information needs to be indicated to UE.**  **Observation 7: For CPC, no extra indication information is needed for UE to identify the CPC type as the UE can get to know the CPC type by implicit way.**  **Proposal 1: RAN2 to agree that UE stores two SPR configurations configured by MN and SN respectively.**  **Proposal 2: RAN2 to confirm that for legacy PSCell change, the PSCell change type indication information is introduced to inform UE the executed PSCell change type.** |
| [6], R2-2305667 | Samsung | **Proposal 1: No new triggers are needed for SPR configuration.**  **Proposal 2: Percentage based threshold variables for SHR can be reused for SPR.**  **Proposal 3: UE clears SPR configuration during the following**   1. **RRC Reestablishment** 2. **RRC Resume initiation** 3. **SCGFailure initiation** 4. **Reception of SCGRelease** 5. **Successful PSCellAddition or PSCellChange** |
| [9], R2-2306204 | Sharp | **Proposal 1: percentage values for timer T310/T312/T304 are configured in SPR configuration.**  **Proposal 2: RAN2 discusses which node configures the SPR configuration in case both MN-initiated CPC and SN-initiated CPC are configured for a UE.**  **Proposal 3: UE may include the PCell identity in the SPR.**  **Proposal 4: RAN2 discusses whether the PCell identity should be always included in SPR.**  **Proposal 5: UE includes PSCell change type, e.g. whether PSCell change is initiated by SN or MN, in the SPR.**  **Proposal 6: RAN2 discusses how the UE knows whether PSCell change is initiated by SN or MN.** |
| [10], R2-2306246 | ZTE | **Proposal 5: For this release, no new trigger is introduced for SPR.**  **Proposal 6: The timer-threshold triggers for SPR a represented in terms of percentage values** |
| [11], R2-2306292 | Huawei | **Proposal 6: No other triggering condition is needed.**  **Proposal 7: SPR triggering conditions are configured in term of percentage and reuse the values defined for SHR.**  **Proposal 8: The UE logs the PCell information where the SPR configuration is sent.**  **Proposal 9: Network sends the indicator to inform UE whether MN initiates the PSCell change.**  **Proposal 10: The UE logs indicator whether the PSCell change was MN-/SN-initiated.**  **Proposal 11: Random access related information is not included for any other conditions.** |
| [12], R2-2306462 | NTT DOCOMO | **(for** **SPR contents)**  **Proposal1: Introduce an indication show** **PSCell change/addition type, i.e., PSCell addition, MN-initiated PSCell change or SN-initiated PSCell change in SPR.** |
| [15], R2-2305987 | Ericsson | **(for** **SPR configuration aspect)**  **Observation 8 To evaluate SPR triggering condition, UE needs to monitor T310/T312 timers associated to the source PSCell.**  **Observation 9 For SN initiated classic PSCell change, source SN node has control of the T310/T312 timers and may decide the T310/T312 triggers.**  **Observation 10 RAN3 agreed for SN initiated classic PSCell change, the source SN node decides the T310/T312 triggers.**  **Observation 11 MN may configure the UE with SPR threshold values using RRCReconfiguration message for MCG bearers which UE uses to monitor SCG resources.**  **Observation 12 SN may configure the UE with SPR threshold values using RRCReconfiguration message for SCG bearers which UE uses to monitor SCG resources. For intra-SN PSCell change, SN does not perform any coordination with MN**  **Observation 13 Setting two events for conditional PSCell change/addition is a delicate task and sub-optimal configuration may lead to sub-optimal performance of PSCell change/addition operation.**  **Observation 14 The time elapsed between fulfilling first and second events (e.g., A3 and A5 events) configured as part of conditional CPAC is subject to optimization.**  **Observation 15 The time elapsed from receiving the CPAC configuration to the time of CPAC execution can be subject to optimization.**  **Observation 16 When the UE is in dual connectivity with a NR-U PSCell the UE can log SPR when it experiences LBT issue during PSCell change/addition operation.**  **Proposal 8 T310 and T312 timer related triggering conditions are set by node initiating the PSCell change procedure. i.e., - MN initiated PSCell change, MN configures the T310 and T312 related triggering conditions. - SN initiated PSCell change, source SN configures the T310 and T312 related triggering conditions.**  **Proposal 9 For the MN initiated PSCell change MN configures only a single threshold value for T310 and T312 thresholds (instead of having a list of percentage values)to trigger SPR. UE logs SPR if the timer T310 or T312 of the source PSCell exceeds the threshold during execution of the PSCell change.**  **Proposal 10 Network includes a flag in the SPR configuration if the PSCell change procedure is MN initiated or SN initiated.**  **Proposal 11 UE logs an indication in the SPR that the PSCell chenage led to the SPR was MN initiated or SN initiated.**  **Proposal 12 SPR is triggered based on the following additional triggers: - time between CPAC triggering threshold - time between receiving CPAC configuration to the execution of the CPAC - Experiencing LBT issues during PSCell change/addition execution**  **(for** **SPR reporting mechanism)**  **Proposal 13 Network collects the SPR from UE using UEInformationRequest/UEinformationRespose messages.**  **Proposal 14 UE indicates availability of SPR report to the network in the following RRC messages:**  **a. RRCReconfigurationComplete**  **b. RRCSetupComplete**  **c. RRCResumeComplete**  **d. RRCReestablishmentComplete**  **Proposal 15 UE performs PLMN identity check before indicating SPR availability to the network.**  **(for content of the SPR)**  **Proposal 16 UE logs the following additional information in the SPR report:**  **• Random access related information if SPR is triggered due to consistent LBT failure**  **• C-RNTI in the PCell**  **• Time between SPR generation at the UE and fetching by the network.**  **• LBT related information and measurements when operating in NR-U** |

### 2.2.1 On SPR configuration

**Values of triggering conditions of SPR**

Vivo, Samsung, Sharp, ZTE and Huawei think Percentage based threshold variables for SHR (T310/T312/T304) can be reused for SPR. The following text is the threshold definition for Rel-17 SHR (from TS 38.331).

SuccessHO-Config-r17 ::= SEQUENCE {

thresholdPercentageT304-r17 ENUMERATED {p40, p60, p80, spare5, spare4, spare3, spare2, spare1} OPTIONAL, --Need R

thresholdPercentageT310-r17 ENUMERATED {p40, p60, p80, spare5, spare4, spare3, spare2, spare1} OPTIONAL, --Need R

thresholdPercentageT312-r17 ENUMERATED {p20, p40, p60, p80, spare4, spare3, spare2, spare1} OPTIONAL, --Need R

sourceDAPS-FailureReporting-r17 ENUMERATED {true} OPTIONAL, --Need R

...

}

One company (Ericsson, [15]) thinks that for the MN initiated PSCell change, MN configures only a single threshold value for T310 and T312 thresholds to trigger SPR.

The email rapporteur see two options for values of triggering conditions of SPR. Both options may have RAN3 impacts, and it will be helpful to send a LS to RAN3 for their confirmation.

Option 1: Percentage based threshold variables for SHR (T310/T312/T304) can be reused for SPR

Option 2: For the MN initiated PSCell change MN configures only a single threshold value for T310 and T312 thresholds (instead of having a list of percentage values) to trigger SPR

**Proposal 13: For values of triggering conditions of SPR, it is proposed RAN2 to discuss the following options, and if needed, send a LS to RAN3 for their confirmation:**

**Option 1: Percentage based threshold variables for SHR (T310/T312/T304) can be reused for SPR**

**Option 2: For the MN initiated PSCell change MN configures only a single threshold value for T310 and T312 thresholds (instead of having a list of percentage values) to trigger SPR**

**New triggering conditions**

Vivo, Samsung, ZTE and Huawei think the current agreed triggering conditions of SPR are ok, and there is no need to introduce other triggering conditions.

One company (Ericsson [15]) proposes a new triggering condition.

**Proposal 14: SPR is triggered based on the following additional triggers:**

* **time between CPAC triggering threshold**
* **time between receiving CPAC configuration to the execution of the CPAC**
* **Experiencing LBT issues during PSCell change/addition execution**

**Two configurations:**

CATT proposes to discuss two SPR configurations (MN/SN). The email rapporteur thinks there may be more details for this proposal, e.g. whether the UE needs to store two SPR reports, whether the UE needs to send the two reports to NW and how.

**Proposal 15: RAN2 to discuss that UE stores two SPR configurations configured by MN and SN respectively.**

**Which node to generate the config:**

In Ericsson [15], P8 is about which node should be responsible for configuring the triggering conditions, and P2 in Sharp [9] is about the same topic. The email rapporteur thinks that RAN3 is also discussing it, so RAN2 may wait for more RAN3 progress.

**Proposal 8 T310 and T312 timer related triggering conditions are set by node initiating the PSCell change procedure. i.e., - MN initiated PSCell change, MN configures the T310 and T312 related triggering conditions. - SN initiated PSCell change, source SN configures the T310 and T312 related triggering conditions.**

**Proposal 2: RAN2 discusses which node configures the SPR configuration in case both MN-initiated CPC and SN-initiated CPC are configured for a UE.**

**Clear the configurations:**

Samsung [6] proposes some conditions for UE clearing SPR configuration, which can be discussed in RAN2.

**Proposal 16: UE clears SPR configuration during the following**

1. **RRC Reestablishment**
2. **RRC Resume initiation**
3. **SCGFailure initiation**
4. **Reception of SCGRelease**
5. **Successful PSCellAddition or PSCellChange**

### 2.2.2 On SPR content and reporting

Companies’ views are listed in the table below.

|  |  |
| --- | --- |
| **Company** | **Views** |
| Vivo [1] | **Proposal 3: The following information should be included in the SPR:**   * **CGI of the PCell which sent the SPR configuration.** * **An indication to indicate the type of PSCell addition/change, i.e., PSCell addition, MN-initiated PSCell change or SN-initiated PSCell change.** |
| Nokia [3] | **Observation 2: SPR availability cannot be indicated to the network by using *RRCReconfigurationComplete* message as the latter is sent to MN too early.**  **Proposal 2: RAN2 discusses a different mechanism (other than indicating it in *RRCReconfigurationComplete* message) to indicate SPR availability to the network.**  **Proposal 3.1: The initiating node of PSCell change should also carry out the root cause analysis based on the contents of the SPR.**  **Proposal 3.2: MN may forward the SPR to the initiating node for root cause analysis.**  **Proposal 3.3: RAN2 to discuss solutions for determining the initiating node for PSCell change associated with an SPR to enable the forwarding of the SPR to the initiating node for root cause analysis.**  **Observation 3: Current SPR content does not allow the network to accurately obtain information of user plane interruption time on a per cell group type granularity during a PSCell change.**  **Proposal 3.4: RAN2 to discuss the possibility of including user plane interruption time measurements on a per cell group type in SPR.** |
| CATT [4] | **Proposal 2: RAN2 to confirm that for legacy PSCell change, the PSCell change type indication information is introduced to inform UE the executed PSCell change type.** |
| Sharp [9] | **Proposal 3: UE may include the PCell identity in the SPR.**  **Proposal 4: RAN2 discusses whether the PCell identity should be always included in SPR.**  **Proposal 5: UE includes PSCell change type, e.g. whether PSCell change is initiated by SN or MN, in the SPR.**  **Proposal 6: RAN2 discusses how the UE knows whether PSCell change is initiated by SN or MN.** |
| Huawei [11] | **Proposal 8: The UE logs the PCell information where the SPR configuration is sent.**  **Proposal 9: Network sends the indicator to inform UE whether MN initiates the PSCell change.**  **Proposal 10: The UE logs indicator whether the PSCell change was MN-/SN-initiated.**  **Proposal 11: Random access related information is not included for any other conditions.** |
| NTT DOCOMO [12] | **Proposal1: Introduce an indication show** **PSCell change/addition type, i.e., PSCell addition, MN-initiated PSCell change or SN-initiated PSCell change in SPR.** |
| Ericsson [15] | **Proposal 13 Network collects the SPR from UE using UEInformationRequest/UEinformationRespose messages.**  **Proposal 14 UE indicates availability of SPR report to the network in the following RRC messages:**  **a. RRCReconfigurationComplete**  **b. RRCSetupComplete**  **c. RRCResumeComplete**  **d. RRCReestablishmentComplete**  **Proposal 15 UE performs PLMN identity check before indicating SPR availability to the network.** |

For the reporting content of SPR, companies have some proposals, and here is a summary:

(a) indication of Pscell change, i.e. PSCell addition, change (vivo, NTT DOCOMO)

(b) indication of MN-initiated and SN-initiated PSCell change (CATT, Sharp, Huawei, NTT DOCOMO)

(c) user plane interruption time measurements on a per cell group type (Nokia)

For (b), it may need network signalling support, e.g. network can send the indication to the UE.

**(agreeable) Proposal 17: Introduce an indication of MN-initiated or SN-initiated PSCell change in SPR.**

**Proposal 18: FFS on how the UE gets the indication.**

**Proposal 19: RAN2 to discuss the following reporting content of SPR:**

* **Indication of Pscell change, i.e. PSCell addition, change**
* **User plane interruption time measurements on a per cell group type**

It is noted that RAN3 has agreed the following, so the relevant proposals are skipped.

**CGI of the PCell which sent the SPR configuration (presence of this IE is to be discussed)**

Some proposals are about the co-ordinations between nodes, and the email rapporteur thinks that they are relevant to RAN3 discussions, so RAN2 may wait for more RAN3 progress.

At RAN2#119b-e meeting, the following was agreed, so the relevant proposal is skipped.

B. SPR is fetched via UE Information Request/Response procedure

The following proposals can be discussed in RAN2.

**Proposal 20: UE indicates availability of SPR report to the network in the following RRC messages:**

**a. RRCReconfigurationComplete**

**b. RRCSetupComplete**

**c. RRCResumeComplete**

**d. RRCReestablishmentComplete**

**Proposal 21: UE performs PLMN identity check before indicating SPR availability to the network.**

### 2.2.3 Other enhancements

Companies’ views are listed in the table below.

|  |  |
| --- | --- |
| **Company** | **Views** |
| Vivo [1] | **Proposal 4: For HO with SN change, the existing SHR and SPR mechanisms are sufficient and no additional work is needed.** |
| Nokia [3] | **Observation 1.1: Outages exceeding a certain percentage of failure criterion during the mobility procedure are triggering an SPR.**  **Observation 1.2: SPR of outages where CPC execution rescued the UE are relevant MRO refinements.**  **Observation 1.3: A SPR is created even though T310 is stopped by RLM and might be therefore wrongly interpreted.**  **Observation 1.4: The current SPR (also SHR) does not allow a distinction of the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**  **Proposal 1.1: RAN2 agrees that current SPR procedure (as well as SHR procedure) does not provide means to distinguish the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**  **Proposal 1.2: RAN2 agrees to means how SPR (as well as SHR procedure) should be enhanced to enable the distinction of the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.** |

For SPR and SHR, Nokia propose to discuss the need of a distinction of the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed. It is proposed RAN2 to discuss it.

**Proposal 22: RAN2 agrees that current SPR procedure (as well as SHR procedure) does not provide means to distinguish the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**

**Proposal 23: RAN2 agrees to means how SPR (as well as SHR procedure) should be enhanced to enable the distinction of the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**

## 2.3 Enhancements on intra-NR SHR

Relevant proposals:

|  |  |  |
| --- | --- | --- |
| **Tdoc** | **Company** | **Proposals** |
| [7], R2-2305704 | Lenovo | **Observation 1: When T304 triggers intra-NR SHR, the target gNB can correlate the intra-NR SHR and NR RLF Report based on target C-RNTI.**  **Observation 2: When T310/T312 triggers intra-NR SHR, source gNB correlates intra-NR SHR and NR RLF Report in case that there is a RLF shortly after a successful intra-NR HO.**  **Proposal 1: For retrieval of UE context at source gNB during intra-NR HO, the UE can include source C-RNTI, and Time between HO command and SHR retrieval in the intra-NR SHR.**  **Proposal 2: When T310/T312 triggers intra-NR SHR, source C-RNTI can be included in the intra-NR SHR.** |
| [15], R2-2305987 | Ericsson | **Proposal 25 Intra-NR SHR to include the time between report generation and report fetching.** |

The email rapporteur thinks that inter-RAT SHR and SPR should be discussed first, and then if time allows, enhancements on Intra-NR SHR can be discussed.

**Proposal 24: RAN2 to discuss enhancements on Intra-NR SHR, i.e. P1, P2 in R2-2305704, P25 in R2-2305987.**

# 3 Conclusion

For the following summary proposals:

* (agreeable) means easily agreeable proposals
* Others are not easily agreeable proposals, which need to be discussed in RAN2

The summary proposals are listed as below:

**Inter-RAT SHR (from NR to LTE)**

*Note: P1 and P2 can be discuss during online session, and P3-P8 can be discussed if time allows.*

**Proposal 1: For inter-RAT SHR from NR to LTE, if T310 or T312 trigger threshold is fulfilled, RAN2 to discuss:**

* **No need to include C-RNTI**
* **Or , include C-RNTI of source cell**

**Proposal 2: For inter-RAT SHR from NR to LTE, if T310 or T312 trigger threshold is fulfilled, RAN2 to discuss the need of inclusion of time between report generating and fetching.**

**Proposal 3: for inter-RAT SHR from NR to LTE, enhance the configuration by:**

* **a triggering condition associated to the number of random accesses attempts toward the LTE cell**

**Proposal 4: for inter-RAT SHR from NR to LTE, enhance the report with the following information:**

* **a counter for the number of RA attempts made for the successful handover**
* **a flag on whether contention was observed for the successful handover**

**Proposal 5: Agree Option 2 as way forward for UE context retrieval i.e. if Mobility Information is sent to the UE together with the T310/T312 threshold configuration, then UE includes Mobility Information in the SHR.**

**Proposal 6: Also note that this behaviour is against a previous RAN2 agreement to not use T304. For this particular case, this agreement must be reverted.RAN2 to agree to allow the source (NR) node to configure triggers for T304 for inter-RAT SHR.**

**Proposal 7: For Inter-RAT SHR, the shr-Cause-r17 IE needs to be extended with a new cause for RACH issues.**

**Proposal 8: The ra-InformationCommon-r17 IE contains information regarding the NR RACH procedure. For handovers to LTE, we need to be able to include information about the LTE RACH procedure. Such information enable optimization on selecting the right target cell based on the RACH performance.For Inter-RAT SHR, an IE for LTE RA related information needs to be added.**

**Inter-RAT SHR (from LTE to NR)**

*Note: P9, P10, and P11 can be discuss during online session, and P12 can be discussed if time allows.*

**(agreeable) Proposal 9: For inter-RAT SHR from LTE to NR, RAN2 confirms that if only T304 trigger is supported, the assumptions of the RAN3 LS R2-2304630 are feasible from RAN2 point of view, and there are no LTE impacts for the assumptions.**

**Proposal 10: For inter-RAT SHR from LTE to NR, RAN2 to discuss whether there are LTE impacts on UE capability scheme, including:**

* **Explicit UE capability indicator reported from UE to LTE network which impacts TS36.331**
* **Define the UE capability information in TS36.306**

**Proposal 11: Send a reply LS to RAN3 to including RAN2 progress.**

**Proposal 12: For the reporting content for inter-RAT SHR from LTE to NR, RAN2 to discuss whether the following content is needed:**

**(a) Source LTE cell id. A new IE is required**

**(b) Target NR cell id**

**(c) Measurement results for source, target and neighbours**

**(d) Cause to indicate which inter-RAT SHR triggering condition**

**(e) UE location Information**

**(f) Target NR C-RNTI**

**SPR**

*Note: P13, P17 and P18 can be discuss during online session, and P14-P16, P19-P23 can be discussed if time allows.*

**Proposal 13: For values of triggering conditions of SPR, it is proposed RAN2 to discuss the following options, and if needed, send a LS to RAN3 for their confirmation:**

**Option 1: Percentage based threshold variables for SHR (T310/T312/T304) can be reused for SPR**

**Option 2: For the MN initiated PSCell change MN configures only a single threshold value for T310 and T312 thresholds (instead of having a list of percentage values) to trigger SPR**

**Proposal 14: SPR is triggered based on the following additional triggers:**

* **time between CPAC triggering threshold**
* **time between receiving CPAC configuration to the execution of the CPAC**
* **Experiencing LBT issues during PSCell change/addition execution**

**Proposal 15: RAN2 to discuss that UE stores two SPR configurations configured by MN and SN respectively.**

**Proposal 16: UE clears SPR configuration during the following**

1. **RRC Reestablishment**
2. **RRC Resume initiation**
3. **SCGFailure initiation**
4. **Reception of SCGRelease**
5. **Successful PSCellAddition or PSCellChange**

**(agreeable) Proposal 17: Introduce an indication of MN-initiated or SN-initiated PSCell change in SPR.**

**Proposal 18: FFS on how the UE gets the indication.**

**Proposal 19: RAN2 to discuss the following reporting content of SPR:**

* **Indication of Pscell change, i.e. PSCell addition, change**
* **User plane interruption time measurements on a per cell group type**

**Proposal 20: UE indicates availability of SPR report to the network in the following RRC messages:**

**a. RRCReconfigurationComplete**

**b. RRCSetupComplete**

**c. RRCResumeComplete**

**d. RRCReestablishmentComplete**

**Proposal 21: UE performs PLMN identity check before indicating SPR availability to the network.**

**Proposal 22: RAN2 agrees that current SPR procedure (as well as SHR procedure) does not provide means to distinguish the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**

**Proposal 23: RAN2 agrees to means how SPR (as well as SHR procedure) should be enhanced to enable the distinction of the case when T310 has almost expired when CPC executed from the case when T310 has been stopped before CPC executed.**

**Enhancements on intra-NR SHR**

*Note: P24 can be discussed during online session if time allows.*

**Proposal 24: RAN2 to discuss enhancements on Intra-NR SHR, i.e. P1, P2 in R2-2305704, P25 in R2-2305987.**

# 4 Reference

[1] R2\_122\_Skeleton\_v2

# 5 The previous RAN2 agreements

## 5.1 RAN2#121 agreements

R2-2301947 Summary of 8.13.4 SHR and SPCR ZTE discussion Rel-18 NR\_ENDC\_SON\_MDT\_enh2-Core

Inter-RAT SHR:

Agreement:

1: For Q1 in the LS R2-2211160, RAN2 agrees to reduce/avoid the impact on LTE specification to support inter-RAT SHR.

2: For handover from NR to LTE,UE generates the NR SHR when SHR for inter-RAT mobility is triggered due to T310 or T312 trigger threshold is fulfilled.

3: For HO from NR to LTE, UE records the SHR for inter-RAT mobility in the VarSuccessHO-Report.

4: For inter-RAT SHR, below parameters is stored, reuse the existing IEs defined in Rel-17 for intra-NR SHR:

a. Source NR cell information

c. Measurement results for source, target and neighbours

d. Cause to indicate which inter-RAT SHR triggering condition was met

e. UE location Information

5: A new EUTRA target cell CGI is introduced in inter-RAT SHR.

6: For HO from NR to LTE, the T310 and T312 threshold is provided to the UE by source gNB in the otherConfig.

7: For handover from NR to LTE, cross-RAT reporting is not supported, i.e., UE reports the SHR report to the network when it comes back to NR.

8: RAN2 further discuss if below content is needed for inter-RAT SHR when HO from NR to LTE:

a. C-RNTI (FFS target or source)

c. FFS: Time between report generating and fetching

Agreement

1: UE includes available location information in SPR .

2: UE stores SPR at most 48 hours after the last successful PSCell addition/PSCell change report is stored at UE if not fetched.

3: At least the following options are needed for releasing SPR report:

a. New SPR is initiated

b. Upon retrieval of SPR

c. Detach is initiated.

4: In SPR, reuse CHO candidate cell flag to indicate whether a neighbor cell is CPAC candidate cell or not.

## 5.2 RAN2#120 agreements

R2-2213197 Report of [Pre120][801][R18 SON/MDT] SHR and SPR (Huawei)

Agreements:

1 For Q5 in R2-2211160, RAN2 confirms the support for the parameters for inter-RAT SHR from NR to LTE when T310 and T312 are configured as triggering condition.

2 T304 trigger for inter-RAT SHR from NR to LTE is not supported.

3 Only MN can retrieve the SPR from the UE.

4 For Q8, RAN2 agree following options: depends on which of nodes initiates SPR, i.e.:

For the MN-initiated PSCell Change/Addition, MN sends the SPR config to the UE

For the SN-initiated PSCell Change, the source-SN sends the Successful PSCell Change configuration within the container through MN.

T304 trigger needs to be configured by the target SN node.

For SPR enhancements (other than LS-related discussions):

Agreements:

1 UE stores both SPCR and SHR configuration (one for each type at most) if received from NW.

2 UE can send the (stored) SPR to gNB. FFS how long UE keeping SPR is FFS.

3 Only the latest successful PSCell change/addition is reported by the UE.

4 Random access related information is included in SPR at least when the SPR is triggered due to T304 exceeds the configured threshold. Other conditions are FFS.

5 UE records/reports PCell SHR and PSCell SPR separately

=> RAN2 to prioritise inter-RAT HO from NR to LTE first. Inter-RAT HO from LTE to NR can be considered after that.

## 5.3 RAN2#119b-e agreements

R2-2210798 Pre-meeting summary of 8.13.4 SHR and SPCR (Ericsson)

* **[AT119bis-e][802][R17 SON/MDT] SHR and SPR (Ericsson)**

Discussion on the proposals 1-7 in R2-2210798

Intended outcome: Report

Deadline: 04:44 UTC, Friday October 14th

R2-2210986 [AT119bis-e][802][R18 SON/MDT] SHR and SPR (Ericsson)

Agreements

1 RAN2 confirms the scenarios for SPR for NR-DC, including:

• SN- and MN-initiated classic PSCell change / CPC

• Intra-SN classic PSCell change / CPC

• Classic Addition / CPA

1a RAN2 will discuss HO with SN change later, after the basic solution for SPR is known

2 Given that PSCell addition is proposed by all companies, SPR is used as the abbreviations to use for the feature.

3 RAN2 confirm to prioritize NR-DC scenario for SPR.

4 SHR solution is taken as baseline for the SPR in terms of configuration and reporting at high level. Details of the configuration and report need to be tailored/customized/new message per use case.

5 Network configures SPR configuration IE for the UE, with at least the following triggering conditions:

• T310 triggering condition

• T312 triggering condition

• T304 triggering condition

5a: Other triggering conditions are FFS

5b: Values of the triggering conditions are FFS

5c: Which node configures the triggering condition is FFS.

6 RAN2 agree to the following:

A. SPR configuration is configured by network through otherConfig

B. SPR is fetched via UE Information Request/Response procedure

7 UE logs at least the following information and measurements in the SPR IE (other information and measurements are FFS).

a) Source PSCell info (cell ID, measurement result)

b) Target PScell info (cell ID, measurement result)

c) Neighbour Cells info (cell ID, measurement result, CPAC Candidate cells flag)

d) Success PSCell change/addition cause value (e.g., t304, t310, t312 cause, etc.)

f) The time elapsed between the CPAC execution towards the target cell and the corresponding latest CPAC configuration received for the selected target cell

7a: FFS on whether to reuse CHO candidate cell flag for the CPAC candidate cells or define a new flag to indicate CPAC candidate cell.

7b: FFS on whether to include or on conditional inclusion of random access related information.

7c: FFS on Location Information