**3GPP TSG-RAN WG2 #131 R2-25xxxxx**

**Bengaluru, India, 25th – 29th August, 2025**

Agenda Item: 8.1.x

Source: Ericsson, ZTE

Title: Report of email discussion [POST130][031][AI PHY] NW side data collection

Document for: Discussion

# Introduction

This paper summarizes the following email discussion:

* [POST130][031][AI PHY] NW side data collection (Ericsson/ZTE)

 Intended outcome: provide two TP(s) for data logging and configuration in RRC on how to capture this in a simple way to RAN2. Discuss impacts to RAN1 for each solution and RAN3.

 Deadline: long

The deadline for providing comments is **8 August 2025, 10:00 UTC**.

The rapporteur will provide two TPs for two solutions for data logging and configuration in RRC, as well as a summary of foreseen RAN1 and RAN3 impacts for each solution, based on the outcome of this email discussion.

Companies providing input to this email discussion are requested to leave contact information below.

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| **Company** | **Name** | **Email Address** |
| Samsung | Beom | s90.jeong@samsung.com |
| Huawei, HiSilicon | Dawid Koziol | dawid.koziol@huawei.com |
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# Discussion

RAN2 has made the following agreements regarding logging and configuration for NW side data collection, that are relevant to this email discussion:

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| **From RAN2#130:**„As a starting point, the data logging is captured in RRC specs.“ „Data is collected on per data logging configuration basis and UE indicates data logging configuration ID. An indication of the “gap” is needed. “Gap” is time interval larger than the configured logging periodicity. FFS if timestamp and relative time stamp for each group is needed per “group”.“„The UE should report the CGI of the serving cell whenever feasible. If CGI is unavailable, the UE shall log PCI-ARFCN as a fallback.“**From RAN2#129bis:**„The measurement configuration of AI/ML data collection can configure measurements for multiple sets of resources and use cases (e.g. BM, Mobility, etc)“**From RAN2#129:**„Support the use of L3 measurement event triggered (i.e. L3 serving cell measurements becoming worse/better than a threshold for TTT) to determine whether the UE performs logging or not. L1 measurement event triggered will not be supported. FFS what to log“**From RAN2#127bis:**„For data collection for both NW-sided/UE sided BM model training, at least L1-RSRPs and/or beam-IDs needs to be collected by UE. FFS if other data needs to be collected based on RAN1 progress“ |

Based on the agreements above, two approaches were proposed in RAN2#130 for introducing the logging configuration for the beam management use case in RRC:

1. The logging configuration is introduced within the L1 CSI measurement framework, e.g. as a new list of configurations under *CSI-MeasConfig*, cf. Figure 1 and [1].
2. The logging configuration is introduced in a new L3 measurement framework, at the same level as *MeasConfig* and *CellGroupConfig*, cf. Figure 2 and [2].

The corresponding TPs for these two approaches are provided as a complement to this document and are based on the RRC changes from the endorsed running CR [R2-2504349], where the additional changes for the two approaches in this email discussion are marked with tracked changes (from Ericsson in the TP for approach 1 and from ZTE in the TP for approach 2).

The two TPs are intended to indicate the main directions of the changes and not to provide the final wording for the procedural text or the final ASN.1. Therefore, companies are kindly asked to focus on the major logging procedures and logging configuration content. Details like IE/parameter names will be revised by the RRC running CR rapporteur when merging the final TP with the running CR and thus do not need to be addressed in this email discussion.



Figure 1 RRC L1 logging configuration structure for approach (1).



Figure 2 RRC L3 logging configuration structure for approach (2).

## 2.1 Content of TPs for RRC

In this section we discuss the contents of the two TPs for RRC.

The TP for approach (1) captures the logging procedures in RRC in a new clause 5.5c, similarly as legacy logging in clause 5.5a. The TP for approach (2) captures the logging procedures in RRC in a new clause 5.5x.

###### **Q1-1: For approach (1), from RRC perspective, do you agree that it is sufficient to capture the logging procedures in the new clause 5.5c? Please comment if you think that the logging procedures should be moved elsewhere in the RRC specs or if you think that something is missing in the RRC procedures in the TP.**

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| **Company**  | **Yes/No** | **Comment**  |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes, but see comments... | It is OK to keep logging action in the newly added section, but the description could be much simplified. In our understanding the performing of measurements needs to be captured in RAN1 specificaitons as for all other L1 measurements. Then logging of measurements should take place whenever there is a measurement provided from lower layer to higher layer. What we should capture in this section is that:1. For non-event based logging, higher layer should indicate to lower layers to perform measurements with a specific configuration continously (according to the resource periodicity).2. For event-based logging, higher layer should indicate to lower layers when it should start/stop measurements when the event is met or no longer met.Then in L1 specifications we should capture that once requested by higher layer, the UE performs L1 measurements according to the provided configuration and forwards the results to upper layer. |
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###### **Q1-2: For approach (2), from RRC perspective, do you agree that it is sufficient to capture the logging procedures in the new clause 5.5x? Please comment if you think that the logging procedures should be moved elsewhere in the RRC specs or if you think that something is missing in the procedures in the TP.**

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| **Company**  | **Yes/No** | **Comment**  |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes, but see comments... | Similar comments as for approach 1. In particular, we should not capture L1 measurement actions in RRC specifications. We have a separation between PHY layer specifications and RRC specifications for a reason and mixing these things goes against layered approach of NR (and any other 3GPP RAN technology actually). |
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In approach (1), for capturing event-triggered logging based on L3 measurements (i.e. L3 serving cell measurements becoming worse/better than a threshold for TTT), the *threshold* and *timeToTrigger* were added in the logging configuration under *CSI-MeasConfig.* Additionally, it was captured how to evaluate the entering and leaving conditions for the event in:

1. changes to clauses 5.5.4.2 and 5.5.4.3 and field description, or alternatively,
2. only in field description for *eventTriggeredConfig* in *CSI-LoggedMeasurementConfig* (similarly to the field description of *eventType* in the *LoggedMeasurementConfiguration* message for legacy logging)*.*

###### **Q2-1: For approach (1), from RRC perspective, do you agree that, to configure the event-triggered logging based on L3 measurements, it is sufficient to add *threshold* and *timeToTrigger* in the logging configuration under *CSI-MeasConfig*? If no, please explain the reason and where the *threshold* and *timeToTrigger* should be included. Please comment also on whether you prefer option a) or b) for capturing the event evaluation.**

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| **Company**  | **Yes/No** | **Preferred option for capturing event evaluation:****a)/b)** | **Comment**  |
| Samsung | Yes | b |  |
| Huawei, HiSilicon | Yes | a) | It is simplest to reuse existing event definitions which allows to reuse current implementations. To make specs changes even simpler, the parameters could be renamed as a1-threshold and a2-threshold and Hys parameter could be added to the event configuration. Then the changes to Hys would not be needed while changes to threshold description could be limited to:*“a1-Threshold* as defined within *reportConfigNR* or in *eventTriggedConfig* in a CSI logged measurement configuration in *csi-LoggedMeasurementConfigToAddModList*” |
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In approach (2), for capturing the L3 measurement event that triggers logging (i.e. L3 serving cell measurements becoming worse/better than a threshold for TTT), two new events N1 and N2were added in clauses 5.5.4.x and 5.5.4.y, respectively, and in the logging configuration (in *eventTriggeredLogging*, in *BM-DataLoggingConfig*).

###### **Q2-2: For approach (2), do you agree that, to configure the event-triggered logging based on L3 measurements, it is sufficient to define and configure the new events N1 and N2 as in the TP? If no, what do you think would be missing in the RRC specs?**

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| **Company**  | **Yes/No** | **Comment**  |
| Samsung | Yes |  |
| Huawei, HiSilicon | No | We are against defining new events for this purpose. These events are virtually the same as A1/A2 and there is no need to overcomplicate things and define new events. |
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RAN2#129 agreed explicitly that event-based logging is based on a threshold and TTT. The hysteresis is another typical parameter for legacy events, but there is no explicit RAN2 agreement to capture it for event-based logging for NW-side data collection.

###### **Q3: For both approaches, do you agree that the *hysteresis* should be configured and used (alongside *threshold* and *timeToTrigger*) for event-triggered logging? If no, please explain why.**

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| **Company**  | **Yes/No** | **Comment**  |
| Samsung | Yes |  |
| Huawei, HiSilicon | Yes | We should reuse existing definitions of events A1/A2 which is the simplest way and allows to reuse existing implementations. |
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###### **Q4: For approaches (1) and (2), are there any other aspects that you think are missing from any of the two TPs? If yes, please explain what you think is missing.**

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| **Company**  | **TP for approach (1)****Yes/No** | **TP for approach (2)****Yes/No** | **Comment**  |
| Samsung | Yes | Yes | For approach 1Better to follow the same way for UE-side data collection agreed in RAN1? i.e., separate resources for Set A and B

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| AgreementFor UE-sided model, for configuring the resource for data collection purpose, support* *CSI-ReportConfig* can used for configuring the resources for data collection purpose without CSI report.
	+ **One *CSI-ResourceConfigId* is configured for Set A.**
	+ **One *CSI-ResourceConfigId* is configured for Set B**.
	+ Note: UE performs measurement on all resources
	+ One or two associated IDs can be configured in *CSI-ReportConfig*
		- When Set B is equal or a subset of set A (i.e., *NZP-CSI-RS-ResourceId*/*SSB-Index* in the resource setfor Set B is within the *NZP-CSI-RS-ResourceId*/*SSB-Index* in the resource setfor Set A), one associated ID is configured,
		- Otherwise, one associated ID is configured for Set A and another one associated ID is configured for Set B
* FFS: whether/how to support 'aperiodic' CSI RS

Note: This is not related to whether/how to support delivery/transmission of the collected data for training for UE-sided model.  |

For approach 21) We support approach 2 in that configuration is defined directly under RRCReconfiguration for future proof (e.g., AI/ML mobility). However, we do not think separate configuration for measurement resource (i.e., *BM-DataMeasResource*) and logging configuration (i.e., *BM-LoggingConfig*) is essential. It requires additional configuration binding (i.e., *LoggedDataCollectionLinkage*). We understand approach 2 has similar configuration structure for legacy RRC measurement reporting (i.e., MeasObject, ReportConfig, and MeasConfig) where a single MeasObject could be used for multiple ReportConfigs. However, we believe it is not the case for NW-sided data collection. i.e., it would not be common that a single resource (i.e., *BM-DataMeasResource*) would be associated to multiple logging configurations (i.e., *BM-LoggingConfig*).2) We assume not only RRCReconfiguration but also RRCResume could be used for configuration. |
| Huawei, HiSilicon | Yes | Yes | As indicated above, L1 measurements should be captured in L1 specifications. Then in RRC we just need to capture that those measurements are logged in dedicated variables whenever they are received from lower layer. |
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## 2.2 Impacts on RAN1

In both approaches for sending the logging configuration for beam management, upon receiving a logging configuration, the UE needs to log CSI related measurements (L1-RSRP and beam index) for the serving cell, without sending any measurements at L1.

###### **Q5: For approaches (1) and (2), do you think there may be RAN1 impact (e.g. in TS 38.214) for ensuring that the UE performs measurements according to the logging configuration and does not trigger L1 reports? If yes, please comment on what RAN1 impacts you foresee.**

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| **Company**  | **Approach (1)****Yes/No** | **Approach (2)****Yes/No** | **Comment**  |
| Samsung | Up to RAN1 | Up to RAN1 | We think it could to good to send an LS to RAN1 inclduing our agreements or agreed TP so that RAN1 decides/specifies what is needed (if any).  |
| Huawei, HiSilicon | Yes | Yes | For both approaches the impact is exactly the same, but very limited. In our view, RAN1 needs to capture that upon receiving logging configuration / indication that an event is met the UE performs L1 measurements and provides the results to higher layers. |
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## 2.3 Impacts on RAN3

The logging configuration (for both approaches) needs to contain:

* references to the resources to be measured for logging (for both periodic and event-triggered logging), which for the beam management use case are *CSI-ResourceConfigId*(s); and
* event-triggered logging configuration based on L3 measurements, including threshold and TTT.

Furthermore, with approach (1) the logging configuration would be generated by the gNB-DU under *CSI-MeasConfig*, whereas with approach (2) the logging configuration would be generated by the gNB-CU at L3.

###### **Q6: For approaches (1) and (2), do you think there may be RAN3 impact? If the answer is yes, please describe. Possible aspects to consider are: 1) CU-DU interaction for configuring the event; 2) CU-DU interaction for configuring the measurement resources; 3) CU-DU interaction for retrieving logged data, 4) CU-DU interaction for de-configuring logging configurations upon low power state indication, etc. In the comments, companies also can provide other potential RAN3 impacts in addition to above mentioned.**

Note: In the rapporteur’s view, RAN3 impacts are present also in other components of AIML for PHY (besides NW-side data collection).

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| **Company**  | **Approach (1)** **Yes/No** | **Approach (2)****Yes/No** | **Comment**  |
| Samsung | Up to RAN3 | Maybe, but up to RAN3 | In our understanding, in approach 2, some CU-DU interaction is needed for configuring resoureces and deconfiguration. However, it would not trigger so much work in RAN3. More importantly, regardless of either option, we should ask RAN3 and all the impact should be discussed/decided by RAN3. |
| Huawei, HiSilicon | Perhaps | Perhaps | According to our analysis, both approaches may have some RAN3 impacts:1. Approach 1: CU should indiate to the DU the requested logging configuration and DU includes this in CSI-MeasConfig. In our view existing singalling could be reused for this as DU already today generates CSI-MeasConfig.2. Approach 2: CU also needs to provide logging configuration to DU so that DU can provide the required CSI-RS signals. DU needs to confirm the request to CU. This would probably require a new procedure to be specified by RAN3.In any case, RAN3 aspects are not necessarily essential to make a decision. We can first decide in RAN2 and request RAN3 to analyze their signalling afterwards.  |
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## 2.4 Final questions

###### **Q7: Among approach (1) and (2), considering the complexities and impacts of the approaches, which one is acceptable/not acceptable?**

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| **Company**  | **Acceptable (approach 1/2)** | **Not acceptable (approach 1/2)** |
| Samsung | Apporach 2 and 1 (We prefer apporach 2 considering aligned configuration framework including AI/ML mobility, but there is no technical issue with either approach) |  |
| Huawei, HiSilicon | Approach 1 | Approach 2 – looking at the provided TP, this approach is overly complex. It introduces a whole new structure while the same goal can be achieved with much less changes as in approach 1. Furthermore, it was argued before this is done for the sake of future compatibility, but the introduced IEs are BM case specific and cannot be reused, e.g. for AIML for mobility use case. |
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# Conclusion

Based on the discussion during the offline meeting, captured in the previous section, we propose the following:

<TBD>

# References

1. R2-2504644, Ericsson, Nokia, Huawei, T-Mobile USA, BT Plc., “Discussion on NW-side data collection framework”, 3GPP TSG-RAN WG2 #130, Malta, May, 2025.
2. R2-2503849, ZTE Corporation, Apple, MediaTek, Samsung, OPPO, Lenovo, Xiaomi, CMCC, China Telecom, vivo, NTT DOCOMO, Sanechips, “Discussion On the NW Side Data Collection RRC Framework”, 3GPP TSG RAN2 Meeting #130, Malta, May, 2025.