**3GPP TSG RAN2 Meeging #130 R2-250xxxx**

**Malta, 19th – 23rd May , 2025**

**Agenda item: 8.1.3**

**Title: Report of** **[AT130][029][AI PHY] NW side data collection**

**Source: ZTE, InterDigital**

**Document for: Discussion and Decision**

# Introduction

This contributions are used for offline discussion **[AT130][029][AI PHY] NW side data collection, according to the chair lady guidance,** the discussion scope includes the following:

- RRC Framework for NW side data collection

# Discussion

## NW side data collection framework

###  layer 3 framework and CSI-RS framework

In order to facilitate the framework down selection between layer 3 framework and CSI-RS framework, rapporteur think the down selection principle shall be aligned with companies.

In my understanding, this is the last R19 meeting for RAN1 to discuss R19 AI/ML for PHY, and there is no any TU allocated in RAN3 for R19 AI/ML for PHY, so I think the basic principle shall be:

**Basic Principle: The solution of NW side data collection framework that causes the minimum impact to other RAN WG is preferred from RAN2 perspective.**

Company please comments on the basic principle:

Nokia: RAN3 People can discuss anytime.

Response to ITD: one buffer for all cases, and other use case

E//: We would like to go for simple solution in RAN2. Unified farmework is good intention, but the unified framework has the same linkage as the current L1/L3 framework, RAN1 shall be informed.

Apple: Support the basic principle for RAN2,

VIVO: RAN1 cannot afford the discussion raised by RAN2

Qualcomm: RAN2 shall resovle the nw SIDE DATA COLLECTION without any impact on RAN1

OPPO: RAN1 have no intention for more work from RAN 2, and logging procedure shall be in RAN2

Xiaomi:Prefer basic pricinple. The way forward

Samsung: Prefer this basic principle, and it can be futurproof to AI mobility

ITD: Future proof is more important, otherwise we have a duplicate discussion for AI mobility.

Response to Nokia: refer the configuration from RRM

HW: support E//’s view.

K: RRC framework

**Basic Principle: The solution of NW side data collection framework that causes the minimum impact to other RAN WG is preferred from RAN2 perspective.**

In [1], the summary for specification impact from layer 3 RRC framework (i.e. option 1a) and CSI-RS framework (i.e. option 2) is shown as below table:

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| --- | --- | --- | --- | --- |
|  | **RAN2 Spec Impact** | **Potential RAN3 Spec Impact** | **RAN1 Spec Impact** | **Potential spec impact for AI mobility**  |
| **Option 1a** | New RRC framework with a same level MeasConfig | F1 interface impact- CU-DU interaction for CU to obtain the Layer 1 measurement resources for data collection from DU. | None  | **RAN2:**- Introduce a list of L3 Measurement Resource Configuration, where each one includes one L3 resource ID referencing to existing measurement resource configurations |
| **Option 2** | *Extend CSI-MeasConfig* | F1 interface impact:- CU-DU interaction is needed for CU to retrieve the logged data upon the UE has been configured with data logging based data collection - CU-DU interaction is needed for DU to configure the L3 event related parameter for data logging. - CU-DU interaction is needed for CU to obtain the logged data configuration to check the validity of the received logged data reporting. | Requires updates to capture the data logging procedures in RAN1 spec (TS 38.214).FFS whether the reporting procedure needs to be captured in in RAN1 spec (TS 38.214). | **RAN2:** - Not extensible. It seems that the only feasible way is to touch the base of L3 RRM RRC framework (i.e. *MeasObjectNR)* because it doesn’t make sense to extend L1 CSI framework (*CSI-MeasConfig*) to L3 measurement logging. **RAN3:** F1 interface impact: - CU-DU interaction regarding the layer 3 event related configuration is needed. - CU-DU interaction regarding the Layer 3 measurement resources generation. |

Besides, in [2], the specification impact is not explicitly provided, but the following observation regarding concerns can be taken into account:

1. Including the L1 CSI resource configuration into the L3 *MeasObjectNR* IE for the NW side data collection raises the following concerns:
	1. Unclear benefits, given the current mechanisms for the gNB-DU and gNB-CU to configure the L1 CSI measurements, and the L3 measurements respectively, for a serving cell
	2. Added complexity to the gNB-CU, to change the handling of L1 measurements configurations received from the gNB-DU
	3. Added complexity to the UE, given the reception of L1 measurement configurations outside the legacy CSI-MeasConfig.
	4. Added complexity if dynamic activation/deactivation of NW-side data collection configurations is supported

Given that all of above in combination, it is noted that:

- the item a in observation, it can not be counted as either pros and cons because that description is too generic.

- the item b in observation is contained in the specification impact analysis in the table from [1].

The following CONs and PROs can be summarized based on above contributions in the below table:

|  |  |  |
| --- | --- | --- |
|  | **PROs** | **CONs** |
| **Layer 3 framework****[1][3]** | 1: Introduce less RAN3 impact in gNB split case- CU-DU interaction for CU to obtain the Layer 1 measurement resources for data collection from DU.2: limited RAN1 spec impact.3: There is no scalability issue for AI/ML mobility case. | 1: From ASN.1 signaling design persepctive, Introducing a new RRC framework for NW side data collection brings the ASN.1 change larger than reusing CSI-RS framework..2: NW complexity is assumed as the NW shall associate the CSI-RS with the NW side data collection.3: Added complexity to the UE, given the reception of L1 measurement configurations outside the legacy CSI-MeasConfig. |
| **CSI-RS framework****[2]** | 2: From ASN.1 signaling design perspective, just to extend the current CSI framework brings the less ASN.1 change than introducing the new Layer 3 framework , e.g. adding the logging related configuration. | 1: Introduce more RAN3 impact in gNB split case: - CU-DU interaction is needed for DU to configure the L3 event related parameter for data logging. - CU-DU interaction is needed for CU to obtain the logged data configuration to check the validity of the received logged data reporting.2:Introduce more RAN1 impact：- Requires updates to capture the L1 measurement and data logging procedures in RAN1 spec (TS 38.214).3: There is some scalability issues to support the use case of AI/ML mobility |

Company comments on PROs for layer 3 framework:

- E//: It depends on where the logging procedure is captured, and the CSI measure framework have some impact to associate the CSI-ResourceConfig to a new container.

- Q//: RAN1 impact is inevitable anyway,but the RAN 1 impact from Layer 3 framework is limited.

- Nokia: Agree with E//

- apple: RAN1 can just introduce reference to RAN2 spec .

- OPPO: RAN1 impact is quite limited.

- ITD: ask if revert L3 event? Xiaomi disagree, apple disagrees, Ericsson agrees.

- Lenovo: limited RAN1 impact may be caused by L3 framework

Company comments on CONs for layer 3 framework:

-Nokia: Think the dynamic activation/deactivation via MAC CE is needed for NW triggered data logging.

-E//: Think the NW additional complexity maybe introduced by linkage between the Layer1 measurement resources and Layer 3 NW side data collection framework.

Company comments on PROs for CSI-RS framework:

- fujitsu: We share the same view with Nokia, would like to go for MAC CE to activate/deactivate the periodic CSI-RS.

- Qualcomm/xiaomi/apple: The current legacy MAC CE for activating/deactivating CSI measurement is not for the purpose for the data collection which is not available.

Company comments on CONs for CSI-RS framework:

**Proposal 1:The solution of NW side data collection framework that causes the minimum impact to other RAN WG is preferred from RAN2 perspective.**

**Proposal 2: The table in below can be the start point for RAN2 discussion for NW side data collection framework.**

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| **Layer 3 framework****[1][3]** | 1: Introduce less RAN3 impact in gNB split case- CU-DU interaction for CU to obtain the Layer 1 measurement resources for data collection from DU.2: limited RAN1 spec impact.3: There is no scalability issue for AI/ML mobility case. | 1: From ASN.1 signaling design persepctive, Introducing a new RRC framework for NW side data collection brings the ASN.1 change larger than reusing CSI-RS framework..2: NW complexity is assumed as the NW shall associate the CSI-RS with the NW side data collection.3: Added complexity to the UE, given the reception of L1 measurement configurations outside the legacy CSI-MeasConfig. |
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# Conclusion

In this contribution, companies provide the views on RRC framework for NW side data collection . We have the following observations and proposals:

**Proposal 1:The solution of NW side data collection framework that causes the minimum impact to other RAN WG is preferred from RAN2 perspective.**

**Proposal 2: The below can be the start point for RAN2 discussion for NW side data collection framework:**

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# References

1. R2-2503849 Discussion on NW side data collection framework ZTE Corporation, Apple, MediaTek, OPPO, Samsung, Lenovo, Xiaomi, CMCC, China Telecom, vivo, NTT DOCOCMO discussion
2. R2-2504644 Discussion on NW-side data collection framework Ericsson, Nokia, Huawei, T-Mobile USA, BT Plc. Discussion

[3] R2-2503590 Consideration on NW side data collection CATT discussion