**3GPP TSG RAN meeting #106 RP-24xxxx**

**Madrid, Spain, Dec. 9th -10th, 2024**

**Source:** RAN2 Chair (InterDigital)

**Title:** Moderator's summary on offline discussion on AI/ML UE sided data collection

**Agenda Item:** 9.3.1.3

**Document for:** Discussion/Decision

# 1 Introduction

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Status from RAN P chair for offline consideration:

* Majority of companies want to specify something for UE side data collection.
* Offline should be on the focus of work moving forward for UE side data collection for standardized solution
* Work plan between RAN and SA

# 2 Discussion

Focus of work

Focus of work moving forward

Proposals presented

1. (2850) RAN to ask SA2 prioritizing the study of UP-based solutions (i.e. 1b and UP-version of 2).
2. (3189) RAN#106 to decide to down select to Options 2 and 3 (described in RP-242389) for data collection for UE-sided model training.

How to proceed:

* Prioritization between CP vs UP ???
* Prioritization of option 2 and 3 ???

Discussion

- Samsung thinks that SA should trigger the work for study purposes and there is nothing left in RAN to discuss. Nokia thinks that we can task SA to help with certain solutions and what we want. Ericsson thinks that there are aspects of the solutions, like option 3 that is heavy from RAN perspective so we can downscope.

- Futurewei thinks we can continue study and don’t think we can downselect. Panasonic thinks that we shouldn’t down-prioritize now if anyways we will do everything in R20 and anyways the design may be different depending on use case.

- ZTE also thinks that final decision should be in RAN and we should confirm with SA whether they are willing to do it.

- Vivo is hesitant to make a decision now as there may be other possibilities. Xiaomi doesn’t want to rush and there is privacy concerns as well.

- Ericsson thinks that from all papers the UP solution seems to be the one that we can agree on. Mediatek thinks that RAN2 should work on the two alternatives that they have already converged, 2 and 3. Also the model transfer should follow a similar mechanism and we will have to consider 2-sided models as well.

- CATT thinks that we need further consideration with UP solution how to guarantee security. Option 3 UP has a big specification impact, so we can downprioritize that.

- AT&T indicates that we are referring to UP component, and option 2 and 3 do have UP component.

- Qualcomm sees a lot more support of user plane solution given scalability so we can say that UP is recommended.

- TIM explains that given the amount of data from RAN1 UP is the best solution. Lenovo thinks that we can give SA2 one more quarter

- Tmobile thinks that option 1b doesn’t meet the requirements anyways, and option 2 and 3 can have UP option.

- Orange agrees that UP applies to both 2 and 3 and what matters most is visibility of UP data. We can also consider standardizing both.

- LG thinks that UP doesn’t have the scalability problem, but we shouldn’t rush SA2.

- Verizon would like to make progress in Rel-19, we have existing CP solutinos that fullfill the requirements but is good with UP.

- Samsung is still not sure whether the UP solution can meet the RAN requirements. Ericsson thinks that this is just us recommending something, and they can prioritize and if it is not good they can come back to us.

- Vodafone thinks that if we focus the discussion we can complete some aspects in Rel-19.

- Nokia clarifies that UP is used for data transfer for option 2 or 3, and Nokia is willing to prioritize option 2. Interdigital agrees that UP can be data transfer and we can leave the control part to working groups. It would be good to give them some directions.

- Mediatek thinks we can remove option 1b for now, and the concerns for solution 3 applies to both UE and NW side data collection.

- Qualcomm thinks that once we say UP solution it can be any combination of solutions. ZTE thinks that CP can work with multiple RRC messages. Qualcomm indicates that it would require more than 16 segments.

Tuesday

- Orange would like to have the option to continue with the legacy path using OAM. Also would like to be able to have the option to have the same framework/architecture for UE sided and NW sided data collection, as similar data can be collected for both. We shouldn’t close the door to these cases. TIM explains that we already have user plane so evolving user plane is easier to evolve than legacy. Mediatek is supportive of Orange’s suggestion as it would save a lot of implementation.

- Orange suggests to study possible commonality of termination and then data can be forwarded to CN or OAM.

- Samsung agrees that we shouldn’t close the door and we have to study the UP option for both 2 and 3.

- Qualcomm clarifies that for NW side data collection there was no agreement that it is OAM. Nokia, Huawei and Mediatek point out that RAN2 made the agreement that it is OAM-centric and we use MDT as baseline.

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| **Way Forward**  For SA  From RAN perspective, transfer of data over UP for Solution 2 in SA2 should be studied and provide feedback on fulfilement of visibility and controllability requirements. Transfer of data over UP for Solution 3 can be studied by SA5  RAN has already concluded that transfer of data over CP for Solution 2 and 3 can meet the visibility and controllability RAN requirements, even though some scalability concerns have been raised for high amount of data transfer. RAN is not expecting SA2 to study the transfer of data over CP for now.  For RAN2   * During Rel-19 RAN2 continues studies on AIML UE sided data collection (excluding 1b)   + Study RAN aspects related to data transfer over UP   + Discuss level of NG-RAN involvement in the control and configuration of UE side data collection.   + Discuss NG-RAN involvement in the data transfer of UE side data collection (if any) (including visibility discussion).   + Discuss aspects/solutions from RAN perspective that enable the data transfer to CN domain or OAM domain.   + Discuss on the scalability aspects of CP   + RAN2 can Liaise with other WGs if/when needed   RAN will make a final decision on way forward taking into account SA inputs. RAN will have a checkpoint in Q2, 2025 |

Work plan

Work plan (including timeline) between RAN and SA

* Vivo clarifies that SA can still do study work on Rel-19, but not normative work.

# 3 Conclusion

TBD

Table from 38.843

Table 7.2.1.3.2-1. Analysis of different data collection options for UE-side model training.

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| **Option**  **Aspect** | **Option 1a)** | **Option 1b)** | **Option 2** | **Option 3** |
| **First termination entity** | Training entity (e.g., Over-The-Top (OTT) server) | Server for data collection for UE-side model training | Inside the CN | Inside OAM domain |
| **AI/ML-specific Data Transfer Path** | UE to OTT server via either 3GPP or non-3GPP network | UE ->Server for data collection for UE-side model training/OTT server  (Note 4) | UE-> CN -> Server for data collection for UE-side model training/OTT server  (Note 4) | UE-> gNB->OAM -> Server for data collection for UE-side model training/OTT server  (Note 4) |
| **UP/CP tunnel** | UP tunnel (for the case of data transfer from UE to OTT server via 3GPP network) | UP tunnel | CP tunnel (provided that the data volume remains within the NAS signalling capacity)  FFS: UP tunnel  (Note 7) | CP tunnel (provided that the data volume remains within the RRC signalling capacity)  FFS: UP tunnel (Note 7) |
| **Protocol layer for data transfer** | Application layer | Application layer | NAS layer for CP tunnel  FFS: the protocol layer for UP tunnel | RRC layer for CP tunnel  FFS: the protocol layer for UP tunnel |
| **Controllability of MNO on data transfer (Note 1)** | No AI/ML specific controllability | FFS: level of controllability (Note 5) | Full controllability | Full controllability |
| **Solution for network controllability** | N/A (the OTT server can directly request data from the UE) | Example: per PDU sessions | Via NAS procedure or FFS other procedures | Via RRC procedure |
| **Possible Options for Visibility of data content in MNO and Data format  (Note 2, Note 3)** | No standardized visibility | FFS on level of visibility (Note 5) | Opt A) Full visibility for standardized data contents.  Opt B) Partial visibility for partially standardized data contents.  (Note 6)  Opt C) No standardized visibility. (Note 6) | Opt A) Full visibility for standardized data contents.  Opt B) Partial visibility for partially standardized data contents.  (Note 6)  Opt C) No standardized visibility. (Note 6) |
| **Impacted WGs** | N/A | SA2, SA3, RAN2, RAN3, CT1 | SA2, SA3, RAN3, RAN2, CT1 and CT3 | RAN2, RAN3, SA3,  SA5, SA2 |
| * Note 1: Full controllability: The MNO can manage data transfer to the server for UE-side data collection, without the need of SLA. This includes initiating, terminating, and fully managing data transfer. * Note 2: Visibility of data content signifies that the MNO can, at least, be aware of, access, and comprehend the data without the need of SLA. * Note 3: The following options are identified to realize the different levels of data content visibility to the MNO:   + Full visibility for standardized data content.   + Partial visibility for partially standardized data content (e.g. UE proprietary information can be included transparently together with the standardized data message).   + No standardized visibility (e.g. only UE proprietary information can be included transparently). * Note 4: The potential involvement of NF or other higher layers entities/functionalities should be discussed in other WGs. Impact on the OTT server is not in the scope of RAN2 discussion. * Note 5: RAN2 cannot reach consensus on the level of MNO controllability and visibility possible via solution 1b without input from SA groups. * Note 6: RAN2 has not concluded on the need for partial and no visibility options. * Note 7: RAN2 could not reach consensus on the feasibility of UP solution in options 2 and 3. | | | | |

**Way forward on requirements RAN 105**

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| **Requirements for data collection for UE sided model training for standardized solution (if standardized) (i.e. Option 1b, 2, 3). Option 1a is not precluded.**   * + 1. The data collected is secured and data integrity and confidentiality for that data is ensured.     2. User data privacy, anonymity and user consent is respected.     3. The MNO has full control of the standardized data collection transfer process and can manage data transfer to the server for UE-side data collection, without the need of SLA for this purpose. This includes initiating, terminating, and fully managing data transfer.     4. MNO has full visibility for standardized data.     5. The design is futureproof and extendable.   FFS/study if and how to handle non-standardized data (i.e. partial visibility).  FFS controllability on data collection  Standardized solutions should follow the principle of aiming to minimize air interface overhead and impact to NW operation |