
LS on 5GC information exposure to UE

Response to:

Release: Release 18

Work Item: FS_AIMLsys / Rel-18

Source: 3GPP SA2

To: 3GPP SA1, 3GPP SA3

Cc:

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Attachments: TR 23.700-80, S2-2203768

1. Overall Description:

As part of the FS_AIMLsys study, “*Key Issue #2: 5GC information exposure to UE*” and solutions addressing this key issue are documented in TR 23.700-80. Corresponding solutions mapping can be found in clause 6.0 of the TR.

Some mobile operators in SA2 (see S2-2203768) have raised security concerns about exposing the network data directly to the UE for application AI/ML operations, i.e. allowing the UE to have direct access to the network data to support its local operation. Indeed, in certain application AI/ML operation, the UE’s local operation can be achieved by coordinating with the AF (e.g., when the AF can get network data from 5GC as per outcome of *Key Issue #3: 5GC Information Exposure to authorized 3rd party for Application Layer AI / ML Operation*), which guides the UE in its behavior.

Therefore, SA2 wonders if SA1 could provide guidance on the issue of exposure to the UE to assist the local AI/ML operation?

1.1 OPPO's draft reply [S1-222150, S1-222151, S1-222253]

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Feedback Form 1: Comments/Questions regarding OPPO's draft reply

1 – ZTE Wistron Telecom AB

It is written in the reply LS "SA1 kindly suggest SA2 to allow UE to have a direct access to obtain UE level network information". But we don't have such requirement defined. Shouldn't it be first discussed and defined in SA1?

2 – Deutsche Telekom AG

We have some comments to the DP:

Observation 1 – it seems such network specific info about QoS is available and consumed by the application. Then the application can make a decision about a split of a model having in mind such info.

Observation – 2 – the application is in control and if the UE takes the responsibility, then suppose more resources would be used at the UE to analyse and take such decision.

We do not see a value in giving such info to the UE as the application consumes such info, has better computation capacity and can be in control of such split. Not giving the UE such info seem to reduce computational resources used in the UE and also seem to reduce the amount of sensitive info available at the UE.

We are not convinced the UE should have access to such statistics.

1.2 China Mobile's draft reply [S1-222184]

Feedback Form 2: Comments/Questions China Mobile's draft

1 – ZTE Wistron Telecom AB

It was asked to provide guidance from SA1 as well. This is missing in the reply LS.

2 – Deutsche Telekom AG

Fully agree to the statements provided in the reply LS from CMCC. SA1 has discussed already this topic during the study phase of FS_AMMT and concluded the 3rd party only can receive such information.

3 – TNO

Fully agree that only the 3rd party should receive information. Where needed the UE can get information via the 3rd party application.

1.3 NTT DOCOMO's draft reply [S1-222043]

Feedback Form 3: Comments/Questions NTT DOCOMO's draft

1 – ZTE Wistron Telecom AB

Guidance from SA1?

2 – Deutsche Telekom AG

SA1 requirements are pointing out to exposure towards authorized 3rd party only and not towards UE. We are not in favour of exposing such information towards UE and fully support NTT DOCOMO's reply.

1.4 Preferred answer

Feedback Form 4: Which answer does your company prefer as a baseline for the LS reply?

1 – CICT

From CATT:

We prefer to a consolidated answer based on all the draft replies and CR proposal.

Regarding TS26.221 6.40.2, the network information such as indication about a change for QoS flow, predicted network condition per UE, and event alerts, etc are only exposed to authorized 3rd party, which is normally understood as Application/AI Server. No explicit requests about exposing the network information to UE directly.

However, based on the use cases illustrated in TS26.221 6.40.1, limited network information exposure such as the analytics result of network status, UE-specific network condition to UE directly could facilitate UE to decide the strategy of operation split, timing to request for ML/AL model download and adaption based on the monitoring result, etc. From this point, it is beneficial to discuss the possibility of requirement enhancement on network information exposure to UE.

It's noted that the considered network information shall be limited to the analytics result and UE-specific information with regard of security and privacy aspects.

2 – KDDI Corporation

Summary: KDDI prefers NTT docomo's answer as the baseline.

Dear all,

SA2 asked SA1 whether there are any new requirements for network information exposure to UE. So, SA1 should clearly inform its fact.

NTT docomo's or China Mobile's answer is in line with that.

3 – vivo Mobile Communication Co.

Summary vivo prefers OPPO's answer as baseline.

Dear all

UE-specific network condition could facilitate and optimize the UE behavior regarding the AI/ML operation and realize better user experience under current network condition. It is beneficial for SA1 to discuss and agree possible requirement on enhancement on network information exposure to UE.

4 – Huawei Technologies France

Summary: Huawei provides comments.

Dear all,

Based on the use cases discussed for AI/ML, we understand certain 5GC information such as the network analytics results to the UE can be beneficial for the applications on the UE versus that done via AF or 3rd party applications, for good reasons to retain freshness of the information in environment with higher degree of dynamics (e.g. V2X). It should be noted not all information should be subject to direct exposure to UE, and enabling this should be subject to operator policy.

As the draft responses roughly agree on the approach, it would be great to align and generate a combined version?

Thanks,

Best regards,

Shuang

5 – ZTE Wistron Telecom AB

I am wondering if any SA1 guidance/plan should be discussed first to introduce the requirement or not, i.e. start work in SA1 in the course of the new WID FS_eNEC_CIP

(Enhanced network exposure capability with critical information preserving) if **appropriate** (to be checked).

6 – Deutsche Telekom AG

Summary: DT prefers NTT DOCOMO's answer.

There has been a Rel18 study FS_AMMT which clearly identified authorized 3rd party as consumer of the respective analytics.

It has been discussed that the application can decide further if to share specific info with the UE via application layer. The application can decide better and expose only information which is needed based on its application specifics. There would be offload of decision/computation of the UE resources. Respective proposals for UE to receive such data were not approved. Please see discussions, e.g. S1-204154.

There is no need to revisit these discussions.

7 – Nokia UK

Nokia prefers the reply from DoCoMo. It is accurate and succinct.

8 – TNO

KPN prefers the reply from DoCoMo (or China Mobile).

9 – Tencent

Tencent provides comments.

Hi all,

I think that there are use cases where exposing 5GC information to UE may be beneficial e.g. AIML case. If AIML is used for V2X and 5G-enabled automated driving scenario, some information e.g. network status and QoS predication related to driving decision in vehicle side can be exposed to UE instead of being exposed firstly to AF and then to UE in application layer. Agree that operator policy should be followed and security issues need to be considered, and these aspects can be considered during stage-2. So I support OPPO's proposal.

Thanks a lot!

Br, Lei from Tencent

10 – Charter Communications

Charter Communications prefers OPPO's proposal.

There are mission critical applications requires network data assisting UE computation in real time, OPPO's proposal is better in this aspect. Security and route through AF should not exclude a solution that the network provides data directly to a UE.

11 – TNO

Moderator comment: Please express your opinion about exposing and to whom the information. My plan is to choose by Thursday an answer.

12 – Ericsson LM

As the DoCoMo and China Mobile answers are in line with current SA1 specifications, we support to use either of these 2 as the baseline for the LS reply.

13 – Guangdong OPPO Mobile Telecom.

OPPO thinks the current answer from CMCC and DoCoMo is not correctly reflecting the SA1 situation and propose way forward.

Current spec does not say which entity the 3rd party application will be run, so is it not correct to say "an authorized 3rd party (i.e., authorized 3rd party application function)" in the LSreply from DoCoMo.

We suggest to confirm two questions as below:

1) whether SA1 define the entity running the 3rd party application?

OPPO's answer is it is defined in downstream working group.

2) Whether UE can get 5GC information

OPPO's answer is the UE can get the information via a AF which is a way we regularly used.

Based on the answers to the questions, it is not proper to simply say "there is no SA1 requirement ..." because SA1 did not define which entity is running the application. Thus we propose to provide the following answer

"As described in TS 22.261, clause 6.40.2, the current service requirements require the 5G system to be able to expose relevant network information to an authorized 3rd party application. SA1 does not further define if such network information needs to be exposed to the 3rd party application running on AF, UE or Both. It belongs to the downstream to define such thing"

14 – Deutsche Telekom AG

DT understanding is prediction information about data connection availability and predictive QoS should be provided only centrally to application/AF. It is clear some companies prefer the other approach, but the arguments for it are not clear. It is pointed out that real time information is needed and notifying the UE via the AF would cause some delay. Can you clarify in details what this delay is? This is predictive data, then how does it matter if it is going to be delivered 20ms later or no? Predictions are made based on statistics and respectively are available in advance to the disturbance event.

To our understanding centralized control of the application saves resources at the UE side. Centralized control from the application also makes possible simultaneous coordination of multiple UEs. In this sense why the UE has to act alone and independent from application decided what to do based on predictive information from the network?

15 – Guangdong OPPO Mobile Telecom.

Hi Vasil/DT colleague, from OPPO perspective, we do not exclude the assumption that the central AF decides the Application layer policy. In the AMMT use case, some predicted change of QoS may be sent to UE, and based on the preconfigured application layer policy (which is negotiated between UE and AF), then the UE can quickly change its realtime behavior in a timely manner as soon as it receives the 5GC information. This needs a fast notification.

Based on your response, it seems you agree the UE can get the information via a AF, which is already today's mechanism, right? Then I think we can add such understanding into the LS reply, since it is possible to let UE get the information using existing mechanism.

16 – Samsung R&D Institute UK

Another point for information sharing to the UE not to the AF is privacy and confidentiality related. This is of course for SA3 to discuss not SA1, but I mention the concern we have here. The NW knows where the UE how it is communicating and much more. If this information is sent to the AF, then the AF also knows a lot about the UE. This may not be appropriate or even allowed. If the AF provides some service, e.g.

image processing, it has no business knowing the exact location of the UE and its communication patterns, etc. even if the UE is providing some FL service. If the UE (application) were informed instead of the AF regarding its status, etc. it could make an optimal decision locally, or send some minimal / abstract information that does not violate the subscriber's privacy.

In addition, SA3 should identify if there is any concern in term of security breach that needs to be addressed and how it should be addressed.

1.4 Actions:

To SA1.

ACTION: SA2 kindly asks SA1 to provide guidance and confirm any new requirements for network information exposure to UE.

To SA3.

ACTION: SA2 kindly asks SA3 to specify if there is any concern in term of security breach that needs to be addressed and how it should be addressed.

SA3 response [S1-222068]: SA3 would like to thank SA2 for their LS S3-221313/S2-2205286 on 5GC information exposure

1.4 Documents related this discussion:

Table 5: Documents related to this discussion

TO	S1-222066	S2-2205286	LS on 5GC information exposure to UE
TO	S1-222068	S3-221621	LS reply on 5GC information exposure to UE
OUT	S1-222150	OPPO	Reply on 5GC information exposure to UE
Cont	S1-222151	OPPO	Concerning Reply LS on 5GC information exposure to UE
CR	S1-222253	Oppo	22.261v18.6.1 Clarification on requirement related to 5GC information exposure
OUT	S1-222184	China Mobile	Reply LS on 5GC information exposure to UE
OUT	S1-222043	NTT DOCOMO	[DRAFT] Reply LS on 5GC information exposure to UE