
1 Introduction

The work tasks in section 2.1 are based on the following items from SP-230759, "Input from TSG SA Rel-19 Workshop: Consolidated SA WG2 Rel-19 Topics for moderated discussions", TSG SA Chair.

- Defining what information goes into an operator managed User Profile and where it is stored in the 5GC.
- Authenticating and Authorizing users.
- Enable charging based on user identity, including how to identify traffic from a user separate from traffic of other users.
- Taking user identity into account when delivering services and service settings.
- How to identify a UE within the 5GC that connects to the residential WLAN AP using PSK
- How to identify whether the UE is connected to the residential AP managed by the operator or a residential AP that is not managed by the operator
- ** ADDED FROM "MOBILE VPN" IN ORIGINAL LIST
 - identification and policy control of individual device connecting behind 3GPP UE (e.g. behind RG)

The content of section 2.1 is also based on the following inputs to the SA Rel-19 workshop.

- SWS-230013, View on SA2 Rel-19 package, TELECOM ITALIA S.p.A.
- SWS-230015, Futurewei's view on Rel-19, Futurewei Technologies
- SWS-230016, AT&T views on Release 19, AT&T
- SWS-230023, KPN's view on SA Rel-19, KPN N.V.
- SWS-230025, MediaTek Thoughts - Release 19, MediaTek Inc.
- SWS-230041, NEC's view on Release 19, NEC Corporation
- SWS-230045, Huawei views on Rel-19 SA, Huawei, Hisilicon
- SWS-230057, Release-19 priorities, Charter Communications, Inc, Comcast, CableLabs
- SWS-230058, Overview of Preferred SA Release 19 Features, Lenovo
- SWS-230059, Philips (health vertical) views on release 19, Philips International B.V.
- SWS-230066, Interdigital's views on SA R19 Package, InterDigital, Europe, Ltd.
- SWS-230069, Google's views on SA2 R19 package, Google Inc.

The content is also based on the following documents which were submitted to SA2 #157 for information.

- S2-2307368, Discussion on Supporting User Identities in Rel-19, InterDigital Inc.
- S2-2307369, New Study on Enhancement of Usage of User Identifiers in the 5G System, InterDigital Inc.
- S2-2307162, Discussion on Mobile Virtual Private Network in R19, Huawei, HiSilicon
- S2-2307163, New Study on Mobile Virtual Private Network, Huawei, HiSilicon
- S2-2307179, Rel-19 topics of interest, Charter Communications, Inc.
- S2-2307401, Discussion on 5WWC Rel-19 Enhancements, CableLabs

2 Scoping

2.1 Work Tasks based on input to and outcome of the Workshop

The initial set of Work Tasks for discussion, based on the input to the workshop and SP-230759 are as follows:

The following work tasks are based on “*Defining what information goes into an operator managed User Profile and where it is stored in the 5GC.*” from SP-230759.

WT-1.1: Define the architectural assumptions that enable the support of user identities and the related involvement of the mobile operator network.

WT-1.2: What information is stored as part of the user identity profile (e.g., a user identity, user identity specific settings, charging details and parameters). Including how user identity profiles are stored and updated in the 5GC.

WT-1.3: Whether and how user identifiers are linked and unlinked with 3GPP subscriptions.

The following work tasks are based on “*Taking user identity into account when delivering services and service settings.*” from SP-230759.

WT-1.4: What user identity specific settings and parameters need to be taken into account by the 3GPP system when delivering a service (e.g., traffic segregation between users and enhancements to mobility management procedures to support delivering MO and MT Services to user(s)). For example, whether and how the UE establishes separate PDU sessions for the different users and how to control the traffic for the different users, e.g., by using the different QoS Rules and/or charging policies.

WT-1.5: How the network takes the user identity into account when adapting network, operator-deployed, and 3rd party service settings (e.g., policies, N6 service chain), for example, when performing network slice selection.

The following work tasks are based on “*Authenticating and Authorizing users*” from SP-230759.

WT-2.1: Whether and how information from the user identity profile is used by the 5GC to authenticate and authorize user identities. Whether and how the 5GC authenticates the identity owner (i.e. a subscriber) to obtain authorization to issue a new user identity.

WT-2.2: How the network controls the usage of user identifiers, including in roaming scenarios (e.g., how the operator restricts the number of simultaneously active user identifiers per UE, restricts the usage of a user identifier in roaming scenarios, and suspends usage of the user identifier based on operator policy or location).

WT-2.3: How and what user identity profile information and functionality can be exposed to application functions (e.g., for edge computing, towards a 3rd party, or towards a human user). For example, the ability for the owner of a user identity to control which 3rd party systems are permitted to interact with the user identity and the ability for the owner of a user identity to obtain information about utilization of the user identity (e.g. time of utilization, quantity of use, associated application functions, etc.).

The following work tasks are based on “*Enable charging based on user identity, including how to identify traffic from a user separate from traffic of other users.*” from SP-230759.

WT-3.1: How charging can be enabled when there is a separation between the user and the subscriber (e.g. for users using the same UE and subscription).

The following work tasks are based on “*identification and policy control of individual device connecting behind 3GPP UE (e.g. behind RG)*” from SP-230759.

WT-4.1: When non-3GPP devices communicate via a UE, whether and how to control the UE, e.g., whether NAT is allowed in the UE, which devices and how many devices are allowed to access the 5GC via the UE, and whether and how to allocate IP addresses for the non-3GPP devices.

WT-4.2: How a UE can use the user identifier of a non-3GPP device to discover and communicate with the non-3GPP device when the non-3GPP device connects via another UE (e.g., a PEGC).

NOTE: The UE that the non-3GPP device uses for connectivity and the UE that discovers and communicates with the non-3GPP device may be behind different NAT functions.

The following work tasks are based on “*How to identify whether the UE is connected to the residential AP managed by the operator or a residential AP that is not managed by the operator*” and “*How to identify a UE within the 5GC that connects to the residential WLAN AP using PSK*” from SP-230759.

WT-5.1: When an RG or residential WLAN AP provides connectivity to a UE or a non-3GPP device that is associated with a user identity, how the 5GC identifies and manages the connection of the UE.

Feedback Form 1: Which of the above Work Tasks should be in scope of Rel-19?

1 – Charter Communications

WT-1.1, WT-1.2, WT-1.3, WT-2.2, WT-2.3, WT-3.1, WT-4.1, WT-4.2, WT-5.1

2 – Ericsson LM

The Work Tasks required to support the scenario of multiple users sharing a UE, including the scenario of multiple non-3GPP devices behind a UE/RG should be part of the study. Currently it is not clear which Work Tasks are really required for the above scenarios/use cases.

3 – Comcast

We want to echo Ericsson’s comment about having work tasks for scenario where a single device is shared by multiple users. We want to extend Ericsson’s scenario to include **multiple users sharing/behind a non-3GPP device** in addition to behind a UE.

4 – MediaTek Inc.

We think that WT-1.1, WT-1.2, WT1.3 (revised wording in feedback form 3) and WT2.3 (revised wording in feedback form 3) are important to be in the scope of Rel-19.

WT-2.1, WT-Philips-4.3, WT-Nokia 4.4, Samsung-WT-1, Samsung-WT-2 can be consolidated together. Nevertheless, it is partly in the remit of SA3.

WT-1.4 and WT- 1.5 are more like solution statement rather than WT and are not needed.

WT-2.2 is not urgent given that the study first need progress on other WTs.

WT-3.1 is in the scope of SA5.

WT- 4.1, 4.2, 5.1 (and new additional WTs suggested WT-Comcast-5.2, WT-Comcast-5.3, WT-Comcast-5.4, WT-Comcast-5.5, WT-Comcast-5.6) can be consolidated together. It is not feasible to have such granularity of WTs in Rel-19.

5 – Comcast

WT-1.1, 1.2, 1.3, 1.4, 1.5, WT-Comcast-1.6, 2.1, 2.3, 3.1 (probably SA5 led), WT-4.1, WT-Charter-4.3, Merged WT-Philips-4.3/WT-Nokia-4.4/WT-CableLabs-5.2., WT-5.1, WT-Comcast 5.2 to 5.6 and Samsung WT-1/2.

With respect to WT-Philips-4.3, the concept of ”authentication of device” is unclear - typically user/subscriber is authenticated instead of the device; can Philips elaborate more in terms of what they are thinking.

More clarification is required with respect to WT-4.2 and rewording is required. The concept of user identifier of a non-3GPP device is unclear.

In terms of merging being proposed by Mediatek, we can put some thought but it is unclear how it would be possible to merge them. If Mediatek can provide starting text for merged WTs, we can review. Also, we made the WTs granular to make sure the tasks are clear which we thought was good for clarity. We could remove some sub-bullets that suggest a solution if that is a concern.

6 – Qualcomm Incorporated

The requirement of user identities was studied in SA1 since Rel-16, for time being, some of the specified requirement of user identities like SSO, has been deployed by UE vendors and UE applications. It's not clear whether mobile operators still have the incentive to deploy the similar system in 5G, which is not supported by the existing network functions and UE subscription based authentication mechanism.

The requirement of traffic differentiation and QoS control for devices behind a relay UE have been supported via PIN and 5WWC solutions. The introduction of user identities may have some overlap and conflict with the existing mechanism of traffic control.

In general, a consolidate use identities capability may fall not in the scope of 3GPP, which has high dependence on UE OS, UE deployment and applications.

Lack of titles of top level of WT.

More clarification is required on which usage scenarios for user identities to be proposed for Rel-19 study, e.g. in WT-1.1.

WT-4.1, WT4.2 and WT-5.1 are essentially all addressing the general question how to identify non-3GPP devices behind a UE (or 5G-RG) and how to perform differentiated policy control for those devices.

Trying to solve this problem by introducing a new "user identifier" is unrealistic because this would require support by the operating system (OS) of the non-3GPP devices. It is unclear why OSs of non-3GPP devices (e.g., laptops, tablets, home appliances, home entertainment devices, ...) would support new 3GPP-based user identifiers. There is no obvious incentive for those OS vendors to introduce such new identifiers. Therefore we do not see value in studying new identifiers for non-3GPP devices behind the UE/5G-RG.

It is also important to note that the issue of differentiated treatment for non-3GPP devices behind a 5G-RG has been studied in Rel-18. To avoid repeating the same study again, we would like to suggest to review the tools that are already available in the system and determine whether any aspects are missing. For instance:

- if the UE/5G-RG uses an Ethernet PDU Session for the traffic for non-3GPP devices, then the existing 5GS QoS features can be reused to police (e.g., block, throttle, etc). traffic to/from specific non-3GPP devices in the UPF. Note that existing BBF signaling (e.g. using BBF's TR-69/369 and TR-181) can be used to retrieve information about the non-3GPP devices behind the 5G-RG (incl. their Mac address). Based on this, a QoS request can be made (e.g. using NEF) to e.g. rate-limit the traffic of individual non-3GPP devices (identified by their MAC address).
- For the case that the UE/RG is operating as a router, i.e. if the RG assigns IP addresses to the NAUN3 devices and if NAT is used, the UE/5G-RG might reserve port ranges for individual non-3GPP devices. Based on this, the UE/5G-RG may use the UE-initiated PDU Session modification procedure to request QoS treatment for the reserved port range to e.g. rate limit the traffic for a particular non-3GPP device. Which QoS to request for a specific device might be based in local configuration or configured using BBF signaling (subject to discussion with BBF).

- Another option might be to check with BBF whether the port ranges to be used by the 5G-RG for NATing traffic of particular non-3GPP devices can be controlled using BBF signaling (or if the signaling could be extended to enable this). If so, then NEF APIs could be used to request a specific QoS treatment for a particular non-3GPP device (identified by the port values used by the NAT function in the 5G-RG).

Only if based on a review (e.g. done offline amongst interested companies) any gaps in existing 3GPP functionality are identified, then depending on the gaps, either a very focused small study or TEI-19 work could be considered.

7 – Motorola Mobile Com Technology

Lenovo supports the following work tasks (WT1.1, 1.2, 1.3, 1.4, 1.5, 2.1, 2.2, 2.4). Proposes to merge all these work tasks into three main work tasks that describe identification of user within 3GPP network with a user identity, how to link a user identity to a 3gpp subscription (e.g. with a user profile) and how a 3rd party and 3gpp network can interact with user identifiers.

WT2.1, 2.2, 2.4 is regarding creation of a user profile and associating user identities to 3gpp subscriptions. Can be covered by WT1.

8 – NEC Europe Ltd

NEC view is that WT-1.1, WT-1.2, WT-1.3, WT-1.4, WT-1.5, WT-2.1, WT-2.2 and WT-2.3 should be handled first within Rel-19. We agree that there could be merging between them to reduce the number of the WTs.

9 – Nokia France

We need to first better understand what we strive to do: does a user correspond to a person, to a device, to an application?

Many of my comments relate with security: if we need to introduce another service delivery level with, as suggested by the WT3, its own level of charging we may need to introduce a corresponding level of authentication.

If the user corresponds to a person what are the use cases to be addressed beyond those of MC PTT (multiple crew persons can share a device and while the device/SIM security/ authentication is handled at 5GC level, the person's authentication is handled at MCPTT's application level)?

We already have defined primary authentication, Slice authentication, DN(N) authentication, would we need to introduce yet another level?

Currently the split between the User and the subscriber is already there in the specs: taking as an example the phone I am using, the User is me, identified by the SIM while the subscriber is my company who has subscribed for me and pays the bill (and all employees of Nokia France are different users, with a single subscriber being Nokia France)

5GC Service delivery is controlled/tuned per the SUPI (associated with UDM/UDR or PCF/UDR subscription data). Do we want to introduce another level of service control meaning that *all over* the system (in all the procedures where SUPI is used) we would need to introduce another sub-user level (the user is

already identified by the SUPI). You are going to tell me that SUPI refers to Subscriber: true that SUPI is 5G Subscription Permanent Identifier but actually the SUPI is the identifier of the User 's subscription.

I note also that MUSIM already allows a given device to support multiple users possibly simultaneously as nothing prevents the 2 SIM(s) from being delivered by the same operator and thus to correspond to the same subscription.

In summary this study would open a kind of rethinking of the whole system which, considering the short release we have, does not seem doable unless strongly scoped and also considering we are at the end of the 5GS definition. As this proposed study could lead to a huge amount of work it could possibly better be a KI of a 6G study!!

10 – vivo Mobile Communication Co.

Many thanks to draft the working task for user ID.

After reviewing all of the WT and cases, from my aspect, that for the current description and motivation of introducing user ID, I am not so convinced for the scenarios.

What I see is maybe the digital ID in Avatar communication may have the requirements and real scenarios, but for other scenarios for example, the multiple users sharing UE didn't have the strong requirements. So, all of the requirements and scenario of user ID may need more discussion.

for WT 1.5, it is obvious that resource configuration is based on service, it is confused and unclear what kind of setting should be based on user ID instead of service

For WT2.2, the requirements for roaming scenarios is not clearly. The example here does not yet show the need to control the number of user IDs. Do you mean that more user IDs will occupy more system resource, so to control the numbers? The relevant scenarios need further elaboration here.

For WT4.1, The NAT function is performed in UE side, why needs the 5GC to control that is unclear.

For WT4.2, the application layer mechanism can do that, for example, the device discovery. It can be done in SA6 aspect.

11 – HUAWEI Technologies Japan K.K.

Huawei support to fulfil the SA1 requirements on User Identity specified in the TS 22.101 since Rel-16, "Identifying distinguished user identities of the user (provided by some external party or by the operator) in the operator network enables an operator to provide an enhanced user experience and optimized performance as well as to offer services to devices that are not part of a 3GPP network." This may provide a new business opportunity to the operators for differentiated service control to the users behind the 3GPP UE or using the UE, apart from providing a way for authentication of the users.

Reply to Qualcomm's comments:

The major gap between the existing 3GPP mechanism and SA1 requirement is that the 5GC is unable to identify the user who is using the device behind the 3GPP UE and unable to provide differentiated QoS and Policy control per user, neither addressed by PIN nor 5WWC in Rel-18. Please also note the requirements from SA1 include identifying the users running the applications on the 3GPP UE or sharing the 3GPP UE, as described in SA1's spec.

You said that the potential solutions have dependency on the UE OS, UE deployment and applications, yes, but the impact is minor if we apply the secondary authentication procedure by using EAP based mechanism which is already supported by the existing OS and non-3GPP devices/UEs, which can be discussed during study phase.

Huawei is proposing to make the WTs simpler and more straight forward, in the Feedback Form 3.

Reply to Nokia's comments:

The key aspect of the study in our understanding is not only about authentication, but also enabling the 5GC to identify the user who is using the device behind the 3GPP UE or using the UE e.g. running different applications by different users, and provide differentiated QoS and policy control for the users. For the authentication, maybe we can reuse the secondary authentication procedure, which has minor impact on the system, whatever the user id is to be managed by the operator or the third party. But this is more for solution discussion.

12 – Cisco Systems Belgium

Cisco supports the following work tasks: 1.1, 1.2, 1.3, 1.4, 2.1, 3.1, 4.1 and 5.1. Others can be studied in later releases.

13 – Beijing Xiaomi Software Tech

Xiaomi supports WT1.1, WT1.2, WT1.3, WT2.1, WT2.3 in scope.

for WT1.4, WT1.5, it looks detailed solutions, and seems covered by WT1.2, or merge into WT1.3

WT2.2, can be merged into WT2.1

WT3.1, should be in scope of SA5

WT4.1, need rewording, in this use case, we are talking about user identifier, when non-3GPP devices with user identifier. This can be supported by PIN, what the gap is not clear

WT4.2, as study in PIN, how UE to discover the PINE, is not in scope of 3GPP. What are the gaps/new impacts?

14 – Samsung Electronics Czech

In addition to the use cases of multiple users sharing a single UE, we also need to consider the scenarios of a single user using multiple UEs, that is a single user id being linked/associated with multiple 3GPP subscription, user identity provider being either the operator or some external party (kindly refer to S2-2307245 as submitted in SA2#157).

15 – Nubia Technology Co.

(from ZTE)

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WT#1.1, #1.2, #1.3, WT#2 and WT#4 should be in the R19

16 – NTT DOCOMO INC.

DOCOMO supports WT-1.1, 1.2, 1.4, 1.5, 2.3, Samsung-WT-1, Samsung-WT-2, and WT-Nokia 4.4.

17 – Nokia France

about Samsung's "**single user id being linked/associated with multiple 3GPP subscription,**" could you clarify the use case; please note that nothing prevents a subscriber (let say Nokia France) from asking the operator to create many users (all nokia France's employees) with the same subscription parameters.

18 – Deutsche Telekom AG

Deutsche Telekom supports

- WT-1.1,
- WT-1.2,
- WT-1.3,
- WT-1.4 reworded - no need for differentiated mobility management procedures),
- WT-1.5 (maybe merged with 1.4),
- WT-2,
- WT-3.1 reworded - if not anyhow considered in scope of SA5 only,
- Samsung-WT-1,
- Samsung-WT-2,

Ad QC comment #6: The requirement of user identities was not only studied but also required. The question whether operators still have incentive to deploy is not for SA2, but for SA1. If SA1 would not see a need any longer, they would remove the requirements. In fact more and more requirements in various studies rely on this functionality.

All other WTs can in our view be de-prioritized from Rel19

19 – InterDigital

InterDigital's view is that all 5 work tasks should be included.

Additionally, the proposals from Comcast, Phillips, Charter, CableLabs, and TNO can be merged into WT-5. Also, the proposal Samsung can be merged into WT-2.

Regarding Nokia's question on about Samsung's "**single user id being linked/associated with multiple 3GPP subscription,**".....For us, one use case that should be addressed is the "Several Users sharing one UE" use case that is described in TR 22.904, section 5.1. This is not about 2 users having the same subscription settings. Rather, this is about one UE with one Subscription (i.e. SUPI) and the UE is used by different human users.

20 – AT&T

In general we would be supportive of all 5 WTs (with possible merger to limit the total number of items).

21 – Apple AB

WT-1.x , WT-2.x WT-3.1 , WT-4.x, WT-5.1

For WT-4.1, we also request a clarification: does it apply only to non-3GPP devices behind the UE or would it also cover tethering use cases? What is the motivation for operator controlled IP address allocation behind the UE?

Some of the WTs can be combined. a few proposals are in the next feedback form

22 – China Mobile Com. Corporation

We support WT-1 and WT-2 to be included in 19.

23 – Dish Network

In general, we're interested in this study,

Rel-19, all WT-1.*, WT-2* and WT-3.1 to be included.

24 – CableLabs

WT-1.1, WT-1.2, WT-1.3, WT-1.4, WT-1.5, WT-Comcast-1.4, WT-2.1, WT-2.2, WT-2.3, WT-4.1, WT-4.2, WT-Phillips-4.3 (preferred) or WT-Nokia-4.4, WT-Charter-4.3, WT-5.1, WT-Comcast-5 (including sub cases), WT-Cablelabs-5.2, WT-4 (proposed by Huawei), Samsung-WT-2.

Overall, we are supportive of WTs to allow non-3GPP UEs sharing a UE/RG (and possibly WLAN AP) where 5GC identifies the device and provides differentiated policy/QoS for each non-3GPP UE/device/user. We support RG can be either 5G-RG or FN-RG.

Regarding Qualcomm's comments (post #6) on gaps in current specifications to support WT-4.1, WT-4.2 and WT-5.1, we see that Rel-18 PIN and WWC do not support 5GC providing an identity, authenticating the identity, and providing policy/QoS control for a user that can be a device behind a gateway UE/RG. We consider these requirements important for operator handling on individual device behind a UE or RG.

25 – Guangdong OPPO Mobile Telecom.

OPPO supports to study WT1.1, WT1.2, WT1.3, WT1.5.

OPPO has concern to WT4 and WT5 since it is unclear what is the gap comparing to what we have studied.

Feedback Form 2: Can any of the Work Tasks above be combined/merged?

<p>1 – MediaTek Inc.</p> <p>WT-2.1, WT-Philips-4.3, WT-Nokia 4.4, Samsung-WT-1, Samsung-WT-2 can be consolidated together. Nevertheless, it is partly in the remit of SA3.</p> <p>WT- 4.1, 4.2, 5.1 (and new additional WTs suggested WT-Comcast-5.2, WT-Comcast-5.3, WT-Comcast-5.4, WT-Comcast-5.5, WT-Comcast-5.6) can be consolidated together.</p>
<p>2 – Comcast</p> <p>See our comment with regards to consolidation of WT-4.1, 4.2, 5.1 and additional Comcast tasks. For example Comcast 5.6 is related to exposure and not sure how that can be consolidated with identification of whether UE is connected from behind an AP or not. Also, 4.1/4.2 seem to be associated with non-3GPP behind a UE while tasks related to 5 are associated with UE connecting to WLAN AP using PSK.</p>
<p>3 – Motorola Mobile Com Technology</p> <p>WT1.4, 1.5, 2.1, 2.2, 2.3 can be merged into three generic work tasks</p>
<p>4 – NTT DOCOMO INC.</p> <p>WT-1.4 and 1.5 are too specific and basically saying related aspect. They can be merged and needs to be more generic wording.</p>
<p>5 – Deutsche Telekom AG</p> <p>Agree with Docomo #4 on merging and generalizing WT-1.4 and 1.5</p>
<p>6 – Apple AB</p> <p>WT1-4 and WT-1.5 may be combined.</p> <p>Similarly WT-4.1 and WT-5.1 could be combined for a generic treatment.</p>
<p>7 – CableLabs</p> <p>WT-4.1 and WT-4.2 may be combined with WT-Philips-4.3, WT-Nokia-4.4, WT-CableLabs-5.2, and WT-Charter-4.3.</p>

Feedback Form 3: Should any of the Work Tasks above be reworded? If so, propose the required rewording.

<p>1 – Guangdong OPPO Mobile Telecom.</p> <p>There is a fundamental question that what does the "User" specifically mean? Different meaning may affect how large the scope of the study will be. For example, we see "A user can be a person, device, or an application" in SWS-230066. From our side, "User can be a person" if fine, however it is not clear why user can be a device or an application considering we already have IMSI/PEI and Application ID/descriptor defined today.</p>
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2 – MediaTek Inc.

***Revised wording* -> WT- 1.3: Whether and how user identifiers are *associated* with 3GPP subscriptions.**

***Revised wording* -> WT- 2.3: Suggest to fully remove the example.**

3 – Motorola Mobile Com Technology

WT1.1: Study how a 3GPP network can identify a user via an external user identity when a specific user of UE registers or requests a connectivity via the 3GPP network

WT1.2: Study how a user identity can be associated to a 3GPP subscription (e.g. by creation of a user profile in 5GC).

WT1.3: Study whether and how a 3rd party and 3gpp network can interact using user identities.

4 – NEC Europe Ltd

WT-2.3: How and what user identity profile information and functionality can be exposed to application functions (e.g., for edge computing, towards a 3rd party, or towards a human user). For example, the ability for the owner of a user identity to control which 3rd party systems are permitted to interact with the user identity and the ability for the owner of a user identity to obtain information about utilization of the user identity (e.g. time of utilization, quantity of use, associated application functions, etc.).

better be re-worded to

WT-2.3: How and what user identity profile information and functionality can be exposed to application functions and how the application functions can control the user identity profile.

5 – HUAWEI Technologies Japan K.K.

Propose to restructure the WTs as below.

WT-1: How a User Identity is associated with the subscription of the 3GPP UE.

WT-2: How a UE can use the User Identifier of a non-3GPP device to discover and communicate with the non-3GPP device when the non-3GPP device connects via another UE.

WT-3: How the network can identify, authenticate, authorize, and provide QoS and policy control for the user that is using the non-3GPP devices behind a 3GPP UE or is using the 3GPP UE or is running applications on the 3GPP UE.

WT-4: How the User Identifier can be exposed to the AF for service control based on the User Identifier.

6 – CableLabs

For WT-4.1 and WT-4.2, it can be merged/replaced based on WT-Philips-4.3 - Study how the network can identify, authenticate, and provide QoS and policy control for individual non-3GPP devices behind a 3GPP UE/RG (e.g., 5G-RG, FN-RG).

2.2 Additional Work Tasks

As well as the initial set of Work Tasks in section 2.1 companies can request to add additional Work Tasks. The naming of these additional Work Tasks should follow the format: WT-company name-# (eg WT-Samsung-1) so that other participants can reference them.

Feedback Form 4: Are there any additional Work Tasks that should be part of Rel-19?

1 – Comcast

WT-Comcast-5.2: How to identify whether the UE is connected to the residential AP managed by the operator or a residential AP that is not managed by the operator

WT-Comcast-5.3: Study methods/procedures to identify the UE when it connects to residential AP using PSK; study encompasses:

- Enhancements to existing N3GPP registration procedure or specifying a new procedure
- Enhancements to UE policy to trigger the procedure when the UE connects to WLAN AP using PSK. This could include updates to USIM configuration

WT-Comcast-5.4: Study methods/enhancements to enable reporting of its continued association with a WLAN AP or a new association with a new WLAN AP

WT-Comcast-5.5: Study methods/enhancements to enable reporting of the N3GPP access related information by the UE (e.g., BSSID, ESSID, UE local IP address, etc.)

WT-Comcast-5.6: Enhance the API framework to enable subscription/notification for N3GPP association information related to a UE by an operator managed AF

2 – Philips International B.V.

Given the formulation of worktasks 4.1 and 4.2, it seems that the main work task of enabling identification and control of individual non-3GPP devices is not addressed. Hence, propose to add the following work task (in line with what is mentioned also in SWS-230059):

WT-Philips-4.3: Study how the network can identify, authenticate and provide QoS and policy control for individual non-3GPP devices behind a 3GPP UE.

3 – Nokia France

we propose following WT (that addresses the main work task of enabling identification and control of individual non-3GPP devices that is not otherwise addressed)(this WT Has quite some similarities with WT-Philips-4.3)

”WT-Nokia 4.4: study 5GC identification and policy control of individual devices connecting behind a 3GPP UE (e.g. behind a 5G RG)”

4 – Samsung Electronics Czech

Samsung-WT-1: Study how to authenticate user’s digital identity (e.g. bio information) and exposing the result of the user authentication to AF (where the user identity is provided by the operator)

Samsung-WT-2: Study how to verify and link user identity authenticated by a 3rd party with 3GPP subscription (where the user identity is provided by the 3rd party)

5 – Charter Communications

Identification and policy control of individual devices connecting behind 3GPP UE (e.g., behind RG) is included in the introduction, but not clearly reflected in clause 2.1. Propose to add a sub-WT to study bridge mode and L2 identification benefits.

6 – CableLabs

WT-CableLabs-5.2: How to identify and provide differentiated service for each non-3GPP device behind a RG (5G-RG and FN-RG).

7 – Guangdong OPPO Mobile Telecom.

We see the same comments about adding ”authenticate user’s digital identity (e.g. bio information) and exposing the result ” in XRM discussion also, we need to determine whether and how much overlapped between ”user id” and ”digital identity”, are they the same thing or with overlapped meaning?

8 – TNO

KPN proposes to add the following WT:

- WT-KPN-1 : Support of service continuity of a user that moves from behind a 3GPP UE (e.g. behind RG) to a direct 5GC connection.

9 – Comcast

Comcast proposes the following additional WT to associate device with user:

WT-Comcast- 1.4: How to link/associated the device being accessed by the user (i.e. user identity) so that network can apply appropriate policies.

10 – Samsung Electronics Czech

Clarification for OPPO’s comments related to Digital Identity and User ID:

Digital Identity (e.g. fingerprints, digital avatar etc.) is the information associated with a User ID.

We intend to study how to utilize person’s bio-information to authenticate a particular user (i.e. it’s User ID).

Feedback Form 5: If there are any additional Work Tasks required, describe them

<p>1 – Comcast</p> <p>The additional work task are those provided in SWS-230057 but were not captured in SWS-230759 as well as that was present in SWS-230759 but might have been overlooked.</p>
<p>2 – Charter Communications</p> <p>WT-Charter-4.3 Study the benefits of L2 visibility and utilizing policy control in a residential domain (e.g., RG)</p> <p>Supportive of additional WT-Comcast-5.x, WT-Philips-4.3, and WT-Nokia-4.4</p>
<p>3 – CableLabs</p> <p>From SWS-230040 - Various use cases such as parental control, prioritized service for work-from-home scenarios, wireless backup, etc require differentiated QoS/policy control for individual device behind CPE/RG.</p>
<p>4 – Comcast</p> <p>WT-Comcast-1.4: This is to capture identify the device that the user is utilizing so that the operator can manage sessions or enable/restrict/notify users to simultaneously use an user identity across multiple devices</p>

3 Dependencies

These feedback forms will help define the dependencies between Work Tasks, dependencies of Work Tasks on other Working Groups (SA, RAN or CT), and dependencies on other potential SA2 Rel-19 SIDs and WIDs. The Work Tasks can be from the list in section 2.1, or any additional Work Tasks identified in the feedback in section 2.2.

Feedback Form 6: Describe the dependencies that any of the Work Tasks have on other 3GPP Working Groups

<p>1 – Qualcomm Incorporated</p> <p>WT-2.1, 2.2, 2.3 have dependencies on SA3.</p>
<p>2 – Cisco Systems Belgium</p> <p>WT-2.1 has dependency with SA3 (security). WT-3.1 has dependency with SA5 (charging)</p>
<p>3 – NTT DOCOMO INC.</p> <p>WT-3.1 should be discussed in SA5.</p>

4 – InterDigital

WT-1.4 has a possible RAN dependency.

WT-2.1 has an SA3 dependency.

WT-3.1 has an SA5 dependency. However, this point should be clarified. WT-3.1 is about making sure that the network architecture enables collection of enough information to charge a user for traffic that is generated with a certain subscription. For example, User-X generated 100 MB of data with SUPI-Y. It may be that SA5 interaction is required to determine if additional information needs to be collected. However, in our view, it is for SA2 to decide HOW the network knows traffic comes from User-X.

Feedback Form 7: Describe dependencies between the Work Tasks

1 – NTT DOCOMO INC.

WT-1.4 and WT-1.5 are related. (so they can be merged as written in Feedback Form 2)

Feedback Form 8: Describe any dependencies on potential work/study items that might be created as a result of the other Q3 moderated discussions.

1 – NTT DOCOMO INC.

WT-2 of XRM Enhancements can be treated in this SI.

2 – InterDigital

WT-2 of XRM Enhancements is related to WT-1 of User Identities. We prefer to cover the needs of XRM WT-2 in WT-1 of a User Identities SID.

4 Partitioning

These questions will help determine whether there is one, or more than one, Study Item, Work Item or TEI-19 item to be created from these Work Tasks.

Feedback Form 9: Should there be more than one SID, WID or TEI-19 item created based on the Work Tasks?

1 – Nokia France considering the other big items we will likely study: Satellite with possibly store and forward, Ambient IoT, sensing, which each add services but don't change the heart of the 5GS, we need to collectively understand whether we can in this short release afford to rethink the heart of the 5GS. Or we need to have a very focused and thus tightly scoped study
2 – Samsung Electronics Czech One SID should be enough in our understanding.
3 – NTT DOCOMO INC. No, one SID is enough.
4 – InterDigital Our view is that this can be covered in one SID.

Feedback Form 10: If the answer to the above question is yes, describe how the Work Tasks should be partitioned into different items.

5 Summary from the Q3 discussions

5.1 Summary from sections 2.1 and 2.2

In Feedback Form 1, companies were asked “Which of the above Work Tasks should be in scope of Rel-19?”

There were 12 Work Tasks listed in section 2.1. The work tasks were numbered 1.1 – 1.5, 2.1 – 2.3, 3.1, 4.1 – 4.2, and 5.1.

25 Responses were received from 23 companies.

19 Companies indicated that WT-1.1 and WT-1.2 should be in scope of Rel-19. Responses from 3 companies are interpreted as an indication that WT-1.1 and WT-1.2 should not be in scope of Rel-19.

18 Companies indicated that WT-1.3 should be in scope of Rel-19. Responses from 4 companies are interpreted as an indication that WT-1.3 should not be in scope of Rel-19.

Moderator Proposal 1: Proposed Conclusion: WT-1.1, WT-1.2, and WT-1.3 should be included in Rel-19. The wording of these work tasks should be updated to account for concerns that were expressed by some companies and to take on suggestions from some companies.

14 Companies indicated that WT-1.4 and WT-1.5 should be in scope of Rel-19. Responses from 8 companies are interpreted as an indication that WT-1.4 and WT-1.5 should not be in scope of Rel-19. 2 of the companies that indicated that indicated that WT-1.4 and WT-1.5 should not be in scope of Rel-19 expressed concerns that

WT-1.4 and WT-1.5 sound like solutions.

Moderator Proposal 2: Proposed Conclusion: WT-1.4 and WT-1.5 should be included in Rel-19. The wording of these work tasks should be updated to account for concerns that were expressed by some companies and to take on suggestions from some companies. In particular, WT-1.4 and WT-1.5 should be re-worded so that they are not so solution specific.

14 Companies indicated that WT-2.1 should be in scope of Rel-19. Responses from 6 companies are interpreted as an indication that WT-2.1 should not be in scope of Rel-19.

12 Companies indicated that WT-2.2 should be in scope of Rel-19. Responses from 7 companies are interpreted as an indication that WT-2.2 should not be in scope of Rel-19.

16 Companies indicated that WT-2.3 should be in scope of Rel-19. Responses from 5 companies are interpreted as an indication that WT-2.3 should not be in scope of Rel-19.

Moderator Proposal 3: Proposed Conclusion: WT-2.1, WT-2.2, and WT-2.3 should be included in Rel-19. The wording of these work tasks should be updated to account for concerns that were expressed by some companies and to take on suggestions from some companies.

8 Companies indicated that WT-3.1 should be in scope of Rel-19. Responses from 10 companies are interpreted as an indication that WT-3.1 should not be in scope of Rel-19. At least 3 other companies indicated that it needs to be in SA5's scope.

Moderator Proposal 4: Proposed Conclusion: WT-3.1 should not be included in Rel-19 as a work task but the SID should clarify that a motivation for the user identity feature is to allow for the collection of charging data containing the User Identifier and the subscription to which it is linked for access.

10 Companies indicated that WT-4.1 should be in scope of Rel-19. Responses from 10 companies are interpreted as an indication that WT-4.1 should not be in scope of Rel-19.

Moderator Proposal 5: Proposed Conclusion: WT-4.1 should be included in Rel-19. The wording of this work task needs to be updated. Multiple companies indicated that the work task should be merged with some of the new work task proposals from Feedback Form 4. WT-4.1 needs to be updated and merged with the new work task proposals.

9 Companies indicated that WT-4.2 should be in scope of Rel-19. Responses from 12 companies are interpreted as an indication that WT-4.2 should not be in scope of Rel-19.

Moderator Proposal 6: Proposed Conclusion: WT-4.2 should not be included in Rel-19.

9 Companies indicated that WT-5.1 should be in scope of Rel-19. Responses from 11 companies are interpreted as an indication that WT-5.1 should not be in scope of Rel-19. However, in Feedback Form 4, companies expressed interest in including different version of WT-5 to address cases where a UE connects via AP.

Moderator Proposal 7: Proposed Conclusion: WT-5.1 needs to be re-written to account for the feedback from companies in Feedback Form 4.

In Feedback Form 2, companies were asked "Can any of the Work Tasks above be combined/merged?"

7 Responses were received from 7 companies.

4 Companies indicated that WT-4.x and WT-5.x should be merged with each other and/or also with new work tasks that were proposed by CableLabs, Charter, Nokia, and Comcast.

Moderator Proposal 8: Proposed Conclusion: WT-4.x and WT-5.x should be updated and merged with the proposals from CableLabs, Charter, Nokia, and Comcast.

4 Companies expressed support for merging WT-1.4 and WT-1.5. Company responses again indicate that WT-1.4 and WT-1.5 are too solution specific. Moderator Proposal 2 above already suggests that WT-1.4 and WT-1.5 should be re-worded so that they are not so solution specific.

In Feedback Form 3, companies were asked “Should any of the Work Tasks above be re-worded? If so, propose the required wording?”

7 Responses were received from 7 companies.

One company asked about the meaning of user.

Moderator Proposal 9: Proposed Conclusion: A user identity SID should clearly define the term user and should be based on SA1 requirements.

The other 6 responses made different wording suggestions for WT-1.x, WT-2.x, WT-3.x, and WT-4.x.

Moderator Proposal 10: Proposed Conclusion: The wording suggestions from these 6 responses should be merged into work tasks 1 thru 4.

In Feedback Form 4, companies were asked “Are there any additional Work Tasks that should be part of Rel-19?”

10 Responses were received from 9 companies.

Responses from Phillips, CableLabs and Nokia relate to WT-4.x and/or WT-5.x. They propose a new WT related to policy control for devices that connect via a UE. In Feedback Form 1, multiple companies expressed support for these proposals from Phillips, CableLabs, and Nokia.

Moderator Proposal 11: Proposed Conclusion: WT-4.x should account for the policy control for devices that connect behind a UE.

The response from Comcast and includes new work tasks for WT-5.x. These work tasks relate to cases where a UE connects via a residential AP. Some companies proposed that the contents of these work tasks be merged/combined with WT-5.x.

Moderator Proposal 12: Proposed Conclusion: Merge/combine the contents of WT-Comcast-5.x into a new WT-5.

OPPO asked about the distinction between a user identity and a digital identity. Proposal 9 above will help to address this question. A user identity SID should clearly define the term user and should be based on SA1 requirements.

In Feedback Form 5, companies were asked “If there are any additional Work Tasks required, describe them.”

4 Responses were received from 4 companies. The responses here were elaborations of responses to Feedback Form 4, so no additional actions are required (beyond what is recommended based on Feedback Form 4).

5.2 Summary from Section 3

In Feedback Form 6, companies were asked “Describe the dependencies that any of the Work Tasks have on other 3GPP Working Groups.”

4 companies responded to this question.

3 companies indicated that aspects of WT-2.x have SA3 dependency.

3 companies indicated that WT-3.1 has SA5 dependency. As mentioned above, in proposal 4, WT-3.1 should not be included in Rel-19 as a work task but the SID should clarify that a motivation for the user identity feature is to allow for the collection of charging data containing the User Identifier and the subscription to which it is linked for access.

1 company indicated that WT-1.4 has RAN dependency. As mentioned in several places in this summary, the text of WT-1.4 needs to be updated so that it is not so solution specific.

In Feedback Form 7, companies were asked “Describe dependencies between the Work Tasks.”

1 company responded to this question.

1 company indicated that WT-1.4 and WT-1.5 are related and can be re-written.

In Feedback Form 8, companies were asked “Describe any dependencies on potential work/study items that might be created as a result of the other Q3 moderated discussions.”

2 companies responded to this question.

Both indicates that aspects of WT-2 from the XRM Enhancements discussion can be merged into WT-2 of this user identity study.

5.3 Summary from Section 4

In Feedback Form 9, companies were asked “Should there be more than one SID, WID or TEI-19 item created based on the Work Tasks?”

4 companies responded to this question.

3 companies indicated that one SID is sufficient.

1 company expressed concern about keeping the study tightly scoped.

In Feedback Form 10, companies were asked “If the answer to the above question is yes, describe how the Work Tasks should be partitioned into different items.”

No companies responded to this question.