

SA2 Rel-19 23Q4 moderated discussion - Architecture related to roaming value-added services - Version 0.0.3

SA2

<https://nwm-trial.etsi.org/#/documents/8707>

1 Introduction

The intent of this document is to define the Work Tasks for the architectural support of Roaming Value Added Services in 5GS enabled by the PLMN based on the use cases described in TR 22.877 and requirements specified in TS 22.261(S1-230688) for:

- Welcome SMS
- Steering of Roaming (SoR) during the registration procedure
- Subscription-based routing to a particular core network (e.g. in a different country)

Following inputs have been taken into account:

Rel-19 Study item proposal on Roaming Value Added Services by Ericsson and Deutsche Telekom in S2-2306445.

Table 1: Contributions regarding RVAS to Release 19 SA Workshop

DocNumber	Source	Title	Brief Description and Key Objectives
SWS-23003	Orange	Roaming Value Added Services	Use cases for Welcome SMS, Steering of Roaming (SoR) during the registration procedure and IMSI based routing to a particular core network e.g. in a different country

SWS-23004	GSMA (AT&T, China Mobile, CK Hutchison, Dish, Deutsche Telekom, EE, KDDI, KPN, KT Corp, Orange, SK Telecom, Telefonica, Telenor, Telia Company, Telstra, Telecom Italia, T-Mobile USA, Verizon, Vodafone)	Roaming	One of the vital roles of MNOs is to provide roaming services. 5G roaming has been developed with security by design. However, the roaming ecosystem is complex, with many players, such as MNOs, IPX, RH, RVAS providers. The 5G system should support all entities of the roaming ecosystem while maintaining a high level of security and flexibility but should try to reduce the complexity.
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SWS-230013	Telecom Italia	5G SA Roaming	<p>Recent discussions in GSMA on 5G Roaming showed the importance to consider and preserve roaming ecosystem intermediaries such as Roaming Hub, IPX and RVAS Providers, when transitioning from 2G/3G/4G roaming to 5G with built-in E2E security. It is recommended to:</p> <ul style="list-style-type: none"> •In cooperation with GSMA, analyze requirements from use cases that are established in roaming currently and that should be provided for 5G SA roaming per the different roles of RH/IPX Provider/RVAS Provider, and provide any architecture enhancements to meet such requirements •Offer solutions to enable provisioning of specific Roaming VAS, as per stage 1 requirements, by either the PLMN or by a fully-trusted roaming intermediary
SWS-230016	AT&T	Roaming Value Added Services	<p>Roaming Value Added Services (RVAS) form part of the roaming services ecosystem and have been discussed in SA1 and GSMA. Potential objectives for release 19</p> <ol style="list-style-type: none"> 1.Welcome SMS 2.Steering of Roaming (SoR) during the registration procedure 3.Subscription-based routing to a particular core network (e.g., in a different country)

SWS-230023	KPN	Roaming Value Added Services	Roaming services like welcome SMS and SOR are a necessity for operators and should be well specified for 5G to be flexible e.g. choice of outsourcing or do it yourself
SWS-230060	Ericsson	Study on Roaming Value Added Services	The objectives of this study are the stage 2 aspects for the following RVAS in 5GS enabled by the PLMN as requirements have been specified in TS 22.261: -Welcome SMS -Steering of Roaming (SoR) during the registration procedure -Subscription-based routing to a particular core network (e.g. in a different country)
SWS-230068	CMCC	Roaming Value-add service	

2 Scoping

Roaming value-added services (RVAS) form part of the roaming services ecosystem and have traditionally been provided by either the PLMN or outsourced to a fully trusted entity. The RVAS provider acting on behalf of the PLMN could be any trusted 3rd party. The RVAS described in stage 1 requirements are all **RVAS enabled by the PLMN** for 5GS roaming.

The objectives of this study are the stage 2 aspects for the following RVAS in 5GS enabled by the PLMN according to requirements specified in TS 22.261:

- Welcome SMS
- Steering of Roaming (SoR) during the registration procedure
- Subscription-based routing to a particular core network (e.g. in a different country)

The purpose of this study is to study the stage 2 aspects for these RVAS enabled by the PLMN.

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, and listed in S2-2306445 are as follows:

WT-1: Study how to support "Welcome SMS" .

WT-2: Study how to support Steering of Roaming (SoR) during the registration procedure

WT-3: Study how to support Subscription-based routing to a particular core network (e.g. in a different country)

The following Feedback forms are intended to capture company input on whether a work task should be in the scope of Rel-19, and can also be used eg to provide input on whether a work task can be merged with another, propose re-wording of the work task, or propose that a WT-1 should be part of another study/work item.

Feedback Form 1: Should WT-1 "Welcome SMS" be in the scope of Rel-19?

1 – TELECOM ITALIA S.p.A. TIM supports WT-1 to be in scope of Rel-19
2 – AT&T GNS Belgium SPRL AT&T supports WT-1 to be in scope for Rel19
3 – Nokia Corporation Please clarify what are the gaps of existing specifications that already support Nnef_EventExposure and the capability for external entities to send SMS to any UE(s).
4 – ZTE Corporation. Yes.
5 – Guangdong OPPO Mobile Telecom. It is unclear to us gaps between the WT#1 and current mechanism.
6 – Orange Orange supports WT-1 to be in scope for Rel-19.
7 – Deutsche Telekom AG Deutsche Telekom supports WT-1 to be in scope for Rel-19.
8 – Qualcomm Technologies Int The SA1 requirements leave ambiguity in terms of the scope of work for this WT in SA2 i.e. whether anything is needed. The current requirement in TS 22.261 states: "The 5G system shall be able to support mechanisms for the HPLMN to provide a notification, including equipment and subscription identifiers, to

a trusted application server when a UE successfully registers in a VPLMN. In response to the notification, the trusted application server can indicate specific actions to the HPLMN (e.g., send an SMS to the UE).

NOTE: The trusted application server can be hosted by the home operator or a trusted 3rd party and is out of 3GPP scope.

Nevertheless it is already possible as defined in TS 23.502, cl.4.13.2.2 an AF (trusted or from 3rd party) to trigger sending SMS to specific UE. Also it is possible via NEF to expose the Ues "roaming status". Putting these aspects together it is already possible to implement today the functionality of "welcome SMS" from HPLMN. What extra does it need to be studied it needs to be clarified.

9 – HUAWEI TECHNOLOGIES Co. Ltd.

In general we are fine on this service requirement. But we also want to know what is the GAP here as it seems possible support today? So it is better later in the justification part to give some clear on what is the GAP to be fixed.

10 – T-Mobile USA Inc.

T-Mobile USA supports this WT as been part of the Study.

11 – Ericsson LM

Ericsson supports this WT as part of the study

12 – Deutsche Telekom AG

AFAIK at least the equipment identifier is missing.

Feedback Form 2: Should WT-2 "Steering of Roaming (SoR) during the registration procedure" be in the scope of Rel-19?

1 – TELECOM ITALIA S.p.A.

TIM supports WT-2 to be in scope of Rel-19

2 – AT&T GNS Belgium SPRL

AT&T supports WT-2 to be in scope for Rel19

3 – Nokia Corporation

Please clarify what are the gaps of existing specifications that already support Steering of Roaming (SoR) during the registration procedure (as defined in TS 23.122), which involves SoR-AF too.

4 – ZTE Corporation.

ZTE supports

5 – Guangdong OPPO Mobile Telecom.

OPPO supports WT#2.

6 – Orange

Orange supports WT-2 to be in scope of Rel-19.

7 – Deutsche Telekom AG

Deutsche Telekom supports WT-2 to be in scope for Rel-19.

8 – Qualcomm Technologies Int

Steering of roaming has been specified between SA3 and CT1 and in SA2 traditionally we only did alignment (right from the beginning of its introduction in rel.15). It is telling that the following is currently documented in TS 23.502 cl. 4.2.2.2.1:

During the registration the Home Network (or Credentials Holder in case of access to an SNPN) can provide Steering of Roaming information to the UE via the AMF (i.e. a list of preferred PLMN/access technology combinations and/or Credentials Holder controlled prioritized lists of preferred SNPNS and GINs and/or Credentials Holder controlled prioritized lists of preferred SNPNS and GINs for accessing Localized Services or HPLMN/Credentials Holder indication that 'no change of the above list(s) stored in the UE is needed'). The Home Network can include an indication for the UE to send an acknowledgement of the reception of this information. Details regarding the handling of Steering of Roaming information including how this information is managed between the AMF and the UE are defined in TS 23.122 [22].

In fact as per TS 23.122 SoR is supported during registration (see 23.122 clause C.2 “Stage-2 flow for steering of UE in VPLMN during registration”).

The NOTE in service requirements in TS 22.261 clause 6.44.1.3:

6.44.1.3 Steering of Roaming (SoR) during the registration

The “Steering of Roaming (SoR) during the registration procedure” service makes the home operator able to steer a user to a certain network during the registration procedure when the user tries to register to a new (non-preferred) network.

NOTE: This functionality is different from Steering of Roaming described in clause 6.30, which aims to influence which network a UE would try to register on.

Is also ambiguous since SoR is also aiming to influence which network (VPLMN) the UE would try to register on. These aspects need to be clarified first but eventually we think this WT should be discussed in CT1 and SA3 first given their prior history in SoR feature.

9 – HUAWEI TECHNOLOGIES Co. Ltd.

same as above, we suggest to give the gap on what is to be fixed. Then it is clear on what is we want to solve.

10 – Ericsson LM

Ericsson supports this WT as part of the study

11 – Deutsche Telekom AG

AFAIK at least the equipment identifier is missing.

Feedback Form 3: Should WT-3 "Subscription-based routing to a particular core network" be in the scope of Rel-19?

1 – TELECOM ITALIA S.p.A.

This WT-3 has been also explicitly requested by GSMA in SP-230352. TIM supports WT-3 to be in the scope of Rel-19

2 – AT&T GNS Belgium SPRL

AT&T has a question about WT-3, is the intention of this WT to support subscription-based routing to a particular core network that is different from VPLMN and HPLMN core network?

3 – Nokia Corporation

Please clarify whether the WT intends to route a PDU session (meaning all traffic on that PDU sessions) to a particular core network (e.g. in a different country) or to route some application traffic to a particular network (e.g. in a different country).

4 – ZTE Corporation.

ZTE supports this working task to be studied in R19.

5 – Orange

Orange supports WT-3 to be in the scope of Rel-19.

6 – Deutsche Telekom AG

Deutsche Telekom supports WT-3 to be in scope for Rel-19.

7 – Qualcomm Technologies Int

Current Routing indicator together with SUCI/SUPI HNI allows selecting a specific AUSF and UDM instances to direct signalling:

Routing Indicator

UE's Routing Indicator that allows together with SUCI/SUPI Home Network Identifier to route network signalling to AUSF and UDM instances capable to serve the subscriber.

The aspect of "different country" in e.g. and possible regulatory requirements that apply due to that, needs to be discussed and discussed with relevant WGs like SA3 and SA3-LI.

<p>8 – HUAWEI TECHNOLOGIES Co. Ltd.</p> <p>We agree this WT have some new requirement to be fulfilled. We are fine to study this WT.</p>
<p>9 – T-Mobile USA Inc.</p> <p>T-Mobile USA thinks this WT should be studied in rel 19 by SA2</p>
<p>10 – Ericsson LM</p> <p>Ericsson supports this WT as part of the study</p>

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?

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3 Additional comments

Any additional input can be provided here.

Feedback Form 5: Any additional comments?

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4 Summary

11 companies

-TELECOM ITALIA, AT&T, Nokia, ZTE, OPPO, Orange, Deutsche Telekom, Qualcomm, HUAWEI, T-Mobile USA, Ericsson

provided feedback on 3 work tasks. No additional work tasks are proposed. No general comment provided. Each work task has 7 clear supporters. Regarding WT1 and WT2 there seem to be small changes needed only. WT3 still needs more discussion for better understanding of the intended scenario.

Table 2: Summary of received comments

WT#	WT to be in scope of Rel19	other comments/questions
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<p>WT1</p>	<p>7 (Telecom Italia, AT&T, ZTE, Orange, Deutsche Telekom, T-Mobile US, Ericsson)</p>	<p>Nokia, OPPO, Qulacomm, Huawei: What are the gaps in existing specification to support this? Nnef_EventExposure of UEs "roaming status" and sending an SMS in TS 23.502, cl.4.13.2.2 an AF (trusted or from 3rd party) to trigger sending SMS to specific UE is already supported. Deutsche Telekom: at least the equipment identifier is missing.</p>
<p>WT2</p>	<p>7 (Telecom Italia, AT&T, ZTE, OPPO, Orange, Deutsche Telekom, Ericsson)</p>	<p>Qualcomm: WT should first be discussed in SA3 and CT1; Qulacomm, Nokia, Huawei: What are the gaps in existing specification to support this? New requirement vs existing SoR functionality is to be clarified. Deutsche Telekom: at least equipment identifier is missing.</p>

<p>WT3</p>	<p>7 (Telecom Italia, ZTE, Orange, Deutsche Telekom, Huawei, T-Mobile US, Ericsson)</p>	<p>Telecom Italia: WT-3 has been also explicitly requested by GSMA in SP-230352.</p> <p>Moderator: To be discussed.</p> <p>AT&T: Is the intention of this WT to support subscription-based routing to a particular core network that is different from VPLMN and HPLMN core network?</p> <p>Moderator: AFAIK, Yes.</p> <p>Nokia: Please clarify whether the WT intends to route a PDU session (meaning all traffic on that PDU sessions) to a particular core network (e.g. in a different country) or to route some application traffic to a particular network (e.g. in a different country).</p> <p>Moderator: AFAIK the scenario is about routing all traffic to a particular core network.</p> <p>Qualcomm: Current Routing indicator together with SUCI/SUPI HNI allows selecting a specific AUSF and UDM instances to direct signalling.</p> <p>Moderator: That is expected to be part of the solution but not enough. Let's discuss further F2F!</p> <p>The aspect of "different country" in e.g. and possible regulatory requirements that apply due to that, needs to be discussed and discussed with relevant WGs like SA3 and SA3-LI.</p> <p>Moderator: To my understanding LI happens in the VPLMN. There is no change to that. No change in security architecture is expected. Let's discuss further F2F!</p>
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5 Moderator proposal

Proposal 1: Discuss/clarify further WT1 regarding gap during F2F and decide how to proceed (e.g. TEI19)

Proposal 2: Discuss/clarify further WT2 regarding gap during F2F and decide how to proceed (e.g. TEI19 or CT1/SA3)

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Proposal 3: Clarify and discuss further intended functionality and scenario regarding WT3 F2F and decide how to proceed (e.g. SID or TEI19)