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# 1 Introduction

Following the guidance from SA#100 plenary and from SA2 chair, this document is used to initiate the moderated discussion on the working scope of IMS and NG\_RTC enhancements in Rel-19.

The contents in section 2 includes the initial working tasks for review and discussion based on the input from SP-230759 and related contributions of Rel-19 workshop.

Please be noted that the contributions in SA2#157 for NG\_RTC enhancements are not fully taken into account according to the guidance from the plenary, i.e. features which have not been raised again in the workshop and SP-230759 are not captured in this document. Those can be proposed during the discussion if needed.

The following contributions contains the proposed objective(s) to IMS and NG\_RTC enhancements :

- SWS-230016 (AT&T):
  - Support interworking and roaming of IMS data channel
  - Enhance IMS data channel related services and operational aspects
  - Enhance IMS media plane architecture, interfaces and procedures to support metaverse and IMS based XR services
  - Mechanisms in IMS enabling an external API invoker to subscribe to specific events related to a specific IMS subscriber / group of IMS subscribers
- SWS-230013 (TIM):
  - It is recommended to study useful enhancements on top of that work such as
    - providing data verified OIP (Originating Identification Presentation) service
    - providing capability exposure to the enterprise/verticals for IMS existing communication services (e.g. simple VoLTE call) as well as for NG\_RTC services
- SWS-230023 (KPN):
  - Investigate and identify Circuit Switched (CS) related activities those that can be removed from relevant processes or signaling procedures when a network no longer supports a CS network for voice or Emergency voice services
  - KPN is supportive to all improvements in emergency voice services
- SWS-230033 (China Unicom):
  - Supporting the exposure of IMS real-time communication capabilities (audio, video, text, data) to the enterprises/verticals

- Enhancements to IMS media plane for supporting new use cases of mobile Metaverse services and IMS based XR services.
- SWS-230054 (NTT DOCOMO):
  - Enhancement of Rel-18 NG\_RTC and Successor of (part of) SA1 Metaverse. The following includes aspects of our interest:
    - Bootstrap DC only media
    - Coexistence with legacy UE/NW
    - DCSF API
    - identity (if there is an accompanying study in SA6).
- SWS-230068 (China Mobile):
  - IMS related services enhancements, including supporting standalone data channel, third party ID etc.
  - Interworking, LBO roaming and Data off for data channel applications
  - Exposure of IMS real-time communication capabilities
  - SBA enhancements on CSCF service registration and discovery, service based media plane
- SWS-230078 (Orange):
  - Enable access to emergency services through SMS
    - EU regulations require that Emergency should be accessible regardless of the service used (voice, SMS, video, ...)
    - Service requirements have been specified in Rel-18 in clause 10.11 of TS 22.101 but no time to study and specify stage-2 and stage-3 impacts during Rel-18 timeframe
- SWS-230004 (GSMA):
  - Interworking and roaming
  - Exposure of IMS real-time communication capabilities
  - Support of mobile Metaverse services and IMS based XR services
  - IMS related services enhancements, e.g. standalone data channel, third party ID
- SWS-230034 (ZTE):
  - R18 Leftover
    - Normative work for third party using specific user identities
    - Network exposure: interface between DCSF and NEF, and between DCSF and DC App Server

- Services based on DC as PS Data Off exempt services clarification according to reply LS from SA1
- GSMA NG input(NG.134): e.g. RTC across multiple operators
- Standalone DC session without audio/video media
- SWS-230035 (Samsung):
  - Architecture enhancement for supporting IMS Data Channel without accompanying audio/video media in an IMS session [S2-2306827])
  - NRF support for IMS nodes the SBI between CSCF to AS and exposure service to 3 rd party AF/AS [S2-2307275] and [S2-2306443]
- SWS-230045 (huawei):
  - Enhancements to the IMS network architecture, interfaces and procedures for the NG-RTC
  - Support for interworking and roaming of IMS data channel
  - Providing IMS data channel in an IMS emergency call
  - Expose IMS real time communication (audio, video, text, data) to third party
  - Support use cases for metaverse (e.g. XR immersive communication among multiple users)
- SWS-230050 (vivo):
  - IMS/NG-RTC Architecture enhancement to support diversity media service
  - Coordination/negotiation between the UE and IMS when performing avatar communication service processing, by considering the following aspects: Service type, UE capability, performance requirements, etc.
  - UE/mobile metaverse server Capability management, e.g., registration, selection, query, updating, exposure, de-registration
  - Coordination with SA4 (e.g. protocol, support of split rendering)
- SWS-230060 (Ericsson):
  - Study on IMS event exposure framework
    - event subscription mechanisms via subscribe / notify procedures to external API invokers
    - identification of IMS events that can be subscribed to
    - locator functionality whereby the IMS NF / IMS NFs serving the specific subscriber(s) for which the specific event was requested is found
    - subscribe / notify procedures from the IMS NF / IMS NFs serving the specific subscriber(s) for the requested event.
    - synergies with the Network Exposure Framework defined in 5GS (e.g., exposure of events to external API invokers via the network exposure function (NEF) from the IMS NF / IMS NFs).

- Study on 3rd party call id in IMS Sessions
  - The objective is to get a solution to KI#1 “How the Originating IMS network signs the 3rd party IDs and terminating IMS network verifies the 3rd party IDs” as outlined in TR 33.890, from the NG-RTC study into normative specifications. The study will ensure that SA3 is involved in the security aspects required for any selected solution
- SWS-230073 (Apple):
  - Study how an SMS is routed to an emergency centre serving the UE location, including in roaming case
  - Study whether IMS emergency registration is used
  - Study how the emergency service is identified in the IMS signalling
  - Study how to support SMS to emergency response centre without a USIM/ISIM
  - Study how the response SM is handled.
- SWS-230029 (Peraton Lab):
  - MPS priority for IMS messaging and SMS including, SMS over NAS and SMS over IP
    - Support of MPS priority for SMS, IMS messaging and MSGin5G
    - Initiated only by UEs with a subscription for MPS, recipient need not have an MPS subscription.
    - EPC and 5GC

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## 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:

WT-1: Study on the enhancements to IMS event exposure framework on

- WT-1.1: study the architecture and procedures to exposure to the enterprise/verticals capabilities of IMS data channel services and of IMS existing communication services (IMS voice/video call, message, data);
- WT-1.2: whether and how Network Exposure Framework defined in 5GS is reused;
- WT-1.3: how to enhance IMS to enable an external API invoker to subscribe to specific events related to a specific IMS subscriber / group of IMS subscribers.

WT-2: Support interworking and roaming of IMS data channel

- WT-2.1: study how to enable IMS to support interworking of

- providing IMS data channel applications to the subscribers who is using a MTSI UE;
  - handling the IMS session between DCMTSI UEs when one of the networks does not support IMS data channel capability.
- WT-2.2: study the enhancement of IMS roaming architecture to support LBO roaming of IMS data channel.

WT-3: Enhance IMS data channel related services and operational aspects including

- WT-3.1: how to support verified OCIP service for 3rd party in IMS sessions;
- WT-3.2: how to support standalone IMS data channel without accompanying audio/video media in an IMS session;
- WT-3.3: whether and how to provide IMS data channel in an IMS emergency call;
- WT-3.4: how to support 3GPP PS Data Off for IMS data channel and applications.

WT-4: Study enhancements to IMS architecture, interfaces and procedures to support metaverse and IMS based XR services on

- WT-4.1: how to negotiate between the UE and IMS the metaverse or XR services to be provided;
- WT-4.2: what information is considered for service negotiation;
- WT-4.3: capability management for UE and IMS, e.g., registration, selection, query, updating, exposure, de-registration

WT-5: study the enhancement to IMS SMS services including

- WT-5.1: how to support emergency SMS
  - Study whether IMS emergency registration is used
  - Study how an emergency SMS and response are routed, including in roaming case, with or without USIM/ISIM
  - Study how the emergency service is identified in the IMS signalling
- WT-5.2: MPS priority for IMS messaging and SMS including, SMS over NAS and SMS over IP

WT-6: Further Harmonization of 5G IMS with SBA

- WT-6.1: study service registration and discovery for IMS nodes, e.g. CSCF, IMS AS
- WT-6.2: study whether and how the ISC interface between CSCF and AS is enhanced to SBI

- WT-6.3: study how to enhance IMS media plane further, including support the service-based interfaces of the legacy IMS media functions (MRF and IMS-AGW) and the service-based discovery and selection mechanism provided by the NRF.

WT-7: Investigate and identify Circuit Switched (CS) related activities those that can be removed from relevant processes or signaling procedures when a network no longer supports a CS network for voice or Emergency voice services

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

<p><b>1 – T-Mobile USA Inc.</b></p> <p>After submitting the SID proposal that became WT-7 above we felt it could be reduced in scope and the main issue addressed as a TEI-19 item. The focus would be on supplying a standard mechanism for a device capable of emergency service to determine the PS network it was connected to had no corresponding CS network to support CS emergency services. A reword is proposed below in answer to the re-wording question.</p>
<p><b>2 – Ericsson LM</b></p> <p>We support the above proposal that WT-7 is handled as a TEI-19 item.</p>
<p><b>3 – Ericsson LM</b></p> <p>We also would like to propose that WT-5 be handled as TEI-19 item. The nature of WT-5 is very different than all other WT. This can be handled as a separate TEI-19 or merged with WT-7 in a combined TEI-19. Treating WT-5 as a TEI-19 will also enable a reasonable TUs be allocated to the remaining WT.</p>
<p><b>4 – Ericsson LM</b></p> <p>We propose that WT6.2 not be in scope of Release 19. The benefits are not very obvious. At minimum it is a priority</p>
<p><b>5 – Nokia Germany</b></p> <p>Handling WT-7 as TEI-19 item is ok for us.</p>
<p><b>6 – Nokia Germany</b></p> <p>Agree that WT-5 can be handled as TEI19.</p>
<p><b>7 – ZTE Corporation</b></p> <p>WT-1~WT-4 and WT-5 should be in scope of Rel-19 under this SI/WI (IMS and NG_RTC), others could be taken as TEI19.</p>

**8 – ZTE Corporation**

WG-6.2: whether this task could be handled in CT groups directly?

**9 – Ericsson LM**

To ZTE: I fail to see how WT-5 relates to NG-RTC. Could this be a typo ?

**10 – ZTE Corporation**

Reply to Ericsson: WT-1~WT-4 and WT-6 should be in scope of Rel-19; it's a typo for WT-5 in the previous post.

**11 – VODAFONE Group Plc**

Agre with previous proposals on WT-7 and WT-5 as TEI

**12 – Peraton Labs**

Specifically, for WT-5.2, given there are SA1 requirements for WT-5.2, we see two options, a WID or TEI.

**13 – MediaTek Inc.**

**In our view, WT3 (esp. WT3.2, WT3.3, WT3.4) can be considered in the scope of Rel-19.**

**WT5 and WT-7 scope seem not related to NG\_RTC. So, they can be down-scoped from Rel-19.**

**14 – Qualcomm Incorporated**

We support WT-1.1, WT-1.2, WT-3.1, WT-3.2, WT-3.4 in the scope of Rel-19.

For WT-1.1, more clarification is required on what information is going to be exposed for "IMS existing communication services".

WT-1.3 can be considered to merge into WT-1.1.

More clarification and rewording on the following requirement of WT-2.1 is required.

- *providing IMS data channel applications to the subscribers who is using a MTSI UE;*
- *handling the IMS session between DCMTSI UEs when one of the networks does not support IMS data channel capability.*

While all the existing IMS roaming deployments are based on home routed architecture, there is no requirement on the supporting LBO roaming of IMS data channel. We propose to remove WT-2.2.

Removal of WT-3.3, due to no existence of regulatory requirements on providing IMS data channel in an IMS emergency call. Any such work needs to start based on regulatory requirements.

More clarification of WT-4 is required, e.g., what extension to IMS is required for supporting of XR, the relation with specified AR communication. Service and media negotiation to support metaverse and IMS based XR services are mainly in the scope of SA4, what is to be done in SA2?

Regarding WT-5.1, we have to decide whether both SMS over NAS and SMS over IP need to be studied. This WT should not be included in NG-RTC enhancement. This WT can be categorized into a separate SID (e.g., emergency service enhancement), with lower priority than NG-RTC.

Regarding WT-5.2, MPS priority support is normally applied per UE. The relationship of MPS with SMS over NAS and SMS over IP is not clear. Further clarification is required on what enhancement are required. We prefer the WT (if agreeable) in a separate SID together with WT-5.1.

The requirement on WT-6 is not clear and the coexisting with legacy IMS entities is an open issue. WT-6 should be in lower priority and may be removed due to the limited TUs.

The scope of WT-7 need to be further clarified. For normal IMS session, if CS is not supported in the network, the related procedures can be skipped by IMS deployment, no more specification is required. The WT may only focus on the scenarios of emergency service. We prefer the WT considered as a separate SID together with WT-5.1.

#### **15 – Orange**

WT-5.1 shall be in Rel-19, considering that service requirements were specified already for Rel-18 (TS 22.101 §10.11). We propose to limit the scope to SMS over IMS (in line with these service requirements).

WT-Philips-2 should be in Rel-19.

WT-1, WT-2, WT-3 should be in Rel-19.

WT-3-X (proposed by Qualcomm) should be in Rel-19.

#### **16 – TELECOM ITALIA S.p.A.**

We support WT-1.1, WT-3.1, WT-3.4 and WT-5.1 as in scope of Rel-19.

#### **17 – Ministère Economie et Finances**

We support WT-5.1 and WT-7 as in scope of Rel-19, specially as WT-5.1 service requirements are already specified in TS 22.101 clause 10.11 for Rel-18...

#### **18 – THALES**

We do support WT-5.1 as in the scope of Rel19.

#### **19 – Samsung R&D Institute UK**

**WT-2.1, WT-3.2, WT-4** should be in scope of Rel-19.

**For WT-1**, more clarification is required. The use cases needed by verticals or third party service providers needs to be explained at first.

- WT-1.1: It is not clear why IMS voice call capability needs to be exposed. Could you clarify what an example of ‘enterprise/vertical capabilities of IMS data channel services’ (by adding a reference if there’s any)?

- WT-1.2: Could you clarify the information to be exposed? Otherwise, what information to be exposed needs to be studied.

- WT-1.3: What the specific event is, and why it should be exposed are not clear.

**For WT-2.2**, whether LBO support is needed is not clear. Is there any requirement? If this WT is needed then at least can we reword as this?: Study “*whether and how to enhance*” IMS roaming architecture to support LBO roaming of IMS data channel.

**For WT-5**, it can be handled as TEI19.

**For WT-6.2**, we believe WT-6.1 already covers it and hence there is no need of mentioning any specific interface. But if this WT is needed then apart from ISC for AS selection, Mw interface needs to be mentioned for CSCF selection.

#### **20 – CISA ECD**

We support WT-5.2 to be in scope of Rel-19. WT-5.2 service requirements are specified in TS 22153 clause 9.4

#### **21 – Verizon UK Ltd**

Verizon supports WT-5.2 to be in scope for Rel-19.

#### **22 – AT&T**

We support WT#1; WT#2; WT#3, WT#4, WT#5

WT#7 should be TEI19

wrt WT#5.2 we agree with Peraton Labs that it can either be a WID or TEI

#### **23 – T-Mobile USA Inc.**

In addition to proposing above that WT 7 should be a TEI19. T-Mobile supports including WT 1, 3.2, 4.1, and 6.1 in this release. We also support addressing WT 5.2 as either a separate SID, or as a TEI in release 19.

#### **24 – Apple (UK) Limited**

We support to create a TEI19 WID for WT-5 and WT-7. These can be merged into a single TEI19 WID or kept in separate TEI19 WIDs.

#### **25 – China Mobile Com. Corporation**

We support WT-1, WT-2, WT-3 and WT-4 to be prioritized in this release. WT-6 has lower priority. We also support changing WT-5 and WT-7 to TEI19.

**26 – Deutsche Telekom AG**

We support WT-1, WT-6, and handling WT-5.1 (only SMS over IMS as required by stage1) and WT-7 as TEI19.

**27 – vivo Mobile Communication Co.**

we prefer WT1, WT2, WT3 and WT4 in scope of R19. WT6 is also acceptable.

**28 – TELEFONICA S.A.**

**WT-1.1, WT-1.2, WT-7 (even as a TEI-19) and WT2.1 are our highest priority; and WT-1.3, WT-3.2, WT-3.4 and WT-4 are nice to have.** Some comments:

- **WT-1** (especially WT-1.1 and WT-1.2). The APIs for third party Apps (DC AS) are a priority for us and we are working on this area (e.g. DC4, mDC2 interfaces either direct or through NEF).
- **WT-2.1** We believe this kind of interworking is super interesting; even we can accept Qualcomm's rewording of it.
- **WT-3.2** We believe having standalone applications is important to utilize IMS XR and generate new use cases.
- **WT-3.3.** We agree with Qualcomm regarding removal of WT-3.3
- **WT-4** It is also important in our view to continue to use IMS as session manager and enabler for XR apps.
- **WT-7:** We believe it is important to keep it in REL19 even though it is moved to a TEI-19, as we need to eliminate the dependency on the CS totally. Another example in this area is how to eliminate the need for VOLTE devices to attach to VLRs; to provide a way for the network to indicate to a VOLTE UE device not to attach to the CS network.

**29 – MITRE Corporation**

We [MITRE] support WT#5.2 to be part of R-19

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

**1 – Qualcomm Incorporated**

WT-1.3 can be merged into WT-1.1.

**2 – Orange**

Not sure we need to break down WT#1 into sub-tasks.

**3 – China Mobile Com. Corporation**

We think it is possible to merge WT-1.1, 1.2 and 1.3 into one WT.

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

**1 – T-Mobile USA Inc.**

WT-7 should be addressed as TEI19 - a reword is proposed as follows -

WT-7 (TEI-19) For a device capable of emergency services connected to a PS network that supports emergency services, specify how the device can know that the PS network has no corresponding CS network on which emergency service attempts can be re-attempted.

**2 – Ericsson LM**

We propose rewording WT-1 as follows:

WT 1.1 Enhance the IMS architecture to define an event subscription mechanism via subscribe / notify procedures aligned with the 5GS network exposure framework to enable subscription to various IMS events including session related events, and existing IMS services. This task includes the identification of relevant IMS events.

WT1.2 Identify IMS Data Channel events and services that can be subscribed to.

WT1.3 Define mechanisms to subscribe to a specific IMS subscriber / groups of IMS subscribers related to an event using the framework of WT1.1.

**3 – Ericsson LM**

We propose slight modification to WT-2.1 for better scoping as follows:

- providing IMS data channel applications to the subscribers who is using a MTSI UE, where appropriate and depending on the DC application.

- handling the IMS session between DCMTSI UEs when one of the networks does not support IMS data channel capability. This work depends on SA4 supporting such capability.

**4 – Ericsson LM**

We proposes replacing WT-4.2 and WT4.3 with the following text below since it is broad and encompasses the needed work. This is based on the Nokia input which is ore appropriate than the current wording:

WT 4.X Enhancements to IMS architecture, procedures, interfaces for supporting avatar and XR calls. This includes support of transition and transcoding between video and avatar media in the UE and in the network

**5 – Ericsson LM**

An alternative wording for WT-7 or may incorporated in the comment from T-Mobile can be as follows:

**Investigate impact on UE supporting CS and/or PS from retiring CS networks on procedures, as well as impacts on emergency services.**

**6 – ZTE Corporation**

Rewording WT-3.3 as following:

WT-3.3: whether and how to provide IMS data channel in an IMS emergency call to delivery call related information, e.g. location of UE.

**7 – ZTE Corporation**

Rewording WT-3.4 as following:

WT-3.4: how to support 3GPP PS Data Off for IMS data channel based services.

**8 – Nokia Germany**

On WT 1.1: we think this scope is too broad, e.g. not clear which services we are looking for (all MMTel services). Relationship with OMA APIs not clarified. Our proposal is to limit WT 1 to DC related events, i.e. to DC3/N33 and DC4 interfaces as defined in the DC architecture. This is left-over from R18 and it makes sense to fill this gap in R19.

**9 – HuaWei Technologies Co.**

On WT 3.4, to align with TS 22.011, should be changed as: how to support services over IMS data channel to be part of the 3GPP PS Data Off Exempt Services.

**10 – Qualcomm Incorporated**

WT-2.1 can be reworded as following:

*WT-2.1: study how to enable IMS to support interaction between DC enabled UE and legacy UE.*

WT-3.1 has no dependency on IMS DC. WT-3.1 should be removed and the content can be moved to a new WT, e.g.:

*WT-X: how to support verified OCIP service for 3rd party in IMS sessions.*

**11 – Ericsson LM**

Ericsson supports moving WT-3.1 to a separate WT as long as it stays in scope of this work item.

**12 – Orange**

WT-2.1 should be reworded as proposed by Qualcomm.

WT-3.1 should be moved to a separate WT. If OCIP stands for OIP, then it should be spelled OIP.

**13 – HuaWei Technologies Co.**

In the SA1 the avatar communication includes accessibility use case, we propose to include this in the WT-4.

Rewording the WT-4.X proposed by Ericsson and Nokia as:

WT 4.X Enhancements to IMS architecture, procedures, interfaces for supporting avatar and XR calls. This includes support of accessibility use case, transition and transcoding between video and avatar media in the UE and in the network

**14 – Orange**

WT-Philips-1 should be reworded as: Study enhancements to IMS architecture to provide storage of digital assets (identity attributes, avatar representation, tokens ..) and secured access to them.

**15 – Samsung R&D Institute UK**

WT-Samsung-1, WT-Nokia-3 (in Feedback Form 4), and WT 4.X from Ericsson (in Feedback Form 3) can be used for rewording WT-4. Our proposal is rewording WT-4 as following:

WT-4: Enhancements to IMS architecture, procedures, interfaces (including media plane protocol) for supporting avatar communications. This includes support of transition and transcoding between video and avatar media in the UE and in the network by considering UE capability, network condition, and user preference.

**16 – CISA ECD**

WT-5 and WT-5.2 may be in a separate SID/WID.

**17 – TELEFONICA S.A.**

**WT-2.1** We can accept Qualcomm’s rewording of it

## 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 – Nokia Germany**

Nokia-WT-X: Support DC for MMTel sessions with more than two involved parties.

**2 – Nokia Germany**

WT-Nokia-1: Study whether and how to support DC in MMTel sessions with more than two involved parties

<p><b>3 – Nokia Germany</b></p> <p>WT-Nokia-2: Study interworking of IMS DC with MMTEL services like Call Forwarding.</p>
<p><b>4 – China Mobile Com. Corporation</b></p> <p>WT-China Mobile-1: Study enhancements of IMS DC architecture and procedure to support multiplexing a SCTP connection for multiple DC applications. (can be put in WT-3)</p>
<p><b>5 – Nokia Germany</b></p> <p>WT-Nokia-3: Enhancements to IMS architecture, procedures, interfaces for supporting avatar calls. This includes support of transition and transcoding between video and avatar media in the UE and in the network.</p>
<p><b>6 – Philips International B.V.</b></p> <p>In order to support Metaverse services, in addition to WT-4 and WT-Nokia-3, we propose to add the following work tasks (e.g. as mentioned in SWS-230059):</p> <p>WT-Philips-1: study enhancements to IMS architecture to provide synchronization of multiple streams from multiple (remote and local) UEs for Metaverse communication (e.g. for multi-party XR/avatar call).</p> <p>WT-Philips-2: study enhancements to IMS architecture to provide support for digital asset and avatar representation in IMS communication (e.g. based on subscription/user identity).</p>
<p><b>7 – Ericsson LM</b></p> <p>WT-Philips-1 is is not in scope of SA2, rather in scope of SA4.</p> <p>WT-Philips-2 not very clear. Can U please expand the use case.</p>
<p><b>8 – Ericsson LM</b></p> <p>On WT-Nokia-1. We think this can be done in CT groups as there and SA2 can align later of need be.</p> <p>WT-Nokia-2 same comment as WT-Nokai-1</p> <p>WT-Nokia-3 can replace current wording in WT-4.2 and WT-4.3 as they do address the same thing, or should at least be addressing the same thing.</p>
<p><b>9 – NTT DOCOMO INC.</b></p> <p>WT-NTT DOCOMO-1: how P-CSCF interacts with PCF when the IMS based XR service is requested. (This is to be a sub task of WT-4 (i.e., WT-4.x).)</p>
<p><b>10 – HuaWei Technologies Co.</b></p> <p>On WT-Nokia-2, this is already in CT1 R18, please check C1-231204.</p>
<p><b>11 – Samsung R&amp;D Institute UK</b></p> <p>WT-Samsung-1 (can be included in WT-4):</p> <p>IMS architecture enhancements (including media plane protocol) for supporting avatar communications including transition between video and avatar media considering UE capability, network condition, and user preference.</p>

<p><b>12 – Ericsson LM</b></p> <p>We support adding multiplexing of multiple application to WT-3</p>
<p><b>13 – HuaWei Technologies Co.</b></p> <p>We support adding multiplexing of multiple application to WT-3</p>
<p><b>14 – Philips International B.V.</b></p> <p>Response to Ericsson:</p> <ul style="list-style-type: none"><li>- Regarding WT-Philips-1, we don't think this is fully in scope of SA4, since this is also about the 5GS providing the necessary information to assess the end-to-end latency of the different UEs involved in a multi-party XR/Metaverse call, and also the necessary mechanisms to handle substantial differences in latency between the different UEs (which may be at the other side of the planet).</li><li>- Regarding WT-Philips-2, this relates to the storage, selection and handling of avatar representations of a user by the 5GC, e.g. as part of a digital asset container. We refer to use cases 5.14, 5.15, 5.16 , 5.22 and 5.28 as described in TR 22.856 for more information.</li></ul>
<p><b>15 – Qualcomm Incorporated</b></p> <p>Different DC applications may have different 5G and IMS resource requirement e.g., number of DCs, QoS, bandwidth, NW procession resources, which may apply different charging policy. Charging per DC application is required in this scenarios . The WT is proposed as following:</p> <p><i>WT-3-X: how to enable per charging per application.</i></p>
<p><b>16 – Qualcomm Incorporated</b></p> <p>The text is updated as following:</p> <p><i>WT-3-X: how to enable charging per application.</i></p>
<p><b>17 – China Mobile Com. Corporation</b></p> <p>WT-Nokia-3 and WT-Samsung-1 can be added to WT-4.</p> <p>WT-3-X from Qualcomm needs more clarification on what work is actually needed for SA2 other than providing application ID as in release 18.</p>
<p><b>18 – Qualcomm Incorporated</b></p> <p><b>Reply to CMCC comments on WT-3-X:</b> SA2 doesn't need to specify the details for charging but need to clarify some general principle of charging enhancement for IMS DC. We may take the clarification in clause 5.16.2.1 of TS 23.228 as a reference example.</p>

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

<p><b>1 – Ericsson LM</b></p> <p>On WT-Nokia-1. We think this can be done in CT groups as there and SA2 can align later of need be.</p> <p>WT-Nokia-2 same comment as WT-Nokai-1</p>
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WT-Nokia-3 can replace current wording in WT-4.2 and WT-4.3 as they do address the same thing, or should at least be addressing the same thing.

**2 – NTT DOCOMO INC.**

On WT-NTT DOCOMO-1:

Rel-18 XRM has specified how AF interacts with PCF. The mechanism is not very clear how this XRM feature can be utilized when P-CSCF, not AF assumed in Rel-18 XRM, interacts with PCF.

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## 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**

**1 – Qualcomm Incorporated**

WT-4 heavily depends on the work of SA4.

WT-3.1 has dependencies on SA3.

WT-3.4 has dependencies on SA1.

**2 – Samsung R&D Institute UK**

[Samsung] WT-2.1, WT-3.2, and WT-4 have dependencies on SA1 (Metaverse), and SA4 (Avatar communications).

**3 – Apple AB**

WT-4.x and proposal from Ericsson/Samsung as replacement to WT-4 depends on SA4 work.

**Feedback Form 7: Describe dependencies between the Work Tasks**

**1 – Qualcomm Incorporated**

WT 3.1 may have dependencies on WT-1.1.

**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 – VODAFONE Group Plc**

Shouldn't all issues related to identities be grouped under one single SID/WID? Identification is also addressed in different SIDs. For better handling and clarity, it would be worth to handle identity issues in the same study.

**2 – Ericsson LM**

I think this one is different than what is described in the SID on identities. Yes, they all deal with users, but very different. This issue been studied already i SA2 and SA3. May be one common aspect relates to provisioning but thats not the core of this study, and other options have been assumed in the study.

**3 – Qualcomm Incorporated**

WT-4 has dependencies on XRM and Metaverse.

**4 – Samsung R&D Institute UK**

[Samsung] WT-4 may have dependencies on XRM/Metaverse.

**5 – China Mobile Com. Corporation**

We believe ID used in CIP is not related to SID for User Identities. ID used for avatar representation may have dependency to SID for User Identities but how IMS link user ID with IMS identities and authenticate user should be studied in this SID if included in rel-19.

**6 – Qualcomm Incorporated**

We share the same comments from Ericsson and CMCC. CIP is totally different from the SID on user identities.

## 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?

<p><b>1 – T-Mobile USA Inc.</b></p> <p>Yes - WT-7 Should be a TEI-19</p>
<p><b>2 – Ericsson LM</b></p> <p>Also WT-5 Should be a TEI-19 alone or combined with WT-7</p>
<p><b>3 – MediaTek Inc.</b></p> <p><b>WT-5 and WT-7 scope seem not related to NG_RTC. So, they can be down-scoped from Rel-19 (whether they can be covered as TEI-19 needs wider discussions).</b></p>
<p><b>4 – Qualcomm Incorporated</b></p> <p>WT-5, WT-7 (if agreed) can be handled in a separate SID/TEI WI.</p>
<p><b>5 – Orange</b></p> <p>1 SID for WT-5, possibly with WT-7.</p> <p>1 or 2 SIDs for the remaining work tasks (NG-RTC, XR/metaverse and other enhancements), depending on what WTs remain.</p>
<p><b>6 – Ministère Economie et Finances</b></p> <p>WT-5 and WT-7 may be handled in TEI-19 WI.</p>
<p><b>7 – Samsung R&amp;D Institute UK</b></p> <p>[Samsung] WT-5 and WT-7 can be studied as TEI19(s).</p>
<p><b>8 – Verizon UK Ltd</b></p> <p>WT-5 can be handled in a separate SID/TEI WI.</p>
<p><b>9 – AT&amp;T</b></p> <p>WT-5.2 can be a handled as a separate SID/TEI</p>

<p><b>10 – T-Mobile USA Inc.</b></p> <p>Agree that WT 5.2 can be handled as a separate SID/TEI</p>
<p><b>11 – Apple (UK) Limited</b></p> <p>WT-5 and WT-7 to be handled as TEI-19 WID(s).</p>
<p><b>12 – China Mobile Com. Corporation</b></p> <p>WT-5 and WT-7 to be handled as TEI-19 WID(s).</p>
<p><b>13 – TELEFONICA S.A.</b></p> <p><b>WT-7:</b> We believe it is important to keep it in REL19 even though it is moved to a TEI-19 WID, as we need to eliminate the dependency on the CS totally. Another example in this area is how to eliminate the need for VOLTE devices to attach to VLRs; to provide a way for the network to indicate to a VOLTE UE device not to attach to the CS network.</p>
<p><b>14 – MITRE Corporation</b></p> <p>We [MITRE] endorse WT#5.2 to be either a WID or TEI</p>

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

<p><b>1 – T-Mobile USA Inc.</b></p> <p>WT-7 should be a TEI-19</p>
<p><b>2 – VODAFONE Group Plc</b></p> <p>WT-5 should be TEI as well</p>
<p><b>3 – Nokia Germany</b></p> <p>WT 5.1 can be done as a WID (TEI19 or own WID code), based on SA1 requirement. For WT-5.2 there is no requirement, we propose to remove it.</p>
<p><b>4 – Peraton Labs</b></p> <p>I think you meant WT-5.2 can be done as a WID (TEI19 or own WID code), given there are SA1 requirements for WT-5.2, see SA1 work item MPS4msg, MPS for Messaging services, Rel-19. Also see TS 22.153.</p> <p>Perhaps there are no SA1 requirements for WT-5.1 (?).</p>
<p><b>5 – Nokia Germany</b></p> <p>WT-5.1 requirement you can find in clause 10.11 of TS 22.101 v18.5.0.</p>

## **6 – Qualcomm Incorporated**

WT-1, 2, 3, 4 (if agreeable) can be included into NG-RTC enhancement SID. WT-5, 7 (if agreeable) can be included into another SID/TEI for enhancement of emergency services.

## **7 – CISA ECD**

Service requirements for WT-5.2 are specified in TS 22.153 clause 9.4. WT-5-2 can be combined with WT-5.1, and done together as a separate SID/WID.

## **8 – TELEFONICA S.A.**

**WT-7:** We believe it is important to keep it in REL19 even though it is moved to a TEI-19 WID, as we need to eliminate the dependency on the CS totally. Another example in this area is how to eliminate the need for VOLTE devices to attach to VLRs; to provide a way for the network to indicate to a VOLTE UE device not to attach to the CS network.

## **9 – MITRE Corporation**

We [MITRE] support WT#5.2 to be handled as a separate WID/TEI

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# 5 Summary

## 5.1 General

There are totally 24 companies contributing to the moderated discussion, including: Apple, AT&T, China Mobile, CISA, Deutsche Telekom, Huawei, MediaTek, Ministère Economie et Finances, MITRE, Nokia, NTT DOCOMO, Orange, Peraton Lab, Philips, Qualcomm, Samsung, Telecom Italia, TELEFONICA, THALES, T-Mobile USA, Verizon, vivo, Vodafone, ZTE.

9 questions were asked and 100 feedbacks were received during the discussion.

## 5.2 Summary of section 2

### 5.2.1 Summary of section 2.1

7 Working Tasks were originally proposed by the moderator based on the input from SA R19 workshop and SA plenary.

The following questions were asked:

**Question #1: Which of the above Work Tasks should be in scope of Rel-19?**

**Question #2: Can any of the Work Tasks above be combined/merged?**

**Question #3: Should any of the Work Tasks above be reworded? If so, propose the required rewording.**

The feedbacks are summarized as follows:

- WT-1 IMS event exposure framework:

9 companies (ZTE, Orange, AT&T, T-Mobile USA, China Mobile, Deutsche Telekom, vivo, TELEFONICA) explicitly support this whole WT to be in R19.

Additionally 2 companies (Qualcomm, Telecom Italia) support WT-1.1 to be in R19 and 1 companies (Qualcomm) support WT-1.2 to be in R19.

Some companies (Qualcomm, Orange and China Mobile) proposed to merge between sub-WTs.

There is no objection to any of the sub-WTs.

**Moderator Proposal #1: Proposed conclusion: WT-1 is included in R19 SID. Further discussions are required on WT merging and objective contents.**

- WT-2 Support interworking and roaming of IMS data channel:

5 companies (ZTE, Orange, AT&T, China Mobile, vivo) explicitly support this whole WT to be in R19.

Additionally 2 companies (Samsung, TELEFONICA) support WT-2.1 to be in R19.

WT-2.2 was objected by 1 company (Qualcomm).

Further clarifications on the requirements and details were requested by some companies.

**Moderator Proposal #2: WT-2 is proposed to be included in R19 SID. Further discussions are required on roaming requirement and interworking scenarios.**

- WT-3 Enhance IMS data channel related services and operational aspects:

6 companies (ZTE, MediaTek, Orange, AT&T, China Mobile, vivo) explicitly support this whole WT to be in R19.

Additionally, 2 companies (Qualcomm, Telecom Italia) support WT-3.1, 5 companies (MediaTek, Qualcomm, Samsung, T-Mobile USA, TELEFONICA) support WT-3.2, 1 company (MediaTek) supports WT-3.3 and 4 companies (MediaTek, Qualcomm, Telecom Italia, TELEFONICA) support WT-3.4 to be in R19.

WT-3.3 was objected by 1 company (Qualcomm).

**Moderator Proposal #3: Proposed conclusion: WT-3.1, WT-3.2 and WT-3.4 are included in R19 SID. WT-3.3 needs further discussions to confirm if the objection is sustained.**

- WT-4 Support metaverse and IMS based XR services:

6 companies (ZTE, Samsung, AT&T, China Mobile, vivo, TELEFONICA) explicitly support this whole WT to be in R19.

Additionally, 1 companies (T-Mobile USA) support WT-4.1 to be in R19.

There is no objection to any of the sub-WTs.

**Moderator Proposal #4: Proposed conclusion: WT-4 is included in R19 SID.**

- WT-5 study the enhancement to IMS SMS services:

5 companies (Orange, Telecom Italia, Ministère Economie et Finances, THALES, AT&T) explicitly support WT-5.1 to be in R19.

Additionally, 1 company (T-Mobile USA) supports WT-4.1 to be in R19, 3 companies (CISA, Verizon, MITRE) support 5.2 to be in R19.

12 companies (Ericsson, Nokia, ZTE, VDF, Qualcomm, Samsung, Apple, Ministère Economie et Finances, Verizon, China Mobile, MITRE, CISA) accept to handle this WT as a separate WID or a TEI19 WID. 4 more companies (Deutsche Telekom, Peraton Lab, AT&T, T-Mobile USA) also propose to handle sub-WTs as separate WID or TEI19 WIDs.

MediaTek think this WT should be out of R19 and Nokia think WT-5.2 should be out of R19.

It is also clarified that this WT only applies to IMS SMS.

**Moderator Proposal #5: Proposed conclusion: WT-5 is not included in R19 NG\_RTC SID. Instead it can be submitted as a separate WID or a TEI19 WID.**

**Moderator Proposal #6: Proposed conclusion: The WID will focus on IMS SMS only.**

- WT-6 Further Harmonization of 5G IMS with SBA:

4 companies (ZTE, Deutsche Telekom, vivo) explicitly support the whole WT-6 to be in R19.

Additionally, 1 company (T-Mobile USA) supports WT-6.1 to be in R19.

2 companies (China Mobile, Qualcomm) think it can be with lower priority if the TU is not enough.

Samsung proposes to merge WT-6.2 into WT-6.1.

2 companies (Ericsson, ZTE) object to include WT-6.2 in R19.

**Moderator Proposal #7: It is proposed to include WT-6.1 and WT-6.3 in R19 NG\_RTC SID at this moment.**

- WT-7 Circuit Switched (CS) related activities to be removed:

12 companies (T-Mobile USA, Ericsson, Nokia, ZTE, VDF, Qualcomm, AT&T, Apple, Deutsche Telekom, TELEFONICA, Ministère Economie et Finances, China Mobile) accept to handle this WT as a separate WID or a TEI19 WID.

MediaTek think this WT should be out of R19.

**Moderator Proposal #8: Proposed conclusion: WT-7 is not included in R19 NG\_RTC SID. Instead it is proposed as a separate WID or a TEI19 WID.**

**Moderator Proposal #9: Proposed conclusion: The moderator updates the R19 NG\_RTC SID considering the above proposals and the rewording suggestions received during the moderated discussion. The SID will be further discussed and updated in the CC and the August SA2 meeting.**

**Table 1:**

<b>WT#</b>	<b>SubWT#</b>	<b>WT de- scription</b>	<b>To be In R19 SID</b>	<b>Merge into other WT</b>	<b>objection</b>	<b>TEI or separate SID/WID</b>

<b>WT-1</b>		<b>IMS event exposure framework</b>	ZTE, Orange, AT&T, T-Mobile USA, China Mobile, Deutsche Telekom, vivo, TELEFONICA			
	WT-1.1	architecture and procedures to exposure to the enterprise/verticals capabilities of IMS data channel services	Qualcomm, Telecom Italia			
	WT-1.2	whether and how Network Exposure Framework defined in 5GS is reused	Qualcomm	Orange, China Mobile		
	WT-1.3	event subscription		Qualcomm, Orange, China Mobile		
<b>WT-2</b>		<b>Support interworking and roaming of IMS data channel</b>	ZTE, Orange, AT&T, China Mobile, vivo			

	WT-2.1	interworking between: DCMTSI UE and MTSI UE, or IMS network supporting DC and IMS network not supporting DC	Samsung, TELEFONICA			
	WT-2.2	LBO roaming			Qualcomm	
<b>WT-3</b>		<b>Enhance IMS data channel related services and operational aspects</b>	ZTE, MediaTek, Orange, AT&T, China Mobile, vivo			
	WT-3.1	how to support verified OCIP service for 3rd party in IMS sessions	Qualcomm, Telecom Italia			
	WT-3.2	how to support standalone IMS data channel	MediaTek, Qualcomm, Samsung, T-Mobile USA, TELEFONICA			
	WT-3.3	whether and how to provide IMS data channel in an IMS emergency call	MediaTek		Qualcomm	

	WT-3.4	how to support 3GPP PS Data Off for IMS data channel	MediaTek, Qualcomm, Telecom Italia, TELEFONICA			
<b>WT-4</b>		<b>support metaverse and IMS based XR services</b>	ZTE, Samsung, AT&T, China Mobile, vivo, TELEFONICA			
	WT-4.1	how to negotiate between the UE and IMS the metaverse or XR services to be provided	T-Mobile USA			
	WT-4.2	what information is considered for service negotiation				
	WT-4.3	capability management				
<b>WT-5</b>		<b>study the enhancement to IMS SMS services</b>			MediaTek	Ericsson, Nokia, ZTE, VDF, Qualcomm, Samsung, Apple, Ministère Economie et Finances, Verizon, China Mobile, MITRE, CISA

	WT-5.1	how to support emergency IMS SMS	Orange, Telecom Italia, Ministère Economie et Finances, THALES, AT&T			Deutsche Telekom
	WT-5.2	MPS priority for IMS SMS	CISA, Verizon, MITRE		Nokia	Peraton Lab, AT&T, T-Mobile USA
<b>WT-6</b>		<b>Further Harmonization of 5G IMS with SBA</b>	ZTE, Deutsche Telekom, vivo			
	WT-6.1	service registration and discovery for IMS nodes,	T-Mobile USA			
	WT-6.2	whether and how the ISC interface between CSCF and AS is enhanced to SBI		Samsung	Ericsson, ZTE	
	WT-6.3	enhance IMS media plane further				

WT-7		<b>Circuit Switched (CS) related activities to be removed</b>	Ministère Economie et Finances		MediaTek	T-Mobile USA, Ericsson, Nokia, ZTE, VDF, Qualcomm, AT&T, Apple, Deutsche Telekom, TELEFONICA, Ministère Economie et Finances, China Mobile
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5.2.2 Summary of section 2.2

The following questions were asked to collect additional WT proposals on top of original 7 WTs:

**Question #4: Are there any additional Work Tasks that should be part of Rel-19?**

**Question #5: If there are any additional Work Tasks re[1]quired, describe them**

In total 9 additional WTs were proposed by 6 companies (3 from Nokia, 1 from China Mobile. 2 from Philips, 1 from NTT DOCOMO, 1 from Samsung and 1 from Qualcomm).

WT-Nokia-1 and WT-Nokia-2 were objected by 2 companies (Ericsson and Huawei) claiming these work is covered by CT.

WT-Nokia-3 is suggested by 2 companies (Ericsson and China Mobile) to merge with WT-4.

WT-China Mobile-1 is explicitly supported by Ericsson and Huawei to be in R19.

WT-Philips-1 is objected by Ericsson and WT-Philips-2 get explicit support from Orange.

WT-Samsung-1 is suggested by China Mobile to merge with WT-4.

WT-3-X from Qualcomm is explicitly supported by Orange. China Mobile request further clarification.

**Moderator Proposal #10: It is proposed to update R19 NG\_RTC SID by adding contents of WT-China**

**Mobile-1, WT-NTT DOCOMO-1 and WT-3-X from Qualcomm and merging WT-Nokia-3, WT-Samsung-1, WT-Philips-1, WT-Philips-2 into WT-4.**

**Table 2:**

<b>WT#</b>	<b>SubWT#</b>	<b>WT description</b>	<b>To be In r19 SID</b>	<b>Merge into other WT</b>	<b>objection</b>	<b>TEI or separate SID/WID</b>
WT-Nokia-1		whether and how to support DC in MMTel sessions with more than two involved parties	Nokia		Ericsson	
WT-Nokia-2		interworking of IMS DC with MMTEL services like Call Forwarding	Nokia		Ericsson, Huawei	
WT-Nokia-3		supporting avatar calls. This includes support of transition and transcoding between video and avatar media in the UE and in the network	Nokia	Ericsson, China Mobile		
WT-China Mobile-1		multiplexing a SCTP connection for multiple DC applications	China Mobile, Ericsson, Huawei			

WT-Philips-1		provide synchronization of multiple streams from multiple (remote and local) UEs for Metaverse communication	Philips		Ericsson	
WT-Philips-2		support for digital asset and avatar representation in IMS communication	Philips, Orange			
WT-NTT DOCOMO-1		how P-CSCF interacts with PCF when the IMS based XR service is requested.	NTT DO-COMO			
WT-Samsung-1		supporting avatar communications including transition between video and avatar media considering UE capability, network condition, and user preference	Samsung	China Mobile		
WT-3-X		how to enable charging per application.	Qualcomm, Orange			

### 5.3 Summary of section 3

The following questions were asked to collect comments on the dependencies between WTs, to other WGs or to other SID/WID:

**Question #6: Describe the dependencies that any of the Work Tasks have on other 3GPP Working Groups**

**Question #7: Describe dependencies between the Work Tasks**

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

- Dependencies to other WGs:

It was mentioned by 3 companies (Qualcomm, Samsung, Apple) that metaverse related WTs has dependency to SA4.

Dependencies to SA1 and SA3 were also commented.

- Dependencies between WTs:

Qualcomm mentioned WT-3.1 may have dependencies on WT-1.1.

- Dependencies to other SID/WID:

2 companies (Qualcomm, Samsung) mentioned NG\_RTC SID has dependency on XRM/metaverse SID.

Vodafone proposed to handle all issues related to identities in a single SID/WID, while Ericsson and China Mobile mentioned that some work is needed in NG\_RTC SID.

**Moderator Proposal #11: It is proposed to reflect the dependency to SA4 in the updated NG\_RTC SID. Further discussions on identities issues and other dependencies is needed.**

## 5.4 Summary of section 4

The following questions were asked about the SID/WID creation proposals:

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

**Question #10: If the answer to the above question is yes, describe how the Work Tasks should be partitioned into different items**

Companies restates their preferences on how to handle WT-5 and WT-7.

**Moderator Proposal #12: See moderator proposal #5 and #8.**