
1 Introduction

Following the guidance of SA2 Chair, this NWM survey is to collecting the comments and suggestions of interested companies on how to evaluate and conclude the KIs of R19 SID FS_NG_RTC_Ph2.

There are 8 KIs in Rel-19 SID FS_NG_RTC_Ph2 as follows:

1. Key Issue #1: Extensible IMS mechanism supporting IMS events in the context of DC communication
2. Key issue #2: Impact on IMS architecture, interfaces and procedures to support IMS capability exposure in the context of IMS data channel session
3. Key Issue #3: Data channel interworking with MTSI UE
4. Key Issue #4: Extensible IMS framework to support authorization and authentication of third-party identities in IMS sessions
5. Key Issue #5: Handling of PS data off exemption for services over IMS DC
6. Key Issue #6: Support of Standalone IMS Data Channel Sessions
7. Key issue #7: Support multiplexing multiple DC applications over single SCTP connection
8. Key Issue #8: Support of IMS Avatar Communication

The details of these KIs refers to TR 23.700-77.

Finally the TR captured 32 solution proposals in total:

Table 1: Mapping of solutions to KIs

Key Issue	Solutions
KI#1	1, 2, 3, 4, 5, 7
KI#2	6, 7, 18
KI#3	8, 9, 30
KI#4	10, 11, 12, 13
KI#5	28, 29
KI#6	14, 15, 16, 19, 20, 21
KI#7	22
KI#8	17, 23, 24, 25, 26, 27, 31, 32

Due to the limit time for conclusion, there will be no new solution and solution update handled. It is supposed to discuss the solution principles and generate the shape of the solutions for normative work.

There are interim conclusions with some principles to KI#3, KI#4 and KI#6 that has been agreed and captured in the updated version of TR 23.700-77. The interim conclusions will be taken as the basis of the discussions of the corresponding 3 KIs.

The following questions will not explicitly discuss the criteria of solution selection but focus on collecting preference of companies on key aspects of differences between alternative solutions. Some open questions are also asked to collect suggestions or comments on the way forward for specific KIs.

2 Questions

2.1 Questions to KI#1 conclusions

The KI covers following aspects:

- Identification and definition of events related to IMS Data Channel services that a Network Function/Application Function can subscribe to. The events can be related to a specific IMS subscriber or list of IMS subscribers.
- Event subscription and notification mechanisms. When the IMS event associated with specific IMS subscriber(s), determine the NF(s) and nodes serving the specific IMS subscriber(s).

Feedback Form 1: Q1: Which solution do you in general prefer to be taken as the basis of normative work (if any)?

1 – Nokia Germany

I prefer we agree first on solution principles. These principles can be reflected in one or several solutions and can be used for normative work.

2 – Ericsson LM

(Ericsson answer) We prefer to use solution 1 as the basis. It is already co-signed by Samsung. QC solution 18 refers to it as well since the mentioned event can only be fulfilled if the subscription goes to HSS.

3 – HuaWei Technologies Co.

We prefer to use solution #2

4 – ZTE Corporation

We can focus on solution principal for event subscription and notification mechanisms, and event definition; then discuss the detailed procedures for subscription/notification and exposed services.

5 – Qualcomm Incorporated

We prefer the following principles: IMS AS registers to HSS for UE context. Consumers (DCSF/NEF/D-CAS) subscribe to HSS for IMS Session event, then HSS subscribes to IMS AS. IMS AS may notify the consumer directly.

6 – Samsung R&D Institute UK

We prefer to focus on solution principles instead of taking a single solution as the basis as all the solutions has some commonalities for discovery and subscription with the NF producer. The detailed procedures and services should be decided during the normative phase.

7 – DOCOMO Communications Lab.

prefer to select Solution 1 as a baseline, but with the following modification: IMS AS registers to the HSS. HSS stores the address of the IMS AS and the supported events in the IMS AS. NEF/AF can discover the IMS AS address and the supported events from the HSS. Then NEF/AF can subscribe for the events directly to the corresponding IMS ASes. HSS does not need to maintain an event subscription.

Feedback Form 2: Q2: How is the notification producer (i.e. IMS AS, DCSF) discovered?

1 – China Mobile Com. Corporation

China Mobile prefer to use mechanism like IMS third-party registration, i.e. when the UE registers, the registration event is notified to the notification consumers (DCSF, DC AS) based on subscription. By this procedure, the notification producers (DCSF, IMS AS) is discovered.

2 – Nokia Germany

Easiest and straight forward way is that IMS AS (and potentially also DCSF) address is stored in HSS per registered subscriber. In that way NEF can discover IMS AS or DCSF.

3 – Ericsson LM

(Ericsson answer) In the Ericsson solution, subscriptions to events are executed via HSS. HSS is aware of the notification producer associated to a given user based on previous registration of the notification producer in HSS.

Managing subscriptions to events via HSS enables that the events can be configured for users that are unregistered by the time the subscription is requested. The HSS sends the subscription request to the appropriate notification producer upon a subsequent registration of the notification producer in HSS when the user becomes available. This also ensure that the subscription to the notification event persists after user deregistration and subsequent registration in the same or different notification producer.

There are numerous negative impacts from subscribing directly to instances, notification producers, handling a specific subscriber by any NF consumer. This NF has to handle the case where the UE is not registered, and has to subscribe to be notified when the UE is deregistered. This doubles the signalling required and puts high overhead for any NF interested in subscribing to an IMS event.

4 – HuaWei Technologies Co.

I am open to this question but I oppose to register the IMS AS served user in NRF because it is not necessary and may not be possible.

5 – ZTE Corporation

Information of IMS AS serving the subscriber can be stored in HSS, other NF consumers can fetch the IMS AS information from HSS and then subscribe to IMS AS.

6 – Qualcomm Incorporated

The pre-condition is that IMS AS registers to HSS for each UE context. Consumers discover IMS AS via HSS.

7 – Samsung R&D Institute UK

NRF based discovery is needed. It is the most consistent way considering that the NF discovery for DCSF is performed by NRF as specified in TS 23.228 for today (in Rel-18), and also consistent to 5G CN.

8 – DOCOMO Communications Lab.

same as Nokia; HSS stores the address of IMS AS, and the address can be discovered from the HSS by the service consumer.

Ericsson lists drawbacks in their answer, but we think these are not real issues; if the UE is not registered to IMS, the HSS does not store an IMS AS address, so the IMS AS cannot be discovered from the HSS. In this case, the HSS can maintain subscription for IMS AS registration; when the IMS AS registers to the HSS, the HSS notifies the service consumer. There is no point to circulate any other SIP or media event via HSS.

9 – DOCOMO Communications Lab.

Regarding NRF, based solutions, NRF is not intended to store session or registration specific status information. NF instances register to the NRF when the NF instance is instantiated.

10 – OPPO

Event notifying to the notification consumers (DCSF, DC AS) by HSS based on subscription is preferred.

Feedback Form 3: Q3: How are the notification events subscribed to notification producer by the notification consumers? directly or indirectly? If indirectly, which NF is responsible for proxy subscription request?

1 – China Mobile Com. Corporation

The subscription should be direct if allowed.

<p>2 – China Mobile Com. Corporation</p> <p>The subscription should be direct if allowed.</p>
<p>3 – Nokia Germany</p> <p>Depends on the nature of the events, e.g. whether events are specific to one user or can be independent of a user.</p>
<p>4 – Ericsson LM</p> <p>(Ericsson answer) Ericsson wants all subscriptions to go to HSS. This applies to subscriptions arriving via the NEF from third party event consumer AS or from another NF event consumer.</p> <p>Direct subscriptions have too many negatives. Please see answer to previous question.</p>
<p>5 – ZTE Corporation</p> <p>DCSF subscribes to IMS AS directly, DC AS subscribes to IMS AS via DCSF (operator hosted DC AS) and/or NEF (3rd party hosted DC AS).</p>
<p>6 – Qualcomm Incorporated</p> <p>If the consumer already has the address of IMS AS (e.g., via previous notify), consumer can subscribe to IMS AS directly. Otherwise, consumer can subscribe via HSS.</p>
<p>7 – Samsung R&D Institute UK</p> <p>The notification consumers directly subscribe to the producer except for the untrusted AF case where it subscribes to NEF first and then NEF subscribes to IMS AS/DCSF.</p>
<p>8 – OPPO</p> <p>Directly if allowed.</p>

**Feedback Form 4: Q4: How are the event notifications reported to the notification consumers? directly or indirectly?
If indirectly, which NF is responsible for proxy event reports?**

<p>1 – China Mobile Com. Corporation</p> <p>directly.</p>
<p>2 – Nokia Germany</p> <p>no explicit view yet</p>

<p>3 – Ericsson LM</p> <p>(Ericsson answer) Ericsson wants all notification to go directly to the NF initiating the subscription. For third party AS, notifications will go to the NEF first since subscriptions came via the NEF.</p>
<p>4 – HuaWei Technologies Co.</p> <p>directly</p>
<p>5 – ZTE Corporation</p> <p>Notification from IMS AS sends to DCSF directly; sends to DC AS via DCSF (operator hosted DC AS) and/or NEF (3rd party hosted DC AS).</p>
<p>6 – Qualcomm Incorporated</p> <p>Directly (via NEF if AS is deployed in untrusted domain).</p>
<p>7 – Samsung R&D Institute UK</p> <p>The notifications are reported directly to the consumers except for the untrusted AF case where NEF forwards the notification from IMS AS/DCSF to the untrusted AF.</p>
<p>8 – OPPO</p> <p>Directly</p>

Feedback Form 5: Q5: What IMS events should be reported in this release? At least two categories of events (IMS session related and DC related) are considered.

<p>1 – China Mobile Com. Corporation</p> <p>IMS session related:</p> <p>On top of IMS session events in R18, at least UE registration/re-registration event and IMS de-registration event should be reported. In the registration event notification, implicit registration set should be included.</p> <p>IMS DC related:</p> <p>IMS DC numbers and type of the DCs in a IMS session;</p> <p>the application id combined with DC;</p> <p>downloading of specific applications;</p>
<p>2 – Nokia Germany</p> <p>IMS events:</p> <p>- user (de)registration,</p>

- establishing, updating, answering, terminating of IMS calls of a user,
- establishing, updating, answering, terminating of IMS calls towards a certain URI or tel number

DC events:

- establishing, updating, terminating of bootstrap data channels,
- establishing, updating, terminating of (P2A, P2A2P, P2P) application data channels,
- downloading of an application via an existing bootstrap data channel,
- how often an application was downloaded in a certain time frame

3 – Nokia Germany

Add-on: tel number or URI can be served by the IMS or not, i.e. also use case the user in operator network calls service number or PSI outside operator's network should be handled.

4 – Ericsson LM

(Ericsson answer) The list of events listed in Nokia solution 7 is a good starting point.

5 – HuaWei Technologies Co.

The list of events listed in Nokia solution 7 is a good starting point.

6 – ZTE Corporation

Both DC related events and IMS session related events are included.

7 – Qualcomm Incorporated

IMS Session related events (Session establishment, update, release);

IMS DC related events (BDC, ADC, establishment, update, release);

IMS DC Application related events (application list downloading, App downloading, activation, deactivation).

8 – vivo Mobile Communication Co.

We support the list of events listed in Nokia solution 7.

9 – Samsung R&D Institute UK

IMS DC session related events and IMS normal session (non-dc media, e.g. audio/video) related events should be supported in this release. The detail events should be decided during the normative phase.

Feedback Form 6: Q6: How is the NEF discovered by the third party DC AS?

1 – China Mobile Com. Corporation By registration event notification or by configuration.
2 – Nokia Germany by existing means
3 – Ericsson LM (Ericsson answer) Use existing procedures defined in 23.502.
4 – HuaWei Technologies Co. don't need new mechanism
5 – ZTE Corporation No new mechanism is needed.
6 – Qualcomm Incorporated Pre-configured, based on the service agreement (nothing new).
7 – Samsung R&D Institute UK By using existing NEF discovery procedure with little enhancement if needed because all NEF may not support the IMS event exposure feature.
8 – OPPO By existing procedure.

Feedback Form 7: Q7: Is there additional aspects or ENs on KI#1 that should be discussed during the survey?

1 – China Mobile Com. Corporation We need to make consensus on what group of IMS users. China Mobile's opinion is that the group of IMS users is not based on any preconfigured list, but a list of users which the notification consumers is interested in, i.e. a group ID is not needed.
2 – Nokia Germany Nokia is not ok to introduce a group concept in IMS for this purpose. List of IMS users can form a group.

3 – Ericsson LM NO
4 – HuaWei Technologies Co. no
5 – ZTE Corporation List of subscribers can be used, instead of introducing group concept.
6 – Qualcomm Incorporated No.

2.2 Questions to KI#2 conclusions

This KI will address the following aspects:

- Study enhancements to IMS architecture, interfaces and procedures to expose IMS services in the following IMS data channel related scenarios:
- IMS data channel initiation, update and release. This includes the initiation, update and release of application and bootstrap data channels.
- Study whether and how an application server can request to use the existing bootstrap data channel for downloading a specific application.

Feedback Form 8: Q1: Which solution do you in general prefer to be taken as the basis of normative work (if any)?

1 – Nokia Germany no preference
2 – Ericsson LM (Ericsson answer) Solution 1 framework is to be used in conjunction with other aspects from other solutions.
3 – ZTE Corporation We can focus on solution principals for this KI.

4 – Qualcomm Incorporated

Following solutions focused different aspects and can be considered as baseline:
Sol#18 (on NW initiated BDC, ADC); Sol#7 (Events for exposure).

5 – Samsung R&D Institute UK

We prefer to agree to which IMS data channel related scenarios described in the solutions can be specified in this release while align with the agreed principles on event subscription/notification mechanism in KI#1, instead of taking particular solutions as the baseline. The network initiated BDC and ADC session establishment scenario described in Sol#18 should be supported in this release.

Feedback Form 9: Q2: Which NF is responsible to receive the session related requests and manage the IMS session establishment (e.g. maintaining session states, correlating session legs to both UEs)? DCSF or IMS AS?

1 – Nokia Germany

IMS AS receives the request and manages the IMS session establishment. We need to investigate further whether request goes via HSS or DCSF, etc.

2 – Ericsson LM

(Ericsson answer) It depends on the IMS session type, and the context. It can go to either one.
DC3 & DC4 must be defined in a generic fashion. Services exposed via DC3 & DC4 shall allow to have audio and video (control / signalling of audio / video) but shall not limit / restrict to use of DC only, audio only, video only:

3 – ZTE Corporation

IMS-AS is responsible to receive the requests and manage the IMS session establishment; and DCSF is responsible for controlling of DC services.

4 – Qualcomm Incorporated

IMS AS, which has full information of an IMS Session (Audio, Video, DC etc.).

5 – Samsung R&D Institute UK

IMS AS receives the IMS session (including DC session) related requests. DCSF receives the DC application related requests.

6 – OPPO

IMS AS is responsible to receive the session related requests

Feedback Form 10: Q3: Is there additional aspects or ENs on KI#2 that should be discussed during the survey?

1 – Nokia Germany

We must clarify which services are exposed to the DC AS, e.g. can DC AS request establishment of an audio/video session, of a bootstrap DC, of a application DC or request download of a specific app to the UE?

2 – Ericsson LM

No

3 – China Mobile Com. Corporation

When the DC is not allowed in the requested IMS session, whether the session should continue or should be rejected? who make the decision?

4 – ZTE Corporation

No

5 – Qualcomm Incorporated

No.

2.3 Questions to KI#6 conclusion

This KI covers following aspects:

- How to support standalone IMS bootstrap and application data channel sessions without accompanying audio/video/messaging media in an IMS session. This includes studying the establishment and termination of standalone IMS data channel sessions.
- Study whether and how to negotiate support of standalone IMS data channel between UE and IMS network, and between two UEs. The negotiation should include the ability to add audio/video/messaging media to an established standalone IMS data channel.
- Whether and how to establish an (standalone) application data channel without accompanying bootstrap data channel.

- Whether and how to establish a (standalone) bootstrap data channel without accompanying application data channel.
- How to add audio/video/messaging media to an established standalone IMS data channel session.
- How to remove audio/video/messaging media from an IMS session that also contains IMS data channel media.
- Whether and how to define new service data in the HSS for support of standalone data channel or extend existing MMTel service data.

Feedback Form 11: Q1: Which solution do you in general prefer to be taken as the basis of normative work (if any)?

<p>1 – Nokia Germany</p> <p>we should first agree on the basic solution principles we want to follow</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) No solution can be used as a basis in its entirety. MMTel session with DC only media which can be extended with audio/video is our preference in this release.</p>
<p>3 – vivo Mobile Communication Co.</p> <p>For Standalone BDC: only Sol 15 mentioned such solution, propose to use it as baseline.</p> <p>For Standalone ADC: propose Sol 14 as baseline.</p> <p>For Standalone ADC+BDC: Sol 20 which touched version-based aspect needs to be further clarified. Some extra new solution proposals which has not been treated in Changsha meeting may need to be discussed, maybe in normative phase.</p>
<p>4 – HuaWei Technologies Co.</p> <p>Propose to use Sol#20 as basis.</p>
<p>5 – Qualcomm Incorporated</p> <p>The supporting of standalone IMS DC should minimize the impact to existing IMS Session with DCs. Sol#16 (no extra enhancement to NF is required); Sol#14 (no need extra subscription or capability negotiation) can be considered as baseline.</p>
<p>6 – China Telecommunication Corp.</p> <p>Prefer to first reach a consensus on the basic principles.</p> <p>(1) Support of single BDC,</p> <p>(2) Support of single ADC,</p>

(3) Whether additional subscription and capability negotiation is needed if the DC application can be both normal DC and standalone DC.

7 – Samsung R&D Institute UK

We prefer to focus on solution principles. The capability negotiation and/or the subscription validation for standalone DC should be supported for backward compatibility as described in Sol#21.

Feedback Form 12: Q2: When the UE initiates an IMS session with combination of standalone bootstrap DC and standalone application DC, how is it handled when the terminating UE has not yet downloaded the application?

1 – Nokia Germany

the terminating UE must be informed of the app that UE A is going to use, so that UE B has a chance to download the app before answering to the INVITE

2 – Ericsson LM

(Ericsson answer) This is a UE implementation. The UE can accept the offer and download it or reject the offer for the DC application SDP mline. It is not a simple question to answer. Note that the context for the applying here is the bootstrap channel, and what have been received by the UE from the local or remote network.

3 – vivo Mobile Communication Co.

After BDC+ADC establishment, terminating UE can download application through the established BDC, and detailed procedures needs to be further improved.

4 – HuaWei Technologies Co.

If UE-A include both BDC+ADC in the initial invite, UE-B will accept ADC if the requested app is cached in the UE-B. Otherwise UE-B will reject ADC and accept BDC. It is impossible for UE-B to download the app first and reply to the initial invite because no BDC is established yet.

5 – China Mobile Com. Corporation

If the SDP offer only contains ADC the UE B shall reject the session. If the SDP offer contains BDC+ADC, the UE B accept BDC and download the applications. Docomo has a contribution to update solution 14 to provide a possibility to update the session after the application is downloaded. We can further discuss if it is a good way.

6 – ZTE Corporation

Terminating UE should download application first if it is not available in UE, and then answers to ADC request.

7 – Qualcomm Incorporated

In general, UE-2 can download the application from BDC based on received binding information in INVITE/re-INVITE.

The details are out of SA2 scope.

8 – vivo Mobile Communication Co.

1. UE-2 can send the SDP answer for BDC and ADC firstly. But for the ADC, e.g., the sctp-port part should be empty due to no DC application downloaded yet.
2. UE-2 can download the DC application through the established BDC after sending the SDP answer for BDC.
3. The UE-2 can update the sctp-port based on the downloaded DC application.

9 – China Telecommunication Corp.

The terminating UE should first respond to the INVITE and establish BDC, then can continue ADC procedure after the application is downloaded.

10 – OPPO

Respond to BDC and ADC first. After downloading the application, the UE can update the ADC session.

11 – Samsung R&D Institute UK

The terminating UE (UE B) should be informed about the application DC offer from the UE A, so that the UE B can decide whether to download the offered DC application before or after answering to the SDP offer. The detailed procedures should be decided during the normative phase.

Feedback Form 13: Q3: Should session changes to/from standalone DC session be supported in this release?

1 – Nokia Germany

we see this problematic as it is not backward compatible to R18 behaviour. For example: if UE A and B have established a voice call with DC and one of the terminates the voice call how do the UEs know whether to terminate the DC (like in R18) or keep it as standalone DC? What happens to charging of the session if the voice part is terminated? this create a lot of complexity and inter-dependency w/o being clear what the benefits for the end user are.

2 – Ericsson LM

(Ericsson answer) Yes only in the context of MMTEL session.

3 – vivo Mobile Communication Co.

Neutral

<p>4 – HuaWei Technologies Co.</p> <p>I propose to support it. In term of Nokia question I think there are easy fix to it. For one we can distinguish SIP reinvite and SIP bye. If it is SIP bye we end DC no matter what, if it is re-invite we handle it as user requested.</p>
<p>5 – China Mobile Com. Corporation</p> <p>Changing to a standalone DC is useful for the user that using applications does not need to keep the voice all the time, especially for A2P applications. Otherwise the user have to ask the remote user not hanging up the call... Using reINVITE and BYE can differentiate the way to release the media component or the whole session. It's up to the user to decide.</p>
<p>6 – ZTE Corporation</p> <p>It can be supported.</p>
<p>7 – Qualcomm Incorporated</p> <p>Yes, the solution should minimize the impact to existing procedures.</p>
<p>8 – China Telecommunication Corp.</p> <p>It needs to be supported, since applications could be both normal DC application and standalone DC application.</p>
<p>9 – Samsung R&D Institute UK</p> <p>Yes. If the standalone DC sessions established only between the R19 UEs based on the capability negotiation, then the session changes to/from standalone DC session can be supported without any problems.</p>

Feedback Form 14: Q4: Is support of application compatibility essential and should be supported in this release?

<p>1 – Nokia Germany</p> <p>it should be possible as an option</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) The bootstrap channel provides a context that avoids that.</p>
<p>3 – vivo Mobile Communication Co.</p> <p>Depend on SA4.</p>

<p>4 – HuaWei Technologies Co.</p> <p>It should be supported.</p>
<p>5 – China Mobile Com. Corporation</p> <p>yes, by any means the UE and network need to make sure the compatibility.</p>
<p>6 – ZTE Corporation</p> <p>It depends on SA4.</p>
<p>7 – Qualcomm Incorporated</p> <p>Not in the scope of SA2.</p> <p>We suppose that's been supported by SA4 via "req-app-ID" attribute. Unless SA4 clarifies different view.</p>
<p>8 – OPPO</p> <p>Depends on SA4.</p>
<p>9 – Samsung R&D Institute UK</p> <p>It depends on the definition of binding information of DC applications.</p>

Feedback Form 15: Q5: Should the capability negotiation of standalone data channel be supported in this release? Why?

<p>1 – Nokia Germany</p> <p>capability negotiation is needed to allow proper interworking with R18 UEs (see comment to Q3) as R18 UEs terminate DC once audio/video is terminated.</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) The offer/answer model supports this functionality. There is no need for any capability negotiation in this Release, but may be considered in future releases.</p>
<p>3 – vivo Mobile Communication Co.</p> <p>Yes, UE implementation enhancement may be needed, such as how to show the UI of incoming standalone application DC request may be different from normal incoming voice call.</p>

<p>4 – HuaWei Technologies Co.</p> <p>I don't see a need for media negotiation. For Nokia's point, again, for Rel-18 UE it will terminate DC with SIP bye whatsoever. For Vivo's point, UE can notice whether this is a standalone DC request by SDP not by media negotiation.</p>
<p>5 – China Mobile Com. Corporation</p> <p>positive to have it. As vivo mentioned, capability negotiation may provide a indication to the UE on what UI is shown to the user, to avoid failure experience when trying to use DC applications.</p>
<p>6 – ZTE Corporation</p> <p>There is no need for specific capability negotiation for standalone DC; and supporting standalone DC could be covered by supporting normal DC capability. SDP will be used for media negotiation for standalone DC.</p>
<p>7 – Qualcomm Incorporated</p> <p>No. NW can always support the SDP media handling, either combined or standalone IMS DC. It's up to UE's internal decision to initiate/accept standalone IMS DC.</p>
<p>8 – Samsung R&D Institute UK</p> <p>Yes, it should be supported. The R18 UEs (and the network) interpret DC only offer as an error, and also the DC only IMS session cannot be maintained. To ensure the stableness and session continuity for standalone DC capable UEs, the capability negotiation should be supported during the session setup procedure.</p>

Feedback Form 16: Q6: Is there additional questions on KI#6 that should be asked during the survey?

<p>1 – vivo Mobile Communication Co.</p> <p>None</p>
<p>2 – China Mobile Com. Corporation</p> <p>there is a EN in interim concusion of KI#6 about AS only supporting standalone DC. Clairification on the scenario and discussion on if it should be supported are needed.</p>
<p>3 – ZTE Corporation</p> <p>No</p>
<p>4 – Qualcomm Incorporated</p> <p>No.</p>

5 – Samsung R&D Institute UK

For this EN “Whether and how to handle session changes with IMS AS only supporting standalone DC is FFS.”, we propose to covert the EN as a Note and discuss during the normative phase.

Feedback Form 17: Q7: Is there additional aspects or ENs on KI#6 that should be discussed during the survey?

1 – vivo Mobile Communication Co.

For standalone ADC or standalone ADC+BDC, when to alert the termination UE needs related solution.

2 – China Mobile Com. Corporation

there is a EN in interim conclusion of KI#6 about AS only supporting standalone DC. Clairification on the scenario and discussion on if it should be supported are needed.

3 – ZTE Corporation

ENs exist in interim conclusion for this KI need to be addressed.

4 – Samsung R&D Institute UK

The EN mentioned by China Mobile’s answer can be resolved as Samsung’s answer in Q6.

2.4 Questions to KI#8 for conclusion

This KI covers following aspects:

- Define and identify the impacts from Avatar communication between two or more users in the context of IMS.
- Study the identifiers required for IMS Avatar communication, e.g. identifier for an Avatar representation in IMS, and the association of an Avatar representation with a user.
- Study whether and how Avatar objects such as an Avatar representation are stored and accessed by the authenticated and authorized UE and/or IMS network nodes avoiding fraud and ensuring privacy.
- Study whether and how to authorise the use of an Avatar representation in an IMS Avatar communication.
- Study whether and how to enable service/capability negotiation between UE and IMS network. This includes service/capability negotiation to enable transition, transcoding and rendering of media in an Avatar

communication.

- Study how to enable transition and transcoding between a MMTel session using audio/video codec and IMS Avatar based communication which may use a special Avatar codec.
- Study how to enable transcoding between speech and gesture (or text) in an IMS Avatar communication.
- Study how to enable UE based and network based rendering in case of IMS Avatar communication.

Feedback Form 18: Q1: Which solution do you in general prefer to be taken as the basis of normative work (if any)?

<p>1 – Nokia Germany</p> <p>again, we prefer first to agree on the basic solution principles as baseline for normative work</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) None in its entirety. Several aspects from different solution can be used.</p>
<p>3 – vivo Mobile Communication Co.</p> <p>For avatar representation download, prefer in BDC. When UE requests data channel application or application list if multiple DC applications are available, the avatar ID or avatar ID list which UE can use is provided via the bootstrap data channel, such as together with the application list. UE will select appropriate avatar representation to download from the DCSF through MF/MRF.</p> <p>For avatar related rendering, prefer to reuse AR communication procedure.</p>
<p>4 – ZTE Corporation</p> <p>We can focus on conclusion principal first; and then consider multiple solutions for different aspects. For transition between MMTel call with audio/video and Avatar communication, it is proposed using procedures in Sol#24 as start point since it's the only one for this aspect.</p>
<p>5 – Qualcomm Incorporated</p> <p>Sol#26 (AR AS is used to distribute the scene description of AR call, the network function can be reused for Avatar communication for the same purpose.)</p>
<p>6 – Samsung R&D Institute UK</p> <p>We prefer to focus on solution principles instead of taking particular solutions as the baseline.</p>

Feedback Form 19: Q2: Should Avatar communication be implemented on DC only in this release?

<p>1 – Nokia Germany</p> <p>we have no strong preference but it must be clear what the purpose of DC is in the context of avatar calls. using DC means that non-DC capable devices cannot use avatar calling which looks like a limitation to us.</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) Yes.</p>
<p>3 – vivo Mobile Communication Co.</p> <p>Yes.</p>
<p>4 – HuaWei Technologies Co.</p> <p>Yes</p>
<p>5 – China Mobile Com. Corporation</p> <p>Yes.</p>
<p>6 – ZTE Corporation</p> <p>In this release, yes.</p>
<p>7 – Qualcomm Incorporated</p> <p>Not clear what’s “DC only”. But we believe both DC and RTP media are required to support Avtar.</p>
<p>8 – Samsung R&D Institute UK</p> <p>Yes.</p>

Feedback Form 20: Q3: Which NF stores the Avatar representation and which NF is responsible to retrieve the representation?

<p>1 – Nokia Germany</p> <p>the representation is stored in the DAC (or whatever name for the avatar repository is used) and downloaded by the application server or optionally by the MF.</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) XR AS is responsible to retrieve the Avatar representation and send it to the MF. This</p>

<p>avoids the need to standardize the retrieval / storage aspects. This means that the Avatar repository must have a reference point with the XR AS.</p>
<p>3 – vivo Mobile Communication Co.</p> <p>New NF e.g., connected with DCSF, store the avatar representation which can be used in avatar communication. The avatar representation is identified by avatar ID.</p>
<p>4 – HuaWei Technologies Co.</p> <p>A new NF. Connect to IMS AS or DCSF.</p>
<p>5 – ZTE Corporation</p> <p>A new NF for Avatar representation repository; DCSF retrieves representation from it.</p>
<p>6 – China Mobile Com. Corporation</p> <p>Avatar representation is represented by Avatar ID, which should be stored in HSS associated with IMS identity. The representation itself is stored in a separate repository. The representation should be downloaded in a secured way by the DC controlling entity, e.g. DCSF or DC AS. Then the representation is sent to the UE or MF for possible rendering.</p>
<p>7 – Qualcomm Incorporated</p> <p>A new repository function deployed in application layer, which can be accessible by MF and UEs via HTTP.</p>
<p>8 – Samsung R&D Institute UK</p> <p>New NF (Avatar Data Repository) stores the Avatar representation, and DCSF is responsible to retrieve the Avatar representation.</p>

Feedback Form 21: Q4: How does the UE configure or download the Avatar ID and Avatar representation?

<p>1 – Nokia Germany</p> <p>UE can be configured with avatar ID by means outside 3gpp or can use the bootstrap DC to download XR app(s) and allowed avatar IDs via the app menu list.</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) For a local UE, the UE interacts with the XR AS and downloads the Avatar representation using the ID which it acquired when it created this Avatar object or learned through offline means.</p>

<p>For a remote UE, there are different scenarios depending on UE capabilities and no answer can be provided.</p>
<p>3 – vivo Mobile Communication Co.</p> <p>No UE configure, avatar ID is provided together with the application list in BDC, and UE can choose which avatar ID to be used.</p>
<p>4 – HuaWei Technologies Co.</p> <p>using BDC</p>
<p>5 – ZTE Corporation</p> <p>Avatar representation can be sent to UE through data channel.</p>
<p>6 – China Mobile Com. Corporation</p> <p>Avatar ID and representation is downloaded via BDC under the control of network.</p>
<p>7 – Qualcomm Incorporated</p> <p>UE communicate the repository via application layer (e.g., HTTP) for configuration and downloading of <i>Avatar ID and Avatar representation</i>.</p>
<p>8 – OPPO</p> <p>UE can get via BDC.</p>
<p>9 – Samsung R&D Institute UK</p> <p>UE should be able to download the Avatar ID(s), only using configured Avatar ID(s) does not work when the remote UE needs to download the Avatar representation of the originating UE.</p>

Feedback Form 22: Q5: Is authentication and authorization of Avatart representation mandated to be supported?

<p>1 – Nokia Germany</p> <p>yes, network or XR AS should have the possibility to check whether user is allowed to use a certain avatar ID.</p>
<p>2 – Ericsson LM</p> <p>(Ericsson answer) YES</p>

3 – vivo Mobile Communication Co. No, avatar ID/representation is published by operator and trusted 3rd party.
4 – HuaWei Technologies Co. Yes, but to be specific in SA3.
5 – ZTE Corporation Yes
6 – China Mobile Com. Corporation yes. The solutions in the TR don't touch this aspect in my opinion. Further consideration is needed and may be decided in normative phase.
7 – Qualcomm Incorporated Yes, can be achieved via application layer. More details are in the scope of SA3.
8 – Samsung R&D Institute UK Yes.

Feedback Form 23: Q6: Which animation mode(s) should be supported, i.e. UE A centric, network centric, UE B centric?

1 – Nokia Germany network centric and UE A centric must be supported, UE B centric can be supported.
2 – Ericsson LM (Ericsson answer) All models are relevant for a full solution, but UE centric can be a priority for this Release.
3 – vivo Mobile Communication Co. All, detail procedures need to be updated in normative phase.
4 – HuaWei Technologies Co. Network centric and UE-A centric. No UE-B centric because there are security, privacy and rendering quality concern.

5 – ZTE Corporation Both network centric and UE centric.
6 – China Mobile Com. Corporation network centric and UE A centric.
7 – Qualcomm Incorporated Animation in the network may deferred to a later phase. More focus on animation at receiver. Animation on sender doesn't require any changes to the standard.
8 – OPPO All should be supported.
9 – Samsung R&D Institute UK All.

Feedback Form 24: Q7: Is there additional question on KI#8 that should be asked during the survey?

1 – HuaWei Technologies Co. Whether the interface MC1 (DCSF-MF) is needed?
2 – ZTE Corporation No
3 – Qualcomm Incorporated No

Feedback Form 25: Q8: Is there additional aspects or ENs on KI#8 that should be discussed during the survey?

1 – ZTE Corporation No
2 – Qualcomm Incorporated The terminologies need to be synced among solutions and SA4 specs.

2.5 Questions to KI#3 conclusion

This key issue covers the following aspects:

- How to enhance IMS architecture and procedures to provide some form of IMS data channel applications service experience by interworking with a MTSI UE supporting only legacy media types (audio/video/messaging) where it is appropriate.
- How the IMS network determines whether interworking with a MTSI UE supporting only legacy media types can be provided, e.g. considering, on a case by case basis, the media types used in the data channel application subject to interworking.

Feedback Form 26: Q1: Is the messaging service to handle the hyperlink supported in this release?

1 – Nokia Germany we do not see a need for this. the benefits are unclear, also not clear how the UE can correlate the hyperlink with an ongoing IMS session.
2 – Ericsson LM (Ericsson answer) Only if it can be made to work in a secure fashion. In other words, it is sent securely to the UE, and it can be verified that when it is used it is indeed the correct UE that received it.
3 – vivo Mobile Communication Co. Yes, we'd better provide more kind of services which can be used for interworking. Considering the usage of video call in real network is not that popular, we think that an SMS based solution would makes sense and could greatly increase usage for interworking. Some updated solution has not discussed in last meeting on how to trigger the DC AS to sends SMS to MTSI UE. <input type="checkbox"/> S2-2404157 <input type="checkbox"/>
4 – HuaWei Technologies Co. Don't understand what aspect of this solution need to be standardized.

5 – ZTE Corporation

Application level or implementation can handle this, no impact on IMS architecture and procedures.

6 – China Mobile Com. Corporation

Whether the terminating UE is impacted needs clarification. We can only accept a solution with no impact on the terminating UE, i.e. the terminating UE can receive the short message and get the file with no further behavior.

7 – Qualcomm Incorporated

No, this is absolutely out of the scope of the study.

MTSI UE can do so anyway up to UE/NW implementation, no need further standardization.

8 – vivo Mobile Communication Co.

We agree CMCC's clarification that no impact on the terminating UE.

To Huawei: as mentioned in S2-2404157, the DCSF may inform the DC AS to perform interworking actions when DCSF determine that the terminating UE is a MTSI UE, we think this part is what needs to be standardized. Then the DC AS may send a SMS with hyperlink.

To ZTE and Qualcomm: we should provide solutions within the scope of NG-RTC, but not based on application level. All the DC application can be replaced by application level solutions.

9 – OPPO

Clarifications may be needed.

10 – Samsung R&D Institute UK

We support to have handling of hyperlink in this release. SMS is an easy option to use.

Feedback Form 27: Q2: Should interworking be supported for the scenario that the MTSI UE initiates the session to DCMTSI UE?

1 – Nokia Germany

interworking solutions depend very much on the nature of the application, e.g. whether application data can be rendered into video/audio streams. The "solutions" leave the rendering process and how applications for which interworking is possible can be detected for implementation. This looks not like a standard solution but something that can be done implementation specific. As such we do not see a need to support this kind of interworking in standards.

2 – Nokia Germany

one additional point: what happens if the UEs have only audio session established? is interworking also in

<p>this case supported and for which apps?</p>
<p>3 – Ericsson LM (Ericsson answer) No.</p>
<p>4 – vivo Mobile Communication Co. MTSI UE initiate interworking to obtain specific operator service is meaningful, for example, the operator can provide a visual menu to MTSI UE.</p>
<p>5 – HuaWei Technologies Co. Yes</p>
<p>6 – ZTE Corporation No, MTSI UE shall initiate audio/video only session based on its capability.</p>
<p>7 – China Mobile Com. Corporation yes, this scenario is also valuable when the terminating UE or the DC application in terminating network want to provide some service experience, e.g. visual menu. But the interworking scenario should be clarified, as Nokia mentioned, when the interworking is based on video streams, the initial call has to be video call.</p>
<p>8 – China Mobile Com. Corporation This scenario will also require the notification to the DCSF even if the incoming session does not include DC media components.</p>
<p>9 – Qualcomm Incorporated No. Only the call initiated by DCMTSI UE may be considered.</p>
<p>10 – Samsung R&D Institute UK Yes. This scenario is useful when the MTSI UE user calls to the service center and the service center communicates with the visual menu – it reduces time to spelling their personal information. The DC session doesn't need to be initiated toward the MTSI UE, but the hyper link should be provided to the MTSI UE. This is just opposite with the DCMTSI UE to MTSI UE scenario. We are open to have video/audio stream not only the audio stream.</p>

Feedback Form 28: Q3: Is there additional aspects or ENs on KI#3 that should be discussed during the survey?

1 – Nokia Germany

in general we are not convinced any solution needs to be standardized for this interworking, especially as such solutions do not and cannot explain in detail how the interworking is done and for which apps it can be provided.

2 – vivo Mobile Communication Co.

1. Can the interworking be supported when there is no video call service between DCMTSI UE and MTSI UE?

Considering the video calling is rarely used in reality, if the answer is no, the interworking will also rarely be used.

2. Focus on the UE impact in Sol#9, UE needs to support to include mobile screen data in RTP stream then send to MF over the application data channels. Does these operations need to update the UE?

3 – ZTE Corporation

No additional questions or ENs; only the ENs in interim conclusion need to be addressed.

4 – China Mobile Com. Corporation

To Nokia:

What application can be interworked is determined by the DCSF, e.g. only the app whose media is also RTP based can be interworked with MTSI UE with audio/video RTP. And MF can just receive the packets from DC and send it from video stream to MTSI UE.

To vivo:

the video stream can only exist between MF and MTSI UE, not necessarily between DCMTSI UE and MF.

IMO there is no impact on DCMTSI UE, which send the media through DC as it is, the MF will take the media out of DC and put into video stream.

5 – Qualcomm Incorporated

No.

6 – vivo Mobile Communication Co.

To CMCC

1.If the original call is a voice call, the call should be changed to video call for terminating UE?

2.For the second question, I mean the screen data should be put in RTP packet firstly then to ADC packet, but not put in ADC packet directly. Does this has impact to DCMTSI UE?

2.6 Questions to KI#7 conclusion

Feedback Form 29: Q1: Is solution 22 taken as the basis of normative work for KI#6?

1 – Nokia Germany as for other KI we prefer to agree first on interim conclusions
2 – HuaWei Technologies Co. Yes
3 – ZTE Corporation Yes
4 – China Mobile Com. Corporation yes. The draft conclusion will be based on solution 22 for further discussion.
5 – Qualcomm Incorporated Yes.
6 – Ericsson LM <p>The offer/answer supports the required functionality to handle Multiplexing subscription.</p> <p>The discovery aspects using Feature-Caps are optimization aspects to avoid a second round of SDP offer/answer. However, this does not impact the setting up of audio IMS session as this second round applies only to multiplexing SDP m= line.</p> <p>Even with the discovery of peer network support, the target UE may not support multiplexing, and the originating UE may need to use SIP Options to discover target UE capability. All in all, we don't need the discovery aspects of the solution.</p> <p>IMS AS needs to be transparent to multiplexing. The DCSF decides what to do in case the originating network or the target network don't support multiplexing during an ongoing IMS DC session. This means that the DCSF must be informed of the received responses during the SDP offer/answer negotiation. The DCSF notifications must be updated to handle that.</p> <p>Additionally, the IMS AS services must be updated so the DCSF can instruct the IMS AS what to do under different conditions:</p> <p>The Nimsas_MediaControl_MediaInstruction is enhanced to receive additional instructions to perform the following:</p>

- Demultiplex an offer towards the target network together with the binding information to be sent to the MF so that the MF can correlate the different application traffic in either direction. The DCSF provides the necessary information to the IMS AS to accomplish this objective.

- Reject an offer towards a UE if the originating network does not support multiplexing. Such rejection must then use existing, SDP-based offer/answer methods for SDP binding information to clearly indicate that unsupported multiplexing is the reason for the rejection. Only setting the port to zero on the m= line in the answer would not provide sufficient indication of this condition.

-

The Nmf_MRM_Create is enhanced to include in case of demultiplexing UE multiplexed applications the necessary information to reserve the required media per application, as well as the necessary binding information to be sent to so that the MF can correlate the different application traffic in either direction.

The Nimsas_SessionEventControl_Notify is enhanced as follows:

- to be able to notify the DCSF of SessionEstablishmentFailureEvent that includes the reason as being target does not support multiplexing. This enables the DCSF to instruct the IMS AS to perform demultiplexing (as depicted in the above enhanced instruction to the IMS AS) if the MF supports the functionality or just terminate-reject the media line and let the originating UE decide what to do.

Nmf_MRF_Update is enhanced to receive additional instructions to handle the case when the DCSF decides to demultiplex UE multiplexed application subsequent to a rejection from the target network that it does not support multiplexing received in an initial offer. In this case, the DCSF instructs the IMS AS via the Nimsas_MediaControl_MediaInstruction Request sent to the IMS AS from DCSF as depicted above. Subsequently, the IMS AS constructs the necessary SDP offer and instructs the MF about the necessary binding information to be maintained between the incoming and outgoing anchor points via the updated service operation Nmf_MRM_Update.

7 – Samsung R&D Institute UK

We prefer to start with Sol#22, but what information (e.g. Application IDs, Application DC type such as P2A or P2P, assistance information for SCTP connection setting) from the SDP offer received by IMS AS should be sent to DCSF should be specified during the normative phase so that DCSF can perform appropriate control of multiplexing and demultiplexing.

Feedback Form 30: Q2: Is there additional aspects or ENs on KI#7 that should be discussed during the survey?

1 – Ericsson LM

(Ericsson answer) See above.

2 – ZTE Corporation

No

3 – China Mobile Com. Corporation no before we discussed the conclusion proposal.
4 – China Mobile Com. Corporation To Ericsson: what the answer above do you refer to? Cant find it.
5 – Qualcomm Incorporated Coordination with SA4 is required.

2.7 Questions to KI#4 conclusion

This KI covers the following:

- Study and if needed, define a mechanism how the serving IMS network can authorize the usage of third party identities in an IMS session.
- Study and if needed, define a mechanism how the terminating IMS network can support the called party to verify third-party specific identities used in a session.
- Study whether and how IMS procedures need to be enhanced to support authentication, authorization, signing and verification of third-party specific identities. This includes for example studying potential impacts on the STIR/SHAKEN procedures defined in TS 24.229 [10].
- Study and if needed, identify required enhancements to IMS subscription data to support third-party identities

Feedback Form 31: Q1: Which NF is responsible for RCD retrieval and verification? Why?

1 – Nokia Germany We prefer IMS AS as the service logic is executed in the MMTel AS and it can also invoke the signing process.
2 – Nokia Germany to clarify: IMS AS should fetch the RCD record, the authorization can be done in S-CSCF or IMS AS.
3 – Ericsson LM (Ericsson answer) IMS AS. Since it does not require any standardization. Information relevant to retrieval is based on transparent data stored in HSS and optionally also on a third-party ID AS and only understood by the IMS S. Any other node will require full standardization and will severely limit the usefulness of the feature.

<p>4 – ZTE Corporation</p> <p>IMS AS; less impact on S-CSCF.</p>
<p>5 – China Mobile Com. Corporation</p> <p>We prefer IMS AS.</p>
<p>6 – Qualcomm Incorporated</p> <p>IMS AS.</p> <p>Third party ID is an optional service, which is not feasible to be supported by all S-CSCFs. The IMS AS supporting RCD retrieval and verification can be deployed more flexible, e.g., a new AS or upgrade from existing AS.</p>
<p>7 – OPPO</p> <p>IMS AS.</p>
<p>8 – Samsung R&D Institute UK</p> <p>Both S-CSCF and IMS AS. When retrieved by S-CSCF and authorize the by the S-CSCF then in case of authorization failure, one leg of invoking IMS AS will be saved. Because the call can be simply rejected based on the operator policy.</p>

Feedback Form 32: Q2: What is RCD information stored in HSS?

<p>1 – Nokia Germany</p> <p>We prefer only a limited set of information to be stored, e.g. company name, job title, etc. We should leave it to stage 3 how this is encoded.</p>
<p>2 – Nokia Germany</p> <p>exact list of data can be defined during normative work</p>
<p>3 – Ericsson LM</p> <p>(Ericsson answer) Per IMPU/wildcarded IMPU, pointer to the third party ID AS where an index would be required and it is the IMPU or the originating user, or pointer to the actual RCD in a third party ID AS, or the actual RCD data itself.</p>
<p>4 – HuaWei Technologies Co.</p> <p>The data should be stored in the repository data and no need to standardize</p>

5 – Qualcomm Incorporated

A hyper link or address of RCD information, either stored in MNO or third party provided server.
Optionally, the RCD can be stored in HSS based on the agreement between enterprise and MNO.

6 – Samsung R&D Institute UK

Agree with Nokia that simple RCD information which is generally common for third party like company name (irrespective of the subscriber/IMPU) is stored. More information can be enhanced during normative phase.

Feedback Form 33: Q3: Is there additional aspects or ENs on KI#4 that should be discussed during the survey?

1 – Nokia Germany

On this

Editor’s Note: it is FFS whether Informative text may be added during the normative phase to depict example(s) on how this can be made to work.

This topic was brought up lately without proper discussion, also requirement is not clear. If this item has not normative implications, we propose to remove it from the conclusions and from R19.

2 – Qualcomm Incorporated

Agree with Nokia to remove the EN. Anyway, potential informative text can be driven by contribution in normative phase.

3 – Samsung R&D Institute UK

On this Editor’s Note “it is FFS whether Informative text may be added during the normative phase to depict example(s) on how this can be made to work”

In our view, the Editor’s Note can be converted to a Note and the multiple RCD information can be discussed based on the contributions during normative phase.

On the EN for signing and verification invocation:

If we see today at TS 24.229 Clause 5.7.1.25.2 (orig procedure) and 5.7.1.25.3 (term procedure) for inter domain call, IMS AS can invoke both Signing and verification server, but still IBCF was added as another option. Clause 5.7.2.25.4 is having details for this Ms interface. Similarly for intra domain call along with IMS AS, S-CSCF also has to be kept as another option for invoking signing and verification server. We object to including only IMS AS as an option.

On the EN for provisioning third party identity to HSS by operator or third party:

Both third party and operator should be allowed to provision. This feature is third party identity verification and this third party identity is given by third party. Hence the flexibility of provisioning should be given for third party as well as operator. We object to including only operator provisioning option.

One important aspect is missed and not sure whether it is covered as part of the existing agreed in the 1st bullet point of the interim conclusion.

This third party identity feature will add delay to call setup time and can't be make mandatory for all the IMPUs to go through third party identity verification. Hence this feature will be invoked only when the subscription parameter of the IMPU is marked enabled for it.

2.8 Questions to KI#5 conclusion

This key issue covers the following:

- Whether and how to enhance the current 3GPP PS Data Off Exempt service information (e.g. list of 3GPP PS Data Off Exempt services) to support 3GPP PS Data Off for services over IMS data channel.

Editor's note: The definition of services over IMS data channel needs to be further clarified. Whether the services over IMS Data channel to be exempted can be per DC service granularity is FFS.

Feedback Form 34: Q1: Is there any aspect in solution 28 and 29 that you think needs more discussion?

1 – Nokia Germany

We strongly prefer to avoid considering specific applications for data off exempt. Solution should follow stage 1 requirement and activate/deactivate PS data off for the IMS DC service as a whole. Which apps are downloaded to the UE is left for implementation.

2 – Ericsson LM

(Ericsson answer) We prefer in this Release to support a complete switch off/On, i.e DC is not exempt/exempt while roaming when PS Dataoff is activated/deactivated.

Optionally, the offer/answer model can be used, as is, to negotiate application choices, if DC is exempt while roaming with PS Dataoff active, with the DCSF enforcing that. Whether the UE has a list of allowed application when PS Dataoff is active, and DC is exempt can be determined during the normative phase.

3 – vivo Mobile Communication Co.

1. We prefer to lower the UE impact. No need for further discussion on solutions. The two existing solutions are not conflict.

2. But we prefer KI#5 takes precedence over KI#7.

<p>4 – HuaWei Technologies Co.</p> <p>I think both solution should be considered, except the concept of timer.</p>
<p>5 – ZTE Corporation</p> <p>No; normative work can be based on the merging of two solutions.</p>
<p>6 – China Mobile Com. Corporation</p> <p>We also think the conclusion can be made based on the two solutions. The both solutions resolved the requirements from stage 1.</p>
<p>7 – China Telecommunication Corp.</p> <p>Need to clarify whether PS Data Off applies to all DC applications (including normal DC and standalone DC), as standalone DC applications could be long-life-cycle applications, to which PS Data Off may not be applicable.</p> <p>It is recommended to make it clear whether PS Data Off applies to all types of DC applications or can be configured according to the operator policy.</p>
<p>8 – Samsung R&D Institute UK</p> <p>We strongly prefer to have less complexity on the system and only provide exemption of IMS DC as a whole and for any application level control should be left to implementation.</p>

3 Summary

This clause summarizes the feedbacks to the questions.

34 questions to 8 KIs were asked for this online discussions. Finally 10 companies (China Mobile, China Telecom, Docomo, Ericsson, Huawei, Nokia, OPPO, Qualcomm, Samsung, vivo, ZTE) provided their feedbacks.

3.1 Summary of KI#1

7 questions were asked and got 56 feedbacks in total.

There is no specific solution agreed to be directly taken as the basis for the normative phase.

It is agreed to notify the events directly from the producer to consumer.

For event producer discovery, 5 companies prefer HSS based discovery, 2 companies prefer using notifications from producer to consumer, 1 company prefers NRF based discovery.

For event subscription, 5 companies explicitly support direct subscription to event producer after the address of the producer is derived (via NEF if the consumer is untrusted). 1 company (Ericsson) prefer indirect subscription HSS.

The consensus is that both IMS session and DC related events should be supported and events listed in solution 7 is taken as the basis for normative phase.

Most of the companies agree that NEF is discovered using existing mechanism.

3 companies mentioned that group of IMS subscribers is not needed, instead list of IMS subscribers is defined.

3.2 Summary of KI#2

3 questions were asked and got 16 feedbacks in total.

There is no specific solution agreed to be directly taken as the basis for the normative phase.

5 companies prefer IMS AS to manage the session with no objections. However whether the request should be sent to IMS AS directly or via DCSF needs further discussion.

It is also proposed to discuss and decide the scope of the exposure.

3.3 Summary of KI#6

Interim conclusion has been agreed in SA2 #162 so 7 questions were asked mainly to the remaining editor's notes and got 55 feedbacks.

7 companies want to support change to/from standalone IMS DC session, while 1 company don't want to support it.

Regarding to the issue on how to handle when the terminating UE has not yet downloaded the application, most of the companies prefer to firstly answer and establish the BDC. After the application is downloaded, the session is updated for ADC. This can be taken as the assumption for further discussion.

For version compatibility, most companies believe SA4 is responsible to provide version compatibility information.

For capability negotiation for standalone DC, 3 companies think it's needed and 4 companies think it's not needed.

it is proposed by vivo to discuss and decide when to alert the terminating UE for standalone DC session.

3.4 Summary of KI#8

8 questions were asked and 53 feedbacks were received in total.

It is agreed avatar communication is implemented on DC only in this release.

It is the consensus that Avatar representation is stored in a new NF as the repository.

For which NF download the representation from the representation repository, DC AS is supported by 3 companies, IMS AS is supported by 1 company, DCSF is supported by 5 companies, MF is supported by 2 companies.

For deriving Avatar ID and representation on UE, besides local configuration, 6 companies support to download Avatar ID and representation to UE via data channel, while 2 companies propose to use application level communications.

For authentication and authorization of Avatar representation, 7 companies think it should be supported. Coordination with SA3 may be needed.

For animation mode, 8 companies believe that network centric and UE A centric modes shall be supported in this release, 5 companies in which propose to support all modes. There is only one company (Qualcomm) who doesn't support network centric mode.

3.5 Summary of KI#3

Interim conclusions have been agreed in SA2 #162 so 3 questions were asked against the remaining ENs. 26 feedbacks were received.

For whether to support accessing DC application via hyperlink in short message, 2 companies think it should be supported, 2 companies think it is not needed. Some companies want to avoid impact on standardization.

For the interworking scenario of MTSI UE initiating a session to DCMTSI, 4 companies want to support it, 4 companies think it is not needed.

Concerns on how to support interworking in SDP level and the impact on the UE are raised which needs further clarifications and discussions.

3.6 Summary of KI#7

Solution #22 is the only solution for this KI so the solution principle should be based on this solution.

Ericsson provides detailed comments on the solution, which will be taken into account when drafting and discussing the solution principle.

The solution principle will be drafted and discussed offline to get more feedbacks.

3.7 Summary of KI#4

Interim conclusions have been agreed in SA2 #162 so 3 questions were asked against the remaining ENs. 17 feedbacks were received.

Regarding to which NF to retrieve and authorize RCD, all companies providing feedback support using IMS AS, while 2 company want to also support using S-CSCF.

<https://nwm-trial.etsi.org/#/documents/8859>

For the information in RCD, Nokia proposed to list limited information in the conclusions and define the exact list of information during normative phase. Huawei proposed to not standardize the information.

It is also proposed to remove the EN of "it is FFS whether Informative text may be added during the normative phase to depict example(s) on how this can be made to work" from the conclusion.

3.8 Summary of KI#5

1 question was asked and 8 feedbacks were received.

On whether to support application level PS data off management, 4 companies prefer to support and 3 companies prefer not to support.