**Source: SA4 MTSI SWG Chairman[[1]](#footnote-0)**

**Title: Draft Report for MTSI SWG 11 Feb 2020 Teleconference #4 on ITT4RT**

**Document for: Approval**

**Agenda Item: 5.1**

## **Executive Summary**

The MTSI SWG teleconference on ITT4RT received six contributions and agreed on three of them. The rest were not discussed and will be covered in the next telco.

## **1. Opening of the conference call**

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| --- | --- |
| **Telco#4 (Topic: ITT4RT, Date: 11 Feb 2020, Time 16:00-18:00 CET, Host: Intel)** | * Update permanent document to include use cases, architecture / call flows, requirements, potential solutions, and working assumptions
* Contribution submission deadline: 23:59 CET, 8 Feb, 2020
 |

The SA4 MTSI SWG chairman, Nikolai Leung (Qualcomm), opened the conference call at about 16:09 hours CET on Feb 11, 2020.

Ozgur Oyman volunteered to take minutes on the conference call. Nikolai also requested the participants to add their names to the attendance list at the end of the on-line minutes located here:

<https://docs.google.com/document/d/10QoKXOc1jZ_ATP136iSsZkw8ajVNf1goL-VohjI-nuM/edit?usp=sharing>

## **2. Approval of the agenda and registration of documents**

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| S4-AHM511R1 | Proposed agenda for SA4 MTSI SWG 11 Feb 2020 Teleconference #4 on ITT4RT | MTSI SWG Chair(Nikolai Leung) | 2 |

The MTSI SWG chairman Nikolai Leung (Qualcomm) presented the agenda and registration of documents.

**S4-AHM511R1 was agreed.**

## **3. Reports and liaisons**

## **4.**  Support of Immersive Teleconferencing and Telepresence for Remote Terminals (ITT4RT)

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| S4-AHM510 | Editor’s Proposed Updates to ITT4RT PD | Intel | 4 |

Presented by Ozgur Oyman of Intel.

Discussion:

* Igor: These are good clarifications. I’d like to see some definition of ROI in this ITT4RT context in section 6.1, how it is useful and for what.
* Ozgur: OK. I think we had that type of text in section 9. Perhaps move that to section 6?
* Igor: Yes.
* Ozgur: I’d also like to make this ROI part of the compact procedure in section 6. Is it OK to agree to this text if I include those changes later?
* Igor: Yes. I’d just like to have this definition I mentioned added.
* Saba: In 9.3 the parameter is still called Viewport\_ID. Should that be renamed?
* Ozgur: Yes, I missed that one. It should be ROI\_ID. Good catch.

The document was **agreed** for inclusion in the PD with the above additions and changes.

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| S4-AHM512 | ITT4RT: Proposed Updates to Potential Solution on Overlays | Intel | 4 |

The document was not treated due to lack of time.

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| S4-AHM513 | Use of Viewport Margins for Bandwidth Adaptation | Nokia Corporation | 4 |

Presented by Saba Ahsan of Nokia.

Discussion:

* Ozgur: making the changes in the margin dynamic, along with changes in the viewport, may be challenging for the encoder. What about the discussion about making the margin a specific % that is pre-negotiated? Among all the possibilities, which is the best?
* Saba: this is not supporting the receiver sending back dynamic requests for margins. Can only make suggestions during the session. Agree that dynamic requests would complicate it too much.
* Imed: Why does the client need to know the margin? Can just check what it receives.
* Saba: Client does not need to know. Just indicate the max margin to the sender.
* Imed: Why does the client need to indicate the margin?
* Saba: User preference
* Imed: why does the user even care? About margins and whether to use them or not?
* Saba:
* Ozgur: margin decided by the sender. can let the receiver know. knowing the margin, the receiver can change its update of the viewport -- if wider does not need to update.
* Imed: the variability of the margin makes this even more difficult, what if sender encoder puts margin left but the receiver turns right. Waiting until you see the actual viewport sent to decide whether to make a request is too late to make the request.
* Saba: agree with Imed that if the margins are dynamic, then it is hard for the receiver client to predict what to send. But for a teleconference call with little motion, the receiver can say it wants a very small margin so that viewport has higher quality.
* Ozgur: thought the receiver does not have any say on what the margin could be.
* Saba: there is a negotiation at the beginning: sender indicates the maximum and the receiver indicates that it wants less. Negotiation is only at the session level, then there is no re-negotiation.
* Ozgur/Saba: negotiate the % of the margin. Sender may extend the margin farther ahead in the direction of motion.
* Ozgur: different levels of margin use:
	+ Simple recommendation for the sender without any additional signalling
	+ Or could have additional indication from the sender on what margin
	+ Or could have more dynamic interaction between sender and receiver -- how to define and how much will this make a difference?
* Ozgur/Saba: agree that need to evaluate what are the pros and cons of each of these.
* Benefits of limiting margins?
	+ For good or bad network -- better to limit or allow larger margins?
* Igor: can we do details and the evaluation of the pros and cons in subsequent discussions?
	+ For now clarifying against questions on the responsibility split
	+ This is not yet the complete solution for clause 9
* Ozgur: Unclear about level of signalling, SIP vs. RTCP
* Igor: can also discuss what level of signalling is needed. SIP sufficient or need RTCP?
* Ozgur: adding this will make a very new addition to the viewport coding. Not just viewport dependent but also margin dependent coding.
* Saba: not proposing to have dynamic viewport coding via RTCP.
* Ozgur: there is some text that implies periodic RTCP feedback
* Igor: do not want receiver to also try to control the margins to avoid conflict. Receiver only makes suggestions and sender decides.
* Ozgur: sender will then indicate what is the margin it has selected?
* Ozgur: still need to decide on what is the benefit of each? Which is the most promising option?
* Igor: Compare SIP and SIP+RTCP
* Ozgur: and no signalling at all. Just recommended guidelines for the encoder.
* Nik: also compare/evaluate whether sender needs to even indicate the margin.
* Ozgur: agree. Could be purely guidelines for how the sender may set margins but does not even indicate the margins.
* Igor: OK to bring in additional information to analyze pros and cons.
* Ozgur: OK to include in the PD along with an editor’s note indicating that this is still under study/analysis for the pros and cons.

The document was **agreed** with the proposed modification to add an editor’s note.

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| S4-AHM514 | Enhancing RTCP Feedback with high level metrics | Nokia Corporation | 4 |

Presented by Saba Ahsan of Nokia.

Discussion:

* Ozgur: This could measure the quality of viewport-dependent conferencing. We recently concluded VR QoE work in S4 for streaming content. Some metrics for motion to high-quality metrics were considered there too. Have you checked the output from that work? Are those metrics aligned with this?
* Saba: Yes. Their solution is based on the OMAF ranking. We have here tried to put motion-to-HQ in the context of (RTP) time stamps.
* Ozgur: I’d like to check internally if there are comments to this metrics approach. In VR QoE it was collecting metrics and reporting them. In MTSI there are also QoE metrics but there it is also about monitoring the session. Here it is also to modify session bandwidth. I’m not sure if this is to be used for real-time bandwidth adaptation? Are you considering both QoE and real-time adaptation?
* Saba: I suggest this to be part of RTCP feedback and that it can be used as part of the adaptation. In DASH it was insightful to see that higher-level metrics are more useful. This can be an important metric to assist adaptation.
* Ozgur: So this could have two impacts, both QoE and in real-time adaptation (e.g. adapting margin percentage).
* Igor: Yes, that was the idea to extend the RTCP feedback.
* Ozgur: I’m OK to include this in the PD.
* Ahmed: I believe this is important and aligned with MPEG-I part 6. I have a concern that we don’t have a way to measure the quality and it would be important to have an aligned metric, to make it more concrete.
* Ozgur: In MPEG-I I believe you put down guidelines how to measure the delay how to get the same quality as before when changing viewport.
* Ahmed: In MPEG-I part 6 we use quality ranking and tiling. If we do something different than DASH here I’m not sure to what extent we can re-use MPEG-I.
* Igor: We’re not suggesting a way to measure the quality of the viewport. This is just the delay measure.
* Ahmed: I understand. I’m just saying it is unclear what is meant with “high quality”.
* Igor. It is the time when the receiver renders the new viewport with high quality.
* Ahmed: How do we know that this is the “high quality”?
* Ozgur: In conference it is not that complex. There’s basic quality for the whole 360 and higher quality for the viewport and that viewport will move. Assuming that the sender always encodes the viewport at a certain quality level, it shouldn’t be too complex. Perhaps two or three quality levels (maybe one for the margin). What those quality levels are would be up to the sender. The receiver would have to figure out when it receives the better quality of the scene it is looking at.
* Ahmed: If you have, say, three levels, that makes sense.
* Igor: In a practical implementation that could be just two levels. The background could be lower quality and a single viewport with higher quality.
* Ahmed: I imagine you would need more than one viewport, since it is 360. You could have a set of viewports.
* Ozgur: This is not DASH. It could also be dependent on the available bandwidth. The provided quality would have to be changed during the conference if available bandwidth changes. At any given time, there could always be two quality levels.
* Igor: Agree. Why would there be more than two? The quality discussion could belong more in the adaptation.
* Ahmed: If I’m switching viewport, from one to another, and if both are at this higher quality, I don’t see how I can know when I get the second one.
* Min: In section 4, you say RTT is not enough because RTCP and RTP are not sent on the same bearer?
* Saba: Yes.
* Min: In MTSI, RTP and RTCP are sent on the same bearer even though they use different ports. Are you going to send this delay measure to the (RTP) sender?
* Saba: Yes, in RTCP feedback, but the details are to be decided.
* Min: If RTP and RTCP are sent on the same bearer, would RTT be enough?
* Saba: No, there could still be delays at the sender that should be reported.
* Min: The processing delay at the sender would not be related to the transport.
* Igor: That was a side comment. The RTT and the motion-to-HQ delay are not the same.
* Min: We only care about the true RTT, related to the bandwidth? The two receiver-related delays in the diagram of section 4 are not related to the transport.
* Saba: It is not only related to predicting the bandwidth. DASH indicates that higher-level metrics such as this improves quality that the client experiences. The sender should adapt to that quality, not only to what bandwidth it experiences.
* Min: How does the sender know the receiver side delays? It has nothing to do with the transmission delay. I agree this is related to experience on the receiver side, but the only information useful on the sender side is the RTT. The receiver side could improve experience by reducing the receiver-side delays.
* Ozgur: The only knob we can turn may be the margin area, assuming we have two quality levels. A wider margin area could mean you have a higher motion-to-HQ latency. So, if you’re not doing any margin adaptation, I think this metric is not needed. I don’t see any other adaptation. We don’t need this metric for bandwidth adaptation.
* Saba: That’s the proposal.
* Igor: This metric is useful for margin adaptation but I think it is also useful in bandwidth adaptation, related to motion.
* Ozgur: The RTP sender would have to send the whole sphere at all times and would have to make sure it doesn’t exceed available bandwidth. It’s that total bandwidth you mustn’t exceed. How you allocate margins etc. change.
* Igor: The question is how to achieve the lowest motion-to-HQ experience.
* Ozgur: I think it could be useful. As a session-level monitoring, it could be a good metric. Maybe we want to study it more.
* Igor: The motion-to-HQ is the main metric in streaming.
* Ozgur: There they don’t use it for real-time adaptation, just for quality monitoring and reporting after the session. The client makes all the choices.
* Nik: Could we take out “bandwidth” in the proposal to use it for “bandwidth adaptation and monitoring”?
* Igor/Min: OK.

The document was agreed for inclusion in the PD at a position decided jointly by the proponent and the editor.

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| S4-AHM515 | Viewport Control Signalling for Viewport Sharing/Following | Nokia Corporation | 4 |

The document was not treated due to lack of time.

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| --- | --- | --- | --- |
| S4-AHM516 | RTCP traffic in ITT4RT | Nokia Corporation | 4 |

The document was not treated due to lack of time.

## **5. Review of the future work plan**

|  |  |
| --- | --- |
| SA#87 (18-20 Mar 2020, e-meeting) | · Approval of CRs to TS 26.114 and TS 26.223 |
| SA4#108 (6-9 April 2020, Sophia Antipolis, France) | · Updates of time plan as found necessary· Update permanent document to keep track of potential solutions and working assumptions addressing work item objectives· Agree on CRs to TS 26.114 and TS 26.223 addressing the work item objectives· Schedule telcos as needed to ensure consistent progress |
| SA4#109 (25-29 May 2020, TBD) | · Updates of time plan as found necessary· Update permanent document to keep track of potential solutions and working assumptions addressing work item objectives· Agree on CRs to TS 26.114 and TS 26.223 addressing the work item objectives· Schedule telcos as needed to ensure consistent progress |
| SA#88 (17-19 Jun 2020, Malmo, Sweden) | · Approval of CRs to TS 26.114 and TS 26.223 |
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| SA#90 (9-11 Dec 2020, USA) | · Approval of CRs to TS 26.114 and TS 26.223· WI Completion |

## **6. Any Other Business**

## **7. Close of the conference call**

Call was closed at 18:00 CET.

List of Annexes:

1. Annex 1: Meeting Agenda (the final revision)

2. Annex 2: List of documents

3. Annex 3: List of participants

## **Annex 1: Meeting Agenda (the final revision)**

**Source: SA4 MTSI SWG Chairman[1]**

**Title: Proposed agenda for SA4 MTSI SWG 11 Feb 2020 Teleconference #4 on ITT4RT**

**Document for: Approval**

**Agenda Item: 2**

**1. Opening of the conference call**

|  |  |
| --- | --- |
| **Telco#4 (Topic: ITT4RT, Date: 11 Feb 2020, Time 16:00-18:00 CET, Host: Intel)** | * Update permanent document to include use cases, architecture / call flows, requirements, potential solutions, and working assumptions
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**2. Approval of the agenda and registration of documents**

|  |  |  |  |
| --- | --- | --- | --- |
| **S4-AHM511R1** | **Proposed agenda for SA4 MTSI SWG 11 Feb 2020 Teleconference #4 on ITT4RT** | **MTSI SWG Chair****(Nikolai Leung)** | **2** |

**3. Reports and liaisons**

**4. Support of Immersive Teleconferencing and Telepresence for Remote Terminals (ITT4RT)**

|  |  |  |  |
| --- | --- | --- | --- |
| **S4-AHM510** | **Editor’s Proposed Updates to ITT4RT PD** | **Intel** | **4** |
| **S4-AHM512** | **ITT4RT: Proposed Updates to Potential Solution on Overlays** | **Intel** | **4** |
| **S4-AHM513** | **Use of Viewport Margins for Bandwidth Adaptation** | **Nokia Corporation** | **4** |
| **S4-AHM514** | **Enhancing RTCP Feedback with high level metrics** | **Nokia Corporation** | **4** |
| **S4-AHM515** | **Viewport Control Signalling for Viewport Sharing/Following** | **Nokia Corporation** | **4** |
| **S4-AHM516** | **RTCP traffic in ITT4RT** | **Nokia Corporation** | **4** |

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**6. Any Other Business**

**7. Close of the conference call**

Note: The deadline for document submission is **8 Feb 2020 @ 23:59 PM CET.** Please ask the MTSI SWG Chair for Tdoc# assignments.

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Tdoc “colour code”: black = submitted for the meeting

 **blue** = postponed from an earlier SA4 meeting

 **red = covered during this meeting**

 **grey** = late submission

 **~~strikethrough~~** = withdrawn

Conclusion codes: **a = agreed**

 **app = approved**

 **n = noted**

 **u = updated**

 **np = not pursued**

 **pp = postponed**

***Note: These conclusion codes appearing in the agenda are only informative. Please refer always to the main body of the meeting report for precise and complete explanation of decisions for each document.***

Other notations: \* = allocated under more than one agenda item

-> = replaced by, [or] action follows

"Noted": A document is "noted" to indicate that its content was made available to the meeting, but that the document itself was not agreed or endorsed by the meeting. Any agreements or actions resulting from discussion of the document are explicitly indicated in the meeting report.

**[1] Nikolai Leung (nleung@qti.qualcomm.com)**

## Annex 2: List of documents

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc** | **Title** | **Source** | **Agenda Item** | **Conclusion** |
| S4-AHM511R1 | Proposed agenda for SA4 MTSI SWG 11 Feb 2020 Teleconference #4 on ITT4RT | MTSI SWG Chair(Nikolai Leung) | 2 | Agreed |
| S4-AHM510 | Editor’s Proposed Updates to ITT4RT PD | Intel | 4 | Agreed |
| S4-AHM512 | ITT4RT: Proposed Updates to Potential Solution on Overlays | Intel | 4 | Postponed |
| S4-AHM513 | Use of Viewport Margins for Bandwidth Adaptation | Nokia Corporation | 4 | Agreed |
| S4-AHM514 | Enhancing RTCP Feedback with high level metrics | Nokia Corporation | 4 | Agreed |
| S4-AHM515 | Viewport Control Signalling for Viewport Sharing/Following | Nokia Corporation | 4 | Postponed |
| S4-AHM516 | RTCP traffic in ITT4RT | Nokia Corporation | 4 | Postponed |

## **Annex 3: List of participants**

|  |  |
| --- | --- |
| **Name** | **Organization Represented** |
| Ahsan, Saba | Nokia |
| Bouazizi, Imed | Qualcomm |
| Burman, Bo | Ericsson LM |
| Curcio, Igor | Nokia |
| Dillen, Paul | Philips |
|  Gunkel, Simon | KPN N.V. |
|  Hamza, Ahmed |  Interdigital |
|  Han, Jae-Shin |  LG Electronics Inc. |
| Kolan, Prakash | Samsung |
| Leung, Nikolai | Qualcomm Incorporated |
| Oyman, Ozgur | Intel |
|  Szucs, Paul |  Sony Corporation |
|  Varga, Imre |  Qualcomm |
|  Wang, Min |  Qualcomm Incorporated |
|  Zhang, Zhuoyun  |  Tencent |

1. Nikolai Leung [↑](#footnote-ref-0)