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| [itu-logo](http://www.itu.int/) | | **International telecommunication union**  **Telecommunication Standardization Bureau** | |  |
|  | | | Geneva, 1 February 2017 | |
| **Ref:** | **Revision 1 to TSB Circular 3** | | **To:**  - Administrations of Member States of the Union;  - ITU-T Sector Members;  - ITU-T SG12 Associates;  - ITU Academia | |
| **Tel:** | +41 22 730 6828 | |
| **Fax:** | +41 22 730 5853 | |
| **E-mail:** | [tsbsg12@itu.int](mailto:email@itu.int) | | **Copy to:**  - To the Chairman and Vice-Chairmen of Study Groups;  - To the Director of the Telecommunication Development Bureau;  - To the Director of the Radiocommunication Bureau;  - To the Co-Chairs of the Video Quality Expert Group (VQEG) | |
| **Subject:** | **Study Group 12 and VQEG call for participation in AVHD-AS/P.NATS Phase 2: Opinion model for estimating video quality of adaptive streaming type applications** | | | |
| **Action:** | Please announce your **final and binding intention to participate** in the AVHD‑AS/P.NATS Phase 2 development by **17 February 2017** by email to [tsbsg12@itu.int](mailto:tsbsg12@itu.int) | | | |

Dear Sir/Madam,

1 Question 14 of ITU-T Study Group 12 (Performance, quality of service (QoS) and quality of experience (QoE)) aims at accelerating the work on the second phase of P.NATS, an opinion model for estimating video quality of adaptive streaming type video.

2 This work will be carried out as a joint project between ITU-T Q14/12 and the Video Quality Experts Group (VQEG), and will be known as AVHD-AS/P.NATS Phase 2.

3 The call for participation in AVHD-AS/P.NATS Phase 2 is given in Annex 1 to this Circular.

4 I will be grateful if you could announce your final, and binding intention to participate in the AVHD-AS/P.NATS Phase 2 development, not later than **17 February 2017**, by email to [tsbsg12@itu.int](mailto:tsbsg12@itu.int).

5 Any requests for further details or clarification with respect to this call for participation should be sent to Mr Jörgen Gustafsson ([jorgen.gustafsson@ericsson.com](mailto:jorgen.gustafsson@ericsson.com)), Mr Alexander Raake (alexander.raake@tu-ilmenau.de), Mr Shahid Mahmood Satti ([ss@opticom.de](mailto:ss@opticom.de)) and Mr Silvio Borer ([Silvio.Borer@rohde-schwarz.com](mailto:Silvio.Borer@rohde-schwarz.com)).

6 I would like to stress the importance of your participation in this work item as it would help ITU-T Study Group 12 and VQEG in their efforts to progress the work on video quality modelling for adaptive streaming services.

Yours faithfully,

Chaesub Lee  
Director of the Telecommunication  
Standardization Bureau

**Annex**: 1

**ANNEX 1**(to TSB Circular 3 Rev.1)

**Call for participation on AVHD-AS/P.NATS Phase 2  
Opinion model for estimating video quality of adaptive streaming services**

**Abstract**

This Call for Participation is directed to all parties who are interested to contribute to AVHD‑AS/P.NATS Phase 2 models for objective assessment of progressive download and adaptive streaming type video. Those parties are invited to announce their interest in contributing to AVHD‑AS/P.NATS Phase 2 and spending further active development and analysis efforts into the project. Interested parties are expected to announce their final and binding intention to participate by 17 February 2017.

**Background**

The ITU-T P.1203 series of standards which target the parametric and bitstream based modelling of video quality have recently been consented to support progressive download and adaptive streaming types of HD video using H.264 video codec. The next step in Q14/12 model standardization is to broaden the scope of P.1203 for various video codecs and higher resolution, aiming at a more comprehensive model that can meet the requirements of modern day Ultra HD video streaming applications.

The ITU-T J.341/J.342 and J.343 series of standards were developed within VQEG targeting pure pixel‑based and hybrid models to support video quality measurement for HDTV digital cable and IP‑based video services, respectively. At present no standardized pixel-based and hybrid models are available for adaptive streaming applications. In addition, modern day streaming services involve a plethora of video codecs and streaming resolutions (up to and including Ultra-HD) for which these types of models need to be researched.

In an effort to measure video quality in a broad operational scope – ranging from head-end encoding optimization to in-network and client side quality monitoring – this project aims to develop different type of models using a common training/validation dataset to determine the potential of these model types in challenging measurement scenarios.

**AVHD-AS/P.NATS Phase 2 work item**

The AVHD-AS/P.NATS Phase 2 model will be developed using a dedicated training phase with a jointly developed set of training databases followed by cross-validation using a jointly developed set of validation databases.

The AVHD-AS/P.NATS Phase 2 work item is planned to have three tracks. Track 1 is a bitstream-based parametric video-only model, where the provided information is given in the same way as P.1203.1. As such, the first track is planned to result in an extension of P.1203.1 for a broader scope. In tracks 2 and 3, Recommendations are being developed which describe how the output of pure pixel-based and hybrid models can be used to obtain the quality of long (up to five minutes) videos in the context of adaptive streaming.

The building blocks of the AVHD-AS/P.NATS Phase 2 models are shown in Figure 1 below:

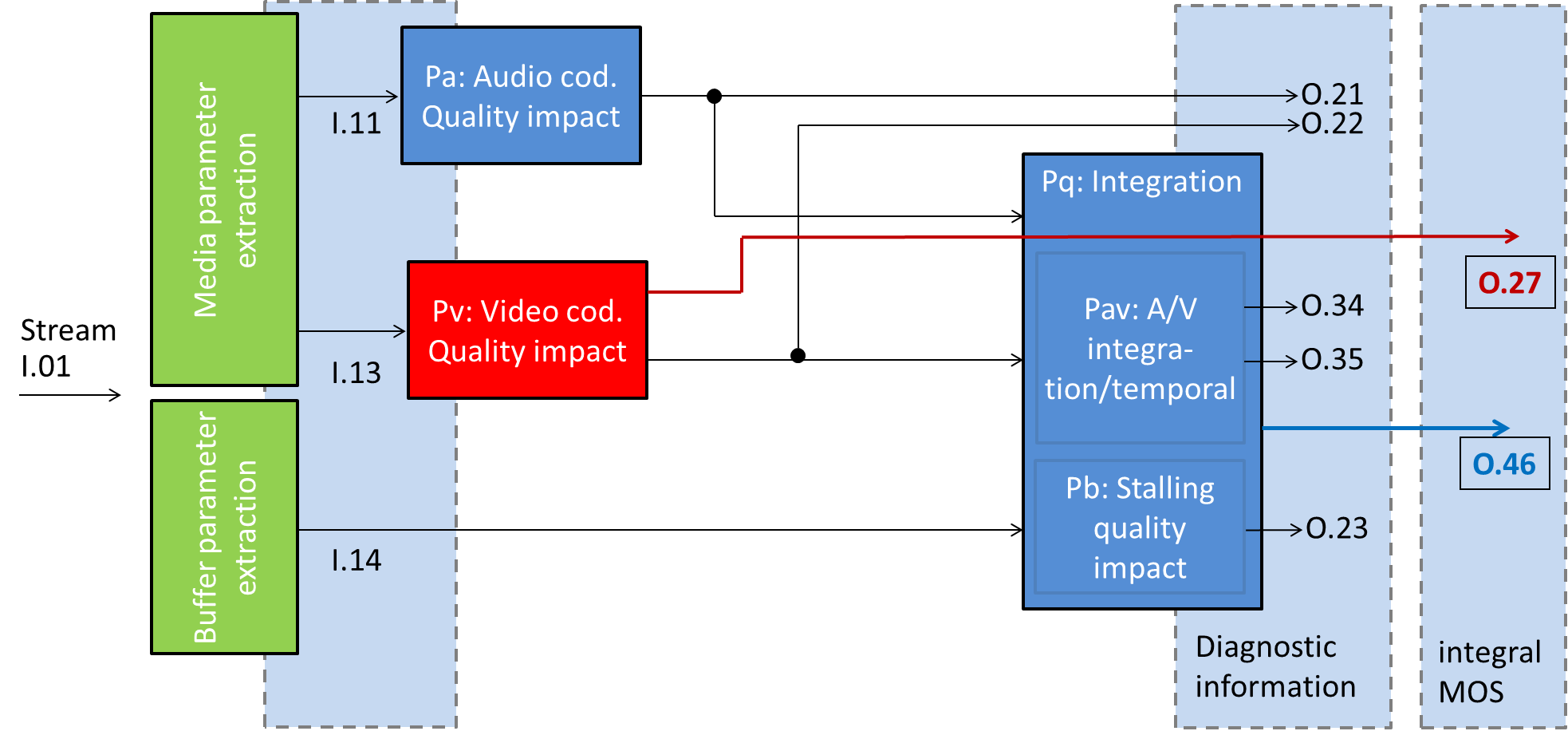
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Figure 1 (a): Building blocks of the bitstream model (track1), only red shaded blocks will be developed, blue blocks are taken from P.1203 for characterization

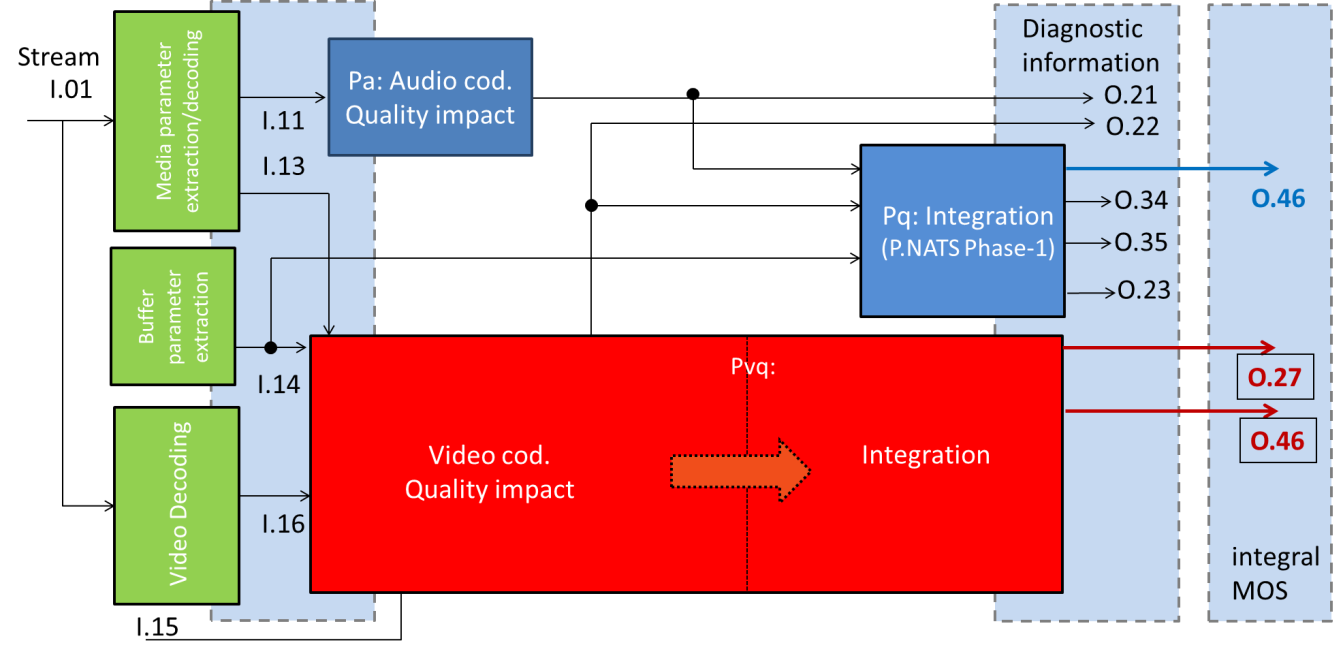


Figure 1 (b): Building blocks of the pixel-based (track2) and hybrid models (track3), only red shaded blocks will be developed, blue blocks are taken from P.1203 for characterization

The individual outputs can be summarized as follows:

* O.27: Final short-term video coding quality score
  + Single score for each short-length video, on 1-5 quality scale
  + Excludes aspects of temporal integration with initial- or re-buffering
* O.46: Final media session quality score
  + Single score for the session, on a 1-5 quality scale
  + Includes initial buffering and stalling and rate adaptivity aspects.
* O.22: Video coding quality per output sampling interval
  + Multiple segment scores provided per session and on a 1-5 quality scale
* O.21: Audio coding quality per output sampling interval
  + Multiple segment scores provided per session and on a 1-5 quality scale
* O.23: Perceptual buffering indication
  + Single score on a 1-5 quality scale for the session
* O.34: Audiovisual segment coding quality per output sampling interval
  + Multiple segment scores provided per session
* O.35: Final long-term audiovisual coding quality score
  + Single score for the session, on a 1-5 quality scale
  + Includes aspects of temporal integration with initial- or re-buffering

It is noted that the output nomenclature can be read as follows: The last number is incrementally specifying the index of the output, the first number specifies the level at which the information is obtained (the higher, the closer to the final media session quality score).

**Requirements on parties**

Interested parties are requested to announce their participation by 17 February 2017, and may then take part in continue creating a set of documents specifying the project layout and modus operandi. Note that many documents are already available and have been agreed by the proponents who provisionally have responded to the call for participation. New parties need to accept the decisions concerning the project already agreed by the parties already participating. The parties which take part in in the coming steps can then contribute to drafting the required documents, and take part in finally creating the new AVHD-AS/P.NATS Phase 2 Recommendation. This work will include producing four databases per proponent.

The announcement of participation in the mentioned project is divided into two steps:

1. Interested parties had to announce their provisional intention to participate in the AVHD‑AS/P.NATS Phase 2 development by **9 January 2017** to [tsbsg12@itu.int](mailto:tsbsg12@itu.int). This deadline has passed and eleven companies have indicated provisionally their participation in this project.
2. A binding commitment to participate in the AVHD-AS/P.NATS Phase 2 development has to be made by **17 February 2017** to the secretariat of ITU-T SG12 ([tsbsg12@itu.int](mailto:tsbsg12@itu.int)), and to the VQEG AVHD Co-Chairs ([cs@opticom.de](mailto:cs@opticom.de); [Quan.Huynh-Thu@cisra.canon.com.au](mailto:Quan.Huynh-Thu@cisra.canon.com.au); [mpinson@ntia.doc.gov](mailto:mpinson@ntia.doc.gov)). Note that parties not responding to the first provisional call are welcome to join the project by answering to this second call. The final commitment is based on a Requirement Specification and Terms of Reference for AVHD-AS/P.NATS Phase 2 that is considered as sufficient by Q14/12 and VQEG/AVHD for starting the development work, and which will be established jointly involving all declared participants according to this call for participation. It is noted that in case of later withdrawal, leaving parties have to grant usage of their already contributed test databases. These aspects will be, as it was done for example for the P.NAMS & P.NBAMS, POLQA and P.NATS development, legally handled outside ITU‑T/VQEG using a respective agreement between the parties.

**Draft overview time plan**

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| --- | --- |
| **Date (Tentative)** | **Result/activity completed** |
| 13 December 2016 | Call for indication of participation sent out  Stable ToR available  Draft requirement specification |
| **9 January 2017** | Deadline for indication of participation |
| End of SG12 January meeting | Updates (if any) for requirement specification and ToR  Draft test specification available |
| **17 February 2017** | Deadline response for binding call for participation |
| May 2017 | All details of test and processing chain set |
| August 2017 | Training databases submitted |
| November 2017 | Model submission |

**Communication**

Participants are encouraged to respond to this call for participation as indicated above. Participants are also encouraged to subscribe to the e-mail reflector of AVHD-AS/P.NATS Phase 2 (pnats2avhd@lists.itu.int), to join the AVHD-AS/P.NATS Phase 2 conference calls announced on the email reflector, and to participate in the in-person project meetings. An ITU TIES or Guest account is required to subscribe. Participants can register for a Guest account at <https://www.itu.int/net/iwm/public/frmUserRegistration.aspx> and sign up for the e-mail reflector at <https://www.itu.int/net4/iwm/?p0=0&p11=ITU&p12=ITU-SEP-ITU-T-SEP-Other%20Groups-SEP-pnats2avhd&p21=ITU&p22=ITU-SEP-ITU-T-SEP-Other%20Groups-SEP-pnats2avhd>.

More information about Study Group 12 can be found at:   
<https://www.itu.int/en/ITU-T/studygroups/2017-2020/12/>.

More information about VQEG can be found at <http://www.its.bldrdoc.gov/vqeg/>.

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