

ITU-T P.NATS

Parametric **N**on-intrusive **A**ssessment of **T**CP-based multimedia **S**treaming quality

Development conducted in ITU-T SG 12 / Q.14

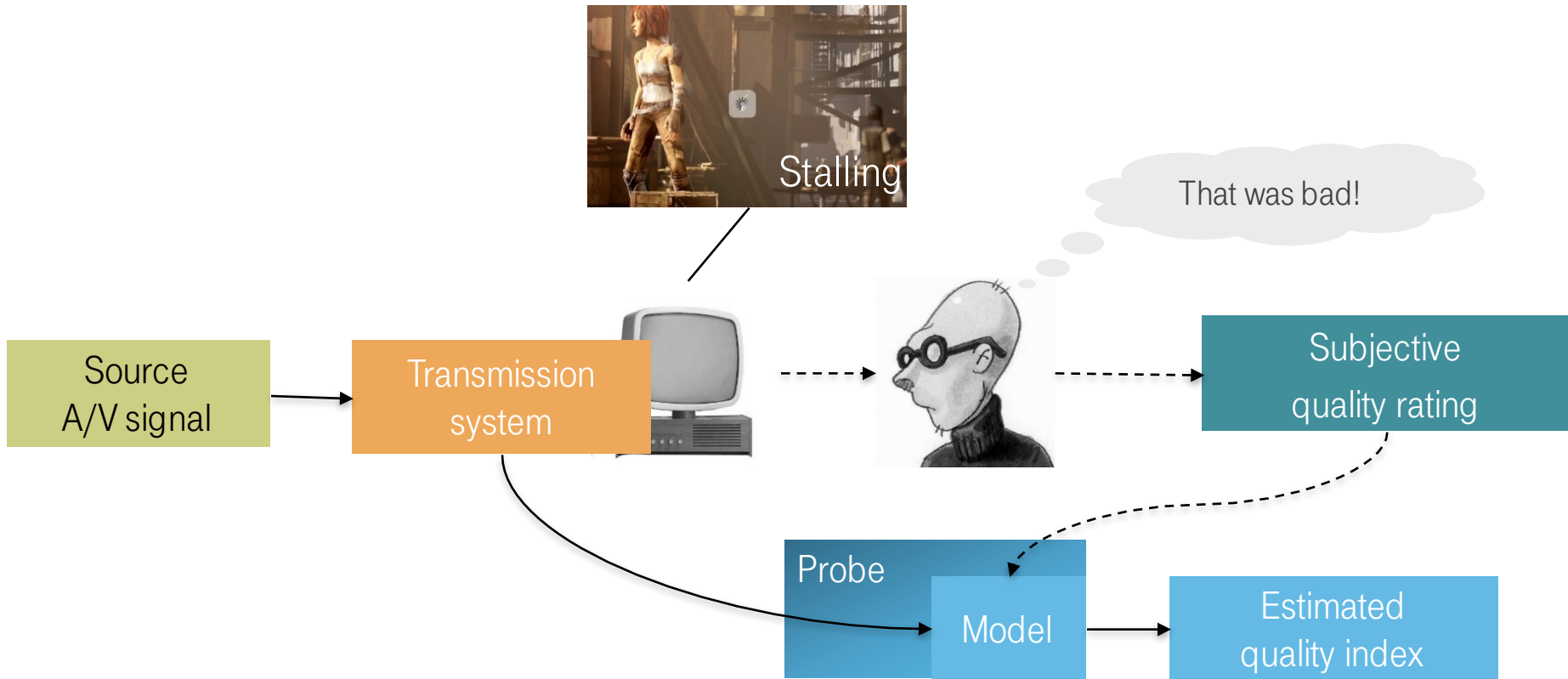
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Quality Models



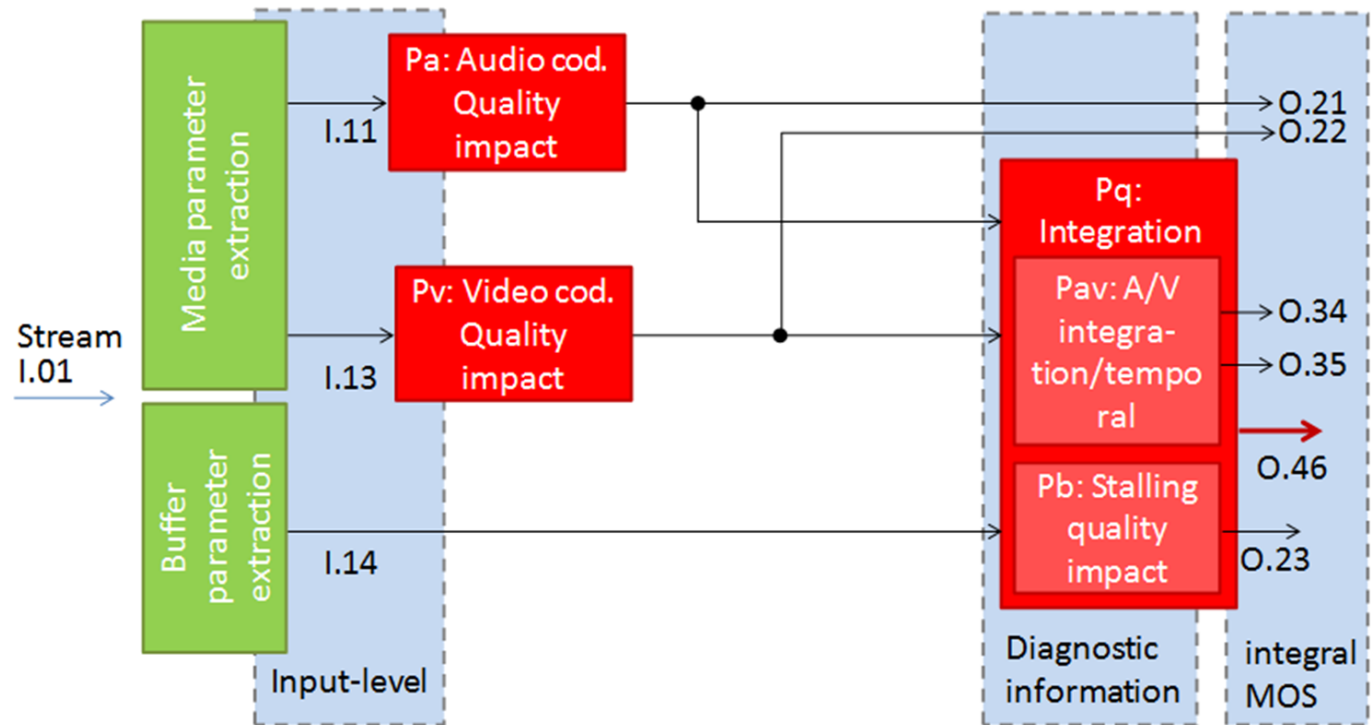
ITU-T Standards related to P.NATS

	UDP		TCP	
\Scenario Timing	Network planning	Service monitoring	Network planning	Service monitoring
Existing / upcoming	G.1071 H.264 ≤ HD audio-visual	P.1201.x same as G.1071		P.NATS (adaptive streaming) same as G.1071 fixed, mobile
			G.1071-PD (non-adaptive streaming)	P.1201.x-PD (non-adaptive streaming)
Phase 1	G.OM_HEVC Extension of G.1071 to H.265	P.1201.x_HEVC Extension of P.1201 to H.265	G.OM_HEVC inserted into P.NATS	G.OM_HEVC inserted into P.NATS
	<i>Collaborative approach</i>		<i>Re-use of G.OM_HEVC databases</i>	
Phase 2	4K (Ultra-HD)			

P.NATS Phase 1 Overview

- Services: **HTTP Adaptive Streaming**
- Video-encoding-resolutions: **360p, 480p, 720p, 1080p**
- Covered degradations:
 - Encoding changes (bitrate/QP, framerate, scaling) due to stream-switching
 - Stalling
 - Initial loading
- Input: model mode-dependent, from side-info to full bitstream
- Output: audiovisual quality estimate for up to **5 min** video + diagnostic information
- 8 participants

P.NATS Ph1. Building Blocks

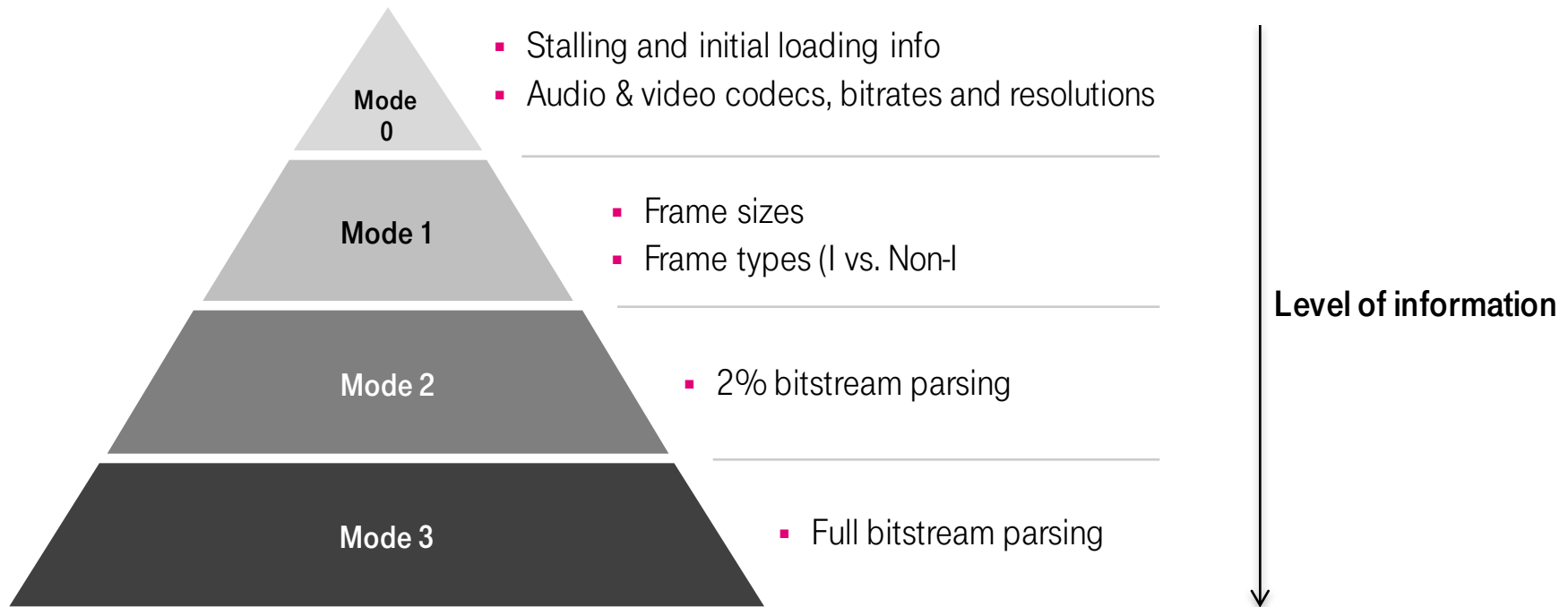


ITU-T T13-SG12-150505-TD-GEN-0671!R1!MSW-E-P.NATS Terms of Reference (ToR).

- **Output: audio visual quality per session (≤ 5 min) \rightarrow 0.46**
- **Diagnostic information**
 - Audio, video, and audiovisual coding quality, per **second/segment/session** (0.21/22/34/35)
 - Stalling quality per session (0.23)
 - Model inputs (I.11/13/14)





P.NATS Modes

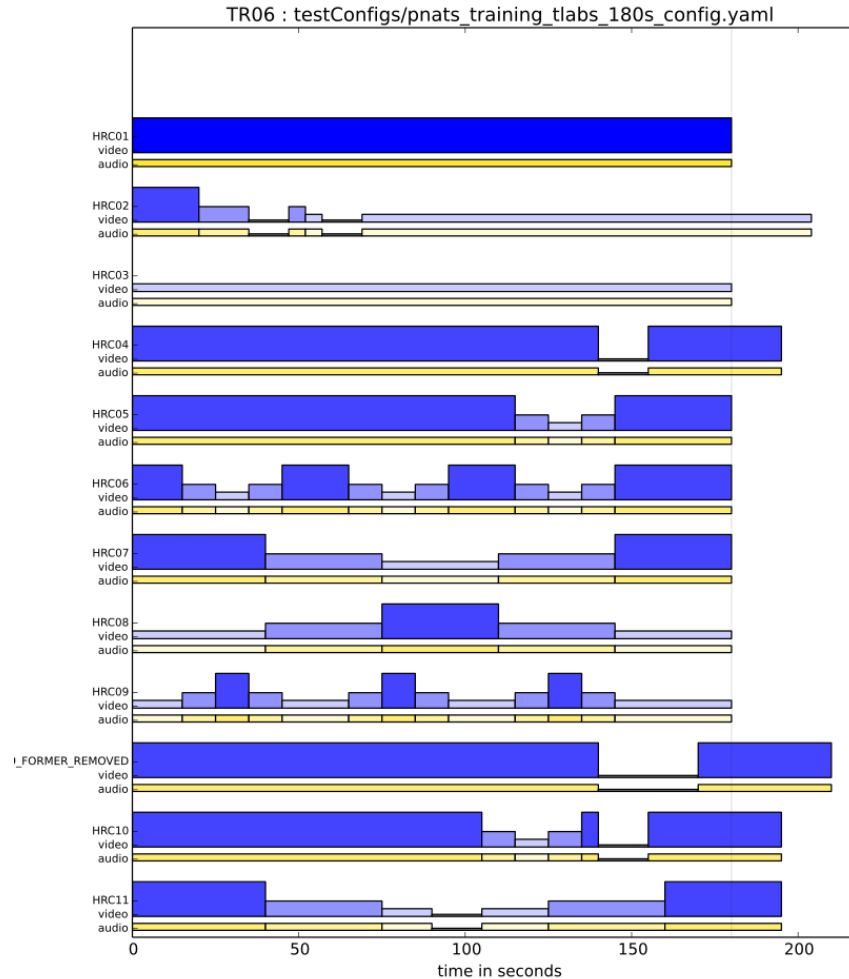
Inputs of audio and video coding modules



P.NATS Ph.1 Sources, test design, and rating example

P.NATS framework

ID - Name	Picture (not always 1 st frame)
SRC01 - Sintel	 © Blender Open Movie Project
SRC02 - TearsOf Steel	 © Blender Open Movie Project
SRC03 - Flamen co	 © ITS NTIA
SRC04 - TheFoot sVideo	 © ITS NTIA



Perceived audiovisual quality?

- 5 - Ausgezeichnet
- 4 - Gut
- 3 - Ordentlich
- 2 - Dürftig
- 1 - Schlecht

P.NATS Ph.1 Subjective Tests

Test method

- Audiovisual
- ACR, 5-point scale
- No SRC repetition within a test, but 50% - 67% SRCs re-used between labs
- Use of anchors, at least for tests with same SRCs duration
- Degradation types: quality switches, stalling, initial loading, mix
- Same proportion of degradation types in all tests

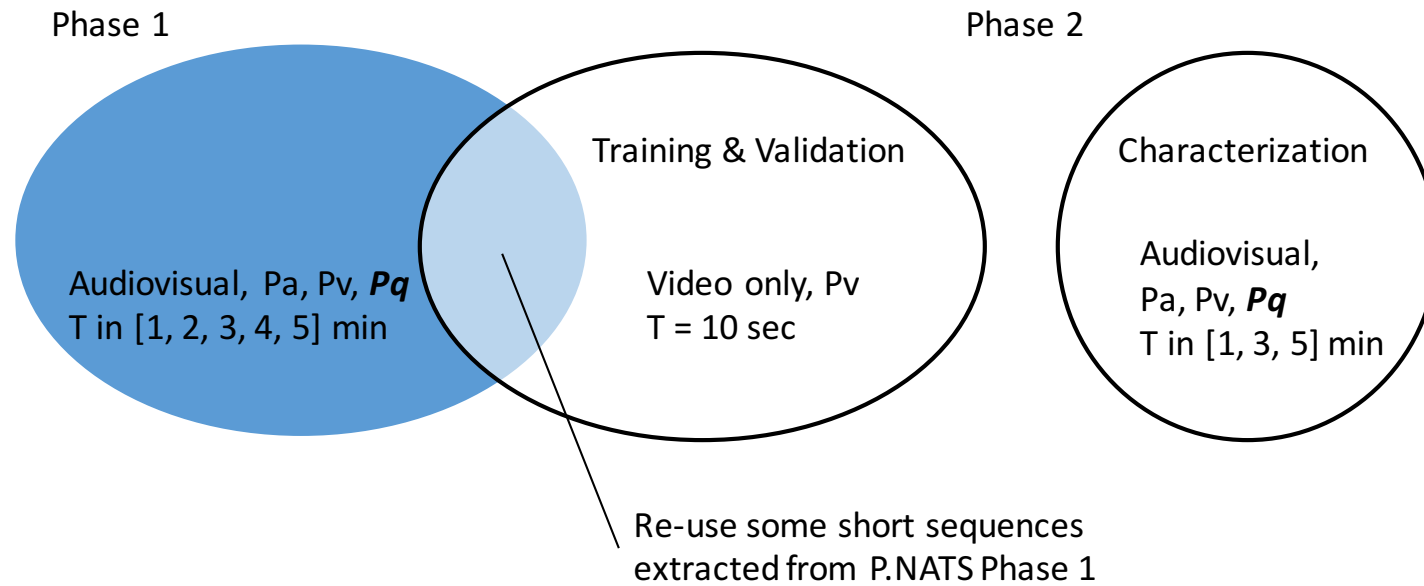
Training

- 5 existing databases from P.1201-PD (progressive download)
- 2 buy-in databases (progressive download and adaptive streaming)
- 16 new training databases
 - 9 LCD: 4x1min-SRCs, 3x3min-SRCs, 2x5min-SRCs
 - 8 mobile: 4x1min-SRCs, 3x3min-SRCs, 1x5min-SRCs

Validation

- 16 validation databases

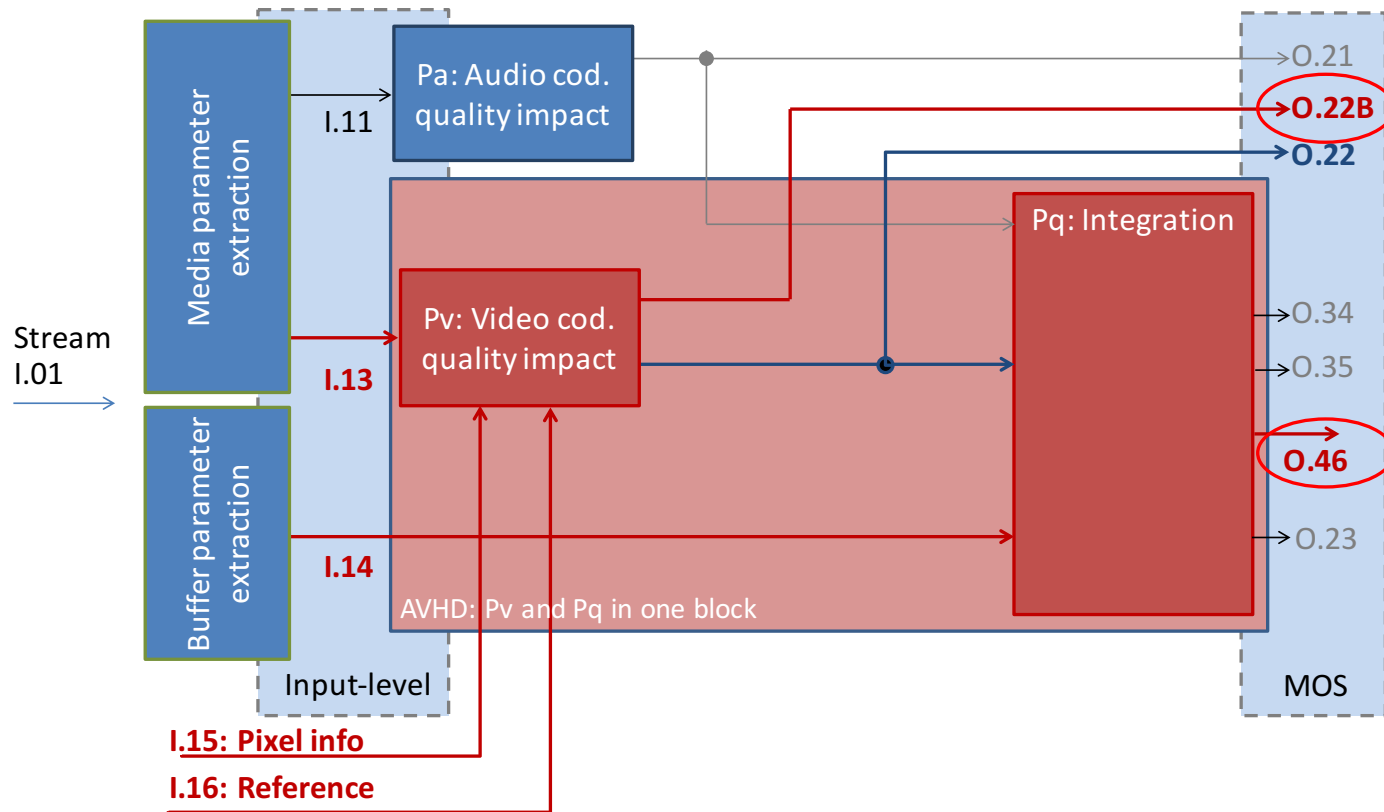
- Training databases submitted and checked: 30 Sept. 2015 (done)
- Model submission: 20 Nov. 2015 (done)
- Validation databases submitted and checked: 20 May 2016
(on-going, subjective tests have started)
- ITU-T SG12 meeting: 7 – 16 June 2016
- Winning model selection: Summer 2016
- Consent P.NATS Phase 1:
Oct. 2016 (tbd. at June 2016 SG12 meeting)



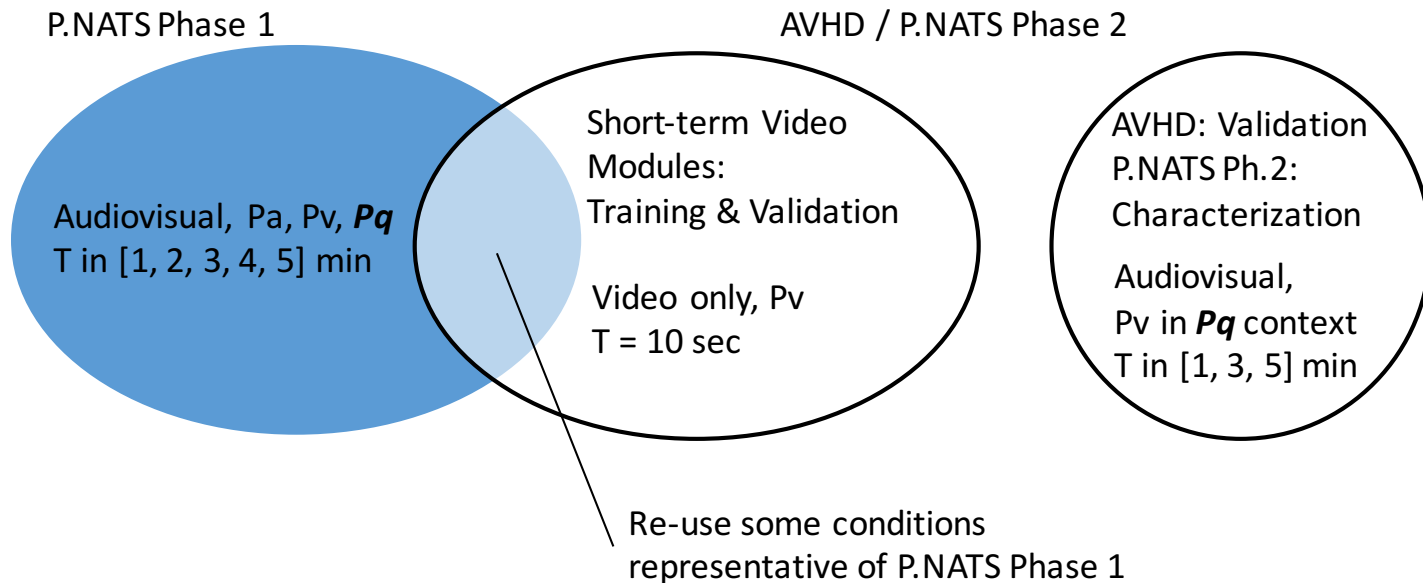
P.NATS Phase 2: Joint project VQEG AVHD?

- Current plan: Collaboration with VQEG AVHD
 - Ongoing discussions about character of joint project work
- Multitude of models considered in one project for first time!
 - Signal-based: FR, RR, NR
 - Bitstream-based: Modes 0, 1, 2, 3
 - Hybrid
- Technology
 - UHD-1, HD
 - HFR
 - Video codecs: H.264, HEVC, VP9

P.NATS Phase 2: Joint project VQEG AVHD?



P.NATS Phase 2: Joint project VQEG AVHD?



→ P.NATS Ph. 2 / VQEG AVHD: To be followed!

Thank You!