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T1A1.5/97-111 R2

Title: Proposal on Video Classes of Operation
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Re: Skeleton of draft new recommendation J.OVQ (ITU-T SG9)

The ITU-T SG 9 and SG 12 Joint Rapporteur's Group on subjective and objective methods for the assessment of audio-visual quality (including television and multimedia applications) is currently preparing a plan to evaluate objective measures of video quality. Members of T1A1.5 have had useful consultations with IEEE Sub-Committee G-2.1.6 of the Broadcast Technology Society on support for these new studies. Working Group T1A1.5 focused its discussion on Multimedia Communication applications, and more recently on Television Classifications. T1A1.5 discussed alternative attributes (other than channel bit rate) that help define the operational conditions typical of, and comprising the conditions under which candidate measurements would be evaluated. The experts in T1A1.5 therefore suggest the following tables giving the results of their discussion, as part of continuing contribution to the ITU-T work-in-progress.

Table 1 Definitions of Classes

TV 0	Loss-less:
TV 1	Contribution: Used for complete post production, many edits and processing layers, intra-plant transmission. Also used for remote site to plant transmission.
TV 2	Primary Distribution: Used for simple modifications, few edits, character/logo overlays, inter-facility transmission. An example would be network to affiliate transmission.
TV 3	Secondary Distribution: Used for delivery to home/consumer (no changes).
MM 4	All frames encoded. Low Artifacts. Usually $\geq$ 30 fps.
MM 5	Frames May be Dropped at Encoder. Perceptual artifacts possible, but useful for designed tasks.
MM 6	Series of Stills. Not Intended to provide full motion. (Examples: Surveillance, Graphics)

Table 2 Attributes of Classes

Class of Operation	Spatial Format	Coding Algorithm[1]	Delivered Frame Rate	Typ.Latency Delay Vari.	Channel Impairment[2]	Nominal Bit Rate, Mbit/s
TV 0	Rec. 601	Loss-less	Max FR	Delay=const var≈0	Infrequent Distortion[3]	270 or 360
TV 1	Rec. 601	MPEG-2	Max FR	Delay=const var≈0	Infrequent Distortion[3]	25 to 50
TV 2	Rec. 601	MPEG-2 (DV)	Max FR	Delay=const var≈0	Infrequent Distortion[3]	10 to 25
TV 3	Rec. 601	MPEG-2	Max FR Infrequent (occasional) frame repitition	Delay=const var≈0	Infrequent Distortion[3]	1.5 to 10
MM 4	Rec. 601	H.262 (MPEG-2)	(15-) 30 fps	Delay=const var≈0	with/without	1.5
MM 4	CIF	H.263	~30 fps	Delay=const var≈0	with/without	0.768
MM 5	CIF		10-30 fps	Del ≈400ms var ≥ 100ms	with/without	
MM 5	QCIF		1-15 fps	Del ≈ var ≥ 200ms	with/without	
MM 5	Sub-QCIF	H.263	>0 fps <30 fps	Del ≈ var ≥	with/without	
MM 6	16CIF	H.263		> 1 sec	with/without	

Note 1: Proprietary coding algorithms are also possible. If used, they shall provide performance at least as good as the specified standard algorithm.

Note 2: Channel impairments will be expressed in terms of the packet/cell loss ratio, the errored packet/cell ratio, or an appropriate bit error specification.

Note 3: "Infrequent Distortion" in the TV classes indicates that if transmission impairment is present, it will cause infrequent video distortion. Although this is somewhat subjective, this clearly excludes cases of continuous (or near-continuous) video distortion.