Status of H.263++ (H.263 version 3) in ITU-T Q.15/SG16

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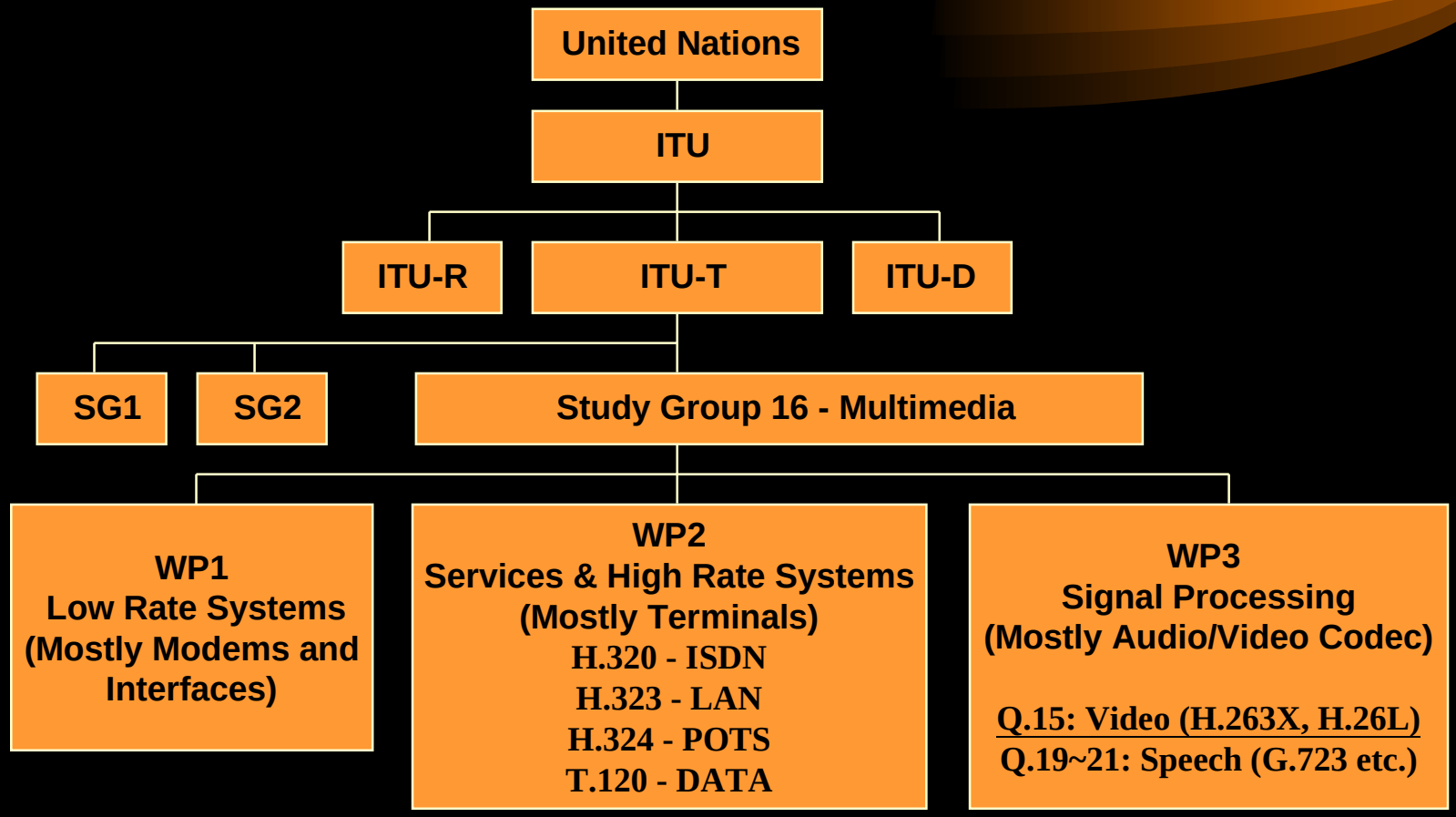
Overview of ITU-T Q.15/SG16: Organisation



Overview of ITU-T Q.15/SG16: H.263 Development

- **H.263 Version 1:** First version of Recommendation H.263 was Decided at a meeting in November '95.
- **H.263 Version 2:** Second version of H.263, called H.263v2 and sometimes H.263+ Determined in March 97, Decided January 98. H.263+ is a superset of H.263, adding to but not changing the original design. It offers substantial efficiency improvements over H.263.
- **H.263 Version 3:** Current work item is the third version of H.263. Called H.263++ or H.263v3. Intended to be a completely compatible superset of H.263v2. H.263++ focussing on several "Key Technical Areas" , two of which were adopted as in H.263++.
  - Error Resilient Data Partitioning Slice Mode
  - Enhanced Reference Picture Selection Mode

H.263-Family: H.263 Version 1

- Includes some advanced options such as Annex D, E, F, and G to achieve coding efficiency
- H.263 version 1 has the following annexes:

Annex	Features
Annex A	Inverse transform accuracy specification
Annex B	Hypothetical reference decoder
Annex C	Consideration for multipoint
Annex D	Unrestricted motion vector mode
Annex E	Syntax-based arithmetic coding mode
Annex F	Advanced prediction mode
Annex G	PB-frame mode
Annex H	Forward error correction for coded video signal

H.263-Family: H.263 Version 2

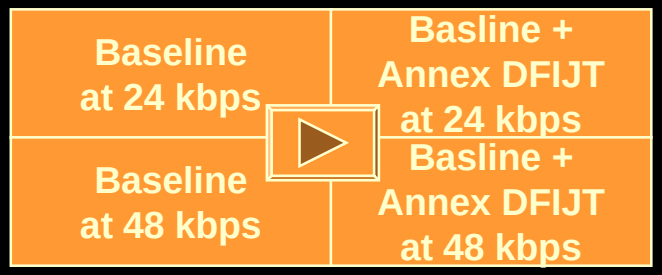
- Includes some more advanced options to achieve coding efficiency, scalability and specialised functions
- H.263 version 2 has the following annexes:

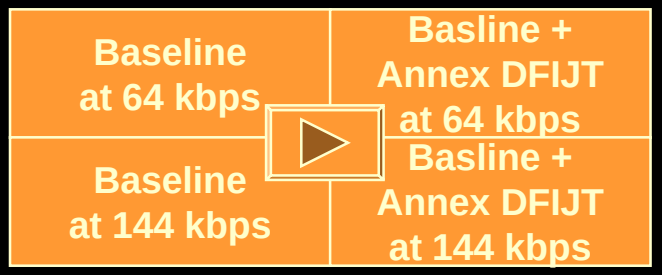
Annex	Features
Annex I	Advanced INTRA coding mode
Annex J	Deblocking filtering mode
Annex K	Slice structure mode
Annex L	Supplemental enhancement information specification
Annex M	Reference picture selection mode
Annex N	Improved PB-frame mode
Annex O	Temporal, SNR, and spatial scalability mode
Annex P	Reference Picture Resampling
Annex Q	Reduced-Resolution Update mode
Annex R	Independent Segment Decoding mode
Annex S	Alternative INTER VLC mode
Annex R	Modified Quantization mode

H.263-Family: Baseline H.263 vs. H.263 Version 2

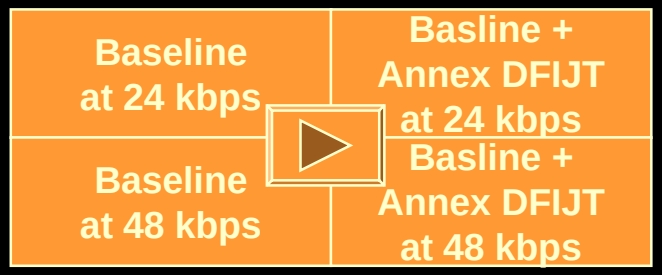
- Video demo on H.263 baseline vs. H.263 with Annex DFIJT w.r.t. four different bitrate

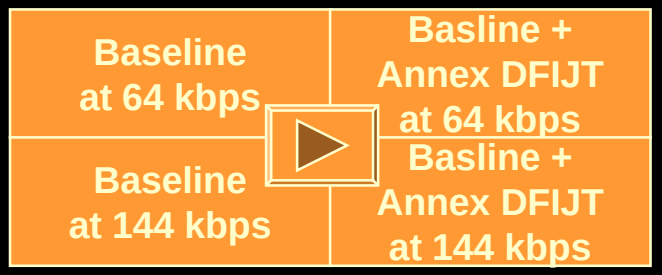
- Demo1: for slowly moving object





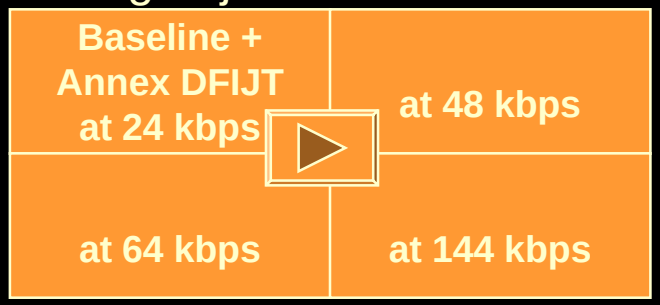
- Demo 2: for highly moving object



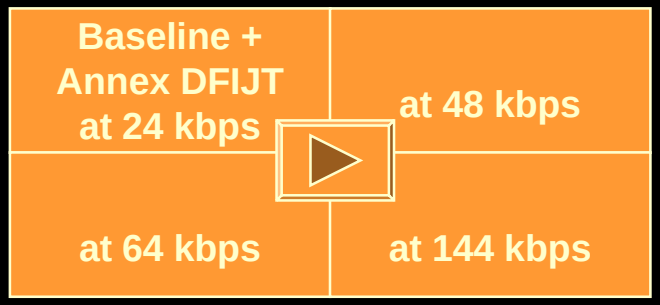


H.263-Family: H.263 Version 2

- Video demo on H.263 with Annex DFIJT w.r.t. four different bitrate
- Demo1: for slowly moving object



- Demo 2: for highly moving object



H.263-Family: H.263 Version 3

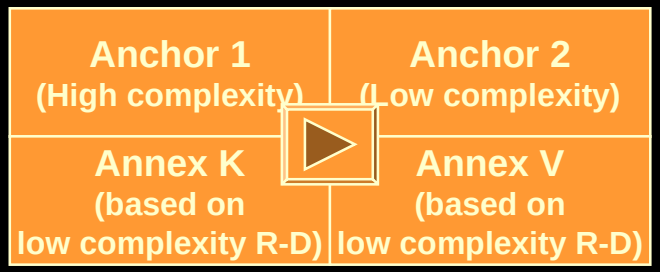
- Two new annexes were adopted by the Q.15/SG group in Feb. 1999

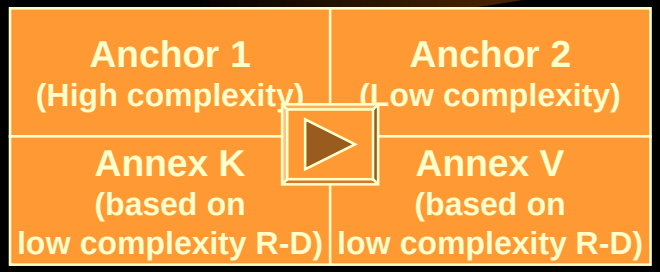
Annex	Features
Annex U	Enhanced reference picture selection mode
Annex V	Data partitioning slice mode
More ?	

- The above-mentioned annexes are scheduled to be ‘Determined’ in Feb. 2000 (refer to workplan of H.263++ project)

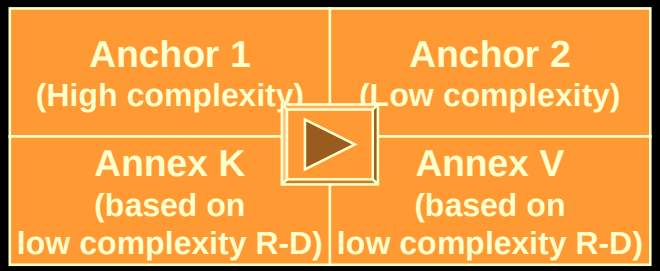
H.263-Family: Video Demo on Error Resilience

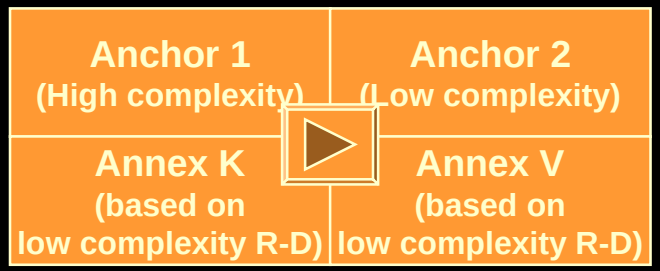
- Against DECT channel (10dB, 1.4km) - 24 kbps, 10 fps





- Against W-CDMA channel (BER: $O(10^{-4})$, 15 bit burst length) - 48 kbps, 10 fps





H.263-Family: Workplan of H.263++

Meeting	Approx Date	Type	Milestone
SG16-1	17 March ‘97	Study Group	
Q15-A	24 Jun ‘97	Experts	
Q15-B	8 Sep ‘97	Experts	Adoption of Workplan
Q15-C	2 Dec ‘97	Experts	Start of Significant Effort
SG16-2	26 Jan ‘98	Study Group	
Q15-D	21 Apr ‘98	Experts	
Q15-E	21 Jul ‘98	Experts	
SG16-3	14 Sep ‘98	Study Group	
Q15-F	3 Nov ‘98	Experts	
Q15-G	**16 Feb ‘99**	**Experts**	**First Formal Draft Adoptions**
SG16-4	May ‘99	Study Group	
Q15-H	Aug ‘99	Experts	Last Formal Draft Adoptions
Q15-I	Nov ‘99	Experts	Final Draft for Determination
SG16-5	Feb ‘00	Study Group	Determination
Q15-J	Apr ‘00	Experts	Bug-checking
Q15-K	Jul ‘00	Experts	Final Draft for Decision
SG16-6	Nov ‘00	Study Group	Decision

H.26L

- What it is - New video coding scheme to provide better functionalities (delivering improved quality video) that cannot be supported by existing standard
- Compatibility with existing standards has not been considered.
- Requirements - articulated in terms of bitrate, picture quality, delay, error resilience, connectivity
- Anchor - best available version of H.263++

H.26L: Workplan

Meeting	Approx Date	Type	Milestone
SG16-1	17 March '97	Study Group	
Q15-A	24 Jun '97	Experts	
Q15-B	8 Sep '97	Experts	
Q15-C	2 Dec '97	Experts	Modified Workplan Adopted
SG16-2	26 Jan '98	SG16	Issue Call for Proposals
Q15-D	21 Apr '98	Experts	
Q15-E	21 Jul '98	Experts	
SG16-3	14 Sep '98	Study Group	
Q15-F	3 Nov '98	Experts	First Formal Evaluations
Q15-G	**16 Feb '99**	**Experts**	
SG16-4	May '99	Study Group	
Q15-H	Aug '99	Experts	First Draft Text and Test Model
Q15-I	Nov '99	Experts	
SG16-5	Feb '00	Study Group	
Q15-J	Apr '00	Experts	
Q15-K	Jul '00	Experts	Final Major Feature Adoptions
SG16-6	Nov '00	Study Group	
Q15-L	Apr '01	Experts	
Q15-M	Jul '01	Experts	
SG16-7	Aug '01	Study Group	Determination
Q15-N	Oct '01	Experts	Bug-Checking
Q15-O	Jan '02	Experts	White Document Generation
SG16-8	May '02	Study Group	Decision

Concluding Remarks

- Current status of Q.15/SG16 has been presented
- Particular relevance to 3GPP effort is error-resilient data partitioning slice mode (Annex V) in H.263 version 3. This annex offers substantial gain over error-prone mobile environments.
- Although the performance of Annex U has not been seen here, it also provides improved coding efficiency and error resilience.
- H.263 version 3 is suited to use in wireless multimedia applications of 3GPP.