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Title: Support of H.263+ on H.320 (Proposal)

1 Introduction

This contribution proposes modifications to the H.320 suite of standards in support of recent enhancements to the video coding Recommendation, H.263.

H.320 was first issued in 1989. At that time, it specified H.261 as its only video coding algorithm. In 1997, H.320 was revised to include, among other things, two additional video algorithms; H.262 (MPEG-2 Video) and H.263, which was originally developed for the GSTN terminal, H.324. In March of 1997, the ITU-T Study Group 16 determined a revision of H.263 that included a number of annexes defining new optional modes of operation. (These new options are known colloquially as H.263+. For convenience, that terminology will be used here.) This document proposes extensions to the current video capabilities signaling such that H.320 terminals will be able to take advantage of the improved H.263. H.263+ is scheduled for decision at the January 1998 meeting of SG16.

This proposal is a modification of an earlier one (Q11-A-31) submitted at the June 1997 meeting of Q11 and Q15. At the June meeting a decision was made to adopt some new functionalities of H.263+ into H.320. However, the precise method of signaling was deferred until H.245 has been updated to include H.263+ capabilities and the H.263+ preferred mode combinations developed. Both of these tasks were accomplished at the September 1997 meeting of Q.11 and Q.15. This proposal has been modified from the original to reflect these changes.

There are three goals in our design to support H.263+ in H.320 equipments. They are:

1. To provide a useful set of enhancements for H.320 equipments while maintaining complete backward compatibility with existing implementations.
2. To allow maximal quality in interoperability with other equipment types using H.245 system structure.
3. To minimize changes to existing H.320 suite of recommendations in light of the new H.324/I (H.324 Annex D) recommendation.

The rest of the document is organized as follows: first we will discuss how the new H.263+ algorithm will fit into the Enhanced Video Algorithm Hierarchy of H.320. This hierarchy defines the implementation requirements to maintain maximal quality in interoperability. Then the capset structure will be described with the complete Multiple Byte Extension (MBE) syntax described in Appendix A. Finally the set of new commands and mode indications to manipulate the operations of H.263+ bitstream transfer will be presented.

2 Enhanced Video Algorithm Hierarchy

The Enhanced Video Algorithm Hierarchy defined in H.320 Annex A is used to provide a guaranteed level of interoperability among all enhanced H.320 video codecs. The Hierarchy is resolution-based and a codec implementing a higher level algorithm is required to support all lower level algorithms at the equivalent resolution (and any smaller resolutions.) The current rank of algorithms is H.261, H.263, H.262SPML and H.262MPML being the highest. To maintain backward compatibility, H.262SPML and H.262 MPML will not depend on the support of H.263+.

Since H.263+ introduces Custom Picture Format, which can be used to represent almost continuous ranges of resolutions, the concept of equivalent resolution needs to be extended. The equivalent resolution in H.263 to a Custom Picture Format in H.263+ is the largest standard resolution, which is just smaller than the upper bound of the resolution range specified in the Custom Picture Format. For example, if the custom picture format range is [176-528] X [144-432], the equivalent resolution in H.263 is CIF (352 X 288). If a H.263+ codec supports a standard resolution with a custom pixel aspect ratio (PAR), the equivalent resolution in H.263 is that standard resolution with standard PAR. For Custom Picture Format, which is smaller than QCIF, the equivalent resolution is still QCIF. The new Hierarchy with H.263+ is shown below in Figure 1.

The hierarchy also enforces the higher level codec to run at a better MPI capability for lower level algorithms. To compare the MPIs (Minimum Picture Interval) between standard picture clock frequency (29.97Hz) and Custom Picture Clock Frequency introduced in H.263+, the MPI needs to be measured in

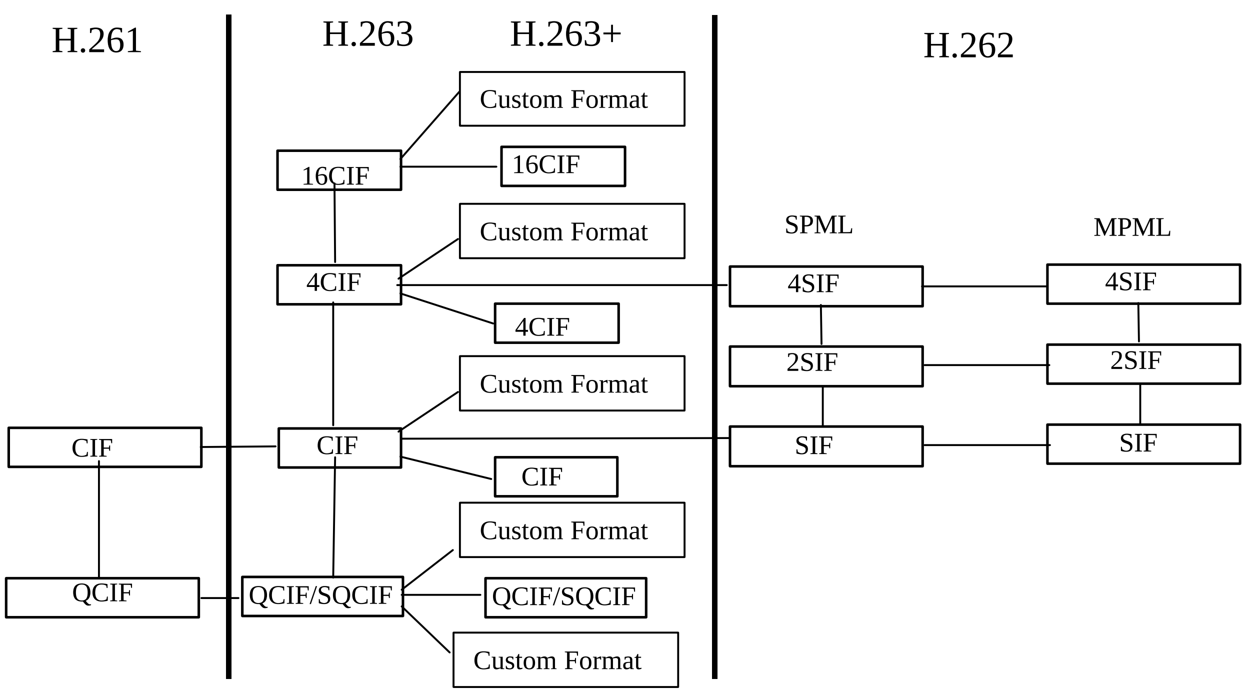

Figure 1: The enhanced video algorithm hierarchy

seconds. For example, if a H.263+ codec has MPI 2 under a 18Hz PCF (0.1111sec), then a H.263 codec will need to have MPI at most 3 (0.1000sec) in order to claim a better MPI capability.

The following two rules state the hierarchical requirements of a H.263+ codec:

1. A H.263+ codec must be able to support H.263 at the equivalent resolution with an equal or better MPI capability.
2. A H.263+ codec must be able to support all the options that have been declared in the H.263 capset for the equivalent resolution in conjunction with all declared H.263+ capabilities.

H.263+ also supports scalability. The above hierarchical requirements only apply to the base layer of a scalable codec. Also, there is no requirement of a scalable codec to perform non-scalable coding beyond the base layer.

3 Enhanced Video Algorithm Capability Sets

3.1 Ordering of Enhanced Video Algorithm Capsets

The capability exchange of H.263+ will be embedded in the same MBE message used for the current H.262/H.263. All the specifications of H.263+ capabilities will come after those of H.263 and H.262, starting with the extension code 01111111. All the H.263+ capabilities should be used only to enhance defined H.263 capabilities. The capability exchange message in H.242 currently allows for specification of multiple formats for H.263. The current capset message structure is as follows:

H.263 Format n_1 capset | H.263 Format n_2 capset | ….|**H.262 cap set(s)**|

The following conventions are currently used:
1. Format n_i is larger than format n_{i+1}.
2. Format n_{i+1} can either inherit all the specifications of format n_i or it may override them and specify its own options.

We will use the same structure for the specification of H.263+ capset. The H.263+ capset will consist of H.263+ capabilities for each of the formats specified for H.263 in the same order. Capsets of all smaller formats can be skipped if their H.263+ capabilities are the same as that of the last declared larger format. However, if some smaller formats have particular H.263+ capabilities to support, their H.263+ capsets cannot be skipped. Hence our design of the signaling includes the option of specifying “no H.263+ capabilities”. Also capset for each custom picture formats is inserted between its respective equivalent resolution and the next larger standard resolution. For example, if the formats supported are the standard formats CIF, 4CIF and the custom source format [176-528] X [144-432], then the following illustrates how the capsets are ordered.

H.263 @ 4CIF capset | H.263 @ CIF capset | H.262 cap set(s)| extension code|H.263+ @ 4CIF capset | H.263+ @ [176-528] X [144-432] capset | H.263+ @ CIF capset.|

3.2 Structure of H.263+ Capset

3.2.1 Tree structure layout

H.263+ introduces twelve new annexes and other features such as custom picture format and picture clock frequency. Some of these features need multiple bits to fully specify them. On the other hand, H.221 only allocates 50 Bytes per second for capability exchange. Obviously, defining all the H.263+ capabilities sequentially will certainly cause too much delay in many situations. Our approach is to use the tree structure shown in Figure 2. The complete specification of the H.263+ capset can be found in Appendix A.

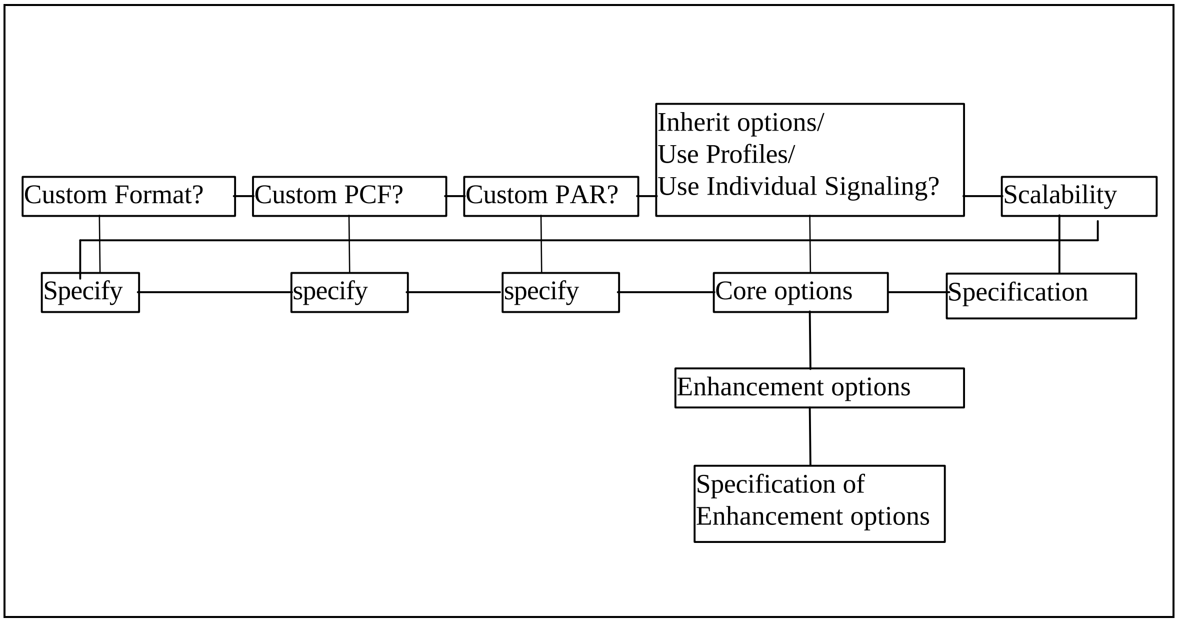

Figure 2. Tree Structure for specification of H.263+ Capset

The leading first byte indicates if custom format, custom picture clock frequency or custom pixel aspect ratio is present. It also indicates if options will be inherited, signaled individually or if levels of preferred modes will be used. Note that the largest format cannot choose to inherit H.263+ options since there are none defined in the capset at that point. For levels of preferred modes, we recommend the levels defined in H.263+ Appendix III. In the current structure there is room to add one more level. Further more an extension code is provided to add more levels at a later date while retaining backward compatibility. Finally, the last bit in the leading first byte indicates support of scalable coding and enhancement layers.

Note that a standard format with either a recommended level or an inheritance of H.263+ options will need only the first byte for description of its H.263+ capabilities. However, if either a custom format feature or individual signaling of options is indicated in the first byte, these are further specified as shown in Appendix A.

3.2.2 Signaling of options

The real challenge in adding H.263+ is a methodology for the support of various H.263+ options. H.263+ has introduced twelve new annexes or options. Some of these options have different flavors. A few others require parameter specification. For development of the signaling scheme for H.320, we used the H.245 document as a guideline. Our method consisted of mapping the video capabilities from H.245 to H.242. However some simplifications were made primarily due to the limited bandwidth of the BAS channel in H.242.

For specifications of the options, we used two categories **-** “core options” and “enhancement options”. The core options need only binary specification, reflect choices which are more appropriate for ISDN environment and are a subset of those included in H.263+ levels. They are:

Core options:

1. DynamicPictureResizingbyFour

2. AdvancedIntraCodingMode
3. DeblockingFilterMode
4. ImprovedPBFramesMode
5. AlternativInteVLCMode
6. ModifiedQuantizationMode

A single bit in the core options byte signals if "enhanced" options are supported. If so, then the next two bytes specify which of the enhanced options are supported. The following are the enhancement options.

Enhancement Options:

1. RefPictureSelection
2. SliceStructuredMode
3. IndependentSegmentDecoding
4. ReducedResolutionUpdate
5. Transparency
6. Unlimited Motion Vectors
7. PartialPictureFreeze
8. DynamicWarpingHalfPel or DynamicWarpingSixteenthPel
9. ResizingPartialPicFreezeAndRelease
10. FullPictureSnapshot
11. PartialPictureSnapshot
12. VideoSegmentTagging
13. ProgressiveRefinement
14. DynamicPictureResizingSixteenthPel

Among the enhancement options, the following require further specification:

1. Reference picture selection mode
2. Slice structured mode

If any of these are turned on, they are further specified.

3.2.3 Scalability capset

If the first byte indicates the presence of scalability capability, the supported scalability layers are specified at the end of the capabilities message. Since H.320 lacks the flexible logical channel structure as described in H.245, specifying the structure of the layered video poses a unique challenge to H.320 terminals. To simplify the problem, the proposed scheme only allows hierarchical scalability in which decoding any layer will require decoding of all the lower SNR and spatial scalable layers. This eliminates the need to specify the dependency between different layers. The maximum number of enhancement layers is restricted to 14. It also seems reasonable to enforce all the layers to use the same capset consistent with their own kind of scalabilities. Hence no further options are specified for each enhancement layer. Four types of scalable layers are supported:

1. Spatial Scalable Layer (x2) of one dimension (vertical only)
2. Spatial Scalable Layer (x2) of two dimension
3. SNR Scalable Layer
4. Temporal Scalable Layer with one B picture.

Note that the MPI and source format defined in the same capset is for the base layer only. The MPI and source format for each enhancement layer can be deduced based on its scalable type respectively. In addition, the maximum bandwidth for each layer (including the base layer) must be specified.

3.2.4 Some Simplifications

Those familiar with H.245 will notice that several simplifications have been made in this proposal. The major ones are:

1. We are not using the coupled/uncoupled mode feature of H.245. This is to limit the time for capability exchange. It is assumed that all indicated options can be used individually or in any combination. If a terminal wishes a more restrictive implementation, it should send a new cap set.

2. The transparency parameters used for transparency are not specified. Default values of zero offsets and no scaling are to be used always. It allows simple chroma keying. Resizing and offset values can still be used by performing the operations at the encoder.

3. We are also not using the “fullPictureFreeze” option of H.263+ since current H.320 terminals support a “freeze frame” comand and we could not find a way to signal it without introducing an addiitonal byte. If there is interest, we can discuss this further at the meeting.

4 Video Commands

The following commands and indications should be added to support H.263+ capability set in H.320. The mode preference commands use the prefix *f*. The commands are binary commands, SBE commands and MBE commands. For each of the SBE commands and the MBE commands, a complete explanation and a recommended course of action has been added. As is customary in ITU recommendations “shall” imply a mandatory course of action whereas “should” implies a recommended not mandatory course of action.

H263BaselineVideoOn

Encoder sends this message to indicate that it will be turning on baseline H263 video (no options).

H263+videoOn

Encoder sends this message to indicate that it will be turning on H263 video (any options).

fH263/Baseline/QCIF

*De*coder or MCU sends this message to indicate a mode preference for H.263 baseline video at QCIF resolution. On receipt of this message, the encoder should switch to baseline H.263 QCIF video.

fH263/Baseline/CIF

Decoder or MCU sends this message to indicate a mode preference for H.263 baseline video at CIF resolution. On receipt of this message, the encoder should switch to baseline H.263 CIF video.

fH263/Baseline/4CIF

Decoder or MCU sends this message to indicate a mode preference for H.263 baseline video at 4CIF resolution. On receipt of this message, the encoder should switch to baseline H.263 4CIF video.

fH263/Baseline/16CIF

Decoder or MCU sends this message to indicate a mode preference for H.263 baseline video at 16CIF resolution. On receipt of this message, the encoder should switch to baseline H.263 16CIF video.

fH263+/QCIF

Decoder or MCU sends this message to indicate a mode preference for H.263+ video at QCIF resolution. On receipt of this message, the encoder should switch to H.263+ QCIF video.

fH263+/CIF

Decoder or MCU sends this message to indicate a mode preference for H.263+ video at CIF resolution. On receipt of this message, the encoder should switch to H.263+ CIF video.

fH263+/4CIF

Decoder or MCU sends this message to indicate a mode preference for H.263+ video at 4CIF resolution. On receipt of this message, the encoder should switch to H.263+ 4CIF video.

fH263+/16CIF

Decoder or MCU sends this message to indicate a mode preference for H.263+ video at 16CIF resolution. On receipt of this message, the encoder should switch to H.263+ 16CIF video.

CustomSourceFormatPreferenceIndicator (fCSFMT)
***<SBE escape code><fCSFMT><FrameHeight/8-1><FrameWidth/*8-1>**

H.263+ allows for a custom source format. We use a SBE code (see Table A.1/H.221 for SBE escapes code and Table 4/H.230 for current occupancy table from SBE escapes code) with three symbols to indicate the custom source format. The first symbol will be the symbol for custom source format this message will be sent by the decoder or MCU to the encoder. The encoder will assume that the first symbol is a binary representation of FrameHeight/8-1 and the second number is a binary representation of FrameWidth/8-1.On receipt of this message, the encoder should switch to H.263+ video at the indicated custom format.

CustomPixelAspectRatioIndicator (fCPAR)
<SBE escape code><fCPAR><Pixel Width-1><Pixel Height-1>

On receipt of this message, the encoder should use the pixel aspect ratio described in the message.

Notice that the pixel width and pixel height should be relatively prime.

CustomPictureClockFrequencyIndicator (fCPCF)
<SBE escape code><fCPCF><PCF code>

On receipt of this message, the encoder should use the custom picture clock frequency for H.263+ coding. The PCF code is the same format as described in Byte 6 of the H.263+ capset.

videoSendSyncEveryGOB

A terminal decoder or a MCU transmits this. On receipt, the terminal encoder shall start sending GOB syncs at every GOB at earliest opportunity.

videoSendSyncEveryGOBCancel

A terminal decoder or a MCU transmits this. On receipt, the terminal encoder should stop sending GOB syncs.

doOneProgression

The terminal decoder or MCU transmits this. On receipt, the terminal encoder shall begin producing a progressive refinement sequence. In this mode, the encoder produces video data consisting of one picture followed by a sequence of zero or more frames of refinement of the quality of same picture. The encoder stays in this mode until the encoder decides that an acceptable fidelity level has been reached or the progressiveRefinementAbortOneCommand is received.

doContinuousProgression

The terminal decoder or the MCU transmits this. On receipt, the terminal encoder shall begin producing progressive refinement sequences. In this mode, the encoder produces video data consisting of one picture followed by a sequence of zero or more frames of refinement of the quality of same picture. The encoder stays in this mode until the encoder decides that an acceptable fidelity level has been reached or the progressiveRefinementAbortOneCommand is received. Then the encoder shall stops refining the current progression and shall start progressive refinement for a different picture. The sequence of progressive refinements shall be aborted when the progressiveRefinementAbortContinuous command is received.

doOneIndependentProgression

The terminal decoder or MCU transmits this. On receipt, the terminal encoder shall begin producing a progressive refinement sequence. In this mode, the encoder produces video data consisting of one intra picture followed by a sequence of zero or more frames of refinement of the quality of same picture. The encoder stays in this mode until the encoder decides that an acceptable fidelity level has been reached or the progressiveRefinementAbortOneCommand is received.

doContinuousIndependentProgression

The terminal decoder or the MCU transmits this. On receipt, the terminal encoder shall begin producing progressive refinement sequences. In this mode, the encoder produces video data consisting of one intra picture followed by a sequence of zero or more frames of refinement of the quality of same picture. The encoder stays in this mode until the encoder decides that an acceptable fidelity level has been reached or the progressiveRefinementAbortOneCommand is received. Then the encoder shall stops refining the current progression and shall start progressive refinement for a different picture consisting of one intra picture followed by a sequence of zero or more frames of refinement. The sequence of progressive refinements shall be aborted when the progressiveRefinementAbortContinuous command is received

progressiveRefinementAbortOne

This is transmitted by the terminal decoder or the MCU. On receipt of this command, the terminal encoder shall terminate doOneProgression, doOneIndependentProgression, or the current progressive refinement in the sequence of progressive refinements in either doContinuousProgression or doContinuousIndependentProgression.

progressiveRefinemenAbortContinuous

The terminal decoder or the MCU transmits this. On receipt of this command, the terminal encoder shall terminate either doContinuousProgressions or doContinuousIndependentProgressions.

VideoSpatialTemporalTradeOff PreferenceIndicator (ƒVSTRD)

<SBE escape code> <ƒVSTRD> <tradeofflevel>

This will be sent by the decoder or MCU to the terminal encoder to indicate a preference for trading frame rate with spatial fidelity. As in H.245, up to 32 levels of spatial temporal trade offs will be specified. On receipt of value of zero, the encoder should send video at the highest possible frame rate and on receipt of the value of 31 the encoder should send video at highest possible spatial fidelity. Intermediate values will indicate a preference on a sliding scale. The actual interpretation will vary for encoders.

ScalabilityPreferenceIndicator (ƒSCLPREF)

<MBE escape code><n/0000 1100/Scalability Specification Message>

This message will be used by the decoder or MCU to indicate a mode preference. We have used a reserve code from Table 2 in H.320 to signal the MBE message. On receipt of this message, the encoder should switch to the scalability preference requested in the message. The MBE code will specify the number of layers. This will be followed by a two-bit specification for each layer using the following convention:

00 - Spatial Scalable layer of one dimension
01 - Spatial Scalable layer of two dimension
10 - SNR layer
11 - Temporal Scalable with one B-picture

The number of bytes in the message depends on the number of enhancement layers. Any layer definitions beyond the number of layers specified will be ignored.

Byte 1:

0-3	Number of layers (n)-1. Valid Range: 0-13
4-5	Layer 1 specification
6-7	Layer 2 specification

Byte i (starting from i=0):

0-1	00
2-3	Layer 3*((i+1) specification
4-5	Layer 3*(i+1)+1 specification
6-7	Layer 3*(i+1)+2 specification

Appendix A: An Example of H.263+ Video Capabilities in H.320

The following describes the structure for H.263+ capabilities in an MBE message. The first byte is the extension codeword. The extension codeword is followed by H.263+ capabilities for the different formats as specified. The notation **Byte a[b-c]** indicates the field specified in Byte *a* from bit *b* to bit *c*. The numbering of bytes for traversing the tree should be reset to 1 at the start of the capabilities specification for each format.

Bit Position	Value	Specification
Byte 0 (Mandatory)		
0-7	7Fh	Extension codeword. If the same codeword, not belonging to the structure of the defined capset, is encountered again in the same MBE message, the data following the codeword will be ignored. Specified once at the end of MBE message specifying H.263 and H.262 cap set.
H.263+ capset for a specific format		
Byte 1 (Mandatory)		
0-1		Source Format
	00	Enhancements defined for the standard format defined in H.263 capability message.
	01	Presence of Custom Picture Format. Two distinct bounds. Enhancements defined for larger of the two formats and the closest standard format.
	10	Presence of Custom Picture Format. Equal bounds. Enhancements defined for the custom picture format and the closest standard format.
	11	Forbidden
2	0/1	Presence of Custom PCF
3	0/1	Presence of custom PAR
4-6		Profiles 000 is reserved to allow separate signaling of individual options and 111 is reserved for a one-byte profile extension.
	000	Separate signaling of individual options
	001	Inherit H.263+ options from immediately larger format.
	010	H.263+ profiles – level 1 supported
	011	H.263+ profiles – levels 1 and 2 supported
	100	H.263+ profiles – levels 1, 2 and 3 supported.
	101	No H.263+ capabilities supported
	110	Reserved
	111	Reserved for Profile extension
7	0/1	Presence of Scalable Layers
Byte 2 Custom Source Format (Present when Byte1[0-1]=01 or Byte1[0-1]=10)		
0-7	x	FrameHeight/8-1 for the upper picture format bound; valid range is [0,143].
Byte 3 Custom Source Format (Present when Byte1[0-1]=01 or Byte1[0-1]=10)		
0-7	x	FrameWidth/8-1 for the upper picture format bound; valid range is [0,233].
Byte 4 Custom Source Format (Present when Byte1[0-1]=10)		
0-7	x	FrameHeight/8-1 for the lower picture format bound; valid range is [Byte3[0-7],143].
Byte 5 Custom Source Format (Present when Byte1[0-1]=10)		
0-7	x	FrameWidth/8-1 for the lower picture format bound; valid range is [Byte4[0-7],233].
Byte 6 (Present when Byte1[2]=1) **Picture Clock Frequency = 1 800 000/ (Clock Conversion Factor * Clock Divisor)**		
0-6	X	Clock Divisor. Valid Range = [0..111] in which 0 means any PCF
7		Clock Conversion Factor (if bit 0-6 is 0, then this bit has no meaning.)
	0	1000
	1	1001
Byte 7 Picture Clock Frequency (Present when Byte1[2]=1)		
0-5	x	(x+1)/PCF is the MPI; valid range is [0,55].

6	0/1	Specify HRD-B
7	0/1	Specify BPPmaxKB
Byte 8 Picture Clock Frequency (Present when Byte1[2]=1)		
0-3	x	HRD-B as defined in H.242.
4-7	x	BPPmaxKB as defined in H.242.
Byte 9 Pixel Width (Present when Bye7[6] or Byte7[7] = 1)		
0-7	X	Pixel Width; Valid Range = [0..223] in which 0 is any pixel width.between 1 and 223.
Byte 10 Pixel Height (Present when Byte1[3]=1)		
0-7	X	Pixel Height; Valid Range = [0..223] in which 0 is any pixel height between 1 and 223. The numbers in Byte 9 and Byte 10 shall be relatively prime.
Byte 11 Profiles/ Future Extension (Present when Byte1[4-6]=111)		
0-7	X	Profile extension (Decoders will be designed to discard this byte for backward compatibility) Valid Range = [0..223].
Byte 12 Core Options (Present when Byte1[4-6]=000)		
0	0	Fixed.
1	0/1	Presence of Enhancement Options.
2	0/1	DynamicPictureResizingbyFour
3	0/1	AdvancedIntraCodingMode
4	0/1	DeblockingFilterMode
5	0/1	ImprovedPBFramesMode
6	0/1	AlternativInteVLCMode
7	0/1	ModifiedQuantizationMode
Byte 13 Enhancement Options (Present only when Byte 12[1]=1)		
0	0	Fixed
1	0/1	RefPictureSelection
2	0/1	SliceStructureMode
3	0/1	IndependentSegmentDecode
4	0/1	ReducedResolutionUpdate
5	0/1	Transparency
6	0/1	UnlimitedMotionVectors (1 only if Unrestricted Motion Vector is also indicated in H.263)
7	0/1	PartialPictureFreeze
Byte 14 Enhancement Options (Present only when Byte12[1]=1)		
0-1	00	DynamicWarpingHalfPel
	01	DynamicWarpingSixteenthPel
	10	Reserved
	11	Forbidden
2	0/1	ResizingPartialPicFreezeAndRelease
3	0/1	FullPictureSnapshot
4	0/1	PartialPictureSnapshot
5	0/1	VideoSegmentTagging
6	0/1	ProgressiveRefinement
7	0/1	DynamicPictureResizingSixteenthPel (1 only if DynamicPictureResizingByFour is 1)
Byte 15 Enhancement option byte present only when Byte13[1]=1 or Byte13[2]=1		
0	0	Fixed
1-2		Valid only of reference picture selection mode is on and messages are sent.
	00	AckMessageOnly
	01	NackMessageOnly
	10	AckOrNackMessageOnly
	11	AckAndNackMessage
3-5	x	Meaningful only when Byte13 [1]=1; It represents the number of additional picture memory - 1.

6-7		Valid only if slices structured mode is on
	00	SlicesInOrder-NonRect
	01	SlicesInOrder-Rect
	10	SlicesNoOrder-NonRect
	11	SlicesNoOrder-Rect
Byte 16 Scalability(Present when Byte1[7] = 1)		
0-3	X	NumberofScalableLayers -1(Valid range:[0-13-])
4-7	X	Maximum Bandwidth of Base Layer
		0000 64kbps 1000 1536 kbps
		0001 128kbps 1010 16kbps
		0010 192kbps 1011 32kbps
		0011 256kbps 1100 48kbps
		0100 320kbps 1011 Reserved
		0101 384kbps 1101 Reserved
		0110 768kbps 1110 Forbidden
		0111 1152kbps 1111 Forbidden
Byte 17 (repeated as many times as value of Byte16[0-3])		
0-3	X	Maximum Bandwidth of this Enhancement Layer
		0000 64kbps 1000 1536 kbps
		0001 128kbps 1010 ¼ of previous layer
		0010 192kbps 1011 ½ of previous layer
		0011 256kbps 1100 ¾ of previous layer
		0100 320kbps 1011 Same as previous layer
		0101 384kbps 1101 3/2 of previous layer
		0110 768kbps 1110 Forbidden
		0111 1152kbps 1111 Forbidden
4	0/1	Spatial scalable layer of one dimension
5	0/1	Spatial scalable layer of two dimension
6	0/1	SNR scalable layer
7	0/1	Temporal scalable layer with 1-B picture