CR-Form-v7

CHANGE REQUEST

| ⌘ | **26.111** CR **010** | ⌘ **rev** **3** | ⌘ | Current version: | **5.1.0** | ⌘ |

For **HELP** *on using this form, see bottom of this page or look at the pop-up text over the* ⌘ *symbols.*

Proposed change affects: │ UICC apps⌘ ☐ ME **X** Radio Access Network ☐ Core Network ☐

Title: ⌘	3G-324M Improvements	
Source: ⌘	Apple Computer, AT&T Wireless Services, Ericsson (editor), France Telecom, Fraunhofer, Nokia, ORANGE, PacketVideo, Panasonic, Philips, RealNetworks, Sharp, Texas Instruments, Toshiba, Vodafone	
Work item code: ⌘	3G-324MI	**Date:** ⌘ 10/09/2004

Category: ⌘	**B**	**Release:** ⌘	Rel-6

Use <u>one</u> of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use <u>one</u> of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘	The 3GPP circuit-switched mobile video telephony standard 3G-324M is now being deployed in several countries and is one of the major services distinguishing 3G networks from 2G. The interest for the 3G-324M service is high and will probably continue to be so in the near future. No major changes have been made to the 3G-324M specifications since 1999, although there now exist better alternatives for media encoding than originally specified and the service requirements have also become more clear.
Summary of change: ⌘	Addition of optional H.264 support.
Consequences if not approved: ⌘	Support for H.264 will either not be available in 3G-324M, making it diverge from other 3GPP services as e.g. 26.235, or there is a substantial risk that support will not be interoperable between implementations and other 3GPP services.

Clauses affected: ⌘	2, 3.2, 6.6 and 6.6.2

	Y	N		⌘	
Other specs affected: ⌘	X		Other core specifications	⌘	CR 26.111 011, CR 26.911 014 rev 1
		X	Test specifications		
		X	O&M Specifications		

Other comments: ⌘	

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2 References

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[18] ITU-T Recommendation H.264 (2003): "Advanced video coding for generic audiovisual services" | ISO/IEC 14496-10:2003: "Information technology ñ Coding of audio-visual objects ñ Part 10: Advanced Video Coding".

[19] ITU-T Recommendation H.241 (2003): "Extended video procedures and control signals for H.300 series terminals".

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3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AVC Advanced Video Codec
FLC Fixed Length Code
RVLC Reverse Variable Length Code
DP Data Partitioning
RM Resynchronization Marker
MCU Multipoint Control Unit

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6.6 Video channels

Support for H.261 [9] is optional.

Support for MPEG-4 Visual is optional. When supported, MPEG-4 Visual codecs shall support Simple Profile @ Level 0. The FLC code 0000 1000 in Table G-1 ñ "FLC table for profile_and_level_indication" in ISO/IEC 14496-2 [14] is assigned to it. Additional information can be found in [14].

MPEG-4 Visual Simple Profile @ level 0 provides error concealment as part of the simple profile through Data Partitioning (DP), Reversible Variable Length Coding (RVLC), Resynchronization Marker (RM) and header extension code. MPEG-4 Visual is baseline compatible with H.263 [8].

When opening a logical channel for MPEG-4 Visual, configuration information (Visual Object Sequence Header, Visual Object Header, and Video Object Layer Header) shall be sent in the decoderConfigurationInformation parameter. The same information shall also be sent in the MPEG-4 video bitstream. If the operational mode of MPEG-4 Visual encoder needs to be changed, the existing MPEG-4 video logical channel shall be closed and H.245 [6] procedures for opening a new MPEG-4 video logical channel shall be started. The new operational mode shall be indicated in the parameters of the new logical channel.

Support for H.264 (MPEG-4 AVC) [19] is optional. When supported, H.264 codecs shall support Baseline level 1, without requirements on output timing conformance (Annex C of [19]).

Support for H.264 [19] shall be signalled according to H.241 chapter 8 "Capability Exchange signalling" [20].

When opening a logical channel for H.264 [19], initial sequence parameter set(s) and picture parameter set(s) should be sent in a H.264 DecoderConfigurationInformation (DCI) defined in Table 1 below, amending H.241 parameters [20].

NOTE: The H.264 DCI parameter can also be used when either party signals a H.245 [6] MasterSlaveDetermination terminalType parameter greater than 128, such as e.g. a Multipoint Conference Unit (MCU).

A sequence parameter set or a picture parameter set with a particular value of seq_parameter_set_id or pic_parameter_set_id, respectively, sent in the H.264 [19] DCI shall be identical to the earliest occurrence of the

sequence parameter set or picture parameter set with the same value of seq_parameter_set_id or pic_parameter_set_id, respectively, sent in the H.264 bitstream.

If DCI was used when a H.264 [19] logical channel was opened and H.264 sequence parameter sets need to be changed or new sets need to be added during the session, the existing H.264 logical channel shall be closed and H.245 [6] procedures for opening a new H.264 logical channel shall be started, in which sequence parameter set(s) and picture parameter set(s) shall be sent in a DCI. Each sequence parameter set of H.264 [19] shall contain the vui_parameters syntax structure including the num_reorder_frames syntax element set equal to 0.

If H.264 picture parameter sets need to be changed or new sets need to be added during a session, it may be done either by opening a new logical channel using the same procedure as described above or within the current channel, by including picture parameter set NAL units directly in the bitstream.

Table 1 / TS 26.111 ñ H.264 Capability Parameter ñ DecoderConfigurationInformation (DCI)

Parameter name	DecoderConfigurationInformation
Parameter description	This is a nonCollapsing GenericParameter. DecoderConfigurationInformation indicates how to configure the decoder for a particular H.264 video sequence [19]. It contains sequence parameter set NAL units, picture parameter set NAL units, or both, using the byte stream format specified in Annex B/H.264, separating NAL units with a start code. The use of a start code before the first parameter set NAL unit is optional.
Parameter identifier value	43
Parameter status	Optional. Shall not be present for Capability Exchange and Mode Request. May be present exactly once for Logical Channel Signalling.
Parameter type	OctetString
Supersedes	-

A decoder may indicate itsí capability to make use of H.264 redundant slices by the following parameter.

Table 2 / TS 26.111 ñ H.264 Capability Parameter ñ AcceptRedundantSlices

Parameter name	AcceptRedundantSlices
Parameter description	This is a collapsing GenericParameter. AcceptRedundantSlices indicates the capability to use H.264 redundant slices and corresponds to the MIME video/H264 parameter ìredundant-pic-capî. When False or when the parameter is not present, it indicates that the receiver makes no attempt to use redundant coded pictures to correct incorrectly decoded primary coded pictures and a sender should not send redundant slices. When True, it indicates that the receiver is capable of decoding any such redundant slice that covers a corrupted area in a primary decoded picture (at least partly), and a sender may send redundant slices. When using a H.264 profile and level that disallows the use of redundant slices, this parameter shall be ignored.
Parameter identifier value	44
Parameter status	Optional. May be present exactly once for Capability Exchange Signalling.
Parameter type	Logical
Supersedes	-

NOTE: An encoder should only code redundant slices if it knows that the far-end decoder makes use of this feature. Encoders should also pay attention to potential implications on end-to-end delay.

A terminal supporting H.264 encoding should respond to all videoFastUpdatePicture commands received via the H.245 control channel. If an H.264 encoder responds to videoFastUpdatePicture, it shall use the procedure specified in subclause 6.2.2 of H.241.

A terminal supporting H.264 shall start decoding immediately when it receives data (even if the stream does not start with an IDR access unit) or alternatively no later than it receives the next IDR access unit or the next recovery point SEI message, whichever is earlier in decoding order. The decoding process for a stream not starting with an IDR access unit shall be the same as for a valid H.264 bitstream. However, the client shall be aware that such a stream may contain references to picture not available in the decoded picture buffer. The display behaviour of the client is out of scope of this specification.

NOTE: Terminals may use full-frame freeze and full-frame freeze release SEI messages of H.264 to control the display process.

6.6.1   MPEG-4 interface to multiplex

As H.263 [8] encoders align picture start codes with the start of an AL-SDU, the same concept applies to MPEG-4 encoders. The following are the requirements of the MPEG-4 interface to the H.223 [1] multiplex.

a)   Each 3G-324M MPEG-4 encoder shall align each visual_object_sequence_start_code with the start of an AL-SDU.

b)   Each 3G-324M MPEG-4 encoder shall align each group_of_vop_start_code (the beginning of a GOV field) with the start of an AL-SDU unless the GOV field immediately follows configuration information.

c)   Each 3G-324M MPEG-4 encoder shall align each vop_start_code with the start of an AL-SDU unless the vop_start_code immediately follows configuration information or a GOV field.

In these requirements, GOV stands for Group_of_VideoObjectPlane() and Configuration information consists of Visual Object Sequence Header, Visual Object Header, and Video Object Layer Header.

6.6.2   H.264 (MPEG-4 AVC) interface to multiplex

Shall conform to the byte stream format according to H.241 chapter 7.1.5 "Transport of H.264 streams in H.324 systems" [20].

More strict alignment of AL-SDU and NAL units may optionally be used. To signal capability for and use of this mode, the generic parameter described in Table 2 shall be used, amending the H.264 Generic Capability in H.241 [20].

Table 3 / TS 26.111 ñ H.264 Capability Parameter ñ NalAlignedMode

Parameter name	NalAlignedMode
Parameter description	This is a collapsing GenericParameter. NalAlignedMode indicates that every AL-SDU carrying H.264 shall contain an integer number of NAL units and that the start of the AL-SDU shall be aligned with the start of a NAL. Individual NAL units within the AL-SDU shall be separated by start codes as described in Annex B/H.264. The use of a start code before the first NAL in an AL-SDU is optional.
Parameter identifier value	45
Parameter status	Optional. May be present exactly once for Capability Exchange, Logical Channel, or Mode Request Signalling.
Parameter type	Logical
Supersedes	-

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