CLAIMS

1. A video encoder configured to:

encode, into a video data stream, a plurality of access units, the plurality of access units comprising:

a first subset of access units having a framerate, and

a second subset of access units having the framerate; and

encode, into the video data stream, a plurality of delay_for_concatenation_ensured_flags such that each access unit of the first subset of access units has an associated delay_for_concatenation_ensured_flag, wherein a delay_for_concatenation_ensured_flag having a value of 1 indicates that an access unit, to which the delay_for_concatenation_ensured_flag is associated, is at a position in the video bitstream where splicing will:

retain the framerate, and

be seamless with an access unit of the second subset of access units when the access of the second subset of access units has a BP SEI message with:

a concatenation_flag equal to 1, and

a selected InitCpbRemovalDelay less than or equal to the value of max_initial_removal_delay_for_concatination.

2. The video encoder of claim 1, wherein seamless means that a CPB removal time distance between the access unit associated with the delay_for_concatenation_ensured_flag having a value of 1 and the access unit of the second subset of access units is the same as consecutive access units in the first subset of access units.

3. The video encoder of claim 1, further configured to:

encode, into the video bitstream, a BP SEI message that designates a temporal sublayer, wherein the encoding of the plurality of delay_for_concatenation_ensured_flags is only performed for access units associated with the temporal sublayer.

4. The video encoder of claim 1, further configured to:

encode, into the video bitstream, a BP SEI message that designates the first subset of access units, wherein the encoding of the plurality of delay_for_concatenation_ensured_flags is only performed for access units in the first subset of access units.

5. The video encoder of claim 4, wherein the BP SEI message that designates the first subset of access units includes a signaled divisor, and wherein the first subset of access units includes all of the access units that:

have a cpb_removal_delay_minus1 that, when divided by the signaled divisor, has a remainder of zero, or

have a dpb_output_delay that, when divided by the signaled divisor, has a remainder of zero.

6. The video encoder of claim 4, wherein the BP SEI message that designates the first subset of access units includes a signaled divisor and a signaled remainder, and wherein the first subset of access units includes all of the access units that:

have a cpb_removal_delay_minus1 that, when divided by the signaled divisor, has a remainder that is equal to the signaled remainder, or

have a dpb_output_delay that, when divided by the signaled divisor, has a remainder that is equal to the signaled remainder.

7. A video decoder configured to:

decode, from a video data stream, a plurality of access units, the plurality of access units comprising:

a first subset of access units having a framerate, and

a second subset of access units having the framerate; and

decode, from the video data stream, a plurality of delay_for_concatenation_ensured_flags such that each access unit of the first subset of access units has an associated delay_for_concatenation_ensured_flag, wherein a delay_for_concatenation_ensured_flag having a value of 1 indicates that an access unit, to which the delay_for_concatenation_ensured_flag is associated, is at a position in the video bitstream where splicing will:

retain the framerate, and

be seamless with an access unit of the second subset of access units when the access of the second subset of access units has a BP SEI message with:

a concatenation_flag equal to 1, and

a selected InitCpbRemovalDelay less than or equal to the value of max_initial_removal_delay_for_concatination.

8. The video decoder of claim 7, wherein seamless means that a CPB removal time distance between the access unit associated with the delay_for_concatenation_ensured_flag having a value of 1 and the access unit of the second subset of access units is the same as consecutive access units in the first subset of access units.

9. The video decoder of claim 7, further configured to:

decode, from the video bitstream, a BP SEI message that designates a temporal sublayer, wherein the encoding of the plurality of delay_for_concatenation_ensured_flags is only performed for access units associated with the temporal sublayer.

10. The video decoder of claim 7, further configured to:

decode, from the video bitstream, a BP SEI message that designates the first subset of access units, wherein the encoding of the plurality of delay_for_concatenation_ensured_flags is only performed for access units in the first subset of access units.

11. The video decoder of claim 10, wherein the BP SEI message that designates the first subset of access units includes a signaled divisor, and wherein the first subset of access units includes all of the access units that:

have a cpb_removal_delay_minus1 that, when divided by the signaled divisor, has a remainder of zero, or

have a dpb_output_delay that, when divided by the signaled divisor, has a remainder of zero.

12. The video decoder of claim 10, wherein the BP SEI message that designates the first subset of access units includes a signaled divisor and a signaled remainder, and wherein the first subset of access units includes all of the access units that:

have a cpb_removal_delay_minus1 that, when divided by the signaled divisor, has a remainder that is equal to the signaled remainder, or

have a dpb_output_delay that, when divided by the signaled divisor, has a remainder that is equal to the signaled remainder.

13. A video decoding method comprising:

decoding, from a video data stream, a plurality of access units, the plurality of access units comprising:

a first subset of access units having a framerate, and

a second subset of access units having the framerate; and

decoding, from the video data stream, a plurality of delay_for_concatenation_ensured_flags such that each access unit of the first subset of access units has an associated delay_for_concatenation_ensured_flag, wherein a delay_for_concatenation_ensured_flag having a value of 1 indicates that an access unit, to which the delay_for_concatenation_ensured_flag is associated, is at a position in the video bitstream where splicing will:

retain the framerate, and

be seamless with an access unit of the second subset of access units when the access of the second subset of access units has a BP SEI message with:

a concatenation_flag equal to 1, and

a selected InitCpbRemovalDelay less than or equal to the value of max_initial_removal_delay_for_concatination.

14. The video decoder of claim 13, wherein seamless means that a CPB removal time distance between the access unit associated with the delay_for_concatenation_ensured_flag having a value of 1 and the access unit of the second subset of access units is the same as consecutive access units in the first subset of access units.

15. The video decoding method of claim 13, further comprising:

decoding, from the video bitstream, a BP SEI message that designates a temporal sublayer, wherein the encoding of the plurality of delay_for_concatenation_ensured_flags is only performed for access units associated with the temporal sublayer.

16. The video decoding method of claim 13, further comprising:

decoding, from the video bitstream, a BP SEI message that designates the first subset of access units, wherein the encoding of the plurality of delay_for_concatenation_ensured_flags is only performed for access units in the first subset of access units.

17. The video decoding method of claim 16, wherein the BP SEI message that designates the first subset of access units includes a signaled divisor, and wherein the first subset of access units includes all of the access units that:

have a cpb_removal_delay_minus1 that, when divided by the signaled divisor, has a remainder of zero, or

have a dpb_output_delay that, when divided by the signaled divisor, has a remainder of zero.

18. The video decoding method of claim 16, wherein the BP SEI message that designates the first subset of access units includes a signaled divisor and a signaled remainder, and wherein the first subset of access units includes all of the access units that:

have a cpb_removal_delay_minus1 that, when divided by the signaled divisor, has a remainder that is equal to the signaled remainder, or

have a dpb_output_delay that, when divided by the signaled divisor, has a remainder that is equal to the signaled remainder.

19. A method of encoding a video, the method comprising the steps of:

encoding, into a video data stream, a plurality of access units, the plurality of access units comprising:

a first subset of access units having a framerate, and

a second subset of access units having the framerate; and

encoding, into the video data stream, a plurality of delay_for_concatenation_ensured_flags such that each access unit of the first subset of access units has an associated delay_for_concatenation_ensured_flag, wherein a delay_for_concatenation_ensured_flag having a value of 1 indicates that an access unit, to which the delay_for_concatenation_ensured_flag is associated, is at a position in the video bitstream where splicing will:

retain the framerate, and

be seamless with an access unit of the second subset of access units when the access of the second subset of access units has a BP SEI message with:

a concatenation_flag equal to 1, and

a selected InitCpbRemovalDelay less than or equal to the value of max_initial_removal_delay_for_concatination.