ORDERING OF NAL UNITS IN CODED VIDEO

CROSS REFERENCE TO RELATED APPLICATIONS

[001] This application is based on International Patent Application No. PCT/US2021/033731, filed on May 21, 2021 which claims the priority to and benefits of U.S. Provisional Patent Application No. 63/029,334, filed on May 22, 2020. All the aforementioned patent applications are hereby incorporated by reference in their entireties.

TECHNICAL FIELD

[002] This patent document relates to image and video encoding and decoding.

BACKGROUND

[003] Digital video accounts for the largest bandwidth use on the internet and other digital communication networks. As the number of connected user devices capable of receiving and displaying video increases, it is expected that the bandwidth demand for digital video usage will continue to grow.

SUMMARY

[004] The present document discloses techniques that can be used by video encoders and decoders to perform video encoding or decoding.

[005] In one example aspect, a video processing method is disclosed. The method includes performing a conversion between a video and a bitstream of the video, wherein the bitstream conforms to a format rule, wherein the bitstream comprises one or more layers comprising one or more picture units (PUs), wherein the format rule specifies that, responsive to a first PU in a layer of the bitstream following an end of sequence network abstraction layer (EOS NAL) unit in the layer in a decoding order, a variable of the first PU is set to a particular value, wherein the variable indicates whether the first PU is a coded layer video sequence start (CLVSS) PU.

[006] In another example aspect, another video processing method is disclosed. The method includes performing a conversion between a video and a bitstream of the video, wherein the bitstream includes one or more layers comprising one or more picture units (PUs) according to a

CLAIMS

1. A method of video processing, comprising:

performing a conversion between a video and a bitstream of the video according to a first format rule,

wherein the bitstream comprises one or more layers comprising one or more network abstraction layer (NAL) units, and

wherein the first format rule specifies that a first layer identifier of an end of sequence network abstraction layer (EOS NAL) unit is required to be equal to a second layer identifier of one of the one or more layers in the bitstream.

2. The method of claim 1, wherein the first format rule further allows for inclusion of more than one EOS NAL units in a picture unit (PU).

3. The method of claim 1 or 2, wherein the first format rule specifies that the first layer identifier of the EOS NAL unit is required to be less than or equal to a third layer identifier of a video coding layer (VCL) NAL unit associated with the EOS NAL unit.

4. The method of any one of claims 1~3, wherein the conversion is performed according to a second format rule,

wherein the bitstream comprises one or more layers comprising one or more picture units (PUs) comprising one or more NAL units, and

wherein the second format rule specifies that, responsive to a first NAL unit indicating an end of sequence in a PU, the first NAL unit is a last NAL unit among all NAL units within the PU other than another NAL unit, if present, indicating another end of sequence or indicating an end of the bitstream, if present.

5. The method of claim 4, wherein the another NAL unit is an end of sequence (EOS) NAL unit.

6. The method of claim 4, wherein the another NAL unit is an end of bitstream (EOB) NAL unit.

7. The method of any one of claims 4~6, wherein the PU comprises a picture header NAL unit, a coded picture comprising one or more video coding layer NAL units and zero or more non-video coding layer NAL units.

8. The method of any one of claims 1~7, wherein the performing the conversion comprises encoding the video into the bitstream.

9. The method of any one of claims 1~7, wherein the performing the conversion comprises decoding the video from the bitstream.

10. An apparatus for processing video data comprising a processor and a non-transitory memory with instructions thereon, wherein the instructions upon execution by the processor, cause the processor to:

perform a conversion between a video and a bitstream of the video according to a first format rule,

wherein the bitstream comprises one or more layers comprising one or more network abstraction layer (NAL) units, and

wherein the first format rule specifies that a first layer identifier of an end of sequence network abstraction layer (EOS NAL) unit is required to be equal to a second layer identifier of one of the one or more layers in the bitstream.

11. The apparatus of claim 10, wherein the first format rule further allows for inclusion of more than one EOS NAL units in a picture unit (PU).

12. The apparatus of claim 10 or 11, wherein the first format rule specifies that the first layer identifier of the EOS NAL unit is required to be less than or equal to a third layer identifier of a video coding layer (VCL) NAL unit associated with the EOS NAL unit.

13. The apparatus of any one of claims 10~12, wherein the conversion is performed according to a second format rule,

wherein the bitstream comprises one or more layers comprising one or more picture units (PUs) comprising one or more NAL units, and

wherein the second format rule specifies that, responsive to a first NAL unit indicating an end of sequence in a PU, the first NAL unit is a last NAL unit among all NAL units within the PU other than another NAL unit, if present, indicating another end of sequence or indicating an end of the bitstream, if present.

14. The apparatus of claim 13, wherein the another NAL unit is an End of Sequence (EOS) NAL unit.

15. The apparatus of claim 13, wherein the another NAL unit is an End of Bitstream (EOB) NAL unit.

16. The apparatus of any one of claims 13~15, wherein the PU comprises a picture header NAL unit, a coded picture comprising one or more video coding layer NAL units and zero or more non-video coding layer NAL units.

17. A non-transitory computer-readable storage medium storing instructions that cause a processor to:

perform a conversion between a video and a bitstream of the video according to a first format rule,

wherein the bitstream comprises one or more layers comprising one or more network abstraction layer (NAL) units, and

wherein the first format rule specifies that a first layer identifier of an end of sequence network abstraction layer (EOS NAL) unit is required to be equal to a second layer identifier of one of the one or more layers in the bitstream.

18. The medium of claim 17, wherein the conversion is performed according to a second format rule,

wherein the bitstream comprises one or more layers comprising one or more picture units (PUs) comprising one or more NAL units, and

wherein the second format rule specifies that, responsive to a first NAL unit indicating an end of sequence in a PU, the first NAL unit is a last NAL unit among all NAL units within the PU other than another NAL unit, if present, indicating another end of sequence or indicating an end of the bitstream, if present.

19. The medium of claim 18, wherein the another NAL unit is an end of sequence (EOS) NAL unit or an end of bitstream (EOB) NAL unit.

20. A non-transitory computer-readable recording medium storing a bitstream of a video which is generated by a method performed by a video processing apparatus, wherein the method comprises:

generating the bitstream of the video according to a first format rule,

wherein the bitstream comprises one or more layers comprising one or more network abstraction layer (NAL) units, and

wherein the first format rule specifies that a first layer identifier of an end of sequence network abstraction layer (EOS NAL) unit is required to be equal to a second layer identifier of one of the one or more layers in the bitstream.