

CLAIMS

What is claimed is:

1. A method of decoding implemented by a video decoder, comprising:
receiving, by the video decoder, a video bitstream including a plurality of layers and a sequence parameter set (SPS) including a flag, wherein each of the plurality of layers referring to the SPS has a same set of (DPB) parameters regardless of whether each of the plurality of layers is an output layer or a non-output layer when the flag has a first value, and wherein each of the plurality of layers referring to the SPS has a first set of DPB parameters that apply to output layers and a second set of DPB parameters that apply to non-output layers when the flag has a second value; and
decoding, by the video decoder, a picture from one of the plurality of layers to obtain a decoded picture.
2. The method of claim 1, further comprising using the same set of DPB parameters to allocate memory for use in the decoding when the flag has the first value.
3. The method of any of claims 1 to 2, further comprising using the first set of DPB parameters to allocate memory for use in the decoding when the flag has the second value and the layers are output layers, and using the second set of DPB parameters to allocate memory for use in the decoding when the flag has the second value and the layers are non-output layers.
4. The method of any of claims 1 to 3, further comprising selecting the output layer from the plurality of layers prior to the decoding, and selecting the picture from the output layer after the output layer has been selected.
5. The method of any of claims 1 to 4, further comprising inferring a second DPB size from a first DPB size included in the DPB size parameters.

6. The method of any of claims 1 to 5, wherein the DPB parameters include a picture reorder number and latency information.
7. The method of any of claims 1 to 6, wherein each of the plurality of layers referring to the SPS has a same level information regardless of whether each of the plurality of layers is the output layer or the non-output layer when the flag has a first value.
8. The method of any of claims 1 to 7, wherein one or more of the plurality of layers comprises one or more sublayers.
9. The method of any of claims 1 to 8, further comprising displaying the decoded picture on a display of an electronic device.
10. A method of encoding implemented by a video encoder, the method comprising:
 - generating, by the video encoder, a plurality of layers and a sequence parameter set (SPS) including a flag;
 - setting, by the video encoder, the flag in the SPS to a first value or a second value, wherein the first value specifies that each of the plurality of layers referring to the SPS has a same set of decoded picture buffer (DPB) parameters regardless of whether each of the plurality of layers is an output layer or a non-output layer, and wherein the second value specifies that each of the plurality of layers referring to the SPS has a first set of DPB parameters that apply to output layers and a second set of DPB parameters that apply to non-output layers;
 - encoding, by the video encoder, the plurality of layers and the SPS into a video bitstream;
 - and
 - storing, by the video encoder, the video bitstream for communication toward a video decoder.
11. The method of claim 10, wherein the DPB parameters comprise one or more DPB sizes.
12. The method of claim 10, wherein the DPB parameters include only a single DPB size.

13. The method of any of claims 10 to 12, wherein the DPB parameters includes one or more of a picture reorder number and latency information.
14. The method of any of claims 10 to 13, wherein one or more of the plurality of layers comprises one or more sublayers.
15. A decoding device, comprising:
a receiver configured to receive a video bitstream including a plurality of layers and a sequence parameter set (SPS) including a flag, wherein each of the plurality of layers referring to the SPS has a same set of (DPB) parameters regardless of whether each of the plurality of layers is an output layer or a non-output layer when the flag has a first value, and wherein each of the plurality of layers referring to the SPS has a first set of DPB parameters that apply to output layers and a second set of DPB parameters that apply to non-output layers when the flag has a second value;
a memory coupled to the receiver, the memory storing instructions; and
a processor coupled to the memory, the processor configured to execute the instructions to cause the decoding device to decode a picture from one of the plurality of layers to obtain a decoded picture.
16. The decoding device of claim 15, wherein the processor is further configured to:
select an output layer from one of the one or more layers prior to the decoding; and
select the picture from the output layer after the output layer has been selected.
17. The decoding device of any of claims 15 to 16, wherein the DPB parameters comprise one or more DPB levels and one or more DPB sizes.
18. The decoding device of any of claims 15 to 17, wherein the processor is configured to infer a second DPB size from a first DPB size included in the DPB size parameters.
19. The decoding device of claim 18, wherein the DPB parameters include a picture reorder number.

20. The decoding device of any of claims 15 to 19, wherein the DPB parameters include latency information.
21. The decoding device of any of claims 15 to 20, wherein one or more of the plurality of layers comprises one or more sublayers.
22. The decoding device of any of claims 15 to 21, further comprising a display configured to display the decoded picture.
23. An encoding device, comprising:
a memory containing instructions;
a processor coupled to the memory, the processor configured to implement the instructions to cause the encoding device to:
generate a plurality of layers and a sequence parameter set (SPS) including a flag;
set the flag in the SPS to a first value when each of the plurality of layers referring to the SPS has a same set of decoded picture buffer (DPB) parameters regardless of whether each of the plurality of layers is an output layer or a non-output layer;
set the flag in the SPS to a second value when each of the plurality of layers referring to the SPS has a first set of DPB parameters that apply to output layers and a second set of DPB parameters that apply to non-output layers; and
encode the plurality of layers and the SPS into a video bitstream; and
a transmitter coupled to the processor, the transmitter configured to transmit the video bitstream toward a video decoder.
24. The encoding device of claim 23, wherein the processor is further configured to cause the encoding device to designate one of the plurality of layers as an output layer and designate another of the plurality of layers as a non-output layer.
25. The encoding device of any of claims 23 to 24, wherein the DPB parameters comprise one or more DPB levels and one or more DPB sizes.

26. The encoding device of claim 23, wherein the DPB parameters include only a single DPB size.
27. The encoding device of any of claims 23 to 26, wherein one or more of the plurality of layers comprises one or more sublayers.
28. A coding apparatus, comprising:
a receiver configured to receive a picture to encode or to receive a bitstream to decode;
a transmitter coupled to the receiver, the transmitter configured to transmit the bitstream to a decoder or to transmit a decoded image to a display;
a memory coupled to at least one of the receiver or the transmitter, the memory configured to store instructions; and
a processor coupled to the memory, the processor configured to execute the instructions stored in the memory to perform the method in any of claims 1 to 9 and any of claims 10 to 14.
29. The coding apparatus of claim 28, further comprising a display configured to display a decoded picture.
30. A system, comprising:
an encoder; and
a decoder in communication with the encoder, wherein the encoder or the decoder includes the decoding device, the encoding device, or the coding apparatus of any of claims 15 to 29.
31. A means for coding, comprising:
receiving means configured to receive a picture to encode or to receive a bitstream to decode;
transmission means coupled to the receiving means, the transmission means configured to transmit the bitstream to a decoding means or to transmit a decoded image to a display means;
storage means coupled to at least one of the receiving means or the transmission means, the storage means configured to store instructions; and

processing means coupled to the storage means, the processing means configured to execute the instructions stored in the storage means to perform the method in any of claims 1 to 9 and any of claims 10 to 14.