Amended Set of Claims

1. A method of decoding video data, the method comprising:

determining, for each received bitstream of a plurality of received bitstreams, whether the received bitstream is conforming or non-conforming, including determining that the received bitstream is a non-conforming bitstream if the received bitstream includes syntax elements in a video parameter set (VPS) that duplicate content for at least one of an operation point or hypothetical reference decoder (HRD) parameter information for the operation point; and

for at least one bitstream of the plurality of received bitstreams determined to be conforming:

decoding first syntax elements in the VPS within the bitstream indicating a first operation point having a first set of content; and

decoding, if present, second syntax elements in the VPS within the bitstream indicating HRD parameter information having a second set of content for the first operation point, wherein the second set of content is different from the first set of content, and

wherein determining that the at least one bitstream is conforming includes determining that the at least one bitstream does not include syntax elements in the VPS that duplicate at least one of the first or second set of content for a second operation point.

2. The method of claim 1, wherein the bitstream does not include syntax elements in the VPS that duplicate the first set of content for the second operation point, the first set of content being unique to the first operation point in the VPS.

3. The method of claim 1, wherein the bitstream does not include syntax elements in the VPS that duplicate the HRD parameter information having the second set of content for the second operation point, the second set of content being unique to the first operation point in the VPS.

4. The method of claim 1, wherein the first set of content comprises a set of layer identifiers for the first operation point that identifies one or more network abstraction

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layer (NAL) units of the bitstream that belong to a sub-bitstream of the first operation point.

5. The method of claim 4, wherein the set of layer identifiers for the first operation point includes two or more layer identifiers, the method further comprising differentially decoding the two or more layer identifiers.

6. The method of claim 4, further comprising decoding one or more syntax elements within the bitstream that indicate whether a simple operation point mode is in use for the first operation point.

7. The method of claim 6, further comprising, based on the indication that the simple operation point mode is used for the first operation point, decoding only a target layer identifier of the set of layer identifiers for the first operation point, wherein the first operation point is identified by the target layer identifier and a temporal identifier that indicates a temporal sub-layer of the conforming bitstream.

8. The method of claim 6, further comprising, based on the indication that the simple operation point mode is not used for the first operation point, explicitly decoding each layer identifier of the set of layer identifiers for the first operation point.

9. The method of claim 1, wherein the first syntax elements indicating the first operation point comprise an operation_point( ) syntax structure in the VPS within the bitstream.

10. The method of claim 1, wherein the second set of content comprises a set of HRD parameters for the first operation point that defines a HRD used to check conformance of a sub-bitstream of the first operation point.

11. The method of claim 1, wherein the second syntax elements indicating the HRD parameter information comprise a hrd_parameters( ) syntax structure in the VPS within the bitstream.

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12. The method of claim 1, further comprising decoding third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for an entire coded video sequence of the bitstream, wherein the bitstream does not include other syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for one or more temporal sub-layers of the coded video sequence.

13. The method of claim 1, wherein third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for the temporal sub-layers are not included in a profile_tier_level( ) syntax structure in the VPS within the bitstream.

14. A method of encoding video data, the method comprising:

encoding a bitstream such that the bitstream is a conforming bitstream, wherein determining whether the bitstream is conforming is defined such that bitstreams that include syntax elements in a video parameter set (VPS) that duplicate content for at least one of an operation point or hypothetical reference decoder (HRD) parameter information for the operation point determined to be non-conforming, and wherein encoding the bitstream includes:

encoding first syntax elements in a video parameter set (VPS) within a conforming bitstream indicating a first operation point having a first set of content; and

encoding second syntax elements in the VPS within the conforming bitstream indicating hypothetical reference decoder (HRD) parameter information having a second set of content for the first operation point,

wherein the conforming bitstream does not include syntax elements in the VPS that duplicate at least one of the first or second set of content for a second operation point.

15. The method of claim 14, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the first set of content for the second operation point, the first set of content being unique to the first operation point in the VPS.

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16. The method of claim 14, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the HRD parameter information having the second set of content for the second operation point, the second set of content being unique to the first operation point in the VPS.

17. The method of claim 14, wherein the first set of content comprises a set of layer identifiers for the first operation point that identifies one or more network abstraction layer (NAL) units of the conforming bitstream that belong to a sub-bitstream of the first operation point.

18. The method of claim 17, wherein the set of layer identifiers for the first operation point includes two or more layer identifiers, the method further comprising differentially encoding the two or more layer identifiers.

19. The method of claim 17, further comprising:

encoding one or more syntax elements within the conforming bitstream that indicate whether a simple operation point mode is in use for the first operation point.

20. The method of claim 19, further comprising, based on the indication that the simple operation point mode is used for the first operation point, encoding only a target layer identifier of the set of layer identifiers for the first operation point, wherein the first operation point is identified by the target layer identifier and a temporal identifier that indicates a temporal sub-layer of the conforming bitstream.

21. The method of claim 20, further comprising, based on the indication that the simple operation point mode is not used for the first operation point, explicitly encoding each layer identifier of the set of layer identifiers for the first operation point.

22. The method of claim 14, wherein the first syntax elements indicating the first operation point comprise an operation_point( ) syntax structure in the VPS within the conforming bitstream.

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23. The method of claim 14, wherein the second set of content comprises a set of HRD parameters for the first operation point that defines a HRD used to check conformance of a sub-bitstream of the first operation point.

24. The method of claim 14, wherein the second syntax elements indicating the HRD parameter information comprise a hrd_parameters( ) syntax structure in the VPS within the conforming bitstream.

25. The method of claim 14, further comprising encoding third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for an entire coded video sequence of the conforming bitstream, wherein the conforming bitstream does not include syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for one or more temporal sub-layers of the coded video sequence.

26. The method of claim 14, wherein third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for the temporal sub-layers are not included in a profile_tier_level( ) syntax structure in the VPS within the conforming bitstream.

27. A video coding device comprising a video coder configured to:

code a conforming bitstream, wherein determining whether the bitstream is conforming is defined such that bitstreams that include syntax elements in a video parameter set (VPS) that duplicate content for at least one of an operation point or hypothetical reference decoder (HRD) parameter information for the operation point are determined to be non-conforming, and wherein the video coding device is configured to code the conforming bitstream by performing actions to:

code first syntax elements in a video parameter set (VPS) within a conforming bitstream indicating a first operation point having a first set of content; and

code, if present, second syntax elements in the VPS within the conforming bitstream indicating hypothetical reference decoder (HRD) parameter information having a second set of content for the first operation point, wherein the second set of content is different from the first set of content, and

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wherein the conforming bitstream does not include syntax elements in the VPS that duplicate at least one of the first or second set of content for a second operation point.

28. The video coding device of claim 27, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the first set of content for the second operation point, the first set of content being unique to the first operation point in the VPS.

29. The video coding device of claim 27, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the HRD parameter information having the second set of content for the second operation point, the second set of content being unique to the first operation point in the VPS.

30. The video coding device of claim 27, wherein the first set of content comprises a set of layer identifiers for the first operation point that identifies one or more network abstraction layer (NAL) units of the conforming bitstream that belong to a sub-bitstream of the first operation point.

31. The video coding device of claim 30, wherein the set of layer identifiers for the first operation point includes two or more layer identifiers, the video coder further configured to differentially code the two or more layer identifiers.

32. The video coding device of claim 30, the video coder further configured to code one or more syntax elements within the conforming bitstream that indicate whether a simple operation point mode is in use for the first operation point.

33. The video coding device of claim 32, the video coder further configured to, based on the indication that the simple operation point mode is used for the first operation point, code only a target layer identifier of the set of layer identifiers for the first operation point, wherein the first operation point is identified by the target layer identifier and a temporal identifier that indicates a temporal sub-layer of the conforming bitstream.

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34. The video coding device of claim 32, the video coder further configured to, based on the indication that the simple operation point mode is not used for the first operation point, explicitly code each layer identifier of the set of layer identifiers for the first operation point.

35. The video coding device of claim 27, wherein the first syntax elements indicating the first operation point comprise an operation_point( ) syntax structure in the VPS within the conforming bitstream.

36. The video coding device of claim 27, wherein the second set of content comprises a set of HRD parameters for the first operation point that defines a HRD used to check conformance of a sub-bitstream of the first operation point.

37. The video coding device of claim 27, wherein second the syntax elements indicating the HRD parameter information comprise a hrd_parameters( ) syntax structure in the VPS within the conforming bitstream.

38. The video coding device of claim 27, the video coder further configured to code third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for an entire coded video sequence of the conforming bitstream, wherein the conforming bitstream does not include syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for one or more temporal sub-layers of the coded video sequence.

39. The video coding device of claim 27, wherein third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for the temporal sub-layers are not included in a profile_tier_level( ) syntax structure in the VPS within the conforming bitstream.

40. The video coding device of claim 27, wherein the video coder comprises a video decoder configured to decode the first syntax elements in the VPS indicating the first operation point, decode, if present, second syntax elements in the VPS indicating HRD parameter information, and decode video data in the conforming bitstream based on the decoded first and second syntax elements.

41. The video coding device of claim 27, wherein the video coder comprises a video encoder configured to encode the first syntax elements in the VPS indicating the first operation point, encode, if present, second syntax elements in the VPS indicating HRD parameter information, and encode video data in the conforming bitstream based on the decoded first and second syntax elements.

42. A computer-readable storage medium having stored thereon instructions that, when executed, cause a processor of a device for coding video data to:

code a conforming bitstream, wherein determining whether the bitstream is conforming is defined such that bitstreams that include syntax elements in a video parameter set (VPS) that duplicate content for at least one of an operation point or hypothetical reference decoder (HRD) parameter information for the operation point are determined to be non-conforming, and wherein coding the conforming bitstream includes performing action to:

code first syntax elements in a video parameter set (VPS) within a conforming bitstream indicating a first operation point having a first set of content; and

code, if present, second syntax elements in the VPS within the conforming bitstream indicating hypothetical reference decoder (HRD) parameter information having a second set of content for the first operation point, wherein the second set of content is different from the first set of content, and

wherein the conforming bitstream does not include syntax elements in the VPS that duplicate at least one of the first or second set of content for a second operation point

43. The computer-readable storage medium of claim 42, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the first set of content for the second operation point, the first set of content being unique to the first operation point in the VPS.

44. The computer-readable storage medium of claim 42, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the HRD parameter information having the second set of content for the second operation point, the second set of content being unique to the first operation point in the VPS.

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45. The computer-readable storage medium of claim 42, wherein the first set of content comprises a set of layer identifiers for the first operation point that identifies one or more network abstraction layer (NAL) units of the conforming bitstream that belong to a sub-bitstream of the first operation point.

46. The computer-readable storage medium of claim 42, wherein the second set of content comprises a set of HRD parameters for the first operation point that defines a HRD used to check conformance of a sub-bitstream of the first operation point.

47. A video coding device comprising:

means for coding a conforming bitstream, wherein determining whether the bitstream is conforming is defined such that bitstreams that include syntax elements in a video parameter set (VPS) that duplicate content for at least one of an operation point or hypothetical reference decoder (HRD) parameter information for the operation point are determined to be non-conforming, and wherein the means for coding includes:

means for coding first syntax elements in a video parameter set (VPS) within a conforming bitstream indicating a first operation point having a first set of content; and

means for coding, if present, second syntax elements in the VPS within the conforming bitstream indicating hypothetical reference decoder (HRD) parameter information having a second set of content for the first operation point, wherein the second set of content is different from the first set of content, and

wherein the conforming bitstream does not include syntax elements in the VPS that duplicate at least one of the first or second set of content for a second operation point.

48. The video coding device of claim 47, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the first set of content for the second operation point, the first set of content being unique to the first operation point in the VPS.

49. The video coding device of claim 47, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the HRD parameter information

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having the second set of content for the second operation point, the second set of content being unique to the first operation point in the VPS.

50. The video coding device of claim 47, wherein the first set of content comprises a set of layer identifiers for the first operation point that identifies one or more network abstraction layer (NAL) units of the conforming bitstream that belong to a sub-bitstream of the first operation point.

51. The video coding device of claim 47, wherein the second set of content comprises a set of HRD parameters for the first operation point that defines a HRD used to check conformance of a sub-bitstream of the first operation point.

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CLAIMS

1. A method of decoding video data, the method comprising:

determining, for each received bitstream of a plurality of received bitstreams of video data, that the received bitstream is a non-conforming bitstream if the received bitstream includes syntax elements in a video parameter set (VPS) that duplicate content for hypothetical reference decoder (HRD) parameter information for different operation points signaled in the VPS;

determining, for each received bitstream of the plurality of received bitstreams of video data, that the received bitstream is a conforming bitstream if the received bitstream does not include any syntax elements in the VPS that duplicate the content for the HRD parameter information for different operation points signaled in the VPS;

for at least one bitstream of the plurality of received bitstreams determined to be conforming:

decoding first syntax elements in the VPS within the bitstream indicating first HRD parameter information; and

decoding, if present, second syntax elements in the VPS within the bitstream indicating second HRD parameter information that is different from the first HRD parameter information.

2. The method of claim 1, wherein the bitstream determined to be conforming does not include syntax elements in the VPS that duplicate the second HRD parameter information.

3. The method of claim **1**, further comprising decoding one or more syntax elements within the bitstream determined to be conforming, the one or more decoded syntax elements indicating whether a simple operation point mode is in use for one or more of the different operation points.

4. The method of claim **3**, further comprising decoding, based on an indication that the simple operation point mode is used for a first operation point of the different operation points, only a target layer identifier of a set of layer identifiers for the first operation point of the different operation points, wherein the first operation point is identified by the target layer identifier and a temporal identifier that indicates a temporal sub-layer of the bitstream determined to be conforming.

5. The method of claim **3**, further comprising explicitly decoding, based on an indication that the simple operation point mode is not used for a first operation point of the different operation points, each layer identifier of a set of layer identifiers for the first operation point of the different operation points.

6. The method of claim **1**, wherein the first HRD parameter information defines HRD parameter information used to check conformance of a sub-bitstream of a first operation point of the different operation points.

7. The method of claim **1**, wherein the syntax elements indicating the first HRD parameter information comprise a hrd_parameters( ) syntax structure in the VPS within the bitstream determined to be conforming.

8. The method of claim **1**, further comprising decoding syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for an entire coded video sequence of the bitstream determined to be conforming, wherein the bitstream determined to be conforming does not include syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for one or more temporal sub-layers of the coded video sequence.

9. The method of claim **8**, wherein the syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for the temporal sub-layers are not included in a profile_tier_level( ) syntax structure in the VPS within the bitstream determined to be conforming.

10. A method of encoding video data, the method comprising:

encoding a bitstream of video data such that the bitstream is a conforming bitstream,

wherein non-conforming bitstreams include syntax elements in a video parameter set (VPS) that duplicate content for hypothetical reference decoder (HRD) parameter information for different operation points,

wherein the conforming bitstream does not include any syntax elements in the VPS that duplicate the content for the HRD parameter information for the different operation points, and

wherein encoding the bitstream comprises:

encoding first syntax elements within the conforming bitstream, the first syntax elements indicating first HRD parameter information; and

encoding second syntax elements in the VPS within the conforming bitstream, the second syntax elements indicating second HRD parameter information that is different from the first HRD parameter information.

11. The method of claim **10**, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the second HRD parameter information.

12. The method of claim **10**, further comprising:

encoding, within the conforming bitstream, one or more syntax elements that indicate whether a simple operation point mode is in use for one or more of the different operation points.

13. The method of claim **12**, further comprising, based on an indication that the simple operation point mode is used for a first operation point of the different operation points, encoding only a target layer identifier of a set of layer identifiers for the first operation point, wherein the first operation point is identified by the target layer identifier and a temporal identifier that indicates a temporal sub-layer of the conforming bitstream.

14. The method of claim **13**, further comprising, based on an indication that the simple operation point mode is not used for a first operation point of the different operation points, explicitly encoding each layer identifier of a set of layer identifiers for the first operation point.

15. The method of claim **10**, wherein the first HRD parameter information defines HRD parameter information used to check conformance of a sub-bitstream of a first operation point of the different operation points.

16. The method of claim **10**, wherein the second syntax elements indicating the first HRD parameter information comprise a hrd_parameters( ) syntax structure in the VPS within the conforming bitstream.

17. The method of claim **10**, further comprising encoding third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for an entire coded video sequence of the conforming bitstream, wherein the conforming bitstream does not include syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for one or more temporal sub-layers of the coded video sequence.

18. The method of claim **17**, wherein the third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for the temporal sub-layers are not included in a profile_tier_level( ) syntax structure in the VPS within the conforming bitstream.

19. A video coding device comprising:

a memory configured to store video data of one or more bitstreams; and

a video coder configured to:

code a conforming bitstream, wherein a determination of whether the bitstream is conforming is defined such that:

bitstreams that include syntax elements in a video parameter set (VPS) that duplicate hypothetical reference decoder (HRD) parameter information for different operation points are determined to be non-conforming bitstreams, and

bitstreams that do not include any syntax elements in the VPS that duplicate the HRD parameter information for the different operation points are determined to be conforming bitstreams, and

wherein to code the conforming bitstream, the video coder is configured to:

code first syntax elements in the VPS within a conforming bitstream, the first syntax elements indicating first HRD parameter information; and

code, if present, second syntax elements in the VPS within the conforming bitstream, the second syntax elements indicating second HRD parameter information that is different from the first HRD parameter information.

20. The video coding device of claim **19**, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the second HRD parameter information.

21. The video coding device of claim **19**, wherein the video coder is further configured to code one or more syntax elements within the conforming bitstream, the one or more coded syntax elements indicating whether a simple operation point mode is in use for one or more of the different operation points.

22. The video coding device of claim **21**, wherein the video coder is further configured to code, based on an indication that the simple operation point mode is used for a first operation point of the different operation points, only a target layer identifier of a set of layer identifiers for the first operation point of the different operation points, wherein the first operation point is identified by the target layer identifier and a temporal identifier that indicates a temporal sub-layer of the conforming bitstream.

23. The video coding device of claim **21**, the video coder further configured to explicitly code, based on an indication that the simple operation point mode is not used for a first operation point of the different operation points, each layer identifier of a set of layer identifiers for the first operation point of the different operation points.

24. The video coding device of claim **19**, wherein the first HRD parameter information defines HRD parameter information used to check conformance of a sub-bitstream of a first operation point of the different operation points.

25. The video coding device of claim **19**, wherein the second syntax elements indicating the first HRD parameter information comprise a hrd_parameters( ) syntax structure in the VPS within the conforming bitstream.

26. The video coding device of claim **19**, the video coder further configured to code syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for an entire coded video sequence of the conforming bitstream, wherein the conforming bitstream does not include syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for one or more temporal sub-layers of the coded video sequence.

27. The video coding device of claim **26**, wherein the third syntax elements indicating one or more of profile space, tier, compatible profiles, and profile-related constraints for the temporal sub-layers are not included in a profile_tier_ level( ) syntax structure in the VPS within the conforming bitstream.

28. The video coding device of claim **19**, wherein the video coder comprises a video decoder configured to:

decode the first syntax elements in the VPS indicating the first HRD parameter information, and

decode, if present, the second syntax elements in the VPS indicating the second HRD parameter information that is different from the first HRD parameter information.

29. The video coding device of claim **19**, wherein the video coder comprises a video encoder configured to: encode the first syntax elements in the VPS indicating the first HRD parameter information, and

encode, if present, the second syntax elements in the VPS indicating the second HRD parameter information that is different from the first HRD parameter information.

30. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause a processor of a device for coding video data to:

code a conforming bitstream, wherein a determination of whether the bitstream is conforming is defined such that:

bitstreams that include syntax elements in a video parameter set (VPS) that duplicate hypothetical reference decoder (HRD) parameter information for different operation points are determined to be non-conforming bitstreams, and

bitstreams that do not include any syntax elements in the VPS that duplicate the HRD parameter information for the different operation points are determined to be conforming bitstreams, and wherein the instructions that cause the processor to code the conforming bitstream include instructions that, when executed, cause the processor to:

code first syntax elements in the VPS within a conforming bitstream, the first syntax elements indicating first HRD parameter information; and

code, if present, second syntax elements in the VPS within the conforming bitstream, the second syntax elements indicating second HRD parameter information that is different from the first HRD parameter information.

31. The non-transitory computer-readable storage medium of claim **30**, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the second HRD parameter information.

32. A video coding device comprising:

means for coding a conforming bitstream, wherein a determination of whether the bitstream is conforming is defined such that:

bitstreams that include syntax elements in a video parameter set (VPS) that duplicate hypothetical reference

decoder (HRD) parameter information for different operation points are determined to be non-conforming bitstreams, and

bitstreams that do not include any syntax elements in the VPS that duplicate the HRD parameter information for the different operation points are determined to be conforming bitstreams, and wherein the means for coding the conforming bitstream includes:

means for coding first syntax elements in the VPS within a conforming bitstream, the first syntax elements indicating first HRD parameter information; and

means for coding, if present, second syntax elements in the VPS within the conforming bitstream, the second syntax elements indicating second HRD parameter information that is different from the first HRD parameter information.

33. The video coding device of claim **32**, wherein the conforming bitstream does not include syntax elements in the VPS that duplicate the second HRD parameter information.

34. The video coding device of claim **32**, wherein the first HRD parameter information defines HRD used to check conformance of a sub-bitstream of a first operation point of the different operation points.