

CLAIMS

What is claimed is:

1. A method implemented by a decoder, the method comprising:
receiving a bitstream comprising one or more output layer sets (OLSs) and a video parameter set (VPS), wherein the VPS specifies the OLSs and comprises sequence-level hypothetical reference decoder (HRD) parameters that apply to all OLSs specified by the VPS, wherein the VPS comprises a sublayer CPB parameters present flag (sublayer_cpb_params_present_flag);
inferring that HRD parameters for all sub-layer representations with temporal identifiers (TemporalIds) less than a maximum TemporalId (hrd_max_tid) are the same as HRD parameters for the sub-layer representation with TemporalId equal to hrd_max_tid when sublayer_cpb_params_present_flag is equal to zero; and
decoding a picture from the OLSs.
2. The method of claim 1, wherein the sequence-level HRD parameters are included in a general HRD parameters (general_hrd_parameters) syntax structure, and wherein the general_hrd_parameters syntax structure provides parameters used in HRD operations.
3. The method of any of claims 1-2, wherein the HRD operations include a set of bitstream conformance tests that are performed by a HRD.
4. The method of any of claims 1-3, wherein the sequence-level HRD parameters include a decoding unit HRD parameters present flag (decoding_unit_hrd_params_present_flag), wherein the decoding_unit_hrd_params_present_flag is set to one when the HRD is scheduled to operate either at an access unit (AU) level or at a decoding unit (DU) level, and wherein the decoding_unit_hrd_params_present_flag is set to zero when the HRD is scheduled to operate at the AU level.
5. The method of any of claims 1-4, wherein the sequence-level HRD parameters include a HRD coded picture buffer count (hrd_cpb_cnt_minus1), wherein the hrd_cpb_cnt_minus1 plus one specifies a number of alternative coded picture buffer (CPB) delivery schedules, and wherein a value of hrd_cpb_cnt_minus1 is constrained to a range from zero to thirty one, inclusive.

6. The method of any of claims 1-5, wherein the `sublayer_cpb_params_present_flag` is set to one when an `ith` layer HRD parameter syntax structure contains HRD parameters for sublayer representations with a temporal identifier (ID) in a range of zero to a maximum HRD temporal ID (`hrd_max_tid[i]`), inclusive, and wherein the `sublayer_cpb_params_present_flag` is set to zero when an `ith` layer HRD parameter syntax structure contains HRD parameters for a sublayer representation with a temporal ID equal to `hrd_max_tid[i]` only.
7. The method of any of claims 1-6, wherein a presence of the sequence-level HRD parameters in the bitstream indicates the decoder is capable of decoding the bitstream according to a delivery schedule.
8. A method implemented by an encoder, the method comprising:
encoding a bitstream comprising one or more output layer sets (OLSs);
encoding into the bitstream a video parameter set (VPS) specifying the OLSs, the VPS comprising sequence-level hypothetical reference decoder (HRD) parameters that apply to all OLSs specified by the VPS, wherein the VPS comprises a sublayer CPB parameters present flag (`sublayer_cpb_params_present_flag`);
inferring that HRD parameters for all sub-layer representations with temporal identifiers (TemporalIds) less than a maximum TemporalId (`hrd_max_tid`) are the same as HRD parameters for the sub-layer representation with TemporalId equal to `hrd_max_tid` when `sublayer_cpb_params_present_flag` is equal to zero; and
performing a set of bitstream conformance tests based on the sequence-level HRD parameters.
9. The method of claim 8, wherein the sequence-level HRD parameters are included in a general HRD parameters (`general_hrd_parameters`) syntax structure, and wherein the `general_hrd_parameters` syntax structure provides parameters used in HRD operations.
10. The method of any of claims 8-9, wherein the HRD operations include the set of bitstream conformance tests, and wherein the bitstream conformance tests are performed by a HRD operating on the encoder.

11. The method of any of claims 8-10, wherein the sequence-level HRD parameters include a decoding unit HRD parameters present flag (`decoding_unit_hrd_params_present_flag`), wherein the `decoding_unit_hrd_params_present_flag` is set to one when the HRD is scheduled to operate either at an access unit (AU) level or at a decoding unit (DU) level, and wherein the `decoding_unit_hrd_params_present_flag` is set to zero when the HRD is scheduled to operate at the AU level.

12. The method of any of claims 8-11, wherein the sequence-level HRD parameters include a HRD coded picture buffer count (`hrd_cpb_cnt_minus1`), wherein the `hrd_cpb_cnt_minus1` plus one specifies a number of alternative coded picture buffer (CPB) delivery schedules, and wherein a value of `hrd_cpb_cnt_minus1` is constrained to a range from zero to thirty one, inclusive.

13. The method of any of claims 8-12, wherein the `sublayer_cpb_params_present_flag` is set to one when an *i*th layer HRD parameter syntax structure contains HRD parameters for sublayer representations with a temporal identifier (ID) in a range of zero to a maximum HRD temporal ID (`hrd_max_tid[i]`), inclusive, and wherein the `sublayer_cpb_params_present_flag` is set to zero when an *i*th layer HRD parameter syntax structure contains HRD parameters for a sublayer representation with a temporal ID equal to `hrd_max_tid[i]` only.

14. The method of any of claims 8-13, wherein a presence of the sequence-level HRD parameters in the bitstream indicates the decoder is capable of decoding the bitstream according to a delivery schedule.

15. A video coding device comprising:

a processor, a receiver coupled to the processor, a memory coupled to the processor, and a transmitter coupled to the processor, wherein the processor, receiver, memory, and transmitter are configured to perform the method of any of claims 1-14.

16. A non-transitory computer readable medium comprising a computer program product for use by a video coding device, the computer program product comprising computer executable instructions stored on the non-transitory computer readable medium such that when executed by a processor cause the video coding device to perform the method of any of claims 1-14.

17. A decoder comprising:

a receiving means for receiving a bitstream comprising one or more output layer sets (OLSs) and a video parameter set (VPS), wherein the VPS specifies the OLSs and comprises sequence-level hypothetical reference decoder (HRD) parameters that apply to all OLSs specified by the VPS, wherein the VPS comprises a sublayer CPB parameters present flag (sublayer_cpb_params_present_flag);

an inferring means, for inferring that HRD parameters for all sub-layer representations with temporal identifiers (TemporalIds) less than a maximum TemporalId (hrd_max_tid) are the same as HRD parameters for the sub-layer representation with TemporalId equal to hrd_max_tid when sublayer_cpb_params_present_flag is equal to zero;

a decoding means for decoding a picture from the OLSs; and

a forwarding means for forwarding the picture for display as part of a decoded video sequence.

18. The decoder of claim 17, wherein the decoder is further configured to perform the method of any of claims 1-7.

19. An encoder comprising:

an encoding means for:

encoding a bitstream comprising one or more output layer sets (OLSs); and

encoding into the bitstream a video parameter set (VPS) specifying the OLSs, the VPS comprising sequence-level hypothetical reference decoder (HRD) parameters that apply to all OLSs specified by the VPS, wherein the VPS comprises a sublayer CPB parameters present flag (sublayer_cpb_params_present_flag);

an inferring means, for inferring that HRD parameters for all sub-layer representations with temporal identifiers (TemporalIds) less than a maximum TemporalId (hrd_max_tid) are the same as HRD parameters for the sub-layer representation with TemporalId equal to hrd_max_tid when sublayer_cpb_params_present_flag is equal to zero;

a HRD means for performing a set of bitstream conformance tests based on the sequence-level HRD parameters; and

a storing means for storing the bitstream for communication toward a decoder.

20. The encoder of claim 19, wherein the encoder is further configured to perform the method of any of claims 8-14.

21. A computer-readable medium comprising a bitstream encoded or decoded by the method of any one of claims 1-14.