

CLAIMS

What is claimed is:

1. A method implemented by a decoder, the method comprising:
receiving, by a receiver of the decoder, a bitstream comprising one or more layers and a scalable nesting supplemental enhancement information (SEI) message, wherein the scalable nesting SEI message includes one or more scalable-nested SEI messages and a scalable nesting output layer set (OLS) flag, and wherein the scalable nesting OLS flag is set to specify whether the scalable-nested SEI messages apply to specific OLSs or specific layers; and
decoding, by a processor of the decoder, a coded picture from the one or more layers, based on the scalable-nested SEI messages, to produce a decoded picture.
2. The method of claim 1, wherein the scalable nesting OLS flag is set to one when specifying that the scalable-nested SEI messages apply to specific OLSs, and wherein the scalable nesting OLS flag is set to zero when specifying that the scalable-nested SEI messages apply to specific layers.
3. The method of any of claims 1-2, wherein the scalable nesting OLS flag is set to one when the scalable nesting SEI message contains an SEI message that has a payload type of buffering period, picture timing, or decoding unit information.
4. The method of any of claims 1-3, wherein the scalable nesting SEI message includes a scalable nesting number of OLSs minus one (`num_olss_minus1`) syntax element when the scalable nesting OLS flag is set to one, and wherein the scalable nesting `num_olss_minus1` syntax element specifies a number of OLSs to which the scalable-nested SEI messages apply, and wherein a value of the scalable nesting `num_olss_minus1` syntax element is in a range of zero to a total number of OLSs (`TotalNumOlss`) – 1, inclusive.
5. The method of any of claims 1-4, wherein the scalable nesting SEI message includes a scalable nesting OLS delta minus one (`ols_idx_delta_minus1[i]`) syntax element used to derive a nesting OLS index (`NestingOlsIdx[i]`) that specifies an OLS index of an i-th OLS to which the scalable-nested SEI messages apply when the scalable nesting OLS flag is equal to

one, wherein a value of the scalable nesting `ols_idx_delta_minus1[ i ]` syntax element is in a range of zero to the `TotalNumOlss - 2`, inclusive.

6. The method of any of claims 1-5, further comprising deriving `NestingOlsIdx[ i ]` as follows:

```

if( i == 0 )
    NestingOlsIdx[ i ] = scalable nesting ols_idx_delta_minus1[ i ]
else
    NestingOlsIdx[ i ] = NestingOlsIdx[ i - 1 ] + scalable nesting
    ols_idx_delta_minus1[ i ] + 1.

```

7. The method of any of claims 1-6, wherein the scalable nesting SEI message includes a scalable nesting number of layers minus one (`num_layers_minus1`) syntax element when the scalable nesting OLS flag is set to zero, and wherein the scalable nesting `num_layers_minus1` syntax element specifies a number of layers to which the scalable-nested SEI messages apply.

8. A method implemented by an encoder, the method comprising:

- encoding, by a processor of the encoder, a bitstream comprising one or more layers;
- encoding into the bitstream, by the processor, a scalable nesting supplemental enhancement information (SEI) message, wherein the scalable nesting SEI message includes one or more scalable-nested SEI messages and a scalable nesting output layer set (OLS) flag, and wherein the scalable nesting OLS flag is set to specify whether the scalable-nested SEI messages apply to specific OLSs or specific layers;
- performing, by the processor, a set of bitstream conformance tests based on the scalable nesting SEI message; and
- storing, by a memory coupled to the processor, the bitstream for communication toward a decoder.

9. The method of claim 8, wherein the scalable nesting OLS flag is set to one when specifying that the scalable-nested SEI messages apply to specific OLSs, and wherein the scalable nesting OLS flag is set to zero when specifying that the scalable-nested SEI messages apply to specific layers.

10. The method of any of claims 8-9, wherein the scalable nesting OLS flag is set to one when the scalable nesting SEI message contains an SEI message that has a payload type of buffering period, picture timing, or decoding unit information.

11. The method of any of claims 8-10, wherein the scalable nesting SEI message includes a scalable nesting number of OLSs minus one (num_olss_minus1) syntax element when the scalable nesting OLS flag is set to one, and wherein the scalable nesting num_olss_minus1 syntax element specifies a number of OLSs to which the scalable-nested SEI messages apply, and wherein a value of the scalable nesting num_olss_minus1 syntax element is in a range of zero to a total number of OLSs ($\text{TotalNumOlss} - 1$), inclusive.

12. The method of any of claims 8-11, wherein the scalable nesting SEI message includes a scalable nesting OLS delta minus one ($\text{ols_idx_delta_minus1}[i]$) syntax element used to derive a nesting OLS index ($\text{NestingOlIdx}[i]$) that specifies an OLS index of an i -th OLS to which the scalable-nested SEI messages apply when the scalable nesting OLS flag is equal to one, wherein a value of the scalable nesting $\text{ols_idx_delta_minus1}[i]$ syntax element is in a range of zero to the $\text{TotalNumOlss} - 2$, inclusive.

13. The method of any of claims 8-12, further comprising deriving $\text{NestingOlIdx}[i]$ as follows:

```

if( i == 0 )
    NestingOlIdx[ i ] = scalable nesting ols_idx_delta_minus1[ i ]
else
    NestingOlIdx[ i ] = NestingOlIdx[ i - 1 ] + scalable nesting
    ols_idx_delta_minus1[ i ] + 1.

```

14. The method of any of claims 8-13, wherein the scalable nesting SEI message includes a scalable nesting number of layers minus one (num_layers_minus1) syntax element when the scalable nesting OLS flag is set to zero, and wherein the scalable nesting num_layers_minus1 syntax element specifies a number of layers to which the scalable-nested SEI messages apply.

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 layers and a scalable nesting supplemental enhancement information (SEI) message, wherein the scalable nesting SEI message includes one or more scalable-nested SEI messages and a scalable nesting output layer set (OLS) flag, and wherein the scalable nesting OLS flag is set to specify whether the scalable-nested SEI messages apply to specific OLSs or specific layers;
a decoding means for decoding a coded picture from the one or more layers, based on the scalable-nested SEI messages, to produce a decoded picture; and
a forwarding means for forwarding the decoded 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 layers; and
encoding into the bitstream a scalable nesting supplemental enhancement information (SEI) message, wherein the scalable nesting SEI message includes one or more scalable-nested SEI messages and a scalable nesting output layer set (OLS) flag, and wherein the scalable nesting OLS flag is set to specify whether the scalable-nested SEI messages apply to specific OLSs or specific layers;

a hypothetical reference decoder (HRD) means for performing a set of bitstream conformance tests based on the scalable nesting SEI message; 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.