

CLAIMS

What is claimed is:

1. A method implemented in a decoder, the method comprising:
 - receiving, by a receiver of the decoder, a bitstream comprising a first adaptation parameter set, APS, network abstraction layer, NAL, unit with an adaptive loop filter, ALF, type associated with a coded slice;
 - obtaining, by a processor of the decoder, ALF parameters from the first APS NAL unit;
 - and
 - decoding, by the processor, the coded slice using the ALF parameters;
 - wherein the bitstream further comprises a third APS NAL unit with a luma mapping with chroma scaling, LMCS, type, wherein the method further comprises obtaining, by the processor, LMCS parameters from the third APS NAL unit, and wherein the coded slice is further decoded using the LMCS parameters;
 - wherein the bitstream comprises an ALF APS assigned to the first APS NAL and a LMCS APS assigned to the third APS NAL, wherein each APS includes an APS ID from a predefined range which is determined based on a parameter type of the each APS, wherein the APS is a syntax structure used to signal information for slices, wherein the LMCS parameters are used for a LMCS which is a process that scale chroma values based on luma mappings, and wherein the ALF parameters are used for an ALF which is a filter that is controlled by parameters included in the ALF APS; and
 - wherein APSs of a particular parameter type share the same predefined range for the APS IDs, and different parameter types of APSs use different predefined ranges of the APS ID;
 - wherein the bitstream further comprises a sequence parameter set, SPS, including a flag set to indicate LMCS is enabled for an encoded video sequence including the coded slice, and wherein the LMCS parameters from the third APS NAL unit are obtained based on the flag;
 - wherein each APS includes an APS parameter type, `aps_params_type`, set to a predefined value indicating the parameter type of each APS, and the parameter type indicates the ALF parameters or the LMCS parameters.
2. The method of claim 1, wherein the bitstream further comprises a second APS NAL unit with a scaling list type, wherein the method further comprises obtaining, by the processor, scaling list parameters from the second APS NAL unit, and wherein the coded slice is further

decoded using the scaling list parameters, wherein the scaling parameters are included in a scaling list for a transform process.

3. The method of any of claims 1-2, wherein the bitstream further comprises a slice header of the coded slice, wherein the slice header references the first APS NAL unit.

4. The method of any of claims 1-3, wherein a current APS includes a current APS identifier, ID, from a predefined range, wherein the current APS ID is sequentially related to a previous APS ID associated with a previous APS of a same type as the current APS, and wherein the current APS ID is not related to another previous APS ID associated with another previous APS of a different type than the current APS.

5. The method of any of claims 1-4, wherein each APS is identified by a combination of a parameter type and an APS ID.

6. The method of any of claims 1-5, wherein the bitstream further comprises a sequence parameter set, SPS, including a flag set to indicate ALF is enabled for an encoded video sequence including the coded slice, and wherein the ALF parameters from the first APS NAL unit are obtained based on the flag.

7. A method implemented in an encoder, the method comprising:

determining, by a processor of the encoder, adaptive loop filter, ALF, parameters associated with a coded slice;

encoding, by the processor, a slice into a bitstream as the coded slice as part of an encoded video sequence;

encoding, by the processor, the ALF parameters into a first adaptation parameter set, APS, network abstraction layer, NAL, unit with an ALF type of the bitstream; and

storing, by a memory coupled to the processor, the bitstream for communication toward a decoder;

the method further comprising:

determining, by the processor, luma mapping with chroma scaling, LMCS, parameters for the coded slice; and

encoding, by the processor, the LMCS parameters into a third APS NAL unit with a LMCS type of the bitstream;

wherein the bitstream comprises an ALF APS assigned to the first APS NAL and a LMCS APS assigned to the third APS NAL, wherein each APS includes an APS ID from a predefined range which is determined based on a parameter type of the each APS, wherein the APS is a syntax structure used to signal information for slices, wherein the LMCS parameters are used for a LMCS which is a process that scale chroma values based on luma mappings, and wherein the ALF parameters are used for an ALF which is a filter that is controlled by parameters included in the ALF APS; and

wherein APSs of a particular parameter type share the same predefined range for the APS IDs, and different parameter types of APSs use different predefined ranges of the APS ID;

wherein the method further comprises encoding, by the processor, a sequence parameter set, SPS, into the bitstream, wherein the SPS includes a flag set to indicate LMCS is enabled for the encoded video sequence including the coded slice;

wherein each APS includes an APS parameter type, `aps_params_type`, set to a predefined value indicating the parameter type of each APS, and the parameter type indicates the ALF parameters or the LMCS parameters.

8. The method of claim 7, further comprising:

determining, by the processor, scaling list parameters for the coded slice wherein the scaling parameters are included in a scaling list for a transform process; and

encoding, by the processor, the scaling list parameters into a second APS NAL unit with a scaling list type of the bitstream.

9. The method of any of claims 7 and 8, further comprising encoding, by the processor, a slice header of the coded slice into the bitstream, wherein the coded slice header references the first APS NAL unit.

10. The method of any of claims 7-9, further comprising encoding, by the processor, a sequence parameter set, SPS, into the bitstream, wherein the SPS includes a flag set to indicate ALF is enabled for the encoded video sequence including the coded slice.

11. A decoder comprising:

a receiving unit, configured to receive a bitstream comprising a first adaptation parameter set, APS, network abstraction layer, NAL, unit with an adaptive loop filter, ALF,

type and a third APS NAL unit with a luma mapping with chroma scaling, LMCS, type associated with a coded slice;

an obtaining unit, configured to:

obtain ALF parameters from the first APS NAL unit;

obtain LMCS parameters from the third APS NAL unit; and

a decoding unit, configured to decoded the coded slice using the ALF parameters, and the LMCS parameters;

wherein the bitstream comprises an ALF APS assigned to the first APS NAL and a LMCS APS assigned to the third APS NAL, wherein each APS includes an APS ID from a predefined range which is determined based on a parameter type of the each APS, wherein the APS is a syntax structure used to signal information for slices, wherein the LMCS parameters are used for a LMCS which is a process that scale chroma values based on luma mappings, and wherein the ALF parameters are used for an ALF which is a filter that is controlled by parameters included in the ALF APS; and

wherein APSs of a particular parameter type share the same predefined range for the APS IDs, and different parameter types of APSs use different predefined ranges of the APS ID;

wherein the bitstream further comprises a sequence parameter set, SPS, including a flag set to indicate LMCS is enabled for an encoded video sequence including the coded slice, and wherein the obtaining unit is configured to obtain LMCS parameters from the third APS NAL unit based on the flag;

wherein each APS includes an APS parameter type, `aps_params_type`, set to a predefined value indicating the parameter type of each APS, and the parameter type indicates the ALF parameters or the LMCS parameters.

12. The decoder of claim 11, wherein the decoder is further configured to perform the method of any of claims 1-6.

13. An encoder comprising:

a determining unit, configured to determine adaptive loop filter, ALF, parameters, and luma mapping with chroma scaling, LMCS, parameters associated with a coded slice;

an encoding unit, configured to:

encode a slice into a bitstream as the coded slice as part of an encoded video sequence;

encode the ALF parameters into a first adaptation parameter set, APS, network abstraction layer, NAL, unit with an ALF type of the bitstream;

encode the LMCS parameters into a third APS NAL unit with a LMCS type of the bitstream; and

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

wherein the bitstream comprises an ALF APS assigned to the first APS NAL and a LMCS APS assigned to the third APS NAL, wherein each APS includes an APS ID from a predefined range which is determined based on a parameter type of the each APS, wherein the APS is a syntax structure used to signal information for slices, wherein the LMCS parameters are used for a LMCS which is a process that scale chroma values based on luma mappings, and wherein the ALF parameters are used for an ALF which is a filter that is controlled by parameters included in the ALF APS; and

wherein APSs of a particular parameter type share the same predefined range for the APS IDs, and different parameter types of APSs use different predefined range of the APS ID;

wherein the encoding unit is further configured to encode a sequence parameter set, SPS, into the bitstream, wherein the SPS includes a flag set to indicate LMCS is enabled for the encoded video sequence including the coded slice;

wherein each APS includes an APS parameter type, `aps_params_type`, set to a predefined value indicating the parameter type of each APS, and the parameter type indicates the ALF parameters or the LMCS parameters.

14. The encoder of claim 13, wherein the encoder is further configured to perform the method of any of claims 7-10.

15. A non-transitory storage medium which includes an encoded bitstream, the bitstream comprising a first adaptation parameter set, APS, network abstraction layer, NAL, unit with an adaptive loop filter, ALF, type associated with a coded slice, wherein the first APS NAL unit comprises ALF parameters;

the bitstream further comprising a third APS NAL unit with a luma mapping with chroma scaling, LMCS, type, wherein the third APS NAL unit comprises LMCS parameters;

wherein the bitstream comprises an ALF APS assigned to the first APS NAL and a LMCS APS assigned to the third APS NAL, wherein each APS includes an APS ID from a predefined range which is determined based on a parameter type of the each APS, wherein the APS is a syntax structure used to signal information for slices, wherein the LMCS parameters

are used for a LMCS which is a process that scale chroma values based on luma mappings, and wherein the ALF parameters are used for an ALF which is a filter that is controlled by parameters included in the ALF APS; and

wherein APSs of a particular parameter type share the same predefined range for the APS IDs, and different parameter types of APSs use different predefined range of the APS ID;

wherein the bitstream further comprises a sequence parameter set, SPS, including a flag set to indicate LMCS is enabled for an encoded video sequence including the coded slice;

wherein each APS includes an APS parameter type, `aps_params_type`, set to a predefined value indicating the parameter type of each APS, and the parameter type indicates the ALF parameters or the LMCS parameters.

16. A non-transitory computer-readable medium carrying a program code which, when executed by a computer device, causes the computer device to perform the method of any one of claims 1 to 10.