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| *Title:* | **MV-HEVC/SHVC HLS: On Scaling List Data Signaling** | | |
| *Status:* | Input Document to JCT-VC | | |
| *Purpose:* | Proposal | | |
| *Author(s) or Contact(s):* | Sachin Deshpande  5750 Pacific Rim Blvd,  Camas, WA 98607,  USA.  Martin Pettersson  Ericsson Research 164 80 Stockholm Sweden  Shan Liu MediaTek USA 2860 Junction Ave, San Jose, CA 95134, USA  Teruhiko Suzuki 2-10-1, Osaki, Shinagawa-ku ,  Tokyo, 141-8610  JAPAN | Tel: Email: | +1 360 817 8486 [sdeshpande@sharplabs.com](mailto:sdeshpande@sharplabs.com)  +46 76 8428380 martin.m.pettersson@ericsson.com  +1 4085261899 shan.liu@mediatek.com  +81 50 3750 2740 [teruhikos@jp.sony.com](mailto:teruhikos@jp.sony.com) |
| *Source:* | Sharp Labs of America, Inc., MediaTek Inc., Sony Corp., Ericsson | | |

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# Abstract

This document provides text for the recommendations agreed for adoptions by the BoG. The text is combined from documents N0200 and N0162.

# Introduction

This document provides text for the recommendations agreed for adoptions by the BoG. The text is combined from documents N0200 and N0162.

# Proposal

***Syntax & Semantics***

|  |  |
| --- | --- |
| seq\_parameter\_set\_rbsp( ) { | Descriptor |
| ... ... |  |
| scaling\_list\_enabled\_flag | u(1) |
| if( scaling\_list\_enaled\_flag ) { |  |
| **sps\_scaling\_list\_data\_present\_flag** | u(1) |
| if( sps\_scaling\_list\_data\_present\_flag ) |  |
| if (nuh\_layer\_id > 0) { |  |
| **sps\_pred\_scaling\_list\_flag** | u(1) |
| if( sps\_pred\_scaling\_list\_flag ) |  |
| **scaling\_list\_sps\_ref\_layer\_id** | u(6) |
| } else |  |
| scaling\_list\_data( ) |  |
| } |  |
| ... ... |  |
| rbsp\_trailing\_bits( ) |  |
| } |  |

* **scaling\_list\_enabled\_flag** equal to 1 specifies that a scaling list is used for the scaling process for transform coefficients. scaling\_list\_enabled\_flag equal to 0 specifies that scaling list is not used for the scaling process for transform coefficients.
* **sps\_scaling\_list\_data\_present\_flag** equal to 1 specifies that scaling list data are present in the SPS. sps\_scaling\_list\_data\_present\_flag equal to 0 specifies that scaling list data are not present in the SPS. When not present, the value of sps\_scaling\_list\_data\_present\_flag is inferred to be equal to 0. When scaling\_list\_enabled\_flag is equal to 1 and sps\_scaling\_list\_data\_present\_flag is equal to 0, the default scaling list data are used to derive the array ScalingFactor as described in the scaling list data semantics specified in subclause 7.4.5.
* **sps\_pred\_scaling\_list\_flag** equal to 1 specifies that the scaling list data is inferred from the scaling list data in the reference layer sequence parameter set. sps\_pred\_scaling\_list\_flag equal to 0 specifies that scaling list data are present in the sequence parameter set. When not present, sps\_pred\_scaling\_list\_flag is inferred to be 0.

When avc\_base\_layer\_flag is equal to 1, it is a requirement of bitstream conformance that sps\_pred\_scaling\_list\_flag shall be equal to 0.

* **scaling\_list\_sps\_ref\_layer\_id** specifies the value of nuh\_layer\_id of the layer whose active SPS is used to obtain the scaling\_list\_data() for the current SPS. The value of scaling\_list\_sps\_ref\_layer\_id shall be in the range of 0 to 63, inclusive.

It is a requirement of bitstream conformance that when a SPS RBSP having a nuh\_layer\_id equal to nuhLayerIdA is activated for a layer having nuh\_layer\_id equal to nuhLayerIdB and sps\_pred\_scaling\_list\_flag is equal to 1 in the SPS RBSP then the sps\_pred\_scaling\_list\_flag must be 0 (i.e. must not be 1) for SPS RBSP active for the layer with nuh\_layer\_id equal to scaling\_list\_sps\_ref\_layer\_id.

It is a requirement of bitstream conformance that when a SPS RBSP having a nuh\_layer\_id equal to nuhLayerIdA is activated for a layer having nuh\_layer\_id equal to nuhLayerIdB, layer with nuh\_layer\_id equal to scaling\_list\_sps\_ref\_layer\_id must be a direct reference layer for the layer with nuhLayerIdB or for one of nuhLayerIdB layer’s direct or indirect reference layers.

|  |  |
| --- | --- |
| pic\_parameter\_set\_rbsp( ) { | Descriptor |
| ... ... |  |
| **pps\_scaling\_list\_data\_present\_flag** | u(1) |
| if( pps\_scaling\_list\_data\_present\_flag ) |  |
| if (nuh\_layer\_id > 0) { |  |
| **pps\_pred\_scaling\_list\_flag** | u(1) |
| if( pps\_pred\_scaling\_list\_flag ) |  |
| **scaling\_list\_pps\_ref\_layer\_id** | u(6) |
| } else |  |
| scaling\_list\_data( ) |  |
| } |  |
| ... ... |  |
| rbsp\_trailing\_bits( ) |  |
| } |  |

* **pps\_scaling\_list\_data\_present\_flag** equal to 1 specifies that parameters are present in the PPS to modify the scaling lists specified in the active SPS. pps\_scaling\_list\_data\_present\_flag equal to 0 specifies that the scaling lists used for the pictures referring to the PPS is inferred to be equal to those specified by the active SPS. When scaling\_list\_enabled\_flag is equal to 0, the value of pps\_scaling\_list\_data\_present\_flag shall be equal to 0. When scaling\_list\_enabled\_flag is equal to 1, sps\_scaling\_list\_data\_present\_flag is equal to 0, and pps\_scaling\_list\_data\_present\_flag is equal to 0, the default scaling list data are used to derive the array ScalingFactor as described in the scaling list data semantics 7.4.5.
* **pps\_pred\_scaling\_list\_flag** equal to 1 specifies that the scaling list data is inferred from the scaling list data in the reference layer picture parameter set. pps\_pred\_scaling\_list\_flag equal to 0 specifies that scaling list data are present in the picture parameter set. When not present, pps\_pred\_scaling\_list\_flag is inferred to be 0.

When avc\_base\_layer\_flag is equal to 1, it is a requirement of bitstream conformance that sps\_pred\_scaling\_list\_flag shall be equal to 0.

* **scaling\_list\_pps\_ref\_layer\_id** specifies the value of nuh\_layer\_id of the layer whose active PPS is used to obtain the scaling\_list\_data() for the current PPS. The value of scaling\_list\_pps\_ref\_layer\_id shall be in the range of 0 to 63, inclusive.

It is a requirement of bitstream conformance that when a PPS RBSP having a nuh\_layer\_id equal to nuhLayerIdA is activated for a layer having nuh\_layer\_id equal to nuhLayerIdB and pps\_ pred\_scaling\_list\_flag is equal to 1 in the PPS RBSP then the pps\_pred\_scaling\_list\_flag must be 0 (i.e. must not be 1) for PPS RBSP active for the layer with nuh\_layer\_id equal to scaling\_list\_pps\_ref\_layer\_id.

red\_scaling\_list\_flag he sps\_ It is a requirement of bitstream conformance that when a PPS RBSP having a nuh\_layer\_id equal to nuhLayerIdA is activated for a layer having nuh\_layer\_id equal to nuhLayerIdB, layer with nuh\_layer\_id equal to scaling\_list\_pps\_ref\_layer\_id must be a direct reference layer for the layer with nuhLayerIdB or for one of nuhLayerIdB layer’s direct or indirect reference layers.

## Parameter Set Activation

## SPS Activation:

The specifications in subclause F.7.4.2.4.2 apply with the following additions.

When a SPS RBSP having nuh\_layer\_id equal to nuhLayerIdA is activated for a layer having nuh\_layer\_id equal to nuhLayerIdB and scaling\_list\_sps\_ ref\_layer\_id is present in the SPS RBSP, the value of scaling\_list\_data() for the layer having nuh\_layer\_id equal to scaling\_list\_sps\_ref\_layer\_id shall be considered in effect for the layer having nuh\_layer\_id equal to nuhLayerIdB.

When a SPS RBSP having nuh\_layer\_id equal to nuhLayerIdA is active for the layer having nuh\_layer\_id equal to nuhLayerIdB and scaling\_list\_sps\_ ref\_layer\_id is present in the SPS RBSP and the SPS RBSP active for the layer with nuh\_layer\_id equal to scaling\_list\_sps\_ref\_layer\_id is deactivated, then the SPS RBSP active for the layer having nuh\_layer\_id equal to nuhLayerIdB shall be deactivated by activating another SPS RBSP for that layer.

## PPS Activation:

The specifications in subclause F.7.4.2.4.2 apply with the following additions.

When a PPS RBSP having nuh\_layer\_id equal to nuhLayerIdA is activated for a layer having nuh\_layer\_id equal to nuhLayerIdB and scaling\_list\_pps\_ ref\_layer\_id is present in the PPS RBSP, the value of scaling\_list\_data() for the layer having nuh\_layer\_id equal to scaling\_list\_pps\_ref\_layer\_id shall be considered in effect for the layer having nuh\_layer\_id equal to nuhLayerIdB.

When a PPS RBSP having nuh\_layer\_id equal to nuhLayerIdA is active for the layer having nuh\_layer\_id equal to nuhLayerIdB and scaling\_list\_pps\_ref\_layer\_id is present in the PPS RBSP and the PPS RBSP active for the layer with nuh\_layer\_id equal to scaling\_list\_pps\_ref\_layer\_id is deactivated, then the PPS RBSP active for the layer having nuh\_layer\_id equal to nuhLayerIdB shall be deactivated by activating another PPS RBSP for that layer.

# Patent rights declaration(s)

**Sharp may have current or pending patent rights relating to the technology described in this contribution and, conditioned on reciprocity, is prepared to grant licenses under reasonable and non-discriminatory terms as necessary for implementation of the resulting ITU-T Recommendation | ISO/IEC International Standard (per box 2 of the ITU-T/ITU-R/ISO/IEC patent statement and licensing declaration form).**

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