

# ISO/IEC TR 29199-1:2011-07 (E)

## Information technology - JPEG XR image coding system - Part 1: System architecture

<b>Contents</b>		<b>Page</b>
Foreword .....		v
<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Terms and definitions .....</b>	<b>1</b>
<b>3</b>	<b>Abbreviations .....</b>	<b>6</b>
<b>4</b>	<b>The JPEG XR image coding system .....</b>	<b>7</b>
<b>5</b>	<b>General overview of technical design .....</b>	<b>7</b>
5.1	Basic technology structure .....	7
5.2	Supported image format types .....	8
5.3	Decoded image structure and interpretation .....	9
5.4	Data processing hierarchy and structures .....	10
5.5	The JPEG XR transform structure and hierarchy .....	11
5.6	Handling of image and tile boundaries .....	13
5.7	Quantization and lossless representation .....	13
5.7.1	Overall quantization design concepts .....	13
5.7.2	Quantization control on a spatial region basis .....	14
5.7.3	Quantization control on a frequency band basis .....	14
5.7.4	Quantization control on a colour plane component basis .....	14
5.7.5	Quantization control type combinations .....	14
5.8	Prediction of transform coefficients and coded block patterns .....	14
5.9	Adaptive ordering of coefficient scanning pattern .....	15
5.10	Entropy coding of transform coefficients .....	15
5.11	Codestream structure .....	16
<b>6</b>	<b>JPEG XR design in relation to baseline JPEG and JPEG 2000 .....</b>	<b>17</b>
6.1	General .....	17
6.2	Image area partitions .....	18
6.3	Image fidelity refinement .....	18
<b>7</b>	<b>High dynamic range (HDR) image coding .....</b>	<b>18</b>
7.1	HDR formats supported in JPEG XR .....	18
7.2	HDR signal processing design in JPEG XR .....	19
7.3	Examples of HDR applications for JPEG XR .....	19
<b>8</b>	<b>JPEG XR profiles and levels .....</b>	<b>19</b>
8.1	Overview of profiles and levels .....	19
8.2	Sub-Baseline profile .....	20
8.3	Baseline profile .....	20
8.4	Main profile .....	20
8.5	Advanced profile .....	20
8.6	Levels .....	21
<b>9</b>	<b>JPEG XR encoding practices .....</b>	<b>21</b>
9.1	General encoding guidelines .....	21
9.2	Encoding for random access .....	21
9.3	Guidelines for tile size selection .....	22
<b>10</b>	<b>The JPEG XR decoding process functionality .....</b>	<b>23</b>

10.1	JPEG XR decoding process structure .....	23
10.2	Output colour conversion .....	24
10.3	Resolution scalability at decoder .....	24
10.3.1	General .....	24
10.3.2	DC-only image decoding .....	24
10.3.3	DC plus LP image decoding .....	24
10.4	Quality scalability at decoder .....	25
10.5	Spatial random access at decoder .....	25
11	JPEG XR codestream compressed-domain manipulation .....	25
11.1	General .....	25
11.2	Flexbits trimming .....	26
11.3	Flexbits and HP band elimination .....	26
11.4	Flexbits and HP and LP band elimination .....	26
11.5	Spatial versus frequency codestream mode switching .....	26
11.6	Rotation and flip .....	26
11.7	Compressed-domain region of interest extraction .....	26
11.8	Switching between interleaved and planar alpha planes .....	27
11.9	Compressed-domain retiling .....	27