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# Introduction

This document includes technologies under consideration for ISO/ IEC 23090-2 (OMAF)

This includes the following:

1. Adaptation parameters for foveated rendering (m61227)

# Adaptation Parameters for Foveated Rendering

The contribution m61074 proposes adaptation parameters for foveated rendering.

In the server-side dynamic adaptation, the client can make some static selection (such as those related to video codec profile, screen size and encryption algorithm), and only leave dynamic adaptation (such as those related to video bitrate, network bandwidth) to the server, by collecting and passing dynamic adaptation parameters needed for Adaptation Logic to the server as part of (http) segment requests. The communication of these adaptation parameters can be implemented in anyone of the following mechanisms:

1. URL query parameters
2. HTTP header parameters

To enable foveated rendering at the server-side and to reduce delivery loads for foveated viewports, a list of parameters is defined in the following table, which can be used as suggested in the CTA WAVE Common Media Client Data.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Key Name | Header Name | Type & Unit | Value Definition |
| Centre Azimuth | 'azim' | SSDA-Request | Integer, degrees | Azimuth component (centre\_azimuth) of a sphere region |
| Centre Elevation | 'elev' | SSDA-Request | Integer, degrees | Elevation component (centre\_elevation) of a sphere region |
| Centre Tilt | ‘tilt’ | SSDA-Request | Integer, degrees | Tilt component (centre\_tilt) of a sphere region |
| Azimuth range | 'azrg' | SSDA-Request | Integer, degrees | Azimuth range of a sphere region |
| Elevation range | 'elrg' | SSDA-Request | Integer, degrees | Elevation range of a sphere region |
| Shape Type | ‘styp’ | SSDA-Request | Integer | Shape type (0 or 1) of a sphere region |
| Foveal Levels | ‘flvl | SSDA-Request | Integer | Number of foveated area levels. Usually, it is equal to   * 0: foveal only, implying no foveated rendering, * 1: foveal and peripheral, * 2: foveal, blended and peripheral, * n>2: foveal, n-2 blended and peripheral.   For all foveated areas signalled within a foveated viewport, they share the viewpoint (specified by the three centre parameters), and each of them has its additional range parameter(s) and one quality ranking parameter. Particularly,   * for each level of foveated area of spherical region shape, a list of Azimuth range, Elevation range, and quality ranking shall be provided. * for each level of foveated area of circular region shape, a list of Azimuth range and Quality Ranking shall be provided. |
| Foveal Shape | 'fovs' | SSDA-Request | Integer | Foveal shape: 0 = rectangular, 1 = circle, others = reserved. |
| Quality Ranking | ‘qrnk’ | SSDA-Request | Integer | Quality ranking of a foveated area or region.  Note that, if more appropriate, this quality ranking parameter can be replaced or supplemented with another parameter for a bitrate in units of kbps. |

With these parameters in DASH http requests for segments related to a foveated viewport, it is expected to return an http response containing:

1. a foveated viewport segment; this is a server-side adaptation or rendering, or
2. a package of tile/sub-picture segments in a MIME multipart message for constructing a foveated viewport segment, just like in the viewport-dependent media processing, but whose content has been adapted with foveated rendered content separately carried in the tile/sub-picture segments.

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