CLAIMS

1. A method of retrieving media data, the method comprising:

retrieving a manifest file specifying data for at least one representation of a media presentation, wherein the manifest file includes data that specifies one or more codecs for the at least one representation, the at least one representation including one or more media files including media data, the manifest file being separate from the at least one representation, the manifest file not including media data;

extracting, from the manifest file, the data that specifies the one or more codecs, including:

extracting a first element representing a sample entry type code of a track of the at least one representation, wherein the first element represents that the track includes video data stored using a restricted scheme; and

extracting a second element representing a restricted scheme type code for the restricted scheme of the track; and

retrieving the one or more media files including the media data of the at least one representation based on the first element and the second element.

2. The method of claim 1, wherein extracting the data that specifies the one or more codecs comprises:

extracting a first set of values for one or more @codecs parameters, wherein the values for the @codecs parameters comprise respective period-delimited lists of elements including the first element and the second element; and

extracting a second set of values comprising additional information for the @codecs parameters from a different MIME type parameter.

3. The method of claim 2, wherein the additional information comprises information indicating a particular type of restricted scheme.

4. The method of claim 2, wherein the different MIME type parameter comprises ‘odvdinfo,’ and wherein extracting the second set of values comprises extracting at least one of ‘povd,’ ‘fovd,’ ‘erp,’ or ‘cmp.’

5. The method of claim 4, further comprising determining that the track of the at least one representation comprises video data including:

projected omnidirectional video data when the restricted scheme type code comprises ‘povd;’

fisheye omnidirectional video data when the restricted scheme type code comprises ‘fovd;’

equirectangular projected omnidirectional video data when the restricted scheme type code comprises ‘erp;’ or

cubemap projected omnidirectional video data when the restricted scheme type code comprises ‘cmp.’

6. The method of claim 2, wherein the additional information comprises information indicating a particular type of frame packed video data.

7. The method of claim 6, wherein the different MIME type parameter comprises ‘fpvdinfo.’

8. The method of claim 6, wherein the particular type of frame packed video data comprises elements corresponding to stereo_scheme and stereo_indication_type.

9. The method of claim 1, further comprising:

receiving one or more values for a MIME type parameter ‘hdrinfo’ for the track, the values for the MIME type parameter including information for at least one of high dynamic range (HDR) or wide color gamut (WCG) video data for the track,

wherein retrieving the media data of the at least one representation comprises retrieving media data of the track based on the values for the MIME type parameter.

10. The method of claim 9, wherein the one or more values are a single value for the MIME type parameter ‘hdrinfo.’

11. The method of claim 9, wherein the one or more values are a comma-separated list of values for the MIME type parameter ‘hdrinfo,’ each of the values in the comma-separated list comprising a single element or a dot-separated list of elements.

12. The method of claim 11, wherein at least one of the values in the comma-separated list comprises a dot-separated list of elements, the elements comprising hexadecimal representations of HDR or WCG fields, including colour_primaries, transfer_characteristics, matrix_coeffs, and full_range_flag.

13. The method of claim 1, wherein the manifest file comprises a dynamic adaptive streaming over HTTP (DASH) media presentation description (MPD).

14. The method of claim 1, wherein the manifest file specifies data for a plurality of representations including the at least one representation, including data that specifies one or more codecs for each of the plurality of representations.

15. The method of claim 14, further comprising selecting the at least one representation in response to determining that a client device includes a video codec conforming to the sample entry type code and the scheme type code.

16. The method of claim 1, wherein the representation comprises a plurality of segments, each of the segments comprising an individually retrievable file associated with a unique uniform resource locator (URL).

17. The method of claim 1, wherein retrieving the media data of the at least one representation comprises retrieving at least one of a segment of the representation using an HTTP GET request or a partial segment of the representation using an HTTP partial GET request.

18. The method of claim 1, wherein the sample entry type code comprises ‘resv.’

19. The method of claim 1, wherein the restricted scheme type code comprises at least one of ‘stvi,’ ‘odvd,’ ‘povd,’ ‘fovd,’ ‘erp,’ or ‘cmp.’

20. The method of claim 19, further comprising determining that the track of the at least one representation comprises video data including:

frame packed video data when the restricted scheme type code comprises ‘stvi;’

omnidirectional video data when the restricted scheme type code comprises ‘odvd;’ projected omnidirectional video data when the restricted scheme type code comprises ‘povd;’

fisheye omnidirectional video data when the restricted scheme type code comprises ‘fovd;’

equirectangular projected omnidirectional video data when the restricted scheme type code comprises ‘erp;’ or

cubemap projected omnidirectional video data when the restricted scheme type code comprises ‘cmp.’

21. The method of claim 1, wherein extracting the data that specifies the one or more codecs further comprises, in response to determining that the restricted scheme type code comprises ‘odvd,’ extracting a third element representing a type of omnidirectional video data for the track.

22. The method of claim 21, further comprising determining that the track of the at least one representation comprises video data including:

projected omnidirectional video data when the third element comprises a value of ‘povd;’ or

fisheye omnidirectional video data when the restricted scheme type code comprises ‘fovd.’

23. The method of claim 21, wherein extracting the data that specifies the one or more codecs further comprises, in response to determining that the third element comprises a value of ‘povd,’ extracting a fourth element that indicates a projection type.

24. The method of claim 23, further comprising, in response to determining that the video data of the track comprises projected omnidirectional video data, determining that the projected omnidirectional video data comprises:

an equirectangular projection when the fourth element has a value of ‘erp;’ or

a cubemap projection when the fourth element has a value of ‘cmp.’

25. The method of claim 1, wherein extracting the data that specifies the one or more codecs comprises extracting a plurality of elements following the first element and the second element.

26. The method of claim 1, wherein extracting the data that specifies the one or more codecs comprises extracting values for one or more @codecs parameters, wherein the values for the @codecs parameters comprise respective period delimited lists of elements.

27. The method of claim 1, further comprising extracting data that specifies that the track includes video data with display orientation changes, wherein the track is included in a media file of the at least one representation, and wherein retrieving the media data of the at least one representation comprises retrieving media data of the track based on the data that specifies that the track includes the video data with the display orientation changes.

28. The method of claim 27, wherein the data that specifies that the track includes the video data with the display orientation changes comprises a ‘vdoc’ value for a restricted scheme type for the track.

29. The method of claim 27, wherein extracting comprises extracting the value for the restricted scheme type from a RestrictedSchemeInfoBox for the track.

30. The method of claim 27, further comprising, in response to determining that the track includes the video data with the display orientation changes, extracting data indicating whether the display orientation changes include either or both of rotation or flipping from a SchemeInformationBox.

31. The method of claim 30, further comprising:

determining that the display orientation changes include both rotation and flipping when the SchemeInformationBox has a value of 0;

determining that the display orientation changes include rotation when the SchemeInformationBox has a value of 1; or

determining that the display orientation changes include flipping when the SchemeInformationBox has a value of 2.

32. A device for retrieving media data, the device comprising:

a memory configured to store media data; and

one or more processors implemented in circuitry and configured to:

retrieve a manifest file specifying data for at least one representation of a media presentation, wherein the manifest file includes data that specifies one or more codecs for the at least one representation, the at least one representation including one or more media files including media data, the manifest file being separate from the at least one

representation, the manifest file not including media data;

extract, from the manifest file, the data that specifies the one or more codecs, the data including a first element representing a sample entry type code of a track of the at least one representation, wherein the first element represents that the track includes video data stored using a restricted scheme, and a second element representing a restricted scheme type code for the restricted scheme of the track; and

retrieve the one or more media files including the the media data of the at least one representation based on the first element and the second element.

33. The device of claim 32, wherein to extract the data that specifies the one or more codecs, the one or more processors are configured to:

extract a first set of values for one or more @codecs parameters, wherein the values for the @codecs parameters comprise respective period-delimited lists of elements; and

extract a second set of values comprising additional information for the @codecs parameters from a different MIME type parameter.

34. The device of claim 33, wherein the different MIME type parameter comprises ‘odvdinfo,’ and wherein extracting the second set of values comprises extracting at least one of ‘povd,’ ‘fovd,’ ‘erp,’ or ‘cmp,’ and wherein the one or more processors are further configured to determine that the track of the at least one representation comprises video data including:

projected omnidirectional video data when the restricted scheme type code comprises ‘povd;’

fisheye omnidirectional video data when the restricted scheme type code comprises ‘fovd;’

equirectangular projected omnidirectional video data when the restricted scheme type code comprises ‘erp;’ or

cubemap projected omnidirectional video data when the restricted scheme type code comprises ‘cmp.’

35. The device of claim 33, wherein the additional information comprises information indicating a particular type of frame packed video data, wherein the different MIME type parameter comprises ‘fpvdinfo,’ and wherein the particular type of frame packed video data

comprises elements corresponding to stereo_scheme and stereo_indication_type.

36. The device of claim 32, wherein the one or more processors are further configured to receive one or more values for a MIME type parameter ‘hdrinfo’ for the track, the values for the MIME type parameter including information for at least one of high dynamic range (HDR) or wide color gamut (WCG) video data for the track, wherein to retrieve the media data of the at least one representation, the one or more processors are configured to retrieve media data of the track based on the values for the MIME type parameter.

37. The device of claim 36, wherein the one or more values comprise one of a single value for the MIME type parameter ‘hdrinfo’ or a comma-separated list of values for the MIME type parameter ‘hdrinfo,’ each of the values in the comma-separated list comprising a single element or a dot-separated list of elements.

38. The device of claim 32, wherein the manifest file comprises a dynamic adaptive streaming over HTTP (DASH) media presentation description (MPD).

39. The device of claim 32, wherein the device comprises at least one of:
an integrated circuit;
a microprocessor; or
a wireless communication device.

40. A device for retrieving media data, the device comprising:

means for retrieving a manifest file specifying data for at least one representation of a media presentation, wherein the manifest file includes data that specifies one or more codecs for the at least one representation, the at least one representation including one or more media files including media data, the manifest file being separate from the at least one representation, the manifest file not including media data;

means for extracting, from the manifest file, the data that specifies the one or more codecs, including:

means for extracting a first element representing a sample entry type code of a track of the at least one representation, wherein the first element represents that the track includes video data stored using a restricted scheme; and

means for extracting a second element representing a restricted scheme type code for the restricted scheme of the track; and

means for retrieving the one or more media files including the media data of the at least one representation based on the first element and the second element.

41. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause a processor to:

retrieve a manifest file specifying data for at least one representation of a media presentation, wherein the manifest file includes data that specifies one or more codecs for the at least one representation, the at least one representation including one or more media files including media data, the manifest file being separate from the at least one representation, the manifest file not including media data;

extract, from the manifest file, the data that specifies the one or more codecs, including instructions that cause the processor to:

extract a first element representing a sample entry type code of a track of the at least one representation, wherein the first element represents that the track includes video data stored using a restricted scheme; and

extract a second element representing a restricted scheme type code for the restricted scheme of the track; and

retrieve the one or more media files including the media data of the at least one representation based on the first element and the second element.