

Amended Set of Claims

1. A method of retrieving multimedia data, the method comprising:
analyzing information of a manifest file for multimedia content, wherein the information of the manifest file indicates that at least one representation of the multimedia content includes a temporal sub-sequence;
determining one or more byte ranges corresponding to locations of data for the temporal sub-sequence in one or more respective segments of the at least one representation; and
submitting one or more requests for the data for the temporal sub-sequence, wherein the requests specify the byte ranges for the respective segments of the at least one representation.
2. The method of claim 1, further comprising presenting the data of the temporal sub-sequence in a trick mode for the representation.
3. The method of claim 1, wherein determining the locations of the data comprises determining the locations of the data for the temporal sub-sequence from the manifest file.
4. The method of claim 1, wherein determining the locations of the data comprises:
retrieving data for a portion of the representation, wherein the portion of the representation includes data indicative of the one or more byte ranges corresponding to the locations of the data for the temporal sub-sequence; and
analyzing the data for the retrieved portion of the representation to determine the byte ranges corresponding to the locations of the data for the temporal sub-sequence of the representation.

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5. The method of claim 4, wherein the data for the portion of the representation defines a continuous byte sequence of one of the respective segments of the representation, wherein the continuous byte sequence comprises the data for the temporal sub-sequence, and wherein submitting one or more requests comprises submitting a single request specifying a byte range defined by the continuous byte sequence.

6. The method of claim 4, wherein the portion of the representation comprises a sub-fragment index box of the representation.

7. The method of claim 4, wherein retrieving the data for the portion of the representation comprises:

determining a starting byte of the portion of the representation and an ending byte of the portion of the representation from data of the manifest file; and

sending a partial GET request that specifies the starting byte, the ending byte, and an identifier of the representation.

8. The method of claim 1, wherein the data for the temporal sub-sequence comprises one or more instantaneous decoder refresh (IDR) pictures of the representation.

9. A device for retrieving multimedia data, the device comprising one or more processors configured to analyze information of a manifest file for multimedia content, wherein the information of the manifest file indicates that at least one representation of the multimedia content includes a temporal sub-sequence, determine one or more byte ranges corresponding to locations of data for the temporal sub-sequence in one or more respective segments of the at least one representation, and submit one or more requests for the data for the temporal sub-sequence, wherein the requests specify the byte ranges for the respective segments of the at least one representation.

10. The device of claim 9, wherein the one or more processors are configured to determine the locations of the data for the temporal sub-sequence from the manifest file.

11. The device of claim 9, wherein to determine the locations of the data the one or more processors are configured to retrieve data for a portion of the representation, wherein the portion of the representation includes data indicative of the one or more byte ranges corresponding to the locations of the data for the temporal sub-sequence, and analyze the data for the retrieved portion of the representation to determine the byte ranges corresponding to the locations of the data for the temporal sub-sequence of the representation.

12. The device of claim 11, wherein the portion of the representation comprises a sub-fragment index box of the representation wherein the data for the portion of the representation defines a continuous byte sequence of one of the respective segments of the representation, wherein the continuous byte sequence comprises the data for the temporal sub-sequence, and wherein the device is configured to submit a single request specifying a byte range defined by the continuous byte sequence.

13. The device of claim 11, wherein to retrieve the data for the portion of the representation, the one or more processors are configured to determine a starting byte of the portion of the representation and an ending byte of the portion of the representation from data of the manifest file, and send a partial GET request that specifies the starting byte, the ending byte, and an identifier of the representation.

14. The device of claim 9, wherein the device comprises at least one of:
an integrated circuit;
a microprocessor; and
a wireless communication device that includes the one or more processors.

15. A device for retrieving multimedia data, the device comprising:

means for analyzing information of a manifest file for multimedia content, wherein the information of the manifest file indicates that at least one representation of the multimedia content includes a temporal sub-sequence;

means for determining one or more byte ranges corresponding to locations of data for the temporal sub-sequence in one or more respective segments of the at least one representation; and

means for submitting one or more requests for the data for the temporal sub-sequence, wherein the requests specify the byte ranges for the respective segments of the at least one representation.

16. The device of claim 15, wherein the means for determining the locations of the data comprises means for determining the locations of the data for the temporal sub-sequence from the manifest file.

17. The device of claim 15, wherein determining the locations of the data comprises:

means for retrieving data for a portion of the representation, wherein the portion of the representation includes data indicative of one or more locations of data for the temporal sub-sequence; and

means for analyzing the data for the retrieved portion of the representation to determine the locations of the data for the temporal sub-sequence of the representation.

18. The device of claim 17, wherein the portion of the representation comprises a sub-fragment index box of the representation, wherein the data for the portion of the representation defines a continuous byte sequence of one of the respective segments of the representation, wherein the continuous byte sequence comprises the data for the temporal sub-sequence, and wherein the means for submitting the one or more requests comprise means for submitting a single request specifying a byte range defined by the continuous byte sequence.

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19. The device of claim 17, wherein the means for retrieving the data for the portion of the representation comprises:

means for determining a starting byte of the portion of the representation and an ending byte of the portion of the representation from data of the manifest file; and

means for sending a partial GET request that specifies the starting byte, the ending byte, and an identifier of the representation.

20. A computer program product comprising a computer-readable medium having stored thereon instructions that, when executed, cause a processor of a device for retrieving multimedia data to:

analyze information of a manifest file for multimedia content, wherein the information of the manifest file indicates that at least one representation of the multimedia content includes a temporal sub-sequence;

determine one or more byte ranges corresponding to locations of data for the temporal sub-sequence in one or more respective segments of the at least one representation; and

submit one or more requests for the data for the temporal sub-sequence, wherein the requests specify the byte ranges for the respective segments of the at least one representation.

21. The computer program product of claim 20, wherein the instructions cause the processor to present the temporal sub-sequence of the representation in a trick mode for the representation.

22. The computer program product of claim 20, wherein the instructions that cause the processor to determine the locations of the data comprise instructions that cause the processor to determine the locations of the data for the temporal sub-sequence from the manifest file.

23. The computer program product of claim 20, wherein the instructions that cause the processor to determine the locations of the data comprise instructions that cause the processor to:

retrieve data for a portion of the representation, wherein the portion of the representation includes data indicative of one or more locations of data for the temporal sub-sequence; and

analyze the data for the retrieved portion of the representation to determine the locations of the data for the temporal sub-sequence of the representation.

24. The computer program product of claim 23, wherein the portion of the representation comprises a sub-fragment index box of the representation, wherein the data for the portion of the representation defines a continuous byte sequence of one of the respective segments of the representation, wherein the continuous byte sequence comprises the data for the temporal sub-sequence, and wherein the instructions that cause the processor to submit the one or more requests comprise instructions that cause the processor to submit a single request specifying a byte range defined by the continuous byte sequence.

25. The computer program product of claim 23, wherein the instructions that cause the processor to retrieve the data for the portion of the representation comprise instructions that cause the processor to:

determine a starting byte of the portion of the representation and an ending byte of the portion of the representation from data of the manifest file; and

send a partial GET request that specifies the starting byte, the ending byte, and an identifier of the representation.

26. A method of sending information for multimedia data, the method comprising:
obtaining data for at least one representation of multimedia content that includes
a temporal sub-sequence;

obtaining data for a manifest file for the multimedia content, wherein
information of the manifest file indicates that the at least one representation of the
multimedia content includes the temporal sub-sequence;

sending at least a portion of the manifest file to a client device; and

sending data indicative of one or more byte ranges corresponding to locations of
data for the temporal sub-sequence in one or more respective segments of the at least
one representation to the client device.

27. The method of claim 26, wherein the manifest file includes the data indicative of
the one or more byte ranges corresponding to the locations of the data for the temporal
sub-sequence.

28. The method of claim 26, wherein a portion of the representation includes the
data indicative of the one or more byte ranges corresponding to the locations of the data
for the temporal sub-sequence, the method further comprising:

receiving a request for the portion of the representation from the client device;

and

sending the portion of the representation to the client device in response to the
request.

29. The method of claim 28, wherein the portion of the representation comprises a
sub-fragment index box of the representation, wherein the data for the portion of the
representation defines a continuous byte sequence of one of the respective segments of
the representation, and wherein the continuous byte sequence comprises the data for the
temporal sub-sequence.

30. The method of claim 28, wherein the manifest file indicates a byte range for the portion of the representation, and wherein the request comprises a partial GET request that specifies the byte range for the portion of the representation.

31. A device for sending information for multimedia data, the device comprising one or more processors configured to obtain data for at least one representation of multimedia content that includes a temporal sub-sequence, obtain data for a manifest file for the multimedia content, wherein information of the manifest file indicates that the at least one representation of the multimedia content includes the temporal sub-sequence, send at least a portion of the manifest file to a client device, and send data indicative of one or more byte ranges corresponding to locations of data for the temporal sub-sequence in one or more respective segments of the at least one representation to the client device.

32. The device of claim 31, wherein the manifest file includes the data indicative of the one or more byte ranges corresponding to the locations of data for the temporal sub-sequence.

33. The device of claim 31, wherein a portion of the representation includes data indicative of the one or more byte ranges corresponding to the locations of the data for the temporal sub-sequence, and wherein the one or more processors are configured to receive a request for the portion of the representation from the client device, and send the portion of the representation to the client device in response to the request.

34. The device of claim 33, wherein the portion of the representation comprises a sub-segment index box of the representation, wherein the data for the portion of the representation defines a continuous byte sequence of one of the respective segments of the representation, and wherein the continuous byte sequence comprises the data for the temporal sub-sequence.

35. The device of claim 33, wherein the manifest file indicates a byte range for the portion of the representation, and wherein the request comprises a partial GET request that specifies the byte range for the portion of the representation.

36. The device of claim 31, wherein the device comprises at least one of:
an integrated circuit;
a microprocessor; and
a wireless communication device that includes the one or more processors.

37. A device for sending information for multimedia data, the device comprising:
means for obtaining data for at least one representation of multimedia content that includes a temporal sub-sequence;

means for obtaining data for a manifest file for the multimedia content, wherein information of the manifest file indicates that the at least one representation of the multimedia content includes the temporal sub-sequence;

means for sending at least a portion of the manifest file to a client device; and
means for sending data indicative of one or more byte ranges corresponding to locations of data for the temporal sub-sequence in one or more respective segments of the at least one representation to the client device.

38. The device of claim 37, wherein the manifest file includes the data indicative of the one or more byte ranges corresponding to the locations of the data for the temporal sub-sequence.

39. The device of claim 37, wherein a portion of the representation includes data indicative of the one or more byte ranges corresponding to the locations of the data for the temporal sub-sequence, further comprising:

means for receiving a request for the portion of the representation from the client device; and

means for sending the portion of the representation to the client device in response to the request.

40. The device of claim 39, wherein the portion of the representation comprises a sub-fragment index box of the representation, wherein the data for the portion of the representation defines a continuous byte sequence of one of the respective segments of the representation, and wherein the continuous byte sequence comprises the data for the temporal sub-sequence.

41. The device of claim 39, wherein the manifest file indicates a byte range for the portion of the representation, and wherein the request comprises a partial GET request that specifies the byte range for the portion of the representation.

42. A computer program product comprising a computer-readable medium having stored thereon instructions that, when executed, cause a processor of a device for sending information for multimedia data to:

- obtain data for at least one representation of multimedia content that includes a temporal sub-sequence;

- obtain data for a manifest file for the multimedia content, wherein information of the manifest file indicates that the at least one representation of the multimedia content includes the temporal sub-sequence;

- send at least a portion of the manifest file to a client device; and

- send data indicative of one or more byte ranges corresponding to locations of data for the temporal sub-sequence in one or more respective segments of the at least one representation to the client device.

43. The computer program product of claim 42, wherein the manifest file includes the data indicative of the one or more byte ranges corresponding to the locations of the data for the temporal sub-sequence.

44. The computer program product of claim 42, wherein a portion of the representation includes data indicative of the one or more byte ranges corresponding to the locations of data for the temporal sub-sequence, further comprising instructions that cause the processor to:

receive a request for the portion of the representation from the client device; and
send the portion of the representation to the client device in response to the request.

45. The computer program product of claim 44, wherein the portion of the representation comprises a sub-fragment index box of the representation, wherein the data for the portion of the representation defines a continuous byte sequence of one of the respective segments of the representation, and wherein the continuous byte sequence comprises the data for the temporal sub-sequence.

46. The computer program product of claim 44, wherein the manifest file indicates a byte range for the portion of the representation, and wherein the request comprises a partial GET request that specifies the byte range for the portion of the representation.

CLAIMS

1. An invention not claimed in any divisional application.