~~**WHAT IS CLAIMED IS:**~~

CLAIMS

1. A method of reporting interactivity usage information while presenting streamed media data, the method comprising:

receiving, by a streaming client of a client device, a manifest file indicating reporting expectations representing data to be reported by the streaming client to a reporting server device during a media streaming session~~;~~

, the manifest file being separate from media files including at least one of media data or interactivity data, the manifest file not including any of the media data or the interactivity data; sending, by the streaming client, data representative of the reporting expectations to an interactivity application executed on the client device;

retrieving, by the streaming client, one or more of the media files including the at least one of the media data or the interactivity data using the manifest file; receiving, by the streaming client, interactivity usage information from the interactivity application executed on the client device; and

reporting, by the streaming client, the interactivity usage information to the reporting server device.

2. The method of claim 1, wherein sending the data representative of the reporting expectations comprises sending the data representative of the reporting expectations to the interactivity application via an application programming interface (API), and wherein receiving the interactivity usage information comprises receiving the interactivity usage information via the API.

3. The method of claim 1, wherein the reporting expectations of the manifest file include one or more of a metrics attribute that lists the interactivity usage information to be reported, a range element indicating a time period of the streaming session during which the interactivity usage information is to be collected, a location filter element indicating a geographic area in which the interactivity usage information is to be collected, one or more streaming source filter elements identifying one or more media presentations for which the interactivity usage information is not to be collected, or a reporting element indicating a reporting method and format in which to report the interactivity usage information.

4. The method of claim 1, wherein the reporting expectations of the manifest file include one or more of an access point name (APN) element defining an access point to which the interactivity usage information is to be reported, a format element indicating a format in which to report the interactivity usage information, a sample percentage element indicating a value to which to compare a randomly generated value to determine whether to report the interactivity usage information, a reporting server element defining a uniform resource locator (URL) of the reporting server device, a reporting time element indicating a media presentation time by which to report the interactivity usage information, a reporting interval element indicating a time interval between successive transmission of reports of the interactivity usage information, or a group identifier value indicating one or more client devices that are to report the interactivity usage information.

5. The method of claim 1, wherein the manifest file comprises a Media Presentation Description (MPD).

6. The method of claim 1, wherein the reporting expectations define a randomly sampled session in which the client device is to participate and a sample percentage value in service announcement signaling.

7. The method of claim 1, wherein the reporting expectations define a targeted group session in which the client device is to participate.

8. The method of claim 7, wherein the reporting expectations define a Group Identifier (ID), and an identifier for the client device corresponds to the Group ID.

9. The method of claim 1, ~~further comprising:~~

~~wherein~~ retrieving the one or more of the media files comprises: retrieving one or more of the media files including the media data;

~~and~~ receiving one or more of the media files including interactive elements~~; and~~

~~of the interactivity data, the method further comprising~~ presenting the media data, wherein presenting the media data comprises, during presentation of the media data, presenting the interactive elements.

10. The method of claim 9, further comprising collecting, by the interactivity application, the interactivity usage information according to user interaction with the ~~interactivity~~interactive elements.

11. The method of claim 1, wherein the interactivity usage information comprises one or more of an amount of viewing by a user of interactivity content, a time duration of engagement by the user with the interactivity content, a number of click-throughs by the user of embedded links in the interactivity content, a number of purchases associated with user interaction with the interactivity content, a monetary value of the purchases, or demographic information associated with the user and interactivity usage reports.

12. The method of claim 1, wherein reporting comprises:

reporting quality of experience (QoE) information in a report to the server device; and

reporting the interactivity usage information in the report to the server device.

13. The method of claim 1, wherein reporting comprises:

reporting quality of experience (QoE) information in a first report to the server device; and

reporting the interactivity usage information in a second report to the server device, the second report being different than the first report.

14. The method of claim 1, wherein reporting comprises:

sending, by the streaming client, the interactivity usage information to a multimedia broadcast~~/~~/multicast service (MBMS) client of the client device; and

reporting, by the MBMS client, the interactivity usage information to the server device.

15. The method of claim 14, wherein the MBMS client comprises an enhanced MBMS client.

16. The method of claim 14, wherein the MBMS client is included in a middleware unit of the client device.

17. The method of claim 1, wherein the streaming client comprises a Dynamic Adaptive Streaming over HTTP (DASH) client.

18. A device for reporting interactivity usage information while presenting streamed media data, the device comprising:

a memory configured to store media data; and

a processor implemented in circuitry and configured to execute a streaming client to:

receive a manifest file indicating reporting expectations representing data to be reported by the streaming client to a reporting server device during a media streaming session~~;~~, the manifest file being separate from media files including at least one of media data or interactivity data, the manifest file not including any of the media data or the interactivity data; send data representative of the reporting expectations to an interactivity application executed on the client device;

retrieve one or more of the media files including the at least one of the media data or the interactivity data using the manifest file; receive interactivity usage information from the interactivity application executed on the client device; and

report the interactivity usage information to the reporting server device.

19. The device of claim 18, wherein the streaming client is configured to send the data representative of the reporting expectations to the interactivity application via an application programming interface (API), and wherein the streaming application is configured to receive the interactivity usage information via the API.

20. The device of claim 18, wherein the reporting expectations of the manifest file include one or more of a metrics attribute that lists the interactivity usage information to be reported, a range element indicating a time period of the streaming session during which the interactivity usage information is to be collected, a location filter element indicating a geographic area in which the interactivity usage information is to be collected, one or more streaming source filter elements identifying one or more media presentations for which the interactivity usage information is not to be collected, or a reporting element indicating a reporting method and format in which to report the interactivity usage information.

21. The device of claim 18, wherein the reporting expectations of the manifest file include one or more of an access point name (APN) element defining an access point to which the interactivity usage information is to be reported, a format element indicating a format in which to report the interactivity usage information, a sample percentage element indicating a value to which to compare a randomly generated value to determine whether to report the interactivity usage information, a reporting server element defining a uniform resource locator (URL) of the reporting server device, a reporting time element indicating a media presentation time by which to report the interactivity usage information, a reporting interval element indicating a time interval between successive transmission of reports of the interactivity usage information, or a group identifier value indicating one or more client devices that are to report the interactivity usage information.

22. The device of claim 18, wherein the manifest file comprises a Media Presentation Description (MPD).

23. The device of claim 18, wherein the streaming client is ~~further~~ configured to:

retrieve one or more of the media files including the media data;

receive one or more of the media files including interactive elements of the interactivity data; and

present the media data and, during presentation of the media data, present the interactive elements.

24. The device of claim 18, wherein the processor is configured to execute the interactivity application to collect the interactivity usage information according to user interaction with the ~~interactivity~~interactive elements.

25. The device of claim 18, wherein the interactivity usage information comprises one or more of an amount of viewing by a user of interactivity content, a time duration of engagement by the user with the interactivity content, a number of click-throughs by the user of embedded links in the interactivity content, a number of purchases associated with user interaction with the interactivity content, a monetary value of the purchases, or demographic information associated with the user and interactivity usage reports.

26. The device of claim 18, wherein the streaming client is configured to:

report quality of experience (QoE) information in a report to the server device; and

——— report the interactivity usage information in the report to the server device.

27.—— The device of claim 18, wherein the streaming client is configured to:

report quality of experience (QoE) information in a first report to the server device; and

——— report the interactivity usage information in a second report to the server device, the second report being different than the first report.

28.—— The device of claim 18, further comprising a multimedia broadcast~~/~~/multicast service (MBMS) client, wherein the streaming client is configured to report the interactivity usage information via the MBMS client.

29.—— The device of claim 18, wherein the device comprises at least one of:

——— an integrated circuit;

———a microprocessor; or

———a wireless communication device.

30.—— A device for reporting interactivity usage information while presenting streamed media data, the device comprising:

——— means for receiving a manifest file indicating reporting expectations representing data to be reported by the streaming client to a reporting server device during a media streaming session~~;~~

———, the manifest file being separate from media files including at least one of media data or interactivity data, the manifest file not including any of the media data or the interactivity data;

means for sending data representative of the reporting expectations to an interactivity application executed on the client device;

——— means for retrieving one or more of the media files including the at least one of the media data or the interactivity data using the manifest file; means for receiving interactivity usage information from the interactivity application executed on the client device; and means for reporting the interactivity usage information to the reporting server device.

~~——— means for reporting the interactivity usage information to the reporting server device.~~

31. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause a processor of a client device executing a streaming client to:

receive a manifest file indicating reporting expectations representing data to be reported by the streaming client to a reporting server device during a media streaming session;

, the manifest file being separate from media files including media data and interactivity data, the manifest file not including any of the media data or the interactivity data; send data representative of the reporting expectations to an interactivity application executed on the client device; retrieve one or more of the media files including the at least one of the media data or the interactivity data using the manifest file; receive interactivity usage information from the interactivity application executed on the client device; and report the interactivity usage information to the reporting server device.

~~receive interactivity usage information from the interactivity application executed on the client device; and~~

~~report the interactivity usage information to the reporting server device.~~

32. The non-transitory computer-readable storage medium of claim 31, wherein the instructions that cause the processor to send the data representative of the reporting expectations comprise instructions that cause the processor to send the data representative of the reporting expectations via an application programming interface (API), and wherein the instructions that cause the processor to receive the interactivity usage information comprise instructions that cause the processor to receive the interactivity usage information via the API.

33. The non-transitory computer-readable storage medium of claim 31, wherein the reporting expectations of the manifest file include one or more of a metrics attribute that lists the interactivity usage information to be reported, a range element indicating a time period of the streaming session during which the interactivity usage information is to be collected, a location filter element indicating a geographic area in which the interactivity usage information is to be collected, one or more streaming source filter elements identifying one or more media presentations for which the interactivity usage information is not to be collected, or a reporting element indicating a reporting method and format in which to report the interactivity usage information.

34. The non-transitory computer-readable storage medium of claim 31, wherein the reporting expectations of the manifest file include one or more of an access point name (APN) element defining an access point to which the interactivity usage information is to be reported, a format element indicating a format in which to report the interactivity usage information, a sample percentage element indicating a value to which to compare a randomly generated value to

determine whether to report the interactivity usage information, a reporting server element defining a uniform resource locator (URL) of the reporting server device, a reporting time element indicating a media presentation time by which to report the interactivity usage information, a reporting interval element indicating a time interval between successive transmission of reports of the interactivity usage information, or a group identifier value indicating one or more client devices that are to report the interactivity usage information.

35.—— The non-transitory computer-readable storage medium of claim 31, wherein the manifest file comprises a Media Presentation Description (MPD).

36.—— The non-transitory computer-readable storage medium of claim 31, wherein the interactivity usage information comprises one or more of an amount of viewing by a user of interactivity content, a time duration of engagement by the user with the interactivity content, a number of click-throughs by the user of embedded links in the interactivity content, a number of purchases associated with user interaction with the interactivity content, a monetary value of the purchases, or demographic information associated with the user and interactivity usage reports.