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(54) SYSTEM AND METHOD FOR ENABLING PLAYLIST NAVIGATION OF DIGITAL MULTIMEDIA CONTENT

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(57) **ABSTRACT**

A multimedia device enables playlist navigation of digital multimedia content using a media player engine and a media application. The media player engine establishes a streaming media session with a content source via a standard control channel over a network, and receives, from the content source, streaming digital multimedia content representative of a current media clip within a playlist during the streaming media session. The media application is in communication with the content source via an external interface over the network and outside the standard control channel between the media player engine and the content source. The media application generates a playlist navigation message to the content source to navigate the playlist and control the streaming digital multimedia content via the external interface.

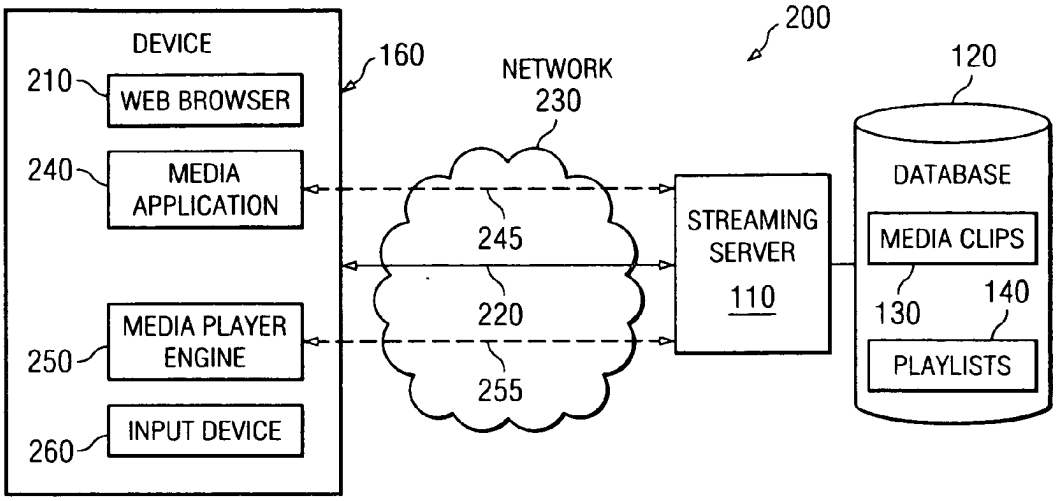
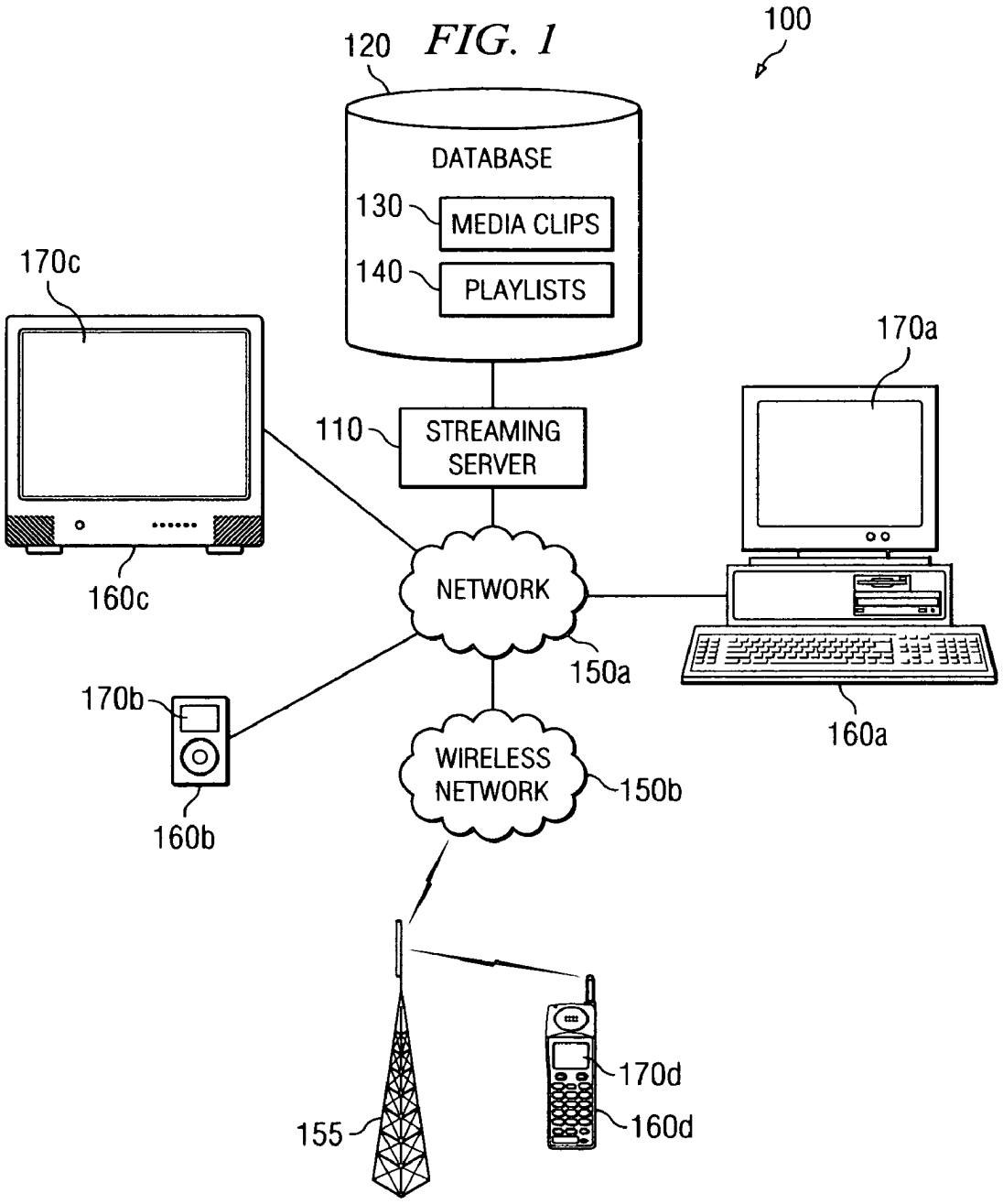


FIG. 1


100
120
DATABASE
130
MEDIA CLIPS
140
PLAYLISTS
170c
170a
110
STREAMING SERVER
NETWORK
150a
160c
160a
170b
160b
WIRELESS NETWORK
150b
155
170d
160d

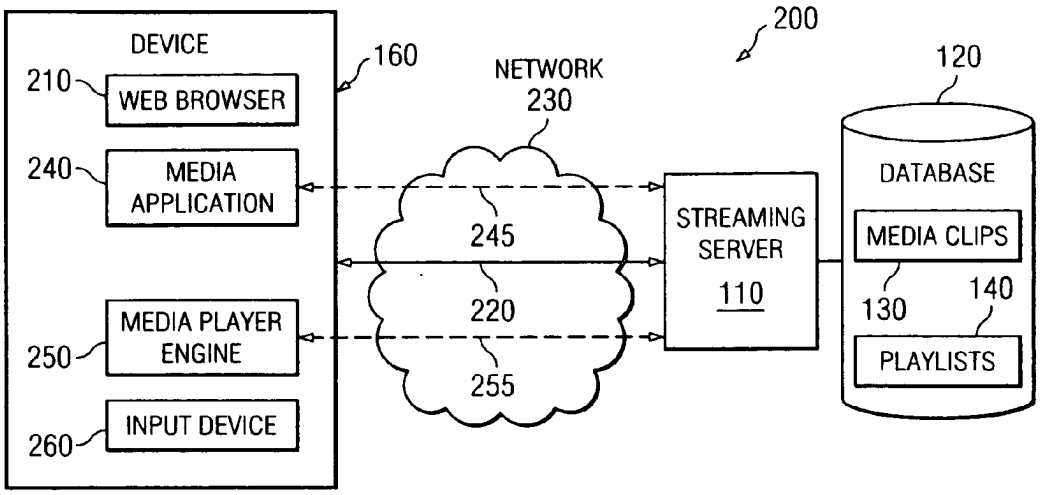


FIG. 2

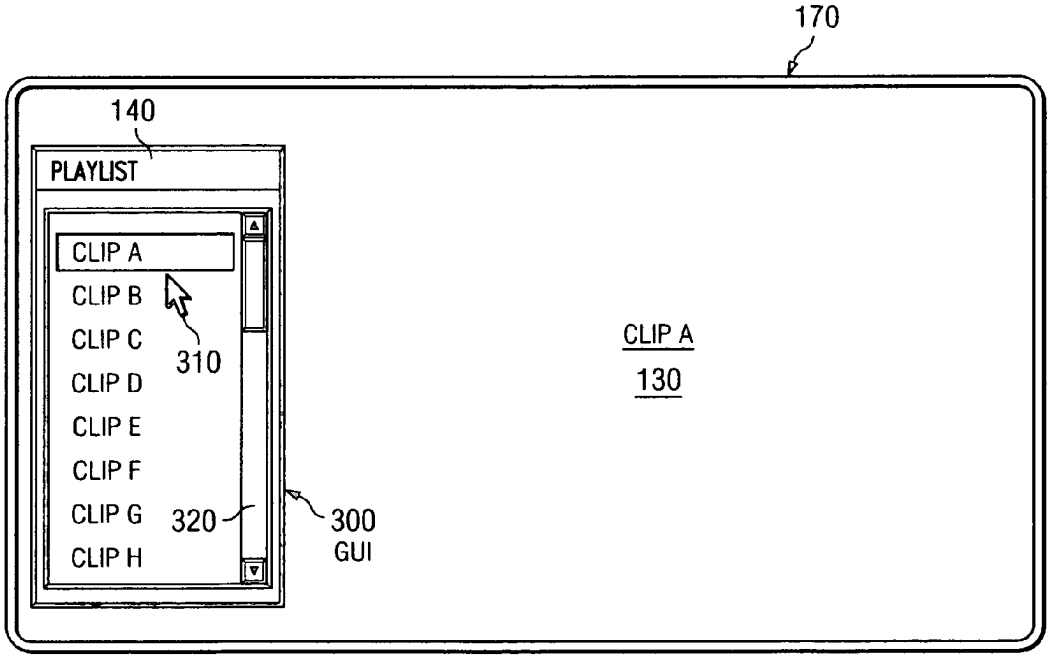


FIG. 3A

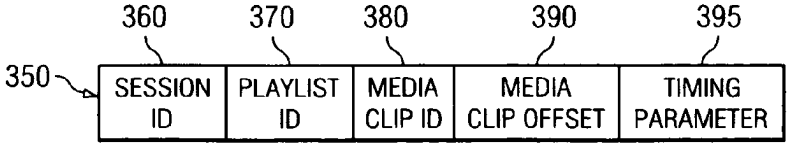


FIG. 3B

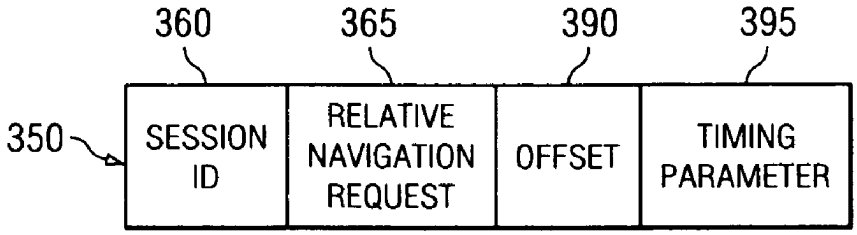

360
365
390
395
350
SESSION ID
RELATIVE NAVIGATION REQUEST
OFFSET
TIMING PARAMETER

FIG. 3C

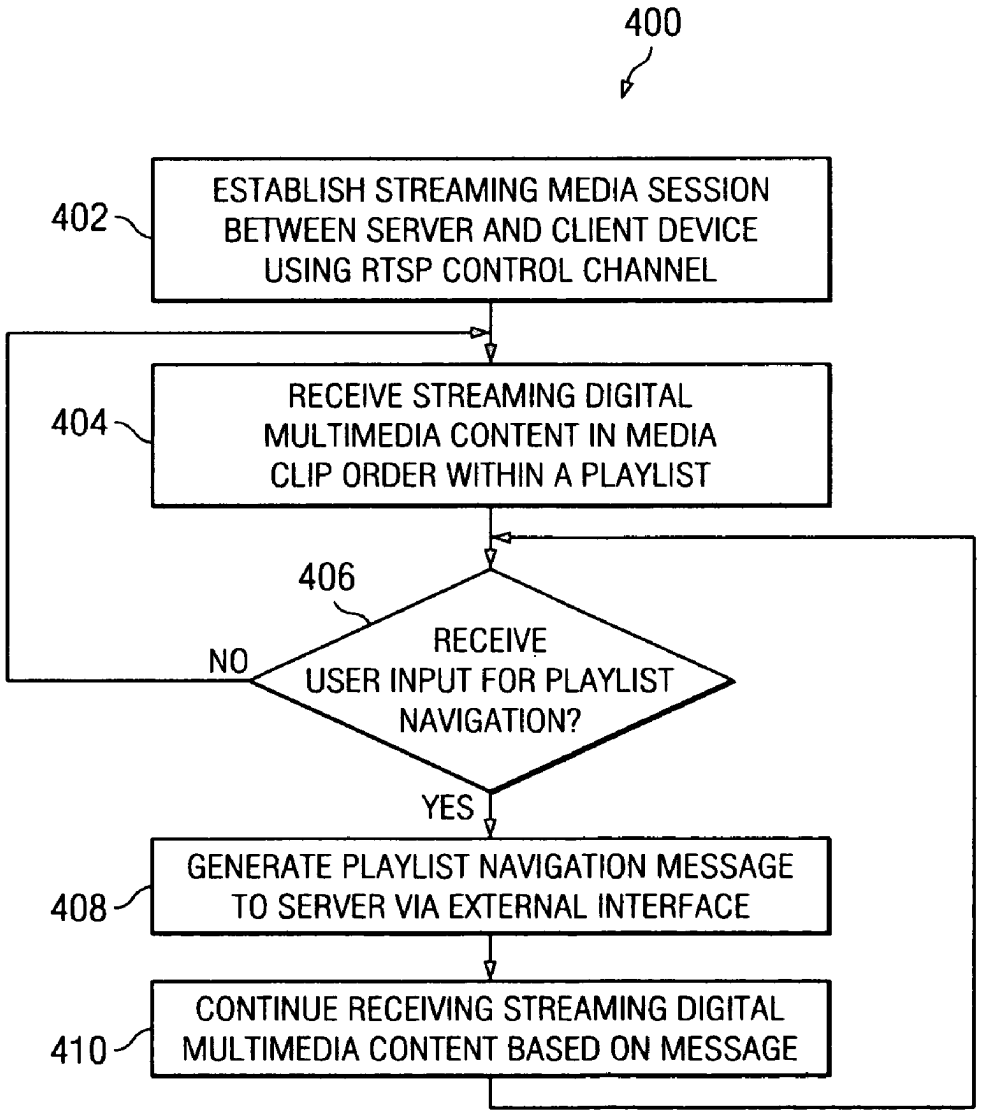

400
402
ESTABLISH STREAMING MEDIA SESSION BETWEEN SERVER AND CLIENT DEVICE USING RTSP CONTROL CHANNEL
404
RECEIVE STREAMING DIGITAL MULTIMEDIA CONTENT IN MEDIA CLIP ORDER WITHIN A PLAYLIST
406
RECEIVE USER INPUT FOR PLAYLIST NAVIGATION?
NO
YES
408
GENERATE PLAYLIST NAVIGATION MESSAGE TO SERVER VIA EXTERNAL INTERFACE
410
CONTINUE RECEIVING STREAMING DIGITAL MULTIMEDIA CONTENT BASED ON MESSAGE

FIG. 4A

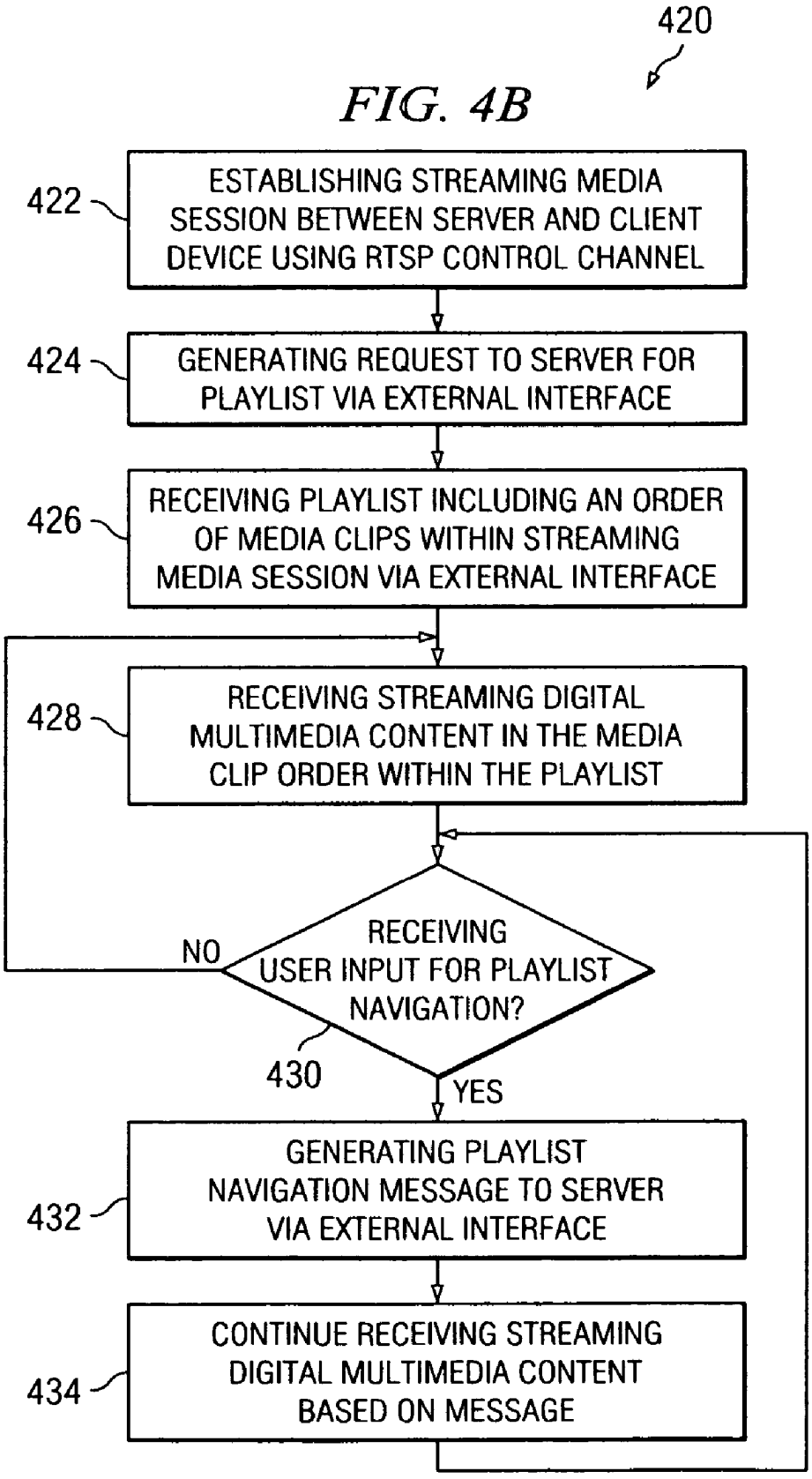

420
422
ESTABLISHING STREAMING MEDIA SESSION BETWEEN SERVER AND CLIENT DEVICE USING RTSP CONTROL CHANNEL
424
GENERATING REQUEST TO SERVER FOR PLAYLIST VIA EXTERNAL INTERFACE
426
RECEIVING PLAYLIST INCLUDING AN ORDER OF MEDIA CLIPS WITHIN STREAMING MEDIA SESSION VIA EXTERNAL INTERFACE
428
RECEIVING STREAMING DIGITAL MULTIMEDIA CONTENT IN THE MEDIA CLIP ORDER WITHIN THE PLAYLIST
RECEIVING USER INPUT FOR PLAYLIST NAVIGATION?
NO
YES
430
432
GENERATING PLAYLIST NAVIGATION MESSAGE TO SERVER VIA EXTERNAL INTERFACE
434
CONTINUE RECEIVING STREAMING DIGITAL MULTIMEDIA CONTENT BASED ON MESSAGE

FIG. 4B

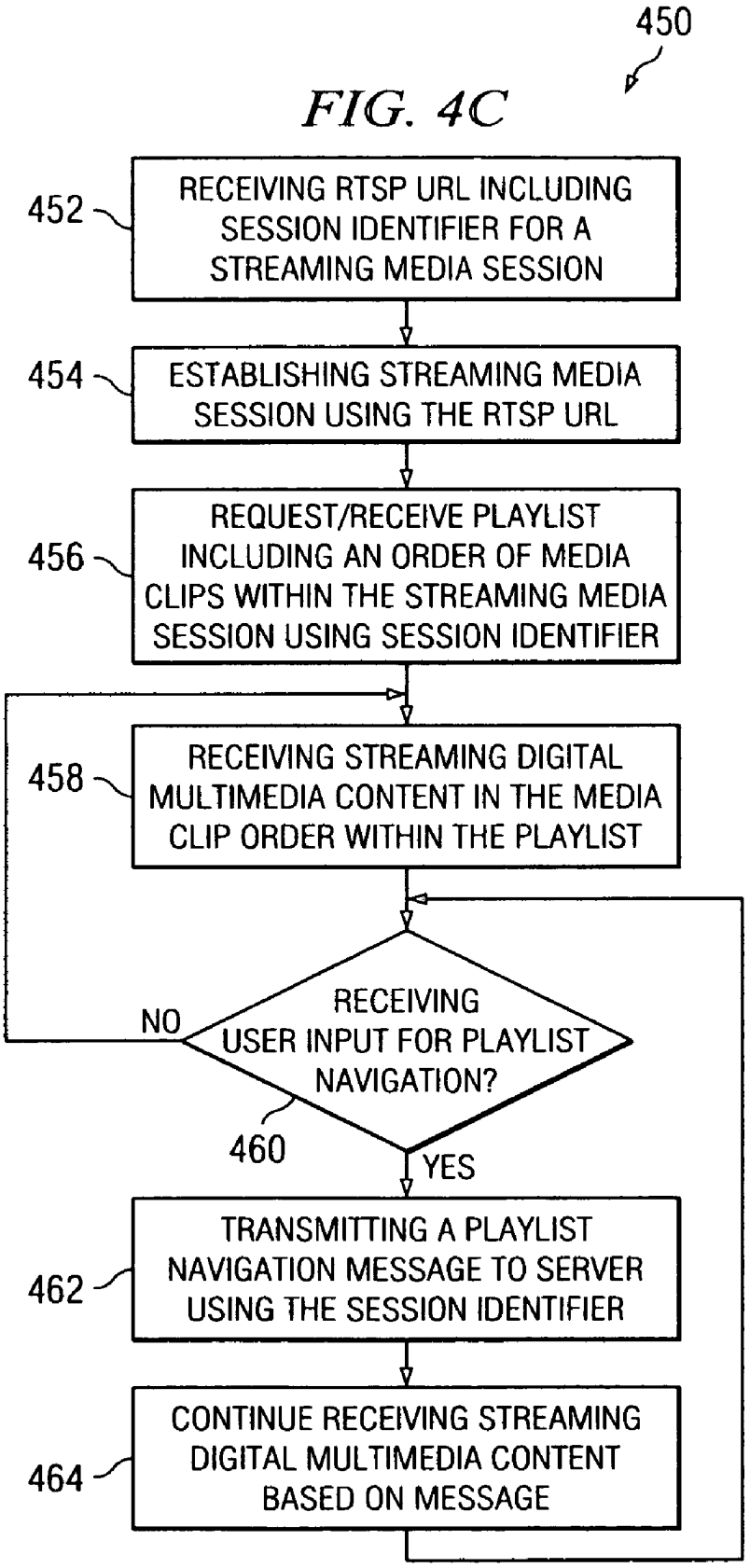

450
FIG. 4C
452
RECEIVING RTSP URL INCLUDING SESSION IDENTIFIER FOR A STREAMING MEDIA SESSION
454
ESTABLISHING STREAMING MEDIA SESSION USING THE RTSP URL
456
REQUEST/RECEIVE PLAYLIST INCLUDING AN ORDER OF MEDIA CLIPS WITHIN THE STREAMING MEDIA SESSION USING SESSION IDENTIFIER
458
RECEIVING STREAMING DIGITAL MULTIMEDIA CONTENT IN THE MEDIA CLIP ORDER WITHIN THE PLAYLIST
RECEIVING USER INPUT FOR PLAYLIST NAVIGATION?
NO
YES
460
462
TRANSMITTING A PLAYLIST NAVIGATION MESSAGE TO SERVER USING THE SESSION IDENTIFIER
464
CONTINUE RECEIVING STREAMING DIGITAL MULTIMEDIA CONTENT BASED ON MESSAGE

FIG. 5

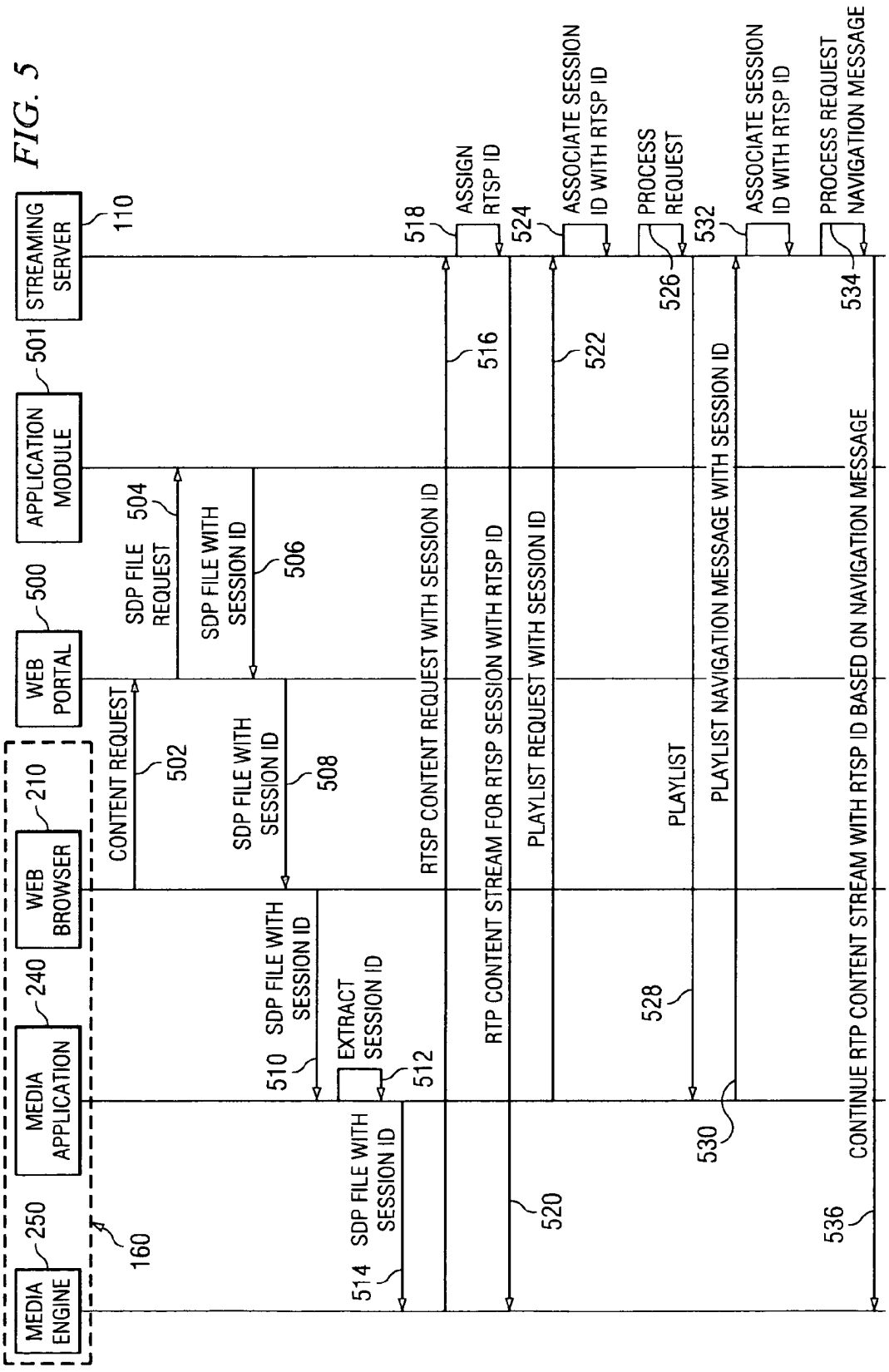

MEDIA ENGINE
250
MEDIA APPLICATION
240
WEB BROWSER
210
160
WEB PORTAL
500
APPLICATION MODULE
501
STREAMING SERVER
110
CONTENT REQUEST
502
SDP FILE REQUEST
504
SDP FILE WITH SESSION ID
506
SDP FILE WITH SESSION ID
508
SDP FILE WITH SESSION ID
510
EXTRACT SESSION ID
512
SDP FILE WITH SESSION ID
514
RTSP CONTENT REQUEST WITH SESSION ID
516
ASSIGN RTSP ID
518
RTP CONTENT STREAM FOR RTSP SESSION WITH RTSP ID
520
ASSOCIATE SESSION ID WITH RTSP ID
522
PLAYLIST REQUEST WITH SESSION ID
524
PROCESS REQUEST
526
PLAYLIST
528
ASSOCIATE SESSION ID WITH RTSP ID
532
PLAYLIST NAVIGATION MESSAGE WITH SESSION ID
530
PROCESS REQUEST NAVIGATION MESSAGE
534
CONTINUE RTP CONTENT STREAM WITH RTSP ID BASED ON NAVIGATION MESSAGE
536

FIG. 6

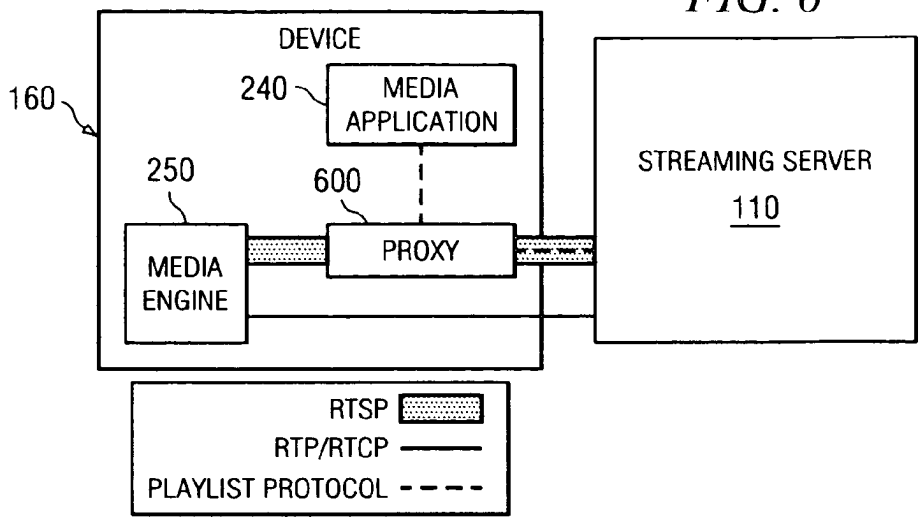


FIG. 7

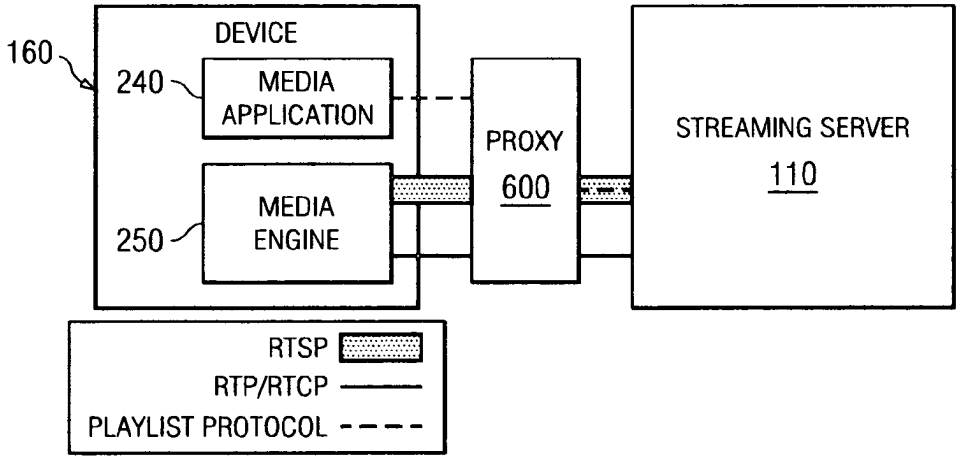


FIG. 8

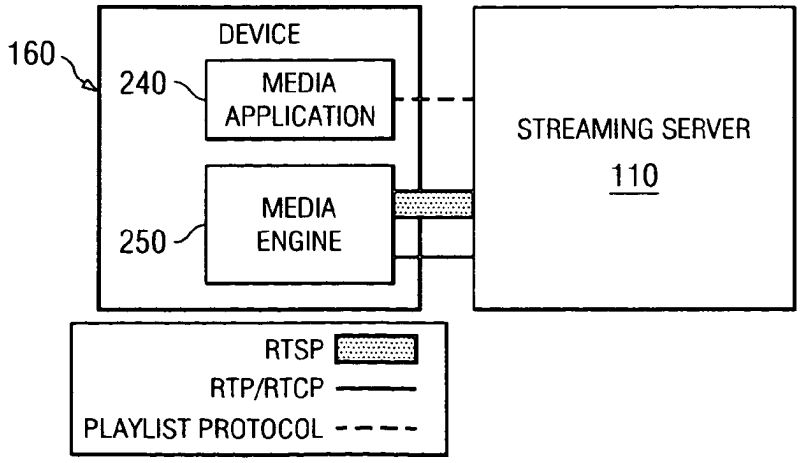


FIG. 9

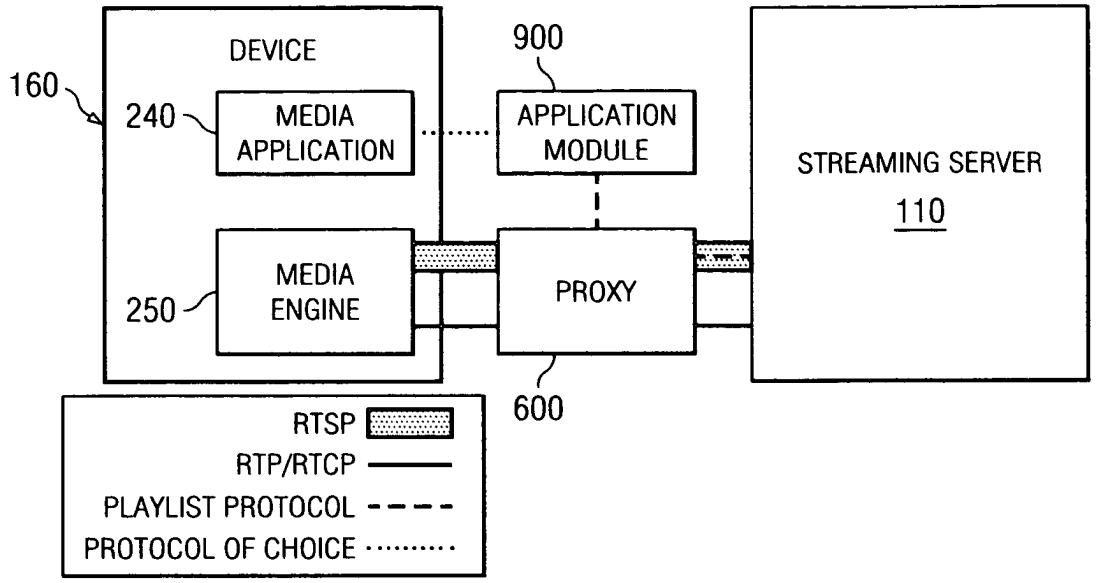

DEVICE
160
240
MEDIA APPLICATION
250
MEDIA ENGINE
900
APPLICATION MODULE
PROXY
600
STREAMING SERVER
110
RTSP
RTP/RTCP
PLAYLIST PROTOCOL
PROTOCOL OF CHOICE

FIG. 10

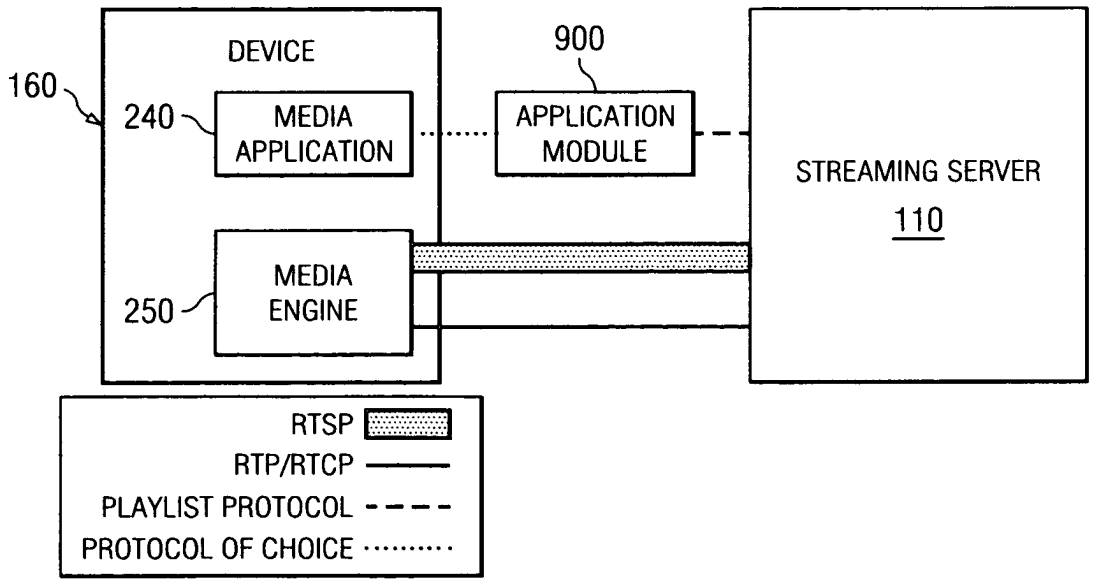

DEVICE
160
240
MEDIA APPLICATION
250
MEDIA ENGINE
900
APPLICATION MODULE
STREAMING SERVER
110
RTSP
RTP/RTCP
PLAYLIST PROTOCOL
PROTOCOL OF CHOICE

FIG. 11

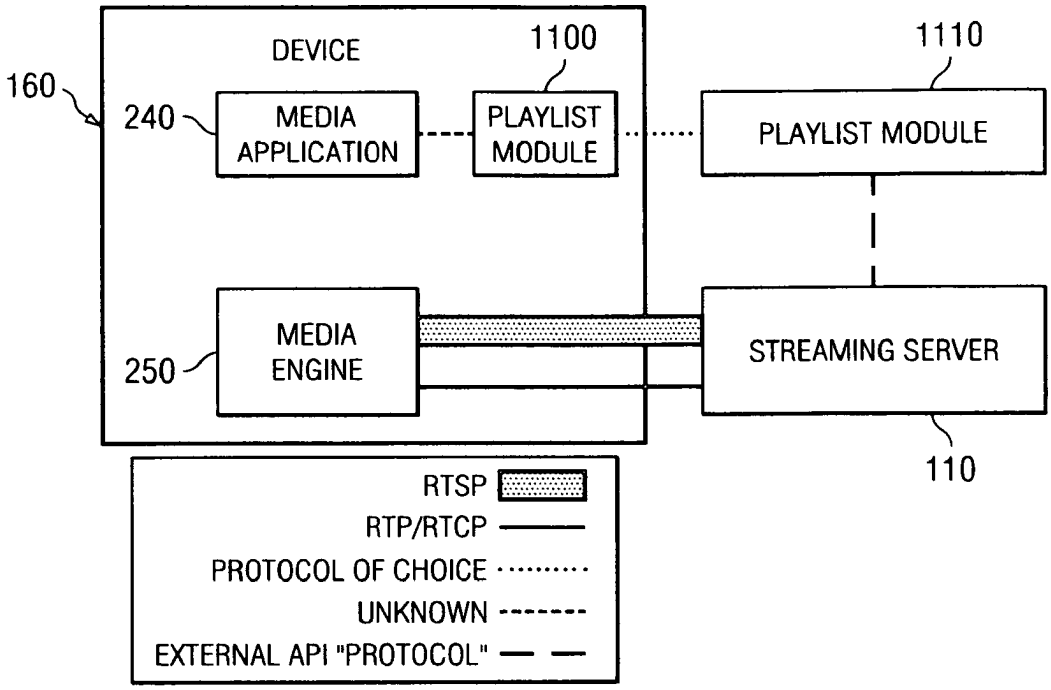
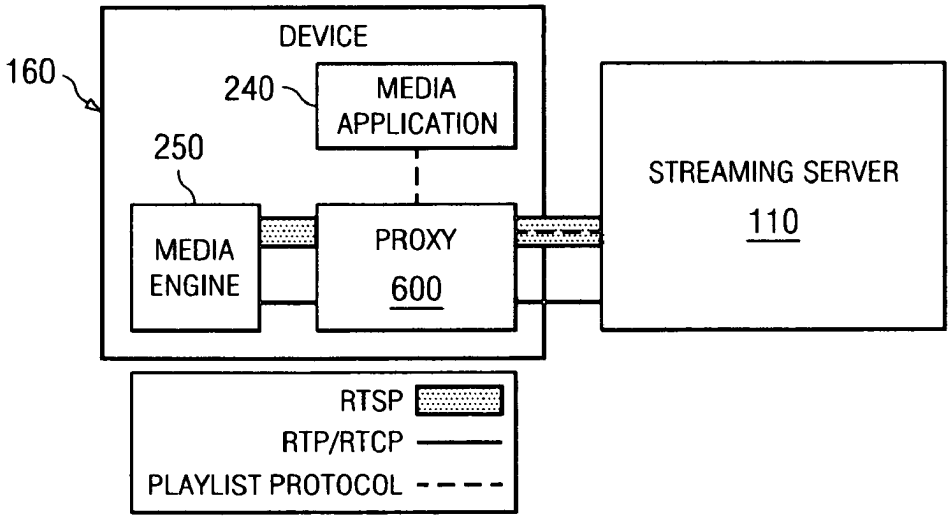

DEVICE
1100
1110
160
240
MEDIA APPLICATION
PLAYLIST MODULE
PLAYLIST MODULE
250
MEDIA ENGINE
STREAMING SERVER
110
RTSP
RTP/RTCP
PROTOCOL OF CHOICE
UNKNOWN
EXTERNAL API "PROTOCOL"

FIG. 12


DEVICE
160
240
MEDIA APPLICATION
250
MEDIA ENGINE
PROXY
600
STREAMING SERVER
110
RTSP
RTP/RTCP
PLAYLIST PROTOCOL

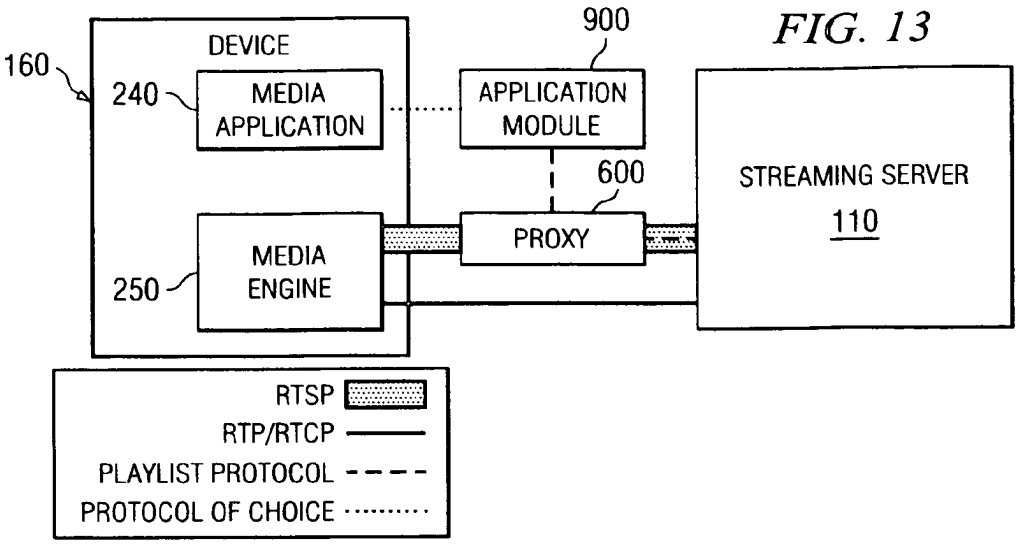


FIG. 13

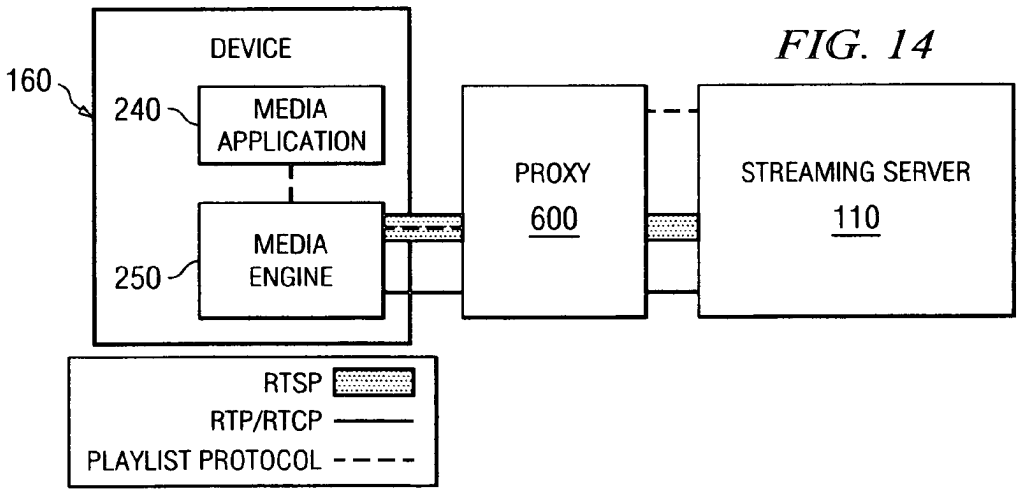


FIG. 14

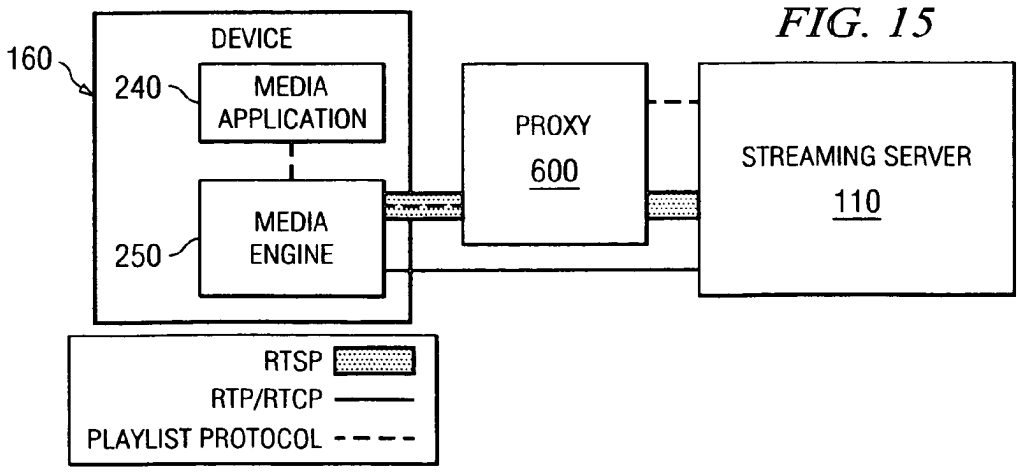


FIG. 15

SYSTEM AND METHOD FOR ENABLING PLAYLIST NAVIGATION OF DIGITAL MULTIMEDIA CONTENT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This U.S. Nonprovisional Application for Patent claims the benefit of the filing date of U.S. Provisional Patent Application entitled, PLAYLIST ENGINE INDEPENDENCE, Attorney Docket No. 134231, having Ser. No. 60/693,741, filed on Jun. 24, 2005, which is incorporated herein by reference for all purposes.

[0002] This U.S. Nonprovisional application for patent is further related by subject matter to the following PCT Patent Applications:

[0003] SYSTEM AND METHOD FOR RETRIEVING DIGITAL MULTIMEDIA CONTENT FROM A NETWORK NODE, Attorney Docket No. 134188 WO, having PCT Application No. PCT/US2005/007145, filed on Mar. 3, 2005; and

[0004] SYSTEM AND METHOD FOR RETRIEVING DIGITAL MULTIMEDIA CONTENT FROM A NETWORK NODE, Attorney Docket No. 134213 WO, having PCT Application No. PCT/US2005/007169, filed on Mar. 3, 2005; the contents of which are expressly incorporated herein in their entirety by reference thereto.

BACKGROUND OF THE INVENTION

[0005] 1. Technical Field of the Invention

[0006] The present invention relates in general to streaming digital multimedia content over a network, and in particular, to providing playlists enabling navigation of the digital multimedia content.

[0007] 2. Description of Related Art

[0008] With today's widespread use of the Internet as a major communication medium, networks are increasingly being used to transmit digital multimedia data or content (e.g., audio, full-motion video, pictures, etc.). An example of a simple network architecture enabling the transmission of multimedia content includes a client device requesting the downloading of the multimedia content from a server. Once downloaded, the client may then consume, or present, the content. Although this architecture is relatively easy to implement, the client must wait for the downloading to complete before the presentation can begin. This delay can be considerable when large blocks of multimedia data are involved.

[0009] A more sophisticated architecture of transmitting multimedia data involves a content server at one network site "streaming" the multimedia content over the network to a client at another site. Streaming is a process in which packets, sent over an Internet Protocol (IP)-based network, are used to present multimedia data continuously to a recipient client as the data arrives at the client. Thus, as perceived by the user, the multimedia content is presented in substantially real-time. Therefore, with a "streaming" architecture, the client does not have to download and store a large file before displaying the multimedia data. That is, the client may begin to present the data as it arrives (i.e., just-in-time rendering), rather than waiting for the entire data set to arrive before beginning presentation. Accordingly, at the client device, received data is buffered into a cache memory and continuously processed as soon as, or soon after, being received by the client for real time presentation of multimedia content.

[0010] Most streaming media sessions are either live sessions or video-on-demand (VOD) sessions that are typically associated with a single media clip (i.e., a single VOD file or a single live source, e.g., a video camera). However, by adding the ability to combine media clips into a single streaming session, much richer applications can be built based on multimedia streaming.

[0011] A "playlist" in its simplest form is just a list of media clips that can be used to manage playback of local multimedia content or to control streaming of server-side multimedia content during a streaming media session. For example, a playlist can include a list of the media clips, e.g., a mixture of program content and advertisements (ads), that a streaming media server can stream to a client device during a streaming media session with the client. As another example, a playlist can include several short media clips or several long blocks of programming. Thus, playlists provide an extensible, dynamic environment for delivering customizable audio and video content to users via streaming.

[0012] In a client-server streaming architecture, two types of playlists may be provided: client-side playlists and server-side playlists. Client-side playlists enable a client device to control the streaming experience, whereas server-side playlists enable a streaming media server to control the streaming experience. In addition, server-side playlists provide the streaming media server with the ability to combine streams from multiple media sources (in sequence) and stream the multimedia content from each of the media sources to a client device in a single session. The client need not (and may not even) be aware that there are multiple media sources. This may be useful for providing ad insertion capability, or for applications where uninterrupted streaming (from multiple media sources) is desired without explicit client requests for each new media source.

[0013] However, one of the drawbacks of server-side playlists is the inability of the client device, or end-user, to dynamically navigate the server-side playlist. One solution suggested by the present inventors in PCT Application Nos. PCT/US2005/007145 and PCT/US2005/007169, both of which were filed on Mar. 3, 2005, involves modifying the Real Time Streaming Protocol (RTSP) to include a playlist protocol that allows the media player engine to receive the server-side playlist and navigate the server-side playlist.

[0014] Because the current playlist protocol takes advantage of proprietary messaging using the existing RTSP channel in a 3GPP streaming session, applications that take full advantage of playlist functionality require a media player that implements this protocol. Currently, due to the proprietary nature of the protocol, there are only a limited number of existing media players (engines) that provide this functionality. This fact precludes a sophisticated playlist application from being developed on top of an existing (non-playlist-aware) 3GPP player, such as ones that are already resident on devices when purchased from the carrier. This necessarily limits the scope of applications in which a playlist streaming media server can be used.

[0015] Thus, due to interface constraints, existing media player engines may not be able to provide the full server-side

playlist navigation functionality. As a result, for server-side playlists to become widely used, the playlist navigation functionality must be made available to all client devices, regardless of the type of media engine within the client device.

[0016] Therefore, what is needed is a system and method for supporting client-side navigational control of server-side playlists with minimal impact to the client device and/or no impact to an existing media player resident on that client device.

SUMMARY OF THE INVENTION

[0017] Embodiments of the present invention provide a multimedia device that enables playlist navigation of digital multimedia content using a media player engine and a media application. The media player engine establishes a streaming media session with a content source via a standard control channel over a network, and receives, from the content source, streaming digital multimedia content representative of a current media clip during the streaming media session. The media application is in communication with the content source via an external interface over the network and outside the standard control channel between the media player engine and the content source. The media application generates a playlist navigation message to the content source to navigate the playlist and control the streaming digital multimedia content via the external interface.

[0018] In one embodiment, the media application is further operable to generate a request to the streaming media server for the playlist that identifies the plurality of media clips including the current media clip and to receive the playlist from the streaming media server via the external interface.

[0019] In another embodiment, the multimedia device further includes a web browser that receives a uniform resource locator (URL) including a session identifier for the streaming media session. The web browser provides the URL including the session identifier to the media engine for use in establishing the streaming media session with the content source. In addition, the media application extracts the session identifier from the URL, and generates the playlist navigation message using the session identifier.

[0020] In a further embodiment, the playlist navigation generated by the media application includes the session identifier, a playlist identifier of the playlist, a media clip identifier for a selected media clip and a timing parameter indicating a time at which the streaming media server switches from the current media clip to the selected media clip. In yet a further embodiment, the playlist navigation message includes a session identifier identifying the streaming media session and a relative navigation request parameter providing navigation information relative to the current media clip.

[0021] Embodiments of the present invention further provide a multimedia system including a streaming media server providing access to media clips and playlists and a multimedia device having a media player engine and a media application. The media player engine establishes a streaming media session with the streaming media server via a standard control channel over a network, and receives, from the streaming media server, streaming digital multimedia content representative of a current one of the media clips during the streaming media session. The media application is in communication with the streaming media server via an external interface over the network and outside the standard control channel between the media player engine and the streaming media server. The media application generates a playlist navigation message to the streaming media server to navigate the playlist and control the streaming digital multimedia content via the external interface.

[0022] In an exemplary embodiment, the multimedia system further includes a conversion module operable to convert between a first protocol used by the media application to generate the playlist navigation message and a second protocol used by the streaming media server to process the playlist navigation message. In one embodiment, the conversion module is within the device. In another embodiment, the conversion module is within the network.

[0023] Embodiments of the present invention further provide a method for enabling playlist navigation of digital multimedia content. The method includes establishing a streaming media session with a content source via a standard control channel over a network and receiving from the content source streaming digital multimedia content representative of a current one of a plurality of media clips within a playlist during the streaming media session. The method further includes generating a playlist navigation message to the content source for navigating the playlist to control the streaming digital multimedia content via an external interface over the network and outside the standard control channel, and continuously receiving from the content source the streaming digital multimedia content based on the playlist navigation message.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] A more complete understanding of the present invention may be obtained by reference to the following detailed description when taken in conjunction with the accompanying drawings wherein:

[0025] FIG. **1** illustrates an exemplary multimedia system for providing media clips in the form of digital multimedia content and playlists identifying the media clips from a streaming media server to a multimedia client device, in accordance with embodiments of the present invention;

[0026] FIG. **2** is a block diagram illustrating an exemplary client-server arrangement enabling playlist navigation, in accordance with embodiments of the present invention;

[0027] FIG. **3**A depicts a client device display on which both digital multimedia content and a playlist are displayed, in accordance with embodiments of the present invention;

[0028] FIGS. **3**B and **3**C are representative of exemplary playlist navigation messages generated by the client device, in accordance with embodiments of the present invention;

[0029] FIG. **4**A is a flowchart illustrating an exemplary process for enabling playlist navigation, in accordance with embodiments of the present invention:

[0030] FIG. **4**B is a flowchart illustrating another exemplary process for enabling playlist navigation, in accordance with embodiments of the present invention;

[0031] FIG. **4**C is a flowchart illustrating yet another exemplary process for enabling playlist navigation, in accordance with embodiments of the present invention;

[0032] FIG. **5** is a message flow diagram illustrating exemplary messaging for navigating a playlist, in accordance with embodiments of the present invention; and

[0033] FIGS. **6-15** are block diagrams illustrating various exemplary client-server arrangements within the multimedia system, in accordance with embodiments of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

[0034] Referring to FIG. **1**, there is illustrated an exemplary multimedia system **100** capable of implementing various embodiments of the present invention. The multimedia system **100** includes a streaming media server **110**, database **120**, a plurality of client multimedia devices **160***a*-**160***d* and networks **150***a* and **150***b*. The streaming media server **110** is coupled to network **150***a* to stream digital multimedia content to one or more client multimedia devices **160***a*-**160***d* using a suitable text-based protocol, such as the Real-Time Streaming Protocol (RTSP). Although the streaming media server **110** is illustrated as a single node coupled to network **150***a*, its functionality may be distributed among a plurality of nodes depending on the underlying streaming media architecture.

[0035] The database **120** serves as a depository of the digital multimedia content. The streaming media server **110** interfaces with the database **120** to retrieve the digital multimedia content to be streamed to the client devices **160***a*-**160***d* via network **150***a* and/or **150***b*. Within the database **120**, the digital multimedia content is stored as media clips **130**. Each media clip **130** contains a digital media file, such as a sound file, picture data file, movie file, text file or any other type of media that can be digitally stored on a computer.

[0036] The media clips **130** are further organized within the database **120** based on parameters that are used to classify, identify and/or describe the media clips **130**. For example, as shown in FIG. **1**, the media clips **130** are organized into server-side playlists **140** that can be generalized to media collections, including collections of mixed digital media. For example, playlists **140** may be used to combine media by genre, mood, artist, director/producer, audience, or any other meaningful arrangement. Each playlist **140** identifies one or more individual media clips **130** stored on the database **120**. While the playlists **140** maintained on the database **120** will typically only identify media clips **130** and other playlists **140** contained within the database **120**, in other embodiments, the playlists **140** may identify media clips or playlists stored on other databases and/or other streaming media servers, depending upon the implementation of the multimedia system **100**. As used herein, the term "playlist" refers to a set of one or more streams, each representing a particular media clip **130**, that are streamed in succession to a client device **160***a*-**160***d* as a complete media feed.

[0037] Networks **150***a* and **150***b* are illustrative of a network infrastructure that can include, among others, any wireline, wireless, satellite, or cable network arrangement, or a combination thereof, that can support transfer of digital multimedia content from the streaming media server **110** to the various client devices **160***a*-**160***d* capable of accepting such content over a client-server network architecture. In one implementation, network **150***a* may comprise a public packet-switched network such as the Internet that is accessible via suitable access means including both narrowband (e.g., dial-up) and broadband (e.g., cable, digital subscriber line or DSL, etc.) access mechanisms. Alternatively, network **150***a* may be implemented as a private enterprise-level intranet. Wireless network **150***b* may be implemented as a wireless packet data service network, such as the General Packet Radio Service (GPRS) network, that provides a packet radio access for mobile devices using the cellular infrastructure of a Global System for Mobile Communications (GSM)-based carrier network. In still further implementations, the wireless network **150***b* may comprise any known or heretofore unknown 3rd Generation Partnership Project (i.e., 3GPP, 3GPP2, etc.) network operable to serve Internet Protocol (IP)-capable handheld devices, e.g., a mobile client device **160***d*, using appropriate wireless infrastructure **155** that includes, among others, short-range wireless fidelity (WiFi) access points (APs), base stations or "hot spots." It should be understood that embodiments of the present invention apply to any particular wireless or wireline network implementation of the networks **150***a* and **150***b*.

[0038] Turning now to FIG. **2**, there is illustrated an exemplary client-server arrangement **200** enabling a client device **160** to select a particular media clip **130** from a playlist **140**, in accordance with embodiments of the present invention. In FIG. **2**, the client device **160** is shown including a web browser **210**, a media application **240**, a media player engine **250** and an input device **260**. The web browser **210** executing on the client device **160** is operable to interact with a web server (not shown) with respect to user requests and user feedback for locating streaming media content, e.g., by identifying a uniform resource locator (URL) for the streaming media server **110**.

[0039] The URL may further identify a particular playlist **140** and/or media clip **130** accessible by the streaming media server **110**. For example, each playlist **140** and/or media clip **130** may be identified by an RTSP URL. As an example, the RTSP URL:

[0040] rtsp://media.example.com.554/twister/audiotrack

identifies the audio stream media clip within the playlist "twister", which can be controlled via RTSP requests to the streaming media server **110** <media.example.com>.

[0041] The media player engine **250**, which may be embodied in software, hardware, firmware, or any combination thereof, communicates with the streaming media server **110** to establish a streaming media session, to receive streaming digital multimedia content therefrom and to control play back of the streaming digital multimedia content during the streaming media session. For example, the media player engine **250** may send RTSP requests to the streaming media server **110** to play, pause or stop a streaming media session.

[0042] The media application **240** is a streaming media application executing on the client device **160** that is operable to provide playlist navigation control during a streaming media session. By way of example, but not limitation the media application **240** may provide instructions to the streaming media server **110** to move within the playlist **140** relative to the current media clip being played by the streaming media server within the playlist (e.g., next media

clip, previous media clip), move within the current media clip relative to the current position of the streaming media server in the media clip (e.g., fast-forward or rewind), skip one or more media clips **130** within the playlist **140** (e.g., skip to media clip X), immediately transition from a current media clip **130** to another media clip **130** within the playlist **140** (e.g., switch to media clip X), begin playing another media clip **130** within the playlist **140** at a particular time (e.g., switch to media clip X at time T) and/or switch to another playlist **140** (e.g., switch to playlist B).

[**0043**] The media application **240** and media player engine **250** each communicate with the streaming media server **110** via respective physical and logical channels over a network **230**, which can include any type or combination of networks, such as the networks **150***a* and **150***b* shown in FIG. **1**. More particularly, the media player engine **250** communicates with the streaming media server **110** via physical channel **220** and a standard logical control channel **255**, while the media application **240** communicates with the streaming media server **110** via logical channel **245**. Logical channel **245** represents an external interface **245** to the streaming media server **110** that is outside of the standard logical control channel **255** between the media player engine **250** and the streaming media server **110**.

[**0044**] The physical channel **220** uses a transport protocol, e.g., Real-Time Protocol (RTP), to stream digital multimedia content from the streaming media server **110** to the media player engine **250** within the client device **160** for real-time play back thereof. The external interface **245** uses one or more communication protocols (e.g., HTTP or other protocol), at least one of which is understood by the streaming media server **110**, to access the playlist **140** associated with the streaming media session and to control playlist navigation. For example, the media application **240** may generate a message in a first protocol for conversion thereof through the external interface **245** into a second protocol used by the streaming media server **110**. A conversion module (not shown) may be included within the client device **160**, within the streaming media server **120** or within the network (e.g., on a network node in communication with the device **160** and server **110**) to perform the protocol conversion.

[**0045**] The standard control channel **255** between the media player engine **250** and the streaming media server **110** uses an application-level text-based protocol, such as RTSP, Session Initiation Protocol (SIP), H.323, etc., to initiate and control the streaming media session. RTSP is operable to control multiple streaming media sessions, provide a means for choosing delivery channels, such as User Datagram Protocol (UDP) channels, multicast UDP channels, etc., as well as provide a means for choosing data delivery mechanisms based upon the Real-Time Protocol (RTP). In general, RTSP establishes and controls play back of one or more time-synchronized streams of continuous media, such as audio and video. For example, RTSP may be used to play, pause or stop a streaming media session.

[**0046**] As mentioned above, the streams controlled by RTSP may use RTP for data delivery over the physical channel **220**, but the operation of RTSP does not depend on the transport mechanism used to carry continuous media. Thus, an RTSP session is not tied to a specific transport-level connection, such as the Transmission Control Protocol (TCP). During an RTSP session, an RTSP client application may open and close a number of TCP transport connections to the server **110** to issue RTSP requests. Alternatively, RTSP may use a connectionless transport protocol, such as UDP. Additional details regarding RTSP may be found in IETF Request for Comments (RFC) 2326, "Real Time Streaming Protocol (RTSP)" by Schulzrinne et al. (dated April 1998), which is incorporated by reference herein.

[**0047**] In an exemplary operation, upon receiving a URL for accessing and retrieving streaming digital multimedia content, the media player engine **250** establishes a streaming media session with the streaming media server **110** associated with the streaming digital multimedia content using the URL over the RTSP control channel **255**. For example, the media player engine **250** can include the URL in an RTSP request to the streaming media server **110** to receive digital multimedia content representing one or more media clips **130** associated with a particular playlist **140**. In response, the streaming media server **110** assigns an RTSP session identifier to the streaming media session and passes the RTSP session identifier back to the media player engine **250** for use in controlling the streaming media session.

[**0048**] Once the streaming media session is established between the streaming media server **110** and the media player engine **250** over the RTSP control channel **255**, the streaming media server **110** accesses the database **120** to retrieve the media clips **130** within the particular playlist **140** requested by the media player engine **250**, and streams the retrieved media clips **130** associated with the particular playlist **140** to the client device **160** over the physical RTP channel **220**.

[**0049**] At any time during the streaming media session, the media application **240** can communicate with the streaming server **110** over the external interface **245** to retrieve the playlist **140** and/or navigate the playlist **140** to control the digital multimedia content streamed to the media player engine **250**. In one embodiment, the media application **240** is communicatively coupled to the web browser **210** to receive the URL and uses information in the URL to retrieve the correct playlist **140** from the streaming media server **110**. For example, the URL can include a unique playlist session identifier that is used by the streaming media server **110** to correlate requests from the media application **240** to the particular streaming media session with the media player engine **160**. The media application **240** includes the session identifier in each message sent to the streaming media server **110** to enable the streaming media server **110** to identify the ongoing streaming media session to which the message is directed. In another embodiment, the media application **240** is provided with the RTSP session identifier, and uses the RTSP session identifier to route messages to the streaming media server **110** over the external interface **245**.

[**0050**] In addition, the media application **240** is operably coupled to the input device **260**, e.g., mouse, keyboard, light pen, stylus, "soft" keyboard or other input device, to receive user signals representing user input for navigating the playlist **140**, thereby controlling the digital multimedia content streamed from the server **110** to the media player engine **250**. For example, the input device **260** may provide user signals to the media application **240** that instruct the media application **240** to generate a playlist navigation message including navigation parameters for navigating the playlist. By way of example, but not limitation, the navigation

parameters may include moving within the playlist **140** to the next media clip **130** or previous media clip **13**O, moving within the current media clip, such as fast-forwarding or rewinding, skipping one or more media clips **130** in the playlist **140**, transitioning to the next media clip **130** in the playlist **140** and/or switching to another playlist. In response to the user signals, the media application **250** generates and transmits the playlist navigation message to the streaming media server **110** via the external interface **245**, and includes either the unique playlist session identifier or the assigned RTSP session identifier in the playlist navigation message. The streaming media server **110** correlates the unique playlist session identifier or the RTSP session identifier with the ongoing streaming media session with media player engine **250**, and processes the message for the ongoing streaming media session.

[**0051**] For example, if the playlist navigation message includes a request for an immediate transition to the next media clip **130** in the playlist **140**, upon receipt of the message, the streaming media server **110** seamlessly stops streaming the current media clip and begins streaming the next media clip. Since the client device **160** continuously receives digital multimedia content from the streaming media server **110**, a user would not perceive any discontinuity in time of the real-time streaming digital multimedia content. Thus, the streaming digital multimedia content would represent the current media clip for a first portion of the streaming media session and represent the next media clip for a second portion of the streaming media session.

[**0052**] FIG. **3**A depicts an exemplary client device display **170** on which both digital multimedia content (media clips **130**) and a playlist **140** are displayed, in accordance with embodiments of the present invention. The playlist **140** is displayed within a graphical user interface (GUI) **300** on the display that enables a user to select media clips **130** from the playlist **140**. For example, the user can control the position of a cursor **310** and/or scroll bar **320** on the GUI **300** using the input device **260** shown in FIG. **2**, to select one or more media clips **130** from the playlist **140**. For example, as shown in FIG. **3**A, the current playlist **140** includes Clips A, B, C, D, E, F, G and H. On the display, Clip A is currently being played. However, if the user desires to skip to Clip C, the user can move the cursor **310** and/or scroll bar **320** to highlight and select Clip C.

[**0053**] FIG. **3**B is representative of an exemplary playlist navigation message **350** generated by the client device, in accordance with embodiments of the present invention. The message **350** includes the session identifier **360** (e.g., either the unique playlist session identifier received in the URL or the RTSP session identifier assigned by the streaming media server), a playlist identifier **370** identifying the selected playlist, a media clip identifier **380** identifying a media clip, a media clip offset **390** and a timing parameter **395**. The media clip offset **390** may be used to specify at which point within the identified clip streaming should begin. The timing parameter **395** (referred to as effective time or activation time) may be provided to determine when a client-initiated playlist navigation request is to be satisfied (e.g., now, end of current clip, end of playlist, or a time value based on a clock). Thus, the timing parameter **395** indicates a time at which the streaming media server switches between media clips.

[**0054**] FIG. **3**C is representative of another exemplary playlist navigation message **350** generated by the client device, in accordance with embodiments of the present invention. The message **350** in FIG. **3**C is a relative playlist navigation message that does not require the media application to have any knowledge of the playlist file. Therefore, in embodiments in which the media application does not have access to the playlist file, the media application can still provide client-side navigation control of the server-side playlist.

[**0055**] In FIG. **3**C, the message **350** includes the session identifier **360** (e.g., either the unique playlist session identifier received in the URL or the RTSP session identifier assigned by the streaming media server), a relative navigation request parameter **365**, a media clip offset **390** and a timing parameter **395**. The relative navigation request parameter **365** provides instructions for the streaming media server to change the multimedia digital content streamed to the client device relative to the current position of the streaming media server within the playlist and/or within the media clip. By way of example, but not limitation, the relative navigation request parameter **365** may include a request to move within the playlist **140** relative to the current media clip being played by the streaming media server within the playlist (e.g., next media clip, previous media clip) or to move within the current media clip relative to the current position of the streaming media server in the media clip (e.g., fast-forward or rewind). The media clip offset **390** may be used to specify at which point within the next/previous clip streaming should begin or at which point within the current clip streaming should begin. The timing parameter **395** (referred to as effective time or activation time) may be provided to determine when a client-initiated playlist navigation request is to be satisfied (e.g., now, end of current clip, end of playlist, or a time value based on a clock).

[**0056**] FIG. **4**A illustrates an exemplary process **400** for enabling playlist navigation, in accordance with embodiments of the present invention. Initially, at block **402**, an RTSP SETUP message is generated by the client device over an RTSP control channel to the streaming media server to establish a streaming media session therebetween. At block **404**, the client device receives streaming digital multimedia content representing a media clip within a playlist associated with the streaming media session. At the end of a current clip, the streaming media server uninterruptedly transitions to streaming from the next media clip in the playlist.

[**0057**] While streaming from the current media clip is continuing, at block **406**, a determination is made whether user input for playlist navigation is received. For example, the user input may request movement within the playlist to the next media clip or previous media clip, movement within the current media clip, such as fast-forwarding or rewinding, skipping one or more media clips in the playlist, transitioning to another media clip in the playlist immediately or at a particular time and/or switching to another playlist. If so (Y branch of **406**), at block **408**, the client device generates a playlist navigation message including navigation parameters that instruct the streaming media server to navigate the playlist and change the digital multimedia content streamed to the client device according to the user input, and transmits the playlist navigation message to the streaming media server via the external interface. For example, the client

device can generate a playlist navigation message which includes new media clip parameters, as described above in connection with FIG. **3**B, or relative navigation request parameters, as described above in connection with FIG. **3**C.

[**0058**] Responsive thereto, at block **410**, the streaming media server navigates the playlist according to the navigation parameters included in the playlist navigation message, and continues to stream digital multimedia content after navigation such that the client device continuously receives streaming digital multimedia content. Thus, the playlist navigation message allows the user to control the digital multimedia content streamed to the client device. Depending on specific message parameters, navigation can begin immediately upon receiving the playlist navigation message or at a particular point in time.

[**0059**] If user input for playlist navigation is not received (N branch of **406**), the client device continues to receive the digital multimedia content in the media clip order designated in the playlist. Thus, upon reaching the end of the current media clip, the streaming media server continues to stream from the next media clip in the playlist. This process continues until the playlist is ended.

[**0060**] FIG. **4**B illustrates another exemplary process **420** for enabling playlist navigation, in accordance with embodiments of the present invention. Initially, at block **422**, an RTSP SETUP message is generated by the client device over an RTSP control channel to the streaming media server to establish a streaming media session therebetween. In addition, at block **424**, the client device further generates a request via an external interface to the streaming media server for a playlist associated with the streaming media session. For example, the playlist can include media clip identifiers and other media clip metadata, such as the set of encodings, network addresses and other information about the content, for all of the media clips within the playlist currently being streamed to the client device. In an exemplary embodiment, the playlist also includes an order by which the media clips will be successively streamed to the client device.

[**0061**] In response to the playlist request, at block **426**, the client device receives the requested playlist from the streaming media server via the external interface. In addition, at block **428**, the client device further receives streaming digital multimedia content representing one of the media clips in the playlist. At the end of a current clip, the streaming media server uninterruptedly transitions to streaming from the next media clip in the playlist.

[**0062**] While streaming from the current media clip is continuing, at block **430**, a determination is made whether user input for playlist navigation is received. For example, the user input may request movement within the playlist to the next media clip or previous media clip, movement within the current media clip, such as fast-forwarding or rewinding, skipping one or more media clips in the playlist, transitioning to another media clip in the playlist immediately or at a particular time and/or switching to another playlist. If so (Y branch of **430**), at block **432**, the client device generates a playlist navigation message including navigation parameters that instruct the streaming media server to navigate the playlist according to the user input and transmits the playlist navigation message to the streaming media server via the external interface.

[**0063**] For example, if the user input selects another media clip in the playlist, the client device can generate a SWITCH message to change from the current media clip to the selected media clip and transmits the message to the streaming media server via the external interface. Responsive thereto, at block **434**, the streaming media server navigates the playlist according to the navigation parameters included in the playlist navigation message, and continues to seamlessly stream digital multimedia content after navigation. Using the above example, the streaming media server would seamlessly switch to the selected media clip in the playlist, such that the client device continuously receives streaming digital multimedia content. Depending on specific message parameters, streaming from the current clip can continue until the end or may be terminated substantially immediately upon receiving the SWITCH message from the client device.

[**0064**] If user input selecting a new media clip is not received (N branch of **430**), the client device continues to receive the digital multimedia content in the media clip order designated in the playlist. Thus, upon reaching the end of the current media clip, the streaming media server continues to stream from the next media clip in the playlist. This process continues until the playlist is ended.

[**0065**] FIG. **4**C illustrates yet another exemplary process **450** for enabling playlist **15** navigation, in accordance with embodiments of the present invention. Initially, at block **452**, a client multimedia device receives an RTSP URL that includes a playlist session identifier for a streaming media session. At block **454**, the client device uses the RTSP URL establish the streaming media session. For example, the client device can include the entire RTSP URL within an RTSP SETUP message sent over an RTSP control channel to a streaming media server to establish a streaming media session therebetween.

[**0066**] In addition, at block **456**, the client device further generates a request to the streaming media server for a playlist associated with the streaming media session using the playlist session identifier included in the RTSP URL. For example, the client device can populate a message with the playlist session identifier and transmit the message via an external interface to the streaming media server. The playlist includes media clip identities of all media clips within the playlist and an order by which the media clips will be successively streamed to the client device. In response to the playlist request, the client device receives the requested playlist from the streaming media server via the external interface. In addition, at block **458**, the client device further receives streaming digital multimedia content representing one of the media clips in the playlist.

[**0067**] While streaming from the current media clip is continuing, at block **460**, a determination is made whether user input for playlist navigation is received. For example, the user input may request movement within the playlist to the next media clip or previous media clip, movement within the current media clip, such as fast-forwarding or rewinding, skipping one or more media clips in the playlist, transitioning to another media clip in the playlist immediately or at a particular time and/or switching to another playlist. If so (Y branch of **460**), at block **462**, the client device generates a playlist navigation message including navigation parameters that instruct the streaming media server to navigate the

playlist according to the user input and transmits the playlist navigation message, including the playlist session identifier, to the streaming media server via the external interface. Responsive thereto, at block **464**, the streaming media server navigates the playlist according to the navigation parameters included in the playlist navigation message, and continues to seamlessly stream digital multimedia content after navigation.

[**0068**] However, if user input selecting a new media clip is not received (N branch of **460**), the client device continues to receive the digital multimedia content in the media clip order designated in the playlist. Thus, upon reaching the end of the current media clip, the streaming media server continues to stream from the next media clip in the playlist. This process continues until the playlist is ended.

[**0069**] FIG. **5** is a message flow diagram illustrating exemplary messaging for navigating a playlist, in accordance with embodiments of the present invention. In FIG. **5**, a web browser **210**, client media application **240** and client media player engine **250** are included in a digital multimedia device **160**, which is disposed in a client-server arrangement with a streaming media server network node **110**. The web browser **210** is in communication with a web portal **500** for accessing playlist and media content identifiers (e.g., URLs) maintained by a server application module (AM) **501**. The server application module **501** is in communication with the streaming media server **110** to receive updated playlist and media content identifiers.

[**0070**] To access a particular playlist, the web browser **210** generates a content request at step **502** to the web portal **500** for the particular playlist. In response to the content request, the web portal **500** generates an SDP file request at step **504** to a CreateMetafile service on the AM **501** for an SDP file associated with the particular playlist. Thereafter, the AM **502** generates an SDP file for the particular playlist and passes the SDP file at step **506** back to the web portal **500**, which in turn, passes the SDP file at step **508** back to the web browser **210**. Those skilled in the art should appreciate that the SDP file contains data that would have been obtained via an RTSP DESCRIBE request, as well as additional information. Thus, the SDP file includes the URL associated with the particular playlist. In addition, in accordance with embodiments of the present invention, the SDP file also includes a unique playlist session identifier that is generated by the CreateMetafile service on the AM **501** for the client device **160**. In an exemplary embodiment, the unique playlist session identifier is included as part of the URL provided in the SDP file.

[**0071**] Upon receipt of the SDP file including the unique playlist session identifier, at step **510**, the web browser **210** passes the SDP file with the unique playlist session identifier to the media application **240**. At step **512**, the media application **240** extracts the unique playlist session identifier from the SDP file, and at step **514**, the media application **240** passes the SDP file with the unique playlist session identifier to the media player engine **250**. The media player engine **250** uses the SDP file to generate an RTSP content request message (e.g., an RTSP SETUP message) to the streaming media server **110** at step **516**. In an exemplary embodiment, the media player engine **250** populates the URL including the unique playlist session identifier within the RTSP content request message to access the particular playlist associated with the streaming media server **110**. The streaming media server **110** extracts the unique playlist session identifier from the RTSP content request and correlates the unique playlist session identifier with an RTSP session identifier that is assigned by the streaming media server **110** at step **518**.

[**0072**] Thereafter, once an RTSP PLAY message is transmitted to the streaming media server **110** by the media player engine **250**, the streaming media server **110** initiates a streaming media session therebetween. During the streaming media session, at step **520**, the streaming media server **110** provides an RTP content stream to the media player engine **250** for the RTSP session associated with the assigned RTSP session identifier. For example, the streaming media server **110** may sequentially stream digital multimedia content representing each of the media clips in the particular playlist identified in the URL. At the end of one media clip, the streaming module uninterruptedly transitions to streaming from the next media clip in the playlist. Thus, during normal playback, the streaming media server **110** is operable to seamlessly open each successive media clip file in the playlist and continue streaming without interruption, which is seen by the media player engine **250** as a continuous RTP session.

[**0073**] To enable playlist selection at the client device **160**, at step **522**, the media application **240** generates a playlist request with the unique playlist session identifier extracted from the SDP file at step **512**, and transmits the playlist request to the streaming media server **110**. In response to the playlist request, at step **524**, the streaming media server **110** associates the unique playlist session identifier included in the playlist request with the RTSP session identifier assigned to the streaming media session with the media player engine **240**, and at step **526**, the streaming media server **110** processes the playlist request to retrieve the playlist associated with the RTSP session identifier for the streaming media session with the media player engine **250**. Therafter, at step **528**, the streaming media server **110** passes the requested playlist to the media application **240**. The playlist includes, for example, media clip identities of all media clips within the playlist and an order by which the media clips will be successively streamed to the media player engine **250**.

[**0074**] It should be understood that in other embodiments, one or more of steps **524-528** may be optional in that the media application **240** either may not request the playlist or the media application **240** may not have access to the playlist. However, the media application **240** can still provide playlist navigation control, as described above in connection with FIGS. **3**C and **4**A, and as described below in connection with steps **530-536**.

[**0075**] During the streaming media session, the media application **240** may generate a playlist navigation message using the unique playlist session identifier to navigate the playlist (e.g., change from the current media clip to a selected media clip within the playlist), and at step **530**, transmit the playlist navigation message, including the playlist session identifier, to the streaming media server **110**. Responsive thereto, at step **532**, the streaming media server **110** associates the unique playlist session identifier included in the playlist request with the RTSP session identifier assigned to the streaming media session with the media player engine **240**, and at step **534**, the streaming media server **110** processes the playlist navigation message to

navigate the playlist in accordance with the navigation parameters included in the playlist navigation message. Therafter, at step **536**, the streaming media server **110** continues the RTP content stream with the RTSP ID based on the navigation message, such that the media player engine **250** continuously receives streaming digital multimedia content from the streaming media server **110**.

[**0076**] FIGS. **6-15** are block diagrams illustrating various exemplary client-server arrangements within the multimedia system, in accordance with embodiments of the present invention. In FIGS. **6-15**, RTSP communication is represented by a thick dotted line, RTP/RTCP communication is represented by a solid line and playlist protocol communication is represented by a broken line. When the broken line is shown by itself, the playlist protocol may be implemented using any external protocol, such as the hyper-text transfer protocol (HTTP). However, when the broken line is shown encapsulated by the thick dotted line, the playlist protocol is a part of the RTSP communication (i.e., the RTSP has been modified to include playlist commands).

[**0077**] In FIG. **6**, an RTSP proxy **600** is implemented on the client device **160** to provide playlist selection ability without having to provide a playlist-enabled media player engine **250**. The streaming media server **110** has no knowledge of the proxy **600**, and therefore, communicates with the client device **160** as if the media player engine **250** is playlist-enabled. Thus, the proxy **600** communicates with the streaming media server **110** using RTSP and the playlist protocol. The proxy **600** passes RTSP communications from the streaming media server **110** to the media player engine **250** and passes playlist protocol communications from the streaming media server to the media application **240**. Thus, the proxy **600** converts between the combined RTSP/playlist protocol used by the streaming media server **110** and the playlist protocol used by the media application **240**. As such, the external interface between the media application **240** and the streaming media server **110** is realized by the proxy **600**.

[**0078**] However, the arrangement shown in FIG. **6** does require a client-side module, i.e., the RTSP/Playlist proxy **600**. This arrangement is dependent on the ability of the proxy **600** to effectively co-opt the TCP socket on the client device **160** with no knowledge or assistance from the 3GPP streaming media player engine **250**, which may be possible on client devices **160** where there is an option of providing networking modules to the 3GPP engine **250** for use in streaming. If such an option is not provided, this arrangement may not be possible.

[**0079**] FIG. **7** illustrates another exemplary client-server arrangement in which the RTSP/playlist proxy **600** resides outside of the client device **160**. In this arrangement, the RTSP and playlist protocol communication flow is effectively identical to that shown in FIG. **6**, but the proxy **600** is located somewhere in the network or within the streaming media server I **10**. In addition, in FIG. **7**, the proxy **600** is also capable of performing RTP/RTCP data proxying between the media engine **250** and the streaming server **110**.

[**0080**] Another alternative client-server arrangement is shown in FIG. **8**. In FIG. **8**, instead of encapsulating the playlist protocol communications within the RTSP communications from the streaming media server **110** (as in FIGS. **6** and **7**), the playlist protocol communications are flowing through an external API on the streaming media server **110**. In effect, this arrangement is conceptually the same interface exposed by the RTSP/RTP Playlist proxy shown in FIGS. **6** and **7**, i.e., in that the proxy **600** appears to the media application **240** as a streaming media server with an external API. However, to implement the arrangement in FIG. **8**, the streaming media server **110** needs to be modified to support the external API.

[**0081**] Although direct communication between the client media application **240** and streaming media server **110** is shown for simplicity's sake in FIG. **8**, in practice, the client media application **250** may need to interface with another server-side module to control content management and access. FIGS. **9** and **10** illustrate client-server arrangements with an additional server-side application module **900**. Although the client-server arrangements shown in FIGS. **9** and **10** are conceptually the same as the arrangement shown in FIG. **8**, in FIGS. **9** and **10** the client media application **240** can utilize any protocol of choice to communicate with the application module **900**. However, the application module **900** will still need to communicate with the streaming media server **110** using the "proxy" external API.

[**0082**] FIG. **11** illustrates yet another exemplary client-server arrangement in which the playlist selection functionality is divided between a client-side playlist module **1100** and a server-side playlist module **1110**. The playlist modules **1100** and **1110** communicate using a playlist protocol of choice. The client-side playlist module **1100** is operable to convert between a protocol used by the media application **240** and the playlist protocol, while the server-side playlist module **1110** is operable to convert between the playlist protocol and the "proxy" external API used by the streaming media server **110**. This arrangement allows for protocol updates between the client-side playlist module **1100** and the server-side playlist module **1110** without affecting the media application **240**, media player engine **250** or streaming media server **110**.

[**0083**] FIG. **12** illustrates a variation of the client-server arrangement shown in FIG. **6**. In FIG. **12**, the proxy **600** included within the client device **160** is also capable of performing RTP/RTCP data proxying between the media engine **250** and the streaming server **110**. FIG. **13** illustrates a variation of the client-server arrangement shown in FIG. **9**. In FIG. **13**, the proxy **600** does not perform RTP/RTCP data proxying between the media engine **250** and the streaming server **110**.

[**0084**] FIGS. **14** and **15** illustrate exemplary client-server arrangements in which the media player engine **250** is playlist-enabled, i.e., the media player engine understands the combined RTSP/playlist protocol, but the streaming media server **110** only understands the external API playlist protocol. Therefore, instead of including the playlist protocol within the RTSP communication directly between the media player engine **250** and the streaming media server **110**, a proxy **600** is provided to communicate playlist protocol messages with the streaming media server **110** via the external API. In FIG. **14**, the proxy **600** is further capable of performing RTP/RTCP data proxying between the media engine **240** and the streaming server **110**, whereas in FIG. **15**, the proxy **600** does not perform RTP/RTCP data proxying.

[**0085**] Based on the foregoing description, it should be appreciated that the present invention provides the ability for

a streaming client media application to request a streaming media server to dynamically navigate within or across a playlist boundary, either in the form of skipping to a media clip within the same playlist or from another playlist file, or to an offset within a particular media clip. Further, such navigation is possible in an exemplary client-server network arrangement regardless of the underlying streaming architecture (e.g., RealMedia, Windows Media, QuickTime, et cetera). Moreover, it should be recognized that the teachings of the present invention may be practiced in conjunction with other client/server protocols such as Session Initiation Protocol (SIP), H.323, etc.

[0086] As will be recognized by those skilled in the art, the innovative concepts described in the present application can be modified and varied over a wide rage of applications. Accordingly, the scope of patents subject matter should not be limited to any of the specific exemplary teachings discussed, but is instead defined by the following claims.

We claim:

1. A multimedia device, comprising:

a media player engine operable to establish a streaming media session with a content source via a standard control channel over a network and to receive from the content source streaming digital multimedia content representative of a current media clip within a playlist during the streaming media session; and

a media application in communication with the content source via an external interface over the network and outside the standard control channel between the media player engine and the content source;

wherein the media application is operable to generate a playlist navigation message to the content source to navigate the playlist and control the streaming digital multimedia content via the external interface.

2. The device of claim 1, wherein the media application is further operable to generate the playlist navigation message in a first protocol for conversion thereof through the external interface into a second protocol used by the content server.

3. The device of claim 2, wherein the second protocol is the real time streaming protocol (RTSP).

4. The device of claim 2, wherein the first protocol is the hyper-text transfer protocol (HTTP).

5. The device of claim 2, further comprising:

a proxy operable to communicate with the media application using the first protocol, communicate with the media player engine using the second protocol and communicate with the content source using both the first protocol and the second protocol, wherein the external interface is realized by the proxy.

6. The device of claim 2, further comprising:

a first playlist module operable to communicate with the media application using a first protocol and to convert between the first protocol and a playlist protocol for communication with a second playlist module that is in communication with the content source using a second protocol, wherein the external interface includes the first playlist module and the second playlist module.

7. The device of claim 1, wherein the media application is further operable to generate a request to the content source for the playlist that identifies a plurality of media clips including the current media clip and to receive the playlist from the content source via the external interface.

8. The device of claim 1, wherein the media application is further operable to receive user input from a user for navigating the playlist to change the digital multimedia content streamed to the media player engine during the streaming media session.

9. The device of claim 8, further comprising:

an input device in communication with the media application to provide input signals representative of the user input to the media application.

10. The device of claim 8, further comprising:

a display for displaying the streaming digital multimedia content and the playlist to the user, the display including a graphical user interface for enabling the user to provide the user input.

11. The device of claim 1, further comprising:

a web browser operable to receive a uniform resource locator (URL) including a session identifier for the streaming media session and to provide the URL including the session identifier to the media player engine for use in establishing the streaming media session with the content source.

12. The device of claim 11, wherein the media application is further operable to extract the session identifier from the URL and to generate the playlist navigation message using the session identifier.

13. The device of claim 12, wherein the playlist navigation message includes the session identifier, a playlist identifier of the playlist, a media clip identifier for a selected media clip and a timing parameter indicating a time at which the content source switches from the current media clip to the selected media clip.

14. The device of claim 1, wherein the playlist navigation message includes a session identifier identifying the streaming media session and a relative navigation request parameter providing navigation information relative to the current media clip.

15. The device of claim 1, wherein the standard control channel is a real time streaming protocol (RTSP) control channel.

16. The device of claim 1, wherein the external interface is a hyper-text transfer protocol (HTTP) interface.

17. A multimedia system, comprising:

a streaming media server providing access to media clips and playlists; and

a device including:

a media player engine operable to establish a streaming media session with the streaming media server via a standard control channel over a network and to receive from the streaming media server streaming digital multimedia content representative of a current one of the media clips within a current one of the playlists during the streaming media session, and

a media application in communication with the streaming media server via an external interface over the network and outside the standard control channel between the media player engine and the streaming media server,

wherein the media application is operable to generate a playlist navigation message to the streaming media server to navigate the playlist and control the streaming digital multimedia content via the external interface.

18. The system of claim 17, further comprising:

a database in communication with the streaming media server for storing the media clips and playlists.

19. The system of claim 17, further comprising:

a conversion module operable to convert between a first protocol used by the media application to generate the playlist navigation message and a second protocol used by the streaming media server to process the playlist navigation message.

20. The system of claim 19, wherein the conversion module includes:

a first playlist module on the device that is operable to convert between the first protocol and a playlist protocol; and

a second playlist module in communication with the first playlist module via the playlist protocol and the streaming media server via the second protocol, wherein the second playlist module is operable to convert between the playlist protocol and the second protocol.

21. The system of claim 19, wherein the conversion module is within the device.

22. The system of claim 19, wherein the conversion module is within the network.

23. The system of claim 17, wherein the media application is further operable to generate a request to the streaming media server for the current playlist and to receive the current playlist from the streaming media server via the external interface.

24. The system of claim 17, wherein the device is operable to receive a uniform resource locator (URL) including a session identifier for the streaming media session and to provide the URL including the session identifier to the media engine for use in establishing the streaming media session with the streaming media server.

25. The system of claim 24, wherein the media application is further operable to extract the session identifier from the URL and to generate the playlist navigation message using the session identifier.

26. The system of claim 25, wherein the playlist navigation message includes navigation parameters for switching from the current playlist to another one of the playlists.

27. The system of claim 17, wherein the standard control channel is a real time streaming protocol (RTSP) control channel.

28. The system of claim 17, wherein the external interface is a hyper-text transfer protocol (HTTP) interface.

29. A method for enabling playlist navigation of digital multimedia content, comprising the steps of:

establishing a streaming media session with a content source via a standard control channel over a network;

receiving from the content source streaming digital multimedia content representative of a current one of a plurality of media clips within a playlist during the streaming media session,

generating a playlist navigation message to the content source for navigating the playlist to control the streaming digital multimedia content via an external interface over the network and outside the standard control channel; and

continuously receiving from the content source the streaming digital multimedia content based on the playlist navigation message.

30. The method of claim 29, wherein the step of generating further comprises the step of:

generating the playlist navigation message to the content source to change from the current one of the media clips to a selected one of the media clips in the playlist via the external interface.

31. The method of claim 30, wherein the step of continuously receiving further comprises the step of:

continuously receiving the streaming digital multimedia content from the content source during the streaming media session, the streaming digital multimedia content representing the current media clip for a first portion of the streaming media session and representing the selected media clip for a second portion of the streaming media session.

32. The method of claim 29, further comprising the steps of:

generating a request to the streaming media server for the playlist via the external interface; and

receiving the current playlist from the streaming media server via the external interface.

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