

[Name of Document] SCOPE OF PATENT CLAIMS

[Claim 1] A content delivery system, comprising an application server system and a connection control system, wherein:

The aforementioned connection control system is configured to receive equipment specification information transmitted by user equipment and establish a connection between the aforementioned application server system and the user equipment based on said received equipment specification information; and

The aforementioned application server system includes:

A content storage means for storing advertisement content data representing advertisement content and main content data representing main content;

A transmission-request reception means for receiving, via the aforementioned connection control system, a content transmission request transmitted by the aforementioned user equipment and containing main-content identification information for identifying the aforementioned main content;

An advertisement-content selection means for selecting the aforementioned stored advertisement content data based on advertisement selection information containing advertisement attribute information representing an attribute of the aforementioned advertisement content; and

A selected-advertisement-content specification-information transmission means for transmitting selected-advertisement-content specification information for specifying the selected advertisement content data, via the aforementioned connection control system to the aforementioned user equipment which has transmitted the aforementioned content transmission request.

[Claim 2] The content delivery system according to Claim 1, wherein:

The aforementioned user equipment comprises:

A selected-advertisement-content specification-information reception means for receiving the aforementioned selected-advertisement-content specification information transmitted by the aforementioned application server system; and

A content-viewing-request transmission means for transmitting, to said application server system, a main-content viewing request containing the aforementioned main-content identification information and an advertisement-content viewing request containing the aforementioned received selected-advertisement-content specification information, when a connection with the aforementioned application server system is established by the aforementioned connection control system, and

The aforementioned application server system comprises a content transmission means for receiving the aforementioned main-content viewing request transmitted by the aforementioned user equipment and transmitting main content data identified by the main-content identification information contained in said received main-content viewing request to said user equipment, and for receiving the aforementioned advertisement-content viewing request transmitted by said user equipment and transmitting advertisement content data specified by the selected-advertisement-content specification information contained in said received advertisement-content viewing request to said user equipment.

[Claim 3] The content delivery system according to Claim 1 or Claim 2, wherein the aforementioned user equipment comprises a content outputting means for receiving main content data and advertisement content data transmitted by the aforementioned application server system and outputting, based on said received main content data and advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[Claim 4] The content delivery system according to any of claims 1 to 3, wherein:

The aforementioned selected-advertisement-content specification-information transmission means is configured to transmit, via the aforementioned connection control system to the aforementioned user equipment that has transmitted the aforementioned content transmission request, playlist information that is information containing the aforementioned main-content identification information contained in the aforementioned content transmission request and the aforementioned selected-advertisement-content specification information and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output;

The aforementioned selected-advertisement-content specification-information reception means is configured to receive the aforementioned playlist information transmitted by the aforementioned application server system; and

The aforementioned content-viewing-request transmission means is configured to transmit the aforementioned main-content viewing request and the aforementioned advertisement-content viewing request to the aforementioned application server system, doing so based on the aforementioned playlist information received.

[Claim 5] The content delivery system according to any of claims 1 to 4, wherein:

The aforementioned content storage means is configured to store the aforementioned advertisement content data and advertisement attribute information representing an attribute of advertisement content represented by said advertisement content data in such a way that said advertisement content data and said advertisement attribute information are associated with respect to each other;

The aforementioned advertisement selection information contains user basic information that is information for specifying the aforementioned advertisement attribute information and is information associated with user identification information for identifying the user of the aforementioned user equipment; and

The aforementioned advertisement-content selection means is configured to select advertisement content data stored in association with the advertisement attribute information specified by the user basic information associated with the user identification information for identifying the user of the user equipment which has transmitted the aforementioned content transmission request.

[Claim 6] The content delivery system according to any of claims 1 to 5, wherein:

The aforementioned content storage means is configured to store the aforementioned advertisement content data and advertisement attribute information representing an attribute of advertisement content represented by said advertisement content data in such a way that said advertisement content data and said advertisement attribute information are associated with respect to each other;

The aforementioned advertisement selection information contains content basic information that is the information for specifying the aforementioned advertisement attribute information and is the information associated with main-content identification information for identifying the aforementioned main content; and

The aforementioned advertisement-content selection means is configured to select advertisement content data stored in association with the advertisement attribute information specified by the content basic information associated with the main-content identification information contained in the aforementioned content transmission request received.

[Claim 7] The content delivery system according to any of claims 1 to 6, wherein the aforementioned selected-advertisement-content specification-information transmission means is configured to transmit the aforementioned selected-advertisement-content specification information to the aforementioned user equipment via said connection control system when the aforementioned connection control system executes a process for establishing the aforementioned connection.

[Claim 8] The content delivery system according to Claim 7, wherein:

The aforementioned connection control system is configured to establish the aforementioned connection by exchanging a predetermined connection establishment message with each of the aforementioned user equipment and the aforementioned application server system; and

The aforementioned selected-advertisement-content specification-information transmission means is configured to transmit the aforementioned selected-advertisement-content specification information to the aforementioned user equipment via said connection control system by including the aforementioned selected-advertisement-content specification information in the aforementioned connection establishment message.

[Claim 9] The content delivery system according to any of claims 1 to 8, wherein:

The aforementioned application server system comprises a service control server and a media server;

The aforementioned service control server is provided with the aforementioned transmission-request reception means, the aforementioned advertisement-content selection means, and the aforementioned selected-advertisement-content specification-information transmission means; and

The aforementioned media server is provided with the aforementioned content storage means.

[Claim 10] The content delivery system according to any of claims 1 to 8, wherein:

The aforementioned application server system comprises a service control server and a media server;

The aforementioned service control server is provided with the aforementioned transmission-request reception means;

The aforementioned media server is provided with the aforementioned content storage means, the aforementioned advertisement-content selection means, and the aforementioned selected-advertisement-content specification-information transmission means;

The aforementioned service control server is provided with advertisement-selection-information transmission means for transmitting the aforementioned advertisement selection information to the aforementioned media server via the aforementioned connection control system;

The aforementioned media server is provided with advertisement-selection-information reception means for receiving the aforementioned advertisement selection information transmitted by the aforementioned service control server; and

The aforementioned advertisement-content selection means is configured to select the aforementioned advertisement content data based on the aforementioned advertisement selection information received.

[Claim 11] A content delivery system, comprising an application server system and a connection control system, wherein:

The aforementioned connection control system is provided with a core IMS part (Internet Protocol Multimedia Subsystem) for receiving equipment specification information transmitted by user equipment and establishing a connection between the aforementioned application server system and said user equipment based on said received equipment specification information,

The aforementioned application server system is provided with:

A media functions part for transmitting content data representing content to the aforementioned user equipment with which the connection is established by the aforementioned core IMS part;

A service-control functions part for controlling a service provided by the aforementioned media functions part; and

A user-profile-server functions part for storing profile information of the user of the aforementioned user equipment,

The aforementioned media functions part is provided with a content storage means for storing advertisement content data representing advertisement content and main content data representing main content,

The aforementioned service-control functions part is provided with:

A transmission-request reception means for receiving, via the aforementioned core IMS part, a content transmission request containing main-content identification information for identifying the aforementioned main content and transmitted by the aforementioned user equipment; and

An advertisement-content selection means for selecting the aforementioned stored advertisement content data based on advertisement selection information, which contains advertisement attribute information representing an attribute of the aforementioned advertisement content and is prestored by the aforementioned user-profile-server functions part, the aforementioned service-control functions part, or the aforementioned connection control system; and

A selected-advertisement-content specification-information transmission means for transmitting selected-advertisement-content specification information for specifying the aforementioned selected advertisement content data, doing so via the aforementioned core IMS part to the aforementioned user equipment which has transmitted the aforementioned content transmission request.

[Claim 12] The content delivery system according to Claim 11, wherein:

The aforementioned user equipment is provided with:

A selected-advertisement-content specification-information reception means for receiving the aforementioned selected-advertisement-content specification information transmitted by the aforementioned service-control functions part; and

A content-viewing-request transmission means for transmitting, to said media functions part, a main-content viewing request containing the aforementioned main-content identification information and an advertisement-content viewing request containing the aforementioned received selected-advertisement-content specification information, doing so when a connection with the aforementioned media functions part is established by the aforementioned core IMS part, and

The aforementioned media functions part is provided with a content transmission means for:

Receiving the aforementioned main-content viewing request transmitted by the aforementioned user equipment and transmitting, to said user equipment, main content data identified by the main-content identification information contained in the aforementioned received main-content viewing request, and

Receiving the aforementioned advertisement-content viewing request transmitted by said user equipment and transmitting, to said user equipment, advertisement content data specified by the selected-advertisement-content specification information contained in said received advertisement-content viewing request.

[Claim 13] The content delivery system according to Claim 1 or Claim 2, wherein the aforementioned user equipment comprises a content outputting means for receiving main content data and advertisement content data transmitted by the aforementioned media functions part and outputting, based on said received main content data and the advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[Claim 14] The content delivery system according to any of claims 11 to 13, wherein

The aforementioned selected-advertisement-content specification-information transmission means is configured to transmit, via the aforementioned core IMS part to the aforementioned user equipment which has transmitted the aforementioned content transmission request, playlist information that is information containing the aforementioned main-content identification information contained in the aforementioned content transmission request and the aforementioned selected-advertisement-content specification information and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output;

The aforementioned selected-advertisement-content specification-information reception means is configured to receive the aforementioned playlist information transmitted by the aforementioned service-control functions part; and

The aforementioned content-viewing-request transmission means is configured to transmit the aforementioned main-content viewing request and the aforementioned advertisement-content viewing request to the aforementioned media functions part, doing so based on the aforementioned playlist information received.

[Claim 15] A content delivery method comprising:

A content storage processing step for storing advertisement content data representing advertisement contents and main content data representing main content in a storage device;

A connection establishment step for receiving equipment specification information transmitted by user equipment and establishing a connection between an application server system and the user equipment based on the received equipment specification information, doing so by a connection control system;

A transmission-request reception step for receiving, via the aforementioned connection control system, a content transmission request containing a main-content identification information for identifying the aforementioned main content and transmitted by the aforementioned user equipment, doing so by the aforementioned application server system;

An advertisement-content selection step for selecting the aforementioned stored advertisement content data based on advertisement selection information containing advertisement attribute information representing an attribute of the aforementioned advertisement content; and

A selected-advertisement-content specification-information transmission step, in which the aforementioned application server system transmits selected-advertisement-content specification information that specifies the aforementioned selected advertisement content data, doing so via the aforementioned connection control system to the aforementioned user equipment which has transmitted the aforementioned content transmission request.

[Claim 16] The content delivery method according to Claim 15, comprising:

A selected-advertisement-content specification-information reception step, in which the aforementioned user equipment receives the aforementioned selected-advertisement-content specification information transmitted by the aforementioned application server system; and

A content-viewing-request transmission step, in which the aforementioned user equipment transmits, to the aforementioned application server system, a main-content viewing request containing the aforementioned main-content identification information and an advertisement-content viewing request containing the aforementioned received selected-advertisement-content specification information, doing so when a connection between said user equipment and said application server system is established, and

A content transmission step, in which the aforementioned application server system receives the aforementioned main-content viewing request transmitted by the aforementioned user equipment and transmits main content data identified by the main-content identification information contained in said received main-content viewing request to said user equipment, and also receives the aforementioned advertisement-content viewing request transmitted by said user equipment and transmits advertisement content data specified by the selected-advertisement-content specification information contained in said received advertisement-content viewing request to said user equipment.

[Claim 17] The content delivery method according to Claim 15 or Claim 16, wherein the aforementioned user equipment comprises a content outputting means for receiving main content data and advertisement content data transmitted by the aforementioned application server system and outputting, based on said received main content data and advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[Claim 18] The content delivery method according to any of claims 15 to 17, wherein:

The aforementioned selected-advertisement-content specification-information transmission step is configured to transmit, via the aforementioned connection control system to the aforementioned user equipment which has transmitted the aforementioned content transmission request, playlist information that is information containing the aforementioned main-content identification information contained in the aforementioned content transmission request and the aforementioned selected-advertisement-content specification information, and is information containing information indicating the sequence in which the main content identified by the aforementioned main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output;

The aforementioned selected-advertisement-content specification-information reception step is configured to receive the aforementioned playlist information transmitted by the aforementioned application server system; and

The aforementioned content-viewing-request transmission step is configured to transmit the aforementioned main-content viewing request and the aforementioned advertisement-content viewing request to the aforementioned application server system, doing so based on the aforementioned playlist information received.

[Claim 19] A program for causing a service control server to realize:

A transmission request reception step for receiving a content transmission request containing main-content identification information for identifying main content and transmitted by user equipment, doing so via a connection control system establishing a connection between a media server and said user equipment;

An advertisement content selection step for selecting advertisement content data prestored in a storage device based on advertisement selection information containing advertisement attribute information representing an attribute of advertisement content; and

A selected-advertisement-content specification-information transmission step for transmitting selected-advertisement-content specification information specifying the aforementioned selected advertisement content data, doing so via the aforementioned connection control system to the aforementioned user equipment which has transmitted the aforementioned content transmission request.

[Claim 20] The program according to Claim 19, wherein the aforementioned selected-advertisement-content specification-information transmission means is configured to transmit, via the aforementioned connection control system to the aforementioned user equipment which has transmitted the aforementioned content transmission request, playlist information that is information containing the aforementioned main-content identification information contained in the aforementioned content transmission request and the aforementioned selected-advertisement-content specification information and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output.

[Claim 21] A program for causing user equipment to realize:

A selected-advertisement-content specification-information reception means for receiving selected-advertisement-content specification information, which is the information that specifies selected advertisement content data and is transmitted by an application server system, doing so via a connection control system establishing a connection between said application server system and said user equipment; and

A content-viewing-request transmission means for transmitting, to the aforementioned application server system, a main-content viewing request containing main-content identification information for identifying main content and an advertisement-content viewing request containing the aforementioned selected-advertisement-content specification information thus received, doing so when a connection with said application server system is established by the aforementioned connection control system.

[Claim 22] The program according to Claim 21 that causes the aforementioned user equipment to further realize a content outputting means for receiving main content data and advertisement content data transmitted by the aforementioned application server system and outputting, based on said received main content data and advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[Claim 23] The program according to Claim 21 or Claim 22, wherein:

The aforementioned selected-advertisement-content specification-information reception means is configured to receive playlist information that is information containing the aforementioned main-content identification information and the aforementioned selected-advertisement-content specification information, and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output; and

The aforementioned content-viewing-request transmission means is configured to transmit the aforementioned main-content viewing request and the aforementioned advertisement-content viewing request to the aforementioned application server system, doing so based on the aforementioned playlist information thus received.

[Name of Document] **SPECIFICATION**

[Title of the Invention] **CONTENT DELIVERY SYSTEM**

TECHNOLOGICAL FIELD

[0001] The present invention relates to a content delivery system that transmits content data representing content to user equipment.

BACKGROUND ART

[0002] A known content delivery system comprises a content transmitter, a content receiver, and a connection controller (SIP (Session Initiation Protocol) server).

[0003] In this content delivery system, the content receiver transmits a content transmission request to the connection controller. In response to the content transmission request, the connection controller transmits a content transmission instruction to the content transmitter, while establishing a connection between the content transmitter and the content receiver. Further, the content delivery system executes a process for reserving the communication bandwidth of a communication channel between the content transmitter and the content receiver. Once the connection is established by the connection controller, the content transmitter transmits prestored content data to the content receiver.

[0004] According to this content delivery system, the communication bandwidth of the communication path between the content transmitter and the content receiver is guaranteed, making it possible to prevent deterioration of the communication quality when the content data is transmitted from the content transmitter to the content receiver.

[Patent Document 1]JP, 2008-153896, A

DISCLOSURE OF THE INVENTION

OBJECTIVE TO BE ACHIEVED BY THE INVENTION

[0005] In the content delivery system described above, the content transmitter transmits prestored content data in response to a request from the content receiver.

[0006] Therefore, it is considered preferable that, in order to cause the user of the content receiver to view viewing content in which advertisement content is inserted into the main content which the user desires to view (user's desired content), the content delivery system should be configured such that viewing content data representing the viewing content is prestored in the content transmitter.

[0007] However, even if the content delivery system is configured in this manner, the content delivery system cannot change the advertisement content inserted into the main content according to the user's desired content and/or the user who views the content, thus posing a problem in that the aforementioned content delivery system is not able to cause a user to view advertisement content selected according to the user's desired content and/or the user.

[0008] It is, therefore, an objective of the present invention to provide a content delivery system capable of solving the problem, i.e., it is impossible to cause a user to view advertisement content selected according to the user's desired content and/or the user.

MEANS FOR ACHIEVING THE OBJECTIVE

[0009] In order to achieve the object as described above, an aspect of the present invention provides a content delivery system including an application server system and a connection control system.

The connection control system is configured to receive equipment specification information transmitted by user equipment and establish a connection between the application server system and the user equipment based on the received equipment specification information.

The application server system includes: a content storage means for storing advertisement content data representing advertisement content and main content data representing main content; a transmission-request reception means for receiving, via the connection control system, a content transmission request transmitted by the user equipment and containing main-content identification information for identifying the main content; an advertisement-content selection means for selecting the stored advertisement content data based on advertisement selection information containing advertisement attribute information representing an attribute of the advertisement content; and a selected-advertisement-content specification-information transmission means for transmitting selected-advertisement-content specification information for specifying the selected advertisement content data, via the connection control system to the user equipment which has transmitted the content transmission request.

[0010] Another aspect of the present invention provides a content delivery system also including an application server system and a connection control system, wherein:

The connection control system includes a core IMS part (Internet Protocol Multimedia Subsystem), which receives equipment specification information transmitted by user equipment and establishes a connection between the above-mentioned application server system and said user equipment based on said equipment specification information thus received;

The above-mentioned application server system includes:

A media functions part for transmitting content data representing content to the user equipment with which the connection is established by the core IMS part;

A service-control functions part for controlling a service provided by the media functions part; and

A user-profile-server functions part for storing profile information of the user of the user equipment.

The media functions part includes content storage means for storing advertisement content data representing advertisement content and main content data representing main content, and

The service-control functions part includes:

A transmission-request reception means for receiving a content transmission request containing main-content identification information for identifying the main content and transmitted by the user equipment, via the core IMS part;

An advertisement-content selection means for selecting the stored advertisement content data based on advertisement selection information containing advertisement attribute information representing an attribute of the advertisement content and prestored by the user-profile-server functions part, the service-control functions part, or the connection control system; and

A selected-advertisement-content specification-information transmission means for transmitting, via the core IMS part, selected-advertisement-content specification information for specifying the selected advertisement content data to the user equipment which has transmitted the content transmission request.

[0011] Another aspect of the present invention provides a content delivery method comprising:

A content-storage processing step for storing advertisement content data representing advertisement contents and main content data representing main content in a storage device;

A connection establishment step for receiving equipment specification information transmitted by user equipment and establishing a connection between an application server system and the user equipment based on the received equipment specification information, by a connection control system;

A transmission-request reception step, in which the application server system receives via the above-mentioned connection control system, a content transmission request containing main-content identification information for identifying the above-mentioned main content and transmitted by the above-mentioned user equipment;

An advertisement-content selection step for selecting the above-mentioned stored advertisement content data based on advertisement selection information containing advertisement attribute information representing an attribute of the above-mentioned advertisement content; and

A selected-advertisement-content specification-information transmission step, in which the above-mentioned application server system transmits selected-advertisement-content specification information that specifies the above-mentioned selected advertisement content data, doing so via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request

[0012] Yet another aspect of the present invention provides a program for causing a service control server to realize:

A transmission-request reception means for receiving a content transmission request containing main-content identification information for identifying main content and transmitted by user equipment, via a connection control system establishing a connection between a media server and said user equipment;

An advertisement-content selection means for selecting advertisement content data prestored in a storage device based on advertisement selection information containing advertisement attribute information representing an attribute of advertisement content; and

A selected-advertisement-content specification-information transmission means for transmitting selected-advertisement-content specification information specifying the above-mentioned selected advertisement content data, via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request.

[0013] Yet another aspect of the present invention provides a program for causing user equipment to realize:

A selected-advertisement-content specification-information reception means for receiving selected-advertisement-content specification information which is the information for specifying selected advertisement content data and transmitted by an application server system, via a connection control system establishing a connection between said application server system and said user equipment; and

A content-viewing-request transmission means for transmitting, to the above-mentioned application server system, a main-content viewing request containing main-content identification information for identifying main content and an advertisement-content viewing request containing the above-mentioned selected-advertisement-content specification information thus received, when a connection with said application server system is established by the above-mentioned connection control system.

EFFECTS OF THE INVENTION

[0014] The present invention configured as described above is capable of allowing a user to view advertisement content selected according to the user's desired content and/or the user.

BEST EMBODIMENTS OF THE INVENTION

[0015] The content delivery system according to an aspect of the present invention comprises an application server system and a connection control system. The above-mentioned connection control system is configured to receive equipment specification information transmitted by user equipment and establish a connection between the above-mentioned application server system and said user equipment based on said received equipment specification information. The above-mentioned application server system comprises:

A content storage means for storing advertisement content data representing advertisement content and main content data representing main content;

A transmission-request reception means for receiving, via the above-mentioned connection control system, a content transmission request transmitted by the user equipment and containing main-content identification information for identifying the main content;

An advertisement-content selection means for selecting the above-mentioned stored advertisement content data based on advertisement selection information containing an advertisement attribute information representing an attribute of the above-mentioned advertisement content; and

A selected-advertisement-content specification-information transmission means for transmitting selected-advertisement-content specification information specifying the above-mentioned selected advertisement content data, via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request.

[0016] Accordingly, the content delivery system transmits, to user equipment, selected-advertisement-content specification information that specifies the advertisement content selected based on the advertisement selection information. Therefore, for example, the user equipment may be configured to output viewing content, in which advertisement content specified by selected-advertisement-content specification information is inserted, while an application server system may be configured to select advertisement content according to the main content (content that the user wants to view) and/or the user, thereby allowing users to view viewing content in which advertisement content according to the main content and/or the user is inserted.

[0017] In this case, it will be preferable if:

The above-mentioned user equipment comprises:

A selected-advertisement-content specification-information reception means for receiving the above-mentioned selected-advertisement-content specification information transmitted by the above-mentioned application server system; and

A content-viewing-request transmission means for transmitting, to said application server system, a main-content viewing request containing the above-mentioned main-content identification information and an advertisement-content viewing request containing the above-mentioned received selected-advertisement-content specification information, when a connection with the above-mentioned application server system is established by the above-mentioned connection control system, and

The above-mentioned application server system comprises a content transmission means for receiving the above-mentioned main-content viewing request transmitted by the above-mentioned user equipment and transmitting main content data identified by the main-content identification information contained in said received main-content viewing request to said user equipment, and for receiving the above-mentioned advertisement-content viewing request transmitted by said user equipment and transmitting advertisement content data specified by the selected-advertisement-content specification information contained in said received advertisement-content viewing request to said user equipment.

[0018] In this case, it will be preferable if the above-mentioned user equipment is provided with a content outputting means for receiving main content data and advertisement content data transmitted by the above-mentioned application server system and outputting, based on said received main content data and advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[0019] Accordingly, for example, the application server system may be configured to select advertisement content according to the main content (content that the user wants to view) and/or the user, thereby allowing users to view viewing content, into which advertisement content according to the main content and/or the user is inserted.

[0020] In this case, it will be preferable if:

The above-mentioned selected-advertisement-content specification-information transmission means is configured to transmit, via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request, playlist information, which is information containing the above-mentioned main-content identification information contained in the above-mentioned content transmission request and the above-mentioned selected-advertisement-content specification information and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output;

The above-mentioned selected-advertisement-content specification-information reception means is configured to receive the above-mentioned playlist information transmitted by the above-mentioned application server system; and

The above-mentioned content-viewing-request transmission means is configured to transmit the above-mentioned main-content viewing request and the above-mentioned advertisement-content viewing request to the above-mentioned application server system, doing so based on the above-mentioned playlist information received.

[0021] Accordingly, the application server system is enabled to determine the sequence in which the user equipment outputs the main content and advertisement content. This makes it possible for users to view advertisement content in a manner that reflects the intentions of the advertisement content provider more significantly.

[0022] In this case, it will be preferable if:

The above-mentioned content storage means is configured to store the above-mentioned advertisement content data and advertisement attribute information representing an attribute of advertisement content represented by said advertisement content data in such a way that the advertisement content data and the advertisement attribute information are associated with respect to each other;

The above-mentioned advertisement selection information contains user basic information, which is information for specifying the above-mentioned advertisement attribute information and is information associated with user identification information for identifying the user of the above-mentioned user equipment; and

The above-mentioned advertisement-content selection means is configured to select advertisement content data stored in association with the advertisement attribute information specified by the user basic information associated with the user identification information for identifying the user of the user equipment which has transmitted the above-mentioned content transmission request.

[0023] This enables the content delivery system to have users view viewing content in which advertisement content is inserted according to the user of the user equipment which has transmitted a content transmission request.

[0024] In this case, it will be preferable if:

The above-mentioned content storage means is configured to store the above-mentioned advertisement content data and advertisement attribute information representing an attribute of advertisement content represented by said advertisement content data in such a way that the advertisement content data and the advertisement attribute information are associated with respect to each other;

The above-mentioned advertisement selection information contains content basic information, which is information for specifying the above-mentioned advertisement attribute information and is information associated with main-content identification information for identifying the above-mentioned main content; and

The above-mentioned advertisement-content selection means is configured to select advertisement content data stored in association with the advertisement attribute information specified by the content basic information associated with the main-content identification information contained in the above-mentioned content transmission request received.

[0025] This enables the content delivery system to have users view viewing content in which advertisement content is inserted according to the main content identified by the main-content identification information contained in the received content transmission request.

[0026] In this case, it will be preferable if the above-mentioned selected-advertisement-content specification-information transmission means is configured to transmit the above-mentioned selected-advertisement-content specification information to the above-mentioned user equipment via said connection control system when the above-mentioned connection control system executes a process for establishing the above-mentioned connection.

[0027] Now, when the application server system is configured to transmit selected-advertisement-content specification information to user equipment before the connection control system executes a process for establishing the connection, and if the selected-advertisement-content specification information is changed after the transmission of the selected-advertisement-content specification information, the advertisement selection information after said change cannot be reflected in the selected-advertisement-content specification information received by the user equipment.

[0028] In contrast, with the above-mentioned configuration, the application server system can transmit, to user equipment, selected-advertisement-content specification information reflecting the latest advertisement selection information as of the point in time when the connection control system executes a process for establishing the connection to the user equipment.

[0029] In this case, it will be preferable if:

The above-mentioned connection control system is configured to establish the above-mentioned connection by exchanging a predetermined connection establishment message with each of the above-mentioned user equipment and the above-mentioned application server system; and

The above-mentioned selected-advertisement-content specification-information transmission means is configured to transmit the above-mentioned selected-advertisement-content specification information to the above-mentioned user equipment via said connection control system by including the above-mentioned selected-advertisement-content specification information in the above-mentioned connection establishment message.

[0030] This eliminates the need for the application server system to transmit other messages besides a connection establishment message in order to transmit selected-advertisement-content specification information to user equipment. That is, the number of communications between the connection control system, the application server system, and user equipment can be reduced. In other words, it becomes possible to reduce the processing load and/or communication load applied to the connection control system, application server system, and user equipment during the transmission/reception of messages.

[0031] In this case, it will be preferable if:

The above-mentioned application server system comprises a service control server and a media server;

The above-mentioned service control server is provided with the above-mentioned transmission-request reception means, the above-mentioned advertisement-content selection means, and the above-mentioned selected-advertisement-content specification-information transmission means; and

The above-mentioned media server is provided with the above-mentioned content storage means.

[0032] Additionally, in another aspect of the above-mentioned content delivery system, it will be preferable if:

The above-mentioned application server system comprises a service control server and a media server;

The above-mentioned service control server is provided with the above-mentioned transmission-request reception means;

The above-mentioned media server is provided with the above-mentioned content storage means, the above-mentioned advertisement-content selection means, and the above-mentioned selected-advertisement-content specification-information transmission means;

The above-mentioned service control server is provided with an advertisement-selection-information transmission means for transmitting the above-mentioned advertisement selection information to the above-mentioned media server via the above-mentioned connection control system; and

The above-mentioned media server is provided with an advertisement-selection-information reception means for receiving the above-mentioned advertisement selection information transmitted by the above-mentioned service control server; and

The above-mentioned advertisement-content selection means is configured to select the above-mentioned advertisement content data based on the above-mentioned advertisement selection information received.

[0033] Additionally, the content delivery system according to another aspect of the present invention is provided with an application server system and a connection control system, wherein:

The connection control system is provided with a core IMS part (Internet Protocol Multimedia Subsystem), which receives equipment specification information transmitted by user equipment and establishes a connection between the above-mentioned application server system and said user equipment based on said equipment specification information thus received;

The above-mentioned application server system is provided with:

A media functions part for transmitting content data representing content to the above-mentioned user equipment with which the connection has been established by the above-mentioned core IMS part;

A service-control functions part for controlling services provided by the media functions part; and

A user-profile-server functions part for storing profile information of users of the above-mentioned user equipment;

The above-mentioned media functions part is provided with a content storage means for storing advertisement content data representing advertisement content and main content data representing main content; and

The service-control functions part is provided with:

A transmission-request reception means for receiving a content transmission request containing main-content identification information for identifying the above-mentioned main content and transmitted by the above-mentioned user equipment, via the above-mentioned core IMS part;

An advertisement-content selection means for selecting the above-mentioned stored advertisement content data, doing so based on advertisement selection information containing advertisement attribute information representing an attribute of the above-mentioned advertisement content and pre-stored by the above-mentioned user-profile-server functions part, the above-mentioned service-control functions part, or the above-mentioned connection control system; and

A selected-advertisement-content specification-information transmission means for transmitting selected-advertisement-content specification information for specifying the above-mentioned selected advertisement content data, via the above-mentioned core IMS part to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request.

[0034] In this case, it will be preferable if:

The above-mentioned user equipment is provided with:

A selected-advertisement-content specification-information reception means for receiving the above-mentioned selected-advertisement-content specification information transmitted by the above-mentioned service-control functions part; and

A content-viewing-request transmission means for transmitting, to said media functions part, a main-content viewing request containing the above-mentioned main-content identification information and an advertisement-content viewing request containing the above-mentioned received selected-advertisement-content specification information, doing so when a connection with the above-mentioned media functions part is established by the above-mentioned core IMS part, and

The above-mentioned media functions part is provided with a content transmission means for receiving the above-mentioned main-content viewing request transmitted by the above-mentioned user equipment and transmitting, to said user equipment, main content data identified by the main-content identification information contained in the above-mentioned received main-content viewing request, and for receiving the above-mentioned advertisement-content viewing request transmitted by said user equipment and transmitting, to said user equipment, advertisement content data specified by the selected-advertisement-content specification information contained in said received advertisement-content viewing request.

[0035] In this case, it will be preferable if the above-mentioned user equipment is provided with a content outputting means for receiving main content data and advertisement content data transmitted by the above-mentioned media functions part and outputting, based on said received main content data and advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[0036] In this case, it will be preferable if:

The above-mentioned selected-advertisement-content specification-information transmission means is configured to transmit, via the above-mentioned core IMS part to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request, playlist information, which is information containing the above-mentioned main-content identification information contained in the above-mentioned content transmission request and the above-mentioned selected-advertisement-content specification information and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output;

The above-mentioned selected-advertisement-content specification-information reception means is configured to receive the above-mentioned playlist information transmitted by the above-mentioned service-control functions part; and

The above-mentioned content-viewing-request transmission means is configured to transmit the above-mentioned main-content viewing request and the above-mentioned advertisement-content viewing request to the above-mentioned media functions part, doing so based on the above-mentioned playlist information received.

[0037] The content delivery method according to another aspect of the present invention comprises:

A content-storage processing step for storing advertisement content data representing advertisement contents and main content data representing main content in a storage device;

A connection establishment step, in which the connection control system receives equipment specification information transmitted by user equipment and establishing a connection between an application server system and the user equipment based on the received equipment specification information;

A transmission-request reception step, in which the application server system receives, via the above-mentioned connection control system, a content transmission request containing a main-content identification information for identifying the above-mentioned main content and transmitted by the above-mentioned user equipment;

An advertisement-content selection step for selecting the above-mentioned stored advertisement content data based on advertisement selection information containing advertisement attribute information representing an attribute of the above-mentioned advertisement content; and

A selected-advertisement-content specification-information transmission step, in which the above-mentioned application server system transmits selected-advertisement-content specification information that specifies the above-mentioned selected advertisement content data, doing so via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request.

[0038] In this case, it will be preferable for the above-mentioned content delivery method if the above-mentioned user equipment comprises:

A selected-advertisement-content specification-information reception step, in which the above-mentioned user equipment receives the above-mentioned selected-advertisement-content specification information transmitted by the above-mentioned application server system;

A content-viewing-request transmission step, in which the above-mentioned user equipment transmits, to the above-mentioned application server system, a main-content viewing request containing the above-mentioned main-content identification information and an advertisement-content viewing request containing the above-mentioned received selected-advertisement-content specification information, when a connection between said user equipment and said application server system is established, and

A content transmission step, in which the above-mentioned application server system receives the above-mentioned main-content viewing request transmitted by the above-mentioned user equipment and transmitting main content data identified by the main-content identification information contained in said received main-content viewing request to said user equipment, and for receiving the above-mentioned advertisement-content viewing request transmitted by said user equipment and transmitting advertisement content data specified by the selected-advertisement-content specification information contained in said received advertisement-content viewing request to said user equipment.

[0039] In this case, it will be preferable for the above-mentioned content delivery method if the above-mentioned user equipment is provided with a content outputting step for receiving main content data and advertisement content data transmitted by the above-mentioned application server system and outputting, based on said received main content data and advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[0040] In this case, it will be preferable if:

The above-mentioned selected-advertisement-content specification-information transmission step is configured to transmit, via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request, playlist information, which is information containing the above-mentioned main-content identification information contained in the above-mentioned content transmission request and the above-mentioned selected-advertisement-content specification information and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output;

The above-mentioned selected-advertisement-content specification-information reception step is configured to receive the above-mentioned playlist information transmitted by the above-mentioned application server system; and

The above-mentioned content-viewing-request transmission step is configured to transmit the above-mentioned main-content viewing request and the above-mentioned advertisement-content viewing request to the above-mentioned application server system, doing so based on the above-mentioned playlist information received.

[0041] The program according to yet another aspect of the present invention is a program for causing a service control server to realize:

A transmission-request reception means for receiving a content transmission request containing main-content identification information for identifying main content and transmitted by user equipment, via a connection control system establishing a connection between a media server and said user equipment;

An advertisement-content selection means for selecting advertisement content data prestored in a storage device based on advertisement selection information containing advertisement attribute information representing an attribute of advertisement content; and

A selected-advertisement-content specification-information transmission means for transmitting selected-advertisement-content specification information specifying the above-mentioned selected advertisement content data, via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request.

[0042] In this case, it will be preferable if the above-mentioned selected-advertisement-content specification-information transmission means is configured to transmit, via the above-mentioned connection control system to the above-mentioned user equipment which has transmitted the above-mentioned content transmission request, playlist information, which is information containing the above-mentioned main-content identification information contained in the above-mentioned content transmission request and the above-mentioned selected-advertisement-content specification information and is the information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output.

[0043] The program according to yet another aspect of the present invention is a program for causing a user equipment to realize:

A selected-advertisement-content specification-information reception means for receiving selected-advertisement-content specification information which is the information for specifying selected advertisement content data and transmitted by an application server system, via a connection control system establishing a connection between said application server system and said user equipment; and

A content-viewing-request transmission means for transmitting, to the above-mentioned application server system, a main-content viewing request containing main-content identification information for identifying main content and an advertisement-content viewing request containing the above-mentioned selected-advertisement-content specification information received, when a connection with said application server system is established by the above-mentioned connection control system.

[0044] In this case, it will be preferable if the above-mentioned program is a program that causes the above-mentioned user equipment to further realize a content outputting means for receiving main content data and advertisement content data transmitted by the above-mentioned application server system and outputting, based on said received main content data and advertisement content data, viewing content in which advertisement content represented by said advertisement content data is inserted into main content represented by said main content data.

[0045] In this case, it will be preferable if:

The above-mentioned selected-advertisement-content specification-information reception means is configured to receive playlist information, which is information containing the above-mentioned main-content identification information and the above-mentioned selected-advertisement-content specification information and is information containing information indicating the sequence in which the main content identified by said main-content identification information and the advertisement content specified by said selected-advertisement-content specification information are output; and

The above-mentioned content-viewing-request transmission means is configured to transmit the above-mentioned main-content viewing request and the above-mentioned advertisement-content viewing request to the above-mentioned application server system, doing so based on the above-mentioned playlist information thus received.

[0046] An invention of a content delivery method or program having the above-described configuration also has the same advantages as the above-mentioned content delivery system and therefore can achieve the purpose of the invention described above.

[0047] The following is an explanation of each embodiment of the content delivery system, content delivery method, and program according to the present invention with reference to FIGS. 1 to 20.

[0048] <First Embodiment>
(Configuration)

As illustrated in FIG. 1, a content delivery system 1 according to a first embodiment is a Video-on-Demand system. Alternatively, the content delivery system 1 may be an IPTV (Internet Protocol Television) system for broadcasting content.

[0049] The content delivery system 1 includes a connection control system 3 and an application server system 4. The connection control system 3 includes a plurality of servers including a connection control server 3a and a connection control server 3b. The application server system 4 includes a plurality of servers including a service control server 4a, a media server 4b, and a user-information management server 4c.

[0050] The connection control server 3a is communicably connected to user equipment (UE) 2 through user-side communication lines NW1 constituting an IP (Internet Protocol) network. The connection control server 3b and the application server system 4 are communicably connected to each other through service-provider-side communication lines NW2 constituting the IP network.

[0051] The user equipment 2 has a set-top box and a remote controller (both not shown). The set-top box is connected to a television receiver (not shown). The set-top box receives content data representing content transmitted from the media server 4b (here, the content is a video consisting of sound and images), and outputs the content to the television receiver by converting the received content data.

[0052] The remote controller has a plurality of buttons (button switches). When a button is pressed by a user, the remote controller transmits an infrared signal corresponding to the pressed button to the set-top box. The set-top box accepts information input by the user by receiving the infrared signal from the remote controller.

[0053] The user equipment 2 stores equipment specification information for specifying the equipment (local terminal) in a memory serving as a storage device.

[0054] The connection control server 3a, the connection control server 3b, the service control server 4a, the media server 4b, and the user-information management server 4c (servers 3a to 4c) each have a central processing unit (CPU) (not shown), and a storage device (memory and hard disk drive (HDD)) (not shown). Each of the servers 3a to 4c is configured to realize functions described below by the CPU executing a program stored in the storage device.

[0055] The connection control server 3a and the connection control server 3b are configured to control connection between a plurality of devices by exchanging (receiving and transmitting) a SIP message (message according to Session Initiation Protocol). In other words, each of the connection control server 3a and the connection control server 3b is a SIP server.

[0056] The connection control system 3 is configured to establish, upon receiving a SIP message containing equipment specification information transmitted by the user equipment 2, connection (a session) between the application server system 4 and the user equipment 2 based on the equipment specification information contained in the received SIP message.

[0057] The service control server 4a controls a service provided by the media server 4b (service to transmit content data). The media server 4b transmits content data representing content to the user equipment 2 with which the connection is established by the connection control system 3. The user-information management server 4c prestores profile information of the user of the user equipment 2 and transmits the stored profile information to the service control server 4a.

[0058] (Functions)

FIG. 2 is a block diagram illustrating functions of the content delivery system 1 configured as described above.

[0059] (Functions: User Equipment)

Functions of the user equipment 2 include a request transmitter 11, a playlist receiver (selected-advertisement-content specification-information reception means) 12, a viewing request transmitter (content-viewing-request transmission means) 13, and a content outputting part (content outputting means) 14.

[0060] The request transmitter 11 transmits, to the connection control server 3a, a SIP message as an equipment authentication request containing the stored equipment specification information, when the state of a power switch of the user equipment 2 is set to the ON state (when power is supplied).

[0061] The request transmitter 11 receives a SIP message containing equipment-authentication success information from the connection control system 3. The equipment-authentication success information is information, which contains equipment-address information representing a position of the equipment in the IP network and indicates that the user equipment 2 located at the position represented by the equipment-address information is authenticated to be valid equipment.

[0062] Further, the request transmitter 11 transmits, to the connection control system 3, a SIP message containing user authentication information received from the user of the user equipment 2 via the remote controller, as a user authentication request. In this example, the user authentication information consists of user identification information, which represents a character string for identifying the user of the user equipment 2, and password information, which represents a character string as a password.

[0063] The request transmitter 11 also receives a SIP message containing user-authentication success information from the connection control system 3. The user-authentication success information is information that contains user identification information and indicates that the user identified by the user identification information (i.e., the user who has input the user authentication information) is a valid user.

[0064] Upon receiving the user-authentication success information from the connection control system 3, the request transmitter 11 transmits a SIP message, which contains a process request for requesting the application server system to execute the process, to the connection control system 3 in response to a request transmission instruction input by the user of the user equipment 2. The process request contains user-authentication success information (i.e., user identification information).

[0065] The playlist receiver 12 receives playlist information transmitted by the application server system 4 (service-control functions part 40 to be described later) via the connection control system 3 (core IMS part 30 to be described later).

[0066] In this example, the playlist information contains multiple pieces of content element information each comprising a set consisting of content identification information for identifying content as well as a reproduction start position and reproduction end position of the content identified by the content identification information. The content identification information as used herein is main-content identification information for identifying main content or advertisement-content identification information (selected-advertisement-content specification information) for identifying advertisement content.

[0067] Further, the playlist information is information containing information indicating the sequence in which the pieces of content (the main content identified by the main-content identification information and the advertisement content specified by the selected-advertisement-content specification information) are output (content output sequence).

[0068] The viewing request transmitter 13 transmits a main-content viewing request and an advertisement-content viewing request to the application server system 4 based on the playlist information received by the playlist receiver 12 when the connection between the user equipment 2 and the application server system 4 is established by the connection control system 3 (core IMS part 30 to be described later).

[0069] The main-content viewing request contains main-content identification information and a reproduction start position. The advertisement-content viewing request contains advertisement-content identification information (selected-advertisement-content specification information) and a reproduction start position.

[0070] Specifically, the viewing request transmitter 13 transmits a content viewing request (main-content viewing request or advertisement-content viewing request), one at a time, at a predetermined timing according to the content output sequence indicated by the playlist information received by the playlist receiver 12.

[0071] In this example, when the reproduction position of content that is being output by a content outputting part 14 (to be described later) reaches a position located before the reproduction end position associated with the content in the playlist information by a predetermined period of time, the viewing request transmitter 13 transmits to the application server system 4 a content viewing request relating to content defined in the playlist information to be output next to the content that is currently being output.

[0072] Further, when the reproduction position of the content that is being output by the content outputting part 14 (to be described later) reaches the reproduction end position associated with the content in the playlist information, the viewing request transmitter 13 transmits to the application server system 4 a reproduction stop request in order to request that the transmission of content data representing the content be stopped, and at the same time transmits to the application server system 4 a reproduction start request for requesting the commencement of a transmission of content data representing content defined in the playlist information to be output next to the content that is being currently output.

[0073] The content outputting part 14 receives content data transmitted by the application server system 4 and outputs content represented by the received content data (in this example, the content is output through a television receiver). It can be said specifically that the content outputting part 14 receives main content data and advertisement content data and outputs, based on the received main content data and advertisement content data, viewing content in which advertisement content represented by the advertisement content data is inserted into main content represented by the main content data.

[0074] (Functions: Connection Control System)

Functions of the connection control system 3 include a core IMS (Internet Protocol Multimedia Subsystem) part 30 and a transport functions (TF) part 80.

[0075] The core IMS part 30 includes a call connection controller 31 and an IMS authentication part (user authentication means) 32. The transport functions part 80 includes a bandwidth guarantee part 81 and an equipment authentication part 82.

[0076] The call connection controller 31 controls connection between a plurality of devices by exchanging (receiving and transmitting) a SIP message.

[0077] When the connection control server 3a receives an equipment authentication request from the user equipment 2, the equipment authentication part 82 authenticates whether or not the user equipment 2 is a valid equipment (executes an equipment authentication process) by determining whether or not equipment specification information contained in the received equipment authentication request corresponds to (coincides with, in this example) equipment-authentication reference information. The equipment-authentication reference information as used herein is information that is prestored in a storage device provided in the connection control server 3a. The equipment-authentication reference information may be stored in a storage device (user-profile-server functions part 50 to be described later) provided in the user-information management server 4c.

[0078] The user equipment 2 is authenticated to be valid equipment, the equipment authentication part 82 transmits a SIP message containing equipment-authentication success information to the user equipment 2. When the user equipment 2 is authenticated to be a valid equipment by the equipment authentication part 82, the call connection controller 31 subsequently executes a process based on the message (process request or the like) transmitted from the user equipment 2 (for example, a process for transferring the message to the application server system 4).

[0079] On the other hand, if the user equipment 2 is not authenticated to be valid equipment by the equipment authentication part 82, the call connection controller 31 does not execute the process based on the message (process request or the like) transmitted from the user equipment 2 from then onward.

[0080] Further, when the connection control server 3a receives a user authentication request from the user equipment 2, the IMS authentication part 32 authenticates whether or not the user who has input the user authentication information (the user identified by the user identification information contained in the user authentication information) is a valid user (whether or not the user identified by the user identification information coincides with the user of the user equipment 2) by determining whether or not the user authentication information contained in the user authentication request corresponds to user-authentication reference information (executes user authentication). The user-authentication reference information as used herein is information that is prestored in the storage device (user-profile-server functions part 50 to be described later) provided in the user-information management server 4c. This means that the user-profile-server functions part 50 constitutes user-authentication reference information storage means.

[0081] When the user who has input the user authentication information is authenticated to be a valid user by the IMS authentication part 32, the call connection controller 31 transmits a SIP message containing user-authentication success information to the user equipment 2. However, if the user who has input the user authentication information is not authenticated to be a valid user by the IMS authentication part 32, the call connection controller 31 does not transmit a SIP message containing user-authentication success information to the user equipment 2.

[0082] Upon receiving a bandwidth guarantee instruction from the service control server 4a, the call connection controller 31 establishes connection between the media server 4b and the user equipment 2. The bandwidth guarantee instruction contains media-delivery specification information, which is used to specify the media server 4b, and communication bandwidth information, which represents a communication bandwidth. The call connection controller 31 transmits, to the transport functions part 80, the received communication bandwidth information and communication-channel specification information for specifying a communication channel between the user equipment 2 and the media server 4b specified by the received media-delivery specification information.

[0083] The bandwidth guarantee part 81 receives the communication bandwidth information and the communication-channel specification information from the call connection controller 31 and executes a process for guaranteeing a communication bandwidth represented by the communication bandwidth information for a communication channel specified by the received communication-channel specification information (bandwidth guarantee process).

[0084] (Functions: User-Information Management Server)

Functions of the user-information management server 4c include a user-profile-server functions (UPSF) part 50. The user-profile-server functions part 50 stores profile information of the user of the user equipment 2. The user-profile-server functions part 50 includes a user-basic-information storage part 51.

[0085] The user-basic-information storage part 51 stores user basic user-basic-information storage part 51 information in association with the user identification information for identifying the user of the user equipment 2. The user basic information is information for specifying advertisement attribute information representing an attribute of advertisement content (in this example, categories of advertisement content such as cars, real estate, travel, insurance, cell-phones, coffee, gadgets, and so on). In this example, the user basic information contains, as shown in FIG. 3, a plurality of information sets consisting of advertisement attribute information and priority information representing priority levels (in this example, indicated by integer values which increase as the priority level rises). The user basic information forms part of advertisement selection information.

[0086] (Functions: Service Control Server)

Furthermore, functions of the service control server 4a include a service control functions (SCF) part 40.

[0087] The service-control functions part 40 includes an information transceiver (transmission-request reception means and selected-advertisement-content specification-information transmission means) 41, a content-basic-information storage part 42, an advertisement-attribute information storage part (part of content storage means, or part of a content storing processing step) 43, an advertisement-insertion-information storage part 44, a playlist generator (advertisement-content selection means) 45, and a transmission request part 46.

[0088] The information transceiver receives various pieces of information (requests, instructions, notifications, and so on) transmitted by the user equipment 2 or the media server 4b via the core IMS part 30 (routed through the core IMS part 30). Further, the information transceiver 41 transmits various pieces of information to the user equipment 2 or the media server 4b via the core IMS part 30. In this example, the various pieces of information are contained in the SIP message.

[0089] Incidentally, only when the service control server 4a receives a process request containing user-authentication success information from the user equipment 2, the service control server 4a executes a process according to the process request. Thus, it can be said that the application server system 4 executes a process according to the process request when the user who has input the user authentication information is authenticated to be a valid user by the IMS authentication part 32.

[0090] The content-basic-information storage part 42 stores the content basic information in association with main-content identification information for identifying the main content. The content basic information is information for specifying advertisement attribute information. In this example, like the user basic information, the content basic information includes a plurality of information sets consisting of advertisement attribute information and priority information representing priority levels. The content basic information forms part of the advertisement selection information.

[0091] The advertisement-attribute-information storage part 43 stores advertisement-content identification information for identifying advertisement content in association with the advertisement attribute information.

[0092] The advertisement-insertion-information storage part 44 stores the main-content identification information, number-of-insertions information, and inserting position information in association with each other. The number-of-insertions information is information representing the number of insertions, i.e., the number of advertisement content items inserted into the main content. The inserting-position information is information representing the inserting positions, i.e., positions in the main content where the advertisement content is to be inserted (in this example, it is indicated by a play time from the beginning of the main content).

[0093] The playlist generator 45 accepts a content transmission request received by the information transceiver 41 as a process request. The content transmission request is information transmitted by the user equipment 2 and containing user-authentication success information (i.e., user identification information), equipment-address information, and main-content identification information.

[0094] The playlist generator 45 acquires, from user basic information stored in the user-basic-information storage part 51, the user basic information stored in association with the user identification information contained in the content transmission request received by the information transceiver 41.

[0095] Further, the playlist generator 45 acquires, from content basic information stored in the content-basic-information storage part 42, the content basic information stored in association with the main-content identification information contained in the content transmission request.

[0096] The playlist generator 45 then calculates a final priority level for each item of the advertisement attribute information by combining a priority level represented by the priority information contained in the acquired user basic information and a priority level represented by the priority information contained in the acquired content basic information for each item of the advertisement attribute information.

[0097] Subsequently, the playlist generator 45 extracts, from advertisement-content identification information stored in the advertisement-attribute-information storage part 43, the advertisement-content identification information associated with the advertisement-attribute-information item with the highest calculated final priority level.

[0098] Furthermore, out of from the number-of-insertions information and the inserting-position information stored in the advertisement-insertion-information storage part 44, the playlist generator 45 acquires number-of-insertions information and inserting-position information stored in association with the main-content identification information contained in the content transmission request.

[0099] The playlist generator 45 then selects, from the extracted advertisement-content identification information, a number of advertisement-content-identification information items, said number being that represented by the acquired number-of-insertions information. Thus, it can be said that the playlist generator 45 selects advertisement content data stored in association with the advertisement attribute information specified on the basis of the user basic information associated with the user identification information for identifying the user of the user equipment 2, which has transmitted the content transmission request, and the content basic information associated with the main-content identification information contained in the content transmission request.

[0100] Subsequently, the playlist generator 45 generates playlist information on the basis of the selected-advertisement-content identification information (i.e., selected-advertisement-content specification information for specifying the advertisement content data which is selected), the main-content identification information contained in the content transmission request, and the acquired inserting-position information.

[0101] Thus, it can be said that the playlist information is information containing the main-content identification information contained in the content transmission request and the selected-advertisement-content specification information specifying the advertisement content data selected by the playlist generator 45.

[0102] The delivery requesting part 46 outputs a content transmission instruction. The content transmission instruction contains the playlist information generated by the playlist generator 45, the user-authentication success information contained in the content transmission request (i.e., user identification information), the equipment-address information, and the main-content identification information.

[0103] The information transceiver 41 transmits the content transmission instruction output by the delivery requesting part 46 to the media server 4b via the core IMS part 30. Further, upon receiving a transmission permission notification transmitted by the media server 4b, the information transceiver 41 transmits the playlist information generated by the playlist generator 45 to the user equipment 2 via the core IMS part 30. The transmission permission notification contains media-delivery specification information for specifying a media server (in this example, the media server 4b) and the playlist information.

[0104] (Functions: Media Server)

Functions of the media server 4b include a media functions (MF) part 60. The media functions part 60 includes a media control functions (MCF) part and a media delivery functions (MDF) part.

[0105] The media functions part 60 includes an information transceiver 61, a content data storage part (part of content storage means, or part of a content storing processing step) 62, a content delivery controller 63, and a content delivering part (content delivering means) 65.

[0106] The information transceiver 61 receives various pieces of information transmitted by the service control server 4a via the core IMS part 30. Specifically, the information transceiver 61 receives a content transmission instruction and so on that have been transmitted by the service control server 4a via the core IMS part 30. The information transceiver 61 transmits the various pieces of information to the service control server 4a via the core IMS part 30. Specifically, the information transceiver 61 transmits a transmission permission notification and so on to the service control server 4a via the core IMS part 30.

[0107] The content-data storage part 62 stores main content data representing main content and main-content identification information for identifying the main content in association with each other. Further, the content-data storage part 62 stores advertisement content data representing advertisement content and advertisement-content identification information for identifying the advertisement content in association with each other.

[0108] The content delivery controller 63 receives a main-content viewing request from the user equipment 2. The main-content viewing request contains main-content identification information, a reproduction start position, and user identification information. The content delivery controller 63 also receives an advertisement-content viewing request from the user equipment 2. The advertisement-content viewing request contains advertisement-content identification information, a reproduction start position, and user identification information.

[0109] The content delivery controller 63 receives a reproduction start request from the user equipment 2. In addition, the content delivery controller 63 receives a reproduction stop request from the user equipment 2.

[0110] Once a reproduction start request is received by the content delivery controller 63, the content delivering part 65 transmits the content data identified by the content transmission request to the user equipment 2 from the reproduction start position contained in the content viewing request.

[0111] The content delivering part 65 transmits the data using a session established by the core IMS part 30, according to a predetermined communication protocol (in this example, RTP (Real-time Transport Protocol)).

[0112] Thus, it can be said that the content delivering part 65 transmits content data stored by the content-data storage part 62 (main content data and advertisement content data) to the user equipment 2 which has transmitted the content transmission request when the connection between the user equipment 2 and the media server 4b is established by the connection control system 3.

[0113] Once a reproduction stop request is received by the content delivery controller 63, the content delivering part 65 stops transmitting the content data which is being transmitted.

[0114] (Operation)

The following is an explanation of the operation of the aforementioned content delivery system 1:

[0115] (Operation: Authentication Process)

The operation of the content delivery system 1 performed when the content delivery system 1 authenticates the user of the user equipment 2 will be described with reference to the sequence diagram of FIG. 4.

[0116] Firstly, power is supplied to the user equipment 2 by the user setting the state of the power switch of the equipment 2 to the ON state. This causes the user equipment 2 to transmit an equipment authentication request containing the stored equipment specification information to the connection control server 3a (transport functions part 80) (step A401).

[0117] The transport functions part 80 authenticates whether or not the user equipment 2 is valid equipment (executes an equipment authentication process) by determining whether or not the equipment specification information contained in the received equipment authentication request corresponds to (in this example, coincides with) the prestored equipment-authentication reference information (step B401). If the user equipment 2 is authenticated to be valid equipment, the transport functions part 80 then transmits equipment-authentication success information to the user equipment 2 (step B402). The equipment-authentication success information is information containing equipment-address information and representing that the user equipment 2 is authenticated to be valid equipment.

[0118] Upon receiving the equipment-authentication success information, the user equipment 2 causes a television receiver (not shown) to display an image to prompt the user UA to input his or her user authentication information. In response to this, the user UA inputs the user authentication information by manipulating a remote controller.

[0119] Upon accepting the input of the user authentication information, the user equipment 2 transmits a user authentication request containing the accepted user authentication information to the core IMS part 30 (step A402).
[0120] Thus, the core IMS part 30 receives the user authentication request. The core IMS part 30 determines whether or not the user authentication information contained in the received user authentication request corresponds to (in this example, coincides with) the prestored user-authentication reference information, whereby it is authenticated whether or not the user identified by the user identification information contained in the user-authentication reference information (the user who has input the user authentication information) is a valid user (executes a user authentication process) (step B403, user authentication step). If the user who has input the user authentication information is authenticated to be a valid user, the core IMS part 30 transmits user-authentication success information to the user equipment 2 (step B404).

[0121] Thus, the user equipment 2 receives the user-authentication success information. After that, the user equipment 2 transmits a process request (a SIP message containing the same) containing the user-authentication success information to the core IMS part 30.

[0122] (Operation: Content Viewing Process)

Next, the operation of the content delivery system 1 performed when transmitting content data to the user equipment 2 in response to an input by the user of the user equipment 2 will be described with reference to the sequence diagrams shown in FIGS. 5 and 6.

[0123] Firstly, the user of the user equipment 2 inputs, to the user equipment 2, information for instructing the user equipment to transmit a process request requesting the transmission of content list information representing a list of viewable content. In response to this, the user equipment 2 transmits the process request to the service control server 4a (service-control functions part 40) via the core IMS part 30.

[0124] The service-control functions part 40 transmits content list information representing a list of main content represented by the main content data stored in the content-data storage part 62 to the user equipment 2 via the core IMS part 30. Upon receiving the content list information, the user equipment 2 causes a television receiver (not shown) to display the list of the main content represented by the received content list information.

[0125] Incidentally, the content delivery system 1 may be configured such that the content list information is transmitted to the user equipment 2 from a portable server (not shown) which is configured to be communicable with the user equipment 2 according to HTTP (Hypertext Transfer Protocol).

[0126] With the list of main content being displayed on the television receiver, the user of the user equipment 2 selects main content that the user wishes to view, and inputs main-content identification information for identifying the selected main content.

[0127] Thus, as shown in FIG. 5, the user equipment 2 transmits, to the core IMS part 30, a content transmission request as a process request containing the input main-content identification information, user-authentication success information as the user identification information for identifying the user, and equipment-address information (step A501). The content transmission request is transmitted as an INVITE message (message in which "INVITE" is set as the method) of a SIP message.

[0128] The core IMS part 30 thus receives the content transmission request. Subsequently, the core IMS part 30 executes a bandwidth reservation process as preparation for guaranteeing a communication bandwidth. The core IMS part 30 then transmits the received content transmission request to the service-control functions part 40 (step B501). [0129] Subsequently, the service-control functions part 40 receives the content transmission request (transmission request reception step). The service-control functions part 40 acquires user basic information and content basic information on the basis of the user identification information and main-content identification information contained in the received content transmission request.

[0130] The service-control functions part 40 then calculates a final priority level for each advertisement-attribute information item based on the acquired user basic information and the acquired content basic information. The service-control functions part 40 extracts, from advertisement-content identification information stored in the advertisement-attribute-information storage part 43, the advertisement-content identification information associated with the advertisement-attribute information item with the highest calculated final priority level.

[0131] On the other hand, the service-control functions part 40 acquires, from number-of-insertions information and inserting-position information stored in the advertisement-insertion-information storage part 44, the number-of-insertions information and the inserting-position information stored in association with the main-content identification information contained in the content transmission request.

[0132] The service-control functions part 40 then selects from the extracted advertisement-content identification information, a number of items of advertisement-content identification information, said number being that represented by the acquired number-of-insertions information (advertisement content selection step). Subsequently, the service-control functions part 40 generates playlist information on the basis of the selected-advertisement-content identification information, the main-content identification information contained in the content transmission request and the acquired inserting-position information (step C501). The playlist information is information containing the main-content identification information and the selected-advertisement-content specification information.

[0133] The service-control functions part 40 then selects a media server 4b (media functions part 60) and transmits the content transmission instruction to the selected media functions part 60 via the core IMS part 30 (step C502). The content transmission instruction contains the generated playlist information, the user identification information, and the equipment-address information.

[0134] The content transmission instruction is transmitted as an INVITE message of a SIP message. As shown in FIG. 7, the INVITE message includes a header HD and a body BD. In this example, the playlist information PL is contained as values in the field of “X-video-sequence” in the header HD of the INVITE message.

[0135] In this example, the playlist information PL includes five portions of content element information separated with commas. The first portion of the content element information is formed of a set of values separated with semicolons, said set of values consisting of “content1” as the main-content identification information, “0” as the reproduction start position of the main content, and “300” as the reproduction end position of the main content. The second portion of the content element information comprises a set of values separated with semicolons, said set of values consisting of “adv1” as the advertisement-content identification information, “0” as the reproduction start position of the advertisement content, and “30” as the reproduction end position of the advertisement content. The third to fifth portions of the content element information are formed in the same manner as the first and second portions of the content element information.

[0136] The media functions part 60 thus receives the content transmission instruction. Subsequently, the media functions part 60 determines a media server to which the content data is to be transmitted on the basis of the playlist information and the equipment-address information contained in the content transmission instruction. Further, the media functions part 60 transmits a transmission permission notification to the service-control functions part 40 via the core IMS part 30 (step D501).

[0137] The transmission permission notification contains media-delivery specification information, which is used to specify the determined media server (in this example, the media server 4b), and the playlist information. The transmission permission notification is transmitted as an OK message (response containing “OK” and “200” as a status code in the start line) of a SIP message.

[0138] Thus, the service-control functions part 40 receives the media-delivery specification information and the playlist information. The service-control functions part 40 then determines a communication bandwidth required for transmitting the main content data identified by the playlist information, on the basis of the received media-delivery specification information and playlist information.

[0139] Further, the service-control functions part 40 transmits, to the core IMS part 30, a bandwidth guarantee instruction containing communication bandwidth information indicating the determined communication bandwidth, and the received media-delivery specification information and playlist information (step C503). The bandwidth guarantee instruction is transmitted as an OK message of a SIP message.

[0140] Upon receiving the bandwidth guarantee instruction, the core IMS part 30 transmits, to the transport functions part 80, the received communication bandwidth information and communication-channel specification information for specifying a communication channel between the user equipment 2 and the media server 4b specified by the received media-delivery specification information. Thus, the transport functions part 80 executes a process for guaranteeing the communication bandwidth represented by the received communication bandwidth information on the communication channel specified by the received communication-channel specification information (bandwidth guarantee process).

[0141] Upon completing the bandwidth guarantee process, the core IMS part 30 transmits a transmission-preparation completion notification to the user equipment 2 (step B502). The transmission-preparation completion notification contains the received media-delivery specification information and playlist information. The transmission-preparation completion notification is transmitted as an OK message of a SIP message.

[0142] As described above, the OK message transmitted as a bandwidth guarantee instruction or transmission-preparation completion notification is one of connection establishment messages which the core IMS part 30 exchanges with the user equipment 2, the service-control functions part 40, and the media functions part 60 in order to establish connection between the user equipment 2 and the media functions part 60.

[0143] Thus, it can be said that the service-control functions part 40 transmits the selected-advertisement-content specification information to the user equipment 2 via the core IMS part 30 by incorporating the selected-advertisement-content specification information in the connection establishment message (selected-advertisement-content specification-information transmission step).

[0144] In other words, it can be said that the service-control functions part 40 transmits playlist information containing the selected-advertisement-content specification information to the user equipment 2 via the core IMS part 30 when the core IMS part 30 executes a process for establishing a connection between the user equipment 2 and the media functions part 60.

[0145] Then, upon receiving the transmission-preparation completion notification (selected-advertisement-content specification-information reception step), the user equipment 2 transmits a connection-preparation completion notification to the service-control functions part 40 via the core IMS part 30 (step A502). The connection-preparation completion notification is transmitted as an ACK message (message in which “ACK” is set as the method) of a SIP message.

[0146] Upon receiving the connection-preparation completion notification, the service-control functions part 40 transmits a connection-preparation completion notification, which is the same as the received connection-preparation completion notification, to the media functions part 60 via the core IMS part 30 (step C504). This connection-preparation completion notification is also transmitted as an ACK message of a SIP message.

[0147] The connection (session) between the media server 4b and the user equipment 2 is established by the media functions part 60 receiving the connection-preparation completion notification (step E501). The processes in step A501 to step E501 together make up a connection establishment step. It can be said that the core IMS part 30 establishes the connection between the media server 4b (media functions part 60) and the user equipment 2 by relaying the SIP message.

[0148] It can also be said that the SIP message which the connection control system 3 (core IMS part 30) exchanges with the user equipment 2, the service control server 4a, and the media server 4b in step A501 to step E501 is a connection establishment message for the connection control system 3 establishing a connection between the user equipment 2 and the media server 4b.

[0149] Incidentally, in this example, both the connection for performing communication according to RTSP (Real Time Streaming Protocol) and the connection for performing communication according to RTP are established simultaneously.

[0150] As shown in FIG. 6, the user equipment 2 then transmits a content viewing request based on the playlist information PL contained in the received transmission-preparation completion notification to a media server 4b (media functions part 60) specified by the media-delivery specification information contained in the received transmission-preparation completion notification (content-viewing-request transmission step).

[0151] More specifically, the user equipment 2 firstly transmits, to the media functions part 60, a content viewing request (main-content viewing request, in this example) containing content identification information ("content1" in this example) contained in the leading portion of the content element information (i.e., first portion of the content element information) in the playlist information PL, and the reproduction start position ("0" in this example) contained in that portion of the content element information (step A503).

[0152] The content viewing request further contains user identification information for identifying the user of the user equipment 2. The content viewing request is transmitted as a SETUP message (message in which "SETUP" is set as the method) of a RTSP message (message according to RTSP).

[0153] The media functions part 60 then receives the content viewing request. Subsequently, the media functions part 60 acquires, from advertisement content data and main content data stored in the content-data storage part 62, the content data identified by the content identification information contained in the received content viewing request.

[0154] The media functions part 60 then transmits a content-delivery-preparation completion notification to the user equipment 2 which has transmitted the content viewing request (step D502). The content-delivery-preparation completion notification is transmitted as an OK message (response containing "OK" and "200" as a status code in the start line) of a RTSP message.

[0155] Upon receiving the content-delivery-preparation completion notification, the user equipment 2 transmits, to the media functions part 60, a reproduction start request for the content relating to the content viewing request transmitted in step A503 (here, the main content identified by "content1" of the main-content identification information) (step A504). The reproduction start request is transmitted as a PLAY message (message in which "PLAY" is set as the method) of a RTSP message.

[0156] Subsequently, upon receiving the reproduction start request, the media functions part 60 transmits a reproduction start notification to the user equipment 2 (step D503). The reproduction start notification is information indicating that transmission of the content data is started. The reproduction start notification is transmitted as an OK message of a RTSP message.

[0157] The media functions part 60 then transmits the content data identified by the received content viewing request (here, the main content data) to the user equipment 2 from the reproduction start position ("0" in this example) (step D504, content transmission step). This transmission of the data is performed by the media functions part 60 using the session established by the core IMS part 30, doing so according to RTP.

[0158] Thus, the user equipment 2 receives the content data and causes the television receiver (not shown) to display the content represented by the received content data (here, the main content identified by the main-content identification information "content1") (content output step).

[0159] After that, when the reproduction position of the content that is being output reaches a position located before the reproduction end position associated with this content in the playlist information PL ("300" in this example) by a predetermined period of time, the user equipment 2 transmits, to the media functions part 60, a content viewing request (advertisement-content viewing request, in this example) containing content identification information ("adv1" in this example) contained in the content element information located next to the content element information relating to the content that is being output in the playlist information PL (that is, the second portion of the content element information), and a reproduction start position contained in that content element information ("0" in this example) (step A505).

[0160] The media functions part 60 then receives the content viewing request. Subsequently, the media functions part 60 transmits a content-delivery-preparation completion notification to the user equipment 2 which has transmitted the content viewing request, in the same manner as in step D502 described above (step D505).

[0161] When the reproduction position of the content which is being output reaches the reproduction end position associated with the content in the playlist information PL ("300" in this example), the user equipment 2 transmits, to the media functions part 60, a reproduction stop request for requesting that the transmission of the content data representing that content (i.e. the main content) be stopped (step A506). The reproduction stop request is transmitted as a PAUSE message (message in which "PAUSE" is set as the method) of a RTSP message.

[0162] Subsequently, upon receiving the reproduction stop request, the media functions part 60 stops the transmission of the content data.

[0163] Further, the user equipment 2 transmits, to the media functions part 60, a reproduction start request for requesting the reproduction of the content relating to the content viewing request transmitted in step A505 described above (here, the advertisement content identified by the advertisement-content identification information "adv1") (step A507).

[0164] Subsequently, upon receiving the reproduction start request, the media functions part 60 transmits a reproduction start notification to the user equipment 2 (step D506). The media functions part 60 then transmits the content data identified by the received content viewing request (here, the advertisement content data) to the user equipment 2, doing so from the reproduction start position contained in the content viewing request ("0" in this example) (step D507, content transmission step).

[0165] Thus, the user equipment 2 receives the content data and causes a television receiver (not shown) to display the content represented by the received content data (here, the advertisement content identified by the advertisement-content identification information “adv1”).

[0166] By repeatedly performing the processes described above, the user equipment 2 outputs, based on the playlist information PL, the viewing content in which the advertisement content represented by the advertisement content data is inserted into the main content represented by the main content data.

[0167] According to the first embodiment of the content delivery system of the present invention, the content delivery system 1 transmits to the user equipment 2 selected-advertisement-content specification information for selecting advertisement content selected based on advertisement selection information. Accordingly, it is possible to cause the user to view viewing content in which advertisement content corresponding to the advertisement selection information has been inserted.

[0168] Further, according to the first embodiment described above, the application server system 4 can be allowed to determine a sequence in which the main content and the advertisement content are output by the user equipment 2. This makes it possible for users to view advertisement content in a manner that reflects the intentions of the advertisement content provider more significantly.

[0169] Further, in the first embodiment described above, the advertisement selection information contains user basic information associated with the user identification information. This enables the content delivery system 1 to cause the user of the user equipment 2 which has transmitted a content transmission request to view viewing content in which advertisement content according to the user has been inserted.

[0170] In addition, in the first embodiment described above, the advertisement selection information contains the content basic information associated with the main-content identification information. This enables the content delivery system 1 to cause the user to view the viewing content in which the advertisement content selected according to the main content identified by the main-content identification information contained in the received content transmission request has been inserted.

[0171] Further, in the first embodiment, the service-control functions part 40 is configured to transmit playlist information containing selected-advertisement-content specification information to the user equipment 2 via the connection control system 3 when the connection control system 3 executes a process for establishing the connection. This enables the service control server 4a to transmit, to the user equipment 2, the playlist information in which the latest advertisement selection information as of the point in time when the connection control system 3 executes a process for establishing the connection is reflected.

[0172] In addition, in the first embodiment described above, the service-control functions part 40 is configured to transmit playlist information containing selected-advertisement-content specification information to the user equipment 2 via the connection control system 3 by incorporating the playlist information into a connection establishment message.

[0173] This eliminates the need for the service control server 4a to transmit any other messages besides the connection establishment message in order to transmit the playlist information to the user equipment 2. This means that the number of communications among the connection control system 3, the service control server 4a, and the user equipment 2 can be reduced. In other words, the processing load and/or communication load required for the connection control system 3, the service control server 4a and the user equipment 2 to exchange messages can be relieved.

[0174] Although in the first embodiment described above, the playlist information is contained in the header HD of the INVITE message, the playlist information may be contained in the start line (Request-Line) of the INVITE message. For example, as shown in FIG. 8, the playlist information PL may be contained in the Request-URI (Uniform Resource Identifier) in the start line.

[0175] Although in the first embodiment described above, the playlist information is contained in the header HD of the INVITE message, the playlist information may be contained in the body BD of the INVITE message. For example, as shown in FIG. 9, the playlist information PL may be contained in the body BD as a value of “videosequence” in the values of type “a” in SDP (Session Description Protocol).

[0176] Further, although in the first embodiment described above, the playlist information is contained in the header HD of an INVITE message, the body BD of the INVITE message may be formed of a first part according to a first format and a second part according to a second format (that is, the body BD is multi-parted), and the playlist information may be contained in one of the first and second parts.

[0177] For example, as shown in FIG. 10, the body may include a first part BD1 according to SDP format and a second part BD2 according to text format, and the playlist information may be contained in the second part BD2.

[0178] Further, although in the first embodiment described above, the playlist information is contained directly in the INVITE message, reference information may be contained in the INVITE message so that the playlist information can be referred to in the reference information. For example, as shown in FIG. 11, reference information (substantially, playlist information) PL representing the URI for referring to (acquiring) the playlist information may be contained in the INVITE message as the value of the type “u” in SDP in the body BD.

[0179] The first embodiment described above is configured to simultaneously establish both the connection for performing communication according to RTSP (RTSP connection) and the connection for performing communication according to RTP (RTP connection) through the execution of the processes of step A501 to step E501. Now, in another modification of the first embodiment, the configuration may be such that the RTSP connection is established first through the execution of the processes of step A501 to step E501, and then the RTP connection is established through the execution of the same processes as those in step A501 to step E501.

[0180] While in the first embodiment described above, the content delivery system 1 is configured to establish only one connection (RTP connection) for communication according to RTP in order to transmit main content data and advertisement content data, content delivery system 1 may be configured to establish two RTP connections consisting of a RTP connection for transmitting main content data and a RTP connection for transmitting advertisement content data.

[0181] While in the first embodiment described above, the service-control functions part 40 is configured to transmit playlist information to the media functions part 60, service-control functions part 40 may be configured to transmit playlist information only to the user equipment 2 without transmitting the playlist information to the media functions part 60 (that is, without incorporating the playlist information in the content transmission instruction).

[0182] <First Modification of the First Embodiment>

The content delivery system according to the first modification of the first embodiment of the present invention will be described. This content delivery system according to the first modification is different from the content delivery system according to the first embodiment in that the playlist information is contained in a message other than the connection establishment message. Therefore, the following description will be made focusing on the difference.

[0183] Unlike the first embodiment, the service-control functions part 40 according to the first modification does not generate playlist information upon receiving a content transmission request transmitted by the user equipment 2. The service-control functions part 40 transmits a content transmission instruction containing no playlist information to the media functions part 60 via the core IMS part 30, as shown in FIG. 12 (step C1101).

[0184] Upon receiving the content transmission instruction, the media functions part 60 transmits a transmission permission notification to the service-control functions part 40 via the core IMS part 3 in the same manner as in step D501 according to the first embodiment (step D1101). The transmission permission notification is transmitted as an OK message of a SIP message.

[0185] Upon receiving the transmission permission notification, the service-control functions part 40 generates playlist information in the same manner as in step C501 according to the first embodiment (step C1102). Subsequently, the service-control functions part 40 transmits a playlist notification containing the generated playlist information to the media functions part 60 via the core IMS part 30 (step C1103). The playlist notification is transmitted as an INFO message (message in which “INFO” is set as the method) of a SIP message. Incidentally, the playlist notification may be transmitted as a MESSAGE message (message in which “MESSAGE” is set as the method) in a SIP message.

[0186] Thus, the media functions part 60 receives the playlist notification. The media functions part 60 then transmits a playlist-reception completion notification to the service-control functions part 40 via the core IMS part 30 (step D1102). The playlist-reception completion notification is information containing playlist information and indicating that the playlist notification has been received. The playlist-reception completion notification is transmitted as an OK message of a SIP message.

[0187] Upon receiving the playlist-reception completion notification, the service-control functions part 40 transmits the playlist information to the user equipment 2 via the core IMS part 30 in the same manner as in step C503 according to the first embodiment. Further, the content delivery system establishes connection between the user equipment 2 and the media server 4b by executing the same processes as those in step C503 and onwards according to the first embodiment, and transmits content data from the media server 4b to the user equipment 2. This first modification also provides the same advantages and effects as those of the first embodiment.

[0188] <Second Modification of the First Embodiment>

The content delivery system according to the second modification of the first embodiment of the present invention will be described. This content delivery system according to the second modification differs from the content delivery system according to the first embodiment in that the playlist information is contained in a message other than the connection establishment message. Therefore, the following description will be made focusing on the difference.

[0189] Unlike the first embodiment, the service-control functions part 40 according to the second modification does not generate playlist information upon receiving a content transmission request transmitted by the user equipment 2. The service-control functions part 40 transmits a content transmission instruction containing no playlist information to the media functions part 60 via the core IMS part 30, as shown in FIG. 13 (step C1201).

[0190] Upon receiving the content transmission instruction, the media functions part 60 transmits a transmission permission notification to the service-control functions part 40 via the core IMS part 3 in the same manner as in step D501 according to the first embodiment (step D1201). The transmission permission notification is transmitted as an OK message of a SIP message.

[0191] Further, the media functions part 60 transmits a playlist transmission request to the service-control functions part 40 via the core IMS part 30 (step D1202). The playlist transmission request is information indicating a request for the transmission of playlist information. It contains user identification information, equipment-address information, and main-content identification information contained in the received content transmission instruction. The playlist transmission request is transmitted as an INFO message of a SIP message. Incidentally, the playlist transmission request may be transmitted as a MESSAGE message of a SIP message.

[0192] Upon receiving the playlist transmission request, the service-control functions part 40 generates playlist information in the same manner as in step C501 according to the first embodiment (step C1202). Subsequently, the service-control functions part 40 transmits a playlist notification containing the generated playlist information to the media functions part 60 via the core IMS part 30 (step C1203). The playlist notification is transmitted as an OK message of a SIP message.

[0193] Thus, the media functions part 60 receives the playlist notification. The media functions part 60 then transmits a playlist-reception completion notification to the service-control functions part 40 via the core IMS part 30 (step D1203). The playlist-reception completion notification is information containing playlist information and indicating that the playlist notification has been received. The playlist-reception completion notification is transmitted as an OK message of a SIP message.

[0194] Upon receiving the playlist-reception completion notification, the service-control functions part 40 transmits the playlist information to the user equipment 2 via the core IMS part 30 in the same manner as in step C503 according to the first embodiment. Further, the content delivery system establishes connection between the user equipment 2 and the media server 4b by executing the same processes as those in step C503 and onwards according to the first embodiment, and transmits content data from the media server 4b to the user equipment 2. This second modification also provides the same advantages and effects as those of the first embodiment.

[0195] <Second Embodiment>

Next, the content delivery system according to the second embodiment of the present invention will be described. The content delivery system according to the second embodiment differs from the content delivery system according to the first embodiment in that while advertisement attribute information is transmitted to the media functions part 60 from the service-control functions part 40, the media functions part 60 generates playlist information based on this advertisement attribute information. Therefore, the following description will be made focusing on the difference.

[0196] As shown in FIG. 14, the service-control functions part 40 according to the second embodiment does not include an advertisement-attribute-information storage part 43, an advertisement-insertion-information storage part 44, or a playlist generator 45. The service-control functions part 40 includes an advertisement-selection-information acquiring part 47.

[0197] The advertisement-selection-information acquiring part 47 accepts a content transmission request as a process request received by the information transceiver 41. The advertisement-selection-information acquiring part 47 acquires, from user basic information stored in the user-basic-information storage part 51, the user basic information stored in association with the user identification information contained in the content transmission request received by the information transceiver 41.

[0198] Further, the advertisement-selection-information acquiring part 47 acquires, from content basic information stored in the content-basic-information storage part 42, the content basic information stored in association with the main-content identification information contained in the content transmission request.

[0199] The delivery requesting part 46 outputs a content transmission instruction. The content transmission instruction contains advertisement selection information containing the user basic information and content basic information acquired by the advertisement-selection-information acquiring part 47, and user-authentication success information (i.e., user identification information), equipment-address information and main-content identification information contained in the content transmission request. The information transceiver (transmission-request reception means and advertisement-selection-information transmission means) 41 transmits the content transmission instruction, which has been output by the delivery requesting part 46, to the media server 4b via the core IMS part 30.

[0200] The media functions part 60 includes an advertisement-attribute-information storage part 66 similar to the advertisement-attribute-information storage part 43, an advertisement-insertion-information storage part 67 similar to the advertisement-insertion-information storage part 44, and a playlist generator (advertisement-content selection means) 68 similar to the playlist generator 45.

[0201] The playlist generator 68 acquires advertisement selection information contained in the content transmission instruction received by the information transceiver (advertisement-selection-information reception means) 61. The playlist generator 68 then calculates a final priority level for each item of the advertisement attribute information based on the acquired advertisement selection information. Subsequently, the playlist generator 68 extracts, from advertisement-content identification information stored in the advertisement-attribute-information storage part 66, the advertisement-content identification information associated with the advertisement-attribute information item with the highest calculated final priority level.

[0202] On the other hand, the playlist generator 68 acquires, from number-of-insertions information and inserting-position information stored in the advertisement-insertion-information storage part 67, the number-of-insertions information and the inserting-position information stored in association with the main-content identification information contained in the content transmission instruction.

[0203] The playlist generator 68 then selects, from the extracted advertisement-content identification information, a number of items of advertisement-content identification information, said number being that represented by the acquired number-of-insertions information. Subsequently, the playlist generator 68 generates playlist information based on the selected-advertisement-content identification information, the main-content identification information contained in the content transmission instruction, and the acquired inserting-position information.

[0204] The information transceiver then transmits the playlist information generated by the playlist generator 68 to the user equipment 2 via the service-control functions part 40 and the core IMS part 30.

[0205] Unlike the first embodiment, the service-control functions part 40 according to the second embodiment does not generate playlist information upon receiving the content transmission request transmitted by the user equipment 2 (transmission request reception step). As shown in FIG. 15, the service-control functions part 40 transmits, in place of playlist information, a content transmission instruction containing advertisement selection information to the media functions part 60 via the core IMS part 30 (step C1401, advertisement selection information transmission step).

[0206] The content transmission instruction is transmitted as an INVITE message of a SIP message. As shown in FIG. 15, the INVITE message includes a header HD and a body BD. In this example, the user basic information UI in the advertisement selection information is contained as values of the field “X-user-favorite” in the header HD of the INVITE message. The content basic information CI in the advertisement selection information is contained as values of the field “X-content-favorite” in the header HD of the INVITE message.

[0207] In this example, each of the user basic information UI and the content basic information CI includes portions of element information separated with commas. In each portion of the element information, the leading part of the two parts separated with a semicolon (;) represents advertisement attribute information (e.g., “car” represents automobiles, and “real estate” represents real estate properties). The end part of the two parts separated with a semicolon (;) represents priority information.

[0208] This INVITE message is one of connection establishment messages which the core IMS part 30 exchanges with the user equipment 2, the service-control functions part 40 and the media functions part 60 so that the core IMS part 30 establishes connection between the user equipment 2 and media functions part 60.

[0209] It can be said that the service-control functions part 40 transmits the advertisement selection information to the media functions part 60 (media server 4b) via the core IMS part 30 by incorporating the advertisement selection information in the connection establishment message.

[0210] In other words, it can be said that the service-control functions part 40 transmits playlist information containing advertisement selection information to the media server 4b via the core IMS part 30 when the core IMS part 30 executes a process for establishing a connection between the user equipment 2 and the media functions part 60.

[0211] The media functions part 60 receives the content transmission instruction transmitted by the service-control functions part 40. Subsequently, the media functions part 60 acquires advertisement selection information contained in the received content transmission instruction.

[0212] Subsequently, the media functions part 60 selects advertisement-content identification information based on the acquired advertisement selection information, the advertisement-content identification information stored in the advertisement-attribute-information storage part 66, and the number-of-insertions information and inserting-position information stored in the advertisement-insertion-information storage part 67 (advertisement content selection step). Further, the media functions part 60 generates playlist information based on the selected-advertisement-content identification information, the main-content identification information contained in the content transmission instruction, and the inserting-position information stored in the advertisement-insertion-information storage part 67 (step D1401).

[0213] The media functions part 60 then transmits a transmission permission notification containing the generated playlist information to the service-control functions part 40 via the core IMS part 30 in the same manner as in step D501 according to the first embodiment (step D501).

[0214] Upon receiving the transmission permission notification, the service-control functions part 40 transmits the playlist information to the user equipment 2 via the core IMS part 30 in the same manner as in step C503 according to the first embodiment. Further, the content delivery system establishes connection between the user equipment 2 and the media server 4b by executing the same processes as those in step C503 and onwards according to the first embodiment, and transmits content data from the media server 4b to the user equipment 2.

[0215] As described above, the content delivery system 1 in the second embodiment of the content delivery system according to the present invention, like the first embodiment, transmits selected-advertisement-content specification information, which specifies the advertisement content selected based on advertisement selection information, to the user equipment 2. Accordingly, it is possible to cause the user to view viewing content in which advertisement content corresponding to the advertisement selection information has been inserted.

[0216] Further, according to the second embodiment described above, the application server system 4 is enabled to determine a sequence in which the main content and the advertisement content are output by the user equipment 2. This makes it possible for users to view advertisement content in a manner that reflects the intentions of the advertisement content provider more significantly.

[0217] Further, in the second embodiment, the advertisement selection information contains user basic information associated with user identification information. This enables the content delivery system 1 to cause the user of the user equipment 2 which has transmitted a content transmission request to view viewing content in which advertisement content according to the user has been inserted.

[0218] In addition, in the second embodiment, the advertisement selection information contains content basic information associated with main-content identification information. This enables the content delivery system 1 to cause the user to view the viewing content in which the advertisement content selected according to the main content identified by the main-content identification information contained in the received content transmission request has been inserted.

[0219] Further, in the second embodiment, the service-control functions part 40 is configured to transmit advertisement selection information to the media server 4b via the connection control system 3 when the connection control system 3 executes a process for establishing the connection. This enables the service control server 4a to transmit, to the media server 4b, the latest advertisement selection information as of the point in time when the connection control system 3 executes the process for establishing the connection. As a result, the media server 4b is able to select advertisement content data based on this updated advertisement selection information.

[0220] In addition, in the second embodiment, the service-control functions part 40 is configured to transmit the advertisement selection information to the media server 4b via the connection control system 3 by incorporating the advertisement selection information in a connection establishment message.

[0221] This releases the service control server 4a from the need to transmit other messages than the connection establishment message in order to transmit the advertisement selection information to the media server 4b. This means that the number of communications performed among the connection control system 3, the service control server 4a, and the media server 4b can be reduced. In other words, the processing load and/or the communication load required for the connection control system 3, the service control server 4a and the media server 4b to exchange messages can be reduced.

[0222] <Third Embodiment>

Next, the content delivery system according to the third embodiment of the present invention will be described. The content delivery system according to the third embodiment differs from the content delivery system according to the first embodiment in that, while selected-advertisement-content specification information is transmitted from the service-control functions part 40 to the media functions part 60, the media functions part 60 generates playlist information based on the selected-advertisement-content specification information. Therefore, the following description will be made focusing on the difference.

[0223] The service-control functions part 40 according to the third embodiment as shown in FIG. 16 does not include the advertisement-insertion-information storage part 44 or the playlist generator 45. The service-control functions part 40 includes an advertisement content selector (advertisement-content selection means) 48.

[0224] The content-basic-information storage part 42 according to the third embodiment stores content basic information and number-of-insertions information in association with main-content identification information for identifying main content.

[0225] The advertisement content selector 48 accepts a content transmission request as a process request received by the information transceiver 41. The advertisement content selector 48 acquires, from user basic information stored in the user-basic-information storage part 51, the user basic information stored in association with the user identification information contained in the content transmission request received by the information transceiver 41.

[0226] Further, the advertisement content selector 48 acquires, from content basic information stored in the content-basic-information storage part 42, the content basic information stored in association with the main-content identification information contained in the content transmission request.

[0227] The advertisement content selector 48 then calculates a final priority level for each item of the advertisement attribute information, doing so based on the acquired user basic information and the acquired content basic information. Subsequently, the advertisement content selector 48 extracts, from advertisement-content identification information stored in the advertisement-attribute-information storage part 43, the advertisement-content identification information associated with the advertisement-attribute information item with the highest calculated final priority level.

[0228] On the other hand, the advertisement content selector 48 acquires, from number-of-insertions information stored in the content-basic-information storage part 42, the number-of-insertions information stored in association with the main-content identification information contained in the content transmission request. The advertisement content selector 48 then selects, from the extracted advertisement-content identification information, a number of items of advertisement-content identification information, said number being that represented by the acquired number-of-insertions information.

[0229] The delivery requesting part 46 outputs a content transmission instruction. The content transmission instruction includes selected-advertisement-content specification information containing the advertisement-content identification information selected by the advertisement content selector 48, and user-authentication success information (i.e., user identification information), equipment-address information and main-content identification information contained in the content transmission request. The information transceiver (transmission-request reception means and selected-advertisement-content specification-information transmission means) 41 transmits the content transmission instruction output by the delivery requesting part 46 to the media server 4b via the core IMS part 30.

[0230] The media functions part 60 includes an advertisement-insertion-information storage part 67 similar to the advertisement-insertion-information storage part 44, and a playlist generator 68 similar to the playlist generator 45.

[0231] The playlist generator 68 acquires selected-advertisement-content specification information contained in the content transmission instruction received by the information transceiver 61. On the other hand, the playlist generator 68 acquires, from inserting-position information stored in the advertisement-insertion-information storage part 67, the inserting-position information stored in association with the main-content identification information contained in the content transmission instruction.

[0232] The playlist generator 68 then generates playlist information based on the advertisement-content identification information contained in the acquired selected-advertisement-content specification information, the main-content identification information contained in the content transmission instruction, and the acquired inserting-position information.

[0233] The information transceiver then transmits the playlist information generated by the playlist generator 68 to the user equipment 2 via the service-control functions part 40 and the core IMS part 30.

[0234] Unlike the first embodiment, the service-control functions part 40 according to the second embodiment does not generate playlist information upon receiving the content transmission request transmitted by the user equipment 3 (transmission request reception step). As shown in FIG. 18, the service-control functions part 40 transmits, in place of playlist information, a content transmission instruction containing selected-advertisement-content specification information to the media functions part 60 via the core IMS part 30 (step C1701).

[0235] The content transmission instruction is transmitted as an INVITE message of a SIP message. As shown in FIG. 19, the INVITE message includes a header HD and a body BD. In this example, selected-advertisement-content specification information AD is contained as values of the field "X-video-advertisement" in the header HD of the INVITE message. In this example, the selected-advertisement-content specification information AD includes advertisement-content identification information separated with commas.

[0236] This INVITE message is one of connection establishment messages which the core IMS part 30 exchanges with the user equipment 2, the service-control functions part 40, and the media functions part 60 so that the core IMS part 30 establishes connection between the user equipment 2 and media functions part 60.

[0237] It can be said that the service-control functions part 40 transmits selected-advertisement-content specification information to the media functions part 60 (media server 4b) via the core IMS part 30 by incorporating the selected-advertisement-content specification information in the connection establishment message.

[0238] In other words, it can be said that the service-control functions part 40 transmits playlist information containing the selected-advertisement-content specification information to the media server 4b via the core IMS part 30 when the core IMS part 30 executes a process for establishing a connection between the user equipment 2 and the media functions part 60.

[0239] Upon receiving the content transmission instruction, the media functions part 60 acquires selected-advertisement-content specification information contained in the received content transmission instruction. Subsequently, the media functions part 60 generates playlist information based on advertisement-content identification information contained in the acquired selected-advertisement-content specification information, inserting-position information stored in the advertisement-insertion-information storage part 67, and main-content identification information contained in the content transmission instruction (step D1701).

[0240] The media functions part 60 then transmits a transmission permission notification containing the generated playlist information to the service-control functions part 40 via the core IMS part 30 in the same manner as in step D501 according to the first embodiment (step D501).

[0241] Upon receiving the transmission permission notification, the service-control functions part 40 transmits the playlist information to the user equipment 2 via the core IMS part 30 in the same manner as in step C503 according to the first embodiment (selected-advertisement-content specification-information transmission step). Further, the content delivery system establishes connection between the user equipment 2 and the media server 4b by executing the same processes as those in step C503 and onwards according to the first embodiment, and transmits content data from the media server 4b to the user equipment 2.

[0242] This third embodiment is also capable of providing the same advantages and effects as those of the second embodiment.

[0243] It should be noted that the present invention is not limited to the above-mentioned embodiments, but various modifications may be employed without departing from the scope of the present invention. For example, an arbitrary combination of the above-described embodiments and modification examples described above may be employed as other modifications of the above-mentioned embodiments.

[0244] Additionally, as shown in FIG. 20, functions of the content delivery system 1 according to other modifications of each embodiment mentioned above may include a content storage part RC, a transmission request receiver 101, an advertisement content selector 102, and a selected-advertisement-content specification information transmitter 103.

[0245] The content storage part RC stores advertisement content data representing advertisement content and main content data representing main content. The transmission request receiver 101 receives, via the connection control system 3, a content transmission request, which contains main-content identification information for identifying main content and is transmitted by the user equipment 2.

[0246] The advertisement content selector 102 selects the advertisement content data stored in the content storage part RC based on advertisement selection information containing advertisement attribute information representing an attribute of the advertisement content. The selected-advertisement-content specification information transmitter 103 transmits selected-advertisement-content specification information for specifying advertisement content data selected by the advertisement content selector 102 via the connection control system 3 to the user equipment 2 which has transmitted the content transmission request.

[0247] According to this modification example, the content delivery system 1 transmits, to the user equipment 2, the selected-advertisement-content specification information for specifying the advertisement content selected based on the advertisement selection information. Thus, for example, when the user equipment 2 is configured to output viewing content in the state in which advertisement content specified by the selected-advertisement-content specification information is inserted while the application server system 4 is configured to select advertisement content according to main content (the user's desired viewing content) and/or the user, it is made possible to cause the user of the user equipment 2 to view viewing content with advertisement content according to the main content and/or the user inserted therein.

[0248] Although in each embodiment described above, the advertisement selection information contains both the user basic information and the content basic information, it may contain only one of the user basic information and the content basic information.

[0249] Although in each embodiment described above, the user-profile-server functions part 50 is configured to include the user-basic-information storage part 51, the service-control functions part 40, instead of the user-profile-server functions part 50, may be configured to include the user-basic-information storage part 51. In other words, the service-control functions part 40 may store the user basic information in association with the user identification information.

[0250] Although, in the embodiments described above, the advertisement selection information contains user basic information and content basic information, the advertisement selection information may contain user-equipment position information representing the position of the user equipment 2, date-and-time-of-transmission information representing the date and time (day of the week may also be included) when the content transmission request is transmitted, and/or user attribute information representing an attribute of the user who has transmitted the content transmission request (e.g., the user's place of residence, age, gender, height, weight and/or occupation), in place of the user basic information and/or the content basic information, or in addition to the user basic information and the content basic information. Furthermore, in this case, the content delivery system 1 may be configured to transmit the user-equipment position information stored in the core IMS part 30 to the media functions part 60.

[0251] Although in the embodiments described above, the content element information contained in the playlist information is composed of the combination of the content identification information and the reproduction start and end positions of the content identified by the content identification information, the playlist information may be composed only of the content identification information. In this case, the content data stored in the content-data storage part 62 is preferably data representing respective portions of the content generated by dividing a single item of main content at positions where advertisement content is inserted.

[0252] Additionally, in the embodiments described above, the final priority level is calculated by combining a priority level represented by priority information contained in the user basic information and a priority level represented by priority information contained in the content basic information. Alternatively, the final priority level may be calculated by combining a value obtained by means of multiplying the priority level, which is indicated in the priority information contained in the user basic information, by a first factor and a value obtained by means of multiplying the priority level, which is indicated in the priority information contained in the content basic information, by a second factor.

[0253] Although in each embodiment mentioned above, the advertisement attribute information associated with the advertisement content to be selected is composed only of a single advertisement-attribute information item (with the highest calculated final priority level), the advertisement attribute information may be composed of a plurality of advertisement-attribute information items. In this case, each of the embodiments described above is preferably configured such that an advertisement-attribute information item associated with advertisement content with the highest calculated final priority level is selected with a higher priority.

[0254] In a modification of the embodiments above, a server having functions of both the service control server 4a and the media server 4b may be provided in place of the service control server 4a and the media server 4b. Further, in a modification of the embodiments above, a server having functions of both of the service control server 4a and the user-information management server 4c may be provided in place of the service control server 4a and the user-information management server 4c.

[0255] Although the media server 4b has the entire media functions part 60 in the embodiments described above, it may be configured in such a way that a first server has part of the media functions part 60 (media control functions part) and a second server has the remaining part of the media functions part 60 (media delivery functions part). Additionally, in a modification of the embodiments above, a plurality of servers having the media delivery functions of the media functions part 60 may be provided.

[0256] Although the connection control system 3 includes a plurality of connection control servers (connection control servers 3a, 3b, and so on) in the modifications of the embodiments above, the connection control system 3 may include a single connection control server.

[0257] Although in each embodiment mentioned above, the content delivery system 1 is configured to transmit the playlist information or the advertisement attribute information according to SIP, it may be configured to transmit according to another communication protocol (such as RTSP).

[0258] It should be noted that although the user equipment 2 is a set-top box in each embodiment mentioned above, the user equipment 2 may be a cell-phone, a PDA (Personal Data Assistance), a Smartphone, a PHS (Personal Handyphone System), a game machine, car navigation equipment, a personal computer, or the like. Further, although the content is a video in each embodiment mentioned above, the content may be images only or audio only.

[0259] Although the components of the content delivery system 1 represent constituent elements of the IMS (IP Multimedia Subsystem) in the description of each embodiment above, they may represent constituent elements of an MMS (Multimedia Messaging Service).

INDUSTRIAL APPLICABILITY

[0260] The present invention is applicable to video-on-demand systems for content delivery via IP networks as well as IPTV systems for TV broadcasting via IP networks.

BRIEF EXPLANATION OF THE DRAWINGS

[0261]

FIG. 1 is a diagram illustrating a schematic configuration of the content delivery system according to the first embodiment of the present invention;

FIG. 2 is a block diagram schematically illustrating functions of the content delivery system shown in FIG. 1;

FIG. 3 is a table illustrating user basic information stored in the user-information management server shown in FIG. 1;

FIG. 4 is a sequence diagram illustrating operation performed by the content delivery system shown in FIG. 1 when authenticating user equipment or the user of the user equipment;

FIG. 5 is a sequence diagram illustrating operation performed by the content delivery system shown in FIG. 1 when transmitting viewing content data to a user equipment in response to an input of the user of the user equipment;

FIG. 6 is a sequence diagram illustrating operation performed by the content delivery system shown in FIG. 1 when transmitting viewing content data to a user equipment in response to an input of the user of the user equipment;

FIG. 7 is a diagram showing an INVITE message containing a content transmission instruction;

FIG. 8 is a diagram showing an INVITE message containing a content transmission instruction according to a modification of the first embodiment;

FIG. 9 is a diagram showing an INVITE message containing a content transmission instruction according to a modification of the first embodiment;

FIG. 10 is a diagram showing an INVITE message containing a content transmission instruction according to a modification of the first embodiment;

FIG. 11 is a diagram showing an INVITE message containing a content transmission instruction according to a modification of the first embodiment;

FIG. 12 is a sequence diagram showing operation performed by the content delivery system according to a first modification of the first embodiment when transmitting viewing content data to the user equipment in response to an input of the user of the user equipment;

FIG. 13 is a sequence diagram showing operation performed by the content delivery system according to the second modification of the first embodiment when transmitting viewing content data to the user equipment in response to an input of the user of the user equipment;

FIG. 14 is a block diagram schematically illustrating the content delivery system according to the second embodiment of the present invention;

FIG. 15 is a sequence diagram showing operation performed by the content delivery system according to the second embodiment of the invention when transmitting viewing content data to the user equipment in response to an input of the user of the user equipment;

FIG. 16 is a diagram showing an INVITE message containing a content transmission instruction according to the second embodiment of the present invention;

FIG. 17 is a block diagram schematically illustrating functions of the content delivery system according to a third embodiment of the present invention;

FIG. 18 is a sequence diagram illustrating operation performed by the content delivery system according to the third embodiment of the present invention when transmitting viewing content data to the user equipment in response to an input of the user of the user equipment;

FIG. 19 is a diagram showing an INVITE message containing a content transmission instruction according to the third embodiment of the present invention; and

FIG. 20 is a block diagram schematically illustrating functions of the content delivery system according to a fourth embodiment of the present invention.

EXPLANATION OF REFERENCE CODING

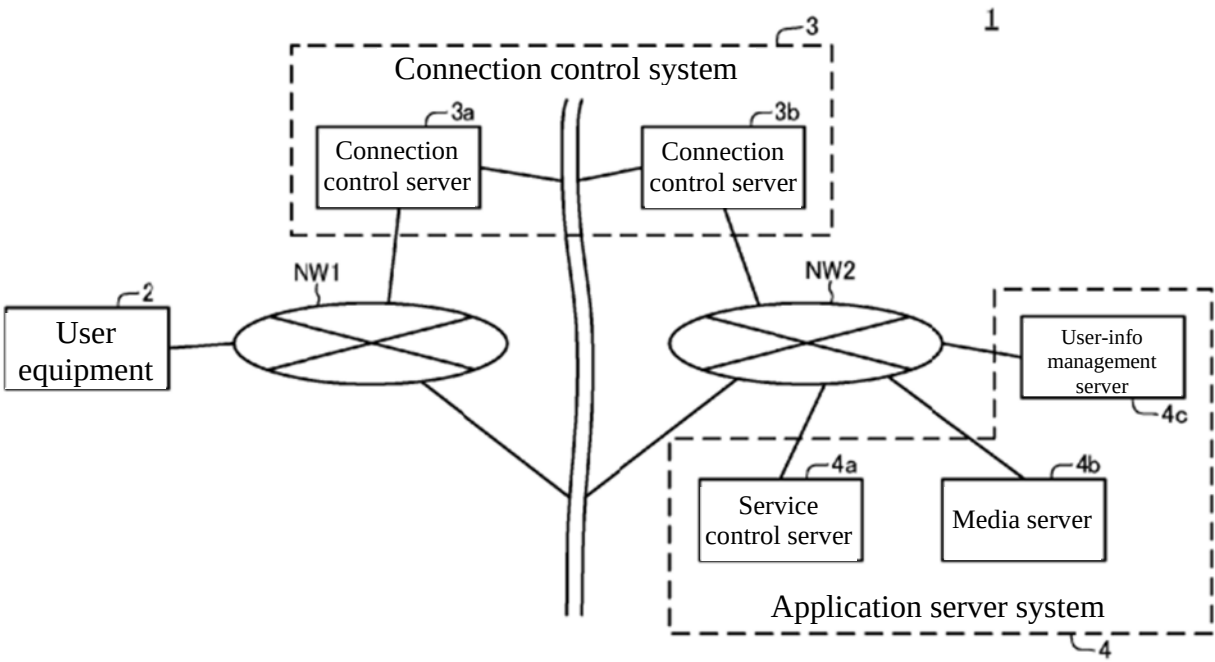
[0262]

1	Content delivery system
2	User equipment
3	Connection control system
3a, 3b	Connection control server
4	Application server system
4a	Service control server
4b	Media server
4C	User-information management server
11	Request transmitter
12	Playlist receiver
13	Viewing request transmitter
14	Content output part
31	Call connection controller
32	IMS authentication part
40	Service-control functions part
41	Information transceiver
42	Content-basic-information storage part
43	Advertisement-attribute-information storage part
44	Advertisement-insertion information storage part
45	Playlist generator
46	Delivery requesting part
47	Advertisement-selection-information acquiring part
48	Advertisement-content selection part
50	User-profile-server functions part
51	User-basic-information storage part
60	Media functions part
61	Information transceiver
62	Content data storage part
63	Content delivery controller
65	Content delivering part
66	Advertisement-attribute-information storage part
67	Advertisement-insertion-information storage part
68	Playlist generator
80	Transport functions part
81	Bandwidth guarantee part
82	Equipment authentication part
101	Transmission request receiver
102	Advertisement content selection part
103	Selected-advertisement-content specification information transmission part
AD	Selected-advertisement-content specification information
BD	Body part
BD1	The first portion
BD2	The second portion
CI	Content basic information

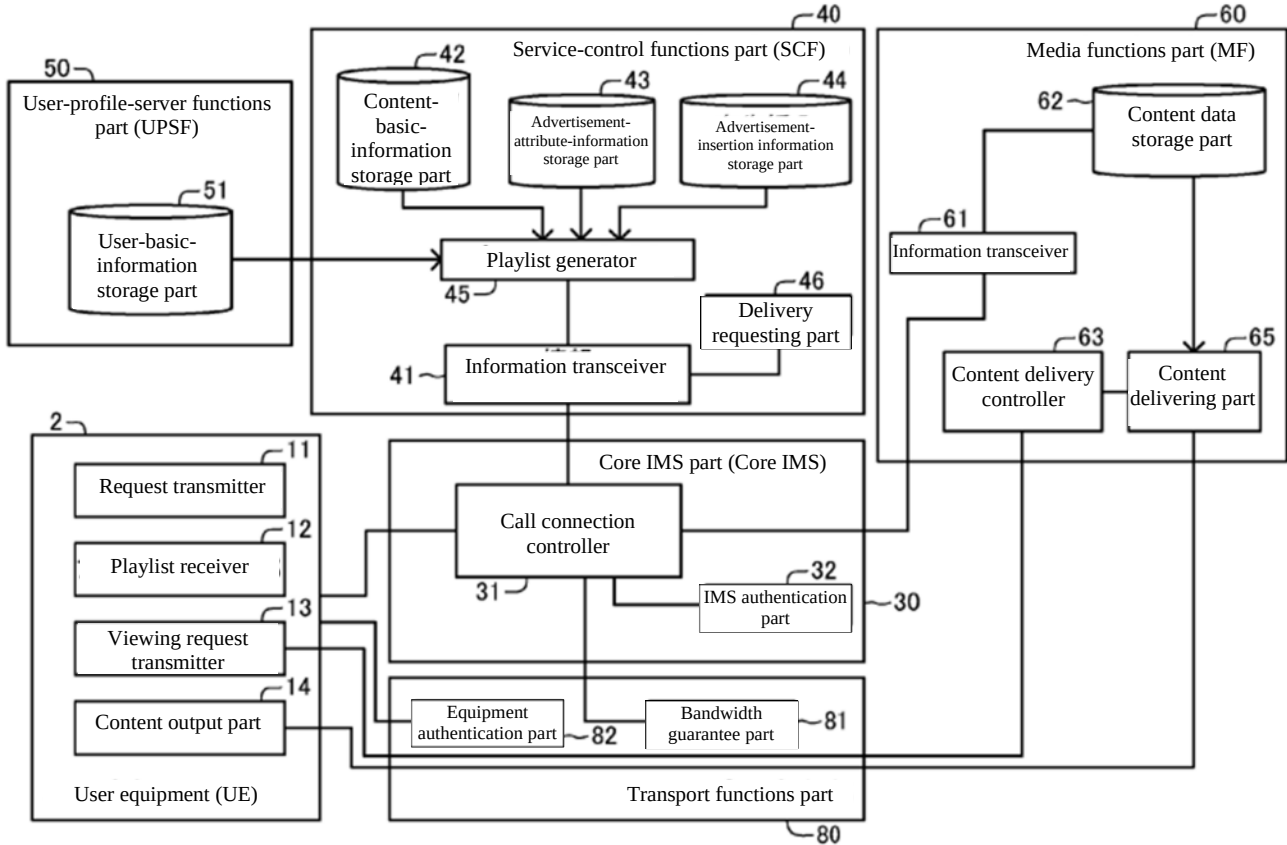
HD	Header section
NW1	User-side communication line
NW2	Provider-side communication line
PL	Playlist information
RC	Content storage part
UI	User basic information

[Name of Document] **DRAWINGS**

[Figure 1]



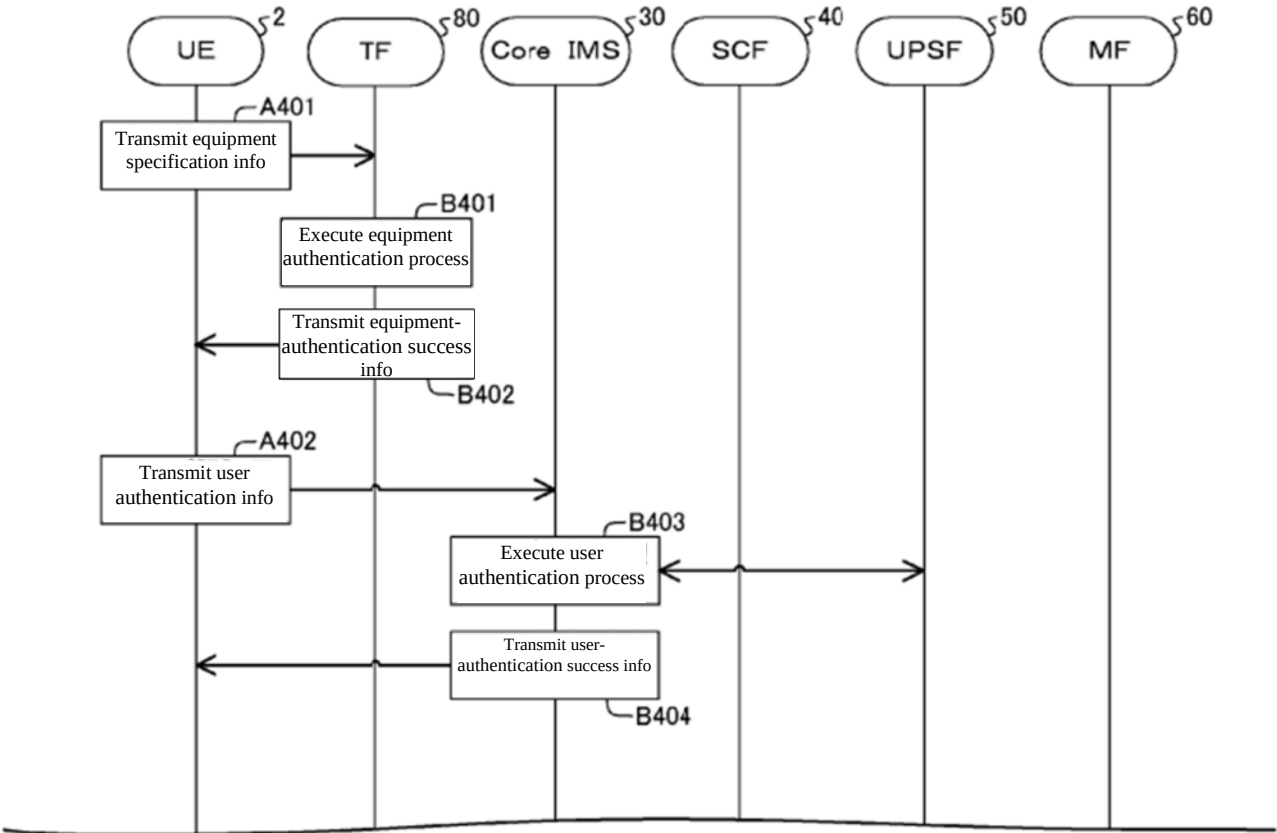
[Figure 2]



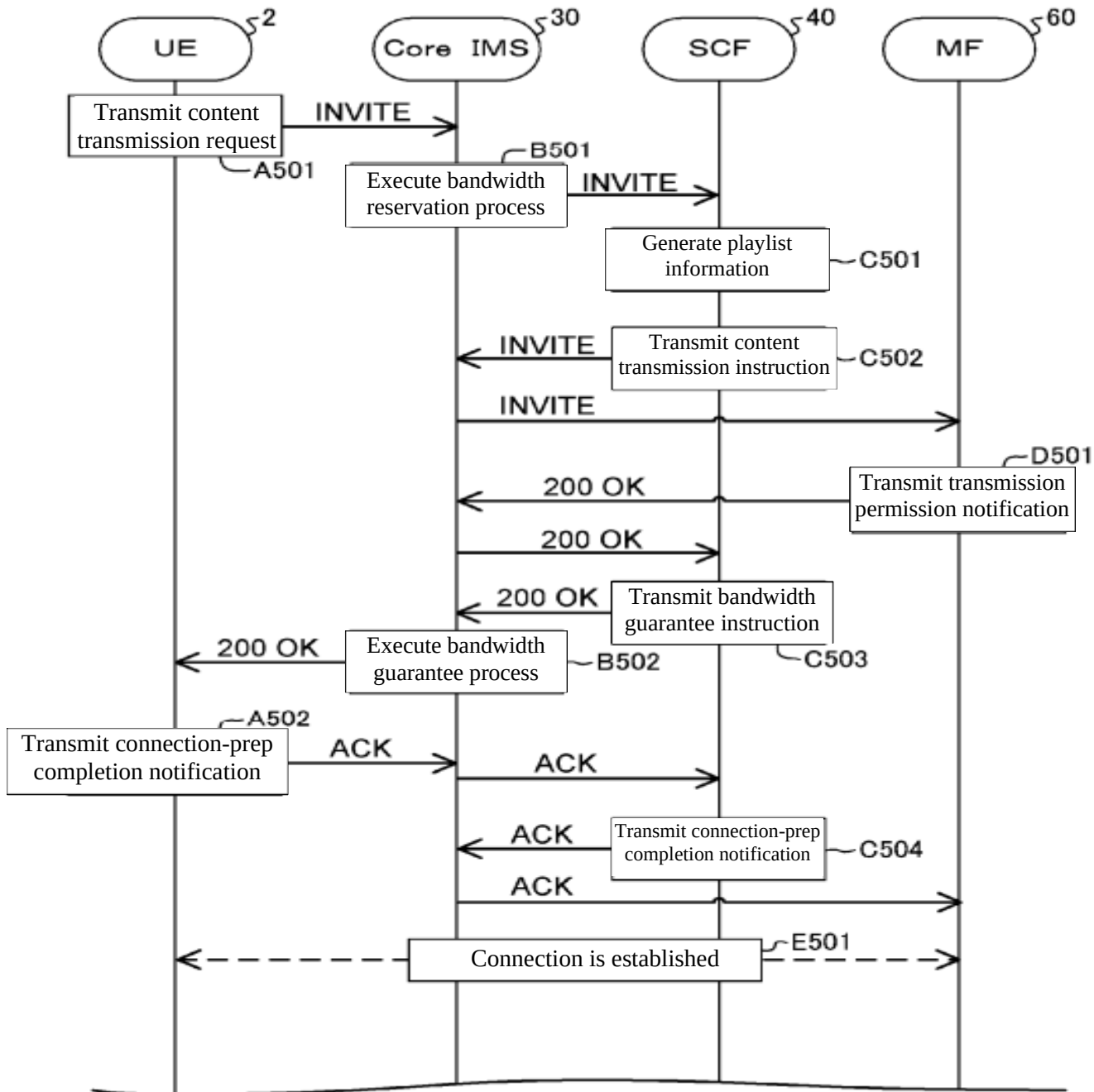
[Figure 3]

Advertisement attribute info	Priority info
Cars	1
Real estate	2
Travel	4
Insurance	5
Cell phone	3
Coffee	3
Gadgets	4
⋮	⋮

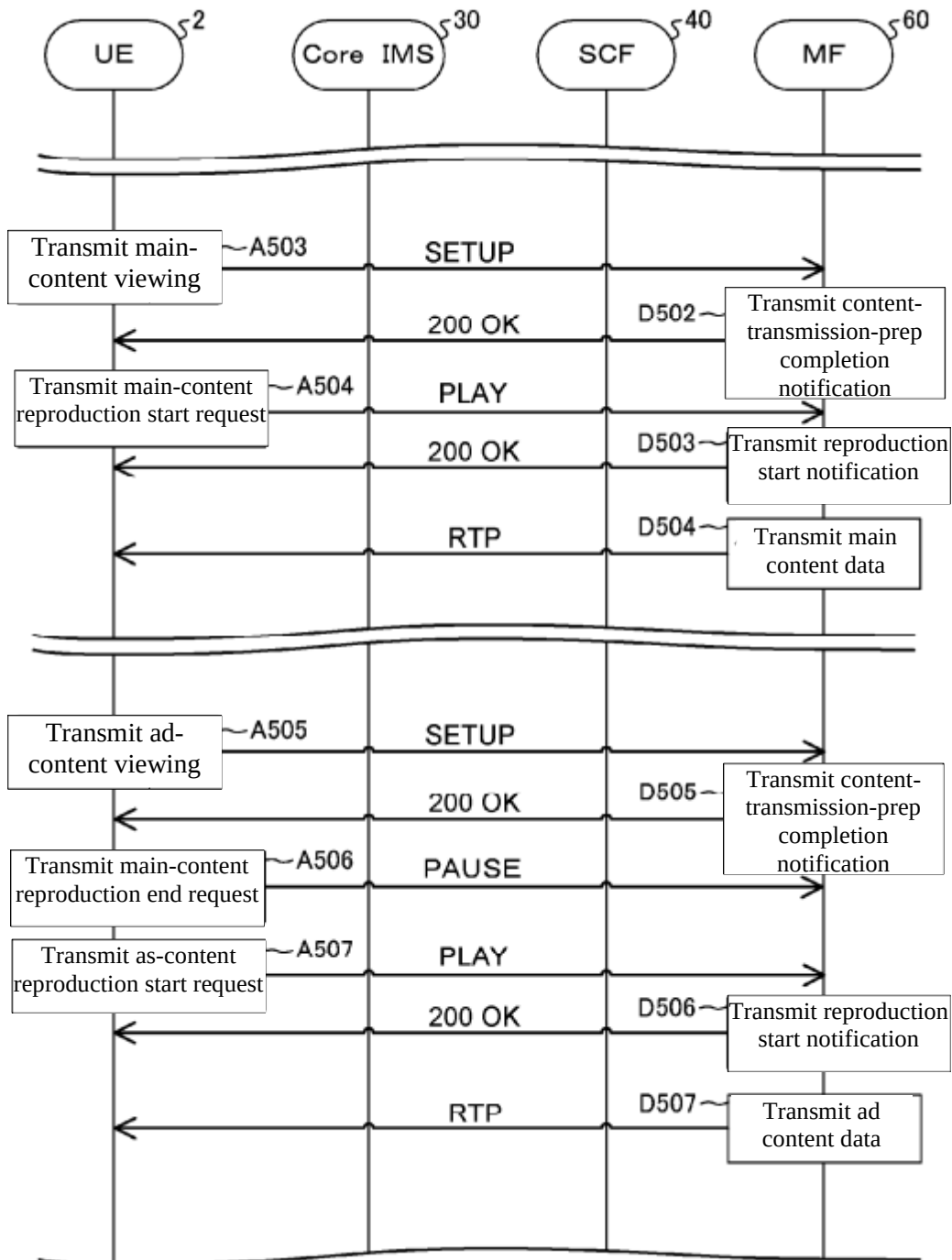
[Figure 4]



[Figure 5]



[Figure 6]



[Figure 7]

The diagram illustrates the structure of a SIP INVITE message. It is enclosed in a large rectangular box. On the left side, a bracket labeled 'PL' spans the entire message. On the right side, two brackets indicate the structure: 'HE' (Header) for the first section and 'BD' (Body) for the second section.

```

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP
pc33.atlanta.com;branch=z9hG4bKnashds8
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710
CSeq: 314159 INVITE
X-video-sequence: content1;0;300,adv1;0;30,content1;301;6
00,adv2;0;30,content1;601;900
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: application/sdp
Content-Length: 142

v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
a=recvonly
m=application 9 TCP/TLS iptv_rtsp
a=setup:active
a=connection:new
c=IN IP4 10.10.10.10
m=audio 49170 RTP/AVP 0
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
m=video 51372 RTP/AVP 99
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
a=rtpmap:99 h263-1998/90000
    
```

The message is divided into two main sections by a blank line:

- Header (HE):** Contains the first 13 lines of the message, starting with 'INVITE' and ending with 'Content-Length: 142'.
- Body (BD):** Contains the SDP description, starting with 'v=0' and ending with 'a=rtpmap:99 h263-1998/90000'.

[Figure 8]

PL { INVITE sip:content1@atlanta.com?seq=adv1+0+30+content1+0+300+adv2+0+30+content1+301+600+adv3+0+30 SIP/2.0
Via: SIP/2.0/UDP
pc33.atlanta.com;branch=z9hG4bKnashds8
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710
CSeq: 314159 INVITE
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: application/sdp
Content-Length: 142

v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
a=recvonly
m=application 9 TCP/TLS iptv_rtsp
a=setup:active
a=connection:new
c=IN IP4 10.10.10.10
m=audio 49170 RTP/AVP 0
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
m=video 51372 RTP/AVP 99
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
a=rtpmap:99 h263-1998/90000

[Figure 9]

```

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP
pc33.atlanta.com;branch=z9hG4bKnashds8
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710
CSeq: 314159 INVITE
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: application/sdp
Content-Length: 142

v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
a=videosequence:adv1;0;30,content1;0;300,adv2;0;30,conte
nt1;301;600,adv3;0;30
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
a=recvonly
m=application 9 TCP/TLS iptv_rtsp
a=setup:active
a=connection:new
c=IN IP4 10.10.10.10
m=audio 49170 RTP/AVP 0
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
m=video 51372 RTP/AVP 99
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
a=rtpmap:99 h263-1998/90000
  
```

PL {

HE {

BD {

[Figure 10]

```

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP
pc33.atlanta.com;branch=z9hG4bKnashds8
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710
CSeq: 314159 INVITE
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: multipart/mixed; boundary="boundary 0000"

--boundary 0000
Content-Type: application/sdp
Content-Length: 142

v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
m=application 9 TCP/TLS iptv_rtsp
a=setup:active
a=connection:new
c=IN IP4 10.10.10.10
m=audio 49170 RTP/AVP 0
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
m=video 51372 RTP/AVP 99
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
a=rtptime:99 h263-1998/90000

--boundary 0000

Content-Type: plain/text
Content-Length: 142

adv1;0;30
content1;0;300
adv2;0;30
content1;301;600
adv3;0;30

--boundary 0000

```

Diagram illustrating a SIP INVITE message structure, showing the message body divided into three parts: HE (Header), BD1 (Body 1), and BD2 (Body 2). The message is enclosed in a box labeled PL (Payload).

The message body is divided into three parts:

- HE (Header):** Contains the SIP header fields, including the To, From, Call-ID, CSeq, Contact, and Content-Type fields.
- BD1 (Body 1):** Contains the SDP (Session Description Protocol) body, including the v=0, o=jdoe, s=SDP Seminar, i=A Seminar on the session description protocol, e=j.doe@example.com (Jane Doe), c=IN IP4 224.2.17.12/127, t=2873397496 2873404696, m=application 9 TCP/TLS iptv_rtsp, a=setup:active, a=connection:new, c=IN IP4 10.10.10.10, m=audio 49170 RTP/AVP 0, c=IN IP4 10.10.10.10, b=AS:150000, a=recvonly, m=video 51372 RTP/AVP 99, c=IN IP4 10.10.10.10, b=AS:150000, a=recvonly, and a=rtptime:99 h263-1998/90000.
- BD2 (Body 2):** Contains the plain text body, including the Content-Type: plain/text and Content-Length: 142 fields, followed by the text: adv1;0;30, content1;0;300, adv2;0;30, content1;301;600, and adv3;0;30.

The message is enclosed in a box labeled PL (Payload).

[Figure 11]

```

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP
pc33.atlanta.com;branch=z9hG4bKnashds8
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710
CSeq: 314159 INVITE
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: application/sdp
Content-Length: 142

v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
u=http://www.example.com/seminars/playlist.xml
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
a=recvonly
m=application 9 TCP/TLS iptv_rtsp
a=setup:active
a=connection:new
c=IN IP4 10.10.10.10
m=audio 49170 RTP/AVP 0
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
m=video 51372 RTP/AVP 99
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
a=rtpmap:99 h263-1998/90000

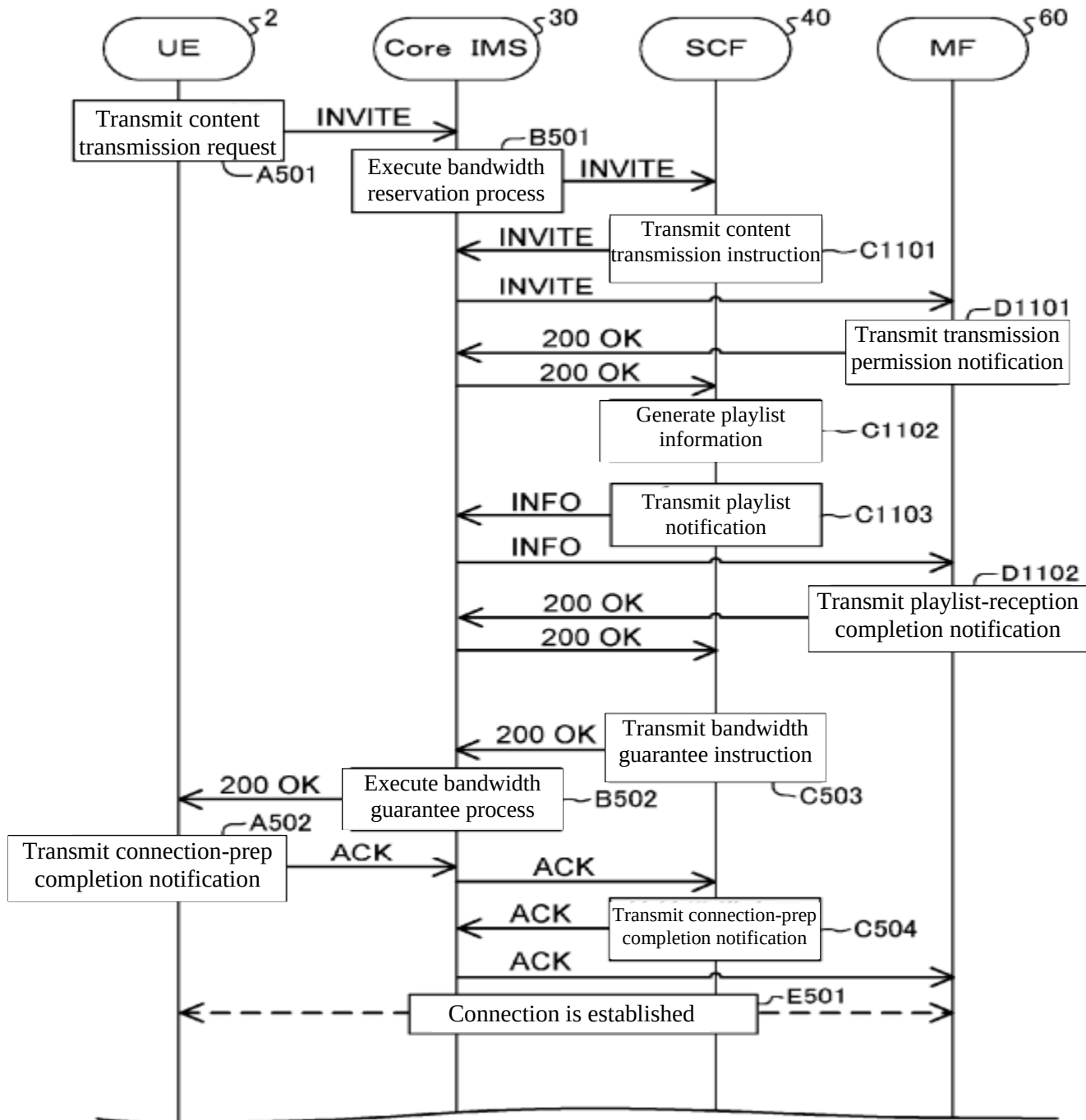
```

PL {

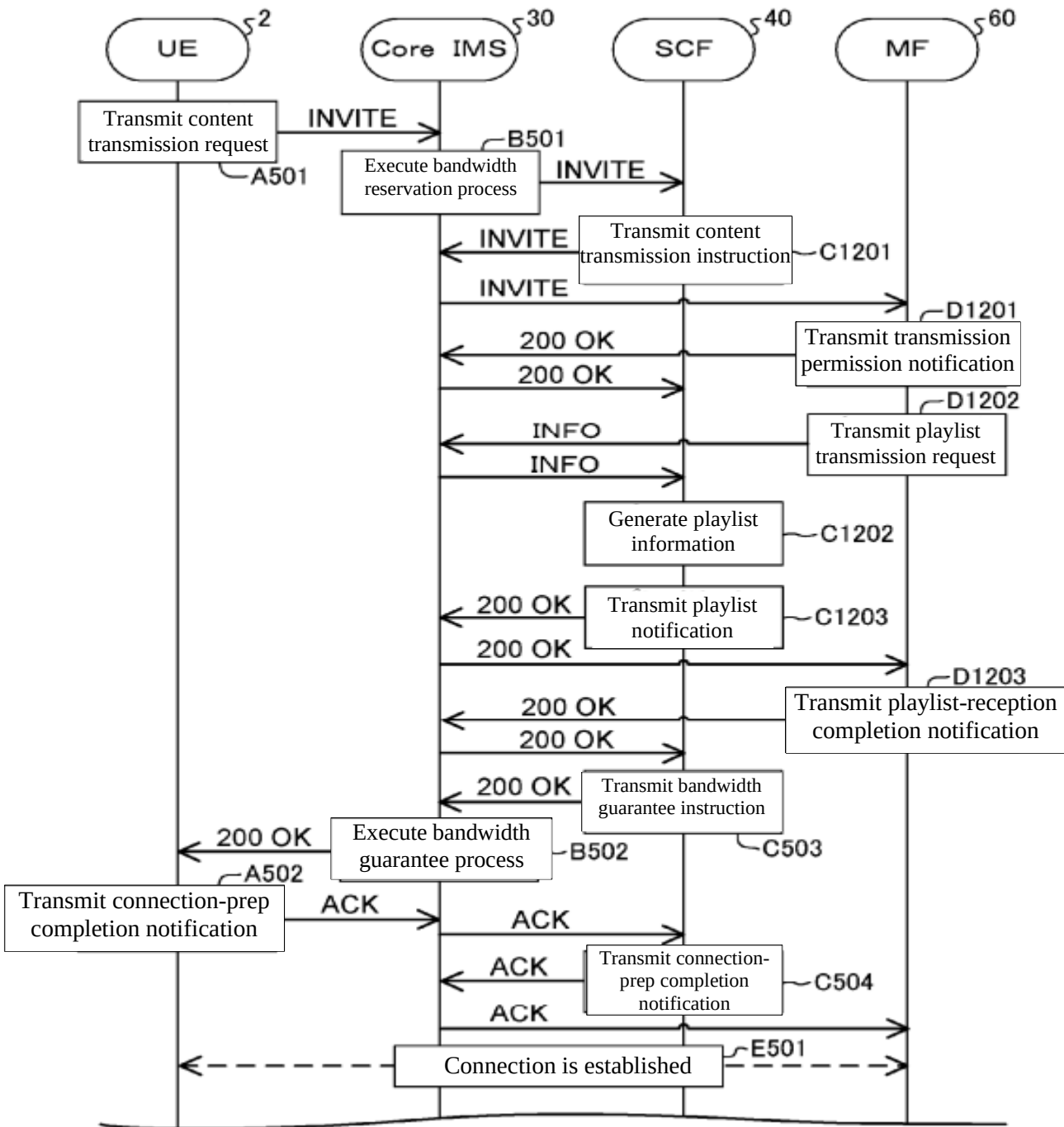
HE {

BD {

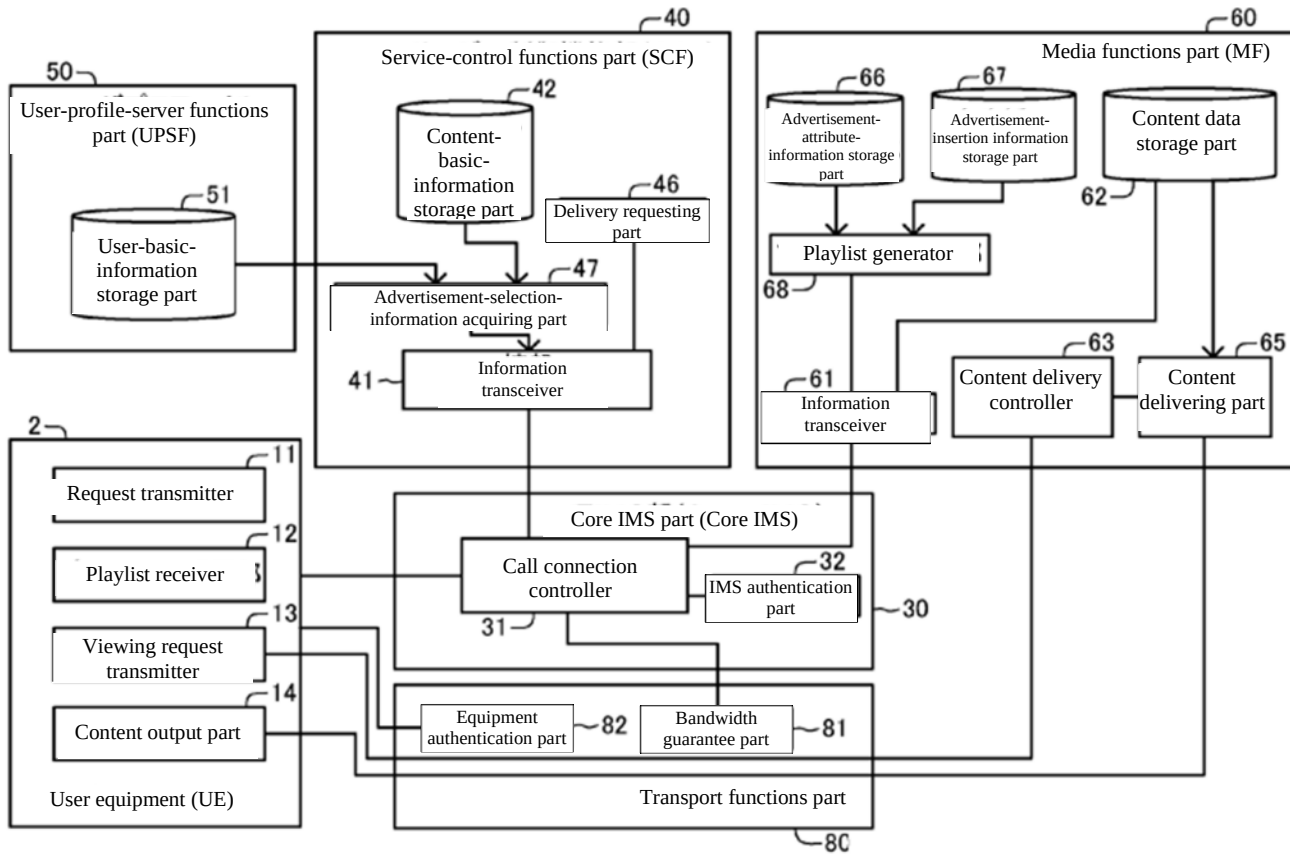
[Figure 12]



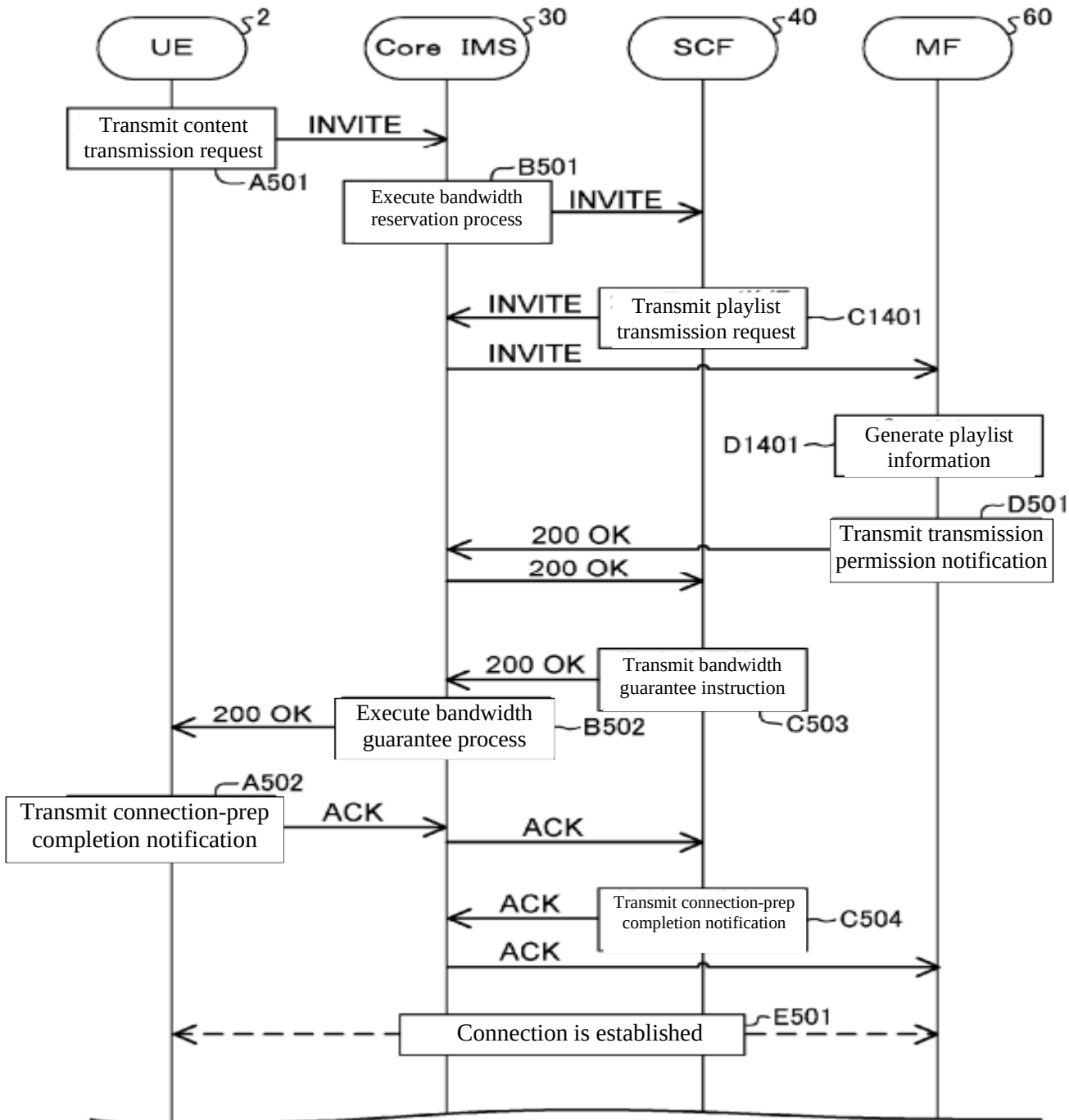
[Figure 13]



[Figure 14]



[Figure 15]



[Figure 16]

```

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP
pc33.atlanta.com;branch=z9hG4bKnashds8
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710
CSeq: 314159 INVITE
X-user-favorite: car;1,real estate;2,travel;3,insurance;5,mobile
phone;3,coffee;3,gadget;4
X-content-favorite: car;3,real estate;1,travel;4,insurance;5,mobile
phone;2,coffee;1,gadget;3
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: application/sdp
Content-Length: 142

v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
a=recvonly
m=application 9 TCP/TLS iptv_rtsp
a=setup:active
a=connection:new
c=IN IP4 10.10.10.10
m=audio 49170 RTP/AVP 0
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
m=video 51372 RTP/AVP 99
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
a=rtpmap:99 h263-1998/90000
  
```

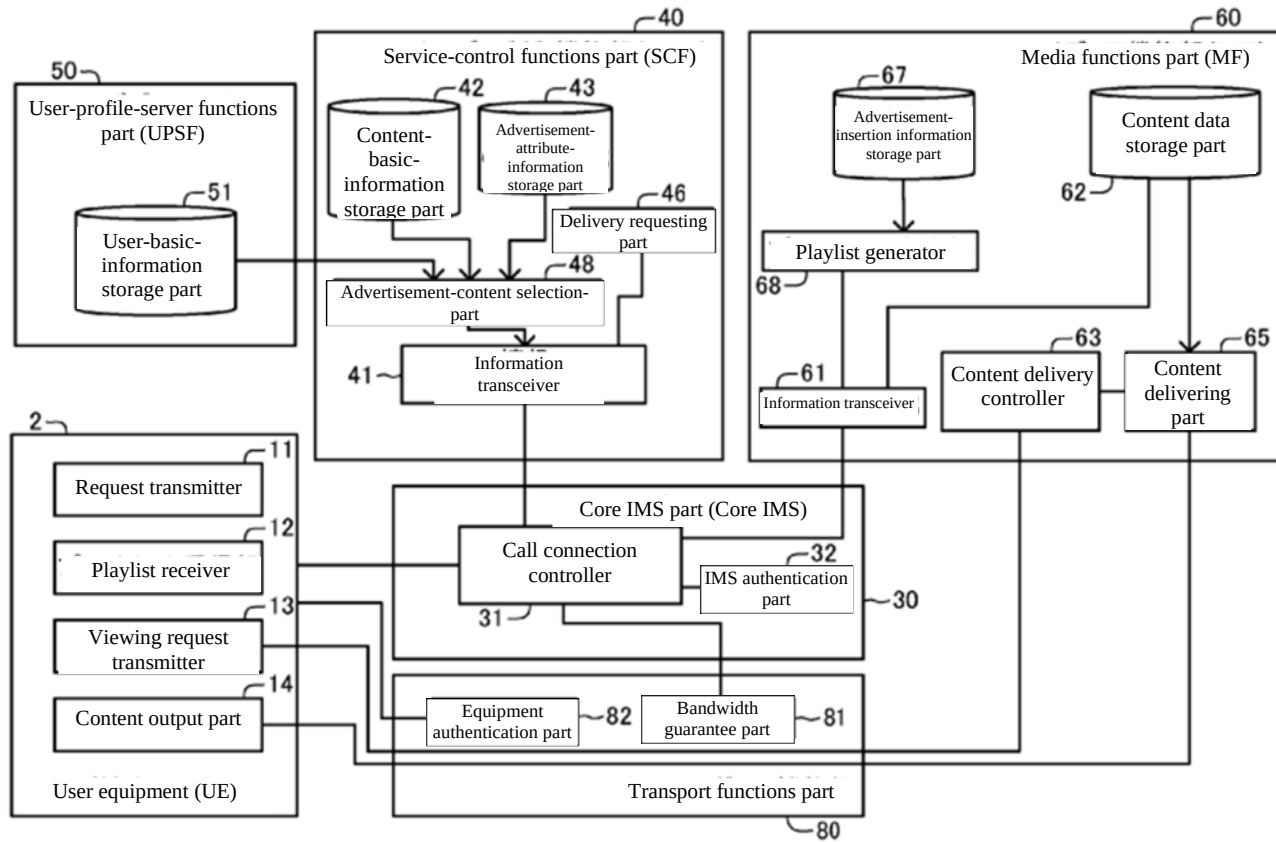
UI {

CI {

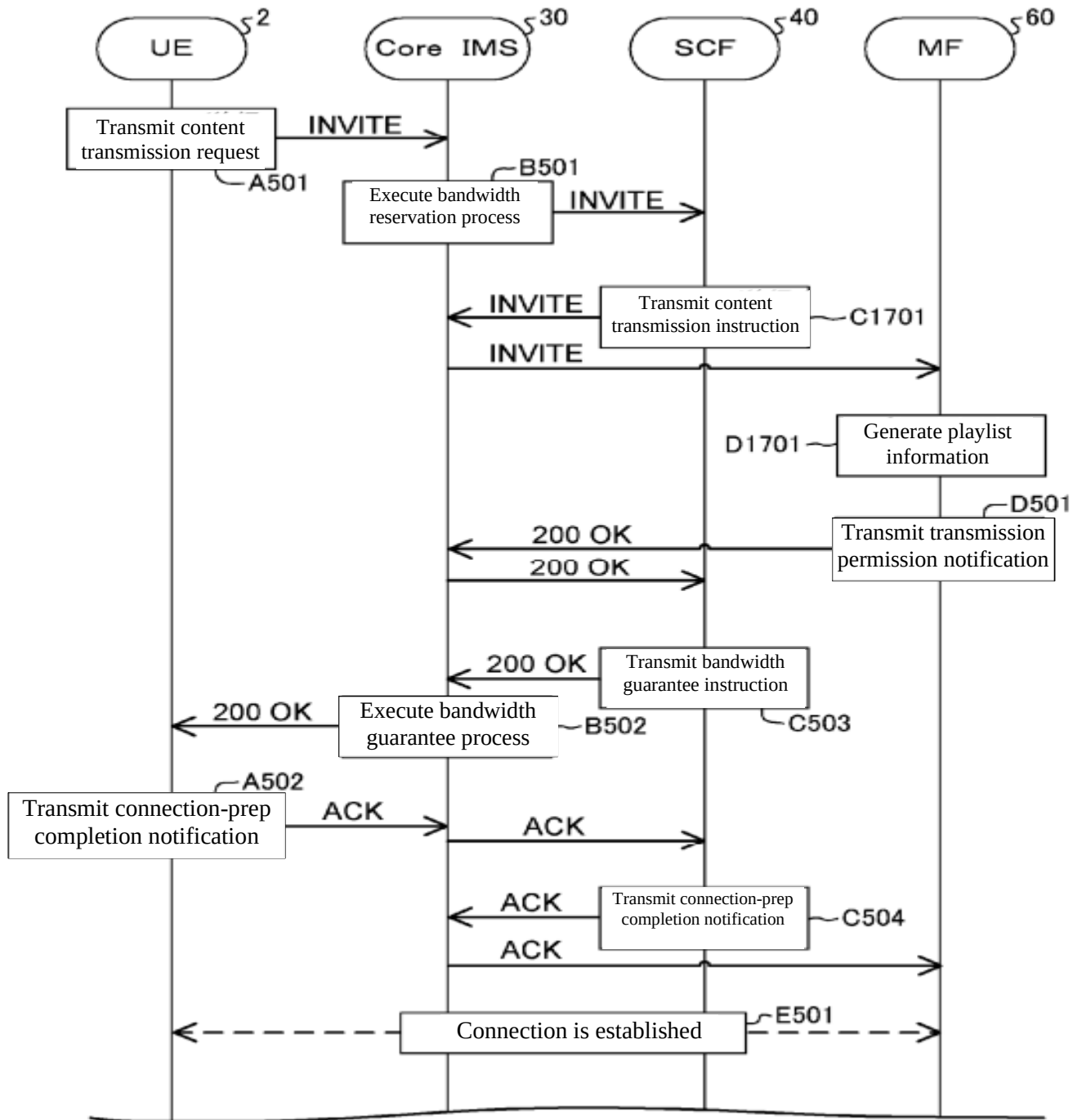
HE {

BD {

[Figure 17]



[Figure 18]



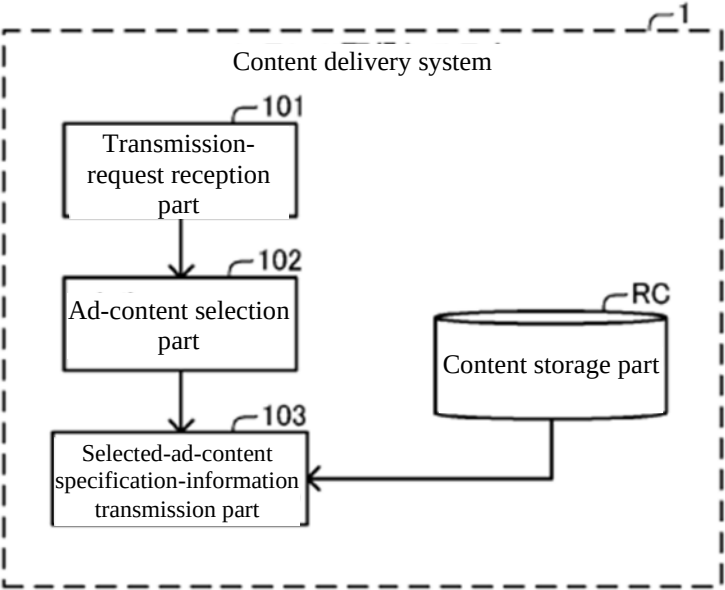
[Figure 19]

```

INVITE sip:bob@biloxi.com SIP/2.0
Via: SIP/2.0/UDP
pc33.atlanta.com;branch=z9hG4bKnashds8
Max-Forwards: 70
To: Bob <sip:bob@biloxi.com>
From: Alice <sip:alice@atlanta.com>;tag=1928301774
Call-ID: a84b4c76e66710
CSeq: 314159 INVITE
X-video-advertisement: adv1,adv2,adv3
Contact: <sip:alice@pc33.atlanta.com>
Content-Type: application/sdp
Content-Length: 142

v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=SDP Seminar
i=A Seminar on the session description protocol
e=j.doe@example.com (Jane Doe)
c=IN IP4 224.2.17.12/127
t=2873397496 2873404696
a=recvonly
m=application 9 TCP/TLS iptv_rtsp
a=setup:active
a=connection:new
c=IN IP4 10.10.10.10
m=audio 49170 RTP/AVP 0
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
m=video 51372 RTP/AVP 99
c=IN IP4 10.10.10.10
b=AS:150000
a=recvonly
a=rtpmap:99 h263-1998/90000
    
```

[Figure 20]



I, Yukie Hirose, hereby declare as follows:

1. I, Yukie Hirose, hereby certify that I am a professional translator fluent in both Japanese and English and I am competent to translate from Japanese into English.
2. I am a translator at Nelles Translations, which is located at 3 Grant Square, #336, Hinsdale, IL 60521.
3. I possess advanced knowledge of the Japanese and English languages.
4. The attached translation is, to the best of my knowledge and belief, a true and accurate English translation of Japanese text in Exhibit 2020 10914 document (specification document) of IPR2023-01240 and IPR-2023-01241.
5. I declare under penalty of perjury that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code.

Dated: 4/30/2024

A handwritten signature in black ink, appearing to read 'Yukie Hirose', is written over a solid black horizontal line.

Ms. Yukie Hirose