METHOD FOR CONTROLLING DELIVERY OF A VIDEO STREAM OF A LIVE-STREAM ROOM, AND CORRESPONDING SERVER AND MOBILE TERMINAL

TECHNICAL FIELD

The present invention relates to the field of a network live-streaming technology and, in particular, to a method for controlling delivery of a video stream of a live-stream room, and corresponding server and mobile terminal.

BACKGROUND

With the development of Internet technologies and intelligent mobile terminal devices, various Internet products bring great convenience and entertainment to people's work and life. In recent years, various kinds of live-stream platforms for video live-streaming have emerged in endlessly. Video live-streaming brings more real-time social experience to people. The current live-stream platform includes a live-stream platform for the mobile terminal and a live-stream platform for the personal computer (PC) terminal.

Due to the diversity of requirements of video live-streaming, an anchor needs to simultaneously live-stream the content on the PC (such as a game picture on the PC) and the personal image of the anchor user to better interact with the viewing users. This manner of live-streaming is called multi-view synchronous live-streaming or multi-platform synchronous live-streaming. The current multi-view synchronous live-streaming adopts the following schemes.

1. A separate PC client and a third-party peripheral camera are used for live-streaming.

For this scheme, complete client software for the PC terminal needs to be separately developed and cooperate with a third-party external camera. After the process window that needs to be live-streamed is manually combined with the camera, the live stream is uploaded to the server through the live-stream client and then delivered by the server to each viewing terminal. The operation and setting process is complicated. Moreover, the simultaneous live-streaming of the personal image and the process window can only be achieved on the premise of the installation and use of third-party peripherals and the addition of third-party video software.

2. The WEB end, the third-party live-stream stream delivery software and the peripheral camera are used for live-streaming.

A general WEB live-stream platform uses the WEB-end background and the third-party live-streaming stream delivery software for live-streaming. After the user registers an account on the WEB-end live-streaming platform and obtains the live-streaming permission of the WEB end through a process, speed of the personal network needs to be measured, and the third-party

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a flowchart of a method for controlling delivery of a video stream of a live-stream room according to an embodiment of the present invention;

FIG. 2 is a flowchart of a method for controlling delivery of a video stream of a live-stream room according to an embodiment of the present disclosure;

FIG. 3 is a schematic diagram of a third live video stream according to an embodiment of the present invention;

FIG. 4 is a schematic diagram illustrating a combination mode selection window displayed on an operation interface of a first terminal after a connection is established between a server and the first terminal according to an embodiment;

FIG. 5 is a schematic diagram illustrating an operation interface of a first terminal obtaining pre-protocol information;

FIG. 6 is a schematic diagram of an apparatus for controlling delivery of a video stream of a live-stream room according to an embodiment of the present invention;

FIG. 7 is a schematic diagram of an apparatus for controlling delivery of a video stream of a live-stream room according to an embodiment of the present invention;

FIG. 8 is a schematic diagram of an apparatus for controlling delivery of a video stream of a live-stream room according to an embodiment of the present invention;

FIG. 9 is a schematic diagram illustrating a structure of a mobile terminal according to an embodiment of the present invention; and

FIG. 10 is a schematic diagram illustrating a system for implementing the method of controlling delivery of a video stream of a live-stream room according to the present invention.

DETAILED DESCRIPTION

Hereinafter the present invention will be further described in conjunction with the drawings and exemplary embodiments. Same reference numbers in the drawings denote same components. In addition, if a detailed description of a known art is not necessary to show the features of the present invention, the detailed description will be omitted.

It should be understood by those skilled in the art that unless expressly stated otherwise and as used herein, the singular forms, “a”, “an”, “the” and “this” may include the plural forms as well. It should be further understood that the word “including” used in the specification of the present invention means that the feature, integer, step, operation, element and/or component exists, but the existence or addition of one or more other features, integers, steps, operations, elements,

(4) the image stream of the first live video stream, the image stream of the second live video stream and the audio stream of the second live video stream; and

(5) the image stream of the first live video stream, the audio stream of the first live video stream, the image stream of the second live video stream, and the audio stream of the second live video stream.

FIG. 4 is a schematic diagram illustrating a combination mode selection window displayed on an operation interface of a first terminal after a connection is established between a server and the first terminal according to an embodiment. The third live video stream includes the image stream of the first live video stream and the image stream of the second live video stream, and may further include the audio stream of the first live video stream and the audio stream of the second live video stream. The image stream of the first live video stream is the character window shown in the figure, and the image stream of the second live video stream is the image window of the "PC picture" shown in the figure, which achieves multi-view and cross-platform synchronous live-streaming.

Preferably, the on/off options of the corresponding video stream and audio stream are provided on the first terminal and the second terminal for the anchor user to select. When the anchor user selects to turn on/off the image stream or the audio stream of a certain video stream, the corresponding combined third live video stream is changed accordingly, so that the anchor user can better display the content of the live-stream room as needed. For example, when the current third live video stream is of the type (5) and the anchor user wants to temporarily turn off the image stream and the audio stream of the first live video stream, so as to interact better with the viewer user through the second video stream and the audio stream, the anchor user may select to turn off the first live video stream on the first terminal, the second live video stream collected by the second terminal is used as the combined third video stream, and then the server receives the third live video stream uploaded by the second terminal and delivers the third live video stream to the viewer user in the live-stream room. Preferably, the anchor user may also select to turn off the first live video stream on the second terminal, and at this time the server does not send the first live video stream to the second terminal. Then the second live video stream collected by the second terminal is used as the combined third video stream and uploaded to the server. The server delivers the third live video stream to the viewing user in the live-stream room. For example, on/off option buttons of the first live video stream and the audio stream are provided on the user interface of the second terminal. After the anchor user selects the "off" option button, the communication link for receiving the first live video stream is closed, and the first live video stream is not received again.

More preferably, the anchor user may further set the display area sizes of the image stream of the first live video stream and the image stream of the second live video stream on the user interface of the second terminal, the corresponding combined third live video stream is modified according to the modification of the first live video stream and the second live video stream, the modified third live video stream is uploaded to the server, and then the server delivers the modified third live video stream to the live-stream room, which provides the anchor user with more custom options to ensure display of the live-stream content of the live-stream room.

In a second aspect, FIG. 2 is a flowchart of a method for controlling delivery of a video stream of a live-stream room according to an embodiment of the present invention. In the embodiment, the method is executed by a first terminal, and the first terminal is preferably a mobile terminal. The method may also be understood to be executed by a video live-stream application on the first terminal, and includes steps S200 to S210.

In step S200, pre-protocol information outputted by a second terminal is obtained, and a connection request including the pre-protocol information is initiated to a server by using an anchor user identity.

Specifically, the pre-protocol information includes a unique device identifier of the second terminal and an authorization token or authentication information for establishing a dedicated link between the server and the terminal. The pre-protocol information is processed in an encryption manner and stored in the link identifier representing the pre-protocol information, and must be parsed and obtained from the link identifier through a corresponding authorized application program. Generally, the encryption manner of the pre-protocol information and the link identifier representing the pre-protocol information are defined by each live-stream platform itself, and the pre-protocol information can be obtained after the application program authorized by the live-stream platform identifies the link identifier.

The first terminal of the anchor user of the live-stream room identifies the link identifier representing the pre-protocol information and outputted by the second terminal, and then obtains the pre-protocol information. In other words, the user runs the video live-stream application on the first terminal to identifies, with the anchor identity and according to the representation form of the pre-protocol information, the link identifier representing the pre-protocol information, obtain the pre-protocol information, initiate a connection request including the pre-protocol information to the server, and send the unique device identifier of the first terminal, identity information of the anchor user, and characteristic information of the live-stream room to the second terminal. The identity information of the anchor user is the

anchor user unique identifier (UID) on the live-stream platform, and is used to represent the unique anchor user. In addition, the characteristic information of the live-stream room is the channel identifier (ID) of the live-stream room. FIG. 5 is a schematic diagram illustrating an