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(54) **METHODS AND SYSTEMS FOR GAME BROADCASTING ON THE INTERNET**

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(57) **ABSTRACT**

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The present invention relates to a method and system for game broadcasting. The method for game broadcasting on the Internet according to the present invention comprises: (a) a step to collect game data on the data exchanges, and file inputs and outputs, arising during the network games between a network game server and a player's computer, or between players' computers; (b) a step to process the collected game data and transmit the processed data so that they may be played back on a viewer's computer; and (c) a step to play back the network game on the viewer's computer using the game data transmitted from the relay server.

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Using the method and system for the Internet game broadcasting according to the present invention, a viewer at a remote site may watch a live game played at the time, or may watch a recorded game using the game data recorded in the network game database.

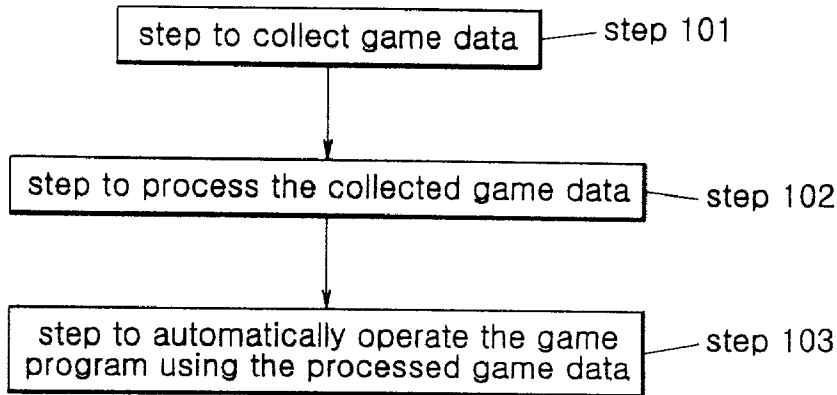


Fig. 1

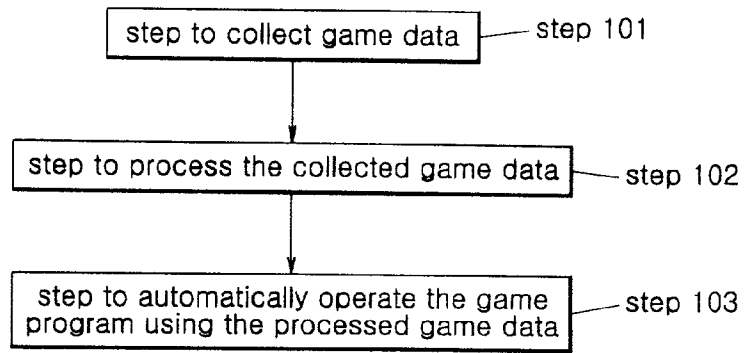
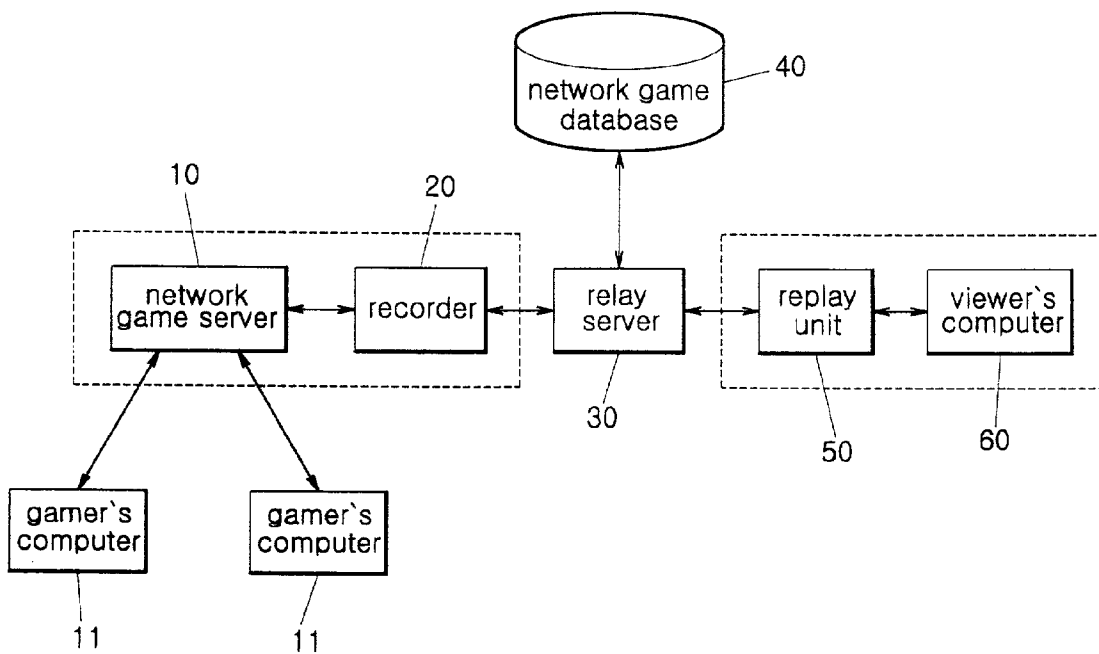


Fig. 2



METHODS AND SYSTEMS FOR GAME BROADCASTING ON THE INTERNET

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to methods and systems for game broadcasting whereby a person may view a live or recorded game from a remote site without being present at the game played at the moment.

[0003] 2. Description of the Related Art

[0004] Presently, the Internet broadcasting adopts the VOD (Video-On-Demand) as a standard service method. In the VOD service method, motion images must be transmitted whenever requested by a viewer. A viewer uses WindowsMedia of Microsoft or RealPlayer of Real Network in order to play the motion images. However, these motion image data are so huge in volume that it is very inefficient to transmit and receive such unprocessed data through dedicated communication lines. Thus, compression technologies are frequently used to reduce the volume of the data. The motion image data played by WindowsMedia or RealPlayer are also such compressed data.

[0005] As the motion image data compression technologies are developing, users of computers connected to the Internet or to a LAN may receive real time motion images. Examples of such motion image data compression technologies, that have been developed to date, are MPEG-2, KVID3 hardware compression technology of KODAK, and H.263, a motion image compression standard proposed by ITU-T, for video conferences or video calls on telecommunication lines with low transmission rates (not greater than 64 kbps).

[0006] The problem is that even the compressed motion image data may not be transmitted to a sufficiently large number of users simultaneously, because the data volume is still very large. In practice, the number of users that may be supported by a server on the Internet providing motion images is approximately less than 2,000. If more users are served, the speed of the motion images would decrease so much that it may hardly be called real time images and the quality of the motion images would deteriorate conspicuously. The reason is the lack of data transmission capacity of the transmission lines and the server, and such problem has not been resolved by the motion image compression technologies currently available. Due to this problem, the size of the screen displayed to a viewer is 320×240, which is smaller than the actual size of the monitor. Considering that monitors and video cards of today support a resolution of at least 1024×768, the above-mentioned problem looms rather serious.

[0007] Presently, there exist sites which broadcast, through the Internet, live or recorded games taking place at different places. However, these sites merely compress motion images and transmit such compressed motion images. As a result, the number of viewers is limited and the quality of the images is very low.

[0008] It is highly probable that a viewer who wishes to view a game broadcast on the Internet has used the game in the past or is presently using the game. Thus, such game is likely to have been installed in the viewer's computer system. Taking advantage of such fact, the present invention,

instead of transmitting compressed motion images, processes and transmits the entire data of the game being played, and using the transmitted data, automatically operates the game program installed in the viewer's computer. As a result, a viewer may see the game played as an observer or a spectator as if he or she were present at the game.

[0009] In order to resolve the above-mentioned problems of a limited number of viewers who may watch a game at the same time and of the low quality of the motion images, the present invention detects data and file inputs and outputs for the network games in progress, plays back the transmitted data to execute the same game which had been installed in the viewer's computer. In this method of automatic operation of the game on the viewer's computer, the present invention provides a method and system for broadcasting live or recorded games.

SUMMARY OF THE INVENTION

[0010] In order to attain the above-mentioned purpose, the present invention's method for game broadcasting on the Internet comprises: (a) a step to collect game data on the data exchanges, and file inputs and outputs, arising during the network games between a network game server and a player's computer, or between players' computers; (b) a step to process the collected game data and transmit the processed data so that they may be played back on a viewer's computer; and (c) a step to play back the network game on the viewer's computer using the game data transmitted from the relay server.

[0011] Furthermore, in order to attain the purpose of this invention, the game broadcasting system according to the present invention comprises: a recorder for collecting game data on the data exchanges, and file inputs and outputs, arising during the network games between a network game server and a player's computer, or between players' computers; a relay server for processing the game data collected by the said recorder and for transmitting such processed data to a viewer's computer; a network game database for recording the game data processed in the said relay server; and a replay unit for playing back the said network game using the game data transmitted from the said relay server.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a flow chart illustrating the present invention's method for game broadcasting on the Internet, and

[0013] FIG. 2 is a block diagram of the present invention's system for game broadcasting on the Internet.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Detailed explanation of the present invention's method and system for game broadcasting on the Internet is provided in the following with references to the attached drawings.

[0015] FIG. 1 is a flow chart illustrating the present invention's Internet game broadcasting method.

[0016] The step to collect game data is a step to collect all information regarding the game, exchanged between the network game server(10), which supports the game pres-

ently played, and a player's computer(11), or between players' computers(11). Such information includes data on coordinates of each unit or character showing on a player's computer, the number of such units or characters, current status, colors, operation instructions, data on the background, sound, and file inputs and outputs (Step 101).

[0017] The game data collected at the said Step 101 are processed so that they may be played back according to the present invention's broadcasting method (Step 102). Generally, the game may be reproduced merely with the collected data themselves. However, the present invention broadcasts games by causing a viewer's computer(60) to automatically execute the game program using the collected data. Thus, the game data must be processed so that the automatic execution may be enabled. The processing of the game data is accomplished by control instructions given during a game by a player for the purpose of automatic execution.

[0018] In order to implement the VOD not only for live broadcasting but also for recorded broadcasting, the present invention records the processed game data and transmits them when there is a demand from a viewer. When a viewer accesses the website for the present invention and selects a game that the viewer wishes to see, the game data of the selected game are automatically transmitted to the viewer's computer. When the transmission is completed, the game program is automatically executed by the replay unit and the viewer will be able to enjoy the game which has previously been broadcast. The processed game data are stored in the network game database(40) of the present invention.

[0019] A viewer's computer(60) automatically operates the game program using the game data processed at the said Step 102 (Step 103). The game program must have been installed in the viewer's computer(60) because the viewer is to observe or watch the game through the automatic operation of the game program which has been installed in the viewer's computer(60). The computer, thus, executes the game program installed in the viewer's computer(60) and runs the game using the data processed at Step 102, as if the game were currently played by each player from a remote site.

[0020] FIG. 2 is a block diagram illustrating the structure of the present invention's system for game broadcasting.

[0021] For players who wish to play network games, the network game server(10) intermediates data exchanges or file inputs and outputs among players' computers connected to the Internet or to a LAN. For example, the existing network games such as Blizzard's Starcraft and Red Storm's Rainbow Six currently provide players with network game services, using various sites for network games such as Battlenet or MSN Gaming Zone. Furthermore, individuals may use server programs provided by each game developer to install a private game server and provide network game services. In case that network games are conducted through a LAN(IPX), a player's computer(11) may become a network game server(10) which has authority to only proceed the game using functions included in the network game. The network game server(10) depicted in FIG. 2 is one of such game servers or sites.

[0022] The player's computer(11) is a computer connected to the said network game server(10) on which the game is

played. Ordinary PCs are used for games, and such computers may individually be upgraded for a particular game. The players' computers(11) in FIG. 2 are computers on which games for various competitions are being played. The present invention may be used not only for game broadcasting in game competitions but also for broadcasting of general players' games. Thus, the players' computers(11) are not necessarily limited to computers in a competition site where a game competition is conducted.

[0023] The recorder(20), a part newly added to this invention, is installed in the network game server(10) or in a player's computer(11) to collect the game data and to transmit such data to the relay server(30). The recorder(20) is not a separate physical device but a program which may be installed in the network game server(10) or a player's computer(11), by a user or the game host who desires to broadcast the game. Such recorder(20) operates independently of server programs used at the network game server(11) or game programs used at a player's computer(11). A computer for the broadcasting purpose, equipped with the said recorder(20), may be separately set up according to the present invention. Because the said recorder(20) merely collects the game data of a game played at the time, such computer does not need to be a computer with advanced specifications. In contrast, the viewer's computer(60), which is described in the following, must satisfy certain specifications for the game desired to be viewed. A network game may be conducted by the players' computers(11)' sharing the game data either simultaneously or sequentially. In other words, either through a method of real time simulation or through a turn method, each player's computer(11) must share, with other players' computers, information about each player's instructions and processes conducted accordingly. In this way, the player's computer(11) may display the game situation at the relevant time on the screen and the players may be able to take appropriate actions. During the game, game data regarding data and file inputs and outputs are exchanged occasionally between the network game server(10) and a relevant player's computer(11). Such game data are provided to the other players' computers(11) at the same time. The game data include all data generated in between a player's computer(11) and the network game server(10) or in between the players' computers(11), such as data on coordinates of each unit or character showing on the screen of a player's computer(11), the number of such units or characters, current status, colors, operation instructions, data on the background, sound, and file inputs and outputs.

[0024] The relay server(30) in the present invention processes the game data transmitted by the said recorder(20) and transmits the processed data so that such data may be played back at a viewer's computer(60). Furthermore, in case that a viewer who missed a live game wishes to see the recorded game, the relay server(30) records the processed game data in the network game database(40). Because the data collected by the recorder(20) are raw data regarding the game presently played, such data must be processed to be in the form that may be played back in a viewer's computer through the automatic operation of the replay unit(50).

[0025] The network game database(40) according to the present invention enables a viewer who missed a live game to see a recorded game. The game broadcasting system of the present invention implements a VOD service by con-

taining a live game data in the said network game database(40) and by transmitting the game data when a viewer wants to see the game. The game data recorded in the said network game database(40) are the game data as processed by the said relay server(30).

[0026] The replay unit(50) of the present invention is a program installed in a viewer's computer(60). A viewer who wants to see games broadcast by the present invention may download the replay unit(50) from the Internet to install it in the viewer's computer. The said replay unit(50) uses the game data of a game which is being played at a remote site or which had been recorded in the said network game database(40), transmitted by the said relay server(30), to execute the game program which has previously been installed in the viewer's computer(60) and to automatically execute the said game program. The viewer may see the game played as an observer or as a spectator. The automatic operation by the said replay unit(50) is possible by the replay unit(50)'s exact simulation of the players' actions taken at remote sites. For example, if Player A and Player B are presently playing a game, the said replay unit(50) in the viewer's computer(60) takes the roles of both Player A and Player B, and sends operation instructions for all the actions taken by Player A and Player B. In this manner, the viewer may watch the game. For a three-dimension action game, a viewer may select a viewpoint to watch the game, and for a two-dimension strategy simulation or turn method simulation or for a role-playing game, a viewer may designate a position to watch the game. Such selection or designation may be changed at any time.

[0027] The viewer's computer(60) is a computer on which the game broadcast by the present invention may be viewed. An ordinary personal computer suffices for the viewer's computer(60). However, because there generally tend to be more and more games requiring computers with advanced specifications to run on, a viewer's computer(60) needs to satisfy such advanced specifications in order to execute such games.

[0028] As described above, through the Internet game broadcasting method and system according to the present invention, a viewer at a remote site may watch a live game which is being played at the time or a recorded game using game data in the network game database.

[0029] Because there is no need to purchase particular equipment for game broadcasting system according to the present invention, any person may conduct broadcasting. Furthermore, only specifications of the viewer's computer are relevant for watching the games broadcast. The specifications of the broadcaster's computer, which transmits the game data, do not affect the quality of the broadcasting at all. Above all, because the volume of the data to be transmitted is approximately equal to or less than one twentieth of the data volume for the conventional motion image transmission method, the load on the network game server and the transmission lines is lessened while the quality of the image

provided in the present invention is higher than the motion images played by WindowsMedia or RealPlayer.

[0030] Additionally, the number of viewers who may watch a live game at the same time is far greater than the number of viewers who may watch motion images in the conventional manner at the same time. In the present invention, the size of the screen and the quality of the images are almost the same as the screen size and the quality of the images of the actual game. Therefore, viewers may feel as if they were present at the games themselves.

What is claimed is:

1. A method for game broadcasting on the Internet, comprising:

- (a) a step to collect game data on the data exchanges, and file inputs and outputs between a network game server and a player's computer, or between players' computers;
- (b) a step to process the collected game data and transmit the processed data so that they may be played back on a viewer's computer; and
- (c) a step to play back the network game on the viewer's computer using the game data transmitted from the relay server.

2. A method for game broadcasting on the Internet according to claim 1, further comprising:

a step to record the said game data in the network game database and to transmit such game data when there is a demand from a viewer.

3. A method for game broadcasting on the Internet according to claim 1, wherein the collected game data are processed to become instructions which can automatically execute game programs installed in the viewer's computer.

4. A method for game broadcasting on the Internet according to claim 1, wherein the processed game data are played back by the automatic execution of the game program installed on the viewer's computer, in the same manner as the players play the game program.

5. A system for game broadcasting on the Internet, comprising:

a recorder for collecting game data on the data exchanges, and file inputs and outputs, arising during the network games between a network game server and a player's computer, or between players' computers;

a relay server for processing the game data collected by the said recorder and for transmitting such processed data to a viewer's computer;

a network game database for recording the game data processed in the said relay server;

and a replay unit for playing back the said network game using the game data transmitted from the said relay server.

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