(51) [Int.Cl.^{7}]	[ID Codes]	[FI]		[Theme Codes (Reference)]
H04N 7/173	610	H04N 7/173	610B	5C064
G06F 13/00	550	G06F 13/00	550P	

[Examination Request] Received
[Number of Claims] 7
[Application Format] Online (OL)
[Total Number of Pages] 7

(54) [Title of the Invention]
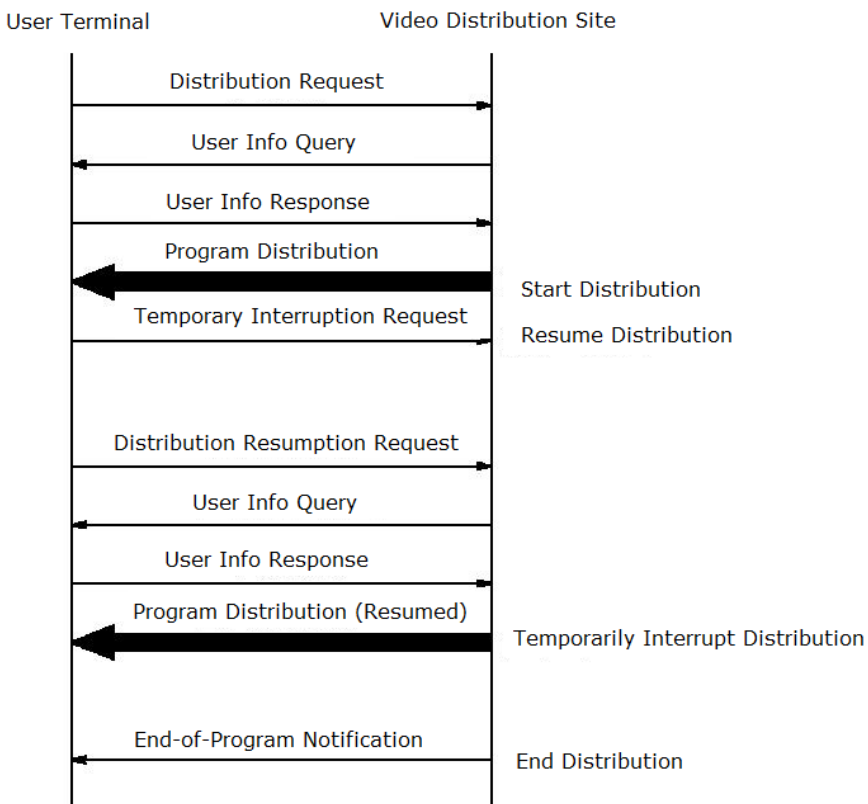
Video Distribution Service System

(57) [Abstract]

[Problem]

To provide a system for a video distribution service which enables a user to continue viewing a video program from the point of temporary suspension when viewing of the video program has been previously suspended.

[Solution]

When a user has selected to temporarily suspend distribution of a video program, a temporary suspension request is sent from the user's terminal to a video distribution site. The video distribution site receiving the temporary suspension request then temporarily stops distribution. When the user later selects to resume distribution of the video program, a request to resume distribution of the video program is sent to the video distribution site. The video distribution site receiving the distribution resumption request then sends a user information query message to the user's terminal. After the user information has been authenticated by the user's terminal, the video distribution site resumes distribution of the video program from the point of temporary suspension. When all of the video program has been distributed, an end-of-program notification is sent and distribution is ended.

User Terminal — Video Distribution Site

Distribution Request

User Info Query

User Info Response

Program Distribution

Start Distribution

Temporary Interruption Request

Resume Distribution

Distribution Resumption Request

User Info Query

User Info Response

Program Distribution (Resumed)

Temporarily Interrupt Distribution

End-of-Program Notification

End Distribution

[Claims]

[Claim 1]

A system for a video distribution service which compresses and distributes desired video program data to a user terminal from a video distribution site via a wired communication network or wireless communication network in response to a distribution request sent from the user terminal to the video distribution site, the system for a video distribution service characterized in that the video distribution site temporarily suspends distribution of the video program data when a request to temporarily suspend distribution is received from the user terminal and then resumes distribution of the video program data from the point of temporary suspension when a request to resume distribution is received from the user terminal.

[Claim 2]

A system for a video distribution service according to claim 1, wherein the video distribution site changes the compression rate of the video program data in response to the communication speed of the communication network.

[Claim 3]

A system for a video distribution service comprising the steps of:
a user terminal sending a request for distribution of a video program the user wishes to view to a video distribution site via a wired communication network or a wireless communication network;
the video distribution site querying the user terminal for user information to authenticate the user when the request for distribution of the video program has been received;
the user terminal responding with user information to the video distribution site when the query for user information has been received;
the video distribution site authenticating the received user information;
the video distribution site starting distribution of the video program when the user information has been authenticated; and
the user terminal having an insertion slot for an IC card with preloaded user information reads the user information from an IC card inserted into the insertion slot to generate and respond with the user information.

[Claim 4]

A system for a video distribution service according to claim 3 further comprising the steps of:
the user terminal sending a request for temporary suspension of distribution of the video program to the video distribution site when the user wishes to temporarily suspend distribution while viewing the video program;
the video distribution site temporarily stopping distribution of the video program when the request for temporary suspension of distribution has been received;
the user terminal sending a request for resumption of distribution of the video program to the video distribution site when the user wishes to resume distribution of the video program;
the video distribution site querying the user terminal for user information to authenticate the user when the request for resuming distribution of the video program has been received; and

the video distribution site resuming distribution of the video program from the point of temporary suspension when the user information has been authenticated.

[Claim 5]

A system for a video distribution service according to claim 3 or 4, wherein the user terminal communicating with the video distribution site via a wired communication network comprises: a set top box (STB) having an insertion slot for an IC card, connecting to the wired communication network and exchanging data with the video distribution site; a TV receiver for displaying received video program data on a screen; and an IC card containing the preloaded user information and inserted into the insertion slot.

[Claim 6]

A system for a video distribution service according to claim 3 or 4, wherein the user terminal communicating with the video distribution site via a wireless communication network comprises: a terminal device having an insertion slot for an IC card, connecting to the wireless communication network and exchanging data with the video distribution site; and an IC card containing the preloaded user information and inserted into the insertion slot.

[Claim 7]

A system for a video distribution service according to claim 3 or 4, wherein the video distribution site further comprises a data compressing means for changing the compression rate of the video program data in response to the communication speed of the wired communication network or wireless communication network.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention]

The present invention relates to a video distribution system and, more specifically, to a video distribution system for distributing video programs in real time.

[0002]

[Prior Art]

In a video distribution system for a video-on-demand service, a video distribution site retrieves video program data stored beforehand in a database (DB) in response to a request from a user terminal, and distributes the video program data to the user terminal via a wired communication network or wireless communication network.

[0003]

When video program data is distributed, the user operates a key on a user terminal or a remote control to send a request for distribution of the desired video program to the video distribution site. The video program data is then continuously distributed to the user terminal without interruption until all of the video program data has been sent.

4

[0004]

[Problem to be Solved by the Invention]

When a video distribution site starts distributing video program data, the video program data is continuously distributed to the user terminal without interruption until all of the video program data has been sent. Therefore, once a user begins viewing a movie or television program, the user cannot view all of the movie or program if the user has to leave his or her seat or go out. Even when the movie or television program is viewed while out using a mobile terminal or viewed after returning home, the movie or program has to be viewed again from the beginning.

[0005]

It is an object of the present invention to provide a system for a video distribution service which enables a user to continue viewing a video program from the point of temporary suspension when viewing of the video program has been previously suspended.

[0006]

[Means for Solving the Problem]

The present invention is a system for a video distribution service which compresses and distributes desired video program data to a user terminal from a video distribution site via a wired communication network or wireless communication network in response to a distribution request sent from the user terminal to the video distribution site. In this system for a video distribution service, the video distribution site temporarily suspends distribution of the video program data when a request to temporarily suspend distribution is received from the user terminal and then resumes distribution of the video program data from the point of temporary suspension when a request to resume distribution is received from the user terminal. The video distribution site also changes the compression rate of the video program data in response to the communication speed of the communication network.

[0007]

More specifically, the system for a video distribution service comprises the steps of: a user terminal sending a request for distribution of a video program the user wishes to view to a video distribution site via a wired communication network or a wireless communication network; the video distribution site querying the user terminal for user information to authenticate the user when the request for distribution of the video program has been received; the user terminal responding with user information to the video distribution site when the query for user information has been received; the video distribution site authenticating the received user information; the video distribution site starting distribution of the video program when the user information has been authenticated; and the user terminal having an insertion slot for an IC card with preloaded user information reads the user information from an IC card inserted into the insertion slot to generate and respond with the user information.

[0008]

The system for a video distribution service also comprises the steps of: the user terminal sending a request for temporary suspension of distribution of the video program to the video distribution site when the user wishes to temporarily suspend

5

distribution while viewing the video program; the video distribution site temporarily stopping distribution of the video program when the request for temporary suspension of distribution has been received; the user terminal sending a request for resumption of distribution of the video program to the video distribution site when the user wishes to resume distribution of the video program; the video distribution site querying the user terminal for user information to authenticate the user when the request for resuming distribution of the video program has been received; and the video distribution site resuming distribution of the video program from the point of temporary suspension when the user information has been authenticated.

[0009]

In the system for a video distribution service, the user terminal communicating with the video distribution site via a wired communication network comprises: a set top box (STB) having an insertion slot for an IC card, connecting to the wired communication network and exchanging data with the video distribution site; a TV receiver for displaying received video program data on a screen; and an IC card containing the preloaded user information and inserted into the insertion slot. In the same system, the user terminal communicating with the video distribution site via a wireless communication network comprises: a terminal device having an insertion slot for an IC card, connecting to the wireless communication network and exchanging data with the video distribution site; and an IC card containing the preloaded user information and inserted into the insertion slot.

[0010]

In the system for a video distribution service, the video distribution site also comprises a data compressing means for changing the compression rate of the video program data in response to the communication speed of the wired communication network or wireless communication network.

[0011]

[Embodiment of the Invention]

The following is a detailed description of the present invention with reference to the drawings.

[0012]

FIG. 1 is a diagram of an embodiment of the present invention. The video distribution site 1 has a provider function for performing a video program distribution service in which video programs are distributed to user residential terminals 2 via a wired communication network 4 and to user mobile terminals 3 via a wireless communication network 5.

[0013]

The video distribution site 1 comprises a video program database (video program DB) 11 in which video program data has been stored beforehand, a user information database (user information DB) 12 in which user information for users with a program distribution contract such as user IDs and passwords has been stored beforehand, a video distribution server 13 for retrieving video program data requested by user terminals from the video program DB 11 and sending the video program data to user terminals, a user authentication server 14 for comparing user information sent from user terminals to user information registered in

6

the user information DB 12 for authentication, and a network access server 15 for connecting the program distribution server 13 and the user authentication server 14 to a wired communication network 4 or a wireless communication network 5.

[0014]

User residential terminals 2 have a set top box (STB) 21 for exchanging data with the video distribution site 1 via the wired communication network 4, a TV receiver 22 for showing video programs on a screen, and an IC card 23 containing user information such as a user ID and password.

[0015]

An IC card insertion slot 24 is provided in the STB 21 of the residential terminal 2 and the IC card 23 is usually inserted in the IC card insertion slot 24. When the video distribution service has been requested, the STB 21 retrieves the user information stored in the IC card 23 and connects to the video distribution site 1. Video program data is received via the wired communication network 4, and the video program is sent to the TV receiver 22 in real time.

[0016]

The mobile terminal 3 has a main unit 31 for exchanging data with the video distribution site 1 via a wireless communication network, and a display unit 32 for displaying received video program data in real time.

[0017]

An insertion slot 34 for an IC card 33 containing user information is provided in the main unit 31 of the mobile terminal 3. The IC card 23 mentioned above can be used as the IC card 33.

[0018]

When the video distribution service is desired, the user presses a key on the main unit 31 to request distribution of a video program. As in the case of the residential terminal 2, the main unit 31 retrieves the user information stored on the IC card inserted into the IC card insertion slot 34 and establishes a connection with the video distribution site 1. Video program data is received via the wireless communication network 5 and a video program is displayed in real time on the display unit 32.

[0019]

The following is an explanation of the operations.

[0020]

FIG. 2 is a diagram showing the distribution processing steps performed by a video distribution site and a user terminal.

[0021]

7

When a video program is to be viewed on the residential terminal 2, the user operates a remote control (not shown), a program menu screen is displayed on the TV receiver 22, and the video program to be viewed is selected. The STB 21 prepares a distribution request message for the video program selected by the user, and sends the message to the video distribution site 1 via the wired communication network 4.

[0022]

The video distribution site 1 receives the distribution request message and sends a user information query message to the STB 21 in the user's residence 2 via the wired communication network.

[0023]

The STB 21 receives the user information query message, retrieves user information from the IC card 23 inserted in the insertion slot 24, prepares a user information message, and responds to the video distribution site 1 with the message.

[0024]

The video distribution site 1 receives the user information message, compares the user information recorded in the user information DB 12 with the user information sent from the user terminal, and begins distribution of the requested video program if the information matches.

[0025]

If the user has to leave his or her seat or go out while viewing the program, the user operates the remote control (not shown) to temporarily suspend viewing. The STB 21 prepares a message to request temporary suspension of distribution of the video program, and sends the message to the video distribution site 1 via the wired communication network 4. The video distribution site 1 receives the temporary suspension request message and temporarily suspends distribution of the video program.

[0026]

When the user has returned home and wishes to resume distribution of the temporarily suspended video program, the user operates the remote control (not shown) to resume distribution. The STB 21 prepares a message to request resumption of distribution of the video program, and sends the message to the video distribution site 1 via the wired communication network 4.

[0027]

The video distribution site 1 receives the distribution resumption request message and replies to the STB 21 with a user information query message. The STB 21 receives the user information query message, retrieves user information from the IC card 23, prepares a user information message, and replies with this message.

[0028]

The video distribution site 1 receives the user information message, compares the user information recorded in the user information DB 12 with the user information sent from the

8

user terminal, and resumes distribution of the suspended video program at the point of temporary suspension. When the entire video program has been distributed, an end-of-program notification is sent and distribution is ended.

[0029]

When a video program is to be viewed on a mobile terminal 3, the user operates a key on the main unit 31 to select the video program and request distribution. The main unit 31 prepares a distribution request message for the video program selected by the user, and sends the message to the video distribution site 1 via the wireless communication network 5.

[0030]

The video distribution site 1 receives the distribution request message and sends a user information query message to the mobile terminal 3 via the wireless communication network.

[0031]

The main unit 31 in the mobile terminal 3 receives the user information query message, retrieves user information from the IC card 33 inserted in the insertion slot 34, prepares a user information message, and responds to the video distribution site 1 with the message.

[0032]

The video distribution site 1 receives the user information message, and begins distribution of the requested video program if the user information has been authenticated.

[0033]

If the user operates a key on the main unit 31 to select temporary suspension of distribution after distribution has begun, the main unit 31 prepares a message to request temporary suspension of distribution of the video program, and sends the message to the video distribution site 1. The video distribution site 1 then temporarily suspends distribution of the video program.

[0034]

When the user has operated a key on the main unit 31 to resume distribution, the main unit 31 prepares a message to request resumption of distribution, and sends the message to the video distribution site 1 via the wireless communication network 5.

[0035]

The video distribution site 1 receives the distribution resumption request message and replies to the mobile terminal 3 with a user information query message. The main unit 31 receives the user information query message, retrieves user information from the IC card 33, prepares a user information message, and replies with this message.

[0036]

9

The video distribution site 1 receives the user information message, and resumes distribution of the video program if the user information has been authenticated. When the entire video program has been distributed, an end-of-program notification is sent and distribution is ended.

[0037]

When a user has been viewing a video program on a residential terminal 2 and wishes to continue viewing the temporarily suspended video program using a mobile terminal 3 while out, the IC card 23 inserted in the STB 21 of the residential terminal 2 is removed, the IC card 23 is inserted into the insertion slot 33 of the mobile terminal 3, and the user operates a key on the main unit 31 to resume distribution.

[0038]

FIG. 3 is a diagram showing processing steps performed by the video distribution site 1.

[0039]

When the network access server 15 at the video distribution site 1 receives a video program distribution request message from a user terminal via a wired communication network or wireless communication network, it replies with a user information query message.

[0040]

The network access server 4 then receives the user information response message and requests user authentication from the user authentication server 14. The user authentication server 14 compares the user information stored in the user information DB 12 with the user information in the user information response message. If there is a match, an authentication completed message is sent to the network access server 15.

[0041]

The network access server 15 receives the authentication complete message and issues a distribution command for the video program requested by the user to the program distribution server 13. The program distribution server 13 receives the program distribution command, selects the specified video program from among the video programs stored beforehand in the video program DB 11, and starts distribution of the program. The video program data is sent to the user terminal via the network access server 15 and the wired communication network 4 or the wireless communication network 5.

[0042]

When the network access server 15 then receives a temporary suspension of distribution request message from the user terminal via the wired communication network or the wireless communication network, a temporarily stop distribution command is sent to the program distribution server 13 to temporarily stop distribution of the program.

[0043]

When the network access server 15 then receives a resumption of distribution request message from the user terminal via the wired communication network or the wireless communication network, it replies to the user terminal with a user information query

10

message and receives a user information response message. A user authentication request is sent to the user authentication server 14, and a resume distribution command is sent to the program distribution server 13 when an authentication complete notification is received. The program distribution server 13 receives the resume distribution command and resumes distribution of the video program from the point of temporary suspension. When the entire video program has been distributed, an end-of-program notification is sent and distribution is ended.

[0044]

FIG. 4 is a block diagram of another embodiment of the present invention.

[0045]

The configurational elements shown in FIG. 1 are denoted by the same reference numbers here. Also, the internal configuration of the residential terminal 2 and the mobile terminal 3 are not depicted here.

[0046]

The point of difference with respect to FIG. 1 is that the compression rate of the video program data is changed based on the communication speed of the communication network prior to distribution. As a result, the configuration is provided with a communication speed information notification unit 16 to provide notification of the communication speed of the communication network and a data compression unit 17 for changing the compression rate of the video program data based on the communication speed.

[0047]

The following is an explanation of the operations.

[0048]

When the network access server 15 in the video distribution site 1 receives a program distribution request message from a user terminal (either a residential terminal 2 or a mobile terminal 3) via the wired communication network 4 or the wireless communication network 5, it replies to the user terminal with a user information query message. When it receives a user information response message, it sends a user authentication request to the user authentication server 14. An authentication complete message is then received from the authentication server 14. Up to this point, the explanation is identical to the embodiment shown in FIG. 1.

[0049]

When the authentication complete notification is received, the network access server 15 sends a program distribution start command to the program distribution server 13. At this time, the communication speed information notification unit 16 sends communication speed information on the communication line to the distribution server.

[0050]

When the distribution server 13 has received the program distribution command and communication speed information, it sets the optimum compression rate for the video

11

program data based on the communication speed and sends the compression rate to the data compression unit 17. The compression rate is increased when the communication speed is slow and the compression rate is decreased when the communication speed is fast to improve picture quality.

[0051]

The video program data is then retrieved from the video program DB 11 and the data is compressed to the compression rate indicated by the data compression unit 17 before distribution.

[0052]

When distribution of a temporarily suspended video program is to be resumed and an authentication complete notification has been received, the network access server 15 sends a resume distribution command to the program distribution server 13, the communication speed information notification unit 16 sends communication speed information on the communication line to the distribution server. When the distribution server 13 has received the program distribution command and communication speed information, it sets the optimum compression rate for the video program data based on the communication speed and sends the compression rate to the data compression unit 17. Video program data is retrieved from the video program DB 11 from the point of temporary suspension, the data is compressed to the compression rate indicated by the data compression unit 17, and distribution is resumed.

[0053]

By changing the compression rate of the video data to conform to the communication line prior to distribution, high quality video programming can be enjoyed when the communication network has high-speed lines, and smooth video can be maintained at lower picture quality on a mobile terminal using a somewhat lower speed wireless channel.

[0054]

[Effects of the Invention]

As explained above, the present invention makes it possible to temporarily suspend and resume distribution of a video program such as a movie in response to a user request. This enables a user to continue viewing a video program from the point of temporary suspension when viewing of the video program has been previously suspended.

[0055]

When user information has been preloaded on an IC card and a terminal is used that supports this IC card, any terminal can be used to connect to a video distribution site and receive the distribution service.

[0056]

Because viewing of a video program can be resumed from the point of temporary suspension using a mobile terminal after going out, a video program can be viewed anywhere at any time.

[Brief Description of the Drawings]

[FIG. 1]

FIG. 1 is a diagram of an embodiment of the present invention.

[FIG. 2]

FIG. 2 is a diagram showing the distribution processing steps performed by a video distribution site and a user terminal.

[FIG. 3]

FIG. 3 is a diagram showing processing steps performed by the video distribution site.

[FIG. 4]

FIG. 4 is a block diagram of another embodiment of the present invention.
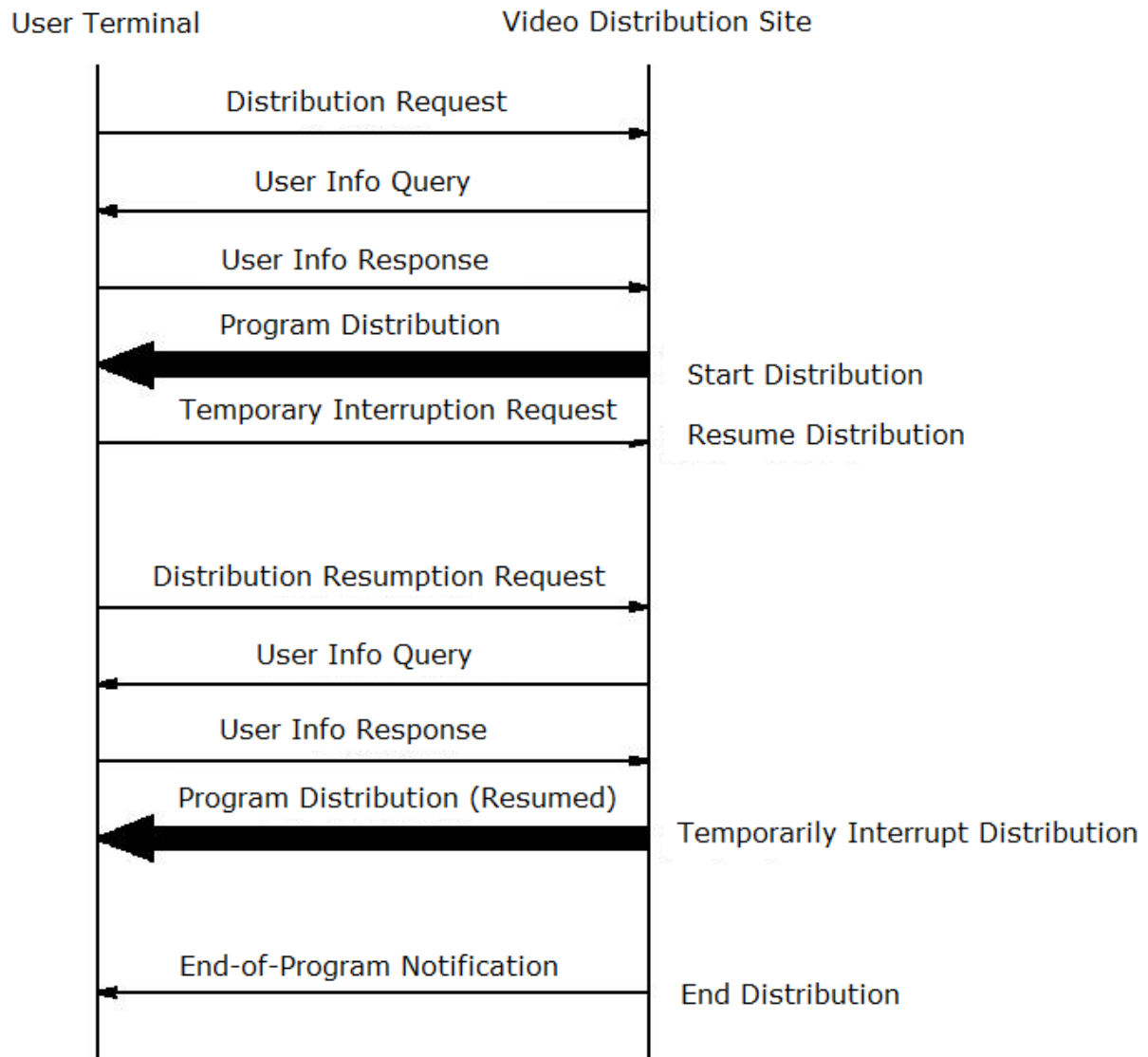
[Key to the Drawings]

1: Video distribution site
2: Residential terminal
3: Mobile terminal
4: Wired communication network
5: Wireless communication network
11: Video program database (video program DB)
12: User information database (user information DB)
13: Program distribution server
14: User authentication server
15: Network access server
16: Communication speed information notification unit
17: Data compression unit
21: STB (set top box)
22: TV receiver
23, 33: IC card
24, 34: IC card insertion slot

[FIG. 1]
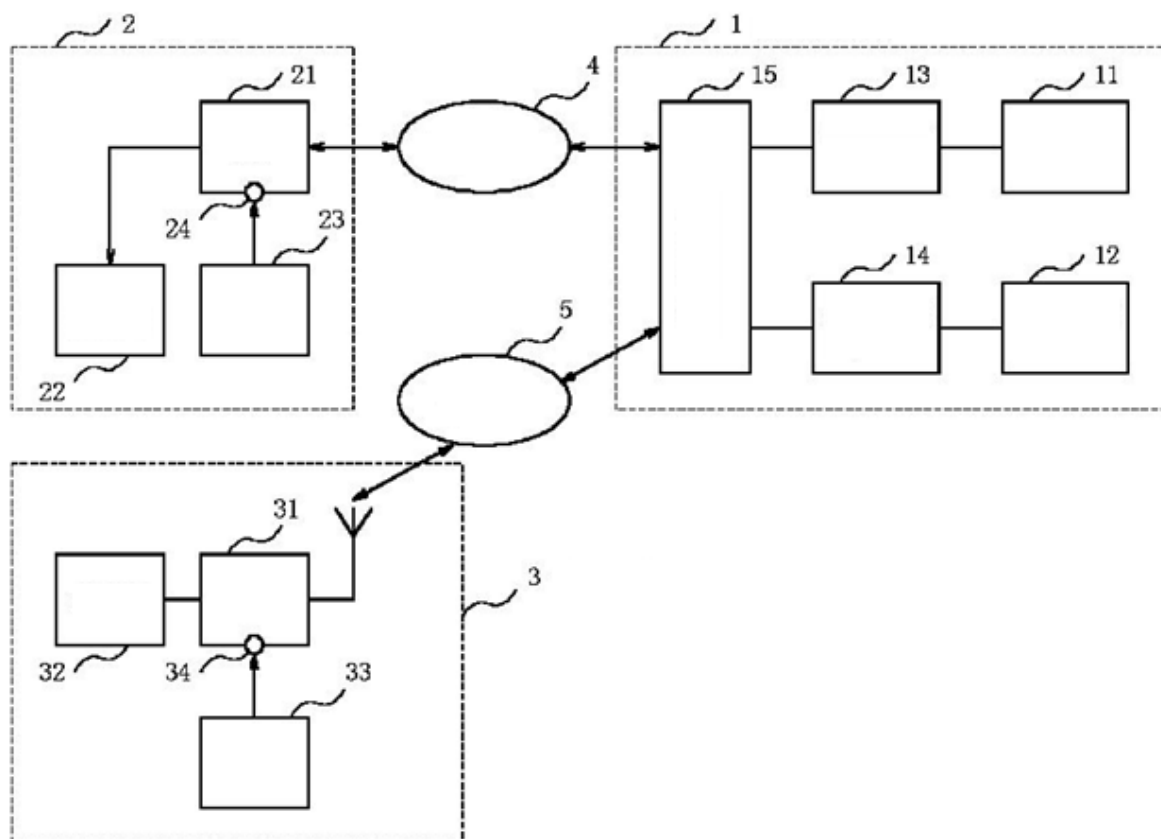
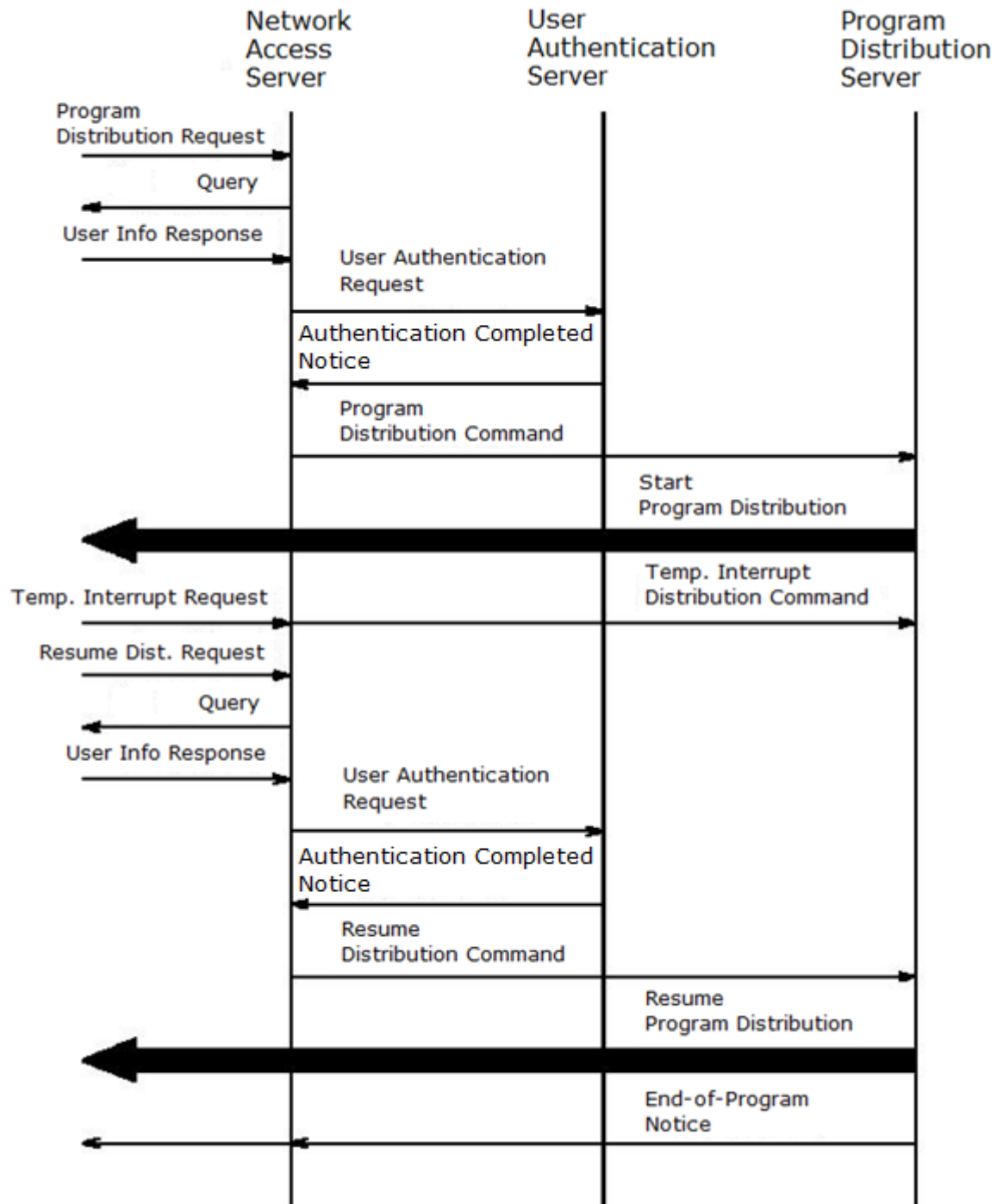1: Video distribution site
2: Residential terminal
3: Mobile terminal
4: Wired communication network
5: Wireless communication network
11: Video program database (video program DB)
12: User information database (user information DB)
13: Program distribution server
14: User authentication server
15: Network access server
21: Set top box
22: TV receiver
23: IC card
31: Main unit
32: Display unit
33: IC card

[FIG. 2]

User Terminal   Video Distribution Site

Distribution Request

User Info Query

User Info Response

Program Distribution

Start Distribution

Temporary Interruption Request

Resume Distribution

Distribution Resumption Request

User Info Query

User Info Response

Program Distribution (Resumed)

Temporarily Interrupt Distribution

End-of-Program Notification

End Distribution

[FIG. 3]

Network Access Server — User Authentication Server — Program Distribution Server

Program Distribution Request → Network Access Server

Query ←

User Info Response →

User Authentication Request →

Authentication Completed Notice ←

Program Distribution Command →

Start Program Distribution →

Temp. Interrupt Request →
Temp. Interrupt Distribution Command →

Resume Dist. Request →

Query ←

User Info Response →

User Authentication Request →

Authentication Completed Notice ←

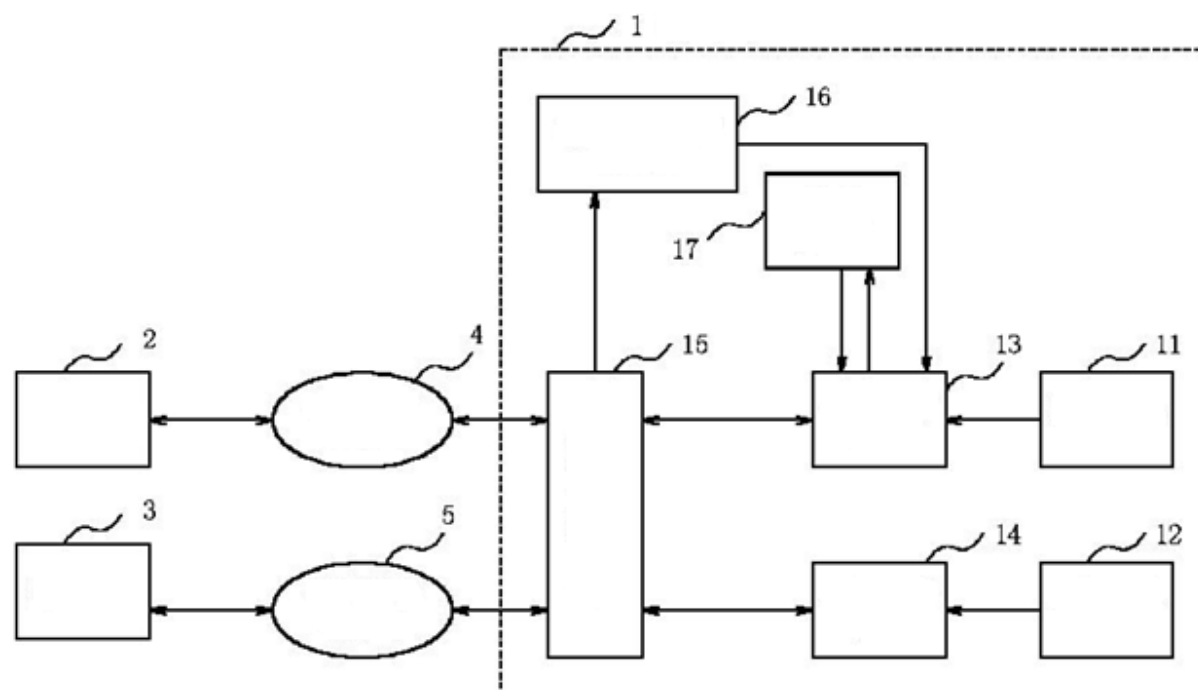Resume Distribution Command →

Resume Program Distribution →

End-of-Program Notice ←

16

[FIG. 4]

1: Video distribution site
2: Residential terminal
3: Mobile terminal
4: Wired communication network
5: Wireless communication network
11: Video program database (video program DB)
12: User information database (user information DB)
13: Program distribution server
14: User authentication server
15: Network access server
16: Communication speed information notification unit
17: Data compression unit

TRANSLATOR CERTIFICATION

I, Frank McGee, hereby declare:

That I possess advanced knowledge of the Japanese and English languages. My qualifications are as follows:

- More than 25 years of experience as a Japanese-English translator of patents and patent-related documents
- MA in East Asian Languages from the University of Chigaco

The attached translation is, to the best of my knowledge and belief, a true and accurate translation from Japanese to English of Japanese Patent Application Publication JP 2001-359073 A. All statements made in this declaration of my own knowledge are true and all statements made on information and belief are believed to be true. I make these statements with the understanding that willful false statements and the like are punishable by fine or imprisonment, or both (17 U.S.C. 1001).

I declare under penalty of perjury that the forgoing is true and correct.

Executed on this 20th day of December, 2019.

At: Wolfeboro, New Hampshire

_____
Frank McGee