DESCRIPTION

INFORMATION RECEPTION AND DELIVERY SYSTEM AND PROGRAM STORAGE MEDIUM THEREOF

Technical Field

This invention relates generally to an information reception and delivery system, and more particularly to an information reception and delivery system having a forced delivery function to receive and deliver information in an integrated manner and forcibly deliver information based on the content of information, and a function to collect access data to ensure the integrated reception and delivery of information based on the content of information so that the reception and delivery of information can be controlled in an appropriate manner based on the content of information, and a medium for storing programs thereof.

Background Art

With the progress of computer networks in recent years, various types of public information are being received and delivered by companies, organizations and individuals via computer networks, crossing the boundaries of those users. News articles distributed by a newspaper via a computer network can be accessed and read by individual readers through their terminals. A large number of companies disclose their business information by making it readily available over the Internet to those who have interests in them.

An increasing number of companies, on the other hand, are establishing their intranets (or networks designed for exclusive use of a corporation or private networks), connecting branches, sales offices, factories, laboratories, etc. via computer networks. In establishing a network within a company, a tree topology is usually adopted, instead of connecting all the terminals used by employees with each other, partly because of the need for information management within the company, and partly because of the large number of terminals involved. For example, an

employee can send and receive necessary information by manipulating his terminal to gain access to the head-office host computer (higher-level server) via the sales-office host computer (lower-level server).

In conventional network systems of this type, a directory list is held by the server, and sent to the client in response to the client's request to send the directory list, based on which the client can receive desired channel information from the server.

Fig. 23 shows a conventional processing flow relating to information delivery. A server shown at the top of the figure represents servers that are usually disposed in a plurality of layers in a tree topology.

The server holds information on articles that are available for delivery by the server ("information on article A", "information on article B", --- "information on article A' ", "information on article B', --- shown in the figure); the article information being held, together with the titles of "Article A", "Article B", --- "Article A' ", "Article B' ", ---, in the form of a list of channel articles.

Furthermore, the server retains a directory list that contains a plurality of channel article lists. In other words, "Channel A Article List", "Channel B Article List", --- in the figure are compiled into a directory list. A directory list contains a title of "Channel A" representing "Channel A Article List", for example.

① The client asks the server to send a directory list at the time of startup.

② The server sends the directory list. Upon receipt of the directory list, the client updates the "directory list" it currently holds.

③ Based on the updated directory list, the client asks the server to send "Channel A Article List", for example.

④ The server sends "Channel A Article List".

⑤ The client compares the received "Channel A Article List" with the "Channel A Article List" he currently possesses. If there is a new article α in the received List, the client asks the server to send information on Article α.

⑥ The server sends information on Article α, and the client obtains the latest information on Article α.

⑦ Similarly, if there is another new article β, the client asks the server to send information on Article β.

⑧ The server sends information on Article β, and the client obtains the latest information on Article β.

⑨ The client then asks the server to send "Channel β Article List," if necessary.

Thus, at the request of the client, the server sends new article information. Although a request for information may be initiated by an individual user who operates the client, more commonly a time management table is provided in the client so that the client requests a "directory list" from the server at predetermined time intervals. After that, the same processing as that described above is repeated.

When establishing an intranet (internal network or private network), the intranet is usually connected to outside open networks (or global network) such as the Internet. Such interconnectivity is considered essential for investment efficiency and from other business and managerial reasons, so that such configurations are employed. This interconnectivity among intranets and global networks allows various kinds of information to be received by gaining access to the Internet from terminals on the intranet, or to be distributed from terminals on the intranet to various destinations via the Internet.

Thus, the present situation is such that the reception and delivery of various types of information can be implemented almost freely from local terminals through interconnections among networks so long as a password and other necessary arrangements are provided.

The great convenience of interconnectivity may lead to a flood of information distributed among intranets that often tends to overwhelm really essential information. That is, truly essential information may not necessarily be delivered to targeted employees who operates the terminals because the network does not distinguish information by its nature; e.g., information that must be delivered to terminals without fail from one that must not be delivered to them, or one that need not be delivered to them.

Thus, it is necessary for an intranet to manage the content of information to be received/delivered. It is also necessary to deal with information in an integrated and well-organized manner while classifying information into one that is to be received/delivered only within the intranet (in-house information, for example) and one that comes from outside networks.

Furthermore, information delivery procedures in accordance with requests made by clients from time to time, or at a relatively long frequency, may not necessarily meet the need for urgent information delivery.

In the aforementioned conventional information reception and delivery system, two modes as shown in Figs. 24 and 25 are known for collecting access data as to what type of information attracted the interest of a lower-level server, or a client connected to the lower-level server, or to what extent such information was accessed.

In Fig. 24, numeral 500 refers to a server, 501-1, 501-2, --- to clients, 502 to accumulated information, and 503-1, 503-2, --- to logs, respectively. In the mode shown in Fig. 24, which corresponds to the former case (i.e., to what type of information interested the client), log information kept as each client 501-i accessed the server 500 is analyzed by the server 500. That is, the server 500 accumulates the log information to extract (i) the field name referred-to, (ii) the address of the user (client), (iii) date and time, etc.

In Fig. 25, numeral 600 to a server, 601-1, 601-2, --- to clients, 602 to accumulated information, 603-1, 603-2, --- to transmission information, and 604-1, 604-2, --- to return information, respectively. In the mode shown in Fig. 25, which corresponds to the latter case (i.e., to what extent such information was accessed), the server 600 sends information to each client 601-i and keeps a record on transmission information 603-i, and receives information on the state of access from each of the client 601-i as return information 604-i and keeps a record on the return information 604-i; both the send and return information being treated as access data.

That is, the server 600 sends information to each of the client 601-i, while the client 601-i returns to the server 600 the return information 604-i as to how long who

accessed what type of information. The server 600 collects the transmission record it sent and the received return record it received as access data.

As described earlier, the present situation is such that the reception and delivery of information can be implemented almost freely from terminals by interconnecting networks, such as interconnections between an intranet and the Internet etc., so long as a password and other necessary arrangements are provided. However, this in turn gives rise to various undesirable problems.

There can be a case, for example, where a terminal on the intranet accesses an outside network to receive information that is totally irrelevant to the business of the company, that is information in which the employee who operates the terminal has a personal interest, such as gambling information for personal use.

The great convenience of interconnectivity may lead to a flood of information distributed among intranets that often tends to overwhelm really essential information. That is, truly essential information may not necessarily be delivered to targeted employees who operates the terminals because the network does not distinguish information by its nature; e.g., information that must be delivered to terminals without fail, from one that must not be delivered to them, or one that need not be delivered to them.

Thus, it is necessary for an intranet to manage the content of information to be received/delivered. It is also necessary to deal with information in an integrated and well-organized manner while classifying information into one that is to be received/delivered only within the intranet (in-house information, for example) and one that comes from outside networks.

Furthermore, it is necessary to manage information to be received/delivered in terms of the content thereof, collect access data as to what type of information attracted individual lower-level servers or clients and to what degree such information was accessed, and determine the type of information to be purchased from a global network, for example.

In collecting such access data, it is necessary for the server 500 or 600 to execute not only processing to deliver desired information to meet the request by the

client 501-i or 601-i, but also processing for collecting the aforementioned access data. This could result in a large increase in processing load.

It is an object of the present invention to receive and deliver information in an integrated and well-organized manner based on the content of information, while distinguishing information relating to an internal network from information sent from outside networks, and efficiently receive and deliver urgent information.

It is another object of the present invention to receive and deliver information in an integrated and well-organized manner based on the content of information, while distinguishing information relating to an internal network from information sent from outside networks, efficiently receive and deliver urgent information, and efficiently collect access data.

It is a further object of the present invention to receive and deliver information in an integrated and well-organized manner based on the content of information, while distinguishing information relating to an internal network from information sent from outside networks, limit the type of information that can be accessed by individual users without being noticed by them, and appropriately group users who can access specific information.

It is still a further object of the present invention to provide a program storage medium storing a program for implementing processing to receive and deliver information in an integrated and well-organized manner based on the content of information, while distinguishing information relating to an internal network from information sent from outside networks, limit the type of information that can be accessed by individual users without being noticed by them, and appropriately group users who can access specific information.

Disclosure of Invention

The information reception and delivery system according to the present invention comprises servers and clients that receive and deliver private information on an internal network as well as global information on outside networks connected to the internal network; an urgent channel information delivery unit provided on the

side of the server, and urgent channel information reception unit provided on the side of the clients, so that when information requiring urgent delivery is generated on the side of the server, the server delivers that information to the urgent channel information reception unit on the side of the clients via the urgent channel information delivery unit.

The information reception and delivery system makes it possible for the server to urgently and forcibly deliver information requiring urgent delivery, and thereby efficiently keep users well informed of such information.

The information reception and delivery system of the present invention comprises servers and clients that receive and deliver private information on an internal network as well as global information on outside networks connected to the internal network; when one of the clients gains access to channel information comprising any one of global information and/or private information, the client sends to the server access data on the state of its access to that channel information, and upon receipt of the channel information the server accumulates the access data.

According to this information reception and delivery system, it is possible to select as the server for accumulating access data a given server, other than the server that generates and holds articles, thereby equalizing the processing load on each server even in collecting and accumulating access data. Thanks to the ability of processing load equalization, the information reception and delivery system can fetch for analysis detailed information, such as information on access state, information on access operations, and that on downloading channel information.

The information reception and delivery system of the present invention comprises servers and clients, both adapted to receive and deliver private information as information within the internal network, and global information as information within an external networks connected to the internal network. The information reception and delivery system has in a predetermined higher-level server within the internal network a list of global directories for holding global information that are directories comprising information sources and reception information as information for receiving information from the information sources, and a list of

private directories for holding private information that are directories comprising information sources and reception information as information for receiving the information. The information reception and delivery system has such a configuration that the predetermined higher-level server manages the reception and delivery of information on other servers within the internal network using the global directory list and the private directory list, and assigns reception and transmission keys in the form of information to the servers, and assigns reception keys in the form of information to the clients; the server having a transmission key description unit for describing the transmission key assigned to the server in transmission information and a key collator unit for collating the transmission key described in the downloaded information with the reception key assigned to the server, and the client having a key collator unit for collating the transmission key described in the downloaded information with the reception key assigned to the client.

The information reception and delivery system of the present invention makes it possible to manage information accessible to lower-level servers and clients. In particular, a user operating a server or client need not feel inconvenience by being refused as access disabled when he tries to access predetermined information, and he also need not be aware of the existence of transmission or reception keys. Furthermore, a system administrator can divide servers and clients into groups by appropriately assigning transmission and reception keys, and easily effect control so as to allow information that is to be viewed by predetermined groups to be delivered to the targeted groups, and prevent information that is not to be viewed or need not be viewed from being delivered to predetermined groups. Furthermore, the information reception and delivery system of the present invention makes it easy to maintain a control system so that predetermined information is allowed to be selectively delivered to targeted users on a predetermined layer of servers connected in a tree topology, for example, and not allowed to be delivered to users below that layer by setting transmission and reception keys differently.

According to the present invention, moreover, the aforementioned type of information reception and delivery system can be implemented using programs that

operate the computer in the aforementioned manner, and these programs can be stored in various program storage media for storing these programs.

Brief Description of Drawings

Fig. 1 is a block diagram illustrating the operating principle of a first embodiment of the present invention.

Fig. 2 is a block diagram illustrating a configuration of the information reception and delivery system according to the present invention.

Fig. 3 is a block diagram illustrating a configuration of the information reception and delivery system according to the present invention.

Fig. 4 is a block diagram illustrating a configuration of the information reception and delivery system according to the present invention.

Fig. 5 is a block diagram illustrating a configuration of the information reception and delivery system of the present invention.

Fig. 6 is a block diagram of assistance in explaining directory management.

Fig. 7 is a diagram of assistance in explaining directory management.

Fig. 8 is a block diagram illustrating an embodiment of the present invention.

Fig. 9 is a diagram illustrating processing for forcibly delivering information from a server.

Fig. 10 is a diagram illustrating another embodiment of the present invention.

Fig. 11 is a diagram illustrating the processing to make queries at short time intervals.

Fig. 12 is a block diagram illustrating the operating principle of a second embodiment of the present invention.

Fig. 13 is a system configuration diagram of assistance in explaining the collection of access data.

Fig. 14 is a system configuration diagram representing a fragmentary detailed view of Fig. 13.

Fig. 15 is a system configuration diagram representing a fragmentary detailed view of Fig. 13.

Fig. 16 is a flow chart of the transmission of access data.

Fig. 17 is a flow chart of the transmission of access data.

Fig. 18 is a diagram of assistance in explaining screen display types.

Fig. 19 is a block diagram illustrating the operating principle of a third embodiment of the present invention.

Fig. 20 is a diagram of assistance in explaining key-operated control between servers and clients.

Fig. 21 is a diagram illustrating a configuration of the server.

Fig. 22 is a diagram illustrating a configuration of the client.

Fig. 23 shows a conventional processing flow of information delivery.

Fig. 24 is a diagram of assistance in explaining a conventional mode of collecting access data.

Fig. 25 is a diagram of assistance in explaining another conventional mode of collecting access data.

Best Mode for Carrying out The Invention

(1st Embodiment)

Fig. 1 is a diagram illustrating the operating principle of an information reception and delivery system (or a network operating system) as a first embodiment of the present invention. This information reception and delivery system receives and delivers private information that belongs to an internal network 100 and global information that belongs to an external network 200 connected to the internal network 100. This information reception and delivery system has a global directory list 2 and a private directory list 3 in a predetermined higher-level server 110 in the internal network 100. The global directory list 2 is a directory comprising information sources (servers) and reception information for receiving information from the sources, and retains the aforementioned global information. The private directory list 3 is a directory comprising information sources (servers) and reception information for receiving information from the sources, and retains the aforementioned private information. The predetermined higher-level server 110

manages the reception and delivery of information for other servers 120 in the internal network 100 using the global directory list 2 and the private directory list 3.

In the information reception and delivery system according to the first embodiment of the present invention, reception information for global information and private information can be retained in advance by the global directory list 2 and the private directory list 3. This permits the reception and delivery of information itself (main text) to be managed on the basis of reception information for each piece of information by integrally managing global information and private information while distinguishing them from each other.

According to the present invention, therefore, information to be received/delivered can be managed on the basis of the content thereof even when a private network, such as an intranet and a public external network (global network) are connected to each other. This permits both the information to be received/delivered within an intranet alone and the information to be received from an external network to be handled in an integrated manner while distinguishing them from each other.

In the present invention, the server 110 (the same applies to the server 120 which is not shown in the figure) has a function to prepare and urgently and forcibly deliver to lower-level servers an urgent information directory list 4 whenever information to be delivered urgently is generated.

Although the conventional information delivery as shown in Fig. 23 employs two stages of "lists"; a directory list and a channel article list, the present invention has also the same arrangement. The present invention may even use three or more stages of "lists" if necessary. In the following description, a "directory list" often represents multiple stages of "lists".

Figs. 2 through 5 show a configuration of the information reception and delivery system according to the first embodiment of the present invention. More specifically, Fig. 2 shows the connection of a network, Fig. 3 shows a configuration of the external (or shared) network (global network) 200, Fig. 4 shows a configuration of

the internal network (private network or LAN) 100, and Fig. 5 shows a configuration of the terminal (client) 140 of the internal network 100.

As shown in Fig. 2, the internal network 100, such as an intranet, is connected to the Internet 201 that is an external network 200 via a circuit 300, such as a public or leased line, to receive and deliver information. A global network 202 that is another external network 200 is connected to the Internet 201 to receive and deliver information. As a result, the internal network 100 is also connected to the global network 202 via the Internet 201 to receive and deliver information. Although the global network 202 can be accessed by the internal network 100 via the Internet 201, the internal network 100 may sometimes be connected directly to the global network 203 that is an external network 200 via the circuit 300 to receive and deliver information. The information mentioned here is public information, such as newspaper articles.

Consequently, the global network 100 receives and delivers information from the Internet, information from the global network 202 and information from the global network 203. These pieces of information are considered global information for the internal network 100 because they are prepared outside the internal network 100 and supplied to the internal network 100 from the outside. In the internal network 100, information prepared in the internal network 100 is also received and delivered. These pieces of information are considered private information for the internal network 100.

As shown in Fig. 3, the external network 200, such as the Internet 201 and the global networks 202, 203, etc., includes a global directory server 210 as a higher-level server, and global servers 220 as lower-level (or intermediate-level) servers. The global directory server 210 is a server on the first (highest) layer in terms of directory management in the external network 200, while the global servers 220 are servers on the second layer in terms of directory management. Though not shown in the figure, lower-level servers and clients are connected under the global servers 220.

The global server 220A (the same applies to global servers 220B and 220C) as one of the global servers 220 prepares and stores information (global information)

comprising an article (archive), and content information or attribute information (content) on the content of the article. This article is expressed as "Archive #a" and captioned as "Content (or Global Content Item) a". The global server A and others are news servers in the Internet, for example.

An example of the archive #a is a "news article (article content) of a newspaper A" prepared and made public by a newspaper company. An example of the content a as the caption thereof can be "Article of Newspaper A" that specifically and clearly indicates the content of the archive #a. The global server A in this case is the global server 220 possessed by the newspaper company.

If the system administrator of the global server A determines that the archive #a may be made public, the global server A then prepares a directory (content directory) "#A" regarding the archive #a in accordance with an instruction entered by the administrator. The directory #A thus prepared is uploaded to the global directory server 210, together with the content a thereof. It should be noted that a directory is always uploaded and transmitted, together with the content thereof. This can also be applied to the following description. The archive #a still remains in the global server A.

The directory of the archive #a comprises information on the global server A as the source of the archive #a and reception information used for receiving the archive #a. More specifically, the directory is an address (including a network or IP address, etc.) or ID of the global server A. The address is expressed as #A. This directory can be regarded as a directory (global directory) on global information, when viewed from the internal network 100.

The global directory server 210 has a directory list 1 having a predetermined format. The global directory server 210 stores into the directory list 1 the directory #A of the content a uploaded from the global server A. The directory "#A" is registered, together with the content name of "Content a"; that is, directory list information (Directory #A having the name of Content a) for storing in the directory list is prepared and stored. Similarly, the directory #B uploaded from the global server B and the directory #C uploaded from the global server C are stored in the

directory list 1. As for the archive prepared by the global directory server 210, the directory thereof may also be stored in the directory list 1.

The global directory server 210 delivers the directory list 1 thus prepared to the global servers A through C whenever the directory list 1 is prepared or updated (or at predetermined time intervals). Delivering the information in the directory list 1 that is public information may pose no problems. Upon receipt of the directory list 1, the global servers A through C further deliver the directory list 1 to lower-level servers or servers in other networks.

As shown in Fig. 4, the internal network 100, such as an intranet, is usually configured into a tree topology (hierarchical structure); including a private directory server 110 that is a higher-level server, private servers (or intranet servers) 120 that are intermediate-level servers, private servers 130 that are lower-level servers, and a client 140 connected to the private server 130. The private directory server 110 is a server or terminal (or host) on the first (highest) layer in terms of directory management for the internal network 100. The private servers 120 and 130 are servers or terminals of the second and third layers in terms of directory management. The client 140 is a terminal of the fourth (lowest, for example) layer in terms of directory management.

The private directory server 110 that is on the highest level of the internal network 100 receives the directory list 1 delivered by the external network 200 over the line 300, as described above, and sends (downloads) it to the global directory list (GD) 2. That is, the private directory server 110 receives the directory list 1 as the global directory list 2 of its own. To this end, the private directory server 110 has the global directory list 2 of a predetermined format, which has the same format as the directory list 1.

The private directory server 110 may receive the directory list 1 from any server of the external network 200. For example, the private directory server 110 may receive the directory list 1 directly from the global directory server 210 or from the global server B (as shown in Fig. 3). In this respect, the private directory server 110 serves as a WWW browser for the Internet 201.

In the internal network 100, on the other hand, a private server X (the same applies to private servers Y and Z), which is one of the private servers 120, prepares and stores information (private information regarding the article "Archive #x" and the content information thereof (content). This content is expressed as "Content (or Private Content) x". If the system administrator of the private server X (or the internal network 100) determines that the content x (therefore, the archive #x, too) may be made public, the private server X prepares a directory "#X" for the archive #x in accordance with the instruction entered by the administrator, and uploads the directory #X to the private directory server 110, together with the content x thereof.

The directory of the content x comprises information on the private server X, which is the source of the content x, and reception information used for receiving the archive #x. More specifically, the directory is the address, ID or the like of the global server X. This directory is expressed as "#X", and can be regarded as a directory (private directory) regarding the private information, when viewed from the internal network 100.

The private directory server 110 has the private directory list (PD) 3 of a predetermined format. The private directory list 3 has the same format as the global directory list 2 or the directory list 1. The directory "#X" is therefore stored in the private directory list 3, as in the case of the directory "#A". That is, directory list information for storing the directory #X is prepared and stored. Similarly, the directory #Y uploaded from the private server Y is also stored in the private directory list 3. As for the archive prepared by the private server 130 or the private directory server 110 itself, the directory thereof may be stored in the private directory list 3.

The private directory server 110 delivers the global directory list 2 received and the private directory list 3 prepared to the private server X through Z whenever the lists are prepared, updated and received (or at predetermined time intervals). Delivering the information in the global directory list 2, which is public information, poses no problems. Delivering the information in the private directory list 3 basically poses no problems so long as it is delivered within a company. The private servers X

through Z, upon receipt of the global directory list 2 and the private directory list 3, deliver them to the lower-level private servers 130 and the clients 140.

As shown in Fig. 5, the client 140 has means for viewing the global directory list 2 and the private directory list 3 delivered to the user who operates the client 140. Thus, when the user of the client 140 wants to view the information (archive), the user instructs to acquire the archive by specifying a global directory and/or a private directory within the global directory list 2 and/or the private directory list 3. In response to such an instruction, the downloader 10 of the client 140 refers to the specified global directory and/or private directory, and sends (downloads) the aimed archive #a, etc. to a memory 11 on the local terminal of the client 140 from the relevant global servers 210 and 220, and/or private servers 110, 120 and 130.

In the client 140, a display program 12 displays on a display 13 the archive #a sent (downloaded) to the memory 11 to allow the user of the client 140 to view the archive #a.

The information reception and delivery system according to the present invention manages in further detail the delivery of the global directory list 2 and the private directory list 3 sent from the private directory server 110, that is, the delivery of directories, as described earlier. Through this detailed management of directories, the reception of archives is also managed in detail.

Figs. 6 and 7 show directory management. Fig. 6 in particular shows a configuration of a server of the internal network, e.g., that of the private server (or intranet server) 120 as an intermediate-level server, and Fig. 7 shows a configuration of a directory management list of the intranet server 120.

Although the following description deals specifically with the configuration of the intranet server 120, the private directory server 110 and the private server 130 have also a similar configuration. This configuration allows appropriate information management in accordance with specific levels of the internal network 100. In other servers, such a configuration may be omitted as the need arises.

As shown in Fig. 6, the intranet server 120 has a directory management list 21, a directory management program 22, a directory downloader 23, a directory update program 24, and a directory uploader 25.

As shown in Fig. 7, furthermore, the directory management list 21 stores a delivery enable flag and an upload enable flag for each content name (for each piece of channel information). The delivery enable flag indicates whether the delivery of a directory from a higher-level server (private directory server 110) to a lower-level server (private server 130) is to be enabled or not. The upload enable flag indicates whether the uploading of a directory from a lower-level server (private server 130) to a higher-level server (private directory server 110) is to be enabled or not. The directory management list 21 therefore collectively manages directories of content that can be delivered to other servers in the intranet server 120 (or internal network 100).

The directory management program 22 manages the reception and delivery of directories for the private directory server 110 and the private server 130 by referring to the directory management list 21. That is, the directory management program 22 manages the delivery of directories from a higher-level server to a lower-level server, and the uploading of directories from a higher-level server to a lower-level server using the directory management list 21. Managing the private directory server 110 results in managing other private servers 120 on the same layer so long as the reception and delivery of directories is concerned.

For this reason, the directory management program 22 sets a delivery enable flag and upload enable flag in the directory management list 21 prior to the reception and delivery of a directory. This flag setting is carried out by the system administrator of the intranet server 120 (or the administrator of the internal network 100) through interaction with the directory management program 22.

Now assume that the content a is a "news article of newspaper A" delivered over the Internet 201, as shown in Fig. 7. Since the content a is supposed to be useful to employees, the delivery enable flag is "enabled", while the upload enable flag is "disabled" for uploading. Next, assume that the content b is "news on a

gambling B" delivered over the Internet 201. Since the content b has no bearing on the business of the company, the delivery enable flag is "disabled" for delivery, while the upload enable flag is also "disabled" for upload because the content b is delivered from the higher-level server.

Furthermore, assume that the content x is a "personnel department uploaded from a lower-level server (client 140). Since the content x is intended to be brought to the attention of all employees, the delivery enable flag is "enabled", and the upload enable flag is also "enabled" for the same reason. Further, assume that the content y is "general-affairs department news Y" uploaded by a lower-level server (client 140). Since the content y has no special bearing on ordinary employees other than those in the general-affairs department, the delivery enable flag is "disabled" and the upload enable flag is also "disabled" for the same reason.

The directory downloader 23 sends (downloads) to the intranet server 120 the global and private directories delivered to a higher-level server, that is, the private server 110, and updates the content of the directory management list 21 on the basis of the downloaded directories. If they are directories of new content, the downloaded directories are added to the directory management list 21, and if they are changes in directories, the existing directories are changed in accordance with them. In Figs. 6 and 7, for example, directories of the content a through c are entered into the directory management list 21 by the directory downloader 23.

A directory for which the delivery enable flag is "enabled" in the directory management list 21 is sent (downloaded) to a lower-level server (private server 130) in the same manner by the directory downloader 23 of the private server 130. In Figs. 6 and 7, for example, directories of the content a, c and x are sent (downloaded) by the directory downloader 23 of the lower-level server.

The directory update program 24 holds in the intranet server 120 the private directory uploaded from a lower-level server, that is, the private server 130, by the directory uploader 25, and updates the content of the directory management list 21 based on the uploaded private directory, as described earlier. In Figs. 6 and 7, for

example, directories of the content x and y are entered into the directory management list 21 by the directory update program 24.

The directory uploader 25 extracts from among the content entered in the directory management list 21 those content for which the upload enable flag indicates "upload enabled", and uploads the directories thereof to the private directory server 110 that is a higher-level server. In Figs. 6 and 7, for example, the directory of the content x is uploaded by the directory uploader 25 from the directory management list 21 to a higher-level server.

Although the information reception and delivery system according to the present invention has the aforementioned configuration, description will be made in the following, focusing on the function to deliver information in an emergency.

Fig. 8 is a diagram illustrating another embodiment of the present invention. Numeral 110 in the figure refers to a server, 140 to a client, 71 to a channel information delivery unit, 72 to an urgent channel information delivery unit, 73 to an urgent channel information reception unit, 74 to a downloader, and 75 to a time management list, respectively.

In the conventional configuration, the client 140 has the time management list 75 and the downloader 74; the time management list 75 issuing requests to the downloader 74 at predetermined time intervals to send directory lists (including channel lists and channel information) to the channel information delivery unit 71 in the server 110.

In the configuration shown in Fig. 8, an urgent channel information delivery unit 72 in the server 110 in addition to the conventional configuration so that an urgent channel information list and urgent information can be delivered when the need for distributing urgent information arises. The urgent information reception unit 73 is provided in the client 140 to receive the urgent channel information list and urgent channel information sent from the server.

Fig. 9 is a diagram illustrating the processing to forcibly deliver information from the server. In the following, description will be made corresponding to the configuration shown in Fig. 8.

(S1): The client 140 generates a request to send a directory list in accordance with a time-out signal from the time management list 75.

(S2): The server 110 sends the directory list.

(S3): The client 140 updates the directory list.

(S4): Upon learning that urgent channel information is likely to be sent, the client 140 sets up an urgent channel information reception unit 73 for receiving the urgent channel information.

(S5): When an urgent article (urgent channel information) is registered in the server 110, the urgent channel article list is updated. The server 110 then sends an urgent channel article list to the urgent channel information reception unit 73 of the client 140 via the urgent channel information delivery unit 72.

(S6): In the client 140, the urgent channel information list (urgent channel information list) that has just been sent is compared with the urgent channel information list retained in the client 140.

(S7): As the above comparison in the client 140 reveals that there is urgent channel information that is not retained, the client 140 automatically generates a request for acquiring corresponding urgent channel information.

(S8): The server 110 sends the requested urgent channel information.

(S9): The client 140 updates the urgent channel information.

(S10): The client 140 then notifies the user of the arrival of the urgent channel information in the form of a pop-up window on the display screen.

Fig. 10 is a diagram showing a configuration of still another embodiment of the present invention. Numerals 110, 140, 71, 72, 73, 74 and 75 in the figure correspond to like numerals in Fig. 8. Numeral 76 denotes a downloader, and 77 a time management list, respectively.

In the configuration shown in Fig. 10, a time management list 77 having a relatively short period (5-minute period, for example) is provided, together with the conventional type of time management list 75 having a relatively long period (6-hour period, for example). Requests from the downloader 74 in the figure are sent to the channel information delivery unit 71 in the figure, while requests from the

downloader 76 in the figure are sent to the urgent channel information delivery unit 72.

Fig. 11 is a diagram showing the processing to make queries at short time intervals. In the following, description will be made corresponding to the configuration shown in Fig. 10.

(S11): The client 140 generates a request to send a directory list in accordance with a time-out signal from the time management list 75.

(S12): The server 110 sends a directory list.

(S13): The client 140 updates the directory list.

(S14): Upon learning that urgent channel information is likely to be sent, the client 140 sets up an urgent channel information reception unit 73, and activates the time management list 77 that times out at a short period.

(S15): As an urgent article (urgent channel information) is registered in the server 110, the urgent channel article list is updated.

(S16): In this condition, as the time management list 77 (short period) in the client 140 times out, the urgent channel information delivery unit 72 is activated, and the server 110 sends an urgent channel article list.

(S17): In the client 140, the urgent channel article list (urgent channel information list) that has just been sent is compared with the urgent channel information list retained in the client 140.

(S18): The aforementioned comparison in the client 140 reveals that there is urgent channel information that is not retained, the client 140 automatically generates a request for acquiring corresponding urgent channel information.

(S19): The server 110 sends the requested urgent channel information.

(S20): The client 140 updates the urgent channel information.

(S21): The client 140 then notifies the user of the arrival of the urgent channel information in the form of a pop-up window on the display screen.

Although it is described, referring to Figs. 9 and 11, that the arrival of urgent channel information is notified to the user in the form of a pop-up window on the display screen, notification may be made using any of the following means;

(a) arrival is displayed in the form of pop-up window on the screen,

(b) arrival is known with a sound,

(c) the content of newly-arrived information (urgent channel information) is displayed in the form of a pop-up window,

(d) the content of newly-arrived information is displayed immediately on a specific "information display client",

(e) a summary of the content of newly-arrived information is displayed in the form of a telop,

(f) a summary of the content of newly-arrived information is displayed in the form of a telop, giving top priority to other telops, and

(g) even when the display screen is kept blanked, or replaced with a screen saver, arrival and/or the content of newly-arrived information is displayed by overwriting the display of the screen saver.

(2nd Embodiment)

Fig. 12 is a block diagram illustrating the operating principle of a second embodiment of the present invention. The figure shows a configuration of the information reception and delivery system according to the present invention. This information reception and delivery system receives and delivers private information that is that in an internal network 100, and global information that is that in an external network 200 connected to the internal network 100. This information reception and delivery system comprises a global directory list 2 and a private directory list 3 in a predetermined higher-level server 110 in the internal network 100. The global directory list 2 is a directory comprising sources (servers) of information and reception information for receiving the information from the sources, and retains the global information. The private directory list 3 is a directory comprising sources of information and information for receiving the information from the sources, and retains the private information. Using the global directory list 2 and the private directory list 3, a predetermined higher-level server 110 manages the

reception and delivery of information on other servers 120, etc. in the internal network 100.

According to the information reception and delivery system as the second embodiment of the present invention, reception information for both the global information and the private information can be held in advance by the global directory list 2 and the private directory list 3. This permits the reception and delivery of information itself (main text) to be managed based on reception information for each piece of information by integrally managing the global information and the private information while distinguishing them from each other.

According to the present invention, therefore, even when a private network, such as an intranet is connected to an open external network (global network), information received and delivered can be managed based on the content thereof. This allows information received/delivered in a network to be integrally managed while distinguishing the information to be received/delivered only in an intranet from the information from an external network.

Under a server 120 provided is a lower-level server (not shown) as necessary, to which a client 140 is connected. As one of such servers provided is an access data accumulation server 180, to which information on the state of access to channel information by the client 140, for example, is sent in the form of return-mail information.

The access data accumulation server 180 prepares accumulation information every time the aforementioned return-mail information from each client is received, and sends the accumulation information to the higher-level server 110 shown in the figure as the need arises.

A plurality of the access data accumulation servers 180 may be provided within the internal network 100, and destinations of the aforementioned return-mail information on the channel information accessed by the client 140 are described in that channel information accessed by the client 140.

Needless to say, the processing burden on the higher-level server 110, for example, can be reduced by providing the access data accumulation server 180 according to the present invention.

Figs. 13 through 18 show a configuration of the information reception and delivery system as the second embodiment of the present invention. Since the information reception and delivery system as the second embodiment of the present invention has the configuration shown in Figs. 2 through 7 as in the case of the information reception and delivery system as the first embodiment of the present invention, description of the configuration is omitted here. In the following, the information reception and delivery system that is the second embodiment of the present invention will be described, focusing on the collection of access data.

Fig. 13 is a system configuration diagram of assistance in explaining the collection of access data. Fig. 13 shows a system configuration in which an internal network is connected to an external network, with each server having the function to accumulate access data. It should be noted that the system configuration shown in Fig. 13 is intended to facilitate explanation, and the present invention is not limited to this configuration.

In Fig. 13, numerals 100, 110, 120, 140 and 210 correspond to Figs. 83, 84, etc. Numeral 1 refers to a global directory list, 14 to a directory list table, 15 to a channel information storage unit, and 16 to an accumulated data storage unit, respectively.

Channel information generated by each server or client is retained in the channel information storage unit 15-i thereof. Each server has a directory list table 14-i, and retains a global directory list GD and a private directory list PD. In addition, each server has a accumulation data storage unit 16-i for collecting access data on the channel information generated by each server as the need arises. In Fig. 13, the server (C2) 120-2, which has no accumulation data storage unit 16-i, has another server (C2') 120-3 perform the function to collect access data. Needless to say, having an entity execute a function on behalf of another entity is one of the characteristics of the present invention.

In the following, description will be made referring to Fig. 13, while the content of the directory list table 14-i and the channel information storage unit 15-i will be described referring to Figs. 14 and 15, rather than Fig. 13.

Figs. 14 and 15 serve as one figure combining both to illustrate Fig. 13 in more detail. Numerals in Figs. 14 and 15 therefore correspond to like numerals in Fig. 13.

In the following, specific pieces of information retained in each server or client will be described.

[I] The server (A) 210 generates a "news content" and a "weather forecast content" in itself, and retains them in the channel information storage unit 15-0. Note that the unit of information including the information described as a "content", as used here in the "news content" and the "weather forecast content" is referred to as channel information (the same applies hereinafter). The server (A) 210 has a directory list 1 (global directory list as used here) for managing channel information. In the content of the global directory list,

(i) "self-generated (Y): News (adrs: A)" means that the "news content" channel information, entitled "News", is generated by the entity concerned, allowed to be made public (Y), and stored by a server identified by address A (server (A) 210 in the current case), and

(ii) "self-generated (Y): Weather forecast (adrs: A)" means that the "weather forecast content" channel information, entitled "Weather forecast", is generated by the server itself, allowed to be made public (Y), and stored by a server identified by address A.

[II] The server (B) 110 receives "news content" channel information from and server (A) 210 in the external network 200 and retains that information in the channel information storage unit 15-1 so that the server (B) 110 behaves as if it generates that channel information (this is called "mirror"). In the content of the directory list table 14-1,

(iii) "mirror: news (adrs: B)" means that the "news content" channel information, entitled "News", is mirrored (retained in its own channel information storage unit 15-1), and stored in a server identified by address B (server (B) 110 in this case),

(iv) "bypassed: weather forecast (adrs: A)" means that the "weather forecast content" channel information, entitled "Weather forecast", is not retained by the server itself (indicated by "bypassed"), but retained by a server identified by address A, and

(v) "bypassed: company notice (adrs: C2)" means that the "company notice content" channel information, entitled "Company notice", is not retained by the server itself, but retained by a server identified by address C2.

(vi) "bypassed: product news (adrs: C1)" means that the "product news content" channel information, entitled "product news", is not retained by the server itself, but retained by a server identified by address C1.

[III] The server (C1) 120-1 generates in itself "product news content" and "development information content", and retains them in the channel information storage unit 15-2. In the content of the directory list table 14-2,

(vii) "bypassed: news (adrs: B)" means that the "news content" channel information, entitled "News", is not retained by the server itself, but retained by a server identified by address B,

(viii) "bypassed: weather forecast (adrs: A)" means that the "weather forecast content" channel information, entitled "Weather forecast", is not retained by the server itself, but retained by a server identified by address A,

(ix) "bypassed: company notice (adrs: C2)" means that the "company notice content" channel information, entitled "Company notice", is not retained by the server itself, but retained by a server identified by address C2,

(x) "self-generated (Y): product news (adrs: C1)" means that the "product news content" channel information, entitled "Product news", is retained by the server itself, allowed to be made public (YES), and stored by a server identified by address C1, and

(xi) "self-generated (N): development information (adrs: C1)" means that the "development information content" channel information, entitled "Development information", is retained by the server itself, not allowed to be made public (NO), and stored by a server identified by address C1.

[IV] The server (C2) 120-2 generates in itself "company content" and "departmental information content", and stores them in the channel information storage unit 15-3. In the directory list table 14-3,

(xii) "bypassed: news (adrs: B)" means that the "news content" channel information, entitled "News", is not held by the server concerned, but retained by a server identified by address B,

(xiii) "bypassed: weather forecast (adrs: A)" means that the weather forecast content" channel information, entitled "Weather forecast", is not held by the server itself, but retained by a server identified by address A,

(xiv) "bypassed: product news (adrs: C1)" means that the product news content" channel information, entitled "Product news", is not held by the server itself, but retained by a server identified by address C1,

(xv) "self-generated (Y): company notice (adrs: C2)" means that the "company notice content" channel information, entitled "Company notice", is held by the server itself, allowed to be made public, and retained by a server identified by address C2, and

(xvi) "self-generated (N): departmental information content" channel information, entitled "Departmental information", is held by the server itself , not allowed to be made public, and stored by a server identified by address C2.

[V] In the client 140-1, directories on the channel information which is allowed to be made public (YES) are downloaded, and those directories on the channel information which is generated by a server on a higher level than the client itself and allowed to be made public only to those on lower levels (not allowed to be made public to others (NO)) are also downloaded. Consequently, the accessible channel information in the client 140-1 includes that entitled "News", "Weather forecast", "Company notice", "Product news" and "Development information". In the figure,

(a) "news: (adrs: B): return address B: A" means that the channel information entitled "News" is retained by a server identified by address B, that the access data on the state of access to that channel information are to be returned to a server identified by address B, and that the mirror-source server is a server of address A,

(b) "weather forecast: (adrs: A): return address A" means that the channel information entitled "Weather forecast" is retained by a server identified by address A, and that the access data on the state of access to that channel information are to be returned to a server identified by address A,

(c) "company notice: (adrs: C2): return address C2"' means that the channel information entitled "Company notice" is retained by a server identified by address C2, and that the access data on the state of access to that channel information are to be returned to a server identified by address A,

(d) "product news: (adrs: C1): return address (unnecessary)" means that the channel information entitled "Product news" is retained be a server identified by address C1, and that the access data on the state of access to that channel information need not be returned, and

(e) "development information: (adrs: C1): return address C1" means that the channel information entitled "Development information" is retained by a server identified by address C1, and that the access data on the state of access to that channel information are to be returned to a server identified by address C1.

[VI] In the client 140-2, directories on the channel information that is allowed to be made public (YES) are downloaded, and directories on the channel information that is generated by a server on a higher level than the client itself and allowed to be made public only to those on lower levels (not allowed to be made public to others (NO)) are also downloaded. Consequently, accessible channel information in the client 140-2 include that entitled "News", "Weather forecast", "Product news", "Company notice", and "Departmental information". In the figure,

(f) "news: (adrs: B): return address B: A" means that the channel information entitled "News" is retained by a server identified by address B, that the access data on the state of access to that channel information are to be returned to a server identified by address B, and that the mirror-source server is a server of address A,

(g) "weather forecast: (adrs: A): return address A" means that the channel information entitled "Weather forecast" is retained by a server identified by address

A, and that the access data on the state of access to that channel information are to be returned to a server identified by address A,

(h) "product news: (adrs: C1): return address (unnecessary)" means that the channel information entitled "Product news" is retained by a server identified by address C1, and that the access data on the state of access to than channel information need not be returned,

(i) "company notice: (adrs: C2): return address C2'" means that the channel information entitled "Company notice" is retained by a server identified by address C2, and that the access data on the state of access to than channel information are to be returned to a server identified by address C2', and

(j) "departmental information: (adrs: C2): return address C2'" means that the channel information entitled "Departmental information" is retained by a server identified by address C2, and that the access data on the state of access to than channel information are to be returned to address C2'.

In the figure, each of the servers 210, 110 and 120-1 receives and accumulates returned access data as to how the channel information prepared by itself was accessed, and stores the accumulated access data in the corresponding accumulated data storage unit 16-i. The server (C2) 120-2, however, entrusts the collection of the aforementioned access data on the channel information prepared by itself to the server (C2') 120-3. Needless to say, the server (C2) 120-2 is informed of the results of data storage by the server (C2') 120-3 in the accumulated data storage unit 16-3 to analyze them.

The ability of a server to entrust the collection of access data to another is one of the characteristics of the present invention. It is to ensure this entrusting processing that individual channel information includes return address to which access data are to be returned. To achieve this, "return address" is described in the list of "accessible channel information" in the client 1401 or 140-2 shown in Figs. 14 and 15. The channel information having a description of "return address C2'" is returned to the server C2' although the channel information is retained by the server C2. As a result, each client receives channel information, the channel information

entitled "Company notice", for example, from the server C2, but the access data on the state of access to that channel information are sent to the server C2'; that is, the collection of access data that is originally to be performed by the server C2 can be carried out by the server C2' on behalf of the server C2.

Figs. 16 and 17 show flow charts of the transmission of access data.

(S1): When the client gains access to channel information, the viewer profile information in the device is cleared, and the information on the viewer, such as age and sex, is entered.

(S2): The access information in the device is cleared.

(S3): The access information is collected.

(S4): Until conditions for transmitting access data are met, processing is returned to Step (S3) every time access is attempted to collect access frequency and time.

(S5): When the time comes to transmit the access data, the currently accessed channel information is referred to. Since the accessed channel information includes the description of return address for sending the access data, as noted earlier, the return address is extracted (now assume that the return address is C2').

(S6): Audience profile information and access information are read and compiled into access data to be returned.

(S7): Access is attempted to a server identified by the return address C2'.

(S8): The data remain on standby until connection is completed.

(S9) Upon completion of connection, the data are written into the server (C2') 120-3.

(S10): Until writing is completed, a standby state is maintained.

(S11): Upon completion of writing, the connection to the server (C2') 120-3 is cut off, and the processing is returned to Step (S2).

Fig. 18 is a diagram of assistance in explaining the mode of display on the screen in the client.

In Fig. 18, a news reader mode display means 701 is a means for displaying on a client terminal the outside or intracompany information, that is, business information provided by various servers, and can selectively display specific articles from among a plurality of articles received. The news reader mode display means

701 can also display a list of article headlines on the lower level, and the texts of articles selected from the headline list. The article headline means the title or summary, or a combination of both, of articles contained in the content concerned.

Display of such a hierarchical construction can be accomplished by dividing the screen into unit, or changing over different screens, or displaying a window (an area of screen) taking over the whole monitor screen, or leaving part of the other windows visible. When a window is displayed, with part of other windows left visible, normal applications, such as word processing, that are run concurrently can be recognized as the hidden windows. Any of such normal applications represented by the partly hidden windows can be displayed as an active window merely by clicking the relevant partly hidden window with a mouse.

A scroll mode display means 702 can display a headline repeatedly like a telop by scrolling the screen horizontally, for example, using part of the screen, or a line on the lower part of the screen, for example, when a normal application, such as word processing, is being displayed. The height of character of a headline being scrolled, or the horizontal width of a display area, or scroll speed, can be freely changed.

The scroll mode of display permits the user to know what kind of business information is received and delivered from the server while a normal application is being run. By double clicking a headline being scrolled, the user can immediately change to a news reader mode display screen to display the text of the double-clicked specific article, or select a specific article to view it on the news reader mode display screen.

A headline list mode display means 703 displays a list of headlines on the entire screen. This display is automatically updated on the display screen. That is, a list of headlines is displayed while being automatically changed over little by little at predetermined time intervals, or by scrolling the screen. In this way, by using the whole screen, or changing the display with the passage of time, a function as a screen saver to prevent the burn-in of the display screen can be implemented. The updating

and changeover of headlines can also be carried out by depressing a key or manipulating the mouse.

A display mode changeover control means 704 changes over the display modes of business information by controlling these three display means, that is, the news reader mode display means 701, the scroll mode display means 702, and the headline list mode display means 703. The changeover of display modes with this display mode changeover control means 704 is accomplished by monitoring and detecting the occurrence of events, such as the depression of any key or the manipulation of the mouse, and monitoring and detecting with a timer that any key or the mouse is left intact for a predetermined period of time. In this way, the present invention has unique representation modes of business information, such as the single-line headline display and the headline list display, in accordance with the changeover of the display mode changeover control means.

As described earlier, the display mode on the client's screen can be selectively changed over in an appropriate way. In the present invention, the types of information extracted as access data are as follows, though not limited to them.

[A] Information on the state of access

(1) Display frequency and/or time in scroll mode display

The time in which telops were displayed while some other jobs are executed is checked.

(2) Display frequency and/or time in headline list mode

The time in which the viewer left his seat is checked.

(3) Display time in news reader mode

The time taken for the viewer to read articles is checked.

(4) Time and/or frequency in which the system is left idle for more than 3 min.

The number of times the screen saver was activated is checked.

[B] Information on access operation

(1) The number of times article were clicked in scroll display mode

The article that attracted the greatest attention is identified.

(2) The number of times articles were clicked in headline list mode

The article the viewer displayed when he returned to his seat is identified.

(3) The number of times channels were selected in news reader mode

The channel information that drew the viewer's interest is identified.

(4) The number of times articles were displayed in news reader mode

The articles that attracted the viewer's interest are identified.

[C] Information on the downloading of channel information

(1) The number of manual downloads

The channels that attracted the viewer's interest are identified.

(2) The number of information updates

The probability that set values in information were updated is checked.

Needless to say, access data in the conventional system, if any, have been limited to such items as sex, age, local codes (postal code, toll number, etc.) and the department the viewer belongs to. The access record in the conventional system has been limited to the information extracted from a log of access to a server as to who viewed which type of information for how many seconds at best.

In the present invention, more detailed information on which article is read to what extent in what mode can be known, in addition to that obtained in the conventional system.

(3rd Embodiment)

Fig. 19 is a block diagram illustrating the operating principle of a third embodiment of the present invention. The figure shows a configuration of the information reception and delivery system (or network operating system) according to the present invention. This information reception and delivery system receives and delivers private information within an internal network 100, and global information within an external network 200 connected to the internal network 100. This information reception and delivery system has a global directory list 2 and a private directory list 3 in a predetermined higher-level server 110 in the internal network 100. The global directory network 2 is a directory comprising information sources and reception information for receiving information, and retains the aforementioned

private information. The predetermined higher-level server 110 controls the reception and delivery of information among other servers 120-1, 120-2, etc. in the internal network 100 using the global directory list 2 and the private directory list 3.

According to the information reception and delivery system as the third embodiment of the present invention, reception information for each of global information and private information can be retained in advance from the global directory list 2 and the private directory list 3. This makes it possible to control the reception and delivery of information itself (text) based on the reception information for each information by integrally controlling the global information and the private information while distinguishing both from each other.

According to the present invention, therefore, even when a private network, such as an intranet, and an open external network (global network) are connected to each other, they can be controlled based on with the content of information received/delivered. This allows information received/delivered in a network to be integrally managed while distinguishing the information to be received/delivered only in an intranet from the information from an external network.

Under a server 120-i provided is a lower-level server (not shown) as necessary, to which clients 140-1. 140-2, --- are connected. Though actually not connected directly to a server 120-2, Fig. 19 shows as if a client 140-1 is connected directly to the server 120-2 to facilitate understanding of the state of information reception and delivery.

In the present invention, when a server on a higher level transmits information to a lower-level server, the higher-level server describes a specific key in the information it transmits, while the lower-level server has a built-in specific key to receive information from the higher-level server.

In delivering and receiving information, the lower-level server check the transmission key sent from the higher-level server against the built-in reception key thereof, so that the transmission information is refused when the transmission key does not match with the reception key. In other words, under a circumstance where each user in each client 140-i is strange to each other, each client 140-i can receive

only the transmission information which has a transmission key that matches with the reception key it has.

Keys SKA, SKB and SKC, as shown in Fig. 19, represent transmission keys described in individual transmission information, whereas keys RKA, RKB and RKC represent reception keys given to individual lower-level servers or clients.

In Fig. 19, the server 120-1 and 120-2, each of which have a reception key RKA, can receive transmission information sent from the higher-level server 110, that is, the transmission information in which a transmission key is described. Similarly, the client 140-1, which has reception keys RKB and RKC, can receive the transmission information sent by the server 120-1 with a description of a transmission key SKB and the transmission information sent by the server 120-2 with a description of a transmission key SKC. However, the client 140-2, which has only a reception key RKC, can receive the transmission information sent by the server 120-2 with a description of a transmission key SKC, but cannot receive the transmission information sent by the server 120-1 with a description of a transmission key SKB.

A user operating each client 140-i does not know what key is given to him, or the presence of a reception key, or in what form such a reception key is built in the client 140-i. Similarly, a user operating each higher-level server does not know the presence of transmission keys, or in what form a transmission key is described in transmission information. Control of such keys is solely in the hands of an authorized person within the internal network 100.

Fig. 19 shows as if communications between the client 140-1 and the server 120-2 are accomplished directly, but it can be considered that such communications are established from the server 120-2 via the higher-level server 110 and the server 120-1 to the client 140-1 (needless to say, a direct physical circuit may be provided between the server 120-2 and the client 140-1, depending on the system configuration).

Figs. 20 through 22 show a configuration of the information reception and delivery system as the third embodiment of the present invention. Since the

information reception and delivery system as the third embodiment of the present invention has the same configuration as that of the first embodiment, as shown in Figs. 2 through 7, description of this configuration will be omitted here. In the following, delivery control using a transmission key SK and a reception key RK as used in the information reception and delivery system of the third embodiment of the present invention will be described.

Fig. 20 is a diagram of assistance in explaining control with keys between the server and the client. In the figure, numerals 110-i, 120-1 and 130-i refer to servers, respectively, and 140-i to a client. Symbols SKA, SKB, --- SKF refer to transmission keys, and RKA, RKB, --- RKF to receiving keys, respectively.

Now assume that transmission and reception keys are given as shown in Fig. 20. Since the server 120-3, for example, has the reception key RKA only, can receive transmission information with a transmission key SKA when it is sent by the server 110-1. The server 120-3, however, cannot receive transmission information with a transmission key SKB even when it is sent by the server 110-2. Similarly, the server 120-5 cannot receive transmission information sent by the server 110-1. The server 120-4 having both reception keys RKA and RKB, on the other hand, can receive transmission information from either the server 110-1 or 110-2.

The server 120-3, for example, receives information from the higher-level server 110-1 using a reception key RKA suffixed by "A", and sends information to a server on the lower level using a transmission key SKE suffixed by "E". In this way, any server can assign new different keys by suffixing "A" or "E" so that it can receive or transmit information. Needless to say, the same suffix, such as "B", may be used as in the case of the server 120-5, in which the reception key is suffixed with RKB and the the transmission key with SKB.

Needless to say, any server can download not only the transmission information sent from a higher-level server to a lower-level server with the information left intact, or processed appropriately, but also the information generated in itself to a lower-level server.

Users operating the clients 140-3 and 140-4 as shown in Fig. 20 can receive information from a group of servers 120-3, 130-1 and 130-2. Consequently, a system administrator can manage the entire system by treating servers 120-3, 130-1 and 130-2, and clients 140-3 and 140-4 as a group.

Similarly, the system administrator can manage the system by treating servers 110-2, 120-4 and 120-5, and a client 140-6 as a group.

The aforementioned transmission information is a directory in which the names of content, such as (an article of newspaper A) and (weather forecast C) as shown in Fig. 97, or archive information (channel information) identified by a content name.

The system administrator incorporates a description function in a server 120-4, for example, so that a transmission key SKC can be described in the transmission information sent by the server 120-4, while incorporating a reception key RKC in the server 130-2, 130-3 and 130-4.

In each server provided is at least one transmission key in the form of information, and at least one reception key in the form of information. Each server, furthermore, has a transmission key description unit for automatically describing a transmission key given in the form of information in the transmission information sent by itself, a key automatic collation unit for reading and automatically collating a transmission key in the transmission information downloaded from a higher-level server with the reception key given in itself in the form of information, and a storage management unit.

Fig. 21 shows a configuration of a server, focusing on key processing. In the figure, numeral 120-j refers to a server, 40 to a reception key storage unit, 41 to an additional reception key storage unit, 42 to a download information buffer, 43 to a key automatic collation unit, 44 to a storage management unit, 45 to a memory, 46 to a transmission key storage unit, 47 to an additional transmission key storage unit, 48 to a transmission key automatic description unit, 49 to transmission information, 50 to a transmission key, and 51 to archive information, respectively.

In addition to rewritable transmission and reception keys that are provided in a so-called fixed length, the server can have additional rewritable transmission and reception keys that are added to them from outside the system as the need arises.

In Fig. 21, the information downloaded from a higher-level server is temporarily buffered in the downloaded information buffer 42. The key automatic collation unit 43 extracts a transmission key described in the downloaded information and collates it with the reception key stored in the reception key storage unit 40 or 41. The storage management unit 44 manages whether the content of the downloaded information buffer 42 should be stored or discarded based on the collation results by the key automatic collation unit 43. It may of course be considered that the fact that servers have such a configuration is unknown to general users.

In Fig. 21, when the transmission information 49 is ready for transmission, the transmission key automatic description unit 48 fetches and describes a transmission key given thereto in the transmission information 49. Such a configuration may of course be considered to be kept unnoticed to general users.

In the server 120-j, when the information downloaded from a higher-level server and the information downloaded from a lower-server are to be displayed on the display screen, keys described in the information are usually not displayed on the display screen.

Fig. 22 shows a configuration of a client, focusing on key processing. In the figure, numeral 140-j refers to a client, 60 to a reception key storage unit, 61 to an additional reception key storage unit, 62 to a downloaded information buffer, 63 to a key automatic collation unit, 64 to a storage management unit, and 65 to a memory, respectively.

In addition to rewritable transmission and reception keys that are provided in a so-called fixed length, the client also can have additional rewritable transmission and reception keys that are added to them from outside the system as the need arises.

In Fig. 22, the information downloaded from a higher-level server is temporarily buffered in the downloaded information buffer 62. The key automatic

collation unit 63 extracts a transmission key described in the downloaded information and collates it with the reception key stored in the reception key storage unit 60 or 61. The storage management unit 64 manages whether the content of the downloaded information buffer 62 should be stored or discarded based on the collation results by the key automatic collation unit 63. It may of course be considered that the fact that servers have such a configuration is unknown to general users.

When the downloaded information is displayed on the display screen in the client 140-j, keys described in the information are generally not displayed on the screen.

Industrial Applicability

As described above, the information reception and delivery system according to the present invention makes it possible to substantially urgently and forcibly deliver from the server the information that need to be delivered urgently, thereby efficiently informing users in the network of such urgent information.

The information reception and delivery system according to the present invention makes it possible to select a given server, other than the server that generates and retains an article, as data for accumulating access data, thereby equalizing the processing burden on each server when collecting and accumulating access data. The aforementioned ability to equalize processing burdens makes it possible to collect and analyze as access data various pieces of minor information, including the information on the state of access, the information on access operations and the information on the downloading of channel information.

The information reception and delivery system according to the present invention also makes it possible to manage information that can be accessed by lower-level servers or clients. Since general users can operate the server or client without being aware of the existence of transmission and reception keys, they won't have to feel inconvenience facing a refusal of their access to information. Furthermore, the system administrator can divide servers and clients into groups by

appropriately setting transmission and reception keys so as to allow the information that need to be accessed to be delivered to a predetermined group, or to prevent the information that need not be accessed or must not be accessed from being delivered to a predetermined group. Moreover, the present invention makes it possible to set in a given server different transmission and reception keys by giving different suffixes; e.g. "A" in RKA and "E" in SKE. This facilitates maintaining a management system in which predetermined information is allowed to be delivered to users on a predetermined level of servers connected in a tree topology, for example, and not allowed to be delivered to users below that level.

Furthermore, according to the present invention, the aforementioned information reception and delivery system can be implemented using computer operating programs as described above, and these programs can be stored in various appropriate program storage media.

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CLAIMS

1. An information reception and delivery system with a forced delivery function having servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network,

characterized in that

an urgent channel information delivery unit is provided on the side of said server, and

an urgent channel information reception unit is provided on the side of said client,

so that when information requiring urgent delivery is generated on the side of said server, said server delivers the information to said urgent channel information reception unit on the side of said client via said urgent channel information delivery unit.

2. An information reception and delivery system with a forced delivery function as set forth in claim 1 wherein said urgent channel information delivery unit is activated in response to the occurrence of urgent information in the server to which said urgent channel information delivery unit belongs.

3. An information reception and delivery system with a forced delivery function as set forth in claim 1 wherein said client comprises at least two types of time management tables; a first time management table for managing a longer period, and a second time management table for managing a shorter period,

so that said urgent channel information delivery unit sends information requiring urgent delivery in response to a request to send based on said second time management table.

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4. An information reception and delivery system with a forced delivery function as set forth in claim 1 wherein upon receipt of information requiring urgent delivery, said client urgently informs of the arrival of such urgent information.

5. An information reception and delivery system with a forced delivery function as set forth in claim 1 wherein upon receipt of information requiring urgent delivery, said client urgently informs of the content of such urgent information.

6. An information reception and delivery system with a forced delivery function as set forth in claim 1 wherein upon receipt of information requiring urgent delivery, said client urgently informs of an outline of such information.

7. An information reception and delivery system with a forced delivery function as set forth in claim 1 wherein upon receipt of information requiring urgent delivery, said client, even when a screen saver is being run on the display screen of said client, urgently informs of information regarding urgent delivery by overriding said screen saver.

8. An information reception and delivery system with a forced delivery function having servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network,

characterized in that

a predetermined higher-level server in said internal network is provided, said server having

a global directory list that is a directory comprising sources of information and reception information for receiving the information and retains said global information, and

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a private directory list that is a directory comprising sources of information and reception information for receiving the information and retained said private information,

said predetermined higher-level server controlling the reception and delivery of information on other servers in said internal network using said global directory list and said private directory list, and

an urgent channel information delivery unit is provided on the side of said server, and an urgent channel information reception unit provided on the side of said client,

so that when information requiring urgent delivery is generated on the side of said server, said server delivers the information to said urgent channel information reception unit on the side of said client via said urgent channel information delivery unit.

9. A program storage medium for storing programs used in a server in an information reception and delivery system comprising servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network;

said programs causing a computer that is said server to execute

processing to receive and deliver said global information and/or said private information, and

processing to deliver information requiring urgent delivery to said client when such information is generated.

10. A program storage medium for storing programs used in a client in an information reception and delivery system comprising servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network,

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said programs causing a computer that is said client to execute

processing to receive and deliver said global information and/or said private information, and

processing to deliver information requiring urgent delivery to said client, when such information is generated, via an urgent channel information delivery unit provided on the side of said server, and an urgent channel information reception unit provided on the side of said client.

11. An information reception and delivery system with an access data collecting function having servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network,

characterized in that

access data on the access to said channel information are sent to said server when one of said clients accesses channel information comprising one of said global information and/or said private information, and

upon receipt of said access data, said server accumulates said access data.

12. An information reception and delivery system with an access data collecting function as set forth in claim 11 wherein said channel information is retained by a server that has provided said channel information.

13. An information reception and delivery system with an access data collecting function as set forth in claim 12 wherein said server receiving said access data is a server other than the server retaining said corresponding channel information.

14. An information reception and delivery system with an access data collecting function as set forth in claim 13 wherein said server receiving said access

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data is designated by information identifying said server in said corresponding channel information.

15. An information reception and delivery system with an access data collecting function as set forth in claim 14 wherein when gaining access to said channel information, said client reads information identifying said server designated in said channel information, and sends said access data to said designated server.

16. An information reception and delivery system with an access data collecting function as set forth in claim 14 wherein when said access data need not be sent, said information identifying said designated server in said channel information is described by a predetermined value or an invalid value.

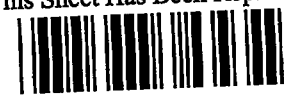
17. An information reception and delivery system with an access data collecting function as set forth in claim 11 wherein said access data include information relating to the state of access to channel information.

18. An information reception and delivery system with an access data collecting function as set forth in claim 11 wherein said access data include information relating to the operation of a viewer who accesses channel information.

19. An information reception and delivery system with an access data collecting function as set forth in claim 11 wherein said access data include information relating to the downloading of channel information.

20. An information reception and delivery system with an access data collecting function having servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network

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characterized in that

a predetermined higher-level server in said internal network is provided ,said server having

a global directory list that is a directory comprising sources of information and reception information for receiving that information and retains said global information, and

a private directory list that is a directory comprising sources of information and reception information for receiving that information and retained said private information,

said predetermined higher-level server controlling the reception and delivery of information on other servers in said internal network using said global directory list and said private directory list, and

when accessing channel information comprising any one of said global information and/or said private information, one of said clients sending access data on the access to said channel information to said server, and

upon receipt of said access data, said server accumulating said access data.

21. A program storage medium for storing programs used in a server in an information reception and delivery system having servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network,

said programs causing a computer that is said server to execute

processing to receive and deliver said global information and/or said private information,

when one of said clients accesses channel information comprising one of said global information and/or said private information, processing to receive access data on the access to said channel information, and

processing to accumulate said access data.

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22. A program storage medium for storing programs used in a server in an information reception and delivery system having servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network,

said programs causing a computer that is said server to execute

processing to receive and deliver said global information and/or said private information, and

when access is made to channel information comprising one of said global information and/or said private information, processing to send access data on the access to said channel information to said server.

23. An information reception and delivery system with a delivery control function having servers and clients forming an internal network for receiving and delivering private information as information within the internal network, and global information as information within an external network connected to the internal network,

characterized in that

a predetermined higher-level server in said internal network, said server having

a global directory list that is a directory comprising sources of information and reception information for receiving that information and retains said global information, and

a private directory list that is a directory comprising sources of information and reception information for receiving that information and retained said private information,

said predetermined higher-level server controlling the reception and delivery of information on other servers in said internal network using said global directory list and said private directory list,

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said servers are assigned a reception key in the form of information and a transmission key in the form of information, and said clients are assigned a reception key in the form of information,

said servers have a transmission key description unit for describing in transmission information said transmission key assigned to themselves, and a key collation unit for collating the transmission key described in the downloaded information with the reception key assigned to themselves, and

said clients have a key collation unit for collating the transmission key descried in the downloaded information with the reception key assigned to themselves.

24. An information reception and delivery system with a delivery control function as set forth in Claim 23 wherein a plurality of said transmission keys and/or said reception keys are assigned in the form of information in a rewritable manner to each server and/or each client.

25. An information reception and delivery system with a delivery control function as set forth in Claim 23 wherein said transmission key described in specific transmission information is not displayed on the display screen when a user display said transmission information on the display screen.

26. An information reception and delivery system with a delivery control function as set forth in Claim 23 wherein said servers describes as a transmission key in transmission information sent thereby the same key as the key described in the received information.

27. An information reception and delivery system with a delivery control function as set forth in Claim 23 wherein said servers describes as a transmission key in transmission information sent thereby a key different from the key described in the received information.

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28. An information reception and delivery system with a delivery control function as set forth in Claim 23 wherein combinations of said transmission keys and reception keys are set for specific servers and clients so as to form predetermined groups for system administration.

29. A program storage medium for storing programs used in a server in an information reception and delivery system having servers and clients forming an internal network for receiving and delivering private information as information within the internal network and global information as information within an external network connected to the internal network, a predetermined higher-level server in said internal network being provided, said server having a global directory list that is a directory comprising sources of information and reception information for receiving that information and retains said global information, and a private directory list that is a directory comprising sources of information and reception information for receiving that information and retained said private information, said predetermined higher-level server controlling the reception and delivery of information on other servers in said internal network using said global directory list and said private directory list, and servers being assigned a reception key in the form of information and a transmission key in the form of information, and said clients being assigned a reception key in the form of information,

said programs causing a computer that is said server to execute

processing to describe in transmission information said transmission key assigned thereto, and

processing to collate the transmission key described in the downloaded information with the reception key assigned thereto.

30. A program storage medium for storing programs used in a server in an information reception and delivery system having servers and clients forming an internal network for receiving and delivering private information as information

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within the internal network and global information as information within an external network connected to the internal network, a predetermined higher-level server in said internal network being provided, said server having a global directory list that is a directory comprising sources of information and reception information for receiving that information and retains said global information, and a private directory list that is a directory comprising sources of information and reception information for receiving that information and retained said private information, said predetermined higher-level server controlling the reception and delivery of information on other servers in said internal network using said global directory list and said private directory list, and said servers are assigned a reception key in the form of information and a transmission key in the form of information, and said clients are assigned a reception key in the form of information,

said programs causing a computer that is said server to execute

processing to collate the transmission key described in the information downloaded from the server that executes processing to describe said transmission key assigned thereto in transmission information.