Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).
Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to an Internet Facsimile apparatus, which operates on an IP network.

Description of the Related Art

[0002] In a TPC/IP network, there is a necessity to assign an IP address per client in order to allow control for transmitting and receiving data packet between clients. As means for performing this IP address assignment automatically, there is a DHCP (Dynamic Host Configuration Protocol). A server for a DHCP assigns an IP address to a request from a client. Generally, the client transmits a request message when the client's apparatus is turned on, and the server that has received this request assigns a vacant IP address to the client. For this reason, the IP address for client differs every time when the client's apparatus is started.


[0004] In the IFAX, at the time of transmission, a scanner scans each page of an original, and obtains a plurality of image data corresponding to each page. Then, the IFAX transmits e-mail to which the obtained image data is appended to an IFAX on a receiver side. The IFAX on the receiver side prints image data appended to the received e-mail by use of a printer. As one of the uses of this IFAX, there is a network scanner. The network scanner aims to transfer image data obtained by scanning the original to the PC, etc., process it by such PC, and store it thereby.

[0005] In the case of using the IFAX as a network scanner, similar to the image communications performed by the aforementioned Internet facsimile apparatus, the IFAX appends a plurality of image data obtained by scanning the original to e-mail, and transmits this e-mail to a specific mail address. An operator accesses a mail server that manages this mail address by use of the PC, which deals with image data, and receives this e-mail.

[0006] However, there is a possibility that delay of mail delivery with the mail server will occur when image data is transmitted to the PC via the mail server. Moreover, similar to the case in which e-mail is generally received, since the operator must activate a mailer on PC and obtain access to the mail server, complicated operations are required of the user.

[0007] In order to solve such a disadvantage, it can be considered a case in which image data is directly transmitted to the PC using an SMTP instead of transmission via the mail server. In the case of using the SMTP, it is necessary for the IFAX to know the IP address for the PC in order to transfer e-mail to a scanned image receiving application, which operates on the PC. In the network in which no DHCP server is introduced, since the IP address for the PC is unchanged until the IP address is changed by a network manager, the IP address may be stored in IFAX one time. However, in the network in which the DHCP server is introduced, the IP address is changed every time when the PC is started as mentioned above. For this reason, IFAX can neither specify the IP address for a destination nor directly transmit image data to the PC.

[0008] Document JP 09275466 relates to a facsimile device which is connected to a plurality of personal computers through a communication network. The facsimile device is provided with a memory part for storing image data, LAN control part for controlling the communication network, and system control part for reading the IP address with which any personal computer is specified out of the system data stored in the memory part and transmitting/controlling the IP address.

[0009] Document JP 10084380 discloses that a fax gateway is provided with a cross reference table between each mail address and each IP address of a personal computer used by a person of the mail address. In the case that mail transmission added with a file resulting from a received facsimile document has failed the fax gateway transfers the fax data file directly received to the personal computer.

[0010] Document JP 10098572 discloses to directly exchange data even between terminals of independent networks by previously registering the address of the terminals used in the network. This document describes a facsimile device comprising an address recognising part which extracts address information from an IP address designated by the network. When address information is recognised from the IP address which is designated as the transmission destination of data transmitted from the personal computer with a server in the network, a data processing part judges whether or not the address information is registered and directly delivers data stored in the memory part to the personal computers.

SUMMARY OF THE INVENTION

[0011] It is an object of the present invention to provide an Internet Facsimile apparatus, which can obtain an IP address for a communication terminal automatically and which can transmit image data to the communication terminal directly in a network in which a DHCP is introduced.

[0012] Thus, the present invention which is defined in claim 1 provides an Internet Facsimile apparatus which store a physical address of the image receiving apparatus, which is assigned from an outer section, and obtains an IP address of the image receiving apparatus by use of this physical address, and transmits image data of the image receiving apparatus by use of this IP address.

[0013] This makes it possible to perform an image
transmission using a communication protocol, which needs an IP address for a receiver side, in accordance with, for example, a DHCP protocol in the network in which an IP address is assigned to a communication terminal from an outer section.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The above and other objects and features of the invention will appear more fully hereinafter from a consideration of the following description taken in connection with the accompanying drawing wherein one example is illustrated by way of example, in which;

FIG. 1 is a conceptual view showing a network system in which an Internet Facsimile apparatus according to a first embodiment of the present invention operate;
FIG. 2 is a block diagram showing hardware of an Internet facsimile apparatus according to the above-mentioned first embodiment;
FIG. 3 is a block diagram showing the functions of the Internet facsimile apparatus according to the above-mentioned first embodiment;
FIG. 4 is a perspective view showing an outline of the Internet facsimile apparatus according to the above-mentioned first embodiment;
FIG. 5 is a functional block diagram showing an IFAX processing section of the Internet facsimile apparatus according to the above-mentioned first embodiment;
FIG. 6 is a functional block diagram showing an MAC address notify analyzing section of the Internet facsimile apparatus according to the above-mentioned first embodiment;
FIG. 7 is a functional block diagram showing a scanned image-receiving application, which operates on PC, according to the above-mentioned first embodiment;
FIG. 8 is a flowchart showing image transmission processing of the Internet facsimile apparatus according to the above-mentioned first embodiment;
FIG. 9 is a sequence view showing RARP processing according to the above-mentioned first embodiment;
FIG. 10 is a flowchart showing MAC address notify processing by an scanned image-receiving application, which operates on PC, according to the above-mentioned first embodiment;
FIG. 11 is a flowchart showing MAC address notify reception processing of the Internet facsimile apparatus according to the above-mentioned first embodiment;
FIG. 12 is a functional block diagram showing an IFAX processing section of the Internet facsimile apparatus according to a second embodiment of the present invention;
FIG. 13 is a one-touch button table according to the above-mentioned second embodiment;
FIG. 14 is a flowchart showing a one-touch button entering operation of the Internet facsimile apparatus according to the above-mentioned second embodiment; and
FIG. 15 is a flowchart showing image transmission processing of the Internet facsimile apparatus according to the above-mentioned first embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] Embodiments of the present invention will be specifically explained with reference to the accompanying drawings herewith.

(First embodiment)

[0016] FIG. 1 is a conceptual view showing a network system in which Internet Facsimile apparatus of according to a first embodiment of the present invention operate.

[0017] An Internet facsimile apparatus 1 (hereinafter referred to as IFAX) according to the first embodiment is connected to a local area network (LAN) 2. A mail server 3 and a personal computer (PC) 4, which are installed in the same local area as the IFAX 1, are connected to the LAN 2. Though a large number of PCs 4 is provided, one of them is illustrated for convenience in explanation.

[0018] Also, the LAN 2 is connected to the Internet 5. The other LAN 6 is also connected to this Internet 5. A mail server 7, an IFAX 8, and a PC 9 are connected to this LAN 6.

[0019] IFAX 1 transmits and receives image data between, for example, the IFAX 8 and the IFAX 1 by use of e-mail. As shown by an arrow A of FIG. 1, e-mail is first transmitted to the mail server 3 of the transmitter side. The mail server 3 of the transmitter side transfers e-mail to the mail server 7 of the receiver side. The mail server 7 of the receiver side stores this e-mail. The IFAX 8 of the receiver side accesses the mail server 7 of the receiver side, and receives e-mail. The aforementioned processing is referred to as IFAX transmission processing. While, the IFAX 1 directly transmits image data, which has been obtained by scanning an original by use of a scanner, to the PC 4 using e-mail. The IFAX 1 performs the transfer of e-mail between the mail server 3 and the PC 4 in accordance with, for example, a mail transfer protocol, more specifically, an SMTP (Simple MAIL Transfer Protocol). The above-mentioned processing is referred to as network scanner processing.

[0020] A DHCP (Dynamic Host Configuration Protocol) server 10 is provided in the LAN 2. This DHCP server 10 automatically assigns an IP address to the PC 4 in accordance with a request from the PC 4, which is a DHCP client.

[0021] FIG. 2 is a block diagram showing hardware of the Internet facsimile apparatus according to the first embodiment. A CPU 11 executes a program, and performs control of the entirety of the apparatus. A ROM 12 stores...
the program to be executed by the CPU 11.

[0022] A RAM 13 has a work area where the program is executed, and a buffer area for temporarily storing various data such as e-mail, an image file, etc.

[0023] A FAX & voice processing section 14 modulates facsimile data and a voice and outputs modulated data to a PSTN 6, and demodulates modulated data received from the PSTN 6 to facsimile data and voice data.

[0024] A scanner 15 scans an original, and obtains image data. A printer 16 prints various data including image data received.

[0025] A LAN interface 17 executes a protocol necessary for transmitting and receiving data on the LAN 2.

[0026] A panel control section 18 comprises dial keys and a touch panel, and receives operations such as a specification of a destination, an instruction of a transmission start, etc., which are executed by an operator.

[0027] The ROM 12 stores the program, and the CPU 11 executes the program. The functions, which are resultantly implemented, are explained as follows. FIG.3 is a block diagram showing the functions of the IFAX according to the first embodiment.

[0028] The IFAX 1 comprises a FAX & voice controlling section 100, a scanner controlling section 200, and a printer controlling section 300 to control each processing section of the FAX & voice processing section 14, the scanner 15, and the printer 16.

[0029] The IFAX 1 also comprises an IFAX processing section 400, which implements the function as IFAX. This IFAX processing section 400 transmits and receives e-mail via the LAN 2 by use of the LAN interface 17. In other words, the IFAX processing section 400 receives e-mail from a sender, and prints received data by use of the printer 16. At this time, if an image file is appended to e-mail, the content of the image file is printed by the printer 16. While, the IFAX processing section 400 converts image data obtained by the scanner 15 to e-mail, and transmits it.

[0030] FIG. 4 is a perspective view showing an outline of the Internet facsimile apparatus according to the first embodiment of the present invention. The following will explain a case in which the IFAX 1 is seen from the direction shown by an arrow C of FIG. 4. In the IFAX 1, the scanner 15 and the printer 16 are integrated into a housing 40 together with other structural elements, that is, CPU 11, ROM 12, RAM 13, FAX & voice processing section 14, LAN interface 17, and panel control section 18. The panel control section 18 is provided at the left surface side, which is an upper surface portion of the IFAX 1. A document plate 41 for supplying an original to the scanner 15 is provided at the right side of the panel control section 18. Output trays 42 and 43 for receiving printed materials discharged from the printer 16 are vertically provided at the left side surface portion of the IFAX 1. A paper feeder section 24 for feeding printing paper to the printer 16 is provided at a bottom surface portion of the IFAX 1.

[0031] FIG. 5 is a functional block diagram showing the IFAX processing section 400 of the IFAX according to the first embodiment of the present invention.

[0032] An input data analyzing section 501 analyzes whether or not input data includes an at sign "@", that is, whether or not input data is a user name. The input data analyzing section 501 sends the result of analysis to a determining section 502. The determining section 502 determines processing afterward on the basis of this analysis.

[0033] When input data is only the user name, a default domain addition section 503 adds a default domain name to this user name, and obtains a mail address. The default domain name is stored in a default domain name area 516 of RAM 13.

[0034] A scanner control section 200 shown in FIG. 3 stores raw image data to a buffer for scanner prepared in the RAM 13. The image obtained by scanning the original is hereinafter referred to as original image. The original image is raw data has been obtained when the scanner 15 scans the original, that is, bit map data in this example.

[0035] An image compressing section 504 compresses the original image stored in the buffer for scanner. The compression format here is HM, MR, MMR, etc. The original image is prepared in unit of one page of the original, and the compression is also performed in unit of one page of the original.

[0036] A TIFF converting section 505 converts a plurality of compressed data to one ITIFF (Tagged Image File Format) file. An e-mail generating section 506 converts the TIFF file to text code data, and adds this text code data to a multi-part mail in accordance with MIME (Multipurpose Internet Mail Extension). Thereby, e-mail to which image data is appended is generated.

[0037] An SMTP transmitting section 507 transmits e-mail generated by the e-mail generating section 506 to the LAN 2 through the LAN interface 17 in accordance with SMTP (Simple Mail Transfer Protocol).

[0038] The SMTP transmitting section 507 transmits e-mail to a different destination in IFAX transmission processing and Network scanner processing. In other words, the SMTP transmitting section 507 transmits e-mail to the mail server 3 of the transmitting side in IFAX transmission processing, while directly transmits e-mail to the PC 4 in network scanner processing. Information of the mail server 3 of the transmitting side is obtained from mail server information 508 of RAM 13.

[0039] The SMTP transmitting section 507 transmits e-mail from IFAX 1 to an application for directly receiving the original image from the IFAX and the SMTP transmitting section 507 in accordance with SMTP in network scanner processing. Hereinafter, the application is referred to as scanned image-receiving application. At this time, since SMTP is used as a communication protocol, the SMTP transmitting section 507 must be informed of the IP address of PC 4. However, the DHCP server 10 is provided in the LAN 2 of the first embodiment, and the IP address of PC 4 is automatically assigned from the DHCP server 10 at the time of activating PC 4. For this
In the first embodiment, the operator inputs the user name of the mail address of PC 4 in network scanner processing but does not input the IP address of PC 4. Therefore, the IFAX 1 according to the first embodiment comprises a RARP processing section 509 for obtaining the IP address on the basis of the user name. This RARP processing section 509 can know the IP address from a physical address such as a MAC (Media Access Control) address as a RARP (Reverse Address Resolution Protocol) client. The MAC address is a physical address, which is distributed per a LAN controller for controlling LAN, and which is the only one address in the world, and which is composed of 48 bits.

Also, the RARP processing section 509 can obtain the MAC address corresponding to the user name with reference to a MAC address table on the basis of the user name received from the determining section 502. The MAC address table is stored in a MAC address table area 510 of RAM 13.

A mail receiving section 511 receives e-mail via the LAN interface 17. The mail receiving section 511 uses a mail transfer protocol such as SMTP, POP (Post Office Protocol, etc. A binary converting section 512 decodes the text code, which is included in the appended file part of received e-mail, to a TIFF file. A TIFF decompressing section 513 decompresses this TIFF file, and sends compressed data to an image decompressing section 514. The image decompressing section 514 decompresses compressed data to bit map data. The printer 16 prints this bit map data.

A MAC address notification analyzing section 515 analyzes e-mail (hereinafter referred to as MAC address notification) for providing notification of the MAC address of PC 4 and the mail address, and registers the result of analysis in the MAC address table. FIG. 6 is a block diagram showing the MAC address notification analyzing section 515 of the IFAX 1 according to the first embodiment. The MAC address notification analyzing section 515 analyzes whether e-mail received by the mail receiving section 511 is a general e-mail or MAC address notification. If this e-mail is the MAC address notification, a MAC address extracting section 602 and a mail address extracting section 603 extract the MAC address and the mail address of PC 4 from this MAC address notification, respectively. A register processing section 604 pairs the extracted MAC address with the mail address, and registers it in a MAC address table 605. In this embodiment, since all terminals in the LAN 2 including the PC 4 have the same domain name, that is, default name, the user name is registered in the MAC address table 605 in place of the mail address.

FIG. 7 is a block diagram showing a MAC address notifying function of the PC 4 according to the first embodiment. The scanned image-receiving application, which is operated by the PC 4, performs an initial setting operation for setting its own mail address. A user’s mail address registering section 701 registers the its own mail address input by a keyboard 702 in a user’s mail address storing area 704 of a RAM 703. Also, a MAC address obtaining section 705 obtains a MAC address of a LAN interface 706, and stores it to an MAC address storing area 707 of the RAM 703. A MAC address notification generating section 708 generates a MAC address notification including the its own mail address and MAC address. An SMTP transmission section 709 transmits this MAC address notification to the FAX 1 as a network scanner via the LAN interface 706.

Next, an explanation will be given of an image transmitting operation of the above-configured IFAX according to the first embodiment. FIG. 8 is a flowchart showing the image transmitting operation of the Internet facsimile apparatus according to the first embodiment. The following explains IFAX transmission processing in which transmission from IFAX 1 shown in FIG. 1 to IFAX 8 is performed, and network scanner processing in which scanning from IFAX 1 to PC 4 is performed.

The operator depresses an Internet button of the panel control section 18 after placing the original on the document plate of the IFAX, and changes an input mode of the panel control section 18 to a character string input mode. This makes it possible for the operator to input character strings such as an alphabet, a mark, etc., using the one-touch button of the panel control section 18, a program button.

In step (hereinafter referred to as ST) 801, an input data analyzing section 501 receives input data from the panel control section 18. Next, in ST802, if the start button is depressed, the input data analyzing section 501 analyzes input data in ST803. The input data analyzing section 501 sends the result of analysis to the determining section 502.

In ST803, the determining section 502 determines whether or not input data is only the user name on the basis of the result of analysis. More specifically, if an at sign “@” is not included in input data, the determining section 502 determines that input data is only the user name. While, if an at sign “@” is included in input data, the determining section 502 determines that input data is an entire address.

Here, if the determining section 502 determines that input data is not the user name, the determining section 502 instructs each section to execute IFAX transmission processing. Specifically, in ST805, the scanner controlling section 200 causes the scanner 15 to scan the original, and stores the resultant obtained original document to the buffer for a scanner. Next, in step S806, the image compressing section 504 compresses the original image. Thereafter, in ST807, the TIFF converting section 505 converts compressed data to a TIFF file, and enters this TIFF in the appended file part of e-mail, and also enters the mail address input to [To:] field of this e-mail therein. As a result, e-mail to which the original image is appended is generated. Next, the SMTP transmitting section 507 transmits the generated e-mail to the
IFAX 8 via the mail server 3 of the transmitting side. At this time, the SMTP transmitting section 507 obtains information of the mail server 3 of the transmitting side from the mail server information area 508 of RAM 13, and puts it to use.

While, if the determining section 502 determines that input data is only the user name, the determining section 502 instructs each section to execute network scanner processing. Specifically, in ST809, it is checked whether or not the user name is registered in the MAC address table 605.

If the input user name is registered in the MAC address table 605 in ST809, the RARP processing section 509 executes RARP processing in ST810. In other words, the RARP processing section 509 obtains a MAC address corresponding to the user name from the MAC address table 605, and obtains the IP address from the PC 4 as a RARP server by use of this MAC address.

FIG. 9 is a sequence view showing RARP processing performed by the IFAX 1 according to the first embodiment. The IFAX 1 broadcasts RARP request messages to terminals 1 to n existing on the LAN 2. The terminals 1 to n mount a RARP server function thereon, identify the RARP request message about its own MAC address, and sends a RARP response message including a pair of its own MAC address and its own IP address. In this example, the IFAX 1 broadcasts the RARP request message in which the MAC address of PC 4 is set, so that the terminal 2 (PC 4) sends the RARP response message to the IFAX 1.

Here, though the RARP server function is provided to all terminals 1 to n, the number of RARP servers, which perform the RARP service, may be at least one on the network.

After obtaining the IP address by the RARP processing, the scanner 15 scans the original in ST811. Next, the image compressing section 504 compresses the original image in ST812. Thereafter, e-mail to which the original image is appended is generated in ST813. Also, according to the IFAX 1 of the first embodiment, the MAC address of PC 4 is stored, and image data is directly transmitted to the PC 4 by SMTP using the obtained IP address. This makes it possible to implement the network scanner, which directly transmits image data to the PC 4, in the network in which the IP address is assigned to the PC 4 from the DHCP server 10.

As explained above, according to the IFAX 1 of the first embodiment, the MAC address of PC 4 is stored, and image data is directly transmitted to the PC 4 by SMTP using the obtained IP address. This makes it possible to implement the network scanner, which directly transmits image data to the PC 4, in the network in which the IP address is assigned to the PC 4 from the DHCP server 10.

Also, according to the IFAX 1 of the first embodiment, the MAC address is stored to correspond to the user name of the mail address of PC 4. Then, the MAC address corresponding to this user name is obtained by the user name input by the operator, the IP address of PC 4 is obtained by use of this MAC address, and image data is directly transmitted to the PC 4 by SMTP using the obtained IP address. As a result, since
the operator has only to input the user name, a complicated operation is not particularly required, and high knowledge about the network of such as MAC address, etc., is not required. The mail address may be, of course, used in place of the user name. Moreover, it is possible to use a logon name of a user, a name of a terminal, an ID of a terminal, etc., which are irrelevant to the mail address.

[0063] Further, according to the IFAX 1 of the first embodiment, if the MAC address notification including a pair of MAC address and IP address is received from the PC 4, the MAC address and the mail address are stored on the basis of this MAC address notification. This makes it unnecessary for the operator to perform such complicated operations in which the MAC address of the PC 4 and the mail address are checked and registered in the IFAX 1. Also, no high knowledge about the network of such as MAC address, etc., is required.

[0064] Moreover, according to the IFAX 1 of the first embodiment, obtaining the MAC address from the LAN interface 17 of PC 4, and generates the MAC address notification including the pair of its own MAC address and its own mail address, and transmits it to the IFAX 1. This makes it unnecessary for the operator to perform such complicated operations in which the MAC address of the PC 4 and the mail address are checked and registered in the IFAX 1. Also, no high knowledge about the network of such as MAC address, etc., is required.

[0065] Moreover, according to the IFAX 1 of the first embodiment, IFAX transmission processing and network scanner processing are differentiated on the basis of the fact whether or not the operator inputs only the user name. Whereby, the operator has only to input only the user name when instructing network scanner processing. This first embodiment is very useful since the destination PC often belongs to the same domain as that of the IFAX when the IFAX is used as a network scanner.

[0066] Moreover, according to the first embodiment, when the input data analyzing section 501 analyzes input data the determining section 502 determines that input data is the user name of the mail address and the user name is not registered in the MAC address table, the default domain adding section 503 fetches the default domain name form RAM 13 and adds it to this user name. As a result, since the operator has only to input only the user name, the operator can easily perform the input of the destination address from the panel control section 18, which is relatively difficult, without generating errors. Moreover, since processing is not decided on the basis of the content of registration, the operator can instruct desired processing regardless of the content of the registration.

(Second embodiment)

[0067] Next, an explanation will be given of the IFAX according to the second embodiment of the present invention.

[0068] FIG. 12 is a functional block diagram showing the IFAX processing section of the IFAX according to the second embodiment. Regarding the same configuration as that of the first embodiment shown in FIG. 1, the same reference numerals as those of the first embodiment are added thereto, and the explanation is omitted.

[0069] A one-touch registering section 1201 assigns a desired destination mail address to the one-touch button of the panel control section 18. The one-touch registering section 1201 controls the registration made by the operator, and writes the content of registration to a one-touch button table stored in a one-touch button table area 1202 of RAM 13. Also, The one-touch registering section 1201 registers whether this destination mail address is used for IFAX transmission processing or network scanner processing at the same time.

[0070] A one-touch button number 1301, a destination mail address 1302, and a scanner flag 1303 are registered in the one-touch button table to be associated with one another as shown in FIG. 13. If the scanner flag 1303 is on, this indicates that this destination mail address 1302 is used in network scanner processing, and if it is off, this indicates that this destination mail address is used in IFAX transmission processing.

[0071] A display controlling section 1203 displays a message for registering the destination mail address 1302 on a display 1206 by control of the one-touch registering section 1201.

[0072] When any one of one-touch buttons is depressed, a one-touch processing section 1204 sends the destination mail address 1302, which corresponds to the depressed one-touch button, to the e-mail generating section 506 with reference to the one-touch button table.

[0073] A determining section 1205 identifies the depressed one-touch button number 1301, and determines whether IFAX transmission processing or network scanner processing is performed with reference to the one-touch button table.

[0074] FIG. 14 is a flowchart showing the registering operation of the one-touch button of the IFAX according to the second embodiment.

[0075] The destination mail address 1302 is input in ST1401, thereafter the one-touch registering section 1201 causes the display controlling section 1203 to display the message, "IFAX or SCAN", on the display 1206. The operator selects either one of IFAX and network scanner (SCAN).

[0076] In ST1403, the one-touch registering section 1201 determines whether or not the operator selects the network scanner. If the operator selects the network scanner, the one-touch registering section 1201 sets the scanner flag 1303 in ST1404 to indicate that the destination mail address is used in network scanner processing. Thereafter, the one-touch registering section 1201 registers the destination mail address 1302 in the one-touch button table in ST1405.

[0077] While, if the operator does not select the net-
work scanner ST1403, the one-touch registering section 1201 doesn't set the scanner flag 1303 to indicate that the destination mail address is used in IFAX transmission processing in ST1406. Thereafter, the one-touch registering section 1201 registers the destination mail address 1302 in the one-touch button table in ST1405.

[0078] Next, an explanation will be given of image transmission processing of the IFAX according to the second embodiment. FIG. 15 is a flowchart showing image transmission processing of the IFAX according to the second embodiment. Regarding the same steps as those of the first embodiment shown in FIG. 8, the same reference numerals as those of the first embodiment are added thereto, and the explanation is omitted.

[0079] In ST1501, the determining section 1205 detects the depression of the one-touch button of the panel control section 18, and recognizes this number 1301. The determining section 1205 detects the depression of the start button in ST1502, and determines whether or not the scanner flag 1303, which corresponds to the depressed one-touch button number 1301, is on with reference to the one-touch button table in ST1503. If the scanner flag 1303 is off, the determining section 1205 instructs each section to execute IFAX transmission processing in ST805 to ST808. While, if the scanner flag 1303 is on, the determining section 1205 instructs each section to execute network scanner processing in ST805 to ST808. As a result, since the operation is different from that of the first embodiment, and the explanation is omitted.

[0080] As mentioned above, the IFAX of the second embodiment is different from that of the first embodiment in that IFAX transmission processing and network scanner processing are differentiated by use of the one-touch button function. According to the second embodiment, the scanner flag 1303 is added to the one-touch button table 1302, and if this scanner flag 1303 is off, it is determined that this is IFAX transmission processing, and if this scanner flag 1303 is on, it is determined that this is network scanner processing. As a result, since the operator has only to depress the one-touch button and the start button sequentially similar to the general facsimile transmission, there is no need to consider the processing content. Also, in the second embodiment, since it is not always necessary to provide a button specifically designed to instruct network scanner processing, neither an increase in the number of components nor a change in the mould is generated, allowing a reduction in the cost of IFAX development and manufacture.

[0081] The second embodiment has explained the case in which the scanner flag is added to the registration table of one-touch button, but the same processing as that of the second processing may be performed by adding the scanner flag to the registration table of abbreviated dialing in place of the one-touch button.

[0082] Also, the second embodiment has explained the case in which the scanner flag is added to the registration table of one-touch button, but if a fax flag may be added to the registration table. If the fax flag is on, this indicates that this destination mail address is used in IFAX transmission processing, and if it is off, this indicates that this destination mail address is used in network scanner processing.

[0083] The present invention is not limited to the aforementioned first and second embodiments. For example, the first and second embodiments use SMTP in order to directly transfer image data to the PC in network scanner processing. However, the present invention can be applied to one, which requires the IP address using the communication protocol other than SMTP, for example, a case in which the JetSend™ system proposed by HP Company is used in transferring image data to the PC.

[0084] Also, the first and second embodiments store the MAC address of PC 4 to the MAC address table area 510 of RAM 13. However, the MAC address of PC 4 is registered in the server, and the plurality of IFAXs may inquire the MAC address of PC 4 of this server.

[0085] Moreover, in the first and second embodiments, the PC 4 itself responds to the RARP request, which is sent to the self-apparatus from the IFAX 4, however, the RARP server for performing the RARP response may be provided aside from the IFAX 1.

[0086] This invention may be conveniently implemented using a conventional general purpose digital computer or microprocessor programmed according to the teachings of the present specification, as well be apparent to those skilled in the computer art. Appropriate software coding can readily be prepared by skilled programmers based on the teachings of the present disclosure, as will be apparent to those skilled in the software are. The invention may also be implemented by the preparation of application specific integrated circuits or by interconnecting an appropriate network of conventional component circuits, as will be readily apparent to those skilled in the art.

[0087] The present invention includes a computer program product which is a storage medium including instructions which can be used to program a computer to perform a process of the invention. The storage medium can include, but is not limited to, any type of disk including floppy disks, optical discs, CD-ROMs, and magneto-optical discs, ROMs, RAMs, EPROMs, EEPROMs, magnetic or optical cards, or any type of medium suitable for storing electronic instructions.

[0088] As mentioned above, according to the present invention, the physical address of the image receiving apparatus is stored, the IP address of the image receiving apparatus is obtained by use of this physical address, and image data is directly transmitted to the image receiving apparatus by use of this obtained IP address. This makes it possible to directly transmit image data to the image receiving apparatus in the network to which the IP address is automatically assigned from the outer section.
[0089] Also, as mentioned above, according to the present invention, the notification of the self-physical address is sent to the image receiving apparatus, the notification of the IP address assigned to the self apparatus is sent in accordance with the request from the image transmitting apparatus by use of this physical address, and image data is directly received from the image receiving apparatus by use of this IP address. This makes it possible to directly receive image data from the image transmitting apparatus in the network to which the IP address is automatically assigned from the outer section.

Claims

1. An internet facsimile apparatus (1) with a network scanning function, for transmitting scanned image data to a receiving apparatus (4) connected to a LAN, to which an IP address is dynamically assigned from an external apparatus (10) connected with the LAN, in which RARP (Reverse Address Resolution Protocol) is used by said facsimile apparatus, said facsimile apparatus comprising:

   - a memory (510) for storing a table including a plurality of physical addresses (MAC addresses) each corresponding to one (4) of a plurality of receiving apparatuses, as the physical address being stored in association with the destination mail address of a corresponding receiving apparatus;
   - a determiner (502) which is adapted to search physical addresses stored in said memory and obtain the physical address corresponding to the destination data input by an input panel (18) of said facsimile apparatus;
   - an RARP processor (509) which is adapted to obtain the current IP address of a receiving apparatus (4) by use of the physical address obtained by said determiner, wherein said processor performs a RARP processing to obtain the current IP address of the receiving apparatus;
   - a transmitter (507) which is adapted to directly transmit the scanned data to the receiving apparatus (4) using the obtained IP address without the use of the mail server (3) on the LAN.

2. The facsimile apparatus according to claim 1, wherein the transmitter (507) further transmits image data in an email format to a remotely-connected receiving apparatus (8) over Internet via a mail server (3).

3. The facsimile apparatus according to claim 2, wherein the determiner (1205) is further configured to detect whether or not a specific mark (@) is included in the mail destination address input by the input panel (18), and wherein when no specific mark (@) is included, the network scanner processing is select-
ed and the transmitter (507) directly transmits image data to the receiving apparatus (4) on the LAN by use of the obtained current IP address, and when the specific mark is included, the IFAX transmission processing is selected and the transmitter (507) transmits image data to the remotely-connected receiving apparatus (8) over Internet via the mail server (3).

4. The facsimile apparatus according to any of claims 1-3, further comprising, a table (1202) for storing the destination mail address and corresponding transmission type information.

5. The facsimile apparatus according to claim 4, wherein the table (1202) is a one-touch button registering table for storing the number of the one-touch button (1301), the corresponding destination mail address (1302), and the corresponding transmission type (1303).

6. The facsimile apparatus according to claim 4, wherein the table is an abbreviated dial registering table for storing an abbreviated dial, the corresponding destination mail address, and the corresponding transmission type.

7. The facsimile apparatus according to any of claims 5 or 6, further comprising, a register (1201) for registering the number of one-touch button and the corresponding destination mail address in said table (1202) so as to request an operator to specify the transmission type at the time of registration.

8. The facsimile apparatus according to claim 7, wherein the register (1201) is further configured to register an abbreviated dial and the corresponding destination mail address in said table (1202) so as to request an operator to specify the transmission type at the time of registration.

9. The facsimile apparatus according to any of claims 1-8, further comprising, a register (515) for receiving notification of the physical address of the receiving apparatus (4) and registering the physical address included in the notification in the memory (510).

10. The facsimile apparatus according to any of claims, wherein the determiner (1205) is further configured to determine whether image data is transmitted to the receiving apparatus (4) on the LAN by the transmitter (507) or transmitted to the remotely-connected receiving apparatus (8) over Internet via a mail server (3) in accordance with the transmission type information (1303) corresponding to the destination mail address (1302).
Patentansprüche

1. Internet-Faxvorrichtung (1) mit einer Netzwerk-Scannereinrichtung zum Senden gesollter Bilddaten zu einer empfangenden Vorrichtung (4), die mit einem LAN verbunden ist, dem eine IP-Adresse dynamisch von einer externen Vorrichtung (10) zugewiesen wird, die mit dem LAN verbunden ist, wobei RARP (Reverse Address Resolution Protocol) von der Faxvorrichtung verwendet wird und die Faxvorrichtung umfasst: einen Speicher (510) zum Speichern einer Tabelle, die eine Vielzahl physikalischer Adressen (MAC-Adressen) enthält, die jeweils einer (4) einer Vielzahl empfangender Vorrichtungen entsprechen, als die physikalische Adresse, die in Verbindung mit der Ziel-E-Mail-Adresse einer entsprechenden empfangenden Vorrichtung gespeichert wird; eine Bestimmungseinrichtung (502), die so eingerichtet ist, dass sie in dem Speicher gespeicherte physikalische Adressen durchsucht und die physikalische Adresse ermittelt, die den über ein Eingabefeld (18) der Faxvorrichtung eingegebenen Ziel-Daten entspricht; einen RARP-Prozessor (509), der so eingerichtet ist, dass er die aktuelle IP-Adresse einer empfangenden Vorrichtung (4) unter Verwendung der durch die Bestimmungseinrichtung ermittelten physikalischen Adresse ermittelt, wobei der Prozessor eine RARP-Verarbeitung durchführt, um die aktuelle IP-Adresse der empfangenden Vorrichtung zu ermitteln; einen Sender (507), der so eingereicht ist, dass er die gespeicherten Daten unter Verwendung der ermittelten IP-Adresse ohne Verwendung des Mail-Servers (3) in dem LAN direkt zu der empfangenden Vorrichtung (4) sendet.

2. Fax-Vorrichtung nach Anspruch 1, wobei der Sender (507) des Weiteren Bilddaten in einem E-Mail-Format zu einer entfernt angeschlossenen empfangenden Vorrichtung (8) via Internet über einen Mail-Server (3) sendet.

3. Fax-Vorrichtung nach Anspruch 2, wobei die Bestimmungseinrichtung (1205) des Weiteren so konfiguriert ist, dass sie erfasst, ob ein spezifisches Zeichen (@) in der über das Eingabefeld (18) eingegebenen Mail-Zieladresse enthalten ist oder nicht, und, wenn kein spezifisches Zeichen (@) enthalten ist, die Netzwerk-Scannerverarbeitung ausgewählt wird und der Sender (507) Bilddaten unter Verwendung der ermittelten aktuellen IP-Adresse in dem LAN direkt zu der empfangenden Vorrichtung (4) sendet, und, wenn das spezifische Zeichen enthalten ist, die IFAX-Sendeverarbeitung ausgewählt wird und der Sender (507) Bilddaten via Internet über den Mail-Server (3) zu der entfernt angeschlossenen empfangenden Vorrichtung (8) sendet.


5. Fax-Vorrichtung nach Anspruch 4, wobei die Tabelle (1202) eine Direktwahlzahlen-Registertabelle ist, die die Nummer der Direktwahlzelle (1301), die entsprechende Ziel-Mail-Adresse (1302) und den entsprechenden Sendetyp (1303) speichert.

6. Fax-Vorrichtung nach Anspruch 4, wobei die Tabelle eine Kurzwahl-Registertabelle ist, die eine Kurzwahl, die entsprechende Ziel-Mail-Adresse und den entsprechenden Sendetyp speichert.

7. Fax-Vorrichtung nach einem der Ansprüche 5 oder 6, die des Weiteren umfasst: ein Register (1201), das die Nummer der Direktwahlzelle und der entsprechende Ziel-Mail-Adresse so in der Tabelle (202) registriert, dass eine Bedienungsperson den Sendetyp zum Zeitpunkt der Registrierung angibt.

8. Fax-Vorrichtung nach Anspruch 7, wobei das Register (1201) des Weiteren so konfiguriert ist, dass es eine Kurzwahl und die entsprechende Ziel-Mail-Adresse so in der Tabelle (1202) registriert, dass eine Bedienungsperson aufgefordert wird, den Sendetyp zum Zeitpunkt der Registrierung anzugeben.

9. Fax-Vorrichtung nach einem der Ansprüche 1-8, die des Weiteren umfasst: ein Register (515), das Mitteilung über die physikalische Adresse der empfangenden Vorrichtung (4) empfängt und die in der Mitteilung enthaltene physikalische Adresse in dem Speicher (510) registriert.

10. Fax-Vorrichtung nach einem der Ansprüche, wobei die Bestimmungseinrichtung (1205) des Weiteren so konfiguriert ist, dass sie gemäß den Sendetyp-Informationen (1303), die der Ziel-Mail-Adresse (1302) entsprechen, feststellt, ob die Bilddaten durch den Sender (507) in dem LAN zu der empfangenden Vorrichtung (4) gesendet werden oder via Internet über einen Mail-Server (3) zu der entfernt angeschlossenen empfangenden Vorrichtung (8) gesendet werden.
Revendications

1. Appareil de télécopie Internet (1) ayant une fonction de numérisation du réseau, pour transmettre des données d’image numérisées à un appareil de réception (4) connecté à un LAN, auquel une adresse IP est allouée dynamiquement en provenance d’un appareil externe (10) connecté au LAN, dans lequel le RARP (Reverse Address Resolution Protocol : protocole de résolution d’adresse inversé) est utilisé par ledit appareil de télécopie, ledit appareil de télécopie comprenant :

   une mémoire (510) pour stocker une table comprenant une pluralité d’adresses physiques (adresses MAC) chacune correspondant à l’un (4) parmi une pluralité d’appareils de réception comme l’adresse physique qui est stockée en association avec l’adresse du courrier électronique de destination d’un appareil de réception correspondant ;

   un déterminateur (502) qui est adapté pour rechercher les adresses physiques stockées dans ladite mémoire et obtenir l’adresse physique correspondant aux données de destination entrées par un panneau d’entrée (18) dudit appareil de télécopie ;

   un processeur RARP (509) qui est adapté pour obtenir l’adresse IP actuelle d’un appareil de réception (4) en utilisant l’adresse physique obtenue par ledit déterminateur, dans lequel ledit processeur réalise un traitement RARP pour obtenir l’adresse IP actuelle de l’appareil de réception correspondant ;

   un émetteur (507) qui est adapté pour transmettre directement les données numérisées à l’appareil de réception (4) en utilisant l’adresse IP obtenue sans l’utilisation du serveur de courrier électronique (3) sur le LAN.

2. Appareil de télécopie selon la revendication 1, dans lequel le déterminateur (1205) est en outre configuré pour déterminer si une marque spécifique (@) est comprise ou non dans l’adresse de destination du courrier électronique entrée par le panneau d’entrée (18), et dans lequel lorsqu’aucune marque spécifique (@) n’est comprise, le traitement du numériseur du réseau est sélectionné et l’émetteur (507) transmet directement les données d’image à l’appareil de réception (4) sur le LAN en utilisant l’adresse IP actuelle obtenue, et lorsque la marque spécifique est comprise, le traitement de transmission d’IFAX est sélectionné et l’émetteur (507) transmet les données d’image à l’appareil de réception connecté à distance (8) sur Internet via le serveur de courrier électronique (3).

3. Appareil de télécopie selon la revendication 2, dans lequel le déterminateur (1205) est en outre configuré pour déterminer si les données d’image sont transmises à l’appareil de réception connecté à distance (8) sur Internet via un serveur de courrier électronique (3) en fonction des informations du type de transmission (1303) correspondant à l’adresse du courrier élec-

4. Appareil de télécopie selon l’une quelconque des revendications 1 à 3, comprenant en outre, une table (1202) pour stocker l’adresse du courrier électronique de destination et les informations du type de transmission correspondante.

5. Appareil de télécopie selon la revendication 4, dans lequel la table (1202) est une table d’enregistrement de composition abrégée pour stocker une composition abrégée, l’adresse du courrier électronique de destination correspondante, et le type de transmission correspondante.

6. Appareil de télécopie selon la revendication 4, dans lequel la table est une table d’enregistrement de composition abrégée pour stocker une composition abrégée, l’adresse du courrier électronique de destination correspondante, et le type de transmission correspondante.

7. Appareil de télécopie selon l’une quelconque des revendications 5 ou 6, comprenant en outre, un enregistreur (1201) pour enregistrer le numéro du bouton unique et l’adresse du courrier électronique de destination correspondante dans ladite table (1202) de façon à demander à un opérateur de spécifier le type de transmission au moment de l’enregistrement.

8. Appareil de télécopie selon la revendication 7, dans lequel l’enregistreur (1201) est configuré en outre pour enregistrer une composition abrégée et l’adresse du courrier électronique de destination correspondante dans ladite table (1202) de façon à demander à un opérateur de spécifier le type de transmission au moment de l’enregistrement.


10. Appareil de télécopie selon l’une quelconque des revendications, dans lequel le déterminateur (1205) est en outre configuré pour déterminer si les données d’image sont transmises à l’appareil de réception (4) sur le LAN par l’émetteur (507) ou transmises à l’appareil de réception connecté à distance (8) sur Internet via un serveur de courrier électronique (3) en fonction des informations du type de transmission (1303) correspondant à l’adresse du courrier élec-
tronique de destination (1302).
FIG. 3
FIG. 6
FIG. 7
START

ST801

INPUT DATA

ST802

IS START BUTTON ON?

NO

YES

ST803

ANALYZE DATA

ST804

ONLY USER NAME?

NO

ST809

IS USER NAME REGISTERED IN MAC ADDRESS TABLE?

NO

ST810

RARP PROCESSING

ST811

SCAN ORIGINAL

ST812

COMPRESSION IMAGE

ST813

GENERATE E-MAIL

ST814

TRANSMIT E-MAIL VIA MAIL SERVER

YES

ST815

ADDED DEFAULT DOMAIN

ST816

SCAN ORIGINAL

ST817

COMPRESSION IMAGE

ST818

GENERATE E-MAIL

ST819

TRANSMIT E-MAIL VIA MAIL SERVER

END

FIG. 8
RARP PROCESSING SEQUENCE

IFAX1 TERMINAL TERMINAL TERMINAL TERMINAL

RARP REQUEST MESSAGE

RARP RESPONSE MESSAGE

FIG. 9
START

START INITIAL SETTING OPERATION

MAIL ADDRESS INPUT REQUEST

IS THERE INPUT?

NO

YES

OBtain MAC ADDRESS

GENERATE MAC ADDRESS NOTIFICATION MAIL MESSAGE

TRANSMIT E-MAIL

END

FIG. 10
START

RECEIVE E-MAIL

IS MAC ADDRESS NOTIFICATION?

YES

EXTRACT MAC ADDRESS MAIL ADDRESS

NO

ST1105

NORMAL MAIL RECEPTION PROCESSING

ST1104

REGISTER IT IN MAC ADDRESS TABLE

END

FIG. 11
<table>
<thead>
<tr>
<th>No.</th>
<th>MAIL ADDRESS</th>
<th>SCANNER FLAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><a href="mailto:aaa@mgcs.co.jp">aaa@mgcs.co.jp</a></td>
<td>ON</td>
</tr>
<tr>
<td>2</td>
<td><a href="mailto:bbb@mei.co.jp">bbb@mei.co.jp</a></td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td><a href="mailto:ccc@mgcs.co.jp">ccc@mgcs.co.jp</a></td>
<td>ON</td>
</tr>
</tbody>
</table>
START

ST1401

INPUT MAIL ADDRESS

ST1402

DISPLAY MESSAGE "IFAX OR SCAN"

ST1403

SCAN?

NO

ST1404

SCANNER FLAG IS ON

YES

ST1405

REGISTER ONE-TOUCH

ST1406

SCANNER FLAG IS OFF

END

FIG. 14
REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 09275466 B [0008]

- JP 10084380 B [0009]