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Storage medium storing program causing computer of information processing apparatus to execute control method for setting a user as a destination of a notification of an event, control method for information processing apparatus, and information processing system

Abstract

A technique that prevents an unnecessary notification to a user. A non-transitory computer-readable storage medium storing a control program causing a computer of an information processing apparatus to execute a control method including a reception step of receiving an event generated in a device, a setting step of setting a user who is a destination of a notification based on the event received in the reception step according to a type of the event received in the reception step, first information showing a group for each type of an event, and second information showing a group for each user, and a notification step of transmitting a notification based on the event received in the reception step to the user set in the setting step.

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Background/Summary

BACKGROUND OF THE INVENTION
Field of the Invention
(1) The present invention relates to a storage medium storing a program causing a computer of an information processing apparatus to execute a control method, a control method for the information processing apparatus, and an information processing system.
Description of the Related Art
(2) A conventional device management system that connects a user terminal like a mobile terminal to an office device like an MFP through a chat application or a management application is known. In such a device management system, a user can remotely operate an MFP and can refer to information in the MFP from a user terminal.
(3) Moreover, some of chat applications and management applications have a function of notifying a user terminal of a phenomenon occurred in an MFP and have a function to communicate with an NAS (Network Attached Storage) or an attendance management system.
(4) In the meantime, since many users access to the MFP through the chat application or the management application in the above-mentioned device management system, the MFP may transmit a notification unnecessary for a user to a user terminal of the user. In order to prevent such an unnecessary notification, there is a known technique that switches a notification method according to a device status of a user terminal that receives a notification (see Japanese Laid-Open Patent Publication (Kokai) No. 2008-40727 (JP 2008-40727A)).
(5) However, a device management system that connects many user terminals to an office device like an MFP needs to notify each user terminal suitably. There is a method that a system administrator beforehand registers notification contents and information about users who are notification destinations. However, such registration becomes troublesome when there are many users who should be registered. Moreover, there is a problem that a notification destination must be updated whenever a registered user's information is changed.
SUMMARY OF THE INVENTION
(6) The present invention provides a technique that prevents an unnecessary notification to a user.
(7) Accordingly, an aspect of the present invention provides a non-transitory computer-readable storage medium storing a control program causing a computer of an information processing apparatus to execute a control method including a reception step of receiving an event generated in a device, a setting step of setting a user who is a destination of a notification based on the event received in the reception step according to a type of the event received in the reception step, first information showing a group for each type of an event, and second information showing a group for each user, and a notification step of transmitting a notification based on the event received in the reception step to the user set in the setting step.
(8) According to the present invention, an unnecessary notification to a user can be prevented.
(9) Further features of the present invention will become apparent from the following description of exemplary embodiments with reference to the attached drawings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS
(1) FIG. **1** is a block diagram schematically showing an entire configuration of a device management system according to each embodiment of the present invention.
(2) FIG. **2** is a block diagram showing a software configuration of an MFP shown in FIG. **1**.
(3) FIG. **3** is a block diagram showing a software configuration of a server shown in FIG. **1**.
(4) FIG. **4** is a view showing a sequence of a general message notification process executed by the server to notify a mobile terminal in FIG. **1** when a certain phenomenon occurs in the MFP.
(5) FIG. **5** is a view showing an example of a user information management table according to a

first embodiment.

(6) FIG. **6** is a view showing an example of a notification condition management table according to the first embodiment.

(7) FIG. **7** is a view showing a sequence of a message notification process according to the first embodiment executed by the server to notify the mobile terminal when a certain phenomenon occurs in the MFP.

(8) FIG. **8** is a flowchart showing details of the process in steps S**701** through S**705** in FIG. **7** according to the first embodiment executed by the server.

(9) FIG. **9** is an explanatory view showing a message display screen displayed on an operation-display unit of the mobile terminal in a step S**706** in FIG. **7**.

(10) FIG. **10** is a view showing an example of a user information management table according to a second embodiment.

(11) FIG. **11** is an explanatory view showing a UI screen of a mobile terminal according the second embodiment.

(12) FIG. **12** is a view showing an example of a notification condition management table according to the second embodiment.

(13) FIG. **13** is a flowchart showing details of the process in steps S**701** through S**705** in FIG. **7** according to the second embodiment executed by the server.

DESCRIPTION OF THE EMBODIMENTS

(14) Hereinafter, a device management system **1** according to each embodiment of the present invention is described by referring to the drawings.

(15) FIG. **1** is a block diagram schematically showing an entire configuration of the device management system **1**. The device management system **1** in FIG. **1** is provided with an MFP **1100** (a first-type information processing apparatus) that is an occurrence origin of at least one phenomenon, a mobile terminal **1130** (a second-type information processing apparatus) that is associated with an account of a user, and a server **1120** (a device management apparatus).

(16) The MFP **1100** has functions, such as copying and printing, and is connected to the server **1120** through a network like a LAN **1140**. The MFP **1100** is provided with an operation unit **111**, a scanner **112**, a printer **113**, and a controller unit **100** that is connected to them.

(17) The controller unit **100** is provided with a CPU **101**, a RAM **102**, a ROM **103**, an HDD **104**, an operation-unit I/F **105**, a network I/F **106**, a scanner I/F **107**, a printer I/F **108**, and a FAX unit **109**. These units are mutually connected through a system bus **110**.

(18) The CPU **101** runs various control programs to control operations of the entire MFP **1100**. The CPU **101** boots the MFP **1100** on the basis of a boot program stored in the ROM **103**. Moreover, the CPU **101** reads a control program stored in the HDD **104** and executes a predetermined process with using the RAM **102** as a work area.

(19) The HDD **104** stores various control programs including functions, such as copying and printing, and stores scan data read by the scanner **112**.

(20) The operation-unit I/F **105** controls data input/output communication with the operation unit **111**.

(21) The network I/F **106** is connected to the LAN **1140** and controls input and output of information through the LAN **1140**.

(22) The scanner I/F **107** inputs image data from the scanner **112** and inputs/outputs scanner control data.

(23) The printer I/F **108** outputs output image data to the printer **113** and inputs/outputs printer control data.

(24) The FAX unit **109** transmits and receives FAX data through a telephone line **1141**.

(25) The operation unit **111** is provided with input devices, such as a touch panel and hard keys, and display devices, such as an LDC and LEDs. The operation unit **111** is an interface that displays an instruction input by a user and displays information to the user. The hard keys include a start

button used to designate start of scanning of a paper document.

(26) The scanner **112** is provided with an optical reading device like a CCD and has a function that scans a paper medium optically and reads as electronic image data. Moreover, the scanner **112** is provided with an automatic document feeder (ADF) and has a function that automatically feeds a document one by one to the optical reading device from a bundle of paper documents stacked on a document tray and ejects a document after reading a document. A sensor can determine whether documents are stacked on the document tray of the ADF.

(27) The printer **113** has a function that prints electronic image data as an image on a recording medium like a sheet.

(28) The server **1120** is connected to the MFP **1100** through the network like the LAN **1140** and receives notification events, such as a log and a notification, transmitted from the MFP **1100**. Moreover, the server **1120** is also connected to the mobile terminal **1130** through a network like a LAN **1150**, and transmits and receives a message with the mobile terminal **1130**.

(29) The server **1120** has a controller **120** connectable to the LANs **1140** and **1150**. The controller **120** is provided with a CPU **121**, a RAM **122**, a ROM **123**, an HDD **124**, and a network OF **125**. These units are mutually connected through a system bus **126**.

(30) The CPU **121** runs various control programs to control operations of the entire server **1120**. The CPU **121** reads a control program stored in the ROM **123** or the HDD **124** and executes a predetermined process with using the RAM **122** as a work area.

(31) The HDD **124** stores various programs, such as a control program that receives an instruction and a message to the MFP **1100** and a control program that transmits a message to the mobile terminal **1130**.

(32) The network OF **125** controls input and output of information through the LANs **1140** and **1150**.

(33) The mobile terminal **1130** is connected to the server **1120** through the network like the LAN **1150** and transmits and receives a message with the server **1120**. The mobile terminal **1130** is provided with an operation-display unit **138**, an operation input unit **139**, and a controller **130** connected to them.

(34) The controller **130** is provided with a CPU **131**, a RAM **132**, a ROM **133**, an HDD **134**, and a network OF **136**. These units are mutually connected through a system bus **137**.

(35) The CPU **131** runs various control programs to control operations of the entire mobile terminal **1130**. The CPU **131** reads a control program stored in the ROM **133** or the HDD **134** and executes a predetermined process with using the RAM **132** as a work area.

(36) The HDD **134** stores various programs, such as a control program that receives a message from the server **1120** in order to display a notification from the MFP **1100** and displays a screen.

(37) The network OF **136** controls input and output of information through the LAN **1150**.

(38) The operation-unit OF **135** controls data output communication to the operation-display unit **138** and data input communication from the operation input unit **139**.

(39) In addition, the device management system **1** includes at least one additional user terminal (the second-type information processing apparatus (not shown in FIG. **1**)) that is different from the mobile terminal **1130** and is connected to the server **1120** through the network. The additional user terminal has the similar hardware configuration (FIG. **1**) as the mobile terminal **1130** and is associated with an account of a user who is different from the user of the mobile terminal **1130** that is managed by a user information management table **501** (FIG. **5**). The additional user terminal may be a mobile terminal or a terminal like a desktop PC of which the position is fixed.

(40) FIG. **2** is a block diagram showing a software configuration of the MFP **1100**. As shown in FIG. **2**, function modules including a function control section **200**, a network communication module **201**, an event reception module **202**, an event interpretation module **203**, an event transmission module **207**, and an event collection module **208** operate in the MFP **1100**.

(41) In each embodiment of the present invention, a software program that achieves each of the

above-mentioned function modules is stored in one memory storage unit among the RAM **102**, ROM **103**, and HDD **104**, and is executed by the CPU **101**.

(42) In the function control section **200**, the software that achieves various functions using the scanner **112**, printer **113**, LAN **1140**, and the above-mentioned memory storage unit operates. The function control section **200** is provided with a UI control module **200***a*, a job control module **200***b*, an error handling module **200***c*, and function applications **200***d*.

(43) The UI control module **200***a* has a function that displays a screen that is operated by a user on the operation unit **111** (FIG. **1**) through the operation-unit OF **105** and a function that transfers a content of an operation of a user to other software. The UI control module **200***a* mainly controls an operation to the hardware of the MFP **1100** and displaying.

(44) The function applications (software) **200***d* respectively operate functions, such as copying, printing, and mail transmission. The function applications **200***d* operate using an operation content of a user transferred from the UI control module **200***a*, data reception through the network like the LAN **1140**, etc., as triggers. Moreover, when a certain phenomenon (a first phenomenon) occurs in a certain function of the MFP **1100**, one of the function applications **200***d* corresponding to the certain function generates an event concerning the first phenomenon and transmits it to the event collection module **208**.

(45) In response to a job execution instruction from one of the function applications **200***d*, the job control module **200***b* controls the scanner **112** through the scanner OF **107** to execute scanning or controls the printer **113** through the printer OF **108** to execute printing.

(46) When receiving a notification about an abnormal status of the job control module **200***b*, the printer **113**, the scanner **112**, or the like, the error handling module **200***c* instructs the entire device management system **1** to stop operations or to shift to degeneration operations.

(47) The network communication module **201** transmits and receives information with the server **1120** through the network like the LAN **1140**.

(48) When the information received by the network communication module **201** is an event, the event reception module **202** transmits the event to the event interpretation module **203**.

(49) When receiving the event from the event reception module **202**, the event interpretation module **203** interprets a content of a device control instruction in the event and sends an execution instruction to one of the function applications **200***d* in accordance with the interpreted content.

(50) When receiving an event from one of the function applications **200***d*, the event collection module **208** selects information about the event, adds the information to data of the event, shapes the data, and stores it as a notification event. Moreover, when receiving a warning or control information from the job control module **200***b* or the error handling module **200***c*, the event collection module **208** shapes data about the warning or the control information in the same manner and stores it as a notification event.

(51) The event transmission module **207** (transmission unit) transmits a notification event stored by the event collection module **208** to the server **1120** through the network communication module **201**.

(52) FIG. **3** is a block diagram showing a software configuration of the server **1120**. As shown in FIG. **3**, function modules including a management section **300**, a network communication module **301**, an MFP event reception module **302**, an MFP event transmission module **307**, a mobile terminal message reception module **308**, and a mobile terminal message transmission module **309** operate in the server **1120**.

(53) In the specification, a software program that achieves each of the above-mentioned function modules is stored in the RAM **122**, the ROM **123**, or the HDD **124**, and is executed by the CPU **121**.

(54) The management section **300** has a main control module **303**, an event-message conversion module **304**, a notification destination management module **305**, and a user management module **306**.

(55) The network communication module **301** transmits and receives information with the MFP **1100** through the network like the LAN **1140**. Moreover, the network communication module **301** transmits and receives information with the mobile terminal **1130** through the network like the LAN **1150**.

(56) When the information received by the network communication module **301** is an event, the MFP event reception module **302** transmits the notification event to the main control module **303**.

(57) When receiving the notification event from the MFP event reception module **302**, the main control module **303** converts the notification event into a message that will be transmitted to the mobile terminal **1130**. A notification event is converted into a message according to the information held in the event-message conversion module **304**.

(58) The notification destination management module **305** (first management unit) manages a condition of a transmission destination (notification destination) that is determined for every notification event type. Specifically, the notification destination management module **305** manages a notification condition management table **601** (FIG. **6**) that defines information about authority that allows a process to a phenomenon given by a notification event. The details of the notification condition management table **601** will be mentioned later.

(59) The user management module **306** (a second management unit) manages accounts of users including the user of the mobile terminal **1130** and the user information management table **501** (FIG. **5**) that defines the information about the authorities thereof. The details of the user information management table **501** will be mentioned later.

(60) The main control unit **303** determines a transmission destination (the mobile terminal **1130** in the description) of the message converted in accordance with the information managed by the notification destination management module **305** and the user management module **306**. After that, the main control module **303** generates the information about the account of the transmission destination and a message transmission instruction including the converted message, and transmits it to the mobile terminal message transmission module **309**.

(61) When receiving the message transmission instruction from the main control module **303**, the mobile terminal message transmission module **309** transmits the message to the mobile terminal **1130** through the network communication module **301**.

(62) The mobile terminal message transmission module **309** transmits the message to the mobile terminal **1130**, when communication with the mobile terminal **1130** is established by referring to the information like the IP address associated with the information about the account included in the message transmission instruction. The mobile terminal message transmission module **309** can be achieved by a method that holds a message in an area corresponding to the account of the mobile terminal **1130** and transmits the message concerned in response to an obtainment request from the mobile terminal **1130**.

(63) The mobile terminal message reception module **308** receives a message from the mobile terminal **1130** through the network communication module **301**.

(64) When receiving a message from the mobile terminal message reception module **308**, the main control module **303** converts the message into a notification event. A message is converted into a notification event according to the information held in the event-message conversion module **304**.

(65) The main control module **303** extracts the information about the account of the mobile terminal **1130** that is the transmitting source of the message from the information managed by the user management module **306**. After that, the main control module **303** generates an event transmission instruction including the extracted account information and the converted notification event and transmits it to the MFP event transmission module **307**.

(66) When receiving the event transmission instruction from the main control module **303**, the MFP event transmission module **307** transmits the notification event to the MFP **1100** through the network communication module **301**.

(67) FIG. **4** is a view showing a sequence of a general message notification process executed by the

server **1120** to notify the mobile terminal **1130** when a certain phenomenon occurs in the MFP **1100**.

(68) When the phenomenon occurs in the MFP **1100**, the MFP **1100** generates a notification event based on the phenomenon and transmits it to the server **1120** in a step S**401**.

(69) When the server **1120** receives the notification event from the MFP **1100**, the main control module **303** generates a message in a step S**402**.

(70) In a step S**403**, the main control module **303** obtains all the user accounts managed by (registered to) the user management module **306** and determines all the obtained accounts as the notification destinations. It should be noted that the user accounts include the account of the mobile terminal **1130**.

(71) In step S**404**, the main control module **303** transmits the message generated in the step S**402** to all the accounts including the account of the mobile terminal **1130** determined as the notification destinations in the step S**403**.

(72) When receiving the message transmitted from the server **1120** in the step S**404**, the mobile terminal **1130** displays the message on the operation-display unit **138** in a step S**405**. And then, this sequence is finished.

(73) Next, the message transmission from the server **1120** to the mobile terminal **1130** in a first embodiment will be described.

(74) FIG. **5** is a view showing an example of the user information management table according to the first embodiment. The user information management table **501** manages the information about the accounts that are managed by the user management module **306** and enable exchange of messages with the server **1120**.

(75) As shown in FIG. **5**, the user information management table **501** includes account names, user names, departments to which users belong, and posts of users as the information about the accounts. The user management module **306** retrieves an account on the basis of the information about the accounts managed by the user information management table **501** and extracts information.

(76) FIG. **6** is a view showing an example of the notification condition management table **601** according to the first embodiment. The notification condition management table **601** manages notification conditions to the mobile terminal **1130** managed by the notification destination management module **305**.

(77) The notification condition management table **601** associates a notification event type with a target post (post information) and target department (belonging information) as the notification conditions of a user who becomes a notification destination. The notification destination management module **305** determines the levels of the target post and target department that becomes the notification destination of the notification event on the basis of the notification condition management table **601**.

(78) The notification of "warning of consumable item", which is one of the notification event types in the notification condition management table **601**, notifies a user of a lack of a consumable item of the MFP **1100**. Any user who notices this notification needs to supply the consumable item urgently. Accordingly, both the target post and target department, which show the authority to cope with the phenomenon of the lack of the consumable item, are set to "all".

(79) The notification of "FAX reception", which is one of the notification event types in the notification condition management table **601**, notifies a user that the MFP **1100** has received FAX. For example, when only the personnel department exchanges a document by FAX, the target department and target post, which show the authority to cope with the phenomenon of the FAX reception, are respectively set to "personnel" and "all". This setting prevents the unnecessary notification of "FAX reception" to departments that do not use FAX.

(80) Moreover, the notification of "used amount report", which is one of the notification event types in the notification condition management table **601**, notifies a user of the used amount of the

MFP **1100** periodically and is used to grasp the use frequency of the MFP **1100**. For example, the authority to cope with the phenomenon of "used amount report" to grasp the use frequency of the MFP **1100** shall be given to a chief staff and upper post in the facility management department that manages the MFP **1100**. In this case, the target department is set to the "facility management" department and the target post is set to "chief staff and section manager" as the notification destination. This setting prevents the excess report from reaching to a user who is not involved with the management job.

(81) The notification of "security warning", which is one of the notification event types in the notification condition management table **601**, notifies a user that the MFP **1100** has received an operation having a security problem. For example, when the authority to cope with the phenomenon of "security warning" to determine presence of a problem of an operation to the MFP **1100** and to share the warning in all the users only when there is a problem is given to a section manager, the target post is set to "section manager" and the target department is set to "all" as the notification destination. This setting prevents the unnecessary notification to a user who does not need to determine the presence of a problem of an operation to the MFP **1100**.

(82) The notification of "charging information", which is one of the notification event types in the notification condition management table **601**, notifies a user of a charging amount etc. in a case of charging according to the used amount of the MFP **1100**. For example, when the authority to cope with the phenomenon of "charging information" to settle a charging amount is given to a section manager in the facility management department that manages the MFP **1100**, the target post is set to "section manager" and the target department is set to the "facility management" department as the notification destination. This setting prevents the unnecessary notification to a user who does not perform a settlement process.

(83) FIG. **7** is a view showing a sequence of a message notification process according to the first embodiment executed by the server **1120** to notify the mobile terminal **1130** when a certain phenomenon occurs in the MFP **1100**.

(84) When the phenomenon occurs in the MFP **1100**, the MFP **1100** generates a notification event based on the phenomenon and transmits it to the server **1120** in a step S**701**.

(85) In a step S**702**, the main control module **303** obtains the target post and target department (notification conditions) corresponding to the notification event transmitted from the MFP **1100** in the step S**701** from the notification destination management module **305**.

(86) In a step S**703**, the main control module **303** determines accounts (notification destinations) that are applicable to the target post and target department (notification conditions) obtained in the step S**702**. In addition, in this embodiment, the determined notification destinations include the account of the mobile terminal **1130**.

(87) In a step S**704**, the main control module **303** generates a message from the notification event transmitted from the MFP **1100**.

(88) In a step S**705**, the main control module **303** transmits the message generated in the step S**704** to the accounts determined as the notification destinations in the step S**703**.

(89) When receiving the message transmitted from the server **1120** in the step S**705**, the mobile terminal **1130** displays the message on the operation-display unit **138** in a step S**706**. And then, this sequence is finished.

(90) FIG. **8** is a flowchart showing details of the process in the steps S**701** through S**705** in FIG. **7** executed by the server **1120**.

(91) In a step S**801**, the MFP event reception module **302** (a first obtainment unit) waits for a reception of the notification event from the MFP **1100** through the LAN **1140**.

(92) Next, in a step S**802**, the MFP event reception module **302** determines whether the notification event that is waited in the step S**801** is received. When it is determined that the notification event is not received (NO in the step S**802**), the process returns to the step S**801**. In the meantime, when it is determined that the notification event is received (YES in the step S**802**), the MFP event

reception module **302** transmits the received notification event to the main control module **303**, and the process proceeds to a step S**803**.

(93) In the step S**803**, the main control module **303** determines whether the notification event received from the MFP event reception module **302** is registered in the notification condition management table **601** of the notification destination management module **305**. When the notification event is not registered in the notification condition management table **601** (NO in the step S**803**), this process is finished as-is. In the meantime, when the notification event is registered in the notification condition management table **601** (YES in the step S**803**), the process proceeds to a step S**804**.

(94) In the step S**804**, the main control module **303** (a second obtainment unit) obtains the notification conditions from the notification destination management module **305**. Specifically, the main control module **303** first transmits a notification condition request, which includes the notification event transmitted from the MFP **1100**, to the notification destination management module **305**. The notification destination management module **305** retrieves the notification event type included in the received notification condition request from the notification condition management table **601**, extracts the target post and target department associated with the retrieved notification event type, and transmits them to the main control module **303** as a response to the notification condition request. The main control module **303** obtains the target post and target department that are transmitted from the notification destination management module **305** as the notification conditions.

(95) In a step S**805**, the main control module **303** (a determination unit) retrieves all accounts that agree with the notification conditions obtained in the step S**804** from the user information management table **501** using the user management module **306** and determines them as notification destinations. Specifically, the main control module **303** transmits the notification destination request that includes the target post and target department (notification conditions) to the user management module **306**. The user management module **306** extracts all accounts that agree with the target post and target department included in the received notification destination request from the user information management table **501**, and transmits them to the main control module **303**. The main control module **303** determines the accounts transmitted from the user management module **306** as the notification destinations. In addition, in this embodiment, the determined notification destinations include the account of the mobile terminal **1130**.

(96) In a step S**806**, the main control module **303** (a conversion unit) converts the notification event into the message, which will be transmitted to the accounts determined as the notification destinations in the step S**805**, on the basis of the information in the event-message conversion module **304**.

(97) In a step S**807**, the main control module **303** transmits the message, which is converted from the notification event in the step S**806**, to the accounts (the account of the mobile terminal **1130**, etc.) determined as the notification destinations in the step S**805**. Specifically, the transmitted message is sent to the mobile terminal message transmission module **309** and is transmitted to the notification destinations (the mobile terminal **1130** etc.) through the network communication module **301**. After that, the process in FIG. **8** is finished.

(98) FIG. **9** is an explanatory view showing a message display screen **901** displayed on the operation-display unit **138** of the mobile terminal **1130** in the step S**706** in FIG. **7**.

(99) When the mobile terminal **1130** receives the message based on the notification event from the MFP **1100**, the message **902** is displayed in the message display screen **901**.

(100) It should be noted that another office device (the first-type information processing apparatus, not shown in FIG. **1**) having a similar hardware configuration (FIG. **1**) and a similar software configuration (FIG. **2**) to the MFP **1100** may be connected to the server **1120** through the network. In this case, a message **903** about a phenomenon that occurs in the other office device is also displayed in the message display screen **901** in addition to the message **902** about the phenomenon

that occurs in the MFP **1100**. The messages **902** and **903** is displayed so as to be arranged in the order of reception time. Although the other office device is an MFP that has the similar hardware configuration (FIG. **1**) to the MFP **1100** in the example shown in FIG. **9**, it is not limited to this. For example, the other office equipment may be a shredder, a security camera, etc.

(101) Moreover, although the user information management table **501** and the notification condition management table **601** are held within the server **1120** in this embodiment, the configuration is not limited to this as long as the tables are held within the device management system **1**. For example, the MFP **1100** may hold the notification condition management table **601**. In this case, the MFP **1100** transmits the notification event and its notification conditions together to the server **1120**. Moreover, an NAS that is connected to at least one of the server **1120** and the MFP **1100** through the network may hold the user information management table **501** and the notification condition management table **601**.

(102) Hereinafter, a second embodiment will be described. Message transmission from the server **1120** to the mobile terminal **1130** in this embodiment will be described.

(103) Hereinafter, configurations of this embodiment that are different from that of the first embodiment are mainly described. The same reference numerals as the first embodiment are applied to the similar configurations to the first embodiment, and the duplicate descriptions are omitted.

(104) In this embodiment, the mobile terminal **1130** and the above-mentioned additional user terminal (the second-type information processing apparatus), which are respectively associated with the accounts of different users, and the server **1120** in the device management system **1** constitute a work management system. The HDD **124** of the server **1120** in this embodiment stores a control program that manages work conditions of users managed by the work management system.

(105) FIG. **10** is a view showing an example of a user information management table **1001** according to this embodiment. The user information management table **1001** includes dynamic information including working forms on the day in addition to static information including the account names, user names, departments, and posts.

(106) The user information management table **1001** is managed by the user management module **306** and is rewritten by the main control module **303** in accordance with the message received by the mobile terminal message reception module **308**.

(107) FIG. **11** is an explanatory view showing a UI screen **1110** of the mobile terminal **1130** according this embodiment. A UI screen **1110** including buttons **1101** through **1104** and a menu **1105** is displayed on the operation-display unit **138** of the mobile terminal **1130**.

(108) When the user presses one of the buttons **1101** through **1104**, the CPU **131** of the mobile terminal **1130** transmits a work management message corresponding to the pressed button to the server **1120**.

(109) The menu **1105** is a pull down menu that enables selection of a working form. The information about the working form displayed in the menu **1105** in pressing one of the buttons **1101** through **1104** is added to the work management message that will be transmitted. In this embodiment, the working form is selected by the user from the pull-down menu of the menu **1105**. Alternatively, the working form may be determined by the CPU **131** on the basis of position information about the mobile terminal **1130** or line information about the LAN **1150**.

(110) When receiving the work management message from the mobile terminal **1130**A, the mobile terminal message reception module **308** of the server **1120** transmits a message content to the main control module **303**. The main control module **303** interprets the message content transmitted from the mobile terminal message reception module **308** and changes the information about the working form in the user information management table **1001** through the user management module **306**.

(111) Although the work management system updates the information about the working form of the user of the mobile terminal **1130** in this embodiment, it is not limited to this. For example, the

information about the working form of the user of the mobile terminal **1130** may be updated using information of a schedule system, the position information about the mobile terminal **1130**, or the line information about the LAN **1150**.

(112) FIG. **12** is an explanatory view showing a notification condition management table **1201** according to this embodiment. The notification condition management table **1201** manages notification conditions to the mobile terminal **1130** managed by the notification destination management module **305**.

(113) The notification condition management table **1201** includes the notification event type, target post, and target department as with the notification condition management table **601**, and further includes a working form of a user who becomes a notification destination associated with a notification event.

(114) Since the notifications of "warning of consumable item" and "FAX reception" among the notification event types require that a user who notices these notification accesses to the MFP **1100** physically and operates it, the working form of each of these notifications is set to "office". This setting prevents the unnecessary notification to a user who is not in the office and cannot operate the MFP **1100**.

(115) Moreover, since the notifications of "used amount report", "security warning", "charging information" among the notification event types in the notification condition management table **1201** should be referred to by all users irrespective of the working form, the working form of each of these notifications is set to "all".

(116) FIG. **13** is a flowchart showing details of the process in the steps S**701** through S**705** in FIG. **7** according to this embodiment executed by the server **1120**.

(117) In a step S**1301**, the MFP event reception module **302** waits for a reception of the notification event from the MFP **1100** through the LAN **1140**.

(118) Next, in a step S**1302**, the MFP event reception module **302** determines whether the notification event that is waited in the step S**1301** is received. When it is determined that the notification event is not received (NO in the step S**1302**), the process returns to the step S**1301**. In the meantime, when it is determined that the notification event is received (YES in the step S**1302**), the MFP event reception module **302** transmits the received notification event to the main control module **303**, and the process proceeds to a step S**1303**.

(119) In the step S**1303**, the main control module **303** determines whether the notification event received from the MFP event reception module **302** is registered in the notification condition management table **1201** of the notification destination management module **305**. When the notification event is not registered in the notification condition management table **1201** (NO in the step S**1303**), this process is finished as-is. In the meantime, when the notification event is registered in the notification condition management table **1201** (YES in the step S**1303**), the process proceeds to a step S**1304**.

(120) In the step S**1304**, the main control module **303** obtains the notification conditions (the target post, target department, and working form) from the notification destination management module **305**.

(121) In a step S**1305**, the main control module **303** retrieves accounts that agree with the target post and target department as the notification conditions that are obtained in the step S**1304** from among the accounts registered in the user information management table **1001** using the user management module **306**.

(122) In a step S**1306**, the main control module **303** determines accounts of which the working form agrees with the working form of the notification conditions obtained in the step S**1304** from among the accounts retrieved in the step S**1305** as the notification destinations using the user management module **306**. In addition, in this embodiment, the determined notification destinations include the account of the mobile terminal **1130**. That is, accounts of which the working form does not agree with the working form obtained in the step S**1304** among the accounts retrieved in the

step S**1305** are excepted from the notification destinations.

(123) In a step S**1307**, the main control module **303** converts the notification event into the message, which will be transmitted to the accounts determined as the notification destinations in the step S**1306**, on the basis of the information in the event-message conversion module **304**.

(124) In a step S**1308**, the main control module **303** transmits the message, which is converted from the notification event in the step S**1307**, to the accounts (the account of the mobile terminal **1130**, etc.) determined as the notification destinations in the step S**1306**. Specifically, the transmitted message is sent to the mobile terminal message transmission module **309** and is transmitted to the notification destinations (the mobile terminal **1130** etc.) through the network communication module **301**. After that, this process in FIG. **13** is finished.

OTHER EMBODIMENTS

(125) Embodiment(s) of the present invention can also be realized by a computer of a system or apparatus that reads out and executes computer executable instructions (e.g., one or more programs) recorded on a storage medium (which may also be referred to more fully as a 'non-transitory computer-readable storage medium') to perform the functions of one or more of the above-described embodiment(s) and/or that includes one or more circuits (e.g., application specific integrated circuit (ASIC)) for performing the functions of one or more of the above-described embodiment(s), and by a method performed by the computer of the system or apparatus by, for example, reading out and executing the computer executable instructions from the storage medium to perform the functions of one or more of the above-described embodiment(s) and/or controlling the one or more circuits to perform the functions of one or more of the above-described embodiment(s). The computer may comprise one or more processors (e.g., central processing unit (CPU), micro processing unit (MPU)) and may include a network of separate computers or separate processors to read out and execute the computer executable instructions. The computer executable instructions may be provided to the computer, for example, from a network or the storage medium. The storage medium may include, for example, one or more of a hard disk, a random-access memory (RAM), a read only memory (ROM), a storage of distributed computing systems, an optical disk (such as a compact disc (CD), digital versatile disc (DVD), or Blu-ray Disc (BD)™), a flash memory device, a memory card, and the like.

(126) While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

(127) This application claims the benefit of Japanese Patent Application No. 2021-201767, filed Dec. 13, 2021, which is hereby incorporated by reference herein in its entirety.

Claims

1. A non-transitory computer-readable storage medium storing a control program configured to cause a computer of an information processing apparatus to execute a method, the method comprising: receiving information indicating that an event has occurred in a device; identifying a first user and a second user that should each receive, based on a type of the event, a notification of the event; obtaining a status of the first user that should receive, based on the type of the event, the notification of the event; obtaining a status of the second user that should receive, based on the type of the received event, the notification of the event; and transmitting, in a first case where the obtained status of the first user that should receive the notification of a first event is a first status and the obtained status of the second user that should receive the notification of the first event is a second status different from the first status, the notification of the first event to the first user without transmitting the notification of the first event to the second user, and transmitting, in a second case where the obtained status of the first user that should receive the notification of a

second event is the first status and the obtained status of the second user that should receive the notification of the second event is the second status different from the first status, the notification of the second event to the first user and to the second user.

2. The non-transitory computer-readable storage medium according to claim 1, wherein the status of the first user includes a status indicating that the first user is in an office.

3. The non-transitory computer-readable storage medium according to claim 1, wherein the status of the second user includes a status indicating that the second user is teleworking.

4. The non-transitory computer-readable storage medium according to claim 1, wherein the status of the second user includes a status indicating that the second user is on break.

5. The non-transitory computer-readable storage medium according to claim 1, wherein the status of the second user includes a status indicating that the second user is on vacation.

6. The non-transitory computer-readable storage medium according to claim 1, wherein the status of the second user includes a status indicating that the second user is in a satellite office.

7. The non-transitory computer-readable storage medium according to claim 1, wherein the status of the first user is set by the first user.

8. The non-transitory computer-readable storage medium according to claim 7, wherein the status of the first user is set by an operation of an external apparatus.

9. The non-transitory computer-readable storage medium according to claim 8, wherein the external apparatus is a mobile terminal.

10. The non-transitory computer-readable storage medium according to claim 1, wherein the status of the first user changes based on position information about a mobile terminal of the first user.

11. The non-transitory computer-readable storage medium according to claim 1, wherein the method further comprises: obtaining, from among first information associating events that may occur in the device with a plurality of target organizational positions of users, target organizational positions of users associated with the first event; identifying, from among second information associating specific users and specific organization positions of the specific users, users whose specific organizational positions agree with the obtained target organizational positions of users associated with the first event, wherein the first user and the second user are each identified in the identifying from among the second information.

12. The non-transitory computer-readable storage medium according to claim 1, wherein the method further comprises: obtaining, from among first information associating events that may occur in the device with statuses of users, a status associated with the first event; and identifying, from among second information associating specific users and statuses of the specific users, users whose status agrees with the obtained status associated with the first event, wherein notification of the first event is transmitted to the identified users whose status agrees with the obtained status associated with the first event.

13. A control method for an information processing apparatus, the control method comprising: receiving information indicating that an event has occurred in a device; identifying a first user and a second user that should each receive, based on a type of the event, a notification of the event; obtaining a status of the first user that should receive, based on the type of the event, the notification of the event; obtaining a status of the second user that should receive, based on the type of the received event, the notification of the event; and transmitting, in a first case where the obtained status of the first user that should receive the notification of a first event is a first status and the obtained status of the second user that should receive the notification of the first event is a second status different from the first status, the notification of the first event to the first user without transmitting the notification of the first event to the second user, and transmitting, in a second case where the obtained status of the first user that should receive the notification of a second event is the first status and the obtained status of the second user that should receive the notification of the second event is the second status different from the first status, the notification of the second event to the first user and to the second user.

14. An information processing system comprising: a memory storing computer-readable instructions; and a processor configured to execute the computer-readable instructions stored in the memory to cause the information processing system to: receive information indicating that an event has occurred in a device; identify a first user and a second user that should each receive, based on a type of the event, a notification of the event; obtain a status of the first user that should receive, based on the type of the event, the notification of the event; obtain a status of the second user that should receive, based on the type of the received event, the notification of the event; and transmit, in a first case where the obtained status of the first user that should receive the notification of a first event is a first status and the obtained status of the second user that should receive the notification of the first event is a second status different from the first status, the notification of the first event to the first user without transmitting the notification of the first event to the second user, and transmit, in a second case where the obtained status of the first user that should receive the notification of a second event is the first status and the obtained status of the second user that should receive the notification of the second event is the second status different from the first status, the notification of the second event to the first user and to the second user.