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Transferring application state across devices with checkpoints.

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A first client device executes a plurality of actively running applications, each having one or more checkpoints, each checkpoint identifying an execution breakpoint at which a respective application can be suspended and subsequently resumed. The first client device detects a transfer triggering condition, stores an application state for each of the plurality of actively running applications, and transmits the stored application state for each of the plurality of actively running applications to a second client device or system. The stored application state for each respective application of the plurality of actively running applications corresponds to a checkpoint of the respective application. Optionally, the transfer triggering condition includes presence of the second client device or system within a predefined proximity of the first client device or system, wherein the predefined proximity is a predefined proximity for near field communication.

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Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift wijkt af van de oorspronkelijk ingediende stukken. Alle ingediende stukken kunnen bij NL Octrooiencentrum worden ingezien.

Transferring Application State Across Devices with Checkpoints

TECHNICAL FIELD

5 [0001] The disclosed embodiments relate generally to wireless communication and more particularly to transferring use of one or more applications between two devices through wireless communication connections.

BACKGROUND

10 [0002] A user with multiple devices, such as one or more smart phones, tablets, laptop computers or the like, may want to switch from using one device to another while continuing to work with or access the same application or content. For example, the user may want to transfer from one device to another in order to use the device best suited for a given task. For example, it is easy to read email from a smart phone but difficult to reply due to the size limitations on the phone keyboard. A user may start a draft of a message on a phone, but prefer to finish the draft using a tablet, which has a
15 larger keyboard. In another example, a user starts playback of a video using a tablet or smart phone, but would prefer to continuing viewing the video on a device with a larger screen such as a television or laptop computer. In yet another example, a user may start a phone call using a landline telephone but want to continue the phone call using a mobile phone using a cellular connection, or vice versa.

20 SUMMARY

[0003] In some embodiments, a first client device or system performs a method that includes executing a plurality of actively running applications, each of the plurality of actively running applications having one or more checkpoints, each checkpoint identifying an execution breakpoint at which the respective application can be
25 suspended and subsequently resumed. The method further includes detecting a transfer triggering condition, storing an application state for each of the plurality of actively running applications, and transmitting the stored application state for each of the plurality of actively running applications to a second client device or system. The stored application state for each respective application of the plurality of actively
30 running applications corresponds to a checkpoint of the respective application.

[0004] Optionally, the transfer triggering condition includes presence of the second client device or system within a predefined proximity of the first client device

or system, wherein the predefined proximity is a predefined proximity for near field communication.

[0005] Optionally, the method includes, upon detecting the triggering condition, waiting for a respective actively running application of the plurality of actively running applications to reach a checkpoint of the respective actively running application, and
5 upon detecting the respective actively running application entering the checkpoint, suspending the respective actively running application.

[0006] Optionally, the method includes, upon detecting the triggering condition, waiting for the plurality of actively running applications to reach respective
10 checkpoints, and upon detecting each respective application entering the corresponding checkpoint, suspending the plurality of actively running applications.

[0007] Optionally, the method includes, notifying each of the actively running applications that the application state has been transmitted to the second client device or system.

15 **[0008]** In some embodiments, a non-transitory computer readable storage medium stores one or more programs for execution by one or more processors of a client device or system, the one or more programs comprising instructions that, when executed by the one or more processors, cause the client device or system to perform the above described method.

20 BRIEF DESCRIPTION OF THE DRAWINGS

[0009] For a better understanding of the disclosed embodiments, reference should be made to the Description of Embodiments below, in conjunction with the following drawings in which like reference numerals refer to corresponding parts throughout the figures.

25 **[0010]** Figure 1 is a block diagram of a system for enabling transferring application state across devices according to one embodiment.

[0011] Figure 2 is a block diagram illustrating of a client device or system, in accordance with some embodiments.

30 **[0012]** Figures 3A-3C include a flow chart illustrating a method of operation of a client device or system, for transmitting the application state of a respective application to another client device or system, in accordance with some embodiments.

[0013] Figures 4A-4C include a flow chart illustrating a method of facilitating transitioning use of an application by a user from a first client device or system to a second device or system, in accordance with some embodiments.

[0014] Figures 5A-5C include a flow chart illustrating a method of transmitting the application states of a plurality of actively running applications from a first client device or system to a second client device or system, in accordance with some embodiments.

[0015] Figure 6 includes a flow chart illustrating a method of transmitting the application state of an actively running application from a first client device or system to a second client device or system, in accordance with some embodiments.

DESCRIPTION OF EMBODIMENTS

[0016] It will be understood that, although the terms “first,” “second,” etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a first application could be termed a second application, and, similarly, a second application could be termed a first application, without changing the meaning of the description, so long as all occurrences of the “first application” are renamed consistently and all occurrences of the second application are renamed consistently. The first application and the second application are both application, but they are not the same application.

[0017] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the claims. As used in the description of the embodiments and the appended claims, the singular forms “a”, “an” and “the” are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will also be understood that the term “and/or” as used herein refers to and encompasses any and all possible combinations of one or more of the associated listed items. It will be further understood that the terms “comprises” and/or “comprising,” when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0018] As used herein, the term “if” may be construed to mean “when” or “upon” or “in response to determining” or “in accordance with a determination” or “in

response to detecting,” that a stated condition precedent is true, depending on the context. Similarly, the phrase “if it is determined [that a stated condition precedent is true]” or “if [a stated condition precedent is true]” or “when [a stated condition precedent is true]” may be construed to mean “upon determining” or “in response to determining” or “in accordance with a determination” or “upon detecting” or “in response to detecting” that the stated condition precedent is true, depending on the context.

[0019] Reference will now be made in detail to various embodiments, examples of which are illustrated in the accompanying drawings. In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the described embodiments. However, some embodiments may be practiced without these specific details. In other instances, well-known methods, procedures, components, and circuits have not been described in detail so as not to unnecessarily obscure aspects of the embodiments.

[0020] Fig. 1 is a block diagram illustrating a distributed system 100 having two or more client devices or systems 102 (hereinafter called clients 102). The distributed system 100 typically further includes one or more communication networks 120 and a plurality of application servers or server systems such as one or more messaging servers 130 and one or more multimedia servers 140.

[0021] In some embodiments, each of the clients 102-1 and 102-2 has a near field communication (NFC) module 104 for handling NFC communications, a network module 106 for handling network communications, an application transfer module 108 discussed in more detail below, and one or more application programs 110, 112, 114. NFC modules 104-1 and 104-2 enable NFC communication between NFC-enabled devices. In some embodiments, the applications on a client 102 include one or more messaging applications 110, one or more multimedia applications 112 and optionally other applications 114 as well. As described in more detail below, in some implementations, when a user brings two clients 102 into close proximity (e.g., within NFC communication distance of each other, which typically means within 10 cm of each other, but optionally means within 5 cm or 4cm), the application state of one or more applications (e.g., the active or foreground application) on one of the clients (e.g., client 102-1) is transferred to the other client (e.g., client 102-2).

[0022] Messaging server 130 includes one or more messaging server applications 131, a messaging database 133 that stores messaging account information 135 for multiple users of a messaging service supported by server 130, and optionally other databases 137 as well. For example, messaging server 130 may be a Gmail server, an email server other than a Gmail server, or an instant messaging server.

Multimedia server 140 includes one or more multimedia server applications 141, one or more multimedia databases 143, including multimedia account information 145, and optionally other databases 147 as well. Examples of multimedia server 140 include a YouTube server, online radio servers, and social gaming servers.

10 **[0023]** In some implements, a user reading an email message using a client-side messaging application 110-1 (e.g., Gmail) on his mobile cell phone (client 102-1) may instead want to reply to the message on a nearby desktop computer (client 102-2) that has a larger keyboard and a bigger display screen. To do this, the user brings his mobile cell phone 102-1 into close proximity with computer 102-2. Both clients 102

15 have NFC modules 104. NFC module 104-1 in client 102-1 detects the presence of computer 104-2, and a NFC communication connection is established between mobile phone 102-1 and computer 102-2. The current state of messaging application 110-1, in this example comprising the user's account identifier (e.g., username@domainname.com) and message identifier is transmitted over the NFC

20 connection to computer 102-2. Optionally, messaging application 110-1 in client 102-1 also communicates with messaging server 130 over communications networks 120 to ensure that server 130 has the most recent status with respect to the message currently displayed by client 102-1. Computer 102-2 receives the current state of messaging application 102-1 from the phone 102-1, and in response, messaging application 110-2

25 in computer 102-2 downloads a copy of the email message from messaging server 130 via communication networks 120. From the user's point of view, as soon as he sits down in front of the display of computer 102-2, the same email message he was reading on phone 102-1 is now displayed on the display screen of computer 102-2 and he can start typing his reply using the keyboard of computer 102-2.

30 **[0024]** Figure 2 is a block diagram illustrating a client device or system (client) 102 in accordance with some embodiments. Client 102 typically includes one or more processors 202 (also called processing units or CPU(s)), memory 204, a near field communication (NFC) transceiver (transmitter and receiver) 206, one or more network

or other communication interfaces 208, a user interface 205 (typically including comprising a display device and a keyboard, mouse, touchpad, touchscreen or other input device), and one or more communication buses 209 for interconnecting these components. The communication buses 209 optionally include circuitry (sometimes
5 called a chipset) that interconnects and controls communications between system components. Memory 204 typically includes high-speed random access memory, such as DRAM, SRAM, DDR RAM or other random access solid state memory devices; and optionally includes non-volatile memory, such as one or more magnetic disk storage devices, optical disk storage devices, flash memory devices, or other non-volatile solid
10 state storage devices. Memory 204 optionally includes one or more storage devices remotely located from the CPU(s) 202. Memory 204, or alternatively the non-volatile memory device(s) within memory 203, comprises a non-transitory computer readable storage medium. In some embodiments, memory 204 or alternatively the non-
15 transitory computer readable storage medium stores the following programs and/or modules for execution by the one or more processors 202 and data structures, or a subset thereof:

- an Operating System 210 that includes procedures for handling various basic system services and for performing hardware dependent tasks;
- a network communications module (or instructions) 106 that is used for
20 connecting client 102 to other computers (e.g., messaging server 130 or multimedia server 140) via one or more network interfaces 208 (wired or wireless) and one or more communication networks 120 (Figure 1), such as the Internet, other wide area networks, local area networks, metropolitan area networks, and so on;
- a near field communications module 104 for connecting client 102 to other
25 clients, devices or systems via NFC transceiver 206, using near field communications;
- an application registration module 212, which maintains application registration information 214 for one or more applications that are registered for sharing their
30 application state with other client devices or systems information; for example, application registration information 214 may include information for a messaging application 110 that is registered to share its application state with another device (e.g., client 102-2) upon detection of a triggering condition;

- an application transfer module 108, for transferring the application state of one or more applications (e.g., applications registered with application registration module 212 to share application state) to another device (e.g., client 102-2) upon detection of a triggering condition; and
- 5 • one or more applications 110, 112, 114, such as a messaging application 1120, browser or multimedia application 112, and optionally one or more other applications 114.

[0025] In some implementations, near field communications module 104 includes an NFC detection module 220 and an NFC communication module 222. NFC
10 detection module 220 detects the presence of another NFC-enabled device or system within a predefined proximity and notifies client 102 upon detecting the presence of another NFC-enabled device or system within the predefined proximity. The predefined proximity is typically the proximity required to successfully establish an NFC communication channel (also called an NFC connection) between two devices, or
15 to successfully conduct NFC communications. While environmental conditions can affect the ability to form an NFC connection, the predefined proximity is typically no greater than 10 cm, and in some implementations requires the two devices to be within 5 cm or 4cm of each other. NFC communication module 222 handles communications between client 102 and other device via NFC transceiver 206, such as the transmission
20 or receipt of application state, or application state information, for one or more applications.

[0026] In some implementations, application registration information 214 includes, for each registered application one or more of: an application program identifier, a mime type, and information (e.g., a procedure name, reference to an API,
25 or the like) that enables application transfer application to obtain the application state of the registered application. Optionally, application registration information 214 is maintained by client 102 as a searchable database, table or list.

[0027] In some implementations, a respective application program stores its own application state information during execution, and thus the application state is
30 updated from time to time. Depending on the type of the applications running, the information type and the size of the application state (e.g., the amount of memory required to store the application state) may be different from one application to another,

and may be stored either locally (i.e., on client 102) or remotely, such as on a remotely located server.

[0028] In some embodiments, messaging application 110 locally stores messaging application state information 224, as well as a user identifier or account name 226. The user identifier or account name 226 indicates the user or account for which messages or other information is being displayed by messaging application 110. Depending on the current application context of messaging application 110, messaging application state information 224 includes at least one of: the identifier of a message and the format of the message currently viewed or worked on by the user, information identifying a list of messages currently displayed by client 102, information identifying a list of conversations (sometimes called message threads) currently displayed by client 102, information identifying a contact for which contract information is currently displayed by client, etc. Messaging application state information 248 may be saved either locally at client 102, or remotely on a messaging server.

[0029] In some embodiments, browser or multimedia application 112 locally stores browser application state information 228. In some implementations, browser application state information 228 is or includes the URL of a document currently being viewed, and is saved locally at client 102. Optionally, browser application state information 228 is or includes additional information, such as one or more of: document position, playback position, user entered content or modifications to the displayed document, etc.

[0030] Optionally, other applications 114, if provided, store application state information 230 of various types, depending on the type of application.

[0031] Each of the above-identified modules, applications or programs corresponds to a set of instructions, executable by the one or more processors of client 102, for performing a function described above. The above identified modules, applications or programs (i.e., sets of instructions) need not be implemented as separate software programs, procedures or modules, and thus various subsets of these modules may be combined or otherwise re-arranged in various embodiments. In some embodiments, memory 203 optionally stores a subset of the modules and data structures identified above. Furthermore, memory 203 may stores additional modules and data structures not described above.

[0032] Figures 3A-3C include a flow chart illustrating a method 300 of operation of a client device or system (hereinafter called a client, for ease for reference) according to some embodiments. Method 300 is performed by a first client, such as client 102-1 described above with reference to Figures 1 and 2. Registration information (e.g., 214, Figure 2) for a respective application (e.g., messaging application 110, browser/multimedia application 112) indicating that the respective application is registered for sharing application state (e.g., messaging application state 224 or browser application state 228) with other devices is retained in memory (302). The application state of the respective application is stored either in memory of client 102 or in memory of a server at a remote location from the client (304). During execution of the respective application, the application state is dynamically updated and stored in memory, as needed.

[0033] A transfer triggering condition for transferring application state of the respective application to another device client (e.g., from first client 102-1 to second client 102-2, Figure 1) is detected (306). The triggering condition is presence of another device (e.g., second client 102-2) within a predefined proximity of first client 102-1 (308). This is sometimes herein called a “zero-click” triggering condition, for “zero-click” sharing. As noted above, the predefined proximity is typically the proximity required to successfully establish an NFC communication channel (also called an NFC connection) between two devices, or to successfully conduct NFC communications. In various implementations, the predefined proximity is no greater than 10 centimeters, 5 centimeters, or 4 centimeters. In some implementations, in addition to detecting the NFC field of another device, a “bump” must be detected (e.g., using one or more accelerometers in client 102-1), including that the two client devices have physically touched. In some implementations, the user need not take any action other than bringing the two devices within the predefined proximity, and hence this is sometimes called “zero-click” sharing.

[0034] In some implementations, the triggering condition further includes successfully establishing a near field communication connection between first client 102-1 and second client 102-2 (310). Optionally, first client 102-1 may need to transmit user authentication information to successfully establish the near field communication connection with second client 102-2.

[0035] Upon detecting the triggering condition, client 102-1 determines, in accordance with the stored registration information (214, Figure 2), that a respective application (e.g., the application running in the foreground of client 102-1) is registered for application state sharing (312), and transmits the application state of the respective application to second client 102-2 (314). For ease of explaining method 300, it shall be assumed that the only application for which an application state is to be transmitted to another device is the foreground application, if any, where the foreground application is the application running in a topmost or foreground application window of first client 102-1. However, in some implementations, described in more detail below with reference to Figures 5A-5C, application state for more than one application is transmitted by first client 102-1 to second client 102-2.

[0036] Optionally, the respective application (at client 102-1) is notified that the application state has been transmitted to client 102-2 upon completion of the transmission (316). In some embodiments, client 102-1 may optionally change the application state of the respective application in response to the notification (e.g., at the end of the transmission of the application state) (318). For example, in the case where the respective application is a browser application, the browser application may terminate after receiving notification that the application state has been transmitted. In another example, where the respective application is an email application, after receiving notification of that the application state has been transmitted to another client, the draft message or the message being reviewed is closed, because it is assumed that the user will resume use of the email application at client 102-2. In yet another example, where the respective application is a multimedia player, playback of a video/audio by first client 102-1 is stopped after the multimedia player state is sent and notification thereof is provided to the multimedia player.

[0037] In some implementations, the respective application is a foreground application, executing in a foreground application window of client 102-1 (322, Figure 3B; 332, Figure 3C). Typically in client devices such as mobile phones or tablet computers, there is only one foreground application. In some implementations, the application state of the respective application includes at least one of the group consisting of: one or more unsent message drafts, state information for an ongoing telephone call, a playback position for video content, a playback position for audio content, a message account identifier, a message identifier for an unsent message draft,

a message identifier for a currently viewed message, a mime type associated with the respective application (324). A playback position is typically a timestamp and/or frame number. The message identifier can be the message identifier for an unsent message draft, or for a message currently being viewed in the foreground at client 102-1. In
5 some implementations, a copy of the application state from the respective application is requested (334) (e.g., application transfer module 108 requests the application state from a respective application, and then transfers that application state to second client 102-2).

[0038] Optionally, when the application state of the respective application is stored remotely (e.g., for an online application), a copy of the application state from the
10 respective application is requested from a respective server and downloaded to first client 102-1, which then transfers it to second client 102-1. Alternatively, when the application state of the respective application is stored remotely (e.g., for an online application), a copy of the application state from the respective application is requested
15 by second client 102-2 from a respective server and is downloaded directly second client 102-2.

[0039] In some embodiments, at least a portion of the application state is transmitted to second client 102-2 using near field communication (336). Furthermore, in some implementations, at least another portion of the application state is transmitted
20 using wireless communication other than near field communication, such as Bluetooth communication or WiFi communication (338). In an exemplary implementation, in which transmitting the application state would exceed a threshold amount of time (e.g., 0.5 seconds), a portion of the application state is transferred by NFC and a remaining portion is transferred using another wireless communication channel. In yet other
25 implementations, the application state is entirely transmitted using a near field communication connection between the first client device or system and the second device or system (340).

[0040] Method 300 is typically governed by instructions that are stored in a non-transitory computer readable storage medium in a respective client 102-1 and that
30 are executed by one or more processors of a respective client device or system 102. Each of the operations shown in Figures 3A-3C typically corresponds to computer readable instructions which are stored in a computer memory or non-transitory computer readable storage medium in a respective client 102-1 and which are executed

by one or more processors of the respective client 102-1. The non-transitory computer readable storage medium includes one or more memory devices of client 102-1, as described above with respect to Figure 2. The computer readable instructions stored on the non-transitory computer readable storage medium of client 102-1 are typically source code, assembly language code or object code.

5 **[0041]** Additionally, it should be noted that details of other processes described herein with respect to methods 400, 500 and 600 (e.g., Figures 4A-4C, 5A-5C and 6, respectively) are also applicable in an analogous manner to method 300 described above with respect to Figures 3A-3C. For example, triggering conditions, and state information transferred may have one or more of the characteristics of the various the methods described herein with reference to methods 400, 500 and 600. For brevity, these details are not repeated here.

10 **[0042]** Attention is now directed to a method 400 of transitioning use of an application by a user from one client device (e.g., first client 102-1) to another (e.g., second client 102-2), as illustrated by the flow chart in Figures 4A-4C. At first client 102-1 which is under control of a respective user, registration information of applications registered to share application information with other devices or systems is optionally retained in memory of client first 102-1 (402). See application registration information 214, Figure 2. A first application is actively running on first client 102-1(404). As described above, the application state of the actively running application is typically stored by first client 102-1.

20 **[0043]** While the first application is running, client 102-1 performs a handoff operation (406). In some embodiments, the handoff operation is performed by or under the control of application transfer module 108 (Figure 2). The handoff operation begins when client 102-1 detects that it is positioned within a predefined proximity of a second device (414). Alternately stated, the handoff operation begins when client 102-1 detects proximity of the second client. In some implementations, such proximity is detected by NFC detection module 220 (Figure 2). As described above, proximity of the second client is typically detected when the second client is within 10 cm, 5 cm or 4 cm of first client 102-1 (416).

30 **[0044]** In some implementations, as part of the handoff operation (406), client 102-1 requests from the actively running application (first application) a copy of its current application state (418). Alternatively, application transfer module 108 directly

accesses state information for the actively running application. Client 102-1 transmits application information (e.g., the aforementioned state information) associated with the first application to client 102-2 (420).

[0045] At second client 102-2, registration information of applications
5 registered to share application information with other devices or systems is optionally retained (412). Second client 102-2 also detects proximity of the first client 1021, when the two devices are within a predefined proximity (422). As part of the handoff operation described above, second client 102-2 receives the application information from client 102-1 (424). In response to receiving application information from first
10 client 102-1, second client 102-2 executes a second application corresponding to the first application with an initial user interface state corresponding to the first client device user interface state (426). In some embodiments, second client 102-2 is under control of the same user who controls first client 102-1. Unless otherwise stated, however, the handoff operation 406 is performed whether the first and second clients
15 are under control of the same user or not.

[0046] In some embodiments, the handoff operation occurs when the second device or system is physically touched by the first device or system. For example, an accelerometer can be used in one or both devices to detect the touch/bump, which is used to ensure that the handoff is in response to an intentional act, and thus avoid
20 accidental handoffs.

[0047] Referring now to Figure 4B, as noted above, second client 102-2 receives application state information from first client 102-1(424). Examples of the application state information received include the mime type of the first application and/or content of the first application. In some embodiments, client 102-2 stores the received application state information and passes the received state information to the
25 second application (430). In some embodiments where a second application corresponding to the mime type does not exist on client 102-2, the user having control of second client 102-2 is prompted to download the second application corresponding to the first application (432). Furthermore, second client 102-2 downloads the
30 respective second application (e.g., from a host server via communications networks 120) in response to user instruction (434). Second client 102-2 executes a second application corresponding to the first application with an initial user interface state corresponding to the first client device user interface state (426). For example, the

second application is an application that can process content of the same type (e.g., MIME type) as the first application.

[0048] In some embodiments, if the second application corresponding to the first application is not already executing as a foreground application in second client 102-2, in response to receiving application information from first client 102-1, second client 102-2 executes the second application corresponding to the first application as the foreground application (440). In some embodiments where the second application is not actively running when the handoff operation is performed, second client 102-2 automatically starts executing the second application within a predefined time period (442). For example, the predefined time period is 0.5 seconds such that the starting of the second application is not noticeable to the user.

[0049] In some implementations, the first application and second application are instances of two distinct applications of a same application type (450). In other implementations, the first application and second application are two instances of a same application (452). In yet other implementations, the first application and second application are applications that both handle the same content type(s) (e.g., MIME type or types), but are optionally different types of applications (e.g., a reader/player vs. an editor).

[0050] In one example, the first application and second application are both email applications (454) (e.g., two distinct email applications, or two instances of the same email application). Note, when both applications of email applications, it is typically required that both clients 102 are under control of the same user or entity to protect the confidential information that may be contained in the email account of the user or entity.

[0051] In another example, the first application and second application are both multimedia players (456). In yet another example, the first application and second application are communication applications for audio or audio/visual communication (458).

[0052] In some embodiments for cases where the first application and second application are both email applications, the first client device user interface state comprises display of a particular message or conversation thread, and the initial user interface state corresponding to the first client device user interface state comprises display of said particular message or conversation thread. In another example, the first

client device user interface state comprises display of an unsent draft message, and the initial user interface state corresponding to the first client device user interface state comprises display of said unsent draft message. In yet another example, the first client device user interface state comprises display of a first list of conversations
5 corresponding to a user-specified search query, and the initial user interface state corresponding to the first client device user interface state comprises display of a second list of conversations corresponding to the user-specified search query. In some implementations, the first and second lists are either the same, or one is shorter than the other when one of the client devices has a smaller display than the other client device.

10 **[0053]** In some embodiments for cases where the first application and second application are both multimedia applications, the first client device user interface state comprises playback of a first multimedia item at a first playback position and the initial user interface state corresponding to the first client device user interface state comprises playback of the first multimedia item at a second playback position
15 corresponding to the first playback position. In some embodiments, the second playback position has a predefined offset with respect to the first playback position. For example, the initial user interface state at the second client device may be earlier in the playback than the first client device user interface state by a predefined offset (e.g., 0.5 to 3.0 seconds earlier), in order to ensure that the handoff does not cause the user to
20 miss any content.

[0054] In some embodiments, for cases where the first application and second application are both communication applications for audio or audio/visual communication, the initial user interface state of the second client corresponds to a communication connection by the second client to a same destination as a
25 communication connection by the first client when the handoff operation is performed.

[0055] In some embodiments, the application content that is transmitted as part of the application state is selected from the group consisting of a URL, contact information for a respective address book entry, information identifying a displayed map, information identifying a displayed map and set of directions for traveling
30 between two locations. For example, second client 102-2, in response to receiving the application state from the first client 102-1, uses the mime type included in the received application state to determine whether the second client has a second application corresponding to the first application. If it is determined that it does not have the

second application with a matching mime type, second client 102-2 displays a prompt to download a respective second application corresponding to the mime type, downloads the respective second application in response to user instruction, and executes the second application.

5 **[0056]** Referring to Figure 4C, first client 102-1 not only can hand off application information (sometimes herein called state information) for a respective application to another client (e.g., client 102-2), as represented by operation 406, but it can also receive application information from another client during a handoff operation (470). For example, after a time after the above described handoff operation 406, the
10 user may want to transfer the state of the same application or another application back to first client 102-1. Typically, first application 102-1 will have no actively running application, or no application running in the foreground, when it receives a handoff operation. However, in other implementations, various other mechanisms may be used to determine whether first client 102-1 should accept application information from
15 another client.

[0057] The second handoff operation, like the one described above, is typically performed in response to detecting a triggering operation. Triggering conditions are described above, and therefore that description is not repeated here. In this second handoff operation, first client 102-1 receives from another client device of system
20 application information (e.g., state information) for a third application (472). For example, the received application information includes a mime type and application content and/or state information. Such information is described above, and thus is not repeated here. Typically, the received application information is stored by first client 102-1 and passed to a respective application (e.g., a fourth application) corresponding
25 to the third application (474). In some implementations, the respective application to be used is determined in accordance with the mime type specified in the received application information. The respective application (e.g., fourth application) corresponding to the third application is executed by the first client device, with an initial user interface corresponding to the user interface at the other client device or
30 system from which the application information was received (476).

[0058] Method 400 is typically be governed by instructions that are stored in a non-transitory computer readable storage medium in a respective client 102-1 and that are executed by one or more processors of a respective client device or system 102.

Each of the operations shown in Figures 4A-4C typically corresponds to computer readable instructions which are stored in a computer memory or non-transitory computer readable storage medium in a respective client 102-1 and which are executed by one or more processors of the respective client 102-1. The non-transitory computer readable storage medium includes one or more memory devices of client 102-1, as described above with respect to Figure 2. The computer readable instructions stored on the non-transitory computer readable storage medium of client 102-1 are typically source code, assembly language code or object code.

[0059] Additionally, it should be noted that details of other processes described herein with respect to methods 300, 500 and 600 (e.g., Figures 3A-3C, 5A-5C and 6, respectively) are also applicable in an analogous manner to method 400 described above with respect to Figures 4A-4C. For example, triggering conditions, and state information transferred may have one or more of the characteristics of the various the methods described herein with reference to methods 300, 500 and 600. For brevity, these details are not repeated here.

[0060] Figures 5A-5C include a flow chart illustrating a method 500 of operation of a client device or system (hereinafter called a client for ease for reference) according to some embodiments. Method 500 is performed by a client device or system, such as first client 102-1 described above with reference to Figures 1 and 2. First client 102-1 executes a plurality of actively running applications with one or multiple checkpoints, each checkpoint identifying an execution breakpoint at which the respective application can be suspended and subsequently resumed (502). The application state of the respective application for each respective application of the plurality of actively running applications corresponding to a checkpoint of the respective application is dynamically stored either in memory of the client or in memory of a server at a remote location from the client (504). A transfer triggering condition for transferring application state of the actively running applications to another device client (e.g., from first client 102-1 to second client 102-2, Figure 1) is detected (506). Optionally, client 102-optionally waits for the plurality of actively running applications to enter their respective checkpoints and suspends execution of the plurality of actively running applications (508, 511). Alternatively, in some implementations, upon detecting the triggering condition, first client 102-1 suspends a respective actively running application of the plurality of actively running applications

when the respective actively running application reaches a checkpoint of the respective actively running application (509).

[0061] The stored application state of the plurality of actively running applications is transmitted to client 102-2 (512). In some embodiments, each of the
5 actively running applications is notified that the application state has been transmitted to the second client device (514).

[0062] Referring to Figure 5B, in some embodiments, detecting the transfer triggering condition (506) includes detecting presence of another client device or system (e.g., second client 102-2) within a predefined proximity of first client 102-1
10 (308). Furthermore, as described above, in some embodiments, the predefined proximity is the proximity required to successfully establish an NFC channel (also called an NFC connection) between two devices, or to successfully conduct NFC communications (507). In some implementations, detecting the transfer triggering condition includes establishing an NFC channel (310). In some embodiments, the
15 transfer triggering condition includes an instruction by a user (e.g., pressing a button or object on a touch sensitive display) of the first client device or system (526). However, in many implementations, no user action other than bringing the two devices close to each other is required.

[0063] Referring to Figure 5C, in some embodiments first client 102-1 starts
20 transmitting the stored application state of the plurality of actively running applications only after detecting the suspension of the plurality of active applications (528). Alternatively, in some embodiments, first client 102-1 transmits the stored application state of an application to the second device or system after detecting the suspension of the respective active application without waiting for the suspension of the other still
25 actively running applications (530). In some embodiments (not shown in Figures 5A-5C), first client 102-1 transmits the stored application state of the plurality of actively running applications after a predefined number of applications have been suspended.

[0064] In some embodiments, to minimize the delay of transferring the application state from first client 102-1 to second client 102-2, the transfer triggering
30 condition comprises detecting the NFC field of the second device without forming a NFC connection. In some embodiments, first client 102-1 establishes a NFC connection with second client 102-2 either after having suspended the plurality of

actively running applications, or while in the process of suspending execution of the plurality of actively running applications.

[0065] In some implementations, first client 102-1 transmits user authentication information as part of the application state transmitted to second client 102-2 (532).

5 **[0066]** As described above, in some embodiments, at least a portion of the application state is transmitted to second client 102-2 using near field communication (336). Furthermore, in some implementations, at least another portion of the application state is transmitted using wireless communication other than near field communication, such as Bluetooth communication or WiFi communication (338). In
10 yet other implementations, the application state is entirely transmitted using a near field communication connection between the first client device or system and the second device or system (340).

[0067] Method 500 is typically be governed by instructions that are stored in a non-transitory computer readable storage medium in a respective client 102-1 and that
15 are executed by one or more processors of a respective client device or system 102. Each of the operations shown in Figures 5A-5C typically corresponds to computer readable instructions which are stored in a computer memory or non-transitory computer readable storage medium in a respective client 102-1 and which are executed by one or more processors of the respective client 102-1. The non-transitory computer
20 readable storage medium includes one or more memory devices of client 102-1, as described above with respect to Figure 2. The computer readable instructions stored on the non-transitory computer readable storage medium of client 102-1 are typically source code, assembly language code or object code.

[0068] Additionally, it should be noted that details of other processes described
25 herein with respect to methods 300, 400 and 600 (e.g., Figures 3A-3C, 4A-4C and 6, respectively) are also applicable in an analogous manner to method 500 described above with respect to Figures 5A-5C. For example, triggering conditions, and state information transferred may have one or more of the characteristics of the various the methods described herein with reference to methods 300, 400 and 600. For brevity,
30 these details are not repeated here.

[0069] Figure 6 includes a flow chart illustrating a method 600 of operation of a client device or system according to some embodiments. Method 600 is performed by a client device or system, such as client device or system 102-1 described above with

reference to Figures 1 and 2. Client 102-1 executes an actively running application having one or more checkpoints, each checkpoint identifying an execution breakpoint at which the actively running application can be suspended and subsequently resumed (602). The application state of the respective actively running application

5 corresponding to a checkpoint of the respective application is dynamically stored either in memory of the client or in memory of a server at a remote location from the client (604). A transfer triggering condition for transferring application state of the respective application to another device client (e.g., from client 102-1 to client 102-2, Figure 1) is detected (606). In some embodiments, the transfer triggering condition includes

10 presence of the second client device or system within a predefined proximity of the first client device or system (306, see also above description with reference to Figure 5B). Furthermore, in some embodiments, the predefined proximity is a predefined proximity for near field communication (308, Figure 5B, described above with reference to Figure 5B). In some embodiments, the transfer triggering condition includes an instruction by

15 a user (e.g., pressing a button or object on a touch sensitive display) of the first client device or system (526, described above with reference to Figure 5B).

[0070] Method 600 is typically be governed by instructions that are stored in a non-transitory computer readable storage medium in a respective client 102-1 and that are executed by one or more processors of a respective client device or system 102.

20 Each of the operations shown in Figure 6 typically corresponds to computer readable instructions which are stored in a computer memory or non-transitory computer readable storage medium in a respective client 102-1 and which are executed by one or more processors of the respective client 102-1. The non-transitory computer readable storage medium includes one or more memory devices of client 102-1, as described

25 above with respect to Figure 2. The computer readable instructions stored on the non-transitory computer readable storage medium of client 102-1 are typically source code, assembly language code or object code.

[0071] Additionally, it should be noted that details of other processes described herein with respect to methods 300, 400 and 500 (e.g., Figures 3A-3C, 4A-4C and 5A-30 5C, respectively) are also applicable in an analogous manner to method 600 described above with respect to Figure 6. For example, triggering conditions, and state information transferred may have one or more of the characteristics of the various the

methods described herein with reference to methods 300, 400 and 500. For brevity, these details are not repeated here.

[0072] The foregoing description, for purpose of explanation, has been described with reference to specific embodiments. However, the illustrative
5 discussions above are not intended to be exhaustive or to limit the invention to the precise forms disclosed. Many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various
10 modifications as are suited to the particular use contemplated.

Conclusies

1. Werkwijze, die wordt uitgevoerd door een eerste cliëntinrichting of -systeem
omvattend één of meer processors en een geheugen waarop één of meer programma's
5 zijn opgeslagen om uitgevoerd te worden door de één of meer processors, waarbij de
werkwijze omvat:

uitvoeren van een veelheid actief draaiende applicaties, waarbij elk van de
veelheid actief draaiende applicaties één of meer controlepunten heeft, waarbij elk
controlepunt een uitvoeringsbreekpunt identificeert waarop de respectieve applicatie
10 kan worden onderbroken en vervolgens kan worden hervat;

detecteren van een overdrachtsinitiatieconditie;

in reactie op het detecteren van de overdrachtsinitiatieconditie:

opslaan van een applicatietoestand voor elke respectieve applicatie van de
veelheid actief draaiende applicaties nadat de respectieve applicatie zijn respectieve
15 controlepunt bereikt, waarbij de opgeslagen applicatietoestand voor elke respectieve
applicatie van de veelheid actief draaiende applicaties correspondeert met het
controlepunt van de respectieve applicatie; en

20 onderbreken van de veelheid actief draaiende applicaties in reactie op het feit
dat de veelheid actief draaiende applicaties hun respectieve controlepunt binnentreedt,
zenden van de opgeslagen applicatietoestand voor elk van de veelheid actief
draaiende applicaties naar een tweede cliëntinrichting of -systeem.

2. Werkwijze volgens conclusie 1, waarbij de overdrachtsinitiatieconditie een
aanwezigheid van de tweede cliëntinrichting of het tweede cliëntsysteem binnen een
25 vooraf gedefinieerde nabijheid van de eerste cliëntinrichting of het eerste cliëntsysteem
omvat.

3. Werkwijze volgens conclusie 1, waarbij de overdrachtsinitiatieconditie een
aanwezigheid van de tweede cliëntinrichting of het tweede cliëntsysteem binnen een
30 vooraf gedefinieerde nabijheid van de eerste cliëntinrichting of het eerste cliëntsysteem
omvat, waarbij de vooraf gedefinieerde nabijheid een vooraf gedefinieerde nabijheid
voor nabije-veld-communicatie is.

4. Werkwijze volgens één van de conclusies 1 – 3, verder omvattend, na het detecteren van de overdrachtsinitiatieconditie, wachten tot een respectieve actief draaiende applicatie van de veelheid actief draaiende applicaties een controlepunt van de respectieve actief draaiende applicatie bereikt; en na het detecteren dat de respectieve actief draaiende applicatie het controlepunt binnentreedt, onderbreken van de respectieve actief draaiende applicatie.

5. Werkwijze volgens één van de conclusies 1-3, waarbij het zenden wordt uitgevoerd na het onderbreken van de veelheid actief draaiende applicaties.

10

6. Werkwijze volgens één van de conclusies 1 – 5, waarbij het zenden van de applicatietoestand het zenden van ten minste een gedeelte van de applicatietoestand onder gebruikmaking van nabije-veld-communicatie omvat.

7. Werkwijze volgens conclusie 6, waarbij het zenden van de applicatietoestand het zenden van ten minste een ander gedeelte van de applicatietoestand onder gebruikmaking van draadloze communicatie anders dan nabije-veld-communicatie omvat.

8. Werkwijze volgens één van de conclusies 1 – 7, waarbij het detecteren van de overdrachtsinitiatieconditie verder het opbouwen van een nabije-veld-communicatieverbinding tussen de eerste cliëntinrichting of het eerste cliëntstelsel en de tweede cliëntinrichting of het tweede cliëntstelsel omvat.

9. Werkwijze volgens één van de conclusies 1 – 8, waarbij de applicatietoestand van elk van de actief draaiende applicaties ten minste één omvat van de groep bestaande uit: één of meer niet-gezonden berichtconcepten, toestandsinformatie voor een lopende telefoonoproep, een afspeelpositie voor video-inhoud, een afspeelpositie voor audio-inhoud, een berichtaccount-identificator, een berichtidentificator voor een niet-gezonden berichtconcept, een berichtidentificator voor een momentaan bekeken bericht, een mime-type dat is geassocieerd met de respectieve applicatie.

30

10. Werkwijze volgens conclusies 1 – 9, verder omvattend het mededelen aan elk van de actief draaiende applicaties dat de applicatietoestand is gezonden naar de tweede cliëntinrichting of het tweede cliëntstelsel.

5 11. Niet-vluchtig computerleesbaar opslagmedium waarop één of meer programma's zijn opgeslagen om uitgevoerd te worden door één of meer processoren van een eerste cliëntinrichting of -stelsel, waarbij de één of meer programma's instructies omvatten voor:

10 uitvoeren van een veelheid actief draaiende applicaties, waarbij elk van de veelheid actief draaiende applicaties één of meer controlepunten heeft, waarbij elk controlepunt een uitvoeringsbreekpunt identificeert waarop de respectieve applicatie kan worden onderbroken en vervolgens kan worden hervat;

 detecteren van een overdrachtsinitiatieconditie;

 in reactie op het detecteren van de overdrachtsinitiatieconditie:

15 opslaan van een applicatietoestand voor elke respectieve applicatie van de veelheid actief draaiende applicaties nadat de respectieve applicatie zijn respectieve controlepunt bereikt, waarbij de opgeslagen applicatietoestand voor elke respectieve applicatie van de veelheid actief draaiende applicaties corresponderen met het controlepunt van de respectieve applicatie; en

20 onderbreken van de veelheid actief draaiende applicaties in reactie op het feit dat de veelheid actief draaiende applicaties hun respectieve controlepunt binnentreedt; en

 zenden van de opgeslagen applicatietoestand voor elk van de veelheid actief draaiende applicaties naar een tweede cliëntinrichting of het tweede cliëntstelsel.

25

12. Computerleesbaar opslagmedium volgens conclusie 11, waarbij één of meer programma's instructies omvatten die, wanneer ze worden uitgevoerd door de één of meer processoren, er voor zorgen dat de eerste cliëntinrichting of het eerste cliëntstelsel de werkwijze volgens één van de conclusies 1-10 uitvoert.

30

13. Eerste cliëntinrichting of -stelsel, omvattend:

één of meer communicatie-interfaces, omvattend een nabij-veld-communicatiezendontvanger;

één of meer processors; en

geheugen waarop één op meer programma's zijn opgeslagen om uitgevoerd te worden door de één of meer processors, waarbij de één of meer programma's instructies omvatten voor:

10 uitvoeren van een veelheid actief draaiende applicaties, waarbij elk van de veelheid actief draaiende applicaties één of meer controlepunten heeft, waarbij elk controlepunt een uitvoeringsbreekpunt identificeert waarop de respectieve applicatie onderbroken kan worden en vervolgens hervat kan worden;

detecteren van een overdrachtsinitiatieconditie;

in reactie op het detecteren van de overdrachtsinitiatieconditie:

15 opslaan van een applicatietoestand voor elke respectieve applicatie van de veelheid actief draaiende applicaties nadat de respectieve applicatie zijn respectieve controlepunt bereikt, waarbij de opgeslagen applicatietoestand voor elke respectieve applicatie van de veelheid actief draaiende applicaties correspondeert met het controlepunt van de respectieve applicatie; en

20 onderbreken van de veelheid actief draaiende applicaties in reactie op het feit dat de veelheid actief draaiende applicaties hun respectieve controlepunt binnentreedt; en

zenden van de opgeslagen applicatietoestand voor elk van de veelheid actief draaiende applicaties naar een tweede cliëntinrichting of het tweede cliëntstelsel.

14. Eerste cliëntinrichting of -stelsel volgens conclusie 13, waarbij de één of 25 meer programma's instructies omvatten die, wanneer ze worden uitgevoerd door de één of meer processors, er voor zorgen dat de eerste cliëntinrichting of het eerste cliëntstelsel de werkwijze volgens één van de conclusies 1-10 uitvoert.

Fig. 1

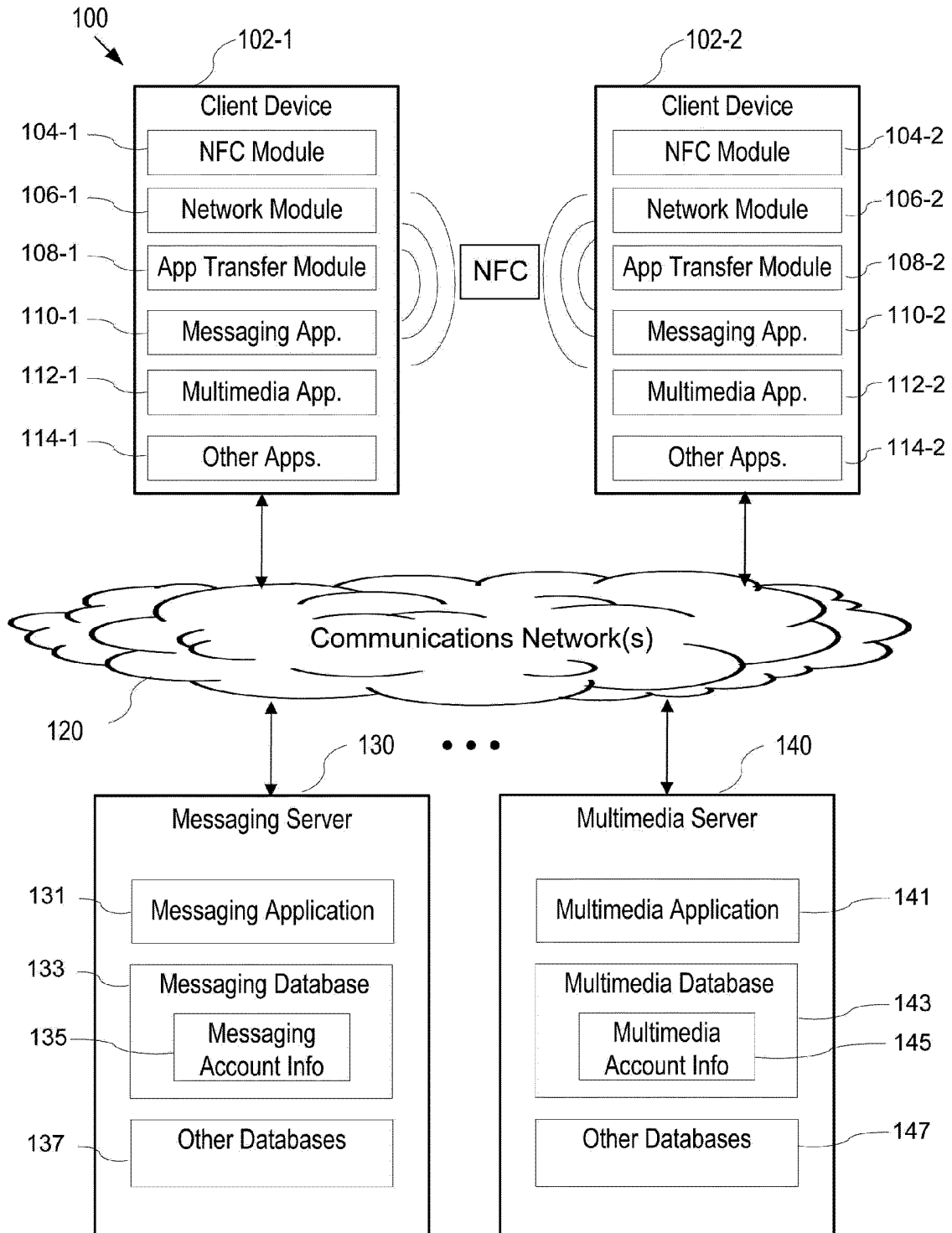


Fig. 2

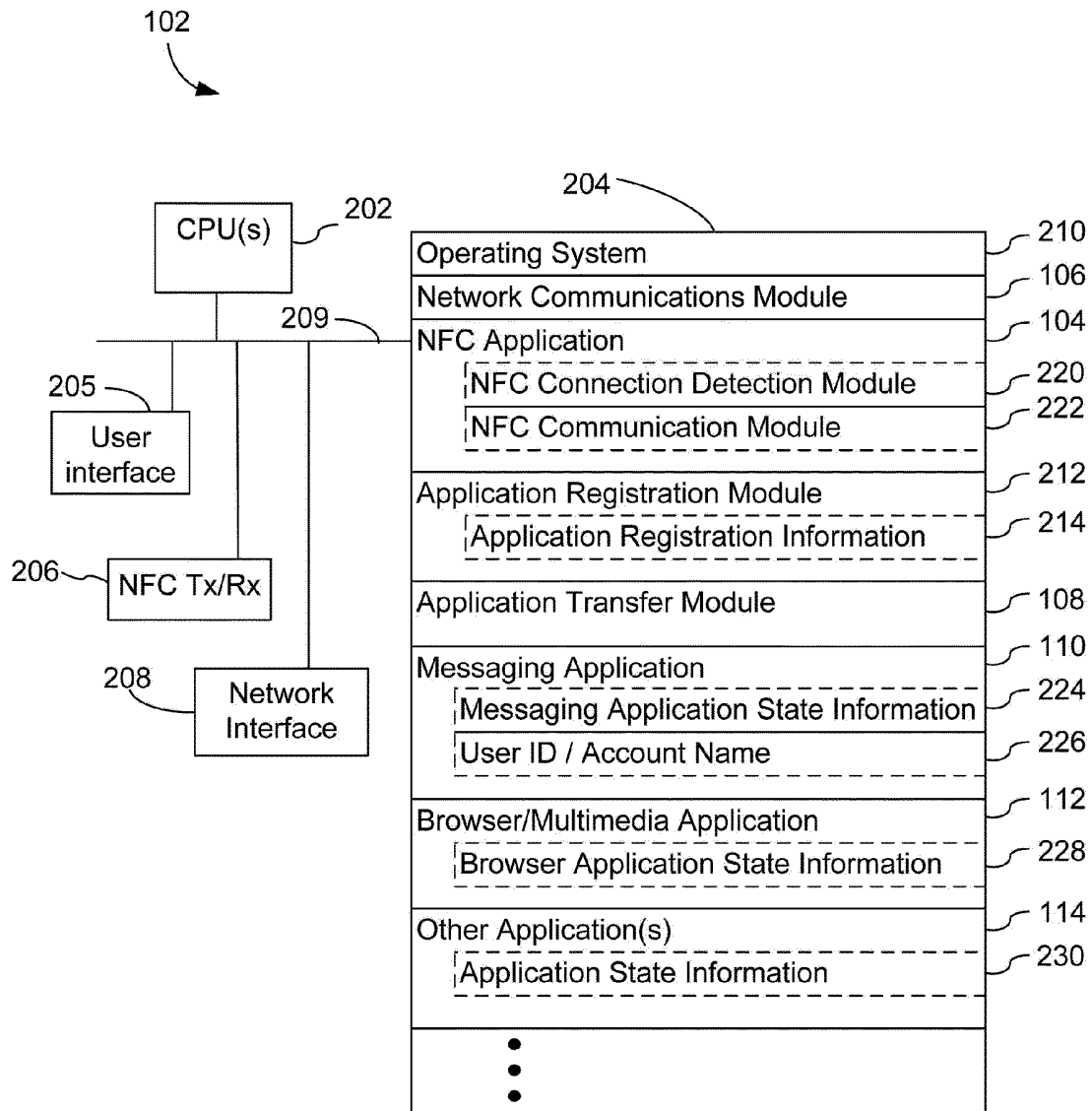


Fig. 3a

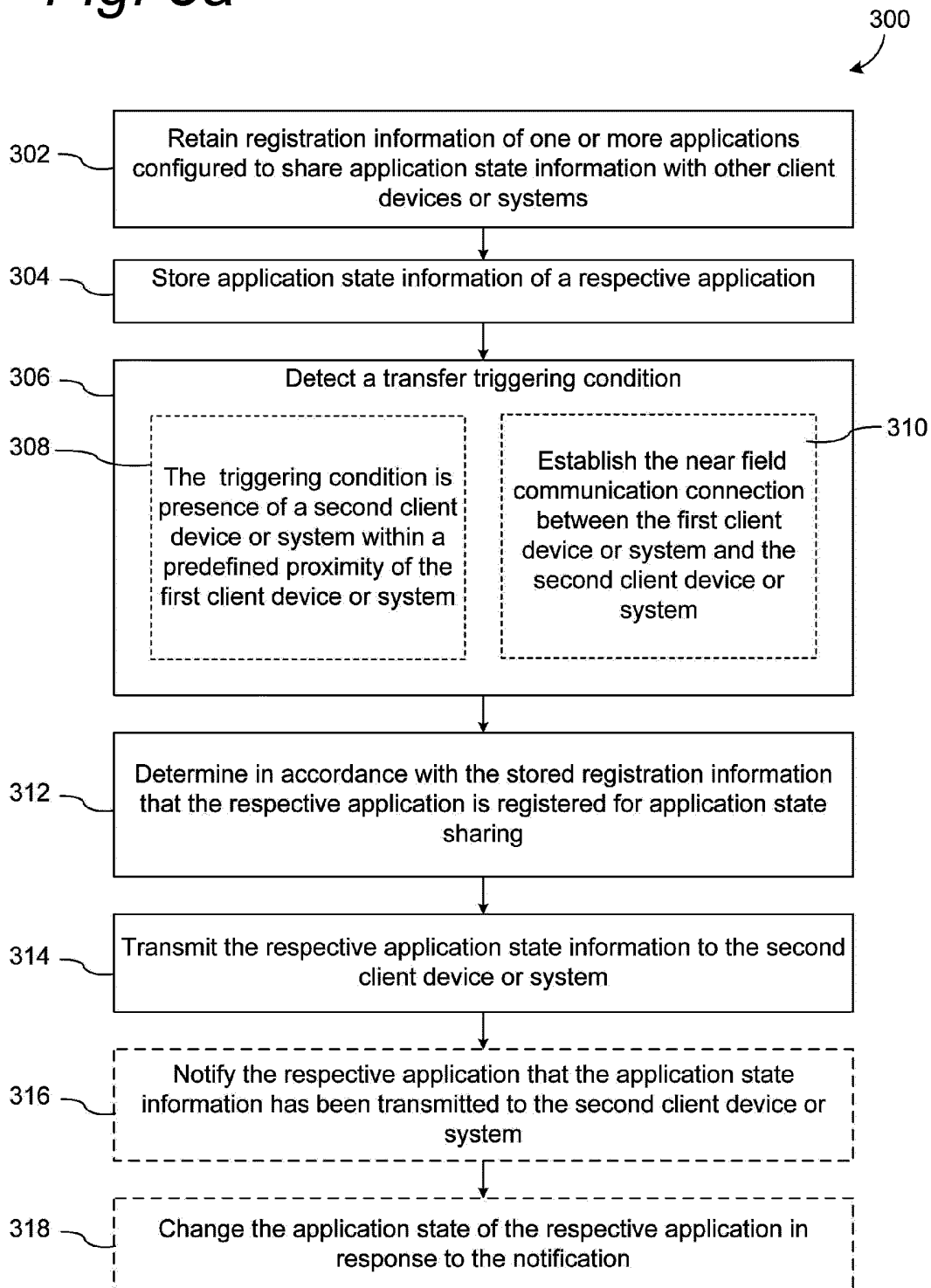


Fig. 3b

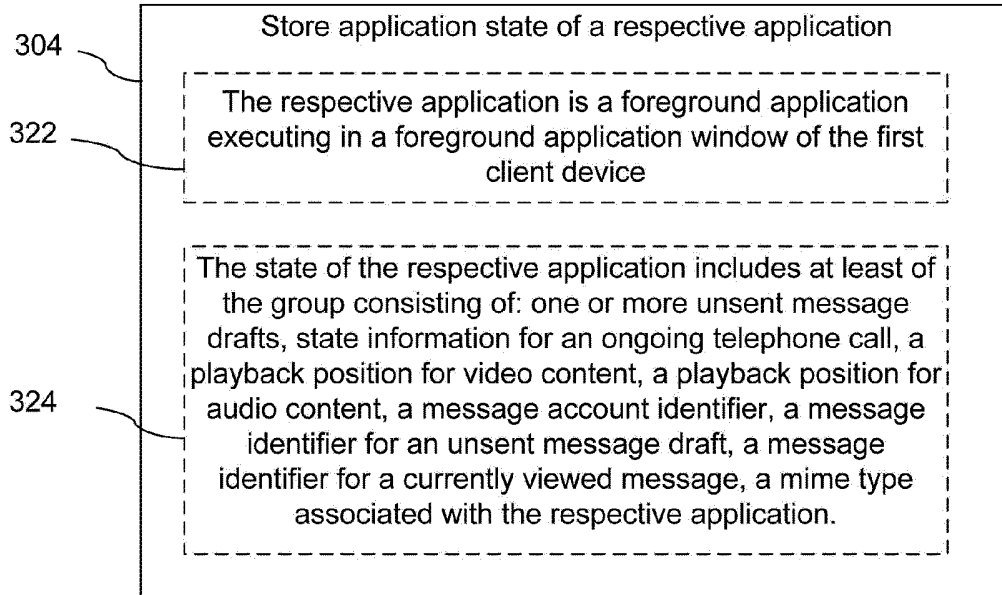


Fig. 3c

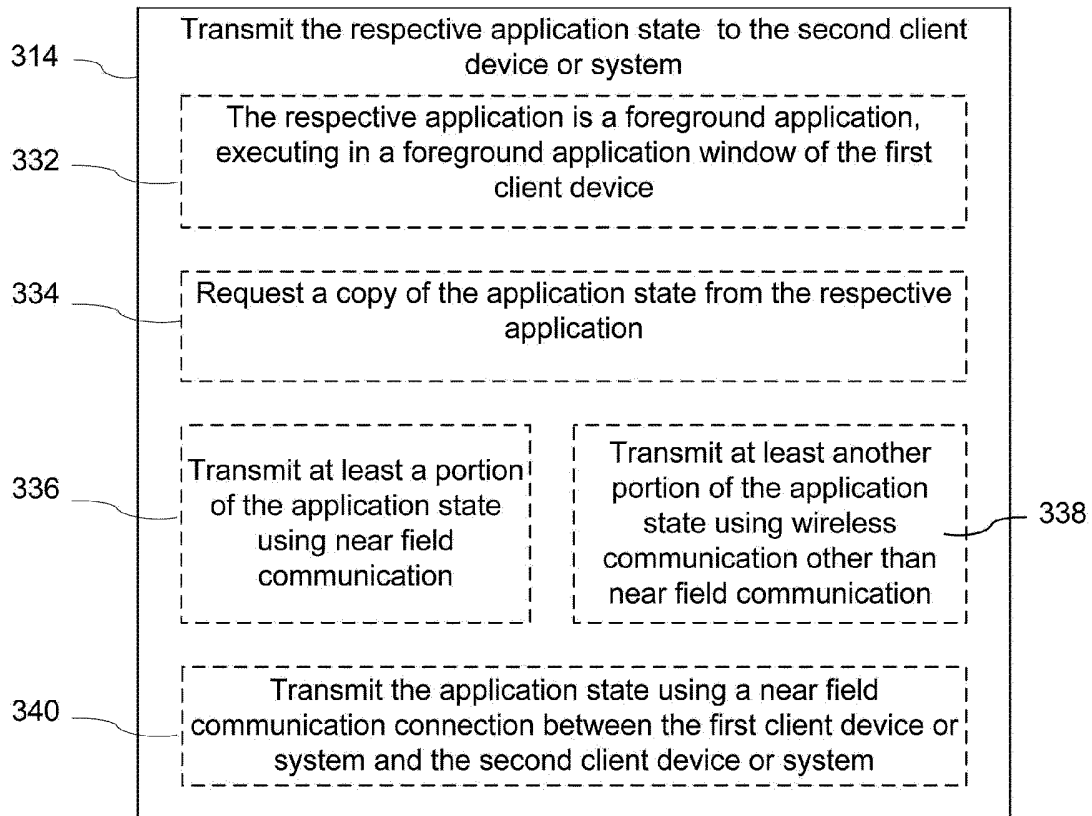


Fig. 4a

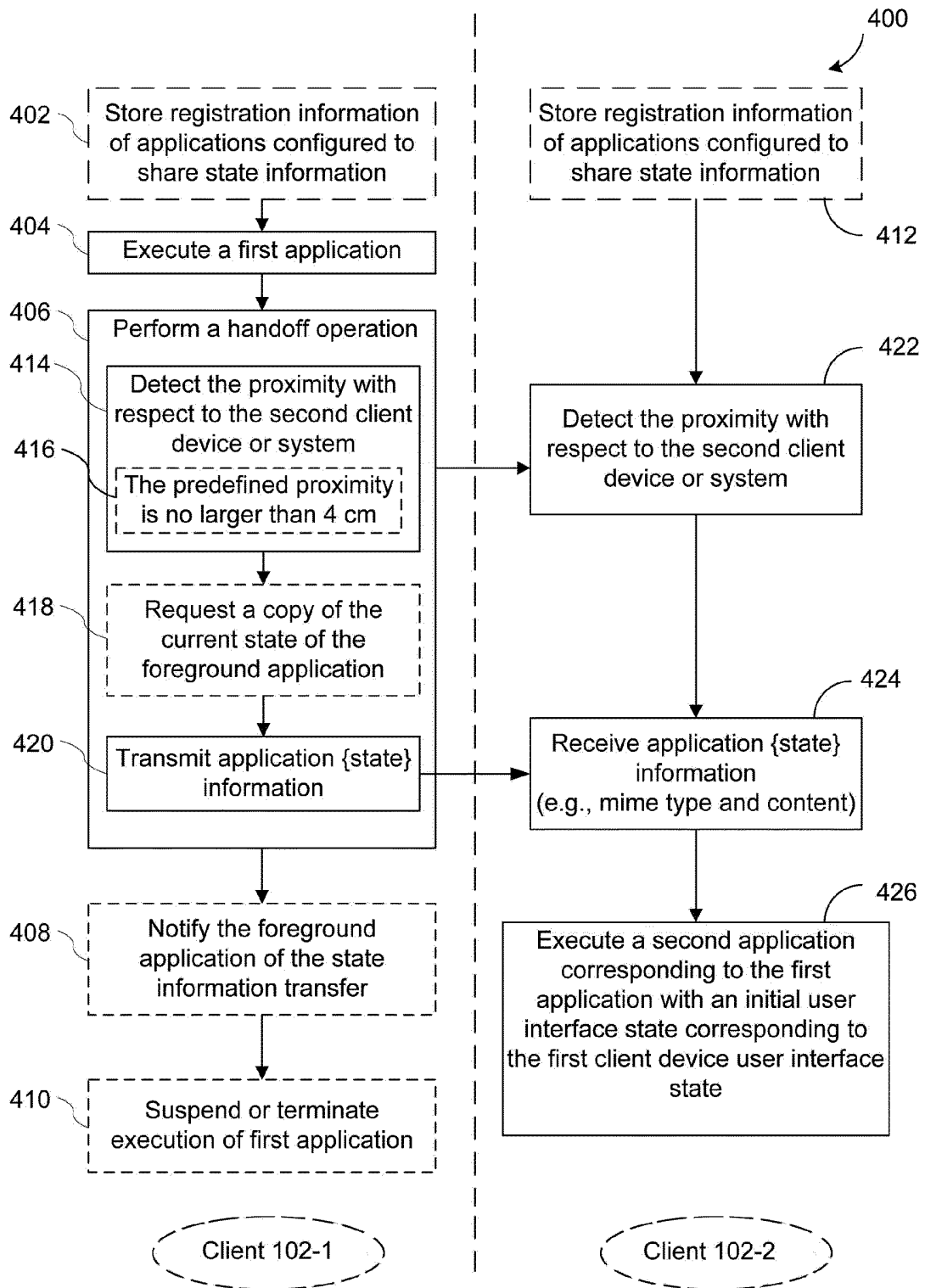


Fig. 4b

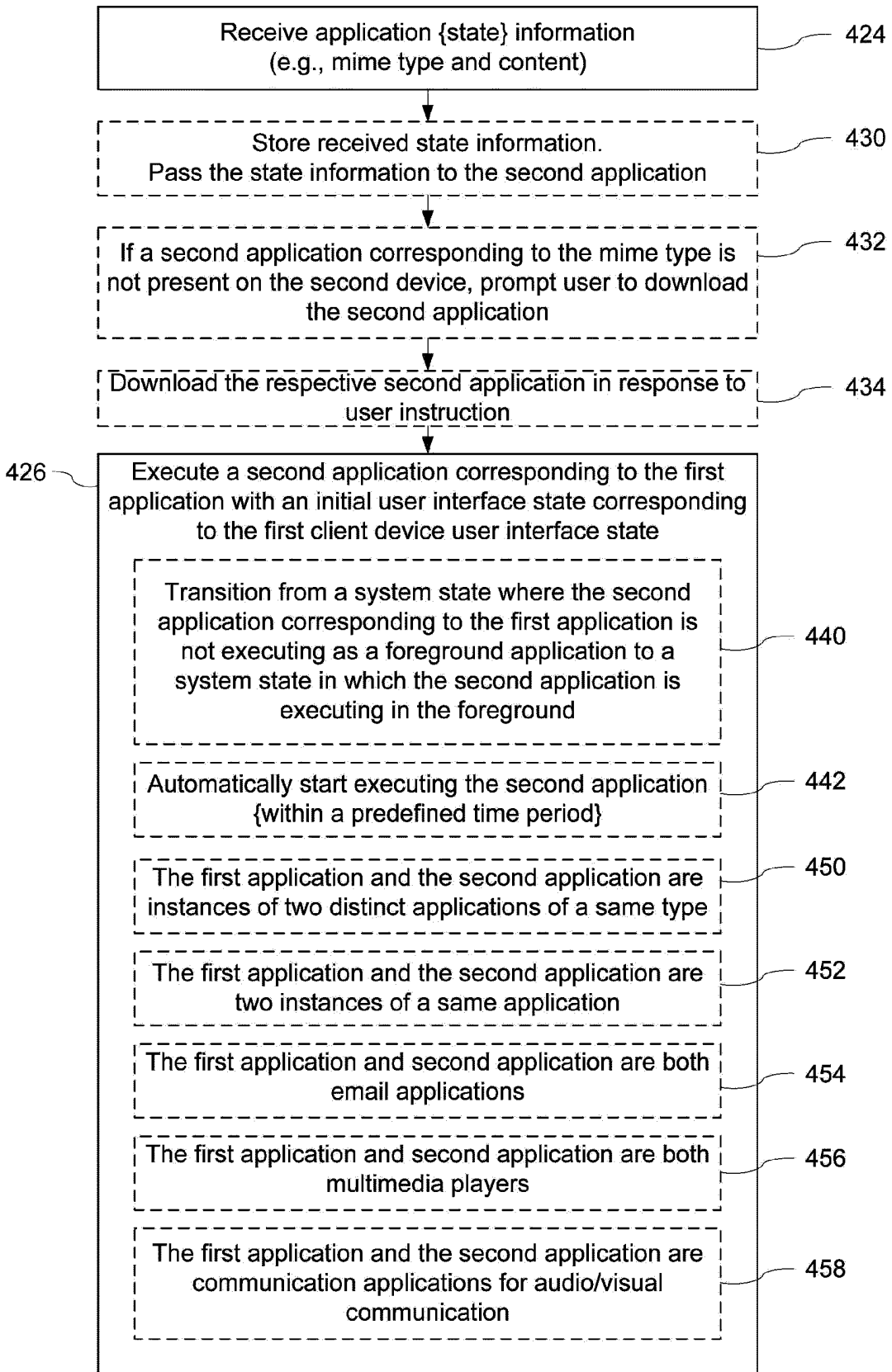


Fig. 4c

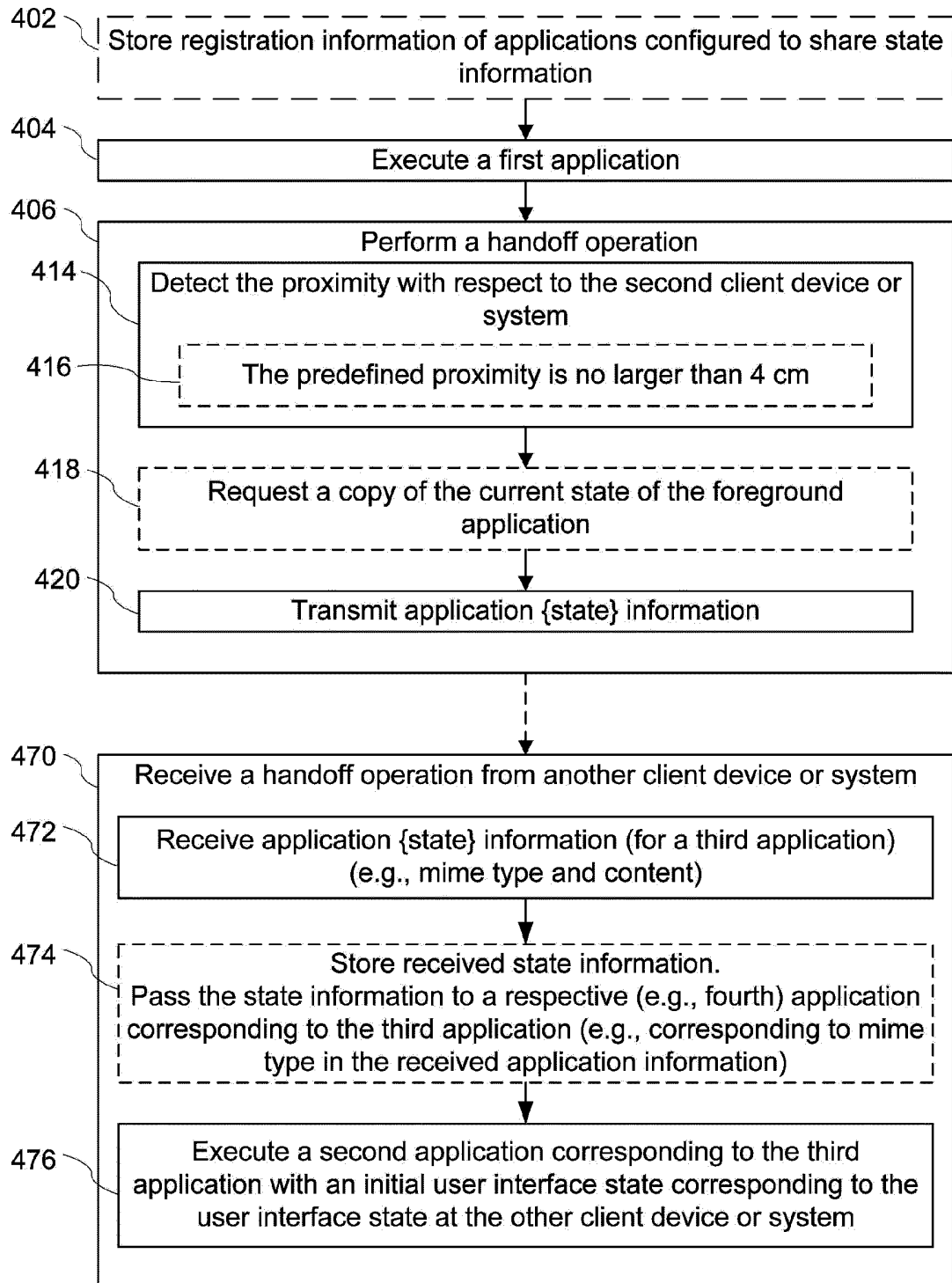


Fig. 5a

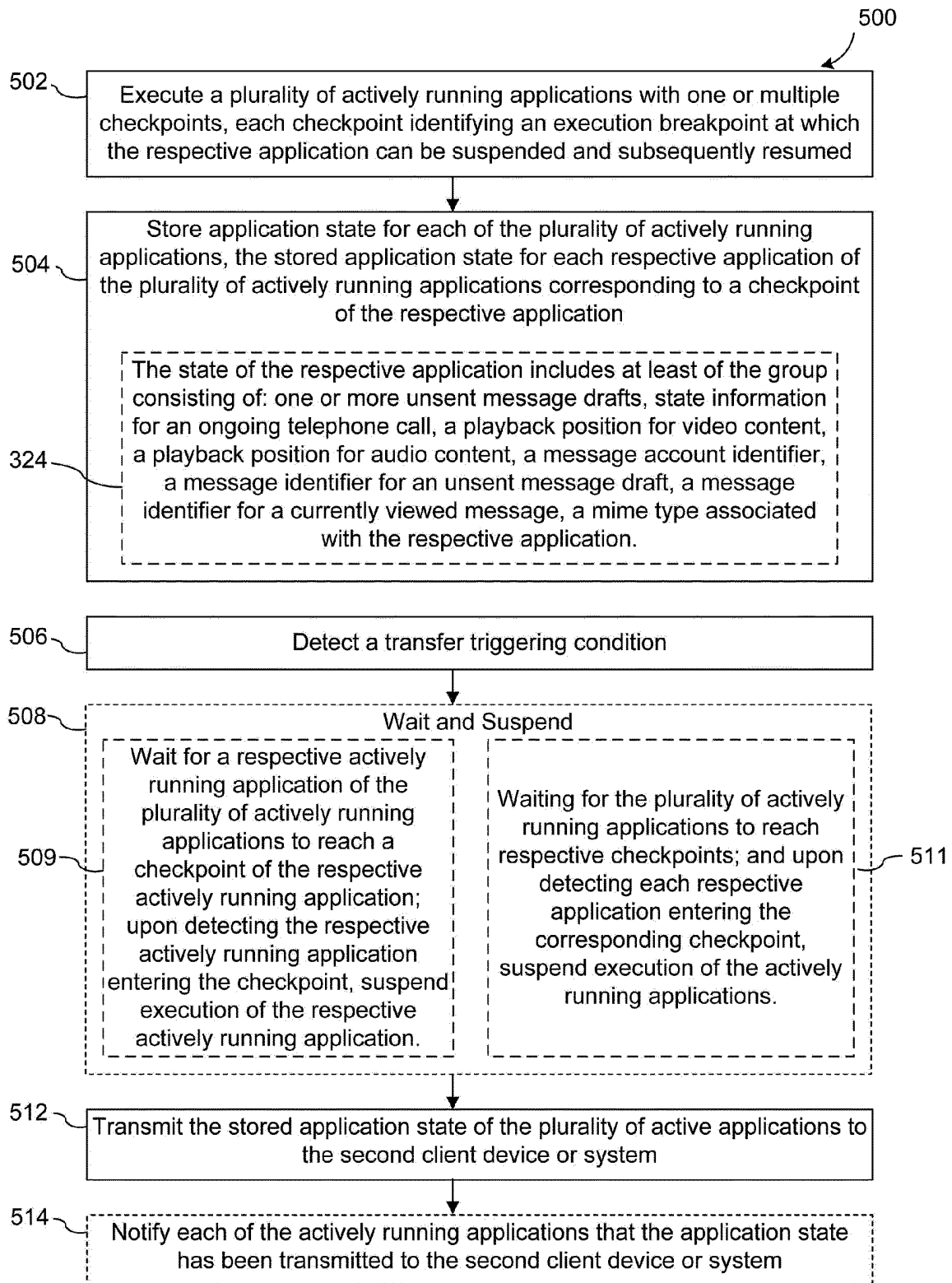


Fig. 5b

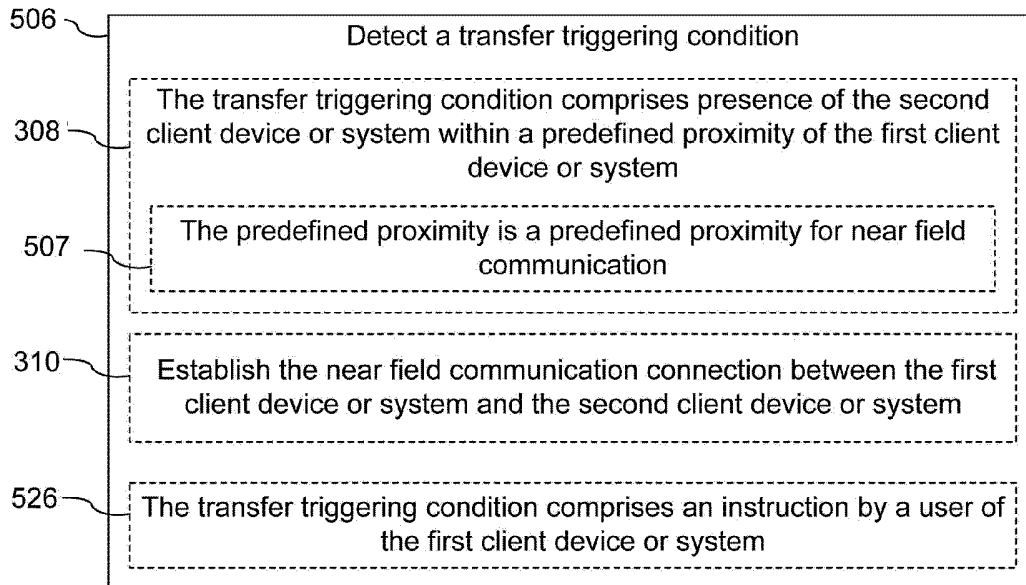


Fig. 5c

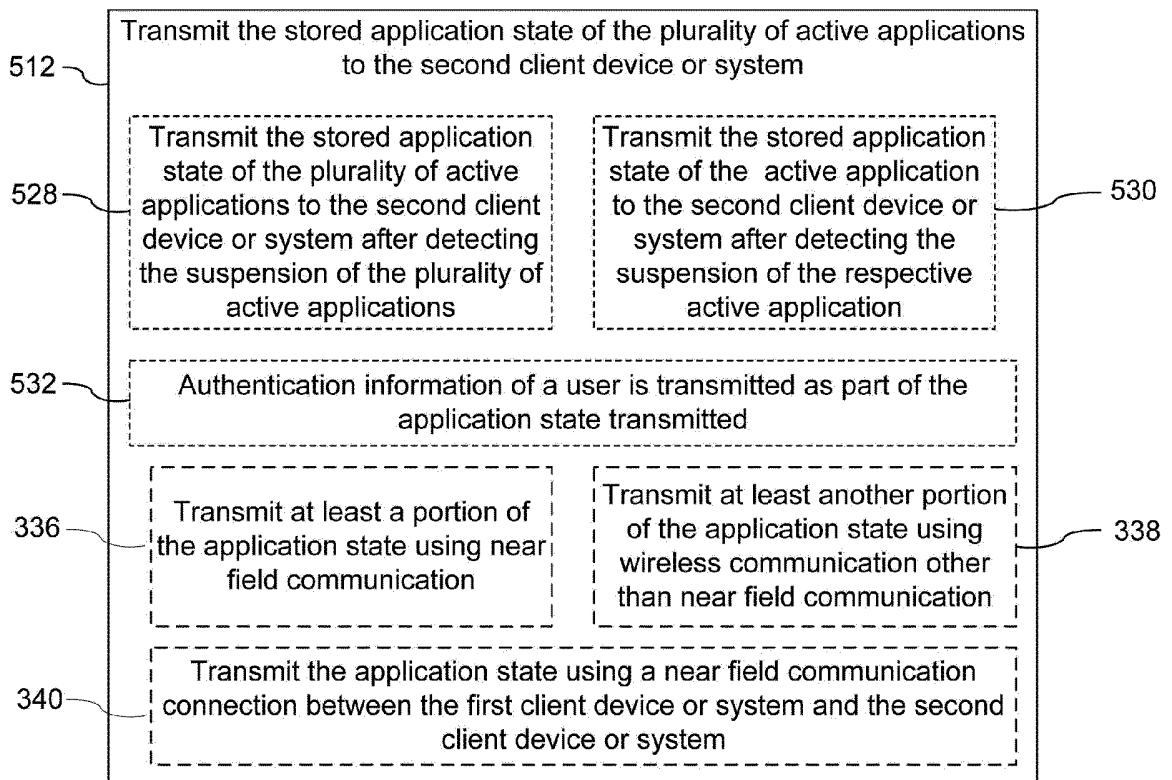
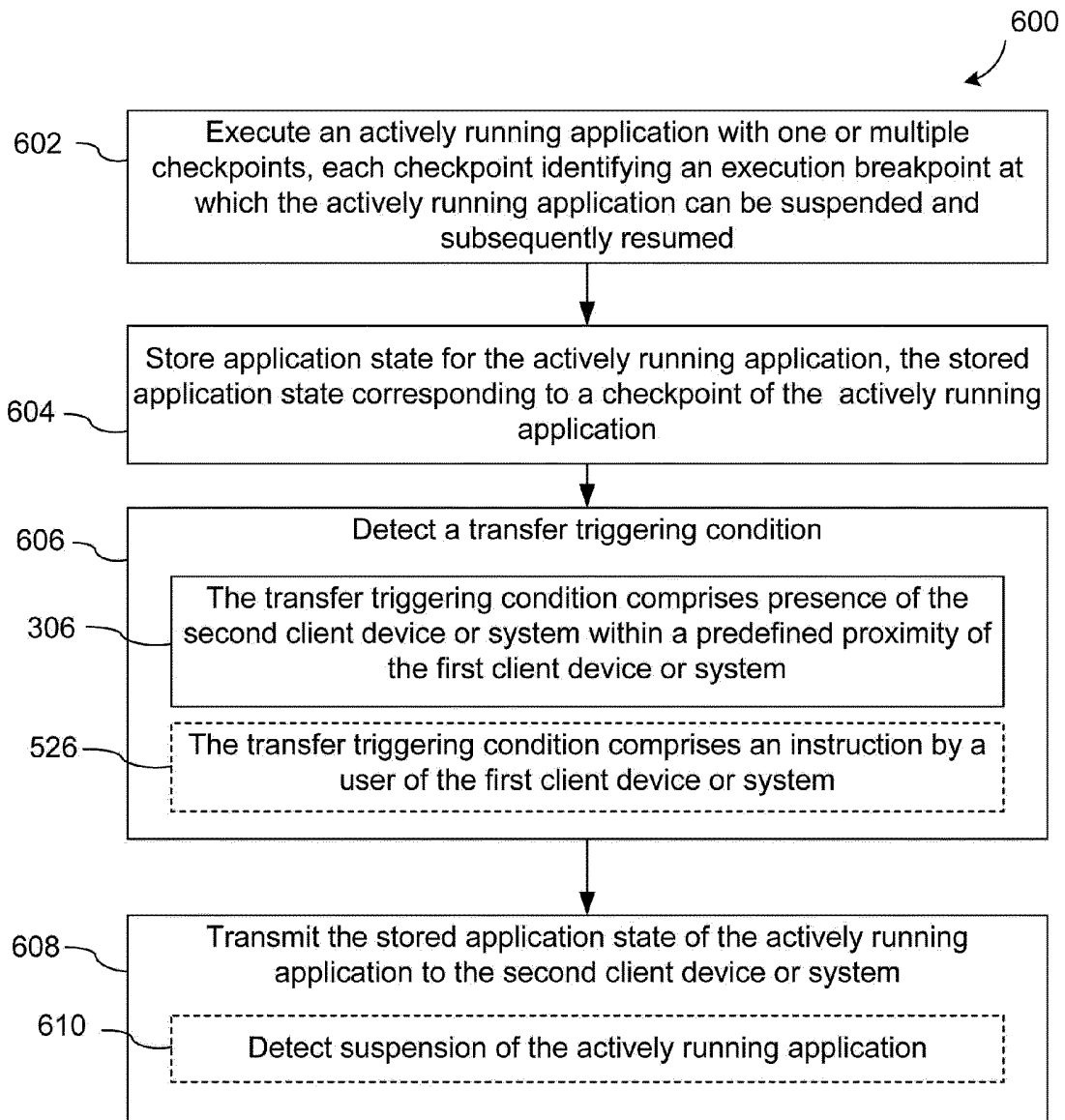


Fig. 4a





ONDERZOEKSRAPPORT

BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK

RELEVANTE LITERATUUR			
Categorie ¹	Literatuur met, voor zover nodig, aanduiding van speciaal van belang zijnde tekstgedeelten of figuren.	Van belang voor conclusie(s) nr.	Classificatie (IPC)
X	EP 1 760 584 A1 (RESEARCH IN MOTION LTD [CA]) 7 maart 2007 (2007-03-07) * alinea [0018] - alinea [0253] * -----	1-41	INV. G06F9/48 H04M1/725
X	US 2011/065384 A1 (CADER MUHAMMAD ABDUL [IN] ET AL) 17 maart 2011 (2011-03-17) * alinea [0021] - alinea [0025] * * alinea [0033] - alinea [0035] * * alinea [0038] - alinea [0039] * -----	27-39	
X	US 2010/094948 A1 (GANESH PERINKULAM I [US] ET AL) 15 april 2010 (2010-04-15) * alinea [0028] - alinea [0029] * * alinea [0030] * * alinea [0094] - alinea [0097] * -----	1,14,40	
A	WO 2010/110788 A1 (HEWLETT PACKARD DEVELOPMENT CO [US]; GIMSON ROGER BRIAN [GB]) 30 september 2010 (2010-09-30) * bladzijde 3, alinea 5 - bladzijde 4, alinea 1 * * bladzijde 8, alinea 4 - bladzijde 11, alinea 2 * * bladzijde 13, alinea 2 - bladzijde 17, alinea 2 * * bladzijde 25, alinea 4 - bladzijde 35, alinea 3 * ----- -/--	1-41	Onderzochte gebieden van de techniek G06F H04M
Indien gewijzigde conclusies zijn ingediend, heeft dit rapport betrekking op de conclusies ingediend op:			
Plaats van onderzoek: München	Datum waarop het onderzoek werd voltooid: 21 december 2012	Bevoegd ambtenaar: Glaser, Norbert	
¹ CATEGORIE VAN DE VERMELDE LITERATUUR			
<p>X: de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur</p> <p>Y: de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht</p> <p>A: niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft</p> <p>O: niet-schriftelijke stand van de techniek</p> <p>P: tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur</p> <p>T: na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding</p> <p>E: eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven</p> <p>D: in de octrooiaanvraag vermeld</p> <p>L: om andere redenen vermelde literatuur</p> <p>&: lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie</p>			

RELEVANTE LITERATUUR		
Categorie ¹	Literatuur met, voor zover nodig, aanduiding van speciaal van belang zijnde tekstgedeelten of figuren.	Van belang voor conclusie(s) nr:
A	US 2005/235029 A1 (HUSSMANN HOLGER [FI]) 20 oktober 2005 (2005-10-20) * alinea [0051] - alinea [0053] * * alinea [0055] - alinea [0066] * * alinea [0067] - alinea [0076] * * figuur 2 * -----	1-41

¹ CATEGORIE VAN DE VERMELDE LITERATUUR

- X: de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur
- Y: de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht
- A: niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft
- O: niet-schriftelijke stand van de techniek
- P: tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur
- T: na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding
- E: eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven
- D: in de octrooiaanvraag vermeld
- L: om andere redenen vermelde literatuur
- &: lid van dezelfde octroofamilie of overeenkomstige octrooipublicatie

4

EOB FORM 02.83 (P0414C)

**AANHANGSEL BEHORENDE BIJ HET RAPPORT BETREFFENDE
HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK,
UITGEVOERD IN DE OCTROOIAANVRAGE NR.**

NO 138294
NL 2008779

Het aanhangsel bevat een opgave van elders gepubliceerde octrooiaanvragen of octrooien (zogenaamde leden van dezelfde octroofamilie), die overeenkomen met octrooischriften genoemd in het rapport.

De opgave is samengesteld aan de hand van gegevens uit het computerbestand van het Europees Octrooibureau per

De juistheid en volledigheid van deze opgave wordt noch door het Europees Octrooibureau, noch door het Bureau voor de Industriële eigendom gegarandeerd; de gegevens worden verstrekt voor informatiedoeleinden.

21-12-2012

In het rapport genoemd octrooigeeschrift		Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
EP 1760584	A1	07-03-2007	CA 2557030	A1 23-02-2007
			CN 1945535	A 11-04-2007
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			US 2011314124	A1 22-12-2011
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			WO 2005101275	A1 27-10-2005



Agentschap NL
Ministerie van Economische Zaken,
Landbouw en Innovatie

SCHRIFTELIJKE OPINIE

DOSSIER NUMMER NO138294	INDIENINGSDATUM 09.05.2012	VOORRANGSDATUM 09.05.2011	AANVRAAGNUMMER NL2008779
CLASSIFICATIE INV. G06F9/48 H04M1/725			
AANVRAGER Google Inc.			

Deze schriftelijke opinie bevat een toelichting op de volgende onderdelen:

- Onderdeel I Basis van de schriftelijke opinie
- Onderdeel II Voorrang
- Onderdeel III Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk
- Onderdeel IV De aanvraag heeft betrekking op meer dan één uitvinding
- Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid
- Onderdeel VI Andere geciteerde documenten
- Onderdeel VII Overige gebreken
- Onderdeel VIII Overige opmerkingen

	DE BEVOEGDE AMBTENAAR Glaser, Norbert
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SCHRIFTELIJKE OPINIE

Aanvraag nr.:

NL2008779

Onderdeel I Basis van de Schriftelijke Opinie

1. Deze schriftelijke opinie is opgesteld op basis van de meest recente conclusies ingediend voor aanvang van het onderzoek.
2. Met betrekking tot **nucleotide en/of aminozuur sequenties** die genoemd worden in de aanvraag en relevant zijn voor de uitvinding zoals beschreven in de conclusies, is dit onderzoek gedaan op basis van:
 - a. type materiaal:
 - sequentie opsomming
 - tabel met betrekking tot de sequentie lijst
 - b. vorm van het materiaal:
 - op papier
 - in elektronische vorm
 - c. moment van indiening/aanlevering:
 - opgenomen in de aanvraag zoals ingediend
 - samen met de aanvraag elektronisch ingediend
 - later aangeleverd voor het onderzoek
3. In geval er meer dan één versie of kopie van een sequentie opsomming of tabel met betrekking op een sequentie is ingediend of aangeleverd, zijn de benodigde verklaringen ingediend dat de informatie in de latere of additionele kopieën identiek is aan de aanvraag zoals ingediend of niet meer informatie bevatten dan de aanvraag zoals oorspronkelijk werd ingediend.
4. Overige opmerkingen:

SCHRIFTELIJKE OPINIE

Aanvraag nr.:
NL2008779

Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid

1. Verklaring

Nieuwheid	Ja: Conclusies Nee: Conclusies 1-41
Inventiviteit	Ja: Conclusies Nee: Conclusies 1-41
Industriële toepasbaarheid	Ja: Conclusies 1-41 Nee: Conclusies

2. Citaties en toelichting:

Zie aparte bladzijde

Onderdeel VIII Overige opmerkingen

De volgende opmerkingen met betrekking tot de duidelijkheid van de conclusies, beschrijving, en figuren, of met betrekking tot de vraag of de conclusies nawerkbaar zijn, worden gemaakt:

Zie aparte bladzijde

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1 EP 1 760 584 A1 (RESEARCH IN MOTION LTD [CA]) 7 March 2007 (2007-03-07)
- D2 US 2011/065384 A1 (CADER MUHAMMAD ABDUL [IN] ET AL) 17 March 2011 (2011-03-17)
- D3 US 2010/094948 A1 (GANESH PERINKULAM I [US] ET AL) 15 April 2010 (2010-04-15)
- D4 WO 2010/110788 A1 (HEWLETT PACKARD DEVELOPMENT CO [US]; GIMSON ROGER BRIAN [GB]) 30 September 2010 (2010-09-30)
- D5 US 2005/235029 A1 (HUSSMANN HOLGER [FI]) 20 October 2005 (2005-10-20)

1. The subject-matter of claim 1 is not new over D1.
2. D1 (D1: paragraphs 20 to 27; Figures 3 and 4) discloses a method, performed by a first client device or system having one or more processors and memory storing one or more programs for execution by the one or more processors. The D1 method comprises the steps of "executing a plurality of actively running applications, each of the plurality of actively running applications having one or more checkpoints, each checkpoint identifying an execution breakpoint at which the respective application can be suspended and subsequently resumed" (D1: paragraphs 20 and 22); "detecting a transfer triggering condition" (D1: paragraph 22, such as the user indicating a desire to switch the mobile device); "storing an application state for each of the plurality of actively running applications, the stored application state for each respective application of the plurality of actively running applications corresponding to a checkpoint of the respective application" (D1: paragraphs 20 and 22); "transmitting the stored application state for each of the plurality of actively running applications to a second client device or system" (D1: paragraphs 20 and 22).
3. The technical meaning of the terms "checkpoint", "breakpoint" and "application state" is open to a broad interpretation due to an unclear definition and contradictory passages in the description.

4. The application state elements of D1 correspond to an execution breakpoint at which the respective application is suspended and subsequently resumed (D1: paragraphs 22, 36 to 37) which allows a user to seamlessly continue working with an application. In regard of paragraphs 60 and 69 of the present application, the term "checkpoint" has the same technical meaning as the term "application state" and represents the state of the application when it is suspended. This is exactly disclosed in D1.
5. Should these checkpoints be seen as sort of predefined breakpoints which have been inserted into an application, then a problem arises that the alleged invention is not described in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the art. because the description remains silent about how to predefine such checkpoints. There is also an inconsistency in regard of several embodiments, for instance, the one of paragraph 60. This embodiment suspends an actively running application upon detecting the triggering condition; it is therefore the triggering condition which suspends an application and not a checkpoint. It is described to be an optional feature - as pointed out in paragraph 69 - that a client waits for an actively running application to reach a checkpoint before transmitting the application state to another device.
6. The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 14 and 40 which therefore are also considered not new.
7. The dependent claims 2 to 13 and 15 to 26 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and inventive step.
8. The subject-matter of claim 27 is not new over D2.
9. D2 (D2: paragraph [0021] - paragraph [0025]; paragraph [0033] - paragraph [0035]; paragraph [0038] - paragraph [0039]; Figure 2) discloses a client device or system which comprises one or more communication interfaces 209, including a near field communication transceiver, one or more processors 205, and memory 207. The D2 device is suitable for the claimed purpose, namely to store one or more programs for execution by the one or more processors which comprise instructions as claimed. D2 discloses the transfer of services and functionality from one device to another device which is connected to the first one via NFC (D2: paragraphs 32 to 39; 45). Portions of information transferred is used for different purposes, such as, establishing a wireless link, e-mail and online services, messaging services, gaming services, voice services and phone calls.

10. The dependent claims 28 to 39 define further instructions of the one or more computer programs stored in the memory. These claims do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty for the same reasons as set out above.
11. The transmission and handling of applications and application states (claims 4 to 6, 13; claims 17 to 19, 26; claims 29 to 32, 39) is known from D4 or D5 (D4: page 14, 3rd paragraph, to page 18, 1st paragraph; D5, paragraphs 51 to 94); NFC and wireless communication (claims 2 to 3; 8 to 11; claims 15 to 16, 21 to 24; claims 28 to 29, 34 to 37) are known from D4 (D4: page 8, 3rd paragraph, to page 1, 2nd paragraph; D5: paragraph 51 and 67); various kinds of applications (claim 12; claim 25; claim 38) is known from D4 (D4: page 30, last paragraph, to page 32, 2nd paragraph); a foreground application (claim 41) is known from D4 (D4: page 14, 2nd paragraph; page 35, 1st to 3rd paragraph);
12. D3 has been cited as prior art about the insertion of checkpoints for the transfer of applications between devices, the suspension and resumption of such applications (D3: paragraph [0028] - paragraph [0029]; paragraph [0030]; paragraph [0094] - paragraph [0097]).

Re Item VIII

Certain observations on the international application

1. Although claims 1 and 40 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness.
2. Independent claim 40 comprises the feature of the "triggering condition" being a detection of the presence of the second client which is defined in dependent claim 2. Claim 1 does not contain this feature and does therefore not meet the requirement that any independent claim must contain all the technical features essential to the definition of the invention. An equivalent objection is raised against independent claims 14 and 27.
3. Independent device claim 27 comprises the feature "near field communication transceiver" without defining its function and role in the detection of a triggering condition. The claim lacks therefore clarity. The role of this feature is at first defined in dependent claim 29 which makes clear that a predefined proximity of near field communication defines the predefined proximity of the first client device or system and determines the triggering condition.

4. Claims 1 to 40 are not clear for the further reasons.
5. The term "client device or system" in claims 1, 14, 27 and 40 renders the subject-matter unclear, because there is no technical difference between a "client device" and a "client system". There is therefore no justification to employ both terms in the mentioned claims.
6. Claims 1, 14, 27 and 40 do not solve the problem mentioned in paragraph 2, that is, to continue working with the same application on a different (mobile) device. The mentioned claims only define to transmit an application state from first to a second client device or system, but not that the user continues working with the same application on the second client device or system. It remains undefined what happens to the application state, once it is received on the second client device or system and how the application is processed. The features defined in claims 4 to 6, or respectively, in claims 17 to 19 and claims 31 to 32, are essential to the definition of the invention. Since independent claims 1, 14, 27 and 40 do not contain these features they do not meet the requirement that any independent claim must contain all the technical features essential to the definition of the invention.
7. The term "one or more programs" in claims 1, 14, 17, 18, 26, 27, 30, 31, 39 and 40 obscures the matter for which protection is sought, because it is not precisely enough defined what kind of programs are stored in the memory or on the medium and how the instructions are split among the different programs stored.
8. A lack of clarity arises from claims 27 to 39 which define a client device or system which stores one or more programs which are suitable for being executed by the one or more processors. These functional statements do not enable the skilled person to determine which technical features are necessary to perform the stated functions.
9. The vague and imprecise statement in the description in paragraph 72 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity when used to interpret them.