



(51) International Patent Classification:
H04L 29/08 (2006.01)

(21) International Application Number:
PCT/MY2012/000179

(22) International Filing Date:
29 June 2012 (29.06.2012)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PI 2011004154 6 September 2011 (06.09.2011) MY

(71) Applicant (for all designated States except US): **MIMOS BERHAD** [MY/MY]; Technology Park Malaysia, Bukit Jalil, Kuala Lumpur 57000 (MY).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WONG TING, Hwee** [MY/MY]; Technology Park Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY). **CHOONG KHONG, Neng** [MY/MY]; Technology Park Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY). **LEE CHENG, Suan** [MY/MY]; Technology Park Malaysia, Bukit Jalil, 57000 Kuala Lumpur (MY).

(74) Agent: **MAHALINGAM, Maniam**; IP Rights (M) SDN BHD, No. 7-M, Biz Avenue, Neo Cyber, Lingkaran Cyber Point Barat, 63000 Cyberjaya, Selangor Darul Ehsan (MY).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to the identity of the inventor (Rule 4.17(i))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(54) Title: SYSTEM AND METHOD FOR RICH INTERNET APPLICATION SESSION TRANSFER

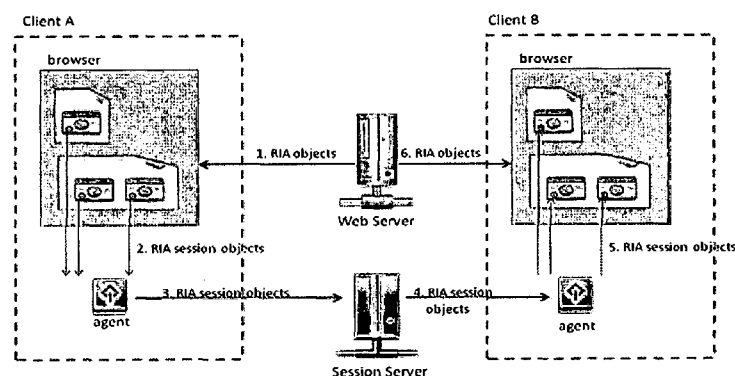


FIG 2

(57) Abstract: There is disclosed a system and method for use in Rich Internet Application (RIA) session transfer between at least two devices, one being the original device and another is the alternative device to which the session transfer is performed. Both devices are installed with a session management agent (100) for sending notifications and communicating event transfer and a dynamic session management server (200) for receiving said notification, monitoring device status and thus synchronizing copies of RIA session objects across devices.

SYSTEM AND METHOD FOR RICH INTERNET APPLICATION SESSION TRANSFER**TECHNICAL FIELD**

5 The present invention relates in general to handheld devices application and management, and more particularly a method and system to facilitate two-way push/pull transfer of Rich Internet Application session(s) between a plurality of handheld devices.

10 BACKGROUND ART

Electronic communication plays an important role for personal purposes or business of all sizes; make it small-size enterprises or multinational corporations. Wide use of such technology has
15 contributed to a rapid growth of communication devices, whereby many of these devices are adapted for mobility or efficiency in establishing a secure connection when in use. Other than these imperative features, enhancements in terms of convenience and comfort associated to these handheld devices include the ability to
20 retrieve information from the Internet, perform various tasks similar to a desktop computer, such as editing documents and playing online games.

In order to achieve the functionalities as discussed above,
25 innovators of the field have developed Rich Internet Applications (RIA) which allows handheld or mobile devices users to carry out a wide variety of tasks, which originally require the execution of desktop environment, merely from a mobile

browser. With such advancement, users have begun to demand for improvements associated to accessing the RIA and its content, data and/or functionalities at anytime, any place thus allowing a seamless transfer of RIA sessions across different devices which are equipped or at least adapted with communication capabilities.

Users would typically prefer a similar interface or layout of RIA as provided on a computer screen to be viewable on their mobiles, with uncompromised quality. Further, a user who is about to travel away from his workstation to instantaneously continue working on the tasks performed with a business workflow RIA previously created on his office workstation. It would be preferred that the business workflow of the RIA session must be transferred right away to a mobile device without incurring the hassle of login/logout multiple times on different devices and repetitively re-keying the same data. Clearly, for seamless transfer as raised in the aforementioned examples to proceed, the dynamic characteristic of RIA session must be handled comprehensively.

Factors which are normally considered during transferring a RIA session includes offering a selection as to which device a transfer should take place and the ability to retain the processes involved during a RIA session in the background, without affecting other activities running concurrently on the same device. FIG 1 shows a prior art method used to transfer web session. In this method, a browser plug-in is incorporated in

order to keep track of the web session for individual webpage, and subsequently send the session information to an agent which proxies it to a session server. Accordingly, with this technique, whenever a request on session transfer is made, the session information stored in the session server will be retrieved by an agent residing in the handheld, being the alternative device. And then said agent instructs the local browser on how to restore the previous web sessions created in the original device.

However, it is evident nowadays that using the prior art methods and systems, the session for a web is more of capturing or snapshots of the web service or content previously accessed thus may not be interactive as provided in the original device.

Therefore, there exists a need for a system and method for providing real-time, seamless transfer of RIA across multiple device users be it handheld or desktop based devices.

SUMMARY OF THE INVENTION

There is provided a method and system for providing a two-way push/pull transfer of Rich Internet Application session(s) across a plurality of devices owned by a user.

In another aspect, there is provided a method and system which characterizes the immediate communication between each RIA and the

agent, where each RIA reports its dynamic session objects to the agent and then proxies these session objects to the session server.

In a further aspect of the present invention, there is provided a method and system for seamless transfer of RIA session between devices, wherein whenever a request on RIA session transfer is made, agent on the alternative device can easily instruct the local browser to restore each of the RIAs previously created in the original device.

10

In another aspect of the present invention, there is provided a method and system which relies on the communication between Dynamic Session Management Server (DSMS) and Session Management Agent (SMA).

15 In a further aspect, there is disclosed a system for facilitating transfer of Rich Internet Application (RIA) session between at least two electronic devices comprising: a session management agent for sending notifications and communicating transfer events; and a DSMS configured to be in communication with a session management agent
20 and for monitoring the device status and synchronizing copies of RIA session between the devices.

In another aspect, a method for facilitating transfer of Rich Internet Application (RIA) session between at least two electronic devices, wherein at least one device is an alternative device and
25 the other is an original device, comprising the steps of: providing at least one module to be configured as a session management agent for sending heartbeat messages and communicating transfer event;

providing at least one DSMS for monitoring device status updated by session management agent; initializing the RIA session transfer between said devices; selecting the specific RIA session to be transferred with push or pull method; performing transfer of RIA session across said devices; and synchronizing copies of RIA session objects across devices.

Additional advantages of the disclose subject matter will be set forth in part in the description that follows, and in part will be obvious from the description, or can be learned by practice of the aspects described below. The advantages described below will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

The present invention consists of features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings, it being understood that various changes in the details may be made without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

FIG 1 shows a prior art system for use in transferring web session;

FIG 2 shows the system implemented with the embodiments of the present invention;

FIG 3 shows the overall architecture of the system and method in accordance with a preferred embodiment of the present invention;

FIG 4 shows the overall architecture of the Session Management Agent (SMA) (100) in accordance with a preferred embodiment of the present invention;

10

FIG 5 shows the overall internal architecture of the Dynamic Session Management Server (200) in accordance with the preferred embodiment of the present invention;

15 FIG 6 shows the process flow involved before a potential occurrence of RIA session transfer;

FIG 7(a) and 7(b) shows the overall structure of push/pull transfer in accordance with the preferred embodiment of the present invention.

20

To further clarify various aspects of some embodiments of the present invention, a more particular description of the invention will be rendered by references to specific embodiments thereof, which are illustrated, in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The

25

invention will be described and explained with additional specificity and detail through the accompanying drawings in which:

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is a system and method to facilitate RIA session(s) and more particularly involving two-way push/pull transfer of Rich Internet Application session(s) across a plurality
10 of connected devices owned by a particular user.

Generally, the system comprises the Session Management Agent (SMA) which is preferably installed on every participating user device, whereby said SMA is configured to listen to the RIA session objects
15 reported by the RIAs running on the same device. This enables the transferred RIA to restore its state till the point prior to the occurrence of a RIA session transfer. The SMA also sends periodic heartbeat message to the Dynamic Session Management Server (DSMS) (which will be described shortly herein) so that the DSMS can
20 maintain a list of user's devices available for transfer. In addition, SMA (100) is acting as a proxy to RIAs in the communication with DSMS, where it is responsible for the exchange of data objects/information/messages between RIAs running locally and the DSMS.

25

In accordance with a preferred embodiment of the present invention, SMA (100) is configured to execute the following tasks during operation: proxying the RIA session objects dynamically to DSMS,

notifying DSMS on the device status in a real-time manner, enabling two-way, i.e. push/pull, transfer of RIA session, and providing the Graphical User Interface (GUI) for seamless transfer of RIA session to occur instantaneously.

5

As briefly mentioned earlier, the system further comprises a Dynamic Session Management Server (DSMS) (200) configured to synchronize the RIA session objects across multiple devices so that a transfer of RIA across devices can happen instantaneously. Accordingly, the primary tasks executed by DSMS (200) includes: storing and relaying real-time, dynamic copy of RIA session objects to devices, maintaining a set of user profile and device information, checking the device availability to maintain the updated list of alternative devices, and notifying devices about successful event of RIA transfer

In the preferred embodiment, the method involves a series of communication designated in between RIA and SMA, SMA and DSMS, RIA and a Web Server (300) to allow the transfer to take place.

FIG 3 shows the overall architecture of the system and method in accordance with a preferred embodiment of the present invention. A user (10) may own a plurality of devices, which may include but not limited to, mobile phones, smart-phones, PDAs, tablets, net-books, laptops, and desktops, that are being connected to a network which

allows these devices to be in communication with both the Dynamic Session Management Server (DSMS) (200) and Web Server (300).

5 In an exemplary scenario as seen in FIG 3, a User 1 (10) has two devices, namely the Device A and Device B. Each of the devices, in turn, is equipped with a browser and a Session Management Agent (SMA) (100). The browser, or any equivalent sandbox applications, is used as an environment and thus configured to support the execution of Rich Internet Applications (RIAs), which access web services
10 and/or content provided by the Web Server(s) (300).

As the Web Server (300) is primarily intended for providing web service/content to user device, DSMS (200) is deployed to be in
15 communication with the SMA (100) so that it can hold or preserve the RIA session objects which are important for the seamless session transfer to take place. These RIA session objects, being exchanged in between DSMS (200) and SMA (100) , would typically constitute not least than Uniform Resource Locator (URL) identifying the locations
20 to access services/contents, as well as a dynamic snapshot of RIA-specific data such as session, state, history, cache, index, metadata, parameters and authentication information.

FIG 4 shows the overall architecture of the Session Management Agent
25 (SMA) (100) in accordance with a preferred embodiment of the present invention.

In effect, the SMA (100) is activated whenever the operating system of which it is residing or installed has been initialized. Being an intermediary, it communicates locally with all the RIAs, and also remotely with the DSMS (200).

5

Now referring to FIG 4, the User Profile/System Configuration module (30) is used to store configuration data, which comprises all details and information related to users such as credentials, preferable browser(s), interval of heartbeat message, and many
10 others. The module (40) may further comprise of system-wide information such as type of operating system, network connection, and runtime environment for RIA, etc.

According to the preferred embodiment of the present invention, the
15 DSMS Proxy (210) is responsible for the communication with DSMS (200). It is configured to deliver configuration data as login information to DSMS (200), and notifies the DSMS (200) on the alternative devices which are available for transfer. This is done via a heartbeat message. Besides, DSMS Proxy (210) characterizes a
20 receiver to intercept remote RIA session objects and device(s) update sent by the DSMS (210), as well as a sender to deliver DSMS with the local RIA session objects.

SMA (100) is also configured to notify DSMS (200) in the event of a
25 successful RIA session transfer, and acts as a two ways interface of which a request for transfer is being transmitted, depending on whether it is a local push request (delivered) or a remote push request (received).

Further in accordance with a preferred embodiment of the present invention, RIA Proxy (250) is configured to communicate with the RIAs running within the local device by way of listening to any local RIA session objects reported by active RIAs. During operation, when a transfer is performed, RIA Proxy (250) is the interface where newly transferred RIA retrieves on the remote RIA session objects previously stored in the RIA Objects Cache, so as to enable the RIA to resume on its execution.

10

Still referring to FIG 4, the Collocator (50) acts as the center point and is configured to coordinate the internal passing of objects/data/information/message from one component to the other. It compresses the RIA session objects before dispatching them to be delivered out by DSMS Proxy (210). Based on the kind of request received, Collocator (50) generate instruction to the action handler to carry actions such as, but not limiting to, opening the RIA in a new browser, ending a RIA whose session has been transferred to another device, etc. In addition, Collocator (50) also interacts with the RIA Objects Cache to either retrieve or store RIA session objects produced by the local device or remote device.

15
20

Another component within the system of the present invention is the User Interface Manager (40). Its primary role is to provide Graphical User Interface to end users, in which users can choose the alternative device(s) for which a push/pull transfer of RIA session should be performed on, and edit certain user profiles/preferences.

25

Another responsibility of User Interface Manager (40) is to display the information dispatched by the Collocator (50), such as the RIAs running actively and the alternative devices available.

5 It should be noted that there is no restrictions on any particular application protocols used to implement the communication layer for both the RIA Proxy and DSMS proxy. Such application protocols may include, but not limiting to, HTTP, SIP, TLS/SSL, XMPP and various others to achieve the desired result.

10

FIG 5 shows the overall internal architecture of the Dynamic Session Management Server (200) in accordance with the preferred embodiment of the present invention. As shown, the DSMS (200) comprises five main modules, these are the session transfer manager (211), the
15 device monitoring manager (212), the session database (213), session coordinator (214) and application level communication and session protocol module (215). The DSMS is preferably built upon a converged server network, which is capable of communicating with the user devices in more than one of the potential application protocols.

20

The Device Monitoring Manager (212) is the primary module within DSMS, and is assigned to monitor the availability of user devices. Further, it is configured to authenticate the login from user devices and monitors the state of these devices by processing the
25 heartbeat messages received thereafter. Accordingly, a copy of such information is stored in the session database (213).

The Session Transfer Manager (211) is configured to keep track of any RIA session objects produced by the RIAs. It is further configured to process the device request for RIA session transfer.

5 The Session Coordinator (214) is configured to monitor and coordinate activities performed by both the device monitoring manager (212) and the session transfer manager (211), whereby it dispatches data to both modules during operation. Prior to sending the data, it is configured to filter, process, and mingle the data
10 received from the device monitoring manager (212) and session transfer manager (211). Upon completed these tasks, it will proceed to deliver the information necessary for transfer to be initiated to the respective user devices.

15 FIG 6 shows the process flow involved before a potential occurrence of RIA session transfer. For the purpose of illustration, examples of scenario which may occur will be elaborated herein shortly. It is noted that these examples are not intended to limit the scope of the claims provided herein.

20

EXAMPLE 1

*User 1 is equipped with two devices, i.e. Device A and Device B. Both devices are accordingly installed with the system of the
25 present invention.*

The SMA (100) initiates its execution whenever the operating system (OS) is booting up. For example, when User 1 turns on or restarts

Device A. Upon initiated, the SMA performs a login to its corresponding DSMS. Following that, DSMS pushes Device A with the any existing remote RIA Session objects produced by Device B, assuming if Device B has already logged in earlier than Device A and
5 that there is at least one active RIA running inside the Device B. Otherwise, if Device B is offline or idle, not data will be pushed to Device A.

Next, Device A sends periodical heartbeat message to DSMS in
10 notifying about its availability. Once the DSMS receives on the heartbeat message, it confirms on the availability of Device A. DSMS then informs Device B on the availability of Device A, thereby updating the list of online alternative devices. In the event that DSMS fails to receive a consecutive order of few heartbeat messages
15 from Device A, it will confirm that Device A is offline and update Device B correspondingly about this event.

Subsequently, User 1 is indicated with using a RIA from the browser to perform on some actions after the completion of SMA activities
20 (OS startup service) that happen without the knowledge of User 1. The RIA is requesting for the relevant services or contents from remote Web Server, which responses by first sending Device A with the application objects. Once successfully loaded, the RIA retrieves the intended RIA data objects from this Web Server. The RIA sends
25 details of any changes pertinent to the session sensitive objects to the SMA via a well known port/address/location. The received RIA session objects are further processed by the SMA, e.g. compressing

on data to conserve connection bandwidth, before sending them to the DSMS.

In order for the transfer of RIA session to take place in a swift manner, a real time copy of these RIA session objects are forwarded from the DSMS to the SMA of Device B. In this way, any RIA session objects received, due to the RIA activity invoked on Device A, will be continuously communicated ahead to Device B.

FIG 7(a) and 7(b) shows the overall structure of push/pull transfer in accordance with the preferred embodiment of the present invention.

According to the preferred embodiment of the present invention, push transfer is initiated when User 1 interacts with the SMA installed on Device A, instructing it to transfer a RIA currently executing in Device A to Device B. In the contrary, Pull transfer occurs when User 1 interacts with the SMA installed on Device B, instructing it to transfer a RIA currently executing in Device A to Device B. This enables user with the flexibility of choosing the specific RIA to be transferred across devices. In other words, User 1 is granted with the freedom of retaining the execution of certain RIA(s) in Device A, while transferring some other RIA(s) to Device B.

In another case scenario, when a particular user has more than two available devices, the user can choose which devices the specific RIA(s) to be transferred onto. In the case of push transfer, having to specify which active RIA(s) to be transferred from Device A to

Device B, DSMS will relay the request to Device B. Device B will then trigger a browser to execute on the said RIA(s) chosen to be transferred. On the other hand, in the case of pull transfer, user interacts directly with the SMA on Device B to trigger a browser to
5 execute on the said RIA(s) chosen to be transferred.

Based on the RIA session objects previously pushed by DSMS, the RIA running in Device B is configured to recognize the steps in restoring the execution of RIA(s) precisely to point or as a guide t
10 where it has reached while executing in Device A. This is achieved by first calling the browser to make a request to the Web Server, where it retrieves the RIA application objects from. Once loaded, the RIA will first verify if there exist any RIA session objects previously stored by the SMA; and if found, the RIA will retrieve
15 them as pointer in guiding the download of RIA data objects relevant to the point prior to its transfer.

When the RIA performs such a request, SMA infers that the session transfer is successful and hence notifies DSMS with such event. In
20 turn, DSMS will route this as a message to Device A, letting it know that it is proper to end the transferred RIA session on Device A. As the RIA execution is exhibiting a high level of dynamicity, the RIA will constantly update SMA with the changes of its session objects, which then, will be then relayed by the SMA to DSMS. DSMS, in turn,
25 sends these remote RIA session objects to all participating alternative devices. SMA of these alternative devices will store the remote RIA session objects within its RIA object cache for future use and thus ensuring smooth upcoming transfers. While the RIA is

running, now in Device B, it will update SMA about its RIA session objects. The SMA will then proxy these RIA session objects received from RIA to DSMS. Subsequently, DSMS relays the RIA session objects to all the alternative devices, including the Device A. The SMA of
5 Device A stores a copy of these RIA session objects locally so that it is ready for a simultaneous transfer at any moment.

In the foregoing specification, specific embodiments of the present
10 invention have been described. However, one of ordinary skill in the art will appreciate that various modifications and changes can be made without departing from the scope of the present invention as set forth in the various embodiments discussed above and the claims that follow.

15

20

25

CLAIMS

1. A system for facilitating transfer of Rich Internet Application (RIA) session between at least two electronic devices

5 comprising:

a session management agent (100) for sending notifications and communicating transfer events; and

10 a dynamic session management (200) configured to be in communication with a session management agent (100) and for monitoring the device status and synchronizing copies of RIA session between the devices.

2. The system as claimed in Claim 1 further comprising of a web
15 server and a browser.

3. The system as claimed in Claim 1 wherein the notifications sent by SMA are in the form of heartbeat message.

4. The system as claimed in Claim 1 wherein the session
20 management agent (100) comprises at least one user profile/system configuration for storing configuration data; a DSMS Proxy (210) for communicating with DSMS (200); a RIA Proxy (250) for communicating with active RIAs running on devices; a RIA object cache for storing RIA session objects
25 and device specific information; a user interface manager (40) for providing graphical user interface for user to perform selection on the type of RIA session transfer and for editing user profiles or preferences.

5. The system as claimed in Claim 1 wherein the DSMS (200) comprises a device monitoring manager (212) for monitoring the status of device; a session transfer manager (211) for keeping track on the active RIAs and their corresponding RIA session objects; a session database (213) for storing objects dispatched by device monitoring manager and session transfer manager; a session coordinator for coordinating the passing of objects between device monitoring manager (212) , session transfer manager (211) and session database (213), processing and compressing the received RIA session objects, and authenticating users.
6. A method for facilitating transfer of Rich Internet Application (RIA) session between at least two electronic devices, wherein at least one device is an alternative device and the other is an original device, comprising the steps of:
- Providing at least one module to be configured as a session management agent for sending heartbeat messages and communicating transfer event;
- Providing at least one dynamic session management server for monitoring device status updated by session management agent;
- Initializing the RIA session transfer between said devices;
- Selecting the specific RIA session to be transferred with push or pull method;
- Performing transfer of RIA session across said devices; and
- Synchronizing copies of RIA session objects across devices.

7. The method as claimed in Claim 6, wherein the steps of initializing the RIA session transfer between said devices further comprises; logging into the dynamic session management server; pushing any existing RIA session objects to the Session Management agent; sending periodical heartbeat messages to the dynamic session management server; updating the alternative device about the device availability when receiving heartbeat messages; connecting to a web server to request for web services/content; providing a response to the browser by sending RIA application objects; loading the RIA application objects; requesting for RIA objects from the web server; sending latest RIA session objects to SMA; uploading processed RIA session objects and information related to devices to DSMS; and updating the alternative devices with remote RIA session objects.

8. The method as claimed in Claim 6, wherein the step of selecting specific RIA session to be transferred comprises the steps of: triggering a GUI on Session Management Agent of original device to select the specific RIAs for push or pull transfer; and relaying the request for push session transfer from the original device to the alternative device chosen for selection method of RIA session transfer to take place.

9. The method as claimed in Claim 6, wherein the step of performing transfer of RIA session across devices further

comprising the steps of: selecting the specific RIAs to be transferred; opening a browser on alternative device and instructing browser to request for the RIA service/content currently accessed from the original device; sending the RIA application objects to the browser of alternative device; loading the RIA application objects; retrieving the remote RIA session objects previously stored by the Session Management Agent; resuming the corresponding services/contents accessed on original device by treating the remote RIA session objects as pointer; informing Dynamic Session Management Server about this successful session transfer; updating Session Management Agent of the original devices about the successful session transfer; triggering the browser to end the transferred RIA sessions; updating Session Management Agent with the latest RIA session objects; processing and sending RIA session objects to Dynamic Session Management Server; synchronizing the RIA session objects on every alternative devices and storing a copy of the remote RIA session objects locally.

1/5

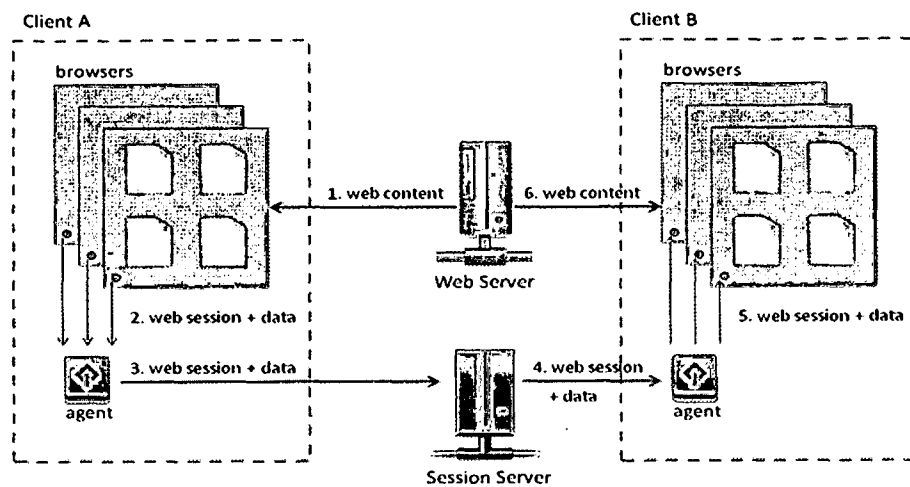


FIG 1

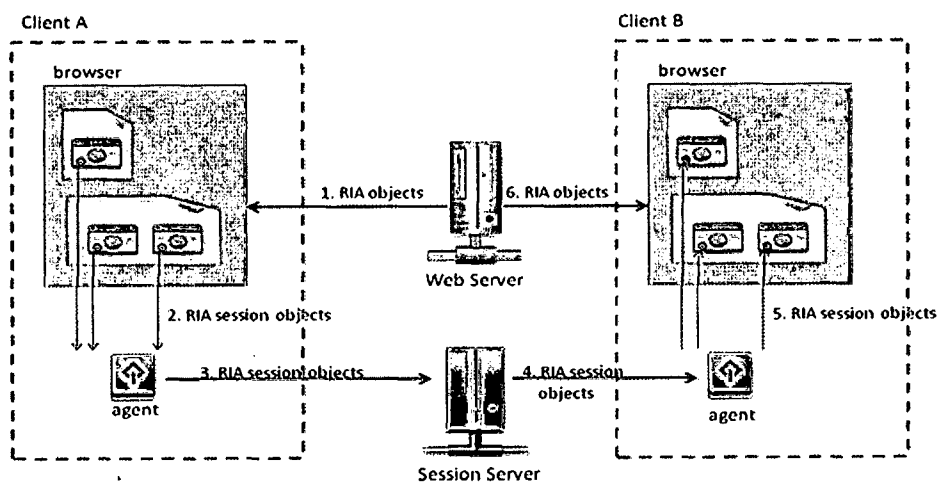


FIG 2

2/5

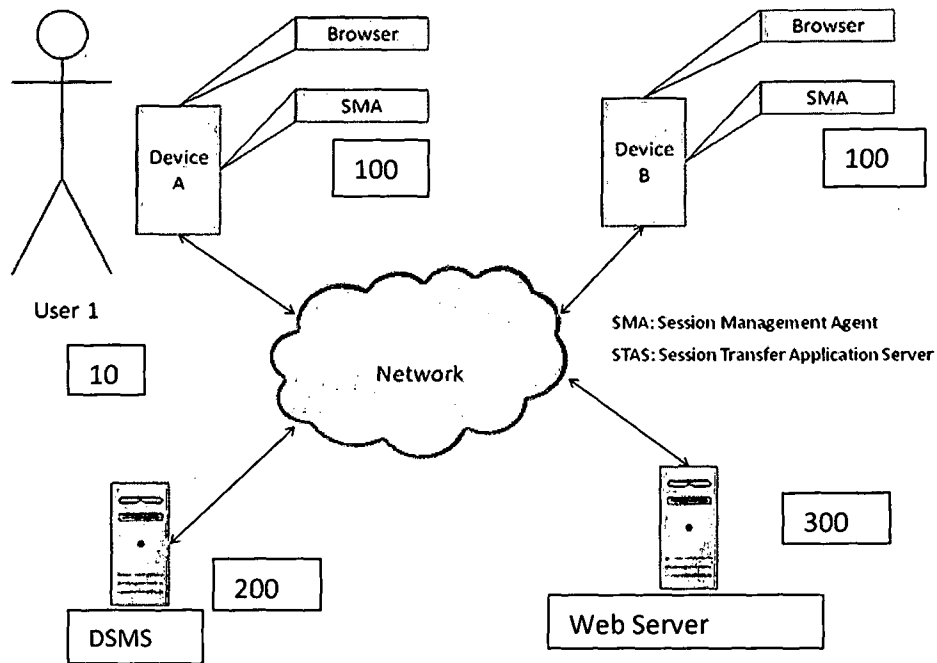
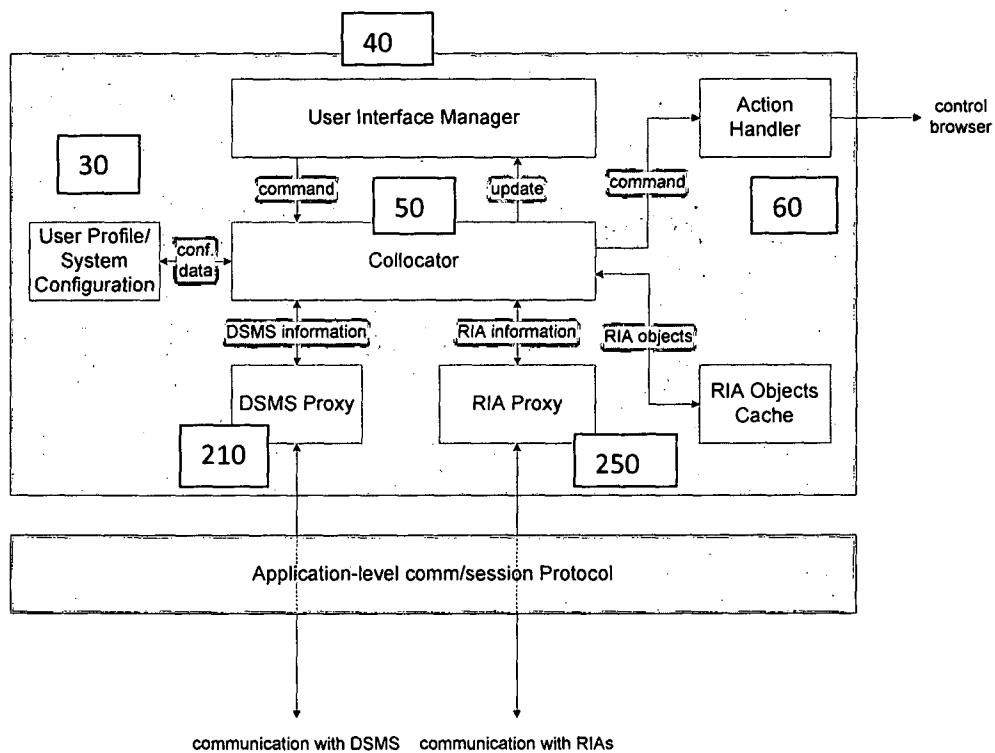


FIG 3



3/5

FIG 4

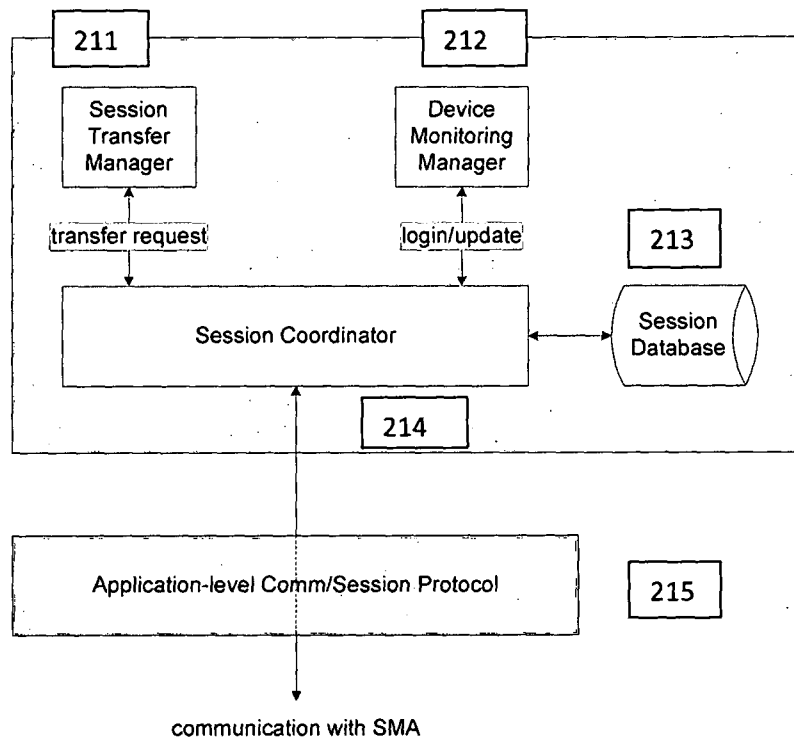
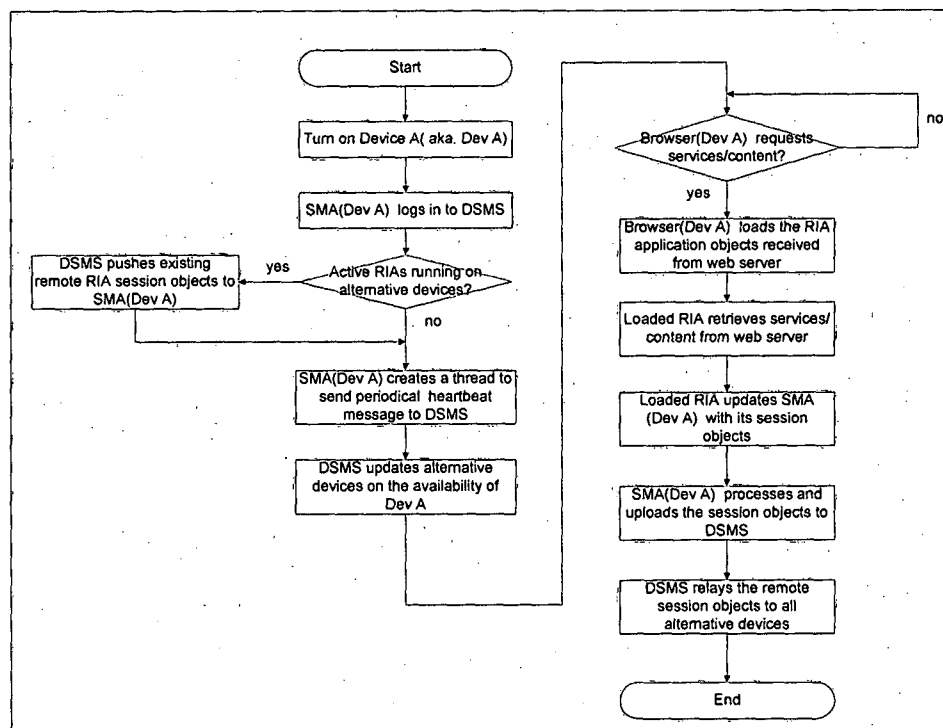


FIG 5



4/5

FIG 6

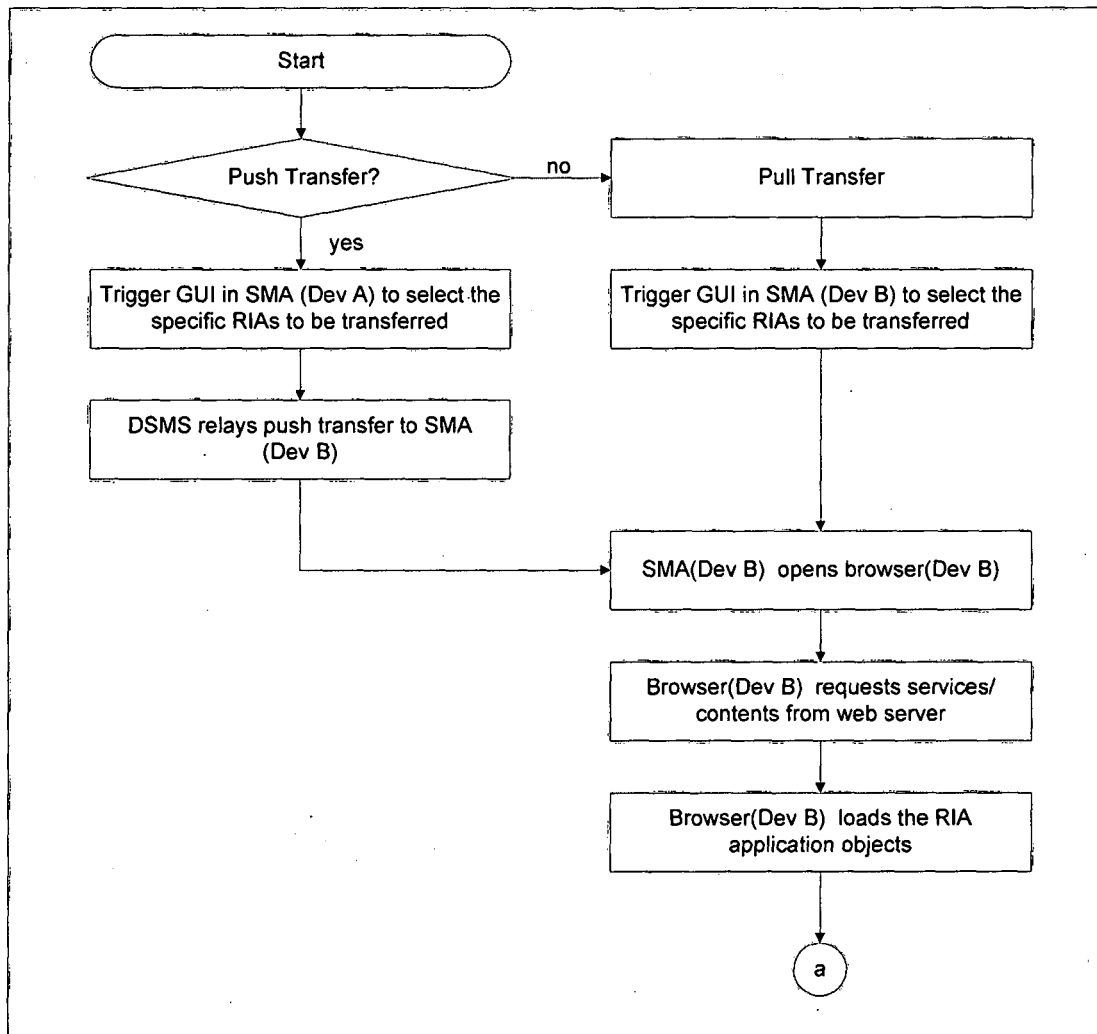


FIG 7(a)

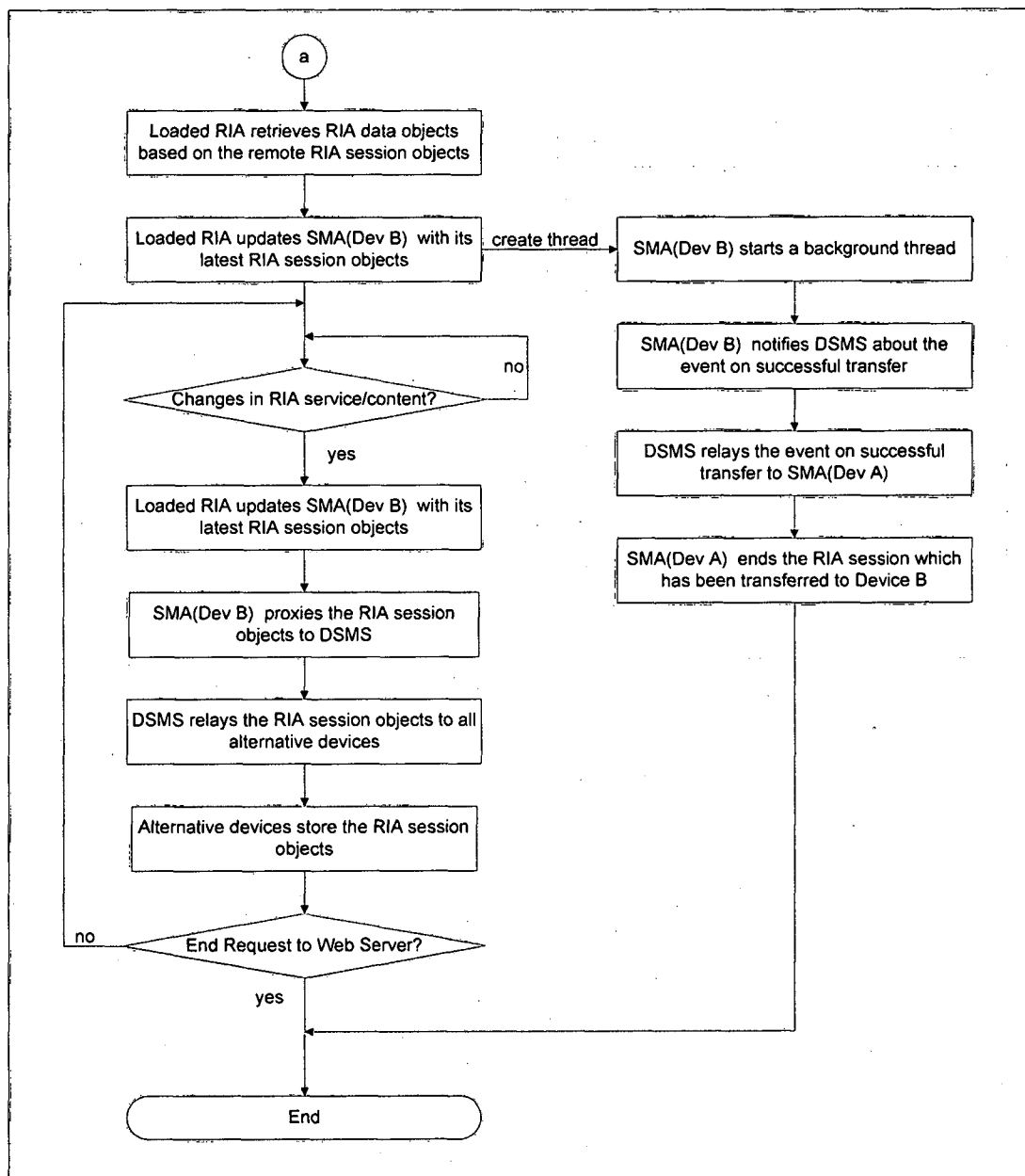


FIG 7(b)

INTERNATIONAL SEARCH REPORT

International application No
PCT/MY2012/000179

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L29/08
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, COMPENDEX, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/187991 A1 (LIN RAYMOND [US] ET AL) 2 October 2003 (2003-10-02) paragraph [0004] paragraph [0007] - paragraph [0008] paragraph [0024] - paragraph [0025] paragraph [0034] - paragraph [0042] paragraph [0053] - paragraph [0060] paragraph [0063] paragraph [0065] - paragraph [0068] figure 1	1-9
A	----- EP 1 330 098 A1 (BRITISH TELECOMM [GB]) 23 July 2003 (2003-07-23) paragraph [0019] - paragraph [0021] claim 1 ----- -/-	1-9

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 January 2013

Date of mailing of the international search report

05/02/2013

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Cankaya, Sukru

INTERNATIONAL SEARCH REPORT

International application No

PCT/MY2012/000179

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; IP Multimedia Subsystem (IMS) Service Continuity; Inter-UE Transfer enhancements; Stage 2 (Release 10)", 3GPP DRAFT; 23831-100, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. SA WG2, no. Brunstad; 20100903, 24 August 2010 (2010-08-24), XP050458394, [retrieved on 2010-08-24] pages 52-55, section 6.1.3.7 -----	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/MY2012/000179

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003187991	A1	02-10-2003	NONE

EP 1330098	A1	23-07-2003	CA 2468143 A1 31-07-2003
			EP 1330098 A1 23-07-2003
			EP 1468545 A1 20-10-2004
			US 2005033843 A1 10-02-2005
			WO 03063451 A1 31-07-2003
