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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. Nos:

60/608,131

**REVOCATION OF POWER OF ATTORNEY WITH NEW POWER OF ATTORNEY AND STATEMENT
UNDER 37 CFR 3.73(b)**

Filed herewith is a Revocation of Power of Attorney that is signed by one authorized to act on behalf of the assignee of the entire interest of the applicant (per 37 C.F.R. § 1.32(b)(4)).

Revocation of Power of Attorney with New Power of Attorney.

All previous powers of attorney given in the above-identified applications (a printed chart is attached and computer disk is enclosed) are hereby revoked, and hereby appointed are the practitioners associated with Customer Number **57541** to prosecute these Applications and transact business in the Patent and Trademark Office connected therewith. Please send all correspondence to the address associated with the same customer number.

Statement under 37 CFR 3.73(b)

Sprint Nextel Corporation. is the assignee of the entire right, title and interest of the Applications, captioned above. The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Respectfully Submitted,



Harley Ball, Vice President
Sprint Nextel Corporation

6/12/06
Date

13281 U.S. PTO
090904

PTO/SB/16 (08-03)

Approved for use through 07/31/2006. OMB 0651-0032

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

15800 U.S. PTO
60/608131

090904

INVENTOR(S)					
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☐ Additional inventors are being named on the separately numbered sheets attached hereto					
TITLE OF THE INVENTION (500 characters max)					
Architectures Options for Facilitating Roaming of Dispatch Subscribers					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
☒ Customer Number 23911					
OR					
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ENCLOSED APPLICATION PARTS (check all that apply)					
☒ Specification		Number of Pages 11		☐ CD(s), Number	
☒ Drawing(s)		Number of Sheets 12		☐ Other (specify)	
☒ Application Data Sheet. See 37 CFR 1.76					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
☐ Applicant claims small entity status. See 37 CFR 1.27.					
☒ A check or money order is enclosed to cover the filing fees					
☒ The Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account Number: 05-1323 (Docket # 100773.55339PV).					
☐ Payment by credit card. Form PTO-2038 is attached.					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
☒ No					
☐ Yes, the name of the U.S. Government agency and the Government contract number are:					

FILING FEE
Amount\$

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Respectfully submitted,

[Page 1 of 1]

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SIGNATURE

REGISTRATION NO. 43,420
(if appropriate)

Docket Number: 100773.55339PV

TYPED or PRINTED NAME Stephen W. Palan

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USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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**ARCHITECTURES OPTIONS FOR FACILITATING
ROAMING OF DISPATCH SUBSCRIBERS**

BACKGROUND OF THE INVENTION

[0001] Cellular communications systems typically provide interconnect and/or dispatch voice communication services. Interconnect voice communication services are those typically provided by most cellular carriers as circuit-switched communications. Dispatch communication services are commonly known as a walkie-talkie type of call such as Nextel's service identified by the trade names Push-To-Talk (PTT) or Direct Connect. Interconnect voice communication services provided by most cellular carriers can be provided between sources and destinations of different cellular carriers. However, dispatch communication services are typically implemented in a proprietary manner which prevents dispatch calls from originating in one cellular carrier's network and terminating in another cellular carrier's network.

SUMMARY OF THE INVENTION

[0002] A system and method for facilitating roaming of dispatch subscribers between different networks is provided. Exemplary embodiments of the present invention can provide either explicit or implicit registration of roaming subscribers. Compared to the explicit registration, the implicit registration does not require the roaming subscriber to explicitly re-register with the QuickConnect network. In accordance with different embodiments of the present invention, the roaming subscriber's dispatch sessions can be managed by the roaming subscriber's home



network, the visited network, or the QuickConnect network.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] Figure 1 illustrates the architecture option of the first exemplary embodiment of the present invention;

[0004] Figure 2 illustrates the architecture option of the second exemplary embodiment of the present invention;

[0005] Figure 3 illustrates the architecture option of the third exemplary embodiment of the present invention

[0006] Figure 4 illustrates a signalling flow for a terminating user in a home network in accordance with the first embodiment of the present invention;

[0007] Figure 5 illustrates a signalling flow for a terminating user in another network in accordance with the first embodiment of the present invention;

[0008] Figure 6 illustrates a signalling flow for a terminating user in a visited network in accordance with the first embodiment of the present invention;

[0009] Figure 7 illustrates a signalling flow for a terminating user in a home network in accordance with the second embodiment of the present invention;

[0010] Figure 8 illustrates a signalling flow for a terminating user in another network in accordance with the second embodiment of the present invention;

[0011] Figure 9 illustrates a signalling flow for a terminating user in a visited network in accordance with the second embodiment of the present invention;

[0012] Figure 10 illustrates a signalling flow for a terminating user in a home network in accordance with the third embodiment of the present invention;

[0013] Figure 11 illustrates a signalling flow for a terminating user in another network in accordance with the third embodiment of the present invention; and

[0014] Figure 12 illustrates a signalling flow for a terminating user in a visited network in accordance with the third embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0015] In the following description, it is assumed that the roaming subscriber has successfully performed bearer and IMS/MMD registrations.

[0016] In accordance with the present invention explicit and implicit registration are two options available for the QuickConnect infrastructure to enable registration and access of dispatch service to subscribers who are traveling and roam into foreign wireless carrier's networks.

[0017] In the explicit registration option, the subscriber needs to explicitly register with the QuickConnect network. First the roaming subscriber tries to register with the visited dispatch service. The visited network forwards the

registration to the QuickConnect network. The QuickConnect may optionally choose to provide a temporary address of record (AOR) and instruct the subscriber device to register with the temporary AOR. The subscriber re-registers with the new AOR. The registration is forwarded to the home carrier, which then authenticates the user credentials. It also notifies the QuickConnect network of the user call restrictions and the available credit. The subscriber then re-registers with the QuickConnect network and informs the network of the available credit. The QuickConnect network verifies the credit and the credentials of the subscriber provided by the home carrier, and confirms the temporary AOR to be used while roaming. It may also inform the visiting carrier's dispatch infrastructure of the temporary credentials and available credit. (This may be required for the second embodiment of the roaming architecture described below).

[0018] This method may require changes to the dispatch technologies to support roaming registration. Moreover, the use of temporary AOR is optional. The client may have multiple identities, one of them to be used for when the user is roaming. It should be noted that the traditional registration process might not be feasible due to proliferation of several competing dispatch technologies with their proprietary registration processes.

[0019] In the implicit registration option, the subscriber need not explicitly re-register with the QuickConnect network. The QuickConnect network relies on the notification from the home carrier to register the subscriber as roamer and informs

the foreign carrier of the available credits. The benefit of this registration method is that no new development is needed either on the dispatch client or the proliferated dispatch infrastructure.

[0020] Again, the temporary AOR is optional and the client may use a pre-assigned public identity assigned for roaming. However, the QuickConnect network needs to be aware of realm used by various carriers to pre-assign roaming public identity for their subscribers.

[0021] In accordance with the present invention, three different embodiments with different architecture options for enabling dispatch sessions while subscribers are roaming are disclosed.

[0022] Figure 1 illustrates the architecture option of the first exemplary embodiment of the present invention. This architecture is a home managed option. This architecture is the standard 3GPP Release 5 architecture, wherein the dispatch service shall be controlled via the home network.

[0023] The dispatch session requests are passed via the visiting carrier and the QuickConnect network to the home dispatch servers, which will then provide the requested service. The QuickConnect network determines whether the incoming request is from a roaming subscriber or a subscriber located in its home network. The use of temporary address of record or its equivalent assists the QuickConnect network in making this decision. The QuickConnect network passes through the incoming request from a roaming subscriber to its home network. The

home network services the request that may involve QuickConnect network (if the called party is roaming or belonging to another carrier).

[0024] The incoming requests from other carriers are translated and forwarded by the QuickConnect to the home network, which will then forwards the request to the roaming subscriber via the QuickConnect network. The dispatch server functions as a B2BUA translating between the roaming user's actual AOR and the temporary roaming AOR. The QuickConnect network may be able to provide a cut-through via its dispatch servers; however this would necessitate that QuickConnect perform a check to determine if the user is roaming or not for every session that traverses it.

[0025] Figures 4-6 present call flows for various types of private call originations from the roaming subscriber for the first embodiment.

[0026] The second embodiment of the present invention is a locally managed architecture. This architecture is a variation of the 3GPP Release 5/6 architecture for local services support, wherein the dispatch service are controlled via the foreign carrier. This architecture option is feasible only when the subscriber roams onto a foreign carrier that has deployed the same dispatch technology as its home network. Figure 2 depicts the locally managed architecture for roaming.

[0027] The local roaming network controls dispatch originations and the QuickConnect network is only used for calls terminating to the home network or other dispatch carriers. The local dispatch servers arbitrate the floor for the

duration of the session. However, QuickConnect network is used to pass or control dispatch originations for subscribers that have roamed onto carriers that do not support the same dispatch technology as the home network. Figures 7-9 illustrate call flows for various types of private call originations from the roaming subscriber.

[0028] The dispatch terminations to the subscriber is transparent to the QuickConnect network. Alternatively, QuickConnect network may be able to cut through the calls originated from other carriers to enhance the latency performance as described in the previous embodiment.

[0029] The third exemplary embodiment of the present invention uses a QuickConnect network managed architecture. In this architecture, all call originations from roaming subscribers, irrespective of the dispatch technologies supported within the foreign carrier, are managed by dispatch servers hosted in the QuickConnect network. The QuickConnect network is responsible for arbitrating the floor and managing the media resources. Figures 10-12 illustrate call flows for various types of private call originations from the roaming subscriber.

[0030] While the invention has been described in connection with various embodiments, it will be understood that the invention is capable of further modifications. This application is intended to cover any variations, uses or adaptation of the invention following, in general, the principles of the invention, and including such departures from the present disclosure as, within the known and customary practice within the art to which the invention pertains.

What is claimed is:

1. A method for facilitating roaming of dispatch subscribers between different networks, the method comprising the acts of:
 - registering, by a roaming subscriber, with a visited dispatch network;
 - forwarding, by the visited network, the registration to a QuickConnect network;
 - providing, by the QuickConnect network, a temporary address of record (AOR) to the roaming subscriber's device;
 - instructing the roaming subscriber's device to register with the temporary AOR;
 - re-registering, by the roaming subscriber, to the visited network with the temporary AOR;
 - forwarding the registration to the roaming subscriber's home network;
 - authenticating, by the roaming subscriber's home network, the roaming subscriber's credentials;
 - notifying, by the roaming subscriber's home network, the QuickConnect network of the roaming subscriber's call restrictions and the available credit;
 - re-registering, by the roaming subscriber, with the QuickConnect network;
 - informing, by the roaming subscriber, the QuickConnect network of the available credit;
 - verifying, by the QuickConnect network, the credit and the credentials of the roaming subscriber; and

confirming, by the QuickConnect network, the temporary AOR.

2. A method for facilitating roaming of dispatch subscribers between different networks, the method comprising the acts of:

registering, by a roaming subscriber, with a visited dispatch network;

forwarding, by the visited network, the registration to a QuickConnect network;

providing, by the QuickConnect network, a temporary address of record (AOR) to the roaming subscriber's device;

instructing the roaming subscriber's device to register with the temporary AOR;

re-registering, by the roaming subscriber, to the visited network with the temporary AOR;

forwarding the registration the roaming subscriber's home network;

authenticating, by the roaming subscriber's home network, the roaming subscriber's credentials;

notifying, by the roaming subscriber's home network, the QuickConnect network of the roaming subscriber's call restrictions and the available credit;

informing, by the roaming subscriber's home network, the QuickConnect network of the available credit;

verifying, by the QuickConnect network, the credit and the credentials of the roaming subscriber; and

confirming, by the QuickConnect network, the temporary AOR.

3. A method for facilitating roaming of dispatch subscribers between different networks, the method comprising the acts of:

roaming, by a subscriber, onto a visited dispatch network; and

controlling, by the visited network, the subscriber's dispatch sessions,

wherein the subscriber's home network and the visited network operate using the same dispatch technology, the visited dispatch network the subscriber's dispatch origination sessions and a QuickConnect network controls sessions terminating to the subscriber's home network and other networks.

4. A method for facilitating roaming of dispatch subscribers between different networks, the method comprising the acts of:

roaming, by a subscriber, onto a visited dispatch network; and

controlling, by a QuickConnect network, the subscriber's dispatch sessions

regardless of the destination of the subscriber's dispatch sessions.

ABSTRACT OF THE DISCLOSURE

A system and method for facilitating roaming of dispatch subscribers between different networks is provided. Exemplary embodiments of the present invention can provide either explicit or implicit registration of roaming subscribers. Compared to the explicit registration, the implicit registration does not require the roaming subscriber to explicitly re-register with the QuickConnect network. In accordance with different embodiments of the present invention, the roaming subscriber's dispatch sessions can be managed by the roaming subscriber's home network, the visited network, or the QuickConnect network.

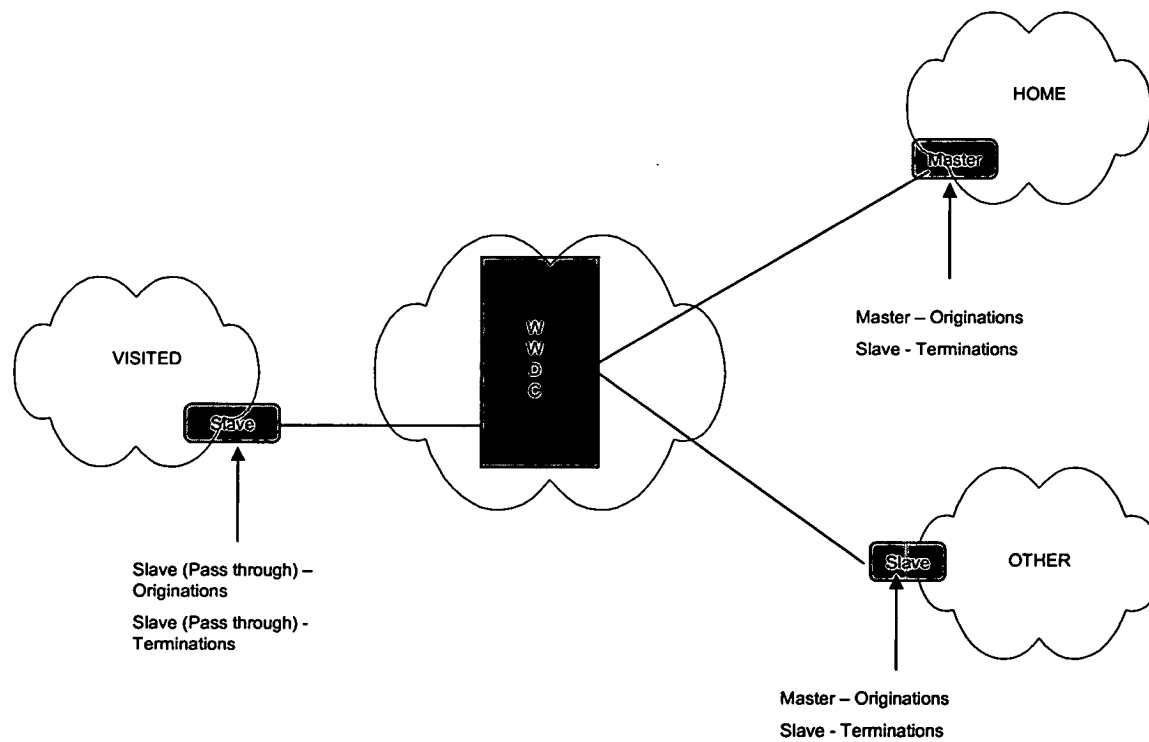


Figure 1

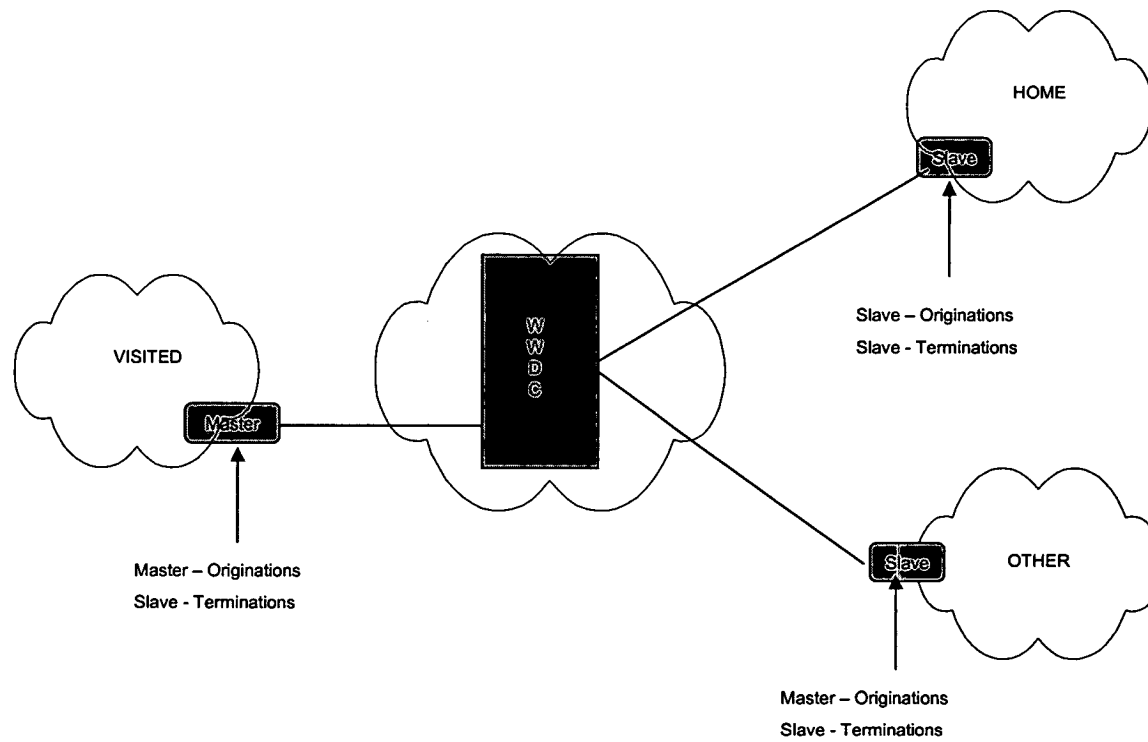


Figure 2

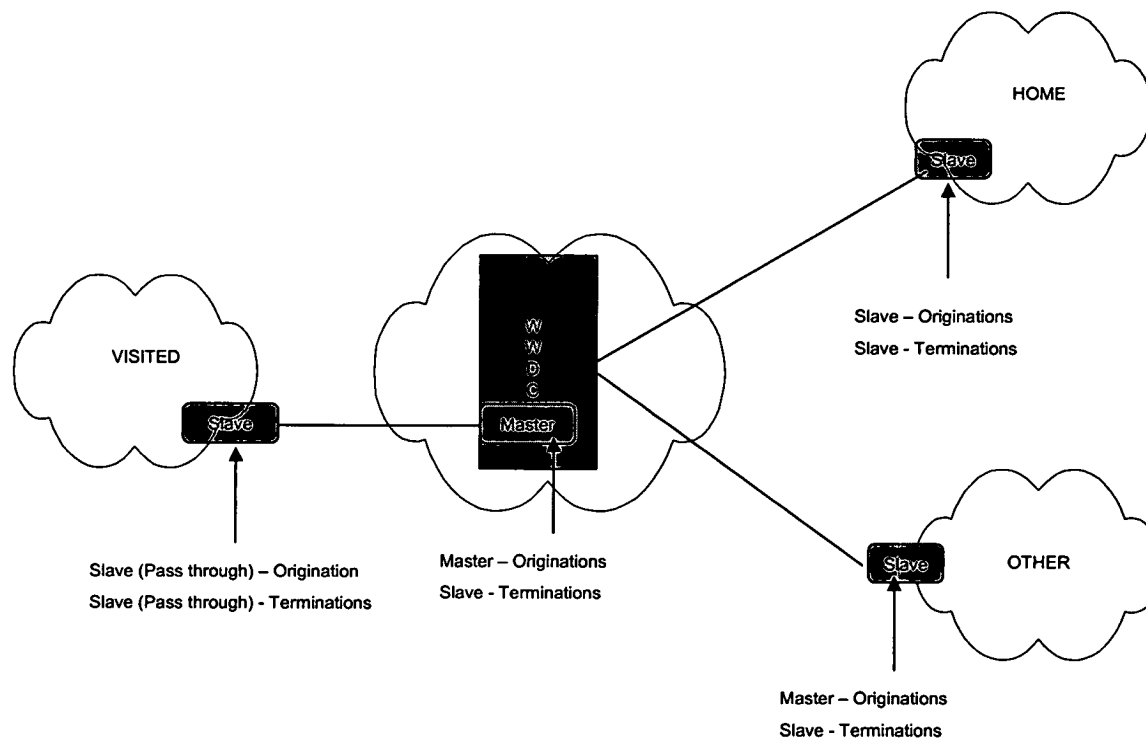


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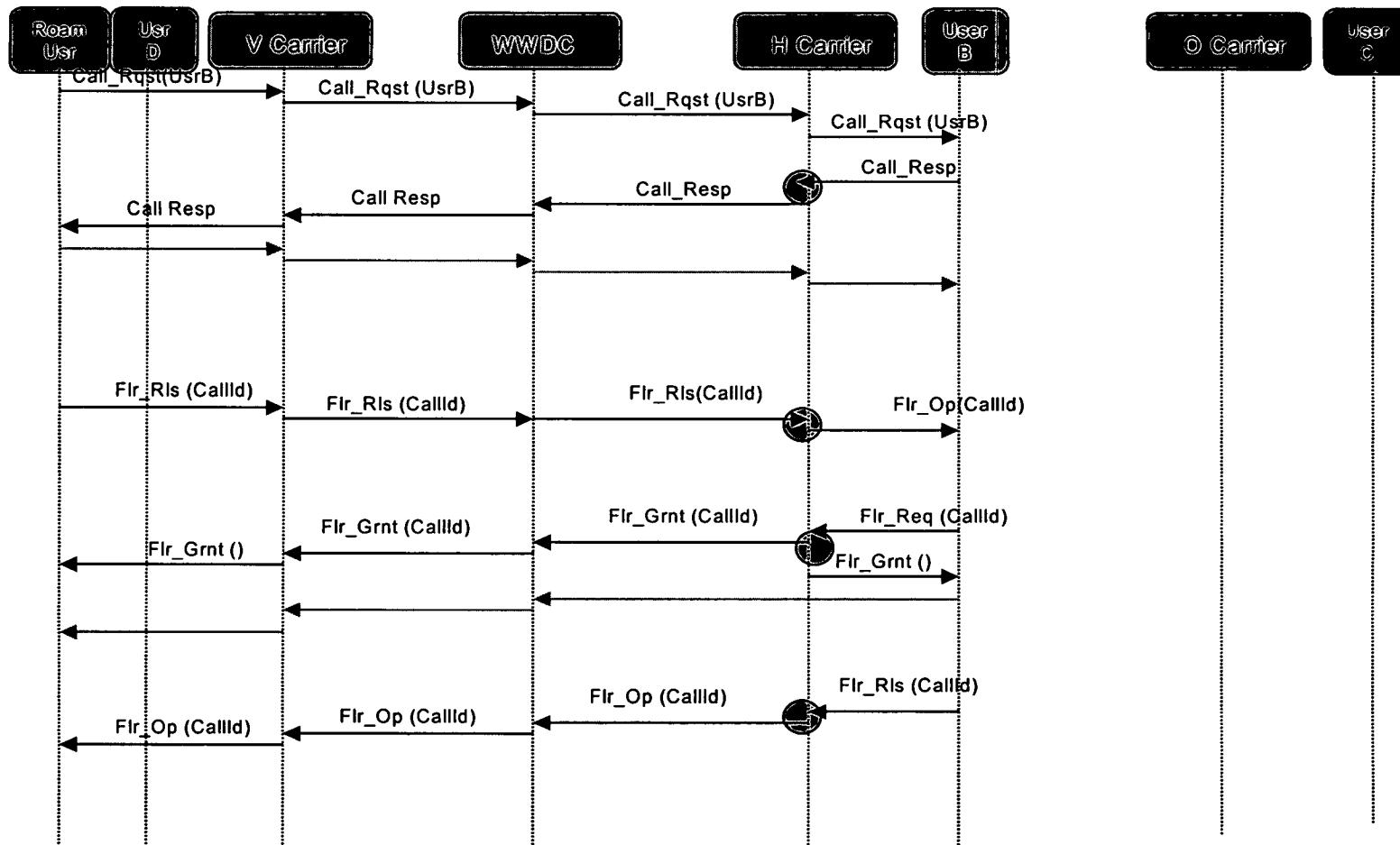


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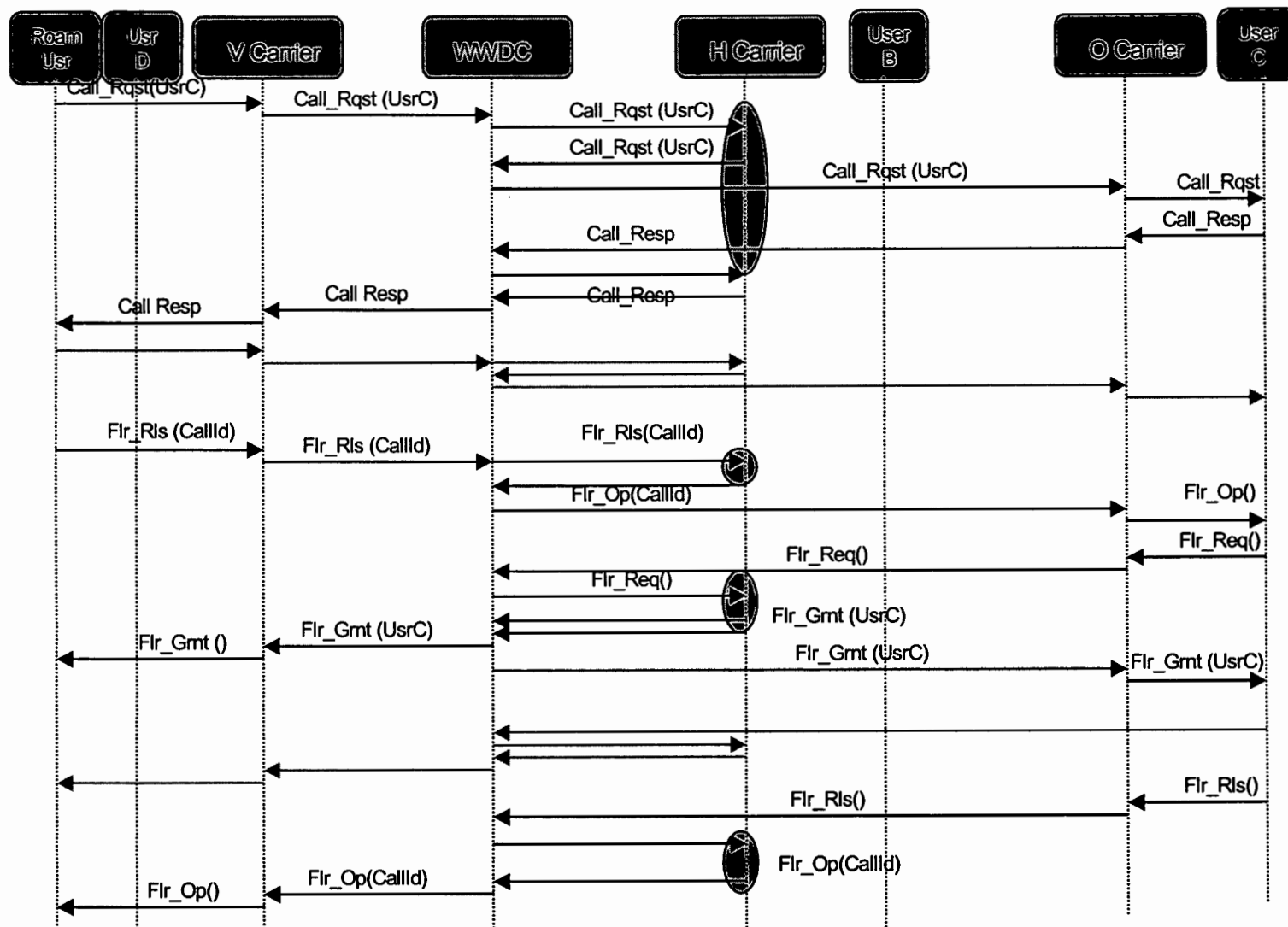


Figure 5

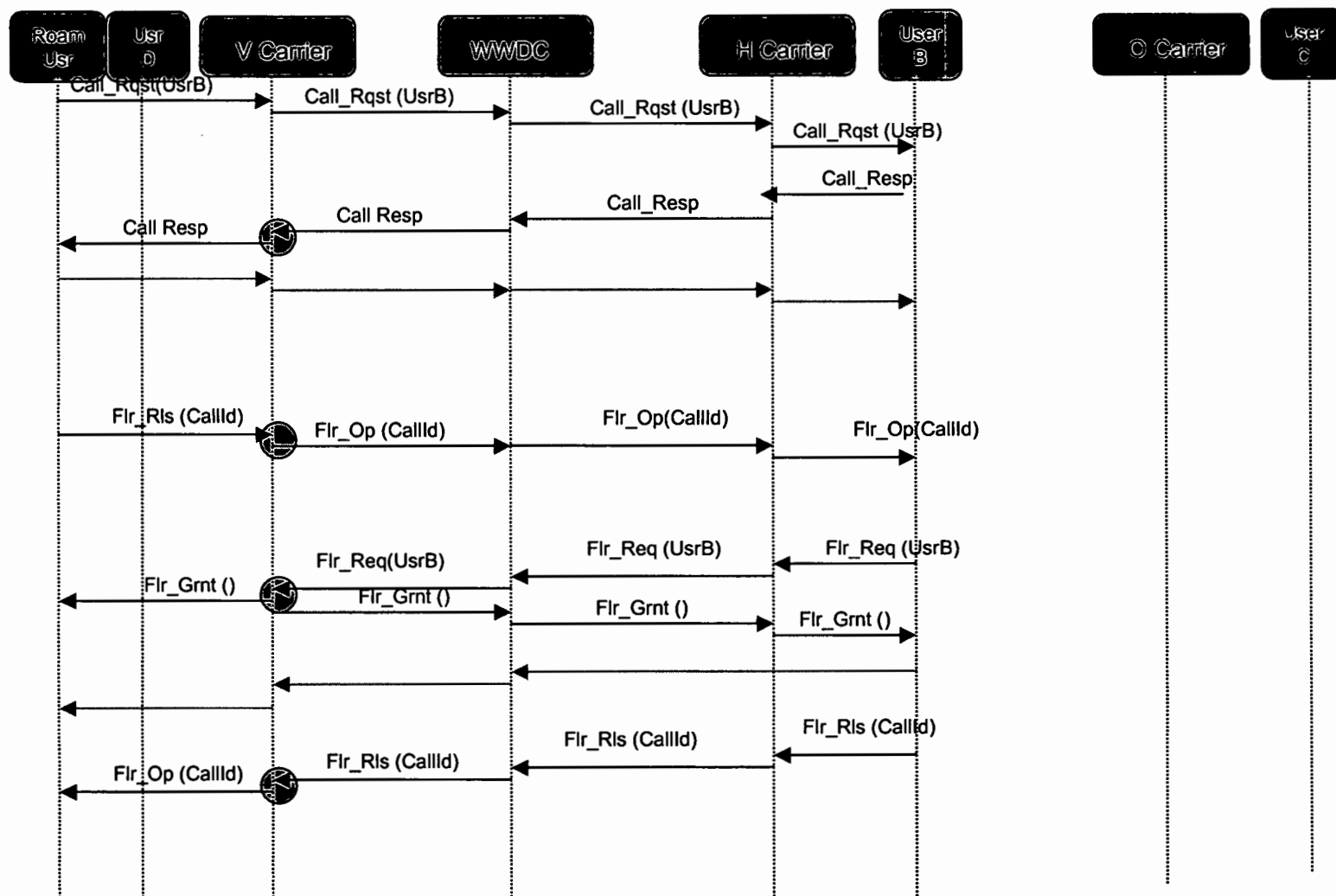


Figure 7

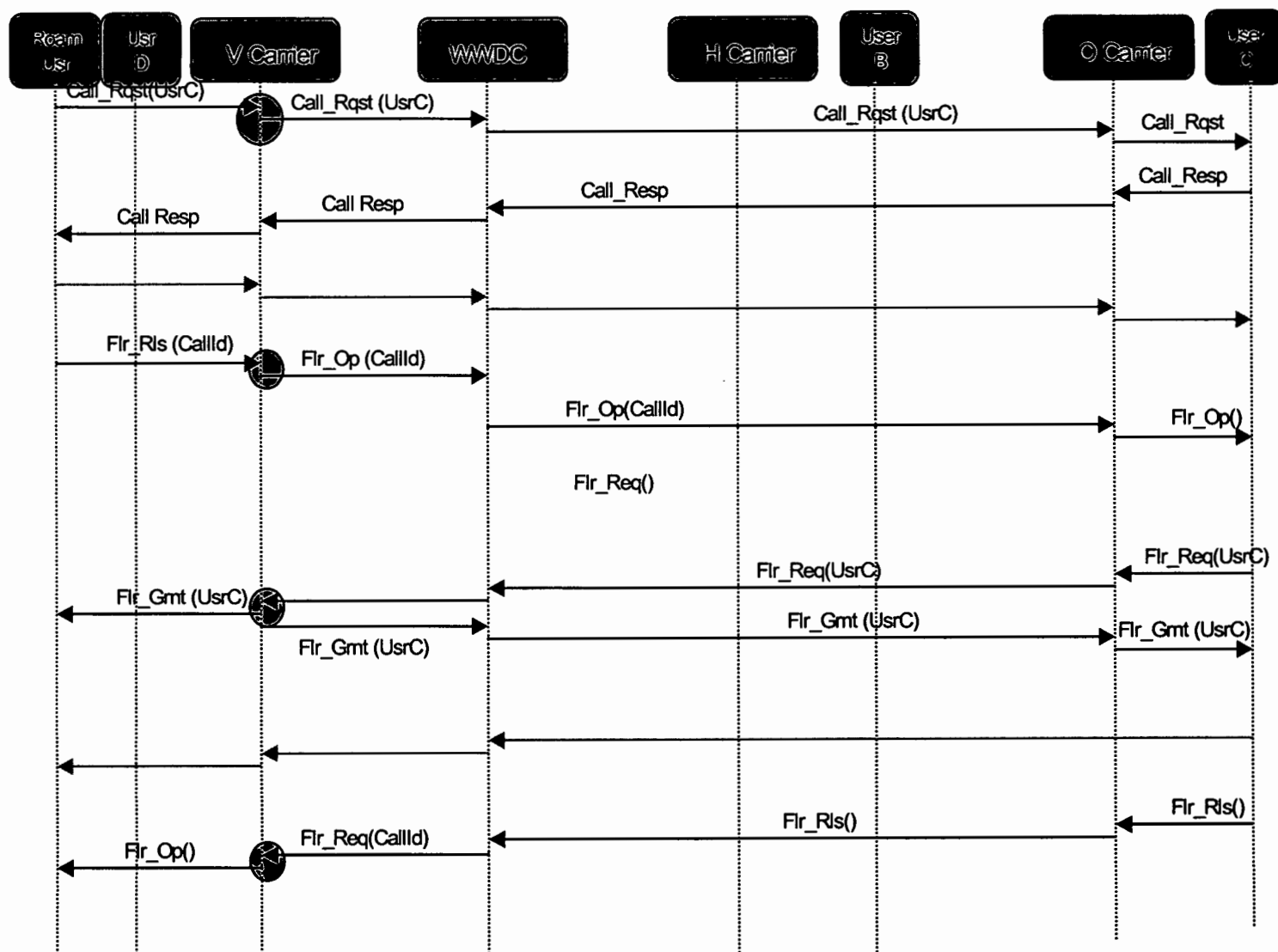


Figure 8

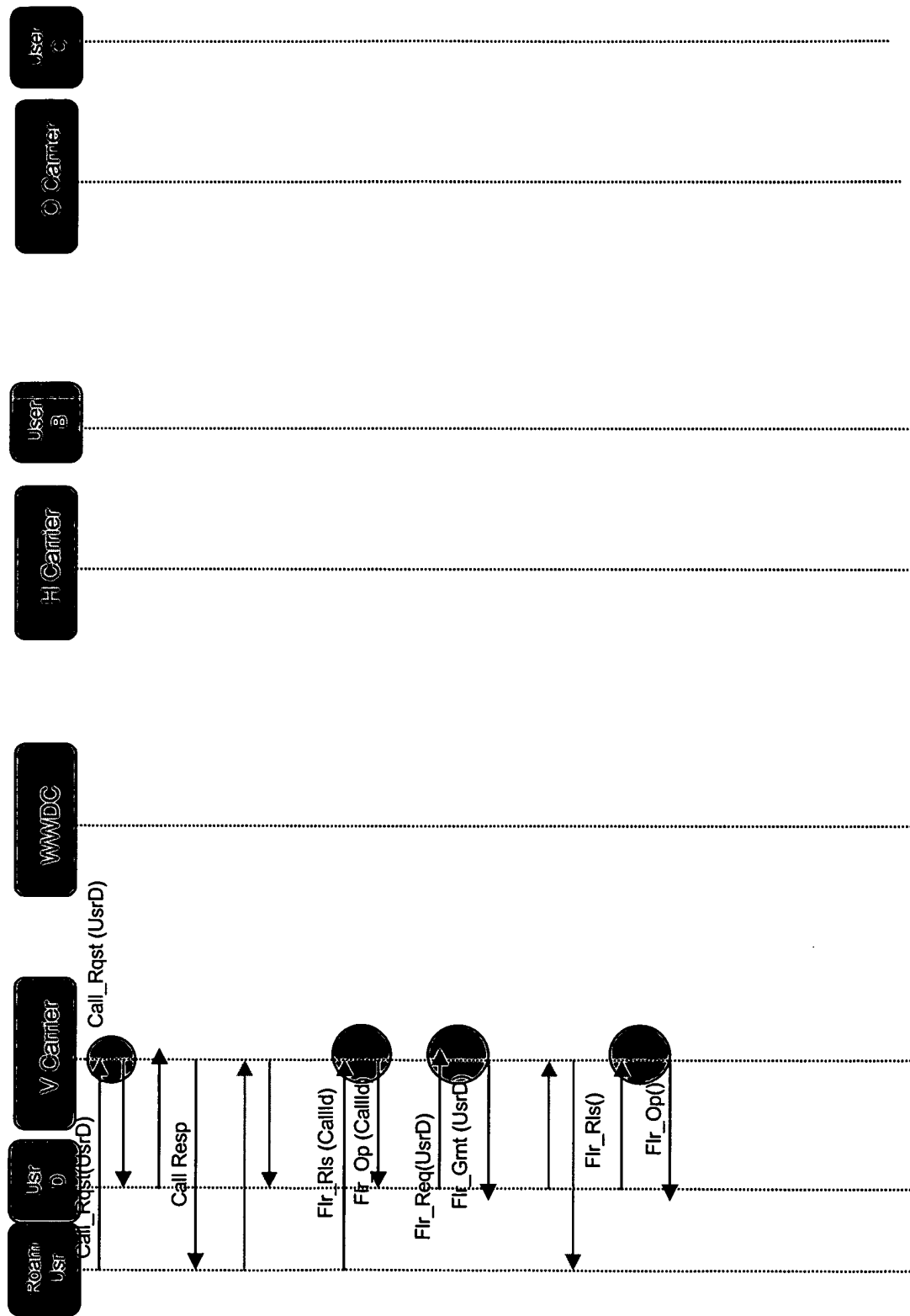


Figure 9

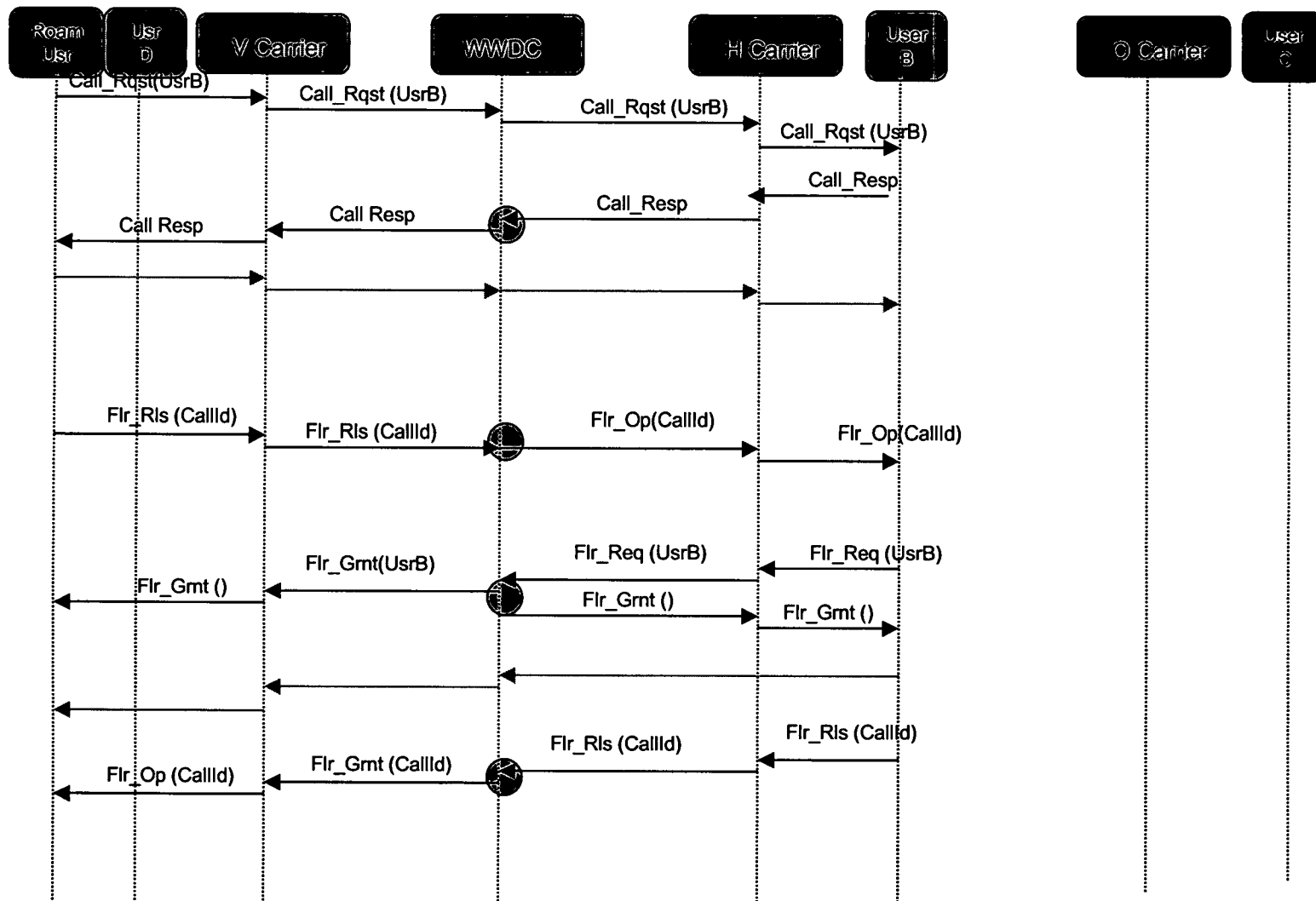


Figure 10

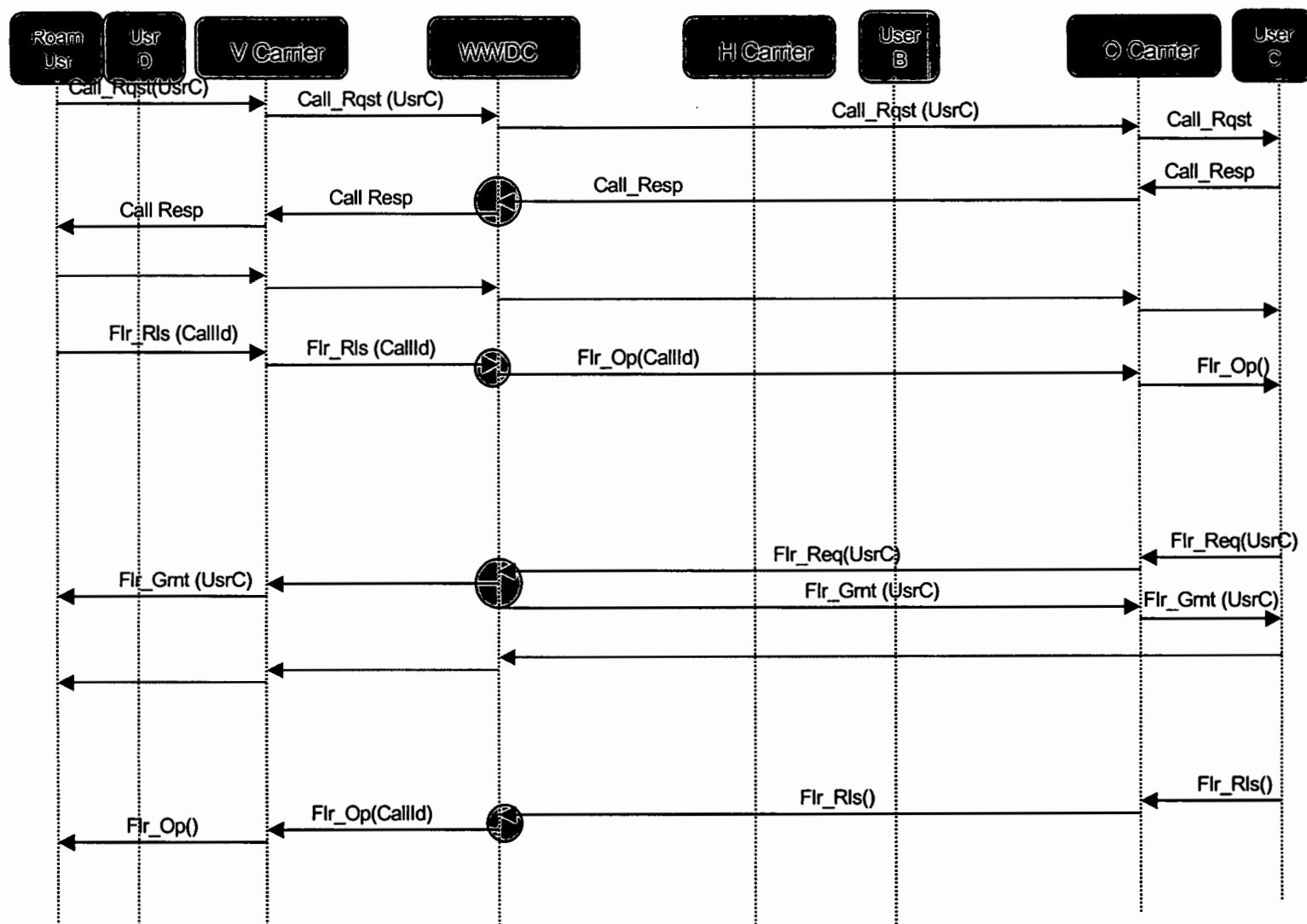


Figure 11

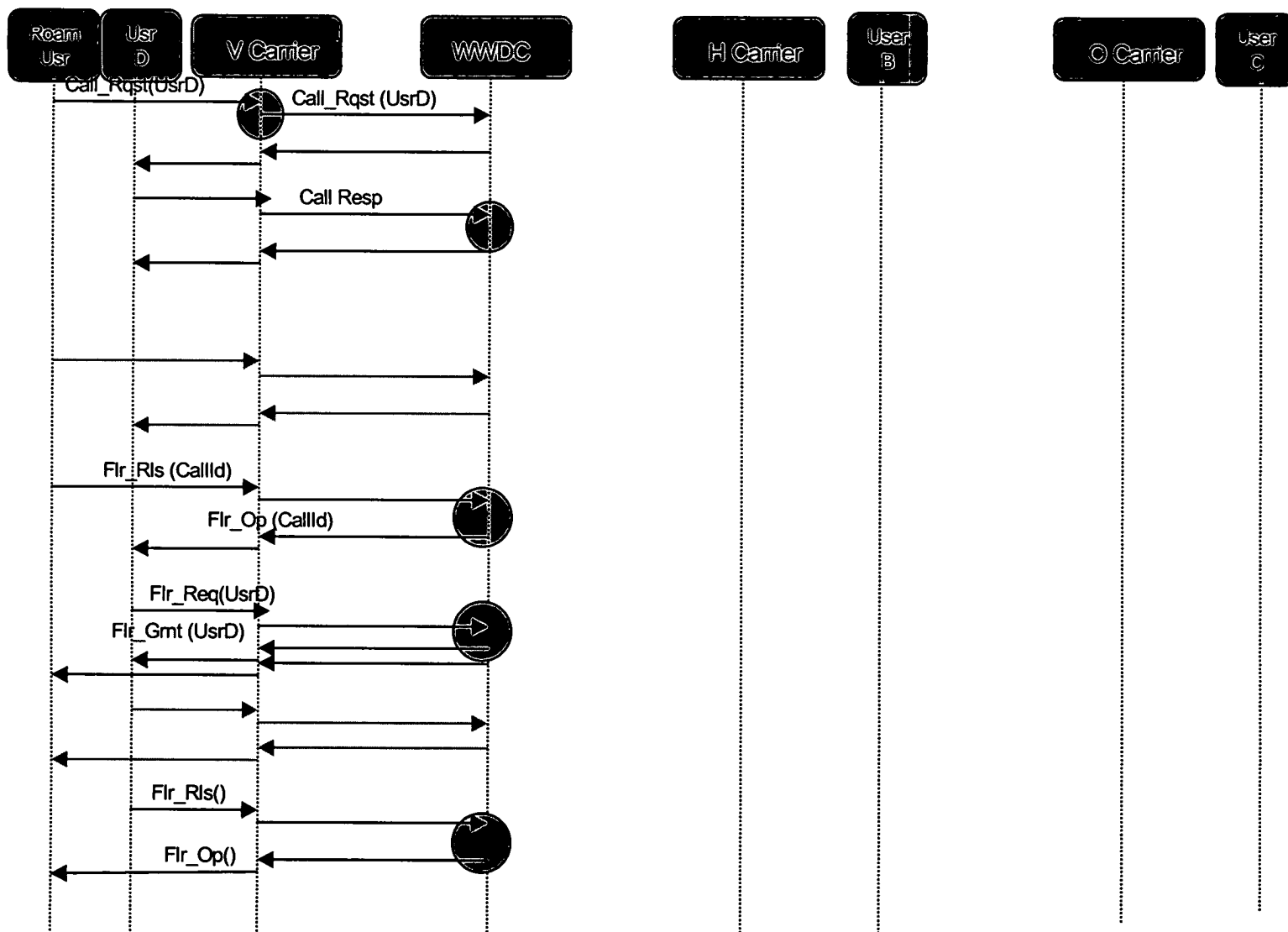


Figure 12

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

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APPLICATION DATA SHEET

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