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(54) METHOD AND APPARATUSES FOR MAINTAINING SERVICE CONTINUITY TO A CENTRALIZATION AND CONTINUITY APPLICATION SERVER

VERFAHREN UND VORRICHTUNGEN ZUM AUFRECHTERHALTEN VON DIENSTKONTINUITÄT ZU EINEM ZENTRALISIERUNGS- UND KONTINUITÄTS-ANWENDUNGSSERVER

PROCÉDÉ ET APPAREILS POUR MAINTENIR UNE CONTINUITÉ DE SERVICE SUR UN SERVEUR D'APPLICATION DE CONTINUITÉ ET DE CENTRALISATION

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Description

TECHNICAL FIELD

[0001] The invention relates to the field of maintaining service continuity in an IP Multimedia Subsystem communication network.

BACKGROUND

[0002] The IP Multimedia Subsystem (IMS) is the technology defined by the Third Generation Partnership Project (3GPP) to provide IP Multimedia services over mobile communication networks. IP Multimedia services provide a dynamic combination of voice, video, messaging, data, etc. within the same session. As the number of basic applications, and the media which it is possible to combine, increases, so will the number of services offered to the end users, giving rise to a new generation of personalised, rich multimedia communication services. The IMS is defined in the 3GPP Specification 23.228.

[0003] The IMS makes use of the Session Initiation Protocol (SIP) to set up and control calls or sessions between user terminals (or user terminals and application servers). The Session Description Protocol (SDP), carried by SIP signalling, is used to describe and negotiate the media components of the session. Whilst SIP was created as a user-to-user protocol, IMS allows operators and service providers to control user access to services and to charge users accordingly.

[0004] IMS relies on Internet Protocol (IP) as a transport technology. Using IP for voice communications, however, presents some challenges, especially in the mobile community where Voice Over IP (VoIP) enabled packet switched (PS) bearers may not always be available. To allow operators to start offering IMS-based services while voice enabled PS-bearers are being built out, the industry has developed solutions that use existing Circuit Switched (CS) networks to access IMS services. These solutions are referred to as IMS Centralized Services (ICS). ICS is also the name of the Work Item in 3GPP Release 8 addressing these matters (IP Multimedia System (IMS) centralized services (Release 8), 3GPP TS 23.292 V8.0.0).

[0005] A functional entity in an IMS network is a Service Centralization and Continuity Application Server (SCC AS), which is an application based in a user's home network IMS Application. The SCC AS provides functionality required to enable IMS Centralized Services. The SCC AS is inserted in a session path using originating and terminating Initial Filter Criteria (iFCs) and configured such that it is the first AS in an originating iFC chain and the last AS in a terminating iFC chain.

[0006] User Equipment (UE) typically communicates with the SCC AS for service control using the Gm reference point. In come circumstances, using a Gm reference point may not be possible (e.g. when using GERAN and the GERAN does not support DTM). In this case, a service control signalling path is handed over to I1. 3GPP TS 23.292, section 7.8 describes the procedure for signalling path handover from Gm to I1 when Gm is lost or not available. The UE sends the handover request to the SCC AS over I1 and the SCC AS is informed that it should now use I1 instead of Gm for controlling the ongoing session with the UE.

[0007] When a handover from Gm to I1 is required, the handover request should be routed from the UE over I1 to the same SCC AS that was previously handling the session over Gm. Suppose, for example, that Unstructured Supplementary Service Data (USSD) is used to communicate over I1. Using current methods, a Home Location Register (HLR) can be statically configured with an E.164 number for the ICS service code for a range of subscribers. This E.164 number can represent the actual SCC AS or a Representative AS (see IP Multimedia Subsystem (IMS); Stage 2 (Release 8), 3GPP TS 23.228 V8.3.0) that performs dynamic allocation of users to an SCC AS. However, routing over Gm is not synchronized with routing over I1. No solution exists to allow the UE to route a request over I1 to the same SCC AS over Gm. There is therefore no guarantee that in the event of a handover from Gm to I1, the handover request over I1 will be routed to the same SCC AS that was previously handling the session over Gm, and so the handover may fail. This problem exists not only for the signalling path handover from Gm to I1, but also in the case of service continuity where a service transfer is made from a Packet Switched (PS) to a Circuit Switched (CS) access. IP Multimedia System (IMS) Service Continuity (Release 8), 3GPP TS 23.237 V8.0.0) addresses service continuity, but is not concerned with service continuity in the event of service disruption,

SUMMARY

[0008] The inventors have devised a method and apparatus for maintaining service continuity in the event of a handover from a Gm to an I1 reference point or from a Packet Switched (PS) only to a Circuit Switched (CS) network, by identifying the Service Centralization and Continuity Application Server (SCC AS) in such a way that the same SCC AS can be used after handover.

[0009] According to a first aspect of the invention, there is provided a method of maintaining service continuity for User Equipment (UE) accessing an IP Multimedia Subsystem (IMS) communication network. A routing identifier identifying a SCC AS allocated to the UE is established, and sent to the UE. In the event of disruption to the service between the UE and the SCC AS, a handover message is sent from the UE via a CS access network. The handover message includes the routing identifier, and is then forwarded to the identified SCC AS. This allows the same SCC AS to be used after the handover as was used before the handover, thereby providing service continuity.

[0010] As an option, the method can be used when the

disruption is caused by handover of signalling between the UE and the SCC AS from a Gm reference point to an I1 reference point, or alternatively, when the disruption is caused by handover from a PS access network to the CS access network.

[0011] Optionally, the routing identifier is sent to the UE in one of a Session Initiation Protocol 200 OK message and a Session Initiation Protocol INVITE message, depending on whether the message originates at the UE or terminates at the UE.

[0012] As an option, the handover message is sent from the CS access network to a Representative Application Server, and the Representative Application Server selects a SCC AS on the basis of the routing identifier prior to forwarding the handover message to the identified SCC AS.

[0013] The handover message is optionally sent in an Unstructured Supplementary Service Data format.

[0014] According to a second aspect of the invention, there is provided a UE for use in an IMS network. The UE is provided with a receiver for receiving a routing identifier identifying a SCC AS allocated to the UE. A memory is provided for storing the received routing identifier, and a processor is provided for detecting disruption to an ongoing service between the UE and the SCC AS. A transmitter is also provided for, in the event that disruption is detected, sending a handover message to an access network node, the handover message including the routing identifier. This allows the UE to request the same SCC AS after the handover as was used before the handover.

[0015] The processor is "optionally arranged to detect a loss of Gm availability between the UE and the SCC AS. Alternatively, or additionally, the processor is optionally arranged to detect a handover from a PS access network to a CS access network.

[0016] According to a third aspect of the invention, there is provided a HLR for use in a communication network. The HLR is provided with a processor for allocating a routing identifier to a SCC AS allocated to a UE, the routing identifier being for use In the event of disruption to a service between the UE and the SCC AS, and a memory for storing the routing identifier and an associated E.164 number for the SCC AS. A transmitter is provided for, in the event of disruption to a service between the User Equipment (1) and the Service Centralization and Continuity Application Server, sending the routing identifier to the UE. A receiver is also provided for receiving, from the UE, a request for signalling path handover, via a circuit switched access network in the event of disruption to the service the request including the routing identifier.

[0017] A second processor is provided for using the routing identifier to determine the E.164 number of the SCC AS, and a second transmitter is provided for forwarding the handover request to the SCC AS. In this case, the HLR optionally is provided with a third processor for removing the routing identifier from the received handover request prior to forwarding the handover request to the SCC AS.

[0018] According to a fourth aspect of the invention, there is provided a SCC AS for use in an IMS communication network. The SCC AS is provided with a processor for allocating a routing identifier to the SCC AS the routing identifier being for use in the event of disruption to a service between a UE and the SCC AS, a memory for storing the routing identifier, and a transmitter for, in the event of disruption to a service between the User Equipment (1) and the Service Centralization and Continuity Application Server, sending the routing identifier to the UE. receiver is provided for receiving, from the UE, a request for signalling path handover, via a circuit switched access network in the event of disruption to the service the request including the routing identifier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019]

Figure 1 is a signalling diagram according to an embodiment of the invention;

Figure 2 is a signalling diagram illustrating routing identifier assignment according to an embodiment of the invention;

Figure 3 is a signalling diagram illustrating handover signalling according to an embodiment of the invention;

Figure 4 is a signalling diagram illustrating signalling required for handover where a Representative AS 7 is used according to an embodiment of the invention;

Figure 5 illustrates schematically in a block diagram a User Equipment according to an embodiment of the invention;

Figure 6 illustrates schematically in a block diagram a Home Location Register according to an embodiment of the invention; and

Figure 7 illustrates schematically in a block diagram a Service Centralization and Continuity Application Server according to an embodiment of the invention.

DETAILED DESCRIPTION

[0020] Referring to Figure 1 herein, there is illustrated a UE 1, a Circuit Switched network 2, an IMS network 3 and an Application Server 4 such as an SCC AS or a representative AS. Each SCC AS 4 is allocated a routing identifier, which can be carried in USSD signalling. The allocation of the routing identifier can be performed in any suitable node, such as a Home Location Register (HLR).

[0021] The following steps are performed:

S1. When the UE 1 initiates a session over a Gm reference point, the SCC AS 4 is allocated to the UE 1 for handling the session using standard IMS procedures. A routing identifier is created according to standard USSD procedures. The routing identifier is known to the SCC AS 4, and can be used by a HLR to find the SCC AS 4, for example by mapping the identifier to an E.164 number which points to the SCC AS 4. The routing identifier of the SCC AS 4 is then sent back to the UE 1 over Gm, for example in the response of the first INVITE send by the UE 1 or in a terminating INVITE.

S2. The UE 1 loses Gm capability.

S3. The UE sends a request for signalling path handover due to loss of Gm capability, and uses the routing identifier over I1.

S4. A HLR in the CS network 2, when it receives this message, maps the routing identifier directly to the SCC AS 4 that was handling the service over Gm, and forwards the signalling path handover message to the SCC AS 4. Alternatively, the HRL forwards the signalling path handover message to the representative AS which in tum uses the routing identifier to select the correct SCC AS 4.

[0022] Referring to Figure 2 herein, assignment and delivery of the routing identifier is illustrated. For sessions originating from the served user UE, (outgoing calls), a normal SIP INVITE procedure is performed, illustrated by steps S5 to S8. Then the SCC AS 4 replies to the IMS network 3 with a SIP 200 OK message (step S9), the routing identifier is included in that message, and forwarded (S10) to the UE 1 from the IMS network 3. As mentioned above, the routing identifier is determined by which SCC AS 4 has been assigned to the user, and is therefore also know to the SCC AS 4 when adding it to the SIP 200 OK.

[0023] For terminating requests (incoming calls), illustrated in steps S11 to S16, the routing identifier is added to the incoming INVITE to the UE 1, as shown in step S12.

[0024] There are several ways in which the routing identifier can be included in the SIP message (either the 200 OK or the INVITE). Example include:

- A separate header in the SIP message, dedicated for the routing identifier, i.e., "P-Routing-Identifier: xyzabc";
- As part of an existing header in the SIP message, such as the 'via' header, or 'contact' header.
- As part of Session Description Protocol, in the media line related to the CS media.

m=audio - PSTN -

c=PSTN E164 +1234567

a=route-identifier:xyzabc

[0025] Figure 3 illustrates signalling path handover using the routing identifier. The following numbering corresponds to the numbering in Figure 3:

S17. The UE 1 detects that it has lost Gm. There are several possible ways in which this detection can be made, for example by detecting that handover to GERAN has been performed and the UE does not support DTM, or detecting that a packet bearer (PDP context) has been lost.

S18. The UE 1 initiates a signalling path handover by sending a handover message over I1 to the CS network 2. In addition, the UE 1 includes the routing identifier in the handover message.

S19. The message is forwarded through the CS network 2 all the way to the HLR 6.

S20. The HLR 6 uses the routing identifier to identify the SCC AS 4 that should be used for the UE 1 and its handover message.

S21. The signalling path handover message is forwarded to correct SCC AS 4. The HLR may remove the routing identifier from the message before forwarding to the SCC AS 4, since such information is of no use to the SCC AS 4, although it is not essential to do so.

S22. An answer is sent from the SCC AS 4 to the HLR 6.

S23. The answer to the signalling path handover message is forwarded back through the CS network 2.

S24. The answer to the signalling path handover message is forwarded back to the UE 1.

[0026] In an alternative embodiment of the invention, a Representative AS represents the SCC AS. Figure 4 is a signalling diagram illustrating signalling required for handover where a Representative AS 7 is used, with the following numbering corresponding to the numbering of Figure 4:

S25. The UE 1 detects that it has lost Gm by some means.

S26. The UE 1 initiates a signalling path handover by sending a handover message over I1 to the CS network 2. In addition, the UE 1 includes the routing identifier in the message.

S27. The message is forwarded through the CS network 2 to the HLR 6.

S28. The HLR 6 identifies the Representative AS 7 that handles all SCC ASs 4, and forwards the message to the Representative AS 7.

S29. The Representative AS uses the routing identifier to identify the SCC AS 4 that should be used for the UE 1 and the handover message

S30. The signalling path handover message is forwarded to correct SCC AS 4. Before forwarding the message, the Representative AS 7 may remove the routing identifier from the message, although this is not essential.

S31. An answer to the signalling path handover message is sent back from the SCC AS 4 to the Representative AS 7.

S32. The answer to the signalling path handover message is forwarded back to the HLR 6.

S33. The answer to the signalling path handover message is forwarded back through the CS network 2.

S34. The answer to the signalling path handover message is forwarded back to the UE 1.

[0027] According to a further embodiment of the invention, the routing identifier is used during service transfer from PS to CS, when performing service continuity (see IP Multimedia System (IMS) Service Continuity (Release 8), 3GPP TS 23.237 V8.0.0). The same problem is addressed, namely how the UE can reach the same SCC AS over I1 after a service transfer from PS to CS. Using the routing identifier ensures that signalling over I1 ends up in the same SCC AS that previously handled the session over Gm before the service transfer. In this case, the routing identifier can be allocated by the SCC AS when the SCC AS contacts the UE over I1 first (since the SCC AS would have the IMSI of the UE) after the service transfer.

[0028] Referring now to Figure 5, there is illustrated a UE 1 according to an embodiment of the invention. The UE 1 is provided with a receiver 8 that receives the routing identifier, and a memory 9 for storing the routing identifier. A processor 10 is used to detect a loss of signalling between the UE 1 and the SCC AS 4, as described above, which may be either because of loss of availability of the Gm reference point or a handover from a PS to a CS access network. In the event of loss of signalling, a transmitter 11 is provided for sending a handover message that includes the routing identifier to the CS access network..

[0029] Figure 6 illustrates schematically a HLR 6 according to an embodiment of the invention. The HLR 6 is provided with a processor 12 that allocates a routing identifier to the SCC AS 4 that is allocated to the UE 1. A memory 13 stores the routing identifier and an associated E.164 number for the SCC AS 4, and a transmitter 14 sends the routing identifier to the UE 1. A receiver 15 is arranged to receive a handover request from the UE 1. A second processor 16 uses the routing identifier received in the handover request to determine the E.164 number of the SCC AS 4, and a second transmitter 17 is arranged to for forward the handover request to the SCC AS 4. If required, a third processor 18 is arranged to remove the routing identifier from the received handover request prior to forwarding the handover request to the SCC AS 4. The three processors 12, 16, 18 are all embodiment in a single processor in the example of Figure 7, although it will be appreciated that they may also be one or more separate processors.

[0030] Referring now to Figure 7, there is illustrated schematically the SCC AS 4. The SCC AS 4 is provided with a processor 19 for allocating a routing identifier to the SCC AS 4. A memory 20 is provided for storing the routing identifier, and a transmitter 21 is provided for sending the routing identifier to the UE 1. A receiver 22 may also be provided for receiving signalling from the UE 1.

[0031] The invention ensures that the same SCC AS is selected when changing the signalling between Gm and I1, and also after performing service transfer from PS to CS. This improves the user experience of the service.

[0032] It will be appreciated by the person of skill in the art that various modifications may be made to the above-described embodiments without departing from the scope of the present invention.

Claims

1. A method of maintaining service continuity for User Equipment (1) accessing an IP Multimedia Subsystem communication network, the method comprising:

   establishing (S1) a routing identifier identifying a Service Centralization and Continuity Application Server (4) allocated to the User Equipment (1);
   sending the routing identifier to the User Equipment (1);
   the method **characterized by**, in the event of disruption to the service between the User Equipment (1) and the Service Centralization

and Continuity Application Server (4), sending (S3) a handover message from the User Equipment (1) via a Circuit Switched access network, the message including the routing identifier; and forwarding (S4) the handover message to the identified Service Centralization and Continuity Application Server (4).

2. The method according to claim 1, wherein the disruption is caused by handover of signalling between the User Equipment (1) and the Service Centralization and Continuity Application Server (4) from a Gm reference point to an I1 reference point.

3. The method according to claim 1, wherein the disruption is caused by handover from a Packet Switched access network to the Circuit Switched access network.

4. The method according to claim 1, 2 or 3, wherein the routing identifier is sent to the User Equipment (1) in one of a Session Initiation Protocol 200 OK message and a Session Initiation Protocol INVITE message.

5. The method according to any one of claims 1 to 4, wherein the handover message is sent from the Circuit Switched access network to a Representative Application Server (7), and the Representative Application Server (7) selects a Service Centralization and Continuity Application Server (4) on the basis of the routing identifier prior to forwarding the handover message to the identified Service Centralization and Continuity Application Server (4).

6. The method according to any one of claims 1 to 5, wherein the handover message is sent in an Unstructured Supplementary Service Data format.

7. User Equipment (1) for use in an IP Multimedia Subsystem communication network, the User Equipment comprising:

a receiver (8) for receiving a routing identifier identifying a Service Centralization and Continuity Application Server allocated to the User Equipment;
a mermory (9) for storing the received routing identifier;
a processor (10) for detecting disruption to an ongoing service between the User Equipment and the Service Centralization and Continuity Application Server; and
a transmitter (11) for sending a handover message via a Circuit Switched access network in the event of disruption to the service to an access network node, the handover message including the routing identifier.

8. The User Equipment (1) according to claim 7, wherein the processor (10) is arranged to detect a loss of Gm availability between the User Equipment and the Service Centralization and Continuity Application Server.

9. The User Equipment (1) according to claim 7 or 8, wherein the processor (10) is arranged to detect a handover from a Packet Switched access network to a Circuit Switched access network.

10. A Home Location Register (6) for use in a communication network, comprising :
a processor (12) for allocating a routing identifier to a Service Centralization and Continuity Application Server (4) allocated to a User Equipment (1), the routing identifier being for use in the event of disruption to a service between the User Equipment (1) and the Service Centralization and Continuity Application Server (4);
a memory (13) for storing the routing identifier and an associated E.164 number for the Service Centralization and Continuity Application Server (4); and
a transmitter (14) for sending the routing identifier to the User Equipment and
a receiver (15) for receiving, from the User Equipment (1), a request for signalling path handover via a Circuit Switched access network in the event of disruption to the service the request including the routing identifier.

11. The Home Location Register (6) according to claim 10, further comprising:

a second processor (16) for using the routing identifier to determine the E.164 number of the Service Centralization and Continuity Application Server (4); and
a second transmitter (17) for forwarding the handover request to the Service Centralization and Continuity Application Server (4).

12. The Home Location Register (6) according to claim 11, further comprising a third processor (18) for removing the routing identifier from the received handover request prior to forwarding the handover request to the Service Centralization and Continuity Application Server (4).

13. A Service Centralization and Continuity Application Server (4) for use in an IP Multimedia Subsystem communication network, the Service Centralization and Continuity Application Server comprising:

a processor (19) for allocating a routing identifier to the Service Centralization and Continuity Application Server (4), the routing identifier being for use in the event of disruption to a service

between a User Equipment (1) and the Service Centralization and Continuity Application Server (4);
a memory (20) for storing the routing identifier,
a transmitter (21) for sending the routing Identifier to the User Equipment (1); and
a receiver (22) for receiving, from the User Equipment (1), a request for signalling path handover via a Circuit Switched access network in the event of disruption to the service the request including the routing identifier.

Patentansprüche

1. Verfahren zum Aufrechterhalten von Dienstkontinuität für ein Benutzergerät (1), das auf ein IP-Multimedia-Subsystem-Kommunikationsnetz zugreift, wobei das Verfahren Folgendes umfasst:

   Herstellen (S1) eines Routing-Identifikators, der einen dem Benutzergerät (1) zugewiesenen Anwendungsserver für Dienstzentralisierung und Kontinuität (4) identifiziert;
   Senden des Routing-Identifikators an das Benutzergerät (1);
   wobei das Verfahren **dadurch gekennzeichnet ist, dass** im Fall von Unterbrechung des Dienstes zwischen dem Benutzergerät (1) und dem Anwendungsserver für Dienstzentralisierung und Kontinuität (4) eine Handover-Nachricht vom Benutzergerät (1) über ein leitungsvermitteltes Zugangsnetz gesendet wird (S3), wobei die Nachricht den Routing-Identifikator enthält; und
   Weiterleiten (S4) der Handover-Nachricht an den identifizierten Anwendungsserver für Dienstzentralisierung und Kontinuität (4).

2. Verfahren nach Anspruch 1, worin die Unterbrechung durch Handover von Signalisierung zwischen dem Benutzergerät (1) und dem Anwendungsserver für Dienstzentralisierung und Kontinuität (4) von einem Gm-Referenzpunkt an einen I1-Referenzpunkt verursacht wird.

3. Verfahren nach Anspruch 1, worin die Unterbrechung durch Handover von einem paketvermittelten Zugangsnetz an das leitungsvermittelte Zugangsnetz verursacht wird.

4. Verfahren nach Anspruch 1, 2 oder 3, worin der Routing-Identifikator in einer von Folgenden an das Benutzergerät (1) gesendet wird: einer SIP(Sitzungsinitiierungsprotokoll)-200-OK-Nachricht und einer SIP-INVITE-Nachricht.

5. Verfahren nach einem der Ansprüche 1 bis 4, worin die Handover-Nachricht vom leitungsvermittelten Zugangsnetz an einen repräsentativen Anwendungsserver (7) gesendet wird und der repräsentative Anwendungsserver (7) einen Anwendungsserver für Dienstzentralisierung und Kontinuität (4) auf der Basis des Routing-Identifikators auswählt, bevor er die Handover-Nachricht an den identifizierten Anwendungsserver für Dienstzentralisierung und Kontinuität (4) weiterleitet.

6. Verfahren nach einem der Ansprüche 1 bis 5, worin die Handover-Nachricht in einem USSD(unstrukturierte Zusatzdienstdaten)-Format gesendet wird.

7. Benutzergerät (1) zur Verwendung in einem IP-Multimediasubsystem-Kommunikationsnetz, wobei das Benutzergerät Folgendes umfasst:

   einen Empfänger (8) zum Empfangen eines Routing-Identifikators, der einen dem Benutzergerät zugewiesenen Anwendungsserver für Dienstzentralisierung und Kontinuität identifiziert;
   einen Speicher (9) zum Speichern des empfangenen Routing-Identifikators;
   einen Prozessor (10) zum Erkennen von Unterbrechung eines laufenden Dienstes zwischen dem Benutzergerät und dem Anwendungsserver für Dienstzentralisierung und Kontinuität; und
   einen Sender (11), um eine Handover-Nachricht über ein leitungsvermitteltes Zugangsnetz im Fall von Unterbrechung des Dienstes an einen Zugangsnetzknoten zu senden, wobei die Handover-Nachricht den Routing-Identifikator enthält.

8. Benutzergerät (1) nach Anspruch 7, worin der Prozessor (10) dazu angeordnet ist, einen Verlust von Gm-Verfiigbarkeit zwischen dem Benutzergerät und dem Anwendungsserver für Dienstzentralisierung und Kontinuität zu erkennen.

9. Benutzergerät (1) nach Anspruch 7 oder 8, worin der Prozessor (10) dazu angeordnet ist, einen Handover von einem paketvermittelten Zugangsnetz an ein leitungsvermitteltes Zugangsnetz zu erkennen.

10. Heimatregister (6) zur Verwendung in einem Kommunikationsnetz, Folgendes umfassend:

    einen Prozessor (12) zum Zuweisen eines Routing-Identifikators an einen einem Benutzergerät (1) zugewiesenen Anwendungsserver für Dienstzentralisierung und Kontinuität (4), wobei der Routing-Identifikator der Verwendung im Fall von Unterbrechung eines Dienstes zwischen dem Benutzergerät (1) und dem Anwen-

dungsserver für Dienstzentralisierung und Kontinuität (4) dient;
einen Speicher (13) zum Speichern des Routing-Identifikators und einer assoziierten E.164-Nummer für den Anwendungsserver für Dienstzentralisierung und Kontinuität (4); und
einen Sender (14) zum Senden des Routing-Identifikators an das Benutzergerät und
einen Empfänger (15), um vom Benutzergerät (1) eine Anforderung für Signalisierungsweg-Handover über ein leitungsvermitteltes Zugangsnetz im Fall von Unterbrechung des Dienstes zu empfangen, wobei die Anforderung den Routing-Identifikator enthält.

11. Heimatregister (6) nach Anspruch 10, außerdem umfassend:

einen zweiten Prozessor (16) zur Verwendung des Routing-Identifikators, um die E.164-Nummer des Anwendungsservers für Dienstzentralisierung und Kontinuität (4) zu bestimmen; und einen zweiten Sender (17) zum Weiterleiten der Handover-Anforderung an den Anwendungsserver für Dienstzentralisierung und Kontinuität (4).

12. Heimatregister (6) nach Anspruch 11, außerdem einen dritten Prozessor (18) umfassend, um den Routing-Identifikator aus der empfangenen Handover-Anforderung zu entfernen, bevor die Handover-Anforderung an den Anwendungsserver für Dienstzentralisierung und Kontinuität (4) weitergeleitet wird.

13. Anwendungsserver für Dienstzentralisierung und Kontinuität (4) zur Verwendung in einem IP-Multimediasubsystem-Kommunikationsnetz, wobei der Anwendungsserver für Dienstzentralisierung und Kontinuität Folgendes umfasst:

einen Prozessor (19) zum Zuweisen eines Routing-Identifikators an den Anwendungsserver für Dienstzentralisierung und Kontinuität (4), wobei der Routing-Identifikator der Verwendung im Fall von Unterbrechung eines Dienstes zwischen einem Benutzergerät (1) und dem Anwendungsserver für Dienstzentralisierung und Kontinuität (4) dient;
einen Speicher (20) zum Speichern des Routing-Identifikators;
einen Sender (21) zum Senden des Routing-Identifikators an das Benutzergerät (1); und
einen Empfänger (22), um vom Benutzergerät (1) eine Anforderung für Signalisierungsweg-Handover über ein leitungsvermitteltes Zugangsnetz im Fall von Unterbrechung des Dienstes zu empfangen, wobei die Anforderung den Routing-Identifikator enthält.

Revendications

1. Procédé destiné à maintenir une continuité de service pour un équipement d'utilisateur (1) accédant à un réseau de communication de sous-système multimédia IP, le procédé comprenant les étapes ci-dessous consistant à :

établir (S1) un identifiant d'acheminement identifiant un serveur d'applications de continuité et de centralisation de service (4) affecté à l'équipement d'utilisateur (1) ;
envoyer l'identifiant d'acheminement à l'équipement d'utilisateur (1) ;
le procédé étant **caractérisé par** les étapes ci-après consistant à, en cas de perturbation du service entre l'équipement d'utilisateur (1) et le serveur d'applications de continuité et de centralisation de service (4), envoyer (S3) un message de transfert intercellulaire à partir de l'équipement d'utilisateur (1) par l'intermédiaire d'un réseau d'accès à commutation de circuits, le message comprenant l'identifiant d'acheminement ; et
transmettre (S4) le message de transfert intercellulaire au serveur d'applications de continuité et de centralisation de service identifié (4).

2. Procédé selon la revendication 1, dans lequel l'interruption est occasionnée par un transfert intercellulaire de signalisation mis en oeuvre entre l'équipement d'utilisateur (1) et le serveur d'applications de continuité et de centralisation de service (4), d'un point de référence Gm à un point de référence 11.

3. Procédé selon la revendication 1, dans lequel l'interruption est occasionnée par un transfert intercellulaire d'un réseau d'accès à commutation de paquets au réseau d'accès à commutation de circuits.

4. Procédé selon la revendication 1, 2 ou 3, dans lequel l'identifiant d'acheminement est envoyé à l'équipement d'utilisateur (1) dans l'un parmi un message « 2000K » de protocole d'ouverture de session et un message d'invitation « INVITE » de protocole d'ouverture de session.

5. Procédé selon l'une quelconque des revendications 1 à 4, dans lequel le message de transfert intercellulaire est envoyé d'un réseau d'accès à commutation de circuits à un serveur d'applications représentatif (7), et dans lequel le serveur d'applications représentatif (7) sélectionne un serveur d'applications de continuité et de centralisation de service (4) sur la base de l'identifiant d'acheminement, préalablement à l'acheminement du message de transfert intercellulaire au serveur d'applications de continuité et de centralisation de service identifié (4).

6. Procédé selon l'une quelconque des revendications 1 à 5, dans lequel le message de transfert intercellulaire est envoyé dans un format de données de service complémentaire non structurées.

7. Équipement d'utilisateur (1) destiné à être utilisé dans un réseau de communication de sous-système multimédia IP, l'équipement d'utilisateur comprenant :

un récepteur (8) destiné à recevoir un identifiant d'acheminement identifiant un serveur d'applications de continuité et de centralisation de service affecté à l'équipement d'utilisateur ;
une mémoire (9) en vue de stocker l'identifiant d'acheminement reçu ;
un processeur (10) en vue de détecter une perturbation d'un service en cours entre l'équipement d'utilisateur et le serveur d'applications de continuité et de centralisation de service ; et
un émetteur (11) destiné à envoyer un message de transfert intercellulaire, par l'intermédiaire d'un réseau d'accès à commutation de circuits, en cas de perturbation du service, à un noeud de réseau d'accès, le message de transfert intercellulaire comprenant l'identifiant d'acheminement.

8. Équipement d'utilisateur (1) selon la revendication 7, dans lequel le processeur (10) est agencé de manière à détecter une perte de disponibilité de point de référence Gm entre l'équipement d'utilisateur et le serveur d'applications de continuité et de centralisation de service.

9. Équipement d'utilisateur (1) selon la revendication 7 ou 8, dans lequel le processeur (10) est agencé de manière à détecter un transfert intercellulaire, d'un réseau d'accès à commutation de paquets à un réseau d'accès à commutation de circuits.

10. Enregistreur de localisation nominal (6) destiné à être utilisé dans un réseau de communication, comprenant :

un processeur (12) en vue d'affecter un identifiant d'acheminement à un serveur d'applications de continuité et de centralisation de service (4) affecté à un équipement d'utilisateur (1), l'identifiant d'acheminement étant destiné à être utilisé en cas de perturbation d'un service entre l'équipement d'utilisateur (1) et le serveur d'applications de continuité et de centralisation de service (4) ;
une mémoire (13) pour stocker l'identifiant d'acheminement et un numéro E.164 associé pour le serveur d'applications de continuité et de centralisation de service (4);
un émetteur (14) destiné à envoyer l'identifiant d'acheminement à l'équipement d'utilisateur ; et
un récepteur (15) en vue de recevoir, à partir de l'équipement d'utilisateur (1), une demande de signalisation de transfert intercellulaire de chemin, par l'intermédiaire d'un réseau d'accès à commutation de circuits, en cas de perturbation du service, la demande incluant l'identifiant d'acheminement.

11. Enregistreur de localisation nominal (6) selon la revendication 10, comprenant en outre :

un deuxième processeur (16) destiné à utiliser l'identifiant d'acheminement en vue de déterminer le numéro E.164 du serveur d'applications de continuité et de centralisation de service (4) ; et
un second émetteur (17) destiné à acheminer la demande de transfert intercellulaire au serveur d'applications de continuité et de centralisation de service (4).

12. Enregistreur de localisation nominal (6) selon la revendication 11, comprenant en outre un troisième processeur (18) en vue de supprimer l'identifiant d'acheminement de la demande de transfert intercellulaire reçue, préalablement à l'acheminement de la demande de transfert intercellulaire au serveur d'applications de continuité et de centralisation de service (4).

13. Serveur d'applications de continuité et de centralisation de service (4) destiné à être utilisé dans un réseau de communication de sous-système multimédia IP, le serveur d'applications de continuité et de centralisation de service comprenant :

un processeur (19) en vue d'affecter un identifiant d'acheminement au serveur d'applications de continuité et de centralisation de service (4), l'identifiant d'acheminement étant destiné à être utilisé en cas de perturbation d'un service entre un équipement d'utilisateur (1) et le serveur d'applications de continuité et de centralisation de service (4) ;
une mémoire (20) pour stocker l'identifiant d'acheminement ;
un émetteur (21) destiné à envoyer l'identifiant d'acheminement à l'équipement d'utilisateur (1) ; et
un récepteur (22) en vue de recevoir, en provenance de l'équipement d'utilisateur (1), une demande de signalisation de transfert intercellulaire de chemin, par l'intermédiaire d'un réseau d'accès à commutation de circuits, en cas de perturbation du service, la demande incluant l'identifiant d'acheminement.

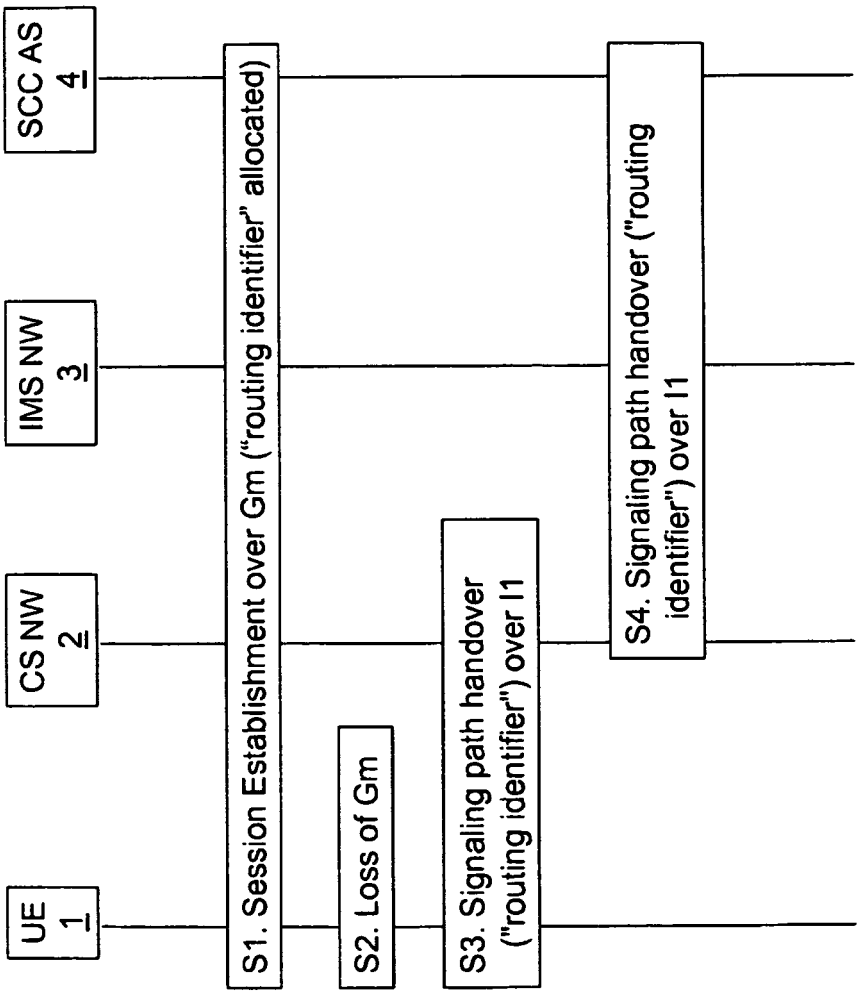
UE 1
CS NW 2
IMS NW 3
SCC AS 4
S1. Session Establishment over Gm ("routing identifier" allocated)
S2. Loss of Gm
S3. Signaling path handover ("routing identifier") over I1
S4. Signaling path handover ("routing identifier") over I1

Figure 1

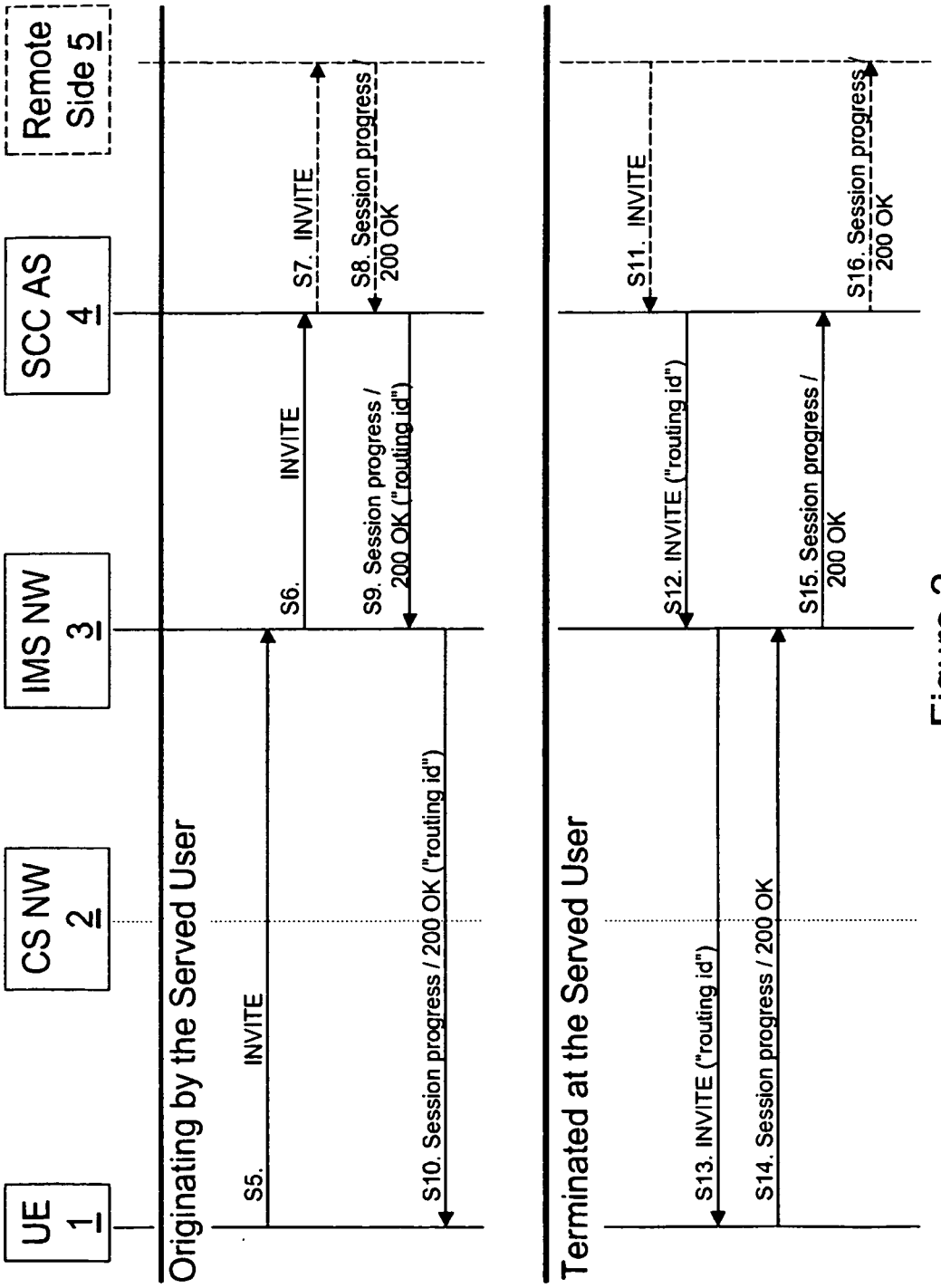
UE 1
CS NW 2
IMS NW 3
SCC AS 4
Remote Side 5
Originating by the Served User
S5. INVITE
S6. INVITE
S7. INVITE
S8. Session progress / 200 OK
S9. Session progress / 200 OK ("routing id")
S10. Session progress / 200 OK ("routing id")
Terminated at the Served User
S11. INVITE
S12. INVITE ("routing id")
S13. INVITE ("routing id")
S14. Session progress / 200 OK
S15. Session progress / 200 OK
S16. Session progress / 200 OK

Figure 2

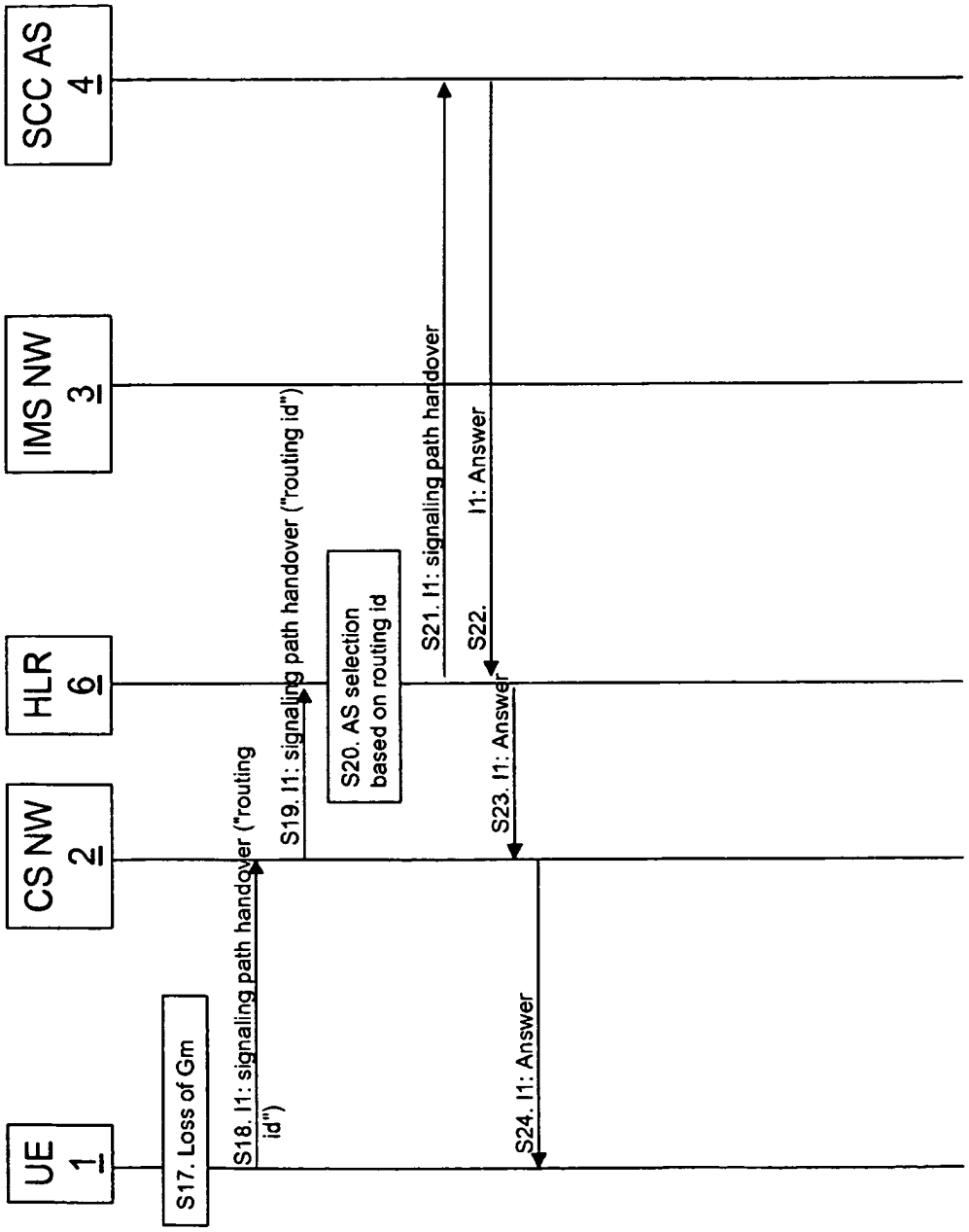
UE 1
CS NW 2
HLR 6
IMS NW 3
SCC AS 4
S17. Loss of Gm
S18. I1: signaling path handover ("routing id")
S19. I1: signaling path handover ("routing id")
S20. AS selection based on routing id
S21. I1: signaling path handover
S22. I1: Answer
S23. I1: Answer
S24. I1: Answer

Figure 3

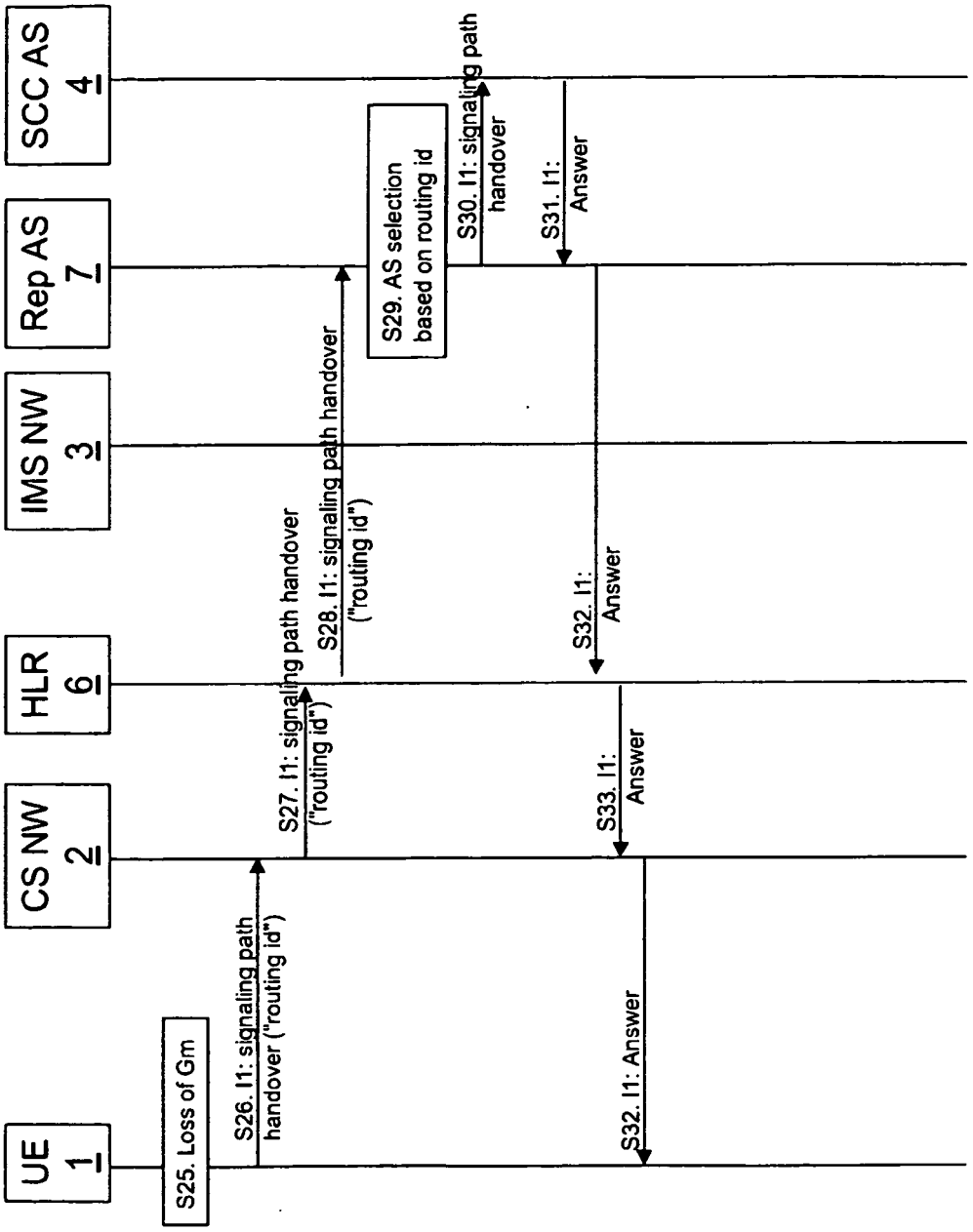
UE 1
CS NW 2
HLR 6
IMS NW 3
Rep AS 7
SCC AS 4
S25. Loss of Gm
S26. I1: signaling path handover ("routing id")
S27. I1: signaling path handover ("routing id")
S28. I1: signaling path handover ("routing id")
S29. AS selection based on routing id
S30. I1: signaling path handover
S31. I1: Answer
S32. I1: Answer
S33. I1: Answer
S32. I1: Answer

Figure 4

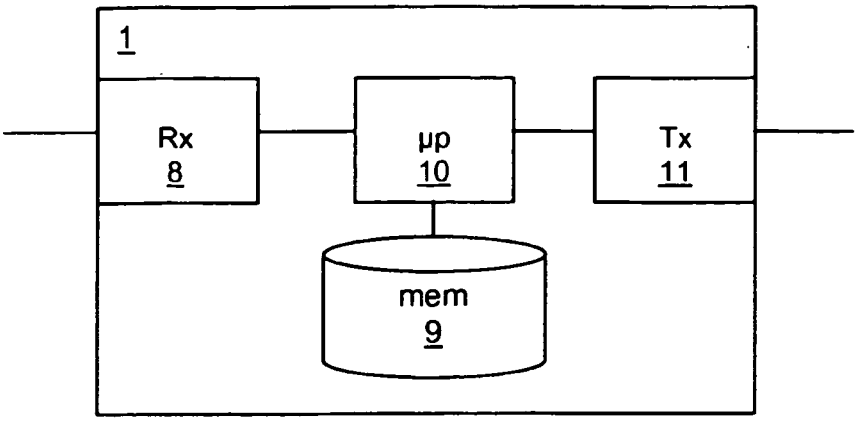

Figure 5

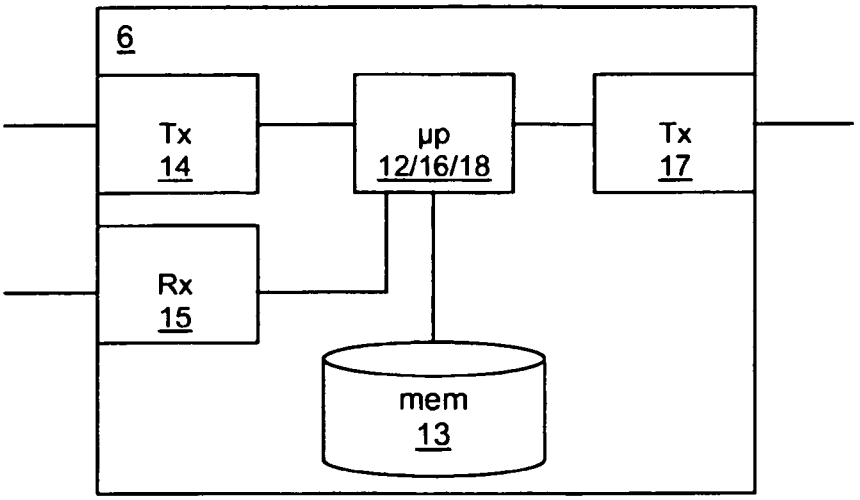

Figure 6

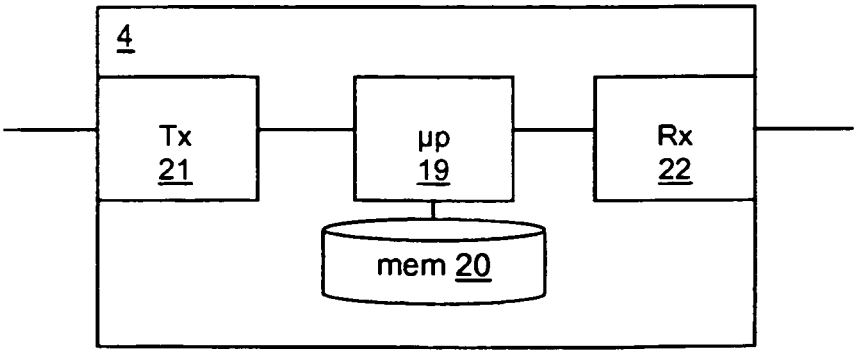

Figure 7