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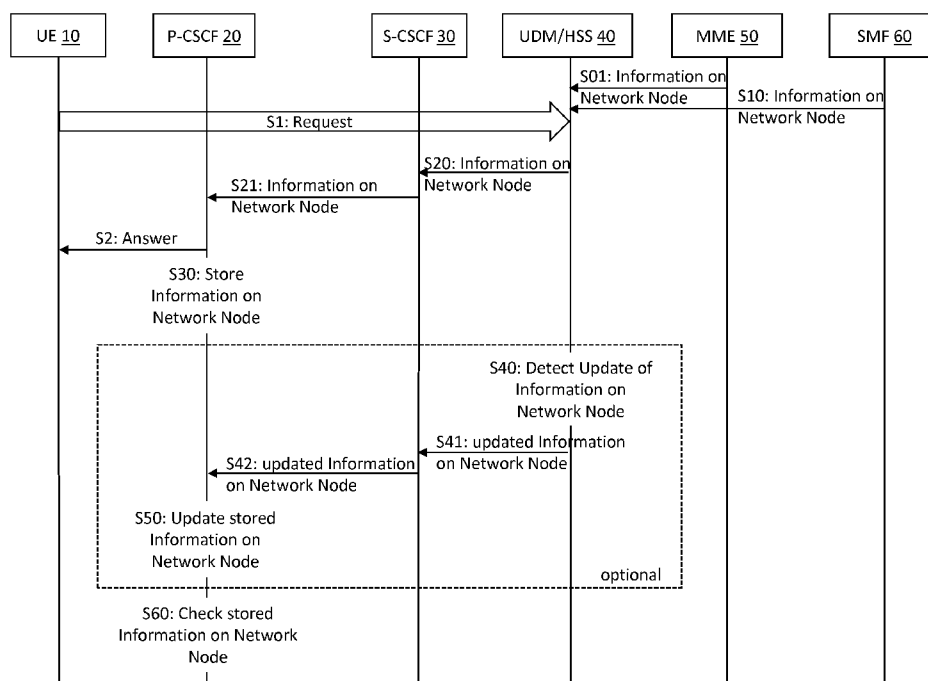


Fig. 1

(57) Abstract: A network function (20, 30) which is to be used for establishing a multimedia session for a user equipment (10), receives (S20, S21), by a message concerning multimedia communication between the user equipment (10) and a communication network, information on a network node which provides an interface to a policy function for the user equipment (10) and complies with at least one of a first communication technology and a second communication technology. The information on the network node is stored (S30) in a registration context for the user equipment (10).

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,
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TITLE

POLICY FUNCTION INTERFACE SELECTION

TECHNICAL FIELD

- 5 At least some embodiments relate to policy function interface selection, e.g. Rx or N5 interface selection.

BACKGROUND

- When integrating IMS with 5GC, 5G nodes along with existing access
10 networks like EPC have to be handled. In this case, P-CSCF needs to identify from an incoming request whether it must invoke N5 as part of 5GC or existing Rx as part of EPC.

LIST OF ABBREVIATIONS

- | | | |
|----|--------|--|
| 15 | 4G | Fourth Generation |
| | 5G | Fifth Generation |
| | 5GC | 5G Core Network |
| | AVP | Attribute Value Pair |
| | CSCF | Call Session Control Function |
| 20 | EPC | Evolved Packet Core |
| | GW | Gateway |
| | HSS | Home Subscriber Server |
| | ID | Identity |
| | IMS | IP Multimedia Core Network Subsystem |
| 25 | IMSI | International Mobile Subscriber Identity |
| | IP | Internet Protocol |
| | MAA | Multimedia Authentication Answer |
| | MAR | Multimedia Authentication Request |
| | NOA | Notification Answer |
| 30 | NOR | Notification Request |
| | PCF | Policy Control Function |
| | PCRF | Policy and Charging Rules Function |
| | P-CSCF | Proxy CSCF |

	PGW	Packet GW
	PLMN	Public Land Mobile Network
	PPA	Push Profile Answer
	PPR	Push Profile Request
5	SAA	Server Assignment Response
	SAR	Server Assignment Request
	S-CSCF	Server CSCF
	SIP	Session Initiation Protocol
	SMF	Session Management Function
10	UDM	User Data Management
	UE	User Equipment
	VPLMN	Visited PLMN

SUMMARY

15 At least some embodiments address the issues of what information is used by a P-CSCF and how the P-CSCF derives the information to determine which policy function interface is used for a specific IMS session establishment, when the P-CSCF supports N5 and Rx simultaneously.

20 According to at least some embodiments, methods, apparatuses and non-transitory computer-readable media are provided as specified in the appended claims.

At least some embodiments help the P-CSCF to identify whether Rx or N5
25 interface will be used when it receives a request from a UE. The P-CSCF has prior information of PGW and SMF in a registration context for each IMSI, e.g. each UE.

According to an example embodiment, at the originating side, when the P-
30 CSCF receives a SIP message "INVITE" from the UE it checks a registration context stored for the UE, and if it indicates a PGW the P-CSCF invokes the Rx interface. If the registration context stored for the UE indicates an SMF, the P-CSCF invokes the N5 interface.

According to an example embodiment, at the terminating side, the P-CSCF checks a registration context of a called party, e.g. a called UE. If the registration context stored for the called UE indicates a PGW, the Rx interface is invoked. The N5 interface is invoked if the registration context indicates an SMF.

In the following, example embodiments and example implementations will be described with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a signaling diagram illustrating communication and processing according to at least some embodiments.

Fig. 2 shows a schematic block diagram illustrating a configuration of control units in which examples of embodiments are implementable.

DESCRIPTION OF THE EMBODIMENTS

Fig. 1 illustrates signaling between a UE 10, a P-CSCF 20, an S-CSCF 30, a UDM/HSS 40, an MME 50, an SMF 60, and an I-CSCF 70. The P-CSCF supports N5 and Rx interfaces simultaneously. The P-CSCF 20, the S-CSCF 30, the UDM/HSS 40, the MME 50, the SMF 60, and the I-CSCF 70 are part of a communication network.

According to at least some embodiments, signaling shown in Fig. 1 is performed in order to provide the P-CSCF 20 with information which enable the P-CSCF 20 to determine which policy function interface is used for a specific multimedia session establishment.

As shown in Fig. 1, in at least one of S01 and S10, the UDM/HSS 40 acquires information on a network node (e.g. PGW, SMF) which provides an interface (e.g. Rx, N5) to a policy function (e.g. PCRF, PCF) for a user equipment such as the UE 10 and complies with at least one of a first

communication technology (e.g. 4G) and a second communication technology (e.g. 5G).

The information on the network node comprises at least one of information about which of the first and second communication technology the network node complies with, an indication of the network node, and an address of the network node.

In case the network node complies with the first communication technology (e.g. in case of EPC), the MME 50 shares the information on the network node (e.g. PGW) to the UDM/HSS 40. According to an example implementation, in S01 the MME 50 shares information on the PGW to HSS of UDM/HSS 40 in an existing MIP6-Agent-Info AVP as part of NOR command.

In case the network node complies with the second communication technology (e.g. in case of 5GC), in S10 the network node, e.g. the SMF 60, shares its information to UDM part of UDM/HSS 40.

In S20, the UDM/HSS 40 transmits the information on the network node to the S-CSCF 30 which represents a first network function that is to be used for establishing a multimedia session (e.g. IMS) for the UE 10. The information on the network node is transmitted by a message (first message) concerning multimedia communication between the UE 10 and the communication network.

According to a first embodiment, the information on the network node is transmitted in S20 during multimedia (e.g. IMS) registration between the UE 10 and the communication network. According to an example implementation of the first embodiment, in S1 of Fig. 1 a register request according to SIP is transmitted from the UE 10 to the communication network.

According to an example implementation of the first embodiment, in case the network node complies with the first communication technology (e.g. in case of EPC), the message by which the information on the network node is transmitted in S20 comprises a server assignment command.

5

According to an example implementation of the first embodiment, in case of EPC, during IMS registration HSS 40 sends the information on the PGW acquired in S01 to the S-CSCF 30 in MIP6-Agent-Info AVP as part of SAA command in S20.

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According to an example implementation of the first embodiment, in case the network node complies with the second communication technology (e.g. in case of 5GC), the message by which the information on the network node is transmitted in S20 comprises a multimedia session registration

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command.

According to an example implementation of the first embodiment, in case of 5GC, during IMS registration UDM 40 sends the information on the SMF acquired in S10 to S-CSCF 30 in Ncx_IMSRegistration_Register in S20.

20

According to an example embodiment, in S40 the UDM/HSS 40 detects updated information of the information on the network node. In S41, the UDM/HSS 40 transmits the updated information to the S-CSCF 30.

25

According to an example implementation, in case the network node complies with the first communication technology (e.g. in case of EPC), the updated information is transmitted by a push profile command in S41. For example, when there is an update of the information on the PGW, acquired in S01, at HSS 30 then PPR is triggered to S-CSCF 30 in S41.

30

According to an example implementation, in case the network node complies with the second communication technology (e.g. in case of 5GC), the updated information is transmitted by a multimedia session update

notification command in S41. For example, when there is an update of the information on the SMF, acquired in S10, at UDM 40, then the UDM 40 sends this information in Ncx_IMSRegistration_UpdateNotification to S-CSCF 30 in S41.

5

In S20, the S-CSCF 30 receives the information on the network node (e.g. PGW, SMF) transmitted from the UDM/HSS 40 as described above.

10 In S21, the S-CSCF 30 transmits the information on the network node to the P-CSCF 20 which represents a second network function which is to be used for establishing the multimedia session for the UE 10. The information on the network node is transmitted in S21 by a second message concerning the multimedia communication between the UE 10 and the communication network.

15

According to the first embodiment, as mentioned above, the information on the network node is transmitted during multimedia (e.g. IMS) registration between the UE 10 and the communication network.

20 According to an example implementation of the first embodiment, the second message by which the information on the network node is transmitted in S21 comprises a 200 OK to register indication with a header including the information on the network node. For example, in 200 OK of REGISTER method S-CSCF 30 shares the information on the PGW or the
25 information on the SMF received in S20 to P-CSCF 20 in a new header in S21.

In case the S-CSCF 30 receives the updated information in S41, in S42 the S-CSCF 30 transmits the updated information to P-CSCF 20. For example,
30 the updated information (e.g. information on the PGW, information on the SMF) is transmitted in S42 via SIP NOTIFY method.

In S21, the P-CSCF 20 receives the information on the network node transmitted from S-CSCF 30 as described above. The information on the network node is received by a message (second message) concerning multimedia communication between the UE 10 and the communication network.

According to the first embodiment, as mentioned above, the information on the network node is transmitted during multimedia (e.g. IMS) registration between the UE 10 and the communication network.

In S30, the P-CSCF 20 stores the information on the network node in a registration context for the UE 10.

According to an example implementation of the first embodiment, the message received in S21 comprises a 200 OK to register indication with a header including the information on the network node. The P-CSCF 20 reads the information on the network node from the header, removes the header from the 200 OK to register indication, and forwards the 200 OK to register indication with the header removed to the UE 10 in S2.

In case the P-CSCF 20 receives the updated information in S42, it updates the information on the network node stored in the registration context of the UE 10 with the updated information in S50.

According to an example implementation of the first embodiment, after receiving 200 OK to REGISTER method in S21, the P-CSCF 20 reads the value of new header which comprises information on the PGW or information on the SMF. Then the P-CSCF 20 stores the information on the PGW or the information on the SMF in the registration context for the UE 10. The header is removed before the P-CSCF 20 forwards the 200 OK to REGISTER method to UE 10 in S2. Also after receiving the NOTIFY in S42 the P-CSCF 20 updates the registration context with the updated information on the PGW or SMF.

According to an example implementation, in case the P-CSCF 20 receives a request regarding the multimedia session and involving the UE 10, the P-CSCF checks the registration context for the UE 10 in S60.

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In case the registration context includes the information on the network node which complies with the first communication technology, the P-CSCF 20 invokes the interface to the policy function of the first communication technology.

10

In case the registration context includes the information on the network node which complies with the second communication technology, the P-CSCF 20 invokes the interface to the policy function of the second communication technology.

15

For example, the request comprises at least one of a register request and an invite request. For example, UE 10 originates the request, or the UE 10 is a called party.

20

According to an example implementation, at the originating side when the P-CSCF 20 receives INVITE from UE 10, it checks the registration context stored for the UE in S30, and if the registration context includes the information on the PGW the P-CSCF 20 invokes Rx interface, or invokes N5 interface if the registration context includes the information on the SMF.

25

At the terminating side also, the P-CSCF 20 checks the registration context stored for the called party. If the registration context includes the information on the PGW, Rx interface is invoked, or N5 interface is invoked if the registration context includes the information on the SMF.

30

According to a second embodiment, an early indication of the information on the network node (e.g. PGW, SMF) is provided to P-CSCF 20 from S-CSCF 30 instead of waiting until 200 OK of REGISTER. This early indication

to P-CSCF 20 supports a scenario where P-CSCF 20 invokes PCF or PCRF to get VPLMN ID for S8HR use case.

5 In the following, mainly aspects different from the first embodiment will be described.

In the second embodiment, the request of S1 comprises e.g. an IMS initial registration after UE 10 has obtained IP connectivity.

10 According to an example implementation of the second embodiment, the message (first message) by which the information on the network node is transmitted in S20 from the UDM/HSS 40 to the S-CSCF 30 comprises a multimedia authentication command. For example, in S20, the UDM/HSS 40 provides information on PGW or SMF in MAR message to S-CSCF 30.

15 According to an example implementation of the second embodiment, the second message by which the information on the network node is transmitted in S21 from the S-CSCF 30 to the P-CSCF 20 comprises a 401 indication.

20 After getting the information on PGW or SMF in S21, the P-CSCF 20 stores the information on the network node in the registration context for the UE 10 in S30, similar to the first embodiment.

25 In S2, according to an example implementation of the second embodiment, the P-CSCF 20 answers the UE 10 with a 401 indication.

30 After S21, when a subsequent REGISTER request is received at the P-CSCF 20 from the UE 10, the P-CSCF 20 can fetch the information on the SMF or PGW and invoke PCF or PCRF accordingly. This supports addressing the VPLMN ID scenario which is needed for S8HR use case.

According to at least some embodiments, a P-CSCF is enabled to support both PCRF for Rx interface and PCF for N5 interface.

Now reference is made to Fig. 2 illustrating a simplified block diagram of various electronic devices that are suitable for use in practicing at least some embodiments.

Fig. 2 shows a control unit 200 comprising processing resources (e.g. processing circuitry) 211, memory resources (e.g. memory circuitry) 212 and interfaces (e.g. interface circuitry) 213, coupled via connection 214. According to an example implementation, the P-CSCF 20 of Fig. 1 comprises the control unit 200. According to an example implementation, the control unit 200 is involved in execution of at least one of steps S1, S21, S2, S30, S42, S50 and S60. According to an example implementation, the memory resources 212 store a program that, when executed by the processing resources 211, cause the control unit 200 to function as P-CSCF 20 according to the above described embodiments.

The control unit 200 is coupled with a control unit 300 via a connection 302.

The control unit 300 comprising processing resources (e.g. processing circuitry) 311, memory resources (e.g. memory circuitry) 312 and interfaces (e.g. interface circuitry) 313, coupled via connection 314. According to an example implementation, the S-CSCF 30 of Fig. 1 comprises the control unit 300. According to an example implementation, the control unit 300 is involved in execution of at least one of steps S1, S20, S21, S41 and S42. According to an example implementation, the memory resources 312 store a program that, when executed by the processing resources 311, cause the control unit 300 to function as S-CSCF 30 according to the above described embodiments.

The control unit 300 is coupled to a control unit 400 via a connection 403.

The control unit 400 comprising processing resources (e.g. processing circuitry) 411, memory resources (e.g. memory circuitry) 412 and interfaces (e.g. interface circuitry) 413, coupled via connection 414.

According to an example implementation, the UDM/HSS 40 of Fig. 1

5 comprises the control unit 400. According to an example implementation, the control unit 400 is involved in execution of at least one of steps S1, S01, S10, S20, S40 and S41. According to an example implementation, the memory resources 412 store a program that, when executed by the processing resources 411, cause the control unit 400 to function as P-
10 UDM/HSS 40 according to the above described embodiments.

The terms "connected," "coupled," or any variant thereof, mean any connection or coupling, either direct or indirect, between two or more elements, and may encompass the presence of one or more intermediate
15 elements between two elements that are "connected" or "coupled" together.

The coupling or connection between the elements can be physical, logical, or a combination thereof. As employed herein two elements may be considered to be "connected" or "coupled" together by the use of one or more wires, cables and printed electrical connections, as well as by the use
20 of electromagnetic energy, such as electromagnetic energy having wavelengths in the radio frequency region, the microwave region and the optical (both visible and invisible) region, as non-limiting examples.

Further, as used in this application, the term "circuitry" refers to one or
25 more or all of the following:

(a) hardware-only circuit implementations (such as implementations in only analog and/or digital circuitry) and

(b) to combinations of circuits and software (and/or firmware), such as (as applicable): (i) to a combination of processor(s) or (ii) to portions of

30 processor(s)/software (including digital signal processor(s)), software, and memory(ies) that work together to cause an apparatus, such as a mobile phone or server, to perform various functions) and

(c) to circuits, such as a microprocessor(s) or a portion of a microprocessor(s), that require software or firmware for operation, even if the software or firmware is not physically present.

- 5 This definition of "circuitry" applies to all uses of this term in this application, including in any claims. As a further example, as used in this application, the term "circuitry" would also cover an implementation of merely a processor (or multiple processors) or portion of a processor and its (or their) accompanying software and/or firmware. The term "circuitry"
- 10 would also cover, for example and if applicable to the particular claim element, a baseband integrated circuit or applications processor integrated circuit for a mobile phone or a similar integrated circuit in server, a cellular network device, or other network device.
- 15 According to an aspect, a network function which is to be used for establishing a multimedia session for a user equipment, receives, by a message concerning multimedia communication between the user equipment and a communication network, information on a network node which provides an interface to a policy function for the user equipment and
- 20 complies with at least one of a first communication technology and a second communication technology. The information on the network node is stored in a registration context for the user equipment.

It is to be understood that the above description is illustrative and is not to be construed as limiting. Various modifications and applications may occur to those skilled in the art without departing from the true spirit and scope as defined by the appended claims.

25

CLAIMS

1. A method for use by an apparatus of a communication network, the method comprising:

5 acquiring information on a network node which provides an interface to a policy function for a user equipment and complies with at least one of a first communication technology and a second communication technology; and

10 transmitting the information on the network node to a first network function which is to be used for establishing a multimedia session for the user equipment, wherein the information on the network node is transmitted by a message concerning multimedia communication between the user equipment and the communication network.

15 2. The method of claim 1, further comprising:

 detecting updated information of the information on the network node; and

 transmitting the updated information to the first network function.

20 3. The method of claim 1 or 2, wherein the information on the network node comprises at least one of:

 information about which of the first and second communication technology the network node complies with,

 an indication of the network node, and

25 an address of the network node.

4. The method of any one of claims 1 to 3, wherein:

 the apparatus complies with the first communication technology, and/or

30 the apparatus is a home subscriber server, and/or

 the network node is a packet gateway of the first communication technology, and/or

 the interface is an Rx interface, and/or

the policy function is part of an evolved packet core, and/or
the information on the network node is acquired from a mobility
management entity, and/or

the information on the network node is acquired by a notification
5 command.

5. The method of any one of claims 1 to 4, wherein:

the information on the network node is transmitted during multimedia
registration between the user equipment and the apparatus, and/or

10 the message by which the information on the network node is
transmitted comprises a server assignment command, and/or
the updated information is transmitted by a push profile command.

6. The method of claim 4, wherein:

15 the message by which the information on the network node is
transmitted comprises a multimedia authentication command, and/or
the updated information is transmitted by a push profile command.

7. The method of any one of claims 1 to 3, wherein:

20 the apparatus complies with the second communication technology,
and/or

the apparatus is a user data management apparatus, and/or

the network node is a session management function of the second
communication technology, and/or

25 the interface is an N5 interface, and/or

the policy function is part of a fifth generation network core, and/or

the information on the network node is acquired from a session
management function.

30 8. The method of any one of claims 1 to 3 and 7, wherein:

the information on the network node is transmitted during multimedia
registration between the user equipment and the apparatus, and/or

the message by which the information on the network node is transmitted comprises a multimedia session registration command, and/or the updated information is transmitted by a multimedia session update notification command.

5

9. The method of any one of claims 1 to 3 and 7, wherein:

the message by which the information on the network node is transmitted comprises a multimedia authentication command, and/or the updated information is transmitted by a multimedia session update notification command.

10

10. A method for use by a first network function which is to be used for establishing a multimedia session for a user equipment, the method comprising:

15

receiving, from an apparatus of a communication network, information on a network node which provides an interface to a policy function for the user equipment and complies with at least one of the first communication technology and a second communication technology, wherein the information on the network node is transmitted by a first message concerning multimedia communication between the user equipment and the communication network; and

20

transmitting the information on the network node to a second network function which is to be used for establishing the multimedia session for the user equipment, wherein the information on the network node is transmitted by a second message concerning the multimedia communication between the user equipment and the communication network.

25

11. The method of claim 10, further comprising:

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receiving updated information of the information on the network node from the apparatus; and transmitting the updated information to the second network function.

12. The method of claim 10 or 11, wherein:

the information on the network node is received during multimedia registration between the user equipment and the apparatus, and/or

the first message by which the information on the network node is
5 received comprises a server assignment command, and/or

the updated information is received by a push profile command,
and/or

the information on the network node is transmitted during multimedia registration between the user equipment and the apparatus, and/or

10 the second message by which the information on the network node is
transmitted comprises a 200 OK to register indication with a header
including the information on the network node, and/or

the updated information is transmitted by a notify command.

15 13. The method of claim 10 or 11, wherein:

the first message by which the information on the network node is
received comprises a multimedia authentication command, and/or

the second message by which the information on the network node is
transmitted comprises a 401 indication, and/or

20 the updated information is received by a multimedia session update
notification command, and/or

the updated information is transmitted by a notify command.

14. The method of claim 10 or 11, wherein:

25 the information on the network node is received during multimedia
registration between the user equipment and the apparatus, and/or

the information on the network node is transmitted during multimedia registration between the user equipment and the apparatus, and/or

the first message by which the information on the network node is
30 received comprises a multimedia session registration command, and/or

the second message by which the information on the network node is
transmitted comprises a 200 OK to register indication with a header
including the information on the network node, and/or

the updated information is received by a multimedia session update notification command, and/or

the updated information is transmitted by a notify command.

- 5 15. A method for use by a second network function which is to be used for establishing a multimedia session for a user equipment, the method comprising:

receiving, from a first network function which is to be used for establishing the multimedia session for the user equipment, information on
10 a network node which provides an interface to a policy function for the user equipment and complies with at least one of a first communication technology and a second communication technology, wherein the information on the network node is received by a message concerning multimedia communication between the user equipment and a
15 communication network; and

storing the information on the network node in a registration context for the user equipment.

16. The method of claim 15, further comprising:

20 receiving updated information of the information on the network node from the first network function; and

updating the information on the network node with the updated information.

- 25 17. The method of claim 15 or 16, wherein:

the information on the network node is received during multimedia registration between the user equipment and the communication network, and/or

the message by which the information on the network node is
30 received comprises a 200 OK to register indication with a header including the information on the network node.

18. The method of any one of claims 15 to 17, wherein the message comprises a 200 OK to register indication with a header including the information on the network node, and the method further comprises:

5 reading the information on the network node from the header;
 removing the header from the 200 OK to register indication; and
 forwarding the 200 OK to register indication with the header removed to the user equipment.

19. The method of claim 15 or 16, wherein:

10 the message by which the information on the network node is received comprises a 401 indication, and/or
 the updated information is received by a notify command.

20. The method of any one of claims 15 to 19, comprising:

15 receiving a request regarding the multimedia session and involving the user equipment;

 checking the registration context for the user equipment;

 in case the registration context includes the information on the network node which complies with the first communication technology,

20 invoking the interface to the policy function of the first communication technology; and

 in case the registration context includes the information on the network node which complies with the second communication technology, invoking the interface to the policy function of the second communication

25 technology.

21. The method of claim 20, wherein:

 the request comprises at least one of a register request and an invite request, and/or

30 the request is received from the user equipment, and/or
 the user equipment is a called party.

22. A non-transitory computer-readable storage medium storing a program comprising software code portions that, when executed by a computer, cause the computer to execute the method of any one of claims 1 to 21.

5 23. An apparatus of a communication network, the apparatus comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus at least to perform:

10 acquiring information on a network node which provides an interface to a policy function for a user equipment and complies with at least one of a first communication technology and a second communication technology; and

transmitting the information on the network node to a first network function which is to be used for establishing a multimedia session for the user equipment, wherein the information on the network node is
15 transmitted by a message concerning multimedia communication between the user equipment and the communication network.

24. The apparatus of claim 23, wherein the at least one memory and the
20 computer program code are configured to, with the at least one processor, cause the apparatus to further perform:

detecting updated information of the information on the network node; and

25 transmitting the updated information to the first network function.

25. The apparatus of claim 23 or 24, wherein the information on the network node comprises at least one of:

information about which of the first and second communication technology the network node complies with,
30 an indication of the network node, and
an address of the network node.

26. The apparatus of any one of claims 23 to 25, wherein:

the apparatus complies with the first communication technology,
and/or

the apparatus is a home subscriber server, and/or

the network node is a packet gateway of the first communication
5 technology, and/or

the interface is an Rx interface, and/or

the policy function is part of an evolved packet core, and/or

the information on the network node is acquired from a mobility
management entity, and/or

10 the information on the network node is acquired by a notification
command.

27. The apparatus of any one of claims 23 to 26, wherein:

the information on the network node is transmitted during multimedia
15 registration between the user equipment and the apparatus, and/or

the message by which the information on the network node is
transmitted comprises a server assignment command, and/or

the updated information is transmitted by a push profile command.

20 28. The apparatus of claim 27, wherein:

the message by which the information on the network node is
transmitted comprises a multimedia authentication command, and/or
the updated information is transmitted by a push profile command.

25 29. The apparatus of any one of claims 23 to 25, wherein:

the apparatus complies with the second communication technology,
and/or

the apparatus is a user data management apparatus, and/or

the network node is a session management function of the second
30 communication technology, and/or

the interface is an N5 interface, and/or

the policy function is part of a fifth generation network core, and/or

the information on the network node is acquired from a session management function.

30. The apparatus of any one of claims 23 to 25 and 29, wherein:

5 the information on the network node is transmitted during multimedia registration between the user equipment and the apparatus, and/or
 the message by which the information on the network node is transmitted comprises a multimedia session registration command, and/or
 the updated information is transmitted by a multimedia session
10 update notification command.

31. The apparatus of any one of claims 23 to 25 and 29, wherein:

 the message by which the information on the network node is transmitted comprises a multimedia authentication command, and/or
15 the updated information is transmitted by a multimedia session update notification command.

32. A first network function which is to be used for establishing a

multimedia session for a user equipment, the first network function
20 comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the first network function at least to perform:

 receiving, from an apparatus of a communication network,
25 information on a network node which provides an interface to a policy function for the user equipment and complies with at least one of the first communication technology and a second communication technology, wherein the information on the network node is transmitted by a first message concerning multimedia communication between the user
30 equipment and the communication network; and

 transmitting the information on the network node to a second network function which is to be used for establishing the multimedia session for the user equipment, wherein the information on the network node is

transmitted by a second message concerning the multimedia communication between the user equipment and the communication network.

- 5 33. The first network function of claim 32, wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the first network function to further perform:
- receiving updated information of the information on the network node from the apparatus; and
- 10 transmitting the updated information to the second network function.

34. The first network function of claim 32 or 33, wherein:
- the information on the network node is received during multimedia registration between the user equipment and the apparatus, and/or
- 15 the first message by which the information on the network node is received comprises a server assignment command, and/or
- the updated information is received by a push profile command, and/or
- the information on the network node is transmitted during multimedia
- 20 registration between the user equipment and the apparatus, and/or
- the second message by which the information on the network node is transmitted comprises a 200 OK to register indication with a header including the information on the network node, and/or
- the updated information is transmitted by a notify command.

- 25 35. The first network function of claim 32 or 33, wherein:
- the first message by which the information on the network node is received comprises a multimedia authentication command, and/or
- the second message by which the information on the network node is
- 30 transmitted comprises a 401 indication, and/or
- the updated information is received by a multimedia session update notification command, and/or
- the updated information is transmitted by a notify command.

36. The first network function of claim 32 or 33, wherein:

the information on the network node is received during multimedia registration between the user equipment and the apparatus, and/or

5 the information on the network node is transmitted during multimedia registration between the user equipment and the apparatus, and/or

the first message by which the information on the network node is received comprises a multimedia session registration command, and/or

10 the second message by which the information on the network node is transmitted comprises a 200 OK to register indication with a header including the information on the network node, and/or

the updated information is received by a multimedia session update notification command, and/or

15 the updated information is transmitted by a notify command.

37. A second network function which is to be used for establishing a multimedia session for a user equipment, the second network function comprising at least one processor and at least one memory including computer program code, the at least one memory and the computer
20 program code configured to, with the at least one processor, cause the second network function at least to perform:

receiving, from a first network function which is to be used for establishing the multimedia session for the user equipment, information on a network node which provides an interface to a policy function for the user
25 equipment and complies with at least one of a first communication technology and a second communication technology, wherein the information on the network node is received by a message concerning multimedia communication between the user equipment and a communication network; and

30 storing the information on the network node in a registration context for the user equipment.

38. The second network function of claim 37, wherein the at least one memory and the computer program code are configured to, with the at least one processor, cause the second network function to further perform:
receiving updated information of the information on the network node
5 form the first network function; and
updating the information on the network node with the updated information.

39. The second network function of claim 37 or 38, wherein:

10 the information on the network node is received during multimedia registration between the user equipment and the communication network, and/or

the message by which the information on the network node is received comprises a 200 OK to register indication with a header including
15 the information on the network node.

40. The second network function of any one of claims 37 to 39, wherein the message comprises a 200 OK to register indication with a header including the information on the network node, and the at least one memory and the
20 computer program code are configured to, with the at least one processor, cause the second network function to further perform:

reading the information on the network node from the header;
removing the header from the 200 OK to register indication; and
forwarding the 200 OK to register indication with the header removed
25 to the user equipment.

41. The second network function of claim 37 or 38, wherein:

the message by which the information on the network node is received comprises a 401 indication, and/or

30 the updated information is received by a notify command.

42. The second network function of any one of claims 37 to 41, wherein the at least one memory and the computer program code are configured to,

with the at least one processor, cause the second network function to further perform:

receiving a request regarding the multimedia session and involving the user equipment;

5 checking the registration context for the user equipment;

in case the registration context includes the information on the network node which complies with the first communication technology, invoking the interface to the policy function of the first communication technology; and

10 in case the registration context includes the information on the network node which complies with the second communication technology, invoking the interface to the policy function of the second communication technology.

15 43. The second network function of claim 42, wherein:

the request comprises at least one of a register request and an invite request, and/or

the request is received from the user equipment, and/or

the user equipment is a called party.

20

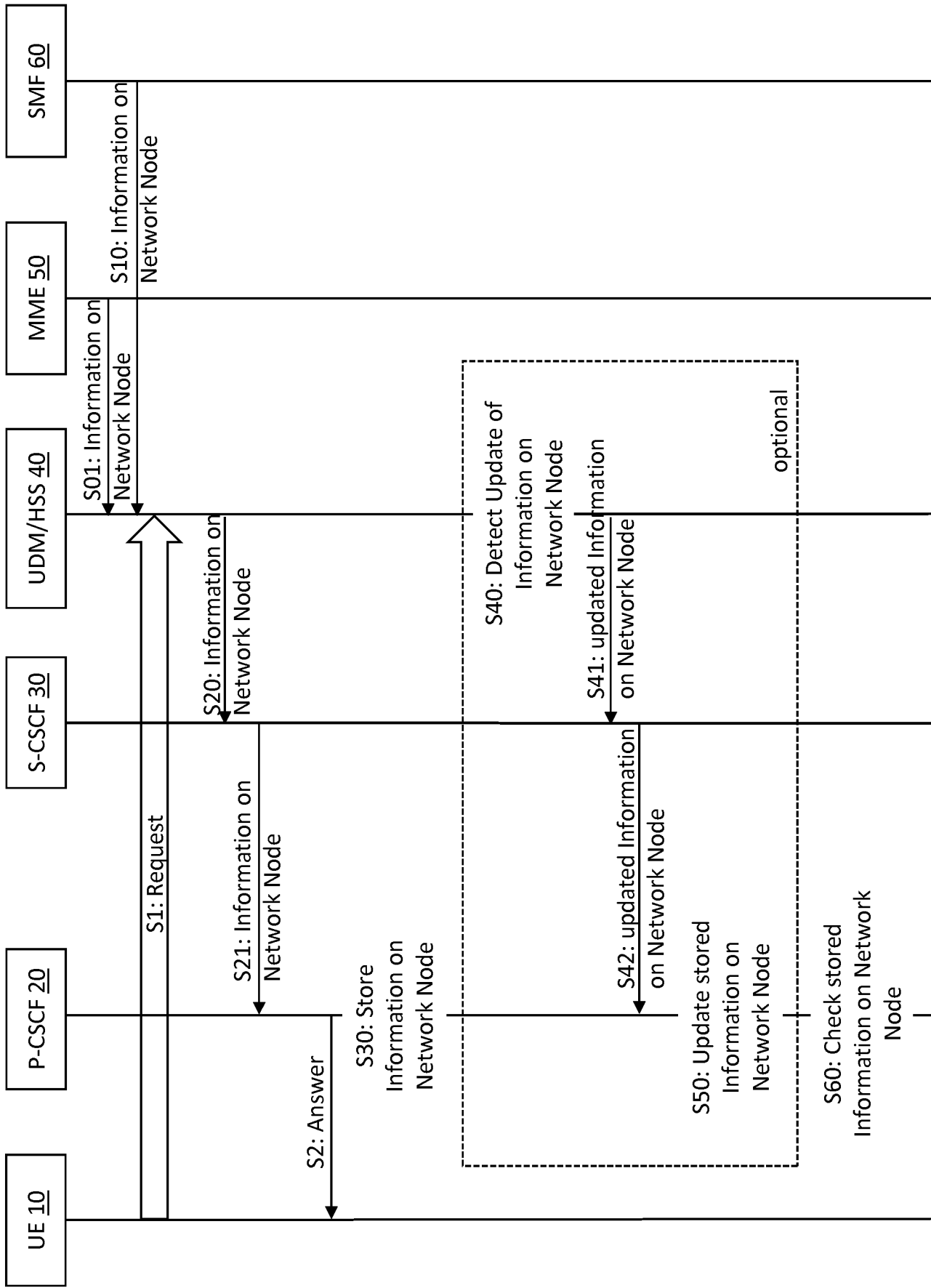


Fig. 1

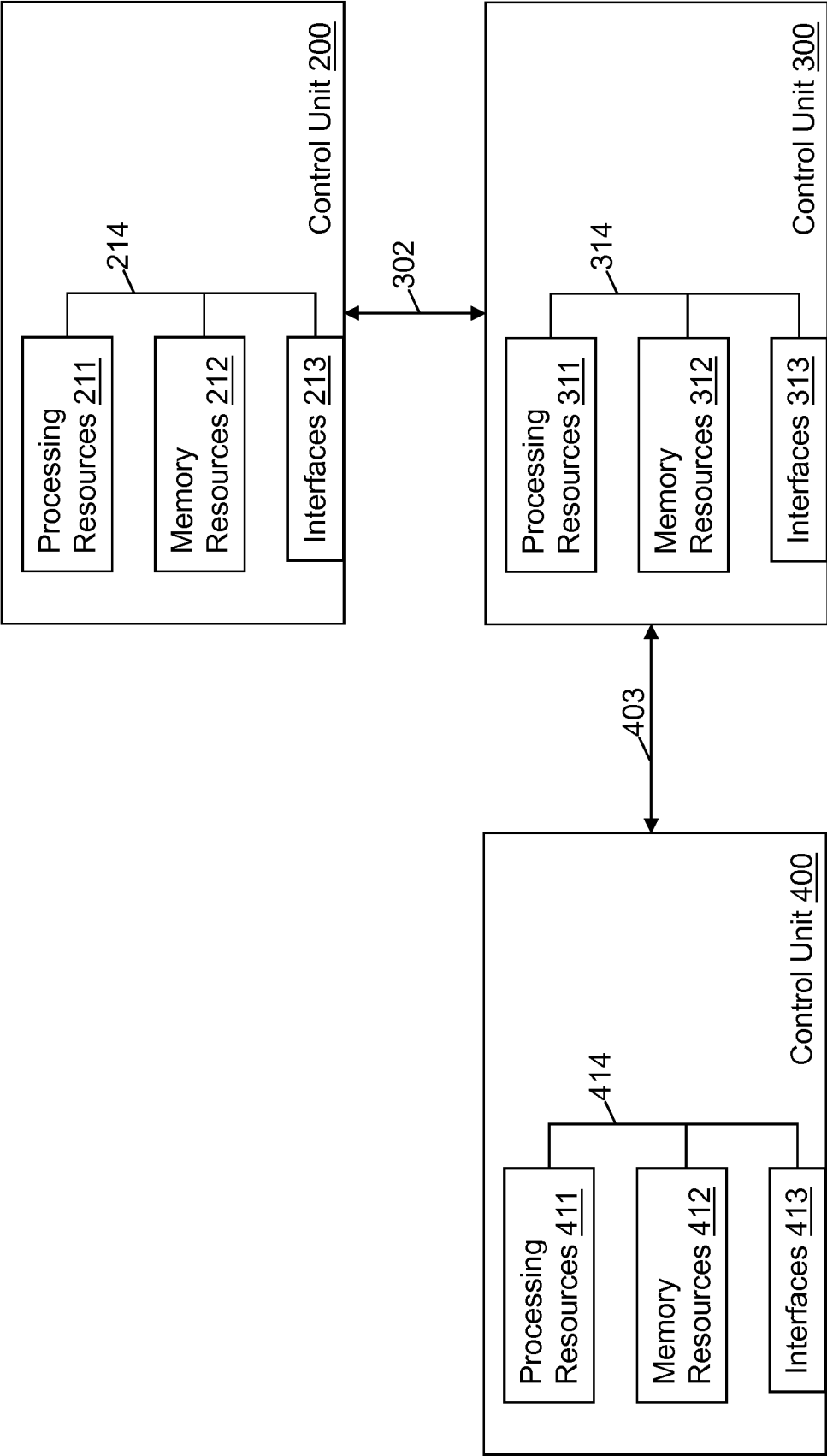


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2018/083187

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04W76/00 H04W80/10 H04W88/00
 ADD. H04L12/24

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)

H04W 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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CHINA MOBILE: "Solution 2 of IMS supporting N5 and Rx simultaneously", 3GPP DRAFT; S2-185265 SOLUTION 2 ON IMS SUPPORTING N5 AND RX SIMULTANEOUSLY, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CE , vol. SA WG2, no. Newport Beach, U.S.; 20180528 - 20180601 27 May 2018 (2018-05-27), XP051448764, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/Meetings%5F3GPP P%5FSYNC/SA2/Docs/ [retrieved on 2018-05-27] Section 1 Discussion and Section 6.Y.1, 6.Y.2 ----- -/-	1-43



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

6 May 2019

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2018/083187

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CHINA MOBILE: "Solution 1 of IMS supporting N5 and Rx simultaneously", 3GPP DRAFT; S2-185264 SOLUTION 1 ON IMS SUPPORTING N5 AND RX SIMULTANEOUSLY, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CE , vol. SA WG2, no. Newport Beach, U.S.; 20180528 - 20180601 27 May 2018 (2018-05-27), XP051448763, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/Meetings%5F3GPP%5FSYNC/SA2/Docs/ [retrieved on 2018-05-27] Section 1 and Sections 6.X.1 and 6.X.2 -----	1-43
A	HUAWEI ET AL: "Solution for utilizing services provided by 5GC", 3GPP DRAFT; S2-183363 SOLUTION FOR UTILIZING SERVICES PROVIDED BY 5GC, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; , vol. SA WG2, no. Sanya, China; 20180416 - 20180420 10 April 2018 (2018-04-10), XP051437703, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg%5Fsa/WG2%5FArch/TSGS2%5F127%5FSanya/Docs/ [retrieved on 2018-04-10] the whole document -----	1-43
A	"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Study on Enhanced IMS to 5GC Integration (Release 16)", 3GPP DRAFT; 23794-040 RM, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE , 15 June 2018 (2018-06-15), XP051535265, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg%5Fsa/WG2%5FArch/Latest%5FSA2%5FSpecs/Latest%5Fdraft%5FS2%5FSpecs/23794%2D040%2Ezip [retrieved on 2018-06-15] Sections 6.14, 6.20 and 6.21 ----- -/--	1-43

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2018/083187

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	T-MOBILE USA INC: "Solutions for Key issue #7 Rx and N5 co-existence", 3GPP DRAFT; S2-185613 WAS S2-185553 WAS S2-185232 P-CR EIMS5G N5 RX SOLUTION, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS C , vol. SA WG2, no. Newport Beach, USA; 20180528 - 20180601 2 June 2018 (2018-06-02), XP051536088, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg%5Fsa/WG2%5FArch/TSGS2%5F127BIS%5FNewport%5FBeach/Docs/S2%2D185613%2Ezip [retrieved on 2018-06-02] the whole document -----	1-43