

binding, as discussed above. However, repeating the method 400 each time that the UE context is moved from one AMF to another AMF may be resource intensive, especially at the UE 402. Therefore, there is a need for improved methods for changing (e.g., adjusting, or hand off between) AMFs without changing an associated RAN when the UE is in connected mode.

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SUMMARY

[0024] The exemplary embodiments disclosed herein are directed to solving the issues relating to one or more of the problems presented in the prior art, as well as providing additional features that will become readily apparent by reference to the following detailed description when taken in conjunction with the accompany drawings. In accordance with various
10 embodiments, exemplary systems, methods, devices and computer program products are disclosed herein. It is understood, however, that these embodiments are presented by way of example and not limitation, and it will be apparent to those of ordinary skill in the art who read the present disclosure that various modifications to the disclosed embodiments can be made while remaining within the scope of the invention.

15 **[0025]** In first aspect, the present disclosure provides a method comprising: receiving, by a second access and mobility management function (AMF), a radio access network (RAN)-user equipment (UE) identifier from a first AMF, the RAN-UE identifier configured to identify a UE for a RAN, wherein the RAN-UE identifier is a RAN UE N2AP ID; producing, by the second AMF, an AMF-UE identifier, the AMF-UE identifier configured to identify the UE for the
20 second AMF, wherein the AMF-UE identifier is an AMF UE N2AP ID; selecting, by the second AMF, a transport network layer association (TNLA) link to the RAN; and sending, by the second AMF, the AMF-UE to the RAN via the TNLA link.

[0026] In an example, the present disclosure provides a method comprising: receiving, by a second access and mobility management function (AMF), a message including a first AMF-user equipment (UE) identifier configured to identify a UE for a first AMF from the radio access network (RAN); retrieving, by the second AMF, UE context information

from a data store using the first AMF-UE identifier; producing, by the second AMF, a second AMF-UE identifier, the second AMF-UE identifier configured to identify the UE for a first interface between the second AMF and the RAN within the second AMF; and sending, by the second AMF, the second AMF-UE identifier to the RAN.

5 **[0027]** In a second aspect, the present disclosure provides an apparatus comprising: a receiver configured to receive a radio access network (RAN)-user equipment (UE) identifier from a first access and mobility management function (AMF), the RAN-UE identifier configured to identify a UE for a RAN, wherein the RAN-UE identifier is a RAN UE N2AP ID; at least one processor configured to: produce an AMF-UE identifier, the AMF-UE identifier configured to
10 identify the UE for a second AMF, wherein the AMF-UE identifier is an AMF UE N2AP ID; and select a transport network layer association (TNLA) link to the RAN; and a transmitter configured to send the AMF-UE identifier to the RAN via the TNLA link.

[0028] In another example, the present disclosure provides an apparatus comprising: a receiver configured to receive a message including a first access and mobility management
15 function (AMF)-user equipment (UE) identifier configured to identify a UE for a first AMF from the radio access network (RAN); at least one processor configured to: retrieve UE context information from a data store using the first AMF-UE identifier; and produce a second AMF-UE identifier, the second AMF-UE identifier configured to identify the UE for a first interface between the second AMF and the RAN within a second AMF; and a transmitter configured to
20 send the second AMF-UE identifier to the RAN.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] Various exemplary embodiments of the invention are described in detail below with reference to the following Figures. The drawings are provided for purposes of illustration only and merely depict exemplary embodiments of the invention to facilitate the reader's understanding of the invention. Therefore, the drawings presented herein should not be

CLAIMS

What is claimed is:

- 5 1. A method, comprising:
receiving, by a second access and mobility management function (AMF), a radio access
network (RAN)-user equipment (UE) identifier from a first AMF, the RAN-UE identifier
configured to identify a UE for a RAN, wherein the RAN-UE identifier is a RAN UE N2AP ID;
producing, by the second AMF, an AMF-UE identifier, the AMF-UE identifier configured
10 to identify the UE for the second AMF, wherein the AMF-UE identifier is an AMF UE N2AP ID;
selecting, by the second AMF, a transport network layer association (TNLA) link to the
RAN; and
sending, by the second AMF, the AMF-UE identifier to the RAN via the TNLA link.
- 15 2. The method of claim 1, wherein:
the RAN-UE identifier is further configured to identify a UE context for the RAN,
the AMF-UE identifier is further configured to identify the UE context for the second
AMF, and
the UE context is associated with UE context information, wherein the UE context
20 information comprises information selected from the group consisting of: a UE identifier, a UE
security state parameter, a UE mobile state parameter, and a UE mobility parameter.
3. An apparatus, comprising:
a receiver configured to receive a radio access network (RAN)-user equipment (UE)

identifier from a first access and mobility management function (AMF), the RAN-UE identifier configured to identify a UE for a RAN, wherein the RAN-UE identifier is a RAN UE N2AP ID;

at least one processor configured to:

produce an AMF-UE identifier, the AMF-UE identifier configured to identify the

5 UE for a second AMF, wherein the AMF-UE identifier is an AMF UE N2AP ID; and

select a transport network layer association (TNLA) link to the RAN; and

a transmitter configured to:

send the AMF-UE identifier to the RAN via the TNLA link.

10 4. The apparatus of claim 3, wherein:

the RAN-UE identifier is further configured to identify a UE context for the RAN,

the AMF-UE identifier is further configured to identify the UE context for the second AMF, and

the UE context is associated with UE context information, and wherein the UE context

15 information comprises information selected from the group consisting of: a UE identifier, a UE security state parameter, a UE mobile state parameter, and a UE mobility parameter.