CLAIMS

1. A method for registering a user equipment (102) the method comprising:

the user equipment, UE (102), transmitting toward a first signal handling function, SHF (114), a request message requesting a certain type of registration;

the UE receiving a registration accept message transmitted by the first SHF after the first SHF processes the request message, wherein

the request message comprises:

i. an identifier allocated to the UE, wherein the identifier is one of a permanent identifier, PID, and a temporary identifier, TID;
ii. registration type information enabling the first SHF to determine the type of registration that the UE is requesting; and
iii. message type information indicating that the request message is Registration Request message, the message type information being separate and distinct from the registration type information included in the request message,

the registration type information can be set to one of a plurality of values including a first value and a second value,

when the registration type information is set to the first value, the registration type information indicates that the UE is currently not in a registered state, and

when the registration type information is set to the second value, the registration type information indicates that the UE is currently in a registered state.

2. The method of claim 1, wherein the registration type information consists of a one bit flag enabling the first SHF to determine whether the UE is requesting a first type of registration or a second type of registration.

3. The method of claim 1, wherein the registration type information comprises a value selected from a pre-defined set of two or more values.

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

the request message comprises the PID allocated to the UE,

the registration accept message comprises a globally unique temporary identifier, GUTI, allocated to the UE, and

the method further comprises: the UE accepting the GUTI and the UE transmitting, in response to the registration accept message, a registration complete message comprising an indication that the UE has accepted the GUTI.

5. The method of any one of claims 1-3, wherein

the request message does not include the PID allocated to the UE, and

the method further comprises:

after transmitting the request message and before receiving the registration accept message, the UE receiving an identity request transmitted by the first SHF, the identity request requesting that the UE transmit an identity response comprising the PID allocated to the UE; and

the UE, in response to the identity request, transmitting to the first SHF the identity response comprising the PID allocated to the UE.

6. The method of any one of claims 1-5, wherein

the registration accept message comprises registration result information for enabling the UE to determine whether or not the first SHF performed an initial registration in response to receiving the request message.

7. The method of any one of claims 1-6, wherein

the registration type information indicates that the UE is not requesting the initial registration, and

the registration accept message includes registration result information indicating that the first SHF completed a procedure for an initial registration procedure notwithstanding the fact that the registration type information indicates that the UE is not requesting an initial registration.

8. The method of claim 7, wherein the registration result information consists of a one bit flag.

9. The method of any one of claims 1-8, wherein

the UE transmitted the request message after the UE detects that the EU is not currently in a registered state.

10. The method of any one of claims 1-9, wherein

the UE transmitted the request message as a result of the UE detecting that the UE has entered a new Tracking area.

11. A method for registering a user equipment, UE (102), the method comprising:

a first signal handling function, SHF (104), receiving a request message transmitted by the UE, the request message requesting a certain type of registration; and

the first SHF processing the request message, wherein

the request message comprises:

i. an identifier allocated to the UE, wherein the identifier is one of a permanent identifier, PID, and a temporary identifier, TID;
ii. registration type information enabling the first SHF to determine the type of registration that the UE is requesting; and
iii. message type information indicating that the request message is Registration Request message, the message type information being separate and distinct from the registration type information included in the request message,

the registration type information can be set to one of a plurality of values including a first value and a second value,

when the registration type information is set to the first value, the registration type information indicates that the UE is currently not in a registered state, and

when the registration type information is set to the second value, the registration type information indicates that the UE is currently in a registered state.

12. The method of claim 11, wherein the registration type information consists of a one bit flag enabling the first SHF to determine whether the UE is requesting a first type of registration or a second type of registration.

13. The method of claim 11, wherein the registration type information comprises a value selected from a pre-defined set of two or more values.

14. The method of any one of claims 11-13, wherein the step of processing the request message comprises examining the registration type information included in the request message to determine whether or not the UE is requesting an initial registration.

15. The method of claim 14, wherein

the first SHF determines, based on the registration type information, that the UE is requesting an initial registration, and

the method further comprises:

the first SHF determining whether the request message includes the PID or the TID.

16. The method of claim 15, wherein

the first SHF determines that the request message does not include the PID,

the first SHF determines that the first SHF does not have certain context information for the UE, and

the method further comprises:

as a result of determining that the request message does not include the PID and the first SHF does not have certain context information for the UE, the first SHF determining an address of a second SHF; and

the first SHF sending to the determined address an information request message comprising: information for identifying the UE and registration type information indicating that the identified UE is requesting an initial registration.

17. The method of claim 16, further comprising:

the second SHF determining, based on the registration type information included in the information request message, that the identified UE is requesting an initial registration; and

as a result of determining that the identified UE is requesting an initial registration, the second SHF retrieves information associated with the identified UE and transmits to the first SHF an information response message comprising the retrieved information, wherein the

retrieved information comprises context data associated with the UE and the PID allocated to the UE.

18. The method of any one of claims 11-15, wherein

the registration type information indicates that the UE is requesting an initial registration,

the request message includes the TID, and

the method further comprises:

the first SHF determining that the first SHF has certain context information for the UE; and

after the first SHF determines that it has the certain context information, the first SHF transmits to the UE a registration accept message.

19. The method of any one of claims 11-15, wherein

the registration type information indicates that the UE is requesting an initial registration,

the request message includes the PID, and

the method further comprises:

the first SHF transmitting to the UE a registration accept message comprising a temporary identifier allocated to the UE; and

the first SHF receiving a registration complete message transmitted by the UE, wherein the registration complete message includes an indication that the UE has accepted the temporary identifier included in the registration access message.

20. The method of any one of claims 11-15, wherein

the registration type information indicates that the UE is not requesting initial registration, and

the method further comprises:

the first SHF determining that it does not have certain context information for the UE;

the first SHF determining an address of a second SHF; and

the first SHF sending to the determined address an information request message comprising: information for identifying the UE and registration type information indicating that the identified UE is not requesting an initial registration.

21. The method of claim 20, further comprising:

the second SHF determining, based on the registration type information included in the information request message, that the identified UE is not requesting an initial registration; and

as a result of determining that the identified UE is not requesting the initial registration, the second SHF retrieves information associated with the identified UE and transmits to the first SHF an information response message comprising the retrieved information, wherein the retrieved information comprises context data associated with the UE, session data associated with the UE, and the PID allocated to the UE.

22. The method of claims 16 or 20, further comprising:

the first SHF receiving an information response that was transmitted by the second SHF after the second SHF processed the information request;

the first SHF determining whether the information response includes the PID allocated to the UE; and

as a result of the first SHF determining that the information response does not include the PID allocated to the UE, the first SHF transmitting to the UE an identity request requesting that the UE transmit an identity response comprising the PID allocated to the UE.

23. The method of any one of claims 11-16 and 20, wherein

the request message comprises the temporary identifier, and

the method further comprises:

the first SHF determining whether an identity request message should be sent to the UE;

as a result of the first SHF determining that an identity request message should be sent to the UE, the first SHF transmitting to the UE the identity request message; and

after transmitting the identity request message to the UE, the first SHF receiving from the UE an identity response message comprising the permanent identifier.

24. The method of claim 23, wherein determining whether an identity request message should be sent to the UE comprises:

the first SHF determining that the temporary identifier maps to an old SHF; and

the first SHF determining that it does not have an interface to the old SHF.

25. The method of claim 23, wherein determining whether an identity request message should be sent to the UE comprises:

the first SHF determining that the temporary identifier maps itself; and

the first SHF determining that it does not have the permanent identifier.

26. The method of any one of claims 11-15, further comprising:

the first SHF transmitting to the UE a registration accept message comprising registration result information for enabling the UE to determine whether or not the first SHF performed an initial registration procedure in response to receiving the request message.

27. The method of any one of claims 11-15, wherein

the registration type information indicates that the UE is not requesting an initial registration, and

the method further comprises:

the first SHF determining whether it has certain context information for the UE; and

as a result of the first SHF determining that it has the certain context information for the UE, the first SHF transmitting to the UE a registration accept message.

28. A user equipment (102), UE (102), the UE being adapted to:

transmit toward a first signal handling function, SHF (114), a request message requesting a certain type of registration;

receive a registration accept message transmitted by the first SHF after the first SHF processes the request message, wherein

the request message comprises:

i. an identifier allocated to the UE, wherein the identifier is one of a permanent identifier, PID, and a temporary identifier, TID;
ii. registration type information enabling the first SHF to determine the type of registration that the UE is requesting; and

iii. message type information indicating that the request message is Registration Request message, the message type information being separate and distinct from the registration type information included in the request message,

the registration type information can be set to one of a plurality of values including a first value and a second value,

when the registration type information is set to the first value, the registration type information indicates that the UE is currently not in a registered state, and

when the registration type information is set to the second value, the registration type information indicates that the UE is currently in a registered state.

29. A first signal handling function (104), SHF (104), being adapted to:

receive a request message transmitted by the UE, the request message requesting a certain type of registration; and

process the request message, wherein

the request message comprises:

i. an identifier allocated to the UE, wherein the identifier is one of a permanent identifier, PID, and a temporary identifier, TID;
ii. registration type information enabling the first SHF to determine the type of registration that the UE is requesting; and
iii. message type information indicating that the request message is Registration Request message, the message type information being separate and distinct from the registration type information included in the request message,

the registration type information can be set to one of a plurality of values including a first value and a second value,

when the registration type information is set to the first value, the registration type information indicates that the UE is currently not in a registered state, and

when the registration type information is set to the second value, the registration type information indicates that the UE is currently in a registered state.