## CLAIMS

What is claimed is:

1. A key identifier generation method, comprising:

receiving, by an authentication management function, an authentication request message #1 from an access and mobility management function, wherein the authentication request message #1 carries a subscription concealed identifier, and the subscription concealed identifier is a subscription concealed identifier generated based on a permanent identifier of a terminal device;

sending, by the authentication management function, an authentication vector get request message #1 to a unified data management function, wherein the authentication vector get request message #1 carries the subscription concealed identifier;

receiving, by the authentication management function, an authentication vector get response message #1 from the unified data management function, wherein the authentication vector get response message #1 comprises indication information of authentication and key management for application;

generating, by the authentication management function based on the indication information of authentication and key management for application, an authentication and key management for application key identifier #1 based on a routing indicator in the subscription concealed identifier; and

storing, by the authentication management function, the routing indicator.

2. The method according to claim 1, wherein the method further comprises:

receiving, by the authentication management function, an authentication request message #2 from the access and mobility management function; and

when the authentication request message #2 carries the permanent identifier, generating, by the authentication management function, a new authentication and key management for application key identifier #2 based on the stored routing indicator.

3. The method according to claim 1 or 2, wherein the generating, by the authentication management function, an authentication and key management for application key identifier #1 based on a routing indicator in the subscription concealed identifier comprises:

generating, by the authentication management function, an authentication and key management for application temporary UE identifier based on an intermediate key generated in

~~an authentication procedure for the terminal device; and~~

~~splicing, by the authentication management function, the routing indicator and the authentication and key management for application temporary UE identifier, to obtain the authentication and key management for application key identifier #1.~~

~~4. The method according to claim 3, wherein the storing, by the authentication management function, the routing indicator comprises:~~

~~storing, by the authentication management function, the authentication and key management for application key identifier #1.~~

~~5. The method according to claim 1 or 2, wherein the authentication vector get response message #1 further comprises the routing indicator; and~~

~~the generating, by the authentication management function, an authentication and key management for application key identifier #1 based on a routing indicator in the subscription concealed identifier comprises:~~

~~generating, by the authentication management function, the authentication and key management for application key identifier #1 based on the routing indicator in the authentication vector get response message #1.~~

~~6. The method according to claim 1 or 2, wherein the storing, by the authentication management function, the routing indicator comprises:~~

~~storing, by the authentication management function, the subscription concealed identifier.~~

~~7. The method according to any one of claims 1 to 6, wherein after the storing, by the authentication management function, the routing indicator, the method further comprises:~~

~~deleting, by the authentication management function, the authentication and key management for application key identifier #1.~~

~~8. The method according to any one of claims 2 to 7, wherein after the generating, by the authentication management function, an authentication and key management for application key identifier #2 based on the stored routing indicator, the method further comprises:~~

~~deleting, by the authentication management function, the authentication and key management for application key identifier #2; and~~

~~continuing, by the authentication management function, to store the routing indicator.~~

~~9~~1. A key identifier generation method, comprising:

receiving, by an authentication management function, an authentication request message #1

from an access and mobility management function, wherein the authentication request message #1 carries a subscription concealed identifier, and the subscription concealed identifier is a subscription concealed identifier generated based on a permanent identifier of a terminal device;

sending, by the authentication management function, an authentication vector get request message #1 to a unified data management function, wherein the authentication vector get request message #1 carries the subscription concealed identifier;

receiving, by the authentication management function, an authentication vector get response message #1 from the unified data management function, wherein the authentication vector get response message #1 comprises indication information of authentication and key management for application, and a routing indicator that is determined based on~~in~~ the subscription concealed identifier; and

generating, by the authentication management function based on the routing indicator and the indication information of authentication and key management for application, an authentication and key management for application-key identifier #1 ~~based on the routing indicator~~.

~~10~~2. The method according to claim ~~9~~1, wherein the method further comprises:

receiving, by the authentication management function, an authentication request message #2 from the access and mobility management function, wherein the authentication request message #2 comprises the permanent identifier;

sending, by the authentication management function, an authentication vector get request message #2 to the unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier;

receiving, by the authentication management function, an authentication vector get response message #2 from the unified data management function, wherein the authentication vector get response message #2 comprises the routing indicator and the indication information of authentication and key management for application; and

generating, by the authentication management function, a new authentication and key management for application-key identifier #2 by using the routing indicator.

~~11~~3. The method according to claim ~~9~~1, wherein the method further comprises:

receiving, by the authentication management function, an authentication request message #2 from the access and mobility management function, wherein the authentication request message #2 comprises the permanent identifier;

sending, by the authentication management function, an authentication vector get request message #2 to the unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier;

obtaining, by the authentication management function, the routing indicator from a core network element based on the indication information of authentication and key management for application; and

generating, by the authentication management function, a new authentication and key management for application-key identifier #2 by using the routing indicator.

~~12~~4. The method according to claim ~~11~~3, wherein the obtaining, by the authentication management function, the routing indicator from another core network element based on the indication information of authentication and key management for application comprises:

determining, by the authentication management function based on the indication information of authentication and key management for application, that the authentication and key management for application-key identifier #2 needs to be generated; and

when the authentication management function does not have the routing indicator locally, obtaining, by the authentication management function, the routing indicator from the core network element.

~~13~~5. The method according to claim ~~11~~ 3 or ~~12~~4, wherein the core network element comprises the unified data management function or the access and mobility management function.

~~14~~6. The method according to claim ~~11~~3, wherein before the obtaining, by the authentication management function, the routing indicator from a core network element based on the indication information of authentication and key management for application, the method further comprises:

receiving, by the authentication management function, an authentication vector get response message #2 from the unified data management function, wherein the authentication vector get response message #2 comprises the indication information of authentication and key management for application.

7. A key identifier generation method, comprising:

receiving, by a unified data management function, an authentication vector get request message #1 from an authentication management function, wherein the authentication vector get request message #1 carries a subscription concealed identifier;

determining, by the unified data management function, a routing indicator based on the

subscription concealed identifier;

sending, by the unified data management function, an authentication vector get response message #1 to the authentication management function, wherein the authentication vector get response message #1 comprises the routing indicator, and indication information of authentication and key management for application.

8. The method according to claim 7, wherein the method further comprises:

receiving, by the unified data management function, an authentication vector get request message #2 from the authentication management function, wherein the authentication vector get request message #2 carries a permanent identifier of a terminal device;

determining, by the unified data management function, the routing indicator based on the permanent identifier;

sending, by the unified data management function, an authentication vector get response message #2 to the authentication management function, wherein the authentication vector get response message #2 comprises the routing indicator, and the indication information of authentication and key management for application.

9. The method according to claim 7 or 8, wherein after determining, by the unified data management function, the routing indicator based on the subscription concealed identifier, the method further comprises:

storing, by the unified data management function, the routing indicator.

10. The method according to any one of claims 7 to 9, further comprising:

determining, by the unified data management function, the terminal device supports a service of authentication and key management for application.

11. A communication apparatus, configured to perform the method according to any one of claims 1 to 6.

12. A communication apparatus, configured to perform the method according to any one of claims 7 to 10.

~~15. A key identifier generation method, comprising:~~

~~receiving, by an authentication management function, an authentication request message #1 from an access and mobility management function, wherein the authentication request message #1 carries a subscription concealed identifier, and the subscription concealed identifier is a~~

~~subscription concealed identifier generated based on a permanent identifier of a terminal device;~~

~~sending, by the authentication management function, an authentication vector get request message #1 to a unified data management function, wherein the authentication vector get request message #1 carries the subscription concealed identifier;~~

~~receiving, by the authentication management function, an authentication vector get response message #1 from the unified data management function, wherein the authentication vector get response message #1 comprises indication information of authentication and key management for application;~~

~~generating, by the authentication management function based on the indication information of authentication and key management for application, an authentication and key management for application key identifier #1 based on a routing indicator in the subscription concealed identifier;~~

~~receiving, by the authentication management function, an authentication request message #2 from the access and mobility management function, wherein the authentication request message #2 comprises the permanent identifier and the routing indicator; and~~

~~generating, by the authentication management function, a new authentication and key management for application key identifier #2 by using the routing indicator received from the access and mobility management function.~~

~~16. The method according to claim 15, wherein before the generating, by the authentication management function, a new authentication and key management for application key identifier #2 by using the routing indicator received from the access and mobility management function, the method further comprises:~~

~~sending, by the authentication management function, an authentication vector get request message #2 to the unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier; and~~

~~receiving, by the authentication management function, an authentication vector get response message #2 from the unified data management function.~~

~~17. The method according to claim 15 or 16, wherein before the receiving, by the authentication management function, an authentication request message #2 from the access and mobility management function, the method further comprises:~~

~~sending, by the authentication management function, a first authentication request response to the access and mobility management function, wherein the first authentication request response~~

~~comprises first indication information, and the first indication information indicates that the terminal device supports an authentication and key management for application service.~~

~~18. The method according to any one of claims 15 to 17, wherein the authentication vector get response message #1 further comprises the routing indicator; and~~

~~the generating, by the authentication management function, an authentication and key management for application-key identifier #1 based on a routing indicator in the subscription concealed identifier comprises:~~

~~generating, by the authentication management function, the authentication and key management for application-key identifier #1 based on the routing indicator in the authentication vector get response message #1.~~

~~19. A key identifier generation method, comprising:~~

~~receiving, by an authentication management function, an authentication request message #2 from an access and mobility management function, wherein the authentication request message #2 comprises a permanent identifier;~~

~~sending, by the authentication management function, an authentication vector get request message #2 to a unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier;~~

~~receiving, by the authentication management function, an authentication vector get response message #2 from the unified data management function, wherein the authentication vector get response message #2 comprises indication information of authentication and key management for application;~~

~~determining, by the authentication management function based on the indication information of authentication and key management for application, that an authentication and key management for application-key identifier needs to be generated;~~

~~when the authentication management function does not have a routing indicator locally, obtaining, by the authentication management function, the routing indicator from a core network element; and~~

~~generating, by the authentication management function, an authentication and key management for application-key identifier #2 by using the routing indicator.~~

~~20. The method according to claim 19, wherein the core network element comprises the unified data management function or the access and mobility management function.~~

21. A communication apparatus, comprising:

a transceiver module, configured to receive an authentication request message #1 from an access and mobility management function, wherein the authentication request message #1 carries a subscription concealed identifier, and the subscription concealed identifier is a subscription concealed identifier generated based on a permanent identifier of a terminal device, wherein

the transceiver module is further configured to send an authentication vector get request message #1 to a unified data management function, wherein the authentication vector get request message #1 carries the subscription concealed identifier; and

the transceiver module is further configured to receive an authentication vector get response message #1 from the unified data management function, wherein the authentication vector get response message #1 comprises indication information of authentication and key management for application; and

a processing module, configured to generate, based on the indication information of authentication and key management for application, an authentication and key management for application-key identifier #1 based on a routing indicator in the subscription concealed identifier, wherein

the processing module is further configured to store the routing indicator.

22. The communication apparatus according to claim 21, wherein

the transceiver module is further configured to receive an authentication request message #2 from the access and mobility management function; and

the processing module is further configured to: when the authentication request message #2 carries the permanent identifier, generate a new authentication and key management for application-key identifier #2 by using the stored routing indicator.

23. The communication apparatus according to claim 21 or 22, wherein

the processing module is further configured to generate an authentication and key management for application-temporary UE identifier based on an intermediate key generated in an authentication procedure for the terminal device; and

the processing module is further configured to splice the routing indicator and the authentication and key management for application-temporary UE identifier, to obtain the authentication and key management for application-key identifier #1.

24. The communication apparatus according to claim 23, wherein

the processing module is further configured to store the authentication and key management for application-key identifier #1.

25. The communication apparatus according to claim 21 or 22, wherein the authentication vector get response message #1 further comprises the routing indicator; and

that the processing module is further configured to generate the authentication and key management for application-key identifier #1 based on the routing indicator in the subscription concealed identifier comprises:

the processing module is further configured to generate the authentication and key management for application-key identifier #1 based on the routing indicator in the authentication vector get response message #1.

26. The communication apparatus according to claim 21 or 22, wherein

the processing module is further configured to store the subscription concealed identifier.

27. The communication apparatus according to any one of claims 21 to 26, wherein

the processing module is further configured to delete the authentication and key management for application-key identifier #1.

28. The communication apparatus according to any one of claims 22 to 27, wherein

the processing module is further configured to delete the authentication and key management for application-key identifier #2; and

the processing module is further configured to continue to store the routing indicator.

29. A communication apparatus, comprising:

a transceiver module, configured to receive an authentication request message #1 from an access and mobility management function, wherein the authentication request message #1 carries a subscription concealed identifier, and the subscription concealed identifier is a subscription concealed identifier generated based on a permanent identifier of a terminal device, wherein

the transceiver module is further configured to send an authentication vector get request message #1 to a unified data management function, wherein the authentication vector get request message #1 carries the subscription concealed identifier; and

the transceiver module is further configured to receive an authentication vector get response message #1 from the unified data management function, wherein the authentication vector get response message #1 comprises indication information of authentication and key management for application and a routing indicator in the subscription concealed identifier; and

a processing module, configured to generate, based on the indication information of authentication and key management for application, an authentication and key management for application-key identifier #1 based on the routing indicator.

30. The communication apparatus according to claim 29, wherein

the transceiver module is further configured to receive an authentication request message #2 from the access and mobility management function, wherein the authentication request message #2 comprises the permanent identifier;

the transceiver module is further configured to send an authentication vector get request message #2 to the unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier;

the transceiver module is further configured to receive an authentication vector get response message #2 from the unified data management function, wherein the authentication vector get response message #2 comprises the routing indicator; and

the processing module is further configured to generate a new authentication and key management for application-key identifier #2 by using the routing indicator.

31. The communication apparatus according to claim 29, wherein

the transceiver module is further configured to receive an authentication request message #2 from the access and mobility management function, wherein the authentication request message #2 comprises the permanent identifier;

the transceiver module is further configured to send an authentication vector get request message #2 to the unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier;

the transceiver module is further configured to obtain the routing indicator from a core network element based on the indication information of authentication and key management for application; and

the processing module is further configured to generate a new authentication and key management for application-key identifier #2 by using the routing indicator.

32. The communication apparatus according to claim 31, wherein

the processing module is further configured to determine, based on the indication information of authentication and key management for application, that the authentication and key management for application-key identifier #2 needs to be generated; and

the transceiver module is further configured to: when the authentication management function does not have the routing indicator locally, obtain the routing indicator from the core network element.

33. The communication apparatus according to claim 31 or 32, wherein the core network element comprises the unified data management function or the access and mobility management function.

34. The communication apparatus according to claim 31, wherein

the transceiver module is further configured to receive an authentication vector get response message #2 from the unified data management function, wherein the authentication vector get response message #2 comprises the indication information of authentication and key management for application.

35. A communication apparatus, comprising:

a transceiver module, configured to receive an authentication request message #1 from an access and mobility management function, wherein the authentication request message #1 carries a subscription concealed identifier, and the subscription concealed identifier is a subscription concealed identifier generated based on a permanent identifier of a terminal device, wherein

the transceiver module is further configured to send an authentication vector get request message #1 to a unified data management function, wherein the authentication vector get request message #1 carries the subscription concealed identifier; and

the transceiver module is further configured to receive an authentication vector get response message #1 from the unified data management function, wherein the authentication vector get response message #1 comprises indication information of authentication and key management for application; and

a processing module, configured to generate, based on the indication information of authentication and key management for application, an authentication and key management for application key identifier #1 based on a routing indicator in the subscription concealed identifier, wherein

the transceiver module is further configured to receive an authentication request message #2 from the access and mobility management function, wherein the authentication request message #2 comprises the permanent identifier and the routing indicator; and

the processing module is further configured to generate a new authentication and key

management for application-key identifier #2 by using the routing indicator received from the access and mobility management function.

36. The communication apparatus according to claim 35, wherein

the transceiver module is further configured to send an authentication vector get request message #2 to the unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier; and

the transceiver module is further configured to receive an authentication vector get response message #2 from the unified data management function.

37. The communication apparatus according to claim 35 or 36, wherein

the transceiver module is further configured to send a first authentication request response to the access and mobility management function, wherein the first authentication request response comprises first indication information, and the first indication information indicates that the terminal device supports an authentication and key management for application service.

38. The communication apparatus according to any one of claims 35 to 37, wherein

the processing module is further configured to generate the authentication and key management for application-key identifier #1 based on the routing indicator in the authentication vector get response message #1.

39. A communication apparatus, comprising:

a transceiver module, configured to receive an authentication request message #2 from an access and mobility management function, wherein the authentication request message #2 comprises a permanent identifier, wherein

the transceiver module is further configured to send an authentication vector get request message #2 to a unified data management function, wherein the authentication vector get request message #2 carries the permanent identifier; and

the transceiver module is further configured to receive an authentication vector get response message #2 from the unified data management function, wherein the authentication vector get response message #2 comprises indication information of authentication and key management for application; and

a processing module, further configured to determine, based on the indication information of authentication and key management for application, that an authentication and key management for application-key identifier needs to be generated, wherein

~~the transceiver module is further configured to: when the authentication management function does not have a routing indicator locally, obtain the routing indicator from a core network element; and~~

~~the processing module is further configured to generate an authentication and key management for application key identifier #2 by using the routing indicator.~~

~~40. The communication apparatus according to claim 39, wherein the core network element comprises the unified data management function or the access and mobility management function.~~

~~41~~13. A communication apparatus, wherein the communication apparatus comprises a processor, wherein

the processor is configured to execute a computer program or instructions stored in a memory, so that the communication apparatus performs the method according to any one of claims 1 to ~~8~~6.

~~42~~14. A communication apparatus, wherein the communication apparatus comprises a processor, wherein

the processor is configured to execute a computer program or instructions stored in a memory, so that the communication apparatus performs the method according to any one of claims ~~9~~ 7 to ~~14~~10.

~~43. A communication apparatus, wherein the communication apparatus comprises a processor, wherein~~

~~the processor is configured to execute a computer program or instructions stored in a memory, so that the communication apparatus performs the method according to any one of claims 15 to 18.~~

~~44. A communication apparatus, wherein the communication apparatus comprises a processor, wherein~~

~~the processor is configured to execute a computer program or instructions stored in a memory, so that the communication apparatus performs the method according to either of claims 19 and 20.~~

~~45~~15. A communication system, comprising the communication apparatus according to ~~any one of~~ claims ~~21~~ 11 ~~to 28~~ and the communication apparatus according to claim ~~41~~12.

~~46~~16. A communication system, comprising the communication apparatus according to claim 13~~any one of claims 29 to 34~~ and the communication apparatus according to claim ~~42~~14.

~~47. A communication system, comprising the communication apparatus according to any one of claims 35 to 38 and the communication apparatus according to claim 43.~~

~~48. A communication system, comprising the communication apparatus according to either~~

~~of claims 39 and 40 and the communication apparatus according to claim 44.~~

~~49~~17. A computer-readable storage medium, wherein the computer-readable storage medium has program instructions, and when the program instructions are directly or indirectly executed, the method according to any one of claims 1 to ~~7~~6, or claims ~~8~~ 7 to ~~15~~10~~, claims 9 to 14, claims 15 to 18, and/or claims 19 and 20~~ is implemented.

~~50~~18. A chip system, wherein the chip system comprises at least one processor, the processor is configured to execute a computer program or instructions stored in a memory, and when the computer program or the instructions is/are executed in the at least one processor, the method according to any one of 1 to 6, or claims 7 to 10~~claims 1 to 7, claims 8 to 15, claims 9 to 14, claims 15 to 18, and/or claims 19 and 20~~ is implemented.

~~51~~19. A computer program product, comprising instructions, wherein when the instructions are run on a computer, the computer is enabled to perform the method according to any one of claims 1 to 6, or claims 7 to 10~~to 7, claims 8 to 15, claims 9 to 14, claims 15 to 18, and/or claims 19 and 20~~.

20. A key identifier generation method, comprising:

receiving, by an authentication management function, an authentication request message #1 from an access and mobility management function, wherein the authentication request message #1 carries a subscription concealed identifier, and the subscription concealed identifier is a subscription concealed identifier generated based on a permanent identifier of a terminal device;

sending, by the authentication management function, an authentication vector get request message #1 to a unified data management function, wherein the authentication vector get request message #1 carries the subscription concealed identifier;

determining, by the unified data management function, a routing indicator based on the subscription concealed identifier;

sending, by the unified data management function, an authentication vector get response message #1 to the authentication management function, wherein the authentication vector get response message #1 comprises indication information of authentication and key management for application, and the routing indicator; and

generating, by the authentication management function based on the routing indicator and the indication information of authentication and key management for application, an authentication and key management for application-key identifier #1 .