CLAIMS

What is claimed is:

1. A method for protecting a truncated parameter, wherein the method comprises:

determining, by a mobility management network element, whether a terminal meets a preset condition; and

sending, by the mobility management network element to the terminal when the terminal meets the preset condition, a downlink non-access stratum (NAS) message on which NAS security protection is performed by using a NAS security context, wherein the downlink NAS message comprises the truncated parameter, and the truncated parameter is used to truncate a 5th generation-system architecture evolution-temporary mobile subscriber identity (5G-S-TMSI) of the terminal.

2. The method according to claim 1, wherein the truncated parameter is pre-stored in the mobility management network element.

3. The method according to claim 1, wherein the preset condition comprises that the terminal uses a control plane cellular internet of things (CIoT) 5th generation system (5GS) optimization function, and the determining, by a mobility management network element, whether a terminal meets a preset condition comprises:

determining, by the mobility management network element, whether the terminal uses the control plane CIoT 5GS optimization function; and

determining, by the mobility management network element when the terminal uses the control plane CIoT 5GS optimization function, that the terminal meets the preset condition.

4. The method according to claim 1 or 2, wherein the preset condition further comprises that the terminal is initially registered with a network; and

the determining, by a mobility management network element, whether a terminal meets a preset condition comprises:

determining, by the mobility management network element, whether the terminal uses the control plane CIoT 5GS optimization function and whether the terminal is initially registered with the network; and

if the terminal uses the control plane CIoT 5GS optimization function and the terminal is initially registered with the network, determining, by the mobility management network element,

that the terminal meets the preset condition; or

if the terminal does not use the control plane CIoT 5GS optimization function or the terminal is not initially registered with the network, determining, by the mobility management network element, that the terminal does not meet the preset condition.

5. The method according to claim 4, wherein the determining, by the mobility management network element, whether the terminal is initially registered with the network comprises:

determining, by the mobility management network element based on a registration type reported by the terminal, that the terminal is initially registered with the network.

6. The method according to claim 1 or 2, wherein the preset condition comprises that the terminal uses a control plane cellular internet of things (CIoT) 5th generation system, 5GS, optimization function and the terminal needs to update the truncated parameter; and

the determining, by a mobility management network element, whether a terminal meets a preset condition comprises:

determining, by the mobility management network element, whether the terminal uses the control plane CIoT 5GS optimization function and whether the terminal needs to update the truncated parameter; and

determining, by the mobility management network element when the terminal uses the control plane CIoT 5GS optimization function and the terminal needs to update the truncated parameter, that the terminal meets the preset condition.

7. The method according to claim 6, wherein the determining, by the mobility management network element, whether the terminal needs to update the truncated parameter comprises:

when a truncated parameter configured in the mobility management network element is different from the truncated parameter that is stored in a context of the terminal, determining, by the mobility management network element, that the terminal needs to update the truncated parameter.

8. The method according to claim 6, wherein the determining, by the mobility management network element, whether the terminal needs to update the truncated parameter comprises:

after the mobility management network element updates the truncated parameter, determining, by the mobility management network element, that the terminal needs to update the truncated parameter.

9. The method according to any one of claims 3 to 8, wherein the determining, by the mobility

management network element, whether the terminal uses the control plane CIoT 5GS optimization function comprises:

when a preferred network behavior reported by the terminal indicates that the terminal prefers to use the control plane CIoT 5GS optimization function, and the mobility management network element supports the control plane CIoT 5GS optimization function, determining, by the mobility management network element, that the terminal uses the control plane CIoT 5GS optimization function.

10. The method according to any one of claims 1 to 9, wherein the method further comprises:

receiving, by the mobility management network element, a registration request message from the terminal before determining whether the terminal meets the preset condition.

11. The method according to any one of claims 1 to 10, wherein the downlink NAS message is a service accept message or a registration accept message.

12. The method according to any one of claims 1 to 11, wherein the first bit to the tenth bit of the 5G-S-TMSI are used to indicate an access and mobility management function (AMF) set ID, the eleventh bit to the sixteenth bit of the 5G-S-TMSI are used to indicate an AMF pointer, and the seventeenth bit to the forty-eighth bit of the 5G-S-TMSI are used to indicate a 5G-TMSI; and

the truncated parameter comprises a first truncated parameter and a second truncated parameter, the first truncated parameter is used to truncate the AMF set ID and the 5G-TMSI, and the second truncated parameter is used to truncate the AMF pointer and the 5G-TMSI.

13. A method for protecting a truncated parameter, wherein the method comprises:

receiving, by an apparatus from a mobility management network element, a downlink NAS message on which NAS security protection is performed by using a NAS security context, wherein the downlink NAS message comprises the truncated parameter, and the truncated parameter is used to truncate a 5G-S-TMSI of the apparatus;

performing, by the apparatus, security deprotection on the downlink NAS message; and

storing, by the apparatus, the truncated parameter after successfully performing security deprotection on the downlink NAS message.

14. The method according to claim 13, wherein the storing, by the apparatus, the truncated parameter comprises:

storing, by a NAS layer of the apparatus, the truncated parameter.

15. The method according to claim 14, wherein the method further comprises:

sending, by the NAS layer of the apparatus, the truncated parameter to a radio resource control (RRC) layer of the apparatus; and

truncating, by the RRC layer of the apparatus, the 5G-S-TMSI of the apparatus based on the truncated parameter, to obtain a truncated 5G-S-TMSI.

16. The method according to claim 15, wherein the method further comprises:

sending, by the apparatus, an RRC reestablishment request message to an access network device, wherein the RRC reestablishment request message comprises the truncated 5G-S-TMSI.

17. The method according to any one of claims 13 to 16, wherein the downlink NAS message is a service accept message or a registration accept message.

18. The method according to any one of claims 13 to 17, wherein the first bit to the tenth bit of the 5G-S-TMSI are used to indicate an access and mobility management function (AMF) set ID, the eleventh bit to the sixteenth bit of the 5G-S-TMSI are used to indicate an AMF pointer, and the seventeenth bit to the forty-eighth bit of the 5G-S-TMSI are used to indicate a 5G-TMSI; and

the truncated parameter comprises a first truncated parameter and a second truncated parameter, the first truncated parameter is used to truncate the AMF set ID and the 5G-TMSI, and the second truncated parameter is used to truncate the AMF pointer and the 5G-TMSI.

19. A communications apparatus, comprising:

at least one processor; and

a memory coupled to the processor and having program instructions stored thereon which, when executed by the at least one processor, cause the communications apparatus to:

determine whether a terminal meets a preset condition; and

send, to the terminal when the terminal meets the preset condition, a downlink non-access stratum (NAS) message on which NAS security protection is performed by using a NAS security context, wherein the downlink NAS message comprises a truncated parameter, and the truncated parameter is used to truncate a 5th generation-system architecture evolution-temporary mobile subscriber identity (5G-S-TMSI) of the terminal.

20. The communications apparatus according to claim 19, wherein the truncated parameter is pre-stored in the mobility management network element.

21. The communications apparatus according to claim 19 or 20, wherein the preset condition comprises that the terminal uses a control plane cellular internet of things (CIoT) 5th generation system (5GS) optimization function, and the program instructions further cause the

communications apparatus to:

determine whether the terminal uses the control plane CIoT 5GS optimization function; and

determine that the terminal meets the preset condition when the terminal uses the control plane CIoT 5GS optimization function.

22. The communications apparatus according to claim 19 or 20, wherein the preset condition comprises that the terminal uses a control plane cellular internet of things (CIoT) 5th generation system, 5GS, optimization function and the terminal needs to update the truncated parameter, and the program instructions further cause the communications apparatus to:

determine whether the terminal uses the control plane CIoT 5GS optimization function and whether the terminal needs to update the truncated parameter; and

determine that the terminal meets the preset condition when the terminal uses the control plane CIoT 5GS optimization function and the terminal needs to update the truncated parameter.

23. The communications apparatus according to claim 21 or 22, wherein the program instructions further cause the communications apparatus to determine that the terminal uses the control plane CIoT 5GS optimization function when a preferred network behavior reported by the terminal indicates that the terminal prefers to use the control plane CIoT 5GS optimization function, and the communications apparatus supports the control plane CIoT 5GS optimization function.

24. The communications apparatus according to any one of claims 19 to 23, wherein the program instructions further cause the communications apparatus to receive a registration request message from the terminal before determining whether the terminal meets the preset condition.

25. The communications apparatus according to any one of claims 19 to 24 wherein the downlink NAS message is a service accept message or a registration accept message.

26. A communications apparatus, comprising:

at least one processor; and

a memory coupled to the processor and having program instructions stored thereon which, when executed by the at least one processor, cause the communications apparatus to:

receive, from a mobility management network element, a downlink NAS message on which NAS security protection is performed by using a NAS security context, wherein the downlink NAS message comprises the truncated parameter, and the truncated parameter is used to truncate a 5G-S-TMSI of the communications apparatus;

perform security deprotection on the downlink NAS message; and

store the truncated parameter after successfully performing security deprotection on the downlink NAS message.

27. The communications apparatus according to claim 26, wherein the program instructions further cause the communications apparatus to store, by a NAS layer of the communications apparatus, the truncated parameter.

28. The communications apparatus according to claim 27, wherein the program instructions further cause the communications apparatus to:

send, by the NAS layer of the communications apparatus, the truncated parameter to a radio resource control (RRC) layer of the terminal; and

truncate, by the RRC layer of the communications apparatus, the 5G-S-TMSI of the communications apparatus based on the truncated parameter, to obtain a truncated 5G-S-TMSI.

29. The communications apparatus according to claim 28, wherein the program instructions further cause the communications apparatus to send an RRC reestablishment request message to an access network device, wherein the RRC reestablishment request message comprises the truncated 5G-S-TMSI.

30. The communications apparatus according to any one of claims 26 to 29, wherein the downlink NAS message is a service accept message or a registration accept message.

31. A computer-readable storage medium, wherein the computer-readable storage medium stores an instruction, and when the instruction is run on a computer, the computer is enabled to perform the method for protecting a truncated parameter according to any one of claims 1 to 18.

32. A chip, comprising a processor, wherein when the processor executes a computer program instruction, the chip is enabled to perform the method for protecting a truncated parameter according to any one of claims 1 to 18.