CLAIMS

What is claimed is:

1. A method for controlling network access, applied to a first communications device comprising a terminal, comprising:

determining (301) whether a preset condition is satisfied; and

when it is determined that the preset condition is satisfied, performing (302) a first operation of accessing a second network through a first network;

wherein the performing a first operation of accessing a second network through a first network comprises:

transmitting first information;

wherein the first information comprises: first indication information and NAS information, or the first information comprises: second NAS information,

wherein the first indication information comprises at least one of the following: first routing indication information, non-second routing indication information, second routing indication information, and non-first routing indication information;

wherein the NAS information comprises at least one of the following: first NAS information and the second NAS information;

wherein the first routing indication information or the non-second routing indication information is related to the first network and comprises at least one of the following: indication information of the first network, indication information of the first NAS information, indication information of a first SRB, indication information of a first DRB, indication information of a first NG connection, indication information of a first AMF, and indication information of a first UPF;

wherein the second routing indication information or the non-first routing indication information is related to the second network and comprises at least one of the following: indication information of the second network, second routing indication information, indication information of the second NAS information, indication information of a second SRB, indication information of a second DRB, indication information of a second NG connection, indication information of a second AMF, indication information of a second UPF, and indication information of a proxy network element;

wherein the second NAS information is control information between the terminal

and the second network and the first NAS information is control information between the terminal and the first network;

in a case that the first information comprises second NAS information but does not comprise the first indication information, the second NAS information is transmitted through a second NAS information element, and the second NAS information element is used to identify the second NAS information.

2. The method according to claim 1, wherein the performing a first operation of accessing a second network through a first network further comprises at least one of the following:

transmitting request information for establishing a second signaling radio bearer SRB;

transmitting request information for establishing a second data radio bearer DRB;

transmitting second non-access stratum NAS information through the second SRB or the second DRB; and

transmitting related information between a terminal and the second network through the second SRB or the second DRB.

3. The method according to claim 2, wherein the first information further comprises information about the second network,

the information about the second network comprises at least one of the following: an identifier of the second network and instruction information for accessing the second network.

4. The method according to any one of claims 1 to 3, wherein the preset condition is at least one of the following:

there is a requirement for interaction between the terminal and the second network;

there is a requirement for transmitting related information between the terminal and the second network;

there is a requirement for transmitting the second NAS information;

there is a requirement for accessing the second network;

there is first network coverage but no second network coverage; and

a current location is covered by the first network but not covered by the second network.

5. The method according to claim 2, wherein the second SRB, the second DRB, and the second NAS information are related to the second network.

6. The method according to claim 1, wherein the second network is at least one of the following: a second access management function AMF of the first network, and a slice of the first network.

7. The method according to claim 1, further comprising:

the first communications device communicates with the second network through a first-network element; or,

the first communications device communicates with the second network through a first-network element and a proxy network element.

8. The method according to claim 1, wherein transmitting first information comprises: transmitting first information to the first-network element.

9. The method according to claim 8, wherein the first-network element comprises a first-network RAN network element.

10. The method according to claim 1, wherein in a case that the first information comprises first indication information and NAS information, the first NAS information and the second NAS information are transmitted in a same NAS information element.

11. A method for controlling network access, applied to a second communications device comprising a second-network element or a proxy network element, comprising:

determining (401) whether a preset condition is satisfied; and

when it is determined that the preset condition is satisfied, performing (402) a second operation of accessing a second network through a first network;

wherein the performing (402) a second operation of accessing a second network through a first network comprises:

transmitting first information;

wherein the first information comprises first indication information and NAS information, or the first information comprises: the second NAS information,

wherein the first indication information comprises at least one of the following: first routing indication information, non-second routing indication information, second routing indication information, and non-first routing indication information;

wherein the NAS information comprises at least one of the following: first NAS information and the second NAS information;

wherein the first routing indication information or the non-second routing indication information is related to the first network and comprises at least one of the following: indication information of the first network, indication information of the first NAS information, indication information of a first SRB, indication information of a first DRB, indication information of a first NG connection, indication information of a first AMF, and indication information of a first UPF;

wherein the second routing indication information or the non-first routing indication information is related to the second network and comprises at least one of the following: indication information of the second network, second routing indication information, indication information of the second NAS information, indication information of a second SRB, indication information of a second DRB, indication information of a second NG connection, indication information of a second AMF, indication information of a second UPF, and indication information of a proxy network element;

wherein the second NAS information is control information between the terminal and the second network and the first NAS information is control information between the terminal and the first network;

in a case that the first information comprises second NAS information but does not comprise the first indication information, the second NAS information is transmitted through a second NAS information element, and the second NAS information element is used to identify the second NAS information.

12. The method according to claim 11, wherein the performing (402) a second operation of accessing a second network through a first network further comprises at least one of the following:

transmitting a paging message, wherein the paging message comprises the first information;

transmitting the first information through a second next generation NG connection or a third NG connection;

transmitting second NAS information or related information between a terminal and the second network through the second NG connection; and

transmitting the second NAS information or related information between the terminal and the second network through the third NG connection.

13. The method according to claim 12, the first information further comprises information about the second network, wherein

the information about the second network comprises at least one of the following: an identifier of the second network and instruction information for accessing the second network, and/or

wherein the preset condition is at least one of the following:

there is a requirement for interaction between the terminal and the second network;

there is a requirement for transmitting related information between the terminal and the second network;

there is a requirement for transmitting the second NAS information; and

the terminal accesses the second network through the first network or a proxy network element;

wherein

the second NG connection is a control plane connection, for the terminal, between a first-network element and a second-network element or a proxy network element;

the third NG connection is a control plane connection, for the terminal, between second-network elements or proxy network elements;

the first routing indication information and the non-second routing indication information are related to the first network; and

the second routing indication information and the non-first routing indication

information are related to the second network.

14. A method for controlling network access, applied to a third communications device comprising a first-network element, comprising:

obtaining (501) first information; and

performing (502), based on the first information, a third operation of accessing a second network through a first network,

wherein the first information comprises: first indication information and NAS information, or the first information comprises: second NAS information,

wherein the first indication information comprises at least one of the following: first routing indication information, non-second routing indication information, second routing indication information, and non-first routing indication information;

wherein the NAS information comprises at least one of the following: first NAS information and the second NAS information;

wherein the first routing indication information or the non-second routing indication information is related to the first network and comprises at least one of the following: indication information of the first network, indication information of the first NAS information, indication information of a first SRB, indication information of a first DRB, indication information of a first NG connection, indication information of a first AMF, and indication information of a first UPF;

wherein the second routing indication information or the non-first routing indication information is related to the second network and comprises at least one of the following: indication information of the second network, second routing indication information, indication information of the second NAS information, indication information of a second SRB, indication information of a second DRB, indication information of a second NG connection, indication information of a second AMF, indication information of a second UPF, and indication information of a proxy network element;

wherein the second NAS information is control information between the terminal and the second network and the first NAS information is control information between the terminal and the first network;

in a case that the first information comprises second NAS information but does not comprise the first indication information, the second NAS information is transmitted through a second NAS information element, and the second NAS information element is used to identify the second NAS information.

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

receiving a paging message, the paging message comprises the first information; or,

receiving a paging message, the paging message comprises at least one of the following: a first paging message and a second paging message; or,

receiving a paging message, the paging message comprises a second paging message;

wherein the first paging message is a paging message of the first network or a paging message triggered by a network element of the first network, and the second paging message is a paging message of the second network or a paging message triggered by a network element of the second network.

16. The method according to claim 14,

wherein the information about the second network comprises at least one of the following: an identifier of the second network and instruction information for accessing the second network;

wherein the performing a third operation of accessing a second network through a first network further comprises at least one of the following:

determining a target end of NAS information transmission;

determining that the NAS information is the second NAS information;

transmitting the second NAS information to a proxy network element or a network element of the second network;

transmitting the second NAS information and the first information to a terminal;

transmitting the NAS information and the first information to the terminal;

determining that the paging message is the second paging message;

transmitting the second paging message to the terminal, wherein the second paging message comprises the first information;

transmitting the paging message to the terminal, wherein the paging message comprises the first information;

selecting a proxy network element of the second network or a network element of the second network for the terminal;

requesting the selected network element or proxy network element of the second network to establish the second NG connection;

establishing the second SRB for the terminal or transmitting configuration information of the second SRB to the terminal;

transmitting the configuration information of the second SRB and the first information to the terminal;

establishing the second DRB for the terminal or transmitting configuration information of the second DRB to the terminal;

transmitting the configuration information of the second DRB and the first information to the terminal;

transmitting the data in the second SRB or the data in the second DRB to the second NG connection;

transmitting the data in the second NG connection to the second SRB or the second DRB;

determining that the NAS information is the first NAS information;

transmitting the second NAS information to a network element of the first network;

determining that the paging message is the first paging message; and

transmitting the first paging message to the terminal, wherein the first paging message comprises the first information.

17. The method according to claim 14, wherein the obtaining second information comprises:

obtaining the second information from at least one of the following:

a terminal, a second communications device, a second communications network element, and a network element and a proxy network element of the second network,

or,

wherein the first routing indication information and the non-second routing indication information are related to the first network;

the second SRB, the second DRB, the second paging message, the second NAS information, the second routing indication information, and the non-first routing indication information are related to the second network; and

the second NG connection is a control plane connection, for a terminal, between a first-network element and a second-network element or a proxy network element.

18. The method according to claim 14, wherein the third communications device comprises a first-network RAN network element.

19. A method for controlling network access, applied to a fourth communications device comprising a terminal, comprising:

obtaining (601)first information; and

performing (602), based on the first information, a fourth operation of accessing a second network through a first network,

wherein the first information comprises: first indication information and NAS information, or the first information comprises: second NAS information,

wherein the first indication information comprises at least one of the following: first routing indication information, non-second routing indication information, second routing indication information, and non-first routing indication information;

wherein the NAS information comprises at least one of the following: first NAS information and the second NAS information;

wherein the first routing indication information or the non-second routing indication information is related to the first network and comprises at least one of the following: indication information of the first network, indication information of the first NAS information, indication information of a first SRB, indication information of a first DRB, indication information of a first NG connection, indication information of a first AMF, and indication information of a first UPF;

wherein the second routing indication information or the non-first routing indication information is related to the second network and comprises at least one of the following: indication information of the second network, second routing indication information, indication information of the second NAS information,

indication information of a second SRB, indication information of a second DRB, indication information of a second NG connection, indication information of a second AMF, indication information of a second UPF, and indication information of a proxy network element;

wherein the second NAS information is control information between the terminal and the second network and the first NAS information is control information between the terminal and the first network;

in a case that the first information comprises second NAS information but does not comprise the first indication information, the second NAS information is transmitted through a second NAS information element, and the second NAS information element is used to identify the second NAS information.

20. The method according to claim 19, wherein the first information comprises: a paging message, a second paging message, configuration information of an SRB, configuration information of a second SRB, configuration information of a DRB, configuration information of a second DRB, data in the second SRB, and data in the second DRB;

wherein the paging message comprises at least one of the following: a first paging message, and the second paging message;

wherein the first paging message is a paging message of the first network or a paging message triggered by a network element of the first network, and the second paging message is a paging message of the second network or a paging message triggered by a network element of the second network;

the information about the second network comprises at least one of the following: an identifier of the second network and instruction information for accessing the second network.

21. A first communications device comprising a terminal, comprising:

a first determining module (101), configured to determine whether a preset condition is satisfied; and

a first execution module (102), configured to: when it is determined that the preset condition is satisfied, perform a first operation of accessing a second network through a first network;

wherein the first execution module is further configured to transmit first information;

wherein the first information comprises: first indication information and NAS information, or the first information comprises: second NAS information,

wherein the first indication information comprises at least one of the following: first routing indication information, non-second routing indication information, second routing indication information, and non-first routing indication information;

wherein the NAS information comprises at least one of the following: first NAS information and the second NAS information;

wherein the first routing indication information or the non-second routing indication information is related to the first network and comprises at least one of the following: indication information of the first network, indication information of the first NAS information, indication information of a first SRB, indication information of a first DRB, indication information of a first NG connection, indication information of a first AMF, and indication information of a first UPF;

wherein the second routing indication information or the non-first routing indication information is related to the second network and comprises at least one of the following: indication information of the second network, second routing indication information, indication information of the second NAS information, indication information of a second SRB, indication information of a second DRB, indication information of a second NG connection, indication information of a second AMF, indication information of a second UPF, and indication information of a proxy network element;

wherein the second NAS information is control information between the terminal and the second network and the first NAS information is control information between the terminal and the first network;

in a case that the first information comprises second NAS information but does not comprise the first indication information, the second NAS information is transmitted through a second NAS information element, and the second NAS information element is used to identify the second NAS information.

22. A second communications device comprising a second-network element or a proxy network element, comprising:

a second determining module (111), configured to determine whether a preset condition is satisfied; and

a second execution module (112), configured to: when it is determined that the preset condition is satisfied, perform a second operation of accessing a second network through a first network;

wherein the second execution module is further configured to transmit first information;

wherein the first information comprises first indication information and NAS information, or the first information comprises: the second NAS information,

wherein the first indication information comprises at least one of the following: first routing indication information, non-second routing indication information, second routing indication information, and non-first routing indication information;

wherein the NAS information comprises at least one of the following: first NAS information and the second NAS information;

wherein the first routing indication information or the non-second routing indication information is related to the first network and comprises at least one of the following: indication information of the first network, indication information of the first NAS information, indication information of a first SRB, indication information of a first DRB, indication information of a first NG connection, indication information of a first AMF, and indication information of a first UPF;

wherein the second routing indication information or the non-first routing indication information is related to the second network and comprises at least one of the following: indication information of the second network, second routing indication information, indication information of the second NAS information,

indication information of a second SRB, indication information of a second DRB, indication information of a second NG connection, indication information of a second AMF, indication information of a second UPF, and indication information of a proxy network element;

wherein the second NAS information is control information between the terminal and the second network and the first NAS information is control information between the terminal and the first network;

in a case that the first information comprises second NAS information but does not comprise the first indication information, the second NAS information is transmitted through a second NAS information element, and the second NAS information element is used to identify the second NAS information.

23. A third communications device comprising a first-network element, comprising:

a first obtaining module (121), configured to obtain first information; and

a third execution module (122), configured to perform, based on the first information, a third operation of accessing a second network through a first network,

wherein the first information comprises: first indication information and NAS information, or the first information comprises: second NAS information,

wherein the first indication information comprises at least one of the following: first routing indication information, non-second routing indication information, second routing indication information, and non-first routing indication information;

wherein the NAS information comprises at least one of the following: first NAS information and the second NAS information; wherein the first routing indication information or the non-second routing indication information is related to the first network and comprises at least one of the following: indication information of the first network, indication information of the first NAS information, indication information of a first SRB, indication information of a first DRB, indication information of a first NG connection, indication information of a first AMF, and indication information of a first UPF;

wherein the second routing indication information or the non-first routing indication information is related to the second network and comprises at least one of

the following: indication information of the second network, second routing indication information, indication information of the second NAS information, indication information of a second SRB, indication information of a second DRB, indication information of a second NG connection, indication information of a second AMF, indication information of a second UPF, and indication information of a proxy network element;

wherein the second NAS information is control information between the terminal and the second network and the first NAS information is control information between the terminal and the first network;

in a case that the first information comprises second NAS information but does not comprise the first indication information, the second NAS information is transmitted through a second NAS information element, and the second NAS information element is used to identify the second NAS information.