CLAIMS

What is claimed is:

1. A multi-link communication method, wherein the method is applied to a first communication apparatus, and the method comprises:

determining a communication frame, wherein the communication frame comprises n multi-link elements, each multi-link element corresponds to one second AP MLD, the multi-link element comprises identifier information of a first access point multi-link device AP MLD and identifier information of the second AP MLD, the n second AP MLDs are affiliated with the first AP MLD, and n is an integer greater than or equal to 1; and

sending the communication frame.

2. The method according to claim 1, wherein the identifier information of the first AP MLD comprises at least one of the following: an identifier ID of the first AP MLD or an MLD medium access control MAC address of the first AP MLD; and

the identifier information of the second AP MLD comprises at least one of the following: an ID of the second AP MLD or an MLD MAC address of the second AP MLD.

3. The method according to claim 2, wherein the multi-link element further comprises a presence bitmap, and the presence bitmap indicates whether the multi-link element comprises at least one of the following: the ID of the first AP MLD, the MLD MAC address of the first AP MLD, the ID of the second AP MLD, or the MLD MAC address of the second AP MLD.

4. The method according to claim 2 or 3, wherein when n is greater than or equal to 2, MLD MAC addresses of first AP MLDs in all the multi-link elements are the same, and IDs of the first AP MLDs in all the multi-link elements are the same.

5. The method according to any one of claims 1 to 4, wherein the communication frame further comprises a reduced neighbor report element, and the reduced neighbor report element carries the identifier information of the first AP MLD and/or the identifier information of the second AP MLD.

6. The method according to any one of claims 1 to 5, wherein the method further comprises:

when the first communication apparatus is an AP, sending a basic service set BSS transition management BTM request frame, wherein the BTM request frame comprises link transition information, and the link transition information indicates whether to perform switching between the second AP MLDs; and

receiving an acknowledgment frame of the BTM request frame; or

when the first communication apparatus is a STA, receiving a BTM request frame, wherein the BTM request frame comprises link transition information, and the link transition information

indicates whether to perform switching between the second AP MLDs; and

sending an acknowledgment frame of the BTM request frame.

7. The method according to claim 6, wherein the method further comprises:

when the first communication apparatus is the AP, receiving a BTM response frame, wherein the BTM response frame comprises a target basic service set identifier BSSID, the target BSSID indicates an MLD MAC address of a target AP MLD, and the target AP MLD comprises a first AP MLD or a second AP MLD; and

sending an acknowledgment frame of the BTM response frame; or

when the first communication apparatus is the STA, sending a BTM response frame, wherein the BTM response frame comprises a target basic service set identifier BSSID, the target BSSID indicates an MLD MAC address of a target AP MLD, and the target AP MLD comprises a first AP MLD or a second AP MLD; and

receiving an acknowledgment frame of the BTM response frame.

8. A multi-link communication method, wherein the method is applied to a second communication apparatus, and the method comprises:

receiving a communication frame, wherein the communication frame comprises n multi-link elements, each multi-link element corresponds to one second AP MLD, the multi-link element comprises identifier information of a first access point multi-link device AP MLD and identifier information of the second AP MLD, the n second AP MLDs are affiliated with the first AP MLD, and n is an integer greater than or equal to 1; and

parsing the communication frame.

9. The method according to claim 8, wherein the identifier information of the first AP MLD comprises at least one of the following: an identifier ID of the first AP MLD or an MLD medium access control MAC address of the first AP MLD; and

the identifier information of the second AP MLD comprises at least one of the following: an ID of the second AP MLD or an MLD MAC address of the second AP MLD.

10. The method according to claim 9, wherein the multi-link element further comprises a presence bitmap, and the presence bitmap indicates whether the multi-link element comprises at least one of the following: the ID of the first AP MLD, the MLD MAC address of the first AP MLD, the ID of the second AP MLD, or the MLD MAC address of the second AP MLD.

11. The method according to claim 9 or 10, wherein when n is greater than or equal to 2, MLD MAC addresses of first AP MLDs in all the multi-link elements are the same, and IDs of the first AP MLDs in all the multi-link elements are the same.

12. The method according to any one of claims 8 to 11, wherein the communication frame further

comprises a reduced neighbor report element, and the reduced neighbor report element carries the identifier information of the first AP MLD and/or the identifier information of the second AP MLD.

13. The method according to any one of claims 8 to 12, wherein the method further comprises:

when the second communication apparatus is a STA, receiving a BTM request frame, wherein the BTM request frame comprises link transition information, and the link transition information indicates whether to perform switching between the second AP MLDs; and

sending an acknowledgment frame of the BTM request frame; or

when the second communication apparatus is an AP, sending a basic service set BSS transition management BTM request frame, wherein the BTM request frame comprises link transition information, and the link transition information indicates whether to perform switching between the second AP MLDs; and

receiving an acknowledgment frame of the BTM request frame.

14. The method according to claim 13, wherein the method further comprises:

when the second communication apparatus is the STA, sending a BTM response frame, wherein the BTM response frame comprises a target basic service set identifier BSSID, the target BSSID indicates an MLD MAC address of a target AP MLD, and the target AP MLD comprises a first AP MLD or a second AP MLD; and

receiving an acknowledgment frame of the BTM response frame; or

when the second communication apparatus is the AP, receiving a BTM response frame, wherein the BTM response frame comprises a target basic service set identifier BSSID, the target BSSID indicates an MLD MAC address of a target AP MLD, and the target AP MLD comprises a first AP MLD or a second AP MLD; and

sending an acknowledgment frame of the BTM response frame.

15. A multi-link communication method, wherein the method comprises:

sending a multi-link reconfiguration request frame, wherein the multi-link reconfiguration request frame comprises first indication information, the first indication information indicates a request for adding a link, the multi-link reconfiguration request frame further comprises first link information, and the first link information indicates link information of a station side corresponding to the added link; and

receiving a multi-link reconfiguration response frame, wherein the multi-link reconfiguration response frame comprises second link information, and the second link information indicates link information of an access point side corresponding to the added link.

16. A multi-link communication method, wherein the method comprises:

receiving a multi-link reconfiguration request frame, wherein the multi-link reconfiguration

request frame comprises first indication information, the first indication information indicates a request for adding a link, the multi-link reconfiguration request frame further comprises first link information, and the first link information indicates link information of a station side corresponding to the added link; and

sending a multi-link reconfiguration response frame, wherein the multi-link reconfiguration response frame comprises second link information, and the second link information indicates link information of an access point side corresponding to the added link.

17. The method according to claim 15 or 16, wherein the first link information comprises at least one of the following information:

capability information, supported rates and basic service set BSS membership selectors, extended supported rates and BSS membership selectors, a power capability, supported channels, a basic multi-link element, or an operating information element.

18. The method according to any one of claims 15 to 17, wherein the second link information comprises at least one of the following information:

capability information, a status code, supported rates and BSS membership selectors, extended supported rates and BSS membership selectors, an enhanced distributed channel access EDCA parameter set, a fast transition element FTE, a basic multi-link element, or an operating channel information OCI element.

19. The method according to claim 18, wherein the FTE comprises a multi-link operating group temporal key MLO GTK, a multi-link operating integrity group temporal key MLO IGTK, and a multi-link operating beacon integrity group temporal key MLO BIGTK.

20. The method according to any one of claims 15 to 19, wherein the multi-link reconfiguration request frame further comprises a reconfiguration multi-link element, and the reconfiguration multi-link element is used to carry link information of a deleted link or link information of a link whose link operation parameter is updated.

21. The method according to claim 17, wherein the basic multi-link element comprises a common information field, the common information field carries link information of one link in M added links, and M is a positive integer.

22. The method according to claim 21, wherein the common information field comprises at least one of the following: a link identifier ID, a station medium access control STA MAC address, a beacon interval, a timing synchronization function TSF offset, delivery traffic indication message DTIM information, or an NSTR indication bitmap, wherein

the link ID field indicates a link ID of the one link;

the STA MAC address field indicates a STA MAC address of a non-AP MLD side corresponding

to the one link, or a BSSID of an AP MLD side corresponding to the one link;

the beacon interval field indicates a beacon interval for the one link;

the TSF offset field indicates a difference between a TSF timer of an AP corresponding to the one link and a TSF timer of a transmit link;

the DTIM information field comprises a DTIM count field and a DTIM period field, wherein the DTIM count field indicates a quantity of beacon frames to a next DTIM, and the DTIM period field indicates a quantity of beacon intervals between two consecutive DTIMs; and

the NSTR indication bitmap indicates whether the one link and another link are NSTR links.

23. The method according to claim 21 or 22, wherein when M is greater than or equal to 2, the basic multi-link element further comprises M–1 per-STA profile subelements, each per-STA profile subelement is used to carry link information of one link in M–1 links, and the M–1 links are M–1 links except for the one link in the M links.

24. The method according to any one of claims 15 to 23, wherein the multi-link reconfiguration response frame further comprises a count field and a reconfiguration status list, the count field indicates a quantity of link IDs and status codes in the reconfiguration status list, and the quantity of link IDs and status codes corresponds to a quantity of per-STA profile subelements carried in the reconfiguration multi-link element in the multi-link reconfiguration request frame.

25. A multi-link communication method, wherein the method comprises:

sending a multi-link reconfiguration request frame, wherein the multi-link reconfiguration request frame comprises a first basic multi-link element, the first basic multi-link element comprises M per-STA profile subelements corresponding to M added links, and each per-STA profile subelement indicates link information of a station STA side corresponding to one link in the M links; and

receiving a multi-link reconfiguration response frame, wherein the multi-link reconfiguration response frame comprises a second basic multi-link element, the second basic multi-link element comprises M per-STA profile subelements corresponding to M added links, and each per-STA profile subelement indicates link information of an access point AP side corresponding to one link in the M links.

26. A multi-link communication method, wherein the method comprises:

receiving a multi-link reconfiguration request frame, wherein the multi-link reconfiguration request frame comprises a first basic multi-link element, the first basic multi-link element comprises M per-STA profile subelements corresponding to M added links, and each per-STA profile subelement indicates link information of a station STA side corresponding to one link in the M links; and

sending a multi-link reconfiguration response frame, wherein the multi-link reconfiguration response frame comprises a second basic multi-link element, the second basic multi-link element

comprises M per-STA profile subelements corresponding to M added links, and each per-STA profile subelement indicates link information of an access point AP side corresponding to one link in the M links.

27. The method according to claim 25 or 26, wherein the multi-link reconfiguration request frame further comprises a reconfiguration multi-link element, and the reconfiguration multi-link element is used to carry link information of a deleted link or link information of a link whose link operation parameter is updated.

28. The method according to any one of claims 25 to 27, wherein the multi-link reconfiguration response frame further comprises a count field and a reconfiguration status list, the count field indicates a quantity of link IDs and status codes in the reconfiguration status list, and the quantity of link IDs and status codes corresponds to a quantity of per-STA profile subelements carried in the reconfiguration multi-link element in the multi-link reconfiguration request frame.

29. The method according to any one of claims 25 to 28, wherein a common information field in the first basic multi-link element does not comprise a link identifier ID field.

30. A communication apparatus, comprising a unit configured to perform the method according to any one of claims 1 to 29.

31. A communication apparatus, comprising a processor and a memory, wherein

the memory is configured to store instructions; and

the processor is configured to execute the instructions, to perform the method according to any one of claims 1 to 29.

32. A communication apparatus, comprising a logic circuit and an interface, wherein the logic circuit is coupled to the interface; and

the interface is configured to input and/or output code instructions, and the logic circuit is configured to execute the code instructions, to perform the method according to any one of claims 1 to 29.

33. A computer-readable storage medium, wherein the computer-readable storage medium is configured to store a computer program, and when the computer program is executed, the method according to any one of claims 1 to 29 is performed.

34. A computer program, wherein when the computer program is executed, the method according to any one of claims 1 to 29 is performed.

35. A communication system, wherein the communication system comprises a first communication apparatus and a second communication apparatus, the first communication apparatus is configured to perform the method according to any one of claims 1 to 7, and the second communication apparatus is configured to perform the method according to any one of claims 8 to

14.

36. A communication system, wherein the communication system comprises a station STA and an access point AP, the STA is configured to perform the method according to any one of claims 15, 17 to 25, and 27 to 29, and the AP is configured to perform the method according to any one of claims 16 to 24 and 26 to 29.