

CLAIMS

What is claimed is:

1. A communication apparatus in a wireless local area network WLAN, comprising:
a processing unit, configured to generate a management frame, wherein an AP belongs to a
5 first AP multi-link device MLD, the management frame comprises MLD information, the MLD
information comprises a first MLD element, a subelement of the first MLD element is used to
carry information about another AP in the first MLD to which the AP belongs, and the first MLD
element comprises type information indicating an MLD element type; and

a transceiver unit, configured to send the management frame.

2. A communication apparatus in a wireless local area network WLAN, comprising:
a transceiver unit, configured to receive a management frame from an access point AP,
wherein the AP belongs to a first AP multilink device MLD, the management frame comprises
MLD information, the MLD information comprises a first MLD element, a subelement of the first
MLD element is used to carry information about another AP in the first MLD to which the AP
15 belongs, and the MLD element comprises type information indicating an MLD element type; and

a processing unit, configured to obtain, based on the management frame, the information
about the another AP in the first MLD to which the AP belongs.

3. The communication apparatus according to claim 1 or 2, wherein the MLD element further
comprises a common control field, and

20 the common control field comprises the type information that indicates the element type of
the MLD element.

4. The communication apparatus according to claim 3, wherein the element type comprises a
formal MLD element and a virtual MLD element, and

the type information specifically comprises:

25 a virtual MLD field that indicates whether the MLD element is a virtual MLD element.

5. The communication apparatus according to claim 4, wherein the virtual MLD field
comprises 1 bit; and

if the MLD element is the virtual MLD element, the virtual MLD field is set to a first value;

or

30 if the MLD element is a formal MLD element, the virtual MLD field is set to a second value.

6. The communication apparatus according to claim 3, wherein the element type comprises a formal MLD element, a virtual MLD element, and a special MLD element; and

the type information comprises:

a virtual MLD field that indicates whether the MLD element is a virtual MLD element, and

a special MLD field that indicates whether the MLD element is a special MLD element.

7. The communication apparatus according to claim 6, wherein the virtual MLD field comprises 1 bit, and the special MLD field comprises 1 bit; and

if the MLD element is the virtual MLD element, the virtual MLD field is set to a first value, and the special MLD field is set to a second value; or

if the MLD element is the special MLD element, the virtual MLD field is set to a second value, and the special MLD field is set to a first value; or

if the MLD element is a formal MLD element, the virtual MLD field is set to a second value, and the special MLD field is set to the second value.

8. The communication apparatus according to any one of claims 1 to 7, wherein the MLD element further comprises an MLD common information field; and

the common control field further comprises: an MLD address present field that indicates whether an MLD address field is present in the MLD common information field, wherein the MLD address field carries an identifier of the first MLD.

9. The communication apparatus according to claim 8, wherein

if the type information indicates that the MLD element is the virtual MLD element, the MLD common information field comprises the MLD address field; or

if the type information indicates that the MLD element is the formal MLD element, the MLD common information field comprises the MLD address field.

10. The communication apparatus according to claim 8 or 9, wherein

if the type information indicates that the MLD element is the special MLD element, the MLD common information field does not comprise the MLD address field.

11. The communication apparatus according to any one of claims 1 to 10, wherein

if the another AP in the first MLD belongs to a second multiple BSSID set, and another AP in the second multiple BSSID set belongs to a second MLD, the MLD information further comprises a second MLD element, wherein a subelement in the second MLD element carries information about an AP in the second MLD.

12. The communication apparatus according to any one of claims 1 to 11, wherein
if the AP belongs to a first multiple BSSID set, the MLD information further comprises a first
multiple BSSID element, wherein the first multiple BSSID element comprises information about
a non-transmitted AP in the first multiple BSSID set.

13. The communication apparatus according to claim 12, wherein
if the non-transmitted AP in the first multiple BSSID set belongs to a third MLD, the multiple
BSSID element further comprises a third MLD element, wherein a subelement of the third MLD
element carries information about another AP in the third MLD.

14. The communication apparatus according to any one of claims 1 to 13, wherein
if the another AP in the first MLD belongs to a third multiple BSSID set, and an AP in the
third multiple BSSID set does not belong to an MLD, the MLD information further comprises a
fourth MLD element, wherein a subelement of the fourth MLD element carries information about
the AP.

15. The communication apparatus according to any one of claims 1 to 14, wherein the first
MLD element is a formal MLD element, and the type information in the first MLD element
indicates that the first MLD element is the formal MLD element.

16. The communication apparatus according to any one of claims 11 to 15, wherein the second
MLD element is a virtual MLD element, and type information in the second MLD element
indicates that the second MLD element is the virtual MLD element.

17. The communication apparatus according to any one of claims 13 to 16, wherein the third
MLD is a formal MLD element, and type information in the second MLD element indicates that
the second MLD element is the formal MLD element.

18. The communication apparatus according to any one of claims 14 to 17, wherein the fourth
MLD element is a special MLD element, and type information in the fourth MLD element
indicates that the fourth MLD element is the special MLD element.

19. A signaling information exchange method in a wireless local area network (WLAN),
comprising:

generating, by an access point (AP), a management frame, wherein the AP belongs to a first
AP multi-link device (MLD), the management frame comprises MLD information, the MLD
information comprises a first MLD element, a subelement of the first MLD element is used to
carry information about another AP in the first MLD to which the AP belongs, and the first MLD

element comprises type information indicating an MLD element type; and
sending, by the access point, the management frame.

202. A signaling information exchange method in a wireless local area network (WLAN),
comprising:

5 receiving, by a station, a management frame from an access point (AP), wherein the AP
belongs to a first AP multilink device (MLD), the management frame comprises MLD information,
the MLD information comprises a first MLD element, a subelement of the first MLD element is
~~used to carry~~ carries information about another AP in the first MLD ~~to which the AP belongs, and~~
~~the MLD element comprises type information indicating an MLD element type; and~~

10 obtaining, by the station based on the management frame, the information about the another
AP in the first MLD ~~to which the AP belongs.~~

243. The method according to claim ~~19 or 201~~ or 2, wherein the first MLD element ~~further~~
comprises a common control field, and

the common control field comprises ~~the~~ type information that indicates ~~the~~ an element type
15 of the first MLD element.

4. The method according to claim 3, wherein the first MLD element is a formal MLD element,
and the type information in the first MLD element indicates that the first MLD element is the
formal MLD element.

225. The method according to claim ~~243~~, wherein the element type comprises a formal MLD
20 element and a virtual MLD element, and

the type information ~~specifically~~ comprises:

a virtual MLD field that indicates whether the MLD element is a virtual MLD element.

236. The method according to claim ~~225~~, wherein the virtual MLD field comprises 1 bit; and
if the MLD element is the virtual MLD element, the virtual MLD field is set to a first value,

25 or

if the MLD element is a formal MLD element, the virtual MLD field is set to a second value.

7. The method according to any one of claims 1 to 6, wherein if a field or element about the
another AP is different from a field or element about the AP, the same field or element about the
another AP is carried in the subelement of the first MLD element.

30 8. The method according to any one of claims 1 to 6, wherein if a field or element about the
another AP is different from a field or element about the AP, the same field or element about the

another AP is carried in the subelement of the first MLD element.

9. The method according to any one of claims 1 to 8, wherein the management frame further comprises: reduced neighbor report (RNR) element.

10. The method according to claim 9, wherein in the RNR element, MLD identifiers of a plurality of reported APs are the same when the plurality of reported APs are from the same MLD.

~~24. The method according to claim 21, wherein the element type comprises a formal MLD element, a virtual MLD element, and a special MLD element; and~~

~~the type information comprises:~~

~~a virtual MLD field that indicates whether the MLD element is a virtual MLD element, and~~

~~a special MLD resource that indicates whether the MLD element is a special MLD element.~~

~~25. The method according to claim 4, wherein the virtual MLD field comprises 1 bit, and the special MLD field comprises 1 bit; and~~

~~if the MLD element is the virtual MLD element, the virtual MLD field is set to a first value, and the special MLD field is set to a second value; or~~

~~if the MLD element is the special MLD element, the virtual MLD field is set to a second value, and the special MLD field is set to a first value; or~~

~~if the MLD element is a formal MLD element, the virtual MLD field is set to a second value, and the special MLD field is set to the second value.~~

~~26. The method according to any one of claims 19 to 25, wherein the MLD element further comprises an MLD common information field; and~~

~~the common control field further comprises: an MLD address present field that indicates whether an MLD address field is present in the MLD common information field, wherein the MLD address field carries an identifier of the first MLD.~~

~~27. The method according to claim 26, wherein~~

~~if the type information indicates that the MLD element is the virtual MLD element, the MLD common information field comprises the MLD address field; or~~

~~if the type information indicates that the MLD element is the formal MLD element, the MLD common information field comprises the MLD address field.~~

~~28. The method according to claim 26 or 27, wherein:~~

~~if the type information indicates that the MLD element is the special MLD element, the MLD common information field does not comprise the MLD address field.~~

2911. The method according to any one of claims 19-1 to 2810, wherein

if the another AP in the first MLD belongs to a second multiple basic service set identifier (BSSID) set, and another AP in the second multiple BSSID set belongs to a second MLD, the MLD information further comprises a second MLD element, wherein a subelement in the second MLD element carries information about an AP in the second MLD.

3012. The method according to any one of claims 19-1 to 2911, wherein

if the AP belongs to a first multiple BSSID set, the MLD information further comprises a first multiple BSSID element, wherein the first multiple BSSID element comprises information about a non-transmitted AP in the first multiple BSSID set.

3413. The method according to claim 3012, wherein

if the non-transmitted AP in the first multiple BSSID set belongs to a third MLD, the first multiple BSSID element further comprises a third MLD element, wherein a subelement of the third MLD element carries information about another AP in the third MLD.

14. The method according to any one of claims 1 to 13, wherein the management frame is a beacon frame, an association response frame, a probe response frame, an authentication frame, or a neighbor report.

~~32. The method according to any one of claims 19 to 31, wherein~~

~~if the another AP in the first MLD belongs to a third multiple BSSID set, and an AP in the third multiple BSSID set does not belong to an MLD, the MLD information further comprises a fourth MLD element, wherein a subelement of the fourth MLD element carries information about the AP.~~

~~33. The method according to any one of claims 19 to 32, wherein the first MLD element is a formal MLD element, and the type information in the first MLD element indicates that the first MLD element is the formal MLD element.~~

~~34. The method according to any one of claims 29 to 33, wherein the second MLD element is a virtual MLD element, and type information in the second MLD element indicates that the second MLD element is the virtual MLD element.~~

~~35. The method according to any one of claims 31 to 34, wherein the third MLD is a formal MLD element, and type information in the second MLD element indicates that the second MLD element is the formal MLD element.~~

~~36. The method according to any one of claims 32 to 35, wherein the fourth MLD element is~~

a special MLD element, and type information in the fourth MLD element indicates that the fourth MLD element is the special MLD element.

15. A signaling information exchange method in a wireless local area network (WLAN), comprising:

generating, by an access point (AP), a management frame, wherein the AP belongs to a first AP multi-link device (MLD), the management frame comprises reduced neighbor report (RNR) element and a multiple basic service set identifier (BSSID) element, wherein the RNR element comprises simplified information about another AP that belongs to a same MLD as the AP, wherein the AP belongs to a multiple BSSID set and the multiple BSSID element comprises information about one or more non-transmitted APs in the multiple BSSID set;

sending, by the access point, the management frame.

16. A signaling information exchange method in a wireless local area network (WLAN), comprising:

receiving, by a station, a management frame from an access point (AP), wherein the AP belongs to a first AP multi-link device MLD, the management frame comprises reduced neighbor report (RNR) element and a multiple basic service set identifier (BSSID) element, wherein the RNR element comprises simplified information about another AP that belongs to the first MLD, wherein the AP belongs to a multiple BSSID set and the multiple BSSID element comprises information about one or more non-transmitted APs in the multiple BSSID set; and

obtaining, by the station based on the management frame, the information about the another AP in the first MLD.

17. The method according to claim 15 or 16, wherein the RNR element further comprises simplified information about another AP that belongs to a third MLD, wherein the one or more non-transmitted APs belong to the third MLD.

18. The method according to any one of claims 15 to 17, wherein the RNR element further comprises an MLD identifier of a reported AP, in the RNR element, MLD identifiers of a plurality of reported APs are the same when the plurality of reported APs are from the same MLD.

19. The method according to claim 15 or 16, wherein the RNR element further comprises link identifier of a reported AP.

20. The method according to claim 15 or 16, wherein the multiple BSSID element further comprises an MLD element, the MLD element comprises a common information field, the

common information field comprises a link identifier of the one or more non-transmitted APs.

21. The method according to claim 15 or 16, wherein the multiple BSSID element further comprises an identifier of an MLD to which the one or more non-transmitted Aps belong.

22. The method according to claim 15 or 16, wherein simplified information about the one or more non-transmitted APs is not carried the RNR element.

3723. An access point (AP)A communication apparatus, comprising a processor and a memory, wherein the memory is configured to store instructions, and when the instructions are run by the processor, the ~~APcommunication apparatus~~ is enabled to perform the method according to any one of claims ~~49-1, 3 to 36~~14, 15 and 17 to 22.

24. A station, comprising a processor and a memory, wherein the memory is configured to store instructions, and when the instructions are run by the processor, the station is enabled to perform the method according to any one of claims 2 to 14 and 16 to 22.

~~38. A communication apparatus, comprising a processor, a transceiver, and a memory, wherein the transceiver is configured to receive and send information or communicate with another network element, the memory is configured to store a computer program or instructions, and the processor is configured to execute the computer program or the instructions, to enable the communication apparatus to perform the method according to any one of claims 19 to 36.~~

3925. A chip, comprising an input/output interface circuit and a processing circuit, wherein the input/output interface circuit is configured to input/output data or signaling information, and the processing circuit is configured to process the data or signaling information provided by the input/output interface circuit, to enable ~~the chip or a device comprising the chip~~ to perform the method according to any one of claims ~~49-1 to 36~~22.

4026. A computer-readable storage medium, wherein the computer-readable storage medium stores computer program code or instructions, and when the computer program or the instructions is/are run on a processor, a device comprising the processor is enabled to perform the method according to any one of claims ~~49-1 to 36~~is performed22.

4127. A computer program product, wherein the program product stores a computer program or instructions, and when the computer program or the instructions is/are run on a processor, a device comprising the processor is enabled to perform the method according to any one of claims ~~49-1 to 36~~22is performed.

~~42. A communication apparatus, configured to perform the method according to any one of~~

~~claims 19 to 36.~~

~~4328.~~ A communication system, wherein the communication system comprises an access point~~the apparatus~~ according to ~~any one of claims 1, 3 to 18~~ claim 23 and ~~the apparatus~~ a station according to ~~any one of claims 2 to 18~~ claim 24.