

CLAIMS

What is claimed is:

1. A communications method, comprising:

sending, by a station in a STA multi-link device, a first frame, to an AP in an AP multi-link device, the first frame comprises first information indicating a temporal frequency at which one or more stations in the STA multi-link device receive a beacon frame, the one or more stations are in a power saving mode;

receiving, by the station in the STA multi-link device, a second frame, from the AP in the AP multi-link device,

wherein the first information indicates a time interval within which the one or more stations in the STA multi-link device receive a beacon frame, the time interval is related to one or more beacon frame intervals at which the AP multi-link device sends a beacon frame on the one or more links, where each beacon frame interval is an interval at which an AP in the AP multi-link device sends a beacon frame on a link,

wherein the unit of the time interval is a largest time interval in the one or more beacon frame intervals at which the AP multi-link device sends a beacon frame on the one or more links.

2. The method according to claim 1, the STA multi-link device includes the one or more stations, the AP multi-link device includes one or more APs, the first frame is used to request the one or more stations in the STA multi-link device associate with the one or more APs in the AP multi-link device correspondingly.

3. The method according to claim 1 or claim 2, the first frame is Association Request frame, the second frame is Association Response frames; or

the first frame is ReAssociation Request frame, the second frame is ReAssociation Response frame.

4. The method according to any one of claims 1 to 3, the first information is carried in a listen interval field of an Association Request frame, or

the first information is carried in a listen interval field of a ReAssociation Request frame.

5. The method according to any one of claims 1 to 4, the time interval is greater than a threshold, the second frame comprises third information, the third information is used to indicate rejecting the association request of the station in a STA multi-link device.

6. The method according to any one of claims 1 to 4, value "0" of the time interval indicates the one or more stations in the STA multi-link device never enter power save mode.

7. The method according to any one of claims 1 to 6, the first information is used to determine the lifetime of cache service of the STA multi-link device.

8. The method according to any one of claims 1 to 7, the first information is used to determine an age function, wherein the age function is used to determine whether to discard the cache service of the STA multi-link device.

9. The method according to any one of claims 5 to 8, the method further comprise:
receiving, by at least one station in the STA multi-link device, a beacon frame within the time interval.

10. A communications method, comprising:
receiving, by an AP in an AP multi-link device, a first frame, from a station in a STA multi-link device, the first frame comprises first information indicating a temporal frequency at which one or more stations in the STA multi-link device receive a beacon frame, the one or more stations are in a power saving mode;

sending, by the AP in an AP multi-link device, a second frame based on first information, to the station in the STA multi-link device,

wherein the first information indicates a time interval within which the one or more stations in the STA multi-link device receive a beacon frame, the time interval is related to one or more beacon frame intervals at which the AP multi-link device sends a beacon frame on the one or more links, where each beacon frame interval is an interval at which an AP in the AP multi-link device sends a beacon frame on a link,

wherein the unit of the time interval is a largest time interval in the one or more beacon frame intervals at which the AP multi-link device sends a beacon frame on the one or more links.

11. The method according to claim 10, the STA multi-link device includes the one or more stations, the AP multi-link device includes one or more APs, the first frame is used to request the one or more stations in the STA multi-link device associate with the one or more APs in the AP multi-link device correspondingly.

12. The method according to claim 10 or claim 11, the first frame is Association Request frame, the second frame is Association Response frames; or

the first frame is ReAssociation Request frame, the second frame is ReAssociation Response frame.

13. The method according to any one of claims 10 to 12, the first information is carried in a listen interval field of an Association Request frame, or

the first information is carried in a listen interval field of a ReAssociation Request frame.

14. The method according to any one of claims 10 to 13, the time interval is greater than a

threshold, the second frame comprises third information, the third information is used to indicate rejecting the association request of the station in a STA multi-link device.

15. The method according to claim 14, value “0” of the time interval indicates the one or more stations in the STA multi-link device never enter power save mode.

16. The method according to any one of claims 10 to 14, the AP multi-link device determines the lifetime of cache service of the STA multi-link device based on the first information.

17. The method according to claim 16, the AP multi-link device determines an age function based on the first information, and determines whether to discard the cache service of the STA multi-link device based on the age function.

18. The method according to any one of claims 10 to 14 , the method further comprise:
sending, by at least one AP in the AP multi-link device, a beacon frame.

19. A communications method, comprising:

sending, by a station in a STA multi-link device, a WNM sleep request frame, to an AP in an AP multi-link device, the WNM sleep request frame carries WNM sleep interval, the WNM sleep interval is used to indicate a temporal frequency at which one or more stations in the WNM sleep state in the STA multi-link device receive a beacon frame;

receiving, by the station in the STA multi-link device, a WNM sleep response frame, from the AP in the AP multi-link device,

wherein the WNM sleep interval indicates an interval within which the one or more stations in the STA multi-link device receive a DTIM beacon frame, the interval is related to one or more DTIM beacon frame intervals at which the AP multi-link device sends a DTIM beacon frame on the one or more links, where each DTIM beacon frame interval is an interval at which an AP in the AP multi-link device sends a DTIM beacon frame on a link,

wherein the unit of the interval is a largest time interval in the one or more DTIM beacon frame intervals at which the AP multi-link device sends a DTIM beacon frame on the one or more links.

20. The method according to claim 19, the WNM sleep interval is applied to the one or more stations in the station multi-link device.

21. The method according to claim 19 or 20, the WNM sleep interval is greater than a threshold, the WNM sleep response frame comprises fourth information, the fourth information is used to indicate rejecting the sleep request of the station in a STA multi-link device.

22. The method according to claim 19 or 20, value “0” of the WNM sleep interval indicates that the one or more stations in the WNM sleep state in the STA multi-link device does not wake up at any specified interval.

23. The method according to any one of claims 19 to 22, the WNM sleep request frame carries

a WNM sleep mode element, and the WNM sleep mode element includes at least one of the following:
element ID, length, action type, WNM sleep mode response status, and the WNM sleep interval.

24. The method according to any one of claims 19 to 23, the WNM sleep interval is used to determine the lifetime of cache service of the STA multi-link device.

25. The method according to claim 24, the WNM sleep interval is used to determine an age function, wherein the age function is used to determine whether to discard the cache service of the STA multi-link device.

26. The method according to any one of claims 19 to 22, the method further comprise:
receiving, by at least one station in the STA multi-link device, a DTIM beacon frame within the interval.

27. A communications method, comprising:
receiving, by an AP in an AP multi-link device, a WNM sleep request frame, from a station in a STA multi-link device, the WNM sleep request frame carries WNM sleep interval, the WNM sleep interval is used to indicate a temporal frequency at which one or more stations in the WNM sleep state in the STA multi-link device receive a beacon frame;

sending, by the AP in an AP multi-link device, a WNM sleep response frame, to the station in the STA multi-link device,

wherein the WNM sleep interval indicates an interval within which the one or more stations in the STA multi-link device receive a DTIM beacon frame, the interval is related to one or more DTIM beacon frame intervals at which the AP multi-link device send a DTIM beacon frame on one or more links, where each DTIM beacon frame interval is an interval at which an AP in the AP multi-link device sends a DTIM beacon frame on a link,

wherein the unit of the interval is a largest time interval in the one or more DTIM beacon frame intervals at which the AP multi-link device sends a DTIM beacon frame on the one or more links.

28. The method according to claim 27, the WNM sleep interval is applied to the one or more stations in the STA multi-link device.

29. The method according to claim 27 or 28, the WNM sleep interval is greater than a threshold, the WNM sleep response frame comprises fourth information, the fourth information is used to indicate rejecting the sleep request of the station in a STA multi-link device.

30. The method according to any one of claims 27 to 29, the WNM sleep request frame carries a WNM sleep mode element, and the WNM sleep mode element includes at least one of the following:
element ID, length, action type, WNM sleep mode response status, and the WNM sleep interval.

31. The method according to any one of claims 27 to 30, the AP multi-link device determines the lifetime of cache service of the STA multi-link device based on the WNM sleep interval.

32. The method according to claim 31, the AP multi-link device determines an age function based on the WNM sleep interval, and determines whether to discard the cache service of the STA multi-link device based on the age function.

33. The method according to any one of claims 27 to 29, the method further comprise:

sending, by at least one AP in the AP multi-link device, a DTIM beacon frame.

34. A communications apparatus, comprising:

a processing circuit and an interface circuit, the processing circuit is configured to control the interface circuit to perform a method as claimed in any one of claims 1 to 9, or a method as claimed in any one of claims 10 to 18, or a method as claimed in any one of claims 19 to 26, or a method as claimed in any one of claims 27 to 33.

35. A computer-readable recording medium on which a program is recorded, wherein the program, when executed, enables a computer to perform a method as claimed in any one of claims 1 to 9, or a method as claimed in any one of claims 10 to 18, or a method as claimed in any one of claims 19 to 26, or a method as claimed in any one of claims 27 to 33.

36. A communications apparatus, configured to perform a method as claimed in any one of claims 1 to 9, or a method as claimed in any one of claims 10 to 18, or a method as claimed in any one of claims 19 to 26, or a method as claimed in any one of claims 27 to 33.

37. A program product, comprising instructions which makes a computer to perform a method as claimed in any one of claims 1 to 9, or a method as claimed in any one of claims 10 to 18, or a method as claimed in any one of claims 19 to 26, or a method as claimed in any one of claims 27 to 33.