

CLAIMS

What is claimed is:

1. A link capability indication method, comprising:

determining, by a first multi-link device based on whether the first multi-link device supports
5 simultaneous transmit and receive (STR) operation in at least one of directions from a first link to
a second link and from the second link to the first link, whether the first multi-link device supports
the STR operation on a link pair, wherein the link pair consists of the first link and the second link;
sending, by the first multi-link device, indication information to a second device, wherein
the indication information indicates whether the first multi-link device supports the STR operation
10 on the link pair.

2. The method according to claim 1, wherein the determining, by the first multi-link device,
whether the first multi-link device supports the STR operation on the link pair, comprises:

when the first multi-link device does not support the STR operation in at least one of
directions from the first link to the second link and from the second link to the first link, the first
15 multi-link device determines that the first multi-link device does not support the STR operation on
the link pair.

3. The method according to claim 2, wherein the first multi-link device does not support the
STR operation in at least one of directions from the first link to the second link and from the second
link to the first link, comprises:

20 the first multi-link device does not support transmission on the first link concurrent with
reception on the second link; or

the first multi-link device does not support transmission on the second link concurrent with
reception on the first link; or

the first multi-link device neither supports transmission on the first link concurrent with
25 reception on the second link, nor supports transmission on the second link concurrent with
reception on the first link.

4. The method according to claim 1, wherein the determining, by the first multi-link device,
whether the first multi-link device supports the STR operation on the link pair, comprises:

when the first multi-link device supports the STR operation in both directions from the first
30 link to the second link and from the second link to the first link, the first multi-link device

determines that the first multi-link device supports the STR operation on the link pair.

5. The method according to any one of claims 1 to 4, wherein the sending the indication information to the second device, comprises:

sending, by the first multi-link device, an association request frame to the second device,
5 wherein the association request frame comprises the indication information.

6. The method according to any one of claims 1 to 5, wherein the indication information is 1-bit information.

7. The method according to claim 6, wherein when the 1-bit information is set to 1, the indication information indicates that the first multi-link device supports the STR operation on the
10 link pair; when the 1-bit information is set to 0, the indication information indicates that the first multi-link device does not support the STR operation on the link pair.

8. The method according to any one of claims 1 to 7, wherein
the first multi-link device is a non-access point multi-link device (non-AP MLD), and the second device is a single-link device AP or an AP MLD; or

15 the first multi-link device is an AP MLD, and the second device is a single-link device station or a non-AP MLD.

9. The method according to any one of claims 1 to 8, wherein the first multi-link device comprises a plurality of affiliated stations, wherein each affiliated station works on one link.

20 10. The method according to claim 9, wherein the plurality of affiliated stations are independent of each other at a low media access control (MAC) layer and a physical layer, and the plurality of affiliated stations share a high MAC layer.

11. The method according to any one of claims 1 to 10, wherein the working frequency bands of the first multi-link device comprise two or more of frequency bands of sub 1 GHz, 2.4 GHz, 5 GHz, 6 GHz, and 60 GHz, wherein each working frequency band corresponds to one link.

25 12. A simultaneous transmit and receive (STR) capability indication method, comprising:
generating, by a first multi-link device, STR capability information; and
sending, by the first multi-link device, the STR capability information, wherein the STR capability information indicates interference parameter information between a first link using a first bandwidth and a second link using a second bandwidth, and the interference parameter
30 information is for determining whether the first multi-link device supports a simultaneous transmit and receive operation on the first link and the second link.

213. A simultaneous transmit and receive (STR) capability indication method, comprising:
receiving, by a second device, STR capability information from a first multi-link device,
wherein the STR capability information indicates interference parameter information between a
first link using a first bandwidth and a second link using a second bandwidth;

5 obtaining, by the second device, an interference parameter threshold; and
determining, by the second device based on the interference parameter information and the
interference parameter threshold, whether the first multi-link device supports a simultaneous
transmit and receive operation on the first link and the second link.

314. The method according to claim 213, wherein the determining, by the second device
10 based on the interference parameter information and the interference parameter threshold, whether
the first multi-link device supports a simultaneous transmit and receive operation on the first link
and the second link comprises:

if an interference parameter comprised in the interference parameter information is less than
the interference parameter threshold, determining, by the second device, that the first multi-link
15 device supports the simultaneous transmit and receive operation on the first link and the second
link; or

if an interference parameter comprised in the interference parameter information is greater
than or equal to the interference parameter threshold, determining, by the second device, that the
first multi-link device does not support the simultaneous transmit and receive operation on the first
20 link and the second link.

415. The method according to any one of claims 12 to 314, wherein the simultaneous transmit
and receive operation comprises a first operation and a second operation, the first operation is that
the first multi-link device transmits a first physical layer protocol data unit (PPDU) on the first
link concurrently with receiving a second PPDU on the second link, and the second operation is
25 that the first multi-link device transmits the second PPDU on the second link concurrently with
receiving the first PPDU on the first link.

516. The method according to claim 415, wherein the first bandwidth is a bandwidth of the
first PPDU and the second bandwidth is a bandwidth of the second PPDU;

the bandwidth of the first PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160
30 MHz, or 320 MHz; and

the bandwidth of the second PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz,

160 MHz, or 320 MHz.

617. The method according to claim 415, wherein the first bandwidth is a maximum bandwidth supported by the first link, and the second bandwidth is a bandwidth of the second PPDU; or

5 the first bandwidth is a bandwidth of the first PPDU, and the second bandwidth is a maximum bandwidth supported by the second link;

the bandwidth of the first PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz; and

the bandwidth of the second PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz,
10 160 MHz, or 320 MHz.

718. The method according to any one of claims 4-15 to 617, wherein the interference parameter information comprises a first interference parameter and a second interference parameter, the first interference parameter is an interference parameter of the first link to the second link when the first multi-link device performs the first operation, and the second
15 interference parameter is an interference parameter of the second link to the first link when the first multi-link device performs the second operation.

819. The method according to any one of claims 12 to 718, wherein the STR capability information further comprises the first bandwidth and the second bandwidth.

920. The method according to any one of claims 12 to 819, wherein the interference parameter
20 information comprises a maximum interference parameter, the maximum interference parameter is a maximum value of at least one interference parameter corresponding to at least one bandwidth combination, the bandwidth combination comprises a bandwidth combination of the bandwidth of the first link and the bandwidth of the second link, and a bandwidth combination comprising the first bandwidth and the second bandwidth in the at least one bandwidth combination corresponds
25 to a maximum interference parameter.

4021. The method according to any one of claims 12 to 920, wherein the STR capability information comprises first information and second information, the first information indicates the interference parameter information between the first link using the first bandwidth and the second link using the second bandwidth, the second information indicates STR mode information of the
30 first link using the first bandwidth and the second link using the second bandwidth, and the STR mode information is a conditional STR mode.

~~4122.~~ The method according to any one of claims ~~12~~ to ~~4021~~, wherein the interference parameter information is carried in an extremely high throughput (EHT) operation element.

~~4223.~~ A communication apparatus, applied to a first multi-link device and comprising:

a processing unit, configured to generate simultaneous transmit and receive (STR) capability information; and

a transceiver unit, configured to send the STR capability information, wherein the STR capability information indicates interference parameter information between a first link using a first bandwidth and a second link using a second bandwidth, and the interference parameter information is for determining whether the first multi-link device supports a simultaneous transmit and receive operation on the first link and the second link.

~~13. The communication apparatus according to claim 12, wherein the simultaneous transmit and receive operation comprises a first operation and a second operation, the first operation is that the first multi-link device transmits a first physical layer protocol data unit PPDU on the first link concurrently with receiving a second PPDU on the second link, and the second operation is that the first multi-link device transmits the second PPDU on the second link concurrently with receiving the first PPDU on the first link.~~

~~14. The communication apparatus according to claim 13, wherein the first bandwidth is a bandwidth of the first PPDU and the second bandwidth is a bandwidth of the second PPDU;~~

~~the bandwidth of the first PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz; and~~

~~the bandwidth of the second PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz.~~

~~15. The communication apparatus according to claim 13, wherein the first bandwidth is a maximum bandwidth supported by the first link, and the second bandwidth is a bandwidth of the second PPDU; or~~

~~the first bandwidth is a bandwidth of the first PPDU, and the second bandwidth is a maximum bandwidth supported by the second link;~~

~~the bandwidth of the first PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz; and~~

~~the bandwidth of the second PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz.~~

16. The communication apparatus according to any one of claims 13 to 15, wherein the interference parameter information comprises a first interference parameter and a second interference parameter, the first interference parameter is an interference parameter of the first link to the second link when the first multi-link device performs the first operation, and the second interference parameter is an interference parameter of the second link to the first link when the first multi-link device performs the second operation.

17. The communication apparatus according to any one of claims 12 to 16, wherein the STR capability information further comprises the first bandwidth and the second bandwidth.

18. The communication apparatus according to any one of claims 12 to 17, wherein the interference parameter information comprises a maximum interference parameter, the maximum interference parameter is a maximum value of at least one interference parameter corresponding to at least one bandwidth combination, the bandwidth combination comprises a bandwidth combination of the bandwidth of the first link and the bandwidth of the second link, and a bandwidth combination comprising the first bandwidth and the second bandwidth in the at least one bandwidth combination corresponds to a maximum interference parameter.

19. The communication apparatus according to any one of claims 12 to 18, wherein the STR capability information comprises first information and second information, the first information indicates the interference parameter information between the first link using the first bandwidth and the second link using the second bandwidth, the second information indicates STR mode information between the first link using the first bandwidth and the second link using the second bandwidth, and the STR mode information is a conditional STR mode.

20. The communication apparatus according to any one of claims 12 to 18, wherein the interference parameter information is carried in an extremely high throughput EHT operation element.

21. A communication apparatus, applied to a second device and comprising:
a transceiver unit, configured to receive simultaneous transmit and receive (STR) capability information from a first multi-link device, wherein the STR capability information indicates interference parameter information between a first link using a first bandwidth and a second link using a second bandwidth; and
a processing unit, configured to obtain an interference parameter threshold, wherein the processing unit is further configured to determine, based on the interference parameter

information and the interference parameter threshold, whether the first multi-link device supports a simultaneous transmit and receive operation on the first link and the second link.

~~22. The communication apparatus according to claim 21, wherein the processing unit is specifically configured to:~~

~~when an interference parameter comprised in the interference parameter information is less than the interference parameter threshold, determine that the first multi-link device supports the simultaneous transmit and receive operation on the first link and the second link; or~~

~~when an interference parameter comprised in the interference parameter information is greater than or equal to the interference parameter threshold, determine that the first multi-link device does not support the simultaneous transmit and receive operation on the first link and the second link.~~

~~23. The communication apparatus according to claim 21 or 22, wherein the simultaneous transmit and receive operation comprises a first operation and a second operation, the first operation is that the first multi-link device transmits a first physical layer protocol data unit PPDU on the first link concurrently with receiving a second PPDU on the second link, and the second operation is that the first multi-link device transmits the second PPDU on the second link concurrently with receiving the first PPDU on the first link.~~

~~24. The communication apparatus according to claim 23, wherein the first bandwidth is a bandwidth of the first PPDU and the second bandwidth is a bandwidth of the second PPDU;~~

~~the bandwidth of the first PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz; and~~

~~the bandwidth of the second PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz.~~

~~25. The communication apparatus according to claim 23, wherein the first bandwidth is a maximum bandwidth supported by the first link, and the second bandwidth is a bandwidth of the second PPDU; or~~

~~the first bandwidth is a bandwidth of the first PPDU, and the second bandwidth is a maximum bandwidth supported by the second link;~~

~~the bandwidth of the first PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz; and~~

~~the bandwidth of the second PPDU is any one of the following: 20 MHz, 40 MHz, 80 MHz,~~

160 MHz, or 320 MHz.

26. The communication apparatus according to any one of claims 23 to 25, wherein the interference parameter information comprises a first interference parameter and a second interference parameter, the first interference parameter is an interference parameter of the first link to the second link when the first multi-link device performs the first operation, and the second interference parameter is an interference parameter of the second link to the first link when the first multi-link device performs the second operation.

27. The communication apparatus according to any one of claims 21 to 26, wherein the STR capability information further comprises the first bandwidth and the second bandwidth.

28. The communication apparatus according to any one of claims 21 to 27, wherein the interference parameter information comprises a maximum interference parameter, the maximum interference parameter is a maximum value of at least one interference parameter corresponding to at least one bandwidth combination, the bandwidth combination comprises a bandwidth combination of the bandwidth of the first link and the bandwidth of the second link, and a bandwidth combination comprising the first bandwidth and the second bandwidth in the at least one bandwidth combination corresponds to a maximum interference parameter.

29. The communication apparatus according to any one of claims 21 to 28, wherein the STR capability information comprises first information and second information, the first information indicates the interference parameter information between the first link using the first bandwidth and the second link using the second bandwidth, the second information indicates STR mode information between the first link using the first bandwidth and the second link using the second bandwidth, and the STR mode information is a conditional STR mode.

30. The communication apparatus according to any one of claims 21 to 29, wherein the interference parameter information is carried in an extremely high throughput EHT operation element.

31. A link capability indication method, comprising:

determining, by a first multi-link device, indication information based on whether the first multi-link device supports transmission on a first link concurrent with reception on a second link, and whether the first multi-link device supports transmission on the second link concurrent with reception on the first link; and

sending, by the first multi-link device, a management frame, wherein the management frame

comprises the indication information.

3226. A link capability indication method, comprising:

receiving, by a second device, a management frame from a first multi-link device, wherein the management frame comprises indication information, and the indication information is determined based on whether the first multi-link device supports transmission on a first link concurrent with reception on a second link, and whether the first multi-link device supports transmission on the second link concurrent with reception on the first link; and

parsing, by the second device, the management frame.

33. The method according to claim 31 or 32, wherein the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not support transmission on the first link concurrent with reception on the second link; or

the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not support transmission on the second link concurrent with reception on the first link.

34. The method according to claim 33, wherein that the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not support transmission on the first link concurrent with reception on the second link specifically comprises:

when the first multi-link device does not support transmission on the first link concurrent with reception on the second link, and the first multi-link device supports transmission on the second link concurrent with reception on the first link, the indication information indicates that the first multi-link device does not support the simultaneous transmit and receive operation on the first link and the second link.

35. The method according to claim 33, wherein that the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not support transmission on the second link concurrent with reception on the first link specifically comprises:

when the first multi-link device does not support transmission on the second link concurrent with reception on the first link, and the first multi-link device supports transmission on the first

link concurrent with reception on the second link, the indication information indicates that the first multi-link device does not support the simultaneous transmit and receive operation on the first link and the second link.

36. The method according to any one of claims 31 to 35, wherein the first multi-link device is a non-access point multi-link device non-AP MLD.

37. The method according to any one of claims 31 to 36, wherein the management frame is an association request frame.

38. The method according to any one of claims 31 to 37, wherein the indication information is one bit.

39. The method according to claim 38, wherein when the indication information is 1, it indicates that the first multi-link device does not support the simultaneous transmit and receive operation on the first link and the second link; or

when the indication information is 0, it indicates that the first multi-link device supports the simultaneous transmit and receive operation on the first link and the second link.

40. A communication apparatus, applied to a first multi-link device and comprising:

a processing unit, configured to determine indication information based on whether the first multi-link device supports transmission on a first link concurrent with reception on a second link, and whether the first multi-link device supports transmission on the second link concurrent with reception on the first link; and

a transceiver unit, configured to send a management frame, wherein the management frame comprises the indication information.

41. A communication apparatus, applied to a second device and comprising:

a transceiver unit, configured to receive a management frame from a first multi-link device, wherein the management frame comprises indication information, and the indication information is determined based on whether the first multi-link device supports transmission on a first link concurrent with reception on a second link, and whether the first multi-link device supports transmission on the second link concurrent with reception on the first link; and

a processing unit, configured to parse the management frame.

42. The communication apparatus according to claim 40 or 41, wherein the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not

support transmission on the first link concurrent with reception on the second link; or

the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not support transmission on the second link concurrent with reception on the first link.

43. The communication apparatus according to claim 42, wherein that the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not support transmission on the first link concurrent with reception on the second link specifically comprises:

when the first multi-link device does not support transmission on the first link concurrent with reception on the second link, and the first multi-link device supports transmission on the second link concurrent with reception on the first link, the indication information indicates that the first multi-link device does not support the simultaneous transmit and receive operation on the first link and the second link.

44. The communication apparatus according to claim 42, wherein that the indication information indicates that the first multi-link device does not support a simultaneous transmit and receive operation on the first link and the second link, when the first multi-link device does not support transmission on the second link concurrent with reception on the first link specifically comprises:

when the first multi-link device does not support transmission on the second link concurrent with reception on the first link, and the first multi-link device supports transmission on the first link concurrent with reception on the second link, the indication information indicates that the first multi-link device does not support the simultaneous transmit and receive operation on the first link and the second link.

45. The communication apparatus according to any one of claims 40 to 44, wherein the first multi-link device is a non-access point multi-link device non-AP MLD.

46. The communication apparatus according to any one of claims 40 to 45, wherein the management frame is an association request frame.

47. The communication apparatus according to any one of claims 40 to 46, wherein the indication information is one bit.

~~48. The communication apparatus according to claim 47, wherein when the indication information is 1, it indicates that the first multi-link device does not support the simultaneous transmit and receive operation on the first link and the second link; or~~

~~when the indication information is 0, it indicates that the first multi-link device supports the simultaneous transmit and receive operation on the first link and the second link.~~

~~49~~29. A communication apparatus, comprising a processor and a transceiver, wherein the transceiver is configured to send or receive signaling or a frame, and the processor is configured to run instructions, to enable the communication apparatus to perform the method according to any one of claims 1 and 4 to ~~11~~22, or perform the method according to any one of claims 31 and ~~33 to 39~~.

~~50. A communication apparatus, comprising a processor and a transceiver, wherein the transceiver is configured to send or receive signaling or a frame, and the processor is configured to run instructions, to enable the communication apparatus to perform the method according to any one of claims 2 to 11, or perform the method according to any one of claims 32 to 39.~~

~~51~~30. A chip or a chip system, comprising an input/output interface and a processing circuit, wherein the input/output interface is configured to exchange information or data, and the processing circuit is configured to run instructions, to enable an apparatus installed with the chip or the chip system to perform the method according to any one of claims 1 to ~~11~~22, or perform the method according to any one of claims 31 to 39.

~~52~~31. A readable storage medium, wherein the readable storage medium stores program instructions; and when the program instructions are run, the method according to any one of claims 1 to ~~11~~22 or claims 31 to 39 is performed.

~~53~~32. A computer program product comprising instructions, wherein when the instructions are run on a computer, the computer is enabled to perform the method according to any one of claims 1 to ~~11~~22, or perform the method according to any one of claims 31 to 39.

~~54. A chip system, wherein the chip system comprises a processor, configured to support an apparatus installed with the chip system in implementing the method according to any one of claims 1 to 11, or implementing the method according to any one of claims 31 to 39.~~

~~55~~33. A wireless communication system, comprising a first multi-link device and a second device, wherein

the first multi-link device is the communication apparatus according to claim 23 or claim 27

~~any one of claims 12 to 20, or the first multi-link device is the communication apparatus according to any one of claims 40 and 42 to 48; and~~

the second device is the communication apparatus according to claim 24 or claim 28~~any one of claims 21 to 30, or the first multi-link device is the communication apparatus according to any~~

5 ~~one of claims 41 to 48.~~