CLAIMS

What is claimed is:

1. A channel listening method, wherein the method is applied to a nonsimultaneous transmit and receive multi-link device (NSTR MLD), and the method comprises:

receiving, by the NSTR MLD, a first frame on a first link, wherein the first frame is a response frame;

receiving, by the NSTR MLD, a second frame on a second link, wherein the second frame is a response frame, and an end time of the first frame is later than an end time of the second frame, wherein the first link and the second link belong to a NSTR link pair;

determining, by the NSTR MLD, that at least one of the first frame and the second frame fails to be received;

performing, by the NSTR MLD, channel listening in a first interframe space after the first frame ends, wherein duration of the first interframe space is less than or equal to duration of a point coordination function interframe space (PIFS).

2. The method according to claim 1, wherein when the first frame fails to be received, the duration of the first interframe space is a difference between the PIFS and first time; and

a value range of the first time is 0 to 4 microseconds.

3. The method according to claim 1, wherein when the first frame fails to be received, the duration of the first interframe space is [PIFS–4, PIFS].

4. The method according to claim 1, wherein when the first frame is correctly received, the duration of the first interframe space is a difference between the PIFS and first time; and

a value range of the first time is 0 to 9 microseconds.

5. The method according to claim 1, wherein when the first frame is correctly received, the duration of the first interframe space is greater than or equal to a short interframe space SIFS.

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

sending, by the NSTR MLD when the second frame is correctly received, a next physical protocol data unit (PPDU) after a second interframe space, wherein the second interframe space is equal to the duration of the PIFS.

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

performing, by the NSTR MLD, channel listening in a second interframe space after the second frame ends, wherein duration of the second interframe space is the duration of the PIFS.

8. The method according to any one of claims 1 to 7, wherein at least one of the first frame and the second frame fails to be transmitted comprises:

the first frame triggers a physical layer receiving start indication (PHY-RXSTART.indication), and a frame check sequence (FCS) check of a media access control MAC layer of the first frame fails; or

the second frame triggers a PHY-RXSTART.indication, and a FCS check of a MAC layer of the second frame fails; or

the first frame triggers a PHY-RXSTART.indication, a frame check sequence (FCS) check of a MAC layer of the first frame fails, and the second frame triggers a PHY-RXSTART.indication, and a FCS check of a MAC layer of the second frame fails.

9. A channel listening method, wherein the method is applied to a nonsimultaneous transmit and receive multi-link device (NSTR MLD), and the method comprises:

transmitting, by the NSTR MLD, a first frame on a first link, wherein the first frame is a physical layer protocol data unit (PPDU);

transmitting, by the NSTR MLD, a second frame on a second link, wherein the second frame is a PPDU, and an end time of the first frame is later than an end time of the second frame, wherein the first link and the second link belong to a NSTR link pair;

determining, by the NSTR MLD, that the first frame and the second frame fail to be transmitted;

performing, by the NSTR MLD, channel listening in a third interframe space after the first frame ends, wherein the third interframe space is less than or equal to duration of a PIFS; or

performing, by the NSTR MLD, channel listening in a fourth interframe space after the second frame ends, wherein the fourth interframe space is greater than or equal to duration of a short interframe space (SIFS) and less than or equal to the duration of the PIFS.

10. A channel listening method, wherein the method is applied to a nonsimultaneous transmit and receive multi-link device (NSTR MLD), and the method comprises:

transmitting, by the NSTR MLD, a first frame on a first link, wherein the first frame is a physical layer protocol data unit (PPDU);

transmitting, by the NSTR MLD, a second frame on a second link, wherein the second frame is a PPDU, and an end time of the first frame is later than an end time of the second frame, wherein the first link and the second link belong to a NSTR link pair;

performing, by the NSTR MLD, channel listening in a sixth interframe space after the second frame ends, wherein duration of the sixth interframe space is a sum of an acknowledgment timeout (AckTimeout) and sixth time.

11. A nonsimultaneous transmit and receive multi-link device (NSTR MLD), wherein the nonsimultaneous transmit and receive multi-link device comprises a first station (STA) and a second STA, the first STA receives a first frame on a first link, the second STA receives a second frame on a second link, the first frame is a response frame, the second frame is a response frame, an end time of the first frame is later than an end time of the second frame, and the NSTR MLD comprises a processing module and a listening module;

the processing module is configured to determine that at least one of the first frame and the second frame fails to be transmitted; and

the listening module is configured to perform channel listening in a first interframe space after the first frame ends, wherein duration of the first interframe space is less than or equal to duration of a point coordination function interframe space (PIFS).

12. A nonsimultaneous transmit and receive multi-link device (NSTR MLD), wherein the NSTR MLD comprises a first station (STA) and a second STA, the first STA transmits a first frame on a first link, the second STA transmits a second frame on a second link, the first frame is a physical layer protocol data unit (PPDU), the second frame is a PPDU, an end time of the first frame is later than an end time of the second frame, and the NSTR MLD comprises a processing module and a listening module;

the processing module is configured to determine that the first frame and the second frame fail to be transmitted;

the listening module is configured to perform channel listening in a third interframe space after the first frame ends, wherein the third interframe space is less than or equal to duration of a PIFS; or

the listening module is further configured to perform channel listening in a fourth interframe

space after the second frame ends, wherein the fourth interframe space is greater than or equal to duration of a short interframe space (SIFS) and less than or equal to the duration of the PIFS.

13. A nonsimultaneous transmit and receive multi-link device (NSTR MLD), wherein the NSTR MLD comprises a first station (STA) and a second STA, the first STA transmits a first frame on a first link, the second STA transmits a second frame on a second link, the first frame is a physical layer protocol data unit (PPDU), the second frame is a PPDU, an end time of the first frame is later than an end time of the second frame, and the NSTR MLD comprises a processing module and a listening module;

the processing module is configured to determine that the first frame and the second frame fail to be transmitted;

the listening module is configured to perform channel listening in a sixth interframe space after the second frame ends, wherein duration of the sixth interframe space is a sum of an acknowledgment timeout (AckTimeout) and sixth time.

14. A computer-readable storage medium, wherein the computer-readable storage medium comprises computer instructions, and when the computer instructions are run on a nonsimultaneous transmit and receive multi-link device, NSTR MLD, the NSTR MLD is enabled to perform the method according to any one of claims 1 to10.

15. A computer program product, wherein the computer program product comprises computer instructions, and when the computer instructions are run on a nonsimultaneous transmit and receive multi-link device, NSTR MLD, the NSTR MLD is enabled to perform the method according to any one of claims 1 to 10.

16. A chip, wherein the chip comprises a processor and a communication interface, the communication interface is configured to communicate with a module outside the chip, and the processor is configured to run a computer program or instructions to cause a nonsimultaneous transmit and receive multi-link device, NSTR MLD, comprising the chip implement the method according to any one of claims 1 to 10.