

CLAIMS

What is claimed is:

1. A communication method, comprising:

sending, by a sending device, a first physical layer protocol data unit (PPDU) over a first link,

wherein the first PPDU carries a trigger frame; and

sending, by the sending device, a second PPDU over a second link, wherein an end time of sending the second PPDU is not earlier than a first time and not later than a second time, the first time is related to an end time of sending the first PPDU and an aRxTxTurnaroundTime state turnaround time in a short interframe space (SIFS) time, and the second time is related to the end time of sending the first PPDU and the SIFS time.

2. The method according to claim 1, wherein the first time satisfies the following formula:

$$M = T_1 - T_2; \text{ and}$$

~~the second time satisfies the following formula: $N = T_1 + T_4$, wherein~~

M represents the first time, T_1 represents the end time of the first PPDU, T_2 represents the aRxTxTurnaroundTime state turnaround time, N represents the second time, and T_4 represents the SIFS time.

~~3. The method according to claim 1 or 2, wherein the first time is further related to a slot time, and the second time is further related to the slot time.~~

3. The method according to claim 1 or claim 2, wherein the second time satisfies the following: the second time equals to the end time of the first PPDU plus a value, wherein the value is greater than 0 and less than the SIFS time.

~~4. The method according to claim 3, wherein the first time satisfies the following formula:~~

$$\text{ ~~$M = T_1 - (T_2 \times x \times T_3), \text{ or } M = T_1 - \text{Max}(0, T_2 \times x \times T_3); \text{ and}$~~ }$$

~~the second time satisfies the following formula: $N = T_1 + (T_4 - y \times T_3)$, wherein~~

N represents the second time ~~M represents the first time, T_1 represents the end time of the first PPDU, T_4 represents the SIFS time, T_2 represents the state turnaround time, x represents a first delay coefficient, T_3 represents the slot time, Max represents obtaining a~~

~~maximum value, N represents the second time, T_4 represents the SIFS time, and y~~
represents a second delay coefficient, T_4 represents the SIFS time.

5. The method according to claim 1 or 2, wherein the first time is further related to a slot time,
and the second time is further related to the slot time.

5 56. The method according to claim ~~3 or 4~~5, wherein the first time is further related to an air
propagation time, and the second time is further related to the air propagation time.

67. The method according to claim ~~56~~, wherein the first time satisfies the following formula:

$$M = T_1 - (T_2 - x \times (T_3 - A)), \text{ or } M = T_1 - \text{Max}(0, T_2 - x \times (T_3 - A)); \text{ and}$$

the second time satisfies the following formula: $N = T_1 + (T_4 - y \times (T_3 - A))$, wherein

10 M represents the first time, T_1 represents the end time of the first PPDU, T_2 represents
the state turnaround time, T_3 represents the slot time, x represents the first delay coefficient,
 Max represents obtaining a maximum value, N represents the second time, T_4 represents the
SIFS time, A represents the air propagation time, and y represents the second delay coefficient.

78. The method according to any one of claims 1 to ~~67~~, wherein the method further comprises:
15 receiving, by the sending device, the aRxTxTurnaroundTime~~state turnaround time~~ from a
receiving device.

89. A communication method, comprising:

sending, by a sending device, a first physical layer protocol data unit (PPDU) over a first link,
20 wherein the first PPDU carries a first trigger frame; and

sending, by the sending device, a second PPDU over a second link, wherein the second PPDU
carries a second trigger frame, wherein

an absolute value of a time difference between an end time of sending the first PPDU and an
end time of sending the second PPDU is less than or equal to a first duration, and the first duration
25 is related to an aRxTxTurnaroundTime~~state turnaround time~~ in a short interframe space (SIFS)
time.

910. The method according to claim ~~89~~, wherein the first duration satisfies the following
formula:

$L=T_2$, wherein

L represents the first duration, and T_2 represents the aRxTxTurnaroundTime state-~~turnaround time~~.

10 ~~4011~~. The method according to claim ~~8-9~~ or ~~910~~, wherein the first duration is further related to a slot time.

~~4112~~. The method according to claim ~~4011~~, wherein the first duration satisfies the following formula:

$$L = T_2 - x \times T_3, \text{ or } L = \text{Max}(0, T_2 - x \times T_3), \text{ wherein}$$

10 L represents the first duration, T_2 represents the aRxTxTurnaroundTime state-~~turnaround time~~, x represents a first delay coefficient, T_3 represents the slot time, and Max represents obtaining a maximum value.

~~4213~~. The method according to claim ~~40-11~~ or ~~4412~~, wherein the first duration is further related to an air propagation time.

15 ~~4314~~. The method according to claim ~~4213~~, wherein the first duration satisfies the following formula:

$$L = T_2 - x \times (T_3 - A), \text{ or } L = \text{Max}(0, T_2 - x \times (T_3 - A)), \text{ wherein}$$

L represents the first duration, T_2 represents the aRxTxTurnaroundTime state-~~turnaround time~~, x represents the first delay coefficient, T_3 represents the slot time, A represents the air propagation time, and Max represents obtaining a maximum value.

20 ~~4415~~. The method according to any one of claims ~~8-9~~ to ~~4314~~, wherein the method further comprises:

receiving, by the sending device, the aRxTxTurnaroundTime state-~~turnaround time~~ from a receiving device.

25 ~~4516~~. A sending device communication apparatus, comprising:

a sending unit, configured to send a first physical layer protocol data unit (PPDU) over a first link, wherein the first PPDU carries a trigger frame; and

the sending unit is further configured to send a second PPDU over a second link, wherein an

end time of sending the second PPDU is not earlier than a first time and not later than a second time, the first time is related to an end time of sending the first PPDU and an aRxTxTurnaroundTime state turnaround time in a short interframe space (SIFS) time, and the second time is related to the end time of sending the first PPDU and the SIFS time.

5 ~~16~~17. The sending device~~apparatus~~ according to claim ~~15~~16, wherein the first time satisfies the following formula: $M = T_1 - T_2$; ~~and~~

~~the second time satisfies the following formula: $N = T_1 + T_4$, wherein~~

M represents the first time, T_1 represents the end time of the first PPDU, T_2 represents the state turnaround time, ~~N represents the second time, and T_4 represents the SIFS time.~~

10 ~~17~~. The ~~apparatus~~ according to claim 15 or 16, wherein the first time is further related to a slot time, and the second time is further related to the slot time.

18. The sending device according to claim 16 or claim 17, wherein the second time satisfies the following:

15 the second time equals to the end time of the first PPDU plus a value, wherein the value is greater than 0 and less than the SIFS time.

~~18~~19. The sending device~~apparatus~~ according to claim ~~17~~18, wherein ~~the first time satisfies the following formula:~~

~~$M = T_1 - (T_2 - x \times T_3)$, or $M = T_1 - \text{Max}(0, T_2 - x \times T_3)$; and~~

the second time satisfies the following formula: $N = T_1 + (T_4 - y \times T_3)$, wherein

20 N represents the second time, T_1 represents the end time of the first PPDU, T_4 represents the SIFS time, T_3 represents the slot time, y represents a second delay coefficient, T_4 represents the SIFS time ~~M represents the first time, T_1 represents the end time of the first PPDU, T_2 represents the state turnaround time, x represents a first delay coefficient, T_3 represents the slot time, Max represents obtaining a maximum value, N represents the second time, T_4 represents the SIFS time, and y represents a second delay coefficient.~~

25 20. The sending device according to claim 16 or 17, wherein the first time is further related to a slot time, and the second time is further related to the slot time.

1921. The sending device~~apparatus~~ according to claim 17 or 1820, wherein the first time is further related to an air propagation time, and the second time is further related to the air propagation time.

2022. The sending device~~apparatus~~ according to claim 1921, wherein the first time satisfies
5 the following formula:

$$M = T_1 - (T_2 - x \times (T_3 - A)), \text{ or } M = T_1 - \text{Max}(0, T_2 - x \times (T_3 - A)); \text{ and}$$

the second time satisfies the following formula: $N = T_1 + (T_4 - y \times (T_3 - A))$, wherein

M represents the first time, T_1 represents the end time of the first PPDU, T_2 represents the state turnaround time, T_3 represents the slot time, x represents the first delay coefficient, Max represents obtaining a maximum value, N represents the second time, T_4 represents the SIFS time, A represents the air propagation time, and y represents the second delay coefficient.

2423. The sending device~~apparatus~~ according to any one of claims 15-16 to 2022, wherein the apparatus further comprises:

a receiving unit, configured to receive the aRxTxTurnaroundTime~~state turnaround time~~ from
15 a receiving device.

2224. A sending device~~communication apparatus~~, comprising:

a sending unit, configured to send a first physical layer protocol data unit (PPDU) over a first link, wherein the first PPDU carries a first trigger frame; and the sending unit is further configured
20 to send a second PPDU over a second link, wherein the second PPDU carries a second trigger frame, wherein

an absolute value of a time difference between an end time of sending the first PPDU and an end time of sending the second PPDU is less than or equal to a first duration, and the first duration is related to an aRxTxTurnaroundTime~~state turnaround time~~ in a short interframe space (SIFS)
25 time.

2325. The sending device~~apparatus~~ according to claim 2224, wherein the first duration satisfies the following formula:

$$L = T_2, \text{ wherein}$$

L represents the first duration, and T_2 represents the aRxTxTurnaroundTime~~state~~

turnaround time.

2426. The sending device~~apparatus~~ according to claim 22-24 or 2325, wherein the first duration is further related to a slot time.

2527. The sending device~~apparatus~~ according to claim 2426, wherein the first duration satisfies the following formula:

$$L = T_2 - x \times T_3, \text{ or } L = \text{Max}(0, T_2 - x \times T_3), \text{ wherein}$$

L represents the first duration, T_2 represents the aRxTxTurnaroundTime~~state turnaround time~~, x represents a first delay coefficient, T_3 represents the slot time, and Max represents obtaining a maximum value.

2628. The sending device~~apparatus~~ according to claim 24-26 or 2527, wherein the first duration is further related to an air propagation time.

2729. The sending device~~apparatus~~ according to claim 2628, wherein the first duration satisfies the following formula:

$$L = T_2 - x \times (T_3 - A), \text{ or } L = \text{Max}(0, T_2 - x \times (T_3 - A)), \text{ wherein}$$

L represents the first duration, T_2 represents the aRxTxTurnaroundTime~~state turnaround time~~, x represents the first delay coefficient, T_3 represents the slot time, A represents the air propagation time, and Max represents obtaining a maximum value.

2830. The sending device~~apparatus~~ according to any one of claims 22-24 to 2729, wherein the apparatus further comprises:

a receiving unit, configured to receive the state turnaround time~~state turnaround time~~ from a receiving device.

31. A communication method, comprising:

receiving, by a receiving device, a first physical layer protocol data unit (PPDU) over a first link, where the first PPDU carries a trigger frame; and

receiving, by the receiving device, a second PPDU over a second link, wherein an end time of the second PPDU is not earlier than a first time and not later than a second time, the first time is related to an end time of the first PPDU and an aRxTxTurnaroundTime in a short interframe space (SIFS) time, and the second time is related to the end time of the first PPDU and the SIFS

time.

32. The method according to claim 31, wherein the first time satisfies the following formula:

$M = T_1 - T_2$; wherein M represents the first time, T_1 represents the end time of the first PPDU,

T_2 represents the aRxTxTurnaroundTime.

5 33. The method according to claim 31 or claim 32, wherein the second time satisfies the following:

the second time equals to the end time of the first PPDU plus a value, wherein the value is greater than 0 and less than the SIFS time.

34. The method according to claim 33, wherein the second time satisfies the following

10 formula: $N = T_1 + (T_4 - y \times T_3)$, wherein N represents the second time, T_1 represents the end time of the first PPDU, T_4 represents the SIFS time, y represents a second delay coefficient, and T_3 represents the slot time.

35. A communication method, comprising:

15 receiving, by a receiving device, a first physical layer protocol data unit (PPDU) over a first link, where the first PPDU carries a first trigger frame, and sending, by the receiving device, after a SIFS time, a TB PPDU for the first PPDU;

receiving, by the receiving device, a second PPDU over a second link, where the second PPDU carries a second trigger frame, and sending, by the receiving device, after the SIFS time, a TB PPDU for the second PPDU; wherein

20 an absolute value of a time difference between an end time of the first PPDU and an end time of the second PPDU is less than or equal to first duration, and the first duration is related to an aRxTxTurnaroundTime in the short interframe space (SIFS) time.

36. The method according to claim 35, wherein the first duration satisfies the following

25 formula: $L = T_2$, wherein L represents the first duration, and T_2 represents the aRxTxTurnaroundTime.

37. The method according to claim 35 or 36, wherein the first duration is further related to a slot time.

38. The method according to claim 37, wherein the first duration satisfies the following

formula:

$$L = T_2 - x \times T_3, \text{ or } L = \text{Max}(0, T_2 - x \times T_3), \text{ wherein}$$

L represents the first duration, T_2 represents the aRxTxTurnaroundTime, x represents a first delay coefficient, T_3 represents the slot time, and Max represents obtaining a maximum value.

39. The method according to claim 37 or 38, wherein the first duration is further related to an air propagation time.

40. The method according to claim 39, wherein the first duration satisfies the following formula:

$$L = T_2 - x \times (T_3 - A), \text{ or } L = \text{Max}(0, T_2 - x \times (T_3 - A)), \text{ wherein}$$

L represents the first duration, T_2 represents the aRxTxTurnaroundTime, x represents the first delay coefficient, T_3 represents the slot time, A represents the air propagation time, and Max represents obtaining a maximum value.

41. The method according to any one of claims 35 to 40, wherein the method further comprises:

sending, by the receiving device, the aRxTxTurnaroundTime.

42. A receiving device, comprising:

a receiving unit, configured to receive a first physical layer protocol data unit (PPDU) over a first link, where the first PPDU carries a trigger frame; and

the receiving unit is further configured to receive a second PPDU over a second link, wherein an end time of the second PPDU is not earlier than a first time and not later than a second time, the first time is related to an end time of the first PPDU and an aRxTxTurnaroundTime in a short interframe space (SIFS) time, and the second time is related to the end time of the first PPDU and the SIFS time.

43. The receiving device according to claim 42, wherein the first time satisfies the following formula: $M = T_1 - T_2$; wherein M represents the first time, T_1 represents the end time of the first PPDU, T_2 represents the aRxTxTurnaroundTime.

44. The receiving device according to claim 42 or claim 43, wherein the second time satisfies the following: the second time equals to the end time of the first PPDU plus a value, wherein the value is greater than 0 and less than the SIFS time.

45. The receiving device according to claim 44, wherein the second time satisfies the following formula: $N = T_1 + (T_4 - y \times T_3)$, wherein N represents the second time, T_1 represents the end time of the first PPDU, T_4 represents the SIFS time, y represents a second delay coefficient, and T_3 represents the slot time.

46. A receiving device, comprising:
a receiving unit, configured to receive a first physical layer protocol data unit (PPDU) over a first link, where the first PPDU carries a first trigger frame; and
a sending unit, configured to send, after a SIFS time, a TB PPDU for the first PPDU;
the receiving unit is further configured to, receive a second PPDU over a second link, where the second PPDU carries a second trigger frame; and
the sending unit is further configured to send, after the SIFS time, a TB PPDU for the second PPDU; wherein
an absolute value of a time difference between an end time of the first PPDU and an end time of the second PPDU is less than or equal to first duration, and the first duration is related to an aRxTxTurnaroundTime in the short interframe space (SIFS) time.

47. The receiving device according to claim 46, wherein the first duration satisfies the following formula: $L = T_2$, wherein L represents the first duration, and T_2 represents the aRxTxTurnaroundTime.

48. The receiving device according to claim 46 or 47, wherein the first duration is further related to a slot time.

49. The receiving device according to claim 48, wherein the first duration satisfies the following formula:

$$L = T_2 - x \times T_3, \text{ or } L = \text{Max}(0, T_2 - x \times T_3), \text{ wherein}$$

L represents the first duration, T_2 represents the aRxTxTurnaroundTime, x represents a first delay coefficient, T_3 represents the slot time, and Max represents obtaining a maximum

value.

50. The receiving device according to claim 48 or 49, wherein the first duration is further related to an air propagation time.

51. The receiving device according to claim 50, wherein the first duration satisfies the following formula:

$$L = T_2 - x \times (T_3 - A), \text{ or } L = \text{Max}(0, T_2 - x \times (T_3 - A)), \text{ wherein}$$

L represents the first duration, T_2 represents the aRxTxTurnaroundTime, x represents the first delay coefficient, T_3 represents the slot time, A represents the air propagation time, and Max represents obtaining a maximum value.

52. The receiving device according to any one of claims 46 to 51, wherein the method further comprises:

sending, by the receiving device, the aRxTxTurnaroundTime.

2953. A communication apparatus, comprising a processing circuit and an interface circuit, wherein the interface circuit is configured to: receive a signal from a communication apparatus other than the communication apparatus and transmit the signal to the processing circuit, or send a signal from the processing circuit to a communication apparatus other than the communication apparatus; and the processing circuit executes code instructions, to implement the method according to any one of claims 1 to 415.

54. A communication apparatus, comprising a processing circuit and an interface circuit, wherein the interface circuit is configured to: receive a signal from a communication apparatus other than the communication apparatus and transmit the signal to the processing circuit, or send a signal from the processing circuit to a communication apparatus other than the communication apparatus; and the processing circuit executes code instructions, to implement the method according to any one of claims 31 to 41.

3055. A computer-readable storage medium, wherein the storage medium stores a program or instructions; and when the program runs or the instructions are run, the method according to any one of claims 1 to 415 is implemented.

56. A computer-readable storage medium, wherein the storage medium stores a program or instructions; and when the program runs or the instructions are run, the method according to any

one of claims 31 to 41 is implemented.

~~31~~57. A computer program, wherein the computer program comprises instructions used to perform the method according to any one of claims 1 to ~~14~~15.

5 58. A computer program, wherein the computer program comprises instructions used to perform the method according to any one of claims 31 to 41.