CLAIMS

What is claimed is:

1. A protocol data unit PPDU transmission method, comprising:

sending, by a first device, a first data unit, wherein the first data unit comprises at least a second data unit and a third data unit, the second data unit is used to carry a first multi-user request to send MU-RTS frame, and the third data unit is used to carry a second MU-RTS frame, wherein

the first MU-RTS frame and the second MU-RTS frame use a same scrambling code initialization value;

the first MU-RTS frame indicates a first channel on which a second device sends a clear to send CTS frame, and the first channel includes a target channel different from a primary channel of the second device; and

the second MU-RTS frame indicates a second channel on which a third device sends a CTS frame, and the second channel includes a target channel different from a primary channel of the third device.

2. The method according to claim 1, wherein when a bandwidth of the first channel partially or completely overlaps a bandwidth of the second channel, the first MU-RTS frame and the second MU-RTS frame use a same scrambling code initialization value.

3. The method according to claim 1, wherein the first data unit comprises a plurality of data units, each of the plurality of data units is used to carry an MU-RTS frame, and scrambling code initialization values of all MU-RTS frames are the same; and the second data unit and the third data unit are two of the plurality of data units.

4. The method according to any one of claims 1 to 3, wherein

the first MU-RTS frame and the second MU-RTS frame each comprise a first bit sequence, and the first bit sequence indicates a bandwidth of the first data unit; or

the first MU-RTS frame comprises a second bit sequence, the second bit sequence indicates a bandwidth of the second data unit, the second MU-RTS frame comprises a third bit sequence, and the third bit sequence indicates a bandwidth of the third data unit.

5. A request to send RTS frame transmission method, comprising:

separately sending, by a first device, a request to send RTS frame on at least two channels, wherein the RTS frame indicates a first channel on which a second device sends a clear to send CTS frame, and the first channel includes a target channel different from a primary channel of the second device; and

receiving, by the first device, clear to send CTS frames with a same frame length on the at least two channels.

6. The method according to claim 5, wherein frame lengths of all RTS frames are the same.

7. The method according to claim 5, wherein first transmit rates of all RTS frames are the same; or

a first transmit rate of each RTS frame is used to determine a same second transmit rate, and the second transmit rate is a main rate at which a second device sends the CTS frame.

8. A clear to send CTS frame transmission method, comprising:

receiving, by a second device, a request to send RTS frame, wherein the RTS frame indicates a first channel on which the second device sends a clear to send CTS frame, and the first channel includes a target channel different from a primary channel of the second device; and

sending, by the second device, a clear to send CTS frame at a second transmit rate, wherein a value of the second transmit rate is a fixed rate; or

sending, by the second device, a CTS frame at a third transmit rate, wherein a frame length of the CTS frame sent at the third transmit rate is the same as a frame length of the CTS frame sent at the fixed rate.

9. A protocol data unit PPDU transmission apparatus, comprising a processing unit and a communication unit, wherein

the processing unit generates a first data unit, wherein the first data unit comprises at least a second data unit and a third data unit, the second data unit is used to carry a first multi-user request to send MU-RTS frame, the third data unit is used to carry a second MU-RTS frame, and

the first MU-RTS frame and the second MU-RTS frame use a same scrambling code initialization value; and

the communication unit is configured to send the first data unit, wherein

the first MU-RTS frame indicates a first channel on which a second device sends a clear to send CTS frame, and the first channel includes a target channel different from a primary channel of the second device; and

the second MU-RTS frame indicates a second channel on which a third device sends a CTS frame, and the second channel includes a target channel different from a primary channel of the third device.

10. The apparatus according to claim 9, wherein when a bandwidth of the first channel partially or completely overlaps a bandwidth of the second channel, the first MU-RTS frame and the second MU-RTS frame use a same scrambling code initialization value.

11. The apparatus according to claim 9, wherein the first data unit comprises a plurality of data units, each of the plurality of data units is used to carry an MU-RTS frame, and scrambling code initialization values of all MU-RTS frames are the same; and the second data unit and the third data unit are two of the plurality of data units.

12. The apparatus according to any one of claims 9 to 11, wherein the first MU-RTS frame and the second MU-RTS frame each comprise a first bit sequence, and the first bit sequence indicates a bandwidth of the first data unit; or

the first MU-RTS frame comprises a second bit sequence, the second bit sequence indicates a bandwidth of the second data unit, the second MU-RTS frame comprises a third bit sequence, and the third bit sequence indicates a bandwidth of the third data unit.

13. A request to send RTS frame transmission apparatus, comprising a processing unit and a communication unit, wherein

the processing unit is configured to generate a plurality of request to send RTS frames;

the communication unit is configured to separately send an RTS frame on at least two channels, wherein the RTS frame indicates a first channel on which a second device sends a clear

to send CTS frame, and the first channel includes a target channel different from a primary channel of the second device; and

the communication unit is further configured to receive clear to send CTS frames with a same frame length on the at least two channels.

14. The apparatus according to claim 13, wherein frame lengths of all RTS frames are the same.

15. The apparatus according to claim 13, wherein first transmit rates of all RTS frames are the same; or

a first transmit rate of each RTS frame is used to determine a same second transmit rate, and the second transmit rate is a main rate at which a second device sends the CTS frame.

16. A clear to send CTS frame transmission apparatus, comprising a processing unit and a communication unit, wherein

the communication unit is configured to receive a request to send RTS frame, wherein the RTS frame indicates a first channel on which a second device sends a clear to send CTS frame, and the first channel includes a target channel different from a primary channel of the second device;

the processing unit is configured to generate a clear to send CTS frame; and

the communication unit is further configured to send the clear to send CTS frame at a second transmit rate, wherein a value of the second transmit rate is a fixed rate; or

the communication unit is further configured to send the CTS frame at a third transmit rate, wherein a frame length of the CTS frame sent at the third transmit rate is the same as a frame length of the CTS frame sent at the fixed rate.

17. An electronic device, wherein the device comprises a processor and a memory, wherein

the memory is configured to store a computer program or instructions; and

the processor is configured to execute the computer program or the instructions in the memory, so that the method according to any one of claims 1 to 4 is performed, or the method according to any one of claims 5 to 7 is performed, or the method according to claim 8 is performed.

18. A computer-readable storage medium, wherein the computer-readable storage medium stores computer-executable instructions, and when the computer-executable instructions are invoked by a computer, the computer is enabled to perform the method according to any one of claims 1 to 4, or perform the method according to any one of claims 5 to 7, or perform the method according to claim 8.