direction of a slot configuration, the entire uplink data repeatedly transmitted will be discarded, which greatly wastes network resources.

SUMMARY

Embodiments of the present disclosure provide a repeated transmission method and apparatus, a network device, and a computer readable storage medium, which mainly solve the problem in the related art of an IAB access in IAB architecture.

The embodiments of the present disclosure provide a method of repeated transmission. The method includes steps described below.

A plurality of transmission occasions (TOs) for uplink data to be repeatedly transmitted is determined.

When at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, does not conflict with a transmission direction of a slot configuration, the uplink data is repeatedly transmitted on the TO.

If the transmission direction of the slot configuration indicates N consecutive flexible (F) symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein $M \leqslant N$, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.

The embodiments of the present disclosure further provide a repeated transmission method. The method includes steps described below.

It is determined whether a type of a repeated transmission of uplink data is a first transmission type or a second transmission type. The first transmission type is repeatly transmitted uplink data according to a plurality of slots, and the second transmission type is repeatly transmitted uplink data according to a plurality of mini-slots in one slot.

The uplink data is repeatedly transmitted according to the determined type of the repeated transmission of the uplink data.

The embodiments of the present disclosure further provide a method for receiving repeated transmission. The method includes steps described below.

A plurality of TOs for uplink data to be repeatedly transmitted is determined.

When at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, does not conflict with a transmission direction of slot configuration, repeatedly transmitted uplink data is received on the TO.

If the transmission direction of the slot configuration indicates N consecutive flexible (F) symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein M<N, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.

The embodiments of the present disclosure further provide a repeated transmission apparatus. The apparatus includes a first transmission determining module and a first transmission module.

The embodiments of the present disclosure provide a device involving repeated transmission. The device comprises at least one processor configured to perform steps described below.

A plurality of transmission occasions (TOs) for uplink data to be repeatedly transmitted is determined.

When at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, does not conflict with a transmission direction of a slot configuration, the uplink data is repeatedly transmitted on the TO.

If the transmission direction of the slot configuration indicates N consecutive flexible (F) symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein M⩽N, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.

The embodiments of the present disclosure further provide a device involving repeated transmission. The device comprises at least one processor configured to perform steps described below.

A plurality of TOs for uplink data to be repeatedly transmitted is determined.

When at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, does not conflict with a transmission direction of slot configuration, repeatedly transmitted uplink data is received on the TO.

If the transmission direction of the slot configuration indicates N consecutive flexible (F)

symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein M<N, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.

What is claimed is:

1. A method of repeated transmission, comprising:

determining a plurality of transmission occasions (TOs), for uplink data to be repeatedly transmitted; and

in response to at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, being not conflicted with a transmission direction of a slot configuration, repeatedly transmitting the uplink data on the at least one TO,

wherein if the transmission direction of the slot configuration indicates N consecutive flexible (F) symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein M≤N, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.

2. The method of claim 1, wherein the repeatedly transmitting the uplink data on the at least one TO comprises:

in response to the plurality of TOs being not conflicted with the transmission direction of the slot configuration, transmitting the uplink data to be repeatedly transmitted from an earliest TO in a time domain that does not conflict with the transmission direction of the slot configuration.

3. The method of claim 1, wherein each of the F symbols comprises a symbol that is flexibly configured in transmission direction.

4. The method of claim 1, wherein N is 1, 2 or 8.

5. The method of claim 1, wherein the slot configuration is obtained in at least one of following manners:

detecting a slot format indicator field in downlink control information (DCI); or

detecting a slot format indication command configured via radio resource control (RRC).

6. The method of claim 1, wherein the repeatedly transmitting the uplink data on the at least one TO comprises: if at least one time domain symbol in each of the at least one TO does not conflict with the transmission direction of the slot configuration, performing rate matching on a

non-conflicting time domain symbol in the each of the at least one TO.

7. The method of claim 1, wherein repeatedly transmitting the uplink data on the at least one TO comprises:

detecting DCI to indicate a usage situation of the at least one TO.

8. The method of claim 1, wherein the repeatedly transmitting the uplink data on the at least one TO further comprises at least one of:

not counting a TO in which a time domain symbol conflicts with the transmission direction of the slot configuration into a number of repeated transmissions of the uplink data, and continuing the repeated transmissions of the uplink data on a TO configured later;

repeatedly transmitting uplink data corresponding to a TO in which a time domain symbol conflicts with the transmission direction of the slot configuration on a preconfigured redundant TO; or

repeatedly transmitting the uplink data on a preconfigured TO which does not conflict with the transmission direction of the slot configuration.

9. The method of claim 1, wherein the slot configuration comprises at least the D symbol, at least one uplink (U) symbol, and at least the N consecutive F symbols.

10. A method for receiving repeated transmission, comprising:

determining a plurality of transmission occasions (TOs) for uplink data to be repeatedly transmitted; and

in response to at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, being not conflicted with a transmission direction of a slot configuration, receiving repeatedly transmitted uplink data on the at least one TO,

wherein if the transmission direction of the slot configuration indicates N consecutive flexible (F) symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein $M<N$, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.

11. The method of claim 10, wherein each of the F symbols comprises a symbol that is flexibly configured in transmission direction.

12. The method of claim 10, wherein N is 1, 2 or 8.

13. The method of claim 10, wherein the slot configuration comprises at least the D symbol, at least one uplink (U) symbol, and at least the N consecutive F symbols.

14. A device involving repeated transmission, comprising at least one processor configured to:

determine a plurality of transmission occasions (TOs), for uplink data to be repeatedly transmitted; and

in response to at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, being not conflicted with a transmission direction of a slot configuration, repeatedly transmit the uplink data on the at least one TO,

wherein if the transmission direction of the slot configuration indicates N consecutive flexible (F) symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein $M \leq N$, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.

15. A device involving repeated transmission, comprising at least one processor configured to:

determine a plurality of transmission occasions (TOs) for uplink data to be repeatedly transmitted; and

in response to at least one TO, among the plurality of TOs for the uplink data to be repeatedly transmitted, being not conflicted with a transmission direction of a slot configuration, receive repeatedly transmitted uplink data on the at least one TO,

wherein if the transmission direction of the slot configuration indicates N consecutive flexible (F) symbols, and an adjacent symbol before the N consecutive F symbols is a downlink (D) symbol, the uplink data is repeatedly transmitted from a time domain symbol corresponding to an M-th F symbol among the N consecutive F symbols, wherein $M<N$, and first (M-1) F symbols among the N consecutive F symbols serve as a guard period.