

for transmitting feedback response information corresponding to a plurality of downlink semi-persistent scheduling resources.

[0081] The configuration information is used for indicating at least one PUCCH resource, and the PUCCH resource can be used for transmitting the feedback response information corresponding to the plurality of downlink semi-persistent scheduling resources. In specific, the configuration information can be used for indicating a slot or sub-slot for the PUCCH, a time domain resource and a frequency domain resource in the slot or sub-slot for the PUCCH, or the like. For example, it can be used for indicating an absolute position of the slot or sub-slot for the PUCCH, such as an index number of the slot or sub-slot in a frame period, the index number of the slot or sub-slot in a frame of 10ms, or the like.

[0082] Optionally, the configuration information may be one piece of information or multiple pieces of information. For example, in initial configuration, the network device transmits a configuration message to notify the terminal of the PUCCH resource corresponding to a part of the downlink SPS resources. If there is any downlink SPS resource newly added subsequently, the configuration message can be transmitted to the terminal again to notify the terminal of the PUCCH resource corresponding to the newly added downlink SPS resource.

[0083] In the present embodiment, the network device can transmit the configuration information to the terminal to instruct the terminal to transmit the feedback response information corresponding to the downlink semi-persistent scheduling resources on the PUCCH resource indicated by the configuration information. The network equipment can clearly indicate the PUCCH resource corresponding to each downlink semi-persistent scheduling resource. As shown in FIG. 4, the frame structure has a period of 5ms, the first 4 slots in each period are downlink (DL) slots, and the last one slot is the uplink (UL) slot. A period of the SPS resource is 7 symbols (half slot), and each downlink slot includes two SPS resource transmission resources. Three PUCCH resources are reserved in the uplink slot for transmitting ACK/NACK information of SPS resource transmission resources. The network device indicates PUCCH resources a, b, and c in the frame period. The network device instructs the terminal to transmit the feedback response information for downlink semi-persistent scheduling resources 1, 2, and 3 on PUCCH resource a, transmit the feedback response information for downlink semi-persistent scheduling resources 4, 5, and 6 on PUCCH resource b, and transmit the feedback response

[0088] In the resource configuration method provided in the present embodiment, the network device transmits the configuration information to the terminal, and since the configuration information is used for indicating at least one PUCCH resource which is used for transmitting the feedback response information corresponding to the plurality of downlink semi-persistent scheduling resources, the terminal can transmit the feedback response information for the downlink semi-persistent scheduling resources on the PUCCH resource indicated by the configuration information, or the plurality of SPS resources can share one PUCCH resource, so that there is a corresponding PUCCH resource for transmitting the feedback response information for each of the downlink semi-persistent scheduling resources, which avoids the situation where there is no PUCCH resource available for some downlink semi-persistent scheduling resources in the related art, and ensures the data transmission quality.

[0089] In the embodiment shown in FIG. 3, the terminal can transmit the feedback response information corresponding to the plurality of downlink semi-persistent scheduling resources on the PUCCH resource indicated by the network device, and it is necessary for the terminal to obtain the plurality of downlink semi-persistent scheduling resources allocated by the network device. Optionally, the base station may simultaneously indicate the plurality of downlink semi-persistent scheduling resources available to the terminal in the above configuration information. Alternatively, the base station may also indicate the plurality of downlink semi-persistent scheduling resources available to the terminal through other signaling messages than the configuration information.

[0090] The resource configuration method provided by the foregoing embodiment can be used in Time Division Duplexing (TDD) or other scenarios where there are more DL slots than UL slots. Since there are more DL slots than UL slots, there are more downlink semi-persistent scheduling resources than the PUCCH resources, and the plurality of downlink semi-persistent scheduling resources may share one PUCCH resource. Optionally, the plurality of downlink semi-persistent scheduling resources are on a TDD carrier. Optionally, the period of the plurality of downlink semi-persistent scheduling resources is less than an uplink-downlink switching period, which can ensure that the period of the plurality of downlink semi-persistent scheduling resources corresponds to at least one PUCCH resource.

[0091] In the embodiment shown in FIG. 3, the network device can use various schemes

semi-persistent scheduling resources in the plurality of downlink semi-persistent scheduling resources.

[00112] In this embodiment, the configuration information can indicate some target downlink semi-persistent scheduling resources and the PUCCH resource corresponding to the target downlink semi-persistent scheduling resources. A group of downlink semi-persistent scheduling resources can be determined according to the target downlink semi-persistent scheduling resources and the PUCCH resource corresponding to the target downlink semi-persistent scheduling resources, and the PUCCH resources corresponding to other groups of downlink semi-persistent scheduling resources can be derived by the predetermined rule without specifying the PUCCH resource corresponding to each group of downlink semi-persistent scheduling resources, which can save signaling overhead. For example, in FIG. 4, the configuration information indicates that the first downlink semi-persistent scheduling resource in a group of downlink semi-persistent scheduling resources is downlink semi-persistent scheduling resource 1, this downlink semi-persistent scheduling resource corresponds to PUCCH resource a, and thus it can be determined based on “a difference in the numbers of the downlink semi-persistent scheduling resources corresponding to different PUCCH resources is equal to 0 or 1” that the group of downlink semi-persistent scheduling resources includes downlink semi-persistent scheduling resources 1-3, and by using the allocation principle of 3, 3, and 2, for example, it can be determined that a group of downlink semi-persistent scheduling resources 4-6 corresponds to PUCCH resource b, and another group of downlink semi-persistent scheduling resources 7 and 8 corresponds to PUCCH resource c.

[00113] Optionally, the target downlink semi-persistent scheduling resource is the first or last one of the plurality of downlink semi-persistent scheduling resources, or the plurality of downlink semi-persistent scheduling resources are divided into one or more groups, and the target downlink semi-persistent scheduling resource is the first or last downlink semi-persistent scheduling resource in one of the groups of downlink semi-persistent scheduling resources.

[00114] In this embodiment, the network device implicitly indicates the downlink semi-persistent scheduling resources and the corresponding PUCCH resource, which can reduce signaling overhead. For example, the network device indicates the PUCCH resource corresponding to the first or last one of the plurality of downlink semi-persistent scheduling

WHAT IS CLAIMED IS:

1. A resource configuration method, comprising:

receiving (S302), by a terminal, configuration information transmitted by a network device, the configuration information being used for indicating at least one physical uplink control channel (PUCCH) resource, wherein one of said at least one PUCCH resource is used for transmitting feedback response information corresponding to a plurality of downlink semi-persistent scheduling resources.

2. The method according to claim 1, wherein the downlink semi-persistent scheduling resources corresponding to the at least one PUCCH resource are determined according to a preset rule.

3. The method according to claim 2, wherein the downlink semi-persistent scheduling resources corresponding to the at least one PUCCH resource are determined according to the preset rule, comprising that:

a time difference between a position of a PUCCH resource in the at least one PUCCH resource and an end position of the corresponding downlink semi-persistent scheduling resources is not less than a first predetermined value, wherein the first predetermined value is not less than PDSCH decoding latency.

4. The method according to claim 3, wherein the downlink semi-persistent scheduling resources corresponding to the at least one PUCCH resource are determined according to the preset rule, comprising that:

a time difference between the position of the PUCCH resource and a start position of the corresponding downlink semi-persistent scheduling resources is not less than a second predetermined value, wherein the second predetermined value is greater than the first predetermined value.

5. The method according to claim 1, wherein the configuration information is further used for indicating a correspondence between one of the at least one PUCCH resource and the plurality of downlink semi-persistent scheduling resources.

6. The method according to claim 1, wherein the plurality of downlink semi-persistent scheduling resources are divided into one or more groups, the configuration information is used for indicating the PUCCH resource corresponding to each group of downlink semi-persistent scheduling resources, and each group of downlink semi-persistent scheduling resources includes at least one downlink semi-persistent scheduling resource.

7. The method according to claim 6, wherein the configuration information is used for indicating the PUCCH resource corresponding to each group of downlink semi-persistent scheduling resources, comprising that:

the configuration information is used for indicating the downlink semi-persistent scheduling resources included in each group of downlink semi-persistent scheduling resources and the corresponding PUCCH resource.

8. The method according to claim 1, wherein the configuration information being used for indicating at least one physical uplink control channel (PUCCH) resource comprises:

the configuration information being used for indicating a target downlink semi-persistent scheduling resource and the PUCCH resource corresponding to the target downlink semi-persistent scheduling resource,

wherein the target downlink semi-persistent scheduling resource is used for determining other downlink semi-persistent scheduling resources in the plurality of downlink semi-persistent scheduling resources.

9. A resource configuration method, comprising:

transmitting (S301), by a network device, configuration information to a terminal, the configuration information being used for indicating at least one PUCCH resource, wherein one of said at least one PUCCH resource is used for transmitting feedback response information corresponding to a plurality of downlink semi-persistent scheduling resources.

10. The method according to claim 9, wherein the plurality of downlink semi-persistent scheduling resources are divided into one or more groups, the configuration information is used for indicating the PUCCH resource corresponding to each group of downlink semi-persistent

scheduling resources, and each group of downlink semi-persistent scheduling resources includes at least one downlink semi-persistent scheduling resource.

11. The method according to claim 10, wherein the configuration information is used for indicating the PUCCH resource corresponding to each group of downlink semi-persistent scheduling resources, comprising that:

the configuration information is used for indicating the downlink semi-persistent scheduling resources included in each group of downlink semi-persistent scheduling resources and the corresponding PUCCH resource.

12. The method according to claim 9, wherein the configuration information being used for indicating at least one physical uplink control channel (PUCCH) resource comprises:

the configuration information being used for indicating a target downlink semi-persistent scheduling resource and the PUCCH resource corresponding to the target downlink semi-persistent scheduling resource,

wherein the target downlink semi-persistent scheduling resource is used for determining other downlink semi-persistent scheduling resources in the plurality of downlink semi-persistent scheduling resources.

13. The method according to claim 9, wherein the configuration information is used for indicating a slot or sub-slot for the PUCCH resource.

14. A resource configuration device, comprising: a receiving module (21) and a processing module (22),

wherein the processing module (22) is configured to receive configuration information transmitted by a network device through the receiving module (21), the configuration information being used for indicating at least one physical uplink control channel PUCCH resource, wherein one of said at least one PUCCH resource is used for transmitting feedback response information corresponding to a plurality of downlink semi-persistent scheduling resources.

15. A resource configuration device, comprising: a transmitting module (11) and a processing module (12),

wherein the processing module is configured to transmit configuration information to a terminal through the transmitting module, the configuration information being used for indicating at least one PUCCH resource, wherein one of said at least one PUCCH resource is used for transmitting feedback response information corresponding to the plurality of downlink semi-persistent scheduling resources.