CLAIMS

1. A hybrid automatic repeat request, HARQ process–based data transmission method, wherein the method is applied to a terminal, and the method comprises:

if receiving a downlink control information, DCI activation command from a network device, determining that one or more HARQ processes that are associated with a first configured grant, CG configuration are in a not pending status, wherein the DCI activation command indicates the terminal to activate the first CG configuration, wherein the first CG configuration comprises one or more CG configurations configured by a network device for the terminal on the first bandwidth part, BWP, and the first BWP is a currently activated BWP of the terminal;

if it is determined that N consecutive uplink listen before talk, LBT failures occur on the first BWP, clearing buffers of all HARQ processes that are associated with a second CG configuration on the first BWP, or determining that all HARQ processes that are associated with a second CG configuration on the first BWP are in the not pending status, wherein

N≥2, and N is an integer; the second CG configuration comprises all CG configurations configured by the network device for the terminal on the first BWP or an activated CG configuration for the terminal on the first BWP; and after the buffers of all the HARQ processes that are associated with the second CG configuration are cleared, all the HARQ processes that are associated with the second CG configuration are in the not pending status; and

sending uplink data to the network device by using a HARQ process that is associated with the first CG configuration and that is in the not pending status.

2. A hybrid automatic repeat request, HARQ process–based data transmission method, wherein the method is applied to a terminal, and the method comprises:

if receiving radio resource control, RRC signaling from a network device, determining that one or more HARQ processes that are associated with a first configured grant, CG configuration are in a not pending status, wherein the RRC signaling is used to configure and activate the first CG configuration for the terminal, wherein the first CG configuration comprises one or more CG configurations configured by the network device for the terminal on the first bandwidth part, BWP, and the first BWP is a currently activated BWP of the terminal;

if it is determined that N consecutive uplink listen before talk, LBT failures occur on the first BWP, clearing buffers of all HARQ processes that are associated with a second CG configuration on the first BWP, or determining that all HARQ processes that are associated with a second CG configuration on the first BWP are in the not pending status, wherein

N≥2, and N is an integer; the second CG configuration comprises all CG configurations

configured by the network device for the terminal on the first BWP or an activated CG configuration for the terminal on the first BWP; and after the buffers of all the HARQ processes that are associated with the second CG configuration are cleared, all the HARQ processes that are associated with the second CG configuration are in the not pending status; and

sending uplink data to the network device by using a HARQ process that is associated with the first CG configuration and that is in the not pending status.

3. The method according to claim 1 or 2, wherein the one or more HARQ processes that are associated with the first CG configuration comprise:

all HARQ processes that are associated with the first CG configuration;

a HARQ process that is one of the HARQ processes that are associated with the first CG configuration and that is in a pending status;

a first HARQ process that is one of the HARQ processes that are associated with the first CG configuration, wherein no uplink grant that is associated with the first HARQ process exists in uplink grant currently delivered to a HARQ entity, and that no uplink grant that is associated with the first HARQ process exists in uplink grant currently delivered to a HARQ entity indicates that the first HARQ process is not used by the terminal;

a HARQ process that is one of the HARQ processes that are associated with the first CG configuration and that is not being used; or

a corresponding HARQ process that is one of the HARQ processes that are associated with the first CG configuration, wherein the corresponding HARQ process is a HARQ process randomly selected by the terminal.

4. The method according to claim 1, wherein the clearing buffers of all HARQ processes that are associated with a second CG configuration on the first BWP, or determining that all HARQ processes that are associated with a second CG configuration on the first BWP are in the not pending status comprises:

when sending a media access control control element, MAC CE to the network device, clearing the buffers of all the HARQ processes that are associated with the second CG configuration, or determining that all the HARQ processes that are associated with the second CG configuration are in the not pending status, wherein

the MAC CE comprises an LBT failure status indicator bit of a serving cell in which the terminal is located.

5. The method according to claim 1, wherein the clearing buffers of all HARQ processes that are associated with a second CG configuration on the first BWP, or determining that all HARQ

processes that are associated with a second CG configuration on the first BWP are in the not pending status comprises:

when the terminal is located in a primary cell or a primary secondary cell, and the terminal actively switches from the first BWP to a second BWP, clearing the buffers of all the HARQ processes that are associated with the second CG configuration, or determining that all the HARQ processes that are associated with the second CG configuration are in the not pending status, wherein

the second BWP is a BWP that is configured with a physical random access channel, PRACH resource and on which the N consecutive uplink LBT failures do not occur, and the second BWP and the first BWP belong to a same serving cell.

6. The method according to claim 1, wherein the clearing buffers of all HARQ processes that are associated with a second CG configuration on the first BWP, or determining that all HARQ processes that are associated with a second CG configuration on the first BWP are in the not pending status comprises:

receiving a BWP switching instruction from the network device; and

in response to the BWP switching instruction, clearing the buffers of all the HARQ processes that are associated with the second CG configuration, or determining that all the HARQ processes that are associated with the second CG configuration are in the not pending status.

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

determining, each time by the terminal that the HARQ process that is used to send the uplink data is used for new transmission or retransmission, and determining whether the HARQ process that is used to send the uplink data is in the pending status;

if the HARQ process that is used to send the uplink data is in the pending status, increasing a quantity of pending times recorded by a pending counter by 1, wherein an initial value of the quantity of pending times recorded by the pending counter is zero; and

if the quantity of pending times recorded by the pending counter is equal to a preset quantity-of-times threshold, clearing, by the terminal, a buffer of the HARQ process that is used to send the uplink data, or determining that the HARQ process that is used to send the uplink data is in the not pending status, wherein after the buffer of the HARQ process that is used to send the uplink data is cleared, the HARQ process that is used to send the uplink data is in the not pending status.

8. The method according to any one of claims 1 to 8, wherein the method further comprises:

determining, each time by the terminal that the HARQ process that is used to send the uplink data is used for new transmission or retransmission, and determining whether the HARQ process that is used to send the uplink data is in the pending status or the not pending status;

determining that the HARQ process that is used to send the uplink data is in the pending status and a pending timer is not started, and starting the pending timer, wherein the pending timer is used to count total duration during which the HARQ process that is used to send the uplink data is in the pending status in a process of transmitting the uplink data;

determining that the HARQ process that is used to send the uplink data is in the not pending status and the pending timer is running, and stopping the pending timer; and

if timing duration of the pending timer is equal to a preset duration threshold, clearing, by the terminal, a buffer of the HARQ process that is used to send the uplink data, or determining that the HARQ process that is used to send the uplink data is in the not pending status, wherein after the buffer of the HARQ process that is used to send the uplink data is cleared, the HARQ process that is used to send the uplink data is in the not pending status.

9. A communication apparatus, comprising a processor and a memory, wherein the processor is coupled to the memory, and the processor is configured to control the apparatus to implement the method according to any one of claims 1 to 8.

10. A computer readable medium, wherein the medium comprises computer readable instructions, and when the computer readable instructions are run on a terminal, the terminal is enabled to perform the method according to any one of claims 1 to 9.

11. A computer program product, wherein the computer program product comprises instructions, and when the instructions are run by a computer, the method according to any one of claims 1 to 9 is implemented.

12. A communication system, wherein the communication system comprises the apparatus to implement the method according to any one of claims 1 to 8 and a network device.