

What is claimed is:

1. A method for transmitting a medium access control (MAC) protocol data unit (PDU), comprising:

5 identifying, by a hybrid automatic repeat request (HARQ) entity, for an uplink grant, a HARQ process associated with the uplink grant; and

obtaining, by the HARQ entity, a MAC PDU to transmit from a HARQ buffer of the identified HARQ process when at least one of following conditions is satisfied:

10 a MAC entity of the HARQ entity is configured with priority based prioritization, the uplink grant is a configured grant, and a previous uplink grant for the HARQ process was de-prioritized and the MAC PDU had already been obtained for the HARQ process;

the uplink grant is a configured grant, the previous uplink grant for the HARQ process was de-prioritized and the MAC PDU had already been obtained for the HARQ process;

15 a previous configured grant for the identified HARQ process was de-prioritized and the MAC PDU obtained in the HARQ buffer had not been successfully transmitted due to overlapping of a physical uplink shared channel (PUSCH) duration of the previous uplink grant with a PUSCH duration of another uplink grant; or

20 the MAC entity is configured with priority based prioritization, the previous configured grant for the identified HARQ process was de-prioritized and the MAC PDU obtained in the HARQ buffer had not been successfully transmitted due to the overlapping.

2. The method of claim 1, further comprising:

25 after obtaining the MAC PDU to transmit, delivering, by the HARQ entity, the MAC PDU and the uplink grant and HARQ information of a transport block (TB) to the identified HARQ process; and

instructing, by the HARQ entity, the identified HARQ process to trigger a new transmission;

30 wherein when the HARQ process is configured with a configured grant timer, the configured grant timer is not started or restarted when at least one of following conditions is satisfied:

the MAC entity is configured with priority based prioritization and the uplink grant is a de-prioritized configured grant; or

the MAC entity is configured with priority based prioritization, the uplink grant is a configured uplink grant and the uplink grant is a deprioritized uplink grant.

35 3. The method of claim 1, further comprising:

delivering, by the MAC entity, the configured uplink grant and associated HARQ

information to the HARQ entity when at least one of following conditions is satisfied:

the previous uplink grant delivered to the HARQ entity for the same HARQ process was a configured uplink grant which was de-prioritized;

5 the previous configured grant for the identified HARQ process was de-prioritized and the MAC PDU obtained in the HARQ buffer of the HARQ process had not been successfully transmitted.

4. The method of claim 3, further comprising:

10 after obtaining the MAC PDU to transmit, delivering, by the HARQ entity, the MAC PDU and the uplink grant and HARQ information of a transport block (TB) to the identified HARQ process;

instructing, by the HARQ entity, the identified HARQ process to trigger a new transmission; and

when the HARQ process is configured with a configured grant timer, starting or restarting, by the HARQ entity, the configured grant timer.

15 5. The method of claim 4, wherein starting or restarting the configured grant timer comprises:

starting or restarting the configured grant timer when the MAC entity determines that the transmission is performed.

20 6. A method for transmitting a medium access control (MAC) protocol data unit (PDU), comprising:

delivering, by a MAC entity, a configured uplink grant and associated HARQ information to a HARQ entity of the MAC entity when at least one of following conditions is satisfied:

a previous uplink grant delivered to the HARQ entity for a same HARQ process was a configured uplink grant which was de-prioritized;

25 a MAC PDU obtained in a HARQ buffer of the HARQ process had not been successfully transmitted due to overlapping of a physical uplink shared channel (PUSCH) duration of the previous uplink grant with a PUSCH duration of another uplink grant;

30 the previous configured grant for the HARQ process was de-prioritized and the MAC PDU obtained in the HARQ buffer of the HARQ process had not been successfully transmitted due to the overlapping;

the MAC entity is configured with priority based prioritization and the previous uplink grant delivered to the HARQ entity for the same HARQ process was a configured uplink grant which was de-prioritized;

35 the MAC entity is configured with priority based prioritization and the MAC PDU obtained in the HARQ buffer of the HARQ process had not been successfully

transmitted due to the overlapping; or

the MAC entity is configured with priority based prioritization and the previous configured grant for the HARQ process was de-prioritized and the MAC PDU obtained in the HARQ buffer of the HARQ process had not been successfully transmitted due to the overlapping;

delivering, by the HARQ entity, the uplink grant and the HARQ information of a transport block (TB) to the HARQ process; and

instructing, by the HARQ entity, the HARQ process to trigger a retransmission.

7. The method of claim 6, further comprising:

identifying, by the HARQ entity, for the uplink grant, the HARQ process associated with the uplink grant; and

in response to obtaining a MAC PDU, delivering, by the HARQ entity, the MAC PDU and the uplink grant and HARQ information of the TB to the identified HARQ process;

instructing, by the HARQ entity, the identified HARQ process to trigger a new transmission; and

when the HARQ process is configured with a configured grant timer, starting or restarting the configured grant timer when at least one of following conditions is satisfied:

the MAC entity is configured with priority based prioritization and the uplink grant is a de-prioritized configured grant; or

the MAC entity is configured with priority based prioritization, the uplink grant is a configured uplink grant and the uplink grant is a deprioritized uplink grant.

8. The method of claim 6, further comprising:

identifying, by the HARQ entity, for the uplink grant, the HARQ process associated with the uplink grant; and

in response to obtaining a MAC PDU, delivering, by the HARQ entity, the MAC PDU and the uplink grant and HARQ information of the TB to the identified HARQ process;

instructing, by the HARQ entity, the identified HARQ process to trigger a new transmission; and

when the HARQ process is configured with a configured grant timer, starting or restarting the configured grant timer.

9. The method of claim 8, wherein starting or restarting the configured grant timer comprises:

starting or restarting the configured grant timer when the MAC entity determines that the transmission is performed.

10. A device for transmitting a medium access control (MAC) protocol data unit (PDU), configured to implement the method of any one of claims 1 to 5.

11. A device for transmitting a medium access control (MAC) protocol data unit (PDU), configured to implement the method of any one of claims 6 to 9.

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