

What is claimed is:

1. A discontinuous reception (DRX) scheduling method, comprising:

receiving, by a first user equipment (UE), m sets of DRX configuration information configured by a network side; wherein m is an integer greater than 1, and the m sets of DRX configuration information have a correspondence relationship including at least one of the following:

the m sets of DRX configuration information correspond to different communication types;

the m sets of DRX configuration information correspond to different scheduling modes;

the m sets of DRX configuration information correspond to different frame types or data types of a service;

the m sets of DRX configuration information correspond to different communication directions of a service or different services;

receiving and/or sending data, by the first UE, according to the m sets of DRX configuration information.

2. The method according to claim 1, wherein the receiving and/or sending data, by the first UE, according to the m sets of DRX configuration information, includes:

receiving and/or sending the data according to the m sets of DRX configuration information and association relationship between at least b sets of DRX configuration information in the m sets of DRX configuration information, wherein b is an integer greater than 1 and less than or equal to m ;

wherein the association relationship between the at least b sets of DRX configuration information is sent to the first UE by the network side through signaling, or is predefined, or is sent to a radio access layer of the first UE from a high layer of the first UE.

3. The method according to claim 2, wherein the association relationship between the at least b sets of DRX configuration information includes at least one of the following:

after receiving or sending data and/or signaling of a t-th service during an active time indicated by an i-th set of DRX configuration information in the m-sets of DRX configuration information, starting, after a specified time or immediately, an inactivity timer of a j-th set of DRX configuration information corresponding to a u-th service, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending data and/or signaling of a t-th service during an active time indicated by an i-th set of DRX configuration information in the m-sets of DRX configuration information, entering, after a specified time or immediately, an activity time of a j-th set of DRX configuration information corresponding to a u-th service, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending data and/or signaling of a t-th service during an active time indicated by an i-th set of DRX configuration information in the m-sets of DRX configuration information, starting, after a specified time or immediately, an on-duration timer of a j-th set of DRX configuration information corresponding to a u-th service, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending data and/or signaling of a t-th service during an active time indicated by an i-th set of DRX configuration information in the m-sets of DRX configuration information, according to data arrival characteristics and/or service performance requirements of an associated u-th service, performing at least one of starting an inactive timer of a j-th set of DRX configuration information corresponding to the u-th service, starting an on-duration timer of the j-th set of DRX configuration information and entering an active time of the j-th set of DRX configuration information, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, starting, after a specified time or

immediately, an inactive timer of a z-th set of DRX configuration information corresponding to a u-th type data and/or signaling of the q-th service, and receiving and/or waiting to receive the u-th type data and/or signaling of the q-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, entering, after a specified time or immediately, an active time of a z-th set of DRX configuration information corresponding to a u-th type of the q-th service, and receiving and/or waiting to receive the u-th type data and/or signaling of the q-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, starting, after a specified time or immediately, an on-duration timer of a z-th set of DRX configuration information corresponding to a u-th type in the first service, and receiving and/or waiting to receive the u-th type data and/or signaling of the q-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, according to service performance requirements including arrival characteristics and/or delay of a u-th type data of an associated q-th service, performing at least one of starting an inactive timer of a z-th set of DRX configuration information corresponding to the u-th type in the q-th service, starting on-duration timer of the z-th set of DRX configuration information and entering an active time of the z-th set of DRX configuration information, and receiving and/or waiting to receive the u-th type data and/or signaling in the q-th service.

4. The method according to claim 2, wherein when the m sets of DRX configuration information correspond to different communication types, the m sets of DRX configuration information include: a first set of DRX configuration information corresponding to a multicast mode, and a second set of DRX configuration information corresponding to a unicast mode;

the association relationship between the at least b sets of DRX configuration information includes: the first set of DRX configuration information is associated with the second set of DRX configuration information;

wherein the receiving and/or sending the data according to the m sets of DRX configuration information and association relationship between at least b sets of DRX configuration information in the m sets of DRX configuration information, includes:

receiving, by the first UE, new transmission data of a multicast service sent by a network device according to the first set of DRX configuration information; and, before receiving the new transmission data or during reception of the new transmission data, determining a reception mode of retransmission data, wherein the reception mode of the retransmission data includes: a multicast reception mode and/or a unicast reception mode;

in case that the first UE fails to receive the new transmission data, according to the reception mode of the retransmission data, monitoring PDCCH scheduling signaling corresponding to the retransmission data and receives the retransmission data; when using the multicast reception mode, based on the first set of DRX configuration information, receiving retransmission data scrambled by group-radio network temporary identify (G-RNTI) and/or Group Configured Scheduling RNTI (G-CS-RNTI); when using the unicast reception mode, based on the second set of DRX configuration information, receiving retransmission data scrambled by C-RNTI and/or CS-RNTI;

or,

wherein the receiving and/or sending, by the first UE, the data according to the m sets of DRX configuration information and association relationship between at least b sets of DRX configuration information in the m sets of DRX configuration information, includes:

according to an i-th set of DRX configuration information, after the first UE receives data and/or signaling of a t-th service sent by the network device, starting, after a specified time or immediately, an inactive timer of a j-th set of DRX

corresponding to a u-th service, and receiving and/or waiting to receive data of the u-th service;

according to an i-th set of DRX configuration information, receiving data and/or signaling of a t-th service sent by the network device; and, before receiving the data and/or signaling of the t-th service sent by the network device or when receiving the data and/or signaling of the t-th service sent by the network device, obtaining a j-th set of DRX configuration information corresponding to a u-th service which is associated with the t-th service corresponding to the i-th set of DRX configuration information; and using the j-th set of DRX configuration information to start an inactive timer of the j-th set of DRX configuration information, and receiving and/or waiting to receive data of the u-th service.

5. The method according to claim 4, wherein the determining a reception mode of retransmission data, includes:

determining, by the first UE, the reception mode of the retransmission data according to indication information for indicating retransmission mode of the new transmission data; wherein when the retransmission mode is a point-to-multipoint (PTM) mode, the reception mode is a multicast reception mode; when the retransmission mode is a point-to-point (PTP) mode, the reception mode is a unicast reception mode; when the retransmission mode is the PTP mode and the PTM mode, the reception mode is the multicast reception mode and the unicast reception mode;

or,

wherein the method further comprises:

extracting, by the first UE, the indication information for indicating retransmission mode of the new transmission data from a scheduling command for scheduling the new transmission data of the multicast service;

or,

wherein the determining a reception mode of retransmission data, further includes:

when the scheduling command of the new transmission data does not include the indication information of the retransmission mode, determining the reception

mode of the retransmission data to be multicast reception mode and unicast reception mode.

6. The method according to claim 4, wherein

when using the multicast reception mode, based on the first set of DRX configuration information, receiving retransmission data scrambled by group-radio network temporary identify (G-RNTI) and/or Group Configured Scheduling RNTI (G-CS-RNTI), includes: starting a multicast round trip time (HARQ RTT) timer; when the multicast HARQ RTT timer expires, starting to monitor retransmission data scrambled by G-RNTI and/or G-CS-RNTI, and starting a corresponding multicast retransmission timer;

when using the unicast reception mode, based on the second set of DRX configuration information, receiving retransmission data scrambled by C-RNTI and/or CS-RNTI, includes: starting a unicast HARQ RTT timer; and when the unicast HARQ RTT timer expires, starting to monitor retransmission data scrambled by C-RNTI and/or CS-RNTI, and starting a corresponding unicast retransmission timer.

7. The method according to claim 6, wherein the first UE communicates with the network device through carrier aggregation; when using the unicast reception mode, based on the second set of DRX configuration information, receiving retransmission data scrambled by C-RNTI and/or CS-RNTI, further includes:

determining a monitored target carrier and/or a target BWP according to indication information of a carrier and/or a bandwidth part (BWP) resource associated with the retransmission data; and monitoring retransmission data scrambled by C-RNTI and/or CS-RNTI on the target carrier and/or the target BWP.

8. The method according to claim 1, further comprising:

receiving a first signaling sent by the network side, wherein the first signaling is used to update time information of a k-th set of DRX configuration information in the m sets of DRX configuration information;

updating, by the first UE, start position information and/or cycle information of an active time in the k-th set of DRX configuration information, according to the first signaling;

wherein the time information updated by the first signaling is related to time information of a target service corresponding to a target logical channel, and the target logical channel is a logical channel corresponding to the k-th set of DRX configuration information;

or,

wherein the method further comprises:

when a time deviation between a start position of an active time of an n-th set of DRX configuration information in the m sets of DRX configuration information and an actual data transmission time of a service reaches a predetermined first threshold, adjusting a DRX cycle and/or a starting position in the n-th set of DRX configuration information;

or,

wherein the method further comprises:

obtaining time information of a valid period and time information of an invalid period of an s-th set of DRX configuration information in the m sets of DRX configuration information;

wherein the receiving and/or sending data, by the first UE, according to the m sets of DRX configuration information, includes:

within a time period indicated by the time information of the valid period of the s-th set of DRX configuration information, performing transmission or reception of data and/or signaling during the active time of the valid period;

within a time period indicated by the time information of the invalid period of the valid period of the s-th set of DRX configuration information, stopping at least one of transmission or reception of data and/or signaling.

9. The method according to claim 8, wherein the obtaining time information of a valid period and time information of an invalid period of an s-th set of DRX configuration information in the m sets of DRX configuration information, includes:

obtaining time information of a service corresponding to the s-th set of DRX configuration information;

determining time information of a valid period and time information of an invalid period of the s-th set of DRX configuration information according to the time information of the service corresponding to the s-th set of DRX configuration information.

10. The method according to claim 1, wherein

a first DRX cycle in a p-th set of DRX configuration information in the m sets of DRX configuration information includes x second DRX cycles, wherein x is an integer greater than 1; and configurations corresponding to the x second DRX cycles are different or partially the same or have a corresponding relationship, which includes at least one of the following manners:

values of the x second DRX cycles are the same or different;

start positions of active time corresponding to the x second DRX cycles are explicitly indicated or have a corresponding relationship;

corresponding values of at least one of inactive timer, retransmission timer and active timer in the x second DRX cycles are set to be the same or different;

wherein

DRX cycles of x multicast services form a multicast DRX cycle, the first DRX cycle is the multicast DRX cycle, and DRX cycle of each multicast service in the x multicast services is corresponding to one of the x second DRX cycles;

the p-th set of DRX configuration information includes at least one of: the multicast DRX cycle, a position of the DRX cycle of each multicast service in the multicast DRX cycle, DRX configuration information of each multicast service, G-RNTI corresponding to each multicast service, whether to enable HARQ feedback for PTM transmission mode corresponding to each multicast service, whether to enable HARQ retransmission for PTM for PTM transmission mode corresponding to each multicast service;

wherein the method further includes: receiving data of each multicast service according to the p-th set of DRX configuration information.

11. A discontinuous reception (DRX) scheduling method, comprising:

sending, by a first network device, to a first user equipment (UE), m sets of DRX configuration information; wherein m is an integer greater than 1, and the m sets of DRX configuration information have a correspondence relationship including at least one of the following:

the m sets of DRX configuration information correspond to different communication types;

the m sets of DRX configuration information correspond to different scheduling modes;

the m sets of DRX configuration information correspond to different frame types or data types of a service;

the m sets of DRX configuration information correspond to different communication directions of a service or different services;

receiving and/or sending data, by the first network device, according to the m sets of DRX configuration information.

12. The method according to claim 11, wherein the receiving and/or sending data, by the first network device, according to the m sets of DRX configuration information, includes:

receiving and/or sending the data, by the first network device, according to the m sets of DRX configuration information and association relationship between at least b sets of DRX configuration information in the m sets of DRX configuration information, wherein b is an integer greater than 1 and less than or equal to m ;

wherein the association relationship between the at least b sets of DRX configuration information is configured by the network side, or is predefined, or is sent to the first network device from the first UE.

13. The method according to claim 12, wherein the association relationship between the at least b sets of DRX configuration information includes at least one of the following:

after receiving or sending data and/or signaling of a t -th service during an active time indicated by an i -th set of DRX configuration information in the m -sets of DRX configuration information, starting, after a specified time or immediately, an

inactivity timer of a j-th set of DRX configuration information corresponding to a u-th service, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending data and/or signaling of a t-th service during an active time indicated by an i-th set of DRX configuration information in the m-sets of DRX configuration information, entering, after a specified time or immediately, an activity time of a j-th set of DRX configuration information corresponding to a u-th service, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending data and/or signaling of a t-th service during an active time indicated by an i-th set of DRX configuration information in the m-sets of DRX configuration information, starting, after a specified time or immediately, an on-duration timer of a j-th set of DRX configuration information corresponding to a u-th service, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending data and/or signaling of a t-th service during an active time indicated by an i-th set of DRX configuration information in the m-sets of DRX configuration information, according to data arrival characteristics and/or service performance requirements of an associated u-th service, performing at least one of starting an inactive timer of a j-th set of DRX configuration information corresponding to the u-th service, starting an on-duration timer of the j-th set of DRX configuration information and entering an active time of the j-th set of DRX configuration information, and receiving and/or waiting to receive data and/or signaling of the u-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, starting, after a specified time or immediately, an inactive timer of a z-th set of DRX configuration information corresponding to a u-th type data and/or signaling of the q-th service, and receiving and/or waiting to receive the u-th type data and/or signaling of the q-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, entering, after a specified time or immediately, an active time of a z-th set of DRX configuration information corresponding to a u-th type of the q-th service, and receiving and/or waiting to receive the u-th type data and/or signaling of the q-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, starting, after a specified time or immediately, an on-duration timer of a z-th set of DRX configuration information corresponding to a u-th type in the first service, and receiving and/or waiting to receive the u-th type data and/or signaling of the q-th service;

after receiving or sending a v-th type data and/or signaling of a q-th service during an active time indicated by an h-th set of DRX configuration information in the m sets of DRX configuration information, according to service performance requirements including arrival characteristics and/or delay of a u-th type data of an associated q-th service, performing at least one of starting an inactive timer of a z-th set of DRX configuration information corresponding to the u-th type in the q-th service, starting on-duration timer of the z-th set of DRX configuration information and entering an active time of the z-th set of DRX configuration information, and receiving and/or waiting to receive the u-th type data and/or signaling in the q-th service.

14. The method according to claim 12, wherein when the m sets of DRX configuration information correspond to different communication types, the m sets of DRX configuration information include: a first set of DRX configuration information corresponding to a multicast mode, and a second set of DRX configuration information corresponding to a unicast mode;

the association relationship between the at least b sets of DRX configuration information includes: the first set of DRX configuration information is associated with the second set of DRX configuration information;

wherein the receiving and/or sending the data according to the m sets of DRX configuration information and association relationship between at least b sets of DRX configuration information in the m sets of DRX configuration information, includes:

sending, by the first network device, new transmission data of a multicast service according to the first set of DRX configuration information; and, before sending the new transmission data or during transmission of the new transmission data, determining a retransmission mode of retransmission data, wherein the retransmission mode of the retransmission data includes: a PTM mode and/or a PTP mode;

when the first UE fails to receive the new transmission data, sending, by the first network device, the retransmission data corresponding to the new transmission data to the first UE according to the retransmission mode of the retransmission data; when using the PTM mode, based on the first set of DRX configuration information, sending retransmission data scrambled by the multicast radio network temporary identifier G-RNTI and/or G-CS-RNTI; when using the PTP mode, based on the second set of DRX configuration information, sending retransmission data scrambled by the C-RNTI and/or CS-RNTI;

or,

wherein the receiving and/or sending data, by the first network device, according to the m sets of DRX configuration information and association relationship between at least b sets of DRX configuration information in the m sets of DRX configuration information, includes at least one of the following:

after the first network device sends data and/or signaling of a t -th service according to an i -th set of DRX configuration information, starting, after a specified time or immediately, an inactivity timer of a j -th set of DRX corresponding to a u -th service, and sending and/or waiting to send data of the u -th service;

after the first network device sends data and/or signaling of a t -th service according to an i -th set of DRX configuration information; and before sending the data and/or signaling of the t -th service or when sending the data and/or signaling of the t -th service, obtaining a j -th set of DRX configuration information corresponding

to a u-th service associated with the t-th service corresponding to the i-th set of DRX configuration information; and using the j-th set of DRX configuration information to start an inactive timer of the j-th set of DRX configuration information, and sending and/or waiting to send data of the u-th service.

15. The method according to claim 14, further comprising:

carrying, by the first network device, indication information of the retransmission mode of the new transmission data in a scheduling command for scheduling the new transmission data of the multicast service; or,

wherein the first UE communicates with the network device through carrier aggregation; when using the PTP mode, based on the second set of DRX configuration information, sending retransmission data scrambled by the C-RNTI and/or CS-RNTI, includes:

sending to the first UE, indication information of a carrier and/or a bandwidth part (BWP) resource associated with the retransmission data, so that the first UE determines a monitored target carrier and/or a target BWP;

or,

wherein based on the second set of DRX configuration information, sending retransmission data scrambled by the C-RNTI and/or CS-RNTI, includes:

sending, by the first network device, the retransmission data scrambled by the C-RNTI and/or CS-RNTI through a second network device.

16. The method according to claim 11, further comprising:

sending, by the network device, a first signaling to the first UE, wherein the first signaling is used to update time information of a k-th set of DRX configuration information in the m sets of DRX configuration information;

wherein the time information updated by the first signaling is related to time information of a target service corresponding to a target logical channel, and the target logical channel is a logical channel corresponding to the k-th set of DRX configuration information;

wherein the method further comprises:

when a time deviation between a start position of an active time of a k-th set of DRX configuration information and an actual data transmission time of a service reaches a predetermined first threshold, adjusting, by the first network, a DRX cycle and/or a start position in the k-th set of DRX configuration information, and sending the first signaling.

17. The method according to claim 11, further comprising:

obtaining, by the first network device, time information of a valid period and time information of an invalid period of an s-th set of DRX configuration information in the m sets of DRX configuration information;

within a time period indicated by the time information of the valid period of the s-th set of DRX configuration information, sending or receiving data and/or signaling during an active time of the valid period;

within a time period indicated by the time information of the invalid period of the s-th set of DRX configuration information, stopping sending or receiving at least one of data and/or signaling.

18. The method according to claim 11, wherein

a first DRX cycle in a p-th set of DRX configuration information in the m sets of DRX configuration information includes x second DRX cycles; and configurations corresponding to the x second DRX cycles are different or partially the same or have a corresponding relationship, which includes at least one of the following manners:

values of the x second DRX cycles are the same or different;

start positions of active time corresponding to the x second DRX cycles are explicitly indicated or have a corresponding relationship;

corresponding values of at least one of inactive timer, retransmission timer and active timer in the x second DRX cycles are set to be the same or different;

wherein

DRX cycles of x multicast services form a multicast DRX cycle, the first DRX cycle is the multicast DRX cycle, and DRX cycle of each multicast service in the x multicast services is corresponding to one of the x second DRX cycles;

the p-th set of DRX configuration information includes at least one of: the multicast DRX cycle, a position of the DRX cycle of each multicast service in the multicast DRX cycle, DRX configuration information of each multicast service, G-RNTI corresponding to each multicast service, whether to enable HARQ feedback for PTM transmission mode corresponding to each multicast service, whether to enable HARQ retransmission for PTM for PTM transmission mode corresponding to each multicast service;

wherein the method further includes: sending, by the first network device, data of each multicast service according to the p-th set of DRX configuration information.

19. A user equipment (UE), comprising: a transceiver and a processor;

wherein the transceiver is configured to receive m sets of DRX configuration information configured by a network side; wherein m is an integer greater than 1, and the m sets of DRX configuration information have a correspondence relationship including at least one of the following:

the m sets of DRX configuration information correspond to different communication types;

the m sets of DRX configuration information correspond to different scheduling modes;

the m sets of DRX configuration information correspond to different frame types or data types of a service;

the m sets of DRX configuration information correspond to different communication directions of a service or different services;

the processor is configured to receive and/or send data according to the m sets of DRX configuration information.

20. A network device, comprising: a transceiver and a processor;

wherein the transceiver is configured to send m sets of DRX configuration information to a first user equipment (UE); wherein m is an integer greater than 1, and the m sets of DRX configuration information have a correspondence relationship including at least one of the following:

the m sets of DRX configuration information correspond to different communication types;

the m sets of DRX configuration information correspond to different scheduling modes;

the m sets of DRX configuration information correspond to different frame types or data types of a service;

the m sets of DRX configuration information correspond to different communication directions of a service or different services;

the processor is configured to receive and/or send data according to the m sets of DRX configuration information.