CLAIMS

What is claimed is:

1. A method, comprising:

at a mobile wireless communication device, wherein when the mobile wireless communication device is connected to a radio network subsystem in a wireless communication network by a first bidirectional radio access bearer and a second bidirectional radio access bearer simultaneously,

transmitting a data packet on an uplink of the first bidirectional radio access bearer to the radio network subsystem;

retransmitting the data packet when the data packet is not correctly received by the radio network subsystem; and

after N retransmissions of the data packet, releasing the first bidirectional radio access bearer while maintaining the second bidirectional radio access bearer.

2. The method as recited in claim 1, further comprising:

after N retransmissions of the data packet, waiting for a deactivation time period before releasing the first bidirectional radio access bearer.

3. The method as recited in claim 1, further comprising:

after N retransmissions of the data packet and before releasing the first bidirectional radio access bearer,

transmitting a reset packet on the uplink of the first bidirectional radio access bearer to the radio network subsystem;

retransmitting the reset packet when the reset packet is not correctly received by the radio network subsystem; and

after M retransmissions of the reset packet, releasing the first bidirectional radio access bearer while maintaining the second bidirectional radio access bearer.

4. The method as recited in claim 1, wherein the first bidirectional radio access bearer provides a channel to transport packet switched data, and the second bidirectional radio access bearer provides a channel to transport circuit switched data.

5. The method as recited in claim 3, wherein the data packet is a layer 2 data protocol data unit and the reset packet is a layer 2 reset data protocol unit.

6. The method as recited in claims 3 or 5, wherein the layer 2 data protocol data unit includes a poll bit enabled, thereby requesting an acknowledgement from the radio network subsystem that the layer 2 data protocol data unit is correctly received.

7. A mobile wireless communication device, comprising:

a wireless transceiver arranged to transmit to and receive from a radio network subsystem in a wireless communication network signals over multiple radio access bearers; and

a processor coupled to the wireless transceiver, the processor arranged to execute instructions for:

when the mobile wireless communication device is connected to the radio network subsystem by a first radio access bearer and a second radio access bearer simultaneously,

transmitting a data packet on an uplink of the first radio access bearer to the radio network subsystem;

retransmitting the data packet when the data packet is not correctly received by the radio network subsystem; and

after N retransmissions of the data packet, releasing the first radio access bearer while maintaining the second radio access bearer.

8. The mobile wireless communication device as recited in claim 7, wherein the processor coupled to the wireless transceiver is further arranged to execute instructions for:

after N retransmissions of the data packet, waiting for a deactivation time period before releasing the first radio access bearer.

9. The mobile wireless communication device as recited in claims 7 or 8, wherein the processor coupled to the wireless transceiver is further arranged to execute instructions for:

after N retransmissions of the data packet and before releasing the first radio access bearer,

transmitting a reset packet on the uplink of the first radio access bearer to the radio network subsystem;

retransmitting the reset packet when the reset packet is not correctly received by the radio network subsystem; and

after M retransmissions of the reset packet, releasing the first radio access bearer while maintaining the second radio access bearer.

10. The mobile wireless communication device as recited in any of claims 7 - 9, wherein the first radio access bearer provides a channel to transport packet switched

data, and the second radio access bearer provides a channel to transport circuit switched data.

11. The mobile wireless communication device as recited in claim 9, wherein the data packet is a layer 2 data protocol data unit and the reset packet is a layer 2 reset data protocol unit.

12. The mobile wireless communication device as recited in claims 9 or 11, wherein the layer 2 data protocol data unit includes a poll bit enabled, thereby requesting an acknowledgement from the radio network subsystem that the layer 2 data protocol data unit is correctly received.

13. Computer program product encoded in a computer readable medium for controlling a mobile wireless communication device connected to a radio access system in a wireless communication network by a plurality of wireless channels simultaneously, the computer program product comprising:

non-transitory computer program code for transmitting a data packet on a first wireless channel in the plurality of wireless channels to the radio access system;

non-transitory computer program code for retransmitting the data packet when the data packet is not correctly received by the radio access system; and

non-transitory computer program code for, after N retransmissions of the data packet, disconnecting the first wireless channel while maintaining a connection of at least one other wireless channel in the plurality of wireless channels to the radio access system.

14. The computer program product as recited in claim 13, further comprising:

non-transitory computer program code for, after N retransmissions of the data packet, waiting for a deactivation time period before releasing the first wireless channel.

15. The computer program product as recited in claim 13, further comprising:

after N retransmissions of the data packet and before releasing the first wireless channel,

non-transitory computer program code for transmitting a reset packet on the first wireless channel to the radio access system;

retransmitting the reset packet when the reset packet is not correctly received by the radio access system; and

after M retransmissions of the reset packet, releasing the first wireless channel while maintaining a connection of at least one other wireless channel in the plurality of wireless channels to the radio access system.

16. The computer program product as recited in claim 13, wherein the first wireless channel transports packet switched data, and at least one other channel in the plurality of wireless channels transports circuit switched data.

17. The computer program product as recited in claim 15, wherein the data packet is a layer 2 data protocol data unit and the reset packet is a layer 2 reset data protocol unit.

18. The computer program product as recited in claims 15 or 17, wherein the layer 2 data protocol data unit includes a poll bit enabled, thereby requesting an acknowledgement from the radio access system that the layer 2 data protocol data unit is correctly received.

19. A method for controlling at least two simultaneous wireless connections between a mobile wireless communication device and a wireless access network, the method comprising:

at the mobile wireless communication device,

transmitting and receiving circuit switched data over a first wireless connection;

transmitting and receiving packet switched data over a second wireless connection;

determining whether the transmitted packet switched data is received correctly by the wireless access network; and

disconnecting the second wireless connection while retaining the first wireless connection with the wireless access network when the transmitted packet switched data is not received correctly by the wireless access network after multiple retransmissions by the mobile wireless communication device.

20. The method as recited in claim 19, further comprising:

resetting the second wireless connection before the disconnecting of the second wireless connection.

Claims

1. A mobile wireless communication device, comprising:

a wireless transceiver arranged to transmit to and receive from a radio network subsystem in a wireless communication network signals over multiple radio access bearers;

a processor coupled to the wireless transceiver; and

logic coupled to the wireless transceiver and to the processor, the logic configured to, when the mobile wireless communication device is connected to the radio network subsystem by a first radio access bearer and a second radio access bearer simultaneously:

transmit a data packet on an uplink of the first radio access bearer to the radio network subsystem;

retransmit the data packet when the data packet is not correctly received by the radio network subsystem; and

after N retransmissions of the data packet:

initiate a deactivation time period;

during the deactivation time period:

transmit a reset packet on the uplink of the first radio access bearer to the network subsystem;

retransmit the reset packet when the reset packet is not correctly received by the radio network subsystem; and

release the first radio access bearer before the end of the deactivation time period, by deactivating a packet data protocol (PDP) context associated with a data connection that uses the first radio access bearer, while maintaining the second radio access bearer.

2. The mobile wireless communication device as recited in claim 1, wherein the first radio access bearer provides a channel to transport packet switched data, and the second radio access bearer provides a channel to transport circuit switched data.

3. The mobile wireless communication device as recited in claim 1, wherein the data packet is a layer 2 data protocol data unit and the reset packet is a layer 2 reset protocol data unit.

4. The mobile wireless communication device as recited in claim 3, wherein the layer 2 data protocol data unit includes a poll bit enabled, thereby requesting an acknowledgement from the radio network subsystem that the layer 2 data protocol data unit is correctly received by the radio network subsystem.

5. A method, comprising:

at a mobile wireless communication device, wherein when the mobile wireless communication device is connected to a radio network subsystem in a wireless communication network by a first bidirectional radio access bearer and a second bidirectional radio access bearer simultaneously:

transmitting a data packet on an uplink of the first bidirectional radio access bearer to the radio network subsystem;

retransmitting the data packet when the data packet is not correctly received by the radio network subsystem; and

after N retransmissions of the data packet:

waiting for a deactivation time interval; and

after the deactivation time interval, releasing the first bidirectional radio access bearer, by deactivating a packet data protocol (PDP) context associated with a data connection that uses the first bidirectional radio access bearer, while maintaining the second bidirectional radio access bearer.

6. The method as recited in claim 5, further comprising:

after N retransmissions of the data packet and before releasing the first bidirectional radio access bearer:

transmitting a reset packet on the uplink of the first bidirectional radio access bearer to the radio network subsystem;

retransmitting the reset packet when the reset packet is not correctly received by the radio network subsystem; and

after M retransmissions of the reset packet and after the deactivation time interval, releasing the first bidirectional radio access bearer while maintaining the second bidirectional radio access bearer.

7. The method as recited in claim 5, wherein the first bidirectional radio access bearer provides a channel to transport packet switched data, and the second bidirectional radio access bearer provides a channel to transport circuit switched data.

8. The method as recited in claim 6, wherein the data packet is a layer 2 data protocol data unit and the reset packet is a layer 2 reset protocol data unit.

9. The method as recited in claim 8, wherein the layer 2 data protocol data unit includes a poll bit enabled, thereby requesting an acknowledgement from the radio network subsystem that the layer 2 data protocol data unit is correctly received.

10. A non-transitory computer readable medium comprising a plurality of instructions for controlling a mobile wireless communication device connected to a radio access system in a wireless communication network by a plurality of wireless channels simultaneously, the plurality of instructions that when executed, cause the mobile wireless communication device to:

transmit a data packet on a first wireless channel in the plurality of wireless channels to the radio access system;

retransmit the data packet when the data packet is not correctly received by the radio access system; and

after N retransmissions of the data packet, disconnect the first wireless channel, by deactivating a packet data protocol (PDP) context associated with a data connection that uses the first wireless channel, while maintaining a connection of at least one other wireless channel in the plurality of wireless channels to the radio access system.

11. The computer readable medium as recited in claim 10, the plurality of instructions further cause mobile wireless communication device to, after N retransmissions of the data packet, wait for a deactivation time period before disconnecting the first wireless channel.

12. The computer readable medium as recited in claim 10, the plurality of instructions further mobile wireless communication device to:
after N retransmissions of the data packet and before disconnecting the first wireless channel:

transmit a reset packet on the first wireless channel to the radio access system; and

retransmit the reset packet when the reset packet is not correctly received by the radio access system; and

after N retransmissions of the data packet and after M retransmissions of the reset packet:

disconnect the first wireless channel, by deactivating the PDP context associated with the data connection that uses the first wireless channel, while maintaining the connection of the at least one other wireless channel in the plurality of wireless channels to the radio access system.

13. The computer readable medium as recited in claim 10, wherein the first wireless channel transports packet switched data, and the at least one other wireless channel in the plurality of wireless channels transports circuit switched data.

14. The computer readable medium as recited in claim 12, wherein the data packet comprises a layer 2 data protocol data unit and the reset packet comprises a layer 2 reset protocol data unit.

15. The computer readable medium as recited in claim 14, wherein the layer 2 data protocol data unit includes a poll bit enabled, thereby requesting an acknowledgement from the radio access system that the layer 2 data protocol data unit is correctly received by the radio access system.

16. A method for controlling at least two simultaneous wireless connections between a mobile wireless communication device and a wireless access network, the method comprising:

transmitting and receiving circuit switched data over a first wireless connection;

transmitting and receiving packet switched data over a second wireless connection;

determining whether the transmitted packet switched data is received correctly by the wireless access network; and

disconnecting the second wireless connection, by deactivating a packet data protocol (PDP) context associated with a data connection that uses the second wireless connection, while retaining the first wireless connection with the wireless access network when the

transmitted packet switched data is not received correctly by the wireless access network after multiple retransmissions by the mobile wireless communication device.

17. The method as recited in claim 16, further comprising resetting the second wireless connection before the disconnecting of the second wireless connection.