

CLAIMS**What is Claimed:**

1. A method implemented by a wireless transmit/receive unit (WTRU), the method comprising:
receiving information indicating a configuration of one or more small data transmission (SDT) resources;
receiving information indicating one or more data radio bearers (DRBs) which support SDT;
receiving information indicating an inactive radio network temporary identifier (I-RNTI);
determining whether uplink (UL) SDT data for transmission is present in a buffer of the WTRU; and
on condition that (1) the UL SDT data is determined to be present in the buffer, (2) a size of the UL SDT data present in the buffer is less than a first threshold, and (3) the UL SDT data present in the buffer is for the one or more DRBs which support SDT:
after receiving the information indicating the I-RNTI, transmitting at least a portion of the UL SDT data present in the buffer using a SDT resource from among the one or more SDT resources.
2. The method of claim 1, wherein, on further condition that the size of the UL SDT data for transmission present in the buffer is greater than a size of the SDT resource, the transmitting of the at least the portion of the UL SDT data present in the buffer using the SDT resource further includes transmitting information indicating the size of the UL SDT present in the buffer using the same SDT resource.
3. The method of claim 2, wherein the information indicating the size of UL SDT present in the buffer is a small data buffer status report.
4. The method of claim 1, wherein the size of the UL SDT data present in the buffer is a size of all the UL SDT data present in the buffer, and
wherein the UL SDT data present in the buffer for the one or more DRBs which support SDT is all the UL SDT data present in the buffer.
5. The method of claim 1, further comprising:
measuring a reference signal received power (RSRP) of one or more reference signals,

wherein the transmitting of the at least the portion of the UL SDT data present in the buffer using the SDT resource is on further condition that (4) the measured RSRP is greater than or equal to a second threshold.

6. The method of claim 1, further comprising:
after receiving the information indicating the I-RNTI, performing a random access procedure,
wherein the SDT resource is a random access channel (RACH) resource, and
wherein the random access procedure includes the transmitting of the at least the portion of the UL SDT data present in the buffer using the RACH resource.

7. A method implemented by a wireless transmit/receive unit (WTRU), the method comprising:
receiving information indicating a configuration of one or more small data transmission (SDT) resources;
receiving information indicating one or more data radio bearers (DRBs) which support SDT;
receiving information indicating an inactive radio network temporary identifier (I-RNTI);
determining whether uplink (UL) SDT data for transmission is present in a buffer of the WTRU; and
on condition that (1) the UL SDT data is determined to be present in the buffer, (2) a size of the UL SDT data present in the buffer is less than a first threshold, and (3) the UL SDT data present in the buffer is for the one or more DRBs which support SDT:
after receiving the information indicating the I-RNTI, transmitting the UL SDT data present in the buffer using a SDT resource from among the one or more SDT resources.

8. The method of claim 7, wherein the size of the UL SDT data present in the buffer is a size of all the UL SDT data present in the buffer, and
wherein the UL SDT data present in the buffer for the one or more DRBs which support SDT is all the UL SDT data present in the buffer.

9. The method of claim 8, further comprising:
measuring a reference signal received power (RSRP) of one or more reference signals,

wherein the transmitting of the UL SDT data present in the buffer using the SDT resource is further on condition that (4) the measured RSRP is greater than or equal to a second threshold.

10. The method of claim 7, further comprising:
after receiving the information indicating the I-RNTI, performing a random access procedure,
wherein the SDT resource is a random access channel (RACH) resource, and
wherein the random access procedure includes the transmitting of the UL SDT data present in the buffer using the RACH resource.
11. The method of any one of claims 1 or 7, wherein the SDT resource is a configured grant (CG) resource.
12. The method of any one of claims 1 or 7, further comprising:
after the transmitting of the at least the portion of the UL SDT data present in the buffer using the SDT resource, sending a request to resume a radio resource control (RRC) connection to a radio access network (RAN).
13. A method implemented by a wireless transmit/receive unit (WTRU), the method comprising:
receiving information indicating a configuration of one or more small data transmission (SDT) resources;
receiving information indicating one or more data radio bearers (DRBs) which support SDT;
receiving information indicating an inactive radio network temporary identifier (I-RNTI);
determining whether uplink (UL) SDT data for transmission is present in a buffer of the WTRU; and
on condition that (1) at least a portion of the UL SDT data present in the buffer is for a DRB which does not support SDT, or (2) the UL SDT data present in the buffer is for the one or more DRBs which support SDT and a size of the UL SDT data present in the buffer is greater than or equal to a first threshold:
sending a request to resume a radio resource control (RRC) connection to a radio access network (RAN), the request to resume the RRC connection including the information indicating the I-RNTI.
14. The method of claim of claim 13, wherein the size of the UL SDT data present in the buffer is a size of all the UL SDT data present in the buffer, and

wherein the UL SDT data present in the buffer for the one or more DRBs which support SDT is all the UL SDT data present in the buffer.

15. The method of claim 13, further comprising:
measuring a reference signal received power (RSRP) of one or more reference signals,
wherein on condition that (1) the at least the portion of the UL SDT data present in the buffer is for the DRB which does not support SDT, (2) the UL SDT data present in the buffer is for the one or more DRBs which support SDT and the size of the UL SDT data present in the buffer is greater than or equal to the first threshold, or (3) the measured RSRP is less than a second threshold:
sending the request to resume the RRC connection.

16. The method of claim 13, wherein the one or more SDT resources include any of a configured grant (CG) resource and/or a random access channel (RACH) resource.

17. A wireless transmit/receive unit (WTRU) comprising:
a transceiver configured to:
receive information indicating a configuration of one or more small data transmission (SDT) resources,
receive information indicating one or more data radio bearers (DRBs) which support SDT, and
receive information indicating an inactive radio network temporary identifier (I-RNTI); and
a processor configured to:
determine whether uplink (UL) SDT data for transmission is present in a buffer of the WTRU,
and
wherein the transceiver is configured to:
on condition that (1) the UL SDT data is determined to be present in the buffer, (2) a size of the UL SDT data present in the buffer is less than a first threshold, and (3) the UL SDT data present in the buffer is for the one or more DRBs which support SDT:
after receiving the information indicating the I-RNTI, transmit at least a portion of the UL SDT data present in the buffer using a SDT resource from among the one or more SDT resources.

18. The WTRU of claim 17, wherein the transceiver is configured such that:

on further condition that the size of the UL SDT data for transmission present in the buffer is greater than a size of the SDT resource, the transmitting of the at least the portion of the UL SDT data present in the buffer includes to transmit information indicating the size of the UL SDT present in the buffer using the same SDT resource.

19. The WTRU of claim 18, wherein the information indicating the size of UL SDT present in the buffer is a small data buffer status report.

20. The WTRU of claim 17, wherein the size of the UL SDT data present in the buffer is a size of all the UL SDT data present in the buffer, and

wherein the UL SDT data present in the buffer for the one or more DRBs which support SDT is all the UL SDT data present in the buffer.

21. The WTRU of claim 17, wherein the processor is further configured to:
measure a reference signal received power (RSRP) of one or more reference signals, and
wherein the transceiver is further configured to:
transmit the at least the portion of the UL SDT data present in the buffer on condition that (4) the measured RSRP is greater than or equal to a second threshold.

22. The WTRU of claim 17, wherein the transceiver is further configured to:
after receiving the information indicating the I-RNTI, perform a random access procedure,
wherein the SDT resource is a random access channel (RACH) resource, and
wherein the random access procedure includes the transmitting of the at least the portion of the UL SDT data present in the buffer using the RACH resource.

23. A wireless transmit/receive unit (WTRU) comprising:
a transceiver configured to:
receive information indicating a configuration of one or more small data transmission (SDT) resources,
receive information indicating one or more data radio bearers (DRBs) which support SDT, and

receive information indicating an inactive radio network temporary identifier (I-RNTI); and
a processor configured to:

determine whether uplink (UL) SDT data for transmission is present in a buffer of the WTRU,
and

wherein the transceiver is configured to:

on condition that (1) the UL SDT data is determined to be present in the buffer, (2) a size of
the UL SDT data present in the buffer is less than a first threshold, and (3) the UL SDT data present in
the buffer is for the one or more DRBs which support SDT:

after receiving the information indicating the I-RNTI, transmit the UL SDT data present in the
buffer using a SDT resource from among the one or more SDT resources.

24. The WTRU of claim 23, wherein the size of the UL SDT data present in the buffer is a size of
all the UL SDT data present in the buffer, and

wherein the UL SDT data present in the buffer for the one or more DRBs which support SDT is all the
UL SDT data present in the buffer.

25. The WTRU of claim 23, wherein the processor is further configured to:

measure a reference signal received power (RSRP) of one or more reference signals, and

wherein the transceiver is further configured to:

transmit the UL SDT data present in the buffer using the SDT resource on condition that (4) the
measured RSRP is greater than or equal to a second threshold.

26. The WTRU of claim 23, wherein the transceiver is configured to:

after receiving the information indicating the I-RNTI, perform a random access procedure,

wherein the SDT resource is a random access channel (RACH) resource, and

wherein the random access procedure includes the transmitting of the at least the portion of the UL
SDT data present in the buffer using the RACH resource.

27. The WTRU of any one of claims 17 or 23, wherein the SDT resource is a configured grant
(CG) resource.

28. The WTRU of any one of claims 17 or 23, wherein the transceiver is further configured to: after the transmitting of the at least the portion of the UL SDT data present in the buffer using the SDT resource, send a request to resume a radio resource control (RRC) connection to a radio access network (RAN), the request to resume the RRC connection including the information indicating the I-RNTI.

29. A wireless transmit/receive unit (WTRU) comprising:

a transceiver configured to:

receive information indicating a configuration of one or more small data transmission (SDT) resources,

receive information indicating one or more data radio bearers (DRBs) which support SDT, and

receive information indicating an inactive radio network temporary identifier (I-RNTI); and

a processor configured to:

determine whether uplink (UL) SDT data for transmission is present in a buffer of the WTRU,

and

wherein the transceiver is configured to:

on condition that (1) at least a portion of the UL SDT data present in the buffer is for a DRB which does not support SDT, or (2) the UL SDT data present in the buffer is for the one or more DRBs which support SDT and a size of the UL SDT data present in the buffer is greater than or equal to a first threshold:

send a request to resume or re-establish a radio resource control (RRC) connection to a radio access network (RAN), the request to resume the RRC connection including the information indicating the I-RNTI.

30. The WTRU of claim of claim 29, wherein the size of the UL SDT data present in the buffer is a size of all the UL SDT data present in the buffer, and

wherein the UL SDT data present in the buffer for the one or more DRBs which support SDT is all the UL SDT data present in the buffer.

31. The WTRU of claim 29, wherein the processor is further configured to:

measure a reference signal received power (RSRP) of one or more reference signals, and

wherein the transceiver is further configured to:

on condition that (1) the at least the portion of the UL SDT data present in the buffer is for the DRB which does not support SDT, or (2) the UL SDT data present in the buffer is for the one or more DRBs which support SDT and the size of the UL SDT data present in the buffer is greater than or equal to the first threshold, or (3) the measured RSRP is less than a second threshold:

send the request to resume the RRC connection to the RAN.

32. The WTRU of claim 29, wherein the one or more SDT resources include any of a configured grant (CG) resource and/or a random access channel (RACH) resource.