

WHAT IS CLAIMED IS:

1. A method for wireless communications by a user equipment (UE), comprising:
 - receiving, from a first network node, a first message integrity protected with a first integrity protection key and encrypted with a first encryption key, wherein the first integrity protection key and the first encryption key are derived from a first key, and the first message comprises information for deriving a second key;
 - transmitting, to a second network node, a second message integrity protected with the first integrity protection key;
 - receiving, from the second network node, a third message comprising one or more indications;
 - determining a third key based in part on at least one of the one or more indications in the third message or a blind detection procedure; and
 - processing the third message based on the third key.
2. The method of claim 1, wherein determining the third key comprises determining whether the third key is the first key or the second key based in part on the one or more indications.
3. The method of claim 2, wherein:
 - the third message comprises a packet data convergence protocol (PDCP) header;
 - and
 - the one or more indications comprises a count value in the PDCP header.
4. The method of claim 3, wherein the determination is that the third key is the first key if the count value is a non-initial value.
5. The method of claim 4, wherein the non-initial count value indicates anchor non-relocation.
6. The method of claim 3, wherein the determination is that the third key is the second key if the count value is an initial value.

7. The method of claim 6, wherein the initial value is a fixed value.
8. The method of claim 6, wherein the initial count value indicates anchor relocation.
9. The method of claim 2, wherein the one or more indications comprise at least one of an indication of whether the third key is the first key or the second key, or an indication of whether one or more parameters for deriving the third key are associated with the first network node or the second network node.
10. The method of claim 9, wherein the one or more indications indicate that the third key is the first key and that the one or more parameters are associated with the first network node.
11. The method of claim 9, wherein the one or more indications indicate that the third key is the first key and that the one or more parameters are associated with the second network node.
12. The method of claim 9, wherein the one or more indications indicate that the third key is the second key and that the one or more parameters are associated with the first network node.
13. The method of claim 9, wherein the one or more indications indicate that the third key is the second key and that the one or more parameters are associated with the second network node.
14. The method of claim 9, wherein the one or more indications are provided in a medium access control (MAC) control element (CE).
15. The method of claim 9, wherein the one or more indications are provided in a packet data convergence protocol (PDCP) control protocol data unit (PDU).

16. The method of claim 9, wherein the one or more parameters comprise at least one of an absolute radio frequency channel number (ARFCN) or a physical cell identifier (PCI).
17. The method of claim 1, wherein determining the third key comprises at least one of:
assuming that the third key is always the second key; or
assuming that one or more parameters for deriving the third key are always associated with the second network node.
18. The method of claim 1, further comprising:
deriving a second integrity protection key and a second encryption key from the third key.
19. The method of claim 18, wherein processing the third message comprises:
decrypting the third message using the second encryption key; and
verifying the third message using the second integrity protection key.
20. The method of claim 18, wherein the third message further comprises information for deriving a fourth key.
21. The method of claim 1, wherein:
the first network node is an anchor base station; and
the second network node is a serving base station.
22. The method of claim 1, wherein the first network node is the same as the second network node.
23. The method of claim 1, further comprising:
entering, based on an indication in the first message, a first state with no dedicated resources allocated to the UE.

24. The method of claim 23, wherein the second message comprises a request to transition from the first state to a second state with dedicated resources allocated to the UE.

25. The method of claim 24, wherein the second message is sent for at least one of a radio access network (RAN) notification area (RNA) update, a location report triggered RAN paging procedure, an uplink data transmission, or a subsequent downlink data transmission.

26. The method of claim 24, further comprising:
 exiting the first state after sending the second message; and
 reentering, based on one of the indications in the third message, the first state after receiving the third message.

27. The method of claim 1, wherein the blind detection procedure comprises at least one of:

 detecting whether the third key is the first key;
 detecting whether the third key is the second key;
 detecting whether one or more parameters for deriving the third key are associated with the first network node; or
 detecting whether the one or more parameters are associated with the second network node.

28. The method of claim 1, further comprising determining after the blind detection procedure that:

 the third key is the second key and the one or more parameters are associated with the first network node; or
 the third key is the first key and the one or more parameters are associated with the first network node.

29. An apparatus for wireless communications, comprising:

a receiver configured to receive, from a first network node, a first message integrity protected with a first integrity protection key and encrypted with a first encryption key, wherein the first integrity protection key and the first encryption key are derived from a first key, and the first message comprises information for deriving a second key;

a transmitter configured to transmit, to a second network node, a second message integrity protected with the first integrity protection key, wherein

the receiver is further configured to receive, from the second network node, a third message comprising one or more indications, the apparatus further comprising:

at least one processor configured to:

determine a third key based in part on at least one of the one or more indications in the third message or a blind detection procedure; and

process the third message based on the third key; and

a memory coupled to the at least one processor.

30. The apparatus of claim 29, wherein the determination of the third key comprises determining whether the third key is the first key or the second key based in part on the one or more indications.

31. The apparatus of claim 30, wherein:

the third message comprises a packet data convergence protocol (PDCP) header;

and

the one or more indications comprises a count value in the PDCP header.

32. The apparatus of claim 31, wherein the determination is that the third key is the first key if the count value is a non-initial value.

33. The apparatus of claim 32, wherein the non-initial count value indicates anchor non-relocation.

34. The apparatus of claim 31, wherein the determination is that the third key is the second key if the count value is an initial value.

35. The apparatus of claim 34, wherein the initial value is a fixed value.
36. The apparatus of claim 34, wherein the initial count value indicates anchor relocation.
37. The apparatus of claim 30, wherein the one or more indications comprise at least one of an indication of whether the third key is the first key or the second key, or an indication of whether one or more parameters for deriving the third key are associated with the first network node or the second network node.
38. The apparatus of claim 37, wherein the one or more indications indicate that the third key is the first key and that the one or more parameters are associated with the first network node.
39. The apparatus of claim 37, wherein the one or more indications indicate that the third key is the first key and that the one or more parameters are associated with the second network node.
40. The apparatus of claim 37, wherein the one or more indications indicate that the third key is the second key and that the one or more parameters are associated with the first network node.
41. The apparatus of claim 37, wherein the one or more indications indicate that the third key is the second key and that the one or more parameters are associated with the second network node.
42. The apparatus of claim 37, wherein the one or more indications are provided in a medium access control (MAC) control element (CE).

43. The apparatus of claim 37, wherein the one or more indications are provided in a packet data convergence protocol (PDCP) control protocol data unit (PDU).
44. The apparatus of claim 37, wherein the one or more parameters comprise at least one of an absolute radio frequency channel number (ARFCN) or a physical cell identifier (PCI).
45. The apparatus of claim 29, wherein the at least one processor is configured to determine the third key by at least one of:
 assuming that the third key is always the second key; or
 assuming that one or more parameters for deriving the third key are always associated with the second network node.
46. The apparatus of claim 29, wherein the at least one processor is further configured to derive a second integrity protection key and a second encryption key from the third key.
47. The apparatus of claim 46, wherein the at least one processor is configured to process the third message by:
 decrypting the third message using the second encryption key; and
 verifying the third message using the second integrity protection key.
48. The apparatus of claim 46, wherein the third message further comprises information for deriving a fourth key.
49. The apparatus of claim 29, wherein:
 the first network node is an anchor base station; and
 the second network node is a serving base station.
50. The apparatus of claim 29, wherein the first network node is the same as the second network node.

51. The apparatus of claim 29, wherein the at least one processor is further configured to enter, based on an indication in the first message, a first state with no dedicated resources allocated to the apparatus.

52. The apparatus of claim 51, wherein the second message comprises a request to transition from the first state to a second state with dedicated resources allocated to the apparatus.

53. The apparatus of claim 52, wherein the second message is sent for at least one of a radio access network (RAN) notification area (RNA) update, a location report triggered RAN paging procedure, an uplink data transmission, or a subsequent downlink data transmission.

54. The apparatus of claim 52, wherein the at least one processor is further configured to:

exit the first state after sending the second message; and

reenter, based on one of the indications in the third message, the first state after receiving the third message.

55. The apparatus of claim 29, wherein the at least one processor is configured to perform the blind detection procedure by at least one of:

detecting whether the third key is the first key;

detecting whether the third key is the second key;

detecting whether one or more parameters for deriving the third key are associated with the first network node; or

detecting whether the one or more parameters are associated with the second network node.

56. The apparatus of claim 29, wherein the at least one processor is further configured to determine after the blind detection procedure that:

the third key is the second key and the one or more parameters are associated with the first network node; or

the third key is the first key and the one or more parameters are associated with the first network node.

57. An apparatus for wireless communications, comprising:

means for receiving, from a first network node, a first message integrity protected with a first integrity protection key and encrypted with a first encryption key, wherein the first integrity protection key and the first encryption key are derived from a first key, and the first message comprises information for deriving a second key;

means for transmitting, to a second network node, a second message integrity protected with the first integrity protection key;

means for receiving, from the second network node, a third message comprising one or more indications;

means for determining a third key based in part on at least one of the one or more indications in the third message or a blind detection procedure; and

means for processing the third message based on the third key.

58. A method for wireless communications by an anchor base station, comprising:

transmitting, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;

determining, during a context retrieval procedure with another base station, a third key for encrypting communications between the UE and the other base station; and

transmitting a second message encrypted with the second key, the second message comprising an indication of the third key.

59. The method of claim 58, wherein the context retrieval procedure comprises:

receiving, from the other base station, a third message comprising information derived from the first key, the third message comprising a request for a context of the UE; and

transmitting the second message to the other base station in response to the third message.

60. The method of claim 58, wherein the second message comprises a radio resource control (RRC) release message.

61. The method of claim 58, wherein determining the third key comprises performing a horizontal key derivation.

62. The method of claim 58, wherein determining the third key comprises performing a vertical key derivation.

63. The method of claim 58, wherein the second key is derived based on one or more parameters associated with the other base station.

64. The method of claim 58, wherein the second key is derived based on one or more parameters associated with the anchor base station.

65. The method of any of claims 63-64, wherein the one or more parameters comprise at least one of an absolute radio frequency channel number (ARFCN) or a physical cell identifier (PCI).

66. The method of claim 64, wherein the second message further comprises an indication that the one or more parameters are associated with the anchor base station.

67. The method of claim 58, wherein the information for deriving the second key comprises a next hop chaining counter (NCC).

68. The method of claim 58, wherein the third key is determined during the context retrieval procedure while the UE is in a state with dedicated resources allocated to the UE.

69. The method of claim 58, further comprising determining whether to perform anchor relocation based on a third message received from the other base station.

70. The method of claim 69, wherein the third message indicates whether the UE has an uplink packet available for transmission.

71. The method of claim 58, further comprising determining whether to perform anchor relocation based on a type of radio access network (RAN) notification area (RNA) update procedure.

72. The method of claim 71, wherein the type of RNA update procedure is determined based on at least one of a radio access network notification area code (RANAC), cell identity, tracking area identity (TAI), UE configured radio access network (RAN) notification area update (RNA) list, or routing area update (RAU) timer associated with the other base station.

73. The method of claim 58, wherein the third key is determined during the context retrieval procedure with anchor non-relocation.

74. The method of claim 73, wherein the anchor non-relocation is associated with at least one of an uplink transmission in a radio resource control (RRC) resume request message, a downlink transmission in a RRC release message, a periodic radio access network (RAN) notification area (RNA) update, or a location report triggered RAN paging procedure.

75. An apparatus for wireless communication, comprising:
a transmitter configured to transmit, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first

message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;

at least one processor configured to determine, during a context retrieval procedure with another base station, a third key for encrypting communications between the UE and the other base station, wherein

the transmitter is further configured to transmit a second message encrypted with the second key, the second message comprising an indication of the third key.

76. The apparatus of claim 75, wherein in the context retrieval procedure:

the receiver is further configured to receive, from the other base station, a third message comprising information derived from the first key, the third message comprising a request for a context of the UE; and

the transmitter is further configured to transmit a second message to the other base station in response to the third message.

77. The apparatus of claim 75, wherein the second message comprises a radio resource control (RRC) release message.

78. The apparatus of claim 75, wherein the at least one processor is configured to determine the third key by performing a horizontal key derivation.

79. The apparatus of claim 75, wherein the at least one processor is configured to determine the third key by performing a vertical key derivation.

80. The apparatus of claim 75, wherein the at least one processor is configured to derive the second key based on one or more parameters associated with the other base station.

81. The apparatus of claim 75, wherein the at least one processor is configured to derive the second key based on one or more parameters associated with the apparatus.

82. The apparatus of any of claims 80-81, wherein the one or more parameters comprise at least one of an absolute radio frequency channel number (ARFCN) or a physical cell identifier (PCI).

83. The apparatus of claim 81, wherein the second message further comprises an indication that the one or more parameters are associated with the anchor base station.

84. The apparatus of claim 75, wherein the information for deriving the second key comprises a next hop chaining counter (NCC).

85. The apparatus of claim 75, wherein the at least one processor is configured to determine the third key during the context retrieval procedure while the UE is in a state with dedicated resources allocated to the UE.

86. The apparatus of claim 75, wherein the at least one processor is further configured to determine whether to perform anchor relocation based on a third message received from the other base station.

87. The apparatus of claim 86, wherein the third message indicates whether the UE has an uplink packet available for transmission.

88. The apparatus of claim 75, wherein the at least one processor is further configured to determine whether to perform anchor relocation based on a type of radio access network (RAN) notification area (RNA) update procedure.

89. The apparatus of claim 88, wherein the type of RNA update procedure is determined based on at least one of a radio access network notification area code (RANAC), cell identity, tracking area identity (TAI), UE configured radio access network (RAN) notification area update (RNA) list, or routing area update (RAU) timer associated with the other base station.

90. The apparatus of claim 75, wherein the at least one processor is configured to determine the third key during the context retrieval procedure with anchor non-relocation.

91. The apparatus of claim 90, wherein the anchor non-relocation is associated with at least one of an uplink transmission in a radio resource control (RRC) resume request message, a downlink transmission in a RRC release message, a periodic radio access network (RAN) notification area (RNA) update, or a location report triggered RAN paging procedure.

92. An apparatus for wireless communication, comprising:

means for transmitting, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;

means for determining, during a context retrieval procedure with another base station, a third key for encrypting communications between the UE and the other base station; and

means for transmitting a second message encrypted with the second key, the second message comprising an indication of the third key.

93. A method for wireless communications by an anchor base station, comprising:

transmitting, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;

after transmitting the first message and before the UE is in the state with no dedicated resources allocated to the UE, determining a third key for encrypting communications between the UE and another base station; and

transmitting a second message encrypted with the second key, the second message comprising an indication of the third key.

94. The method of claim 93, wherein the first message comprises a radio resource control (RRC) release message.
95. The method of claim 93, wherein the second message comprises a radio resource control (RRC) release message.
96. The method of claim 93, wherein determining the third key comprises performing a vertical key derivation.
97. The method of claim 93, wherein the third key is determined prior to a context retrieval procedure with the other base station.
98. The method of claim 93, further comprising:
after transmitting the second message, determining a fourth key for encrypting communications between the UE and the other base station after the UE has been triggered to enter the state with no dedicated resources allocated to the UE.
99. The method of claim 98, wherein determining the fourth key comprises performing a vertical key derivation.
100. The method of claim 98, wherein the fourth key is determined after a context retrieval procedure with the other base station.
101. An apparatus for wireless communication, comprising:
a transmitter configured to transmit, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;
at least one processor configured to determine a third key for encrypting communications between the UE and another base station, after transmitting the first

message and before the UE is in the state with no dedicated resources allocated to the UE, wherein

the transmitter is further configured to transmit a second message encrypted with the second key, the second message comprising an indication of the third key.

102. The apparatus of claim 101, wherein the first message comprises a radio resource control (RRC) release message.

103. The apparatus of claim 101, wherein the second message comprises a radio resource control (RRC) release message.

104. The apparatus of claim 101, wherein the at least one processor is configured to determine the third key by performing a vertical key derivation.

105. The apparatus of claim 101, wherein the at least one processor is configured to determine the third key prior to a context retrieval procedure with the other base station.

106. The apparatus of claim 101, wherein the at least one processor is further configured to determine a fourth key for encrypting communications between the UE and the other base station after the UE has been triggered to enter the state with no dedicated resources allocated to the UE.

107. The apparatus of claim 106, wherein the at least one processor is configured to determine the fourth key by performing a vertical key derivation.

108. The apparatus of claim 106, wherein the at least one processor is configured to determine the fourth key after a context retrieval procedure with the other base station.

109. An apparatus for wireless communication, comprising:

means for transmitting, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message

comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;

means for determining a third key for encrypting communications between the UE and another base station, after transmitting the first message and before the UE is in the state with no dedicated resources allocated to the UE; and

means for transmitting a second message encrypted with the second key, the second message comprising an indication of the third key.

110. A method for wireless communications by an anchor base station, comprising:

transmitting, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;

receiving, while the UE is in the state with dedicated resources allocated to the UE, a second message comprising information derived from the first key and a request for a context of the UE; and

transmitting, in response to the second message, a third message encrypted with the first key, the third message comprising the context of the UE.

111. The method of claim 110, wherein the third message further comprises a radio resource control (RRC) release message.

112. An apparatus for wireless communication, comprising:

a transmitter configured to transmit, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE; and

a receiver configured to receive, while the UE is in the state with dedicated resources allocated to the UE, a second message comprising information derived from the first key and a request for a context of the UE, wherein

the transmitter is further configured to transmit, in response to the second message, a third message encrypted with the first key, the third message comprising the context of the UE.

113. The apparatus of claim 112, wherein the third message further comprises a radio resource control (RRC) release message.

114. An apparatus for wireless communication, comprising:

means for transmitting, to a user equipment (UE) that is in a state with dedicated resources allocated to the UE, a first message encrypted with a first key, the first message comprising information for deriving a second key and an indication triggering the UE to enter a state with no dedicated resources allocated to the UE;

means for receiving, while the UE is in the state with dedicated resources allocated to the UE, a second message comprising information derived from the first key and a request for a context of the UE; and

means for transmitting, in response to the second message, a third message encrypted with the first key, the third message comprising the context of the UE.

115. A method for wireless communications by a serving base station, comprising:

receiving, from a user equipment (UE) that is in a state with no dedicated resources allocated to the UE, a first message requesting to resume a radio resource control (RRC) connection, the first message integrity protected with a first key;

transmitting a second message requesting a context of the UE to an anchor base station, in response to the first message;

receiving, in response to the second message, a third message encrypted with a second key, the third message comprising the context of the UE and a third key for encrypting communications between the UE and the serving base station; and

transmitting a fourth message triggering the UE to transition to the state with no dedicated resources allocated to the UE, the fourth message encrypted with the second key and including an indication of the third key.

116. The method of claim 115, wherein the fourth message further comprises one or more security key derivation parameters associated with the serving base station.

117. The method of claim 115, wherein the fourth message further comprises one or more security key derivation parameters associated with the anchor base station.

118. The method of any of claims 116-117, wherein the one or more security key derivation parameters comprise at least one of an absolute radio frequency channel number (ARFCN) or a physical cell identifier (PCI).

119. An apparatus for wireless communication, comprising:

a receiver configured to receive, from a user equipment (UE) that is in a state with no dedicated resources allocated to the UE, a first message requesting to resume a radio resource control (RRC) connection, the first message integrity protected with a first key; and

a transmitter configured to transmit a second message requesting a context of the UE to an anchor base station, in response to the first message, wherein:

the receiver is further configured to receive, in response to the second message, a third message encrypted with a second key, the third message comprising the context of the UE and a third key for encrypting communications between the UE and the serving base station; and

the transmitter is further configured to transmit a fourth message triggering the UE to transition to the state with no dedicated resources allocated to the UE, the fourth message encrypted with the second key and including an indication of the third key.

120. The apparatus of claim 119, wherein the fourth message further comprises one or more security key derivation parameters associated with the serving base station.

121. The apparatus of claim 119, wherein the fourth message further comprises one or more security key derivation parameters associated with the anchor base station.

122. The apparatus of any of claims 120-121, wherein the one or more security key derivation parameters comprise at least one of an absolute radio frequency channel number (ARFCN) or a physical cell identifier (PCI).

123. An apparatus for wireless communication, comprising:

means for receiving, from a user equipment (UE) that is in a state with no dedicated resources allocated to the UE, a first message requesting to resume a radio resource control (RRC) connection, the first message integrity protected with a first key;

means for transmitting a second message requesting a context of the UE to an anchor base station, in response to the first message;

means for receiving, in response to the second message, a third message encrypted with a second key, the third message comprising the context of the UE and a third key for encrypting communications between the UE and the serving base station; and

means for transmitting a fourth message triggering the UE to transition to the state with no dedicated resources allocated to the UE, the fourth message encrypted with the second key and including an indication of the third key.