

CLAIMS

1. A method (1900) performed by a wireless device, the method comprising:
transmitting (1910), to a network node, a request message requesting the network node
to grant the wireless device resources for transmitting a first message;
5 receiving (1920), from the network node, a grant message granting the wireless device
the resources for transmitting the first message;
determining (1930), based at least in part on content of the grant message, whether a
length of a temporary device identifier of the wireless device exceeds a limit that the network
node is capable of receiving in the first message;
10 when the temporary device identifier does not exceed the limit, transmitting (1940) the
first message to the network node, the first message comprising the temporary device identifier;
and
when the temporary device identifier does exceed the limit:
transmitting (1950) the first message to the network node, the first message
15 comprising a first portion of the temporary device identifier; and
transmitting (1960) a second message to the network node, the second message
comprising a second portion of the temporary device identifier.
2. The method of Claim 1, wherein the first message comprises a Radio Resource
20 Control (RRC) Setup Request.
3. The method of any of Claims 1-2, wherein the second message comprises an RRC
Setup Complete message.
- 25 4. The method of any of Claims 1-3, wherein the second message is transmitted in
response to receiving an RRC Setup message from the network node.
5. The method of any of Claims 1-4 wherein, prior to transmitting the first message
and the second message, the method further comprises splitting the temporary device identifier
30 into the first portion and the second portion.
6. The method of Claim 5, wherein splitting the temporary device identifier into the
first portion and the second portion is based on the determination that the length of the
temporary device identifier exceeds the limit.

7. The method of any of Claims 1-6, further comprising determining, based at least in part on information received from the network node, which portion of the temporary device identifier to include in the second message.

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8. The method of any of Claims 1-7, wherein the temporary device identifier is a Fifth Generation System Temporary Mobile Subscriber Identity (5G-S-TMSI).

9. A wireless device (110, 200, 330, 491, 492, 530) comprising:
10 a memory (130, 215, 390-1, 390-2) configured to store instructions; and
processing circuitry (120, 201, 360, 538) configured to execute the instructions;
wherein the wireless device is configured to:

transmit, to a network node, a request message requesting the network node to
grant the wireless device resources for transmitting a first message;

15 receive, from the network node, a grant message granting the wireless device
the resources for transmitting the first message;

determine, based at least in part on content of the grant message, whether a
length of a temporary device identifier of the wireless device exceeds a limit that the network
node is capable of receiving in the first message;

20 when the temporary device identifier does not exceed the limit, transmit the first
message to the network node, the first message comprising the temporary device identifier; and

when the temporary device identifier does exceed the limit:

transmit the first message to the network node, the first message
comprising a first portion of the temporary device identifier; and

25 transmit a second message to the network node, the second message
comprising a second portion of the temporary device identifier.

10. The wireless device of Claim 9, wherein the first message comprises a Radio
Resource Control (RRC) Setup Request.

30 11. The wireless device of any of Claims 9-10, wherein the second message comprises
an RRC Setup Complete message.

12. The wireless device of any of Claims 9-11, wherein the second message is
transmitted in response to receiving an RRC Setup message from the network node.

13. The wireless device of any of Claims 9-12 wherein, prior to transmitting the first message and the second message, the wireless device is configured to split the temporary device identifier into the first portion and the second portion.

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14. The wireless device of Claim 13, wherein the wireless device is configured to split the temporary device identifier into the first portion and the second portion based on the determination that the length of the temporary device identifier exceeds the limit.

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15. The wireless device of any of Claims 9-14, wherein the wireless device is further configured to determine, based at least in part on information received from the network node, which portion of the temporary device identifier to include in the second message.

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16. The wireless device of any of Claims 9-15, wherein the temporary device identifier is a Fifth Generation System Temporary Mobile Subscriber Identity (5G-S-TMSI)

17. A computer program product comprising a non-transitory computer readable medium (130, 215, 390-1, 390-2) storing computer readable program code, the computer readable program code comprises:

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program code for transmitting, to a network node, a request message requesting the network node to grant the wireless device resources for transmitting a first message;

program code for receiving, from the network node, a grant message granting the wireless device the resources for transmitting the first message;

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program code for determining, based at least in part on content of the grant message, whether a length of a temporary device identifier of the wireless device exceeds a limit that the network node is capable of receiving in the first message;

program code for, when the temporary device identifier does not exceed the limit, transmitting the first message to the network node, the first message comprising the temporary device identifier; and

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program code for, when the temporary device identifier does exceed the limit:

transmitting the first message to the network node, the first message comprising a first portion of the temporary device identifier; and

transmitting a second message to the network node, the second message comprising a second portion of the temporary device identifier.

18. A method (2000) performed by a wireless device, the method comprising:
transmitting (2010) a first message to a network node, the first message comprising a first portion of a Fifth Generation System Temporary Mobile Subscriber Identity (5G-S-TMSI); and
5 transmitting (2020) a second message to the network node, the second message comprising a second portion of the 5G-S-TMSI.
19. The method of Claim 18, wherein the first message comprises a Radio Resource
10 Control (RRC) request.
20. The method of any of Claims 18-19, wherein the second message comprises an RRC setup complete message.
- 15 21. The method of any of Claims 18-20, wherein the second message is transmitted in response to receiving an RRC setup message from the network node.
22. The method of any of Claims 18-21, wherein, prior to transmitting the first message and the second message, the method further comprises:
20 transmitting (2030), to the network node, a request message requesting the network node to grant the wireless device resources for transmitting the first message; and
receiving (2040), from the network node, a grant message granting the wireless device the resources for transmitting the first message.
- 25 23. The method of any of Claims 18-22 wherein, prior to transmitting the first message and the second message, the method further comprises splitting (2050) the 5G-S-TMSI into the first portion and the second portion.
24. The method of Claim 23, wherein splitting the 5G-S-TMSI into the first portion
30 and the second portion is based on a determination that the length of the 5G-S-TMSI exceeds a limit that the network node is capable of receiving in the first message.

25. The method of any of Claims 18-24, further comprising determining, based at least in part on information received from the network node, which portion of the 5G-S-TMSI to include in the second message.

5 26. A wireless device (110, 200, 330, 491, 492, 530) comprising:
a memory (130, 215, 390-1, 390-2) configured to store instructions; and
processing circuitry (120, 201, 360, 538) configured to execute the instructions,
wherein the wireless device is configured to:
transmit a first message to a network node, the first message comprising a first
10 portion of a Fifth Generation System Temporary Mobile Subscriber Identity (5G-S-TMSI); and
transmit a second message to the network node, the second message comprising
a second portion of the 5G-S-TMSI.

27. The wireless device of Claim 26, wherein the first message comprises a Radio
15 Resource Control (RRC) request.

28. The wireless device of any of Claims 26-27, wherein the second message comprises an RRC setup complete message.

20 29. The wireless device of any of Claims 26-28, wherein the second message is transmitted in response to receiving an RRC setup message from the network node.

30. The wireless device of any of Claims 26-29, wherein, prior to transmitting the first message and the second message, the wireless device is configured to:
25 – transmit, to the network node, a request message requesting the network node to grant the wireless device resources for transmitting the first message; and
– receive, from the network node, a grant message granting the wireless device the resources for transmitting the first message.

30 31. The wireless device of any of Claims 26-30 wherein, prior to transmitting the first message and the second message, the wireless device is configured to split the 5G-S-TMSI into the first portion and the second portion.

32. The wireless device of Claim 31, wherein splitting the 5G-S-TMSI into the first portion and the second portion is based on a determination that the length of the 5G-S-TMSI exceeds a limit that the network node is capable of receiving in the first message.

5 33. The wireless device of any of Claims 26-32, wherein the wireless device is further configured to determine, based at least in part on information received from the network node, which portion of the 5G-S-TMSI to include in the second message.

34. A computer program product comprising a non-transitory computer readable
10 medium (130, 215, 390-1, 390-2) storing computer readable program code, the computer readable program code comprises:

program code for transmitting a first message to a network node, the first message comprising a first portion of a Fifth Generation System Temporary Mobile Subscriber Identity (5G-S-TMSI); and

15 program code for transmitting a second message to the network node, the second message comprising a second portion of the 5G-S-TMSI.

35. A method (2100) performed by a network node, the method comprising:
receiving (2110) a first message from a wireless device, the first message comprising a first portion of a Fifth Generation System Temporary Mobile Subscriber Identity (5G-S-TMSI);
5 receiving (2120) a second message from the wireless device, the second message comprising a second portion of the 5G-S-TMSI; and
obtaining (2130) the 5G-S-TMSI by reassembling the first portion of the 5G-S-TMSI and the second portion of the 5G-TMSI received from the wireless device.
- 10 36. The method of Claim 35, wherein a size of the obtained 5G-S-TMSI exceeds a limit that the network node is capable of receiving in the first message.
37. The method of any of Claims 35-36, wherein the first message comprises a Radio Resource Control (RRC) request.
- 15 38. The method of any of Claims 35-37, wherein the second message comprises an RRC setup complete message.
39. The method of any of Claims 35-38, further comprising transmitting an RRC setup
20 message to the wireless device in response to receiving the first message.
40. The method of any of Claims 35-39, wherein, prior to receiving the first message and the second message, the method further comprises:
receiving, from the wireless device, a request message requesting the network node to
25 grant the wireless device resources for transmitting the first message; and
transmitting, to the wireless device, a grant message granting the wireless device the resources for transmitting the first message.
41. The method of any of Claims 35-40, further comprising transmitting, to the
30 wireless device, information indicating which bits of the 5G-S-TMSI to include in the first portion or the second portion.
42. The method of any of Claims 35-41, further comprising transmitting, to the wireless device, an indicator that indicates a length of the first portion of the 5G-S-TMSI that the network node is capable of receiving in the first message.

43. The method of any of Claims 35-42, further comprising using the 5G-S-TMSI to identify the wireless device in a subsequent message.

5 44. A network node (160, 330, 412, 520) comprising:
a memory (180, 390-1, 390-2) configured to store instructions; and
processing circuitry (170, 360, 528) configured to execute the instructions, wherein the
network node is configured to:
receive a first message from a wireless device, the first message comprising a
10 first portion of a Fifth Generation System Temporary Mobile Subscriber Identity (5G-S-TMSI);
receive a second message from the wireless device, the second message
comprising a second portion of the 5G-S-TMSI; and
obtain the 5G-S-TMSI by reassembling the first portion of the 5G-S-TMSI and
15 the second portion of the 5G-TMSI received from the wireless device.

45. The network node of Claim 44, wherein a size of the obtained 5G-S-TMSI exceeds a limit that the network node is capable of receiving in the first message.

20 46. The network node of any of Claims 44-45, wherein the first message comprises a Radio Resource Control (RRC) request.

47. The network node of any of Claims 44-46, wherein the second message comprises an RRC setup complete message.

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48. The network node of any of Claims 44-47, wherein the network node is further configured to transmit an RRC setup message to the wireless device in response to receiving the first message.

30 49. The network node of any of Claims 44-48, wherein, prior to receiving the first message and the second message, the network node is configured to:

receive, from the wireless device, a request message requesting the network node to grant the wireless device resources for transmitting the first message; and

transmit, to the wireless device, a grant message granting the wireless device the resources for transmitting the first message.

50. The network node of any of Claims 44-49, wherein the network node is further
5 configured to transmit, to the wireless device, information indicating which bits of the 5G-S-TMSI to include in the first portion or the second portion.

51. The network node of any of Claims 44-50, wherein the network node is further
10 configured to transmit, to the wireless device, an indicator that indicates a length of the first portion of the 5G-S-TMSI that the network node is capable of receiving in the first message.

52. The network node of any of Claims 44-51, wherein the network node is further configured to use the 5G-S-TMSI to identify the wireless device in a subsequent message.

15 53. A computer program product comprising a non-transitory computer readable medium (180, 390-1, 390-2) storing computer readable program code, the computer readable program code comprises:

program code for receiving a first message from a wireless device, the first message comprising a first portion of a Fifth Generation System Temporary Mobile Subscriber Identity
20 (5G-S-TMSI);

program code for receiving a second message from the wireless device, the second message comprising a second portion of the 5G-S-TMSI; and

program code for obtaining the 5G-S-TMSI by reassembling the first portion of the 5G-S-TMSI and the second portion of the 5G-TMSI received from the wireless device.

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