CLAIMS

1. A method of wireless communications by a user equipment (UE), comprising:

communicating with and camping on a next generation node B (gNB) in a 5G new radio (NR) system;

initiating a voice call with the gNB;

receiving a 5G NR-to-long term evolution (LTE) handover command in response to initiating the voice call;

performing a handover procedure in response to the handover command;

detecting a failure in the handover procedure; and

taking one or more actions in response to detecting the failure in the handover procedure, wherein taking the one or more actions comprises: returning to camp on the gNB in the 5G NR system when the UE has not received, from the gNB, at least one of: an NR-to-LTE voice fallback indicator; or an indication of evolved packet system (EPS) or inter-radio access technology (RAT) fallback support; and attempting a handover procedure with one or more secondary LTE cells after returning to camp on the gNB.

2. The method of claim 1, wherein taking one or more actions comprises performing a cell selection or re-selection procedure to determine a new cell to camp on, wherein performing the cell selection or re-selection procedure comprises excluding the gNB from being selected based on information indicating the 5G NR system does not support voice calls; and

further comprising receiving the information in a registration accept message associated with the 5G NR system, wherein the information is received from an access management function (AMF) associated with the 5G NR system.

3. The method of claim 1, wherein taking one or more actions comprises performing a cell selection or re-selection procedure to determine a new cell to camp on, wherein performing the cell selection or re-selection procedure comprises excluding the gNB from being selected based on an NR-to-LTE voice fallback indicator received in the handover command, wherein the fallback indicator provides an indication that gNB does not support the voice call and excluding the gNB is based on the indication that the gNB does not support the voice call.

4. The method of claim 1, further comprising detecting that the handover command is received in response to the initiated voice call based on a timing relationship between when the voice call was initiated and when the handover command was received.

5. The method of claim 1, wherein taking one or more actions comprises performing an LTE cell search.

6. The method of claim 5, wherein:

the LTE cell search is performed according to a first timer; and

when the first timer expires before an LTE cell is found, taking one or more actions further comprises:

performing at least one of a WCDMA cell search or GSM cell search to handle the voice call according to a second timer; and

returning to camping on the gNB when the second timer expires before a WCDMA cell or a GSM cell is found.

7. The method of claim 6, wherein taking one or more actions further comprises:

camping on one of a WCDMA cell based on the WCDMA cell search or a GSM cell based on the GSM cell search; and

receiving an indication of a Session Transfer Number for Single Radio Voice Call Continuity (STN-SR) for handling the voice call in at least one of: a registration accept message received from the 5G NR system; a SIP message; or configuration information stored in the UE; and using the STN-SR to handle the voice call in a circuit switched domain.

~~a registration accept message received from the 5G NR system;~~

~~a SIP message; or~~

~~configuration information stored in the UE; and~~

~~using the STN-SR to handle the voice call in a circuit switched domain.~~

~~8. The method of claim 1, wherein taking one or more actions comprises returning to camp on the gNB in the 5G NR system when the handover command does not include an NR-to-LTE voice fallback indicator.~~

~~9.~~ 8. The method of claim 1, wherein the initiated voice call is one of a mobile originating voice call or a mobile terminating voice call.

~~10.~~ 9. The method of claim 1, wherein ~~taking one or more actions comprises one of:~~

~~returning to camp on the gNB in the 5G new radio (NR) system when the 5G NR system does not indicate EPS/Inter-RAT fallback support in a registration accept message; or~~

~~returning to camp on the gNB in the 5G new radio (NR) system when the 5G NR system does not include an NR-to-LTE voice fallback indicator or an indication of EPS/Inter-RAT fallback support; and~~

~~attempting a handover procedure with one or more secondary LTE cells.~~

~~11. The method of claim 1, wherein:~~

: the handover command comprises a handover command, a re-direction command, or any other command directing the UE from NR to LTE.

~~12.~~ 10. An apparatus for wireless communications by a user equipment (UE), comprising:

at least one processor configured to:

communicate with and camping on a next generation node B (gNB) in a 5G new radio (NR) system;

initiate a voice call with the gNB;

receive a 5G NR-to-long term evolution (LTE) handover command in response to initiating the voice call;

perform a handover procedure in response to the handover command;

detect a failure in the handover procedure; and

take one or more actions in response to detecting the failure in the handover procedure, wherein: in order to take the one or more action, the at least one processor is further configured to: return to camp on the gNB in the 5G NR system when the UE has not received, from the gNB, at least one of: an NR-to-LTE voice fallback indicator; or an indication of evolved packet system (EPS) or inter-radio access technology (RAT) fallback support; and

attempt a handover procedure with one or more secondary LTE cells after returning to camp on the gNB; and a memory coupled with the at least one processor.

~~13.~~ 11. The apparatus of claim ~~12~~10, wherein ~~the at least one processor is further configured~~: in order to~~:~~

take the one or more actions ~~by performing~~, the at least one processor is further configured perform a cell selection or re-selection procedure to determine a new cell to camp on~~,~~ ~~wherein performing~~; in order to perform the cell selection or re-selection procedure ~~comprises excluding~~, the at least one processor is further configured to exclude the gNB from

being selected based on information indicating the 5G NR system does not support voice calls; and the at least one processor is configured to receive the information in a registration accept message from an access management function (AMF) associated with the 5G NR system.

receive the information in a registration accept message associated with the 5G NR system, wherein the information is received from an access management function (AMF) associated with the 5G NR system. .

14. 12. The apparatus of claim 1210, wherein:

the at least one processor is further configured in order to take the one or more actions by performing, the at least one processor is further configured perform a cell selection or re-selection procedure to determine a new cell to camp on;

performing in order to perform the cell selection or re-selection procedure comprises excluding, the at least one processor is further configured to exclude the gNB from being selected based on an NR-to-LTE voice fallback indicator received in the handover command; andthe fallback indicator provides an indication that gNB does not support the voice call; and the at least one processor is configured to exclude the gNB based on the indication that the gNB does not support the voice call.

the fallback indicator provides an indication that gNB does not support the voice call and excluding the gNB is based on the indication that the gNB does not support he voice call.

15. 13. The apparatus of claim 1210, wherein the at least one processor is further configured to detect that the handover command is received in response to the initiated voice call based on a timing relationship between when the voice call was initiated and when the handover command was received.

16. 14. The apparatus of claim 1210, wherein, in order to perform the one or more actions, the at least one processor is further configured to take the one or more actions by performingperform an LTE cell search.

17. 15. The apparatus of claim 1614, wherein:

the at least one processor is further configured to perform the LTE cell search according to a first timer; and

when the first timer expires before an LTE cell is found, in order to perform the one or more actions, the at least one processor is further configured to take one or more actions further by:

performing: perform at least one of a WCDMA cell search or GSM cell search to handle the voice call according to a second timer; and return to camping on the gNB when the second timer expires before a WCDMA cell or a GSM cell is found.

returning to camping on the gNB when the second timer expires before a WCDMA cell or a GSM cell is found.

18. 16. The apparatus of claim 17 15, wherein, in order to perform the one or more actions, the at least one processor is further configured to take the one or more actions by:

camping: camp on one of a WCDMA cell based on the WCDMA cell search or a GSM cell based on the GSM cell search; and

receiving receive an indication of a Session Transfer Number for Single Radio Voice Call Continuity (STN-SR) for handling the voice call in at least one of: a registration accept message received from the 5G NR system; a SIP message; or configuration information stored in the UE; and use the STN-SR to handle the voice call in a circuit switched domain.

a registration accept message received from the 5G NR system;

a SIP message; or

configuration information stored in the UE

using the STN-SR to handle the voice call in a circuit switched domain.

19. The apparatus of claim 12, wherein the at least one processor is further configured to take the one or more actions by returning to camp on the gNB in the 5G NR system when the handover command does not include an NR-to-LTE voice fallback indicator.

20. The apparatus of claim 12 17. The apparatus of claim 10, wherein the initiated voice call is one of a mobile originating voice call or a mobile terminating voice call.

21. 18. The apparatus of claim 12 10, wherein the at least one processor is further configured to take the one or more actions by one of:

returning to camp on the gNB in the 5G new radio (NR) system when the 5G NR system does not indicate EPS/Inter-RAT fallback support in a registration accept message; or

returning to camp on the gNB in the 5G new radio (NR) system when the 5G NR system does not include an NR-to-LTE voice fallback indicator or an indication of EPS/Inter-RAT fallback support; and

attempting a handover procedure with one or more secondary LTE cells.

~~22. The apparatus of claim 12, wherein:~~

: the handover command comprises a handover command, a re-direction command, or any other command directing the UE from NR to LTE.

~~23.~~ 19. A method for wireless communication by a base station, comprising:

communicating with a user equipment (UE) in a 5G new radio (NR) system;

initiating a voice call with the UE; ~~and~~

transmitting a 5G NR-to-long term evolution (LTE) handover command in response to initiating the voice call; reestablishing communication with the UE, after a handover procedure based on the handover command fails, if the base station has not transmitted, to the UE, at least one of: an NR-to-LTE voice fallback indicator; or an indication of evolved packet system (EPS) or inter-radio access technology (RAT) fallback support; and attempting to handover the UE to one or more secondary LTE cells after the handover procedure fails and the communication with the UE is reestablished.

~~24.~~ 20. The method of claim ~~23~~19, further comprising including an NR-to-LTE voice fallback indicator in the handover command, wherein the fallback indicator provides an indication that base station does not support the voice call.

~~25. The method of claim 23, further comprising deciding not to include an NR-to-LTE voice fallback indicator in the handover command, requiring the UE to return to camping on the base station if a handover procedure associated with the handover command fails.~~

~~26. The method of claim 23~~21. The method of claim 19, wherein the handover command comprises a handover command, a re-direction command, or any other command directing the UE from NR to LTE.

~~27.~~ 22. An apparatus for wireless communication by a base station, comprising:

at least one processor configured to:

communicate with a user equipment (UE) in a 5G new radio (NR) system;

initiate a voice call with the UE; and

transmit a 5G NR-to-long term evolution (LTE) handover command in response to initiating the voice call; ~~and~~

reestablish communication with the UE, after a handover procedure based on the handover command fails, if the base station has not transmitted, to the UE, at least one of: an NR-to-

LTE voice fallback indicator; or an indication of evolved packet system (EPS) or inter-radio access technology (RAT) fallback support; and attempt to handover the UE to one or more secondary LTE cells after the handover procedure fails and the communication with the UE is reestablished; and a memory coupled with the at least one processor.

~~28.~~ 23. The apparatus of claim ~~27~~22, wherein the at least one processor is further configured to include an NR-to-LTE voice fallback indicator in the handover command, wherein the fallback indicator provides an indication that base station does not support the voice call.

~~29. The apparatus of claim 27, wherein the at least one processor is further configured to decide not to include an NR-to-LTE voice fallback indicator in the handover command, requiring the UE to return to camping on the base station if a handover procedure associated with the handover command fails.~~

~~30. The apparatus of claim 27~~24. The apparatus of claim 22, wherein the handover command comprises a handover command, a re-direction command, or any other command directing the UE from NR to LTE.