is UTRAN (3G radio). Other examples of communication systems are the long-term evolution (LTE) of the Universal Mobile Telecommunications System (UMTS) radio-access technology and so-called 5G or New Radio (NR) networks. Standardization of 5G or New Radio networks is currently under discussion. LTE is being standardized by the 3rd Generation Partnership Project (3GPP).

Summary

According to a first aspect, there is provided a method comprising: detecting a cell at a ~~device~~ user equipment associated with a first public land mobile network of a plurality of public land mobile networks supported ~~,~~by the ~~a~~ cell; receiving, at the user equipment for each of a plurality of public land mobile networks supported by the cell, an indication as to whether ~~or not~~ the cell is available for standalone access for a corresponding one of the ~~that~~ public land mobile networks, wherein the indication comprises an absence of a tracking area code for the corresponding public land mobile network for which the cell is not available for standalone access; and determining, at the user equipment and based on the absence of the tracking area code ~~in dependence upon the indications and based on~~ for the first public land mobile network, ~~whether to request~~ that standalone access ~~of the cell~~is not available for the first public land mobile network.

In some embodiments, the cell is available for standalone access for some of the plurality of public land mobile networks; and the cell is unavailable for standalone access for some of the plurality of public land mobile networks.

In some embodiments, the method comprises, if the indications indicate that the cell is available for standalone access for the first public land mobile network, requesting standalone access for the cell.

In some embodiments, at least prior to requesting standalone access for the cell, the device is in IDLE mode.

In some embodiments, the method comprises, if the indications indicate that the cell is unavailable for standalone access for the first public land mobile network, accessing the cell in dual connectivity mode.

In embodiment, the method comprises receiving from the base station, a system information block comprising the indications as to whether or not the cell is available for standalone access for the plurality of public land mobile networks.

In some embodiments, wherein for at least one of the plurality of public land mobile networks, the indication comprises a presence or absence of a tracking area code.

In some embodiments, wherein for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in a field of tracking area code information.

In some embodiments, wherein, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in cell access related information.

According to a second aspect, there is provided a method comprising: for each of a plurality of public land mobile networks supported by a cell, causing a transmission, from a base station to a device, of an indication as to whether ~~or not~~ the cell is available for standalone access for a corresponding one of ~~that~~ the public land mobile networks, wherein the indication comprises an absence of a tracking area code for the corresponding public land mobile network.

In some embodiments, wherein the cell is available for standalone access for some of the plurality of public land mobile networks; and the cell is unavailable for standalone access for some of the plurality of public land mobile networks.

In some embodiments, the method comprises, if the indication indicates that the cell is available for standalone access for a first public land mobile network supported by the device, receiving a request for standalone access for the cell from the device.

In some embodiments, the method comprises if the indication indicates that the cell is unavailable for standalone access for a first public land mobile network supported by the device, receiving a request for non-standalone access of the cell from the device.

In some embodiments, the method comprises causing the transmission to the device of a system information block comprising the indications as to whether or not the cell is available for standalone access for the plurality of public land mobile networks.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a presence or absence of a tracking area code.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in a field of tracking area code information.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in cell access related information.

According to a third aspect, there is provided a non-transitory computer readable medium ~~program comprising~~ having instructions embodied thereon such that when the ~~computer program is~~ instructions are executed on a computing device ~~provides a method~~, the computing device is arranged to perform the ~~steps~~ method of ~~either~~ the first aspect or the second aspect.

According to a fourth aspect, there is provided an apparatus comprising: at least one processor and at least one memory including a computer program code, the at least one memory and the computer

program code configured to, with the at least one processor, cause the apparatus at least to: detect a cell at a ~~device~~ user equipment associated with a first public land mobile network of a plurality of public land mobile networks supported ~~,~~ by ~~a~~the cell; receive, at the user equipment for each of a plurality of public land mobile networks supported by the cell, an indication as to whether ~~or not~~ the cell is

available for standalone access for a corresponding one of ~~that~~ the public land mobile networks, wherein the indication comprises an absence of a tracking area code for the corresponding public land mobile network for which the cell is not available for standalone access; and determine, at the user equipment ~~in dependence upon the indications~~ and based on the absence of the tracking code for first public land mobile network, ~~whether to request~~that standalone access ~~of the cell~~is not available for the first public land mobile network.

In some embodiments, the cell is available for standalone access for some of the plurality of public land mobile networks; and the cell is unavailable for standalone access for some of the plurality of public land mobile networks.

In some embodiments, the apparatus is configured to, if the indications indicate that the cell is available for standalone access for the first public land mobile network, request standalone access for the cell.

In some embodiments, at least prior to requesting standalone access for the cell, the device is in IDLE mode.

In some embodiments, the apparatus is configured to, if the indications indicate that the cell is unavailable for standalone access for the first public land mobile network, access the cell in dual connectivity mode.

In some embodiments, the apparatus is configured to receive from the base station, a system information block comprising the indications as to whether or not the cell is available for standalone access for the plurality of public land mobile networks.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a presence or absence of a tracking area code.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in a field of tracking area code information.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in cell access related information.

According to a fifth aspect, there is provided an apparatus comprising: at least one processor and at least one memory including a computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus at least to: for each

of a plurality of public land mobile networks supported by a cell, cause a transmission, from a base station to a device, of an indication as to whether ~~or not~~ the cell is available for standalone access for a corresponding one of ~~that~~ the public land mobile networks, wherein the indication comprises an absence of a tracking area code for the corresponding public land mobile network.

In some embodiments, the cell is available for standalone access for some of the plurality of public land mobile networks; and the cell is unavailable for standalone access for some of the plurality of public land mobile networks.

In some embodiments, the apparatus is configured to, if the indication indicates that the cell is available for standalone access for a first public land mobile network supported by the device, receive a request for standalone access for the cell from the device.

In some embodiments, the apparatus configured to, if the indication indicates that the cell is unavailable for standalone access for a first public land mobile network supported by the device, receive a request for non-standalone access of the cell from the device.

In some embodiments, the apparatus is configured to cause the transmission to the device of a system information block comprising the indications as to whether or not the cell is available for standalone access for the plurality of public land mobile networks.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a presence or absence of a tracking area code.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in a field of tracking area code information.

In some embodiments, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in cell access related information.

According to a sixth ~~aspect~~ example, there is provided an apparatus comprising: means for detecting at a device associated with a first public land mobile network, a cell; means for receiving, for each of a plurality of public land mobile networks supported by the cell, an indication as to whether or not the cell is available for standalone access for that public land mobile network; and means for determining, in dependence upon the indications and based on the first public land mobile network, whether to request standalone access of the cell.

According to a seventh ~~aspect~~ example, there is provided an apparatus comprising: means for, for each of a plurality of public land mobile networks supported by a cell, causing a transmission to a device of an indication as to whether or not the cell is available for standalone access of that public land mobile network.

Claims

1. A method comprising:

detecting ~~(S710)~~ a cell at a user equipment ~~(510)~~ associated with a first public land mobile network of a plurality of public land mobile networks supported by the cell;

receiving ~~(S720)~~, at the user equipment ~~(510)~~ for each of the plurality of public land mobile networks supported by the cell, an indication as to whether the cell is available for standalone access for a corresponding one of the public land mobile networks, wherein the indication comprises an ~~presence or~~ absence of a tracking area code for the corresponding public land mobile network for which the cell is not available for standalone access; and

determining ~~(S730)~~, at the user equipment ~~(510)~~ and based on the absence of the tracking area code ~~indication~~ for the first public land mobile network, ~~whether to request~~ that standalone access ~~to the cell~~is not available for the first public land mobile network.

2. ~~A~~ The method as claimed in claim 1, wherein the cell is available for standalone access for ~~some~~ one or more public land mobile networks of the plurality of public land mobile networks~~;~~, and wherein the cell is unavailable for standalone access for one more other public land mobile networks ~~some~~ of the plurality of public land mobile networks.

3. ~~A~~The method as claimed in ~~any preceding~~ claim 1 or 2, comprising, if the indication~~s~~ indicates that the cell is available for standalone access for the first public land mobile network, requesting ~~(S740)~~ standalone access for the cell.

4. ~~A~~The method as claimed in claim 3, wherein at least prior to requesting standalone access for the cell, the user equipment is in IDLE mode.

5. ~~A~~The method as claimed in ~~any preceding~~ claim 1, comprising, if the indication~~s~~ indicates that the cell is unavailable for standalone access for the first public land mobile network, accessing, ~~(S760)~~by the user equipment, the cell when the user equipment is configured to operate in dual connectivity mode.

6. ~~A~~The method as claimed in any one of ~~preceding~~ claims 1 to 5, comprising receiving, by the user equipment, from ~~the~~a base station, a system information block comprising the indication~~s~~ as to whether the cell is available for standalone access for the plurality of public land mobile networks.

7. ~~A~~The method as claimed in any one of ~~preceding~~ claims 1 to 6, wherein for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in a field of tracking area code information.

8. ~~A~~The method as claimed in any ~~preceding~~ one of claims 1 to 7, wherein, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in cell access related information.

9. A method comprising:

for each of a plurality of public land mobile networks supported by a cell, causing a transmission ~~(S810)~~, from a base station ~~(620)~~ to a device, of an indication as to whether the cell is available for standalone access for a corresponding one of the public land mobile networks, wherein the indication comprises an ~~presence or~~ absence of a tracking area code for the corresponding public land mobile network.

10. ~~A~~ The method as claimed in claim 9, comprising, if the indication indicates that the cell is available for standalone access for a first public land mobile network supported by the device, receiving ~~(S830)~~ a request for standalone access to the cell from the device.

11. ~~A~~The method as claimed in ~~any of~~ claim~~s~~ 9 ~~to 10~~, comprising, if the indication indicates that the cell is unavailable for standalone access for a first public land mobile network supported by the device, receiving a request for non-standalone access to the cell from the device.

12. ~~A~~The method as claimed in any one of claims 9 to 11, comprising causing the transmission to the device of a system information block comprising the indication~~s~~ as to whether the cell is available for standalone access for the plurality of public land mobile networks.

13. A non-transitory computer readable medium ~~program comprising~~ having instructions embodied thereon such that when the ~~computer program is~~ instructions are executed on a computing device ~~provides a method~~, the computing device is arranged to perform the ~~steps~~ method of any one of claims 1 to 1~~3~~2.

14. An apparatus ~~for a user equipment (610), the apparatus~~ comprising:

at least one processor and at least one memory including a computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus at least to:

detect ~~(S710)~~ a cell at a user equipment ~~(510)~~ associated with a first public land mobile network of a plurality of public land mobile networks supported by the cell;

receive ~~(S720)~~, at the user equipment ~~(510)~~ for each of the plurality of public land mobile networks supported by the cell, an indication as to whether the cell is available for standalone access for a corresponding one of the public land mobile networks, wherein the indication comprises an ~~presence or~~ absence of a tracking area code for the corresponding public land mobile network for which the cell is not available for standalone access; and

determine ~~(S730)~~, at the user equipment ~~(510)~~ and based on the ~~indication~~ absence of the tracking area code for the first public land mobile network, ~~whether to request~~ that standalone access ~~to the cell~~is not available for the first public land mobile network.

15. ~~An~~ The apparatus as claimed in claim 14, wherein the cell is available for standalone access for ~~some~~ one or more public land mobile networks of the plurality of public land mobile networks~~,~~; and wherein the cell is unavailable for standalone access for ~~some~~ one or more other public land mobile networks of the plurality of public land mobile networks.

16. ~~An~~ The apparatus as claimed in claim 14 or ~~claim~~ 15, configured to, if the indication~~s~~ indicate~~s~~ that the cell is available for standalone access for the first public land mobile network, request ~~(S740)~~ standalone access to the cell.

17. ~~An~~ The apparatus as claimed in any one of claims 14 to 16, wherein at least prior to requesting standalone access for the cell, the user equipment is in IDLE mode.

18. ~~An~~ The apparatus as claimed in ~~any of~~ claim~~s~~ 14 ~~to 17~~, configured to, if the indication~~s~~ indicate~~s~~ that the cell is unavailable for standalone access for the first public land mobile network, access ~~(S760)~~ the cell when the apparatus is configured to operate in dual connectivity mode.

19. ~~An~~ The apparatus as claimed in any one of claims 14 to 18, configured to receive from ~~the~~ a base station, a system information block comprising the indication~~s~~ as to whether the cell is available for standalone access for the plurality of public land mobile networks.

20. ~~An~~ The apparatus as claimed in any one of claims 14 to 19, wherein, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in a field of tracking area code information.

21. ~~An~~ The apparatus as claimed in any one of claims 14 to 20, wherein, for at least one of the plurality of public land mobile networks, the indication comprises a binary indicator in cell access related information.

22. An apparatus comprising:

at least one processor and at least one memory including a computer program code, the at least one memory and the computer program code configured to, with the at least one processor, cause the apparatus at least to:

for each of a plurality of public land mobile networks supported by a cell, cause a transmission ~~(S810)~~, from a base station ~~(620)~~ to a device, of an indication as to whether the cell is available for standalone access for a corresponding one of the public land mobile networks, wherein the indication comprises an ~~presence or~~ absence of a tracking area code for the corresponding public land mobile network.

23. ~~An~~ The apparatus as claimed in claim 22, configured to, if the indication indicates that the cell is available for standalone access for a first public land mobile network supported by the device, receive ~~(S830)~~ a request for standalone access to the cell from the device.

24. ~~An~~ The apparatus as claimed in ~~either of~~ claim 22 ~~or claim 23~~, configured to, if the indication indicates that the cell is unavailable for standalone access for a first public land mobile network supported by the device, receive a request for non-standalone access to the cell from the device.

25. An apparatus as claimed in any one of claims 22 to 24, configured to cause the transmission to the device of a system information block comprising the indication~~s~~ as to whether the cell is available for standalone access for the plurality of public land mobile networks.