METHOD AND APPARATUS FOR MANUALLY SELECTING A NETWORK

TECHNICAL FIELD

The present disclosure relates to an apparatus, a method, and a computer program and in particular but not exclusively for an apparatus, methods and computer programs for manually selecting a network.

BACKGROUND

A communication system can be seen as a facility that enables communication sessions between two or more entities such as communication devices, base stations/access points and/or other nodes by providing carriers between the various entities involved in the communications path. A communication system can be provided for example by means of a communication network and one or more compatible communications devices.

Access to the communication system may be via an appropriate communications device or terminal. A communications device is provided with an appropriate signal receiving and transmitting apparatus for enabling communications, for example enabling access to a communication network or communications directly with other communications device. The communications device may access a carrier provided by a station or access point, and transmit and/or receive communications on the carrier.

The communication system and associated devices typically operate in accordance with a given standard or specification which sets out what the various entities associated with the system are permitted to do and how that should be achieved.

~~STATEMENT OF INVENTION~~SUMMARY

In a first aspect, the present disclosure refers to a method comprising determining, by a user equipment, that a non-closed access group cell is available to the user equipment in a public land mobile network, wherein the public land mobile network is identified by a public land mobile network identity and the user equipment is only allowed to access the public land mobile network via one or more closed access group cells; displaying, on the user equipment, the public land mobile network identity for user selection, wherein the displayed public land mobile network identity is associated with an indication that the user equipment is only allowed to access the public land mobile network identified by the public land mobile network identity via one or more closed access group cells; receiving a user selection of the public land mobile network identity; and based on the received user selection, transmitting a registration request to the public land mobile network identified by the selected public land mobile network identity.

According to an ~~aspect~~example, there is provided a method comprising determining, by a user equipment, that a non-closed access group cell is available to the user equipment in a public land mobile network, wherein the public land mobile network is identified by a public land mobile network identity and the user equipment is only allowed to access the public land mobile network via one or more closed access group cells; displaying the public land mobile network identity to a user; receiving user input selecting the public land mobile network identity; and transmitting a registration request to the public land mobile network identified by the public land mobile network identity.

The public land mobile network identity may be stored in a list comprising one or more public land mobile network identities, wherein for each public land mobile network identity there is an associated zero or more closed access group identities which the user equipment

is allowed to use in the public land mobile network identified by the public land mobile network identity.

For each public land mobile network identity, there may be an indication that the user equipment is only allowed to access a 5G system via closed access group cells.

The displayed public land mobile network identity may be associated with an indication that a user equipment is only allowed to access the public land mobile network identified by the public land mobile network identity via one or more closed access group cells.

The method may comprise receiving a registration accept message; and deleting the indication that the user equipment is only allowed to access a 5G system via closed access group cells for the public land mobile network identified by the public land mobile network identity.

The method may comprise receiving a registration reject message; and retaining the indication that the user equipment is only allowed to access 5G system via closed access group cells.

Displaying the public land mobile network identity may comprise displaying the public land mobile network identity associated with a list of one or more closed access group identities, wherein there exists a closed access group cell available to a user equipment in the public land mobile network identified by the public land mobile network identity, and wherein for each of the closed access group identities, it is indicated whether the user equipment is allowed for the closed access group identity.

The list comprising the one or more closed access group identities may include a closed access group identity field, which is either populated with a respective closed access group identity if the entry has a closed access group identity, or is populated with an entry indicating a null closed access group identity if the entry does not have a closed access group identity.

The method may comprise displaying the public land mobile network identity without a list of one or more closed access group identities in addition to the public land mobile network identity displayed with a list of one or more closed access group identities.

In a second aspect, the present disclosure refers to an apparatus comprising at least one processor; and at least one memory including computer program code, the at least one memory and computer program code configured to, with the at least one processor, cause the apparatus to perform: determining that a non-closed access group cell is available to the apparatus in a public land mobile network, wherein the public land mobile network is identified by a public land mobile network identity and the user equipment is only allowed to access the public land mobile network via one or more closed

access group cells; displaying the public land mobile network identity for user selection, wherein the displayed public land mobile network identity is associated with an indication that the user equipment is only allowed to access the public land mobile network identified by the public land mobile network identity via one or more closed access group cells; receiving a user selection of the public land mobile network identity; and based on the received user selection, transmitting a registration request to the public land mobile network identified by the selected public land mobile network identity.

According to an ~~aspect~~example, there is provided an apparatus comprising means for determining that a non-closed access group cell is available to the user equipment in a public land mobile network, wherein the public land mobile network is identified by a public land mobile network identity and the user equipment is only allowed to access the public land mobile network via one or more closed access group cells; displaying the public land mobile network identity to a user; receiving user input selecting the public land mobile network

identity; and transmitting a registration request to the public land mobile network identified by the public land mobile network identity.

The public land mobile network identity may be stored in a list comprising one or more public land mobile network identities, wherein for each public land mobile network identity there is an associated zero or more closed access group identities which the user equipment is allowed to use in the public land mobile network identified by the public land mobile network identity.

For each public land mobile network identity, there may be an indication that the user equipment is only allowed to access a 5G system via closed access group cells.

The displayed public land mobile network identity may be associated with an indication that a user equipment is only allowed to access the public land mobile network identified by the public land mobile network identity via one or more closed access group cells.

The means may further configured to perform receiving a registration accept message; and deleting the indication that the user equipment is only allowed to access a 5G system via closed access group cells for the public land mobile network identified by the public land mobile network identity.

The means may further configured to perform receiving a registration reject message; and retaining the indication that the user equipment is only allowed to access 5G system via closed access group cells.

Displaying the public land mobile network identity may comprise displaying the public land mobile network identity associated with a list of one or more closed access group identities, wherein there exists a closed access group cell available to a user equipment in the public land mobile network identified by the public land mobile network identity, and wherein for each of the closed access group identities, it is indicated whether the user equipment is allowed for the closed access group identity.

The list comprising the one or more closed access group identities may include a closed access group identity field, which is either populated with a respective closed access group identity if the entry has a closed access group identity, or is populated with an entry indicating a null closed access group identity if the entry does not have a closed access group identity.

The means may further configured to perform displaying the public land mobile network identity without a list of one or more closed access group identities in addition to the public land mobile network identity displayed with a list of one or more closed access group identities

According to an ~~aspect~~example, there is provided an apparatus comprising at least one processor; and at least one memory including computer program code, the at least one memory and computer program code configured to, with the at least one processor, cause the

The apparatus may be further configured to perform: displaying the public land mobile network identity without a list of one or more closed access group identities in addition to the public land mobile network identity displayed with a list of one or more closed access group identities.

According to an ~~aspect~~example, there is provided a non-transitory computer readable storage medium comprising computer readable instructions, which when run by at least one processor, cause an apparatus to determine that a non-closed access group cell is available to the user equipment in a public land mobile network, wherein the public land mobile network is identified by a public land mobile network identity and the user equipment is only allowed to access the public land mobile network via one or more closed access group cells; display the public land mobile network identity to a user; receive user input selecting the public land mobile network identity; and transmit a registration request to the public land mobile network identified by the public land mobile network identity.

According to an ~~aspect~~example, there is provided a computer program comprising instructions for causing an apparatus to perform at least determining that a non-closed access group cell is available to the user equipment in a public land mobile network, wherein the public land mobile network is identified by a public land mobile network identity and the user equipment is only allowed to access the public land mobile network via one or more closed access group cells; displaying the public land mobile network identity to a user; receiving user input selecting the public land mobile network identity; and transmitting a registration request to the public land mobile network identified by the public land mobile network identity.

According to an ~~aspect~~example, there is provided an apparatus comprising: determining circuitry for determining that a non-closed access group cell is available to the user equipment in a public land mobile network, wherein the public land mobile network is identified by a public land mobile network identity and the user equipment is only allowed to access the public land mobile network via one or more closed access group cells;

displaying circuitry for displaying the public land mobile network identity to a user; receiving circuitry for receiving user input selecting the public land mobile network identity; and transmitting circuitry for transmitting a registration request to the public land mobile network identified by the public land mobile network identity.

In the above, many different ~~aspect~~examples have been described. It should be appreciated that further ~~aspect~~examples may be provided by the combination of any two or more of the ~~aspect~~examples described above.

Various other ~~aspect~~examples are also described in the following detailed description and in the attached claims.