

# **SLICE INFORMATION FOR CELL SELECTION OR CELL RESELECTION**

## **TECHNICAL FIELD**

This disclosure is directed generally to digital wireless communications.

## **BACKGROUND**

Mobile telecommunication technologies are moving the world toward an increasingly connected and networked society. In comparison with the existing wireless networks, next generation systems and wireless communication techniques will need to support a much wider range of use-case characteristics and provide a more complex and sophisticated range of access requirements and flexibilities.

Long-Term Evolution (LTE) is a standard for wireless communication for mobile devices and data terminals developed by 3rd Generation Partnership Project (3GPP). LTE Advanced (LTE-A) is a wireless communication standard that enhances the LTE standard. The 5th generation of wireless system, known as 5G, advances the LTE and LTE-A wireless standards and is committed to supporting higher data-rates, large number of connections, ultra-low latency, high reliability and other emerging business needs.

## **SUMMARY**

Techniques are disclosed for indicating to a communication device (e.g., user equipment (UE)) slice information with which the communication device can perform cell selection operation or cell reselection operation.

In a first aspect, the present disclosure provides a wireless communication method comprises receiving, by a communication device, a slice information that indicates a configuration associated with one or more slices; performing, by the communication device, a cell re-selection operation with a target cell that is determined by the communication device using the slice information, wherein the slice information includes: a first frequency operated by a first network device as a serving frequency; one or more second frequencies associated with at least one of the first network device or one or more second network devices; a list of one or more slice group identifiers for the first frequency and each of the one or more second frequencies, wherein each slice group indicated by the list of one or more

slice group identifiers is associated with at least one slice; and one or more reselection priority values, wherein each slice group identifier in the list of one or more slice group identifiers is associated with one reselection priority value for a frequency. In some examples, the slice information includes a first list of one or more slice identifiers of the one or more slices, and each slice identifier in the first list is associated with one or more frequencies that support a slice. In some examples, the slice information includes a second list of one or more slice group identifiers, each slice group identifier in the

second list is associated with one or more frequencies that support a slice group, and each slice group indicated by the second list is associated with at least one slice. In some examples, the slice information includes a third list of one or more access category identifiers associated with the one or more slices, and each slice identifier in the third list is associated with one or more frequencies that support an access category.

In some examples, the slice information includes: a serving frequency operated by the network device and one or more other frequencies associated with the network device or each of one or more other network devices. In some examples, the slice information includes, for the serving frequency and for each of the one or more frequencies, a first list of one or more slice identifiers of the one or more slices. In some examples, the slice information includes, for the serving frequency and for each of the one or more frequencies, a second list of one or more slice group identifiers, and each slice group indicated by the second list is associated with at least one slice. In some examples, the slice information includes, for the serving frequency and for each of the one or more frequencies, a third list of one or more access category identifiers associated with the one or more slices. In some examples, the slice information includes one or more reselection priority values, and each slice identifier in the first list or each slice group identifier in the second list or each access category identifier in the third list is associated with one reselection priority value for a frequency.

In some example, the communication device performs the cell re-selection operation by determining a plurality of reselection priority values of a plurality of frequencies and by determining the target cell associated with one frequency from the plurality of frequencies. In some example, the plurality of reselection priority values of the plurality of frequencies is determined according to a set of reselection priority values associated with the one or more slices, or one or more slice groups, or the one or more access categories. In some examples, the plurality of reselection priority values of the plurality of frequency is determined according to a number of the one or more slices, or a number of the one or more slice groups, or a number of the one or more access categories supported in each frequency. In some examples, the communication device performs the cell selection operation or the cell re-selection operation by determining that the target cell is a highest ranked cell from a plurality of cells. In some example, the communication device ranks the plurality of cells in an order

based on a cell ranking criterion upon determining that the plurality of cells are associated with a same frequency.

In some examples, the communication device ranks the plurality of cells in an order based on a cell ranking criterion upon determining that one frequency from one cell from the plurality of cells is associated with a same reselection priority value as another frequency from another cell from the plurality of cells. In some examples, the plurality of cells are associated with at least one frequency that satisfies a cell selection criterion. In some examples, the plurality of cells are from a fourth list of cells indicated in the slice information, and the plurality of cells satisfy a cell selection criterion.

An example wireless communication method comprises transmitting, by a network device to a communication device, a slice information that indicates a configuration associated with one or more slices, where the slice information includes a first list of one or more slice identifiers of the one or more slices, and where each slice identifier in the first list is associated with one or more frequencies that support a slice.

An example wireless communication method comprises transmitting, by a network device to a communication device, a slice information that indicates a configuration associated with one or more slices, where the slice information includes a second list of one or more slice group identifiers, where each slice group identifier in the second list is associated with one or more frequencies that support a slice group, and where each slice group indicated by the second list is associated with at least one slice.

An example wireless communication method comprises transmitting, by a network device to a communication device, a slice information that indicates a configuration associated with one or more slices, where the slice information includes a third list of one or more access category identifiers associated with the one or more slices, and where each access category identifier in the third list is associated with one or more frequencies that support an access category.

In a second aspect, the present disclosure provides a wireless communication method comprises transmitting, by a first network device to a communication device, a slice information that indicates a configuration associated with one or more slices, where the slice information includes: a first frequency

operated by the network device as serving frequency, one or more second frequencies associated with at least one of the first network device or one or more second network devices; a list of one or more slice group identifiers for the first frequency and each of the one or more second frequencies, wherein each slice group indicated by the list of one or more slice group identifiers is associated with at least one slice; and one or more reselection priority values, wherein each slice group identifier in the list of one or more slice group identifiers is associated with one reselection priority value for a frequency.

In a third aspect, the present disclosure provides an apparatus for wireless communication comprising a processor, configured to implement a method according to the first or second aspect.

In some examples, the slice information includes, for the serving frequency and for each of the one or more frequencies, a first list of one or more slice identifiers of the one or more slices. In some examples, the slice information includes, for the serving frequency and for each of the one or more frequencies, a second list of one or more slice group identifiers, and each slice group indicated by the second list is associated with at least one slice. In some examples, the slice information includes, for the serving frequency and for each of the one or more frequencies, a third list of one or more access category identifiers associated with the one or more slices. In some examples, the slice information includes one or more reselection priority values, and each slice identifier in the first list or each slice group identifier in the second list or each access category identifier in the third list is associated with one reselection priority value for a frequency.

In yet another exemplary aspect, the above-described methods are embodied in the form of processor-executable code and stored in a non-transitory computer-readable storage medium. The code included in the computer readable storage medium when executed by a processor, causes the processor to implement the methods described in this patent document.

In yet another example, a device that is configured or operable to perform the above-described methods is disclosed.

The above and other aspects and their implementations are described in greater detail in the drawings, the descriptions, and the claims.

## BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows an exemplary flowchart for indicating slice information for a cell selection operation or a cell re-selection operation.

FIGS. 2A-2C and 3 show exemplary flowcharts for indicating slice information.

FIG. 4 shows an exemplary block diagram of a hardware platform that may be a part of a network device or a communication device.

FIG. 5 shows an example of wireless communication including a base station (BS) and user equipment (UE) based on some implementations of the disclosed technology.

## CLAIMS

What is claimed is:

1. A wireless communication method, comprising:
  - receiving, by a communication device, a slice information that indicates a configuration associated with one or more slices;
  - performing, by the communication device, a cell re-selection operation with a target cell that is determined by the communication device using the slice information,
  - wherein the slice information includes:
    - a first frequency operated by a first network device as a serving frequency;
    - one or more second frequencies associated with at least one of the first network device or one or more second network devices;
    - a list of one or more slice group identifiers for the first frequency and each of the one or more second frequencies, wherein each slice group indicated by the list of one or more slice group identifiers is associated with at least one slice; and
    - one or more reselection priority values, wherein each slice group identifier in the list of one or more slice group identifiers is associated with one reselection priority value for a frequency.
2. The method of claim 1, wherein the performing the cell re-selection operation includes: determining a plurality of reselection priority values of a plurality of frequencies and determining, as the target cell, a cell that is associated with one frequency of the plurality of frequencies.
3. The method of claim 2, wherein the plurality of reselection priority values of the plurality of frequencies is determined according to a set of reselection priority values associated with one or more slice groups.

4. A wireless communication method, comprising:
  - transmitting, by a first network device to a communication device, a slice information that indicates a configuration associated with one or more slices, wherein the slice information includes:
    - a first frequency operated by the network device as serving frequency;
    - one or more second frequencies associated with at least one of the first network device or one or more second network devices;
    - a list of one or more slice group identifiers for the first frequency and each of the one or more second frequencies, wherein each slice group indicated by the list of one or more slice group identifiers is associated with at least one slice; and
    - one or more reselection priority values, wherein each slice group identifier in the list of one or more slice group identifiers is associated with one reselection priority value for a frequency.
5. The method of any of claims 1 and 4, wherein a cell re-selection operation is performed by determining that a target cell is a highest ranked cell from a plurality of cells.
6. The method of claim 5, wherein the plurality of cells is ranked in an order based on a cell ranking criterion upon determining that the plurality of cells is associated with a same frequency.
7. The method of claim 5, wherein the plurality of cells is ranked in an order based on a cell ranking criterion upon determining that one frequency from one cell out of the plurality of cells is associated with a same reselection priority value as another frequency from another cell out of the plurality of cells.
8. The method of claim 5, wherein the plurality of cells is associated with at least one frequency that satisfies a cell selection criterion.

9. The method of any of claims 1 and 4, wherein the slice information include a list of slice groups associated with slices supported by each frequency, and one or more of a reselection priority value or a list of cells identified by physical cell identity (PCI) included in each slice group.
10. The method of any of claims 1 and 4, wherein the slice information is indicated using a frequency information list that includes: a first item that refers to the serving frequency; a second item that refers to a first frequency in an inter-frequency carrier frequency list in system information block type 4 (SIB4) and a third item that refers to a second frequency in the inter-frequency carrier frequency list in SIB4.
11. The method of any of claims 1 and 4, wherein the one or more slice group identifiers are indicated using at least one of: radio resource control (RRC) release; slice specific frequency priority list; frequency priority; carrier frequency; absolute radio frequency channel number (ARFCN); slice information; slice identity; cell reselection priority; or cell reselection subpriority.
12. The method of any of claims 1 and 4, wherein a slice is selected based on slice priority and non-access stratum (NAS) signaling to configure.
13. An apparatus for wireless communication comprising a processor, configured to implement a method recited in one or more of claims 1 to 12.