

METHODS AND SYSTEMS FOR REFERENCE SIGNALING IN WIRELESS COMMUNICATION NETWORKS

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

Apparatuses, methods, systems, and computer readable media are disclosed. In a first aspect, a wireless communication method is disclosed. The method includes determining, by a wireless device, a plurality of physical cell identifiers of a serving cell, determining by the wireless device, a first physical cell identifier corresponding to a target element from the plurality of physical cell identifiers; and determining one or more parameters of the target element based on the first physical cell identifier, wherein the target element includes a channel or a signal., and wherein the target element is in the serving cell.

In a second aspect, the present disclosure provides an apparatus for wireless communication, comprising a memory and a processor, wherein the processor reads code from the memory and implements a method according to the first aspect.

In a third aspect, the present disclosure provides a computer readable program storage medium having code stored thereon, the code, when executed by a processor, causing the processor to implement a method according to the first aspect.

In another example, a wireless communication method includes determining, by a wireless device, a first physical cell identifier corresponding to a target element from the plurality of physical cell identifiers, and determining one or more parameters of the target element based on the first physical cell identifier, wherein the target element includes a channel or a signal.

In another example, a wireless communication method includes determining, by a wireless device, whether boundaries of radio frames corresponding to the plurality of physical cell identifiers are aligned.

In another example, a wireless communication method includes determining, by a wireless device, a bandwidth part switching delay depending on a relationship between a third physical cell identifier of a newly activated bandwidth part and a second physical cell identifier of an old bandwidth part.

In another example, a wireless communication method includes determining, by a wireless device, a time of applying a new parameter in a signaling according to a relationship between a fourth physical cell identifier of a parameter included in the signaling and a fifth physical cell identifier of an old parameter.

In another example, a wireless communication method includes determining, by a wireless device, a sixth physical cell identifier from the plurality of physical cell identifiers of the serving cell, and determining a mobility measurement result of the serving cell based on mobility measurement reference signals of the sixth physical cell identifier.

In another example, a wireless communication method includes determining, by a wireless device, a seventh physical cell identifier from the plurality of physical cell identifiers of the serving cell, and using the seventh physical cell identifier to obtain first common information.

In another example, a wireless communication method includes determining, by a wireless device, a mobility reference signal as a quasi-co-location reference signal of a target reference signal in the serving cell, wherein the mobility reference signal is associated with one of the plurality of physical cell identifiers of the serving cell.

In another example, a wireless communication method includes determining, by a wireless device, a mapping relationship between the plurality of physical cell identifiers and one or more M fourth parameters, wherein M is positive integer. The fourth parameters includes at least one of following parameter: RNTI (Radio Network Temporary Identifier); the association between RACH resources and SSB(s); the association between RACH resources and CSI-RS; common RACH resources, and system information.

In another example, a wireless communication method includes determining a mobility measurement reference signal as a quasi-co-location reference signal of a target reference signal in a serving cell.

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

CLAIMS

What is claimed is:

1. A wireless communication method, comprising:
determining, by a wireless device, a plurality of physical cell identifiers of a serving cell;
determining, by the wireless device, a first physical cell identifier corresponding to a target element from the plurality of physical cell identifiers; and
determining one or more parameters of the target element based on the first physical cell identifier,
wherein the target element includes a channel or a signal, and wherein the target element is in the serving cell.
2. The method of claim 1, wherein the target element includes at least two target elements that are in the serving cell, and each of the at least two target elements is associated with a first physical cell identifier respectively, wherein parameters of each of the at least two target elements are determined based on the first physical cell identifier associated with each of the at least two target elements respectively.
3. The method of any of claims 1-2, further comprising reporting, by the wireless device, to a second device, a maximum number of the physical cell identifiers activated for the serving cell.
4. The method of claim 1, wherein different physical cell identifiers are associated with different second elements, respectively, and wherein each of the different second elements includes at least one of a control resource set pool, a transmission configuration indicator state pool, or a bandwidth part in the serving cell.
5. The method of claim 1, wherein a medium access control element (MAC-CE) signaling activates a physical cell identifier for a second element of the serving cell, wherein the second element includes at least one of a control resource set pool, a transmission configuration indicator state pool, or a bandwidth part in the serving cell.

6. The method of claim 1, further comprising determining whether boundaries of radio frames corresponding to the plurality of physical cell identifiers are aligned.
7. The method of claim 6, wherein whether the boundaries of radio frames corresponding to the plurality of physical cell identifiers are aligned is determined based on signaling from a base station, and wherein each of the plurality of physical cell identifiers is associated with frequencies of synchronization signals respectively.
8. The method of claim 1, further comprising determining a time of applying a new parameter in a signaling according to a relationship between a fourth physical cell identifier of the new parameter and a fifth physical cell identifier of an old parameter, wherein the signaling includes at least one of a medium access control element (MAC-CE) signaling or a downlink control information (DCI) signaling.
9. The method of claim 1, further comprising:
 - determining a seventh physical cell identifier from the plurality of physical cell identifiers of the serving cell; and
 - using the seventh physical cell identifier to obtain first common information, wherein the first common information includes at least one of a physical broadcast channel (PBCH), a control resource set with a first index, a monitoring occasion of a search space with the first index, a quasi-co-location reference signal for the search space with the first index, a monitoring occasion of a common search space, time domain resources of the common search space, system messages, or random access resource parameters.
10. The method of any of claims 1-9, wherein the wireless device receives a signaling that includes a time unit offset between a physical cell identifier from the plurality of physical cell identifier and a reference physical cell identifier.
11. The method of any of claims 1-9, wherein each of the plurality of physical cell identifiers is associated with a third parameter, respectively, wherein the third parameter includes at least one of an absolute radio frequency channel number (ARFCN), or a mobility object identifier.

12. The method of claim 1, further comprising:
determining a mapping relationship between the plurality of physical cell identifiers and M fourth parameters, wherein M is positive integer, and wherein the fourth parameters include at least one of: radio network temporary identifier (RNTI); the association between RACH resources and one or more SSBs; the association between RACH resources and one or more CSI-RS; common RACH resources; or system information.
13. The method of any of claims 1-12, wherein the plurality of physical cell identifiers of the serving cell is activated at different times, and there is only one activated physical cell identifier of the serving cell at a given time.
14. An apparatus for wireless communication, comprising a memory and a processor, wherein the processor reads code from the memory and implements a method recited in any of claims 1 to 13.
15. A computer readable program storage medium having code stored thereon, the code, when executed by a processor, causing the processor to implement a method recited in any of claims 1 to 13.