# METHOD AND DEVICE FOR DETERMINING RESOURCES AND STORAGE MEDIUM

## TECHNICAL FIELD

The disclosure relates to wireless communications, and particularly to a method and device for determining resources and a storage medium.

## BACKGROUND

In a Fourth Generation mobile communication long term evolution (4G LTE) system, a user equipment (UE) always supports a system bandwidth of a carrier, and resource allocation is performed over the whole system bandwidth.

In a Fifth Generation mobile communication new radio air interface (5G NR) system, the system bandwidth of a carrier is dramatically increased (could be up to 400MHz). A UE may merely support or merely need to operate in a bandwidth much smaller than the system bandwidth. Therefore, resource allocation over the whole system bandwidth introduces a too large signaling overhead.

In order to solve this problem, a legacy 2-step resource assignment approach may be employed as follows. In a first step, a "bandwidth part (BWP)" which is smaller than the UE supporting bandwidth is indicated; and then the detailed Physical Resource Blocks (PRB) are indicated over the bandwidth part. And the bandwidth part is semi-statically configured by the base station, i.e., gNB.

The legacy approach as described above has the following deficiencies: carrier aggregation (CA) will also be supported in the 5G NR system. However, the legacy approach cannot support CA operation. For a UE also operating in a secondary component carrier (CC), since the UE only has the Radio Resource Control (RRC) connection with the primary CC, the UE's bandwidth part in the secondary CC cannot be configured. Hence the UE's resource in the secondary CC can still be allocated over the whole system bandwidth. This results in an excessive signaling overhead in resource allocation for the secondary CC.

## SUMMARY

In view of the above, embodiments of the disclosure provide a method and device for determining resources and a storage medium.

In an aspect, a method for determining resources is provided, which includes the following operation performed by a user equipment (UE): receiving a first message over a first cell, wherein the first message is used for determining M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell; wherein one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In some embodiments of the disclosure, the M first BWPs may be indicated by the first message, and the method may further include the following operation

performed by the UE: determining the M first BWPs based on the first message.

In some embodiments of the disclosure, N second BWPs may be indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the method may further include the following operation performed by the UE: receiving a second message over the first or second cell, wherein the second message indicates the M first BWPs among the N second BWPs.

In some embodiments of the disclosure, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In some embodiments of the disclosure, the first message may be conveyed by RRC signaling or system information (SI).

In some embodiments of the disclosure, the first message may further contain information about configuration in the first BWPs, the information about configuration in the first BWPs may contain at least one of the following: subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

In some embodiments of the disclosure, the method may further include the following operation performed by the UE: receiving a third message over the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell.

In some embodiments of the disclosure, the third message may be conveyed by the DCI or the MAC CE.

In some embodiments of the disclosure, the bandwidth of the second cell may be a system bandwidth.

In another aspect, a method for determining resources is provided, which includes the following operation performed by a network device: transmitting a first message to a user equipment (UE) over a first cell, wherein the first message is used for the UE to determine M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell; wherein one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In some embodiments of the disclosure, the M first BWPs may be indicated by the first message.

In some embodiments of the disclosure, N second BWPs may be indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the method may further include the following operation performed by the network device: transmitting a second message to the UE over the first or second cell, wherein the second message indicates the M first BWPs among the N second BWPs.

In some embodiments of the disclosure, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In some embodiments of the disclosure, the first message may be conveyed by RRC signaling or system information (SI).

In some embodiments of the disclosure, the first message may further contain information about configuration in the first BWPs, and the information about configuration in the first BWPs may contain at least one of the following: subcarrier

spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

In some embodiments of the disclosure, the method may further include the following operation performed by the network device: transmitting a third message over the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell.

In some embodiments of the disclosure, the third message may be conveyed by the DCI or the MAC CE.

In some embodiments of the disclosure, the bandwidth of the second cell may be a system bandwidth.

In another aspect, a device for determining resources is provided, which includes a first reception unit, configured to receive a first message over a first cell, wherein the first message is used for determining M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell; wherein one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In some embodiments of the disclosure, the M first BWPs may be indicated by the first message, and the device may further include a determination unit, configured to determine the M first BWPs based on the first message.

In some embodiments of the disclosure, N second BWPs may be indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the device may further include: a second reception unit, configured to receive a second message over the first or second cell, wherein the second message indicates the M first BWPs among the N second BWPs; and a determination unit, configured to determine the M first BWPs based on the first message and the second message.

In some embodiments of the disclosure, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In some embodiments of the disclosure, the first message may be conveyed by RRC signaling or system information (SI).

In some embodiments of the disclosure, the first message may further contain information about configuration in the first BWPs, wherein the information about configuration in the first BWPs contains at least one of the following: subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

In some embodiments of the disclosure, the device may further include a third reception unit, configured to receive a third message over the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell.

In some embodiments of the disclosure, the third message may be conveyed by the DCI or the MAC CE.

In some embodiments of the disclosure, the bandwidth of the second cell may be a system bandwidth.

In another aspect, a device for determining resources is provided, which includes a first transmission unit, configured to transmit a first message to a user

equipment (UE) over a first cell, wherein the first message is used for the UE to determine M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell; wherein one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In some embodiments of the disclosure, the M first BWPs may be indicated by the first message.

In some embodiments of the disclosure, N second BWPs may be indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the device may further include: a second transmission unit, configured to transmit a second message to the UE over the first or second cell, wherein the second message indicates the M first BWPs among the N second BWPs.

In some embodiments of the disclosure, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In some embodiments of the disclosure, the first message may be conveyed by RRC signaling or system information (SI).

In some embodiments of the disclosure, the first message may further contain information about configuration in the first BWPs, and the information about configuration in the first BWPs may contain at least one of the following: subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

In some embodiments of the disclosure, the device may further include a third transmission unit, configured to transmit a third message to the UE over the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell.

In some embodiments of the disclosure, the third message may be conveyed by the DCI or the MAC CE.

In some embodiments of the disclosure, the bandwidth of the second cell may be a system bandwidth.

In another aspect, a computer-readable storage medium is provided, which stores computer executable instructions, which, when executed by a processor, cause the processor to implement the method for determining resources.

With the legacy approach, a UE cannot be configured a bandwidth part in a carrier (called second carrier) other than the carrier (called first carrier) in which the UE has RRC connection. Due to the deficiency, the resource in the second carrier has to be allocated throughout the whole system bandwidth. However, in case that the UE supported bandwidth is substantially smaller than the system bandwidth (it is a common case for 5G), the resource allocation is very inefficient and consumes excessive signaling overhead.

In the embodiments of the disclosure, a UE receives a first message over a first cell, wherein the first message is used for determining M first BWPs in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell, where one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs. Herein, a cell may represent a carrier. This innovation designed a new approach to

configure from the one carrier the bandwidth part of another carrier. With the new approach, the problem is solved and the deficiency is improved as below:

1) By cross-carrier configuration of a bandwidth part, resource for a UE in a second carrier can be allocated over the bandwidth part with a much smaller size. It can significantly reduce the complexity and signaling overhead for resource allocation. Hence it enables a UE to perform an efficient carrier aggregation operation in an ultra-wideband system e.g. 5G.

2) Furthermore, it also supports dynamic selection of bandwidth part by the second carrier from a set of candidates pre-configured by the first carrier. This keeps the flexibility of bandwidth part configuration in case no perfect backhauling supporting dynamic signaling exchange exists between the two carriers.

## BRIEF DESCRIPTION OF DRAWINGS

In order to describe the technical solutions of the embodiments of the disclosure more clearly, the drawings required to be used in the embodiments of the disclosure will be simply introduced below. Obviously, the drawings described below are only some embodiments of the disclosure. Other drawings may further be obtained by those skilled in the art according to these drawings without creative work.

FIG. 1 illustrates a flow chart of a method for determining resources according to some embodiments of the disclosure.

FIG. 2 illustrates a flow chart of a method for determining resources according to some embodiments of the disclosure.

FIG. 3 illustrates a resource schematic view of resource determining scheme 1 with third message from second carrier, according to some embodiments of the disclosure.

FIG. 4 illustrates a resource schematic view of resource determining scheme 1 with third message from first carrier according to some embodiments of the disclosure.

FIG. 5 illustrates a resource schematic view of resource determining scheme 2 with second and third messages both from second carrier according to some embodiments of the disclosure.

FIG. 6 illustrates a resource schematic view of resource determining scheme 2 with second message from second carrier and third message from first carrier according to some embodiments of the disclosure.

FIG. 7 illustrates a resource schematic view of resource determining Scheme 2 with second message from first carrier and third message from second carrier according to some embodiments of the disclosure.

FIG. 8 illustrates a resource schematic view of resource determining Scheme 2 with second and third messages both from first carrier according to some embodiments of the disclosure.

FIG. 9 illustrates a block diagram of a device for determining resources according to some embodiments of the disclosure.

FIG. 10 illustrates a block diagram of another device for determining resources according to some embodiments of the disclosure.

FIG. 11 illustrates a block diagram of a computer device according to some embodiments of the disclosure.

## DETAILED DESCRIPTION

In order to better understand the features and technical contents of the embodiments of the disclosure, the implementations of embodiments of the disclosure will be illustrated in details in connection with the drawings. The drawings are provided merely for reference but not to limit the embodiments of the disclosure.

FIG. 1 illustrates a flow chart of a method for determining resources according to some embodiments of the disclosure. As illustrated in FIG. 1, the method for determining resources includes operations illustrated in blocks. The operations may begin from block 101.

At block 101, a UE receives a first message over a first cell. Here, the first message is used for determining M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell; and one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In the embodiments of the disclosure, the UE may be a mobile phone, a laptop, a notebook computer, a desktop computer or any device that can communicate with a network device.

In the embodiments of the disclosure, the UE may receive the first message from the network device over a first cell. Here, the network device may be a base station, e.g., a gNB in the 5G NR system.

In an implementation, the bandwidth of the second cell may be a system bandwidth.

In the embodiments of the disclosure, transmission resources in the first cell may be implemented by the first carrier, and transmission resources in the second cell may be implemented by the second carrier. In an implementation, the first cell (i.e., the first carrier) may be a main cell (i.e., a main carrier), and the second cell (i.e., the second carrier) may be an auxiliary cell (i.e., an auxiliary carrier). The UE may transmit signals in a carrier aggregation manner by using the first and/or second cells.

In the embodiments of the disclosure, the UE may determine the M first BWPs in the second cell based on the first message in the first cell, so as to transmit signals by utilizing one or more transmission resources within at least one of the M first BWPs.

In the embodiments of the disclosure, the UE may determine the M first BWPs in the second cell in the following ways.

Scheme 1: the M first BWPs are indicated by the first message, and the UE determines the M first BWPs based on the first message.

For example, 3 first BWPs, i.e., BWP1, BWP2, and BWP3 are indicated by the first message, and the UE determines BWP1, BWP2, and BWP3 based on the first message.

Scheme 2: N second BWPs are indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the UE receives a second message over the first or second cell, wherein the second message indicates the M first BWPs among the N second BWPs.

For example, six second BWPs, i.e., BWP1, BWP2, BWP3, BWP4, BWP5, and BWP6 are indicated by the first message, the second message is used to indicate three BWPs, i.e., BWP1, BWP2, and BWP3 among the six BWPs. The UE determines BWP1, BWP2, and BWP3 based on the first message and the second

message.

In an implementation, the first message may be conveyed by RRC signaling or system information (SI).

In an implementation, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In an implementation, the first message may further contain information about configuration in the first BWPs, wherein the information about configuration in the first BWPs contains at least one of the following: subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

It is to be understood that if M=1, the first message contains information about configuration in one first BWP; if M$\geqslant$2, the first message contains information about configuration in all first BWPs. In this way, the UE can determine information about configuration in the first BWPs based on the first message and perform signal transmission over the transmission resources within the first BWPs based on the information about configuration in the first BWPs.

In an implementation, the UE receives a third message over the first or second cell, where the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell. Here, the transmission resources for the UE are time-domain resources and/or frequency-domain resources for the UE, and the UE performs signal transmission within the indicated transmission resources.

In an implementation, the third message may be conveyed by the DCI or the MAC CE.

In some embodiments of the disclosure, the first message may be transmitted over the first cell, the second message may be transmitted over the first or second cell, and the third message may be transmitted over the first or second cell.

In an implementation, if the second message is transmitted over the second cell, the second message is transmitted by using the transmission resources within the first BWPs.

In an implementation, if the third message is transmitted over the second cell, the third message is transmitted by using the transmission resources within the first BWPs.

FIG. 2 illustrates a flow chart of another method for determining resources according to some embodiments of the disclosure. As illustrated in FIG. 2, the method for determining resources includes operations illustrated in blocks. The operations may begin from block 201.

At block 201, a network device transmits a first message over a first cell. Here, the first message is used for determining M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell; and one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In the embodiments of the disclosure, the UE may determine the M first BWPs in the second cell in the following ways.

Scheme 1: the M first BWPs are indicated by the first message.

In this scheme, the UE determines the M first BWPs within the second cell based on the first message.

Scheme 2: N second BWPs are indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the network device transmits a second message to the UE over

the first or second cell, where the second message indicates the M first BWPs among the N second BWPs.

In this scheme, the UE determines the M first BWPs within the second cell based on the first message and the second message.

In an implementation, the first message may be conveyed by RRC signaling or system information (SI).

In an implementation, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In an implementation, the first message may further contain information about configuration in the first BWPs, wherein the information about configuration in the first BWPs contains at least one of the following: subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

In an implementation, the network device transmits a third message over the first or second cell, where the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell.

In an implementation, the third message may be conveyed by the DCI or the MAC CE.

In some embodiments of the disclosure, the bandwidth of the second cell is the system bandwidth.

Hereinafter, specific examples are given to further describe the embodiments of the disclosure in detail. In the following examples, $W_{UE}$ indicates the first BWP, candidate bands or candidates represents the second BWP, first carrier indicates the first cell, and second carrier indicates the second cell.

**Example 1: Scheme 1 with third message from second carrier**

As illustrated in FIG. 3, a UE receives information about one or multiple WUE (taking one $W_{UE}$ for example in FIG. 3) including its/their corresponding configurations indicated by the first message (e.g. in a RRC signaling) from the first carrier. The UE receives information about the detailed resource allocation within WUE indicated by the third message (e.g. in a DCI) from the second carrier.

**Example 2: Scheme 1 with third message from first carrier**

As illustrated in FIG. 4, a UE receives information about one or multiple WUE (taking one WUE for example in FIG. 4) including its/their corresponding configurations indicated by the first message (e.g. in a RRC signaling) from the first carrier. The UE receives information about the detailed resource allocation within WUE indicated by the third message (e.g. in a DCI) from the first carrier.

**Example 3: Scheme 2 with second and third messages both from second carrier**

As illustrated in FIG. 5, a UE receives information about multiple WUE candidates including their corresponding configurations indicated by the first message (e.g. in a RRC signaling) from the first carrier. Then the UE receives the second message over the second carrier indicating the specific selected WUE from the candidates of (candidate band 1 is selected for WUE in example in FIG. 5). The UE receives information about the detailed resource allocation within WUE indicated by the third message (e.g. in a DCI) also from the second carrier.

**Example 4: Scheme 2 with second message from second carrier and third message from first carrier**

As illustrated in FIG. 6, a UE receives information about multiple WUE candidates including their corresponding configurations indicated by the first message

(e.g. in a RRC signaling) from the first carrier. Then the UE receives the second message from the second carrier indicating the specific selected WUE from the candidates of (candidate band 1 is selected for WUE in example in FIG. 6). The UE receives information about the detailed resource allocation within WUE indicated by the third message (e.g. in a DCI) from the first carrier.

**Example 5: Scheme 2 with second message from first carrier and third message from second carrier**

As illustrated in FIG. 7, a UE receives information about multiple WUE candidates including their corresponding configurations indicated by the first message (e.g. in a RRC signaling) from the first carrier. Then the UE receives the second message from the first carrier indicating the specific selected WUE from the candidates of (candidate band 1 is selected for WUE in example in FIG. 7). The UE receives information about the detailed resource allocation within WUE indicated by the third message (e.g. in a DCI) from the second carrier.

**Example 6: Scheme 2 with second and third messages both from first carrier**

As illustrated in FIG. 8, a UE receives information about multiple WUE candidates including their corresponding configurations indicated by the first message (e.g. in a RRC signaling) from the first carrier. Then the UE receives the second message from the first carrier indicating the specific selected WUE from the candidates of (candidate band 1 is selected for WUE in example in FIG. 8). The UE receives information about the detailed resource allocation within WUE indicated by the third message (e.g. in a DCI) from the first carrier.

FIG. 9 illustrates a block diagram of a device for determining resources according to some embodiments of the disclosure. As illustrated in FIG. 9, the device for determining resources includes a first reception unit 901.

The first reception unit 901 is configured to receive a first message over a first cell, wherein the first message is used for determining M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell; one or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In an implementation, the M first BWPs may be indicated by the first message, and the device may further include a determination unit 902, configured to determine the M first BWPs based on the first message.

In an implementation, N second BWPs may be indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the device may further include a second reception unit 903 and a determination unit 902.

The second reception unit 903 may configured to receive a second message over the first or second cell, where the second message indicates the M first BWPs among the N second BWPs.

The determination unit 902 may be configured to determine the M first BWPs based on the first message and the second message.

In an implementation, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In an implementation, the first message may be conveyed by RRC signaling or system information (SI).

In an implementation, the first message may further contain information about configuration in the first BWPs, where the information about configuration in the first BWPs contains at least one of the following: subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

In an implementation, the device may further include a third reception unit 904, configured to receive a third message over the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell.

In an implementation, the third message may be conveyed by the DCI or the MAC CE.

In an implementation, the bandwidth of the second cell may be a system bandwidth.

As people of ordinary skill in the art may appreciate, functions of the units in the device for determining resources as illustrated in FIG. 9 can be understood based on the above relevant descriptions regarding the method for determining resources, and can be implemented by programs running a processor or by logical circuits. Alternatively, the first reception unit 901, the second reception unit 903 and the third reception unit 904 may be implemented by a receiver, and the determination unit 902 may be implemented by a processor.

FIG. 10 illustrates a block diagram of another device for determining resources according to some embodiments of the disclosure. As illustrated in FIG. 10, the device for determining resources includes a first transmission unit 1001.

The first transmission unit 1001 is configured to transmit a first message to a user equipment (UE) over a first cell. The first message is used for the UE to determine M first bandwidth parts (BWPs) in a second cell, M is an integer greater than or equal to 1, each of the M first BWPs is smaller than or equal to a bandwidth of the second cell. One or more transmission resources for the UE in the second cell is within at least one of the M first BWPs.

In an implementation, the M first BWPs may be indicated by the first message.

In an implementation, N second BWPs may be indicated by the first message, N is an integer greater than M, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and the device may further include: a second transmission unit 1002, configured to transmit a second message to the UE over the first or second cell, wherein the second message indicates the M first BWPs among the N second BWPs.

In an implementation, the second message may be conveyed by downlink control information (DCI) or a media access control control element (MAC CE).

In an implementation, the first message may be conveyed by RRC signaling or system information (SI).

In an implementation, the first message may further contain information about configuration in the first BWPs, and the information about configuration in the first BWPs may contain at least one of the following: subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

In some embodiments of the disclosure, the device may further include a third transmission unit 1003, configured to transmit a third message to the UE over

the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWPs of the second cell.

In some embodiments of the disclosure, the third message may be conveyed by the DCI or the MAC CE.

In some embodiments of the disclosure, the bandwidth of the second cell may be a system bandwidth.

As people of ordinary skill in the art may appreciate, functions of the units in the device for determining resources as illustrated in FIG. 10 can be understood based on the above relevant descriptions regarding the method for determining resources, and can be implemented by programs running a processor or by logical circuits. Alternatively, the first transmission unit 1001, the second transmission unit 1002 and the third transmission unit 1003 may be implemented by a transmitter.

For the devices for determining resources as described above, when being implemented in form of software function unit and sold or used as an independent product, the function may also be stored in a computer-readable storage medium. Based on such an understanding, the technical solutions of the disclosure substantially or parts making contributions to the prior art or part of the technical solutions may be embodied in form of software product, and the computer software product is stored in a storage medium, including a plurality of instructions configured to enable a piece of computer equipment (which may be a personal computer, a server, a network device or the like) to execute all or part of the operations of the method in each embodiment of the disclosure. The abovementioned storage medium includes: various media capable of storing program codes such as a U disk, a mobile hard disk, a Read-Only Memory (ROM), a Random Access Memory (RAM), a magnetic disk or an optical disk. As such, the embodiments of the disclosure are not limited to any specific combination of software and hardware.

In some embodiments of the disclosure, a computer readable storage medium is provided, storing instructions, which, when executed by a processor, cause the processor to execute the above described method for determining resources.

FIG. 11 illustrates a block diagram of a computer device according to some embodiments of the disclosure. The computer device may be a terminal, or may be a network device. As illustrated in FIG. 11, the computer device 110 may include one or more (only one is illustrated) processors 1102 (the processor 1102 may include, but is not limited to, a micro controller unit (MCU) or a programmable logic device (FPGA, Field Programmable Gate Array), etc.), a memory 1104 for storing data, and a transceiver 1106 for implementing a communication function. Persons of ordinary skill in the art should understand that the structure illustrated in FIG. 11 is merely illustrative, and does not limit the structure of the electronic device. For example, the computer device 110 may also include more or fewer components than illustrated in FIG. 11 or have a different configuration from that illustrated in FIG. 11.

The memory 1104 may be configured to store software programs and modules, such as the program instructions / modules corresponding to the methods in the embodiments of the disclosure. The processor 1102 executes various functional applications and data processing by running the software programs and modules stored in the memory 1104, that is, to implement the above methods. The memory 1104 may include high-speed random access memory, or may include non-volatile memory such as one or more magnetic storage devices, flash memory, or other non-volatile solid-state memories. In some examples, the memory 1104 may further include one or more memories remote to the processor 1102, and the memories may

be connected to the computer device 110 over a network. Examples of such a network include, but are not limited to, the Internet, intranets, local area networks, mobile communication networks, and combinations thereof.

The transceiver 1106 is configured to receive or transmit data through a network. The network may include, for example, a wireless network provided a communication provider of the computer device 110. In an example, the transceiver 1106 includes a network interface controller (NIC) which can be connected to other network devices through a base station to implement communication with the Internet. In an example, the transceiver 1106 may be a radio frequency (RF) circuit which can implement communication with the Internet wirelessly.

The embodiments of the disclosure may be combined with each other freely without confliction.

In the several embodiments provided in the application, it shall be understood that the disclosed systems, devices and methods may be realized in other modes. For example, the embodiments of the above-described devices are only exemplary, for example, the division of the units is only a logic function division, other division modes may be adopted in practice, e.g., multiple units or components may be combined or integrated in another system, or some characteristics may be omitted or be not executed. From another point of view, the displayed or discussed mutual coupling or direct coupling or communication connection may be indirect coupling or communication connection of devices or units through some interfaces, and may also be in electrical, mechanical or other forms.

The units illustrated as separate components may be or may not be physically separated, and the components displayed as units may be or may not be physical units, that is, the components may be positioned at one place or may be distributed on multiple network units. The objective of the solution of the embodiments may be fulfilled by selecting part of or all of the units according to actual needs.

In addition, in various embodiments of the disclosure, the functional units may be integrated in one processing unit, or the functional units may separately and physically exist, or two or more units may be integrated in one unit. The integrated units may be implemented by hardware or by hardware plus software functional units.

The above is only the specific implementation mode of the disclosure and not intended to limit the scope of protection of the disclosure. Any variations or replacements apparent to those skilled in the art within the technical scope disclosed by the disclosure shall fall within the scope of protection of the disclosure.

## CLAIMS

1. A method for determining resources, comprising:

receiving, by a user equipment (UE), a first message over a first cell, wherein the first message is used for determining a first bandwidth part (BWP) in a second cell, the first BWP is smaller than or equal to a bandwidth of the second cell;

wherein one or more transmission resources for the UE in the second cell is within the first BWP.

2. The method according to claim 1, wherein the first BWP is indicated by the first message, and

wherein the method further comprises:

determining, by the UE, the first BWP based on the first message.

3. The method according to claim 1, wherein N second BWPs are indicated by the first message, N is an integer greater than 1, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and

wherein the method further comprises:

receiving, by the UE, a second message over the first or second cell, wherein the second message indicates the first BWP among the N second BWPs.

4. The method according to claim 3, wherein the second message is conveyed by downlink control information (DCI) or a media access control (MAC) control element (CE).

5. The method according to any of claims 1 to 4, wherein the first message is conveyed by RRC signaling or system information (SI).

6. The method according to any of claims 1 to 5, wherein the first message further contains information about configuration in the first BWP, wherein the information about configuration in the first BWP contains at least one of the following:

subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

7. The method according to any of claims 1 to 6, further comprising:

receiving, by the UE, a third message over the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWP of the second cell.

8. The method according to claim 7, wherein the third message is conveyed by downlink control information (DCI) or a media access control(MAC) control element (CE).

9. A device for determining resources, comprising:

a first reception unit, configured to receive a first message over a first cell, wherein the first message is used for determining a first bandwidth part (BWP) in a second cell, the first BWP is smaller than or equal to a bandwidth of the second cell;

wherein one or more transmission resources for the UE in the second cell is within the first BWP.

10. The device according to claim 9, wherein the first BWP is indicated by the first message, and

wherein the device further comprises:

a determination unit, configured to determine the first BWP based on the first message.

11. The device according to claim 9, wherein N second BWPs are indicated by the first message, N is an integer greater than 1, each of the N second BWPs is smaller than or equal to the bandwidth of the second cell, and

wherein the device further comprises:

a second reception unit, configured to receive a second message over the first or second cell, wherein the second message indicates the first BWP among the N second BWPs; and

a determination unit, configured to determine the first BWP based on the first message and the second message.

12. The device according to claim 11, wherein the second message is conveyed by downlink control information (DCI) or a media access control (MAC) control element (CE).

13. The device according to any of claims 9 to 12, wherein the first message is conveyed by RRC signaling or system information (SI).

14. The device according to any of claims 9 to 13, wherein the first message further contains information about configuration in the first BWP, wherein the information about configuration in the first BWP contains at least one of the following:

subcarrier spacing (SCS); bandwidth size; frequency-domain position; time-domain structure; configurations of synchronization signal; broadcast channel; system information; or reference signal.

15. The device according to any of claims 9 to 14, further comprising:

a third reception unit, configured to receive a third message over the first or second cell, wherein the third message indicates the one or more transmission resources for the UE within the first BWP of the second cell.

16. The device according to claim 15, wherein the third message is conveyed by downlink control information (DCI) or a media access control (MAC) control element (CE).

17. A computer-readable storage medium, storing computer executable instructions, which, when executed by a processor of a device, cause the device to implement the method according to any of claims 1 to 8.

18. A processor configured in a device, wherein when computer executable instructions stored in a computer-readable storage medium are executed by the processor, cause the device to implement the method according to any of claims 1 to 8.