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(71) Applicant: LENOVO (BEIJING) LIMITED [CN/CN]; 6 Shangdi West Road, Haidian District, Beijing 100085 (CN).

(72) Inventors: SUN, Zhennian; Lenovo Hq East, Building No.1, No.10 Xibeiwang East Road, Haidian District, Beijing 100094 (CN). YU, Xiaodong; Lenovo Hq East, Building No.1, No.10 Xibeiwang East Road, Haidian District, Beijing 100094 (CN). LEI, Haipeng; Lenovo Hq East, Building No.1, No.10 Xibeiwang East Road, Haidian District, Beijing 100094 (CN). GUO, Xin; Lenovo Hq East, Building No.1, No.10 Xibeiwang East Road, Haidian District, Beijing 100094 (CN).

(74) Agent: LEE AND LI - LEAVEN IPR AGENCY LTD.; Unit 2202, Tower A, Beijing Pudi Hotel, No. 7, Jian Guo Men South Avenue, Dongcheng District, Beijing 100005 (CN).

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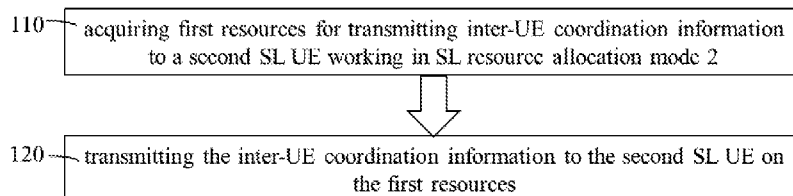


Figure 1

(57) Abstract: Disclosed are methods and apparatuses for inter-UE coordination information transmission during sidelink (SL) communication. An embodiment of the subject application provides a first SL user equipment (UE). The first SL UE includes a processor and a wireless transceiver coupled to the processor. The processor is configured to, with the wireless transceiver: acquire first resources for transmitting inter-UE coordination information to a second SL UE working in SL resource allocation mode 2, and transmit the inter-UE coordination information to the second SL UE on the first resources, wherein the first SL UE works in SL resource allocation mode 1, and the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission.



METHODS AND APPARATUSES FOR COORDINATION INFORMATION TRANSMISSION DURING SIDELINK COMMUNICATION

TECHNICAL FIELD

[0001] The present disclosure generally relates to wireless communication technologies, and especially relates to methods and apparatuses for coordination information transmission between two sidelink (SL) user equipments (UEs) during SL communication.

BACKGROUND OF THE INVENTION

[0002] Inter-UE coordination is supported for SL resource allocation Mode 2, wherein inter-UE coordination transmission may support inter-UE coordination scheme 1. The inter-UE coordination scheme 1 is defined as that: a set of resources is determined at UE-A and sent to UE-B working in SL resource allocation Mode 2; UE-B takes this information into account in the resource selection for its own SL transmission. In inter-UE coordination scheme 1, the inter-UE coordination information is a set of resources (or in other words, the inter-UE coordination information is associated with a set of resources), which is preferred and/or non-preferred for UE-B's SL transmission.

[0003] In the case that both UE-A and UE-B work in SL resource allocation Mode 2, if the inter-UE coordination is triggered by an explicit request in inter-UE coordination Scheme 1, UE-A uses a TX resource pool used for UE-B's request transmission to determine the set of resources and to transmit the set of resources to UE-B; if the inter-UE coordination is triggered by a condition in inter-UE coordination Scheme 1, UE-A transmits the inter-UE coordination information on the resources of the same resource pool where the resources contained in the inter-UE coordination information are associated.

SUMMARY

[0004] Various embodiments and methods of the present disclosure provide solutions related to inter-UE coordination information transmission in SL communication.

[0005] According to some embodiment of the present disclosure, an exemplary first SL UE is provided. The first SL UE includes: a processor and a wireless transceiver coupled to the processor, wherein the processor is configured to: acquire first resources for transmitting inter-UE coordination information to a second SL UE working in SL resource allocation mode 2; and transmit the inter-UE coordination information to the second SL UE on the first resources, wherein the first SL UE works in SL resource allocation mode 1, and the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission.

[0006] In some embodiments, in response to the fact that there is an ongoing SL transmission to the second SL UE, to acquire the first resources, the processor is further configured to multiplex SL shared channel (SCH) resources allocated for the ongoing SL transmission to construct the first resources.

[0007] In some embodiments, to acquire the first resources, the processor is further configured to acquire the first resources in a first resource pool of SL resource allocation mode 1.

[0008] In some embodiments, to acquire the first resources in the first resource pool of SL resource allocation mode 1, the processor is further configured to: transmit a scheduling request (SR) to a base station (BS) requiring resource allocation, and receive the first resources granted by the BS.

[0009] In some embodiments, the first SL UE is configured with multiple SRs, each SR is associated with a priority; to transmit the SR, the processor is further configured to select the SR from the multiple SRs according to an associated priority of the inter-UE coordination information.

[0010] In some embodiments, the SL UE is configured with multiple SR, each SR is associated with a time window; to transmit the SR, the processor is further configured to select the SR from the multiple SRs according to a time boundary indicated by the second SL UE, or determined by the first SL UE, or predefined.

[0011] In some embodiments, the processor is further configured to indicate a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information or to indicate the first resource pool via the SR, wherein the mapping between the second resource pool and first resource pool is configured.

[0012] In some embodiments, the processor is further configured to indicate a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information in response to the fact that: the transmission of the inter-UE coordination information is triggered by an explicit request from the second SL UE, and multiple processes between the first SL UE and the second SL UE are allowed simultaneously; or the transmission of the inter-UE coordination information is triggered by a condition.

[0013] In some embodiments, to indicate the second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information, the processor is further configured to indicate a resource pool identity of the second resource pool in a Sidelink Control Information (SCI) or in a Medium Access Control (MAC) control element (CE) carrying the inter-UE coordination information.

[0014] In some embodiments, the resource pool identity of the second resource pool is a resource pool index among multiple configured resource pools of SL resource allocation mode 2.

[0015] In some embodiments, to acquire the first resources, the processor is further configured to perform sensing and resource selection in a second resource pool of SL resource allocation mode 2 to determine the first resources.

[0016] In some embodiments, whether SL transmission in SL resource allocation mode 1 is prioritized over the transmission of the inter-UE coordination information if they are overlapping in time domain is predefined, configured by a BS, or determined by the first SL UE.

[0017] In some embodiments, to acquire the first resources, the processor is further configured to perform resource re-selection in the second resource pool to determine the first resources in response to the fact that: SL transmission in SL resource allocation mode 1 has a higher priority than that of the transmission of the inter-UE coordination information, or SL transmission in SL resource allocation mode 1 is configured or predefined to be prioritized over that of the transmission of the inter-UE coordination information.

[0018] In some embodiments, the processor is further configured to drop an SL transmission granted by a BS in SL resource allocation mode 1 during the transmission of the inter-UE coordination information in response to the fact that: SL transmission in SL resource allocation mode 1 has a lower priority than that of the transmission of the inter-UE coordination information, or the transmission of the inter-UE coordination information is configured or predefined to be prioritized over the SL transmission in SL resource allocation mode 1.

[0019] In some embodiments, the processor is further configured to transmit Negative Acknowledgement (NACK) to the BS in response to that the BS indicates Physical Uplink Control Channel (PUCCH) resource for SL Hybrid Automatic Repeat Request (HARQ) Acknowledgement (ACK) report.

[0020] According to some embodiments of the present disclosure, an exemplary BS is provided. The BS includes a processor and a wireless transceiver coupled to the processor, wherein the processor is configured to: receive an SR from a first SL UE requiring resources allocation; and grant and transmitting first resources in a first resource pool of SL resource allocation mode 1 to the first SL UE, wherein the first SL UE works in SL resource allocation mode 1, and the first resources are used for the first SL UE transmitting inter-UE coordination information to a second SL UE.

[0021] In some embodiments, the SR indicates a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information via the SR, wherein the mapping between the second resource pool and first resource pool is configured.

[0022] In some embodiments, the processor is further configured to configuring multiple SRs for the first SL UE, wherein: each SR is associated with a priority; or each SR is associated with a time window.

[0023] In some embodiments, the processor is further configured to enable the first SL UE to support both SL resource allocation mode 1 and SL resource allocation mode 2.

[0024] In some embodiments, the processor is further configured to configure that SL transmission in SL resource allocation mode 1 has a higher priority than that of the transmission of the inter-UE coordination information.

[0025] In some embodiments, the processor is further configured to configure that SL transmission in SL resource allocation mode 1 has a lower priority than that of the transmission of the inter-UE coordination information.

[0026] According to some embodiments of the present disclosure, an exemplary method performed by a first SL UE is provided. The method includes: acquiring first resources for transmitting inter-UE coordination information to a second SL UE working in SL resource allocation mode 2; and transmitting the inter-UE coordination information to the second SL UE on the first resources, wherein the first SL UE works in SL resource allocation mode 1, and the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission.

[0027] In some embodiments, in response to the fact that there is an ongoing SL transmission to the second SL UE, acquiring the first resources further includes multiplexing SCH resources allocated for the ongoing SL transmission to construct the first resources.

[0028] In some embodiments, acquiring the first resources further includes acquiring the first resources in a first resource pool of SL resource allocation mode 1.

[0029] In some embodiments, acquiring the first resources in the first resource pool of SL resource allocation mode 1 further includes: transmitting an SR to a BS requiring resource allocation, and receiving the first resources granted by the BS.

[0030] In some embodiments, the first SL UE is configured with multiple SRs, each SR is associated with a priority, and transmitting the SR further includes selecting the SR from the multiple SRs according to an associated priority of the inter-UE coordination information.

[0031] In some embodiments, the SL UE is configured with multiple SR, each SR is associated with a time window, and transmitting the SR further includes selecting the SR from the multiple SRs according to a time boundary indicated by the second SL UE, or determined by the first SL UE, or predefined.

[0032] In some embodiments, the method further includes indicating a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information or indicating the first resource pool via the SR, wherein the mapping between the second resource pool and first resource pool is configured.

[0033] In some embodiments, the method further includes indicating a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information in response to the fact that: the transmission of the inter-UE coordination information is triggered by an explicit request from the second SL UE, and multiple processes between the first SL UE and the second SL UE are allowed simultaneously; or the transmission of the inter-UE coordination information is triggered by a condition.

[0034] In some embodiments, indicating the second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information further

includes indicating a resource pool identity of the second resource pool in an SCI or in an MAC CE carrying the inter-UE coordination information.

[0035] In some embodiments, the resource pool identity of the second resource pool is a resource pool index among multiple configured resource pools of SL resource allocation mode 2.

[0036] In some embodiments, acquiring the first resources further includes performing sensing and resource selection in a second resource pool of SL resource allocation mode 2 to determine the first resources.

[0037] In some embodiments, whether SL transmission in SL resource allocation mode 1 is prioritized over the transmission of the inter-UE coordination information if they are overlapping in time domain is predefined, configured by a BS, or determined by the first SL UE.

[0038] In some embodiments, acquiring the first resources further includes performing resource re-selection in the second resource pool to determine the first resources in response to the fact that: SL transmission in SL resource allocation mode 1 has a higher priority than that of the transmission of the inter-UE coordination information; or SL transmission in SL resource allocation mode 1 is configured or predefined to be prioritized over that of the transmission of the inter-UE coordination information.

[0039] In some embodiments, the method further includes dropping an SL transmission granted by a BS in SL resource allocation mode 1 during the transmission of the inter-UE coordination information in response to the fact that: SL transmission in SL resource allocation mode 1 has a lower priority than that of the transmission of the inter-UE coordination information, or the transmission of the inter-UE coordination information is configured or predefined to be prioritized over the SL transmission in SL resource allocation mode 1.

[0040] In some embodiments, the method further includes transmitting NACK to the BS in response to that the BS indicates PUCCH resource for SL HARQ ACK report.

[0041] According to some embodiments of the present disclosure, an exemplary method performed by a BS is provided. The method includes: receiving an SR from a first SL UE requiring resources allocation; and granting and transmitting first resources in a first resource pool of SL resource allocation mode 1 to the first SL UE, wherein the first SL UE works in SL resource allocation mode 1, and the first resources are used for the first SL UE transmitting inter-UE coordination information to a second SL UE.

[0042] In some embodiments, the SR indicates a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information via the SR, wherein the mapping between the second resource pool and first resource pool is configured.

[0043] In some embodiments, the method further includes configuring multiple SRs for the first SL UE, wherein: each SR is associated with a priority; or each SR is associated with a time window.

[0044] In some embodiments, the method further includes enabling the first SL UE to support both SL resource allocation mode 1 and SL resource allocation mode 2.

[0045] In some embodiments, the method further includes configuring that SL transmission in SL resource allocation mode 1 has a higher priority than that of the transmission of the inter-UE coordination information.

[0046] In some embodiments, the method further includes configuring that SL transmission in SL resource allocation mode 1 has a lower priority than that of the transmission of the inter-UE coordination information.

BRIEF DESCRIPTION OF THE DRAWINGS

[0047] In order to describe the manner in which advantages and features of the present disclosure can be obtained, a description of the present disclosure is rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. These drawings depict only exemplary embodiments of the present disclosure and are not therefore intended to limit the scope of the present disclosure.

[0048] Figure 1 illustrates an exemplary flowchart of a method performed by an SL UE according to some embodiments of the present disclosure;

[0049] Figure 2 illustrates an exemplary signaling flowchart performed by an SL UE according to some embodiments of the present disclosure;

[0050] Figure 3 illustrates an exemplary flowchart about how to determine a second resource pool;

[0051] Figure 4 illustrates an exemplary flowchart about how to determine a second resource pool;

[0052] Figure 5 illustrates an exemplary flowchart of a method performed by an SL UE according to some embodiments of the present disclosure;

[0053] Figure 6 illustrates an exemplary flowchart of a method performed by a BS according to some embodiments of the present disclosure; and

[0054] Figure 7 illustrates a simplified block diagram of an exemplary apparatus according to some other embodiments of the present disclosure.

DETAILED DESCRIPTION

[0055] The detailed description of the appended drawings is intended as a description of some embodiments of the present disclosure and is not intended to represent the only form in which the present disclosure may be practiced. It should

be understood that the same or equivalent functions may be accomplished by different embodiments that are intended to be encompassed within the spirit and scope of the present disclosure.

[0056] While operations are depicted in the drawings in a particular order, persons skilled in the art will readily recognize that such operations need not be performed in the particular order shown or in sequential order, or that among all illustrated operations be performed, to achieve desirable results, sometimes one or more operations can be skipped. Further, the drawings can schematically depict one or more example processes in the form of a flow diagram. However, other operations that are not depicted can be incorporated in the example processes that are schematically illustrated. For example, one or more additional operations can be performed before, after, simultaneously, or between any of the illustrated operations. In certain circumstances, multitasking and parallel processing can be advantageous.

[0057] Reference will now be made in detail to some embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings. To facilitate understanding, embodiments are provided under specific network architecture and new service scenarios, such as 3GPP 5G NR, 3GPP long-term evolution (LTE), and so on. It is contemplated that along with the developments of network architectures and new service scenarios, all embodiments in the present disclosure are also applicable to similar technical problems; and moreover, the terminologies recited in the present disclosure may change, which should not affect the principle of the present disclosure.

[0058] According to the spirit of the present disclosure, the SL UEs are not special SL UEs, they may be computing devices, such as desktop computers, laptop computers, personal digital assistants (PDAs), tablet computers, smart televisions (e.g., televisions connected to the Internet), set-top boxes, game consoles, security systems (including security cameras), vehicle on-board computers, network devices (e.g., routers, switches, and modems), road side units (RSUs), or the like that may support SL functionality. According to an embodiment of the present disclosure, the SL UE may include a portable wireless communication device, a smart phone, a cellular

telephone, a flip phone, a device having a subscriber identity module, a personal computer, a selective call receiver, or any other device that is capable of transmitting and receiving SL communication signals on a wireless network. In some embodiments, the SL UE may be wearable devices, such as smart watches, fitness bands, optical head-mounted displays, or the like that support SL functionality.

[0059] In some embodiments of the present disclosure, a BS may be referred to as an access point, an access terminal, a base, a base unit, a macro cell, a wireless node, a Node-B, an enhanced Node-B, an evolved Node B (eNB), a next generation Node B (gNB), a Home Node-B, a relay node, or a device, or described using other terminology used in the art. The BS is generally part of a radio access network that may include a controller communicably coupled to the BS.

[0060] The present disclosure provides various methods and embodiment about SL communication between a first SL UE and a second SL UE; more specifically, the present disclosure relates to inter-UE coordination information transmission from the first SL UE to the second SL UE during SL communication, wherein the first SL UE works in SL resource allocation Mode 1, and the second SL UE works in SL resource allocation Mode 2. In such a scenario, the resource pool used for the first SL UE transmitting inter-UE coordination information may be different from the resource pool where the second SL UE performs sensing and resource selection; and in some cases, there may be some possible resource collision between the resource pools.

[0061] According to the present disclosure, the first SL UE need to transmit the inter-UE coordination information to the second SL UE timely to guarantee that the second SL UE can use the inter-UE coordination information during its resource selection procedure, wherein inter-UE coordination scheme 1 is considered, the first SL UE works in SL resource allocation Mode 1, and the second SL UE works in SL resource allocation Mode 2.

[0062] Currently two kinds of inter-UE coordination scheme 1 are supported:

- Inter-UE coordination information transmission is triggered by an explicitly request from the second SL UE. The second SL UE request the first SL UE to transmit the inter-UE coordination information before a time boundary to guarantee that the inter-UE coordination is not outdated. The time boundary may be indicated by the second SL UE, or the second SL UE indicates its remaining PDB or starting/ending of its resource selection window to the first SL UE, and the time boundary is determined by the indicated remaining PDB or starting/ending of the resource selection window; and
- Inter-UE coordination information transmission is triggered by a condition, wherein the first SL UE may determine the time boundary to transmit the inter-UE coordination information to the second SL UE by itself.

[0063] Figure 1 illustrates an exemplary flowchart of method 100 performed by a first SL UE according to some embodiments of the present disclosure. In some embodiments, the first SL UE and the second SL UE as shown in method 100 or in other methods described later may not be special SL UEs. For example, each of them can be a generic SL device or an SL apparatus, or a part of an SL device or an SL apparatus that uses the technical solution of the present application.

[0064] In operation 110, the first SL UE acquires first resources for transmitting inter-UE coordination information to a second SL UE working in SL resource allocation Mode 2, wherein the first SL UE works in SL resource allocation Mode 1, and wherein the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission, or in other words, the second resources contained in the inter-UE coordination information.

[0065] In operation 120, the first SL UE transmits the inter-UE coordination information to the second SL UE on the first resources.

[0066] In some embodiments of operation 110, if there is an ongoing SL transmission from the first SL UE to the second SL UE, in operation 110, the first SL UE may multiplex SCH resources allocated for the ongoing SL transmission to construct the first resources; i.e., the first SL UE may acquire the first resources from the SCH resources allocated for the ongoing SL transmission.

[0067] For example, if an MAC entity has SL resources allocated for an ongoing SL transmission to the second SL UE, and the associated SL-SCH resources can accommodate a MAC CE carrying the inter-UE coordination information under the restriction of logical channel prioritization (LCP), the first SL UE may instruct the multiplexing and assembly procedure to generate the MAC CE carrying the inter-UE coordination information.

[0068] In some embodiments of operation 110, as the first SL UE works in SL resource allocation Mode 1, the first resources are allocated and granted by a BS; i.e., the first resources may be acquired from a first resource pool of SL resource allocation Mode 1.

[0069] In operation 120, in some embodiments, the first SL UE may generate an MAC CE on the first resources, and the MAC CE carries the inter-UE coordination information; the first SL UE transmits the MAC CE to the second SL UE.

[0070] Figure 2 illustrates an exemplary flowchart of method 200 performed by a first SL UE, which is based on method 100, wherein the first SL UE works in SL resource allocation Mode 1, the first SL UE transmits an SR to a BS for requiring resources for inter-UE coordination information transmission to the second SL UE.

[0071] In operation 210, the first SL UE transmits an SR to a BS requiring resources for inter-UE coordination information transmission to a second SL UE working in SL resource allocation Mode 2, wherein the first SL UE works in SL resource allocation

Mode 1, and the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission.

[0072] According to the present disclosure, the SR is dedicated for request resources from a resource pool of SL resource allocation Mode 1 for inter-UE coordination information transmission. After the BS receives such SR, the BS may allocate and grant the first resources from a resource pool of SL resource allocation Mode 1, and transmit the first resources to the first SL UE.

[0073] In operation 220, the first SL UE acquires first resources from the BS for transmitting inter-UE coordination information to the second SL UE.

[0074] In operation 230, the first SL UE transmits the inter-UE coordination information to the second SL UE on the first resources.

[0075] In some embodiment, the first SL UE is configured with only one dedicated SR for all inter-UE coordination information transmission. When the BS receives this SR, it may firstly allocate and grant the first resources within the first resource pool of SL resource allocation Mode 1, and transmit the first resource to the second SL UE, prioritized over other ongoing SL transmission(s).

[0076] In some embodiments, the first SL UE is configured with multiple SRs, and each SR is associated with a priority. Each inter-UE coordination information is associated with a priority as well. In operation 210, when the first SL UE needs to transmit an SR for requiring resources, the first SL UE may select an SR from the multiple SRs according to an associated priority of the inter-UE coordination information to be transmitted.

[0077] In some embodiments, the first SL UE is configured with multiple SRs, and each SR is associated with a time window. In operation 210, when the first SL UE

needs to transmit an SR for requiring resources, the first SL UE may select an SR from the multiple SRs according to a time boundary. In some embodiments, the time boundary is indicated by the second SL UE, or determined by the first SL UE itself, or predefined.

[0078] According to method 200, the first SL UE works in SL resource allocation Mode 1, and the first resources where the inter-UE coordination information are transmitted are within the first resource pool of SL resource allocation Mode 1. The second SL UE works in SL resource allocation Mode 2, and the second resources indicated in the inter-UE coordination information are within the second resource pool of SL resource allocation Mode 2. In some cases, the first resource pool may be different from the second resource pool, and the second SL UE may need to know which resource pool is the second resource pool. For example, in some cases, the second SL UE may need to know the resource pool identity (e.g., the resource pool index) of the second resource pool among multiple configured resource pools of SL resource allocation Mode 2.

[0079] In the case that the inter-UE coordination transmission is triggered by an explicit request in inter-UE coordination scheme 1, and only one process of inter-UE coordination information transmission is allowed between the first SL UE and the second SL UE at the same time, the first SL UE does not need to indicate to the second SL UE the second resource pool that the inter-UE coordination information is associated with, wherein the inter-UE coordination information is second resources of the second resource pool.

[0080] In the case that the inter-UE coordination transmission is triggered by an explicit request in inter-UE coordination scheme 1, and multiple processes of inter-UE coordination information transmission are allowed between the first SL UE and the second SL UE at the same time, the first resource pool in each process may be

different, and the second resource pool in each process may be different, then the first SL UE needs to indicate to the second SL UE the second resource pool that the inter-UE coordination information is associated with for each process; i.e., the first SL UE needs to indicate to the second SL UE the second resource pool where the second resources contained in the inter-UE coordination information are for each process. In some embodiments, the resource pool identity of the second resource pool may be indicated in the MAC CE carrying the inter-UE coordination information or in an SCI for each process.

[0081] In the case that the inter-UE coordination transmission is triggered by a condition in inter-UE coordination scheme 1, the first SL UE needs to indicate to the second SL UE the second resource pool that the inter-UE coordination information is associated with; i.e., the first SL UE needs to indicate to the second SL UE the second resource pool where the second resources contained in the inter-UE coordination information are. In some embodiments, the resource pool identity of the second resource pool may be indicated in the MAC CE carrying the inter-UE coordination information or in an SCI.

[0082] Alternatively, in some cases, there is a mapping between the second resource pool and first resource pool configured by a BS, or predefined; the first SL UE and the second SL UE are aware of the mapping. In such cases, the mapping can be used for indicating the second resource pool to the second SL UE. If the first SL UE determines the second resource pool where the second resources are, the first resource pool is determined according to the map. The first SL UE may indicate the first resource pool or the second resource pool via the SR sent to the BS. In other words, in operation 210 of method 200, the SR may further indicate the first resource pool or the second resource pool to the BS.

[0083] For example, the first SL UE works in SL resource allocation Mode 1, the second SL UE works in SL resource allocation Mode 2, and a BS are aware of the mapping between the second resource pool of SL allocation mode 2 and the first resource pool of SL allocation mode 1. In this example, referring to Figure 3, in operation 310, the first SL UE determines the second resource pool of SL resource allocation Mode 2 where the second resources are. In operation 320, the first SL UE transmits an SR to a BS, wherein the SR requires resource allocation for the inter-UE coordination information transmission, and also indicates the second resource pool. In operation 330, after reception of the SR, the BS determines the first resource pool according to the mapping between the first resource pool and the second resource pool. In operation 340, the BS allocates and grants the first resources within the determined first resource pool, and transmits the first resources to the first SL UE. In operation 350, the first SL UE receives the first resources. In operation 360, the first SL UE transmits the inter-UE coordination information to the second SL UE on the first resources within the first resource pool. In operation 370, the second SL UE receives the inter-UE coordination information on the first resources within the first resource pool. In operation 380, according to the mapping between the second resource pool and the first resource pool, the second SL UE determines the second resource pool where the second resources contained in the inter-UE coordination information are.

[0084] In an alternative example, the first SL UE and the second SL UE are aware of the mapping between the second resource pool of SL allocation mode 2 and the first resource pool of SL allocation mode 1; the BS may be or may be not aware the mapping. In this alternative example, referring to Figure 4, in operation 410, the first SL UE determines the second resource pool of SL resource allocation Mode 2 and the first resource pool of SL resource allocation Mode 1, the second resource pool and the first resource pool meets the mapping. In operation 420, the first SL UE

transmits an SR to a BS, wherein the SR requires resource allocation for the inter-UE coordination information transmission, and also indicates the first resource pool directly. In operation 430, the BS receives the SR. In operation 440, the BS allocates and grants the first resources within the first resource pool indicated in the SR, and transmits the first resources to the first SL UE. In operation 450, the first SL UE receives the first resources. In operation 460, the first SL UE transmits the inter-UE coordination information to the second SL UE on the first resources within the first resource pool. In operation 470, the second SL UE receives the inter-UE coordination information on the first resources within the first resource pool. In operation 480, according to the mapping between the second resource pool and the first resource pool, the second SL UE determines the second resource pool where the second resources contained in the inter-UE coordination information are.

[0085] In the examples shown in Figure 3 and Figure 4, the second resources may be determined at any time as long as the determination is made before the first SL UE transmits the inter-UE coordination information. It is appreciated that the spirit of the present disclosure is not limited to the examples illustrated in Figure 3 and Figure 4.

[0086] In some embodiments, although the first SL UE works in SL resource allocation Mode 1, it may support SL resource allocation Mode 2 at the same time. In such cases, in operation 110, the first SL UE may acquire the first resources by performing sensing and resource selection in a second resource pool of SL resource allocation Mode 2 and determining the first resources then.

[0087] Figure 5 illustrates an exemplary flowchart of method 500 performed by a first SL UE, which is based on method 100, wherein the first SL UE works in SL resource allocation Mode 1 and supports SL resource allocation Mode 2 at the same time.

[0088] In operation 510, the first SL UE performs sensing and resource selection in a second resource pool of SL resource allocation Mode 2.

[0089] In operation 520, the first SL UE determines the first SL resources from the sensed and selected resources.

[0090] In operation 530, the first SL UE transmits inter-UE coordination information transmission to a second SL UE working in SL resource allocation Mode 2 on the first resources, wherein the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission.

[0091] In some embodiments, both the first resources and the second resources are on the same resource pool of SL resource allocation Mode 2.

[0092] According to method 500, the first SL UE supports SL resource allocation Mode 1 and SL resource allocation Mode 2 simultaneously, if a resource pool for SL resource allocation Mode 1 (e.g., the first resource pool) and a resource pool for SL resource allocation Mode 2 (e.g., the second resource pool) are overlapping in a time domain, the first SL UE may have to perform an inter-UE coordination information transmission on first resources of SL resource allocation Mode 2 and an SL transmission granted by a BS on resources of SL resource allocation Mode 1 simultaneously; this is because that the BS has no knowledge on the inter-UE coordination information transmission from the first SL UE on first resources of a first resource pool of SL resource allocation Mode 2.

[0093] As the first UE cannot perform two transmissions at the same time, the first UE may need to select one of the inter-UE coordination information transmission and an SL transmission to perform first.

[0094] In some embodiments, the SL transmission granted by the BS (i.e., the SL transmission on resource of a resource pool of SL resource allocation Mode 1) is always prioritized over the inter-UE coordination information transmission on resources in a resource pool of SL resource allocation Mode 2; this can be predefined, configured by a BS, or determined by the first SL UE. Accordingly, if the SL transmission granted by the BS and the inter-UE coordination information transmission are overlapping in time domains, the first UE may perform the SL transmission granted by the BS first.

[0095] In some embodiments, the inter-UE coordination information transmission on resources in a resource pool of SL resource allocation Mode 2 is always prioritized over the SL transmission granted by the BS; this can be predefined, configured by a BS, or determined by the first SL UE. Accordingly, if the SL transmission granted by the BS and the inter-UE coordination information transmission are overlapping in time domains, the first UE may perform the inter-UE coordination information transmission first.

[0096] In some embodiments, the SL transmission granted by the BS has an associated priority; the inter-UE coordination information transmission on resources in a resource pool of SL resource allocation Mode 2 has an associated priority. If both transmissions are overlapping in the time domain, the first SL UE may select one of them to perform according to their associated priorities. For example, if the SL transmission granted by the BS has a higher priority, the first SL UE may perform the SL transmission granted by the BS first; otherwise, the first UE may perform the inter-UE coordination information transmission on resources in resource pool of SL resource allocation Mode 2 first. The priority of the SL transmission granted by the BS and the priority of the inter-UE coordination information transmission may not be fixed.

[0097] In the case that an SL transmission granted by the BS (i.e., an SL transmission in SL resource allocation mode 1) and an inter-UE coordination information on resources in a resource pool of SL resource allocation Mode 2 are overlapping in the time domain, if the SL transmission granted by the BS has a higher priority than that of the transmission of the inter-UE coordination information on resources in a resource pool of SL resource allocation Mode 2, or the SL transmission granted by the BS is configured or predefined to be prioritized over that of the transmission of the inter-UE coordination information in a resource pool of SL resource allocation Mode 2, the first SL UE may further perform resource re-selection in the resource pool of SL resource allocation Mode 2 to determine the first resources again after the inter-UE coordination information transmission is interrupted and restored. But the first SL UE may not need to perform resource re-selection in the resource pool of SL resource allocation Mode 2 to determine the second resources again, due to the second SL UE works only in SL resource allocation mode 2.

[0098] In the case that an SL transmission granted by the BS and an inter-UE coordination information on resources in a resource pool of SL resource allocation Mode 2 are overlapping in the time domain, if the SL transmission granted by the BS has a lower priority than that of the transmission of the inter-UE coordination information on resources in a resource pool of SL resource allocation Mode 2, or the transmission of the inter-UE coordination information in a resource pool of SL resource allocation Mode 2 is configured or predefined to be prioritized over that of the SL transmission granted by the BS, the first SL UE may further perform dropping the SL transmission granted by a BS during the transmission of the inter-UE coordination information. In some embodiments, the first SL UE may further transmit NACK to the BS in response to that the BS indicates PUCCH resource for SL HARQ ACK report.

[0099] It would be appreciated that, according to the present disclosure, the BS may perform corresponding methods for the inter-UE coordination information transmission.

[0100] Figure 6 illustrates an exemplary flowchart of method 600 performed by a BS corresponding to method 200 performed by the first SL UE. In some embodiments, the BS as shown in method 600 or in other methods described later may not be a special BS. For example, it can be a generic device or an apparatus, or a part of a device or an apparatus that uses the technical solution of the present disclosure.

[0101] In operation 610, the BS receives an SR from a first SL UE, wherein the SR requires resources for inter-UE coordination information transmission, wherein the first SL UE needs to transmit inter-UE coordination information on the resources to a second SL UE; wherein the first SL UE works in SL resource allocation Mode 1, and the second SL UE works in SL resource allocation Mode 2. According to the present disclosure, the SR is dedicated for request SL resources from a resource pool of SL resource allocation Mode 1.

[0102] In operation 620, after reception of the SR, the BS allocates and grants first resources in a resource pool of SL resource allocation Mode 1, and transmits the first resources to the first SL UE.

[0103] In some embodiments, a mapping between a resource pool of SL resource allocation Mode 1 and a resource pool of SL resource allocation Mode 2 is configured, and at least the first SL UE and the second SL UE may be aware of it.

[0104] In such cases, in some embodiments, the SR may further indicate to the BS a second resource pool of SL resource allocation Mode 2 associated with the inter-UE coordination information via the SR. In some embodiments, the SR may further

indicate to the BS a first resource pool of SL resource allocation Mode 1 where the first resources for transmitting the inter-UE coordination information are.

[0105] In some embodiments, the BS may be aware of the mapping as well (please refer to the example illustrated in Figure 3).

[0106] In some embodiments, the BS may be or may not be aware of the mapping (please refer to the example illustrated in Figure 4).

[0107] In some embodiments, the BS may configure only one SR for the first SL UE.

[0108] In some embodiments, the BS may configure multiple SRs for the first SL UE, wherein each SR is associated with a priority. When the first SL UE needs to transmit an SR for acquiring the first resources, the first SL UE may select an SR from the multiple SRs according to an associated priority of the inter-UE coordination information to be transmitted.

[0109] In some embodiments, the BS may configure multiple SRs, wherein each SR is associated with a time window. When the first SL UE needs to transmit an SR for acquiring the first resources, the first SL UE may select an SR from the multiple SRs according to a time boundary; wherein the time boundary is indicated by the second SL UE, or determined by the first SL UE itself, or predefined.

[0110] In some embodiments, the BS may enable the first SL UE to support both SL resource allocation Mode 1 and SL resource allocation Mode 2. The first SL UE may perform SL transmission granted by the BS (i.e., perform SL transmission in SL resource allocation Mode 1), and may also perform inter-UE coordination information transformation, but the first SL UE is allowed to select one kind of transmission to be

performed at a time, according to e.g., the priorities associated with the two kind of transmissions.

[0111] In some embodiments, the BS may configure that SL transmission in SL resource allocation Mode 1 always has a higher priority than that of the transmission of the inter-UE coordination information.

[0112] In some embodiments, the BS may configure that SL transmission in SL resource allocation Mode 1 always has a lower priority than that of the transmission of the inter-UE coordination information.

[0113] In this disclosure various methods and embodiments are provided for inter-UE coordination information transmission when the SL UE transmitting the inter-UE coordination information works in SL resource allocation Mode 1.

[0114] In some embodiments, the BS configures one or a set of SRs for the SL UE selecting one SR to request SL resources in a resource pool of SL resource allocation Mode 1 for inter-UE coordination information transmission.

[0115] In some embodiments, if the BS configures a set of SRs, each SR is associated with one priority, the SL UE selects one SR according to the associated priority of the inter-UE coordination information, and the BS may decide the SL grant/SL resource allocation according to the associated priority of the SR.

[0116] In some embodiments, if the BS configures a set of SRs, each SR is associated with one time window, the SL UE selects one SR according to the time boundary indicated by another SL UE receiving the inter-UE coordination information, or the time boundary determined by itself, and the BS may decide the SL grant/SL resource allocation taking the associated time window into consider.

[0117] In some embodiments, the SL UE transmitting the inter-UE coordination information may further indicate to the BS the corresponding resource pool where the inter-UE coordination information is associated, via the SR transmitted to the BS.

[0118] In some embodiments, the present disclosure provides some alternative methods and embodiments for the SL UE transmitting the inter-UE coordination information to indicate the corresponding resource pool where the inter-UE coordination information is associated to the SL UE receiving the inter-UE coordination information.

[0119] In some embodiments, in the case that the SL UE transmitting the inter-UE coordination information supports both SL resource allocation Mode 1 and SL resource allocation Mode 2 and that the resource pool for SL transmission in SL resource allocation Mode 1 and the resource pool for inter-UE coordination information transmission (in SL resource allocation Mode 2) are overlapping, the present disclosure provides some solutions to avoid resource collision, e.g., based on associated priority.

[0120] Figure 7 illustrates a simplified block diagram of an exemplary apparatus 700 according to various embodiments of the present disclosure.

[0121] In some embodiments, apparatus 700 may be or include at least a part of an SL UE or similar device having similar SL functionality.

[0122] In some embodiments, apparatus 700 may be or include at least a part of a BS or similar device that can use the technology of the present disclosure.

[0123] As shown in Figure 7, apparatus 700 may include at least wireless transceiver 710 and processor 720, wherein wireless transceiver 710 may be coupled to processor 720. Furthermore, apparatus 700 may include non-transitory computer-readable medium 730 with computer-executable instructions 740 stored thereon, wherein non-transitory computer-readable medium 730 may be coupled to processor 720, and computer-executable instructions 740 may be configured to be executable by

processor 720. In some embodiments, wireless transceiver 710, non-transitory computer-readable medium 730, and processor 720 may be coupled to each other via one or more local buses.

[0124] Although in Figure 7, elements such as wireless transceiver 710, non-transitory computer-readable medium 730, and processor 720 are described in the singular, the plural is contemplated unless limitation to the singular is explicitly stated. In some embodiments of the present disclosure, the wireless transceiver 710 may be configured for wireless communication. In some embodiments of the present disclosure, wireless transceiver 710 can be integrated into a transceiver. In certain embodiments of the present disclosure, the apparatus 700 may further include other components for actual usage.

[0125] In some embodiments, apparatus 700 is an SL UE or at least a part of an SL UE. Processor 720 is configured to cause the apparatus 700 at least to perform, with wireless transceiver 710, any method described above which is performed by an SL UE according to the present disclosure.

[0126] In some embodiments, processor 720 is configured to, with wireless transceiver 710, acquire first resources for transmitting inter-UE coordination information to a second SL UE working in SL resource allocation mode 2, and transmit the inter-UE coordination information to the second SL UE on the first resources, wherein the first SL UE works in SL resource allocation mode 1, and the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission.

[0127] In some embodiments, in response to the fact that there is an ongoing SL transmission to the second SL UE, to acquire the first resources, processor 720 is further configured to multiplex SCH resources allocated for the ongoing SL transmission to construct the first resources.

[0128] In some embodiments, to acquire the first resources, processor 720 is further configured to, with wireless transceiver 710, acquire the first resources in a first resource pool of SL resource allocation mode 1.

[0129] In some embodiments, to acquire the first resources, processor 720 is further configured to, with wireless transceiver 710, transmit an SR to a BS requiring resource allocation, and receives the first resources granted by the BS.

[0130] In some embodiments, the first SL UE is configured with multiple SRs, each SR is associated with a priority; to transmit the SR, processor 720 further configured to select the SR from the multiple SRs according to an associated priority of the inter-UE coordination information.

[0131] In some embodiments, the SL UE is configured with multiple SR, each SR is associated with a time window, to transmit the SR, processor 720 further configured to select the SR from the multiple SRs according to a time boundary indicated by the second SL UE, or determined by the first SL UE, or predefined.

[0132] In some embodiments, processor 720 is further configured to indicate a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information or to indicate the first resource pool via the SR, wherein the mapping between the second resource pool and first resource pool is configured.

[0133] In some embodiments, processor 720 is further configured to indicate a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information in response to the fact that: the transmission of the inter-UE coordination information is triggered by an explicit request from the second SL UE, and multiple processes between the first SL UE and the second SL UE are allowed simultaneously; or the transmission of the inter-UE coordination information is triggered by a condition.

[0134] In some embodiments, to indicate the second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information, processor

720 is further configured to indicating a resource pool identity of the second resource pool in an SCI or in an MAC CE carrying the inter-UE coordination information.

[0135] In some embodiments, the resource pool identity of the second resource pool is a resource pool index among multiple configured resource pools of SL resource allocation mode 2.

[0136] In some embodiments, to acquire the first resources, processor 720 is further configured to, with wireless transceiver 710, perform sensing and resource selection in a second resource pool of SL resource allocation mode 2 to determine the first resources.

[0137] In some embodiments, whether SL transmission in SL resource allocation mode 1 is prioritized over the transmission of the inter-UE coordination information if they are overlapping in time domain is predefined, configured by a BS, or determined by the first SL UE

[0138] In some embodiments, to acquire the first resources, processor 720 is further configured to, with wireless transceiver 710, perform resource re-selection in the second resource pool to determine the first resources in response to the fact that: SL transmission in SL resource allocation mode 1 has a higher priority than that of the transmission of the inter-UE coordination information; or SL transmission in SL resource allocation mode 1 is configured or predefined to be prioritized over that of the transmission of the inter-UE coordination information.

[0139] In some embodiments, processor 720 is further configured to drop an SL transmission granted by a BS in SL resource allocation mode 1 during the transmission of the inter-UE coordination information in response to the fact that: SL transmission in SL resource allocation mode 1 has a lower priority than that of the transmission of the inter-UE coordination information; or the transmission of the inter-UE coordination information is configured or predefined to be prioritized over the SL transmission in SL resource allocation mode 1.

[0140] In some embodiments, processor 720 is further configured to, with wireless transceiver 710, transmit NACK to the BS in response to that the BS indicates PUCCH resource for SL HARQ ACK report.

[0141] In some embodiments, apparatus 700 is a BS or at least a part of a BS that can use the technology of the present disclosure. Processor 720 is configured to cause the apparatus 700 at least to perform, with wireless transceiver 710, any method described above which is performed by a BS according to the present disclosure.

[0142] In some embodiments, processor 720 is configured to, with wireless transceiver 710, receive an SR from a first SL UE requiring resources allocation; and grant and transmitting first resources in a first resource pool of SL resource allocation mode 1 to the first SL UE, wherein the first SL UE works in SL resource allocation mode 1, and the first resources are used for the first SL UE transmitting inter-UE coordination information to a second SL UE

[0143] In some embodiments, the SR indicates a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information via the SR, wherein the mapping between the second resource pool and first resource pool is configured.

[0144] In some embodiments, processor 720 is further configured to, with wireless transceiver 710, configure multiple SRs for the first SL UE, wherein: each SR is associated with a priority, or each SR is associated with a time window.

[0145] In some embodiments, processor 720 is further configured to, with wireless transceiver 710, enable the first SL UE to support both SL resource allocation mode 1 and SL resource allocation mode 2.

[0146] In some embodiments, processor 720 is further configured to configure that SL transmission in SL resource allocation mode 1 has a higher priority than that of the transmission of the inter-UE coordination information.

[0147] In some embodiments, processor 720 is further configured to configure that SL transmission in SL resource allocation mode 1 has a lower priority than that of the transmission of the inter-UE coordination information.

[0148] In various example embodiments, processor 720 may include, but is not limited to, at least one hardware processor, including at least one microprocessor such as a CPU, a portion of at least one hardware processor, and any other suitable dedicated processor such as those developed based on for example Field Programmable Gate Array (FPGA) and Application Specific Integrated Circuit (ASIC). Further, processor 720 may also include at least one other circuitry or element not shown in Figure 7.

[0149] In various example embodiments, non-transitory computer-readable medium 730 may include at least one storage medium in various forms, such as a volatile memory and/or a non-volatile memory. The volatile memory may include, but is not limited to, for example, an RAM, a cache, and so on. The non-volatile memory may include, but is not limited to, for example, an ROM, a hard disk, a flash memory, and so on. Further, non-transitory computer-readable medium 730 may include, but is not limited to, an electric, a magnetic, an optical, an electromagnetic, an infrared, or a semiconductor system, apparatus, or device or any combination of the above.

[0150] Further, in various example embodiments, exemplary apparatus 700 may also include at least one other circuitry, element, and interface, for example antenna element, and the like.

[0151] In various example embodiments, the circuitries, parts, elements, and interfaces in exemplary apparatus 700, including processor 720 and non-transitory computer-readable medium 730, may be coupled together via any suitable connections including, but not limited to, buses, crossbars, wiring and/or wireless lines, in any suitable ways, for example electrically, magnetically, optically, electromagnetically, and the like.

[0152] The methods of the present disclosure can be implemented on a programmed

processor. However, controllers, flowcharts, and modules may also be implemented on a general purpose or special purpose computer, a programmed microprocessor or microcontroller and peripheral integrated circuit elements, an integrated circuit, a hardware electronic or logic circuit such as a discrete element circuit, a programmable logic device, or the like. In general, any device that has a finite state machine capable of implementing the flowcharts shown in the figures may be used to implement the processing functions of the present disclosure.

[0153] While the present disclosure has been described with specific embodiments thereof, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art. For example, various components of the embodiments may be interchanged, added, or substituted in other embodiments. Also, all of the elements shown in each figure are not necessary for operation of the disclosed embodiments. For example, one skilled in the art of the disclosed embodiments would be capable of making and using the teachings of the present disclosure by simply employing the elements of the independent claims. Accordingly, the embodiments of the present disclosure as set forth herein are intended to be illustrative, not limiting. Various changes may be made without departing from the spirit and scope of the present disclosure.

[0154] The terms "includes," "comprising," "includes," "including," or any other variation thereof, are intended to cover a non-exclusive inclusion, such that a process, method, article, or apparatus that includes a list of elements does not include only those elements but may include other elements not expressly listed or inherent to such process, method, article, or apparatus. An element preceded by "a," "an," or the like does not, without more constraints, preclude the existence of additional identical elements in the process, method, article, or apparatus that includes the element. Also, the term "another" is defined as at least a second or more. The terms "including," "having," and the like, as used herein, are defined as "comprising."

1. A first sidelink (SL) user equipment (UE) comprising:
 - a processor; and
 - a wireless transceiver coupled to the processor,wherein the processor is configured to, with the wireless transceiver:
 - acquire first resources for transmitting inter-UE coordination information to a second SL UE working in SL resource allocation mode 2; and
 - transmit the inter-UE coordination information to the second SL UE on the first resources, wherein
 - the first SL UE works in SL resource allocation mode 1, and the inter-UE coordination information is associated with second resources where the second SL UE performs SL transmission.
2. The first SL UE of Claim 1, wherein to acquire the first resources, the processor is further configured to, with the wireless transceiver, acquire the first resources in a first resource pool of SL resource allocation mode 1.
3. The first SL UE of Claim 2, wherein to acquire the first resources in the first resource pool of SL resource allocation mode 1, the processor is further configured to, with the wireless transceiver:
 - transmit a scheduling request (SR) to a base station (BS) requiring resource allocation; and
 - receive the first resources granted by the BS.
4. The first SL UE of Claim 3, wherein the first SL UE is configured with multiple SRs, each SR is associated with a priority, to transmit the SR, the processor is further configured to:
 - select the SR from the multiple SRs according to an associated priority of the inter-UE coordination information.
5. The first SL UE of Claim 3, wherein the SL UE is configured with multiple SR, each SR is associated with a time window, to transmit the SR, the processor is further configured to:

select the SR from the multiple SRs according to a time boundary indicated by the second SL UE, or determined by the first SL UE, or predefined.

6. The first SL UE of Claim 3, the processor is further configured to indicate a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information or to indicate the first resource pool via the SR, wherein the mapping between the second resource pool and first resource pool is configured.

7. The first SL UE of Claim 2, the processor is further configured to indicate a second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information in response to the fact that:

the transmission of the inter-UE coordination information is triggered by an explicit request from the second SL UE, and multiple processes between the first SL UE and the second SL UE are allowed simultaneously; or

the transmission of the inter-UE coordination information is triggered by a condition.

8. The first SL UE of Claim 7, wherein to indicate the second resource pool of SL resource allocation mode 2 associated with the inter-UE coordination information, the processor is further configured to indicate a resource pool identity of the second resource pool in a Sidelink Control Information (SCI) or in a Medium Access Control (MAC) control element (CE) carrying the inter-UE coordination information.

9. The first SL UE of Claim 8, wherein the resource pool identity of the second resource pool is a resource pool index among multiple configured resource pools of SL resource allocation mode 2.

10. The first SL UE of Claim 1, wherein to acquire the first resources, the processor is further configured to, with the wireless transceiver, perform sensing and resource selection in a second resource pool of SL resource allocation mode 2 to determine the first resources.

11. The first SL UE of Claim 10, wherein whether SL transmission in SL resource allocation mode 1 is prioritized over the transmission of the inter-UE coordination information if they are overlapping in time domain is predefined, configured by a BS, or determined by the first SL UE.

12. The first SL UE of Claim 11, wherein to acquire the first resources, the processor is further configured to, with the wireless transceiver, perform resource re-selection in the second resource pool to determine the first resources in response to the fact that:

SL transmission in SL resource allocation mode 1 has a higher priority than that of the transmission of the inter-UE coordination information, or

SL transmission in SL resource allocation mode 1 is configured or predefined to be prioritized over that of the transmission of the inter-UE coordination information.

13. The first SL UE of Claim 11, the processor is further configured to drop an SL transmission granted by a BS in SL resource allocation mode 1 during the transmission of the inter-UE coordination information in response to the fact that:

SL transmission in SL resource allocation mode 1 has a lower priority than that of the transmission of the inter-UE coordination information, or

the transmission of the inter-UE coordination information is configured or predefined to be prioritized over the SL transmission in SL resource allocation mode 1.

14. A base station (BS) comprising:

a processor; and

a wireless transceiver coupled to the processor,

wherein the processor is configured to, with the wireless transceiver:

receive a scheduling request (SR) from a first SL UE requiring resources allocation; and

grant and transmitting first resources in a first resource pool of SL resource allocation mode 1 to the first SL UE, wherein

the first SL UE works in SL resource allocation mode 1, and the first resources are used for the first SL UE transmitting inter-UE coordination information to a second SL UE.

15. The BS of Claim 14, wherein the processor is further configured to configuring multiple SRs for the first SL UE, wherein:

each SR is associated with a priority; or
each SR is associated with a time window.

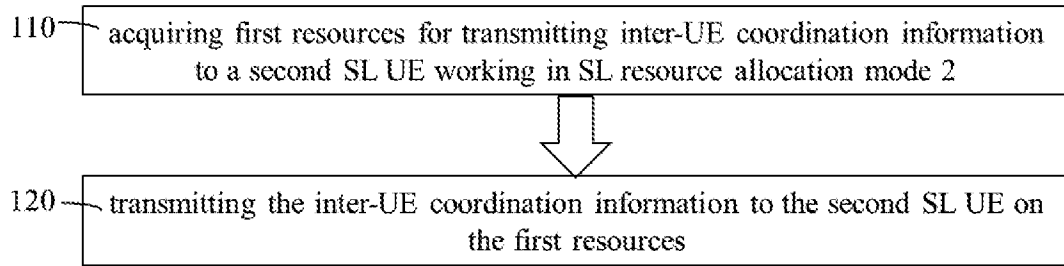
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Figure 1

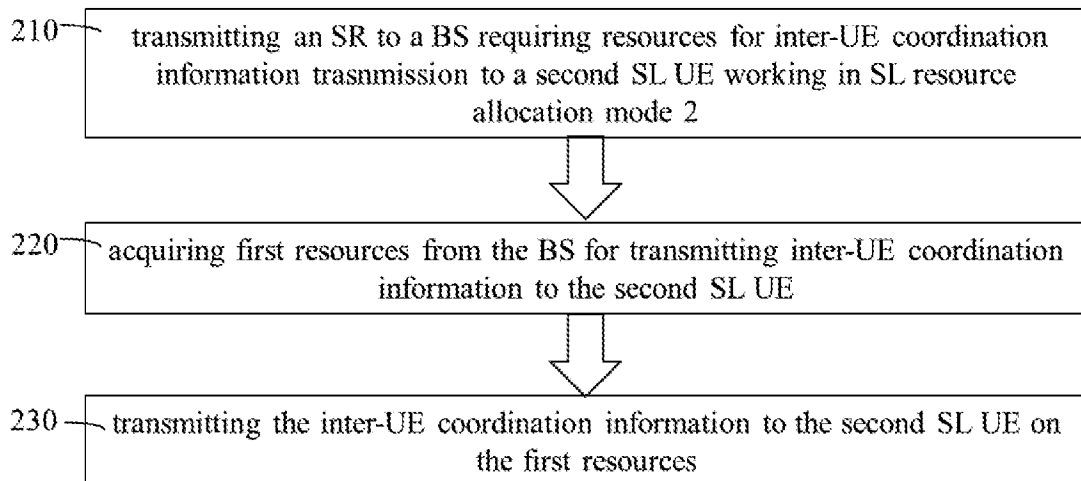
200

Figure 2

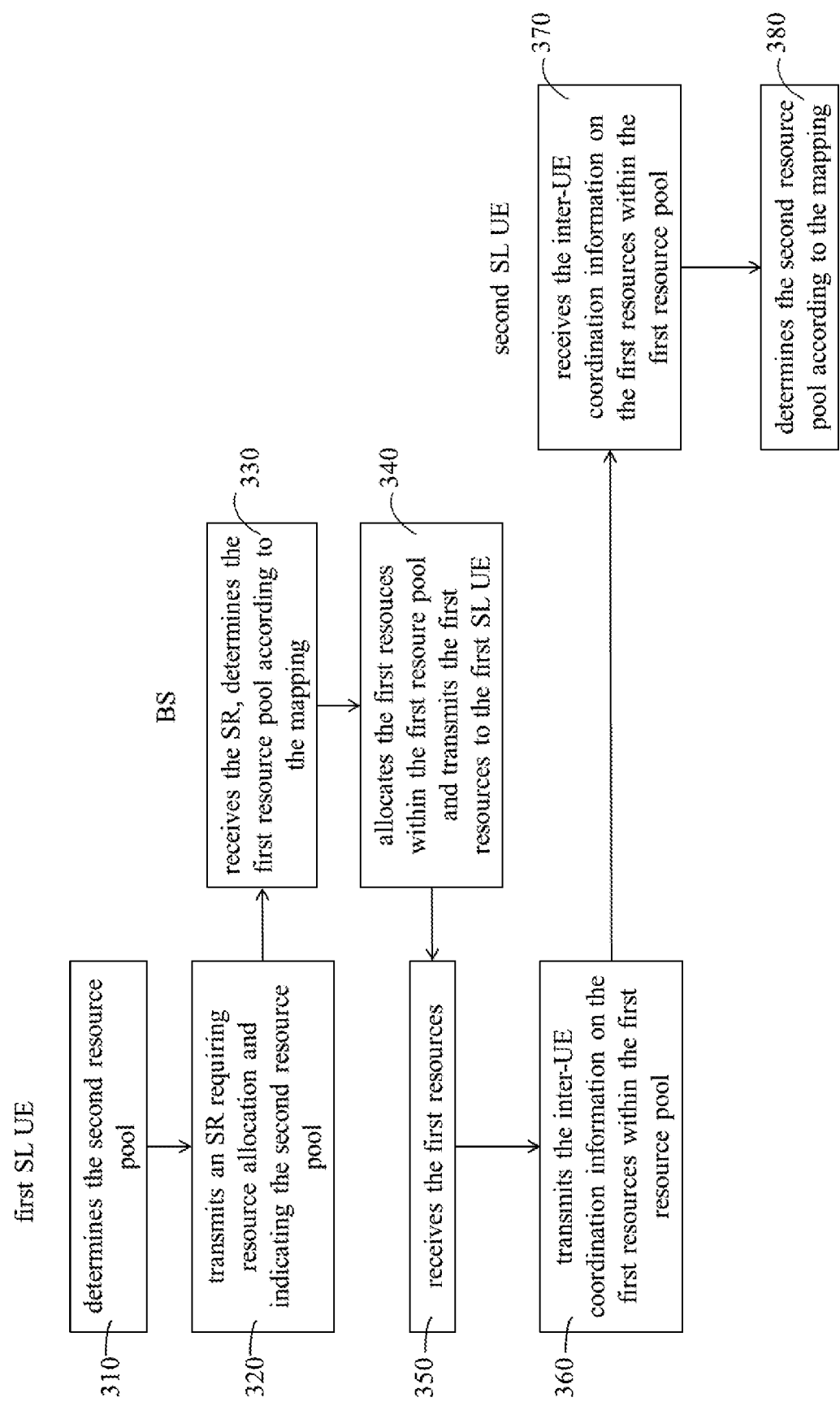


Figure 3

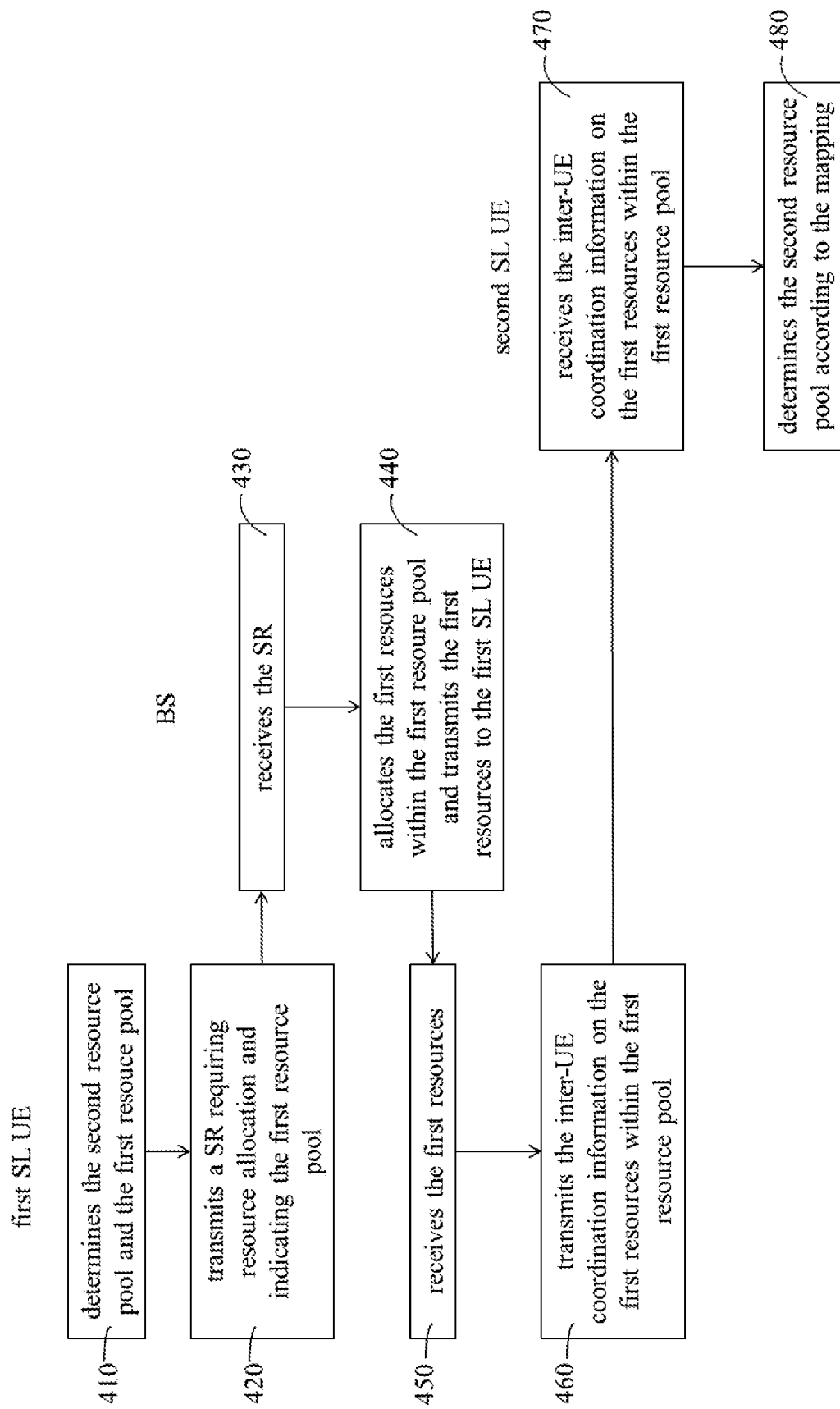


Figure 4

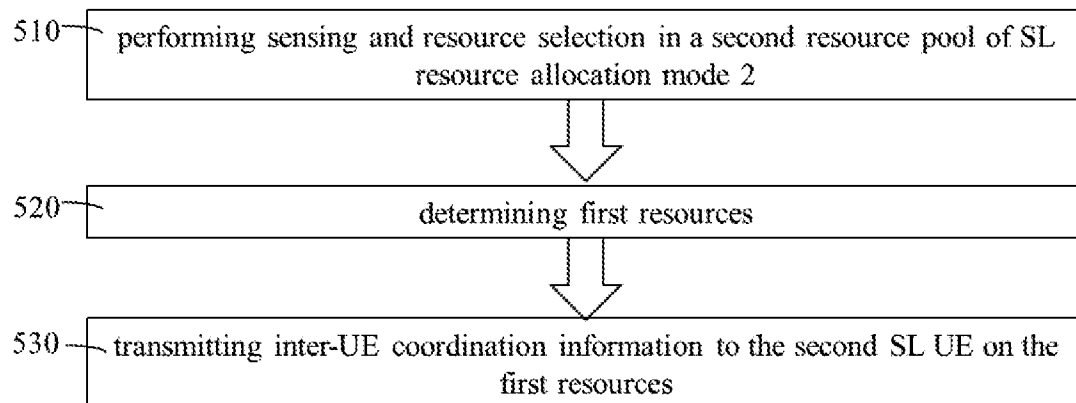
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Figure 5

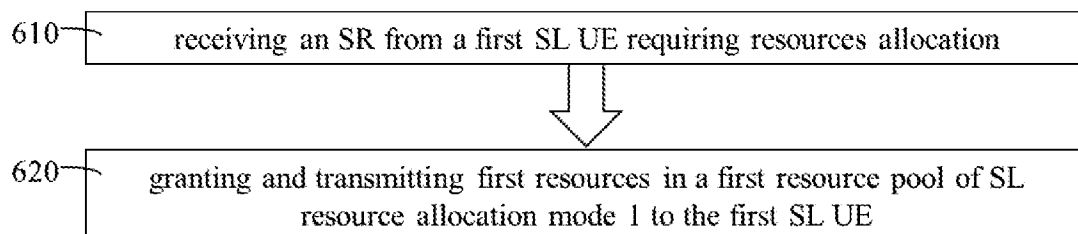
600

Figure 6

700

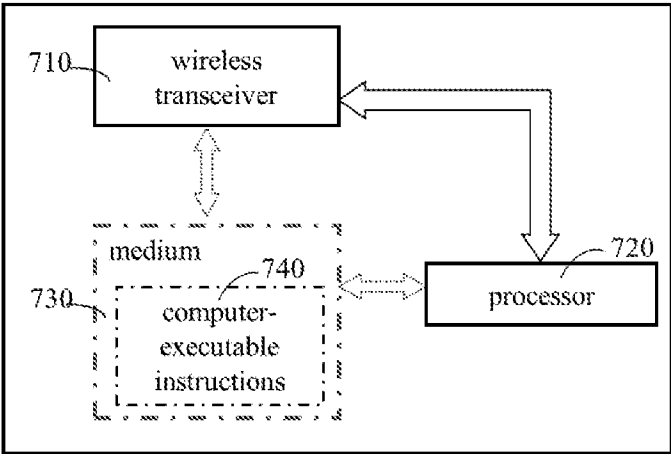


Figure 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/140879

A. CLASSIFICATION OF SUBJECT MATTER

H04W 72/12(2009.01)i; H04W 72/02(2009.01)i; H04W 92/18(2009.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04W; H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT,CNKI,WPI,EPODOC,3GPP: Sidelink, SL, coordination information, resource allocation, mode 2, mode 1, scheduling request, SR, resource pool

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NOKIA et al. "Discussion on RAN2 scope for resource allocation enhancement" <i>3GPP TSG-RAN WG2 Meeting #112 Electronic R2-2010047</i> , 13 November 2020 (2020-11-13), sections 2-3	1-15
X	WO 2021241958 A1 (SAMSUNG ELECTRONICS CO., LTD.) 02 December 2021 (2021-12-02) description, paragraphs [50]-[83], figures 1-4	1-15
A	US 2021250919 A1 (MEDIATEK SINGAPORE PTE. LTD.) 12 August 2021 (2021-08-12) the whole document	1-15
A	US 2016338095 A1 (BLACKBERRY LIMITED) 17 November 2016 (2016-11-17) the whole document	1-15
A	US 2021314750 A1 (NEC CORPORATION) 07 October 2021 (2021-10-07) the whole document	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

15 July 2022

Date of mailing of the international search report

27 July 2022

Name and mailing address of the ISA/CN

National Intellectual Property Administration, PRC
6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing
100088, China

Facsimile No. (86-10)62019451

Authorized officer

FU,Yuanyuan

Telephone No. 86-(10)-53961775

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2021/140879

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				CN	113225827	A	06 August 2021
				WO	2021155527	A1	12 August 2021
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				WO	2016181094	A1	17 November 2016
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				EP	3641460	A1	22 April 2020
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US	2021314750	A1	07 October 2021	WO	2020035983	A1	20 February 2020