

Citation List**Non Patent Literature**

- [0006] NPL 1 : 3GPP TR 22.803, "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Feasibility study for Proximity Services (ProSe)"

Summary**Technical Problem**

- [0007] For example, a discovery signal that enables another device to discover a device conducting D2D communication is transmitted by the terminal device conducting D2D communication. However, if carrier aggregation is supported, the other terminal device conducting D2D communication may be unable to determine which component carrier the above discovery signal is transmitted on, and whether or not the discovery signal is receivable. For this reason, the other terminal device may, for example, conduct a detection process for detecting the discovery signal on the signals transmitted on all component carriers. As a result, the load on that other terminal device may increase.

- [0008] Accordingly, it is desirable to provide a mechanism that enables a moderation of the load for a device conducting device-to-device communication (D2D communication).

Solution to Problem

- [0008a] According to a first aspect of the present invention, there is provided a communication control device comprising: circuitry configured to acquire system information indicating information to enable a device to communicate with another device via device-to-device communication; and control transmission of the system information to a terminal device.

- [0008b] According to a second aspect of the present invention, there is provided a communication control method comprising: acquiring system information indicating information to enable a device to communicate with another via device-to-device communication; and controlling, with a processor, transmission of the system information to a terminal device.

- [0008c] According to a third aspect of the present invention, there is provided a terminal device comprising: circuitry configured to acquire system information indicating information to enable a device to communicate with another device via device-to-device communication; and control a detection process for detecting a discovery signal on the basis of the system information.

- [0008d] According to a fourth aspect of the present invention, there is provided a method for a terminal device, comprising: acquiring, with circuitry, individual information to enable the

terminal device to communicate with another device via device-to-device communication;
and controlling, with the circuitry, transmission of the individual information to a base station.

5 [0008e] According to a fifth aspect of the present invention, there is provided a terminal device
comprising: circuitry configured to acquire information indicating information to enable a
device to communicate with another device via device-to-device communication; and control
transmission of a discovery signal on the basis of the information.

[0009] According to an embodiment of the present disclosure, there is provided a communication
control device including an acquisition unit that acquires carrier information indicating, from
among a plurality of component carriers used for carrier aggregation, a component carrier for
10 transmitting a discovery signal that enables another device to discover a device conducting
device-to-device communication, and a control unit that controls transmission of the carrier
information to a terminal device.

[0010] According to another embodiment of the present disclosure, there is provided a
communication control method including acquiring carrier information indicating, from
15 among a plurality of component carriers used for carrier aggregation, a component carrier for
transmitting a discovery signal that enables another device to discover a device conducting
device-to-device communication, and controlling, with a processor, transmission of the
carrier information to a terminal device.

[0011] According to another embodiment of the present disclosure, there is provided a terminal
20 device including an acquisition unit that acquires carrier information indicating, from among
a plurality of component carriers used for carrier aggregation, a component carrier for
transmitting a discovery signal that enables another device to discover a device conducting
device-to-device communication, and a control unit that controls a detection process for
detecting the discovery signal on the basis of the carrier information.

25 [0012] According to another embodiment of the present disclosure, there is provided a

terminal device including an acquisition unit that acquires individual carrier information indicating, from among a plurality of component carriers used for carrier aggregation, a component carrier used by the terminal device to transmit a discovery signal that enables another device to discover a device conducting device-to-device communication, and a control unit that controls transmission of the individual carrier information to a base station.

[0013] According to another embodiment of the present disclosure, there is provided a terminal device including an acquisition unit that acquires carrier information indicating, from among a plurality of component carriers used for carrier aggregation, a component carrier for transmitting a discovery signal that enables another device to discover a device conducting device-to-device communication, and a control unit that controls transmission of the discovery signal on the basis of the carrier information.

[0014] According to another embodiment of the present disclosure, there is provided a terminal device including an acquisition unit that acquires information related to each of a plurality of component carriers used for carrier aggregation, and a control unit that controls transmission of a discovery signal that enables another device to discover a device conducting device-to-device communication in a manner that the discovery signal is transmitted on each of the plurality of component carriers.

[0015] According to another embodiment of the present disclosure, there is provided a terminal device including an acquisition unit that acquires information related to one component carrier from among a plurality of component carriers used for carrier aggregation, and a control unit that controls a detection process for detecting a discovery signal that enables another device to discover a device conducting device-to-device communication in a manner that the detection process is conducted on a signal transmitted on the one component carrier. The discovery signal is a signal transmitted on each of the plurality of component carriers.

[0016] According to another embodiment of the present disclosure, a communication control device includes circuitry that acquires system information indicating information to enable a device to communicate with another device via device-to-device communication, and that controls transmission of the system information to a terminal device.

[0017] In another embodiment of the present disclosure, a terminal device includes circuitry that acquires system information indicating information to enable a device to communicate with another device via device-to-device communication, and controls a detection process for detecting a discovery signal on the basis of the system information

[0018] In a further embodiment of the present disclosure, a terminal device includes circuitry that acquires individual information to enable a terminal device to communicate with another device via device-to-device communication, and

controls transmission of the individual information to a base station.

[0019] In still further embodiments of the present disclosure, a terminal device includes circuitry that acquires information indicating information to enable a device to communicate with another device via device-to-device communication, and controls transmission of a discovery signal on the basis of the information.

Advantageous Effects of Invention

[0020] According to an embodiment of the present disclosure-invention as described above, it becomes possible to moderate the load for a device conducting device-to-device communication (D2D communication). Note that the above advantageous effects are not strictly limiting, and that any advantageous effect indicated in the present disclosure or another advantageous effect that may be reasoned from the present disclosure may also be exhibited in addition to, or instead of, the above advantageous effects.

Brief Description of Drawings

[0021] [fig. 1] FIG. 1 is an explanatory diagram for illustrating an example of D2D communication.

[fig. 2] FIG. 2 is an explanatory diagram illustrating an example of a schematic configuration of a communication system according to an embodiment of the present disclosure.

[fig. 3] FIG. 3 is a block diagram illustrating an example of a configuration of a base station according to the first embodiment.

[fig. 4] FIG. 4 is an explanatory diagram for illustrating a first example of a CC for transmitting a discovery signal.

[fig. 5] FIG. 5 is an explanatory diagram for illustrating a second example of a CC for transmitting a discovery signal.

[fig. 6] FIG. 6 is a block diagram illustrating an example of a configuration of a terminal device according to the first embodiment.

[fig. 7] FIG. 7 is an explanatory diagram for illustrating a first example of a detection process for detecting a discovery signal in the first embodiment.

[fig. 8] FIG. 8 is an explanatory diagram for illustrating a second example of a detection process for detecting a discovery signal in the first embodiment.

[fig. 9] FIG. 9 is a sequence diagram illustrating an example of a diagrammatic flow of a communication control process according to the first embodiment.

[fig. 10] FIG. 10 is a sequence diagram illustrating an example of a diagrammatic flow of a communication control process according to a first modification of the first embodiment.

[fig. 11] FIG. 11 is a block diagram illustrating an example of a configuration of a terminal device according to the second embodiment.

acquiring system information indicating information to enable a device to communicate with another ~~discover~~ a device via device-to-device communication; and
controlling, with a processor, transmission of the system information to a terminal device.

[Claim 10] A terminal device comprising:

circuitry configured to
acquire system information indicating information to enable a device to communicate with another device via device-to-device communication; and
control a detection process for detecting a discovery signal on the basis of the system information.

[Claim 11] The terminal device according to claim 10, wherein

the circuitry, after detecting the discovery signal transmitted by another terminal device, controls transmission of the discovery signal in a manner that the discovery signal is relayed on a component carrier that does not carry the discovery signal transmitted by the other terminal device from among a plurality of component carriers.

[Claim 12] The communication control device according to claim 1, wherein the system information includes radio resource information to be used by the device when communication with the other device.

[Claim 13] A method for a terminal device, comprising:

acquiring, with circuitry, individual information to enable the terminal device to communicate with another device via device-to-device communication; and
controlling, with the circuitry, transmission of the individual information to a base station.

[Claim 14] A terminal device comprising:

circuitry configured to
acquire information indicating information to enable a device to communicate with another device via device-to-device communication; and
control transmission of a discovery signal on the basis of the information.

[Claim 15] The terminal device according to claim 14, wherein the discovery signal is transmitted on a component carrier of a plurality of component carriers for carrier aggregation.

[Claim 16] The terminal device according to claim 15, wherein the information includes information regarding the plurality of component carriers used